

VERITAS NetBackup™ DataCenter 3.4

Media Manager System Administrator's Guide

UNIX

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VERITAS

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About this Guide

VERITAS Media Manager is used to configure and manage media, drives, and robots for the VERITAS NetBackup DataCenter and Storage Migrator products.

This guide describes the Java administrative interface (GUI) that you can use to manage Media Manager software and its components. See Chapter 1 for a description of the other Media Manager administrative interfaces that are available.

In this guide, VERITAS NetBackup DataCenter is referred to as NetBackup and VERITAS Storage Migrator is referred to as Storage Migrator.

Audience

This guide is intended primarily for the system administrator, who most likely will want to read every chapter.

An operator should read Chapter 4. A tape user, who has no responsibility for administration, may have an interest in reading Chapter 6, which describes the user command interface and possibly the Media Manager overview in Chapter 1.

In this manual, various roles are defined as follows:

- ◆ A system administrator is a person with typical UNIX administrator privileges and responsibilities.
- ◆ An operator may be any user of the system; by default, root user privileges are required to use the operator interface and, to mount volumes, the operator must have physical access to the area where volumes and drives are located.
- ◆ A user is anyone with access to the commands of the system; root user privileges are required to use tapes. The number of tape drives available to a user at one time is determined by the system administrator.

This guide assumes you are familiar with the operating system of the platform on which Media Manager is being used and UNIX systems in general.

Organization

There are six chapters in this guide as follows:



- ◆ Chapter 1 provides an overview of Media Manager and the administrative interfaces that are available.
- ◆ Chapter 2 explains how to configure Media Manager software to manage the drives and robots at your site.
- ◆ Chapter 3 explains how to define media in the volume database so it can be used by the devices controlled by Media Manager.
- ◆ Chapter 4 discusses tasks, such as how to assign a drive to a tape request.
- ◆ Chapter 5 explains how to start and stop the media management daemons and how these daemons relate to each other.
- ◆ Chapter 6 describes the commands for requesting tape mounts, writing files, and other user-related operations.

In addition to these chapters, there are the following appendixes, a glossary of terms, and an index.

- ◆ Appendix A contains the `man` pages for the commands that relate to media management. You can also use the UNIX `man` command to view these commands online.
- ◆ Appendix B provides background information on important Media Manager features and concepts.
- ◆ Appendix C explains how to use the `tpconfig` utility for configuring robots and devices. `tpconfig` is a character-based menu utility.
- ◆ Appendix D explains how to use `vmadm` to define media in the volume database. `vmadm` is a character-based menu utility.
- ◆ Appendix E contains diagrams showing the slot layout and drive locations in many of the robots supported by Media Manager.
- ◆ Appendix F explains how Media Manager works with StorageTek (STK) Automated Cartridge System (ACS) robots.
- ◆ Appendix G explains how Media Manager works with the IBM Automated Tape Library (ATL) to control Tape Library Half-inch (TLH) robots, including the IBM 3494 library.
- ◆ Appendix H explains how Media Manager works with the EMASS Distributed AML Server (DAS) to control Tape Library Multimedia (TLM) robots, including the Grau AML Library.
- ◆ Appendix I explains how Media Manager works with robots under control of the Fujitsu Library Management Facility (LMF).



Related Documents

NetBackup documents that will be useful are listed below. For a complete list of NetBackup related documents, see the NetBackup release notes. Depending on your configuration, other documents may also be required.

- ◆ *NetBackup DataCenter Installation Guide - UNIX*
Provides information on installing NetBackup DataCenter software on a UNIX server.
- ◆ *NetBackup DataCenter System Administrator's Guide - UNIX*
Explains how to configure and manage NetBackup DataCenter on a UNIX system. This manual focuses mainly on the policies that control client backups.
- ◆ *NetBackup Media Manager Device Configuration Guide - UNIX*
Provides information about configuring storage devices on various UNIX systems. This guide is for the NetBackup DataCenter and NetBackup Business Server products.
- ◆ *NetBackup Release Notes*
Contains information, such as, list of new features, platforms and operating systems that are supported, and operating notes that may not be in the manuals or the online help.
- ◆ *NetBackup Troubleshooting Guide - UNIX*
Provides troubleshooting information for the UNIX NetBackup products.
- ◆ *Storage Migrator Release Notes - UNIX*
Provides information, such as, the platforms and operating systems that are supported and operating notes that may not be in the Storage Migrator manuals.
- ◆ *Storage Migrator System Administrator's Guide - UNIX*
Explains how to configure and manage Storage Migrator on a UNIX system.

If your configuration includes Windows NT/2000 servers, you may also need the following manuals:

- ◆ *NetBackup DataCenter Installation Guide - Windows NT/2000*
Provides information on installing NetBackup DataCenter software on a Windows NT/2000 server.
- ◆ *NetBackup DataCenter System Administrator's Guide - Windows NT/2000*
Explains how to configure and manage NetBackup DataCenter on a Windows NT/2000 system.
- ◆ *NetBackup Troubleshooting Guide - Windows NT/2000*



Provides troubleshooting information for the Windows NT/2000 NetBackup products.

- ◆ `Readme.txt`

Provides important information that was not available in time to be included in the manuals. This file is located on the CD ROM and by default is installed in the `NetBackup` directory on your system.

Conventions

The following explains typographical and other conventions used in this guide.

Type Style

Table 1. Typographic Conventions

Typeface	Usage
Bold fixed width	Input. For example, type <code>cd</code> to change directories.
Fixed width	Paths, commands, filenames, or output. For example: The default installation directory is <code>/opt/VRTSxx</code> .
<i>Italics</i>	Book titles, new terms, or used for emphasis. For example: <i>Do not</i> ignore cautions.
<i>Sans serif (italics)</i>	Placeholder text or variables. For example: Replace <i>filename</i> with the name of your file.
Sans serif (no italics)	Graphical user interface (GUI) objects, such as fields, menu choices, etc. For example: Enter your password in the Password field.

Notes and Cautions

Note This is a Note and is used to call attention to information that makes it easier to use the product or helps you to avoid problems.

Caution This is a Caution and is used to warn you about situations that can cause data loss.

Key Combinations

Some keyboard command sequences use two or more keys at the same time. For example, you may have to hold down the Ctrl key before you press another key. When this type of command is referenced, the keys are connected by plus signs. For example:

Press `Ctrl+t`



Command Usage

The following conventions are frequently used in the synopsis of command usage.

brackets []

The enclosed command line component is optional.

Vertical bar or pipe (|)

Separates optional arguments from which the user can choose. For example, when a command has the following format:

```
command arg1 | arg2
```

the user can use either the *arg1* or *arg2* variable.

Getting Help

For updated information about this product, including system requirements, supported platforms, supported peripherals, and a list of current patches available from Technical Support, visit our web site:

```
http://www.veritas.com/
```

For product assistance, contact VERITAS Customer Support.

US and Canadian Customers: 1-800-342-0652

International Customers: +1 (650) 335-8555

VERITAS Customer Support can also be reached through electronic mail at:

```
support@veritas.com
```





Media Manager is used by NetBackup and Storage Migrator to provide media and device management capabilities for tape and optical disk drives. These capabilities include the following:

- ◆ Media and device management interfaces that allow configuration of storage devices.
- ◆ Device monitor interfaces that display the current status of all defined tape devices and pending requests for volumes, allowing the operator to assign tapes or optical disks to the appropriate drives and respond to problems.
- ◆ Automatic scanning of devices for loaded media with automatic volume recognition of recorded volume labels.

Note Automatic volume recognition is the only aspect of ANSI labeled tapes that Media Manager supports. Once a tape is assigned to a request, all volumes are treated as unlabeled, and the user or application is responsible for reading or writing labels if applicable.

- ◆ Support of numerous robotic tape library and optical disk library devices that can automatically retrieve, mount, assign, unmount, and store removable volumes.
- ◆ A volume database containing location and other information about volumes that can be used to identify and retrieve volumes in the robotic devices.
- ◆ Allow any user to request and unmount a specific volume. See “Allowing Nonroot Users to Administer NetBackup” in one of the UNIX NetBackup system administrator’s guides.
- ◆ Ability to obtain a media inventory of a robotic device and update the associated volume database to provide efficient media tracking.
- ◆ The capacity to record statistics. For example, the first and last time the volume was mounted, the date it was created, an expiration date, and the number of times the volume was mounted.
- ◆ Grouping volumes into volume pools for convenience and protection.
- ◆ Capability to perform automated drive cleaning, based on the TapeAlert feature or a frequency-based cleaning schedule.



- ◆ Capability to automatically share tape drives across multiple hosts that have physical access to shared drives through appropriate hardware. This capability requires the installation of the Multihosted Drives option (Shared Storage Option).

See the NetBackup release notes for a list of the platforms and peripherals that Media Manager supports.

Administrator and User Interfaces

The following table shows the Media Manager administrative interface choices that are available. The terminology, general concepts, and results in the databases are the same, regardless of which interface you use.

Table 2. Administrator Interfaces

	GUI	X Windows		Menus		CLI	Wizards
Task	jnbSA	xvmadm	xdevadm	tpconfig	vmadm		
Configure Devices	X		X	X			X
Configure Media	X	X			X	X	X
Manage Devices	X		X			X	

See the following sections for more information on these interfaces:

- ◆ “Java Administrative GUI” on page 29.
- ◆ “X Windows Administrative Interfaces” on page 29.
- ◆ “Menu-Based Administrative Interfaces” on page 29.
- ◆ “Command Line Administrative Interfaces (CLI)” on page 30.
- ◆ “The Device Configuration Wizard” on page 30.
- ◆ “The Volume Configuration Wizard” on page 30.

Note For ease of use, the wizards are recommended for device and media configuration.

In addition, a device installation script can be used for some very simple configurations. See “Device Installation Script” on page 31.



Java Administrative GUI

The NetBackup Java administrative interface allows you to configure and manage media and devices from one main interface. This interface is available on certain UNIX platforms, and by using the NetBackup Windows Display Console on a Windows NT/2000, 98, or 95 system.

See the NetBackup release notes for information on configuring and using the Java interface and the UNIX NetBackup system administrator's guide for an overview of the interface.

To start the Java administrative interface enter the following:

```
/usr/opensv/netbackup/bin/jnbSA
```

X Windows Administrative Interfaces

`xvmadm` is a media management utility with an X Windows graphical interface. This utility has options for configuring and managing the use of media within Media Manager. You can add volumes, delete volumes, and change their attributes. You can also control the Media Manager volume daemon (`vmc`) and access the device management utility, `xdevadm`.

`xdevadm` is a device management utility with an X Windows graphical interface. This utility has options for defining and controlling the devices and robots that run under Media Manager. You can request robotic inventory reports, add and delete devices. If a user sends a tape mount request to Media Manager, you can manually assign the tape to a drive so it can be mounted. In addition, you can list pending requests, deny requests and access the `xvmadm` utility.

These interfaces have an OSF/Motif look-and-feel and require an X terminal or workstation that has X server compatibility with release X11.R5 or later.

Menu-Based Administrative Interfaces

Media Manager has the following utilities that you can use from terminals that do not support Java or X Windows capabilities. These utilities have character-based interfaces that let you choose operations from menus and prompt you for necessary information. You can also use these utilities from X Windows terminals.

`tpconfig`

Used for device configuration. See Appendix C for more information.

`vmadm`

Used for media configuration. See Appendix D for more information.



Command Line Administrative Interfaces (CLI)

Media Manager has commands that you can use from terminals that do not support Java or X Windows capabilities.

`vmopr cmd`

Used for device management. Performs operator functions on drives.

Users and administrators that are not using NetBackup or Storage Migrator can manually request Media Manager to mount and unmount specific volumes. Chapter 6 explains these commands.

`tpreq`

Used to request and mount volumes.

`tpunmount`

Used to unmount volumes.

For more information about these and other commands, see Appendix A.

The Device Configuration Wizard

You can use the Device Configuration Wizard to configure robots and drives. This wizard requires that the devices that you are configuring support complete device serialization. This wizard does not support the configuring of the following:

- ◆ Optical robotic devices.
- ◆ NDMP robotic devices.
- ◆ API robotic devices. API robots are ACS, LMF, RSM, TLH, or TLM Media Manager robot types.

This wizard is available from NetBackup Assistant. Start NetBackup Assistant from the Start menu of the NetBackup Administration window.

The Volume Configuration Wizard

You can use the Volume Configuration Wizard to configure media (volumes). This wizard is available from NetBackup Assistant or the Getting Started Wizard. Start NetBackup Assistant from the Start menu of the NetBackup Administration window.

This wizard configures volumes for standalone drives and robots, but does not support the configuring of the following:

- ◆ Robots that have more than one type of drive
- ◆ API robots



- ◆ Optical robots
- ◆ Optical standalone drives

To configure volumes for other devices, you must use one of the Media and Device Management administrative interfaces.

Device Installation Script

Note For ease of use, the Device Configuration Wizard is recommended for device configuration.

`vmconf` is a configuration and installation script that lets you add new robotic peripherals and drives to a simple Media Manager configuration without using other configuration interfaces.

`vmconf` is intended for use primarily during initial installation of a robotic peripheral. Run the script only once for each robotic peripheral in your system configuration.

Note In complex configurations where multiple hosts or multiple SCSI bus/adaptor connections are used for a single robotic peripheral, you cannot use `vmconf` to complete the device configuration. An example where you cannot this script is with an Automated Cartridge System.

In addition to adding devices, the script does the following:

- ◆ Changes file ownership and group for all files read from the Media Manager and robotic software installation tapes.
- ◆ Checks for `/etc/services` and NIS entries for the Media Manager daemons.
- ◆ Starts all appropriate Media Manager daemons.

Initiate the script by entering `/usr/opensv/volmgr/bin/vmconf`. Further information on using `vmconf` can be found in the tutorial that is available from within the script.

Allowable Media Manager Names

The following set of characters can be used in user-defined names, such as volume groups, volume pool names, media IDs, and drive names. These characters must be used even when specifying these items in foreign languages.

Do not use a minus as the first character or leave any spaces between characters.

- ◆ Alphabetic (A-Z a-z)
- ◆ Numeric (0-9)



- ◆ Period (.)
- ◆ Plus (+)
- ◆ Minus (-)
- ◆ Underscore (_)

Configuring Media Manager - Overview

1. Physically attach the storage devices to the Media Manager server and perform any configuration steps specified by the device or operating system vendor. Also, see the NetBackup Media Manager device configuration guide.

2. Create the system device files for the drives and robotic control.

This is usually done during installation. See the NetBackup Media Manager device configuration guide for information. Device files are created automatically on some UNIX platforms.

3. Make robots and drives available to Media Manager, by adding them to your Media Manager configuration using the Device Configuration Wizard.

When you add devices to the Media Manager configuration, you assign unique robot numbers for robots and drive names for drives. For drives, you also specify whether they are robotic or standalone.

See Chapter 2 for more information. See Chapter 3 for an overview of the Media and Device Management interface that you can also use to add devices.

4. Use the Volume Configuration Wizard to add the media that you will be using in the storage devices.

When you logically add a new volume (or move volumes) in a robot that supports barcodes, a scan occurs and the Media Manager volume database is updated to reflect the contents of the robotic library.

See Chapter 3 for more information. See “Updating the Volume Configuration for a Robot” on page 128 for advanced robot inventory options.

Using Media Manager - Overview

When configuration is complete, you enable device management by starting the Media Manager device daemon (`ltid`). This starts the following daemons:

- ◆ Media Manager device daemon (`ltid`). This daemon allows Media Manager to mount volumes on the tape or optical storage devices in response to user requests.



- ◆ Media Manager volume daemon (`vmd`). This daemon allows Media Manager to track the location of on-line and off-line volumes and remotely manage devices.
- ◆ Automatic volume recognition daemon (`avrd`). If a tape or optical volume is labeled and mounted in a drive, `avrd` automatically reads the label. If the label matches that contained in a pending request, Media Manager assigns the drive to that request.
- ◆ Robotic daemons. If you defined any robotics, `ltid` starts the corresponding robotic daemons.

Once these daemons are started, applications and users can request volumes.

Requesting Volumes

NetBackup and Storage Migrator requests specify the volume's media ID and device density. A request must have a file name to use as a link to the device that is assigned and the EVSN (external volume serial number) for the volume (EVSN corresponds to media ID). When Media Manager receives a request for a volume, it searches its volume database(s) for the media ID.

If the volume is in a robot, the volume database information includes the specific robot that has the volume and the location of the volume within the robot (if applicable). Media Manager then issues a mount command to the robotic daemon controlling the robot and the volume is mounted. Control is returned to NetBackup or Storage Migrator and the media read or write operation proceeds.

Note For standalone drives, NetBackup attempts to use the media in the drive, if the media meets the selection criteria in the request. For more information, see the standalone drive extensions in the UNIX NetBackup system administrator's guides.

Checking Barcodes

Media Manager checks barcodes to ensure that the robot loads the correct tape, in the event that the volume database is incorrect. If the barcode on the tape does not match the barcode in the mount request, Media Manager logs an error and stops the operation. In the case of a backup or restore, NetBackup also logs an error.

If a requested volume is not in a robot, a pending request message appears on the Device Monitor display. The operator must then find the volume, check the display to find a suitable drive, and mount the requested volume in that drive.

If the volume is labeled (tape or optical platter), `avrd` reads the label and the drive is assigned to the request. If the volume is unlabeled, the operator manually assigns the drive to the request.



Volume Pools

Media Manager also uses a concept called volume pools. A volume pool is a set of media that can be used only by the users that you designate when you configure the pool. You specify volume pools and assign media to them when you configure Media Manager. The Media Manager device daemon validates access to volume pools.

Whenever a new volume is required for a robotic or standalone drive, Media Manager allocates it from the volume pool requested by the application. If there are no volumes available in the requested volume pool and a scratch pool has been configured, Media Manager allocates a volume from the scratch pool.

A pool named NetBackup is created by default and, unless you specify otherwise in the class or schedule, all NetBackup images go to media in the NetBackup pool. You can create other volume pools as desired.

See “Volume Pools and Volume Groups” on page 291 for more information.

Allowing Nonroot Users to Administer Media Manager

If you want to allow nonroot users to administer Media Manager, see “Allowing Nonroot Users to Administer NetBackup” in one of the UNIX NetBackup system administrator’s guides.

Administrator’s Quick Reference

Table 3 and Table 4 provide a quick reference to information that you will frequently use while administrating Media Manager.

The Media Manager man pages provide detailed information about most of the commands shown in Table 3.

The Java administrative interface command is located in the directory `/usr/opensv/netbackup/bin`. The other commands shown in the tables are located in `/usr/opensv/volmgr/bin`.

Table 3. Commands

Command	Description
Administrator Utilities	
jnbSA	Starts the Java media and device management, and device monitor administrative interfaces.
xvadm	Starts the X windows based media management utility.
xdevadm	Starts the X windows based, device management utility.



Table 3. Commands (continued)

Command	Description
<code>vmadm</code>	Starts the character-based, menu driven media management utility.
<code>tpconfig</code>	Starts the character-based, menu driven device utility for device configuration.
<code>robtest</code>	Starts the robotic test utilities.
Starting Daemons	
<code>acsd</code>	The Automated Cartridge System robotic daemon. This daemon is started by <code>ltid</code> .
<code>avrdd</code>	Starts the Automatic Volume Recognition daemon.
<code>lmfcd</code>	Starts the Library Management Facility robotic-control daemon.
<code>lmfd</code>	The Library Management Facility robotic daemon. This daemon is started by <code>ltid</code> .
<code>ltid</code>	Starts the Media Manager device daemon. Starting <code>ltid</code> also starts the robotic, robotic control, and Media Manager volume (<code>avrdd</code>) daemons.
<code>odld</code>	The Optical Disk Library robotic daemon. This daemon is started by <code>ltid</code> .
<code>t14d</code>	The Tape Library 4MM robotic daemon. This daemon is started by <code>ltid</code> .
<code>t18cd</code>	Starts the Tape Library 8MM robotic-control daemon.
<code>t18d</code>	The Tape Library 8MM robotic daemon. This daemon is started by <code>ltid</code> .
<code>t1dcd</code>	Starts the Tape Library DLT robotic-control daemon.
<code>t1dd</code>	The Tape Library DLT robotic daemon. This daemon is started by <code>ltid</code> .
<code>t1hcd</code>	Starts the Tape Library Half-inch robotic-control daemon.
<code>t1hd</code>	The Tape Library Half-inch robotic daemon. This daemon is started by <code>ltid</code> .
<code>t1md</code>	The Tape Library Multimedia daemon. This daemon is started by <code>ltid</code> .
<code>ts8d</code>	The Tape Stacker 8MM robotic daemon. This daemon is started by <code>ltid</code> .
<code>tsdd</code>	The Tape Stacker DLT robotic daemon. This daemon is started by <code>ltid</code> .
<code>tshd</code>	The Tape Stacker Half-inch robotic daemon. This daemon is started by <code>ltid</code> .
<code>vmd</code>	Starts the Media Manager volume daemon.
Stopping Daemons	
<code>kill pid</code>	Stops the process for the daemon with the specified <code>pid</code> (process id). This is a system command with a path of <code>/usr/bin/kill</code> or <code>/bin/kill</code> .
<code>lmfcd -t</code>	Stops the Library Management Facility robotic control daemon.
<code>stopltid</code>	Stops the device, robotic, and robotic-control daemons.
<code>t1dcd -t</code>	Stops the Tape Library DLT robotic-control daemon.



Table 3. Commands (continued)

Command	Description
<code>tl8cd -t</code>	Stops the Tape Library 8MM robotic-control daemon.
<code>tlhcd -t</code>	Stops the Tape Library Half-inch robotic-control daemon.
<code>xdevadm</code>	Options for starting and stopping <code>ltid</code> .
<code>xvmadm</code>	Options for starting and stopping <code>vmd</code> .
<code>vmctrldbm -t</code>	Stops the Media Manager volume daemon, <code>vmd</code> .
Monitoring Processes	
<code>vmpps</code>	Lists the active processes.

Table 4 contains descriptions of important Media Manager log files.

Table 4. Logs

Log File	Description
System Log (syslog)	Contains general Media Manager logging, including errors. All log messages use the <code>daemon</code> facility. For debug logging, use the <code>-v</code> option on the command starting the daemon.
<code>daemon/log.ddmmyy</code>	Contains debug information for the volume daemon (<code>vmd</code>) and its associated processes (<code>opr</code> and <code>rdevmi</code>). The directory path is <code>/usr/opensv/volmgr/debug/daemon</code> .
<code>reqlib/log.ddmmyy</code>	Contains debug information on the processes that request <code>vmd</code> . The directory path is <code>/usr/opensv/volmgr/debug/reqlib</code> .
<code>xvmadm/log.ddmmyy</code>	Contains debug information for <code>xvmadm</code> (the path is <code>/usr/opensv/volmgr/debug/xvmadm</code>).
<code>acsssi/event.log</code>	Contains debug and error information for the <code>acsssi</code> component of ACS robotic control. See Appendix F, "Automated Cartridge System".

This chapter explains how to attach drives and robots, and set up Media Manager to use them. If this is the first time you have configured devices, read the following topics in the order they are presented.

- ◆ Using the Device Configuration Wizard
- ◆ Notes on Device Configuration Changes
- ◆ To Perform Initial Device Configuration
- ◆ Remote Administration of Devices on Other Device Hosts
- ◆ To Add Robots
- ◆ To Add Multihosted Drives
- ◆ To Add Drives
- ◆ Managing Robots and Drives
- ◆ Robot and Drive Configuration Examples

See “The Media and Device Management Window” on page 79 for an explanation of the administrative interface that you will use in the procedures of this chapter.

Using the Device Configuration Wizard

Using the Device Configuration Wizard is the recommended method of configuring robots and drives. This wizard requires that the robots and drives that you are configuring support complete device serialization.

This wizard is available on the Actions menu of the Media and Device Management window or from NetBackup Assistant.

The Device Configuration Wizard does not support the following devices:

- ◆ API robots and drives. API robots are ACS, LMF, RSM, TLH, or TLM Media Manager robot types.
- ◆ Optical drives.
- ◆ NDMP robots and drives.



Notes on Device Configuration Changes

The following topics explain important differences to remember when making device configuration changes:

- ◆ Making Changes to UNIX Hosts
- ◆ Making Changes to Windows NT/2000 Hosts

Making Changes to UNIX Hosts

1. Make your device configuration changes.
2. Stop and restart the Media Manager device daemon (`ltid`) using Start/Stop Media Manager Device Daemon on the Actions menu.

Stopping and restarting `ltid` also stops and restarts the robot daemons.

In the dialog box, the browse button to the right of the Device Host box allows you to select a device host. The Current Status box shows the status of this host.

Select a host and the Stop/Restart action, and OK when ready.

Note By using Apply, you can select device hosts and actions for more than one device host before clicking OK to close the dialog box.

Making Changes to Windows NT/2000 Hosts

1. Make your device configuration changes.
2. Stop and restart the NetBackup Device Manager service using Start/Stop Media Manager Device Daemon found on the Actions menu in the Media and Device Management window.

To Perform Initial Device Configuration

1. Physically attach the storage devices to the Media Manager host and perform any configuration steps specified by the device or operating system vendor. Also, see the NetBackup Media Manager device configuration guide for UNIX.
2. Create system device files for the drives and robotic control. This is usually done during installation. See the NetBackup Media Manager device configuration guide for UNIX for instructions. Device files are created automatically on some UNIX platforms.

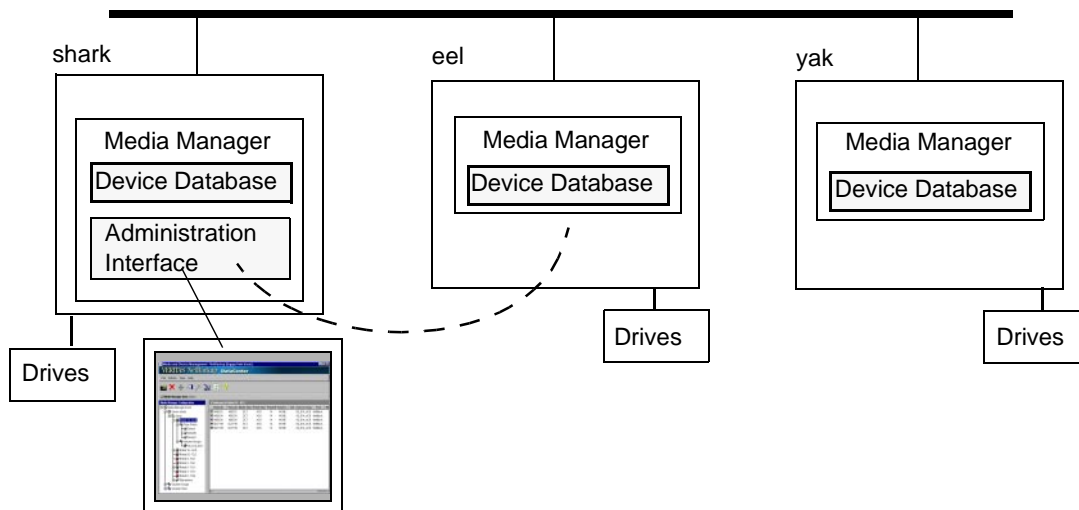


3. Add the storage devices to the Media Manager configuration. If this is the first time you have configured devices:
 - a. See the topics “Notes on Device Configuration Changes” on page 38 and “The Media and Device Management Window” on page 79.
 - b. Depending on the type of device you are adding, proceed to one of the following topics:
 - ◆ “To Add Robots” on page 42.
 - ◆ “To Add Drives” on page 51.

If you are adding the device to a remote host, also see “Remote Administration of Devices on Other Device Hosts” on page 39.

Remote Administration of Devices on Other Device Hosts

By default, you are able to manage storage devices on the server where you are running the Media Manager interface. In the following figure, the administrator is running Media Manager on host shark and managing devices on host eel.

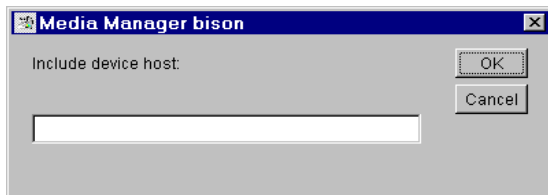


The list of device hosts in the tree pane of the Media and Device Management window initially includes the current Media Manager host (see “Tree and Detail Panes” on page 82).

You can also add other device hosts to the list, so you can easily view and manage their device configurations. To add other device hosts:



1. In the NetBackup Administration window, click Media and Device Management.
2. On the Actions menu, click Include New Device Host.
3. In the dialog box that appears, enter the name of the host whose device configuration you want to add to your view.



4. Click OK.

The tree pane now includes an icon for the device host that you added.

If you encounter problems, see “Configuring Remote Administration of Other UNIX Hosts”.

Configuring Remote Administration of Other UNIX Hosts

The name of the UNIX host that you specify in the Login box, when starting the NetBackup Administration interface, must be in the `bp.conf` file on the remote UNIX host where you want to monitor devices.

Remote Administration Example

For example, you could start the administration interface from a NetBackup Windows Display Console (WDC) running on the Windows host (bear) and specify the UNIX host (shark) in the Login box.

In this example, you

- ◆ Started the interface from the host named bear.
- ◆ Are managing NetBackup, through Java application server software running on the host named shark.
- ◆ Want to manage devices on a third host, named tiger.

The `bp.conf` file on host tiger must include the name of the server that you logged into (shark), not the host where you first started the administration interface (bear).

If you cannot connect to host tiger, add host shark to the `bp.conf` file on host tiger.

Adding SERVER Entries in the `bp.conf` File

1. Add a `SERVER = host` entry below any existing server entries in the `/usr/opensv/netbackup/bp.conf` file.
2. Stop and restart the NetBackup database manager (`bpdbm`) and NetBackup request daemon (`bprd`).

See the NetBackup system administrator's guide for UNIX for more information.

Also, the Media Manager volume daemon must be running on host `tiger` or Media Manager will not be able to update its configuration. This daemon is normally started when you start the Media Manager device daemon. If you suspect that the volume daemon is not running, you should stop and restart the device daemon (see "Making Changes to UNIX Hosts" on page 38).

If you are unable to access the devices, you may need to add a `SERVER` entry to the `vm.conf` file on `tiger`. See "Media Manager Security".

Media Manager Security

For Media Manager to access devices on another host, it may be necessary to add a `SERVER` entry to the `vm.conf` file on the remote host.

`SERVER` entries are used for security. Without any `SERVER` entries and authentication not enabled, *any* host can manage the devices on the host. You can add entries allowing only specific hosts to remotely access the devices. If the `vm.conf` file on a remote host has

- ◆ No `SERVER` entries and authentication is not enabled, any host can manage the devices on this host. It is not necessary to make any additions to `vm.conf`.
- ◆ `SERVER` entries, you must add a `SERVER` entry for the host where you are running the NetBackup Administration utility (if it is not present).

`vmmd` is the Media Manager volume daemon. Device configuration changes, even those made local to a server, may require `vmmd` to be running. It is recommended that `vmmd` be running at all times, including when changes are being made to the Media Manager device configuration.

Note Media Manager authentication/authorization may affect systems where NetBackup authentication/authorization has been enabled. Connections to `vmmd` will fail if authentication/authorization are enabled, an `AUTHORIZATION_REQUIRED` entry is present in `vm.conf`, and the caller of `vmmd` does not have the required permission to use `vmmd` functions.

If authentication/authorization is needed in NetBackup but not in Media Manager, you can add `SERVER` entries in `vm.conf`, or have no `SERVER` and no `AUTHORIZATION_REQUIRED` entries in `vm.conf`.



See “vmd Security” on page 300 for more information.

Example SERVER Entries

Assume that we have three hosts, named eel, yak, and shark; and that NetBackup authentication is not enabled.

We want to centralize device management on host shark and also permit each host to manage its own devices.

- ◆ The `vm.conf` file on shark contains

```
SERVER = shark
```

The `vm.conf` file on shark does not require any additional `SERVER` entries, because all device management for shark will be performed from shark.

- ◆ The `vm.conf` file on eel contains

```
SERVER = eel
```

```
SERVER = shark
```

This allows eel to manage its own devices and also permits shark to access them.

- ◆ The `vm.conf` file on yak contains

```
SERVER = yak
```

```
SERVER = shark
```

This allows yak to manage its own devices and also permits shark to access them.

To Add Robots

Using the Device Configuration Wizard (available on the Actions menu) is the recommended method of configuring robots and drives. See “Using the Device Configuration Wizard” on page 37.

When manually adding a robot and drives, the best method is to add the robot first, as explained in this procedure and then add the drives (see “To Add Drives” on page 51).

1. Perform the steps necessary for the host to recognize it (see “To Perform Initial Device Configuration” on page 38).
2. In the NetBackup Administration window, click Media and Device Management.
3. In the tree pane of the window, expand the tree to show the device host where you want to add the robot.

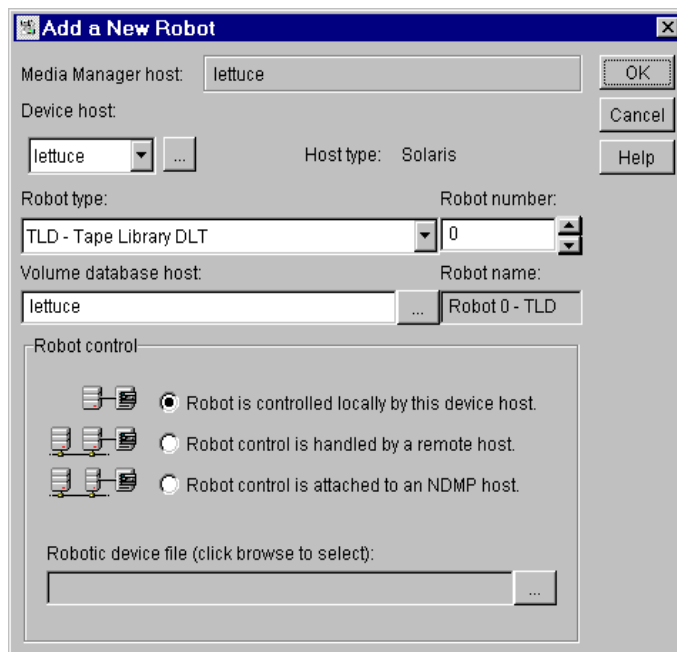


See “Remote Administration of Devices on Other Device Hosts” on page 39 for more information.

4. On the Actions menu, point to New and then click Robot.

The dialog box for adding a robot appears. The properties that appear in this dialog box vary depending on the host platform and robot type.

The following is an example for a TLD robot on a UNIX host:



5. Specify the properties for the robot as explained in “Dialog Box Entries for Robots” on page 43.
6. Click OK.

Dialog Box Entries for Robots

The following topics describe the properties that you specify when you add a robot or change a robot configuration. Note that some of these properties apply only to specific robots or host platforms.



Device Host

Specifies the Media Manager host to which you are adding the robot. The host that is shown initially in the box is the device host you selected earlier in the tree.

If you want to specify a different host, click in the Device Host box and select a name from the list. To choose a device host that is not in the list, click the browse button to the right of the box. In the dialog box that appears, specify the name of the host you want to include. This host is also added to the Media Manager configuration.

Robot Type

Specifies the type of robot that you are adding. Click in the Robot Type box to display a list of the types that Media Manager supports, and select the one that you want to add.

See the latest NetBackup release notes for the robot type to use for specific vendors and models.

Microsoft Windows 2000 Removable Storage Manager (RSM)

If you want to use the RSM robot type, review the following important points:

- ◆ Your device host must be running Windows 2000.
- ◆ You want the Microsoft Removable Storage Manager to control the robot, rather than Media Manager.
- ◆ A robot configured as an RSM robot, cannot also be used as a Media Manager direct-controlled (SCSI) robot (for example, TLD).

Robot Number

Specifies a unique, logical identification number for the robot. This number identifies the robot in listings (for example, Robot 48 - TLD) and you also use it when adding the robot's media to the Media Manager configuration.

Specify a robot number as follows:

- ◆ Robot numbers must be unique for all physically-distinct robots on all hosts in the configuration. This applies regardless of the robot type or the host that controls them. For example, if you have two robots, use different robot numbers even if they are controlled by and configured on different hosts.
- ◆ If you are adding a robot definition for a robot where the robot control is handled by a remote device host (not this device host), be sure to use the same robot number as used for that robot on all other device hosts.

Also, if the robot has its robotic control and drives on different hosts (for example, as permitted by a Tape Library DLT), be certain to specify the same robot number in all references to that library. That is, use the same robot number on the hosts with the drives, as you do on the host that has the robotic control. See “Example 3: Robot and Drives Shared Among Hosts” on page 68.

Volume Database Host

Specifies the name of the host where Media Manager keeps the volume configuration information about the media in the robot. You will have to know the name of the volume database host when adding volumes to the robot.

Adding volumes is explained in Chapter 3.

You can specify any Media Manager host as the volume database host, even if the host does not have any attached drives or robots.

Caution VERITAS recommends that you use one volume database host for all your volumes (robotic and standalone). Although, it is possible to maintain separate volume databases on multiple hosts, administration is more difficult and it is not possible to merge the databases later.

“Example 3: Robot and Drives Shared Among Hosts” on page 68, shows a configuration where the volume database is on a central host.

Robot Control

In this section you specify the control for the robot.

Table 5 provides an overview of configuring robot control, based on robot type and the device host platform. The third column in the table indicates the robot control button that is valid for that particular type and platform, as follows:

- ◆ Local - Robot is controlled locally by this device host
- ◆ Remote - Robot control is handled by a remote host
- ◆ NDMP - Robot control is attached to an NDMP host

Table 5. Robot Control Configuration Overview

Robot Type	Valid Device Host Platform	Robot Control	Information Required for Configuration
ACS	Any (except UNIX Auspex)	Remote	ACSLs host
LMF	UNIX Solaris	Local	Library name
LMF	UNIX Solaris	Remote	Robot control host



Table 5. Robot Control Configuration Overview (continued)

Robot Type	Valid Device Host Platform	Robot Control	Information Required for Configuration
ODL, TL4, TL8, TLD TS8, TSD, TSH	UNIX	Local	Robotic device file
RSM	Windows 2000	Local	Robot device
TL4, TL8, TLD TS8, TSD	Windows NT/2000	Local	Robot device
TL8	Any (except UNIX Auspex, NCR, and Pyramid)	Remote	Robot control host
TLD	Any	Remote	Robot control host
TL8, TLD, TSD	Windows NT/2000 UNIX AIX UNIX Solaris UNIX HP/UX	NDMP	NDMP host name Robot device
TLH	UNIX AIX	Local	LMCP device file
TLH	UNIX (Non-AIX)	Local	Library name
TLH	Windows NT (Intel only)	Local	Library name
TLH	Any	Remote	Robot control host
TLM	UNIX	Remote	DAS server

Depending on the robot type you are adding and the type of device host, various combinations of the robot control buttons will be available. The possibilities are as follows:

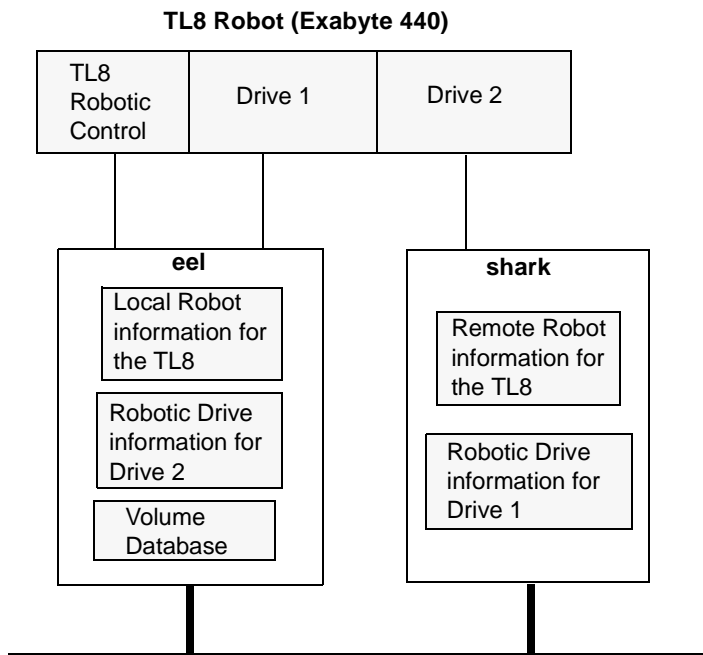
- ◆ You can select one of the three robot control types that are presented.
- ◆ You can select one of two robot control types presented. A third choice is not presented.
- ◆ The robot control type is preselected for you and other choices are not available.

Figure 1 is an example of two hosts using two drives in the same TL8 robot. The robotic control for the robot is on the host named `ee1`. One drive in the robot is connected to `ee1` and the other is connected to the host `shark`.

When you add this robot to the device configuration on `ee1`, you select Robot is controlled locally by this device host. When you add the robot to the device configuration on `shark`, you select Robot control is handled by a remote host.



Figure 1. Robot Control Host Example



Robot is controlled locally by this device host

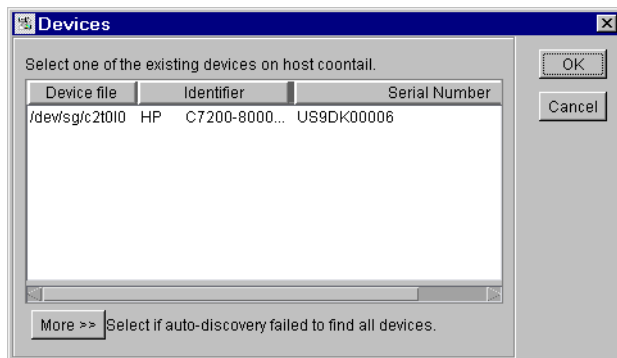
For this type of robot control, you have the following possibilities based on the robot type and device host platform that you selected.

Robotic Device File

For UNIX device hosts, specify the robotic device file path as follows. This file is used for a SCSI connection and is located in the `/dev` directory tree on the Media Manager host.



1. Click the browse button and then select a robotic device file from the list shown in the Devices dialog box.



If the device file entry does not exist, create it as explained in the NetBackup Media Manager device configuration guide for UNIX.

2. If the browse operation fails to find and display all of the attached robots, click the More button to display a dialog box that allows you to enter the path of the device file. Your entry will be set in the Robot Control text box.

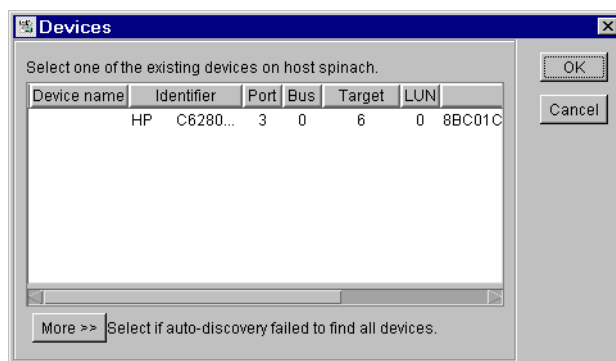
If the browse operation fails, a dialog appears that allows you to enter the path of the device file. Your entry will be set in the Robot Control text box.

Robot Device

For Windows NT/2000 device hosts, specify the robot as follows. For information on RSM robots, see the RSM appendix in the NetBackup Media Manager system administrator's guides for Windows NT/2000.

1. Click the browse button and then select a device from the list shown in the Devices dialog box. Selecting a robot in this dialog will

Set the following in the Robot Control text box	For the following device host
SCSI Port, Bus, Target, and LUN numbers	Windows NT hosts
SCSI Port, Bus, Target, and LUN numbers	Windows 2000 hosts where a changer driver <i>is not</i> in control of the robot
Device name (for example, Changer1)	Windows 2000 hosts where a changer driver <i>is</i> in control of the robot



2. If the browse operation fails to find and display all of the attached robots, click the More button to display a dialog box that allows you to specify the Port, Bus, Target, and LUN numbers, or the device name. Your entry will be set in the Robot Control text box.

If the browse operation fails, a dialog box appears allowing you to specify the Port, Bus, Target, and LUN numbers, or the device name. Your entry will be set in the Robot Control text box.

Note You can find Port, Bus, Target, and LUN numbers in the appropriate Windows NT/2000 applet.

LMCP Device File

For TLH robot types where the IBM ATL is controlled from an AIX device host, specify the LMCP (Library Manager Control Point) device file name, as it is configured on the AIX Media Manager host.



Library Name

For LMF robot types specify the library name. You can use the Fujitsu `lmadmin` command to determine the name.

For TLH robot types where the IBM ATL is controlled from a non-AIX UNIX host, specify the library name that is configured in the `/etc/ibmatl.conf` file on the UNIX host.

For TLH robot types on a Windows NT (Intel) host, specify the library name that is configured in the `C:\winnt\ibmatl.conf` file.

Determine the library name by viewing the file. The following is an example entry in that file, where `3494AH` is the library name:

```
3494AH 176.123.154.141 ibmpc1
```

For more information on TLH and LMF robots, see Appendix G and Appendix I.

Robot control is handled by a remote host

For this type of robot control, you have the following possibilities based on the robot type and device host platform that you selected.

Robot Control Host

For LMF, TL8, TLD, or TLH robot types, specify the device host that controls the robot. Enter the name of the device host where you have defined or will define the robot information for this robot.

Referring to Figure 1 on page 47, you would specify `eel` as the Robot Control Host when adding a robot to host `shark`.

For more information on TLH and LMF robots, see Appendix G and Appendix I.

DAS Server

For TLM robot types that are controlled by an ADIC Distributed AML Server (DAS), specify the host name of the DAS server. This host is usually an OS/2 workstation near or within the ADIC Grau cabinet.

For more information on TLM robots, see Appendix H.

ACSLS Host

For ACS robots, specify the host name of the ACSLS server (which can also be a Media Manager host).

STK LibAttach software must be installed on a Windows NT/2000 Media Manager host that has drives under ACS control.



For an overview of ACS robots, see Appendix F.

Robot control is attached to an NDMP host

For this type of robot control, you specify the following:

NDMP Host Name

Specify the name of the NDMP host where the robot is attached.

Robot Device

Specify the robot device that is attached to the NDMP host.

Click Browse to select a robot device from the list in the Devices dialog.

To Add Multihosted Drives

To add a multihosted drive, you can

- ◆ Click Configure Multihosted Drive from the Actions menu.
- ◆ Point to New and click Multihosted Drive from the Actions menu.

Either action starts a wizard that guides you through the steps involved in configuring drives that will be shared among hosts.

To Add Drives

Using the Device Configuration Wizard (available on the Actions menu) is the recommended method of configuring drives. See “Using the Device Configuration Wizard” on page 37.

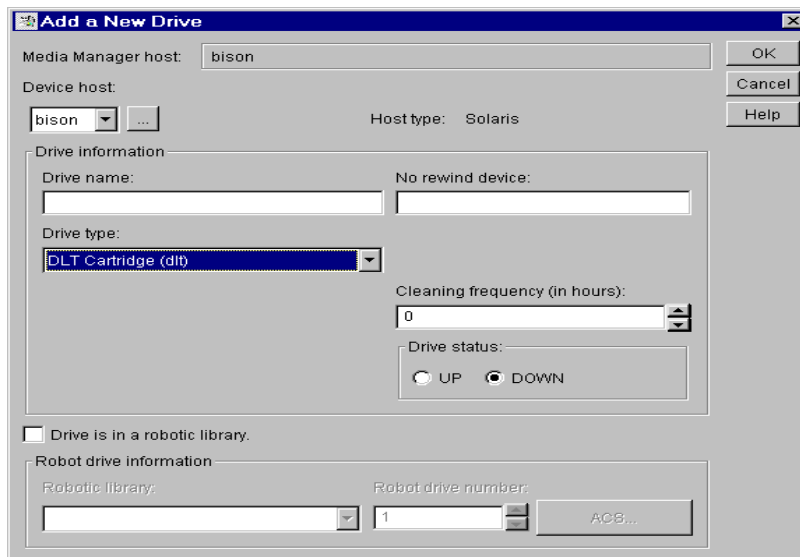
The following procedure explains how to add drives:

1. Perform the steps necessary for the host to recognize the attached drives (see “To Perform Initial Device Configuration” on page 38).
2. In the NetBackup Administration window, click Media and Device Management.
3. In the tree pane of the window, expand the tree to show the device host where you want to add the drive. See “Remote Administration of Devices on Other Device Hosts” on page 39 for more information.
4. On the Actions menu, click New and then click Drive.



The properties that appear in this dialog box vary depending on the host platform and robot type.

The following is an example for a DLT cartridge drive on a UNIX host:



5. Specify the properties of the drive as explained in “Dialog Box Entries for Drives” on page 52.
6. Click OK.
The display now shows the new drive information.
7. If the new drive was standalone, verify the volume database host setting and change it if necessary. See “To Change the Volume Database Host for Standalone Drives” on page 60.

Dialog Box Entries for Drives

The following are the properties that you specify for a drive. Some of these properties apply only to specific types of drives or host platforms.

Device Host

Specifies the Media Manager host to which you are adding the drive. The host that is shown initially in the box is the device host you selected in the tree pane.

If you want to specify a different host, click in the Device Host box and select a name from the list. To choose a host that is not in the list, click the browse button to the right of the box. In the dialog box that appears, specify the name of the host you want to include. This host is also added to the Media Manager configuration.

Drive Information

Drive Type

Specifies the type of drive that you are adding. Click the button in the Drive Type box to display a list of the drive types that Media Manager supports.

See “Media Manager Media Types” on page 274 for more information.

Drive Name

Specify a name that will be used by Media Manager to identify the drive. Descriptive names are recommended and the name *must* be unique if you are using the multihosted drives option.

Device Name

Note Applies only to Windows NT/2000 hosts.

Specify the name of the drive as it is recognized by Windows NT/2000. Enter the name in the box. You can find the name in the registry.

For example, if the registry shows the following display, the device name for the tape is Tape0:

```
Logical Unit Id 0      - TapePeripheral (Tape0)
```

You can also get the device name for the drive from the appropriate Windows NT/2000 applet.

The host type appears to the right of the Device Host box.

No Rewind Device

Note Does not apply to Windows NT/2000 hosts.

Although both no rewind and rewind device files are usually available, Media Manager requires only the no rewind on close device file.

Enter the no rewind on close device file path for the drive.



Device files are located in the `/dev` directory on the UNIX host. If the device files do not exist, create them as explained in the NetBackup Media Manager device configuration guide for UNIX.

A no rewind on close device remains at its current position on a close operation. Usually the device file name is preceded or followed by the letter `n`.

Character Device

Note Applies only to optical disk drives and does not apply to Windows NT/2000 hosts.

Enter the Character Device file path for the drive.

Character device files are in the `/dev` directory on the UNIX host. If the entries do not exist, you can create them as explained in the NetBackup Media Manager device configuration guide for UNIX.

Media Manager uses character mode device files.

Volume Header Device

Note Applies only to optical disk drives on certain UNIX hosts. Does not apply to Windows NT/2000 hosts.

Enter the Volume Header Device path for the drive. This file is in the `/dev` directory on the UNIX host. If the entry does not exist, create it as explained in the NetBackup Media Manager device configuration guide for UNIX.

Cleaning Frequency

If you want to setup a frequency-based cleaning schedule for the drive you are adding, set the desired number of hours between drive cleanings. When you add a drive, Media Manager starts recording the amount of time that volumes have been mounted in that drive.

If you do not specify a cleaning frequency, you can still utilize automated drive cleaning with the Tape Alert feature, provided the following conditions have been met:

- ◆ A cleaning volume has been defined in Media Manager.
- ◆ The host platform, robot type, and drive support drive cleaning.

If the drive is in a robot that supports drive cleaning and a cleaning cartridge is defined in that robot, cleaning occurs when the accumulated mount time exceeds the time you specify for cleaning frequency. The mount time is reset when the drive is cleaned.

See “Drive Cleaning” on page 285 for information on manual cleaning and cleaning tapes.

Drive Status

Note Applies only to UNIX hosts.

The default drive status is UP, meaning the drive is immediately available. You can change the drive status using commands found on the Drives menu of the Device Monitor window.

When the drive status is UP, the default mode is AVR (Automatic Volume Recognition) for all drives except optical drives on an HP9000-800, which are normally in OPR mode.

Drive Is In A Robotic Library

Specifies that the drive is under robotic control. Clear the box for standalone (nonrobotic) drives.

Robotic Drive Information

Robotic Library

If you selected Drive Is In A Robotic Library, this box allows you to select any currently configured robot that can control the drive. Click the box and select from the list.

Robot Drive Number

Note The Robot Drive Number does not apply when adding drives to an ACS (Automated Cartridge System) robot. See “ACS” on page 58.

Specifies the physical location within the robot, of the drive that you specified. It also corresponds to a drive element address or index in the robot software.

Select the number that correlates to the location of the drive that you are adding. When adding more than one drive to a robot, you can add the physical drives in any order. For example, in a TS8 robot you can add drive 2 before drive 1.

When the drive has been added, the Robot Drive designation appears by the drive name in the tree pane. For example, 2-dlt(robA_drv6).

If you assign the wrong number, Media Manager does not detect it, but an error occurs when the robotic control attempts to mount media on the wrong drive. To determine the correct number, you must know which physical drive in the robot is identified by the logical device name (Windows NT/2000) or device file (UNIX) that you specify in this dialog box.



Note The following two topics on configuring drives on Windows NT/2000 and UNIX hosts, may not be necessary if you used the Device Configuration Wizard to configure your drives, and the drives support device serialization.

To Correlate Device Files to Physical Drives (on Windows NT/2000 Hosts)

When selecting the robot drive number for a tape drive, match the logical device name with the drives in the physical drive layout as follows:

1. Note the SCSI target of the drive and check the Windows NT/2000 Tape Devices display to determine which device name (for example, Tape0) was assigned to the tape.
2. Correlate the SCSI target to the robot drive number using the robot's interface panel or checking the indicators on the rear panel of the tape drive.
3. Determine the physical drive number by checking labels on the robot itself or by using the robot and slot layouts in Appendix E.

This appendix shows the layout for many of the robots that Media Manager supports.

4. Optionally, use the appropriate robotic test utility to verify the configuration.
 - a. Stop the NetBackup Device Manager service (`ltid`).
 - b. Start `ltid` to start the Automatic Volume Recognition process (`avrd`). Also start the remote robotic control process, if robotic control is not local to this host.
You must stop and restart `ltid` to ensure that the current device configuration has been activated.
 - c. Use the robotic test utility to mount a tape on a drive.
 - d. Use the Device Monitor to verify the tape was mounted on the correct robot drive number.

For example, assume you have the following drives in a TLD robot and have the device names configured as follows:

Drive 1: Tape0

Drive 2: Tape1

Drive 3: Tape2



Also assume that in step c you requested that the tape be mounted on Drive 1. If the device name for the drive is correctly configured, the Device Monitor shows the tape mounted on Drive 1. Unload and unmount the tape from Drive 1 using the robotic test utility. It may be necessary to unload the drive with a command from another host or from the drive's front panel, if the true data path to the drive where the tape was mounted is not on the host with direct robotic control. Repeat the test for each drive.

During your testing, if the Device Monitor shows the tape mounted on a drive other than the drive you specified in the test utility, the device name for that drive is not correctly configured. For instance, if you mounted a tape on Drive 2 and the Device Monitor shows the tape mounted on Drive 3, the device name for Drive 2 is incorrect. Replace the Drive 2 device name (`Tape1`) with the correct device name (`Tape2`) for Drive 3. You may need to use a temporary device name while making these changes. In this case, you also know that the device name for Drive 3 is incorrect. Possibly, the device names were swapped during configuration.

To Correlate Device Files to Physical Drives (on UNIX Hosts)

Establish device file to physical drive correlation during installation when you create the device files for each drive. The following is a general procedure:

1. Determine the physical location of each drive within the robot. This is usually shown on the connectors to the drives or in the vendor's documentation.

Appendix E shows drive locations in many of the robots that Media Manager supports. Also see Appendix G, Appendix H, and Appendix I.

2. Physically connect the drives to SCSI adapters in your host.
3. Record the adapter and SCSI addresses to which you connected each drive.
4. Create device files for each drive based on the SCSI addresses of the drives and adapters. Add the device file using your notes from step 3 to complete the correlation between device files and physical drive location.
5. Configure the robot and then add the drives.

When you add the drives, check your notes to ensure that you are assigning the correct robot drive number to each device path.

6. Optionally, you can use the appropriate robotic test utility to verify the configuration.
 - a. Stop the device daemon (`ltid`).
 - b. Start `ltid` to start the Automatic Volume Recognition daemon (`avrd`). Also start the remote robotic control daemon, if robotic control is not local to this host.



You must stop and restart `ltid` to ensure that the current device configuration has been activated.

- c. Use the robotic test utility to mount a tape on a drive.
- d. Use the Device Monitor to verify the tape was mounted on the correct robot drive number.

For example, assume you have the following drives in a TLD robot and have the device paths configured as follows:

Drive 1: `/dev/rmt/0cbn`

Drive 2: `/dev/rmt/1cbn`

Drive 3: `/dev/rmt/3cbn`

Also assume that in step c you requested that the tape be mounted on Drive 1. If the device path for the drive is correctly configured, the Device Monitor shows the tape mounted on Drive 1. Unload and unmount the tape from Drive 1 using the robotic test utility. It may be necessary to unload the drive with a command from another host or from the drive's front panel, if the true data path to the drive where the tape was mounted is not on the host with direct robotic control. Repeat the test for each drive.

During your testing, if the Device Monitor shows the tape mounted on a drive other than the drive you specified in the test utility, the device path for that drive is not correctly configured. For instance, if you mounted a tape on Drive 2 and the Device Monitor shows the tape mounted on Drive 3, the device path for Drive 2 is incorrect. Replace the Drive 2 device path (`/dev/rmt/1cbn`) with the correct device path (`/dev/rmt/3cbn`) for Drive 3. You may need to use a temporary device path while making these changes. In this case, you also know that the device path for Drive 3 is incorrect. Possibly, the device paths were swapped during configuration.

ACS

For drives in an Automated Cartridge System robot, click ACS to specify the physical location of the drive within the ACS robot. A dialog box appears that allows you to enter the following:

- ◆ ACS Number - The index (in ACSLS terms) that identifies the robot that has this drive.
- ◆ LSM Number - The Library Storage Module that has this drive.
- ◆ Panel Number - The robot panel where this drive is located.
- ◆ Drive Number - The physical number of the drive (in ACSLS terms).

If you assign the wrong parameters, Media Manager does not detect it but an error eventually occurs when the Automated Cartridge System mounts media on the wrong drive. To determine the physical location, you must know which physical drive in the robot is identified by the device files that you specified earlier. You establish this correlation during installation.

Appendix F, has further information.

Managing Robots and Drives

The following topics explain how to manage your robots and drives:

- ◆ To Change a Robot Configuration
- ◆ To Change a Drive Configuration
- ◆ To Change the Volume Database Host for Standalone Drives
- ◆ To Delete Robots
- ◆ To Delete Drives

Rerunning the Device Configuration Wizard updates the Media Manager configuration. For example, adding a new SCSI adapter may change the path to a robot. A similar change to the configuration may occur if you add a new drive.

The Device Configuration Wizard will update the Media Manager configuration to match the new configuration. See “Using the Device Configuration Wizard” on page 37.

To Change a Robot Configuration

1. In the NetBackup Administration window, click Media and Device Management.
2. In the tree pane, expand the tree to show the device host that has the robot you want to update. See “Remote Administration of Devices on Other Device Hosts” on page 39 for more information.
3. Choose the robot.
4. On the Actions menu, click Change.
A dialog box appears, showing the current information for the selected robot.
5. Make the desired changes (see “Dialog Box Entries for Robots” on page 43).
6. Click OK.



To Change a Drive Configuration

To change information about a drive, use the following procedure:

1. In the NetBackup Administration window, click Media and Device Management.
2. In the tree pane, expand the tree to show the device host that has the robot and drive you want to update. See “Remote Administration of Devices on Other Device Hosts” on page 39 for more information.
3. Choose the drive.
4. On the Actions menu, click Change.
 - a. If the drive you selected is a multihosted drive, a wizard is started to guide you through the steps involved in changing the configuration for a multihosted drive. Follow the prompts.
 - b. If the drive you selected is a not multihosted drive, a dialog box appears showing the current information for the selected drive. Make the desired changes (see “Dialog Box Entries for Drives” on page 52) and Click OK.

To Change the Volume Database Host for Standalone Drives

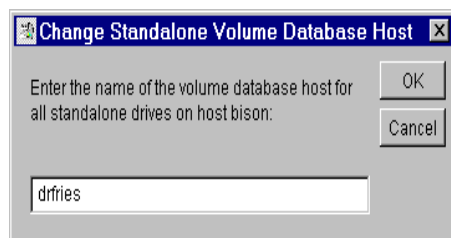
All standalone drives on a specific host must use the same volume database.

To change this host:

1. In the NetBackup Administration window, click Media and Device Management.
2. In the tree pane, expand the tree to show the device host where the drive is attached. See “Remote Administration of Devices on Other Device Hosts” on page 39 for more information.
3. Choose the Standalone entry.
4. On the Actions menu, click Change.

The Change Standalone Volume Database Host dialog box appears, showing the current host.





5. To change the host, enter the new host name in the text box .

You can enter any Media Manager host, even if it does not have any attached drives. However, VERITAS recommends that you use a single volume database host for all your volumes (robotic and standalone). It is possible to maintain separate volume databases on multiple hosts, but administration is more difficult and it is not possible to merge the databases later.

6. Click OK.

To Delete Robots

1. In the NetBackup Administration window, click Media and Device Management.
2. In the tree pane, expand the tree to show the device host and the robot. See “Remote Administration of Devices on Other Device Hosts” on page 39 for more information.
3. Choose the robot.
4. On the Actions menu, click Delete.

Any drives that were configured on the robot are changed to standalone drives.

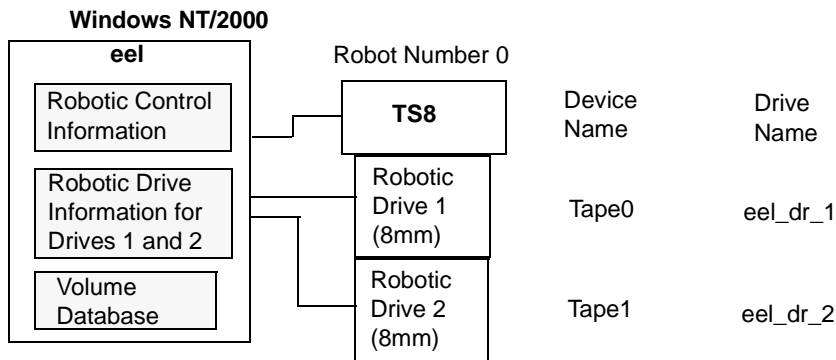
To Delete Drives

1. In the NetBackup Administration window, click Media and Device Management.
2. In the tree pane, expand the tree to show the device host and the drive. See “Remote Administration of Devices on Other Device Hosts” on page 39 for more information.
3. Choose the drive.
4. On the Actions menu, click Delete.



Robot and Drive Configuration Examples

Example 1: Host With One Robot



This is a configuration with a tape stacker containing two 8mm tape drives. The robot and drives are connected to a host running Windows NT/2000.

After installing Media Manager software and attaching the drives, run the Device Configuration Wizard or complete the Add Robot and Add Drive dialog box entries as shown in the following tables.

Table 6. Example 1: Add Robot Dialog Entries

Device Host	eel
Robot Type	TS8 - Tape Stacker 8MM
Volume Database Host	eel
Robot Number	0
Robot is controlled locally by this device host	Set (cannot be changed for this robot type)
Robot Device	<p>Selecting a robot device sets the SCSI Port, Bus, Target, and LUN numbers in the dialog for Windows NT hosts and for Windows 2000 hosts where a changer driver <i>is not</i> in control of the robot.</p> <p>On Windows 2000 hosts where a changer driver <i>is</i> in control of the robot, selecting a robot device sets the changer name in the dialog.</p>

Table 7. Example 1: Add Drive Dialog Entries (Tape0)

Device Host	eel
Drive Type	8mm Cartridge (8mm)
Drive Name	eel_dr_1
Device Name	Tape0
Drive is in a Robotic Library	Yes
Robotic Library	TS8(0) - eel
Robot Drive Number	1

Table 8. Example 1: Add Drive Dialog Entries (Tape1)

Device Host	eel
Drive Type	8mm Cartridge (8mm)
Drive Name	eel_dr_2
Device Name	Tape1
Drive is in a Robotic Library	Yes
Robotic Library	TS8(0) - eel
Robot Drive Number	2

If eel was a UNIX host, you would complete the following dialog box entries. Your actual entries needed may vary from these examples.

Table 9. Example 1 (UNIX): Add Robot Dialog Entries

Device Host	eel
Robot Type	TS8 - Tape Stacker 8MM
Volume Database Host	eel
Robot Number	0
Robot is controlled locally by this device host	Set (cannot be changed for this robot type)
Robotic Device File	/dev/sg/c0t410



Table 10. Example 1 (UNIX): Add Drive Dialog Entries (Tape0)

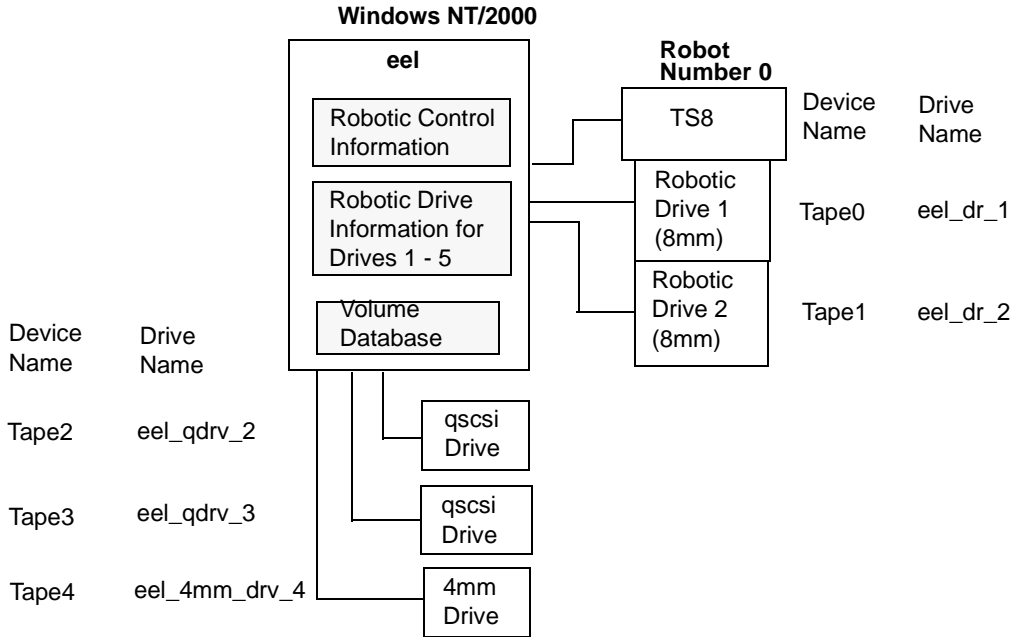
Device Host	eel
Drive Name	eel_dr_1
Drive Type	8mm Cartridge (8mm)
No Rewind Device	/dev/rmt/5cbn
Cleaning Frequency	25
Drive Status	UP
Drive is in a Robotic Library	Yes
Robotic Library	TS8(0) - eel
Robot Drive Number	1

Table 11. Example 1 (UNIX): Add Drive Dialog Entries (Tape1)

Device Host	eel
Drive Name	eel_dr_2
Drive Type	8mm Cartridge (8mm)
No Rewind Device	/dev/rmt/6cbn
Cleaning Frequency	25
Drive Status	UP
Drive is in a Robotic Library	Yes
Robotic Library	TS8(0) - eel
Robot Drive Number	2



Example 2: Host With Standalone Drives



This example adds three standalone drives to the device configuration for host eel shown in Example 1. As in that example, the volume database and all devices are on the same host. The following tables show the Add Drive dialog box entries for the standalone drives. Configuration information for the robot and its two drives are the same as in Example 1 and is not repeated here.

Table 12. Example 2: Add Drive Dialog Entries (Tape2)

Device Host	eel
Drive Type	1/4" Cartridge (qscsi)
Drive Name	eel_qdrv_2
Device Name	Tape2
Drive is in a Robotic Library	No

Table 13. Example 2: Add Drive Dialog Entries (Tape3)

Device Host	eel
-------------	-----



Table 13. Example 2: Add Drive Dialog Entries (Tape3)

Drive Type	1/4" Cartridge (qscsi)
Drive Name	eel_qdrv_3
Device Name	Tape3
Drive is in a Robotic Library	No

Table 14. Example 2: Add Drive Dialog Entries (Tape4)

Device Host	eel
Drive Type	4mm Cartridge (4mm)
Drive Name	eel_4mm_drv_4
Device Name	Tape4
Drive is in a Robotic Library	No

If eel was a UNIX host, you would complete the following dialog box entries. Your actual entries may vary from these examples.

Table 15. Example 2 (UNIX): Add Drive Dialog Entries (Tape2)

Device Host	eel
Drive Name	eel_qdrv_2
Drive Type	1/4" Cartridge (qscsi)
No Rewind Device	/dev/rmt/2cbn
Drive Status	UP
Drive is in a Robotic Library	No

Table 16. Example 2 (UNIX): Add Drive Dialog Entries (Tape3)

Device Host	eel
Drive Name	eel_qdrv_3
Drive Type	1/4" Cartridge (qscsi)
No Rewind Device	/dev/rmt/3cbn
Drive Status	UP



Table 16. Example 2 (UNIX): Add Drive Dialog Entries (Tape3)

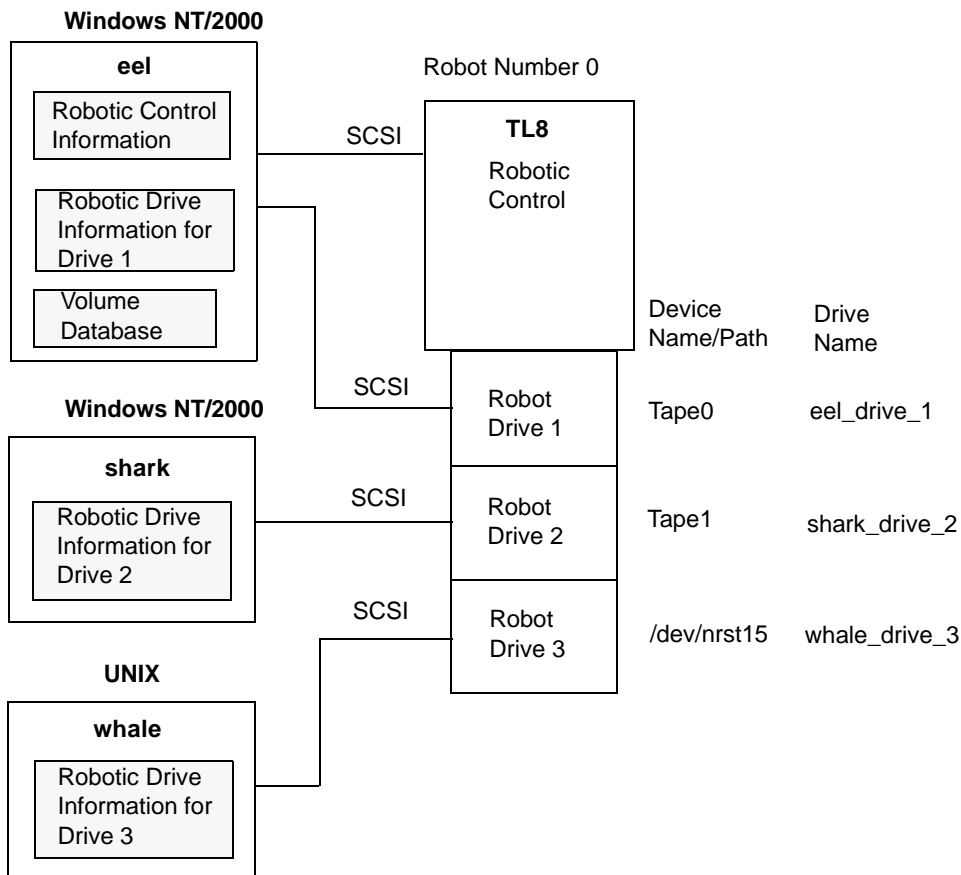
Drive is in a Robotic Library	No
-------------------------------	----

Table 17. Example 2 (UNIX): Add Drive Dialog Entries (Tape4)

Device Host	eel
Drive Name	eel_4mm_drv_4
Drive Type	4mm Cartridge (4mm)
No Rewind Device	/dev/rmt/4cbr
Cleaning Frequency	25
Drive Status	UP
Drive is in a Robotic Library	No



Example 3: Robot and Drives Shared Among Hosts



This is a more complex configuration than the previous examples because it involves a robot that has its robotic control on one host and its drives used by two other hosts.

After installing Media Manager software and attaching the drives, run the Device Configuration Wizard or complete the Add Robot and Add Drive dialog box entries as shown in the following tables. Some things to note when examining these tables follow:

- ◆ Media for all devices is configured in a common volume database, which is located on eel.
- ◆ The Robot Number is 0 in all three cases. This is required because the three hosts refer to the physical robot. In this case, robotic control is on host eel.
- ◆ Robot Drive Numbers correlate to the physical drive assignment within the robot.

- ◆ When you add volumes, add them to host eel because the volume database is on that host.

Configuration on the Windows NT/2000 Host eel

Make the following entries to the Add Robot and Add Drive dialogs:

Table 18. Example 3 (eel): Add Robot Dialog Entries

Device Host	eel
Robot Type	TL8 - Tape Library 8MM
Volume Database Host	eel
Robot Number	0
Robot is controlled locally by this device host	Set
Robot Device	<p>Selecting a robot device sets the SCSI Port, Bus, Target, and LUN numbers in the dialog for Windows NT hosts and for Windows 2000 hosts where a changer driver <i>is not</i> in control of the robot.</p> <p>On Windows 2000 hosts where a changer driver <i>is</i> in control of the robot, selecting a robot device sets the changer name in the dialog.</p>

Table 19. Example 3 (eel): Add Drive Dialog Entries (Drive 1)

Device Host	eel
Drive Type	8mm Cartridge (8mm)
Drive Name	eel_drive_1
Device Name	Tape0
Drive is in a Robotic Library	Yes
Robotic Library	TL8(0) - eel
Robot Drive Number	1



Configuration on the Windows NT/2000 Host shark

Make the following entries in the Add Robot and Add Drive dialogs:

Table 20. Example 3 (shark): Add Robot Dialog Entries

Device Host	shark
Robot Type	TL8 - Tape Library 8MM
Volume Database Host	eel
Robot Number	0
Robot control is handled by a remote host	Set
Robot Control Host	eel

Table 21. Example 3 (shark): Add Drive Dialog Entries (Drive 2)

Device Host	shark
Drive Type	8mm Cartridge (8mm)
Drive Name	shark_drive_2
Device Name	Tape1
Drive is in a Robotic Library	Yes
Robotic Library	TL8(0) - eel
Robot Drive Number	2

Configuration on the UNIX Host whale

Make the following entries to the Add Robot and Add Drive dialogs:

Table 22. Example 3 (whale): Add Robot Dialog Entries

Device Host	whale
Robot Type	TL8 - Tape Library 8MM
Volume Database Host	eel
Robot Number	0
Robot control is handled by a remote host	Set
Robot Control Host	eel

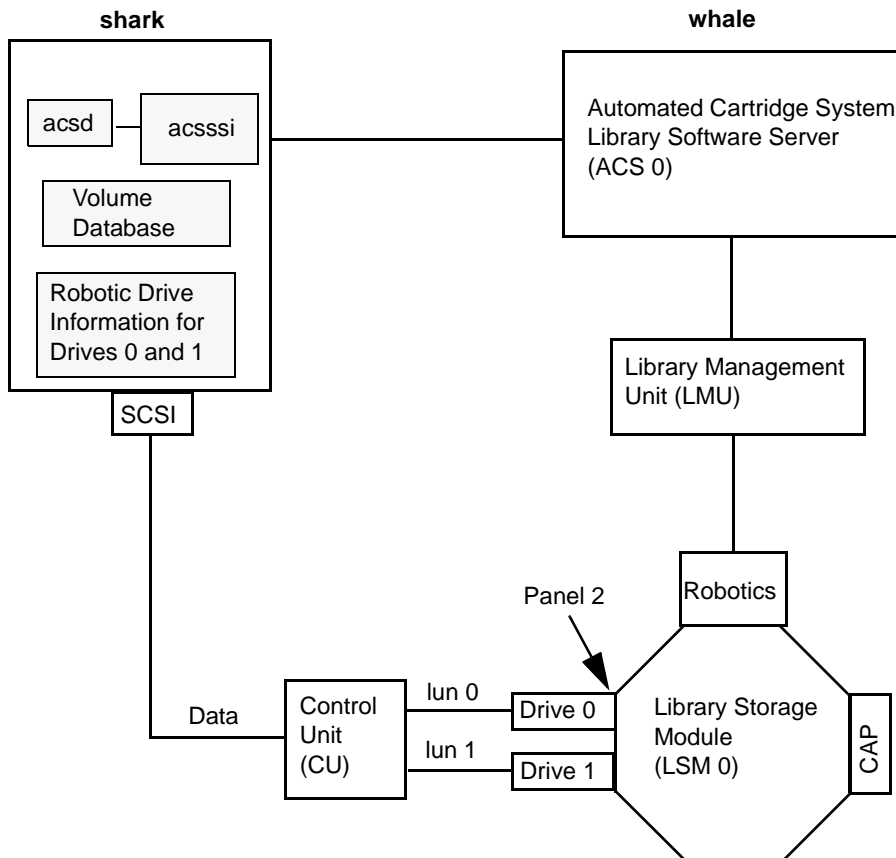


Table 23. Example 3 (whale): Add Drive Dialog Entries (Drive 3)

Device Host	whale
Drive Name	whale_drive_3
Drive Type	8mm Cartridge (8mm)
No Rewind Device	/dev/nrst15
Cleaning Frequency	20
Drive Status	UP
Drive is in a Robotic Library	Yes
Robotic Library	TL8(0) - eel
Robot Drive Number	3



Example 4: UNIX Host With An ACS Robot



This configuration uses an Automated Cartridge System robot for storage. Host shark can be a UNIX NetBackup master server or media server. The following tables show the Add Drive and Add Robot dialog entries for host shark. Some things to note when reviewing these tables follow:

- ◆ The ACSLS host is whale, the ACSLS server. Note that it is also possible to run Media Manager and ACSLS server software on the same host, eliminating the need for two servers (only Sun Solaris and IBM RS6000 are supported ACSLS servers).
- ◆ The ACS, PANEL, LSM, and DRIVE numbers are part of the ACSLS configuration and must be obtained from the administrator of that system.
- ◆ Robot number and ACS number are different terms. Robot number is the robot identifier used in Media Manager. ACS number is the robot identifier in ACSLS. These numbers can be different, although they both default to zero.

- ◆ It is possible for the drives to connect through an independent Control Unit. If so, the correct Logical Unit Numbers are needed in order to find the correct tape name to use.
- ◆ The Add Robot dialog entries include an ACSLS Host entry, since communication with the ACSLS server is over the network using ACS Server System Interface (*acsssi*).

See Appendix F for more information.

Table 24. Example 4: Add Robot Dialog Entries

Device Host	shark
Robot Type	ACS - Automated Cartridge System
Volume Database Host	shark
Robot Number	0
Robot control is handled by a remote host	Set (cannot be changed for this robot type)
ACSLS Host	whale

Table 25. Example 4: Add Drive Dialog Entries (Drive 0)

Device Host	shark
Drive Type	1/2" Cartridge (hcart)
Drive Name	shark_drive_0
Drive is in a Robotic Tape Library	Yes
Robotic Library	ACS(0) - whale
ACS	ACS Number: 0 LSM Number: 2 PANEL Number: 0 DRIVE Number: 0

Table 26. Example 4: Add Drive Dialog Entries (Drive 1)

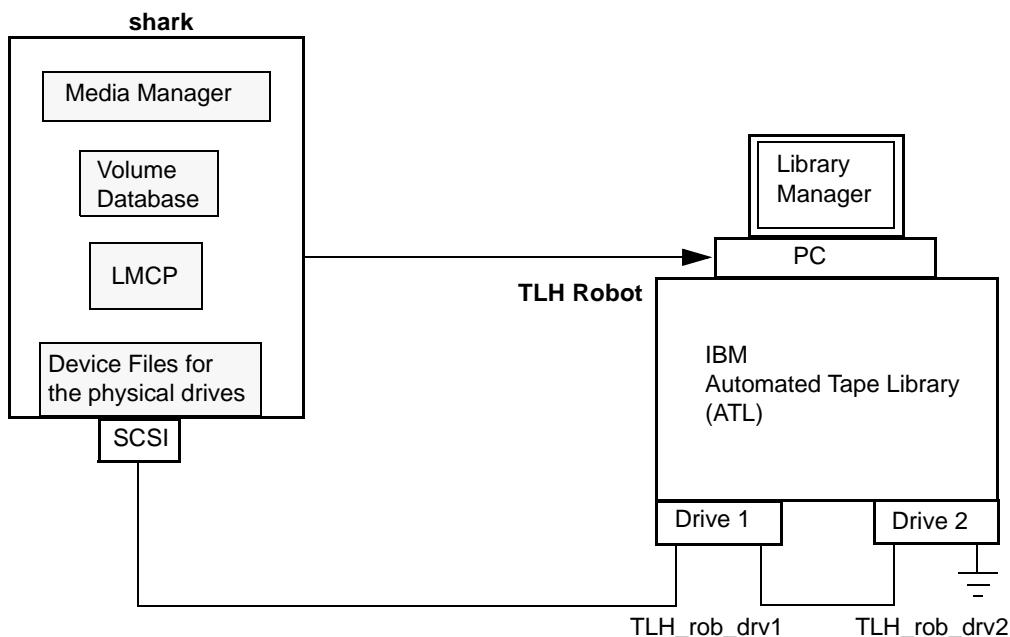
Device Host	shark
Drive Type	1/2" Cartridge (hcart)



Table 26. Example 4: Add Drive Dialog Entries (Drive 1)

Drive Name	shark_drive_1
Drive is in a Robotic Library	Yes
Robotic Library	ACS(0) - whale
ACS	ACS Number: 0 LSM Number: 2 PANEL Number: 0 DRIVE Number: 1

Example 5: UNIX Host With A TLH Robot



This configuration uses a TLH robot for storage. Device host shark can be a UNIX AIX, Solaris, HP-UX, IRIX, or Windows NT (Intel only) system, and can be a NetBackup master server or media server.

The following tables show the Add Drive and Add Robot dialog box entries. Some things to note when examining these tables follow:

- ◆ The robot control host is the host, shark. Note that it is also possible to have the robotic control (tlhcd) on a different host.

- ◆ The main difference between configuring a TLH robot and other robot types is the robotic device file. The robotic device file is the Library Manager Control Point (LMCP) file on AIX systems and is the library name on non-AIX systems.

In this example, shark is a UNIX AIX host, so the LMCP file is specified for the robotic device file.

If shark was a UNIX non-AIX or a Windows NT host, you would specify the library name (for example 3494AH).

See Appendix G for more information.

- ◆ The drive configuration is the same as for other robot types, except that you cannot assign a cleaning frequency using Media Manager.

Table 27. Example 5 (shark): Add Robot Dialog Entries

Device Host	shark
Robot Type	TLH - Tape Library Half-inch
Volume Database Host	shark
Robot Number	0
Robot is controlled locally by this device host	Set
LMCP Device File	/dev/lmcp0

Table 28. Example 5 (shark): Add Drive Dialog Entries (Drive 1)

Device Host	shark
Drive Name	TLH_rob_drv1
Drive Type	1/2" Cartridge (hcart)
Drive is in a Robotic Tape Library	Yes
Robotic Library	TLH(0) - shark
Robot Drive Number	1
No Rewind Device	/dev/rmt4.1
Drive Status	Up

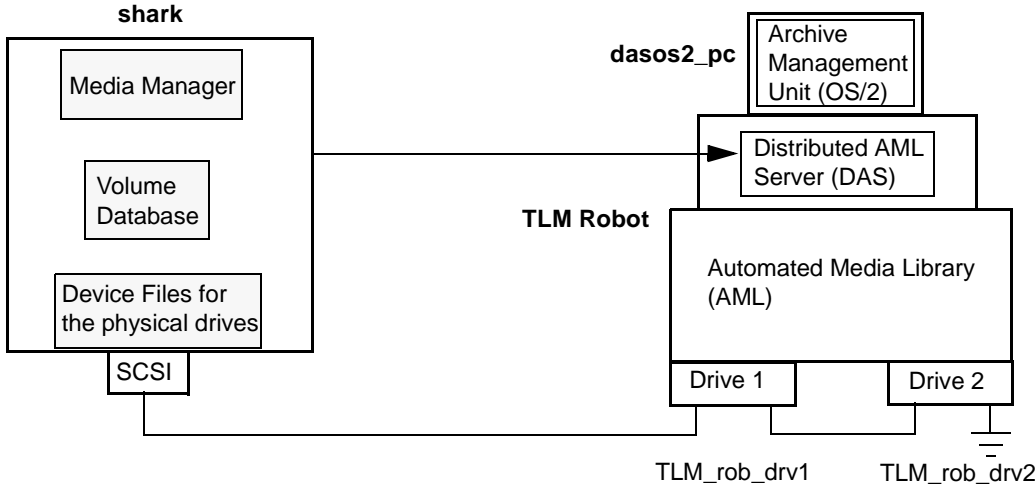


Table 29. Example 5 (shark): Add Drive Dialog Entries (Drive 2)

Device Host	shark
Drive Name	TLH_rob_drv2
Drive Type	1/2" Cartridge (hcart)
Drive is in a Robotic Tape Library	Yes
Robotic Library	TLH(0) - shark
Robot Drive Number	2
No Rewind Device	/dev/rmt1.1
Drive Status	Up



Example 6: UNIX Host With A TLM Robot



This configuration uses a TLM robot for storage. In Media Manager, the device configuration for this robot is similar to the TS8 explained in “Example 1: Host With One Robot” on page 62.

However, with a TLM robot, you specify the DAS server instead of a robot control host. The DAS server resides on an IBM OS/2 system, usually in or near the Grau cabinet.

In this example, the DAS Server entry is `dasos2_pc`. It is also necessary to verify that the Distributed AML Server is configured to recognize host `shark` as a client and that the AML drives are allocated to `shark`.

See Appendix H for further information.

Table 30. Example 6 (shark): Add Robot Dialog Entries

Device Host	shark
Robot Type	TLM - Tape Library Multimedia
Volume Database Host	shark
Robot Number	0
Robot control is handled by a remote host	Set (cannot be changed for this robot type)
DAS Server	dasos2_pc



Table 31. Example 6 (shark): Add Drive Dialog Entries (Drive 1)

Device Host	shark
Drive Name	TLM_rob_drv1
Drive Type	1/2" Cartridge (hcart)
Drive is in a Robotic Tape Library	Yes
Robotic Library	TLM(0) - shark
Robot Drive Number	1
No Rewind Device	/dev/rmt/rmt0h
Cleaning Frequency	25
Drive Status	Up

Table 32. Example 6 (shark): Add Drive Dialog Entries (Drive 2)

Device Host	shark
Drive Name	TLM_rob_drv2
Drive Type	1/2" Cartridge (hcart)
Drive is in a Robotic Tape Library	Yes
Robotic Library	TLM(0) - shark
Robot Drive Number	2
No Rewind Device	/dev/rmt/rmt1h
Cleaning Frequency	25
Drive Status	Up

Managing Media

3

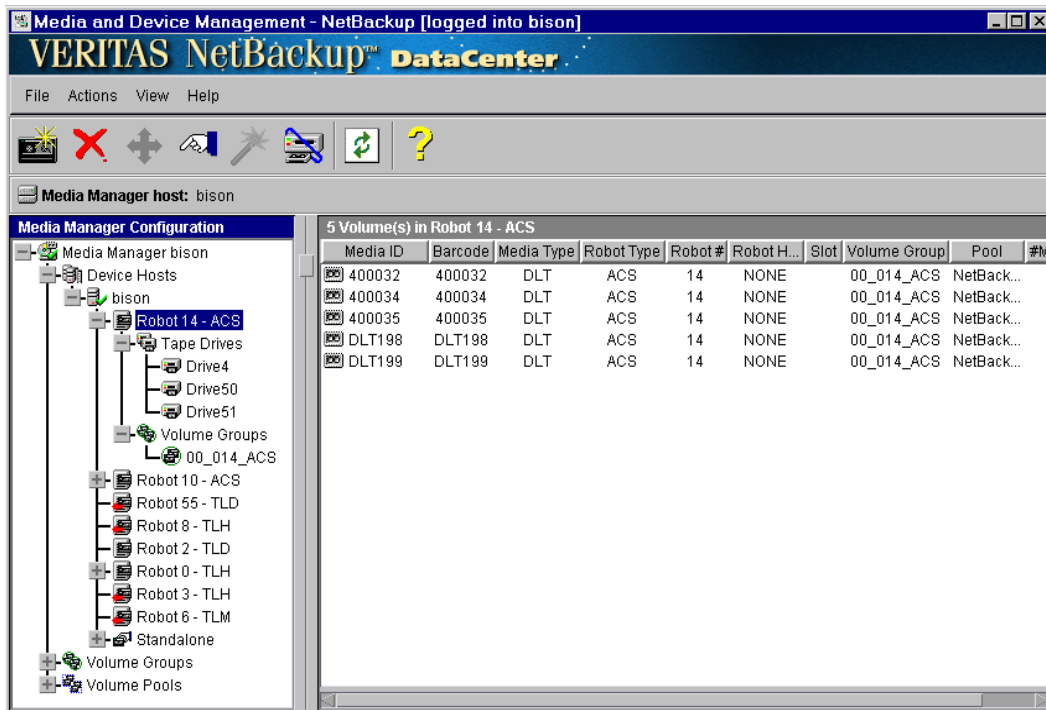
This section explains how to add and manage the removable media that Media Manager controls. These media are referred to as volumes and are assigned media IDs and other attributes that are required in order to track and manage them.

The Media and Device Management Window

The Media and Device Management window provides the tools required to manage the volumes and devices that Media Manager uses. To display this window, click Media and Device Management in the NetBackup Administration window.



Figure 2. Media and Device Management Window



The following topics provide an overview of the window's contents:

- ◆ Toolbars
- ◆ Menus
- ◆ Shortcut Menus
- ◆ Tree and Detail Panes

Other topics in this chapter explain the tasks that you can perform.

Toolbars

The buttons on the toolbar provide shortcuts for commands that are on the menus. If the toolbar is not visible or you want to change the display of its buttons:

1. From the View menu, click Preferences.
2. Make your choices in the Preferences dialog box.



Menus

The Media and Device Management window has the following menus and commands:

Table 33. Media and Device Management Menus and Commands

Menu	Commands
File	<p>Change Media Manager Host - (Without Global Data Manager) Displays a dialog box that allows you to specify the host on which you are going to manage the volume database.</p> <p>Append Media Manager - (With Global Data Manager) Displays a dialog box that allows you to add a host to your tree view.</p> <p>Exit - Closes the window.</p>
Actions	<p>New - Displays a dialog box for adding volumes, volume pools, robots, drives, or multihosted drives to a configuration.</p> <p>Change - Displays a dialog box for changing the configuration of the selected items.</p> <p>Move - Displays a dialog box for specifying where you want to move the selected item. This command is not available for volume pools.</p> <p>Move Volume Group - Displays a dialog box for specifying where you want to logically move a group of volumes.</p> <p>Delete - Deletes selected items from the configuration.</p> <p>Change Volume Group - Displays a dialog box for changing the volume group for selected volumes.</p> <p>Configure Multihosted Drive - Starts a wizard that guides you through the steps involved in configuring drives that will be shared among hosts.</p> <p>Device Configuration Wizard - Starts a wizard that guides you through the steps involved in configuring robots and drives.</p> <p>Rescan/Update Barcodes - Rescans the barcodes in the selected robot and updates the barcodes for the selected volumes, as necessary.</p> <p>Analyze Configuration - Displays a dialog box for starting the configuration analyzer. This analyzer verifies that the settings in your Shared Storage Option (multihosted drive) configuration are consistent and checks for potential problems.</p> <p>Eject Volume From Robot - Ejects a selected volume to the robot's exit port.</p> <p>Inventory Robot - Displays a dialog box with choices for performing an inventory of the selected robot or updating the volume configuration to match the contents of the robot.</p> <p>Include New Device Host - Adds the specified host to the list of device hosts that appear in the tree.</p> <p>Start/Stop Media Manager Device Daemon - Controls the Media Manager device daemon.</p>



Table 33. Media and Device Management Menus and Commands

Menu	Commands
View	Preferences - Displays a dialog box that allows you to specify your display preferences. Ignore Host(s) - (With Global Data Manager) Sets a server to the ignored state so the Master of Masters will not attempt connections to it. Recognize Host(s) - (With Global Data Manager) Sets a server to the recognized state so the Master of Masters can connect to it. Refresh - Refreshes the lists in the window.
Help	Help Topics - Provides online help information about the NetBackup application window. About Media and Device Management - Displays program information, version number, and copyright information.

Shortcut Menus

Clicking the right mouse button while the pointer is over a pane or a selection in a pane, displays a shortcut menu with commands that apply in that context. Most of these commands are also available on the menus.

With Global Data Manager

See the Global Data Manager appendix of the UNIX NetBackup system administrator's guide for information on the following commands that are available with the Global Data Manager option:

- ◆ Ignore Host
- ◆ Recognize Host
- ◆ Append Media Manager

You can view all of the available columns in the detail pane, by clicking the right mouse button and selecting Show All Columns.

Tree and Detail Panes

The contents of the tree pane (on the left) and detail pane (on the right) vary, depending on whether you are running the administration interface on a server that has the Global Data Manager option installed or not.

For an introduction and overview of the Global Data Manager option, see the Global Data Manager appendix of the UNIX NetBackup system administrator's guide.

The View Without Global Data Manager

The tree pane of the Media and Device Management window includes the hosts and devices that you can currently manage.

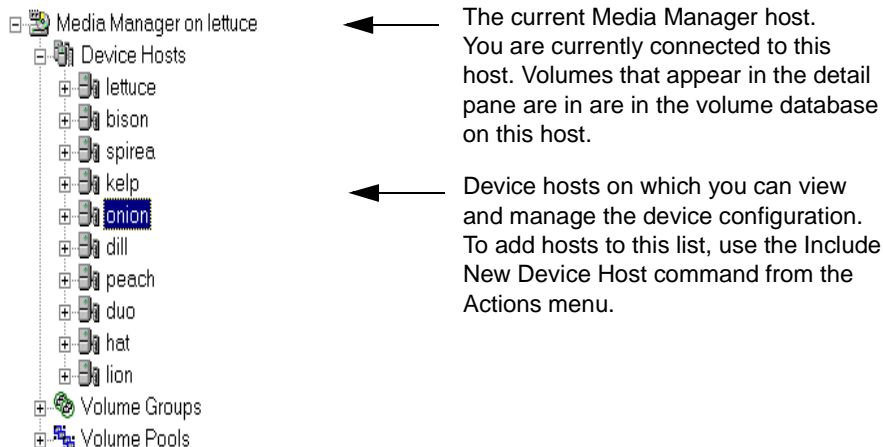
The first node in the tree pane specifies the Media Manager host to which you are currently connected. The view in the detail pane (on the right) shows the volumes that are in the volume database on this host. If you add any volumes, they are added to this volume database. If there are no volumes configured, the detail pane will be blank.

To see or configure volumes on another host, change your connection to that host by using Change Media Manager Host on the File menu. See “Remote Administration of Media on Other Hosts” on page 91 for more information.

Directly below the current Media Manager host in the tree pane is a list of device hosts. These are the Media Manager hosts on which you can monitor and configure devices. To add other device hosts to the list, use Include New Device Host on the Actions menu.

Chapter 2 has procedures for adding devices or modifying the device configuration on a device host.

The following figure shows device hosts lettuce, onion, peach, and others:



A device host can be expanded to show the robots and drives that are attached. The expanded view also shows the volume groups that are used in the specific devices and are in the volume database on the current Media Manager host.

The following figure shows an expanded view of the devices a device host:



The screenshot shows a tree view for 'Media Manager on bison'. Under 'Device Hosts', there is a sub-tree for 'bison' containing 'Robot 14 - ACS', 'Robot 10 - ACS', 'Tape Drives' (with sub-items 'hcart(SHARE)', 'dlt(Drive_TWO)', 'dlt(Drive3)'), and 'Volume Groups' (with sub-items '00_010_ACS', '01_010_ACS', '02_010_ACS'). Below this are other robots: 'Robot 55 - TLD', 'Robot 8 - TLH', 'Robot 2 - TLD', 'Robot 0 - TLH', 'Robot 3 - TLH', and 'Robot 6 - TLM'. At the bottom are 'Standalone' items: 'Tape Drives' and 'Volume Groups' (with sub-item '-').

Robot name. If you select it, the detail pane will show the volumes that are in that robot and in the volume database on this Media Manager host.

Tape drives configured to be in in this robot.

The volume groups in this robot and in the volume database on this host. If you select one, the detail pane lists the volumes in that group.

The standalone volume groups on this host and in the volume database on this host. If you select one, the detail pane lists the volumes in that group.

Shown below the list of device hosts are all of the volume groups and volume pools in the volume database on the current Media Manager host.

The following figure shows an expanded view of the volume groups and pools for host lettuce:

The screenshot shows a tree view for 'Media Manager on lettuce'. Under 'Device Hosts', there is a list of hosts: 'lettuce', 'bison', 'spirea', 'kelp', 'onion', 'dill', 'peach', 'duo', 'hat', and 'lion'. Below this are 'Volume Groups' (with sub-item '00_014_TLD') and 'Volume Pools' (with sub-items 'None', 'NetBackup', 'satPOOL8', 'satPOOL18').

All the volume groups in the volume database on the current Media Manager host. If you select Volume Groups, the detail pane shows all the volumes in all groups. Selecting an individual group lists only the volumes in that group.

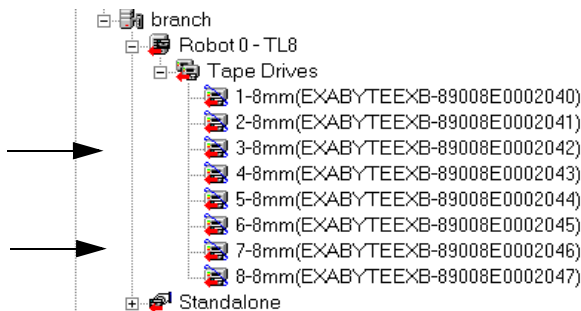
All the volume pools in the volume database on the current Media Manager host. If you select Volume Pools, the detail pane shows all the volumes in all pools. Selecting an individual pool lists only the volumes in that pool.

If a device icon contains a red arrow near the bottom of the icon, as shown in the following figure, the current Media Manager host is *not* the volume database host for the device. In this case, you must change to the correct host before adding volumes for this device (see “Remote Administration of Media on Other Hosts” on page 91).

If the drive is configured as a multihosted drive, the drive icon has a blue oval around it.

The ovals in the icon indicate that the drive is a multihosted drive.

The arrows in the icon indicate that the volume database for this device is on another MediaManager host.



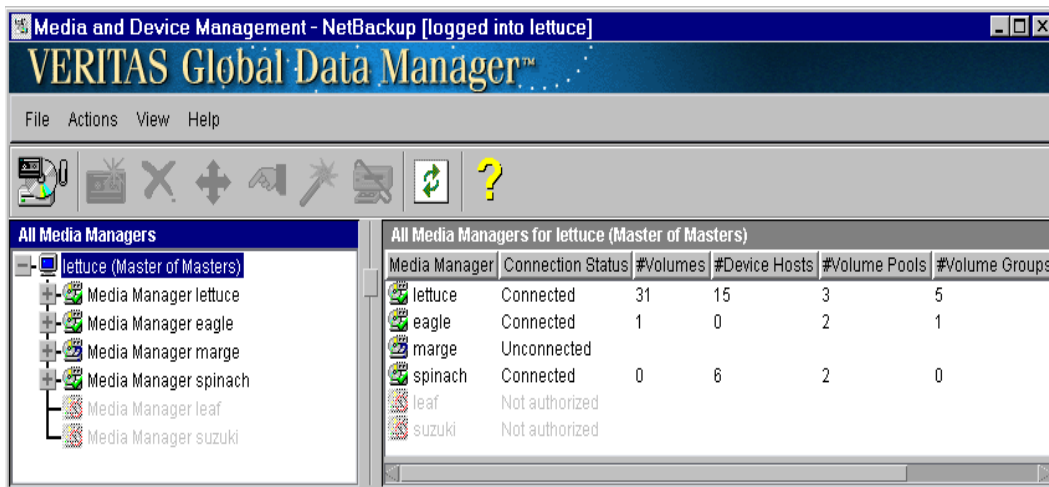
The View With Global Data Manager

If you are running the NetBackup Administration interface on a server that has the Global Data Manager option installed, the window shows all of the Media Manager hosts that you can administer.

Initially, the tree pane shows the Master of Masters and the currently configured Media Manager hosts. The detail pane lists the Media Manager hosts along with details, such as: connection status, and the number of device hosts and volume pools for each host.



Figure 3. Media and Device Management Window - Initial View

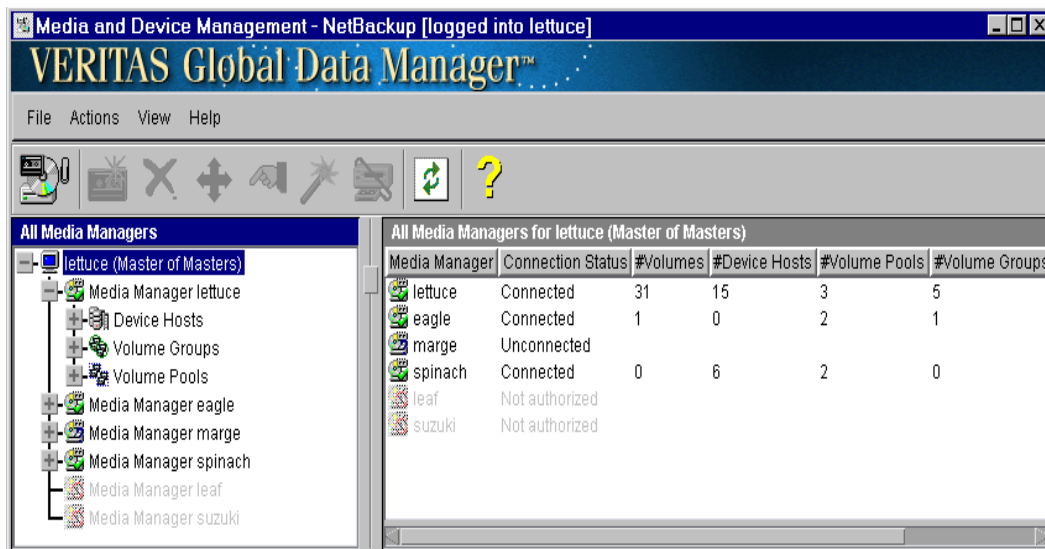


Media Manager Hosts

These are the hosts you can connect to and manage media. To add other Media Manager hosts to this list, use Append Media Manager on the File menu. The host icons convey the current connection status.

Each Media Manager host can be expanded to view the device hosts, volume groups, and volume pools under it (see Figure 4). If you expand any of these three items, the detail pane contains the volume list (see Figure 5 and “Detail Pane (Volume List)” on page 88).

Figure 4. Media and Device Management Window - Media Manager Hosts



◆ Device Hosts

These are all the hosts on which you can monitor and configure devices under the currently selected Media Manager host (Figure 5 shows the device hosts under Media Manager host lettuce). To add other device hosts to the list, use Include New Device Host on the Actions menu. The shapes and colors of the device host icons convey the connection status. Each device host can be expanded to view its robots, drives, and (possibly) volume groups.

This view can include the volume groups that are in the volume database located on the selected Media Manager host, when the Media Manager host is also the selected device host. This host is shown in the line at the top of the detail pane (in Figure 5, this host is lettuce). This view is the same as selecting the Volume Groups icon under Media Manager host lettuce in the collapsed view (see Figure 4).

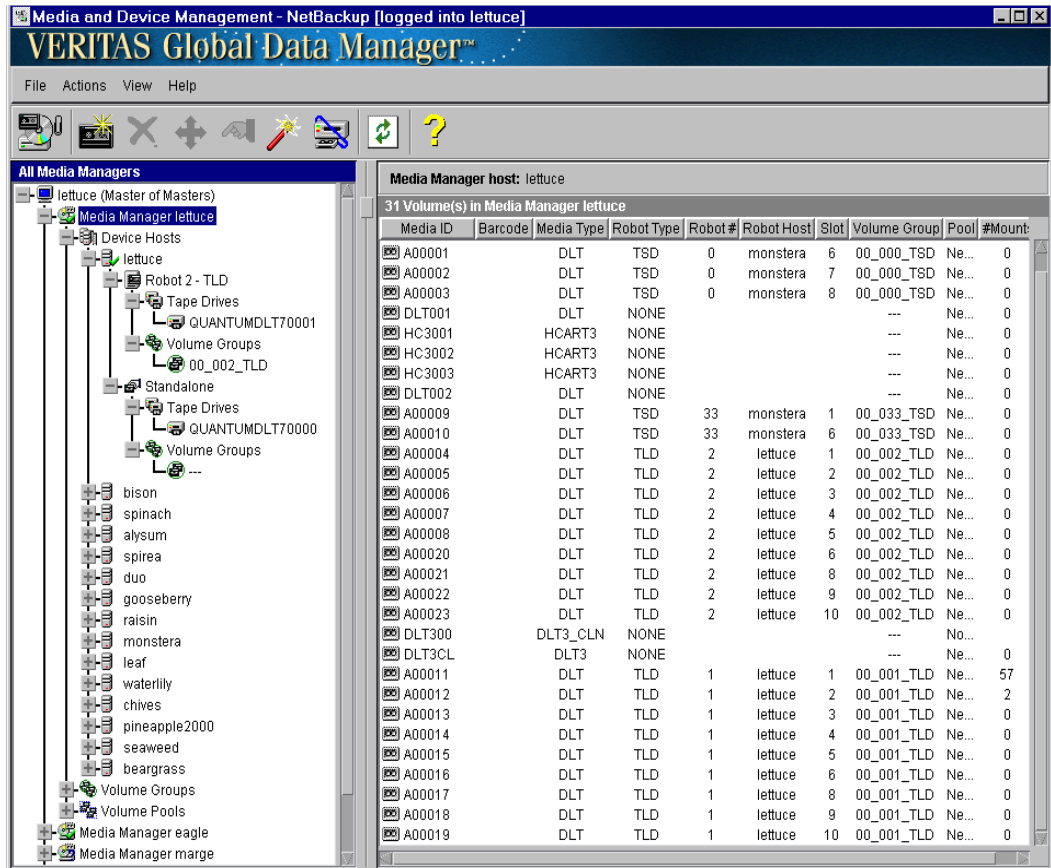
◆ Volume Groups

These are all of the volume groups defined in the volume database located on the currently selected Media Manager host. This host is shown in the line at the top of the detail pane (in Figure 5, this host is lettuce).

◆ Volume Pools

These are all of the volume pools defined in the volume database located on the currently selected Media Manager host. This host is shown in the line at the top of the detail pane (in Figure 5, this host is lettuce).

Figure 5. Media and Device Management Window - Volume List



Detail Pane (Volume List)

The detail pane of the Media and Device Management window lists the volumes in the volume database located on the current Media Manager host. Table 34 defines the columns in the volume list.

You can view all of the columns in the detail pane by clicking the right mouse button in the detail pane and selecting Show All Columns.

Table 34. Volume List

Column	Description
Media ID	Identifies the volume in six or less alphanumeric characters. This value is assumed to be the same as the external volume serial number (EVSN). You specify the media ID when you add volumes to Media Manager.
Barcode	Uniquely identifies the barcode of a volume in 13 alphanumeric characters or less. When you add volumes, the robot scans the barcodes; you need not enter them at the keyboard. The barcodes for volumes in an API robot are equivalent to the volume's identifier, as configured with the robot-vendor software.
Media Type	Media type of the volume. See "Media Manager Media Types" on page 274 for a list of the supported media types.
Robot #	Number of the robot that contains this volume. If the robot type is NONE, this column is blank.
Robot Host	Name of the host that is providing the robotic control. If this column contains NONE, robotic control is allowed from any host on which a drive in the robot is configured (ACS and TLM robot types only). If this column is blank, the Robot Type is NONE (meaning standalone drive).
Slot	Robot slot that contains the volume. This column is blank for API robots, since Media Manager does not track slot information for these robots. For these robot types, the vendor software tracks the slot information.
Volume Group	Volume group for this volume. A volume group defines the volume by location and is a logical group of volumes that are at the same physical location. Volume groups are a convenience for administrating multiple volumes. By using a volume group, you can logically move a set of volumes between a robot and a standalone location, or delete them by specifying the group name rather than each individual media ID. More than one volume group can share the same location. For example, a robot can contain volumes from more than one volume group and there can be more than one standalone volume group. All volumes in a volume group must have a compatible media type.



Table 34. Volume List (continued)

Column	Description
Pool	<p>The volume pool defines the usage for the volume. Volumes in a pool are grouped together for use by a single application and are protected from access by other applications and users.</p> <p>None is the default pool for users of applications, other than NetBackup and Storage Migrator.</p> <p>NetBackup is the default pool name for NetBackup.</p> <p>HSM is the default pool name for Storage Migrator.</p>
# Mounts	Number of times that the volume has been mounted (does not apply to cleaning media types).
Max Mounts	Number of times the volume can be mounted. If maximum mounts is reached, a message is logged to the system application log and Media Manager allows no further mounts in write mode. Further mounts in read mode are allowed.
Expiration Date	Refers to the age of the volume. If the expiration date is reached, the volume is considered too old to be reliable and Media Manager allows no further mounts in write mode. Further mounts in read mode are allowed, but a message is logged to the system application log indicating that the expiration date has been reached. If the column is blank, the volume has no expiration date.
Time Assigned	<p>Shows the time at which the volume was assigned for use by NetBackup or Storage Migrator.</p> <p>It is not possible to delete a volume or change its volume pool while it is assigned to an application.</p>
Last Mount	Date and time that the volume was last mounted.
Cleanings Remaining	For a cleaning tape, this column shows how many more times the tape can be used. To use a cleaning tape, the value in this column must be greater than zero. You can change this count by selecting the volume and using Change on the Actions menu in the Media and Device Management window.
Side/Face	<p>Location of the volume. If the media type is an optical disk, this column shows A or B, representing the platter side on which the volume is located.</p> <p>If the media type is an 8mm tape and the robot type is TL8, this column shows the xy coordinates for the slot number.</p> <p>For any other media type, this column is blank.</p>
Created	Date and time that the volume was added.



Table 34. Volume List (continued)

Column	Description
Status	Relevant only to volumes that are assigned to NetBackup or Storage Migrator. A status of 0, means the volume is assigned to NetBackup regular backups. 1, means the volume is assigned to NetBackup database backups. 2, means the volume is assigned to Storage Migrator. There is also a date, in the Time Assigned column for assigned volumes. The Time Assigned column is empty if the volume is not assigned.
Partner	For optical disks, this column shows the media ID of the volume on the other side of the optical platter. For all other media types, the column is blank. You define this value as Partner ID when you add the volume.
Description	Describes the volume in 25 or less alphanumeric characters. You create the description when you add volumes.

Remote Administration of Media on Other Hosts

Each Media Manager host can have a volume database. However, to simplify administration, VERITAS recommends that you centralize the volume database on one host and keep the other volume databases empty. Adding volumes to multiple hosts makes administration more complicated and it is not possible to merge the databases later.

The configuration for each robot or set of standalone drives designates the volume database host that contains the volume information for those devices. Before adding a volume to the volume configuration, you must be managing the correct Media Manager host or the volume will not be found when it is required. To verify which Media Manager host has the volume database for a device, see “To Determine the Volume Database Host for a Device”.

To Determine the Volume Database Host for a Device

1. In the NetBackup Administration window, click Media and Device Management.
2. In the tree pane, expand the tree to show the device host that has the device that you want to manage.

If the device host does not appear in the list of device hosts, you can add it by using Include New Device Host on the Actions menu.

3. Choose a robot or a standalone drive node under that device host.



4. Click Change on the Actions menu.
 - ◆ For a robot, the Change Robot dialog box appears. The volume database host name is shown in the Volume Database Host box.
 - ◆ For standalone drives, the Change Standalone Volume Database Host dialog box appears. The volume database host name is shown in this dialog box.

To Manage Media on Other Media Manager Hosts

Without Global Data Manager

1. In the NetBackup Administration window, click Media and Device Management.
2. On the File menu, click Change Media Manager Host.
3. In the dialog box that appears, enter the name of the host you want to monitor.

The detail pane now shows the volume information for the new host.

If you encounter problems, see “Configuring Remote Administration of Other UNIX Hosts” on page 93.

With Global Data Manager

1. In the NetBackup Administration window, click Media and Device Management.
2. Change Media Manager hosts by navigating the tree and clicking on a host.

If the Media Manager host is not in your initial tree view, you can append the host. Duplicate, invalid, or unreachable Media Manager hosts are not appended.

For example, if you attempt to append a host that is not accessible because of network problems, access restrictions imposed by that host (in the `bp.conf` or `vm.conf` files), or authentication/authorization security then the append is not done.

To append a Media Manager host:

1. In the NetBackup Administration window, click Media and Device Management.
2. On the File menu, click Append Media Manager.
A dialog box appears.
3. Enter the name of the Media Manager host and click OK.

The new Media Manager host is added to the end of the tree.



If you encounter problems, see “Configuring Remote Administration of Other UNIX Hosts”.

Configuring Remote Administration of Other UNIX Hosts

The name of the UNIX host that you specify in the Login box, when starting the NetBackup Administration interface, must be in the `bp.conf` file on the remote UNIX host where you want to manage media or monitor devices.

Remote Administration Example

For example, you could start the administration interface from a NetBackup Windows Display Console (WDC) running on a Windows host (named bear); and specify the UNIX host (named shark) in the Login box.

In this example, you

- ◆ Started the interface from the host named bear.
- ◆ Are managing NetBackup, through Java application server software running on the host named shark.
- ◆ Want to manage media or devices on a third host, named tiger.

The `bp.conf` file on host tiger, must include the name of the server that you logged into (shark), not the host where you first started the administration interface (bear).

If you cannot connect to host tiger, add host shark to the `bp.conf` file on host tiger.

Adding `SERVER` Entries in the `bp.conf` File

1. Add a `SERVER = host` entry below any existing server entries in the `/usr/opensv/netbackup/bp.conf` file.
2. Stop and restart the NetBackup database manager (`bpdbm`) and NetBackup request daemon (`bprd`).

See the UNIX NetBackup system administrator’s guide for more information.

Also, the Media Manager volume daemon must be running on host tiger or Media Manager will not be able to update its configuration. This daemon is normally started when you start the Media Manager device daemon.

If you suspect that the volume daemon is not running, you need to go to that host and restart the daemon. If you are unable to access media and device information, you may need to add a `SERVER` entry to the `vm.conf` file on tiger. See “Media Manager Security” on page 41.



vmd Considerations

vmd is the Media Manager volume daemon. Media Manager authentication/authorization may affect systems where NetBackup authentication/authorization has been enabled.

Connections to vmd will fail if authentication/authorization are enabled, an `AUTHORIZATION_REQUIRED` entry is present in `vm.conf`, and the caller of vmd does not have the required permission to use vmd functions.

If authentication/authorization is needed in NetBackup but not in Media Manager, you can add `SERVER` entries in `vm.conf`, or have no `SERVER` and no `AUTHORIZATION_REQUIRED` entries in `vm.conf`.

See “vmd Security” on page 300 for more information.

Configuring Volume Pools

A volume pool identifies a logical set of volumes by usage. Associating volumes with a volume pool protects them from access by unauthorized users, groups, or applications.

With the exception of the NetBackup volume pool, you must create a volume pool before you can add volumes to it. Media Manager creates a volume pool, named NetBackup, for NetBackup. (On UNIX hosts, a pool is also created for Storage Migrator volumes).

During initial configuration, it is easiest to create all of your volume pools first. Then as you add volumes, you can assign them to volume pools.

It is also possible to configure a scratch pool from which Media Manager can transfer volumes, when another volume pool has no volumes available.

For background information, see “Volume Pools” on page 292.

The following topics explain volume pool configuration:

- ◆ To Add a New Volume Pool
- ◆ To Change the Attributes for a Volume Pool
- ◆ To Change the Volume Pool Assignment for a Volume
- ◆ To Delete a Volume Pool
- ◆ Configuring the Scratch Volume Pool

To Add a New Volume Pool

1. In the NetBackup Administration window, click Media and Device Management.
2. Choose the Media Manager host where you want to add the pool. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
3. On the Actions menu, click New and then Volume Pool.



4. In the Pool Name text box, enter a name for the new volume pool.
The name can be 20 characters or less, and cannot contain any spaces or special characters.
5. In the Description text box, enter a brief description for the pool.
6. To allow only a specified host to use the volumes in this pool:
 - a. Select the check box.
 - b. In the Host name text box, enter the name of the host that is allowed to request and use the volumes in this volume pool.

Note VERITAS recommends that you do *not* specify a specific host. Allowing any host (the default) is recommended, and is required if you have NetBackup media servers controlled by a master server. Never specify the name of a client.

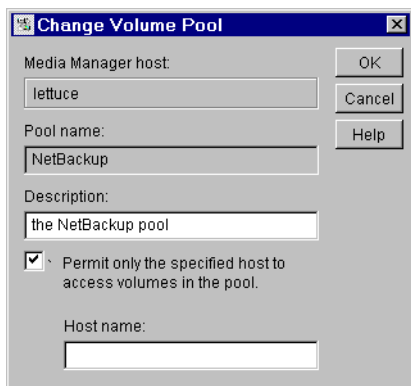
7. Click OK.



To Change the Attributes for a Volume Pool

1. In the NetBackup Administration window, click Media and Device Management.
2. Select the desired pool from the Volume Pools list, showing in the left window.
3. On the Actions menu, click Change.

A dialog box appears.



4. In the Description text box, enter a new description for the pool.
5. To allow only a specified host to use the volumes in this pool:
 - a. Select the check box.
 - b. In the Host name text box, enter the name of the host that is allowed to request and use the volumes in this volume pool.

Note VERITAS recommends that you do *not* specify a specific host. Allowing any host (the default) is recommended, and is required if you have NetBackup media servers controlled by a master server. Never specify the name of a client.

6. Click OK.

To Change the Volume Pool Assignment for a Volume

Volumes are grouped in a specific volume pool. The Pool column in the Volumes list shows the name of the volume pool to which the volumes belong. Change the volume pool assignment as follows:

1. In the NetBackup Administration window, click Media and Device Management.
2. Choose the Media Manager host that has the volumes you want to change. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
3. Select a volume or a range of consecutive volumes from the list in the detail pane of the window.

Note You are unable to change the volume pool for any assigned volumes until the application deassigns them (see “Deassigning Volumes” on page 112).

4. On the Actions menu, click Change.

The Change Volumes dialog box appears. The volumes you selected are listed in the top section of the dialog.

The screenshot shows the 'Change Volumes' dialog box. At the top, the 'Media Manager host' is set to 'bison'. Below this is a table with the following columns: Media ID, Media Type, Description, Max Mounts, Expiration, and Pool. The table contains one row: CLN019, DLT_CLN, DLT clean..., and None. To the right of the table are buttons for OK, Cancel, and Help. Below the table are several sections with radio buttons and input fields:

- Maximum mounts:** Radio buttons for 'Do not change' (selected), 'Unlimited', and 'Number'. The 'Number' field contains '0'.
- Expiration date:** Radio buttons for 'Do not change' (selected), 'Never', and 'Date'. The 'Date' field contains '06/23/2000 12:17:18'.
- Description:** Radio buttons for 'Do not change' (selected) and 'New description'. There is an empty text input field.
- Volume pool:** Radio buttons for 'Do not change' (selected) and 'New pool'. The 'New pool' dropdown menu is set to 'None'.
- Number of cleanings remaining:** Radio buttons for 'Do not change' (selected) and 'New count'. The 'New count' field contains '0'.

5. In the Volume Pool section, select New Pool and then click the button at the right to open a list of the available volume pools.
6. Select the desired volume pool from the list.
7. Click OK.



To Delete a Volume Pool

Note that you cannot delete any of the following:

- ◆ A volume pool that contains volumes
- ◆ Scratch pools
- ◆ The NetBackup volume pool
- ◆ The None volume pool

Delete a volume pool as follows:

1. In the NetBackup Administration window, click Media and Device Management.
2. Choose the Media Manager host that has the volume pool you want to delete. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
3. Choose the volume pool.
4. Ensure that the volume pool is empty.

If necessary, change the volume pool name for any volumes in the pool. Or, if the volumes are not needed, delete them.

5. On the Actions menu, click Delete.

Configuring the Scratch Volume Pool

The scratch pool is a special volume pool that you can optionally configure. If a scratch pool is configured, Media Manager moves volumes from that pool to other pools that do not have volumes available.

For background information, see “Scratch Volume Pools” on page 294.

To Configure the Scratch Pool

1. Add a volume pool to be used as the scratch pool (see “To Add a New Volume Pool” on page 95). Specify the attributes for the scratch pool as follows:
 - ◆ Pool Name: Any name, except NetBackup or None. The name can be 20 characters or less, and cannot contain any spaces or special characters.
 - ◆ Host Name: ANYHOST. (Do not use the check box to specify a specific host).
 - ◆ Description: Scratch Pool.
2. Add volumes for each robotic or standalone device that requires them.



Follow the steps as when adding other volumes (see “Adding New Volumes” on page 99), except in this case specify the scratch pool as the volume pool.

3. Add a `SCRATCH_POOL` entry to the `/usr/opensv/volmgr/vm.conf` file.

See “Media Manager Configuration File (vm.conf)” on page 302 for an overview of the `vm.conf` file.

Note If the scratch pool does not already exist, Media Manager creates one when you add the `SCRATCH_POOL` entry to the `vm.conf` file.

Adding New Volumes

Media Manager volumes are logical units of data storage or cleaning capability on media that have been assigned media IDs and other attributes, which are recorded in the Media Manager volume database.

When you add a new volume, there is no default expiration date.

Methods Available for Adding Volumes

The methods available to add volumes depend on how the volume will be used, as follows.

Using the Volume Configuration Wizard

You can use the Volume Configuration Wizard to configure volumes (media). This wizard is available from NetBackup Assistant or the Getting Started Wizard.

This wizard configures volumes for standalone drives and robots, but does not support the configuring of the following:

- ◆ Robots that have more than one type of drive.
- ◆ API robots and drives. API robots are ACS, LMF, RSM, TLH, or TLM Media Manager robot types.
- ◆ Optical robots and standalone drives.

To configure volumes for these devices, you must use the advanced features of the Media and Device Management administrative interface.



Robotic Volumes (Volumes Located in a Robot)

- ◆ The easiest way to add robotic volumes is to perform the Update Volume Configuration procedure. During the update, Media Manager assigns the media IDs and other attributes.

See “To Add Volumes - Using Update Volume Configuration” on page 101.

- ◆ To manually add volumes, follow the instructions in “To Add Volumes - Using Manual Update” on page 102.

Standalone Volumes (Volumes To Be Used in Standalone Drives)

- ◆ The easiest way to add standalone volumes is to insert them into the drive. For an unused volume, NetBackup assigns a media ID, labels the volume, and uses it (if it needs a volume of that type for a backup). Media Manager adds the media ID (designated by NetBackup) and other attributes for the volume.

The `DISABLE_STANDALONE_DRIVE_EXTENSIONS` NetBackup configuration option turns off NetBackup’s automatic use of standalone volumes. See the UNIX NetBackup system administrator’s guide for more information.

- ◆ To manually choose the media IDs, label the volume with the NetBackup `bplabel` command and follow the instructions in “To Add Volumes - Using Manual Update” on page 102.

Even if you normally use NetBackup’s assignment capabilities for standalone volumes, manually adding extra standalone volumes prevents "out of media" errors in some situations.

For example, if a volume in a standalone drive is full or unusable because of errors, NetBackup requests that Media Manager eject the volume. NetBackup then searches for another unused volume. If another appropriate volume is not defined, NetBackup exits with an error.

Labeling a volume (using the NetBackup `bplabel` command) and adding it prevents this problem, because Media Manager displays a mount request for that volume rather than returning an error to NetBackup.

NetBackup Database Backup Volumes

- ◆ Prior to using volumes for NetBackup catalog backups, you must manually add them. You can also use the NetBackup `bplabel` command to label the volume.

See “To Add Volumes - Using Manual Update” on page 102.



Notes on Labeling NetBackup Volumes

Labeling volumes is controlled by the application. Refer to the NetBackup DataCenter system administrator's guide for UNIX or the Storage Migrator system administrator's guide for more information.

NetBackup controls the labeling of its volumes and in most cases performs this operation automatically.

- ◆ If a volume in a robot has not been labeled, NetBackup labels it with the media ID assigned by Media Manager the first time that it uses the volumes for a backup. This is done unless those volumes
 - ◆ Were last used for NetBackup catalog backups. You do not want to label the volumes unless they are no longer being used for catalog backups.
 - ◆ Contain data from a recognized non-NetBackup application. The NetBackup configuration option, `ALLOW_MEDIA_OVERWRITE` can be set to allow the volume to be overwritten.
- ◆ If you prefer to assign specific media IDs to NetBackup volumes, label them with the NetBackup `bplabel` command and add them using the manual update procedure.
- ◆ NetBackup uses a default prefix of A when assigning media IDs (for example, A00001). To change this default, use the NetBackup `MEDIA_ID_PREFIX` configuration option.
- ◆ An optical disk platter must be formatted and have an external volume serial number (EVSN) and a volume label before you can use it with Media Manager. Use `vmadm` or the `tpformat` command to add an optical disk volume. When using `vmadm`, you can choose the label option, thus making it unnecessary to use `tpformat` from the command line. See Appendix D or the `tpformat(1M)` man page for more information.

To Add Volumes - Using Update Volume Configuration

1. Insert the volume into the robot.
2. Click Inventory Robot on the Actions menu to update the volume database to match the contents of the robot. See “Updating the Volume Configuration for a Robot” on page 128 for more information.

The update includes the generation of media IDs for new logical volumes as follows. If the robot

- ◆ Supports barcodes and the volumes have readable barcode labels, the update part of the operation generates media IDs for new logical volumes based on the last six characters of the barcodes.



- ◆ Does not support barcodes or the volumes do not have readable barcodes, the new media IDs are based on a media ID prefix that you specify.

When you use barcode rules, new volumes that are added through a barcode rule are assigned a media type, volume pool, maximum number of mounts (or maximum cleanings), and description (see “Configuring Barcode Rules” on page 155).

To Add Volumes - Using Manual Update

1. If you are adding new volumes to a robot, insert them into the proper slots.
2. In the NetBackup Administration window, click Media and Device Management.
3. Verify that you are adding volumes on the volume database host for the robot or a standalone device that will be using the new volumes.
See “To Determine the Volume Database Host for a Device” on page 91.
4. Choose the Media Manager and device host where you want to add volumes. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
5. On the Actions menu, click New and then Volumes.

6. Specify the properties for the volumes as explained in “Dialog Box Entries for Adding New Volumes” on page 103.

7. Click OK.

The detail pane now shows the new volume information.

If the robot has a barcode reader, Media Manager does the following:

- ◆ Adds an entry in the volume database, using the specified media ID.
- ◆ Reads the barcode of each new volume.
- ◆ Adds the barcodes as attributes in the volume database.

Note If you are making multiple additions, clicking Apply updates the configuration without closing the dialog box or refreshing the display. This allows you to add another volume by modifying the dialog box contents and then clicking Apply or OK.

Dialog Box Entries for Adding New Volumes

Media Type

Specifies the media type that you are going to add. Click in the box to open a list of the available media types and select from the list.

Volume Is In a Robotic Library

Specifies that the volume is in a robotic library. When you select this box, the Select Robot section (containing Device Host and Robot) of the dialog box is available.

Device Host

Specifies the device host where the robot is defined.

To change the device host, click the box and select from the list. To choose a host that is not in the list, click the browse button to the right of the box and enter the name of the desired device host in the dialog box.

Robot

Specifies the robot to which you are adding the volumes.

To specify a different robot, click the box and select from the list. The list shows robots that have volumes in the volume database on the current Media Manager host and can use the selected media type.



Number of Volumes

Specify the number of volumes. For a robot, this refers to the number of slots that must be reserved for the new volumes.

If you are adding

- ◆ One volume, you also must specify Media ID.
- ◆ More than one volume, you also must specify First media ID and Media ID naming style.

Media ID Naming Style

If you are adding more than one volume, click the Media ID Naming Style box to open a list of possible combinations of alphanumeric characters and digits. Then select a style to use in creating the media IDs for this range of new volumes.

Note In this guide, ACS, LMF, RSM, TLH, and TLM Media Manager robot types are often grouped together and the term API robot is used to identify these robot types.

Media IDs for an API robot must always match the barcodes. This means that you must get a list of the barcodes prior to adding the volumes. You can obtain this information through a robotic inventory or from the robot vendor's software. For API robots, Media Manager supports barcodes with six or less characters.

Media ID or First Media ID

In the text box, enter a 1- to 6-character ID for the new volume.

If you are adding one volume, Media ID is the ID for the volume.

If you are adding more than one volume, First Media ID is the ID for the first volume in the range of volumes. Use the same pattern that you chose in the Media ID Naming Style box. Media Manager names the remaining volumes by incrementing the digits.

Media IDs for an API robot must always match the barcodes. This means that you must get a list of the barcodes prior to adding the volumes. You can obtain this information through a robotic inventory or from the robot vendor's software. For API robots, Media Manager supports barcodes with six or less characters.

Description

Enter a 1 to 25-character description of the volumes that you are adding.

First Slot Number

Note You cannot enter slot information for volumes in an API robot. The robot vendor or the operating system software tracks the slot locations for these robot types.

For volumes in a robot, specify the first slot number to be used by the range of volumes that you are adding. Media Manager assigns the remainder of the slot numbers sequentially.

Appendix E shows the slot layout for many of the robots that Media Manager supports.

Maximum Mounts

For volumes intended for backups, specify the maximum number of times that Media Manager is able to mount the volumes. When a volume reaches this mount limit, the volume can be read, but not written.

To help determine the maximum mount limit to use, consult your vendor documentation for information on the expected life of the volume.

Note Specify the number 0 to permit an unlimited number of mounts.

Maximum Cleanings

For a cleaning tape, specify a number greater than zero for the number of cleanings that can be performed. See “Drive Cleaning” on page 285 for information on manual cleaning and cleaning tapes.

Volume Group

Enter the name of the volume group for the volumes you are adding, or click the button at the right of the box to select from a list of previously configured groups.

If you leave the box blank, then for

- ◆ Standalone volumes, Media Manager does not assign a volume group.
- ◆ Robotic volumes, Media Manager generates a name by using the robot number and type. For example, if the robot is a TS8 and has a robot number of 50, the group name will be 00_050_TS8.

Note Do not confuse volume groups with volume pools. Refer to “Volume Pools and Volume Groups” on page 291 for an explanation of the differences.



Rules for Assigning Volume Groups

- ◆ All volumes in a group must be the same media type.
However, a media type and its corresponding cleaning media type are allowed in the same volume group (for example, DLT and DLT_CLN).
- ◆ All volumes in a robot *must* belong to a volume group. You cannot add volumes to a robot without specifying a group or having Media Manager generate a name.
- ◆ The only way to clear a volume group name is to move the volume to standalone and not specify a volume group.
- ◆ More than one volume group can share the same location. For example, a robot can contain volumes from more than one volume group and you can have more than one standalone volume group.
- ◆ All members of a group must be in the same robot or be standalone. That is, Media Manager will not let you add a group (or part of a group) to a robot, if it already exists in another robot.

Volume Pool

Click the button at the right of the box and select from the list as follows:

- ◆ Select None to make the volume available to any user or application (cleaning tapes must be in the None pool).
- ◆ Select NetBackup to make the volume available only to NetBackup.
- ◆ Select one of the other volume pools in the list. Other pools appear only if you created them earlier as explained in “Configuring Volume Pools” on page 94.

Inject Volume Into Robot

Note This check box is enabled only for robot types that support entry ports. This box may be enabled for some robots that actually do not have entry ports, since the robot type for the robot only indicates that entry ports are possible.

Specifies that you are going to insert a volume into the entry port, so it can be injected into the correct slot in the robot. When you select this box you must insert the volume, and then Media Manager will add it to the configuration.

Moving Volumes

When you move volumes in or out of a robot, you must physically *and* logically move the volume, as follows:



- ◆ Physical move

This is done when you insert or remove the volume. For some robot types, Media Manager can be used to physically move the volume (using Inject/Eject).

- ◆ Logical move

This is done when you use Media Manager to move volumes. Media Manager updates the volume database to show the volume at the new location.

You can move volumes using one of the following methods:

- ◆ To Move Volumes - Using Update Volume Configuration

- ◆ To Move Volumes - Manually

When moving volumes from one robot to another robot, you must move the volumes to standalone as an intermediate step, and then to the new robot.

For background information, see “Moving Volumes” on page 296.

To Move Volumes - Using Update Volume Configuration

Note The robot must support barcodes and the volumes must have readable barcodes to use this procedure.

1. Physically move the volumes to their new location.
2. Click Inventory Robot on the Actions menu to update the volume database to agree with the contents of the robot.

See “Updating the Volume Configuration for a Robot” on page 128.

To Move Volumes - Manually

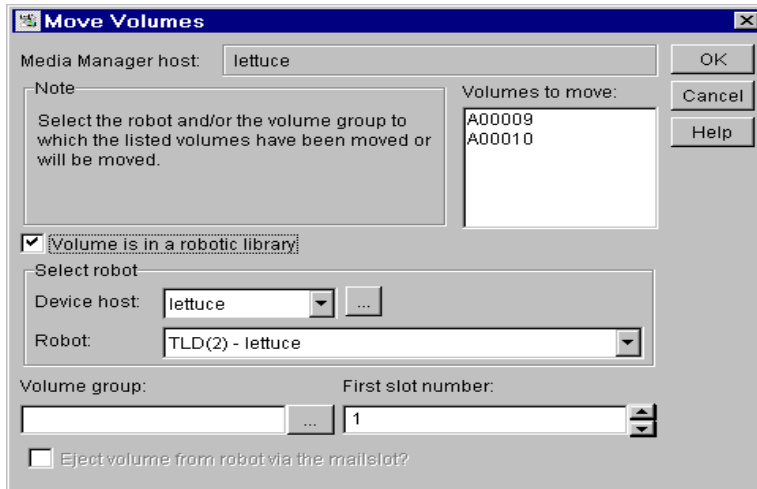
Note When you move a volume to a robot that has a barcode reader, Media Manager updates the configuration to show the correct barcode for the volume.

Note When moving volumes from one robot to another, you must move the volumes to standalone as an intermediate step and then to the new robot.

1. Physically move the volumes to their new location.
2. In the NetBackup Administration window, click Media and Device Management.



3. Choose the Media Manager host that has the volumes you want to move. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
4. In the detail pane, select the volumes you want to move.
5. On the Actions menu, click Move.



6. Specify the properties for the move as explained in “Dialog Box Entries for Move Volumes” on page 108.

Note If you are moving a single volume, the dialog box entries are set to show the current location of the volume.

7. Click OK to execute the move.

Dialog Box Entries for Move Volumes

Volumes to Move

Lists the Media IDs of the volumes that you selected to move. If you selected only one side of an optical disk platter, only that side appears in the Volumes to Move box, but both sides will be moved.

Volume Is In a Robotic Library

Specifies the robot to which you are moving the volumes. When you select this check box, the Select a Robot section of the dialog box (containing Device Host and Robot) is available.

Note If you are moving a single volume, the Select a Robot section initially shows the current location of the volume.

Select this check box, in either of the following cases, and then specify the robot and the slot number for the volume.

- ◆ You are injecting a volume into a robot.
- ◆ The volume has already been injected into the robot and you are updating the volume database for this volume.

Clear this check box, in either of the following cases:

- ◆ You are ejecting a volume from a robot.
- ◆ The volume has already been ejected from the robot and you are updating the volume database for this volume.

Device Host

Specifies the device host where the robot is defined.

To change this host, click the box and select from the list. To choose a host that is not in the list, click the browse button to the right of the box to select the desired host.

Robot

Specifies the robot to which you are moving the volumes.

To specify a different robot, click the box and select from the list. The list shows robots that have volumes in the volume database on the current Media Manager host and can use the selected media type.

Volume Group

Enter the name of the volume group for the volumes that you are moving, or click the button at the right of the box to select from a list of previously configured groups.

If you leave the box blank for

- ◆ Standalone volumes, Media Manager does not assign a volume group.



- ◆ Robotic volumes, Media Manager generates a name by using the robot number and type. For example, if the robot is a TS8 and has a robot number of 50, the group name will be 00_050_TS8.

Rules for Moving Volumes Between Groups

- ◆ You must move volumes to a new volume group or to an existing volume group that has the same type of volumes as you are moving.
- ◆ All volumes in a robot *must* belong to a volume group. You cannot move volumes into a robot without specifying a group or having Media Manager generate a name.
- ◆ More than one volume group can share the same location. For example, a robot can contain volumes from more than one volume group and you can have more than one standalone volume group.
- ◆ All members of a group must be in the same robot or be standalone. That is, Media Manager will not let you add a group (or part of a group) to a robot, if it already exists in another robot.

First Slot Number

Note You cannot enter slot information for volumes in an API robot. The robot vendor or the operating system software tracks the slot locations for these robot types.

For volumes in a robot, specify the first slot number to be used in the destination robot.

Media Manager assigns the remainder of the slot numbers sequentially.

Appendix E shows the slot layout for many of the robots that Media Manager supports.

Eject Volume From Robot

Select this check box to eject a selected volume through the robot's exit port. This check box is available only if the following are true:

- ◆ You are moving a single volume from a robot to standalone.
- ◆ The robot has an exit port.
- ◆ Media Manager supports eject for the robot type involved.

Inject Volume Into Robot

Note This check box is enabled only if you are moving a single volume from standalone to a robot, and the robot type supports entry ports. This box may be enabled for some robots that actually do not have entry ports, since the robot type for the robot only indicates that entry ports are possible.

Select this check box to insert a selected volume in the robot's entry port. The robot will then move the volume to the correct slot.

Deleting Volumes

There may be times when you want to delete volumes. For example, if any of the following apply. The volume is

- ◆ No longer used and you want to recycle it by relabeling it with a different media ID.
- ◆ Unusable because of repeated media errors.
- ◆ Past its expiration date or has too many mounts, and you want to replace it with a new volume.
- ◆ Lost and you want to clean up the volume database.

Once a volume is deleted, you can discard it or add it back under the same or a different media ID.

Before deleting and reusing or discarding a volume, ensure that it does not have any important data. NetBackup and Storage Migrator volumes have an extra safeguard against accidental deletion. Volumes assigned to those applications cannot be deleted while they are still assigned. See “Deassigning Volumes” on page 112.

To Delete Volumes

1. In the NetBackup Administration window, click Media and Device Management.
2. Choose the Media Manager host that has the volumes you want to delete. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
3. In the detail pane, select the volumes that you want to delete.

Note You are unable to delete any assigned volumes until the application using them deassigns them (see “Deassigning Volumes” on page 112).

4. On the Actions menu, click Delete.



A dialog box appears, asking you to confirm the action.

Note If you selected only one side of a platter, the volume on other side is also deleted.

5. Remove the deleted volumes from the storage device.

To Delete a Volume Group

1. In the NetBackup Administration window, click Media and Device Management.
2. Choose the Media Manager host that has the volume group that you want to delete. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
3. In the detail pane, look at the Time Assigned column to check if any of the volumes in the group you want to delete are assigned.

The Time Assigned column is hidden by default. To display this column, see “Shortcut Menus” on page 82.

If any of the volumes are assigned, you cannot delete the group until these volumes are deassigned by the application (see “Deassigning Volumes” on page 112). Use the “To Delete Volumes” procedure to delete individual volumes that are unassigned.

4. On the Actions menu, click Delete.
A dialog box appears asking you to confirm the deletion.
5. Remove the deleted volumes from the storage device.

Deassigning Volumes

An assigned volume is currently assigned for exclusive use by NetBackup or Storage Migrator (but not both). A volume is set to the assigned state when NetBackup or Storage Migrator first starts using it to store data. The time of the assignment appears in the Time Assigned column for the volume in the detail pane of the Media and Device Management window. When a volume is assigned, you cannot delete it or change its volume pool.

A volume remains assigned until the application deassigns it. NetBackup and Storage Migrator deassign a volume only when they no longer need the data.

In the case of a NetBackup volume:

- ◆ A regular backup volume is deassigned when the retention period has expired for all the backups on the volume.



- ◆ A catalog backup volume is deassigned when you stop using it for catalog backups.

Determining Which Application is Using a Volume

To determine which application is using the volume, look at the Status column in the detail pane of the window.

A status of

- ◆ 0 means that NetBackup is using the volume for its regular backups.
- ◆ 1 means that NetBackup is using the volume for its database backups.
- ◆ 2 means that Storage Migrator is using the volume.

Deassigning NetBackup Volumes

Caution It is recommended that you *do not* manually deassign NetBackup volumes. If you do, be certain that the volumes do not have any important data. If you are uncertain, duplicate the images to another volume.

Although, you must be very careful, it is possible to manually deassign a NetBackup volume. The procedure is different depending on whether the volume is currently being used for regular backups or for backing up the NetBackup databases.

Deassigning NetBackup Regular Backup Volumes

NetBackup deassigns a regular backup volume when the retention periods have expired for all backups on the volume. If you do not need the data and do not want to wait for normal expiration to occur, you can expire the backup by using the `bpexpdate` command on the master server.

This command is located in the `/usr/opensv/netbackup/bin/admincmd` directory and has the following format:

```
bpexpdate -d 0 -ev media id [-host hname]
```

Where:

media id is the media ID to be expired.

hname is the name of the NetBackup master server that has the media ID (server where media ID was written). Specify *hname* only if your configuration uses master servers and media servers.

The following example assumes there is only one NetBackup server and expires all the backups on media ID ABC001:

```
/usr/opensv/netbackup/bin/admincmd/bpexpdate -d 0 -ev ABC001
```



If you use this command to expire the volume, NetBackup stops tracking the backups that are on it and deassigns it. This makes the volume available to be reused, deleted, or its volume pool changed. You can manually expire the backups regardless of the volume's prior state (frozen, suspended, and so on).

Expiring the volume does not change anything on the volume itself. When a media ID is expired, however, you must use the NetBackup import feature before restoring the backups it contains (a restore is possible only if the volume has not been overwritten).

Deassigning NetBackup Catalog Backup Volumes

Volumes used for backing up the NetBackup catalogs are tracked separately from the regular backup volumes. To deassign these volumes (assuming they do not contain any important data), specify None or a different media ID for catalog backups (see the NetBackup system administrator's guide for UNIX). Then the media ID is available to be reassigned, deleted, or its volume pool can be changed.

Deassigning Storage Migrator Volumes

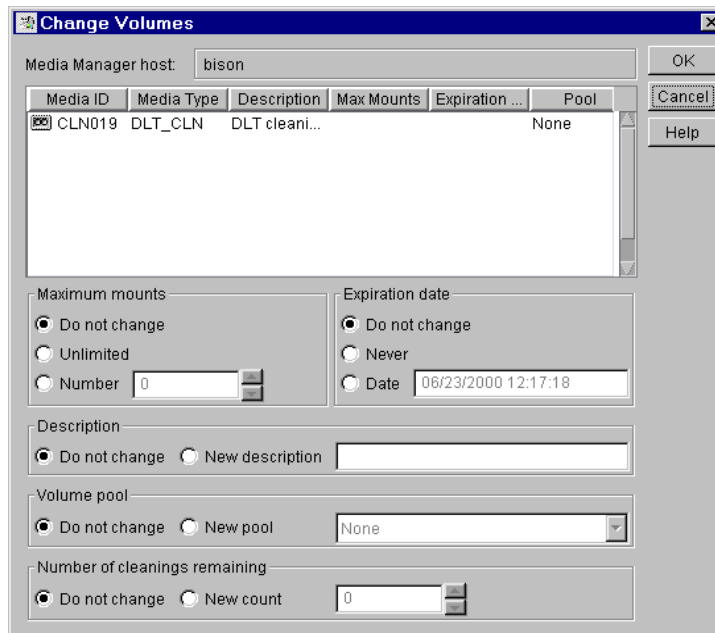
Caution If a volume is assigned to Storage Migrator, you must wait for Storage Migrator to deassign them. Storage Migrator deassigns a volume when the images are no longer required. Attempting to manually deassign Storage Migrator volumes could result in loss of data. For more information on how Storage Migrator manages its volumes, see the Storage Migrator system administrator's guide for UNIX.

To Change the Attributes for a Volume

1. In the NetBackup Administration window, click Media and Device Management.
2. Choose the Media Manager host that has the volume that you want to change. See "Remote Administration of Media on Other Hosts" on page 91 for more information.
3. In the detail pane, select the volumes.
4. On the Actions menu, click Change.

The Change Volumes dialog box appears and shows the media ID and other attributes for each selected volume.

Note that Number of Cleanings Remaining applies only if you have selected a cleaning tape.



5. In the dialog box, change the attributes as explained in “Dialog Box Entries for Change Volumes” on page 115.
6. Click OK to apply the changes to the selected volumes.

Dialog Box Entries for Change Volumes

Maximum Mounts

Note Does not apply to cleaning tapes.

Controls the number of times that the selected volumes can be mounted.

Select

- ◆ Do Not Change - if you do not want to make any changes.
- ◆ Unlimited - to allow an unlimited number of mounts. Unlimited is the default.
- ◆ Number - to set a specific limit for the number of mounts. When the limit is passed the volume can still be read, but it will not be mounted for a write.

Entering 0 (the default) is the same as selecting Unlimited.



To help determine the maximum mount limit to use, consult your vendor documentation for information on the expected life of the volume.

Expiration Date

Note Expiration date does not apply to cleaning tapes. When you add a new volume, there is no default expiration date.

Changes the expiration date for the selected volumes. This date refers to the age of the volume and is the time at which the volume is considered too old to be reliable. When the expiration date has passed, a volume can still be read but will not be mounted for a write.

Do not confuse the expiration date with the retention period for the backup data on the volume. The expiration date that you can set in this dialog box refers only to the physical expiration of the volume and is independent of the backup data written on the volume.

The backup data expiration date is separately managed by the application that is using the volume. In the case of NetBackup, the expiration date for the data is set as the retention level during schedule configuration.

Select

- ◆ Do Not Change - if you do not want to make any changes.
- ◆ Never - to set the expiration date to infinity.
- ◆ Date - to set a specific date and time when you want Media Manager to stop using the volumes.

Description

Specifies the description for the selected volumes.

Select

- ◆ Do Not Change - if you do not want to make any changes.
- ◆ New Description - to enter a short description of what the volumes are being used for.

Volume Pool

Note Does not apply to cleaning tapes.

Specifies the desired volume pool.

Select

- ◆ Do Not Change - if you do not want to make any changes.

- ◆ New Pool - to specify a volume pool. Click in the box for a list of all previously configured volume pools.

Number of Cleanings Remaining

Note Applies to cleaning tapes only.

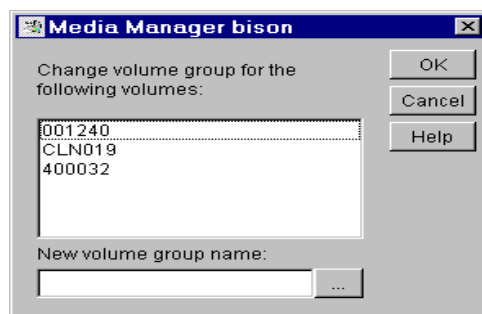
Specifies the number of cleanings that are allowed for the cleaning tape. This number is decremented with each cleaning and when it is zero, Media Manager stops using the tape. At this point, you can change the cleaning tape or increase the number of cleanings allowed.

Select

- ◆ Do Not Change - if you do not want to make any changes.
- ◆ New Count - to change the number of cleanings.

To Change the Volume Group of a Volume

1. In the NetBackup Administration window, click Media and Device Management.
2. Choose the Media Manager host that has the volumes that you want to change. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
3. In the detail pane, select the volumes.
4. On the Actions menu, click Change Volume Group.



5. Enter a name in the New Volume Group Name box or click the browse button to the right of the box and select a name from the list.
6. Click OK.



The name change is reflected in the volume list entry for the selected volumes. If you specified a new volume group, the group appears under the appropriate robot or under Standalone in the tree pane of the window.

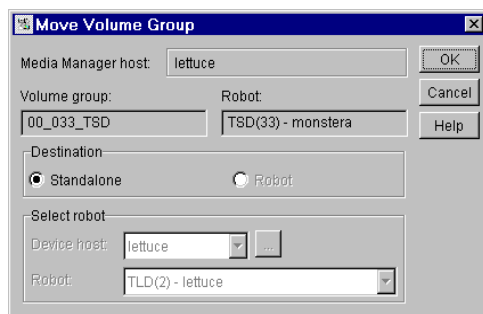
To Move A Volume Group

In addition to moving individual volumes, you can move an entire volume group. This move can be one of the following:

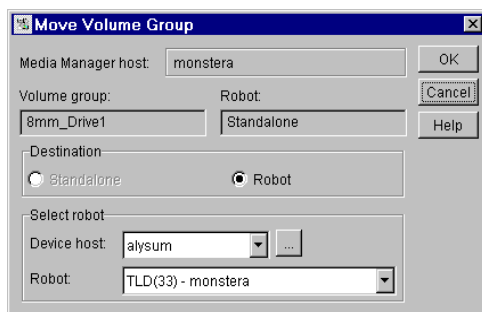
- ◆ From a robot to standalone
 - ◆ From standalone to a robot
1. In the NetBackup Administration window, click Media and Device Management.
 2. Choose the Media Manager host that has the volumes that you want to change. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
 3. In the tree pane of the window, select the volume group that you want to move.
 4. On the Actions menu, click Move Volume Group.

In the dialog box that appears, the current attributes of the volume group you selected are displayed. These fields cannot be changed.

5. If you are moving the volume group from a robot to standalone, Standalone is selected as the destination. For this type of move, fields that are not used cannot be changed.



6. If you are moving the volume group from standalone to a robot, Robot is selected as the destination.



- a. Select the device host that controls the robot, by clicking the box and selecting from the list.

To choose a device host that is not in the list, click the browse button to the right of the box and enter the name of the host in the dialog box that appears.

- b. Select the destination robot, by clicking the robot box and selecting from the list.

7. Click OK.

8. Move the volumes physically to their new location.

Moving a volume group in Media Manager changes only their residence in the volume database. They must also be moved physically.

Robot Inventory

You can select any of the following robot inventory operations in the Robot Inventory dialog box:

- ◆ Show Contents of Robot

Inventories the selected robot and generates a report showing which media ID is in each slot. This operation does not check or change the volume database, but is useful for determining the contents of a robot.

For instructions, see “To Show the Contents of a Robot” on page 120.

- ◆ Compare Robot Contents With Volume Configuration

Compares the results of a robot physical inventory with the contents of the volume database. Regardless of the result the volume database is not changed. This is useful for determining if volumes have been physically moved within a robot.

For instructions, see “To Compare a Robot’s Contents With the Volume Configuration” on page 125.



◆ Preview Volume Configuration Update

Inventories the selected robot and compares the results with the contents of the volume database. If there are differences, the results section shows a list of recommended changes. You can then perform the Volume Configuration Update operation to update the volume database to agree with the contents of the robot.

For instructions, see “To Update the Volume Configuration for a Robot” on page 130.

◆ Perform Volume Configuration Update

Inventories the selected robot and compares the results with the contents of the volume database. If there are differences, Media Manager updates the volume database to match the contents of the robot.

When you perform an update operation, you can also assign media-type mappings if applicable.

For instructions, see “Updating the Volume Configuration for a Robot” on page 128.

To Show the Contents of a Robot

This procedure explains how to initiate a physical inventory of a selected robot and generate a report showing which volume is in each slot. This inventory operation does not check or change the volume database, but can be used to determine the contents of a robot.

Note In this guide, ACS, LMF, RSM, TLH, and TLM Media Manager robot types are often grouped together and the term API robot is used to identify these robot types.

1. In the NetBackup Administration window, click Media and Device Management.
2. In the tree pane of the window, expand the tree to show the device host that controls the robot that you want to inventory. See “Remote Administration of Media on Other Hosts” on page 91 for more information.

If the device host does not appear in the list of device hosts, add it by using Include New Device Host on the Actions menu.
3. Select the robot.
4. On the Actions menu, click Inventory Robot.
5. In the Robot Inventory dialog box, the Robot box contains the selected robot and the Device host box contains the name of the host that controls the robot.

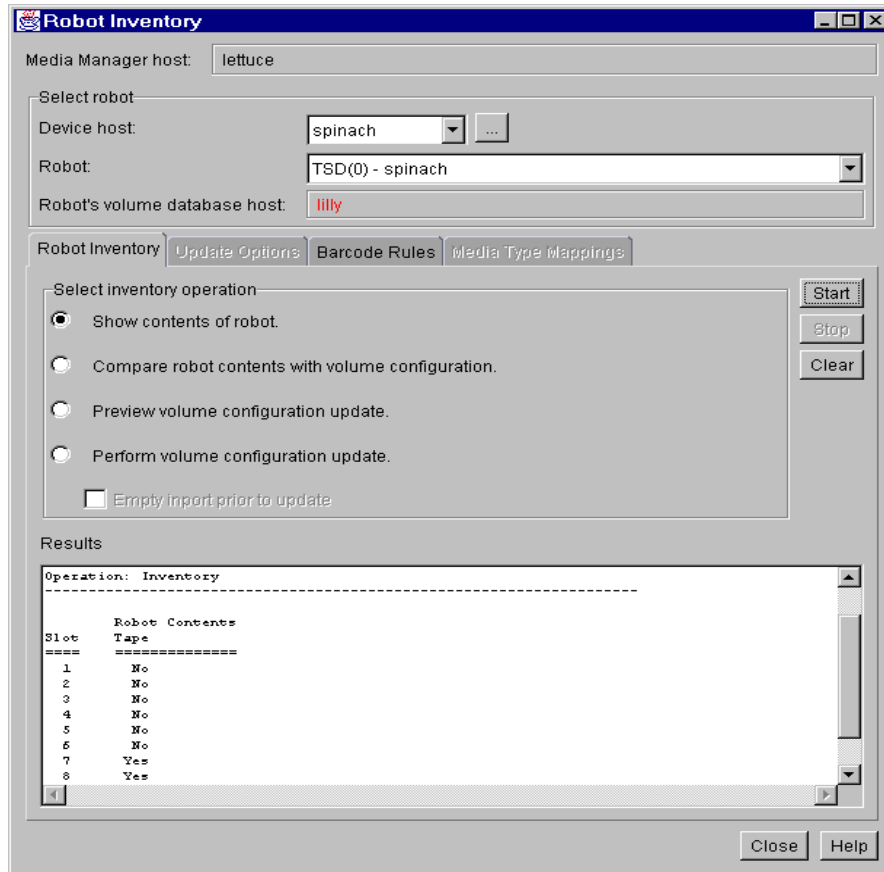
- a.** To select a robot on a different host, click the Device host box and select a host. To select a robot on a different host, click the Device host box and select a host from the list.

To choose a host that is not in the list, click the browse button to the right of the box and enter the name of the host in the dialog box. Then, click the Robot box to choose the robot.

- b.** To select a different robot on the same host, click in the Robot box and choose from the list of robots on that host.
- 6.** On the Robot Inventory tab, select Show Contents of Robot.
- 7.** Click Start to initiate the inventory.
The inventory report appears in the Results box.



Figure 6. Robot Inventory - Show Contents Report



Note If a volume happens to be in a drive, the inventory report shows it in the slot that it came from.

For robots (other than API robots) that have a barcode reader, Media Manager obtains the barcode and includes it in the report.

If the robot does not support barcodes or the volume does not have a readable barcode, -none- appears in place of the barcode.

See “Robot Attributes” on page 276 for information on the robots that support barcode readers. These robots can have up to eight characters in the barcodes.

Inventory Reports for API Robots

Figure 7 is an example Show Contents report for an ACS robot. The reports for other API robots are similar.

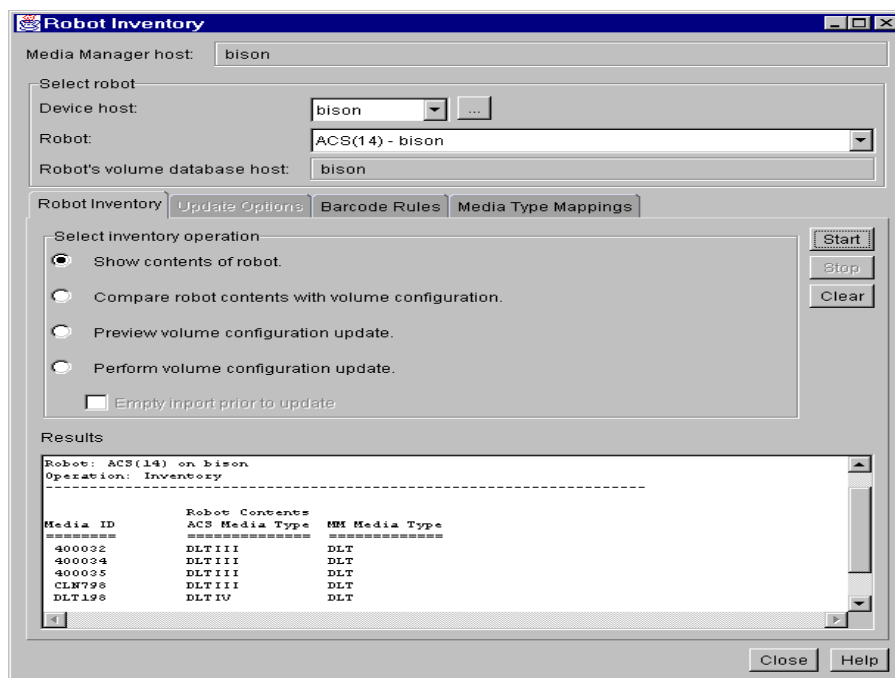
ACS Robots

Media Manager reports what it receives from ACSLS (Automated Cartridge System Library Software). The resulting report shows the ACSLS volume ID (in the first column), the ACS media type, and the Media Manager media type.

- ◆ The Media Manager media ID corresponds to the ACSLS volume ID.
- ◆ The report shows the mapping between the ACSLS media type and the corresponding Media Manager media type (without considering barcode rules).

See “Robot Inventory Operations” on page 421 for more information on how Media Manager reports what it receives from ACSLS.

Figure 7. Robot Inventory - Show Contents Report (ACS Robot)



TLH Robots

Media Manager reports what it receives from the Automated Tape Library (ATL) library manager. The resulting report shows the volser (volume serial number, in the first column), the ATL media type, and the Media Manager media type.

- ◆ The Media Manager media ID corresponds to the ATL volser.
- ◆ The report shows the mapping between the ATL media type and the corresponding Media Manager media type (without considering barcode rules).

See Appendix G for more information on how Media Manager reports what it receives from the IBM ATL library manager.

TLM Robots

Media Manager reports what it receives from DAS (Distributed AML Server). The resulting report shows the volser (volume serial number, in the first column), the DAS media type, and the Media Manager media type.

- ◆ The Media Manager media ID corresponds to the DAS volser.
- ◆ The report shows the mapping between the DAS media type and the corresponding Media Manager media type (without considering barcode rules).

See Appendix H for more information on how Media Manager reports what it receives from DAS.

LMF Robots

Media Manager reports what it receives from the Library Management Facility (LMF). The resulting report shows the volser (volume serial number, in the first column), the LMF media type, and the Media Manager media type.

- ◆ The Media Manager media ID corresponds to the LMF volser.
- ◆ The report shows the mapping between the LMF media type and the corresponding Media Manager media type (without considering barcode rules).

See Appendix I for more information on how Media Manager reports what it receives from LMF.

RSM Robots

Media Manager reports what it receives from the Windows 2000 Removable Storage service. The resulting report shows a list of media (by media name) obtained from the service along with their RSM and Media Manager media types.



To Compare a Robot's Contents With the Volume Configuration

This procedure explains how to compare the contents of a robot with the contents of the volume database. Regardless of the result, the volume database is not changed. This is useful for determining if volumes have been physically moved within a robot.

1. In the NetBackup Administration window, click Media and Device Management.
2. In the tree pane of the window, expand the tree to show the device host that controls the robot that you want to inventory. See “Remote Administration of Media on Other Hosts” on page 91 for more information.

If the device host does not appear in the list of device hosts, add it by using Include New Device Host on the Actions menu.

3. Select the robot.
4. On the Actions menu, click Inventory Robot.
5. In the Robot Inventory dialog box, the Robot box contains the selected robot and the Device host box contains the name of the host that controls the robot.

- a. To select a robot on a different host, click in the Device host box and select a host from the list.

To choose a host that is not in the list, click the browse button to the right of the box and specify the name of the host in the dialog box. Then, click the Robot box to choose the robot.

- b. To select a different robot on the same host, click in the Robot box and choose from the list of robots on that host.

Note The volume database host name is highlighted if it differs from the Media Manager database host name, indicating possible conflicts.

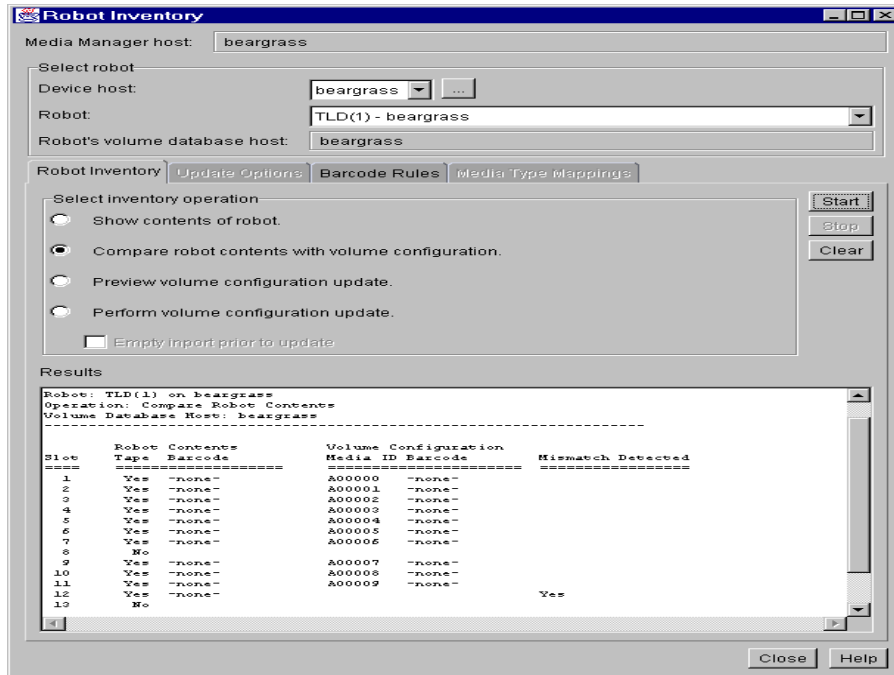
6. On the Robot Inventory tab, select Compare Robot Contents with Volume Configuration.
7. Click Start, to initiate the inventory.

Media Manager requests an inventory from the selected robot and compares the results with the contents of the volume database. The Results section of the dialog box shows any discrepancies as follows:



- ◆ If the robot can read barcodes (see “Robot Attributes” on page 276), the report includes barcode information. Media Manager determines if the barcodes in the robot match those in the volume database. Figure 8 shows an example report.

Figure 8. Robot Inventory - Compare Contents Report (Non-API Robot That Can Read Barcodes)



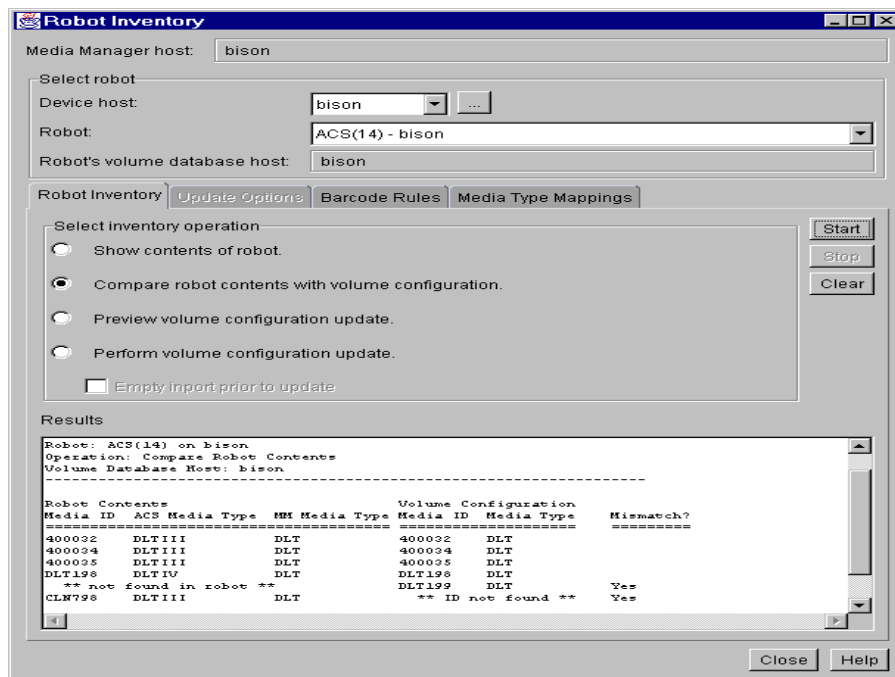
- ◆ Figure 9 shows an example report for an ACS robot. For ACS robots, Media Manager determines whether the media ID and media type in the Media Manager volume database matches the ACSLS database.

Reports for the other API robots are similar to an ACS robot report.

See “Robot Inventory Operations” on page 421 for more information on what Media Manager receives from ACSLS.



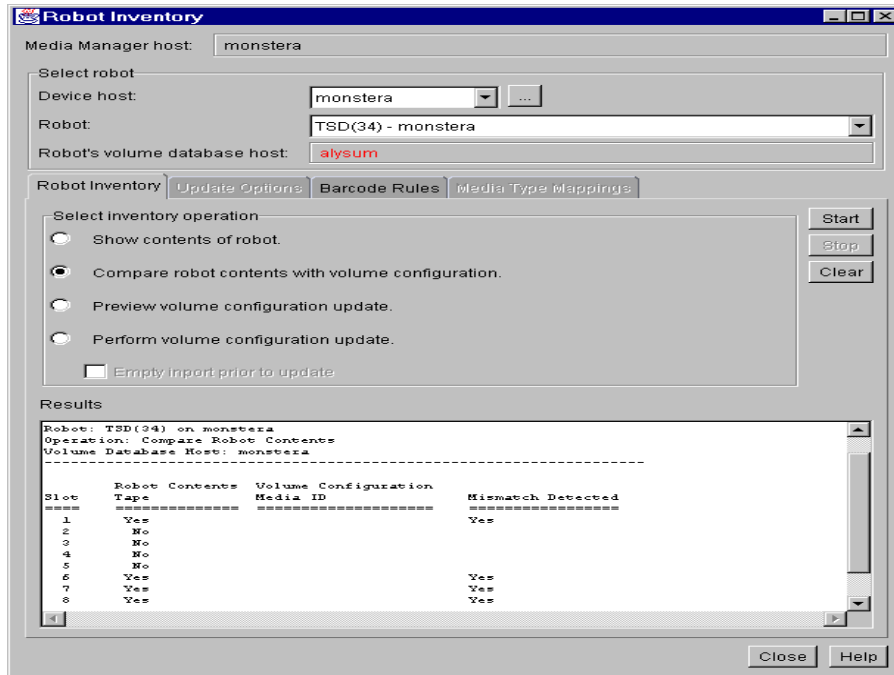
Figure 9. Robot Inventory - Compare Contents Report (ACS Robot)



- ◆ If the robot cannot read barcodes, Media Manager verifies only whether the volume database correctly shows whether a slot contains a volume. Figure 10 is an example report from a robot that cannot read barcodes.



Figure 10. Robot Inventory - Compare Contents Report (Robot Cannot Read Barcodes)



8. If the report shows that the volume database does not match the contents of the robot, do one of the following:
 - ◆ Physically move the volume.
 - ◆ Correct the condition by using Move Volume on the Actions menu or by updating the volume configuration as explained in “Updating the Volume Configuration for a Robot” on page 128.

Updating the Volume Configuration for a Robot

The following topics in this section explain how to use the Update Volume Configuration feature:

- ◆ When to Use Update Volume Configuration
- ◆ When Not to Use Update Volume Configuration
- ◆ To Update the Volume Configuration for a Robot
- ◆ To Change the Update Options



These topics explain how to inventory a robot, and optionally update the volume database to match the contents of the robot. In these topics, *insert* means the volume is placed physically in the robot without using an add or move option to update the volume database, and *remove* means to take a volume out of a robot without using a move or eject option.

If you have inserted new volumes, the configuration update includes creation of media IDs (based on barcodes or a prefix that you specify).

When you use barcode rules, a new volume that is added through a barcode rule is also assigned a media type, volume pool, maximum number of mounts (or maximum number of cleanings), and description. For instructions on setting up barcode rules, see “Configuring Barcode Rules” on page 155.

When to Use Update Volume Configuration

You can use this operation on robots that Media Manager supports, regardless of whether they can read barcodes. The Update Volume Configuration operation is useful for updating the volume’s configuration information, after performing one of the following tasks:

- ◆ Removing existing volumes from a robot.

The operation updates the residence information, in the volume database, to show the new standalone location. You specify the volume group to use.

- ◆ Inserting new volumes into a robot.

If the robot supports barcodes and the volume has readable barcode labels, the operation creates new volume entries in the volume database with media IDs that are based on the last six characters of the barcodes.

If the robot does not support barcodes or the volumes do not have readable barcodes, the new media IDs are based on a media ID prefix that you specify.

For more information on adding new volumes, see “To Add Volumes - Using Update Volume Configuration” on page 101.

If the robot supports barcodes and the volume has a readable barcode, you can use this operation in the following cases. If you are

- ◆ Inserting existing volumes into a robot.

The operation updates the residence information, in the volume database, to show the new robotic location. This includes the robot host, robot type, robot number, and slot location. You specify the volume group to use.

- ◆ Physically moving existing volumes within a robot.

The operation updates the residence information, in the volume database, to show the new slot location.



- ◆ Physically moving volumes between robotic and standalone.

The operation updates the residence information, in the volume database, to show the new robotic or standalone location.

- ◆ Physically moving volumes from one robot to another.

If the volumes for the robots are in the same volume database, you must perform two separate updates as explained in “Example 6: Moving existing volumes between robots” on page 141.

These updates move the volumes to standalone, as an intermediate step, and then to the new robot. Otherwise, Media Manager is unable to update the entries and you receive an “Update failed” error.

When Not to Use Update Volume Configuration

The following situations require a move operation, rather than using Update Volume Configuration:

- ◆ After inserting existing volumes into a robot, and the volume does not have readable barcodes or the robot does not support barcodes.

Without barcodes, Media Manager cannot identify the volume and assigns a new media ID that uses the media ID prefix you select for the update. A volume entry for the old media ID remains in the volume database. An error may occur if an application attempts to use the new or old volume.

- ◆ After physically moving existing volumes that do not have readable barcodes or if the volumes are in a robot that does not support barcodes.

If you swap volumes between two different locations, Media Manager is unable to detect the change and does not update the volume database.

If you remove a volume from a slot and place it in an empty slot, Media Manager assumes it is a new volume. Media Manager then adds a new logical volume entry with a generated media ID at its new robotic location. The volume entry for the old media ID is moved to standalone. An error may occur if an application attempts to use the volume entry with the new or old media ID. See “Example 7: Adding existing volumes when barcodes are not used” on page 142.

To Update the Volume Configuration for a Robot

1. Check the barcode capabilities of the robot and the volume by performing the procedure “To Compare a Robot’s Contents With the Volume Configuration” on page 125.

Determine if the following are true:

- ◆ The robot supports barcodes.



- ◆ Any new volume that was inserted has readable barcodes.
2. If the robot does not support barcodes or the volume does not have readable barcodes, consider the following:
 - ◆ Save the results of the verify, as it may be useful in deciding on a media ID prefix if you use Update Options to assign a prefix later in this procedure.
 - ◆ For API robots (ACS, LMF, RSM, TLH, or TLM robot types), assign media-type mappings. If you do not, defaults are used.

See “To Change the Update Options” on page 143 for instructions.

For ACS robots, media-type mappings are explained in Appendix F.

For TLH robots, media-type mappings are explained in Appendix G.

For TLM robots, media-type mappings are explained in Appendix H.

For LMF robots, media-type mappings are explained in Appendix I.

For information on RSM media type mappings, see the Windows NT/2000 NetBackup Media Manager system administrator’s guides.
 3. Create barcode rules.

Barcode rules are optional and are used for updating the volume database for a volume that has been inserted into the robot. See “Configuring Barcode Rules” on page 155 for information.
 4. In the tree pane, expand the tree to show the device host and robot that you are going to inventory.

If the device host does not appear in the list of device hosts, you can add it using Include New Device Host on the Actions menu.
 5. Select the robot.
 6. On the Actions menu, click Inventory Robot.
 7. In the Robot Inventory dialog box, the Robot box contains the selected robot and the Device host box contains the name of the host that controls the robot.
 - a. To select a different robot on the same host, click the Robot box and choose from the list of robots on that host.
 - b. To select a robot on a different host, click the Device Host box and select the host from the list. To choose a host that is not in the list, click the browse button to the right of the box and specify the name of the desired host in the dialog box. Then, click the Robot box to choose the robot.



Note The volume database host name is highlighted, if it differs from the Media Manager database host name, indicating possible conflicts.

8. On the Robot Inventory tab, select Perform Volume Configuration Update.

Note To preview the update without making any changes, select Preview Volume Configuration Update.

9. If you have a TLD or TL8 robot and you want any volumes in the inport slots moved into the robotic library before initiating the update, select Empty Inport Prior To Update. If the robot has an entry port that can hold multiple volumes, each volume in the entry port is moved from the entry port to the first empty slot in the robot. After all volumes are moved to the empty slots or all slots are full, the update proceeds as usual.

Note This box may be enabled for some TLD or TL8 robots that do not have entry ports, since the robot type for the robot only indicates that entry ports are possible.

Note If you have ejected volumes from the robot with the eject or move operations, remove the volume from the exit port before performing a move with Empty Inport Prior To Update selected. Otherwise, if the entry and exit ports are the same, the volumes that you ejected could be moved back into the robot.

10. To view or change the settings for the update (or preview), click the Update Options tab. See “To Change the Update Options” on page 143 for instructions.
11. Click Start to initiate the update (or the preview).

The following figure shows example results for a robot that is not an API robot.



Figure 11. Report Inventory - Update Volume Configuration Report (Not an API Robot)

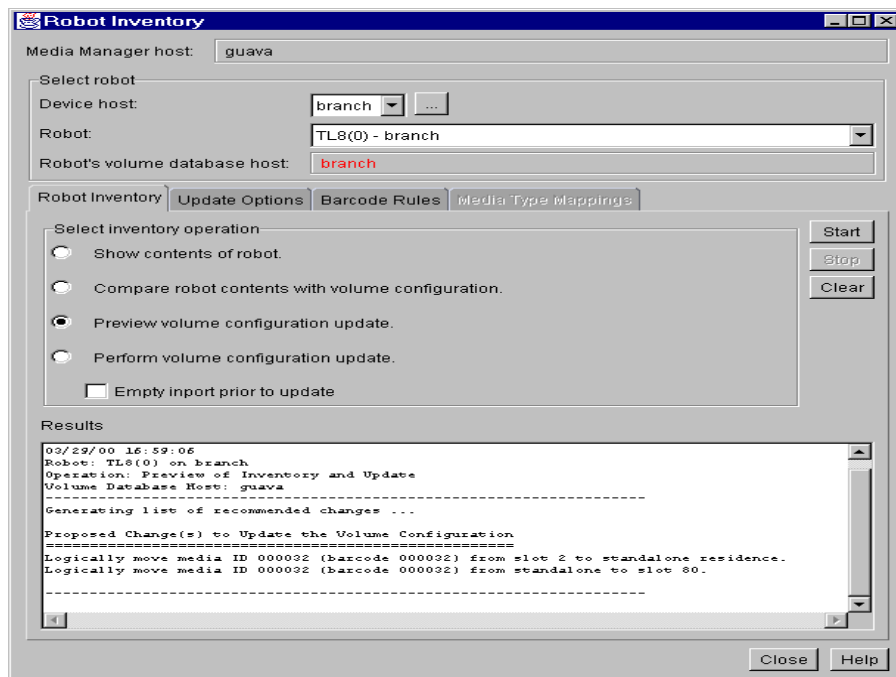
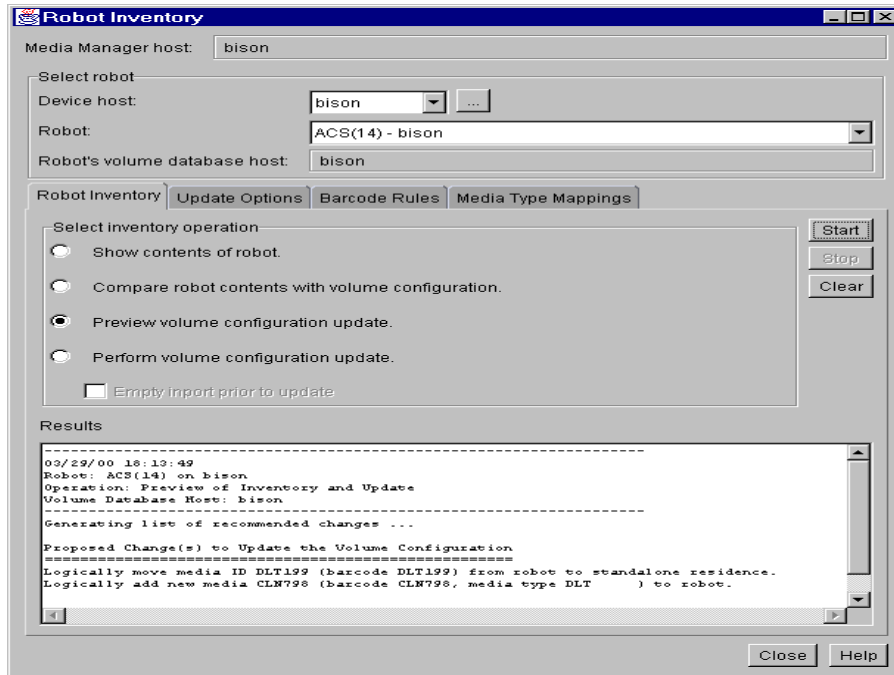


Figure 12 shows an example report for an ACS robot (the report is similar for other API robots).



Figure 12. Robot Inventory - Update Volume Configuration Report (ACS Robot)



Examples of Updating the Volume Configuration

Note The following examples show only the relevant dialog box and volume attributes.

Example 1: Remove a volume from a robot

The following is an example of removing a volume from a robot. It does not matter whether the robot supports barcodes.

1. The following are the attributes for media ID 800001.

media ID	800001
media type	8MM cartridge tape
barcode	TL800001
description	tl8 backup volume
volume pool	NetBackup
robot type	TL8 - Tape Library 8MM
volume group	EXB220
max mounts allowed	0 (unlimited)

2. Assume that you remove the volume from the robot, specify the following in the Update Options dialog box, and then execute the update.

media type:	DEFAULT
volume group	NONROB_8MM
volume pool	DEFAULT

3. The resulting volume attributes for media ID 800001 are as follows:

media ID	800001
media type	8MM cartridge tape
barcode	TL800001
description	tl8 backup volume
volume pool	NetBackup
robot type	NONE - Not Robotic
volume group	NONROB_8MM
max mounts allowed	0 (unlimited)

The new residence information, in the volume database, shows a standalone location in the volume group, specified by Volume Group on the Update Options dialog. The media type and volume pool remain unchanged.

The results are the same for a volume that does not have a barcode.



Example 2: Add existing standalone volumes to a robot

The following is an example of adding an existing barcoded standalone volume to a robot that supports barcodes (TL8).

Note When moving volumes from robot to robot, you must do two separate updates, as explained in “Example 6: Moving existing volumes between robots” on page 141.

1. The following are the volume attributes for media ID 800021, which has a readable barcode and already exists as a standalone volume.

media ID	800021
media type	8MM cartridge tape
barcode	TL800021
description	8MM standalone
volume pool	None
robot type	None (Standalone)
volume group	NONROB_8MM
max mounts allowed	0 (unlimited)

2. Assume that you insert the volume into a TL8 robot, specify the following in the Update Options dialog box, and then execute the update.

media type	DEFAULT
volume group	EXB220
use barcode rules	YES
volume pool	NetBackup

3. The barcode rules shown in the following table exist:

Barcode Tag	Media Type	Volume Pool	Max Mounts/ Cleanings	Description
CLND	DLT_CLN	None	30	dlt cleaning
CLN8	8MM_CLN	None	20	8mm cleaning
TL8	8MM	NetBackup	0	tl8 backup
DLT	DLT	d_pool	200	dlt backup



Barcode Tag	Media Type	Volume Pool	Max Mounts/ Cleanings	Description
TS	8MM	None	0	8mm no pool
<NONE>	DEFAULT	None	0	no barcode
<DEFAULT>	DEFAULT	NetBackup	0	other barcodes

4. Media Manager recognizes that the media ID exists and changes the volume database to reflect the new robotic location, rather than creating a new media ID. The resulting volume attributes for media ID 800021 are as follows:

media ID	800021
media type	8MM cartridge tape
barcode	TL800021
description	8MM standalone
volume pool	NONE
robot type	TL8 - Tape Library 8MM
robot number	0
robot slot	1
robot host	shark
volume group	EXB220
max mounts allowed	0 (unlimited)

Because the last six characters of the barcode match the media ID of an existing standalone volume in the configuration, the residence information in the volume database is updated to reflect the new robotic location. Since the volume is not new, barcode rules are ignored. The only options used in the Update Options dialog box are the volume group for added or moved volumes and the media type.

Example 3: Move existing volumes within a robot

The following is an example of moving a volume from one slot to another within the same robot. The robot supports barcodes and the volume has a readable barcode.

Caution For volumes moved within a robot, use Update Volume Configuration only if the robot supports barcodes and the volumes have readable barcodes. Otherwise, Media Manager is unable to properly recognize the move (see “When Not to Use Update Volume Configuration” on page 130 and “Example 7: Adding existing volumes when barcodes are not used” on page 142).



1. The following are the attributes for media ID 800002, which currently resides in slot 1 of the robot.

media ID	800002
media type	8MM cartridge tape
barcode	TL800002
description	tl8 backup
volume pool	NetBackup
robot type	TL8 - Tape Library 8MM
robot number	0
robot slot	1
robot host	shark
volume group	EXB220
max mounts allowed	0 (unlimited)

2. Assume that you move the volume to empty slot 10, specify the following in the Update Options dialog box, and then execute the update.

media type	DEFAULT
volume group	EXB220
use barcode rules	NO
volume pool	DEFAULT

3. The resulting volume attributes are:

media ID	800002
media type	8MM cartridge tape
barcode	TL800002
description	tl8 backup
volume pool	NetBackup
robot type	TL8 - Tape Library 8MM
robot number	0
robot slot	10
robot host	shark



volume group EXB220
max mounts allowed 0 (unlimited)

The updated volume attributes show the new slot number, but all other information is unchanged.

Example 4: Add new volumes to a robot

The following is an example of adding new barcoded volumes to a robot that supports barcodes.

1. Assume the new volume is an 8MM tape with readable barcode of TL800002.
2. You specify the following in the Update Options dialog box and execute the update.

media type DEFAULT
volume group EXB2220
use barcode rules YES
volume pool DEFAULT

3. The barcode rules shown in the following table exist:

Barcode Tag	Media Type	Volume Pool	Max Mounts/ Cleanings	Description
CLND	DLT_CLN	None	30	dlt cleaning
CLN8	8MM_CLN	None	20	8mm cleaning
TL8	8MM	NetBackup	0	t18 backup
DLT	DLT	d_pool	200	dlt backup
TS	8MM	None	0	8mm no pool
<NONE>	DEFAULT	None	0	no barcode

4. The barcode on the media matches the barcode rule named TL8 and the resulting volume attributes for the new volume are as follows:

media ID 800002
media type 8MM cartridge tape
barcode TL800002



description	tl8 backup
volume pool	NetBackup
robot type	TL8 - Tape Library 8MM
robot number	0
robot slot	1
robot host	shark
volume group	EXB220
max mounts allowed	0 (unlimited)

The media ID is from the last six characters of the barcode. The new residence information in the volume database, shows the robot host, robot type, robot number, slot, and host. The volume group is from the Update Options dialog. The volume pool and max mounts allowed are from the barcode rule.

If barcode rules (or barcodes) had not been used, the description, volume pool, and max mounts allowed would be set to the following defaults:

- ◆ Description: added by Media Manager
- ◆ Volume pool: NetBackup for data tapes or None for cleaning tapes
- ◆ Max mounts: 0 (unlimited)

Note If the robot does not support barcodes or the barcode is unreadable, you must specify a media ID prefix in the Update Options dialog box or Media Manager will not add new media IDs.

Example 5: Add cleaning tapes to a robot

A special case exists when adding cleaning tapes. For example, assume you are doing an update for a TLD robot.

1. The tapes you inserted include regular tapes with barcodes ranging from DLT00000 to DLT00010 and a cleaning tape with a barcode of CLN001.
2. The barcode rules shown in the following table exist:

Barcode Tag	Media Type	Volume Pool	Max Mounts/ Cleanings	Description
CLN	DLT_CLN	None	30	dlt cleaning
DL	DLT	d_pool	200	dlt backup



Barcode Tag	Media Type	Volume Pool	Max Mounts/ Cleanings	Description
<NONE>	DEFAULT	None	0	no barcode

3. You specify the following in the Update Options dialog box and then execute the update.

media type	DLT
volume group	STK7430
use barcode rules	YES

4. The barcodes on the regular tapes match the DL barcode rule and the media type of the DL barcode rule matches the media type in the Update Options dialog box. These tapes are added as DLT.

The cleaning tape matches the CLN barcode rule and Media Manager recognizes that DLT_CLN is the cleaning tape for DLT. The cleaning tape CLN001 is added as DLT_CLN media along with the regular volumes.

This illustrates Media Manager's ability to add cleaning cartridges along with regular volumes when you use Update Volume Configuration.

If the volumes you insert include a cleaning tape, Media Manager adds the volumes correctly if the following are true:

- ◆ The media type in the Update Options dialog box is the regular media (DLT in this example).
- ◆ The barcode on the volume matches a barcode tag (CLN in this example) and the media type for the barcode rule is the correct cleaning media (DLT_CLN in this example).

To add only cleaning media, specify the cleaning media type in the Update Options dialog box and in the barcode rule (DLT_CLN in this example).

Example 6: Moving existing volumes between robots

When you move volumes from one robot to another and the volumes in both robots are in the same volume database, you must perform two separate updates. These updates move the volumes to standalone, as an intermediate step, and then to the new robot.

Otherwise, Media Manager is unable to update the entries and you receive an "Update request failed" error.



Caution This procedure assumes that robot 2 is able to read barcodes and the volume has readable barcodes. Otherwise, you will encounter the problem mentioned in “Example 7: Adding existing volumes when barcodes are not used” on page 142.

1. Remove the volume from robot 1.
Insert the volume in robot 2.
2. Perform an Update Volume Configuration on robot 1.
This updates the volume attributes to show the volume as standalone.
3. Perform an Update Volume Configuration on robot 2.
This updates the configuration to show the volume in robot 2.

Example 7: Adding existing volumes when barcodes are not used

Caution This example is *NOT* recommended and is shown only to illustrate the results.

The following is an example of adding an existing standalone volume to a TL4 robot. A TL4 robot supports inventory (detects media presence), but not barcodes.

1. The following are the attributes for media ID 400021, which already exists as a standalone volume.

media ID	400021
media type	4MM cartridge tape
barcode	-----
description	4MM standalone
volume pool	None
robot type	NONE - Not Robotic
volume group	NONROB_4MM
max mounts allowed	0 (unlimited)

2. Assume that you insert the volume into the robot, specify the following in the Update Options dialog box, and then execute the update.

media type	DEFAULT
------------	---------



volume group	00_000_TL4
media ID prefix	C4
volume pool	DEFAULT

3. The resulting volume attributes are:

media ID	C40000
media type	4MM cartridge tape
barcode	-----
description	Added by Media Manager
volume pool	NetBackup
robot type	TL4 - Tape Library 4MM
robot number	0
robot slot	1
robot host	shark
volume group	00_000_TL4
max mounts allowed	0 (unlimited)

It is important to note that Media Manager assigned a new media ID to the volume. This always occurs if you use Update Volume Configuration to add volumes that do not have readable barcodes or if the robot does not support barcodes. Without a barcode, Media Manager cannot identify the volume and assumes it is new. The new media ID (C40000) is generated from the media ID prefix on the Update Options dialog.

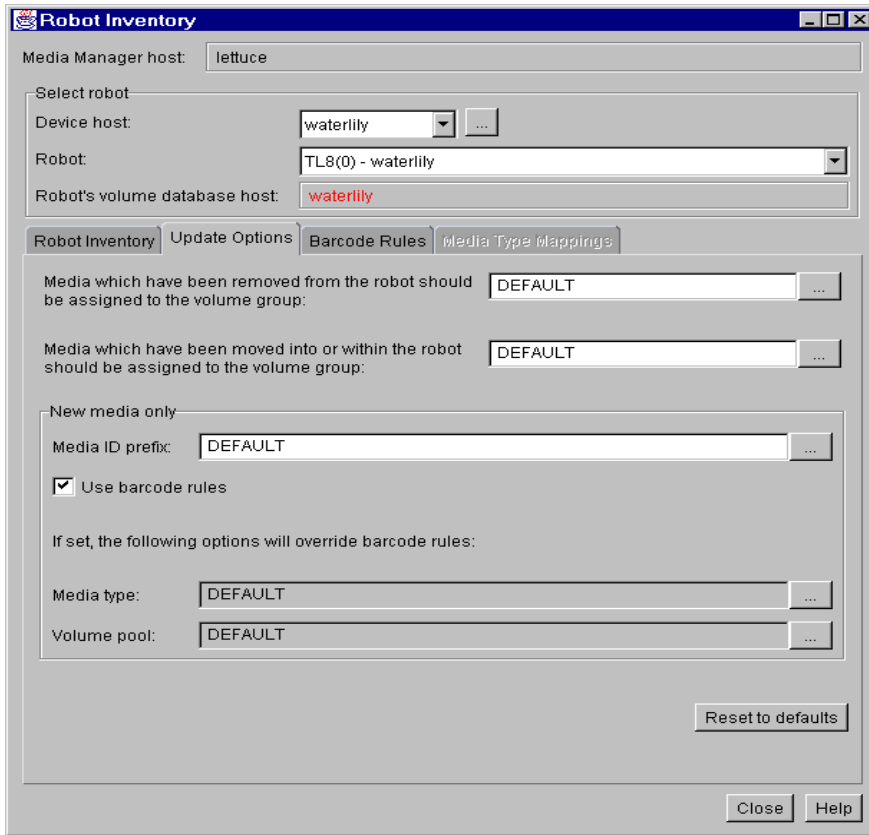
The old media ID (400021) remains in the configuration unchanged. The information for the new media ID (C40000) shows the robotic location, including the robot host, robot type, number, slot, and host. The volume group and volume pool are according to the Update Options dialog box selections. The max mounts allowed is set to the default (0).

To Change the Update Options

1. In the Robot Inventory dialog box, click the Update Options tab.

See “To Update the Volume Configuration for a Robot” on page 130 for the complete procedure.





2. Specify update options properties as explained in “Dialog Box Entries for Update Options” on page 145.

To reset all settings on this tab to their defaults, click Reset to defaults.

3. When you are satisfied with the settings, click the Robot Inventory tab.
4. Click Start to initiate the update.

Dialog Box Entries for Update Options

Media Which Have Been Removed From the Robot Should Be Assigned to the Volume Group:

If you leave the volume group at `DEFAULT` and there is an existing group with a compatible residence for the volume, the volume is added to that group. A compatible residence means the same robot type, robot number, robot host, and media type (DLT and DLT_CLN are considered equivalent in this regard). If a suitable volume group does not currently exist, Media Manager generates a new volume group name.

To change from `DEFAULT`, do one of the following:

- ◆ Specify a new group

Select the box and then enter the group name.

- ◆ Pick from a selection list

Click the browse button in the box. This opens a list of choices for the volume group that Media Manager can assign to volumes that you have removed from the robot. Selecting from the list copies your selection to the text box.

The selection list always has the following choices:

- ◆ `DEFAULT` - Let Media Manger choose the volume group.
- ◆ `AUTO-GENERATE` - Automatically generate a new volume group.
- ◆ `NO VOLUME GROUP` - Do not assign a volume group.

The other available choices show *all* available volume groups. It is better to leave the volume group setting as `DEFAULT`, especially if the robot contains multiple media types.

Media Which Have Been Moved Into or Within the Robot Should Be Assigned to the Volume Group:

If you leave the volume group at `DEFAULT` and there is an existing group with a compatible residence for the volume, the volume is added to that group. A compatible residence means the same robot type, robot number, robot host, and media type (DLT and DLT_CLN are considered equivalent in this regard). If a suitable volume group does not currently exist, Media Manager generates a new volume group name.

To change from `DEFAULT`, do one of the following:

- ◆ Specify a new group

Enter the group name in the box.

- ◆ Pick from a selection list



Click the browse button to the right of the box. This opens a list of choices for the volume group that Media Manager can assign to volumes that you have removed from the robot. Select from the list to copy that choice to the text box.

The selection list always has the following choices:

- ◆ DEFAULT - Let Media Manger choose the volume group.
- ◆ AUTO-GENERATE - Automatically generate a new volume group.

Note If the robot contains multiple media types, it is better to leave the volume group setting as `DEFAULT`. If you specify a volume group and volumes of different media types have been moved into or within the robot since the last update, the new update will fail. This is because volumes of differing media types cannot have the same volume group.

The other available choices show *all* available volume groups. It is better to leave the volume group setting as `DEFAULT`, especially if the robot contains multiple media types.

Media ID Prefix

Specify a Media ID prefix, if either of the following conditions exist:

- ◆ The robot does not support barcodes.
- ◆ The volume that was inserted does not have readable barcodes.

Note If the robot supports barcodes and the volume has readable barcodes, a prefix is not required since Media Manager assigns the last six characters of the barcode as the media ID. This applies whether or not a barcode rule is used.

If you want media IDs for media without barcodes generated based on a specific prefix, you can do one of the following:

- ◆ Pick a prefix from a selection list (see Option 1).
- ◆ Enter a new value for the prefix (see Option 2).

Option 1: Picking A Prefix From A Selection List

To pick from a selection list, click the browse button to the right of the Media ID Prefix text box. This opens a list of choices. Select from the list to copy that choice to the text box.

The selection list will be similar to the following example. The first three items in this example list are existing media ID prefixes.

NV
NETB

HS
 DEFAULT
 NOT USED

These prefixes come from `MEDIA_ID_PREFIX` entries that were added to the `vm.conf` file, on the host where you are running the NetBackup administration utility. For example, `vm.conf` entries for these items in the list are as follows:

```
MEDIA_ID_PREFIX = NV
MEDIA_ID_PREFIX = NETB
MEDIA_ID_PREFIX = HS
```

See “Media Manager Configuration File (`vm.conf`)” on page 302 for an overview of the `vm.conf` file.

`DEFAULT` always appears in the selection list. If you select `DEFAULT`, Media Manager checks the `vm.conf` file for `MEDIA_ID_PREFIX` entries.

If `vm.conf`

- ◆ Contains prefix entries, Media Manager assigns the last one as the default prefix.
- ◆ Does not contain any prefix entries, Media Manager uses the letter A as the default prefix.

`NOT USED` also always appears in the selection list. If you select `NOT USED`, the operation succeeds only if the robot supports barcodes and the volume has readable barcodes. Otherwise, Media Manager is unable to assign new media IDs and the operation fails. `NOT USED` may be useful if you are using barcoded volumes and want updates to fail when unreadable or missing barcodes are encountered.

Option 2: Entering a New Value For a Prefix

You can enter a new value for the Media ID Prefix directly in the text box. You can specify a prefix having from one to five alpha-numeric characters. Media Manager assigns the remaining numeric characters. For example, if the prefix is `NETB`, the media IDs are: `NETB00`, `NETB01`, and so on.

Note If you enter a new media ID prefix, the prefix is used only for the current operation. It is not added to the `vm.conf` file.

Use Barcode Rules

This check box specifies whether you are using barcode rules, as follows:

- ◆ Select the check box, to have Media Manager search existing barcode rules and apply the rules to new volumes that have been inserted into a robot.



- ◆ Clear the check box, to have Media Manager ignore barcode rules.

Media Type (for robots that are not API robots)

Note See “Media Type (for API robots)” on page 150 for instructions for specifying Media Type for API robots (ACS, LMF, RSM, TLH, or TLM robot types).

Specifies the media type for the volume that is being added.

Click in the box to view the media types that are valid for this robot. Select from the list to copy that choice to the box. The following is an example list for a TLD robot:

```
DEFAULT
1/2" cartridge tape
DLT cartridge tape
DTF cartridge tape
1/2" cartridge tape 2
DLT cartridge tape 2
1/2" cartridge tape 3
DLT cartridge tape 3
1/2" cleaning tape
1/2" cleaning tape 2
1/2" cleaning tape 3
DLT cleaning tape
DLT cleaning tape 2
DLT cleaning tape 3
DTF cleaning tape
```

The procedure you follow to pick a media type depends on whether you are using barcode rules as follows:

- ◆ If you are *not* using barcode rules, see the instructions in Topic 1.
- ◆ If you are using barcode rules, see the instructions in Topic 2.

Topic 1: Media Type When Not Using Barcode Rules

If you are not using barcode rules and you want to use

- ◆ The default media type, select `DEFAULT`. Media Manager then uses the default type for the robot.
- ◆ A media type other than the default, select one from the list.

Selecting from the list is necessary when the robot supports multiple media types and you do not want the default. For example, the default for a TLD robot is DLT, but the robot also supports half-inch cartridges. To add half-inch cartridges to this robot type, you must specify half-inch cartridge in the Update Options tab.

Table 35 shows the default media types for robots.

Table 35. Default Media Types for Robots (Not API robots)

Robot Type	Default Media Type
Optical Disk Library (ODL)	Rewritable optical disk
Tape Library 4MM (TL4)	4MM cartridge tape
Tape Library 8MM (TL8)	8MM cartridge tape
Tape Library DLT (TLD)	DLT cartridge tape ¹
Tape Stacker 8MM (TS8)	8MM cartridge tape
Tape Stacker DLT (TSD)	DLT cartridge tape
Tape Stacker Half-inch (TSH)	1/2-inch cartridge ²

¹ Also supports 1/2-inch cartridge tape, 1/2-inch cartridge tape 2, 1/2-inch cartridge tape 3, DLT cartridge tape 2, and DLT cartridge tape 3.

² Also supports 1/2-inch cartridge tape 2.

Topic 2: Media Type When Using Barcode Rules

If you are using barcode rules and you want to

- ◆ Let the barcode rule determine the media type that is assigned, select `DEFAULT`.
For example, assume you want to add DLT and half-inch cartridges to a TLD robot with a single update operation. First create separate rules for DLT and half-inch cartridges and select the specific media type in the barcode rules. Then, select `DEFAULT` in the Update Options tab. Media Manager now uses the media type in the barcode rules when it does the update.

Note If you choose `DEFAULT` here and in the barcode rule, Media Manager assigns the default media type for the robot.

- ◆ Use a media type other than the default, select a type from the list.
For example, to use the same rule to add DLT or half-inch cartridges to a TLD robot, select a specific media type in Update Options and select `DEFAULT` for the barcode rule media type when you add the barcode rule. Now you can perform one update for DLT and another for half-inch cartridge and use the same rule for both.
The update media type always overrides the rule. If you specify any value other than `DEFAULT` in the Update Options tab, the media type for the rule must be the same type or be `DEFAULT` in order to obtain a match (except for cleaning media).



The following table shows the results for various combinations of update and barcode rule media types:

Update Options Media Type	Barcode Rule Media Type	Rule Used	Media Type in Volume Configuration
DLT	DEFAULT	Yes	DLT
HCART	DEFAULT	Yes	HCART
DLT	DLT	Yes	DLT
DLT	DLT_CLN	Yes	DLT_CLN
DLT_CLN	DLT	No	
DLT_CLN	DLT_CLN	Yes	DLT_CLN
DLT_CLN	DEFAULT	Yes	DLT_CLN
DLT	8MM, 4MM, and so on	No	
DEFAULT	DEFAULT	Yes	DLT
DEFAULT	DLT	Yes	DLT
DEFAULT	DLT_CLN	Yes	DLT_CLN
DEFAULT	8MM, 4MM, and so on	No	

The fourth barcode rule in the table shows Media Manager's ability to add cleaning cartridges with regular volumes when you execute an update for a robot.

If the volumes that you insert include a cleaning tape, Media Manager adds the volumes correctly, if the following are true:

- ◆ The update options media type is for the regular media (DLT in this example).
- ◆ The barcode on the volume matches a barcode tag and the barcode rule media type is the cleaning media (DLT_CLN in this example).

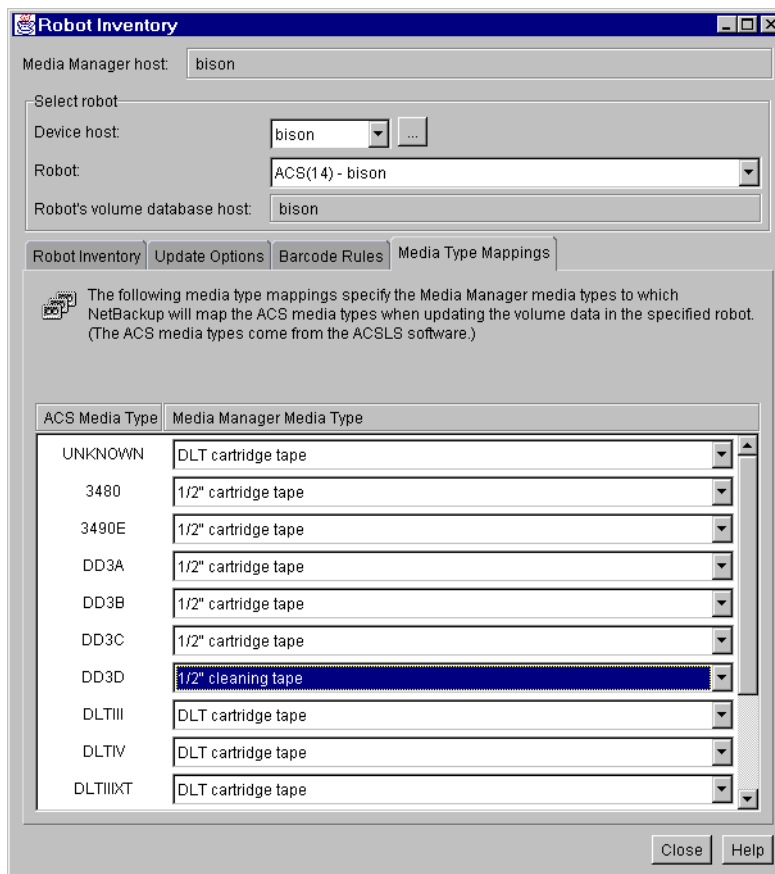
Also see "Example 5: Add cleaning tapes to a robot" on page 140.

The sixth and seventh rules in the table illustrate how to add only a cleaning tape. In the sixth rule, you specify the cleaning media type in the Update Options tab and in the barcode rule. In the seventh rule, you specify the cleaning media in Update Options and choose default when you configure the barcode rule.

Media Type (for API robots)

For ACS, LMF, RSM, TLH, or TLM robot types (API robots), the Media Type setting is always `DEFAULT`. Media Manager uses the mappings on the Media Type Mappings tab to set the media type for new volumes. This tab is available only for these robot types.





In Media Type Mappings, you map the media type specified by the robot vendor or operating system software to a corresponding Media Manager type.

Click in the box to the right of the vendor media type and select a Media Manager type from the list that appears. Your mappings apply only to the current update.

You can set the defaults that appear in Media Type Mappings by adding media mappings to the Media Manager configuration file, `vm.conf`, on the host where you are running the NetBackup Administration utility.

For ACS robots, adding media mappings entries is explained in “`vm.conf` Map Entries for ACS Robots” on page 423.

For TLH robots, adding media mappings entries is explained in “`vm.conf` Map Entries For TLH Robots” on page 445.

For TLM robots, adding media mappings entries is explained in “`vm.conf` Map Entries For TLM Robots” on page 455.



For LMF robots, adding media mappings entries is explained in “vm.conf Map Entries for LMF Robots” on page 469.

For information on adding RSM media mapping entries to the vm.conf file, see the Windows NT/2000 NetBackup Media Manager system administrator’s guides.

If the `vm.conf` file does not exist or does not contain media mappings, Media Manager uses the default media type mappings shown in Table 36 through Table 40.

Table 36. Default Media Types for ACS Robots

ACS Media Type	Default Media Manager Media Type
3480	1/2-inch cartridge (HCART)
3490E	1/2-inch cartridge (HCART)
DLTIII	Digital Linear Tape (DLT)
DLTIIIXT	Digital Linear Tape (DLT)
DLTIV	Digital Linear Tape (DLT)
DD3A	1/2-inch cartridge tape 2 (HCART2)
DD3B	1/2-inch cartridge tape 2 (HCART2)
DD3C	1/2-inch cartridge tape 2 (HCART2)
DD3D	1/2-inch cartridge cleaning tape 2 (HC2_CLN)
STK1R	1/2-inch cartridge (HCART)
STK1U	1/2-inch cartridge cleaning tape (HC_CLN)
EECART	1/2-inch cartridge (HCART)
JLABEL	1/2-inch cartridge (HCART)
UNKNOWN ¹	1/2-inch cartridge tape 2 (HCART2)

¹ All unknown ACS media types map to 1/2-inch cartridge tape 2.

Table 37. Default Media Types for LMF Robots

LMF Media Type	Default Media Manager Media Type
18/36TRK	1/2-inch cartridge (HCART)
128TRK	1/2-inch cartridge (HCART)
UNKNOWN	1/2-inch cartridge tape 2 (HCART2)



Table 38. Default Media Types for RSM Robots

RSM Media Type	Default Media Manager Media Type
DDS_4MM	4MM
MINI_QIC	1/4-inch cartridge (QCART)
TRAVAN	1/4-inch cartridge (QCART)
QIC	1/4-inch cartridge (QCART)
MP_8MM	8MM
AME_8MM	8MM
AIT1_8MM	8MM
DLT	DLT
IBM_MAGSTAR_3590	1/2-inch cartridge (HCART)
IBM_MAGSTAR_MP	1/2-inch cartridge (HCART)
STK_DATA_D3	1/2-inch cartridge (HCART)
MP2_8MM	8MM
CLEANER_CARTRIDGE	1/2-inch cartridge (HC_CLN)
UNKNOWN	1/2-inch cartridge (HCART)

Table 39. Default Media Types for TLH Robots

TLH Media Type	Default Media Manager Media Type
3480	1/2-inch cartridge (HCART)
3490E	1/2-inch cartridge (HCART)
3590J	1/2-inch cartridge (HCART)
3590K	1/2-inch cartridge (HCART)
UNKNOWN	1/2-inch cartridge tape 2 (HCART2)

Table 40. Default Media Types for TLM Robots

TLM Media Type	Default Media Manager Media Type
3480	1/2-inch cartridge (HCART)



Table 40. Default Media Types for TLM Robots (continued)

TLM Media Type	Default Media Manager Media Type
OD_THICK	Rewritable optical disk (REWR_OPT) ¹
OD_THIN	NONE (not supported)
DECDLT	Digital Linear Tape (DLT)
8MM	8mm cartridge (8MM)
4MM	4mm cartridge (4MM)
D2	NONE (not supported)
VHS	NONE (not supported)
3590	1/2-inch cartridge (HCART)
CD	NONE (not supported)
TRAVAN	NONE (not supported)
DTF	DTF cartridge (DTF)
BETACAM	NONE (not supported)
UNKNOWN	1/2-inch cartridge tape 2 (HCART2)

¹ Optical disk is not supported on Windows NT/2000 and is not supported with Update Volume Configuration.

Volume Pool

Specifies the volume pool. Click in the Volume pool box to view the volume pools to which you can assign new volumes. Select from the list to copy that choice to the box.

The selection list will be similar to the following example:

```
DEFAULT
None
NetBackup
a_pool
b_pool
```

If you are using barcode rules and you want to

- ◆ Let the barcode rule determine the volume pool that is assigned to new volumes, click DEFAULT.
- ◆ Use a volume pool other than the default, click that pool name in the list. The Update Options volume pool always overrides the rule.

If you are *not* using barcode rules and you want to use



- ◆ The NetBackup volume pool for data volumes and no volume pool for cleaning tapes, click `DEFAULT`.
- ◆ A volume pool other than the default, click that pool name in the list.

Configuring Barcode Rules

A barcode rule specifies criteria for assigning attributes to new robotic volumes. The attributes are assigned according to the barcode that is detected by the robot. You choose whether to use barcode rules when you set up the update operation.

For background information, see “Barcode Rules” on page 298.

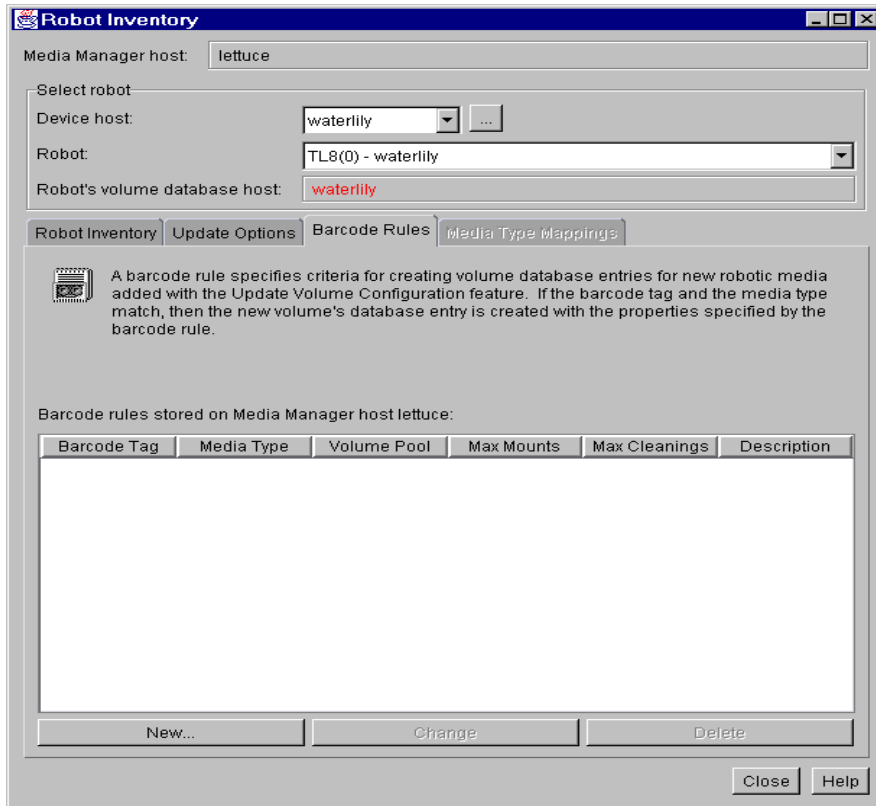
The following topics explain how to use barcode rules:

- ◆ To Add a New Barcode Rule
- ◆ Dialog Box Entries for Barcode Rules
- ◆ To Change a Barcode Rule
- ◆ To Delete a Barcode Rule

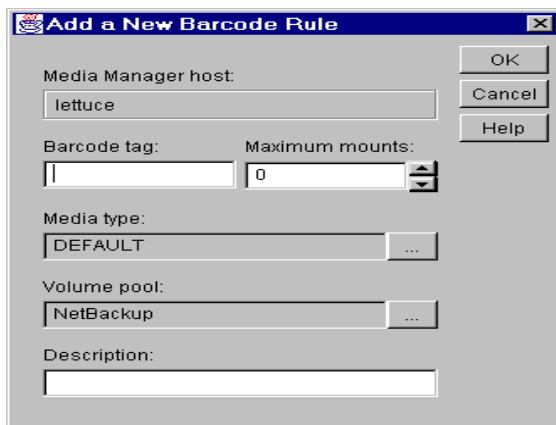
To Add a New Barcode Rule

1. Choose the Media Manager host that has the volume database where you want to add barcode rules. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
2. On the Actions menu, click Inventory Robot.
The Robot Inventory dialog box appears.
3. In the Robot Inventory dialog box, click the Barcode Rules tab.





4. Click New.



5. Specify the properties for the barcode rule and click OK.

See “Dialog Box Entries for Barcode Rules” for help on specifying the barcode rule properties.

Dialog Box Entries for Barcode Rules

Barcode Tag

Specifies the barcode tag for the rule. The tag can have from 1 to 16 characters, but no spaces.

The following rules can have special characters in the barcode tags:

- ◆ <NONE > - Matches when rules are used and the volume has an unreadable barcode or the robot does not support barcodes.
- ◆ <DEFAULT> - For barcoded volumes, this tag matches when none of the other barcode tags match, providing the media type in the <DEFAULT> rule and the media type on the Update Options tab are compatible.

Use Update Options to set up the criteria for a robot update (see “Updating the Volume Configuration for a Robot” on page 128).

Media Type

Specifies the media type for which this rule will be used.

If you want to have the rule

- ◆ Match *any* media type that you select in Update Options, select `DEFAULT`.
If you also select `DEFAULT` in Update Options, Media Manager uses the default media type for the robot (see “Media Type (for robots that are not API robots)” on page 148).
- ◆ Match *only* when you select that specific media type or `DEFAULT` in Update Options, select a specific media type.

If you choose `DEFAULT` for the update, Media Manager assigns the rule’s media type.

Note Always select `DEFAULT` for API robots.

The following table shows various combinations of update selections and barcode rule media types for a TLD robot. A TLD robot can have DLT or half-inch cartridge media.

Update Media Type	Barcode Rule Media Type	Rule Used	Media Type Added To Volume Configuration
DLT	DEFAULT	Yes	DLT



Update Media Type	Barcode Rule Media Type	Rule Used	Media Type Added To Volume Configuration
HCART	DEFAULT	Yes	HCARTT
DLT	DLT	Yes	DLT
DLT	DLT_CLN	Yes	DLT_CLN
DLT_CLN	DLT	No	
DLT_CLN	DLT_CLN	Yes	DLT_CLN
DLT_CLN	DEFAULT	Yes	DLT_CLN
DLT	8MM, 4MM, and so on	No	
DEFAULT	DEFAULT	Yes	DLT
DEFAULT	DLT	Yes	DLT
DEFAULT	DLT_CLN	Yes	DLT_CLN
DEFAULT	HCART	Yes	HCART
DEFAULT	8MM, 4MM, and so on	No	

When setting up the update operation, a rule is not used if the media type in the rule is not compatible with the media type you select in Update Options. See “Updating the Volume Configuration for a Robot” on page 128.

For an API robot, Media Manager determines whether the media type is compatible by mapping it according to the setting in the media mappings dialog box. See “Media Type (for API robots)” on page 150 for more information.

Volume Pool

Specify a volume pool for the volume. This is the pool that the volume will be added to, when a barcode matches the rule.

Whenever the barcode rule is used, and the Update Options dialog shows

- ◆ DEFAULT for the volume pool, then the volume is assigned to the pool you specified in the barcode rule.
- ◆ A specific volume pool, then that selection overrides the pool you specified in the barcode rule.

Maximum Mounts

Specifies the maximum number of mounts or cleanings that are allowed for this volume, as follows:

- ◆ For media other than cleaning tapes, enter the maximum number of mounts to allow.



- ◆ For cleaning tapes, enter the number of cleanings to allow.

When a barcode rule is used, Media Manager adds the number you specify to the volume database for the media ID.

Note When you specify 0 (unlimited), a cleaning tape whose barcode happens to match the rule will be assigned a 0 for Cleanings. This means it will not be used unless you subsequently change Cleanings to another value. You can avoid this situation by carefully selecting the barcodes for your cleaning media.

Description

This can be a description of how the barcode rule will be used or any useful description determined by your site. You can enter from 1 to 25 characters.

To Change a Barcode Rule

1. Choose the Media Manager host that has the volume database where you want to change barcode rules. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
2. On the Actions menu, click Inventory Robot.
The Robot Inventory dialog box appears.
3. In this dialog box, click the Barcode Rules tab.
4. Select a rule from those listed.
5. Click Change.
The Change Barcode Rule dialog box appears.
6. Specify your changes.
See “Dialog Box Entries for Barcode Rules” on page 157 for help in changing the properties of the rule.

Note You cannot change the barcode tag. You must delete the rule and then add a rule with a new tag.



To Delete a Barcode Rule

1. Choose the Media Manager host that has the volume database where you want to delete barcode rules. See “Remote Administration of Media on Other Hosts” on page 91 for more information.
2. On the Actions menu, click Inventory Robot.
The Robot Inventory dialog box appears.
3. In this dialog box, click the Barcode Rules tab.
4. Select the rule from those listed.
5. Click Delete.

This opens a confirmation dialog box, allowing you to confirm or cancel the action.

Rescan and Update Barcodes for a Robot

Note The Rescan/Update Barcodes command does not apply to volumes in API robot types.

Use the Rescan/Update Barcodes command to check the barcodes of volumes in a robot and update the volume database to agree with the contents of the robot.

“Robot Attributes” on page 276 lists the robots that support barcodes.

When to Use Rescan/Update

Use Rescan/Update Barcodes only to fill in barcodes that are missing from the volume database.

For example, if you added a new volume to your configuration but did not physically insert the volume into the robot when the logical volume entry was added, the Media Manager volume database will not include the barcode. In this case, you can use this command to fill in the missing barcode, provided that the media has since been physically placed in the robot.

When Not to Use Rescan/Update

Do not use this command to correct attributes that show a media ID in the wrong slot. In this case, you must do one of the following:

- ◆ Logically move the volume using Move Volume on the Actions menu.



- ◆ Logically move the volume using Inventory Robot (see “Updating the Volume Configuration for a Robot” on page 128).

To obtain an inventory of the robot without updating the barcodes, select Show Contents in the Robot Inventory dialog box. See “To Compare a Robot’s Contents With the Volume Configuration” on page 125 for more information.

To Rescan/Update Barcodes

To check barcodes and update the volume database:

1. In the volume list in the Media and Device Management window, select the volumes that you want to check and update.
2. On the Actions menu, click Rescan/Update Barcodes.

A dialog box appears that allows you to continue or cancel the update. If you continue, a dialog box appears with the results of the update.

Replacing Volumes

In general, you should replace volumes that are any of the following:

- ◆ Full
- ◆ Past their maximum allowable number of mounts
- ◆ Too old (past their expiration date)
- ◆ Unusable, for example, because of repeated media errors

The following are two possible procedures for replacing volumes, depending on whether you want to reuse the old media ID.

To Replace a Volume Without Reusing the Media ID

Use this procedure when the volume you are replacing has unexpired images. For example, the volume may be full.

1. Move the volume to another location (see “Moving Volumes” on page 106).
If the volume is in a robot, you may want to take it out of the robot and move it to a standalone group.
2. Add a new volume or move an existing volume in as a replacement.
If you are adding a new volume, specify the same attributes as the old volume, except for media ID. See “Adding New Volumes” on page 99.



3. Physically replace the old volume, but do not delete the volume entry for that Media ID.

To Replace a Volume and Reuse the Media ID

This procedure lets you reuse the same set of media IDs, which may be convenient in some instances.

Caution Reuse a media ID only if all data on the old volume is no longer needed and you are going to recycle it later, or if the volume is damaged and you are going to discard it. Otherwise, you may encounter serious operational problems and possible loss of data.

1. Delete the volume entry and physically remove the old volume from the storage device. See “Deleting Volumes” on page 111.
2. Physically add the new volume to the storage device.
3. Logically add the new volume to the configuration and specify the same attributes, including the media ID. See “Adding New Volumes” on page 99.
4. Set a new Expiration Date for this volume. See “To Change the Attributes for a Volume” on page 114.
5. Reset the number of mounts. Otherwise, the number continues to be incremented from the value accumulated for the old volume. You can reset the number of mounts using the following command:

```
/usr/opensv/volmgr/bin/vmchange -m media_id -n number_of_mounts
```

Where:

- ◆ *media_id* is the media ID for which you are changing the number of mounts.
- ◆ *number_of_mounts* is the new number that you want for this media ID.

Recycling Volumes

Caution Recycle a volume only if all data on the volume is no longer needed, or if the volume is damaged and unusable. Otherwise, you may encounter serious operational problems and possible loss of data.



Recycling Volumes Under the Same Media ID

Reusing a NetBackup or Storage Migrator volume without changing its media ID is usually done when the last image expires. If the volume has unexpired NetBackup or Storage Migrator images, see “Deassigning Volumes” on page 112.

Recycling Volumes Under a New Media ID

Before changing the media ID and reusing a volume, be certain that it does not have any required data.

1. Physically remove the volume from the storage device.
2. If the volume is in a robot, move it to standalone. See “Moving Volumes” on page 106.
3. Record the number of mounts and expiration date for the volume.
4. Delete the volume entry. See “Deleting Volumes” on page 111.
5. Add the new volume entry, and physically add the volume to the storage device. See “Adding New Volumes” on page 99.
6. Set the number of mounts to the value you recorded in step 3 by using the following command:

```
/usr/opensv/volmgr/bin/vmchange -m media_id -n number_of_mounts
```

Where:

- ◆ *media_id* is the media ID for which you are changing the number of mounts.
 - ◆ *number_of_mounts* is the new number that you want in the volume database for this media ID.
7. Set the expiration date to the value you recorded in step 3.





The Device Monitor has options for monitoring and controlling the activity of storage devices that are under control of Media Manager. This chapter explains these options and contains the following topics:

- ◆ Starting and Stopping the Media Manager Device Daemon
- ◆ Starting the Device Monitor Interface
- ◆ Remote Administration of Devices on Other Hosts
- ◆ Handling Requests and Actions
- ◆ Assigning a Drive to a Request
- ◆ Resolving Pending Actions
- ◆ Resubmitting Requests
- ◆ Denying Requests
- ◆ Changing the Operating Mode of a Drive
- ◆ Resetting a Drive
- ◆ Adding a Comment for a Drive

Starting and Stopping the Media Manager Device Daemon

The Media Manager device daemon must be running on the host being monitored or the lists in the Device Monitor detail panes will be blank. If the daemon is not running when you start the Device Monitor, NetBackup prompts you so you can start it.

Note If the device host you want to monitor is a Windows NT/2000 host, the following procedure also controls the NetBackup Device Manager service on that Windows NT/2000 host.

The device daemon can be controlled as follows:



1. Click Start/Stop Media Manager Device Daemon on the Host menu.
2. In the dialog box that appears, the browse button to the right of the Device Host box allows you to select a device host. The Current Status box shows the status of this host.

If the device host is known to be a Backup Exec server, the server does not appear in the list.
3. Select the action you want to perform on the selected host.
4. Click OK when done.

Note By using the Apply button, you can select device hosts and actions for more than one device host before clicking OK to close the dialog box.

Starting the Device Monitor Interface

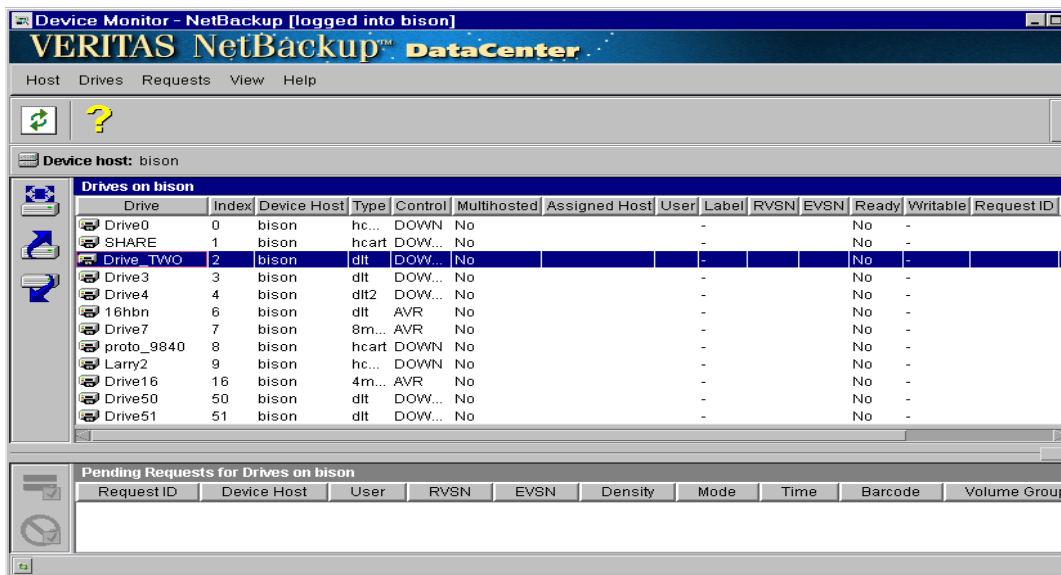
In the NetBackup Administration window, click Device Monitor.

The Device Monitor window appears (see Figure 13, or Figure 18 if you have Global Data Manager).

The following topics provide an overview of the Device Monitor interface:

- ◆ Toolbars
- ◆ Screen Display Refresh Rate
- ◆ Menus
- ◆ Shortcut Menus
- ◆ Tree Pane (With Global Data Manager)
- ◆ Detail Panes

Figure 13. Device Monitor Window



Toolbars

The buttons on the toolbars provide shortcuts for menu commands. If a toolbar is not visible or you want to change the display of the buttons:

1. From the View menu, click the Preferences command.
2. Make your desired choices in the Display Options tab.

Screen Display Refresh Rate

If you want to change how often the data on display is refreshed:

1. From the View menu, click the Preferences command.
2. Make your desired choices in the Refresh Rate tab.
3. Click Apply.



Menus

The Device Monitor window has the following menus and commands on these menus:

Table 41. Device Monitor Menus and Commands

Menu	Commands
Host	<p>Change Device Host - (Without Global Data Manager) Displays a dialog box that allows you to change to a different device host.</p> <p>Append Master Server - (With Global Data Manager) Displays a dialog box that allows you to append a master server to your tree view.</p> <p>Start/Stop Media Manager Device Daemon - Controls the Media Manager device daemon on the host being monitored.</p> <p>Exit - Closes the window.</p>
Drives	<p>Reset Drive - Resets the selected drive.</p> <p>Up Drive - Sets the selected drive to the UP state in AVR (Automatic Volume Recognition) mode.</p> <p>Up Drive, Operator Control - Sets the selected drive to the UP state under operator control.</p> <p>Down Drive - Sets the selected drive to the DOWN state, so it is not available to Media Manager.</p> <p>Change Drive Comment - Displays a dialog box for changing the comment for the selected drive.</p> <p>Analyze Configuration - Displays a dialog box for starting the configuration analyzer. The analyzer verifies that the settings in your device configuration are consistent and checks for potential problems.</p> <p>View Multihosted Drive Status - Displays a dialog box that allows you to display internal Media Manager information, about your Shared Storage Option (multihosted drive) configuration.</p>
Requests	<p>Assign Request - Assigns a standalone drive to a pending request.</p> <p>Deny Request - Denies a pending request.</p> <p>Redo Request - Resubmits a pending request.</p> <p>Display Pending Action - Displays information about the pending action.</p>
View	<p>Preferences - Displays a dialog box that allows you to specify your viewing preferences on the Display Options tab or change how often the screen is refreshed on the Refresh Rate tab.</p> <p>Ignore Server(s) - (With Global Data Manager) Sets a server to the ignored state so the Master of Masters will not attempt connections to it.</p> <p>Recognize Server(s) - (With Global Data Manager) Sets a server to the recognized state so the Master of Masters can connect to it.</p> <p>Refresh - Refreshes the displays in the window.</p>



Table 41. Device Monitor Menus and Commands (continued)

Menu	Commands
Help	Help Topics - Provides online help information about the application window. About Device Monitor - Displays program information, version number, and copyright information.

Shortcut Menus

Clicking the right mouse button while the pointer is over a pane or a selection in a pane, displays a shortcut menu with commands that apply to that context. Most of these commands are also available on the menus.

With Global Data Manager

For information on the following commands that are available with the Global Data Manager option, see the Global Data Manager appendix of the NetBackup system administrator's guides for UNIX:

- ◆ Ignore Server
- ◆ Recognize Server
- ◆ Append Master Server

Tree Pane (With Global Data Manager)

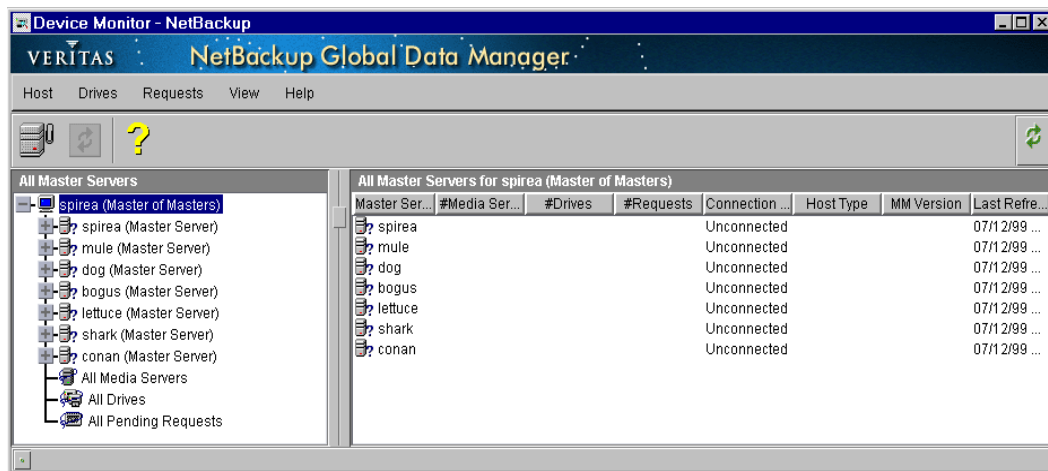
For an introduction and overview of the Global Data Manager option, see the Global Data Manager appendix of the NetBackup system administrator's guides for UNIX.

The tree view in the left pane of the window is present, if you are running the NetBackup Administration interface on a server that has the Global Data Manager option installed. This view shows the device hosts that you can monitor.

Initially, the tree pane shows the Master of Masters and its configured master servers, and the detail pane on the right shows the same servers along with columns of information, such as: connection status, host type, and time of last refresh.

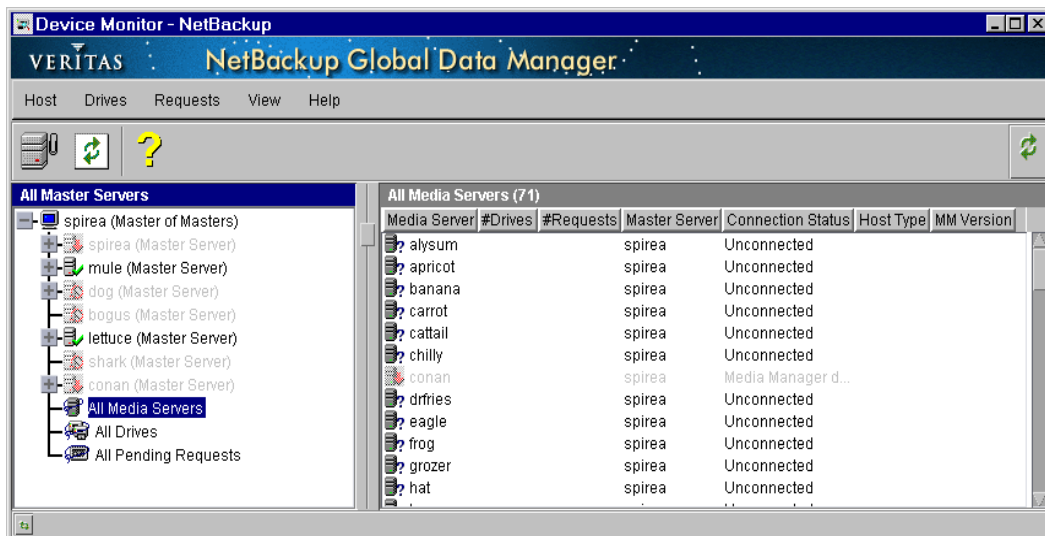


Figure 14. GDM Device Monitor Window - Initial View



Selecting All Media Servers in the tree pane provides information about all the media servers in the current configuration. These media servers can be master servers or media servers. The columns in the detail pane contain information such as: number of drives and requests, Master Server, and last known status for each server.

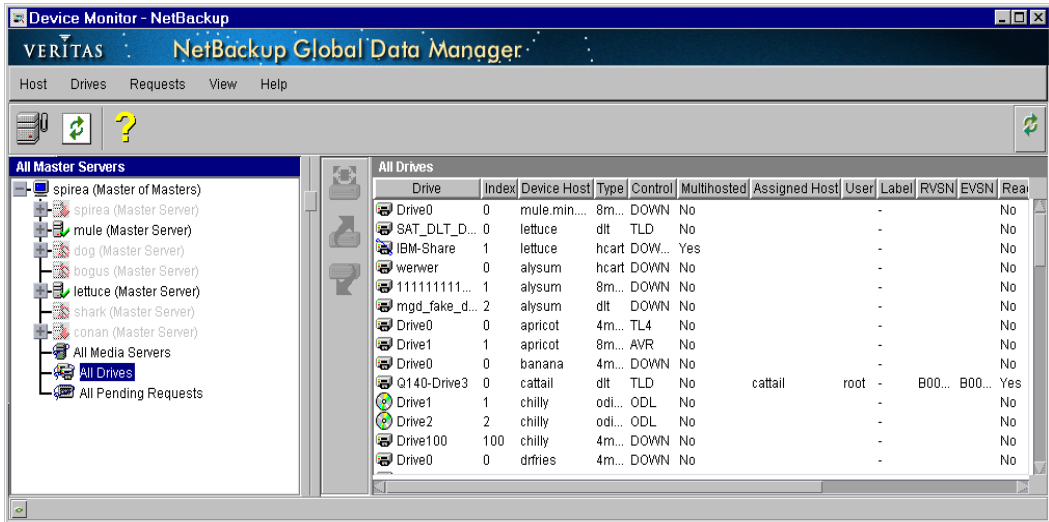
Figure 15. GDM Device Monitor Window - All Media Servers View



Selecting All Drives in the tree pane provides information about all drives in the current configuration. The columns in the detail pane contain drive status information, such as: drive name, device host, and device type (see Figure 16 and “Detail Panes”).

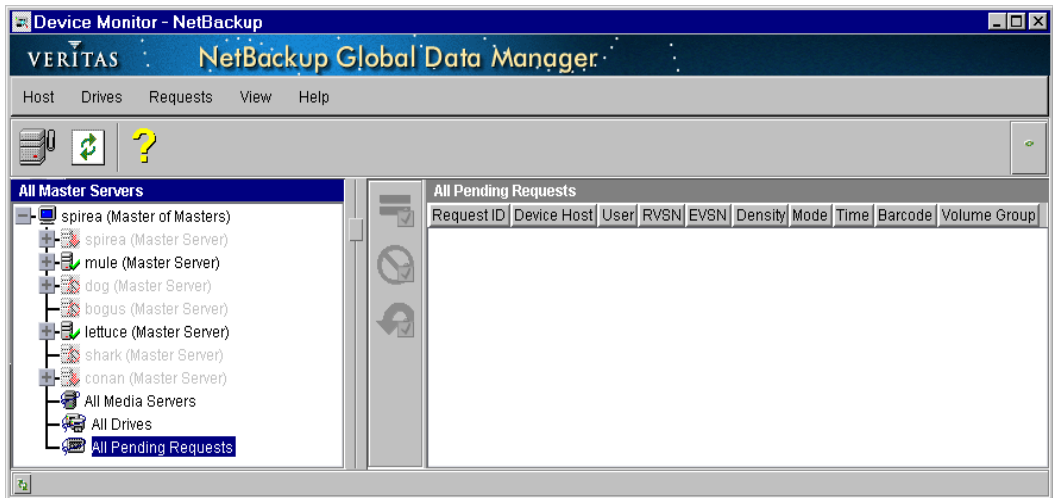


Figure 16. GDM Device Monitor Window - All Drives View



Selecting All Pending Requests in the tree pane provides information about pending requests (or pending actions) on all of the media servers. The columns in the detail pane contain request information, such as: request ID, device host, and user ID (see Figure 17 and “Detail Panes”).

Figure 17. GDM Device Monitor Window - All Pending Requests View

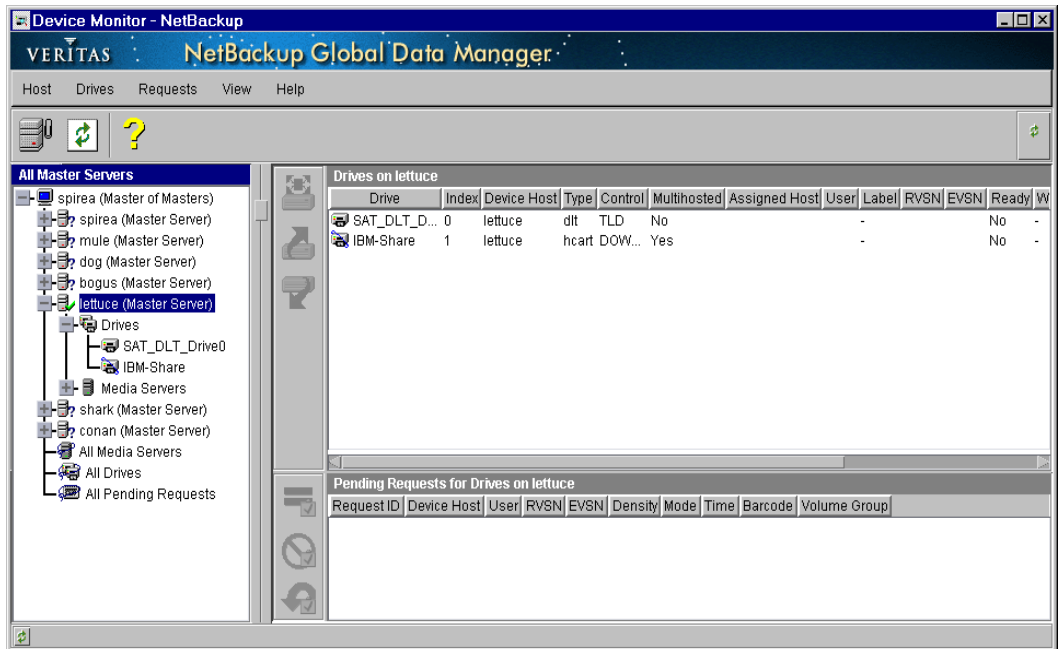


Detail Panes

The two detail panes for drives and pending requests (or pending actions) are displayed when you start the Device Monitor interface (see Figure 13).

If you are using the Global Data Manager option, the detail panes are displayed on the right after you select a device host that you want to monitor from the tree pane on the left (see Figure 18).

Figure 18. GDM Detail Panes



The top detail pane shows the status of the drives that Media Manager controls (see “Drive Status Columns” on page 179). You defined these drives for Media Manager as explained in Chapter 2.

The bottom detail pane shows pending requests (or pending actions) for volumes. These usually originate from NetBackup, but can come from a user or Storage Migrator. See “Pending Request Columns” on page 177.

Remote Administration of Devices on Other Hosts

The following topics explain how to remotely monitor devices on other hosts:

- ◆ Without Global Data Manager



- ◆ With Global Data Manager
- ◆ Configuring Remote Administration of Other UNIX Hosts

Without Global Data Manager

Initially, you can monitor devices on the Media Manager device host where you are running the Device Monitor interface. The name of this host is shown in the Device host line above the Drive Status pane.

To change to a different device host:

1. In the NetBackup Administration window, click Device Monitor.
2. On the Host menu, click Change Device Host.
3. In the dialog box that appears, enter the name of the host you want to monitor.
4. Click OK.
5. The name of the new host appears in the Device Host line and the lists in the panes show device information for the new device host.

The Media Manager device daemon must be running on the host that you are going to monitor, or the lists in the detail panes will be blank. If it is not running when you attempt to connect, a message box prompts you to start the daemon. Click Yes in this box.

If you encounter problems, see “Configuring Remote Administration of Other UNIX Hosts” on page 175.

With Global Data Manager

Initially, you can monitor any of the Media Manager device hosts shown in your tree view, as follows:

1. In the NetBackup Administration window, click Device Monitor.
2. Change Media Manager device hosts by navigating the tree and clicking on the desired device host.

If a device host is not in your initial tree view, you can append the host as follows:

1. On the Host menu, click Append Master Server.

A dialog box appears.



2. Enter the name of the device host and click OK.

The Media Manager device daemon must be running on the host that you are going to monitor, or the lists in the detail panes will be blank. If it is not running when you attempt to connect, a message box prompts you to start the daemon. Click Yes in this box.

If you encounter problems, see “Configuring Remote Administration of Other UNIX Hosts” on page 175.

Configuring Remote Administration of Other UNIX Hosts

The name of the UNIX host that you specify in the Login box, when starting the NetBackup Administration interface, must be in the `bp.conf` file on the remote UNIX host where you want to monitor devices.

Remote Administration Example

For example, you could start the administration interface from a NetBackup Windows Display Console (WDC) running on a Windows host (named bear); and specify the UNIX host (named shark) in the Login box.

In this example, you

- ◆ Started the interface from the host named bear.
- ◆ Are managing NetBackup, through Java application server software running on the host named shark.
- ◆ Want to manage devices on a third host, named tiger.

The `bp.conf` file on host tiger, must include the name of the server that you logged into (shark), not the host where you first started the administration interface (bear).

If you cannot connect to host tiger, add host shark to the `bp.conf` file on host tiger.

Adding `SERVER` Entries in the `bp.conf` File

1. Add a `SERVER = host` entry below any existing server entries in the `/usr/opensv/netbackup/bp.conf` file.
2. Stop and restart the NetBackup database manager (`bpdbm`) and NetBackup request daemon (`bprd`).

For more information, see the NetBackup system administrator’s guides for UNIX.

If you are unable to access the devices, you may need to add a `SERVER` entry to the `vm.conf` file on tiger. See “Media Manager Security” on page 13.



vmd Considerations

vmd is the Media Manager volume daemon. Media Manager authentication/authorization may affect systems where NetBackup authentication/authorization has been enabled.

Connections to vmd will fail if authentication/authorization are enabled, an AUTHORIZATION_REQUIRED entry is present in vm.conf, and the caller of vmd does not have the required permission to use vmd functions.

If authentication/authorization is needed in NetBackup but not in Media Manager, you can do one of the following:

- ◆ Add SERVER entries in vm.conf.
- ◆ Have no SERVER and no AUTHORIZATION_REQUIRED entries in vm.conf.

See “vmd Security” on page 300 for more information.

Handling Requests and Actions

This section explains how to handle requests and actions. In the following topics, the *operator* is the person responsible for performing the manual intervention. A *user* is a person or application that initiates requests.

When NetBackup needs operator assistance to complete a tape mount, it displays a request in the lower detail pane. The following is an example request (without Global Data Manager installed):

```
Request ID User RVSN   EVSN   Density Mode Time Barcode Volume Group
0         ldr  LDR001 LDR001 4mm      Write 7:22 LDR001 rack_1
```

Table 42 explains each column in a pending request line.

Media Manager is able to resolve most requests automatically. For example, if the required volume is labeled and in a robot, Media Manager assigns the request as soon as the volume and a drive are available and then deletes the request from the window.

However, manual intervention is sometimes required. For example, if the required drive is UP under operator control (see Table 45) or the volume in a drive is unlabeled, Media Manager is unable to automatically assign the request and the request remains in the window. In this case, proceed as explained in “Assigning a Drive to a Request” on page 178.

A pending action is indicated by a media icon with a hand on it, located to the left of the Request ID column.

In these cases, the problem must be resolved before proceeding. See “Resolving Pending Actions” on page 183.



A request for a volume that is displayed in the Device Monitor window is sometimes called a *mount* request. This term means to make the volume available for reading or writing by placing it in an appropriate drive and then assigning the associated request to that drive.

Pending Request Columns

The following table describes the columns that are displayed in the lower detail pane for a pending request or action:

Table 42. Pending Requests Columns and Descriptions

Column	Description
Request ID	<p>Identification number for the request or action. This is a system-assigned number that identifies the request.</p> <p>A pending action is indicated by a media icon with a hand on it, located to the left of the Request ID.</p>
Device Host	The name of the device host that has the pending request.
User	User ID of the person or application making the request.
RVSN	<p>Recorded volume serial number of the volume requested by the user. It is the same as the media ID that is recorded in the volume database. The RVSN consists of up to six alphanumeric characters that are recorded at the beginning of the volume and identify the volume. A volume with an RVSN is called a labeled volume (that is, a VOL1 label has been recognized on the volume). Unlabeled volumes do not have recorded volume serial numbers.</p> <p>When a user requests an unlabeled volume and does not specify an RVSN, the EVSN (external volume serial number) appears in this column by default (the EVSN is not actually recorded on the volume). This occurs because the system assumes the RVSN and EVSN labels are the same unless otherwise specified.</p>
EVSN	External volume serial number of the volume requested by the user. The EVSN consists of up to six alphanumeric characters and is usually written on an external label attached to the outside of the volume. The EVSN is not recorded on the volume. The EVSN is used to identify the volume before it is inserted.



Table 42. Pending Requests Columns and Descriptions (continued)

Column	Description
Density	<p>Recording density of the volume required by the user. You must mount the volume on a drive that supports the required density.</p> <p>Densities correspond to the following drive types:</p> <p>4mm: 4mm cartridge tape</p> <p>8mm: 8mm cartridge tape</p> <p>dlt: DLT cartridge tape</p> <p>dlt2: DLT cartridge tape 2</p> <p>dlt3: DLT cartridge tape 3</p> <p>dtf: DTF cartridge</p> <p>hcart: 1/2-inch cartridge tape</p> <p>hcart2: 1/2-inch cartridge tape 2</p> <p>hcart3: 1/2-inch cartridge tape 3</p> <p>odiskwm: Optical disk-write many</p> <p>odiskwo: Optical disk-write once</p> <p>qscsi: 1/4-inch cartridge tape</p> <p>To find a drive of the correct type, check the Drive Status list.</p>
Mode	<p>Specifies whether the volume should be write-enabled. Write in this column means you must write-enable the volume. Read means you do not have to write-enable the volume, unless specified by site policy. To write-enable a cartridge volume, move the tab off the safe position.</p>
Time	<p>Time of day the user made the request for access.</p>
Barcode	<p>Alphanumeric representation of the barcode label on the volume that was requested by the user. The barcode can contain up to 13 characters.</p>
Volume Group	<p>Volume group to which this volume belongs. A volume group defines the volume by location and is a logical group of volumes that are at the same physical location.</p>

Assigning a Drive to a Request

You must manually assign a drive to a request if the required volume is in a drive that has been set to UP under Operator Control (see Table 45) or if the volume is unlabeled.

1. In the NetBackup Administration window, click Device Monitor.
2. Choose the device host that you want to monitor. See “Remote Administration of Devices on Other Hosts” on page 173 for more information.



3. In the lower detail pane, select the request. Also, note the contents of the following columns of the request:
 - ◆ Density - to determine the recording density that is required.
 - ◆ EVSN - to determine the media ID required.
 - ◆ Mode - to determine whether the volume should be write-enabled.
4. In the upper detail pane:
 - a. Find a drive type that matches the density for the request. Table 43 lists the densities that each drive type supports.
 - b. Ensure that the drive is in the UP state, ready, write enabled, and not assigned to another request.
 - c. Select the drive.
5. If necessary, get the media, write enable it, and insert it into the drive.
6. Wait for the drive to become ready, as explained in the drive equipment manual.
7. Click Assign Request.
Verify that the request disappears from the list.
8. In the upper pane, verify that the assigned request ID appears in the Request ID column for the drive and that the user ID is filled in.

Drive Status Columns

Table 43 describes the columns in the Drive Status list that are displayed in the upper detail pane.

Table 43. Columns in the Drive Status List

Column	Description
Drive	Drive name assigned to the drive during configuration.
Index	Drive index assigned to the drive during configuration.
Device Host	The name of the device host that has the drive.



Table 43. Columns in the Drive Status List (continued)

Column	Description
Type	<p>Drive type. Use this column to find a drive that supports the density required by the request. The drive type to use for each density is as follows:</p> <p>4mm: 4mm cartridge 8mm: 8mm cartridge dlt: DLT cartridge dlt2: DLT cartridge tape 2 dlt3: DLT cartridge tape 3 dtf: DTF cartridge hcart: 1/2-inch cartridge hcart2: 1/2-inch cartridge tape 2 hcart3: 1/2-inch cartridge tape 3 odiskwm: Optical disk-write many odiskwo: Optical disk-write once qscsi: 1/4-inch cartridge</p>
Control	<p>Drive control mode.</p> <p>If the drive is robotic and the robotic process is in an UP state, a designation of the robot, such as TS8 or TS8-DOWN, appears in this column.</p> <p>If the drive is standalone or the robotic process is in a DOWN state, this column shows the selected mode as follows:</p> <ul style="list-style-type: none"> ◆ AVR (UP in Automatic Volume Recognition mode). This is the normal operating mode (see Table 45). ◆ OPR (UP in operator control mode). You can set the drive to this state with the Up Drive, Operator Control command on the Drives menu. (see Table 45). ◆ DOWN. In this state, the Drive is not available to Media Manager. A drive can be in the DOWN state because of problems or because it was set to that state with the Down Drive command (see Table 45).
Multihosted	Shows if this drive is configured as a multihosted drive (SSO). Yes, means the drive is a multihosted drive. No, means the drive is not a multihosted drive.
Assigned Host	If this is a multihosted drive, this column shows the device host that has this drive assigned. If this is not a multihosted drive, this column is blank.
User	User ID of the person or application whose request is currently assigned to this drive.
Label	Shows whether a labeled or unlabeled volume is mounted on this drive. Yes, means labeled. No, means unlabeled. A dash means there is no volume mounted on the drive.
RVSN	Recorded volume serial number of the volume mounted on this drive. This identifier is the same as the media ID.



Table 43. Columns in the Drive Status List (continued)

Column	Description
EVSN	External volume serial number of the volume mounted on this drive. Normally this identifier should match the RVSN.
Ready	Status of the drive, indicating if it is ready to perform an operation on the loaded volume. Yes, means ready. No, means not ready. See the vendor's manual for the drive for instructions to make it ready, if it does not become ready automatically.
Writable	Shows whether the volume currently mounted on this drive is write-enabled. Yes, means the volume is write-enabled. No, means it is write-protected.
Request ID	If this drive is assigned to a request, this column contains the ID of the request.
Last Cleaned	The date that the drive was last cleaned.
Comment	Comments that the administrator has added about this drive. See "Adding a Comment for a Drive" on page 188.

Example 1

This example assigns Drv7 to request 2.

Note Some columns of the Drive Status and Pending Requests lists are not shown in this example.

Figure 19 shows the detail panes of the Device Monitor window before assigning the request. Notice that the User and Request ID columns are empty for Drv7.

Figure 19. Assigning a Drive to a Request (Before)

Drive	Type	Control	User	Label	RVSN	EVSN	Ready	Writable	Request ID	Comment
Drv1	qscsi	OPR	rhs	No	TST401	TST401	Yes	No	0	
Drv2	4mm	AVR	hdk	Yes	CTR111	CTR111	Yes	Yes	1	
Drv3	8mm	AVR					No			
Drv6	4mm	OPR					No			
Drv7	4mm	OPR					Yes			

Request ID	User	RVSN	EVSN	Density	Mode	Time	Barcode	Volume Group
2	cas	CAS135	CAS135	4mm	Read	7:30	CAS135	offsite

Figure 20 shows the detail panes after the request is assigned. Notice that for Drv7, the Request ID column shows request 2 and the User column shows cas.



Figure 20. Assigning a Drive to a Request (After)

Drive	Type	Control	User	Label	RVSN	EVSN	Ready	Writable	Request ID	Comment
Drv1	qscsi	OPR	rhs	No	TST401	TST401	Yes	No	0	
Drv2	4mm	AVR	hdk	Yes	CTR111	CTR111	Yes	Yes	1	
Drv3	8mm	AVR					No			
Drv6	4mm	OPR					No			
Drv7	4mm	OPR	cas		CAS135	CAS135	Yes	Yes	2	

Request ID	User	RVSN	EVSN	Density	Mode	Time	Barcode	Volume Group
------------	------	------	------	---------	------	------	---------	--------------

Example 2

This example (without Global Data Manager installed) shows how to satisfy a typical request where drives are under AVR control.

Note Because of page limitations, some columns of the Drive Status and Pending Requests lists are not shown in this example.

1. Assume that you have the following pending request:

```
Request Id  User  RVSN  EVSN  Density  Mode  Time  Barcode  Volume Group
4           NBU  TV101  TV101  4mm     Write  11:35  TV101    nonrob
```

The contents of the request line determines how to proceed. The first step is to find an available tape drive. The request specifies a recording density of 4mm. This means you need a 4mm cartridge tape drive. The volume is labeled so you do not have to assign the drive, unless it has been set to UP in operator control mode by using the Up Drive, Operator Control command.

2. Check the Drive Status list to see if an appropriate tape drive is available.

```
Drive  Type  Control  User  Label  RVSN  Ready  Writable  Request ID
Drive1  dlt  AVR      User  Label  RVSN  Ready  Writable  Request ID
Drive2  4mm  AVR      User  Label  RVSN  Ready  Writable  Request ID
```

Drive2 is a 4mm cartridge tape drive and is available, since it is not down and there is not a request number in the Request ID column. Table 43 explains each column in the Drive Status list.

3. Get the volume with EVSN TV101 and barcode TV101. Depending on your site's use of the Volume Group column, the volume group may give an indication of where the media ID is located.



4. Insert the volume into the drive. Assume that the tape drive is powered on and ready to receive the volume. Also, assume that when you insert the volume, the tape drive loads and positions it to the beginning.
5. Check the Drive Status list for the drive to verify that the drive is assigned to request ID 4.

The following status line shows that the assignment was successful. Drive2 is assigned to request 4, which is a request to write information on labeled volume TV101.

Drive	Type	Control	User	Label	RVSN	EVSN	Ready	Writable	Request	ID
Drive1	dlt	AVR					No			
Drive2	4mm	AVR	NBU	Yes	TV101	TV101	Yes	Yes	4	

In this example, the drive is UP in Automatic Volume Recognition mode as indicated by AVR in the Control column. This means Media Manager assigned it automatically (which it does in AVR mode, providing the media ID on the volume header matches the RVSN for the request).

The write operation proceeds. When complete, NetBackup or the `tpunmount` command requests Media Manager to release the drive and Drive2 is available for other requests.

Resolving Pending Actions

If manual intervention is required in addition to assigning the request to a drive, a media icon with a hand on it appears to the left of the Request ID column.

Table 44 shows the pending action messages and describes the conditions that caused the action.

The procedure for resolving an action is as follows:

1. Select the request.
2. On the Requests menu, click Display Pending Action.

This opens a dialog box that has a description of the problem and a list of actions to correct it. The dialog box also shows other information, such as user name, RVSN and EVSN, and drive number.

3. In most cases, you can do one of the following:
 - ◆ Correct the error condition and resubmit the request.
See “Resubmitting Requests” on page 184
 - ◆ Click Deny Request to deny the request.



See “Denying Requests” on page 185.

Pending Action Messages

The following table lists the pending action messages and their causes:

Table 44. Pending Action Messages

Message	Cause
TAPE NEEDS WRITE ENABLE	The volume was requested with write access and mounted with write access disabled.
ALL DRIVES DOWN	The requested volume is in a robot with all drives in a DOWN state.
VSN IN DOWN DRIVE	The requested volume is in a robot controlled drive that is currently in a DOWN state.
LSM OFFLINE	There is a Library Storage Module (LSM) in an ACS device which is currently off-line.
VSN IN INACCESSIBLE ACS	The requested volume is in an ACS device that is not accessible by this machine.
MISPLACED TAPE	The requested volume is not in the correct slot in the robot.
UNREADABLE LABEL	The requested volume has an unreadable external label (barcode).
VSN ON OTHER SYSTEM	The requested volume is currently in a drive that is not configured under Media Manager.
TAPE IS UNMOUNTABLE	The requested volume has been determined to be unmountable on more than one drive.

Resubmitting Requests

If a pending action message involves a robot, you must correct the problem and then resubmit the request that caused the message before the operation can proceed.

For example, if a volume is requested after being removed from a robot, do the following:

- ◆ Insert the volume in the robot
- ◆ Perform an Update Volume Configuration
- ◆ Resubmit the request

To resubmit a request:

1. Correct the problem identified by the pending action message.
2. In the lower detail pane, select the request.
3. From the Requests menu, click Redo Request.

The pending action message disappears from the list and the operation proceeds.

Denying Requests

Some situations may require you to deny requests for service (for example, when drives are not available, you cannot find the volume, or the user is not authorized to use it). Denying a request returns an error message to the user.

1. In the lower detail pane, select the request.
2. On the Requests menu, click Deny Request.

The request is deleted from the list.

Changing the Operating Mode of a Drive

It is usually not necessary to change the operating mode of a drive. Drives are set to the UP in AVR mode (the default mode) when you add drives to your configuration, and usually can be left at that setting. Other operating mode settings are used for special purposes. See Table 45 for an explanation of each operating mode.

For RSM robots, Media Manager does not scan the RSM library to update device statuses. Therefore any physical device status changes done in the Microsoft RSM applet should also be updated in the Device Monitor. For example, if drive 2 is down in the RSM library, you must deactivate the drive on both the RSM applet *and* in Device Monitor. However, if drive 2 is functional but you do not want NetBackup to assign it, then only the Device Monitor interface need be updated.

If it is necessary to change the mode of a drive, do as follows:

1. In the NetBackup Administration window, click Device Monitor.
2. Choose the device host that you want to monitor. See “Remote Administration of Devices on Other Hosts” on page 173 for more information.
3. In the upper detail pane, select the drive.

You can select only one drive at a time.



4. On the Drives menu, choose the command for the new operating mode you want.
5. Verify that the correct value appears in the Control column for the drive. You may need to click Refresh, if the new mode does not appear after a short delay.

Changing Mode Example

The following example changes the operating mode of Drive2 from AVR to DOWN.

Note Because of page limitations, some columns of the Drive Status list are not shown in this example.

Figure 21 shows the Drive Status list before changing the drive mode. Notice that the Control column shows AVR and the Ready column shows Yes.

Figure 21. Changing Mode (Before)

Drive	Type	Control	User	Label	RVSN	EVSN	Ready	Writable	Request	ID	Comment
Drive1	qscsi	OPR	rhs	No	TST401	TST401	Yes	No	0		
Drive2	4mm	AVR					Yes				

Figure 22 shows the Drive Status list after setting Drive2 to DOWN. Notice that the Control column shows DOWN and the Ready column shows No.

Figure 22. Changing Mode (After)

Drive	Type	Control	User	Label	RVSN	EVSN	Ready	Writable	Request	ID	Comment
Drive1	qscsi	OPR	rhs	No	TST401	TST401	Yes	No	0		
Drive2	4mm	DOWN					No				

Operating Mode Commands

The following table lists the available operating mode commands for drives:

Table 45. Drive Control Choices

Command	Description
Reset Drive	Resets the specified drive, terminating the drive assignment and taking control away from the assigned user. For more information, see “Resetting a Drive” on page 187.



Table 45. Drive Control Choices (continued)

Command	Description
Up Drive	<p>Sets the drive to UP in AVR (automatic volume recognition) mode. This is the default mode for all drives.</p> <p>For labeled volumes, when the volume is mounted and the tape drive is ready, the system automatically reads the RVSN and assigns the tape drive.</p> <p>For unlabeled volumes, assign tape drives to requests using the Assign Drive command on the Requests menu.</p> <p>In this mode, a robot automatically retrieves, mounts, unmounts, and stores volumes. Manual intervention is necessary only when a request causes an error.</p>
Up Drive, Operator Control	<p>Sets the drive to UP in operator control mode. This mode is normally used only for security reasons.</p> <p>All operations are the same as for AVR mode, except that labeled volumes are not automatically assigned. The drive reads or writes only when you assign it to a request by using Assign Drive on the Requests menu.</p> <p>Do not use this command for drives that are being used by NetBackup.</p>
Down Drive	<p>Sets the drive to DOWN. In this mode, drives are not under control of Media Manager and cannot be assigned to requests. Change the drive to UP using the Up Drive or Up Drive, Operator Control commands.</p>

Resetting a Drive

Caution Do not reset an assigned drive unless directed by site policy or the system administrator. Terminating an active job can destroy user data.

The actions that result from resetting a drive, depend on the state of the drive as follows:

- ◆ If the drive is in the DOWN state, Media Manager attempts to unload the drive. This occurs for standalone drives, as well as drives in a robot.
- ◆ If the drive is in the UP state, not assigned to a user or application and in a ready state, Media Manager attempts to unload the drive. If the drive is not ready, no action occurs.
- ◆ If the drive is in the UP state and assigned to a user or application, resetting the drive removes the tape. This takes control away from the user.

Use the reset capability with caution. A situation where resetting a drive might be necessary is if a system problem causes the drive to remain assigned after a job is complete. In this case, the drive cannot be used for another request and the only way to regain control of the drive is to reset it.



Note Resetting a drive does not perform any SCSI bus or SCSI device resets.

To reset a drive:

1. In the NetBackup Administration window, click Device Monitor.
2. Choose the device host that you want to monitor. See “Remote Administration of Devices on Other Hosts” on page 173 for more information.
3. In the upper detail pane, select the drive.
4. On the Drives menu, click Reset Drive.
5. Verify that the assignment was terminated by checking that the User and Request ID columns are empty for the drive number.

Adding a Comment for a Drive

1. In the NetBackup Administration window, click Device Monitor.
2. Choose the device host that you want to monitor. See “Remote Administration of Devices on Other Hosts” on page 173 for more information.
3. In the upper detail pane, select the drive.
4. On the Drives menu, click Change Drive Comment.
The Change Drive Comment dialog box appears.
5. Enter a comment and click OK.



This chapter includes the following Media Manager daemon topics:

- ◆ Overview of Media Manager Daemons
- ◆ Media Manager Device Daemon (`ltid`)
- ◆ Automatic Volume Recognition Daemon (`avrd`)
- ◆ Media Manager Volume Daemon (`vmd`)
- ◆ Robotic Daemons
- ◆ Displaying Process Status using the `vmops` Script
- ◆ Logging

Overview of Media Manager Daemons

The following daemons manage the assignment and scanning of devices:

- ◆ `ltid` - The Media Manager device daemon.
- ◆ `avrd` - The automatic volume recognition daemon.
- ◆ `vmd` - The Media Manager volume daemon enables remote device management and controls the volume database. This daemon informs `ltid` of the location of requested volumes, and tracks the number of mounts and last mount time for each volume.

Robotic Daemons and Robotic Control Daemons

A Media Manager robotic daemon (and possibly a robotic control daemon) exists for each robot that you install on a Media Manager host.

Every Media Manager host that has a drive in a robot has a robotic daemon for that robot. The robotic daemon receives requests from the Media Manager device daemon and sends necessary information directly to the robotics or to a robotic control daemon.



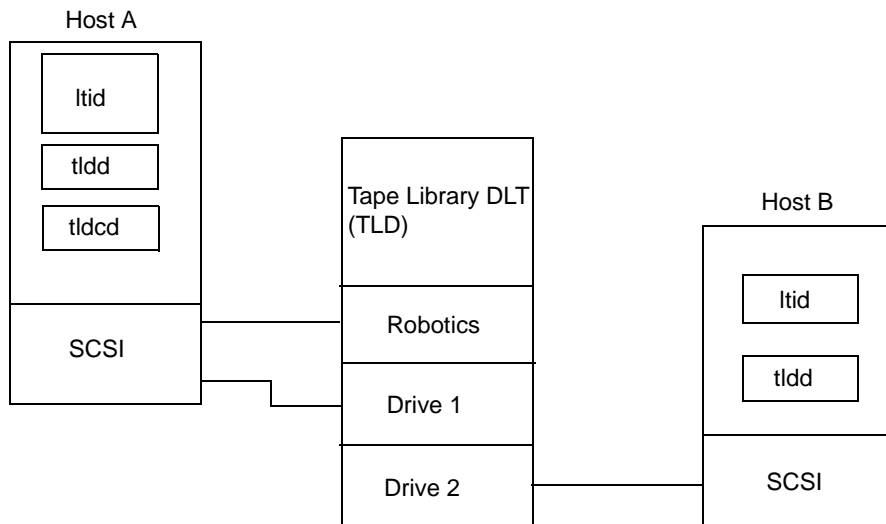
Robotic control daemons also exist for robot types where drives can optionally attach to hosts other than the host with direct robotic control. For example, each drive in a Tape Library DLT (TLD) robot can be attached to a different host and each host would have a `tldd` daemon. The robotics are controlled by a single host and only that host has the robotic control daemon, `tlcdc`. When it is necessary to mount a tape, the robotic daemon on the host with the drive, sends control information to the robotic control daemon on the host controlling the robotics.

Figure 23 shows the daemons for a Tape Library DLT robot. In this figure, note the following:

- ◆ Each host connects to one drive and has a robotic daemon, `tldd`.
- ◆ The robotic control and therefore the robotic control daemon, `tlcdc`, is on Host A.

The Media Manager device daemons on host A and B start `tldd`. The `tldd` daemon on Host A also starts `tlcdc`. Requests to mount tapes from host B go to `tldd` on Host B, which then sends the robotic command to `tlcdc` on Host A.

Figure 23. Example TLD Configuration



Media Manager Device Daemon (`ltid`)

`ltid` is the interface between Media Manager commands and device control. `ltid` controls the reservation and assignment of volumes and optical disks. When a tape request is issued, `ltid` requests `vmd` to find the volume and then requests the appropriate robot to mount the volume. If necessary, `ltid` notifies the operator that the volume must be mounted manually.

Starting the Device Daemon

Starting `ltid` also starts `avrd`, `vmd`, and the daemons for any robots with defined drives.

From a Command Line

Enter the following command.

```
/usr/opensv/volmgr/bin/ltid
```

To start `ltid` and the robotic daemons in verbose mode and log debug information through `syslogd`, use the `-v` option. This option should only be used when needed for debugging, since it can use large amounts of disk space to save extra information.

From the Java Administrative Interface

1. Use the Start/Stop Media Manager Device Daemon command on the Actions menu.
2. In the dialog box, the button to the right of the Device Host box allows you to select a device host. The Current Status box shows the status of this host.
3. Select a host and the Start action, and OK when ready. This also starts the daemons for any robots that are configured.

Stopping the Device Daemon

Stopping `ltid` stops robotic daemons. `vmd` continues to run.

The ACS robotic processes (`acsssi` and `acsse1`) also continue to run, since they are used by the ACS test facility and do not normally need to be stopped.

From the Java administrative interface, stop the device daemon before making any changes to the device configuration as follows:

1. Notify users and operators that the system will be unavailable.
2. Check the Pending Requests list to ensure that no tapes are currently assigned. If any tapes are assigned, you cannot stop the daemons.
3. Use the Start/Stop Media Manager Device Daemon command on the Actions menu.
4. In the dialog box, the button to the right of the Device Host box allows you to select a device host. The Current Status box shows the status of this host.
5. Select a host and the Stop action, and OK when ready.



Automatic Volume Recognition Daemon (avrd)

This daemon handles automatic volume recognition and label scanning. This allows Media Manager to read labeled tape and optical disk volumes and assign the associated removable media requests to drives.

avrd is started when you start ltid and stops when you stop ltid. You do not have to start and stop it at any other times.

Media Manager Volume Daemon (vmd)

When vmd receives information from ltid about a requested volume, it searches the volume database and returns the robotic location of the volume to ltid. Because vmd may be running on or servicing requests from another system, and because it is used for remote device configuration and device management, vmd continues to run even after ltid and the other daemons have been stopped.

vmd must be active to change the volume configuration.

An additional function that vmd can provide is to be the device allocator (DA) for multihosted drives. In this case, vmd is known as vmd/DA. See “Multihosted Drives (Shared Storage Option)” on page 286 for more information.

You can do either of the following when starting this daemon:

- ◆ Start ltid. This also starts vmd.
- ◆ Start only vmd, by using the following command:

```
/usr/opensv/volmgr/bin/vmd
```

To stop this daemon use the following command:

```
/usr/opensv/volmgr/bin/vmctrldbm -t
```

Robotic Daemons

Table 46 lists the robotic daemons and robotic control daemons (if applicable) for each robot type. For more information about these daemons, see Appendix A.

Table 46. Robotic and Robotic Control Daemons

Robot	Daemon	Description
Automated Cartridge System (ACS)	acsd	This daemon runs on a Media Manager server and communicates mount and unmount requests to the host that controls the ACS robotics.



Table 46. Robotic and Robotic Control Daemons (continued)

Robot	Daemon	Description
Library Management Facility (LMF)	lmfd lmfcd	(UNIX hosts only) The robotic daemon, <code>lmfd</code> , resides on a Media Manager server and passes mount and dismount requests to the LMF robotic control daemon (<code>lmfcd</code>). <code>lmfcd</code> receives mount or dismount requests from <code>lmfd</code> or robot inventory requests through an external socket interface. This daemon must reside on a host that is running the LMF Server or the LMF Client.
Optical Disk Library (ODL)	odld	(UNIX hosts only) This daemon runs on a Media Manager server that has an Optical Disk Library. <code>odld</code> receives requests to mount and unmount volumes and communicates these requests to the robotics through a SCSI interface.
Tape Library DLT (TLD)	tldd tldcd	The robotic daemon, <code>tldd</code> , runs on each Media Manager server that has a drive in a Tape Library DLT. This daemon receives requests to mount and unmount volumes and sends these requests to the robotic control daemon, <code>tldcd</code> . <code>tldcd</code> runs on the Media Manager server that has the robotic control and communicates with the Tape Library DLT robotics through a SCSI interface. Drives in the same robot may be configured on different hosts.
Tape Library 4MM (TL4)	t14d	This daemon runs on a host that has a Tape Library 4MM. <code>t14d</code> receives requests to mount and unmount volumes and communicates these requests to the robotics through a SCSI interface.
Tape Library 8MM (TL8)	t18d t18cd	The robotic daemon, <code>t18d</code> , runs on each Media Manager server that has a drive in a Tape Library 8MM. This daemon receives requests to mount and unmount volumes and sends these requests to the robotic control daemon, <code>t18cd</code> . <code>t18cd</code> runs on the Media Manager server that has the robotic control and communicates with the Tape Library 8MM robotics through a SCSI interface. Drives in the same robot may be configured on different hosts.



Table 46. Robotic and Robotic Control Daemons (continued)

Robot	Daemon	Description
Tape Library Half-inch (TLH)	tlhd tlhcd	(UNIX hosts only) The robotic daemon, <code>tlhd</code> runs on each Media Manager server that has a drive in a Tape Library Half-inch. This daemon receives requests to mount and unmount volumes and sends these requests to the robotic control daemon, <code>tlhcd</code> . <code>tlhcd</code> runs only on the Media Manager server that has the robotic control and communicates with the IBM Automated Tape Library Software, which controls a library, such as an IBM 3494.
Tape Library Multimedia (TLM)	tlmd	(UNIX hosts only) This daemon interfaces with the EMASS Distributed AML Server (DAS), which controls the robotics, such as a Grau Automated Media Library (AML).
Tape Stacker 8MM (TS8)	ts8d	This daemon runs on a Media Manager server that has a Tape Stacker 8MM. <code>ts8d</code> receives requests to mount and unmount volumes and communicates these requests to the robotics through a SCSI interface.
Tape Stacker DLT (TSD)	tsdd	This daemon runs on a Media Manager server that has a Tape Stacker DLT. This daemon receives requests to mount and unmount volumes and communicates these requests to the robotics through a SCSI interface.
Tape Stacker Half-inch (TSH)	tshd	(UNIX hosts only) This daemon runs on a Media Manager server that has a Tape Library Half-inch. <code>tshd</code> receives requests to mount and unmount volumes and communicates these requests to the robotics through a SCSI interface.

Starting and Stopping Robotic Daemons

Starting `ltid` also starts the robotic daemons for all configured robots. Stopping `ltid` also stops robotic daemons.

The ACS robotic processes (`acsssi` and `acssel`) continue to run, since they are used by the ACS test facility and do not normally need to be stopped.

You can start and stop robotic daemons independently of `ltid` as follows. To run the daemons in verbose mode and log debug information through syslog, use the `-v` option on the command for the daemon, or start `ltid` with the `-v` option. This option should only be used when needed for debugging, since it can use large amounts of disk space to save the extra information.

- ◆ To start a robotic daemon use the following command:



```
/usr/opensv/volmgr/bin/daemon_name [-v] &
```

For example:

```
/usr/opensv/volmgr/bin/tlidd -v &
```

- ◆ To stop a robotic daemon without stopping `ltid`, determine the process ID for the daemon using the `vmmps` script and then use the `kill` command as follows.

See “Displaying Process Status using the `vmmps` Script” for information on using this script.

```
/usr/opensv/volmgr/bin/vmmps | grep daemon_name
```

```
kill daemon pid#
```

For example:

```
/usr/opensv/volmgr/bin/vmmps | grep tlidd
```

```
kill 23145
```

- ◆ To stop robotic control daemons use the following commands:

```
/usr/opensv/volmgr/bin/lmfcd -t
```

```
/usr/opensv/volmgr/bin/tl8cd -t
```

```
/usr/opensv/volmgr/bin/tldcd -t
```

```
/usr/opensv/volmgr/bin/tlhcd -t
```

You can also stop these control daemons with the `kill` command as described earlier.

Once started, a robotic daemon can be in an UP or DOWN state. When a connection is made to the appropriate robot, the corresponding daemon is in the UP state and can mount or unmount tapes (or platters). If the connection cannot be made or if errors exist, the daemon moves to the DOWN state. Even in the DOWN state, the daemon is still running and automatically returns to the UP state when the connection is made or problems no longer exist.

Displaying Process Status using the `vmmps` Script

The `vmmps` script shows the Media Manager daemon processes that are active. You can execute this script using the following command:

```
/usr/opensv/volmgr/bin/vmmps
```

In the following sample display, the second column contains the process IDs for the processes.

```
root      303  0.0  0.2  136  264 ?  S    Feb 11  4:32  ltid -v
root      305  0.0  0.0  156    0 ?  IW   Feb 11  0:54  vmd -v
```



Logging

```
root      306  0.0  0.0  104    0 ?  IW   Feb 11  0:15 t18d -v
root      307  0.0  0.0   68   56 ?  S    Feb 11 12:16 avrd
root      310  0.0  0.0  116    0 ?  IW   Feb 11  0:07 t18cd -v
```

Logging

Robotic errors and network errors are logged using `syslogd`. See the NetBackup troubleshooting guide for UNIX for more information.



If you are not using NetBackup or Storage Migrator, you can manually request Media Manager to mount and unmount specific volumes by using the commands found in this chapter.

Requesting Tapes

The `tpreq` command allows you to request a tape of a particular density and specify various options, such as the access mode. This command implicitly reserves a single drive and creates a file in the current working directory (unless a full path is specified). The file acts as a symbolic link to the tape and all subsequent access to the tape is through this file name. Users do not have to be concerned with the full path to a specific device file.

The information you supply on the `tpreq` command is registered for use by the Media Manager device daemon and used to validate all access requests to the tape file.

For all types of tapes, the tape is actually mounted and assigned when you enter the `tpreq` command.

By default, the drive assigned is one which supports DLT cartridge tapes, using the density `dlt`. You can use the `density` option on `tpreq` to request a drive that supports another density. See the `Density` field in Table 42 on page 177 for a list of supported densities and drive types.

Density is not selected automatically on drives. It is requested, so an operator can satisfy the correct drive. Density is determined by the `/dev` device name that was used when you added the drive to the Media Manager configuration or by the physical selection buttons on the drive itself.

A `tpreq` command must include an RVSN (recorded volume serial number) or an EVSN (external volume serial number) or both. Usually they are the same and, if one is not specified, the name that is specified is assumed for both. The RVSN does not apply to optical disks; only the EVSN can be specified.

A `tpreq` command must also include a file name. If the tape volume is associated with a volume pool (configured using Media Manager), the name of the volume pool must be specified using the `-p` parameter.

The following `tpreq` command reserves a tape drive and creates a symbolic tape file:



```
/usr/opensv/volmgr/bin/tpreq -f tape1 -ev jlr01 -a w -d qscsi
```

This example creates a file named `tape1` in the user's current working directory and links the file to the drive containing the tape volume having the external label JLR01. The access mode for the tape file is set to write and a 1/4-inch cartridge drive is assigned.

See the `tpreq(1)` man page for more information.

Reading and Writing Tape Files

Reading or writing tape files involves copying the file from tape to disk or from disk to tape. To perform read or write operations, use one of the UNIX commands that performs input/output operations, for example `tar` or `mt`.

Positioning Tape Files

A tape file begins at the load point or beginning of volume on the first volume associated with the tape file, and it ends at the end of volume on the last volume associated with the tape file.

The `mt` command positions tape files by skipping forward or backward according to tapemarks. Table 47 shows the operations available on the `mt` command for positioning tapes and how they affect tape files.

Table 47. `mt` Command Operations

Command	Description
<code>eof, weof</code>	Writes end-of-file tapemarks at the current position on the tape according to the count option on <code>mt</code> .
<code>fsf, bsf</code>	Spaces forward or backward the number of tapemarks on the count option.
<code>fsr, bsr</code>	Spaces forward and backward the number of records according to the count option on <code>mt</code> . <code>bsr</code> is only supported for the undefined record type.

The following example uses `mt` to skip forward three files on a tape:

```
mt -f tape1 fsf 3
```

Rewinding Tape Files

When a file is rewound, it is positioned to the beginning of information. To rewind a tape file, you can use the `mt` command.

The following command causes rewinding of tape file `tape1`. `tape1` is positioned to the beginning of the tape volume associated with the file.



```
mt -f tape1 rewind
```

The count option is not used for the rewind operation. If a count is specified, it is ignored.

Removing Tape Files

When you have completed reading or writing tape files, use the `/usr/opensv/volmgr/bin/tpunmount` command to end the assignment of the tape file. This command removes from the directory the tape file you created using `tpreq` and causes the tape volume to be removed from the tape drive. `tpunmount` is required for each file created by a `tpreq` command.

See the `tpunmount(1)` man page for more information.

Using an Optical Disk

An optical disk cannot be used in the same ways that a tape can. It does have many similarities and takes advantage of the automation provided by Media Manager: it allows automatic volume recognition, and can be mounted and moved by a robot.

Optical disks work well with VERITAS storage management applications. These applications use databases to handle location information (offsets, capacity, and so forth) that would otherwise have to be done by the user. A user who is willing to keep track of such information can access an optical disk using the tape commands described in this topic.

In the following example, a user performs two `tar` operations to an optical disk, then lists the second `tar` image.

1. A rewritable optical disk is requested.

```
tpreq tape -ev XXX01A -d odiskwm -p NetBackup
```

2. The first `tar` is performed, starting at the beginning of the disk.

```
tar -cvf - /home/arh | dd of=tape ibs=10240 obs=10240
0+473 records in
189+0 records out
```

3. The second `tar` is performed, starting at the end of the previous data. The records out information is used for the `oseek` parameter.

```
tar -cvf - /home/arh/.cshrc | dd of=tape ibs=10240 obs=10240
oseek=189
```



4. The disk is unmounted.

```
tpunmount tape
```

5. The optical disk is requested again.

```
tpreq tape -ev XXX01A -d odiskwm
```

6. The second `tar` image is listed. To access the data, the user must know where it is located for the `iseek` parameter.

```
dd if=tape ibs=10240 obs=10240 iseek=189 | tar -tvf -  
rw-r--r--357/110 2386 Jul 9 14:01 1992  
/home/arh/.cshrc
```

7. The disk is unmounted.

```
tpunmount tape
```

External Access to Media Manager Controlled Devices

The device daemon, `ltid`, restricts access to Media Manager controlled drives that are in an UP state by changing the permissions of device files for those drives. The permissions are changed to `0600` when `ltid` starts and to `0666` when `ltid` is terminated (or when a drive's state is changed to DOWN).

Do not modify the permissions of these device files when `ltid` is active. To ensure reliable operation, only users that use the `tpreq` and `tpunmount` commands explained in this chapter can have access to an UP drive under `ltid` control.

The following example uses `tpreq`:

```
tpreq tape -ev xxx -d 4mm -f /tmp/tape  
/bin/tar -cvf /tmp/tape files  
tpunmount /tmp/tape
```

Users that do not use `tpreq` and `tpunmount` to access drives that are in the UP state may encounter both access and data reliability problems. These problems occur because the Media Manager `avrd` daemon periodically attempts to rewind and read data from media in UP drives that are not currently assigned.

A user that is unable to use `tpreq` and `tpunmount` must do one of the following before attempting to access the drive:

- ◆ Down the drive prior to accessing it.



- ◆ Terminate `ltid` by executing `stopltid` and then restart `ltid` after accessing the drive.

User Messages

The following messages may occur as a result of executing tape commands:

Invalid Drive Type/Density

An invalid density was specified on the `-d` parameter on `tpreq`.

IPC Error: Daemon may not be running

A request to the Media Manager device daemon could not be serviced. Most likely, the daemon is not running.

File name does not exist

Attempted a `tpunmount` on logical tape files that do not exist for this user.

Requested number of drives are not configured

Attempted a `tpreq` and there are not enough drives that match the requested density in the configuration.

File name already exists

Attempted a `tpreq` with a tape file name that already exists for this user.

You do not have permission to create the file

Attempted to perform a `tpreq` in a directory where the current user does not have permission to create files.

Tape file path exceeds 255 character maximum

Logical file names are limited to 255 characters.

Operator denied mount request

The operator denied a mount request.

Mount canceled, device daemon is terminating

Mount requests pending were canceled because the administrator terminated the Media Manager device daemon, `ltid`.

Cannot assign due to EVSN mismatch

Attempted to assign an optical disk request to a volume that contained a different recorded EVSN than was requested. Refer to the `tpformat man` page to change recorded EVSNs on optical platters.

Request terminated because of volume pool mismatch



The volume pool specified on the `tpreq` command did not match the volume pool specified in the Media Manager configuration for the media ID.

Request terminated because user not validated for volume pool

The user is not validated to use the media ID because of permissions defined for the volume pool in which the media ID is contained.

Request terminated because user/group not validated for volume pool

The user or group is not validated to use the media ID because of permissions defined for the volume pool in which the media ID is contained.

Request terminated because host not validated for volume pool

The host where the `tpreq` command was initiated cannot access the media ID.

Request terminated because media id is expired

The media ID being requested is expired.

Request terminated because media id will exceed maximum mount count

The media ID being requested has reached the maximum mount count specified in the Media Manager configuration for the media.

Request terminated because media is unavailable (in DOWN drive, misplaced, write protected or unmountable)

The media ID being requested is not available.



Media Manager Man Pages

A

This appendix describes Media Manager commands and Media Manager processes associated with robotic control.

`tpreq` and `tpunmount` are user commands for requesting tape mounts and unmounts for configured drives. They can be executed from the command line.

`tpclean`, `tpconfig`, `tpformat`, `xdevadm`, and `vmopr cmd` are administrative commands for device management. `vmadd`, `vmadm`, `vmchange`, `vmdelete`, `vm pool`, `xvmadm`, and `vmquery` are administrative commands for media management. These administrative commands can also be executed from the command line.

The remaining commands in this appendix are for robotic control of devices, and are started or stopped by the Media Manager device daemon (`ltid`) as needed.

The following conventions are used in the command descriptions:

- ◆ Brackets [] indicate that the enclosed component of the command line is optional.
- ◆ A vertical bar (or the pipe symbol) | separates optional arguments.

For example, if a command has the following format, you can choose `arg1` or `arg2` (but not both):

```
command [arg1 | arg2]
```

- ◆ Italics indicate that the information is user supplied.



acsd(1M)

NAME

acsd - Automated Cartridge System (ACS) daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/acsd [-v]
```

DESCRIPTION

`acsd` interfaces with Media Manager to automatically mount and unmount tapes that are under Automated Cartridge System (ACS) control. It is initiated by `ltid` (the Media Manager device daemon), if the Media Manager device configuration shows drives in an ACS robot.

Stopping `ltid` stops `acsd`. You can start or stop `acsd` independently of `ltid` using `/usr/opensv/volmgr/bin/vmps` or your server's `ps` command to identify `acsd`'s process id and then entering the following commands:

```
kill acsd_pid
```

```
/usr/opensv/volmgr/bin/acsd [-v] &
```

`acsd` performs its tasks by sending requests to the ACS Server System Interface process (`acsssi`) which communicates with the server that controls the Automated Cartridge System.

When the connection is established, `acsd` puts the ACS robot in the UP state and can mount and unmount tapes. If the connection cannot be established or Automated Cartridge System errors exist, `acsd` changes the robot to the DOWN state. In this state, `acsd` is still running and returns the robot to the UP state when the problem no longer exists.

The Internet service number for `acsd` must be in `/etc/services`. If you are using NIS (Network Information Service), you should place the entry in this host's `/etc/services` file in the master NIS server database for services. To override the services file, create the file `/usr/opensv/volmgr/database/ports/acsd` with a single line containing the service number for `acsd`. The default service number is 13702.

OPTIONS

`-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, `acsd` also starts with `-v`.

ERRORS

`acsd` returns an error message if there is a copy of `acsd` running.



Media Manager logs ACS and network errors to `syslogd`. Log entries are also made when the state changes between UP and DOWN.

`acsssi` logs to a log file in the directory `/usr/opensv/volmgr/debug/acsssi`.

SEE ALSO

`ltid(1M)`, `syslogd(8)`, `tpconfig(1M)`, `vmadm(1M)`



lmfd(1M)

NAME

lmfd, lmfcd - Library Management Facility (LMF) daemon and control daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/lmfd [-v]
/usr/opensv/volmgr/bin/lmfcd [-v] [-t]
```

DESCRIPTION

lmfd and lmfcd interface with Media Manager to mount and unmount tape volumes in an LMF robot.

Note lmfd and lmfcd only run on Solaris platforms.

lmfd directly interfaces with ltid (the Media Manager device daemon). lmfd runs on each host with a drive connection and sends mount and unmount requests to the control daemon, lmfcd.

lmfcd communicates with the Fujitsu LMF Server, which processes all requests and control functions for the robotic library. lmfcd can be running on a different host than lmfd, depending on where the Fujitsu library control is configured (see EXAMPLES). When communication with the library is established, lmfd puts the LMF robot in the UP state and can request volume mounts and unmounts. If the library or control daemon is inaccessible, lmfd changes the robot to the DOWN state. In this state, lmfd is still running and returns the robot to the UP state if lmfcd is able to make a connection.

Note If drives are on different hosts, the robotic information must be entered in the Media Manager device configuration on all hosts and the robot number must be the same on all hosts.

lmfd and lmfcd are automatically started when ltid is started and stopped when ltid is stopped. You can stop and start lmfd independently of ltid using /usr/opensv/volmgr/bin/vmps or your server's ps command to identify the lmfd process id and then entering the following commands:

```
kill lmfd_pid
/usr/opensv/volmgr/bin/lmfd [-v] &
```

lmfcd is on the host that has the robotic control and is automatically started by lmfd on that host. lmfcd is terminated when you stop ltid. The media ID (EVSN) for the volumes to be used in the library must be entered into the volume configuration before



any volumes can be accessed using `ltid`, `lmfd`, and `lmfcd`. Both the initial volume database population and future updates can be accomplished using the Media Manager robotic inventory options.

Drives are numbered 1 through n , based on information obtained from the Fujitsu library. To map Fujitsu library drive names to the appropriate Media Manager robot drive numbers, you can use the robotic test utility, `lmftest` (or `robtest` if the robot is configured). You can also use this utility along with the Fujitsu `lmdisplay` command-line interface to verify library communications, status, and functionality.

Drive cleaning for LMF robotic drives must be configured through a Fujitsu administrative interface, since these operations are not made available to applications that are using the Fujitsu library. For this reason, cleaning volumes cannot be defined using Media Manager. In addition, you cannot use the `tpclean(1M)` command for cleaning operations on drives under LMF robotic control.

The Internet service number for `lmfcd` must be in `/etc/services`. If you are using NIS (Network Information Service), the entry found in this host's `/etc/services` file should be placed in the master NIS server database for services. To override the services file, create the file `/usr/opensv/volmgr/database/ports/lmfcd` with a single line containing the service number for `lmfcd`. The default service number is 13718.

OPTIONS

- `-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, `lmfd` and `lmfcd` are also started with `-v`.
- `-t` Terminates `lmfcd`.

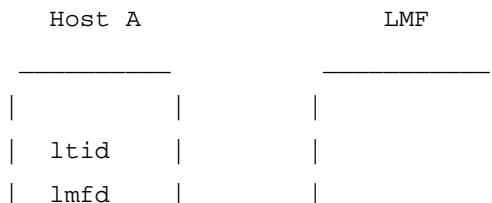
ERRORS

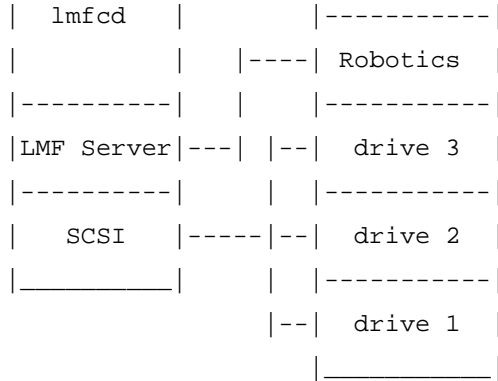
`lmfd` and `lmfcd` log an error message if there is a copy of the daemon running.

Media Manager logs any LMF robotic errors to `syslogd`. Log entries are also made when the state changes between UP and DOWN.

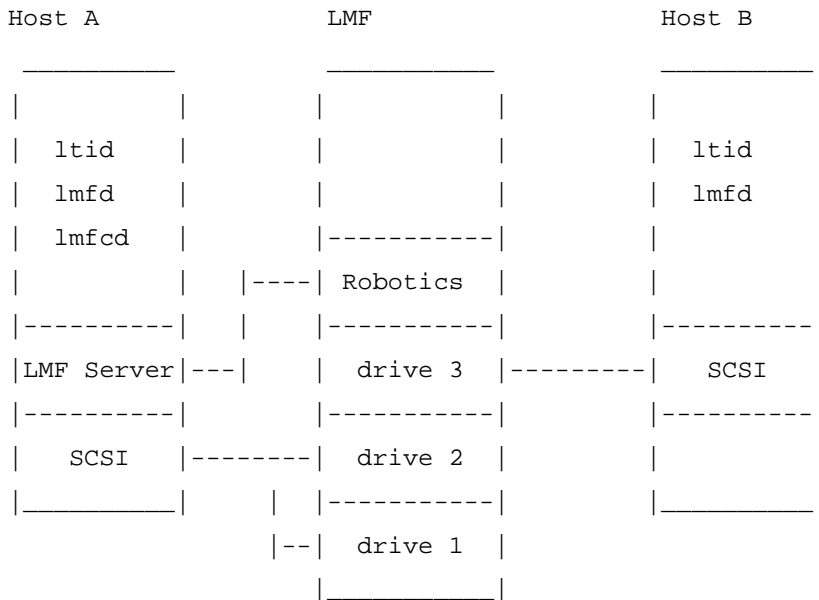
EXAMPLES

In the following diagram, the drives are attached to and the robotics are controlled from a single host. `ltid` initiates `lmfd`, which initiates `lmfcd`. The Fujitsu LMF Server daemon must be running on Host A.





In the following diagram, drives are attached to Host A and Host B. The robotics are controlled from Host A. `ltid` on each machine initiates `lmfd`. The `lmfd` on Host A also initiates `lmfcd`, since that is where the robotic control is defined. Requests to mount tapes from Host B go to `lmfd` on Host B, which sends the robotic command to `lmfcd` on Host A.



SEE ALSO

`ltid(1M)`, `syslog(8)`, `tpclean(1M)`, `tpconfig(1M)`, `vmadm(1M)`



ltid(1M)

NAME

ltid, stopltid - start and stop the Media Manager device daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/ltid [-v] [-nsu] [-logmounts [minutes]]  
    [-noverify]
```

```
/usr/opensv/volmgr/bin/stopltid
```

DESCRIPTION

The `ltid` command starts the Media Manager device daemon (`ltid`) and Automatic Volume Recognition daemon (`avrd`). These daemons manage Media Manager devices. With both daemons started, an operator can initiate the operator display and control the assignment of requests to drives. `ltid` can be placed in a system initialization script.

The Media Manager volume daemon, `vmc`, is also started by the `ltid` command. `ltid` also starts the appropriate robotic daemons, if robotic devices were defined in Media Manager.

The `stopltid` command stops `ltid`, `avrd`, and the robotic daemons. `stopltid` returns immediately without waiting for these daemons to stop. The daemons stop when they have completed any operations that are in progress.

OPTIONS

`-v`

Logs debug information using `syslogd`. This is most informative when robotic devices are in use.

`-nsu`

If this option is specified, tapes in standalone drives are not ejected when `tpunmount` is issued (though they are ejected if end of media is reached during a NetBackup backup or archive). You can override this option by specifying the `-force` option on `tpunmount`.

This option can be used in a NetBackup environment where it is desirable to keep the standalone drives ready after successful backups are performed.

Specifying this option is equivalent to specifying `DO_NOT_EJECT_STANDALONE` in the `vm.conf` file.



`-logmounts` *minutes*

If this option is specified, `ltid` logs mount requests using `syslogd`. The mount requests are still posted to Media Manager displays. The mount requests are only logged after a delay of the specified number of minutes.

If `-logmounts` is specified, the default number of minutes is 3. If `-logmounts 0` is specified, `ltid` logs the mount request through `syslogd` immediately. If *minutes* is not zero and the mount request is satisfied before the number of minutes are up, the request is not logged through `syslogd`.

`-noverify`

If this option is specified, `ltid` does not verify drive names. Normally, `ltid` verifies that the no rewind on close drive name has the correct minor number bits relating to no rewind, variable, berkeley-style, and so on. This option is normally not required, but may be helpful if using non-standard platform device files. If this option is specified, caution should be taken in making sure the device files are correct.

ERRORS

`stopltid` does not stop the daemons if any drives are assigned to users. Ensure that all users have unmounted assigned tapes before attempting to stop the daemons.

Error messages are logged using `syslogd`.

SEE ALSO

`rc(8)`, `syslogd(8)`, `tpconfig(1M)`, `vmadm(1M)`, `tpunmount(1)`



odld(1M)

NAME

odld - Optical Disk Library (ODL) daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/odld [-v]
```

DESCRIPTION

odld interfaces with Media Manager to mount and unmount optical platters in an Optical Disk Library. It is initiated by `ltid` (the Media Manager device daemon), if drives have been defined to be in an Optical Disk Library.

odld performs its tasks by communicating directly with the robotics using a SCSI interface. When the connection is established (that is, the path for robotics can be opened), odld puts the robot in the UP state and can mount and unmount platters. If the robotics are inaccessible, odld changes the robot to the DOWN state. In this state, odld is still running and it returns the robot to the UP state when it is able to make a connection.

You can stop or start odld independently of `ltid` using

`/usr/opensv/volmgr/bin/vmps` or the `ps` command to identify the odld process id and then entering the following commands:

```
kill odld_pid
```

```
/usr/opensv/volmgr/bin/odld [-v] &
```

The Media Manager administrator must enter the media ID (EVSN) and slot number information for the platters in the Optical Disk Library into the volume database before users can access any platters using `ltid` and `odld`. Note that each optical platter contains two volumes (EVSNs), one per side. This information can be entered using `vmadm`.

The Internet service number for odld must be in `/etc/services`. If you are using NIS (Network Information Service), you should place the entry in this host's `/etc/services` file in the master NIS server database for services. To override the services file, create the file `/usr/opensv/volmgr/database/ports/odld` with a single line containing the service number for odld. The default service number is 13706.

OPTION

`-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, odld also starts with `-v`.

ERRORS

odld returns an error message if there is a copy of odld running.



Any ODL and robotic errors are logged using `syslogd`. Log entries are also made when the state changes between UP and DOWN.

SEE ALSO

`ltid(1M)`, `syslogd(8)`, `tpconfig(1M)`, `tpformat(1M)`, `vmadm(1M)`



tl4d(1M)

NAME

tl4d - Tape Library 4MM (TL4) daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/tl4d [-v]
```

DESCRIPTION

tl4d interfaces with Media Manager to mount and unmount tapes in a Tape Library 4MM (TL4) robot. It is started by ltid (the Media Manager device daemon), if the Media Manager device configuration shows drives in the robot.

Stopping ltid stops tl4d. You can stop tl4d independently of ltid using /usr/opensv/volmgr/bin/vmps or your server's ps command to identify the tl4d process ID and entering the following commands:

```
kill tl4d_pid
```

```
/usr/opensv/volmgr/bin/tl4d [-v] &
```

tl4d communicates with the robotics through a SCSI interface. When the connection is established (the path for robotics can be opened), tl4d puts the TL4 robot in the UP state and can mount and unmount tapes. If the robotics are inaccessible, tl4d changes the robot to the DOWN state. In this state, tl4d is still running and returns the robot to the UP state if it is able to make a connection.

The media ID (EVSN) and slot number information for the 4 mm tapes in the robot must be entered into the Media Manager volume configuration before any tapes can be accessed through ltid and tl4d.

If a cleaning volume is used, it must be defined in the volume configuration. See tpclean(1M) for information on setting the frequency for automatic drive cleaning.

The Internet service number for tl4d must be in /etc/services. If you are using NIS (Network Information Service), you should place the entry in this host's /etc/services file in the master NIS server database for

```
/usr/opensv/volmgr/database/ports/tl4d
```

 with a single line containing the service number for tl4d. The default service number is 13713.

OPTION

-v Logs debug information using syslogd. If you start ltid with -v, tl4d also starts with -v.



ERRORS

tl4d returns an error message if there is a copy of tl4d running.

Media Manager logs any Tape Library 4MM and robotic errors to `syslogd`. Log entries are also made when the state changes between UP and DOWN.

SEE ALSO

ltid(1M), tpclean(1M), tpconfig(1M), vmadm(1M)



t18d(1M)

NAME

t18d, t18cd - Tape Library 8MM (TL8) daemon and control daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/t18d [-v]
/usr/opensv/volmgr/bin/t18cd [-v] [-t] [-n]
```

DESCRIPTION

t18d and t18cd interface with Media Manager to mount and unmount volumes in a Tape Library 8MM robot.

t18d directly interfaces with the Media Manager device daemon (ltid). A t18d daemon runs on each host with a drive connection and sends mount and unmount requests to the control daemon (t18cd). t18cd communicates with the robotics through a SCSI interface.

Tape Library 8MM robotic control software permits drives in the same robot to be configured on different hosts. t18cd may be running on a different host than t18d, depending on where the SCSI connection resides (see EXAMPLES). When the connection is established (that is, the path for robotics can be opened), t18d puts the TL8 robot in the UP state and can mount and unmount volumes. If the robotics are inaccessible, t18d changes the robot to the DOWN state. In this state, t18d is still running and returns the robot to the UP state if t18cd is able to make a connection.

Note If drives are on different hosts, the robotic information must be entered in the Media Manager configuration on all machines and the robot number must be the same on all machines.

t18d and t18cd are automatically started when ltid is started and stopped when ltid is stopped. You can stop or start t18d independently of ltid using /usr/opensv/volmgr/bin/vmps or your server's ps command to identify the t18d process id and then entering the following commands:

```
kill t18d_pid
/usr/opensv/volmgr/bin/t18d [-v] &
```

The control daemon, t18cd, is on the host that has the robotic control and is started by t18d on that host (see EXAMPLES).

The media ID (EVSN) and slot number information for the volumes in the robot must be defined in the volume configuration before any volumes can be accessed through ltid, t18d, and t18cd.



If a cleaning volume is used, it must be defined in the volume configuration. See `tpclean(1M)` for information on setting the frequency for automatic drive cleaning.

If the `vm.conf` configuration option `PREVENT_MEDIA_REMOVAL` is enabled when `t18cd` is active, `t18cd` disables access to the volumes and mailslot by issuing a command to the TL8 robot. If it is necessary to open the door of the cabinet, you must terminate `t18cd` first. By default, access to the library is allowed.

The drives are logically numbered 1 through n , where n is the number of drives in the robotic library. Use one or more of the following to determine the correct robot drive numbers:

- ◆ The Device Configuration wizard (if the robotic library and drives support serialization).
- ◆ The Robot Drive and Slot Layout appendix in the NetBackup Media Manager system administrator's guides.
- ◆ The robotic library vendor's documentation on drive indexing.
- ◆ The robotic test utility, or experiment by mounting media and watching the operator display.

The Internet service number for `t18cd` must be in `/etc/services`. If you are using NIS (Network Information Service), the entry found in this host's `/etc/services` file should be placed in the master NIS server database for services. To override the services file, create the file `/usr/opensv/volmgr/database/ports/t18cd` file with a single line containing the service number for `t18cd`. The default service number is 13705.

OPTIONS

- `-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, `t18d` and `t18cd` are also started with `-v`.
- `-t` Terminates `t18cd`.
- `-n` Causes `t18cd` to run with barcode checking disabled. This option is useful, if all or most of the volumes in the library do not contain barcodes, because it takes the robot a lot less time to scan volumes.
Note that if the volumes contain barcodes and the `-n` option is selected, the barcodes are ignored.

ERRORS

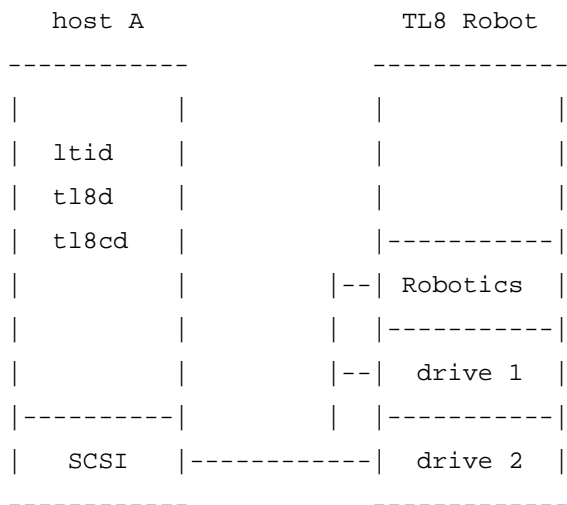
`t18d` and `t18cd` log error messages if there is a copy of the daemon running.

Media Manager logs any Tape Library 8MM and robotic errors to `syslogd`. Log entries are also made when the state changes between UP and DOWN.

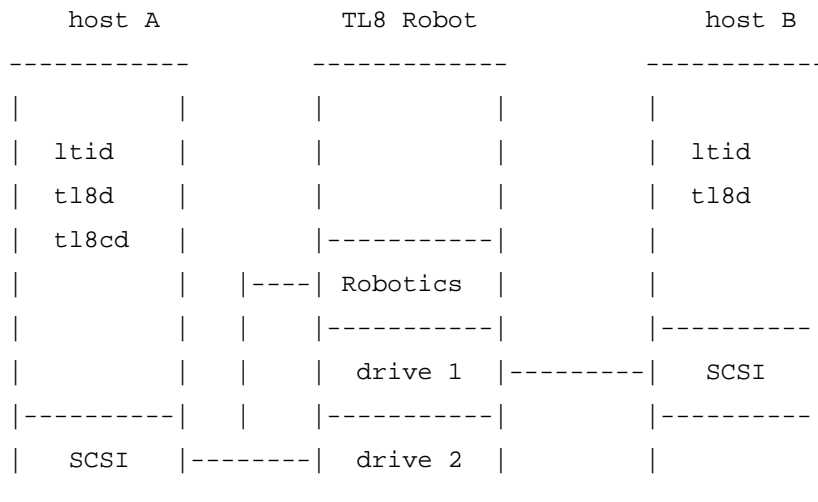


EXAMPLES

In the following diagram, the drives and the robotics are connected to a single host. `ltid` initiates `t18d`, which in turn initiates `t18cd`.



In the following diagram, each host is connected to one drive in the robot and the robotics are connected to host A. `ltid` on each host initiates `t18d`. The `t18d` on host A also initiates `t18cd`, since that is where the robotic control is defined. Requests to mount tapes from host B go to `t18d` on host B, which sends the robotic command to `t18cd` on host A.

**SEE ALSO**

`ltid(1M)`, `syslogd(8)`, `tpclean(1M)`, `tpconfig(1M)`, `vmadm(1M)`



tldd(1M)

NAME

tldd, tldcd - Tape Library DLT (TLD) daemon and control daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/tldd [-v]
/usr/opensv/volmgr/bin/tldcd [-v] [-t]
```

DESCRIPTION

tldd and tldcd interface with Media Manager to mount and unmount volumes in a Tape Library DLT (TLD) robot.

tldd directly interfaces with ltid (the Media Manager device daemon). tldd runs on each host with a drive connection and sends mount and unmount requests to the control daemon (tldcd). tldcd communicates directly with the robotics through a SCSI interface.

TLD robotic control software permits drives in the same robot to be configured on different hosts. tldcd may be running on a different host than tldd, depending on where the interface connection resides (see EXAMPLES). When the connection is established (that is, the path for robotics can be opened), tldd puts the TLD robot in the UP state and can mount and unmount volumes. If the robotics are inaccessible, tldd changes the robot to the DOWN state. In this state, tldd is still running and returns the robot to the UP state if tldcd is able to make a connection.

Note If drives are on different hosts, the robotic information must be entered in the Media Manager device configuration on all machines and the robot number must be the same on all machines.

tldd and tldcd are started when ltid is started and stopped when ltid is stopped. You can stop or start tldd independently of ltid using /usr/opensv/volmgr/bin/vmps or your server's ps command to identify the tldd process ID and then entering the following commands:

```
kill tldd_pid
```

```
/usr/opensv/volmgr/bin/tldd [-v] &
```

tldcd is on the host that has the robotic control and is automatically started by tldd on that host (see EXAMPLES).

The media ID (EVSN) and slot number information for the volumes in the robot must be entered into the volume configuration before any volumes can be accessed through ltid, tldd, and tldcd.



If a cleaning volume is used, it must be defined in the volume configuration. See `tpclean(1M)` for information on setting the frequency for automatic drive cleaning.

The drives are logically numbered 1 through N , where N is the number of drives in the robotic library. Use one or more of the following to determine the correct robot drive numbers:

- ◆ The Device Configuration wizard (if the robotic library and drives support serialization).
- ◆ The Robot Drive and Slot Layout appendix in the NetBackup Media Manager system administrator's guides.
- ◆ The robotic library vendor's documentation on drive indexing.
- ◆ The robotic test utility, or experiment by mounting media and watching the operator display.

The Internet service number for `tldcd` must be in `/etc/services`. If you are using NIS (Network Information Service), the entry found in this host's `/etc/services` file should be placed in the master NIS server database for services. To override the services file, create the `/usr/opensv/volmgr/database/ports/tldcd` file with a single line containing the service number for `tldcd`. The default service number is 13711.

OPTIONS

- `-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, `tddd` and `tldcd` are also started with `-v`.
- `-t` Terminates `tldcd`.

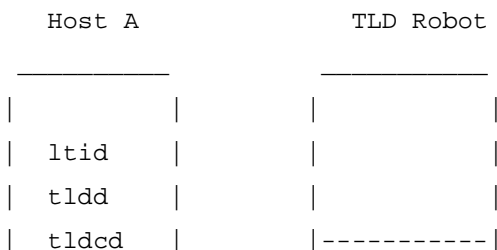
ERRORS

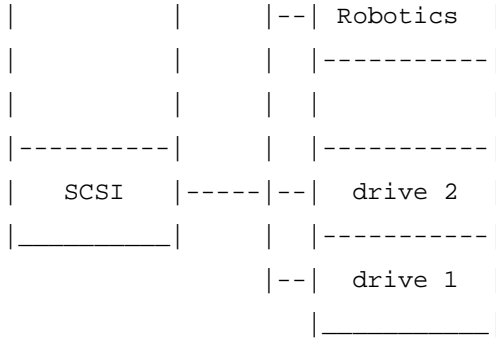
`tddd` and `tldcd` log an error message if there is another copy of the daemon running.

Media Manager logs any Tape Library DLT and robotic errors to `syslogd`. Log entries are also made when the state changes between UP and DOWN.

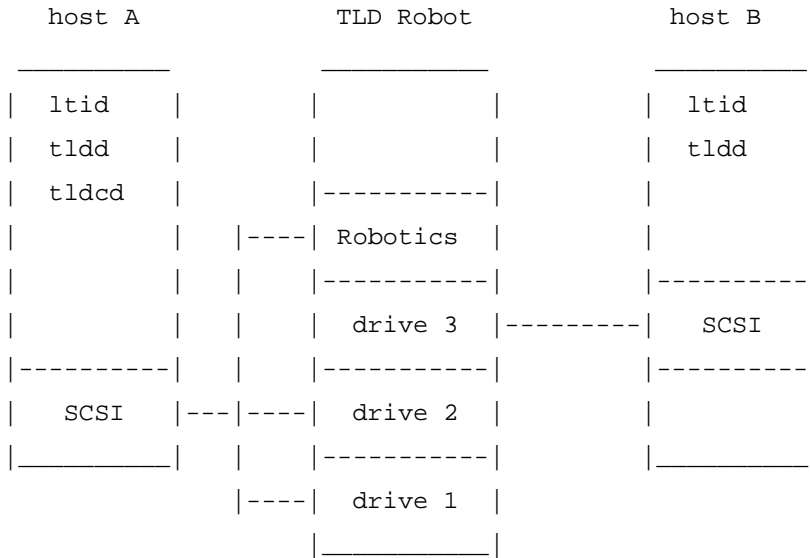
EXAMPLES

In the following diagram, the two drives and the robotics connect to Host A. `ltid` initiates `tddd`, which in turn initiates `tldcd`.





In the following diagram, each host connects to one drive and the robotics connect to host A. `ltid` on each machine initiates `tldd`. The `tldd` on host A also initiates `tldcd`, since that is where the robotic control is defined. Requests to mount tapes from host B go to `tldd` on host B, which sends the robotic command to `tldcd` on host A.



SEE ALSO

`ltid(1M)`, `syslog(8)`, `tpclean(1M)`, `tpconfig(1M)`, `vmadm(1M)`



tlhd(1M)

NAME

tlhd, tlhcd - Tape Library Half-inch (TLH) daemon and control daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/tlhd [-v]
/usr/opensv/volmgr/bin/tlhcd [-v] [-t]
```

DESCRIPTION

tlhd and tlhcd interface with Media Manager to mount and unmount tape volumes in a Tape Library Half-inch (TLH) robot.

tlhd directly interfaces with ltid (the Media Manager device daemon). tlhd runs on each host with a drive connection and sends mount and unmount requests to the control daemon, tlhcd.

tlhcd communicates with the IBM Automated Tape Library (ATL) library manager, which processes all requests and control functions for the robotic library. TLH robotic control software permits drives in the same robot to be configured on different hosts. tlhcd can be running on a different host than tlhd, depending on where the IBM library control is configured (see EXAMPLES). When communication with the library is established, tlhd puts the TLH robot in the UP state and can request volume mounts and unmounts. If the library or control daemon is inaccessible, tlhd changes the robot to the DOWN state. In this state, tlhd is still running and returns the robot to the UP state if tlhcd is able to make a connection.

Note If drives are on different hosts, the robotic information must be entered in the Media Manager device configuration on all machines and the robot number must be the same on all machines.

tlhd and tlhcd are automatically started when ltid is started and stopped when ltid is stopped. You can stop and start tlhd independently of ltid using /usr/opensv/volmgr/bin/vmps or your server's ps command to identify the tlhd process id and then entering the following commands:

```
kill tlhd_pid
/usr/opensv/volmgr/bin/tlhd [-v] &
```

tlhcd is on the host that has the robotic control and is automatically started by tlhd on that host. tlhcd is terminated when you stop ltid.



The Media Manager media ID (EVSN) for volumes to be used in the library must be entered into the volume configuration before any volumes can be accessed using `ltid`, `tlhd`, and `tlhcd`. Both the initial volume database population and future updates can be accomplished using Media Manager robotic inventory options.

The drives are numbered 1 through *n*, based on information obtained from the IBM library system call, `MTIOCLQ`. To map IBM ATL devices to the appropriate Media Manager robot drive numbers, you can use the robotic test utility, `tlhtest` (or `robtest` if the robot is configured). You can also use this utility along with IBM's `mtlib` command-line interface to verify library communications, status, and functionality.

Drive cleaning for Tape Library Half-inch robotic control must be configured through an IBM library manager console, since these operations are not made available to applications that are using the IBM library manager. For this reason, cleaning volumes cannot be defined through Media Manager. In addition, you cannot use the Media Manager utilities or the `tpclean (1M)` command for cleaning operations on drives under TLH robotic control.

The Internet service number for `tlhcd` must be in `/etc/services`. If you are using NIS (Network Information Service), the entry found in this host's `/etc/services` file should be placed in the master NIS server database for services. To override the services file, create the file `/usr/opensv/volmgr/database/ports/tlhcd` with a single line containing the service number for `tlhcd`. The default service number is 13717.

OPTIONS

- `-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, `tlhd` and `tlhcd` are also started with `-v`.
- `-t` Terminates `tlhcd`.

ERRORS

`tlhd` and `tlhcd` log an error message if there is a copy of the daemon running.

Media Manager logs any Tape Library Half-inch and robotic errors to `syslogd`. Log entries are also made when the state changes between UP and DOWN.

EXAMPLES

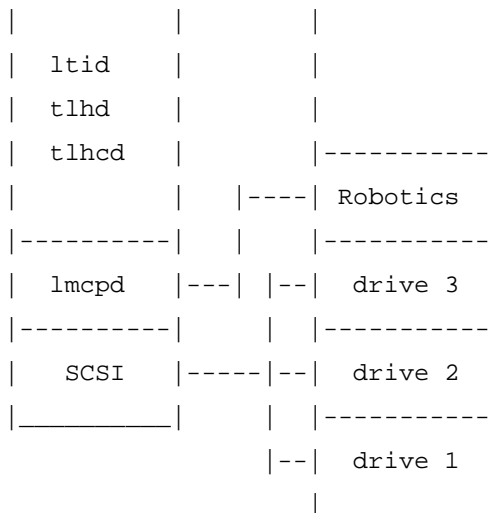
In the following examples, the device hosts can be Windows NT (Intel only), UNIX AIX, UNIX HP-UX, UNIX IRIX, or UNIX Solaris platforms.

In the following diagram, the drives are attached to and the robotics are controlled from a single host. `ltid` initiates `tlhd`, which in turn initiates `tlhcd`. The IBM library manager control-point daemon (`lmcpd`) must be running on Host A.

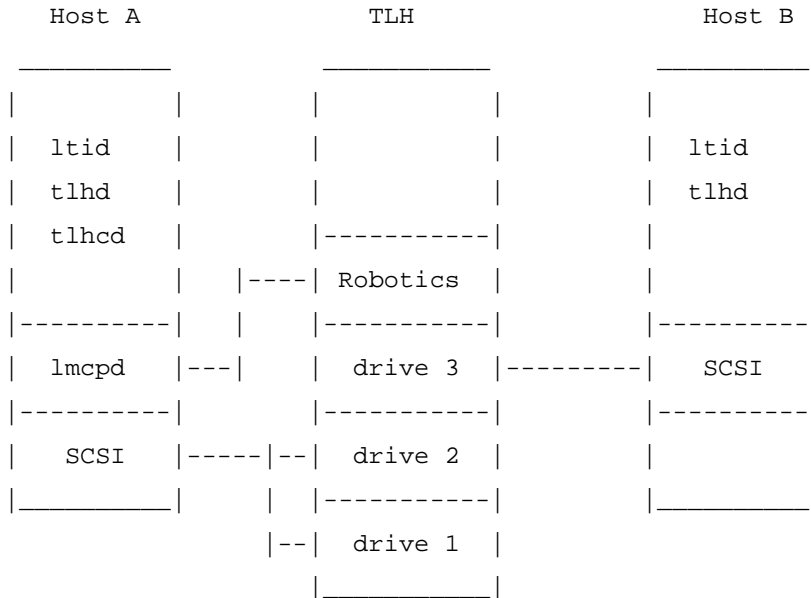
Host A

TLH





In the following diagram, each host is connected to at least one drive and the robotics are controlled from Host A. `ltid` on each machine initiates `tlhd`. The `tlhd` on Host A also initiates `tlhcd`, since that is where the robotic control is defined. Requests to mount tapes from Host B go to `tlhd` on Host B, which sends the robotic command to `tlhcd` on Host A.



SEE ALSO

`ltid(1M)`, `syslog(8)`, `tpclean(1M)`, `tpconfig(1M)`, `vmadm(1M)`



tlmd(1M)

NAME

tlmd - Tape Library Multimedia (TLM) daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/tlmd [-v]
```

DESCRIPTION

tlmd interfaces with Media Manager to mount and unmount tapes in a Tape Library Multimedia (TLM) robot. It is initiated by ltid (the Media Manager device daemon), if drives have been defined in Media Manager to be in a Tape Library Multimedia robot.

tlmd communicates with the ADIC Distributed AML Server (DAS), which is a client/server software product designed to provide shared access to the family of ADIC Automated Media Libraries (AML). When the connection is established, tlmd puts the TLM robot in the UP state and can request inventories as well as media mounts and dismounts. If the connection cannot be established or DAS errors occur, tlmd changes the robot to the DOWN state but keeps running. In this state, tlmd keeps running and returns the robot to the UP state when the problem no longer exists.

For each TLM robot defined, tlmd connects to the DAS server that is defined by the DAS server entry in the Media Manager device configuration. From the perspective of DAS, tlmd is connecting as a DAS client. The host running tlmd establishes communication as the DAS client that is specified by the DAS_CLIENT entry in the Media Manager configuration file, /usr/opensv/volmgr/vm.conf. If no DAS_CLIENT entry exists, the DAS client name will be the standard host name for the host that is running tlmd.

You can stop and start tlmd independently of ltid using

/usr/opensv/volmgr/bin/vmps or your server's ps command to identify tlmd's process id and then entering the following commands:

```
kill tlmd_pid
```

```
/usr/opensv/volmgr/bin/tlmd [-v] &
```

The drives are numbered 1 through N, based on information obtained from the DAS server. To map DAS devices to the appropriate Media Manager robot drive numbers, you can use the robotic test utility, tlmtest (or robtest if the robot is configured). You can also use ADIC's DASADMIN to verify library communications, status, and functionality.

The Internet service number for tlmd must be in /etc/services. If you are using NIS (Network Information Service), you should place the entry in this the host's /etc/services file in the master NIS server database for services. To override the services file, create the file /usr/opensv/volmgr/database/ports/tlmd with a single line containing the service number for tlmd. The default service number is 13716.



OPTION

`-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, `tlmd` also starts with `-v`.

ERRORS

`tlmd` returns an error message if there is a copy of `tlmd` running.

Tape Library Multimedia robot and network errors are logged using `syslogd`. Log entries are also made when the state changes between UP and DOWN.

SEE ALSO

`ltid(1M)`, `syslogd(8)`, `tpconfig(1M)`, `vmadm(1M)`



tpclean(1M)

NAME

tpclean - manages tape drive cleaning

SYNOPSIS

```
/usr/opensv/volmgr/bin/tpclean -L
/usr/opensv/volmgr/bin/tpclean -C drive_name
/usr/opensv/volmgr/bin/tpclean -M drive_name
/usr/opensv/volmgr/bin/tpclean -F drive_name cleaning_frequency
```

DESCRIPTION

tpclean allows you to monitor Media Manager tape drive usage and optionally configure tape drives to be automatically cleaned (except drives in ACS, LMF, ODL, RSM, or TLH robots).

Media Manager tracks the total amount of time that volumes have been mounted in the drives. You can use tpclean to specify a cleaning frequency (in hours) for a drive.

When the mount time exceeds the cleaning frequency and the drive is

- ◆ In a robot and the Media Manager volume configuration shows a cleaning tape in the robot, then drive cleaning occurs.
- ◆ Standalone or does not have a cleaning tape defined, then the Comment field in the tpclean -L output contains the message, NEEDS CLEANING. You can then manually clean the drive and reset the mount time using the -M option.

For the -C, -M, and -F options, ltid must be running. You must also have root privileges to execute this command.

See the reference topics appendix of the NetBackup Media Manager system administrator's guides for information about the TapeAlert feature and drive cleaning.

OPTIONS

-C *drive_name*

Initiates the cleaning of a drive in a robot. The drive must be defined in a robot and a cleaning tape defined in the Media Manager volume configuration. The mount time is reset to zero. The drive name is the name that was assigned to the drive, when it was added.

-L

Prints cleaning statistics to stdout.



-M *drive_name*

Use this option to indicate that the drive has been manually cleaned. The mount time is reset to zero. The drive name is the name that was assigned to the drive, when it was added.

-F *drive_name cleaning_frequency*

Sets cleaning frequency for the specified drive to *cleaning_frequency* hours. The drive name is the name that was assigned to the drive when it was added. The value of *cleaning_frequency* must be between 0 and 10,000 hours.

Frequency-based cleaning is not supported for multihosted drives.

EXAMPLES

The following example displays cleaning statistics. An asterisk next to the drive type means the device is defined as robotic.

```
#tpclean -L
```

Drive Name	Type	Mount Time	Frequency	Last Cleaned	Comment
*****	****	*****	*****	*****	*****
rob_A_drv0	qscsi	0.0	0	N/A	
rob_A_drv1	8mm*	11.4	30	14:33 05/29/92	
rob_B_drv5	hcart	5.6	10	13:01 06/02/92	
rob_B_drv6	odisk	3.0	0	N/A	

The following example sets the cleaning frequency for the drive named `rob_A_drv0` to 25 hours. The drive will be flagged as needing cleaning after 25 hours of mount time has occurred.

```
tpclean -F rob_A_drv0 25
```

The following example resets the mount time for the drive named `rob_A_drv1` to zero. You would normally use this command after you had manually cleaned the drive.

```
tpclean -M rob_A_drv1
```

The following example initiates the cleaning of drive `rob_A_drv1`. This example assumes the drive is a robotic drive, with a cleaning tape defined. The mount time is reset to zero.

You can use the `-C` option to force the cleaning of a drive prior to reaching *cleaning_frequency*. Normally, robotic drives are cleaned automatically when their mount time exceeds the cleaning frequency.

```
tpclean -C rob_A_drv1
```



Note To use a cleaning tape, the Cleanings Remaining for that tape (as shown in the Media and Device Management volume list) must be greater than zero. This cleaning count refers to how many more times the cleaning tape can be used. You can change this count by selecting the volume and using the Change command on the Media and Device Management Actions menu.

SEE ALSO

ltid(1M), tpconfig(1M), vmadm(1M)

tpconfig(1M)

NAME

tpconfig - tape configuration utility

SYNOPSIS

```
/usr/opensv/volmgr/bin/tpconfig [-d] [-noverify]
```

DESCRIPTION

`tpconfig` starts the Media Manager Device Configuration Utility. This menu-based utility creates and modifies databases in the `/usr/opensv/volmgr/database` directory. These databases identify the robotics and drives that are under control of `ltid` (the Media Manager device daemon). `ltid` uses these files to correlate drives in the operator's drive status display to the device files in the `/dev` directory.

For example, assume that you want to configure a drive recognized by the system as an 8-mm type drive. Look in the `/dev` directory and locate the no rewind on close device name for an 8-mm type drive and then specify this device name for the drive. `tpconfig` then records the device name in the appropriate device database.

You can also use `tpconfig` to define robotic devices.

After using `tpconfig` to change your tape configuration, use the `stopltid` command to stop the `ltid` and `avr`d (automatic volume recognition) daemons (if they are running). Then use the `ltid` command to start the daemons again. See `ltid(1M)` for more information.

You must be the root user to execute this utility.

OPTION

`-d`

Prints the current Media Manager device configuration to `stdout`.

`-noverify`

If this option is specified, drive names are not verified. Normally, `tpconfig` verifies that the no rewind on close drive name has the correct minor number bits relating to no rewind, variable, Berkeley-style, and so on. This option is normally not required, but may be helpful if using non-standard platform device files. If this option is specified, caution should be taken in making sure the device files are correct.

FILES

```
/usr/opensv/volmgr/database/ltidevs
```

```
/usr/opensv/volmgr/database/robotic_def
```



/usr/opensv/volmgr/help/tpconfig* (Help files)

SEE ALSO

ltid(1M)

tpformat(1M)

NAME

tpformat - formats optical disks for use by Media Manager

SYNOPSIS

```
/usr/opensv/volmgr/bin/tpformat -ev evsn [-d odiskwm | odiskwo]
[-f] [-o] [-r robot_number]
```

DESCRIPTION

The `tpformat` command writes a volume label and an RVSN (Recorded Volume Serial Number) on an optical disk platter. When used with the `-f` option, this command also formats the platter.

The volume label contains the RVSN and is a partition table that is required by the disk drivers on most platforms. The RVSN is recorded in the volume configuration as the media ID. When a platter is mounted, Media Manager compares the RVSN to the media ID that was requested in order to verify that the correct platter is mounted.

With `tpformat`, you specify the EVSN (external volume serial number) as the RVSN to be written on the disk. The EVSN is an identifier that is written on the outside of the volume so the operator can find the volume. The RVSN and EVSN must always be the same or the wrong volume will be mounted.

Whether it is necessary to label an optical disk with `tpformat` depends on the platform that has the optical disk drive as follows:

- ◆ On SunOS, Solaris, and SGI platforms, you must use `tpformat` to write a system-specific volume label (that is, partition table) and RVSN on each side of a platter before you can use it with Media Manager. This action is required regardless of whether the platter has been formatted. However, if the platter is preformatted you do not have to reformat it.
- ◆ On HP9000-700, HP9000-800, and IBM RS6000 systems, volume labels do not apply and it is not mandatory to use `tpformat`, unless you must use it to format the volume. However, labeling is still recommended so the volume will have an RVSN that Media Manager can use to verify that the correct volume is mounted.

All optical disk platters must be formatted before Media Manager can use them. You can purchase preformatted platters (recommended) or format them manually with the `tpformat -f` option.



You must be a root user to execute `tpformat` and you can use it only on the server that has the optical drive. For example, you cannot use `tpformat` on a NetBackup master server to format media that is mounted in a drive on a NetBackup media server. In addition, the drive must be under control of Media Manager and the Media Manager device daemon (`ltid`) must be running.

`tpformat` causes a mount request to appear in the operator displays. Or, if the volume is in a robot and the RVSN that you specify exists in the volume database, the volume is automatically mounted.

When using `vmadm` to add media to Media Manager, you can choose the label option, thus making it unnecessary to use `tpformat`.

OPTIONS

`-ev evsn`

Writes the EVSN (external volume serial number) on the optical platter. You can specify up to six alpha-numeric characters for the EVSN. Once written on the media, this identifier becomes the RVSN and is also referred to as the media ID.

`-d odiskwm | odiskwo`

The density (media type) that is being formatted. The default is `odiskwm`. `odiskwm` specifies rewritable (write many) media. `odiskwo` specifies write once (WORM) media.

Note WORM media can be formatted only once by `tpformat`.

`-f`

Formats the selected disk surface. Since it takes approximately 25 minutes per surface to format, use this option only for disks not formatted at the factory.

`-o`

You must specify this option (overwrite) to use `tpformat` on a platter that has an RVSN (that is, contains a label).

`-r robot_number`

Verifies that the robot number specified is configured and is a valid robot type that supports the formatting of optical volumes.

EXAMPLES

The following example writes EVSN `diska` and a volume header to a rewritable optical disk:

```
tpformat -ev diska -d odiskwm
```



The following is an example where a platter has a recorded EVSN and you specify a new EVSN by including the `-o` option:

```
tpformat -o -ev disk1 -d odiskwm
```

SEE ALSO

ltid(1M), tpconfig(1M), tpreq(1), vmadm(1M)



tpreq(1)

NAME

tpreq - request a tape volume for mounting and associate a file name with the assigned drive

SYNOPSIS

```
/usr/opensv/volmgr/bin/tpreq -rv rvsn | -ev evsn [-a accessmode]  
[-d density] [-p poolname] [-f] filename
```

DESCRIPTION

This command initiates a mount request for a tape volume on a removable media device. The information that you specify with this command identifies and registers the specified file as a logical identifier for the mount request with Media Manager and manages access to the volume.

Media Manager automatically mounts the media if it is in a robotic drive. Otherwise, an operator mount request appears in the Device Monitor window.

When the operation is complete, use the `tpunmount` command to remove the file name from the directory in which the file was created.

If you request optical disk densities (`odiskwm` or `odiskwo`), `tpreq` acts differently than with sequential tape devices. The logical file name is a link to the data partition of the disk device. By default, it is the character device.

Note Optical platters are labeled by `tpformat` with the volume-header partition being the label and the data partition being the rest of the disk.

You must specify a file name, and the `-rv` or `-ev` option.

OPTIONS

`-rv` *rvsn*

Specifies a recorded volume serial number (RVSN) that is associated with the tape file.

If `-rv` is specified and `-ev` is not specified, *rvsn* is used for both options. You can enter *rvsn* in upper or lowercase; Media Manager converts it to uppercase.

Recorded vsn has no meaning for optical disks (`-d odiskwm` or `-d odiskwo`). See `tpformat(1M)` for more information about recorded and external vsn for optical disks.



- `-ev evsn`
Specifies an external volume serial number (EVSN) that will be associated with the tape file.
If `-ev` is specified and `-rv` is not specified, `evsn` is used for both options. The external serial number of a volume is specified on the physical external label. You can enter `evsn` in upper or lowercase; Media Manager converts it to uppercase.
- `-a accessmode`
Specifies the access mode of the volume. Valid access modes are `w` and `r`. If the access mode is `w` (write), the media must be mounted with write enabled. The default is `r` (read), which means the media may be write protected.
- `-d density`
Specifies the density of the drive. This option determines the type of drive on which the tape volume is mounted.
Valid densities are as follows. The default density is `dlt`.
4mm: 4-mm cartridge
8mm: 8-mm cartridge
`dlt`: DLT cartridge
`dlt2`: DLT cartridge 2
`dlt3`: DLT cartridge 3
`dtf`: DTF cartridge
`hcart`: 1/2 Inch cartridge
`hcart2`: 1/2 Inch cartridge 2
`hcart3`: 1/2 Inch cartridge 3
`odiskwm`: Optical disk-write many
`odiskwo`: Optical disk-write once
`qscsi`: 1/4-inch cartridge
The mount request must be performed on a drive type that satisfies the density.
The half-inch cartridge densities (`hcart`, `hcart2`, and `hcart3`) can be used to distinguish between any supported half-inch drive types. However, tape requests can only be assigned to drives of the associated media type. For example, a tape request with density `hcart2` specifying an EVSN with media type `HCART2` will be assigned to an `hcart2` drive. Likewise, a tape request with density `hcart` specifying an EVSN with media type `HCART` will be assigned to an `hcart` drive. The same rule applies to `hcart3`, `dlt`, `dlt2`, and `dlt3`.



-p *poolname*

Specifies the volume pool where the volume resides. *poolname* is case sensitive. The default is None.

-f *filename*

Specifies the file associated with the volume. The file name represents a symbolic link to the drive where the volume is mounted.

The file name can be a single name or a complete path. If you specify only a file name, the file is created in the current working directory. If you specify a path, the file is created in the directory named in the path.

filename cannot be an existing file.

Specifying **-f** before *filename* is optional.

SEE ALSO

tpformat(1M), tpunmount(1), vmadm(1M)



tpunmount(1)

NAME

tpunmount - removes a tape volume from a drive and tape file from the directory

SYNOPSIS

```
/usr/opensv/volmgr/bin/tpunmount [-f] filename [-force]
```

DESCRIPTION

tpunmount removes a tape file from the directory and removes the tape volume from the drive (if the media was mounted). An exception occurs if the `ltid` option, `-nsu` (no standalone unload), or the `DO_NOT_EJECT_STANDALONE` option in the `vm.conf` file was specified.

The tape file and the device must be closed before you can use `tpunmount`.

OPTIONS

`-f filename`

Specifies the file associated with the media. You must specify a file name. Specifying `-f` before *filename* is optional.

`-force`

Ejects the volume from a standalone drive, even if the `-nsu` option was specified for `ltid` or `DO_NOT_EJECT_STANDALONE` is specified in the `vm.conf` file.

EXAMPLE

The following command unmounts the tape volume associated with file `tape1` and removes the file from the current directory:

```
tpunmount tape1
```

SEE ALSO

`tpreq(1)`, `ltid(1M)`



ts8d(1M)

NAME

ts8d - Tape Stacker 8MM (TS8) daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/ts8d [-v]
```

DESCRIPTION

ts8d interfaces with Media Manager to mount and unmount tapes in a Tape Stacker 8MM robot. It is initiated by ltid (the Media Manager device daemon), if the Media Manager device configuration shows drives in a Tape Stacker 8MM.

Stopping ltid stops ts8d. You can stop or start ts8d independently of ltid using the /usr/opensv/volmgr/bin/vmps command or your server's ps command to identify the ts8d process id and then entering the following commands:

```
kill ts8d_pid
```

```
/usr/opensv/volmgr/bin/ts8d [-v] &
```

ts8d communicates directly with the robotics through a SCSI interface. When the connection is established (the path for robotics can be opened), ts8d puts the TS8 robot in the UP state and can mount and unmount tapes. If the robotics are inaccessible, ts8d changes the robot to the DOWN state. In this state, ts8d is still running and returns the robot to the UP state if it is able to make a connection.

The media ID (EVSN) and slot number information for the 8mm tapes in the robot must be entered in the volume configuration before any tapes can be accessed through ltid and ts8d.

If a cleaning volume is used, it must be defined in the volume configuration. See tpclean(1M) for information on setting the frequency for automatic drive cleaning.

The Internet service number for ts8d must be in /etc/services. If you are using NIS (Network Information Service), you should place the entry in this host's /etc/services file in the master NIS server database for services. To override the services file, create the file /usr/opensv/volmgr/database/ports/ts8d with a single line containing the service number for ts8d. The default service number is 13709.

OPTION

-v Logs debug information using syslogd. If you start ltid with -v, ts8d also starts with -v.



ERRORS

ts8d returns an error message if there is a copy of ts8d running.

Media Manager logs any Tape Stacker 8MM and robotic errors to syslogd. Log entries are also made when the state changes between UP and DOWN.

SEE ALSO

ltid(1M), syslogd(8), tpclean(1M), tpconfig(1M), vmadm(1M)



tsdd(1M)

NAME

tsdd - Tape Stacker DLT (TSD) daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/tsdd [-v]
```

DESCRIPTION

tsdd interfaces with Media Manager to mount and unmount tapes in Tape Stacker DLT (TSD) robots. It is initiated by `ltid` (the Media Manager device daemon), if the Media Manager device configuration shows drives in the Tape Stacker DLT (TSD).

Stopping `ltid` stops `tsdd`. You can stop or start `tsdd` independently of `ltid` using the `/usr/opensv/volmgr/bin/vmps` command or your server's `ps` command to identify the process id for `tsdd`, and then entering the following commands:

```
kill tsdd_pid
```

```
/usr/opensv/volmgr/bin/tsdd [-v] &
```

`tsdd` communicates directly with the robotics using a SCSI interface. When the connection is established (the path for robotics can be opened), `tsdd` puts the TSD robot in the UP state and can mount and unmount tapes. If the robotics are inaccessible, `tsdd` changes the robot to the DOWN state. In this state, `tsdd` is still running and returns the robot to the UP state if it is able to make a connection.

The media ID (EVSN) and slot number information for the DLT tapes in the robot must be entered into the volume configuration before any tapes can be accessed through the `ltid` and `tsdd`.

If a cleaning volume is used, it must be defined in the volume configuration. See `tpclean(1M)` for information on setting the frequency for automatic drive cleaning.

The Internet service number for `tsdd` must be in `/etc/services`. If you are using NIS (Network Information Service), you should place the entry in this host's `/etc/services` file in the master NIS server database for services. To override the services file, create the file `/usr/opensv/volmgr/database/ports/tsdd` with a single line containing the service number for `tsdd`. The default service number is 13714.

OPTION

`-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, `tsdd` also starts with `-v`.



ERRORS

tsdd returns an error message if there is a copy of tsdd running.

Media Manager logs any Tape Stacker DLT robot and robotic errors to `syslogd`. Log entries are also made when the state changes between UP and DOWN.

SEE ALSO

`ltid(1M)`, `tpclean(1M)`, `tpconfig(1M)`, `vmadm(1M)`



tshd(1M)

NAME

tshd - Tape Stacker Half-inch (TSH) daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/tshd [-v]
```

DESCRIPTION

tshd interfaces with Media Manager to mount and unmount tapes in Tape Stacker Half-inch (TSH) robots. It is initiated by `ltid` (the Media Manager device daemon), if drives have been defined in Media Manager to be in a TSH robot.

This daemon communicates directly with the robotics using a SCSI interface. When the connection is established (that is, the path for robotics can be opened), tshd puts the TSH robot in the UP state and can mount and unmount tapes. If the robotics are inaccessible, tshd changes the robot to the DOWN state. In this state, tshd is still running and it returns the robot to the UP state when it is able to make a connection.

You can stop or start tshd independently of `ltid` using the `/usr/opensv/volmgr/bin/vmps` command or your server's `ps` command to identify tshd's process id and then entering the following commands:

```
kill tshd_pid
```

```
/usr/opensv/volmgr/bin/tshd [-v] &
```

The Media Manager media ID (EVSN) and slot number information for the half-inch tapes in the Tape Stacker must be entered into the volume database before any tapes can be accessed using `ltid` and `tshd`.

A cleaning volume can also reside in the tape stacker and if so, must be defined. See `tpclean(1M)` for information on setting the frequency for automatic drive cleaning.

The Internet service number for tshd must be in `/etc/services`. If you are using NIS (Network Information Service), you should place the entry in this host's `/etc/services` file in the master NIS server database for services. To override the services file, create the file `/usr/opensv/volmgr/database/ports/tshd` with a single line containing the service number for tshd. The default service number is 13715.

OPTION

`-v` Logs debug information using `syslogd`. If you start `ltid` with `-v`, tshd also starts with `-v`.



ERRORS

tshd returns an error message if there is another copy of tshd running.

Any Tape Stacker Half-inch and robotic errors are logged using `syslogd`. Log entries are also made when the state changes between UP and DOWN.

SEE ALSO

`ltid(1M)`, `tpclean(1M)`, `tpconfig(1M)`, `vmadm(1M)`



vmadd(1M)

NAME

vmadd - Add media to the volume database

SYNOPSIS

```
/usr/opensv/volmgr/bin/vmadd -m media_id -mt media_type [-M  
  master_server] [-h volume_database_host] [-verbose] [-b  
  barcode] [-rt robot_type] [-rn robot_number] [-rh  
  robot_host] [-rc1 rob_slot] [-rc2 rob_side] [-p pool_number]  
  [-mm max_mounts | -n cleanings] [-op optical_partner] [-d  
  "description" ]
```

DESCRIPTION

Add media to the volume database.

OPTIONS

-m *media_id*

Specifies the media id of the volume to add. The media id can be a maximum of 6 ASCII characters. If you are adding an optical disk, specify the media ID for the A side of the optical platter.

Media IDs for an API robot must always match the barcodes.

-mt *media_type*

Specifies the media type of the volume to add. Valid media types are as follows:

4mm

8mm

dlt

dlt2

dlt3

dtf

hcart

hcart2

hcart3

odiskwm

odiskwo

qcart

4mm_clean



- 8mm_clean
- dlt_clean
- dlt2_clean
- dlt3_clean
- dtf_clean
- hcart_clean
- hcart2_clean
- hcart3_clean
- M *master_server*
Specifies the master server.
- h *volume_database_host*
Name of the host that has the volume database which contains information about the volumes in a robot. If no host is specified, the host where you execute the command is assumed.
- verbose
Selects verbose mode.
- b *barcode*
Specifies the barcode attached to the volume.
- rt *robot_type*
Specifies the robot type of the robot where the volume is located. Valid robot types are as follows:
 - none
 - acs
 - lmf
 - odl
 - rsm
 - tl4
 - tl8
 - tld
 - tlh
 - tlm
 - ts8
 - tsd
 - tsh
- rn *robot_number*
Unique, logical identification number for the robot where the volume is located.



- `-rh robot_host`
Name of the host which controls the robot, where the volume is located.
- `-rc1 rob_slot`
Robot coordinate 1 is the slot number in the robot where the volume is located. Do not enter slot information for API robot types. The robot software tracks the slot locations for these devices.
- `-rc2 rob_side`
Robot coordinate 2 is the platter side for optical disks (A or B).
- `-p pool_number`
Index of the volume pool which will contain this volume. You can use `vmppool -listall` to determine the index for a given pool name.
- `-mm max_mounts`
Maximum number of mounts allowed for this volume. Only used for non-cleaning media. When this limit is exceeded, the volume can be mounted for read operations only.
- `-n cleanings`
Number of cleanings remaining for this volume. Only used for cleaning media.
- `-op optical_partner`
If this is an optical disk, specify the media ID of the B side of the optical platter.
- `-d "description"`
Description of the volume. The double quote marks are required if the description contains any spaces.

EXAMPLES

The following command adds volume AJU244 in the NetBackup volume pool to the volume database on the host named llama. The volume, with a barcode of AJU244, is in slot 2 of TLD robot 1. For write operations, the volume may be mounted a maximum of 1000 times.

Note This command is usually entered on one line.

```
vmadd -m AJU244 -mt dlt -h llama -b AJU244 -rt tld -rn 1 -rh llama  
-rc1 2 -p 1 -mm 1000 -d "vmadd example"
```

NOTES

Only limited validation of the option parameters is done.



SEE ALSO

vmchange(1M), vmdelete(1M), vmpool(1M), vmquery(1M)



vmadm(1M)

NAME

vmadm - character-based media management utility

SYNOPSIS

```
/usr/opensv/volmgr/bin/vmadm
```

DESCRIPTION

The `vmadm` utility can be used to add, change, delete, or list volumes in the volume database, managed by the Media Manager volume daemon (`vmd`). Any actions performed using this utility are serviced by making requests to `vmd`. You must be the root user to use this utility.

This utility has a character-based user interface and can be used from any terminal. When this utility is initiated, the administrator is presented with a menu of operations that can be performed.

You can also start the `tpconfig` utility from `vmadm`.

ERRORS

If `vmd` is not running, most `vmadm` operations fail and the following message appears:

```
cannot connect to vmd
```

See `vmd(1M)` to obtain additional debugging information should problems persist.

FILES

```
/usr/opensv/volmgr/help/vmadm* (these are help files)
```

```
/usr/opensv/volmgr/database/volDB
```

SEE ALSO

```
ltid(1M), tpconfig(1M), vmd(1M)
```



vmchange(1M)

NAME

vmchange - change media information in the volume database

SYNOPSIS

Change volume group residence

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h
    volume_database_host] -vg_res -rt robot_type -rn
    robot_number -rh robot_host -v volume_group
```

Change volume residence

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h
    volume_database_host] -res -m media_id -mt media_type -rt
    robot_type -rn robot_number -rh robot_host -v volume_group
    -rc1 rob_slot [-rc2 rob_side]
```

Change volume expiration date

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h
    volume_database_host] -exp mm/dd/yy hh:mm:ss -m media_id
```

Change the barcode for a volume

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h
    volume_database_host] -barcode barcode -m media_id [-rt
    robot_type]
```

Change volume description

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h
    volume_database_host] -d "description" -m media_id
```

Associate this volume with a different pool

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h
    volume_database_host] -p pool_number -m media_id
```

Change a volume's maximum mount count

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h
    volume_database_host] -maxmounts max_mounts -m media_id
```

Change a volume's number of mounts count or cleanings

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h
    volume_database_host] -n num_mounts/cleanings -m media_id
```

Change a volume's media type



```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h  
    volume_database_host] -new_mt media_type -m media_id
```

Change a volume's robot type

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h  
    volume_database_host] -new_rt robot_type -m media_id -rn  
    robot_number
```

Change a volume's group

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h  
    volume_database_host] -new_v volume_group [-m media_id | -b  
    barcode -mt media_type -rt robot_type]
```

Change a volume's offsite location

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h  
    volume_database_host] -offloc offsite_location -m media_id
```

Change the date the volume was sent offsite

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h  
    volume_database_host] -offsent mm/dd/yy hh:mm:ss -m  
    media_id
```

Change the date when the volume returns from offsite

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h  
    volume_database_host] -offreturn mm/dd/yy hh:mm:ss -m  
    media_id
```

Change the offsite slot number

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h  
    volume_database_host] -offslot offsite_slot -m media_id
```

Change the offsite session id

```
/usr/opensv/volmgr/bin/vmchange [-M master_server] [-h  
    volume_database_host] -offsid offsite_sessionid -m media_id
```

DESCRIPTION

Change volume information in the volume database.

OPTIONS

-M *master_server*
 Specifies the master server.



-
- h** *volume_database_host*
Name of the host that has the volume database which keeps information about the media in a robot. If no host is specified, the host where you execute the command is assumed.
- vg_res**
Change volume group residence.
- rt** *robot_type*
Specifies the robot type of the robot where the volume is located. Valid robot types are as follows:
none
acs
lmf
odl
rsm
tl4
tl8
tld
tlh
tln
ts8
tsd
tsh
- rn** *robot_number*
Unique, logical identification number for the robot where the volume is located.
- rh** *robot_host*
Name of the host which controls the robot, where the volume is located.
- v** *volume_group*
A volume group is a logical grouping that identifies a set of volumes that reside at the same physical location.
- res**
Change the volume's residence.
- m** *media_id*
Specifies the media id of the volume to change.
- mt** *media_type*
Specifies the media type of the volume to change. Valid media types follow:



4mm
8mm
dlt
dlt2
dlt3
dtf
hcart
hcart2
hcart3
odiskwm
odiskwo
qcart
4mm_clean
8mm_clean
dlt_clean
dlt2_clean
dlt3_clean
dtf_clean
hcart_clean
hcart2_clean
hcart3_clean

-rc1 *rob_slot*

Robot coordinate 1 is the slot number in the robot where the volume is located. Do not enter slot information for API robot types. The robot software tracks the slot locations for these devices.

-rc2 *rob_side*

Robot coordinate 2 is the platter side for optical disks (A or B).

-exp *mm/dd/yy hh:mm:ss*

Expiration date for this volume.

-barcode *barcode*

Specifies the barcode attached to the volume.

-d "*description*"

Description of the volume. The double quote marks are required if the description contains any spaces

-p *pool_number*

Index of the volume pool which will contain this volume. You can get the pool index using `vmpool -listall`.



- maxmounts *max_mounts*
Maximum number of mounts allowed for this volume. Only used for non-cleaning media.
- n *num_mounts/cleanings*
For non-cleaning media, *num_mounts* is the number of times this volume has been mounted.
For cleaning media, *cleanings* is the number of cleanings left for this cleaning tape.
- new_mt *media_type*
Specifies the media type of the volume to change. See the `-mt` option for a list of media types.
- new_rt *robot_type*
Specifies the robot type. See the `-rt` option for a list of robot types.
- new_v *volume_group*
A volume group is a logical grouping that identifies a set of volumes that reside at the same physical location.
- b *barcode*
Specifies the barcode attached to the volume.
- offloc *offsite_location*
Specify the offsite location where this volume is stored.
- offsent *mm/dd/yy hh:mm:ss*
Specify the date the volume was sent to the offsite location.
- offreturn *mm/dd/yy hh:mm:ss*
Specify the date the volume is scheduled to return from the offsite location.
- offslot *offsite_slot*
Specify the offsite slot where this volume is stored.
- offsid *offsite_sessionid*
Specify the offsite session id.

EXAMPLES

The following command changes the expiration date of volume AJS100:

```
vmchange -exp 12/31/99 23:59:59 -m AJS100
```

The following command changes the pool (which contains volume AJS999) to pool 1 (which is the NetBackup pool):

```
vmchange -h dill -p 1 -m AJS999
```



NOTES

Only limited validation of the option parameters is done.

SEE ALSO

vmadd(1M), vmdelete(1M), vmpool (1M), vmquery(1M)

vmd(1M)

NAME

vmd - Media Manager volume daemon

SYNOPSIS

```
/usr/opensv/volmgr/bin/vmd [-v]
```

DESCRIPTION

vmd manages the volume database, responding to requests to add, change, list, or delete volumes. By maintaining the location of media, vmd allows volumes to be removed and recognized by Media Manager. vmd is used with the Media Manager device daemon (ltid) to determine the location of requested volumes and keep track of the number of mounts and last mount time. vmd is initiated by ltid, but remains running when ltid is terminated using stopltid.

ltid does not require volumes to be defined in the volume database before being used. Automatic mounting of volumes in robotic devices, however, does not take place until volumes are defined and their slot information (for non API robots) is entered in the volume database.

A direct interface to the volume database is provided to easily facilitate volume database administrative activities. Graphical, menu-driven, and command line Media Manager utilities are provided.

vmd is also used for remote Media Manager device management and for managing the volume pool, barcode rules, and global device databases.

In addition, vmd is the device allocator (DA) for multihosted drives. vmd/DA maintains multihosted drive and host information, such as a list of hosts that are registered to share a drive and which host currently has the drive reserved.

Multihosted drive information is modified only by requests from ltid. When ltid initializes on a device host, it calls vmd/DA with a list of shared drives. vmd/DA adds these drives and the host name to its configuration, if necessary. Since ltid passes a complete list of drives each time, vmd/DA deletes references to drives for that host when a change in configuration removes them from that host's shared drive list. This deletion occurs when ltid shuts down gracefully or after it is restarted.

The Internet service number for vmd must be in /etc/services. If you are using NIS (Network Information Service), the entry found in this host's /etc/services file should be placed in the master NIS server database for services. To override the services file, create the file /usr/opensv/volmgr/database/ports/vmd with a single line containing the service number for vmd. The default service number is 13701.



OPTION

- `-v` Logs detailed debug information if you create the `debug/daemon` directory (see **ERRORS**). Specify this option only if problems occur or if requested by VERITAS support.

ERRORS

`vmd` logs an error message using `syslogd`, if there is a copy of `vmd` running.

`vmd` logs an error message using `syslogd`, if the port that it binds to is in use. If this occurs, it may be necessary to override the services file using the mechanism described under **DESCRIPTION**.

To run `vmd` in debug mode do the following:

1. Before starting `vmd`, create the following directory:

```
/usr/opensv/volmgr/debug/daemon
```

If `vmd` is running, stop and restart it after creating the directory.

2. Start `vmd` in verbose mode as follows or put a `VERBOSE` entry in `vm.conf`.

```
/usr/opensv/volmgr/bin/vmd -v
```

3. Check the log in `/usr/opensv/volmgr/debug/daemon`.

If problems persist, you can obtain more debug information on the requestor by creating the following directories:

```
/usr/opensv/volmgr/debug/reqlib
```

```
/usr/opensv/volmgr/debug/xvmadm
```

One log per day is created in each debug directory. These logs continue to build until the debug directory is moved or removed, unless you specify a `DAYS_TO_KEEP_LOGS` entry in `vm.conf`. Running `vmd` in debug mode should be done only when necessary.

FILES

```
/usr/opensv/volmgr/database/volDB
```

```
/usr/opensv/volmgr/debug/daemon/*
```

```
/usr/opensv/volmgr/debug/reqlib/*
```

```
/usr/opensv/volmgr/debug/xvmadm/*
```

SEE ALSO

`ltid(1M)`, `vmadm(1M)`, `vmadd(1M)`, `vmchange(1M)`, `vmdelete(1M)`,
`vmquery(1M)`



vmdelete(1M)

NAME

vmdelete - Delete media from the volume database

SYNOPSIS

```
/usr/opensv/volmgr/bin/vmdelete [-M master_server, ...  
                                master_server] [-h volume_database_host] [-m media_id | -v  
                                volume_group]
```

DESCRIPTION

Delete media from the volume database.

OPTIONS

- M *master_server*
Specifies the master server.
- h *volume_database_host*
Name of the host that has the volume database which contains information about the volumes in a robot. If no host is specified, the host where you execute the command is assumed.
For NetBackup BusinessServer, the volume database host is always the Media Manager host.
- m *media_id*
Specifies the media id of the volume to delete from the volume database.
- v *volume_group*
Specifies the volume group to delete. All volumes in this group are deleted from the volume database.

EXAMPLES

The following command deletes a single volume:

```
vmdelete -m AJS144
```

The following command deletes all volumes with the volume group name of DELETE_ME:

```
vmdelete -v DELETE_ME
```

NOTES

Only limited validation of the option parameters is done.



SEE ALSO

vmadd(1M), vmchange(1M), vmquery(1M)



vmopr cmd(1M)

NAME

vmopr cmd - perform operator functions on drives

SYNOPSIS

```
/usr/opensv/volmgr/bin/vmopr cmd [-h volume_database_host] -down |
  -up | -upopr | -reset drive_index | -downbyname |
  -upbyname | -upoprbyname | -resetbyname drive_name |
  -comment drive_index ["comment"] | -commentbyname
  drive_name ["comment"] | -assign drive_index
  mount_request_id | -assignbyname drive_name mount_request_id
  | -deny | -resubmit mount_request_id | -d [pr | ds | ad]
  | -help
```

DESCRIPTION

Perform operator functions on drives. The `-h` option is not required, but you must choose one and only one of the other nine options listed below.

OPTIONS

`-h volume_database_host`
 Name of the host where the drives are attached and configured. If no host is specified, the host where you execute the command is assumed. For NetBackup BusinessServer, the volume database host is always the Media Manager host.

`-down` | `-up` | `-upopr` | `-reset drive_index`
`-down` Sets the drive to the DOWN state, if it is not assigned.
`-up` Sets the drive to UP in Automatic Volume Recognition (AVR) mode. This is the normal mode for all drives.
`-upopr` Sets the drive to UP in Operator (OPR) mode. This mode is normally used only for security reasons. For a drive in a robot, OPR and AVR are treated identically while the robot daemon is up.
`-reset` Resets the specified drive, terminating the drive assignment and taking control away from the assigned user.

Caution Do not reset an assigned drive unless directed by site policy or the system administrator. Terminating an active job can destroy user data.



- downbyname | -upbyname | -upoprbyname | -resetbyname *drive_name*
These options are similar to -down, -up, -upopr, and -reset respectively, except the drive is specified by the drive name instead of drive index.
- comment *drive_index* [" *comment* "
Add a comment for the drive. The quotes are required if your comment contains any spaces. If you do not specify *comment*, any existing comments for the drive are deleted.
- commentbyname *drive_name* [" *comment* "
This option is similar to the -comment option, except the drive is specified by the drive name instead of drive index.
- assign *drive_index mount_request_id*
Assign a drive to a mount request.
- assignbyname *drive_name mount_request_id*
This option is similar to the -assign option, except the drive is specified by the drive name instead of drive index.
- deny | -resubmit *mount_request_id*
-deny Denying a mount request returns an error message to the user.
-resubmit Resubmit a mount request. If a pending action message involves a robot, you must correct the problem and resubmit the request that caused the message.
- d [pr | ds | ad]
If none of the following optional display parameters are specified, all information is displayed.
pr Display pending requests.
ds Display the status of drives under control of Media Manager.
ad Display additional status of drives under control of Media Manager.
- help
Display the usage statement for this command.

EXAMPLES

The following command sets the drive, with a drive index of 0, to UP mode:

```
vmoprcommand -up 0
```

The following command displays the drive status of all drives:

```
vmoprcommand -d ds
```

The following command displays pending requests and the drive status of all drives on the host named crab:



```
vmoprcmd -h crab
```

NOTES

Only limited validation of the option parameters is done.

SEE ALSO

```
tpconfig(1M)
```



vmpool(1M)

NAME

vmpool - Add, change, delete, or list volume pools

SYNOPSIS

```
/usr/opensv/volmgr/bin/vmpool [-h volume_database_host] -listall  
[-b] | -listscratch | -add pool_name "description" host uid  
gid | -change pool_name "description" host uid gid | -delete  
pool_name
```

DESCRIPTION

Use this command to add, change, delete, or list volume pools. The `-h` option is not required, but you must choose one and only one of the other five options.

OPTIONS

- `-h volume_database_host`
Name of the host that has the volume database which keeps information about the media in a robot. If no host is specified, the host where you execute the command is assumed.
 - `-listall [-b]`
List information about all volume pools. You can use the `-b` option to specify a brief format for volume pool information.
 - `-listscratch`
List all configured scratch pools.
 - `-add pool_name "description" host uid gid`
Add a new volume pool. The double quote marks are required if the description contains any spaces
 - `-change pool_name "description" host uid gid`
Change an existing volume pool. The double quote marks are required if the description contains any spaces
 - `-delete pool_name`
Delete a volume pool.
- description*
Description of the volume pool.
- host*
Name of the host that will be permitted to request and use volumes in this volume pool.



To permit only a specific host to access the volume pool, enter the name of that host. To permit any host to access the volume pool, enter ANYHOST. Using ANYHOST is recommended.

uid

Specify the user id of the user that is permitted to request and use volumes in the volume pool. Enter a specific user id to permit only processes running at that user id, to access the volume pool.

Enter the default value, -1 (ANY), to permit any user id to access the pool.

Note: For a NetBackup or Storage Migrator volume pool, always enter the user id for root.

If you specify a specific user id and a different user id requests the pool, then Media Manager verifies the group id (see *gid*).

gid

Enter the group id of the group that is permitted to request and use volumes in this volume pool.

Enter a specific group id to permit only processes running as that group id, to access the volume pool.

Enter the default value, -2 (NONE), to permit only the user id specified by *uid* to request or access the volume pool.

EXAMPLES

The following command adds a new pool named MyPool on the host named llama with the default host, user id, and group id permissions:

```
vmpool -h llama -add MyPool "my description" ANYHOST -1 -2
```

The following command lists all pools configured on the host where the command is executed:

```
vmpool -listall -b
```

NOTES

Only limited validation of the option parameters is done.

uid and *gid* should only be used for restricting access to volumes by user or by group on UNIX hosts.



vmquery(1M)

NAME

vmquery - Query the volume database

SYNOPSIS

```
/usr/opensv/volmgr/bin/vmquery [-M master_server] [-h  
    volume_database_host, ... -h volume_database_host] [-b |  
-w] -a | -m media_id | -v volume_group | -rn robot_number  
| -rt robot_type | -mt media_type | -p pool_number | -pn  
pool_name | -res robot_type robot_number robot_host rob_slot  
rob_side | -assignbyid media_id media_type pool_number stat  
asg_time | -deassignbyid media_id pool_number stat
```

DESCRIPTION

Query the volume database for volume information. The `-M`, `-h`, `-b`, and `-w` options are not required, but you must choose one and only one of the other eleven options.

OPTIONS

- `-M master_server`
Specifies the name of the master server.
- `-h volume_database_host`
Name of the host that has the volume database maintaining information about the volumes in a robot. If no host is specified, the host where you execute the command is assumed. Up to 100 volume database hosts can be queried.
- `-b`
Specify the brief format for volume information.
- `-w`
Specify the wide output format for volume information. This option includes additional information not shown by the `-b` option.
- `-a`
Show all volumes.
- `-m media_id`
Query volumes by media id. The media id is a maximum of 6 ASCII characters.
- `-v volume_group`
Query volumes by volume group. A volume group is a logical grouping that identifies a set of volumes that reside at the same physical location.



-
- `-rn` *robot_number*
Query volumes by robot number. A robot number is a unique, logical identification number for the robot where the volume is located.
- `-rt` *robot_type*
Query volumes by the type of the robot where the volume is located. Valid robot types are as follows:
- none
 - acs
 - lmf
 - odl
 - rsm
 - tl4
 - tl8
 - tld
 - tlh
 - tlm
 - ts8
 - tsd
 - tsh
- `-mt` *media_type*
Query volumes by media type. Valid media types follow:
- 4mm
 - 8mm
 - dlt
 - dlt2
 - dlt3
 - dtf
 - hcart
 - hcart2
 - hcart3
 - odiskwm
 - odiskwo
 - qcart
 - 4mm_clean
 - 8mm_clean
 - dlt_clean



dlt2_clean
dlt3_clean
dtf_clean
hcart_clean
hcart2_clean
hcart3_clean

-p pool_number

Query volumes by pool number. Pool number is an index into the volume pool. You can use `vmppool -listall` to determine the index for a given pool name.

-pn pool_name

Query volumes by pool name.

-res robot_type robot_number robot_host rob_slot rob_side

Query volumes by residence.

robot_host

Name of the host which controls the robot, where the volume is located.

rob_slot

This is the slot number in the robot (robot coordinate 1) where the volume resides.

rob_side

This is the platter side (robot coordinate 2) for optical disks (A or B). If the volume is not an optical disk, specify zero for *rob_side*.

-assignbyid media_id media_type pool_number stat asg_time

Assign volume by media id, pool, and status.

stat

Status applies only to volumes that are assigned to NetBackup or Storage Migrator.

A status of 0 means it is assigned to NetBackup regular backups.

A status of 1 means it is assigned to NetBackup database backups.

A status of 2 means it is assigned to Storage Migrator.

asg_time

Applies only to volumes assigned to NetBackup or Storage Migrator.

asg_time is the time when the volume was assigned and is the number of seconds since 00:00:00 UTC, January 1, 1970. *asg_time* was originally created using the `time()` call.

-deassignbyid media_id pool_number stat

Unassign volume by media id, pool, and status.



EXAMPLES

The following command lists all volume information, in brief format from the volume database on the host named llama:

```
vmquery -h llama -b -a
```

The following command assigns volume A23456, which is in pool 1 (NetBackup), and sets the status to 0 and the assign time to 12/31/98 15:50:22:

```
vmquery -assignbyid A23456 8mm 1 0 915141022
```

The following command deassigns volume A23456, which is in pool 1 (NetBackup), with a status of 0:

```
vmquery -deassignbyid A23456 1 0
```

NOTES

Only limited validation of the option parameters is done.

SEE ALSO

vmadd(1M), vmchange(1M), vmdelete(1M), vmpool(1M)



xdevadm(1M)

NAME

xdevadm - Device management utility with an X Windows interface

SYNOPSIS

```
/usr/opensv/volmgr/bin/xdevadm [X_options]
```

DESCRIPTION

The xdevadm utility allows the system administrator to define the devices that Media Manager will control and also to manage the use of those devices.

This utility requires root privileges and an X terminal or a workstation running X server software that is compatible with MIT release X11.R5 (or later). xdevadm can also be started from xvmadm. The xdevadm display follows OSF/Motif conventions.

Note You cannot use this utility to clean drives in ACS, ODL, RSM, TLH, or LMF robots.

OPTIONS

This utility supports the standard command-line options for X programs. One of these is the `-d` option which can be used to force the name of the X terminal or server. Most users will already have their `DISPLAY` environment variable defined and can ignore the `-d` option.

Other useful X options are:

- `-bg color`
Specifies the color to use for the background of the window.
- `-fg color`
Specifies the color to use for displaying text.
- `-font`
Allows you to enlarge text for visibility. It is best to use fixed-pitch fonts because some text is formatted into columns. These columns can appear uneven with proportional fonts.
- `-geometry`
Allows you to control the initial size and position of the window.

FILES

```
/usr/opensv/volmgr/help/xdevadm/*
```



SEE ALSO

ltid(1M), tpconfig(1M)



xvmadm(1M)

NAME

xvmadm - Media management utility with an X Windows interface

SYNOPSIS

```
/usr/opensv/volmgr/bin/xvmadm [X_toolkit_options]
```

DESCRIPTION

xvmadm can be used for administrating Media Manager media. You must have root user privileges to use this utility.

This utility provides a graphical user interface using the MIT X Window System and OSF/Motif look-and-feel. xvmadm requires an X terminal or a workstation with an X server, compatible with release X11.R5 or later.

xvmadm supports most standard X11 command line options, including `-d` to set the display, `-fn` and `-font` to set the font, and `-geometry` for window size and placement. You can also use `-bg color` to specify the background color (default is *white*) and `-fg color` to specify text color (default is *black*). Some of these resources can also be defined using "application defaults" files. This is explained in the on-line help file. The `-name` option can be used to force the selection of particular application defaults when more than one set is defined.

Because xvmadm is an X program, you need to set your `DISPLAY` environment variable or use the `-d` command line option to name your X server. See the `X(1)` man page for further explanation of these conventions. The following is a C shell example of a common way to accomplish this:

```
% setenv DISPLAY host1.lab.room.com:0
% /usr/opensv/volmgr/bin/xvmadm &
```

Since xvmadm creates its own screen window, there is usually no need for an interactive shell to wait for it to complete; thus, an ampersand is suggested, as shown in the preceding example, so that the calling terminal emulation session can go on to be used for other work.

ERRORS

When an error occurs, a small window contains the error message text. After you have read the message, you can close the window by clicking the OK button. Similar popup windows are produced when you are reminded to perform a physical action, such as manipulating the injection mailslot on certain types of robots.

If `vmd` is not running when you initiate xvmadm, an error dialog appears with the following message:



cannot connect to vmd

You can start vmd manually or through the file menu. See vmd(1M) for how to obtain additional information should problems persist.

FILES

/usr/opensv/volmgr/help/xvmadm (on-line help directory)

/usr/opensv/volmgr/database/volDB

SEE ALSO

ltid(1M), tpconfig(1M), vmadm(1M), vmd(1M), X(1)





Media Manager Reference Topics

B

This chapter includes the following Media Manager reference and conceptual topics:

- ◆ Robot Overview
- ◆ Drive Cleaning
- ◆ Multihosted Drives (Shared Storage Option)
- ◆ Volume Pools and Volume Groups
- ◆ Barcodes
- ◆ Media Manager Configuration File (vm.conf)

Robot Overview

In Media Manager, a robot is a peripheral device that contains a mechanism for the automated mounting and dismounting of media in tape or optical disk drives. A robot may also be called a robotic library, media changer, automated library, jukebox, or tape stacker. Media Manager considers any of these types of devices to be robots. Media Manager software that controls robots is referred to as robotic control software.

Media Manager Robot Types

Media Manager classifies robots by robot type, according to one of the following:

- ◆ The physical characteristics of the robot.
Library usually refers to a larger robot, in terms of slot capacity or number of drives.
Stacker usually refers to a robot with one drive and low media capacity (6 - 12 media slots).
- ◆ The media type commonly used by that class of robots.
4 MM and 8 MM are examples of media types.
- ◆ The communication methods used by the underlying robotics (for example, SCSI-based or API robots).



ACS and LMF robots are examples of robots classified by vendor API.

Note In this document, ACS, LMF, RSM, TLH, and TLM Media Manager robot types are often grouped together and the term API robot is used to identify these robot types.

The following table lists the Media Manager robot types.

See the NetBackup release notes to determine which robot type applies to the model of robot that you are using.

Table 48. Media Manager Robot Types

Robot Type	Description
ACS	Automated Cartridge System
LMF	Library Management Facility
ODL	Optical Disk Library
RSM	Removable Storage Manager
TL4	Tape Library 4MM
TL8	Tape Library 8MM
TLD	Tape Library DLT
TLH	Tape Library Half-inch
TLM	Tape Library Multimedia
TS8	Tape Stacker 8MM
TSD	Tape Stacker DLT
TSH	Tape Stacker Half-inch

Media Manager Media Types

Media Manager uses media types to differentiate tape or optical media with differing physical characteristics. Each Media Manager media type may represent a specific physical media type, for example Sony AIT media has a Media Manager media type of 8MM.

The following table lists the Media Manager media types:

Table 49. Media Manager Media Types

Media Type	Description
QCART	QIC 1/4 inch cartridge tape



Table 49. Media Manager Media Types (continued)

Media Type	Description
4MM	4MM cartridge tape
4MM_CLN	4MM cleaning tape
8MM	8MM cartridge tape
8MM_CLN	8MM cleaning tape
DLT	DLT cartridge tape
DLT_CLN	DLT cleaning tape
DLT2	DLT cartridge tape 2
DLT2_CLN	DLT cleaning tape 2
DLT3	DLT cartridge tape 3
DLT3_CLN	DLT cleaning tape 3
DTF	DTF cartridge tape
DTF_CLN	DTF cleaning tape
HCART	1/2 inch cartridge tape
HC_CLN	1/2 inch cleaning tape
HCART2	1/2 inch cartridge tape 2
HC2_CLN	1/2 inch cleaning tape 2
HCART3	1/2 inch cartridge tape 3
HC3_CLN	1/2 inch cleaning tape 3
REWR_OPT	Rewritable optical disk
WORM_OPT	WORM optical disk

Use the DLT2, DLT3, HCART2, or HCART3 media types when you have more than one type of DLT or 1/2 inch cartridge tape in the same robot and you want to differentiate between them.

For example, if a robot has DLT7000 and DLT4000 drives, you do not want to accidentally load a tape that was written in a DLT7000 drive into a DLT4000 drive. In this case, you can specify the DLT media type for DLT4000 tapes and DLT2 for DLT7000 tapes, assuming the drive types were configured using the same convention.

Note In a robot, all of the volumes of a particular vendor media type *must* be the same Media Manager media type.



In the example that follows for a TLH robot type, the HCART2 media type is not valid. Both volumes must be HCART or both must be HCART2.

Volume	TLH Media Type	Media Manager Media Type
ABC123	3490E	HCART
ABC156	3490E	HCART2

Robot Attributes

Media Manager configures and controls a robot device differently depending on the robot type. The following tables list the attributes that dictate how these robot types differ.

See the NetBackup release notes and the VERITAS web site for more detailed information on supported peripherals, platforms, and firmware levels tested.

Table 50. ACS Robot Attributes

SCSI Control	No
LAN Control	Yes
Remote Robot Control	No. Each host that has ACS drives attached has robotic control.
NDMP Support	Yes
Multihosted Drives Support	Yes
Media Type Support	<ul style="list-style-type: none"> ◆ DLT ◆ DLT2 ◆ DLT3 ◆ HCART ◆ HCART2 ◆ HCART3
Barcode Support	Yes. Depends on ACSLS or LibStation software. Barcodes are assumed to be the same as the media ID.
Drive Cleaning Support	No. Drive cleaning is managed by ACSLS, LibStation, or the library.
Mailslot Support	No
Media Manager Tracks Slots	No
For More Information	See Appendix F.



Table 50. ACS Robot Attributes

Robot Examples	<ul style="list-style-type: none"> ◆ STK 97xx ◆ STK L180 ◆ STK L700 ◆ STK Silo
Host Supported	<ul style="list-style-type: none"> ◆ Windows NT/2000. Requires STK LibAttach software. ◆ UNIX

Table 51. LMF Robot Attributes

SCSI Control	No
LAN Control	Yes
Remote Robot Control	Yes
NDMP Support	No
Multihosted Drives Support	No
Media Type Support	<ul style="list-style-type: none"> ◆ HCART ◆ HCART2
Barcode Support	Yes. Depends on LMF software. Barcodes are assumed to be the same as the media ID.
Drive Cleaning Support	No. Managed by the library.
Mailslot Support	Yes
Media Manager Tracks Slots	No
For More Information	See Appendix I.
Robot Examples	F6458
Host Supported	UNIX Solaris

Table 52. ODL Robot Attributes

SCSI Control	Yes
LAN Control	No
Remote Robot Control	No
NDMP Support	No



Table 52. ODL Robot Attributes

Multihosted Drives Support	No
Media Type Support	<ul style="list-style-type: none"> ◆ REWR_OPT ◆ WORM_OPT
Barcode Support	No, but the robot has inventory capability and can report whether a slot has media.
Drive Cleaning Support	No
Mailslot Support	Yes
Media Manager Tracks Slots	Yes
For More Information	See the NetBackup Media Manager device configuration guide for UNIX.
Robot Examples	<ul style="list-style-type: none"> ◆ HP Optical Disk Libraries ◆ HP SureStore Optical Libraries
Host Supported	UNIX

Table 53. RSM Robot Attributes

SCSI Control	No
LAN Control	No
Remote Robot Control	No
NDMP Support	No
Multihosted Drives Support	No
Media Type Support	<ul style="list-style-type: none"> ◆ 4MM ◆ 8MM ◆ DLT ◆ DLT2 ◆ DLT3 ◆ HCART ◆ HCART2 ◆ HCART3 ◆ QIC
Barcode Support	Yes, if the robot supports barcodes. Barcodes are assumed to be the same as the media ID.
Drive Cleaning Support	No, drive cleaning is supported using the RSM utilities in Windows 2000.



Table 53. RSM Robot Attributes

Mailslot Support	Eject is supported. Inject is not supported, but the Windows 2000 RSM Inject wizard can be used.
Media Manager Tracks Slots	No
For More Information	See the RSM appendix in the NetBackup Media Manager system administrator's guides for Windows NT/2000.
Robot Examples	<ul style="list-style-type: none"> ◆ Exabyte 210 ◆ Quantum DLTStor
Host Supported	Windows 2000

Table 54. TL4 Robot Attributes

SCSI Control	Yes
LAN Control	No
Remote Robot Control	No
NDMP Support	No
Multihosted Drives Support	No
Media Type Support	4MM
Barcode Support	No, but the robot has inventory capability and can report whether a slot has media.
Drive Cleaning Support	Yes
Mailslot Support	No
Media Manager Tracks Slots	Yes
For More Information	See the NetBackup Media Manager device configuration guide for UNIX.
Robot Examples	<ul style="list-style-type: none"> ◆ ADIC 4mm DAT Autochanger ◆ HP DAT Autoloader
Host Supported	<ul style="list-style-type: none"> ◆ Windows NT/2000 ◆ UNIX

Table 55. TL8 Robot Attributes

SCSI Control	Yes
LAN Control	No



Table 55. TL8 Robot Attributes

Remote Robot Control	Yes
NDMP Support	Yes
Multihosted Drives Support	Yes
Media Type Support	8MM
Barcode Support	Yes
Drive Cleaning Support	Yes
Mailslot Support	Yes
Media Manager Tracks Slots	Yes
For More Information	See the NetBackup Media Manager device configuration guide for UNIX.
Robot Examples	<ul style="list-style-type: none"> ◆ IBM 7331 ◆ Qualstar 46120 ◆ Exabyte X200
Host Supported	<ul style="list-style-type: none"> ◆ Windows NT/2000 ◆ UNIX

Table 56. TLD Robot Attributes

SCSI Control	Yes
LAN Control	No
Remote Robot Control	Yes
NDMP Support	Yes
Multihosted Drives Support	Yes
Media Type Support	<ul style="list-style-type: none"> ◆ DLT ◆ DLT2 ◆ DLT3 ◆ DTF ◆ HCART ◆ HCART2 ◆ HCART3
Barcode Support	Yes
Drive Cleaning Support	Yes
Mailslot Support	Yes



Table 56. TLD Robot Attributes

Media Manager Tracks Slots	Yes
For More Information	See the NetBackup Media Manager device configuration guide for UNIX.
Robot Examples	<ul style="list-style-type: none"> ◆ ADIC Scalar 1000 DLT ◆ ATL 7100 ◆ Breece Hill Q210 ◆ HP SureStore DLT Library ◆ IBM 3575 ◆ Spectralogic 9000 ◆ STK 97xx
Host Supported	<ul style="list-style-type: none"> ◆ Windows NT/2000 ◆ UNIX

Table 57. TLH Robot Attributes

SCSI Control	No
LAN Control	Yes
Remote Robot Control	Yes
NDMP Support	No
Multihosted Drives Support	Yes
Media Type Support	<ul style="list-style-type: none"> ◆ HCART ◆ HCART2
Barcode Support	Yes. Depends on IBM ATL software. Barcodes are assumed to be the same as the media ID.
Drive Cleaning Support	No. Managed by the library.
Mailslot Support	No
Media Manager Tracks Slots	No
For More Information	See Appendix G.
Robot Examples	IBM 3494
Host Supported	<ul style="list-style-type: none"> ◆ Windows NT/2000 ◆ UNIX



Table 58. TLM Robot Attributes

SCSI Control	No
LAN Control	Yes
Remote Robot Control	No. Each host that has TLM drives attached has robotic control.
NDMP Support	No
Multihosted Drives Support	No
Media Type Support	<ul style="list-style-type: none"> ◆ 4MM ◆ 8MM ◆ DLT ◆ DLT2 ◆ DLT3 ◆ DTF ◆ HCART ◆ HCART2 ◆ REWR_OPT (HP9000-800 only) ◆ WORM_OPT (HP9000-800 only)
Barcode Support	Yes. Depends on DAS software. Barcodes are assumed to be the same as the media ID.
Drive Cleaning Support	Yes
Mailslot Support	No
Media Manager Tracks Slots	No
For More Information	See Appendix H.
Robot Examples	<ul style="list-style-type: none"> ◆ ADIC AML/J ◆ ADIC AML/S
Host Supported	UNIX

Table 59. TS8 Robot Attributes

SCSI Control	Yes
LAN Control	No
Remote Robot Control	No



Table 59. TS8 Robot Attributes

NDMP Support	No
Multihosted Drives Support	No
Media Type Support	8MM
Barcode Support	Yes
Drive Cleaning Support	Yes
Mailslot Support	No
Media Manager Tracks Slots	Yes
For More Information	See the NetBackup Media Manager device configuration guide for UNIX.
Robot Examples	<ul style="list-style-type: none"> ◆ Exabyte 10x ◆ Exabyte 210
Host Supported	<ul style="list-style-type: none"> ◆ Windows NT/2000 ◆ UNIX

Table 60. TSD Robot Attributes

SCSI Control	Yes
LAN Control	No
Remote Robot Control	No
NDMP Support	Yes
Multihosted Drives Support	No
Media Type Support	<ul style="list-style-type: none"> ◆ DLT ◆ DLT2 ◆ DLT3
Barcode Support	No, but the robot has inventory capability and can report whether a slot has media.
Drive Cleaning Support	Yes
Mailslot Support	No
Media Manager Tracks Slots	Yes
For More Information	See the NetBackup Media Manager device configuration guide for UNIX.



Table 60. TSD Robot Attributes

Robot Examples	<ul style="list-style-type: none"> ◆ HP SureStore DLT AutoLoader 418 ◆ Sun StorEdge L280 ◆ Quantum DLTStor
Host Supported	<ul style="list-style-type: none"> ◆ Windows NT/2000 ◆ UNIX

Table 61. TSH Robot Attributes

SCSI Control	Yes
LAN Control	No
Remote Robot Control	No
NDMP Support	No
Multihosted Drives Support	No
Media Type Support	<ul style="list-style-type: none"> ◆ HCART ◆ HCART2
Barcode Support	No, but the robot has inventory capability and can report whether a slot has media.
Drive Cleaning Support	Yes
Mailslot Support	Yes
Media Manager Tracks Slots	Yes
For More Information	See the NetBackup Media Manager device configuration guide for UNIX.
Robot Examples	IBM 3590 B11 Autoloader
Host Supported	UNIX

Robotic Test Utilities

You can use the robotic test utilities for configured robots by executing `/usr/opensv/volmgr/bin/robtest` and selecting the desired robot.

From each test utility, you can obtain a list of available test commands by entering a question mark.

Use the `drstat` command to determine the drive addressing parameters for ACS, LMF, TLH, and TLM robot types. This command is available in the test utilities for these robot types. For most robot types, the drive addressing parameter is the robot drive number. For the ACS robot type, drives are addressed by ACS, LSM, Panel, and Drive number.



Drive Cleaning

For drives in libraries that are under ACS, LMF, RSM, or TLH robotic control, the library software controls drive cleaning. To manage drive cleaning, use the vendor or operating system administrative interfaces for these robots.

This topic on drive cleaning covers the following areas:

- ◆ Frequency-Based Cleaning
- ◆ Manual Cleaning
- ◆ Using a Cleaning Tape
- ◆ TapeAlert

Frequency-Based Cleaning

Note Frequency-based cleaning is not supported for multihosted drives.

When you add a drive, you can specify the number of hours (cleaning frequency) a tape will be used between drive cleanings. Media Manager updates the mount time for the drive each time a tape is unmounted.

You can also change the cleaning frequency value.

If the drive is in a robot that supports cleaning (see “Robot Attributes” on page 276) and a cleaning tape is configured in that robot, cleaning occurs when the accumulated mount time exceeds the time you specified for cleaning frequency.

Media Manager cleans the drive immediately after the unmount. Drive cleaning never causes an unmount in the middle of an active backup. The mount time is reset after the drive is cleaned. The cleaning frequency value remains the same.

A cleaning can occur within a backup if you are spanning tapes. For example, if cleaning is due after the first tape is full, Media Manager cleans the drive before proceeding to the next tape.

Leaving media in a drive for extended periods does not affect cleaning frequency because Media Manager increments the mount time only when the media is actually assigned to a process.

Manual Cleaning

If the drive is standalone or if a cleaning tape is not defined, the message NEEDS CLEANING appears in the Comment field of the output from the `tpclean -L` command. You can then use `tpclean` to manually clean the drive and reset the accumulated mount time to zero after cleaning the drive.



You can also manually clean a drive regardless of the cleaning frequency and accumulated mount time. You can clean standalone and robotic drives if a cleaning tape of the correct media type and residence for the drive has been added to the appropriate volume database.

Using a Cleaning Tape

You can specify the number of cleanings that are allowed for a cleaning tape. This number is decremented with each cleaning and when it is zero, Media Manager stops using the cleaning tape. At this point, you can use a new cleaning tape or increase the number of cleanings allowed. You can also change this number of cleanings at any time in Media Manager.

TapeAlert

This feature allows reactive cleaning for most drive types. TapeAlert allows a tape drive to notify Media Manager when it needs to be cleaned. Media Manager then performs the cleaning. You must have a cleaning tape configured for the robot.

Not all platforms, robots, and drives, at all firmware levels, support this type of reactive cleaning. In the case where reactive cleaning is not supported on a particular drive, frequency-based cleaning may be utilized.

See your NetBackup release notes and “Robot Attributes” on page 276 to determine the robots and drives that support TapeAlert.

Note Frequency-based cleaning is not supported for multihosted drives.

Using TapeAlert with frequency-based cleaning ensures that a given drive will get cleaned at least every x hours, depending on the cleaning frequency value. The drive may be cleaned sooner, if the CLEAN_NOW flag is raised by the drive.

Using TapeAlert without frequency-based cleaning, ensures that the tape will be cleaned only when the drive sets its CLEAN_NOW flag.

Multihosted Drives (Shared Storage Option)

Multihosted Drives (SSO) is a separately priced VERITAS option that allows individual tape drives (standalone or in a robotic library) to be dynamically shared between multiple NetBackup and Storage Migrator servers. This software option requires appropriate hardware connectivity (such as, fibre channel hubs, switches, and SCSI-to-fibre bridges).



Shared drives are allocated and deallocated across multiple servers as backup and restore operations dictate. Storage Migrator and user tape requests can also share multihosted drives. Shared drives are connected to each host through enabling hardware. If the robotic control is SCSI based, only one host controls the robotics.

A major function of the Media Manager volume daemon (`vmd`) is to manage media information. An additional function that `vmd` can provide is to be the device allocator (DA) for multihosted drives. In this case, `vmd` is known as `vmd/DA`.

For multihosted drive configurations, the host that is configured as the volume database host for a drive in a robot or a standalone drive is also known as the device allocation host (see “Device Allocation Host” on page 289). The device allocation host is the host where `vmd/DA` resides. Other hosts have `vmd` without the device allocator functionality.

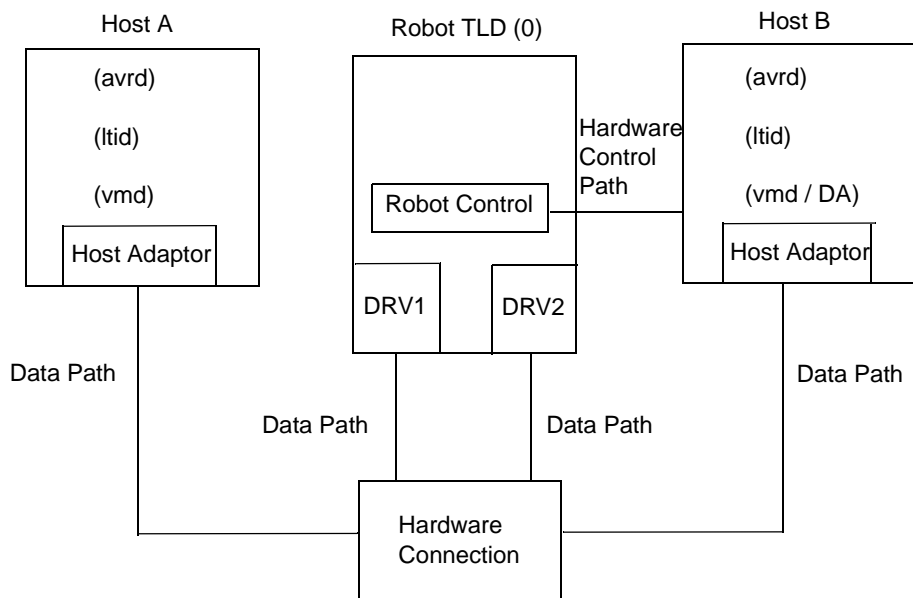
`vmd/DA` maintains multihosted drive and host information, such as a list of hosts that are registered to share a drive and which host currently has the drive reserved. Multihosted drive information is modified only by requests from `ltid` (Media Manager device daemon) and is dynamic since it is built and maintained at runtime, rather than being stored on the device allocation host.

When `ltid` initializes on a device host, it calls `vmd/DA` with a list of multihosted drives. `vmd/DA` adds these drives and the host name to its configuration, if necessary. Since `ltid` passes a complete list of drives each time, `vmd/DA` deletes references to drives for that host when a change in configuration removes them from that host’s shared drive list. This deletion occurs when `ltid` is shutdown gracefully or after it is restarted.

Figure 24 shows an example of a multihosted drive configuration.



Figure 24. Multihosted Drive Configuration



In this figure, Host A is

- ◆ Connected to drives DRV1 and DRV2 through enabling hardware.
- ◆ The host where `ltid` was started first and called `vmd/DA` on the device allocation host (Host B) to register a shared drive. This action identifies Host A as the initial scan host for drives DRV1 and DRV2.

In this figure, Host B

- ◆ Is connected to drives DRV1 and DRV2 through enabling hardware.
- ◆ Is configured to be the volume database host for the robot TLD (0) and therefore is also the device allocation host. `vmd/DA` is active on this host.
- ◆ Controls the robotics.
- ◆ Is optionally configured as a Highly Available (HA) server.

Scan Host

Each shared drive has a host that is identified as the scan host. A scan host is the host where `avrd` (the automatic volume recognition daemon) is scanning the drive. A scan host must have data-path access to the drive, even if another host is requesting a tape mount for the shared drive.



Scan hosts are determined by `vmd/DA` and may be different for each multihosted drive. The first device host that registers a shared drive with `vmd/DA` becomes the initial scan host for that drive.

All device hosts that register with `vmd/DA` pass a list of multihosted drives. The name of the currently assigned scan host for each drive is then returned to each registering host.

Instances of `ltid` on hosts with the same shared drive configured create `rdevmi` (remote device management interface) connections to the scan host, to receive drive status information from the scan host. This information is used to maintain the multihosted drive information on the remote hosts.

A scan host is assigned for a multihosted drive until some interruption occurs (for example, the socket connection, the host, the drive, or the network goes down). A new scan host is then chosen.

If a scan host is declared unavailable, `vmd/DA` clears all reservations for that scan host and assigns a new scan host immediately, so that the requesting host can resume as soon as the previous scan host relinquishes its use of the drive.

A scan host for a drive needs to periodically re-register with `vmd/DA` to ensure that it remains the scan host. A host that is not identified as a scan host does not need to re-register until some disruptive event occurs (for example, a restart of `ltid` or a failure to get drive status data from the scan host for one or more drives).

Re-registering with `vmd/DA` keeps `vmd/DA` and the host that is registering in coordination with a dynamic multihosted drive configuration.

Device Allocation Host

The device allocation host is the host where `vmd/DA` manages multiple reservations for a shared drive on a host-by-host basis. For shared drives, the current volume database host for the drive is always the device allocation host for that drive.

The device allocation host has the following configuration requirements. The device allocation host must be

- ◆ Network accessible from all hosts that are sharing drives managed by that device allocation host.
- ◆ Running the same version of Media Manager as the hosts that are sharing drives managed by that device allocation host.

VERITAS also has the following recommendations for the volume database (and device allocation) host in a multihosted drive configuration:

- ◆ Use a common volume database host for your site.
- ◆ Configure the common volume database host as a Highly Available host.
- ◆ Use a relatively high-powered server for your volume database host.



Sony AIT Tape Drive Limitations

Sony AIT tape drives may require specific dip switch settings for proper configuration and these settings can be different on various hosts. See the NetBackup Media Manager device configuration guide for UNIX for the correct switch settings.

This is a limitation in their use in a multihosted drive configuration. For example, a Sony AIT drive cannot be connected to multiple hosts that require different dip switch settings.

vm.conf Entries

The following entries for multihosted drives can be added to the `vm.conf` configuration file.

Scan Ability Factor

When `ltid` registers with `vmd/DA`, it specifies a scan ability factor. This factor allows the assignment of scan hosts to be prioritized, if a drive's scan host changes. The `vm.conf` configuration entry is as follows:

```
MH_SCAN_ABILITY = factor
```

factor can be an integer from 1 to 9, and has a default value of 5.

For example, if a host is underpowered and you do not want to use it as a scan host, you can create the following configuration entry on that host:

```
MH_SCAN_ABILITY = 1
```

Then, if the scan host for a drive is changed and there are other available hosts (registered for that drive) that have a higher scan ability factor, they will be chosen first. Likewise, a high-powered server may have a scan ability of 9 assigned and will be chosen as the new scan host (over other hosts that have a scan ability of less than 9) whenever the scan host changes.

Device Allocator Retry Timeout

If `ltid` on a host in a shared drive configuration encounters problems during communications with `vmd/DA` or a failure while attempting to reserve a multihosted drive with `vmd/DA`, it delays before trying again.

You can tune this delay period by adding the following `vm.conf` configuration entry on the host where `ltid` is running:

```
MH_DA_RETRY_TIMEOUT = delay_in_minutes
```

delay_in_minutes can be an integer from 1 to *n*, and has a default value of 3.

For example:



```
MH_DA_RETRY_TIMEOUT = 2
```

After adding this entry, `ltid` must be stopped and restarted for the change to take effect.

If you specify a low timeout value, the load on `vmd/DA` is increased. `vmd/DA` may not be able to satisfy all of its requests if many hosts request its services often. This is especially true when large or many volume-related requests (such as refreshes of volume information in media management interfaces) are active.

Device Allocator Re-register Interval

`ltid` on a scan host periodically re-registers its multihosted drives with `vmd/DA` to ensure that it is still providing the drive scanning function on behalf of other hosts. This re-registration allows conditions such as a device allocator (`vmd/DA`) restart to have minimal impact on use of multihosted drives.

By default, the re-registration interval is five minutes. You can tune this interval by adding the following `vm.conf` configuration entry on the host where `ltid` is running:

```
MH_DA_REREGISTER_INTERVAL = delay_in_minutes
```

For example:

```
MH_DA_REREGISTER_INTERVAL = 4
```

After adding this entry, `ltid` must be stopped and restarted for the change to take effect.

If you specify a short interval, the load on `vmd/DA` is increased. This load is not significant if there are few scan hosts or few multihosted drives managed by a particular `vmd/DA`.

Volume Pools and Volume Groups

This topic on volume pools and groups covers the following areas:

- ◆ Volume Pools
- ◆ Volume Groups
- ◆ Volume Pools and Groups Example
- ◆ Scratch Volume Pools
- ◆ Moving Volumes



Volume Pools

A volume pool is used to identify a logical set of volumes by usage. Associating volumes with a volume pool protects them from access by unauthorized users, groups, or applications. You can create volume pools for user groups or other reasons; and as you add volumes, associate them with the appropriate pool. You can also move unassigned volumes to a different pool later.

With the exception of the NetBackup volume pool, you must create a volume pool before you can add volumes to it. Media Manager creates a volume pool, called NetBackup.

During initial configuration, it is easiest to create all of your volume pools first if you want to use volume pools other than the NetBackup volume pool. Then, as you add volumes, you can assign them to these volume pools.

Volume Groups

A volume group is a logical grouping that identifies a set of volumes that reside at the same physical location. Volume groups are an administration convenience for logically moving multiple volumes (where a logical move means to change the volume attributes to show the new location). Using a volume group lets you move a set of volumes between a robot and a standalone location, or delete them from the configuration by specifying the group name, rather than each individual media ID. Volume groups are also convenient for tracking location, such as when a group is moved offsite.

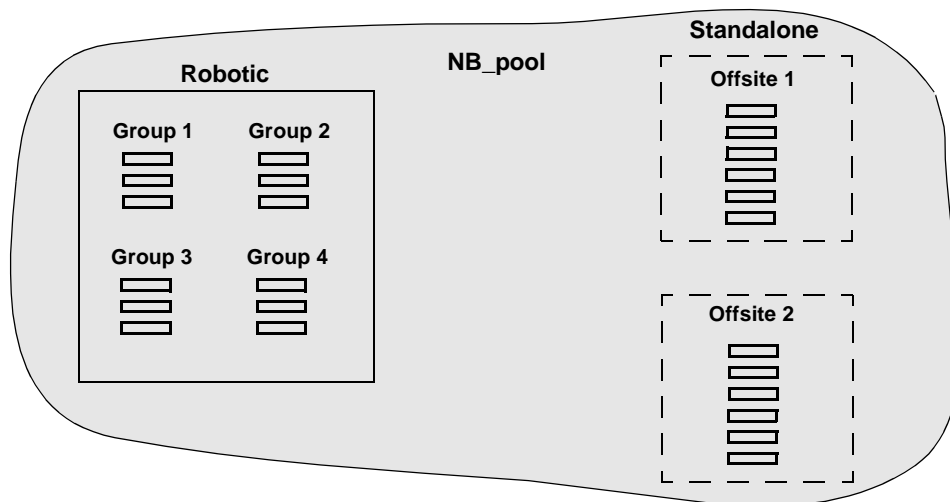
Do not confuse volume pools with volume groups. Remember that

- ◆ A volume pool identifies a set of volumes by usage.
- ◆ A volume group identifies a set of volumes by physical location and, like the volume pool, is specified when you add the volume. Groups are convenient for updating the configuration when moving volumes (for example from robotic to standalone).

Volume Pools and Groups Example

Figure 25 shows an example with one volume pool (NB_pool) and several volume groups. In this example, volumes can be moved between the groups in the robot and the groups that are offsite. All volumes, however, remain in the same pool.

Figure 25. Volume Pool With Multiple Volume Groups

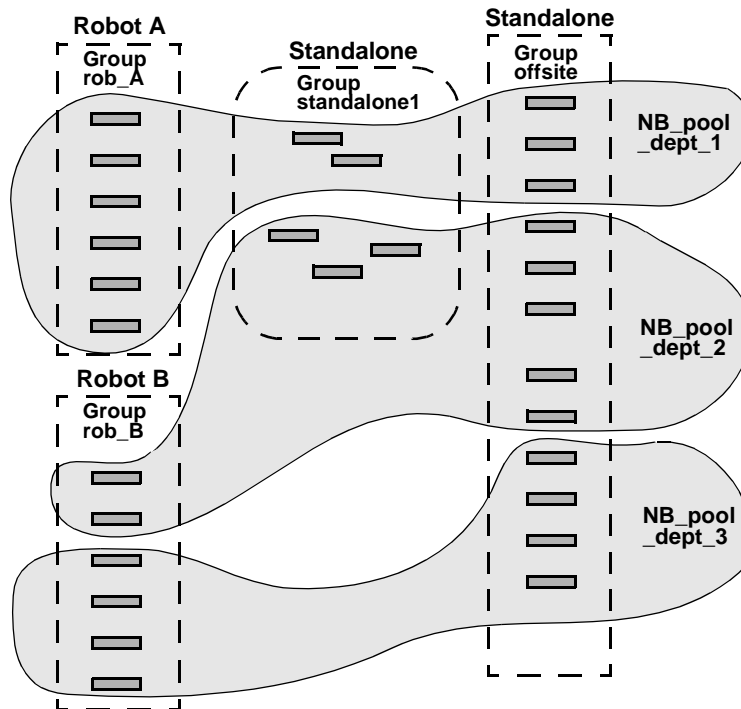


In Figure 26, members of the same volume pools are in different volume groups. The important thing to notice in this example is that the data intended for use by different departments are kept on separate volumes by assigning different volume pools. The volumes in a pool can be in more than one physical location and in more than one volume group.

In this example, the volumes in `NB_pool_dept_1` are spread among the `rob_A`, `standalone1`, and `offsite` volume groups. These groups also have volumes from more than one pool (though the volumes in each group must all be the same type).



Figure 26. Volume Groups With Multiple Volume Pools



It is also possible to configure a scratch pool from which Media Manager can transfer volumes when another volume pool has no media available (see “Scratch Volume Pools” on page 294).

Scratch Volume Pools

The scratch pool is an optional volume pool that you can configure. If the scratch pool is configured, Media Manager moves volumes from that pool to other pools that have do not have volumes available.

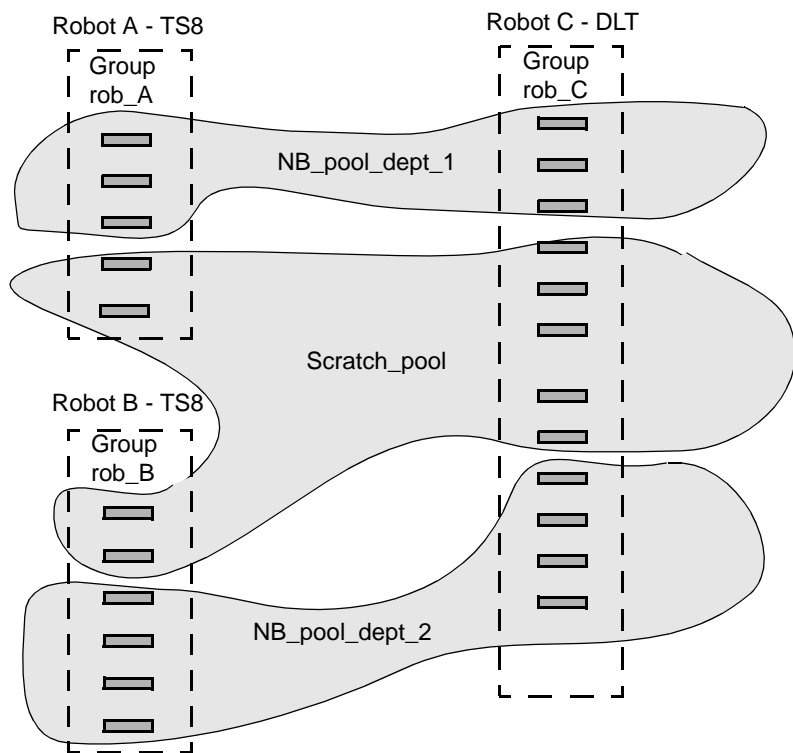
See “Configuring the Scratch Volume Pool” on page 98 for configuration information.

For example in Figure 27, the scratch pool is named Scratch_pool and the three robots contain volumes from that pool in addition to those from other pools. Assume the following

- ◆ NetBackup requires a DLT volume, so Media Manager attempts to assign one from NB_pool_dept_1 in Robot C.
- ◆ Robot C has no unassigned volumes available in the NB_pool_dept_1 pool.

Media Manager searches the scratch pool for an unassigned DLT volume in Robot C. If there is an available volume, Media Manager moves it to NB_pool_dept_1 and assigns it to NetBackup. Otherwise, a media unavailable status is logged.

Figure 27. Scratch Pools



Notes on Scratch Pool Usage

- ◆ If the `SCRATCH_POOL` entry in the `vm.conf` file specifies a volume pool that contains assigned volumes, these volumes remain in the scratch pool. Media Manager does not move assigned volumes to other pools as it does with unassigned volumes.
- ◆ Media Manager will not assign volumes while they are in the scratch pool. For example, if a NetBackup class or schedule specifies the scratch pool, all requests for those volumes are denied.
- ◆ Volumes moved from the scratch pool to another pool remain in that new pool. Media Manager does not automatically move it again for any reason, but you can manually reassign it to another volume pool.



- ◆ To have Media Manager allocate all volumes to volume pools, do one of the following:
 - ◆ Create other volume pools as required, but add no volumes to them.
 - ◆ Create the scratch pool and add all volumes to it. Media Manager will move volumes to the other pools as they are required.

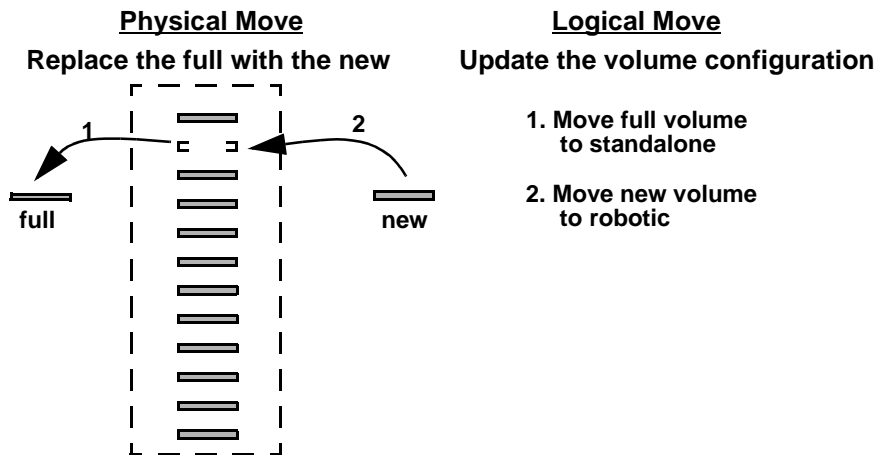
Moving Volumes

When you move volumes in or out of a robot or from one robot to another, you must physically and logically move the volume (see Figure 28).

- ◆ The physical part of the move consists of inserting or removing the volume. For some robot types, Media Manager (Inject/Eject) can be used to physically move the volume.
- ◆ The logical part of the move is done by Media Manager. Media Manager updates the volume database to show the volume at the new location.

Figure 28. Example of Moving Volumes

Example of replacing a full volume with a new volume.



Common instances when you move volumes are as follows:

- ◆ Replacing full volumes in a robot. When a volume is full and there are no more empty slots in the robot, you move the full volume to standalone and configure a volume for the empty slot, or move a volume into that slot. Use the same process to replace a defective volume.
- ◆ Moving volumes from a robot to an offsite location or from an offsite location into a robot. When you move tapes to an offsite location, you move them to standalone.



- ◆ Moving volumes from one robot to another (for example, if a robot is down).
- ◆ Changing the volume group for a volume or volumes.

In one move operation, you can move a single volume, multiple volumes, or combinations of single and multiple volumes. You are limited only in that you cannot move volumes to an invalid location (for example, DLT media to an 8-mm robot).

The best approach is to keep your moves simple by selecting and moving only one type of media at a time to a single destination. For example, if you have to move 8 mm and 4 mm cartridge tapes, do it in separate moves.

Barcodes

Reading barcodes is a function of the robot hardware. When a robot has a barcode reader, it scans media for barcodes and stores the results. This associates the slot number and the barcode with the media in that slot. Media Manager obtains that association for its own use from the robot.

VERITAS suggests that you use barcoded media in robots that can read barcodes. Barcodes offer the following advantages:

- ◆ Automatic media ID assignment.

When you add new media to a robot, Media Manager is able to assign media IDs according to the criteria that you specify.

- ◆ More accurate tracking of volume location.

The Update Volume Configuration option can easily determine which media IDs are in a robot.

- ◆ Increased performance.

Media Manager works well whether or not barcodes are used. However, not using barcodes can adversely affect performance for some robots.

A robot that reads barcodes will perform a scan each time it moves a tape. This is normal and is done in order to store the correct barcode in memory or to verify a previously saved barcode. However, if a barcode is missing, the robot will retry the scan multiple times, degrading performance.

Note Volumes in an API robot have a real or a logical barcode. This volume identifier is used as the Media Manager media ID. This volume identifier is the volume serial number in ACS, LMF, TLH, and TLM robots and must be six characters or less. For RSM robots, the last six characters of the media name are used. If these characters contain spaces, only the characters back to the first space are used.

When selecting barcodes for your volumes keep the following points in mind:



- ◆ Barcodes appear on labels that you attach to the outside of tape volumes.
Barcodes are not generally used on optical disks and Media Manager does not support barcodes for optical disk libraries (ODL robots).
- ◆ Media Manager supports barcodes, with eight or less characters (six or less characters in API robots).
- ◆ When you buy barcode labels for use with Media Manager, always follow the robot vendor's recommendations. The following are some general guidelines:

Ensure that the barcodes have the correct number of characters.

Barcodes can represent any combination of alpha and numeric characters, but different robots support different lengths of barcodes. See the vendor's documentation to determine the requirements for a specific robot type.

Use barcodes without spaces (leading spaces, trailing spaces, or spaces between any characters). Otherwise, the robot or Media Manager can have difficulty interpreting them.

- ◆ You can match barcodes to media IDs by getting custom labels with six-character barcodes in the same series as your media IDs. For example, to match a set of media IDs from AA0000 to ZZ9999, get barcode labels in that series.

However, except for API robots, the barcode for a tape does not have to match the media ID.

- ◆ When a robot can contain more than one media type, a good strategy for assigning barcodes is to assign specific leading characters in the barcode to different media types. Another approach is to use barcodes to differentiate between data tapes and cleaning tapes or between volume pools.

Barcode Rules

A barcode rule specifies criteria for assigning attributes to new robotic volumes. The attributes are assigned according to the barcode that is detected by the robot. You choose whether to use barcode rules when you set up the robot inventory update operation.

Table 62 shows some example barcode rules.

Table 62. Example Barcode Rules

Barcode Tag	Media Type	Volume Pool	Max Mounts/ Cleanings	Description
0080	8MM	b_pool	55	new 008 volumes
DLT	DLT	d_pool	200	dlt backup
CLD	DLT_CLN	None	30	dlt cleaning



Table 62. Example Barcode Rules (continued)

Barcode Tag	Media Type	Volume Pool	Max Mounts/ Cleanings	Description
CLT	8MM_CLN	None	20	8-mm cleaning
TS8	8MM	t_pool	0	8-mm backup
TS	8MM	None	0	8-mm no pool
<NONE>	DEFAULT	None	0	no barcode
<DEFAULT>	DEFAULT	NetBackup	0	other barcodes

Rules are sorted first according to the number of characters in the barcode tag (see Table 62) and then in the order you add them. Two exceptions are the <NONE> and <DEFAULT> rules, which are always at the end of the list.

When a robot update operation uses barcode rules and a new barcode is detected in a slot, Media Manager searches the rules starting at the top of the list and checks for a barcode tag that matches the new barcode. If a tag matches, the media type for the rule is checked to ensure that it is compatible with what you specified for the robot update. If the media type also matches, Media Manager uses the rule's media type, volume pool, maximum number of mounts (or number of cleanings), and description when it assigns the attributes.

Note Media Manager will not use barcode rules for barcodes that are being used by existing volumes.

For example, assume that you select the following Update Options for a new 8-mm tape in a TS8 robot:

Media Type: 8MM
 Volume Group: 00_000_TS8
 Use Barcode Rules: YES
 Volume Pool: DEFAULT

If a new tape in this robot has a barcode of TS800001, Media Manager uses the rule with the barcode tag named TS8 and specifies the following attributes for the tape:

Media ID: 800001 (last six characters of barcode)
 Volume Group: 00_000_TS8
 Volume Pool: t_pool
 Max Mounts: 0 (infinite)

If a new tape has a barcode of TS000001, Media Manager uses the rule with the barcode tag named TS and the attributes for the tape are:



Media ID: 000001 (last six characters of barcode)

Volume Group: 00_000_TS8

Volume Pool: None

Max Mounts: 0 (infinite)

vmd Security

Media Manager vmd security works in conjunction with NetBackup authentication/authorization security to control user access to vmd. vmd is the Media Manager volume daemon.

An overview of NetBackup authentication/authorization security is presented in “NetBackup Authentication/Authorization” on page 300.

Media Manager vmd security consists of two levels of security. These levels are explained in the following sections:

- ◆ “Media Manager vmd Authentication/Authorization”
- ◆ “Media Manager Server-Based vmd Security”

Note Media Manager authentication/authorization may affect systems where NetBackup authentication/authorization has been enabled.

Connections to vmd will fail if authentication/authorization are enabled, an `AUTHORIZATION_REQUIRED` entry is present in `vm.conf`, and the caller of vmd does not have the required permission to use vmd functions.

If authentication/authorization is needed in NetBackup but not in Media Manager, you can add `SERVER` entries in `vm.conf`; or have no `SERVER` and no `AUTHORIZATION_REQUIRED` entries in `vm.conf`.

NetBackup Authentication/Authorization

NetBackup authentication verifies NetBackup client to host access and also controls access to the services available on that host.

NetBackup authorization verifies if a NetBackup administration user has permission to use the services available on that host. Authorization provides additional security over the security provided by authentication.

See the Enhanced Authentication and the NetBackup Authorization sections of the NetBackup system administrator's guides for more information including

- ◆ Explanations of authentication and authorization
- ◆ Definition of the NetBackup configuration file (`bp.conf`)

- ◆ Definitions of the `methods.txt`, `methods_allow.txt`, and `authorize.txt` files
- ◆ Information on `bpauthsync(1M)`, `vopied(1M)`, and `vopie_util(1M)` man pages

Media Manager vmd Authentication/Authorization

Media Manager authentication/authorization security works with NetBackup authentication/authorization, and Media Manager server-based security to control access to vmd.

Table 63 and Table 64 provide an overview of Media Manager vmd security. Server Name, used in these matrices, refers to `SERVER` entries in the `vm.conf` file. See “Media Manager Configuration File (`vm.conf`)” for more information about `SERVER`, `AUTHORIZATION_REQUIRED`, and `PREFERRED_GROUP` entries.

Table 63 describes Media Manager vmd security when there is *no* `AUTHORIZATION_REQUIRED` entry in the `vm.conf` file.

Table 63. vmd Security Matrix - No `AUTHORIZATION_REQUIRED` Entry in `vm.conf`

Access to vmd Functionality?	Server Name is in <code>vm.conf</code>	No Server Names in <code>vm.conf</code> (or there is no <code>vm.conf</code> File)	Server Name is Not in <code>vm.conf</code> (other Server Names are) in <code>vm.conf</code>
Authentication Failed	Denied	Denied	Denied
Authentication Enabled and User is Authorized	Allowed	Allowed	Allowed (overrides server-based security)
Authentication Enabled and User is Not Authorized	Allowed (uses server-based security)	Allowed (uses server-based security)	Denied
Authentication Not Enabled	Allowed	Allowed	Denied

Table 64 describes Media Manager vmd security when there *is* an `AUTHORIZATION_REQUIRED` entry in the `vm.conf` file.

Table 64. vmd Security Matrix - `AUTHORIZATION_REQUIRED` Entry is in `vm.conf`

Access to vmd Functionality?	Server Name is in <code>vm.conf</code>	No Server Names in <code>vm.conf</code>	Server Name is Not in <code>vm.conf</code> (other Server Names are) in <code>vm.conf</code>
Authentication Failed	Denied	Denied	Denied



Table 64. vmd Security Matrix - AUTHORIZATION_REQUIRED Entry is in vm.conf

Access to vmd Functionality?	Server Name is in vm.conf	No Server Names in vm.conf	Server Name is Not in vm.conf (other Server Names are) in vm.conf
Authentication Enabled and User is Authorized	Allowed	Allowed	Allowed (overrides server-based security)
Authentication Enabled and User is Not Authorized	Allowed (uses server-based security)	Denied (disables server-based security)	Denied
Authentication Not Enabled	Allowed	Denied	Denied

Your level of security is dependent upon your use of the following:

- ◆ Authentication
- ◆ Authorization
- ◆ SERVER entries

If Authentication is not enabled (see the fourth row in Table 63), the resulting security reduces to Media Manager server-based security.

Media Manager Server-Based vmd Security

SERVER entries in vm.conf are used for server-based Media Manager vmd security. Without any SERVER entries present on a particular host, other hosts can access vmd on the host. You can add SERVER entries allowing only specific hosts to remotely access vmd.

If a host's vm.conf file contains *any* SERVER entries, there *must* also be a SERVER entry for that host or it will not be able to manage its own devices.

The fourth row in Table 63 provides an overview of Media Manager server-based vmd security.

Media Manager Configuration File (vm.conf)

The /usr/opensv/volmgr/vm.conf file contains entries for media and device management. This file usually is created by NetBackup, but if it does not exist you may need to create it to add entries.

The entries that it can contain are as follows:

- ◆ ACS_mediatype



Maps ACS (Automated Cartridge System) media types to Media Manager media types (see Appendix F).

- ◆ `ACS_SEL_SOCKET = socket_name`

By default, `acssel` listens on socket name 13740. You can use this entry to change the default.

- ◆ `ACS_SSI_SOCKET = ACSLs_host socket_name`

By default, `acsssi` listens on unique, consecutive socket names starting with 13741. To specify socket names on a ACSLS host basis, you can use this entry.

- ◆ `ACS_SSI_HOSTNAME = host`

Specifies the host where ACSLS/LibStation RPC return packets are routed for ACS network communications. By default, the local host name is used.

See Appendix F for more information.

- ◆ `AUTHORIZATION_REQUIRED`

If this entry is specified, Media Manager and NetBackup utilities must have authorization to connect to `vm`; or a `SERVER` entry must be present in the `vm.conf` file. This entry is recommended for maximum security.

If this entry is not specified, Media Manager and NetBackup utilities may connect to `vm` without specific authorization, except in the case when a non-matching `SERVER` entry is present in `vm.conf`.

- ◆ `AVRD_SCAN_DELAY = number_of_seconds`

If this entry is specified, `avrd` will wait *number_of_seconds* between normal scan cycles. You can use this entry to minimize tape mount times. Without this entry present, a mount request is delayed by an average of 7.5 seconds.

The minimum for *number_of_seconds* is 1. The maximum is 180. 0 is converted to 1 second. The default is 15 seconds.

- ◆ `DAS_CLIENT`

Specifies the DAS client name that the TLM robot uses for communications with the DAS server. By default this is the host name of the Media Manager server. See Appendix H for more information.

- ◆ `DAYS_TO_KEEP_LOGS`

Specifies the number of days to keep debug logs before `vm` deletes them. 0 means that the logs are not deleted. The default is 0.

- ◆ `DEVICE_HOST = host_name`

Specifies the hosts that are included in the device host list for the Media and Device Management interface.



◆ DO_NOT_EJECT_STANDALONE

If this entry is specified, tapes in any standalone drives will not be ejected when a backup has completed (tapes will be ejected, if end of media is reached during a backup). This entry can be used in a NetBackup environment, where it is desirable to keep a standalone drive ready after successful backups are performed.

◆ INVENTORY_FILTER = *robot_type robot_number mode value1 [value2 . . .]*

Used for robotic inventory filtering (see Appendix F, Appendix G, and Appendix I for more information).

Note: This entry is required if you are doing a robot inventory for an ACS robot and the ACSLS host is an STK Library Station.

robot_type can be ACS, TLH, or LMF.

robot_number is the number of the robot as configured in Media Manager.

mode is BY_ACS_POOL for ACS, BY_CATEGORY for TLH, or BY_PREFIX for LMF robot types.

The following are some examples:

```
INVENTORY_FILTER = ACS 0 BY_ACS_POOL 4 5
```

```
INVENTORY_FILTER = TLH 0 BY_CATEGORY FFFA CDB0
```

```
INVENTORY_FILTER = LMF 0 BY_PREFIX zzz yy
```

◆ KNOWN = *host_name*

Note: This entry is valid only if you are using the Motif administrative interface for Media Manager.

This entry specifies the hosts that will appear in the list of hosts that you can monitor. You can monitor the status of attached devices on these hosts.

◆ LMF_mediatype

Maps Fujitsu LMF media types in LMF robots to Media Manager media types (see Appendix I).

◆ MEDIA_ID_PREFIX = *media_id_prefix*

Defines the media ID prefixes to use for media without barcodes. You add the media to a robot with Update Volume Configuration option (see “To Change the Update Options” on page 143).

◆ MH_DA_REREGISTER_INTERVAL = *minutes*

This entry is used only with the optional multihosted drives feature (see “Multihosted Drives (Shared Storage Option)” on page 286).



`ltid` on a scan host periodically re-registers its multihosted drives with `vmcd/DA` to ensure that it is still providing the drive scanning function on behalf of other hosts sharing the drives. This re-registration allows conditions such as a device allocator restart to have minimal impact on use of multihosted drives.

5 minutes is the default for the re-registration interval. You can use this entry to tune this interval. After adding this entry, `ltid` must be stopped and restarted for the change to take effect.

- ◆ `MH_DA_RETRY_TIMEOUT = minutes`

This entry is used only with the optional multihosted drives feature (see “Multihosted Drives (Shared Storage Option)” on page 286).

If `ltid` encounters problems during communications with `vmcd/DA`, or a failure while attempting to reserve a multihosted drive, it delays before trying again.

3 minutes is the default for the delay. You can use this entry to tune this delay period. After adding this entry, `ltid` must be stopped and restarted for the change to take effect.

- ◆ `MH_HOST_NAME = host_name`

This entry is used only with the optional multihosted drives feature (see “Multihosted Drives (Shared Storage Option)” on page 286).

Specifies the name used by the current host to register, reserve, and release multihosted drives with `vmcd/DA`. The default is the local host name.

- ◆ `MH_SCAN_ABILITY = scan_factor`

This entry is used only with the optional multihosted drives feature (see “Multihosted Drives (Shared Storage Option)” on page 286).

A scan ability factor ranges from 1 to 9, with a default value of 5. This factor allows the assignment of scan hosts to be prioritized, if a drive's scan host changes. Scan hosts that have a higher scan ability factor are chosen first.

- ◆ `PREFERRED_GROUP = netgroup_name`

This entry is used by all callers in Media Manager and NetBackup (other than `bpgetmedia` and `bptm`) for authentication/authorization for `vmcd`. `netgroup_name` is case sensitive.

If this entry is specified, a check is made to determine if the user is in the netgroup using the `innetgr()` function (refer to the `innetgr` man page). If a `PREFERRED_GROUP` entry is not specified or the user is not a member of the netgroup, the local group name is obtained.

The following is an example:

```
PREFERRED_GROUP = nbadmins
```



Note: Netgroups are not supported on Pyramid and Sequent systems.

- ◆ `PREVENT_MEDIA_REMOVAL`

Note: Specifying this entry changes the default operation for TL8 robots. Without this entry present, Media Manager allows the removal of media.

If this entry is specified, TL8 robots will execute the SCSI command `PREVENT MEDIUM REMOVAL`. You then will not be able to open the robot's main door or gain access to the mailslot while the robotic control daemon is running. You can override this action by doing one of the following:

- ◆ Use the test utility and execute `allow media removal`.
 - ◆ Use `inject/eject` for access, when adding or moving volumes.
- ◆ `REFRESH_RATE = seconds`

Note: This entry is valid only if you are using the Motif administrative interface for Media Manager.

Indicates the number of seconds that will elapse before the display screen is updated with current information. The default is 5 seconds.

- ◆ `SCRATCH_POOL = pool_name`

Configures the specified volume pool as the scratch pool. The scratch pool is a special volume pool from which media is moved as needed into volume pools that have no available media.

You can specify any scratch pool name, except `NetBackup` or `None`. If the specified volume pool does not exist, Media Manager creates it and sets the host, user, group, and description for the pool to `ANYHOST`, `root`, `NONE`, and `Scratch Pool`, respectively.

If you subsequently delete the `SCRATCH_POOL` entry, the specified volume pool will no longer be the scratch pool.

- ◆ `SERVER = host_name`

This entry is used for security and specifies which hosts can monitor and control devices on this host. Without any `SERVER` entries and authentication enabled, any host can manage the devices and volumes on the local host.

For security you can add entries allowing only specific hosts to remotely access the devices. If a host's `vm.conf` file contains any `SERVER` entries, there must also be a `SERVER` entry for that host or it will not be able to manage its own devices.

- ◆ `TLH_mediatype`

Maps IBM ATL media types in Tape Library Half-inch (TLH) robots to Media Manager media types (see Appendix G).

- ◆ `TLM_mediatype`



Maps DAS media types in Tape Library Multimedia (TLM) robots to Media Manager media types (see Appendix H).

◆ **VERBOSE**

Causes most Media Manager daemons to be started with verbose logging enabled.

Specify this option only if problems occur or if requested by VERITAS support. After the problem is resolved, remember to remove any debug logs that were created.

Example `vm.conf` File

The following is an example of a `vm.conf` file, on host `yak`:

```
KNOWN = yak
SERVER = yak
SERVER = whale
MEDIA_ID_PREFIX = NV
MEDIA_ID_PREFIX = NETB
ACS_3490E = HCART2
SCRATCH_POOL = ScratchPool
```





This appendix explains how to configure drives and robots using the device management configuration utility, `tpconfig`. This menu-driven utility creates and updates the configuration files that define drives and robots to Media Manager.

There are also other Media Manager interfaces available to configure drives and robots (see “Administrator and User Interfaces” on page 28). The terminology, general concepts, and results are the same, regardless of which interface you use.

Terms and Concepts

The following Media Manager terms and concepts are used when configuring drives and robots.

Robot Number

A robot number is the unique, logical identification number of a robot. You assign it when you add a robot to the configuration. `tpconfig` prompts you to enter a number or accept the next available robot number which it displays. This number identifies the robot in displays and listings, and it follows the robotic type in parentheses, such as TL8(2). It is also used when entering the robot's media in the volume database, as described in Chapter 3.

If you are configuring robots on multiple systems, robot numbers must be unique. If you are connecting drives from a robot, for example, drives in a Tape Library 8MM (TL8), to multiple systems; you must specify the same robot number for the robot on both systems.

Robotic Control Path

The control path to a robot is through a SCSI connection. For most robots, you or the operating system creates this path in the `/dev` directory when you add a robot to the configuration. When `tpconfig` prompts you, enter the path to the robotic control as found in the `/dev` directory. If the entries do not exist, see the NetBackup Media Manager device configuration guide.

For API robots, see the appendices in this guide for information on configuring robotic control.



The control path to a robot may be on another host. If so, enter the host name of the host instead of a path. When you define a robot that is actually controlled by another host, the robot number must be the same on both hosts.

Host Name

You must specify a host name in the following cases.

When you add

- ◆ An ACS robot, enter the name of the host where the ACS Library Software resides, instead of a robotic control path.
See Appendix F.
- ◆ A TLM robot, enter the DAS server host name instead of a robotic control path.
See Appendix H.
- ◆ An LMF, TL8, TLD, or TLH robot that has robotic control on another host, you are prompted for the host name of that host.
See also “Volume Database Host Name” on page 311.

No Rewind On Close Device Name

This device name applies to all devices, except optical disk drives. This type of device remains at its current position on a close operation.

You specify a no rewind on close device name when you add a drive. Usually the device name is preceded or followed by the letter *n*. If the device name entries do not exist, you must create them as explained in the NetBackup Media Manager device configuration guide.

In `tpconfig` displays and listings, these device names are shown under the heading `DrivePath`.

Character Device Name

Character device name applies only to optical disk devices. A drive used as a character device uses a complete 512-byte block each time it writes (note that some systems may use 1024 byte blocks). If less than 512 bytes are used, the remaining bytes are padded out. A character device is also referred to as a raw device. NetBackup and Storage Migrator use character mode.

You specify a device name when you add an optical disk to the configuration. When prompted, enter the path name to the device as found in the `/dev` directory. If the entries do not exist, you must create them as explained in the NetBackup Media Manager device configuration guide.



In `tpconfig` displays and listings, the character device name appears under the heading `DrivePath`.

Volume Header Device Name

Note Volume headers do not apply to all systems.

The volume header device name is used internally, but still must be specified when adding an optical drive to a configuration. When prompted, enter the path name to the device as found in the `/dev` directory. To display the volume header device name, choose the `Update` or `Delete` option from the Drive Configuration menu.

On Sun systems, the `MAKEDEV` command may have to be run first to create these entries. For more information, see the NetBackup Media Manager device configuration guide and the `MAKEDEV(8)` man page.

Drive Status

Drive status can be `UP` or `DOWN`, and indicates whether Media Manager considers a drive available. You specify the initial drive status when you add a drive to the configuration. You can change the status, using the `Update` option of the Drive Configuration menu in `tpconfig` or if `ltid` has been started, by using a Device Monitor interface, `xdevadm`, or `vmopr cmd`.

Volume Database Host Name

The volume database host name identifies the host where the volume database is located. A volume database host name is associated with each robot and the entire set of standalone drives on a device host.

You can change or view the volume database host by using the Volume Database Host Configuration menu.

Starting the `tpconfig` Utility

You can start `tpconfig` from the `vmadm` Media Management menu or with the following command from the command line. You must have root user privileges.

```
/usr/opensv/volmgr/bin/tpconfig
```



The following menu appears:

```
Device Management Configuration Utility
```

- 1) Drive Configuration
- 2) Robot Configuration
- 3) Volume Database Host Configuration
- 4) Print Configuration
- 5) Help
- 6) Quit

```
Enter option:
```

Note If the Media Manager device daemon is running, you should stop it with the `stopltid` command (see “Media Manager Device Daemon (ltid)” on page 190).

- ◆ Drive Configuration opens a menu for adding, deleting, updating, or listing definitions of drives and robots in the drive and robot databases.
- ◆ Robot Configuration opens a menu for adding, deleting, updating, or listing definitions of drives and robots in the drive and robot databases.
- ◆ Volume Database Host Configuration opens a menu for updating or listing the name of the host where the volume database for a specific device resides.
- ◆ Print Configuration on the main menu and the List Configuration commands on subsequent menus allow you to display the current configuration on the screen or write it to a file.

Specifying just the `-d` option on the `tpconfig` command also writes the current configuration to stdout (the screen) without invoking the menus.

- ◆ Online help is available on the main menu and most submenus.
- ◆ Quit terminates the utility and returns you to the UNIX prompt.

You can return to the main menu from anywhere in the utility by entering Ctrl C or using the Escape key.

Adding Robots

When you configure robots and drives, the most efficient process is to first add the robot using the Robot Configuration menu and then add the drives using the Drive Configuration menu.



If you want to reconfigure drives configured as standalone to indicate that they are in a robot, use the `Update` option of the Drive Configuration menu. See “Updating Drive Configurations” on page 315.

The procedure for adding a robot follows:

1. Select the Robot Configuration menu. If any robots exist, they are displayed above this menu.
2. Select the Add option.
From the list of possible robot types displayed, select the one you want to add.
3. Enter a robot number you know is unused or accept the default number.
4. Indicate where the robotic control for the library is located as follows:
 - a. If robotic control is on another host, enter that host name.
For an ACS robot you must enter the name of the ACSLS server. See Appendix F.
For a TLM robot, you must enter the name of the DAS server. See Appendix H.
 - b. If robotic control is on this host, enter the device file path or library name. The Help option on the Robot Configuration menu has examples of typical path names.
For an ACS robot you enter the name of the ACSLS server. See Appendix F.
For a TLM robot, you enter the name of the DAS server. See Appendix H.
For a TLH robot, enter the LMCP Device File, if this is an AIX system. Otherwise, enter the Automated Tape Library Name. See Appendix G.
For a LMF robot, enter the library name rather than the path name. See Appendix I.
5. If no conflicts are detected with the new configuration, you see a message that the robot has been added.

Adding Drives

1. Select the Drive Configuration menu.
2. Select the Add option.
3. Type a drive name or use the Enter key to use the default drive name that is shown.



Specify a name, from the ASCII character set, that will be used by Media Manager to identify the drive. If you are using the multihosted drives option (see step 9), all hosts that are sharing the same physical drive must use the same name for the drive. Descriptive drive names are recommended.

4. From the list of possible drive types displayed, select the one you want to add.
5. Enter the no rewind on close device path as shown in the `/dev` directory.

If the device is an optical disk, enter the character device and volume header device file paths, from the `/dev` directory (volume headers are not applicable to all systems).

The `Help` option on the Drive Configuration menu has examples of typical path names.

6. Enter the drive status (Up or Down).
7. If a robot exists that the drive could be added to, indicate whether the drive should be added to the robot or be a standalone drive.

If there are no robots to which the drive can be added, `tpconfig` automatically adds the drive as a standalone drive.

If you choose to add a drive to a robot and more than one possible robot exists, enter the robot number that will control the drive.

Depending on the type of robot, you may also be prompted to add the robot drive number (see “Robot Drive Number” on page 55).

8. For a drive in an ACS robot, you are prompted for four drive identifiers. For ACS robots, see Appendix F.

For the following robot types use the references to determine what to enter for the robot drive number:

For LMF robots, see Appendix I.

For TLH robots, see Appendix G,

For TLM robots, see Appendix H.

9. You are asked if this drive will be shared with multiple hosts (y/n).

For background information on shared drives, see “Multihosted Drives (Shared Storage Option)” on page 286.

10. When finished, you see a message that the drive has been added, followed by a listing of the drive.



Updating Robot and Drive Configurations

Updating Robot Configurations

You can change the robot number or the robotic control path for a robot as explained in the following steps:

1. On the main menu, choose `Robot Configuration`.

Note If only one robot is configured, step 2 is skipped.

2. On the Robot Configuration menu, choose `Update`. The following prompt is displayed

Enter robot number to update:

Enter the robot number of the library you want to change.

3. The following prompt is displayed:

Enter new robot number or <RETURN> to use existing (n):

Enter a new robot number to replace the existing robot number, or press Enter to retain the current robot number.

4. You are prompted to enter robotic control information. The actual prompts depend on the type of robotic library you are updating.

Enter the appropriate robotic control path or host name associated with the robot.

When you are done, a message confirming that the robot has been updated is displayed.

Updating Drive Configurations

To change information about a drive (for example, to add it to a robot) perform the following steps:

1. On the main menu, choose `Drive Configuration`.
2. On the Drive Configuration menu, choose `Update`.



3. Enter the name of the drive you want to update, when the following prompt is displayed:

```
Enter name of drive to update:
```

4. The current drive information is displayed, followed by prompts to change each field. Enter a new value or use the Enter key to keep the existing value.

One of the prompts asks if you want to configure the drive in a robot and, if so, adds the drive immediately or gives you the opportunity to choose from any existing robot of the appropriate type.

5. When you have responded to all prompts, a revised Drive Information display appears, along with the following prompt:

```
Are you sure you want to UPDATE drive name xxxxx? (y/n) n:
```

Enter *y* to update the drive or *n* to keep the original configuration.

6. A message confirming that the drive has been updated (or not updated) is displayed.

Deleting Drives and Robots

Deleting Drives

1. On the main menu, choose *Drive Configuration*.
2. On the *Drive Configuration* menu, choose *Delete*.
3. Enter the name of the drive you want to delete, when the following prompt is displayed:

```
Enter name of drive to delete:
```

4. Drive information and a prompt similar to the following are displayed:

```
Are you sure you want to DELETE drive name xxxxx? (y/n) n:
```

5. Enter *y* to delete the drive, or *n* (Enter) to cancel the action.



- a. If you respond with `y`, a message confirming the drive has been deleted is displayed.
- b. If you respond with `n` (or Enter), pressing any key returns you to the Drive Configuration menu and the delete action is canceled.

Deleting Robots

1. On the main menu, choose `Robot Configuration`.
2. On the Robot Configuration menu, choose `Delete`.

Note If only one robot is configured, step 3 is skipped.

3. The following prompt is displayed:

```
Enter robot number to delete:
```

Enter the robot number of the robot you want to delete.

4. A prompt similar to the following is displayed:

```
Deleting robotic definition:
TLD(0) robotic path = /dev/sg/clt0d0s0, volume database host=vat
Any drives defined on this robot will be changed to standalone drives
Do you want to proceed? (y/n) n:
```

5. Enter `y` to delete the robot, or `n` (or Return) to cancel the action.
 - a. If you respond with `y`, a message confirming that the robot has been deleted is displayed.
 - b. If you respond with `n`, pressing any key returns you to the Robot Configuration menu and the delete action is canceled.

Specifying the Volume Database Host

A volume database host is associated with each robot and set of standalone drives on a device host. It identifies the host where the volume database for the device is located.



By default, the volume database host name for standalone drives and robotic drives with local robotic control is the local host name, which is also the host where `tpconfig` is running.

For robotic drives that have remote robotic control (drives in LMF, TL8, TLD, and TLH robots), the default volume database host name is the host where the robotic control is defined (SCSI or library name/device).

You need to change the volume database host name, if volumes are defined on hosts other than the default hosts. This may be necessary, for example, in a configuration that has drives connected to different hosts.

VERITAS recommends that the volumes for the entire configuration be defined in one volume database. Also, multihosted drive configurations require that a common volume database host is used for all hosts where a shared drive is configured.

1. On the main menu, choose `Volume Database Host Configuration`.

The current volume database hosts for all defined devices are displayed, along with the `Volume Database Host Configuration` menu and a prompt.

2. Select `Update` to change a host name.

The following prompt is displayed:

```
Enter robot number (or 'n' for standalone drives):
```

3. Enter a robot number or `n` to change the host name for all standalone drives.

The following prompt is then displayed:

```
Enter new Volume Database Host name:
```

4. Enter a new name. The updated list of host names is displayed, along with the menu options and prompt.

Displaying and Printing the Configuration

You can display the current configuration from every menu in `tpconfig` by using the `Print Configuration` option on the main menu, or the `List Configuration` option on the subsequent menus.

You can print the configuration using the `Print Configuration` option on the main menu. When prompted, specify a file where the configuration will be written, or press `Enter` to display the configuration on the screen.



In addition, you can specify the `-d` option on the `tpconfig` command to write the current configuration to stdout without invoking the menus.





This appendix explains how to use the media management utility (`vmadm`) to add, delete, or change media in the Media Manager volume configuration. This utility has a character-based interface that can be used at most terminals.

There are also other Media Manager interfaces available to configure media (see “Administrator and User Interfaces” on page 28). The terminology, general concepts, and results in the database are the same, regardless of which interface you use.

Starting the `vmadm` Utility

1. The Media Manager volume daemon, `vmd`, must be active to make any changes with `vmadm`. You can start `vmd` by entering `/usr/opensv/volmgr/bin/vmd` at the UNIX prompt or you can use the `Initiate Media Manager Volume Daemon` command on the `Special Actions` menu. You need root privileges to start `vmd`.
2. To start `vmadm`, enter the command (requires root privileges):

```
/usr/opensv/volmgr/bin/vmadm
```



The main menu appears.

```
Volume Database Host:  shark
Media Management
-----
a) Add Volumes
d) Delete Volumes
m) Move Volumes
p) Print Information about Volumes

c) Configure Volume Pools
s) Special Actions

u) Device Configuration Utility

h) Help
q) Quit
ENTER CHOICE:
```

The Volume Database Host shown at the top of the main menu is the host where the volume database is located and the Media Manager volume daemon (`vmvd`) is running.

The following list summarizes each menu command. The remaining topics in this chapter explain how to perform common operations.

a) Add Volumes

Add one or more volumes.

d) Delete Volumes

Delete one or more volumes.

m) Move Volumes

Move one or more volumes.

p) Print Information about Volumes

Print or display information about selected volumes based on criteria you provide.

c) Configure Volume Pools

Add a new volume pool, delete an existing one, change information about a volume pool, or list information about the currently defined volume pools.

s) Special Actions

Opens a menu with special actions.

u) Device Configuration Utility



Start the `tpconfig` device configuration utility.

See Appendix C.

h) Help

Provides on line help.

q) Quit

Terminates the utility and returns you to the UNIX prompt. You can abort many operations by pressing the ESC key.

Configuring Volume Pools

A volume pool identifies a logical set of volumes that are associated by usage rather than physical location. For example, you can create a volume pool for each storage application you are using. Then, as you add volumes to use with an application, you can associate them with a volume pool. You can also move volumes to a different pool later. Volumes associated with a particular volume pool are grouped together and protected from access by unauthorized users, groups, or applications.

Before adding volumes to a pool, you must add the pool and configure its attributes as explained in the following topics. Note that you do not have to configure a pool for NetBackup. Media Manager automatically reserves a pool named NetBackup that you specify when adding NetBackup volumes.

When you enter `c` on the main menu, the following menu appears:

```

                Display Mode:  BRIEF
Output Destination:  SCREEN

Configure Volume Pools
-----
a)  Add Pool
c)  Change Pool
d)  Delete Pool
l)  List Pools

m)  Mode (brief or full)
o)  Output Destination (screen or file)
h)  Help
q)  Quit Menu

ENTER CHOICE:
```

The following list summarizes the operations you can perform from this menu:



a) Add Pool

Defines a new volume pool. After choosing this option, you are prompted to define the following:

- ◆ **Volume pool name:** Name for the new volume pool. Enter a name of 20 ASCII characters or less. Names are case-sensitive, and no spaces or special characters are allowed.
- ◆ **Description:** Enter the description of the new volume pool (30 ASCII characters or less).
- ◆ **Pool host name:** Name of the host that can request and use volumes in this volume pool.

Entering a specific host name allows only that host to access the volume pool.

Using the default, `ANYHOST`, allows any host to access the volume pool.

Note If you have a single NetBackup server, use `anyhost` or the name of the server (not a client). If you have multiple NetBackup servers (master and media servers), always set this value to `ANYHOST` (the default).

- ◆ **Pool user name:** Login name of the user that is allowed to request and use volumes in the volume pool.

Entering a specific name allows only the processes running as that user to access the volume pool. If a different user requests the pool, then Media Manager verifies the group name (see Pool group name).

Using the default, `ANY`, allows any user to access the pool.

For NetBackup or Storage Migrator, enter `root` for the pool user name.

- ◆ **Pool group name:** Name of the user group that can request and use volumes in this volume pool.

Entering a specific name allows any processes running as that user group to access the volume pool.

Using the default, `NONE`, allows only the user specified by User Name to request or access the volume pool. All other users in any groups are denied access.

c) Change Pool

Changes the description, pool host name, pool user name, or pool group name. You are prompted for each of these items.

d) Delete Pool

Deletes the volume pool and its allocated name, description, and access permissions.

l) List Pools



Lists the currently defined volume pools and their associated descriptions and permissions.

m) Mode (brief or full)

Toggles the display mode to BRIEF or FULL.

o) Output destination (screen or file)

Toggles between the output destination between SCREEN and FILE. (SCREEN is the default). If you choose to write to a file, you can define your own file name or you can use the default file, /tmp/vmadm_pool_output.

Adding Volumes for Standalone Drives

Adding a Single Standalone Volume

1. On the main menu, choose a for Add Volumes.
2. The following prompt appears:

```
Add Single Volume, Range of Volumes, or Auto-Populate? (s/r/a):
```

Enter s to add a single volume.

You are prompted for the media type with a menu similar to the following that displays the possible types:



Enter the number for the type of media you want to add.

```
Adding Volumes
-----
Media Type
-----
1)  DLT cartridge tape
2)  8MM cartridge tape
3)  4MM cartridge tape
4)  1/2" cartridge tape
5)  DTF cartridge tape
6)  Rewritable optical disk
7)  WORM optical disk
8)  QIC - 1/4" cartridge tape
9)  DLT cartridge tape 2
10) 1/2" cartridge tape 2
11) 1/2" cartridge tape 3
12) 1/2" cartridge tape 3
13) DLT cartridge tape 3
14) 8MM cleaning tape
15) 4MM cleaning tape
16) 1/2" cleaning tape
17) DTF cleaning tape
18) DLT cleaning tape 2
19) 1/2" cleaning tape 2
20) 1/2" cleaning tape 3
21) DLT cleaning tape 3
Enter Choice [1-21]:
```

3. If you are adding a cleaning tape, you are prompted for the number of cleanings you want available. For any other media type, the next step occurs immediately.
4. You are prompted to enter the media ID. If you selected an optical disk media type, you are prompted to enter a media ID for both side A of the platter and side B of the platter. Enter a 1 to 6 ASCII character name.
5. You are prompted for a description. Enter 1 to 25 characters of text to describe the volume being added.



6. You are prompted to enter the volume pool:

```

Volume Pool
-----
1) None
2) NetBackup
3) oldpool
4) newpool
5) POOL1
6) POOL2
Enter Choice:

```

If you enter 1 (None) the volume is assigned to a generic volume pool and is available to any user or application. Enter 2 if you want the volume to be available to NetBackup only, or enter another choice to have the volume assigned to one of the volume pools listed.

For all media types, you are prompted to enter the physical location of the volume using a menu of possible locations, similar to the following menu for an 8mm cartridge tape.

```

Physical Location
-----
1) Not in robotic device
2) TS8 - Tape Stacker 8MM
3) TL8 - Tape Library 8MM
Enter Choice [1-3]:

```

Enter 1 for a volume for a standalone drive.

7. You are prompted to enter the volume group, by a menu similar to the following:

```

Volume Group
-----
1) tl8grp1
2) No Volume Group
3) Specify New Volume Group Name
4) Auto-Generate New Volume Group Name
Enter choice:

```

You may

- ◆ Choose from any existing standalone volume groups that allow this volume's media type.



- ◆ Elect not to associate the volume with any volume group (if the option is offered).
 - ◆ Enter a new name of your own choice.
 - ◆ Have a name generated by `vmadm`, if the name of volume group is not important in this case.
8. The action taken next depends on the media type you selected.
- ◆ If you selected a tape media type, the volume is added at this point and you are returned to the main menu.
 - ◆ If you selected an optical disk, you are given the option to format the platters using `tpformat`. (Formatting may cause an operator mount request to occur on the host.) Choosing `n` adds the volume immediately and you are returned to the main menu. If you choose `y` and the formatting does not complete, the volumes are still added.

Note All platforms and operating systems do not support 1024 byte-per-sector platters. Most support only 512 byte-per-sector sizes. Before purchasing optical disk platters, check your vendor documentation to determine the sector sizes supported by your platform and operating system. Also, see the NetBackup release notes for information on what has been tested by VERITAS. In all cases, VERITAS urges you to use preformatted platters.

Adding a Range of Standalone Volumes

1. On the main menu, choose `a` for Add Volumes.
2. The following prompt appears:

```
Add Single Volume, Range of Volumes, or Auto-Populate? (s/r/a):
```

Enter `r` to add a range of volumes.

3. You are prompted for the media type with a menu similar to the following that displays the possible types.

Enter the number for the type of media you want to add.

```
Adding Range of Volumes
-----
Media Type
-----
1)   DLT cartridge tape
2)   8MM cartridge tape
3)   4MM cartridge tape
4)   1/2" cartridge tape
5)   DTF cartridge tape
6)   Rewritable optical disk
7)   WORM optical disk
8)   QIC - 1/4" cartridge tape
9)   DLT cartridge tape 2
10)  1/2" cartridge tape 2
11)  1/2" cartridge tape 3
12)  DLT cleaning tape
13)  DLT cartridge tape 3
14)  8MM cleaning tape
15)  4MM cleaning tape
16)  1/2" cleaning tape
17)  DTF cleaning tape
18)  DLT cleaning tape 2
19)  1/2" cleaning tape 2
20)  1/2" cleaning tape 3
21)  DLT cleaning tape 3
Enter Choice [1-21]:
```

4. If you selected to add a range of cleaning tapes, you are prompted to enter a single number which indicates the number of cleanings you want available on each volume in the range. For any other media type, the next step occurs immediately.
5. You are prompted for a description. Enter 1 to 25 characters of text to describe the volumes being added. This description applies to all of the volumes in the range.



You are then prompted to enter the volume pool.

```

Volume Pool
-----
1)  None
2)  NetBackup
3)  oldpool
4)  oldpool4
5)  POOL1
6)  POOL2
Enter Choice:
    
```

For a range of standalone volumes, enter 1. If you enter 1, the volumes are associated with a generic volume pool and are available to any user or application.

Enter 2 if you want the volumes to be available to NetBackup only.

Enter another choice to have the volumes assigned to one of the volume pools listed.

6. You are prompted to enter the physical location of the volumes using a menu of possible locations, similar to the following menu for an 8mm cartridge tape:

```

Physical Location
-----
1)  Not in robotic device
2)  TS8 - Tape Stacker 8MM
3)  TL8 - Tape Library 8MM
Enter Choice [1-3]:
    
```

7. You are prompted to enter the volume group, by a menu similar to the following:

```

Volume Group
-----
1)  tl8grp1
2)  No Volume Group
3)  Specify New Volume Group Name
4)  Auto-Generate New Volume Group Name
Enter choice:
    
```

You may

- ◆ Choose from any existing standalone volume groups that allow this volume's media type.
- ◆ Elect not to associate the volume with any volume group (if the option is offered).



- ◆ Enter a new name of your own choice.
 - ◆ Have a name generated by `vmadm`, if the name of volume group is not important in this case.
8. You are prompted to enter the media ID naming mode with a menu displaying the possible modes. If you selected an optical disk media type, the display is as follows :

```
Media ID Naming Mode
-----
a)  0 characters and 6 digits
b)  1 character  and 5 digits
c)  2 characters and 4 digits
d)  3 characters and 3 digits
e)  4 characters and 2 digits
f)  0 characters, 5 digits, and 1 character platter-side
g)  1 character,  4 digits, and 1 character platter-side
h)  2 characters, 3 digits, and 1 character platter-side
i)  3 characters, 2 digits, and 1 character platter-side
j)  4 characters, 1 digit,  and 1 character platter-side
Enter Choice:
```

If you selected any device other than an optical disk media type, only options a through e are displayed.

Enter the desired naming mode. When the volumes are added, the digit field is incremented by one for each volume. (Only numbers are incremented.)

9. You are prompted for the media ID of the first volume:

```
Enter Media ID for first volume -- using naming mode e:
```

If you had selected naming mode e and entered the 4-character, 2-digit ID, `tape01`, the media ID of the first volume added would be `TAPE01`, the second `TAPE02`, and so on.

10. You are prompted for the number of volumes to add.

- a. If you selected an optical disk media type, the prompt is:

```
Enter Number of Platters (2 Volumes/Platters) in Range:
```

Each side of a platter is considered one volume. Entering the number 4, for example, causes eight volumes (four platters) to be added.



You are then given the option to format the platters being added using `tpformat`. Choosing `n` (no) adds the volumes immediately and you are returned to the main menu.

- b.** If you selected any media type other than optical disk, the prompt is:

```
Enter Number of Volumes in Range:
```

- 11.** The volumes are added to the database and you are returned to the main menu.

If any volume cannot be added (for example, if the range you specified overlaps with existing volumes), the operation aborts but volumes added before the failure remain in the database.

Adding Volumes to a Robot

Auto-Populating a Robot

You can use auto-populate for robots that support barcodes and for robots that do not support barcodes with some operational limitations (see “Robot Attributes” on page 276). The easiest way to add new media to a robot is to physically add the media and then use Media Manager’s auto-populate feature to update the volume database to agree with the contents of the robot. The database update includes automatic creation of media IDs.

If the robot supports barcodes and the media has readable barcode labels, auto-populate creates new media IDs, based on the last six characters of the barcodes. When you use barcode rules, new media that is added through a barcode rule is also assigned a media type, pool name, maximum number of mounts (or cleaning count), and description (see “Configuring Barcode Rules” on page 374).

If the robot does not support barcodes or the media does not have readable barcodes, the new media IDs are based on a media ID prefix that you specify.

Using Auto-Populate

The auto-populate operation is the same as an inventory and update operation (“Inventory and Update Robot Volume Configuration” on page 363). The following procedure explains how to auto-populate a robot and refers you to the update procedure at the proper time.

1. Insert the new media into the robot.
2. Check the barcode capabilities of the robot and its media.



Before starting an auto-populate operation, perform “Inventory and Compare Robot Volume Configuration” on page 359 and check whether the following are true:

- ◆ The robot supports barcodes.
- ◆ The new media that was inserted has readable barcodes.

If either of the above statements is not true, save the results of the verify for reference, in case you assign a media ID prefix later in this procedure. You do not need a prefix if the robot supports barcodes and the media has a readable barcode.

3. Create barcode rules (optional).

Refer to “Configuring Barcode Rules” on page 374 and create any additional barcode rules that you want to use for auto-populating the database, for the media you have inserted into the robot.

4. For API robots (ACS, LMF, RSM, TLH, or TLM robot types).

Create media type mappings for the robot as explained in step 2 under “Changing Update Options” on page 366

For ACS robots create default ACSLS to Media Manager media type mappings as explained in “vm.conf Map Entries for ACS Robots” on page 423.

For LMF robots create default LMF to Media Manager media type mappings as explained in “vm.conf Map Entries for LMF Robots” on page 469.

For TLH robots create default IBM ATL to Media Manager media type mappings as explained in “vm.conf Map Entries For TLH Robots” on page 445.

For TLM robots create default EMASS DAS to Media Manager media type mappings as explained in “vm.conf Map Entries For TLM Robots” on page 455.

For RSM robots create default RSM to Media Manager media type mappings as explained in the Windows NT/2000 Media Manager system administrator guides.

5. Ensure that the appropriate control daemons are active on the robot control host.

6. On the main menu, choose a for Add Volumes.

7. Respond to the prompt with a, to use auto-populate.

This brings up a robot selection prompt for selecting the robot where you added the media.

The remaining steps are the same as for a robot inventory and update operation. Go to step 5 under “Inventory and Update Robot Volume Configuration” on page 363.



Adding a Single Volume to a Robot (Without Auto-Populate)

The following procedure explains how to add a single volume to a robot using the `s` option, rather than Auto-Populate.

Note The first seven steps of this procedure are the same as adding a standalone volume (see “Adding a Single Standalone Volume” on page 325) and are only summarized here. Refer to that procedure.

1. On the main menu, choose `a` for Add Volumes.
2. Respond to the prompt with `s`, to add a single volume.
3. Enter the number for the type of media you want to add.
4. If you selected a cleaning tape, enter the number of cleanings you want available.
5. Enter a single media ID for tape or two media IDs for an optical disk. A media ID can contain from 1 to 6 characters.

Note Media IDs for API robots must always match the barcodes. This means that you must get a list of the barcodes prior to adding the volumes to Media Manager. You can obtain this information from the interface that is provided by the robot vendor or operating system, or you can use one of the robotic inventory options on the Special Actions menu.

6. Enter a volume description (1 to 25 characters).
7. Select a volume pool.
8. Specify that you want the volume added to a robot. You are prompted to enter the physical location of the volume using a menu of possible locations, similar to the following menu for an 8mm cartridge tape:

```

Physical Location
-----
1)  Not in robotic device
2)  TS8 - Tape Stacker 8MM
3)  TL8 - Tape Library 8MM
Enter Choice [1-3]:
    
```

Enter the number of the type of device to which you want to add a volume. If a device of the specified type does not currently exist, step 10 occurs immediately.



9. The devices of the selected type that currently have volumes in the database are displayed, along with the option to specify a new one, similar to the following:

```

Applicable Robot List
-----
22)  TL8 - Tape Library 8MM  (bobcat)
n)   New Robot Number
Enter Choice:

```

Enter the number of the robot you want to add to, or `n` to specify a new robot.

10. If you enter `n` or the robot you chose does not exist, you are prompted for a new, unique robot number (which must match the number that will be used when you configure the robot or was used when you configured the robot) and the new robot control host (where the robotics are controlled). Otherwise, the next step occurs. (No host name is requested for an ACS or TLM robot.)
11. You are prompted for specific information about the volume and where it should go. This information varies depending on the type of robot to which the volume is being added.
- ◆ If the robot is an API robot, the volume is added immediately. You do not enter slot information. Media Manager does not require slot location for those robot types, because this information is tracked by the robot vendor software.
 - ◆ If the robot is not an API robot, you are prompted to enter the slot number. See Appendix E.
12. You are prompted to enter the volume group by a menu similar to the following:

```

Volume Group
-----
1)  tl8grp1
2)  Specify New Volume Group Name
3)  Auto-Generate New Volume Group Name
Enter choice:

```

You may choose from any existing volume groups on the device.

13. For some robots, you are asked whether the volume should be injected using the entry port (or mailslot). For an ODL robot, you are asked whether the platters should be formatted.



Note This prompt occurs for robot types that support entry ports. This prompt may be shown for some robots that do not have entry ports, since the robot type for the robot only indicates that entry ports are possible.

14. A reminder to insert the volume in the proper slot, mailslot, or entry port is displayed and you are then returned to the main menu.

If you do not insert the volume now, it is still added to the database and logically associated with the robot.

If the robot is not an API robot and it has a barcode reader, the barcode is read and added to the database when you add the volume, provided you also physically insert the volume in the proper slot.

If you insert the volume later, then you must use `Update/Validate Barcodes for Volumes` on the `Special` menu at that time (see “Updating Barcodes for Selected Volumes in a Robot” on page 362).

Adding a Range of Volumes to a Robot (Without Auto-Populate)

The following procedure explains how to add a range of volumes to a robot by using the `r` option, rather than Auto-Populate.

Note The first six steps of this procedure are the same as adding a standalone volume (see “Adding a Range of Standalone Volumes” on page 328) and are only summarized here. Refer to that procedure.

1. On the main menu, choose `a` for `Add Volumes`.
2. Respond to the prompt with `r`, to add a range of volumes.
3. Enter the number for the type of media you want to add.
4. If you selected a range of cleaning tapes, enter a single number that indicates the number of cleanings you want available on each volume in the range.
5. Enter a single description (1 to 25 characters) that applies to all volumes in the range.
6. Select a volume pool.



7. Specify that you want to add the volumes to a robot. You are prompted for the physical location of the volumes using a menu of possible locations, similar to the following menu for an 8 mm cartridge tape:

```
Physical Location
-----
1)  Not in robotic device
2)  TS8 - Tape Stacker 8MM
3)  TL8 - Tape Library 8MM
Enter Choice [1-3]:
```

Enter the number of the type of robot to which you want to add the volumes. (If a device of the specified type does not currently exist, step 8 is skipped and step 9 occurs.)

8. The devices of the selected type that currently exist in the database are displayed, along with the option to specify a new robot, similar to the following:

```
Applicable Robot List
-----
22) TL8 - Tape Library 8MM (bobcat)
n)  New Robot Number
Enter Choice:
```

Enter the number of the robot you want to add to, or n to specify a new robot.

9. If you enter n or the robot you chose does not exist, you are prompted for a new, unique robot number and the new control host. Otherwise, the next step occurs. (No host name is requested for an ACS or TLM robot.)
10. You are prompted to enter the volume group, by a menu similar to the following:

```
Volume Group
-----
1)  tl8grp1
2)  Specify New Volume Group Name
3)  Auto-Generate New Volume Group Name
Enter choice:
```

You may choose from any existing volume groups on the device.



11. You are prompted for specific information about the volume and where it should go. This information varies depending on the type of robot to which the volume is being added.

If the robot is an API robot, the volume is added immediately. You do not enter slot information. Media Manager does not require slot location for those robot types, because this information is tracked by the robot vendor software.

If the robot is not an API robot, you are prompted to enter the slot number. See Appendix E.

12. At this point, the procedure is similar to adding a standalone volume. You are prompted to enter the media ID naming mode with a menu displaying the possible modes.

Note Media IDs for API robots must always match the barcodes. This means that you must get a list of the barcodes prior to adding the volumes to Media Manager. You can obtain this information from the interface that is provided by the robot vendor or operating system, or you can use one of the robotic inventory options on the Special Actions menu.

If you selected an optical disk media type, the display appears as follows:

```
Media ID Naming Mode
-----
a)  0 characters and 6 digits
b)  1 character  and 5 digits
c)  2 characters and 4 digits
d)  3 characters and 3 digits
e)  4 characters and 2 digits
f)  0 characters, 5 digits, and 1 character platter-side
g)  1 character,  4 digits, and 1 character platter-side
h)  2 characters, 3 digits, and 1 character platter-side
i)  3 characters, 2 digits, and 1 character platter-side
j)  4 characters, 1 digit,  and 1 character platter-side
Enter Choice:
```

If you selected any device other than an optical disk media type, only options a through e are displayed.

Enter the desired naming mode. When the volumes are added, the digit field is incremented by one for each volume. Only numbers are incremented.

- 13.** For all devices other than an API robot, you are prompted for the media ID of the first volume. The prompt is appropriate for the media type and is similar to one of the following:

```
Enter Media ID for slot xxx, side A -- using naming mode e:
```

(xxx is the slot number you entered in step 11.)

or

```
Enter Media ID for slot xxx -- using naming mode a:
```

or

```
Enter 3 Character Prefix for ALL Media IDs:
```

If you had selected naming mode `e` and entered the ID, `tape01`, the media ID of the first volume added would be `TAPE01`, the second `TAPE02`, and so on.

- 14.** You are prompted for the number of volumes to add.

- a.** If you selected an optical disk media type, the prompt is:

```
Enter Number of Platters (2 Volumes/Platters) in Range [x-y]:
```

Where `x` and `y` represent the range of platters available.

For example, entering 4 causes eight volumes (four platters) to be added. You are then given the option to format the platters being added using `tpformat`.

Choosing `n` (no) adds the volumes immediately and you are returned to the main menu.

- b.** If you selected a media type other than optical disk, the prompt is:

```
Enter Number of Volumes in Range [x-y]:
```

Where `x` and `y` represent the range of volumes available. A range is not presented, if the robot is an API robot.

- 15.** The volumes are added to the database and you are returned to the main menu.



If any volume cannot be added (for example, if the range you specified overlaps with existing volumes), the operation aborts, but volumes added before the failure remain in the database.

If you do not insert the volume now, it is still added to the database and logically associated with the robot.

If the robot is not an API robot and it has a barcode reader, the barcode is read and added to the database when you add the volume, providing you also physically insert the volume in the proper slot. If you insert the volume later, then you must use `Update/Validate Barcodes for Volumes on the Special` menu at that time (see “Updating Barcodes for Selected Volumes in a Robot” on page 362).

Displaying the Volume Configuration

1. On the `vmadm` menu, choose `p` for `Print Information about Volumes`. The current print criteria are displayed along with a menu which allows you to change the criteria, similar to the following example:

```

                Display Filter:  ALL
                Display Mode:   BRIEF
Output Destination:  SCREEN

Display Options
-----
s) Search
m) Mode (brief or full)
o) Output Destination (screen or file)
f) Filter
h) Help
q) Quit Menu
ENTER CHOICE:

```

2. To accept the current settings, select `s` for `Search`. With the settings shown in the example, you would receive brief information about all volumes on your screen.
3. To change the print criteria, select one of the following options:

Table 65. Print Criteria

m	Select <code>m</code> to toggle the display mode. FULL mode displays the most extensive information about each selected volume. BRIEF mode displays a subset, one line of information about each selected volume. In this mode, volumes are listed in alphabetical order by media ID. The default mode is BRIEF.
---	--



Table 65. Print Criteria (continued)

-
- o Select `o` to toggle the output destination between the screen and a file of your choice. When you switch from the screen setting to a file, you are prompted for the file name. You must enter an absolute path or the enter key for the default file `/tmp/vmadm_output`.

 - f Select `f` to change the display filter that determines which volumes are displayed. The following options are shown:
 - 1) ALL
 - 2) MEDIA ID
 - 3) MEDIA TYPE
 - 4) VOLUME GROUP
 - 5) ROBOT NUMBER
 - 6) ROBOT TYPE
 - 7) VOLUME POOLFor entries 2 through 7, you are prompted to enter the appropriate value. Menus of the possibilities are provided for entries 3 through 7. The default is the last value chosen and is shown in parentheses following the prompt. Initially, information about all volumes is shown.

4. After you change a print option, you must select `s` for the information to be printed or displayed. If you choose to copy the information to a file, you receive a message after you select `s` that output is written to the file.
- `vmadm` uses the `more` utility to display information on the screen.



The amount of information displayed depends on the mode that you specify. FULL mode displays all available information about the selected volumes in a format similar to the following example for a single volume:

```

media ID:                MIN028
media type:              8MM cartridge tape (4)
barcode:                00000018
description:            configured by vmconf
volume pool:            POOL2 (7)
robot type:             TL8 - Tape Library 8MM (6)
robot number:           0
robot slot:             28 (C08)
robot host:             hare
volume group:           TL8-0
created:                Mon Nov 29 08:39:09 1993
assigned:               Tue Nov 30 20:51:28 1993
last mounted:          Sun Dec 5 20:51:49 1993
first mount:           Tue Nov 30 20:54:00 1993
expiration date:       ---
number of mounts:      6
max mounts allowed:    ---
status:                 0x0
    
```

For a standalone volume, fields that do not apply (for example, robot type, robot number, and so on) are not included in the FULL mode display.

For a cleaning tape, number of mounts is replaced by cleanings left.

The status field is not displayed unless the media is assigned.

BRIEF mode displays a subset of the most pertinent information, showing one line per volume, by default in alphabetical order by media ID, similar to the example below:

media ID	media type	robot type	robot #	robot slot	side/face	optical partner	# mounts/cleanings	last mount time
000001	DLT	TLD	1	1	-	-	17	06/03/1996 00:01
000002	DLT	TLD	1	12	-	-	14	06/03/1996 00:02
000022	DLT	TLD	0	7	-	-	1	04/18/1996 09:25

Even when the same kind of information is returned, such as media type and robot type, the FULL display expands the description and is more complete. With an optical disk, for example, BRIEF mode shows a media type of REWR_OPT while FULL mode shows Rewritable optical disk.

See Table 34 on page 89 for an explanation of the fields in these displays.



Moving Volumes

When you move volumes in or out of a robot, or from one robot to another, you must physically and logically move the volume. The physical part of the move is when you remove or insert the volume. The logical move changes the volume database to show the volume at the new location.

You can perform the following types of logical moves:

- ◆ Move single volumes
- ◆ Move multiple volumes
- ◆ Move volume groups

Common instances where you use the move options are:

- ◆ Replacing full volumes in a robot. When a robotic volume is full and there are no more empty slots in the robot, you move the full volume to standalone, and then configure a volume for the empty slot or move a volume into that slot. You could use a similar process to replace a defective volume.
- ◆ Moving volumes from a robot to an offsite location or from an offsite location into a robot. When you move tapes to an offsite location you move them to standalone.
- ◆ Moving volumes from one robot to another (for example, if a robot is down).

Moving Volumes (With Inventory and Update)

Inventory a Robot and Update Volume Configuration on the Special Actions menu provides the easiest way to logically move media when the following are true:

- ◆ The move involves a robot that supports barcodes, see “Robot Attributes” on page 276.
- ◆ The media has readable barcodes.

See “Inventory and Update Robot Volume Configuration” on page 363 for instructions on using this option.

If the robot does not support barcodes or the barcodes are unreadable, use the move procedures explained in the following topics.



Moving a Single Volume (Without Inventory and Update)

1. On the main menu, choose `m` to Move Volumes.
2. The following prompt is displayed:

```
Move Single Volume, Multiple Volumes, or Volume Group? (s/m/v):
```

Enter `s` to move a single volume.

3. You are prompted for the media ID of the volume you want to move:

```
Changing Volume Residence
-----
Enter Media ID:
```

4. The current residence of the volume is displayed, along with the possible locations to which it could be moved, similar to the following example:

```
Current Residence of 000003:
robot type:          TL8 - Tape Library 8MM  (6)
robot number:        10
robot control host:  dill
volume group:        Sca1000
robot slot:          4
barcode:             000003

New Residence:

Physical Location
-----
1) Not in robotic device
2) TL8 - Tape Library 8MM
3) TS8 - Tape Stacker 8MM
Enter Choice [1-3]: (2)
```

5. Enter the new residence for the volume.

- a. If you move a volume out of an ODL, TSH, TLD, or TL8 robot to a standalone location, you are asked whether the volume should be ejected using the mailslot (outport or exit port). This is the final step in the procedure.

Note This prompt occurs for robot types that support mailslots. This prompt may be shown for some robots that do not have mailslots, since the robot type for the robot only indicates that mailslots are possible.

- b. If you choose to move a volume into a robot, you are prompted with a menu of possible robots, similar to the following:

```

Applicable Robot List
-----
10) TL8 - Tape Library 8MM (dill)
20) TL8 - Tape Library 8MM (dill)
n) New Robot Number
Enter choice:

```

Enter the number of the appropriate robot. If you choose n, you are prompted to enter a new robot number and robot control host.

You are prompted for specific information about where the volume should be moved. This information varies depending on the device to which the volumes are being moved.

- ◆ If the robot is an API robot, the volume is immediately moved.
- ◆ If the robot is not an API robot, you are prompted for the tape slot where the volume should be moved. See Appendix E.

6. You are prompted to enter the volume group, by a menu similar to the following:

```

Volume Group
-----
1) tl8grp1
2) No Volume Group
3) Specify New Volume Group Name
4) Auto-Generate New Volume Group Name
Enter choice:

```

You may do one of the following:

- ◆ Choose from any volume groups in the list.
- ◆ Elect not to associate the volume with any volume group (if the option is offered).



- ◆ Enter a new name of your own choice.
 - ◆ Have a name generated by `vmadm`, if the name of volume group is not important in this case.
7. If you move a volume from or to robots that support mailslots, you are asked whether the volume should be ejected and then injected using the mailslot, or using the inport (entry port) and output (exit port).

Moving a volume in `vmadm` changes only its logical residence in the volume database. It must also be moved physically, unless it is injected or ejected using the mailslot (provided the robot has a mailslot).

When you move a volume to a non-API robot that has a barcode reader, Media Manager performs a Validate and Update Barcode operation on that volume.

Moving Multiple Volumes

Moving multiple volumes is similar to moving single volumes, except that once you choose where you want the volumes to be moved, you are prompted to continue entering media IDs of volumes to move. You also do not have the option to eject and inject volumes using the mailslot, or inport (entry port) and output (exit port).

1. On the main menu, choose `m` to Move Volumes.
2. The following prompt is displayed:

```
Move Single Volume, Multiple Volumes, or Volume Group? (s/m/v):
```

Enter `m` to move multiple volumes.

3. You are prompted for the media ID of the first volume you want to move:

```
Moving Volumes
-----
Enter First Media ID:
```

4. If you are moving a volume on an optical disk, you are reminded that moving the volume on one side of the platter also moves the volume on the other side.

Then, the current residence of the volume is displayed, along with the possible locations to which it could be moved, similar to the following menu:

5.

```

Current Residence for all volumes in list:
robot type:          TL8 - Tape Library 8MM  (6)
robot number:       10
robot control host: dill
volume group:       Sca1000
robot slot:         3
barcode:            000002

New Residence for all volumes in list:

Physical Location
-----
1)  Not in robotic device
2)  TL8 - Tape Library 8MM
3)  TS8 - Tape Stacker 8mm
Enter Choice [1-3]: (2)

```

6. Enter the new residence for the volumes, which you will specify next.
7. If you move the volumes into a robot, you are prompted with a menu of possible libraries, similar to the following:

```

Applicable Robot List
-----
10) TL8 - Tape Library 8MM (dill)
20) TL8 - Tape Library 8MM (dill)
n)  New Robot Number
Enter choice:

```

Enter the number of the appropriate robot. If you choose n, you are prompted to enter a new robot number and a new robot control host.

8. You are prompted to enter the volume group, by a menu similar to the following:

```

Volume Group
-----
1)  tl8grp1
2)  No Volume Group
3)  Specify New Volume Group Name
4)  Auto-Generate New Volume Group Name
Enter choice:

```



You may

- ◆ Choose from any volume groups in the list.
- ◆ Elect not to associate the volume with any volume group (if the option is offered).
- ◆ Enter a new name of your own choice.
- ◆ Have a name generated by `vmadm`, if the name of volume group is not important in this case.

9. Depending on the device, you are prompted for a media ID or to specify location information for each volume.

Note You do not enter slot information for media added to an API robot. Media Manager does not require slot location for these robot types, since this information is tracked by the operating system or the robot vendor software.

10. At this point, the volumes are moved, messages confirming the moves are displayed, and you are returned to the main menu.

Moving volumes in `vmadm` changes only their logical residence in the volume database. They must also be moved physically. When you move volumes to a non-API robot that has a barcode reader, Media Manager performs a Validate/Update Barcode operation on those volumes.

Moving a Volume Group

A volume group can be moved to a new robot or made standalone. All volumes must have their new slot numbers identified, as the move operation leaves slot numbers unmodified.

See “Volume Pools and Volume Groups” on page 291, for a definition of a volume group.

Note If a volume group is moved back into a robot, every volume must be returned to its original slot.

1. On the main menu, choose `m` for Move Volumes.
2. The following prompt is displayed:

Move Single Volume, Multiple Volumes, or Volume Group? (s/m/v):

Enter `v` to move a volume group.



3. A menu of possible groups is displayed, similar to the following menu:

```

Volume Group
-----
1)  00_025_TL8
2)  10i-1
3)  10i-2
4)  axc
Enter choice:

```

Enter the number of the volume group you want to move.

4. The current residence of the volume group is displayed, along with a prompt to choose the new location, similar to the following menu:

```

Current Residence for Volume Group 00_025_TL8:
-----
robot type:          TL8 - Tape Library 8MM  (3)
robot number:        25
robot control host:  bobcat

New Residence:

Physical Location
-----
1)  Not in robotic device
Enter Choice [1-1]: (1)

```

You can move a volume group only between a robotic location and standalone. To move a group from one robot to another, you must move the group to standalone, as an intermediate step, and then to the new robot.

If you selected a standalone volume group to move, the physical locations listed would not offer option (1), but would show the robot type to which the volumes could be moved, as in the following sample menu:

```

New Residence:
Physical Location
-----
1)  TS8 - Tape Stacker 8MM
2)  TL8 - Tape Library 8MM
Enter Choice [1-2]:

```



Enter the new residence for the volume group. The volumes are logically moved and you are returned to the main menu.

Moving volumes in `vmadm` changes only their logical residence in the volume database. They must also be moved physically.

Deleting a Single Volume

Note You cannot delete volumes that are assigned, until they are deassigned. Only NetBackup and Storage Migrator use the assigned state. See “Deassigning Volumes” on page 112 for more information..

1. On the main menu, choose `d` for `Delete Volumes`.
2. The following prompt appears:

```
Delete Single Volume, Multiple Volumes, or Volume Group? (s/m/v):
```

Enter `s` to delete a single volume.

3. You are then prompted for the media ID of the volume you want to delete:

```
Deleting Volume
-----
Enter Media ID:
```

If you are deleting an optical disk volume, you get the following additional warning and prompt:

```
Deleting volume xxxxxA will also delete xxxxxB
are you sure you want to delete both volumes? (y/n):
```

(`xxxxxA` and `xxxxxB` represent the media IDs of sides A and B of the volume's platter.)

Entering `n` cancels the operation. Entering `y` continues the operation.

4. The deletion is confirmed with a message, and you are returned to the main menu. The volume is deleted from the database, not physically from the device.



Deleting Multiple Volumes

Note You cannot delete volumes that are assigned, until they are deassigned. Only NetBackup and Storage Migrator use the assigned state. See “Deassigning Volumes” on page 112 for more information..

1. On the main menu, choose `d` for Delete Volumes.
2. The following prompt appears:

```
Delete Single Volume, Multiple Volumes, or Volume Group? (s/m/v):
```

Enter `m` to delete multiple volumes.

3. You are then prompted for the media ID of the volume you want to delete:

```
Deleting Volumes
-----
Enter Media ID:
```

If you are deleting an optical disk volume, you get the following additional warning:

```
Deleting volume xxxxxA will also delete xxxxxB
```

(xxxxxA and xxxxxB represent the media IDs of sides A and B of the volume's platter.)

Pressing the Escape key cancels the operation. Continuing causes the volume to be deleted, when all the desired volumes have been entered. You continue to be prompted for media IDs until you press only the Enter key.

4. The volumes are deleted, messages confirm each deletion, and you are returned to the main menu.

The volumes are deleted from the database, not physically from the device.

Deleting a Volume Group

Note You cannot delete volumes that are assigned, until they are deassigned. Only NetBackup and Storage Migrator use the assigned state. See “Deassigning Volumes” on page 112 for more information..



1. On the main menu, choose `d` for `Delete Volumes`.
2. The following prompt appears:

```
Delete Single Volume, Multiple Volumes, or Volume Group? (s/m/v):
```

Enter `v` to delete a volume group.

3. A menu of the possible volume groups is displayed, similar to the following:

```
Volume Group
-----
1) 00_025_TL8
2) 10i-1
3) 10i-2
4) cc
Enter choice:
```

Enter the number of the volume group you want to delete.

4. The volumes in the specified group are deleted and you are returned to the main menu.

The volumes are deleted from the database, not physically from the device.

Changing a Volume's Description

1. On the main menu, choose `s` for `Special Actions`.
2. Choose `d` for `Change Description for Volume`.
3. The following prompt appears:

```
Changing Description of Volume
-----
Enter Media ID:
```

Enter the media ID of the volume whose description you want to change.



- The current volume description and a prompt for the new description is displayed, similar to the following:

```
Current Description for 000000: test
Enter Description(25 char max):
```

Enter the new description and press Enter. You are returned to the Special Actions menu.

Changing a Volume's Volume Pool

Volumes are in a specific volume pool or are associated with a generic volume pool. The volume pool row in the Print Information about Volumes FULL display mode, shows the name of the volume pool to which the volumes belong (if any).

Once associated with a pool, volumes are assigned or unassigned. Only the NetBackup and Storage Migrator applications use the assigned state. A NetBackup or Storage Migrator volume becomes assigned when it is requested by a user or an application. The time of the assignment appears in the assigned row in the Print Information about Volumes FULL display mode.

A volume must be in an unassigned state before you can change its volume pool. Attempting to change its volume pool while the volume is assigned results in an error.

- Deassign the volume if it is assigned to NetBackup (See "Deassigning Volumes" on page 112 for more information).
- On the main menu, choose `s` for Special Actions.
- Choose `p` for Change Volume Pool for Volumes.
- The list of defined volume pools appears:

```
Changing Volume Pool for Volumes
-----
Volume Pool
-----
1) None
2) NetBackup
3) oldplatters
4) newplatters
5) POOL1
6) POOL2
Enter Choice:
```



Enter 1, if you want the volume associated with the generic volume pool; the volume will be available to any user or application. Enter 2 if you want the volume to be available to NetBackup only; or enter another choice to have the volume associated with one of the volume pools listed.

5. You are prompted for the media ID of the volume to change. You will continue to be prompted for media IDs until you press the Enter key without typing a media ID.

Changing the volume pool for an optical disk volume also changes the volume pool for its partner volume.

Changing the Expiration Date for Volumes

The administrator can change the expiration date for any volume in the volume database. The expiration date refers to the age of the media (not the data on the media) and is the time at which the media is considered too old to be reliable.

When its expiration date has passed a volume can still be read, but it will not be mounted for a write access. Requesting write access to a volume whose expiration date has passed results in an error; requesting read access results in a warning being logged to the system console log.

You can set or change an expiration date for a single volume or for multiple volumes.

1. On the main menu, choose `s` for `Special Actions`.
2. Choose `e` for `Change Expiration Date for Volumes`.

At the prompt, enter `0` for no expiration date or enter a date in one of the following formats:

- ◆ `mm/dd/yy hh/mm/ss`
- ◆ `mm/dd/yyyy hh/mm/ss`
- ◆ `mm/dd/yy`
- ◆ `mm/dd/yyyy`
- ◆ `mm/dd`

3. You are then prompted to enter the media ID of the volume to associate with this expiration date. You will continue to be prompted for media IDs until you press the Enter key without typing a media ID.



Changing the Volume Group for Volumes

1. On the main menu, choose `s` for `Special Actions`.
2. Choose `g` for `Change Volume Group for Volumes`.

The following prompt appears:

```

Changing Volume Group for Volumes
-----
Enter Media ID:

```

3. Enter the media ID of the first volume you want to change and press `Enter`. You will continue to be prompted for media IDs until you press the `Enter` key without typing a media ID.

As you enter the media IDs, Media Manager validates them to ensure they have common media types and residences.

4. When you exit from this prompt, a list similar to the following appears:

```

Volume Group
-----
    1) 00_000_TL8
    2) Specify New Volume Group Name
    3) Auto-Generate New Volume Group Name
Enter Choice:

```

The list will include existing volume groups that are valid for the media you specified in step 3, (`00_000_TL8` in this example), and also have options for specifying a new volume group name or having `vmadm` generate a new name.

If you choose to specify a new volume group name, a prompt appears allowing you to enter the name.

Setting the Maximum Mounts for Volumes

You can set or change the maximum number of times a volume can be mounted. Once this number is reached, any further requests to mount the volume for a write operation result in an error. Specifying a maximum allowed mount count of 0, means there is no limit on the number of times a volume can be mounted.

To help determine the maximum mount count to use, consult your vendor documentation for information on the expected life of the media.



You can set the maximum allowed mounts for a single volume or for multiple volumes (note that you cannot set the maximum number of mounts for a cleaning cartridge).

1. On the main menu, choose `s` for `Special Actions`.
2. Choose `s` for `Set Maximum Allowed Mounts for Volumes`.
A prompt is displayed for specifying a maximum mount count. Entering `0` means there is no limit to the number of times the volume can be mounted.
3. You are then prompted for the media IDs for which you want this maximum allowed mounts applied. You will continue to be prompted for media IDs until you press the `Enter` key without typing a media ID.

Changing the Cleanings Allowed for a Cleaning Tape

When you added cleaning tapes, you specified a cleaning count. If you need to adjust that count, use the following procedure:

1. On the main menu, choose `s` for `Special Actions`.
2. Choose `m` for `Modify Number of Cleanings on Cleaning Cartridge`.
3. The following prompt appears:

```
Changing Cleaning Count for Volume
-----
Enter Media ID:
```

Enter the media ID of the cleaning tape for which you want to change the cleaning count.

4. The current number of cleanings and a prompt to enter a new number for the cleaning count is displayed, similar to the following:

```
Current Number of Cleanings for TEST:26
Enter New Number of Cleanings:
```

5. Enter a new number. The cleaning count is changed to the new number and you are returned to the `Special Actions` menu.

For more information about cleaning tapes, see the `tpclean(1M)` man page.



Starting and Stopping the Media Manager Volume Daemon

The Media Manager volume daemon, `vmd`, must be active to perform the operations in `vmadm`, even though you can start the utility without `vmd` running.

You can start `vmd` by entering the following command:

```
/usr/opensv/volmgr/bin/vmd
```

You can also control `vmd` from `vmadm`, as follows:

To Start the Media Manager Volume Daemon

1. On the main menu, choose `s` for `Special Actions`.
2. Choose `i` for `Initiate Media Manager Volume Daemon`. This starts `vmd` and you are returned to the `Special Actions` menu.

To Stop the Media Manager Volume Daemon

1. On the main menu, choose `s` for `Special Actions`.
2. Choose `t` for `Terminate Media Manager Volume Daemon`. This stops the daemon and returns you to the `Special Actions` menu.

Inventory and Report Robot Volume Configuration

Use `Inventory a Robot` and `Report Contents` from the `Special Actions` menu, to inventory a selected robot and obtain a report that shows which media ID is in each slot. If the robot can read barcodes (see “Robot Attributes” on page 276) then barcode information is included in the report.

Note If a volume happens to be in a drive, the report shows it in the slot it came from.

This option does not check or change the database, but is useful for listing the contents of a robot.

1. Ensure that the appropriate control daemon is active on the host that controls the robot you are going to inventory. See “Robotic Daemons” on page 192.
2. On the main menu, choose `s` for `Special Actions`.
3. Choose `c` for `Inventory a Robot and Report Contents`.



If the volume database has entries for robotic volumes, `vmadm` lists the robot number, robot type, and robot host for those robot types (except ACS and TLM robots). For example:

```
Robot from Volume Configuration
-----
1)  TLD 2 -- breaker
2)  TL4 3 -- breaker
3)  TL8 0 -- whale
4)  none of the above
Enter choice:
```

- a. If the desired robot is not in the list, choose none of the above and go to step 4.
- b. If the desired robot is in the list, enter the number corresponding to the robot (for example, enter 3 for TL8 0 on whale) and go to step 5.
- c. If the desired robot is an ACS type, the menu shows a robot control host of NONE. If you choose an ACS robot, you are prompted for the Robot Control Host. At this prompt, enter the host on which the ACS daemon (`acsd`) is running. This can be the ACSLS host or it can be another host.
- d. If the desired robot is a TLM type, the menu shows a robot control host of NONE. If you choose a TLM robot, you are prompted for the Robot Control Host. At this prompt, enter the host on which the TLM daemon (`tlmd`) is running--do not choose the host that is the DAS Server.
- e. If the volume database has no entries for robotic volumes, you are prompted to specify a robot control host on which to search the device configuration for robots.

```
Enter Robot Control Host:  (whale)
```

Respond to this prompt as explained in step 4.

- 4. If the device configuration has no robots or you have chosen an ACS or TLM robot or none of the above in step 3, you are prompted to select a robot control host on which to search the device configuration for robots:

```
Enter Robot Control Host:  (whale)
```



- a. Enter a host name and then the Enter key, or press Enter without typing a name to select the default host shown in the parentheses. Media Manager searches for robots in the device configuration on the selected host.

Note If Media Manager does not find any robots in the device configuration, `vmadm` displays a “robot not obtained” message.

- b. If Media Manager finds robots in the device configuration, it lists their robot number, robot type, and robot host. For example:

```

Robot from Device Configuration
-----
1)  TLD 0 -- shark
2)  TLD 1 -- shark
3)  none of the above
Enter choice:

```

To report the contents of a robot in the list, enter the number corresponding to the robot (for example, 1 for TLD 0 on shark) and go to step 5.

If a list appears but the desired robot is not shown, choose `none of the above`. In this case, `vmadm` shows a “robot not obtained” message and you must configure the robot and insert media before you can perform the inventory and report.

5. When you have selected a robot, `vmadm` displays a report that shows the contents of the robot.

For robots with a barcode reader, Media Manager obtains the barcode and includes it in the report. If the robot does not support barcodes or the media does not have a readable barcode, `<none>` appears in place of the barcode.

Inventory and Compare Robot Volume Configuration

Use the `Inventory a Robot and Compare with Volume Configuration` on the `Special Actions` menu to physically inventory a robot, compare the results with the contents of the volume database, and obtain a list of recommended changes.

The report shows discrepancies between the contents of the robot and the contents of the volume database. If the robot can read barcodes, then barcode information is included in the report.

This option does not change the database, but is useful for verifying whether the volume database is correct after tapes have been physically moved in the robot. If the report shows that the media in a slot does not match what is in the database, you can physically



move the media or change the database using a move option (see “Moving Volumes” on page 343) or the inventory and update option (see “Inventory and Update Robot Volume Configuration” on page 363).

1. Ensure that the appropriate control daemon is active on the host that controls the robot you are going to inventory. See “Robotic Daemons” on page 192.
2. On the main menu, choose `s` for Special Actions.
3. Choose `v` for Inventory a Robot and Compare with Volume Configuration.

If the volume database has entries for robotic volumes, `vmadm` lists the robot number, robot type, and robot host for those robots (except ACS and TLM robots). For example:

```
Robot from Volume Configuration
-----
1)  TLD 2 -- breaker
2)  TL4 3 -- breaker
3)  TL8 0 -- whale
4)  none of the above
Enter choice:
```

- a. If the desired robot is not in the list, choose none of the above and go to step 4.
- b. If the desired robot is an ACS type, the menu shows a robot control host of NONE. If you choose an ACS robot, you are prompted for the Robot Control Host. At this prompt, enter the host on which the ACS daemon (`acsd`) is running. This can be the ACSLS host or it can be another host.
- c. If the desired robot is a TLM type, the menu shows a robot control host of NONE. For a TLM robot, you are prompted for the Robot Control Host. At this prompt, enter the host on which the TLM daemon (`tlmd`) is running. Do not choose the host that is the DAS Server.
- d. If the desired robot is in the list, enter the number corresponding to the robot (for example, enter 3 for TL8 0 on whale) and go to step 5.
- e. If the volume database has no entries for robotic volumes, you are prompted to specify a robot control host on which to search the device configuration for robots.

```
Enter Robot Control Host:  (whale)
```



Respond to this prompt as explained in step 4.

Note A robot does not appear in the list, if it does not have any volume entries in the volume database you are using for the compare.

4. If the volume database has no robotic volumes or you have chosen none of the above in step 3, you are prompted to select a robot control host on which to search the device configuration for robots:

```
Enter Robot Control Host:  (whale)
```

- a. Enter a host name and then the Enter key, or press Enter without typing a name to select the default host shown in the parentheses. Media Manager searches for robots in the device configuration on the selected host.

Note If Media Manager does not find any robots in the device configuration, `vmadm` shows a “robot not obtained” message.

- b. If Media Manager finds robots in the device configuration, it lists their robot number, robot type, and robot host. For example:

```
Robot from Device Configuration
-----
1)  TLD 0 -- shark
2)  TLD 1 -- shark
3)  none of the above
Enter choice:
```

To inventory and compare the volume database entries for a robot in the list, enter the number corresponding to the robot (for example, 1 for TLD 0 on shark) and go to the next step.

If a list appears but the desired robot is not shown, choose none of the above. In this case, `vmadm` displays a “robot not obtained” message and you must configure the robot and insert media before you can perform the inventory and update.

5. When you have selected a robot, `vmadm` displays a report comparing the contents of the robot with the contents of the volume database. See “To Compare a Robot’s Contents With the Volume Configuration” on page 125 for example reports.

For API robots (ACS, LMF, RSM, TLH, or TLM), Media Manager determines whether the media ID and media type that is stored in its own database matches the database for the robot-vendor software.



For robots that are not API robots that have a barcode reader, Media Manager determines whether the barcodes in the robot match those in the volume database. When the report shows <none>, it means that the media does not have a barcode.

For robots that cannot read barcodes, `vmadm` verifies only whether the volume database correctly shows whether a slot contains media.

Updating Barcodes for Selected Volumes in a Robot

Use `Update/Validate Barcode for Volume` on the `Special Actions` menu to check the barcodes of selected volumes in robots (that can read barcodes) and update the volume database if necessary. “Robot Attributes” on page 276 lists the robots that support barcodes.

Use this option only to fill in barcodes that are missing from the database. For example, if you logically add a new volume but do not physically insert it into the robot, the database will not include the barcode. In this case, you can use the `Update/Validate Barcode` option to fill in the missing barcode.

Do not use this option to correct a database entry that shows an incorrect media ID in a slot. Here, you must update the database by using a move option (see “Moving Volumes” on page 343) or the inventory and update option (see “Inventory and Update Robot Volume Configuration” on page 363).

Note You cannot use the `Update/Validate Barcodes` option for API robots since Media Manager does not manage location information for media in these robot types.

1. Ensure that the appropriate robotic daemons are active on the robot control host. To start the daemons, see “Robotic Daemons” on page 192.
2. On the main menu, choose `s` for `Special Actions`.
3. Choose `u` for `Update/Validate Barcode for Volumes`.

The following prompt appears:

```
Validating/Updating Barcodes for Volumes
-----
Enter Media ID:
```

4. Enter the media ID of the first volume you want to update and press the Enter key. You will continue to be prompted for media IDs until you press the Enter key without entering a media ID.



When you press the Enter key to exit from the Enter Media ID prompt, the barcodes are updated and you are returned to the `Special Actions` menu.

Inventory and Update Robot Volume Configuration

Use `Inventory a Robot and Update Volume Configuration` on the `Special Actions` menu to inventory a robot and compare the results with the contents of the volume database.

You can then optionally update the volume database to agree with what is in the robot. When you insert new media, the database update includes automatic creation of media IDs (based on barcodes or a prefix that you specify). If you use barcode rules, new media that is added through a barcode rule can also be assigned a media type, volume pool, maximum number of mounts (or number of cleanings), and description (see “Configuring Barcode Rules” on page 374).

Note *insert* means the media is placed physically in the robot without using an add or move option to update the database. *remove* means to take media out of a robot without using a move option.

See “Updating the Volume Configuration for a Robot” on page 128 for instructions on when to use and when not to use the `Inventory and Update` option.

To Inventory and Update Robot Volume Configuration

1. Check the barcode capabilities of the robot and its media (optional).

Before doing an inventory and update, perform “Inventory and Compare Robot Volume Configuration” on page 359 and check whether the following are true:

- ◆ The robot supports barcodes.
- ◆ The new media that was inserted has readable barcodes.

If the robot does not support barcodes or the media does not have readable barcodes, save the results of the verify for reference, in case you assign a media ID prefix later in this procedure.

For API robot types, assign media mappings as explained in the following appendices:

- ◆ For ACS robots, see “Robot Inventory Operations” on page 421.
- ◆ For TLH robots, see “Robot Inventory Operations” on page 444.
- ◆ For TLM robots, see “Robot Inventory Operations” on page 453.
- ◆ For LMF robots, see “Robot Inventory Operations” on page 467.



- ◆ For RSM robots, see the Windows NT/2000 Media Manager system administrator guides.

2. Create barcode rules (optional).

Refer to “Configuring Barcode Rules” on page 374 and create any barcode rules that you want to use for updating the database for media that has been inserted into the robot.

3. Ensure that the appropriate control daemons are active on the robot control host.

To start the daemons, see “Robotic Daemons” on page 192.

4. On the main menu, choose `s` for Special Actions.

5. Choose `r` for Inventory a Robot and Update Volume Configuration.

If the volume database has entries for robotic volumes, `vmadm` lists the robot number, robot type, and robot host for those robots (except ACS and TLM robot types). For example:

```
Robot from Volume Configuration
-----
1)  TLD 2 -- breaker
2)  TL4 3 -- breaker
3)  TL8 0 -- whale
4)  none of the above
Enter choice:
```

- a. If the robot you want to inventory and update is in the list, enter the number corresponding to the robot (for example, enter 3 for TL8 0 on whale) and go to step 7.
- b. If the desired robot is not in the list, choose `none of the above` and go to step 6.
- c. If the desired robot is an ACS type, the menu shows a robot control host of NONE. If you choose an ACS robot, you are prompted for the Robot Control Host. At this prompt, enter the host on which the ACS daemon (`acsd`) is running. This can be the ACSLS host or it can be another host.
- d. If the desired robot is a TLM type, the menu shows a robot control host of NONE. If you choose a TLM robot, you are prompted for the Robot Control Host. At this prompt, enter the host on which the TLM daemon (`t1md`) is running. Do not choose the host that is the DAS Server.



- e. If the volume database has no entries for robotic volumes, you are prompted to specify a robot control host on which to search the device configuration for robots.

```
Enter Robot Control Host: (whale)
```

Respond to this prompt as explained in step 6.

Note A robot does not appear in the list if it does not have any volume entries in the volume database you are updating. This will be the case, if you configure a new robot and are adding media to it using the inventory and update option.

6. If the volume database has no robotic volumes or you have chosen none of the above in step 5, you are prompted to select a robot control host on which to search the device configuration for robots:

```
Enter Robot Control Host: (whale)
```

- a. Enter a host name and then the Enter key, or press Enter without typing a name to select the default host shown in the parentheses. Media Manager searches for robots in the device configuration on the selected host.

Note If Media Manager does not find any robots in the device configuration, `vmadm` shows a “robot not obtained” message.

- b. If Media Manager finds robots in the device configuration, it lists their robot number, robot type, and robot host. For example:

```
Robot from Device Configuration
-----
1) TLD 0 -- shark
2) TLD 1 -- shark
3) none of the above
Enter choice:
```

To inventory and update the volume database entries for a robot in the list, enter the number corresponding to the robot (for example, 0 for TLD 1 on shark) and go to step 7.

If a list appears but the desired robot is not shown, choose none of the above. In this case, `vmadm` shows a “robot not obtained” message and you must configure the robot and insert media before you can perform the inventory and update.



7. When you have selected a robot, the Inventory and Update Robot menu appears. For example:

```
Inventory and Update Robot:  TLD (10) - whale

Update Mode:  INTERACTIVE

Inventory and Update
-----
u)  Inventory Robot and Update Volume Configuration
m)  Change Update Mode
o)  Change Update Options

h)  Help
q)  Quit Menu

ENTER CHOICE:
```

Inventory a robot and update its volume database entries as follows:

- a. Use the **m** option to toggle the update mode.
 - ◆ **INTERACTIVE** causes `vmadm` to display a list of recommended changes after the inventory, and prompts you to confirm whether to proceed with updating the database.
 - ◆ **NOT INTERACTIVE** causes `vmadm` to make the recommended database changes without prompting for a confirmation.

You may want to use the **NOT INTERACTIVE** mode after you become familiar with performing robot inventories
- b. To view the current inventory and update settings or change them, choose **o** and refer to “Changing Update Options” on page 366”.
- c. When the update options are as you want them, choose the **u** option to start the inventory and update operation.

See “To Update the Volume Configuration for a Robot” on page 130 for example reports.

Changing Update Options

When you choose **o** from the Inventory and Update Robot menu, the Update Options menu appears. The example below shows the defaults for a new installation.



These are also the defaults each time you enter the options menu, with the possible exception of the Media ID Prefix. The Media ID prefix default will be the last entry in the `vm.conf` file, if one exists (see step 6 below).

For most configurations, the default update options work well. You should only change the defaults if your configuration has special hardware or usage requirements.

```

Update Robot:  TL8 (10) - whale

OPTION FOR REMOVED MEDIA
-----
          Volume Group:  DEFAULT
OPTIONS FOR ADDED OR MOVED MEDIA
-----
          Volume Group:  DEFAULT
Use Barcode Rules:  YES
          Media Type:    DEFAULT
          Media ID Prefix:  DEFAULT
          Volume Pool:   DEFAULT

          Update Options
          -----
b) Use Barcode Rules      r) Volume Group for REMOVED media
m) Media Type             a) Volume Group for ADDED or MOVED media
i) Media ID Prefix       p) Volume Pool

h) Help
q) Quit Menu

ENTER CHOICE:

```

1. Choose whether to use barcode rules when adding new media, by using the `b` option to toggle `Use Barcode Rules` between `YES` and `NO`.

Note Media Manager attempts to use barcode rules only for barcodes that are not already in the volume database.

- ◆ `YES` causes Media Manager to search existing barcode rules and apply them to new media that has been inserted into a robot.
- ◆ `NO` causes Media Manager to ignore the barcode rules.

See “Configuring Barcode Rules” on page 374 for more information on barcode rules and how to define them.

2. If you are updating an API robot, check the Media Type Mappings.



To change the mapping choose `c` from the `Update Options` menu and make your changes on the menu. The `c` option appears only for these robot types.

The default mapping originates from the `vm.conf` file on the host where you are running `vmadm`. If this file does not exist or contain a mapping for the media, Media Manager uses the defaults for these robot types (see the tables in “To Change the Update Options” on page 143).

3. Choose `m` to open a menu that shows the media types that are valid for this robot. The menu will be similar to the following.

```
Media Type
-----
 1) DEFAULT
 2) DLT cartridge tape
 3) 1/2" cartridge tape
 4) DLT cartridge tape 2
 5) 1/2" cartridge tape 2
 6) DLT cleaning tape
 7) 1/2" cleaning tape
 8) DLT cleaning tape 2
 9) 1/2" cleaning tape 2
Enter Choice [0-9]: (0)
```

- a. If you are not using barcode rules:

- ◆ To use the default media type, select `DEFAULT`.

If the robot is an API robot, Media Manager uses the Media Type Mappings that are displayed.

If a robot is not an API robot, Media Manager uses the default media type for the robot (see Table 35 on page 149).

- ◆ To use a media type other than the default, choose one from the menu.

Selecting from the menu is necessary when the robot supports multiple media types and you do not want the default. For example, the default for a TLD robot is DLT but the robot also supports half-inch cartridges. To add half-inch cartridges to a TLD robot, you must specify half-inch cartridge on the `Update Options` menu.

- b. If you are using barcode rules:

- ◆ Choose `DEFAULT` to let the barcode rule determine the media type that is assigned.



For example, assume you want to add both DLT and half-inch cartridges to a TLD robot with a single update operation. To accomplish this, first create separate rules for DLT and half-inch cartridges and select the specific media type in the barcode rules. Then, select DEFAULT from the Update Options menu. Media Manager will now use the media type in the barcode rules when it does the inventory and update.

Note If you also choose DEFAULT for the barcode rule, Media Manager assigns the default media type for the robot (see Table 35 on page 149).

- ◆ To use a media type other than the default, choose a specific type from the menu.

For example, to use the same rule to add DLT or half-inch cartridges to a TLD, choose specific media from the Update Options menu and DEFAULT for the barcode rule. Now you can perform one update for DLT and another for half-inch cartridge and use the same rule for both.

The update media type always overrides the rule. If you specify any value other than DEFAULT on the Update Options menu, the media type for the rule must be the same type or DEFAULT in order to obtain a match (except for cleaning media as explained below).

The following list shows what happens for various combinations of update and barcode rule media types.

Update Options Media Type	Barcode Rule Media Type	Rule Used	Media Type in Volume Database
-----	-----	-----	-----
DLT	DEFAULT	Yes	DLT
1/2" CART	DEFAULT	Yes	1/2" CART
DLT	DLT	Yes	DLT
DLT	DLT CLEAN	Yes	DLT CLEAN
DLT CLEAN	DLT	No	
DLT CLEAN	DLT CLEAN	Yes	DLT CLEAN
DLT CLEAN	DEFAULT	Yes	DLT CLEAN
DLT	(8MM, 4MM, etc)	No	
DEFAULT	DEFAULT	Yes	DLT
DEFAULT	DLT	Yes	DLT
DEFAULT	DLT CLEAN	Yes	DLT CLEAN
DEFAULT	1/2" CART	Yes	1/2" CART
DEFAULT	(8MM, 4MM, etc)	No	

- ◆ The fourth barcode rule in the list shows Media Manager's ability to automatically add cleaning cartridges with regular media, when you execute an update for a robot.



If the media you insert includes a cleaning tape, then Media Manager automatically adds the tape correctly, if the following are true:

- ◆ The update media type is for the regular media (DLT in this example).
- ◆ The barcode on the tape matches a barcode tag and the barcode rule media type is the cleaning media (DLT CLEAN in this example).

Also see “Example 5: Add cleaning tapes to a robot” on page 140.

- ◆ The sixth and seventh rules in the list illustrate how to add only cleaning media.

In the sixth rule, you specify the cleaning media type on both the `Update Options` menu and in the barcode rule. In the seventh rule, you specify the cleaning media on the `Update Options` menu and choose default in the barcode rule.

4. Choose `a` to open a menu for selecting the volume group that Media Manager will assign to media that you have inserted into the robot (or moved to a new location within the robot).

The menu will be similar to the following:

```

Volume Group
-----
1)  00_000_TL8
2)  Specify New Volume Group Name
3)  Auto-Generate New Volume Group Name
Enter choice:

```

The menu always has choices for:

- ◆ Specifying a new volume group name.
- ◆ Auto generating a new volume group (default). You can also auto generate a new volume group name by entering `DEFAULT` for the new volume group name.

Other choices that are available depend on the selected media type.

- ◆ If Media Type is `DEFAULT`, the menu shows existing volume groups that are valid for the robot’s default Media Type.
- ◆ If Media Type is other than `DEFAULT`, the menu shows the existing volume groups that are valid for the media type.

5. Choose `r` to open a menu for selecting the volume group that Media Manager will assign to media that you have removed from the robot.



The menu will be similar to the following:

```
Volume Group
-----
1) 00_000_NON
2) No Volume Group
3) Specify New Volume Group Name
4) Auto-Generate New Volume Group Name
Enter choice:
```

The menu always has choices for:

- ◆ Specifying no volume group name.
- ◆ Specifying a new volume group name.
- ◆ Auto generating a new volume group (default). You can also auto generate a new volume group name, by entering DEFAULT for the new volume group name.

Other choices that are available depend on the selected media type.

- ◆ If Media Type is DEFAULT, the menu shows existing volume groups that are valid for the robot's default Media Type.
- ◆ If Media Type is other than DEFAULT, the menu shows the existing volume groups that are valid for the media type.

6. Specify a value for Media ID prefix if either of the following conditions are true (see step 1 under "Inventory and Update Robot Volume Configuration" on page 363):
 - ◆ The robot does not support barcodes
 - ◆ The media that was inserted does not have readable barcodes.

Note If neither of the above conditions are true, a prefix is not required because Media Manager always assigns the last six characters of the barcode as the media ID for media added to the robot. This applies whether or not a barcode rule is used.



To select a value for Media ID prefix, choose `i` from the `Update Options` menu to display a selection list that is similar to the following:

```
Media ID Prefix
-----
1) NV
2) NETB
3) ADD
4) Default Media ID Prefix
5) Use No Media ID Prefix
6) Specify New Media ID Prefix
Enter choice:
```

Choose one of the following from the list:

- ◆ If there are existing media ID prefixes, you can choose one of them from the list. The existing prefixes come from `MEDIA_ID_PREFIX` entries that you added to the `vm.conf` file on the host where you are running `vmadm`. For example, entries for the list above would be:

```
MEDIA_ID_PREFIX = NV
```

```
MEDIA_ID_PREFIX = NETB
```

```
MEDIA_ID_PREFIX = ADD
```

- ◆ **Default Media ID Prefix**

In this case, Media Manager first checks the `vm.conf` file for `MEDIA_ID_PREFIX` entries.

- ◆ If `vm.conf` has `MEDIA_ID_PREFIX` entries, then Media Manager assigns the last one as the default prefix.
- ◆ If `vm.conf` does not have any prefix entries, Media Manager assigns the letter `A` as the default prefix.

- ◆ **Use No Media ID Prefix**

This operation will succeed only if the robot supports barcodes and the media has readable barcodes. Otherwise, Media Manager is unable to assign new media IDs and the operation fails (with an accompanying error message).

This choice may be useful if you are using barcoded media and want updates to fail when unreadable or missing barcodes are encountered.

- ◆ **Specify New Media ID Prefix**

You can specify a new media ID prefix having from one to five alpha-numeric characters. Media Manager assigns the remaining numeric characters. For example, if the prefix is `NETB`, the media IDs are `NETB00`, `NETB01`, and so on.



For optical disk media, the final character reflects the platter side, unless you choose NO for Use Platter Side in Optical ID (see step 7).

Note A new media ID prefix is used only for the current operation. It is not added to `vm.conf` and does not appear in the Media ID prefix list the next time you use the Update Options menu.

7. If the robot is an ODL robot, choose the `s` option to toggle Use Platter Side in Media ID to YES or NO, depending on whether you want designate the platter-side in media IDs for optical disk media.

Note Use Platter Side in Media ID appears on the Update Options menu only if you are doing the inventory and update on an ODL robot and are using a Media ID Prefix.

The two sides of an optical disk platter are referred to as media ID partners.

- ◆ If you set Use Platter Side in Media ID to YES, one side will have a media ID of `xxxxxA` and the other side `xxxxxB`, where `xxxxx` is the media ID prefix and is an auto-generated number.
 - ◆ If you set Use Platter Side in Media ID to NO, the platter side is not included in the media ID.
8. Choose `p` to change the volume pool from the default. A menu similar to the following appears:

```

Volume Pool
-----
 1) None
 2) NetBackup
 3) a_pool
 4) b_pool
 5) Default Volume Pool
Enter choice:

```

If you are using barcode rules:

- ◆ Choose Default Volume Pool to let the barcode rule determine the volume pool that is assigned.
 - ◆ To use a volume pool other than the default, choose one from the menu.
- The Update Options volume pool always overrides the rule.

If you are not using barcode rules:



- ◆ Choose `Default Volume Pool` to use the NetBackup volume pool for data volumes and no volume pool for cleaning tapes (the same as choosing `None`).
 - ◆ To use a volume pool other than the default, choose one from the menu.
9. When you are satisfied with the settings, choose `q` to return to the `Inventory and Update Robot` menu.

Configuring Barcode Rules

A barcode rule specifies criteria for creating volume database entries for new robotic volumes that you are adding through an auto-populate or inventory and update operation (see “Auto-Populating a Robot” on page 332 and “Inventory and Update Robot Volume Configuration” on page 363). You select whether to use barcode rules when you set up the auto-populate, or inventory and update.

The following are some example barcode rules.

Barcode Tag	Media Type	Volume Pool	Max Mounts/ Cleanings	Description
0080	8MM	b_pool	55	new 008 volumes
DLT	DLT	d_pool	200	dlt backup
CLD	DLT_CLN	None	30	dlt cleaning
CLT	8MM_CLN	None	20	8mm cleaning
TS8	8MM	t_pool	0	8mm backup
TS	8MM	None	0	8mm no pool
<NONE>	DEFAULT	None	0	no barcode
<DEFAULT>	DEFAULT	NetBackup	0	other barcodes

Barcode Rule Sorting

Rules are sorted, first according to the number of characters in the barcode tag (see example list above) and then in the order you add them. The two exceptions are the `<NONE>` and `<DEFAULT>` rules which are always at the end of the list.

When an inventory and update, or auto-populate operation uses barcode rules and a new barcode is detected in a slot, Media Manager searches the rules starting at the top of the list and checks for a barcode tag that matches the new barcode. If a barcode tag matches, the media type for the rule is checked to ensure that it is compatible with what you specified for the inventory and update. If the media type also matches, Media Manager uses the rule’s media type, volume pool, max mounts (or number of cleanings), and description to create a volume database entry for the media ID.



Note Media Manager attempts to use barcode rules only for barcodes that are not already in the volume database.

Barcode Rule Examples

For example, assume that during an inventory and update for a TS8 robot, you select the following update options for a new 8 mm tape (see “Inventory and Update Robot Volume Configuration” on page 363):

```
Media Type: 8MM
Volume Group: 00_000_TS8
Use Barcode Rules: YES
Volume Pool: DEFAULT
```

If a new tape in this robot has a barcode of TS800001, Media Manager uses the rule with the barcode tag named TS8 and includes the following values in the volume database entry for the tape:

```
Media ID:      800001 (last six characters of barcode:
Volume Group: 00_000_TS8
Volume Pool:   t_pool
Max Mounts:    0 (infinite)
```

If a new tape has a barcode of TS000001, the rule named TS is used and volume database entry for the tape will contain:

```
Media ID:      000001 (last six characters of barcode:
Volume Group: 00_000_TS8
Volume Pool:   None
Max Mounts:    0 (infinite)
```



Barcode Rule Menu

To configure barcode rules, choose `Configure Barcode Rules` from the `Special Actions` menu. The following menu appears:

```
                Display Mode:  BRIEF
                Output Destination:  SCREEN

Configure Barcode Rules
-----
a)  Add Rule
c)  Change Rule
d)  Delete Rule
l)  List Rules

m)  Mode (brief or full)
o)  Output Destination (screen or file)
h)  Help
q)  Quit Menu

ENTER CHOICE:
```

Adding a Barcode Rule

To add a new barcode rule, choose a from the `Configure Barcode Rules` menu and enter the following information at the prompts:

Barcode Tag

Enter a barcode tag for the rule. The rule can have from 1 to 16 characters and no spaces.

The only rules where you can use special characters in the barcode tags areas follows:

<NONE >

Matches when rules are used and the media has an unreadable barcode, or the robot does not support barcodes.

<DEFAULT>

For barcoded media, this tag matches when none of the other barcode tags match, providing the media type in the <DEFAULT> rule and the media type on the `Update Options` menu are compatible. The `Update Options` menu is where you set up the criteria for an inventory and update operation (see “Inventory and Update Robot Volume Configuration” on page 363).



Description

Enter a 1 to 25 character description of the rule that will be assigned to new volumes when the rule is used.

Media Type

A rule is disregarded if the media type in the rule is not compatible with the media type for the update. See “Inventory and Update Robot Volume Configuration” on page 363.

Select the media type for this rule, as follows:

- ◆ Select DEFAULT to have the rule match *any* media type that you select on the Update Options menu. If you also select DEFAULT for the update, Media Manager uses the default media type for the robot. See “To Change the Update Options” on page 143.
- ◆ Select a specific media type to have the rule match *only* when you select that specific media type or DEFAULT on the Update Options menu. If you choose DEFAULT for the update, Media Manager assigns the rule’s media type.

The following example shows the results with various combinations of update selections and barcode rule media types for a TLD robot. This type of robot is the most complex case because it can have DLT or half-inch cartridge media.

Update Options Media Type	Barcode Rule Media Type	Rule Used	Media Type in Volume Database
-----	-----	-----	-----
dlt	default	Yes	dlt
1/2" cart	default	Yes	1/2" cart
dlt	dlt	Yes	dlt
dlt	dlt clean	Yes	dlt clean
dlt clean	dlt	No	
dlt clean	dlt clean	Yes	dlt clean
dlt	(8mm, 4mm, etc)	No	
default	default	Yes	dlt
default	dlt	Yes	dlt
default	dlt clean	Yes	dlt clean
default	1/2" cart	Yes	1/2" cart
default	(8mm, 4mm, etc)	No	

Maximum Allowed Mounts or Number of Cleanings

When a barcode rule is used, Media Manager adds the number you specify to the volume database for the media ID.

For

- ◆ Media other than cleaning tapes, enter the maximum number of mounts to allow for this media ID (also see “Setting the Maximum Mounts for Volumes” on page 355).



- ◆ Cleaning tapes, enter the number of cleanings to allow (also see “Changing the Cleanings Allowed for a Cleaning Tape” on page 356).

Volume Pool

Specify a volume pool for the volume. This is the pool that the volume will be added to, when a barcode matches the rule.

Whenever the barcode rule is used, and the `Update Options` menu shows

- ◆ `DEFAULT` for the volume pool, then the volume is assigned to the pool specified in the barcode rule.
- ◆ A specific volume pool, then that selection overrides the pool specified in the barcode rule.

Changing a Barcode Rule

To change a barcode rule, choose `c` from the `Configure Barcode Rules` menu and select the desired rule from the resulting list. You are then prompted to change the description, Media Type, Maximum Allowed Mounts (or Number of Cleanings), and Volume Pool.

For Media Type, Maximum Allowed Mounts, and Number of Cleanings, the current value appears in parentheses (pressing the Enter key without typing a new value leaves the value unchanged).

Note You cannot use `Change Barcode Rule` to change the barcode tag. To change a barcode tag, delete the rule and then add a rule with the new tag.

Deleting a Barcode Rule

To delete a barcode rule, choose `d` from the `Configure Barcode Rules` menu and select the desired rule from the list.

Listing Barcode Rules

To list existing barcode rules, set the `Display Mode` and `Output Destination` options and then choose `l` (`List Rules`) from the `Configure Barcode Rules` menu.

Formatting Optical Disks

Before an optical disk platter can be used with Media Manager, an external volume serial number (EVSN) and a volume label must be written to it. There are two ways to write this information:

- ◆ Format the platter when you add the optical disk volume using `vmadm`.
- ◆ Use the `tpformat` command.

When you use `vmadm`, the media ID is used as the EVSN. The process for using `vmadm` is described here. See the `tpformat` man page for a description of how to use that command.

Note All platforms and operating systems do not support 1024 byte-per-sector platters. Most support only 512 byte-per-sector sizes. Before purchasing optical disk platters, check your vendor documentation to determine the sector sizes supported by your platform and operating system. Also, see the NetBackup release notes or the VERITAS web site for information on what is supported. VERITAS urges you to use preformatted platters.

1. Perform the same steps for adding a volume, described in the preceding sections on adding single volumes or ranges of volumes.
2. The last step is a prompt similar to the following:

```
Do you want to tpformat xxxxxA and xxxxxB? (y/n)
```

(xxxxxA and xxxxxB represent sides A and B of the volume's platter.)

Enter `y` to proceed or `n` to cancel the operation.

The `tpformat` request is sent to the host on which `vmadm` is running. This action may cause a mount request that requires manual assignment by the operator. If labels already exist on the tape, you are asked if they should be overwritten.

Even if the formatting cannot be completed for some reason, the volume or volumes are still added.





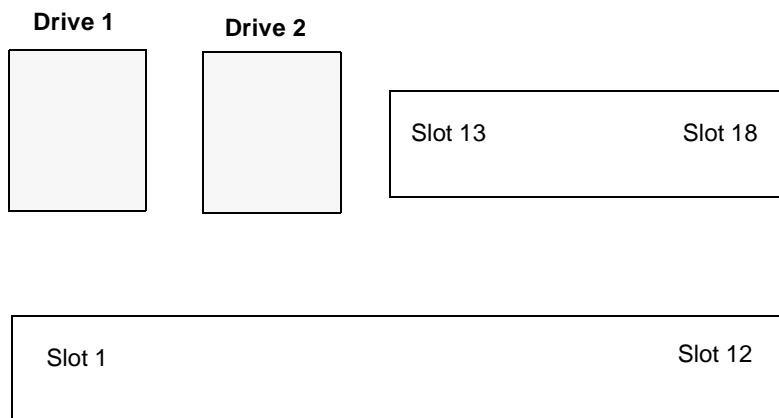
Robot Drive and Slot Layout

E

This appendix contains diagrams of slot layouts and drive locations in some of the more popular robots supported by Media Manager. If your robot is not included here, see the vendor's documentation for the device.

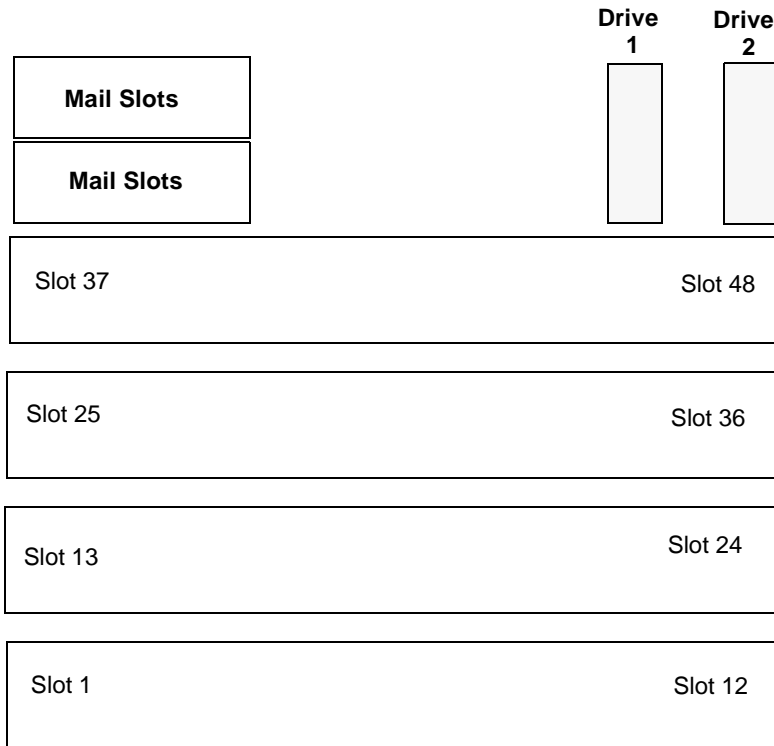


ADIC Scalar 218 (TLD)

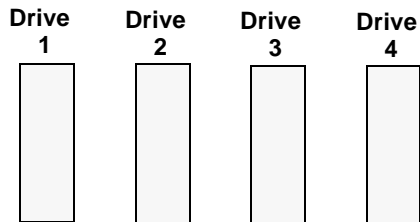


Note With a barcode reader installed, the slot physically labeled as slot 1 is disabled, and physical slots 2 through 18 become known in Media Manager as slots 1 through 17. With a virtual mailslot configured, physical slot 12 becomes the mailslot and physical slots 2-11 and 13-18 become known in Media Manager as slots 1-16.

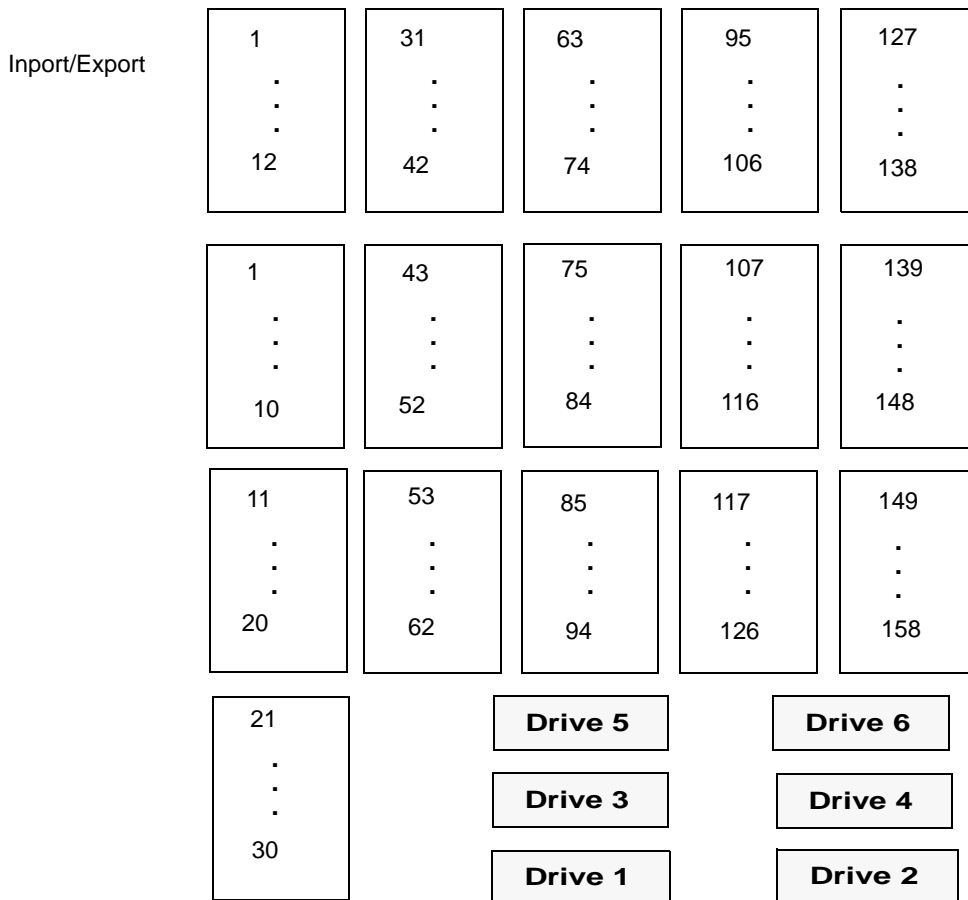
ADIC Scalar 448/458 (TLD)



Drives are installed right to left, but are numbered left to right. With a four drive configuration, the drive numbering is as follows:



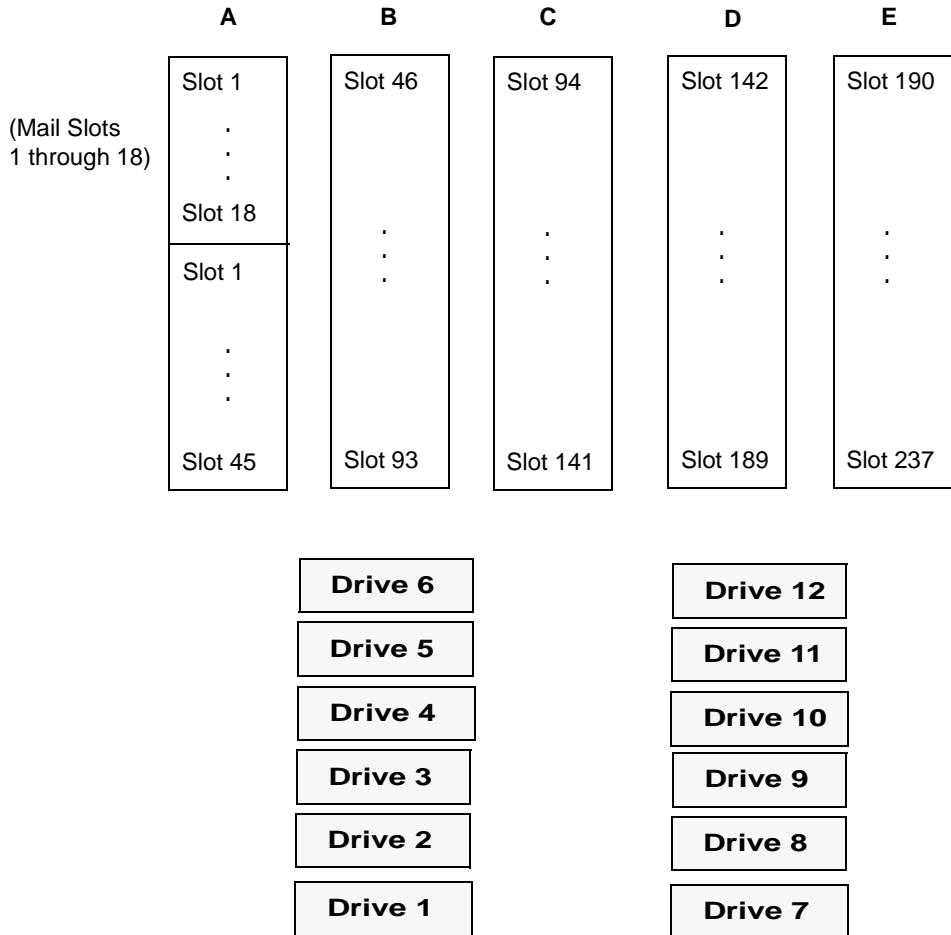
ADIC Scalar 1000 - DLT version (TLD)



ADIC Scalar 1000 - AIT/AIT2 (TL8)

The slot mapping shown below is for a 12 drive, 237 slot model. Other robot models may vary.

Note This view of the mail slots is looking through the glass door from the front.

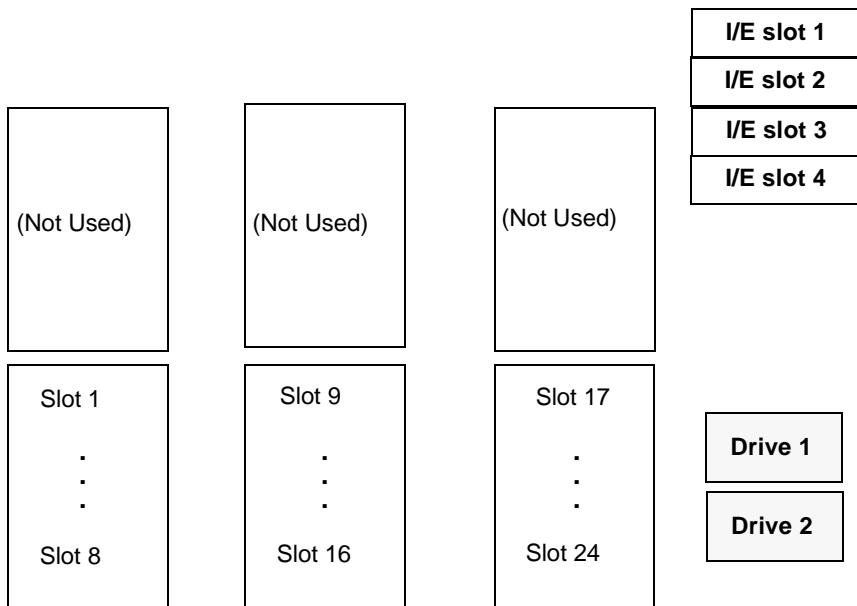


ADIC VLS DLT (TSD)



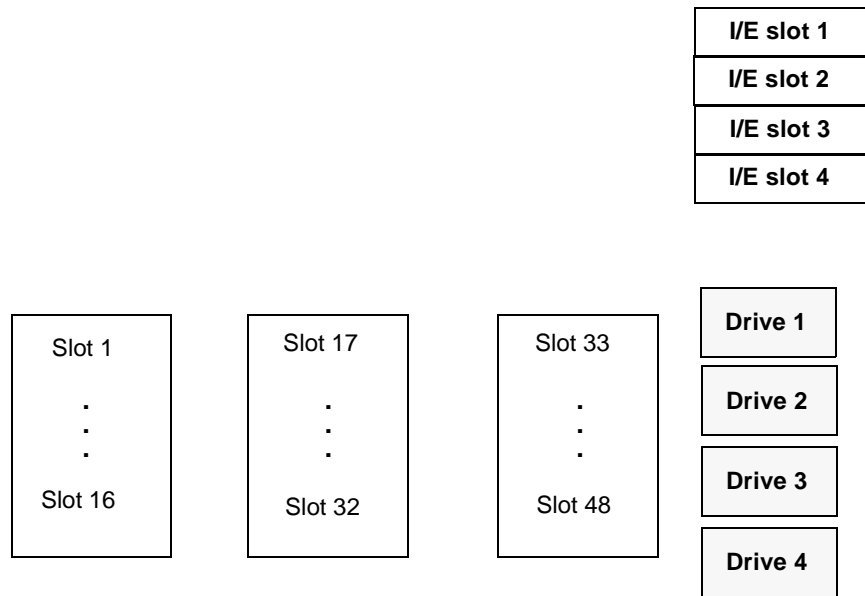
Drive 1 (the only drive)

ATL 2/28 DLT Library (TLD)

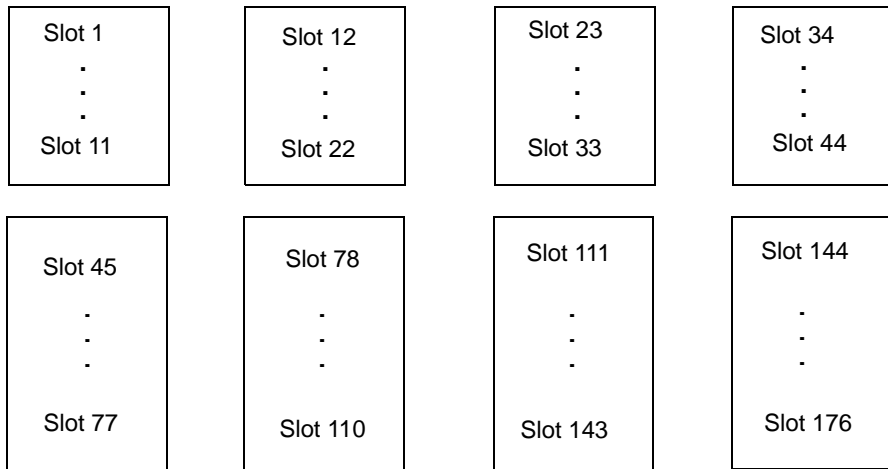
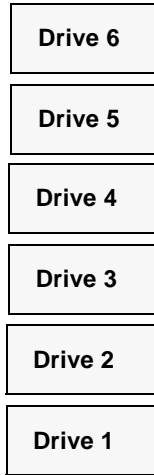


ATL 4/52 DLT Library
ATL 2/52 DLT Library
Compaq TL810
Compaq TL812
Compaq TL894
Sun StorEdge L1800 (TLD)

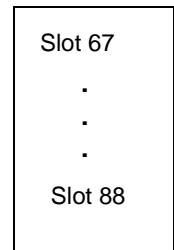
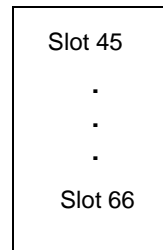
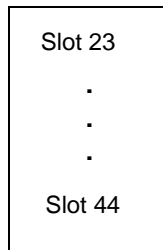
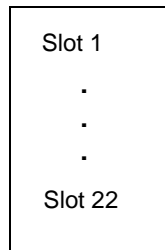
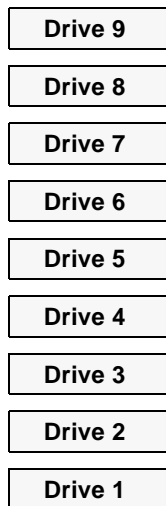
The slot mapping shown below represents the ATL 4/52. The ATL 2/52 is similar with only two drives.



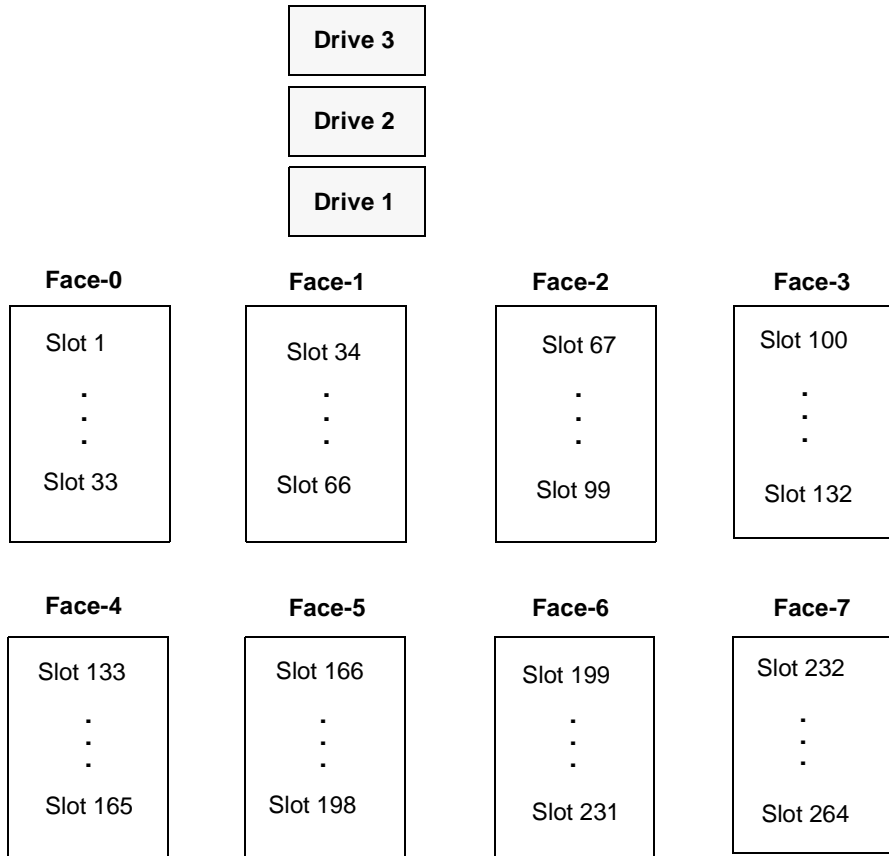
ATL 6/176 DLT Library Compaq TL826 Compaq TL896 (TLD)



ATL 9/88 DLT Library (TLD)



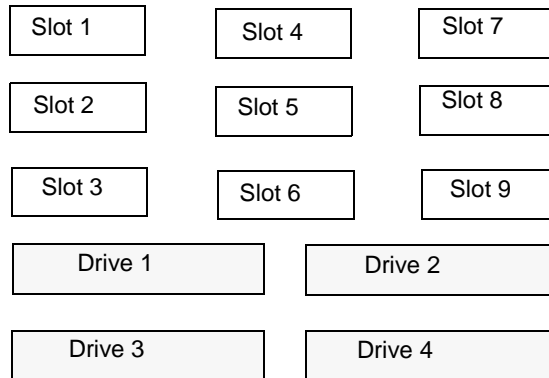
ATL 3/264 (2640) DLT Library
Compaq TL820
Compaq TL822
Compaq TL893 (TLD)



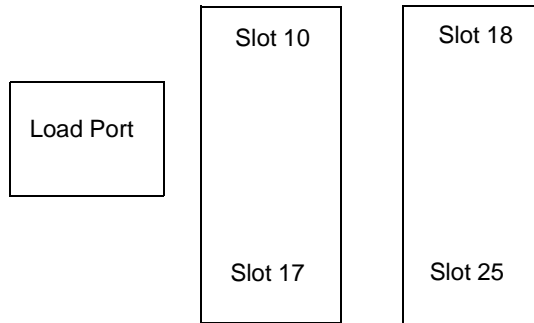
ATL P1000 Sun StorEdge L1000 (TLD)

The slot mapping shown below apply to libraries that are configured with 25 slots. Other configurations may vary.

Back (Inside view of back wall from the front)

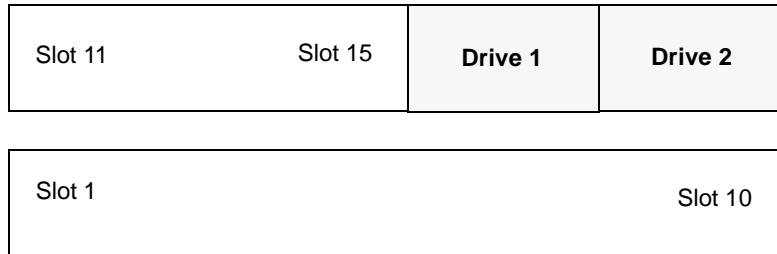


Front (Inside view of front wall from the back)

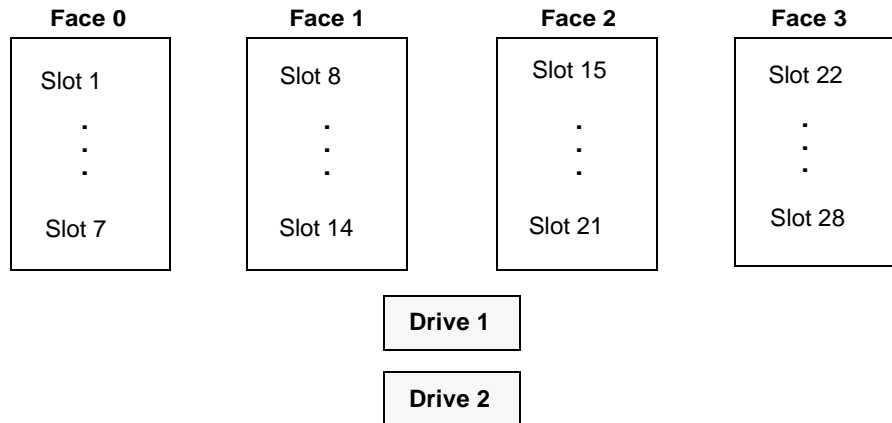


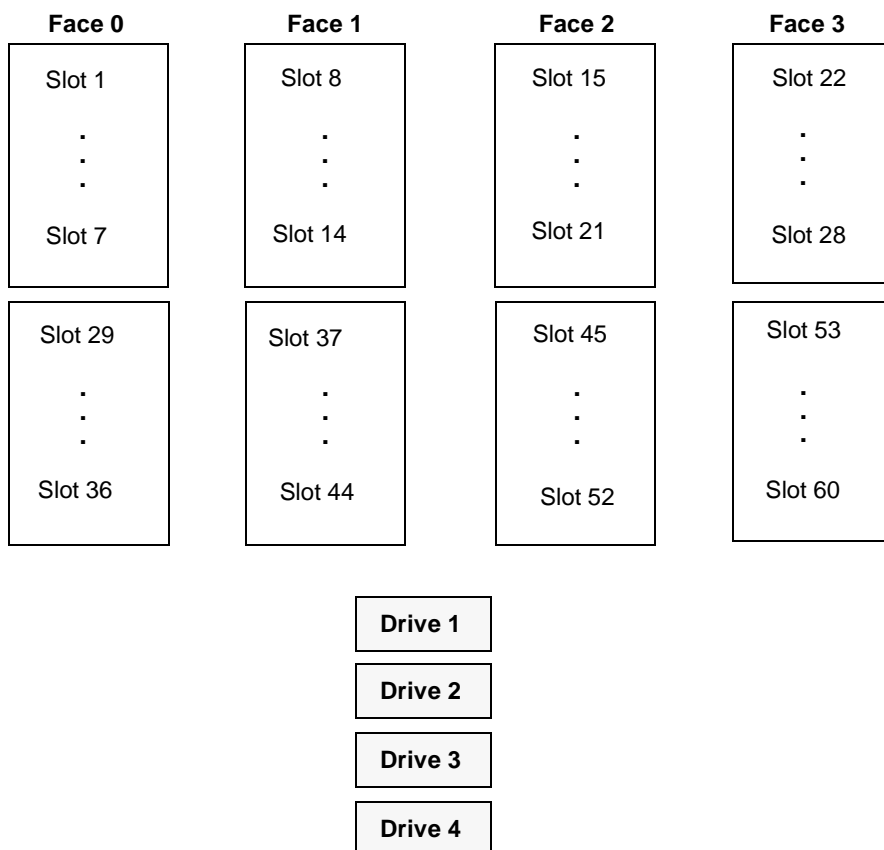
Breece Hill Q2.15 IBM 7337-305 IBM 3447-105 (TLD)

(Top View)



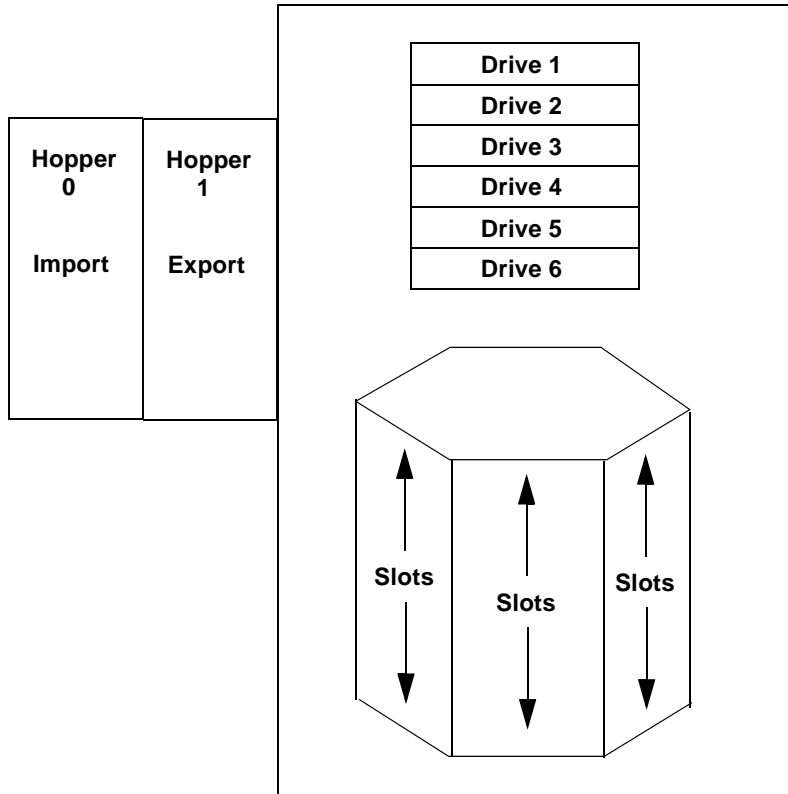
Breece Hill Q7 (TLD)



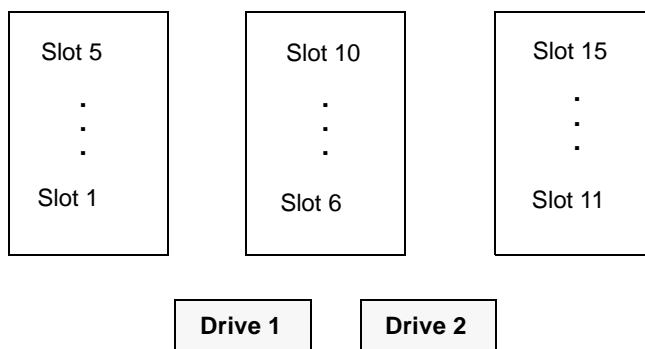
Breece Hill Q47 (TLD)

Breece Hill Q70
Breece Hill Q210
Breece Hill Q140 (TLD)

The slot figure shown below represents the Breece Hill Q210.



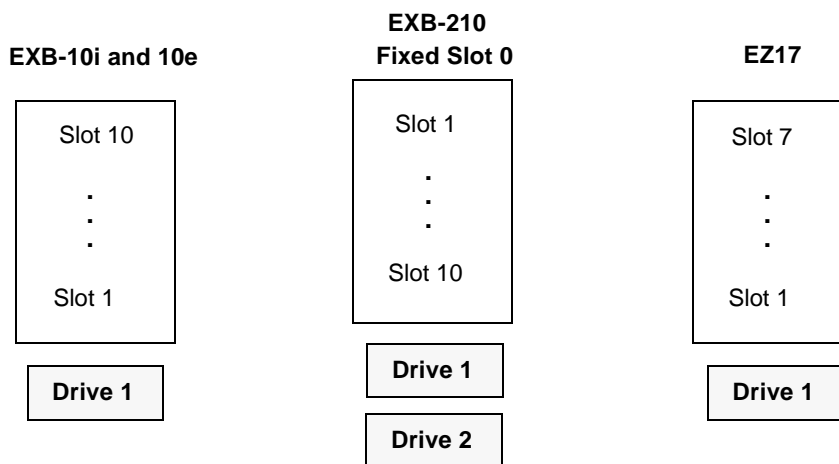
Compaq 35/70 (TLD)



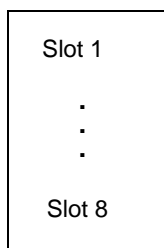
Exabyte 10i, 10e, 10h

Exabyte 210

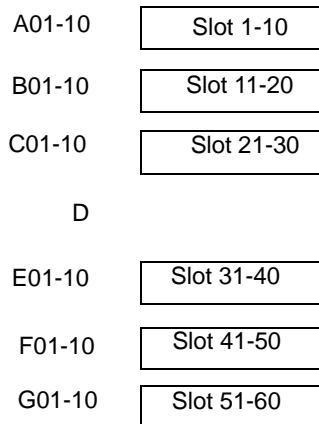
Exabyte EZ17 (TS8)



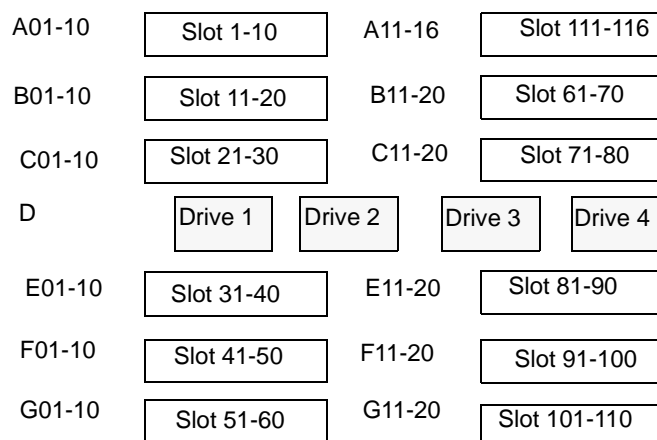
Exabyte 18D (TLD)



Exabyte 60 (TL8)

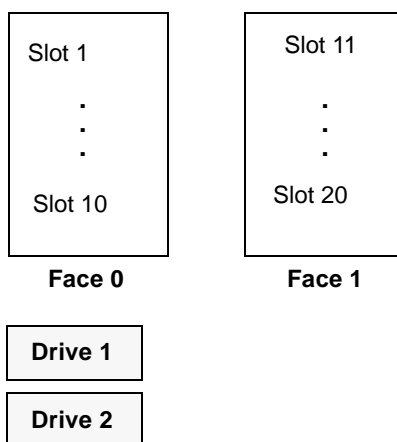


Exabyte 120 (TL8)

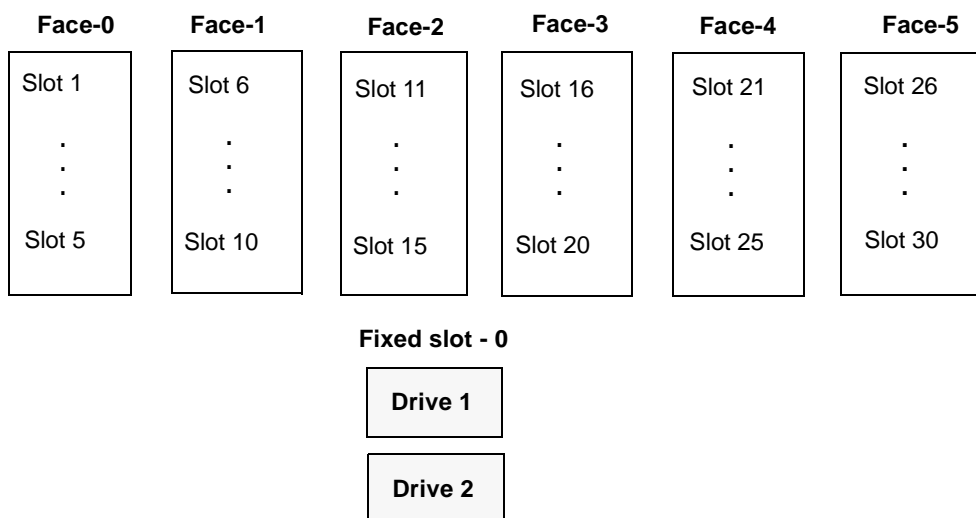


Exabyte 220 ADIC Scalar AIT 220 Sun StorEdge L400 (TL8)

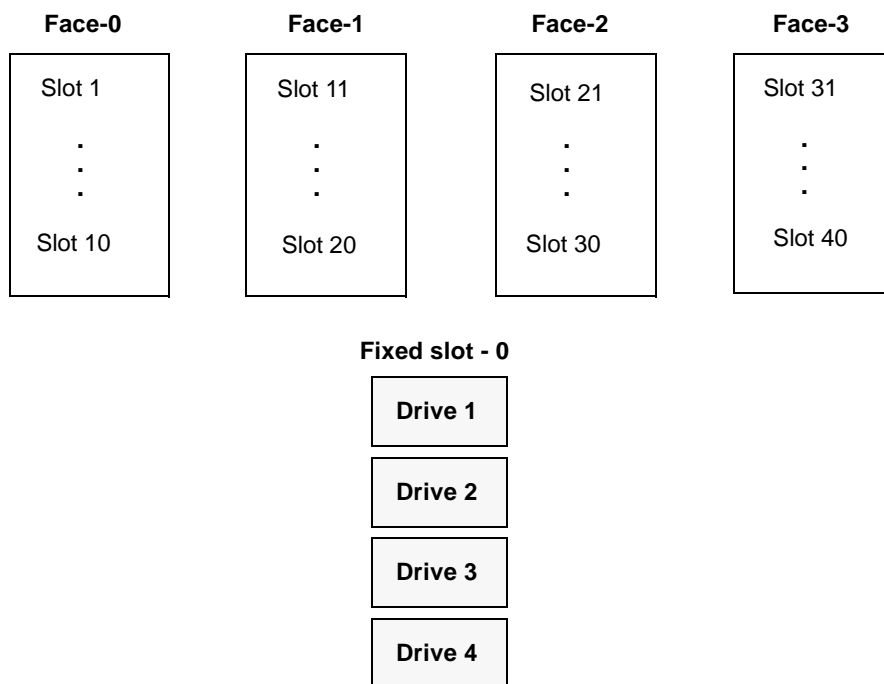
Fixed Slot 0



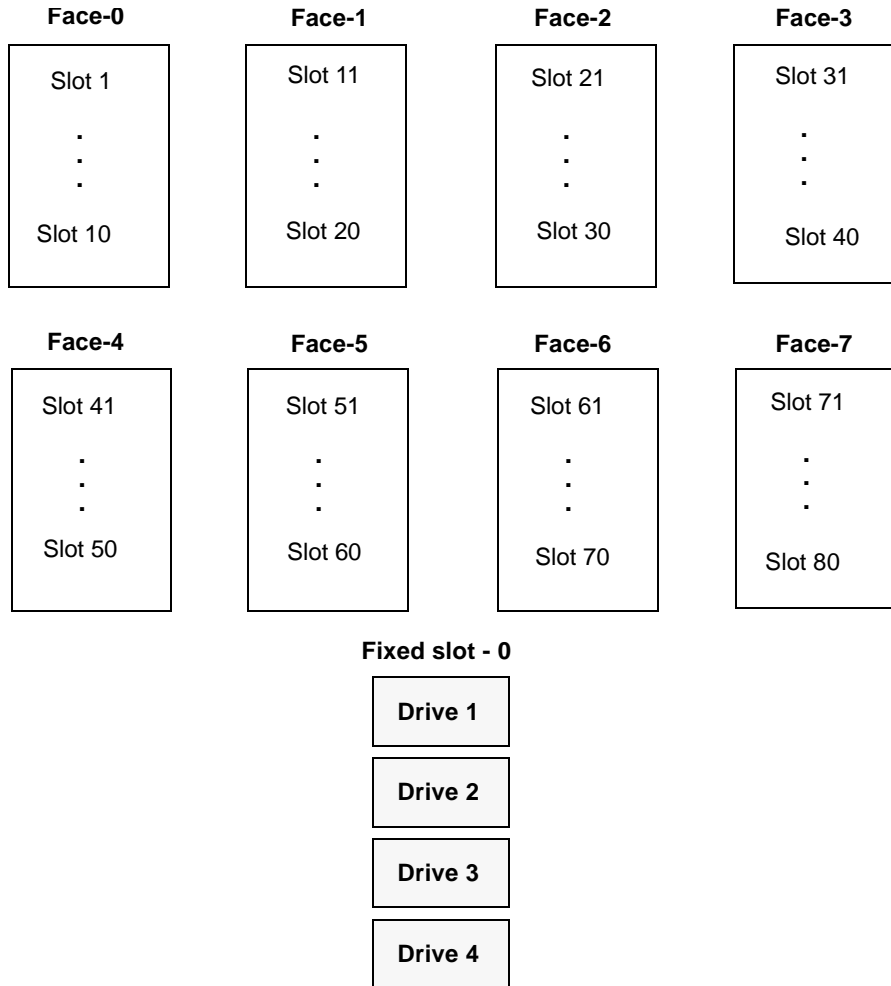
Exabyte 230D (TLD)



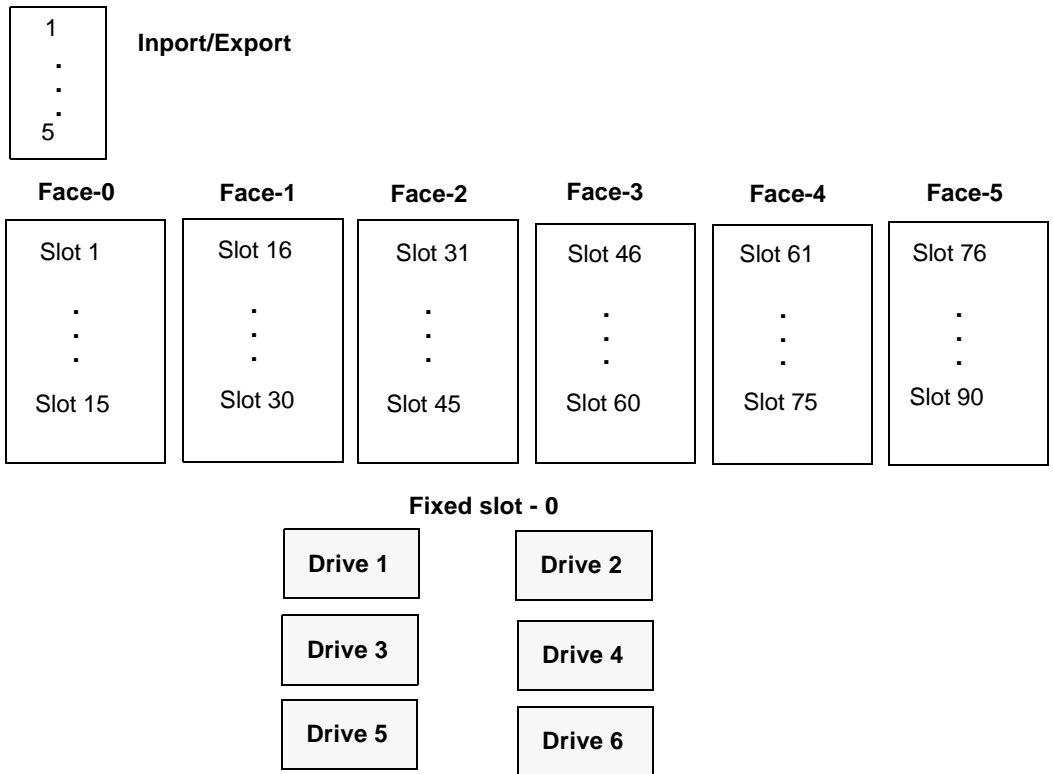
Exabyte 440 (TL8)



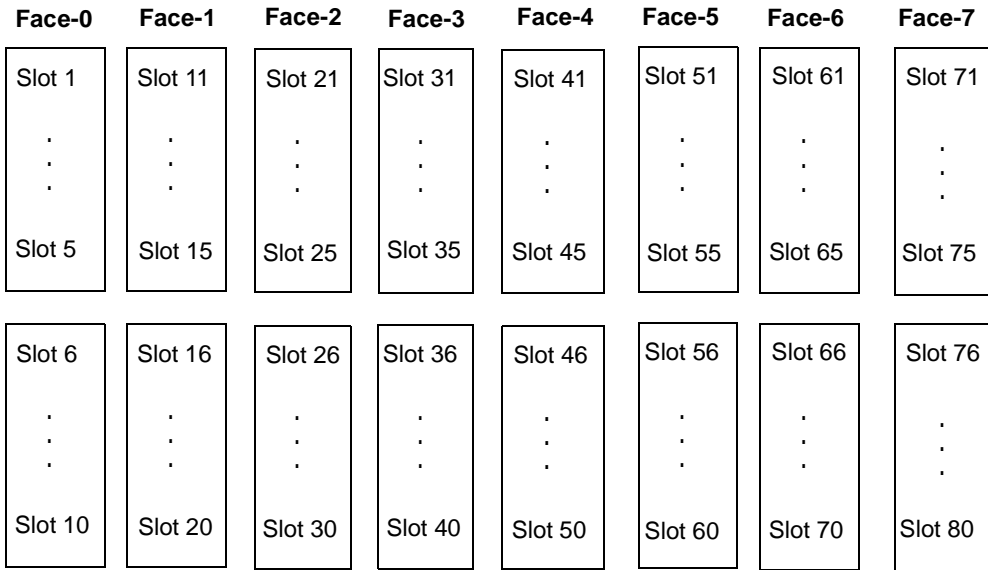
Exabyte 480 ADIC Scalar AIT 480 (TL8)



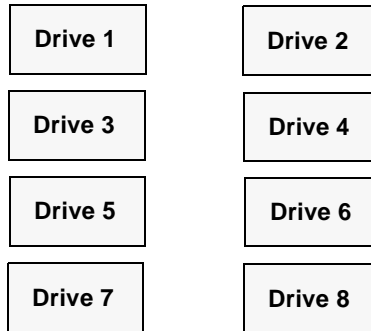
Exabyte 690D (TLD)



Exabyte X80 (TL8)



Fixed slot - 0



Exabyte X200 (TL8)

Face-0	Face-1	Face-2	Face-3	Face-4	Face-5	Face-6	Face-7
Slot 1 ⋮ Slot 6	Slot 31 ⋮ Slot 36	Slot 61 ⋮ Slot 66	Slot 91 ⋮ Slot 96	Slot 121 ⋮ Slot 126	Slot 151 ⋮ Slot 156	Slot 181 ⋮ Slot 186	Slot 211 ⋮ Slot 216
Slot 7 ⋮ Slot 12	Slot 37 ⋮ Slot 42	Slot 67 ⋮ Slot 72	Slot 97 ⋮ Slot 102	Slot 127 ⋮ Slot 132	Slot 157 ⋮ Slot 162	Slot 187 ⋮ Slot 192	Slot 217 ⋮ Slot 222
Slot 13 ⋮ Slot 18	Slot 43 ⋮ Slot 48	Slot 73 ⋮ Slot 78	Slot 103 ⋮ Slot 108	Slot 133 ⋮ Slot 138	Slot 163 ⋮ Slot 168	Slot 193 ⋮ Slot 198	Slot 223 ⋮ Slot 228
Slot 19 ⋮ Slot 24	Slot 49 ⋮ Slot 54	Slot 79 ⋮ Slot 84	Slot 109 ⋮ Slot 114	Slot 139 ⋮ Slot 144	Slot 169 ⋮ Slot 174	Slot 199 ⋮ Slot 204	Slot 229 ⋮ Slot 234
Slot 25 ⋮ Slot 30	Slot 55 ⋮ Slot 60	Slot 85 ⋮ Slot 90	Slot 115 ⋮ Slot 120	Slot 145 ⋮ Slot 150	Slot 175 ⋮ Slot 180	Slot 205 ⋮ Slot 210	Slot 235 ⋮ Slot 240

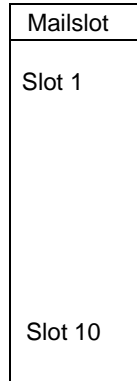
Fixed slot - 0

Drive 1	Drive 2
Drive 3	Drive 4
Drive 5	Drive 6
Drive 7	Drive 8
Drive 9	Drive 10



IBM 3590 B11 IBM 3590 E11 (TSH)

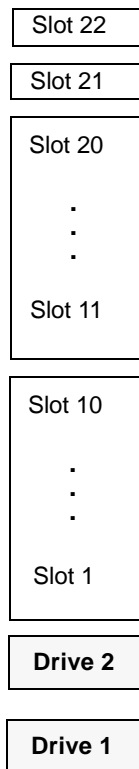
Note Supported only on UNIX Media Manager hosts.



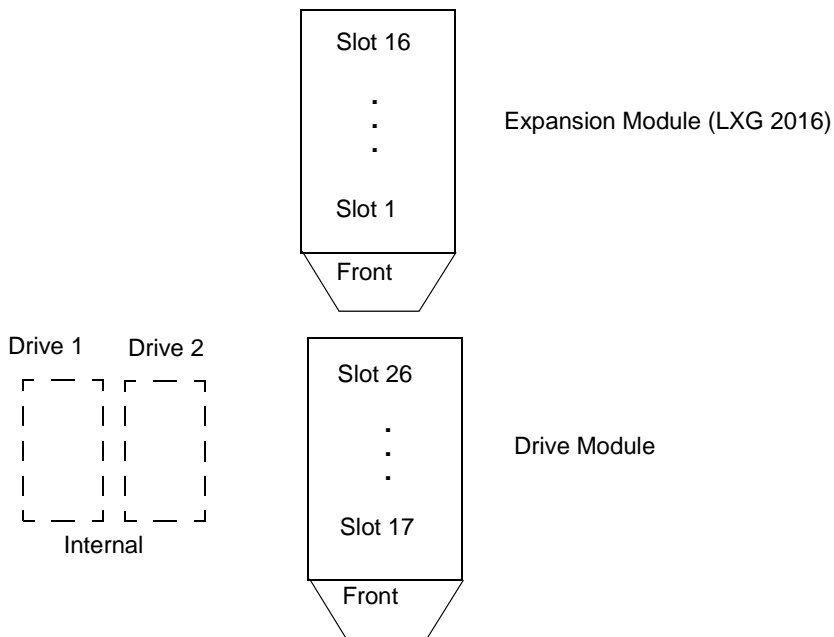
(One drive inside)

IBM 7331 (TL8)

Note Supported only on UNIX Media Manager hosts.

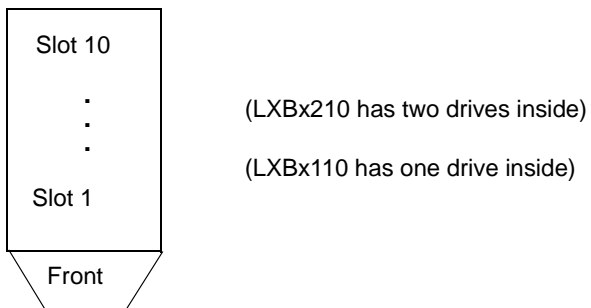


Overland Data DLT Library Xpress (TLD)

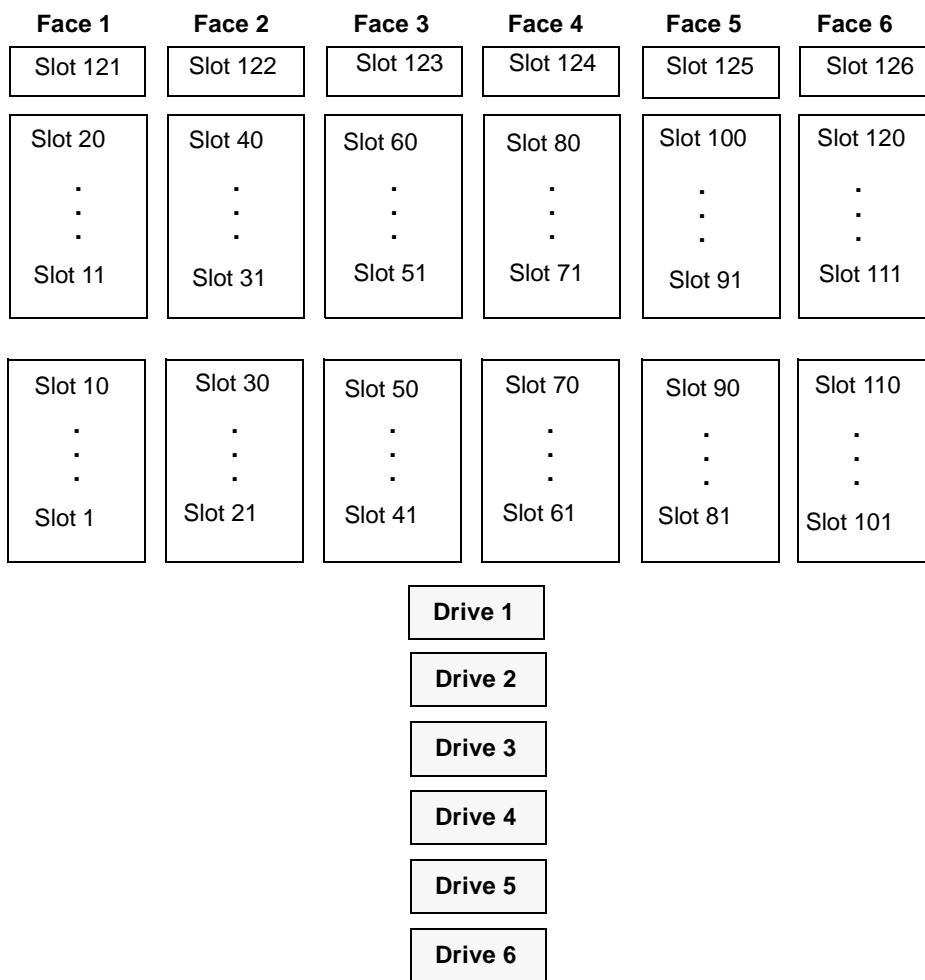


Overland Data LxBx110
Overland Data LxBx210
Compaq TL891
Compaq TL892 (TLD)

(Tape Holder)

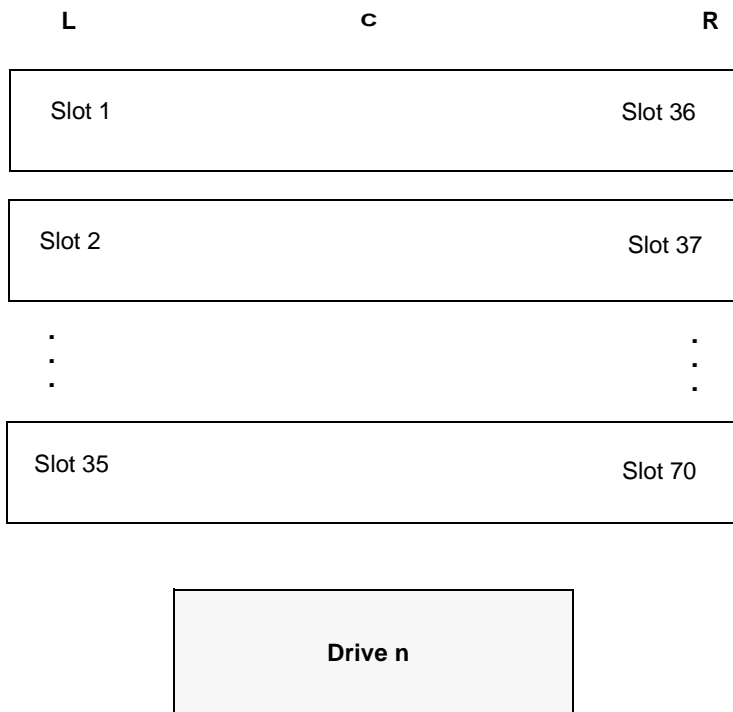


Qualstar 46120 (TL8)



Sony DMS (TLD)

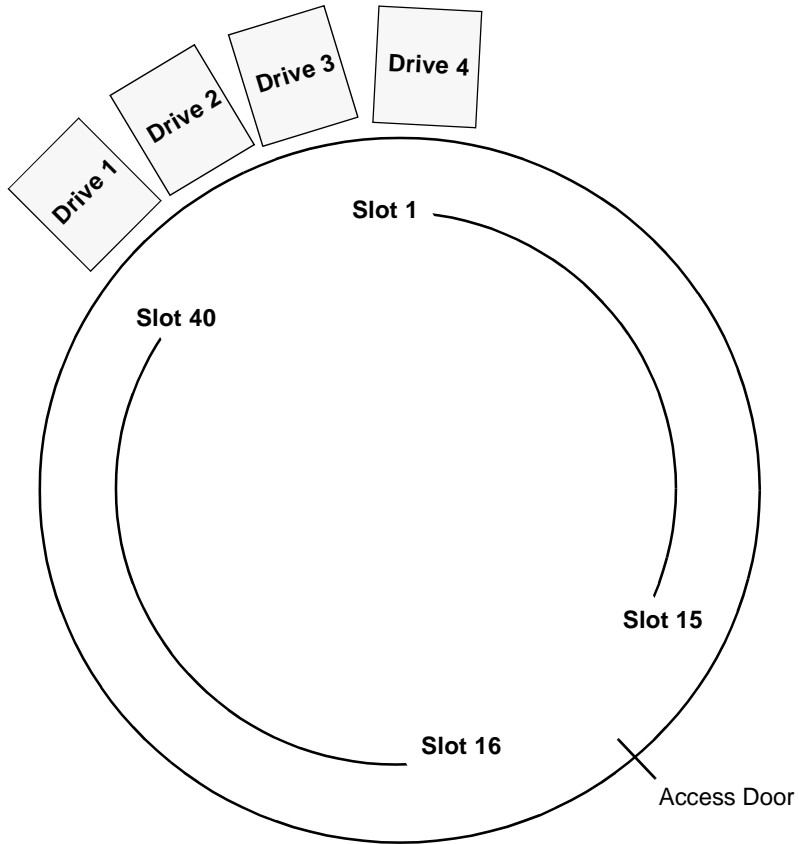
This slot diagram is for the Sony DMS-B35 with one drive configured. Other models differ.



Note Some cassettes requires two slots. For example, if a large cassette is in slot 1, slot 36 is unusable.

Spectra Logic 9000/20 Spectra Logic 9000/40 (TL8)

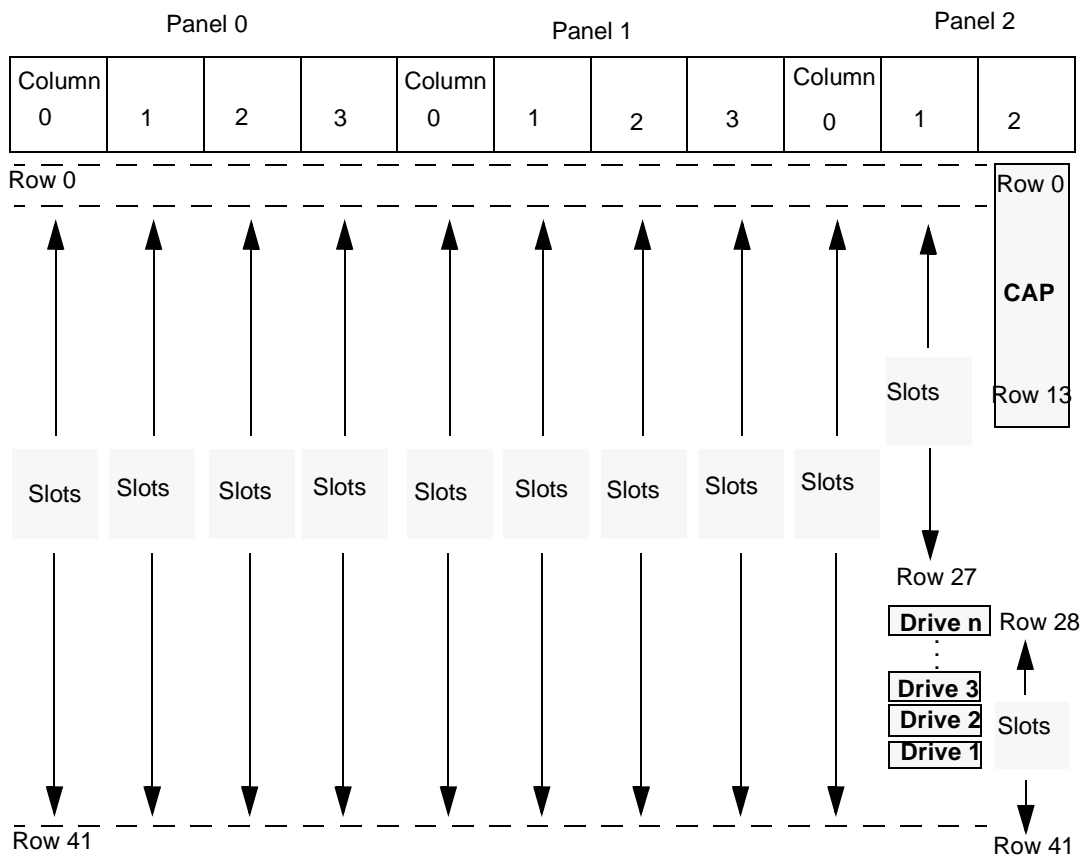
The slot figure shown below represents the 9000/40. The 9000/20 is similar with fewer slots.



STK 9710 STK 9740 HP SureStore 10/588 (A4845A) (TLD)

Drive and cell capacity are configurable. The following diagram is based on an STK 9710 configuration. Other STK library configurations may vary.

For example, STK 9740 libraries may number drives from the top down. Also 9740 drives may be installed in Panel 0, not in Panel 2.



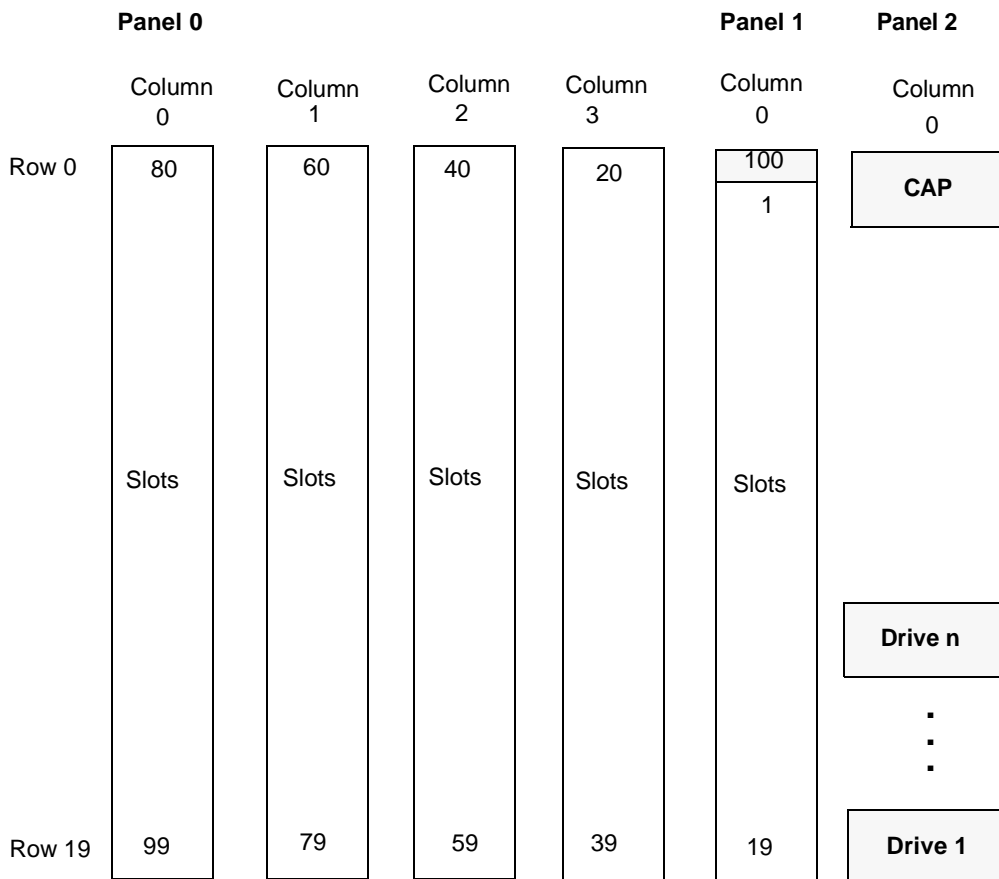
TLD slot numbering is different than STK Cell Element numbering. To obtain the TLD slot number, add 1 to the STK Cell Element. For example, STK Cell Element 224 corresponds to TLD slot 225. Cell elements are labeled on the inside walls of the robot. See your STK documentation for more information on Library Cell Mapping.

TLD drives are numbered from 1 to *n*. The drive number can be obtained by adding one to the STK drive index, which starts at zero.



For STK libraries under ACS control, enter the STK drive parameters (ACS, LSM, panel, and drive) directly into the device configuration.

STK 9714 HP SureStore E 6/100 (A4846A) (TLD)

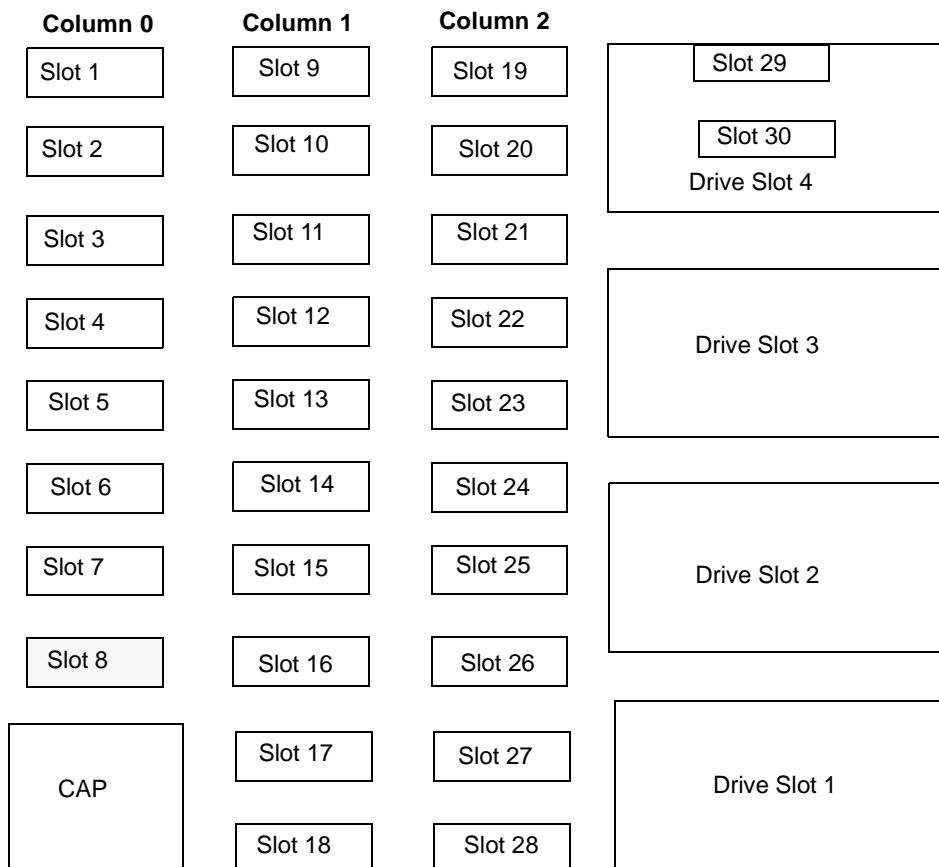


Note See your STK documentation for more information on 9714 Library Cell Mapping.




**STK 9730
STK 9738
DELL 130T
HP SureStore E 3/30 (A4853A) (TLD)**

If auto cleaning is set, slots 9 through 30 (or 9 through 28) become slots 8 through 29 (or 8 through 27). The slot labeled below as slot 8 becomes reserved for library use (for a cleaning tape). Other configurations may vary.



Drives	Cartridges	CAP
1-4	28 or 30	1

 Represents a cleaning cartridge cell if auto clean is enabled

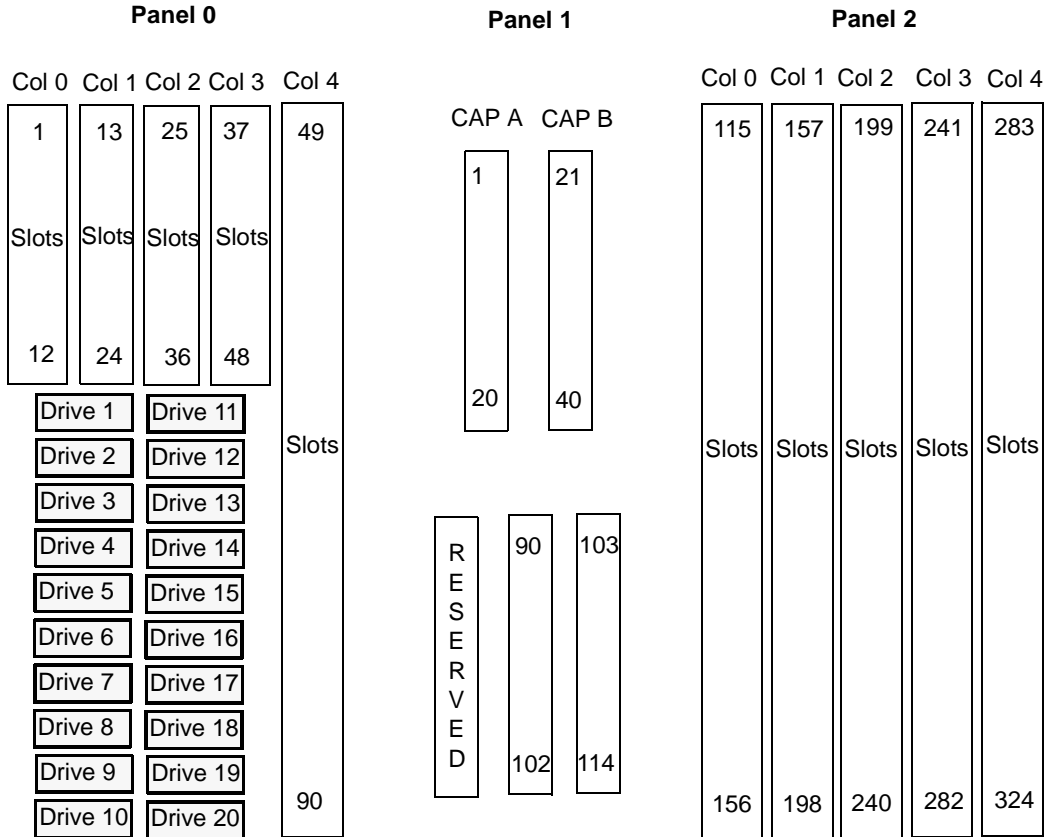
Note: If a drive is not installed in slot 3, additional storage cells can be



STK L700

Sun StorEdge L700

HP SureStore E 20/700 (A5597A) (TLD)





Automated Cartridge System (ACS)

F

Under Media Manager, robotic support for Automated Cartridge System robots is classified as (ACS) and these robots are considered API robots (the robot manages its own media). Manager operates differently with a StorageTek ACS robot (STK library or STK silo) than it does with most other robots. The main difference is that Media Manager does not have to keep slot location for the media, since this information is provided by the ACSLS component of an ACS robot.

Automated Cartridge System (ACS) can refer to any of the following:

- ◆ A type of Media Manager robotic control.
- ◆ The StorageTek (STK) system for robotic control.
- ◆ The highest level component under STK's Automated Cartridge System Library Software (ACSLs), which refers to a specific standalone robotic library or to multiple libraries connected with a media pass-through mechanism.

The topics in this appendix

- ◆ Explain how Media Manager handles media requests for an ACS robot.
- ◆ Cover configuration and operational differences to be aware of when using these robots.
- ◆ Explain various advanced ACS topics.



Figure 29 shows a typical Automated Cartridge System configuration. Table 66, explains the major components in that configuration.

Figure 29. Automated Cartridge System Example Configuration

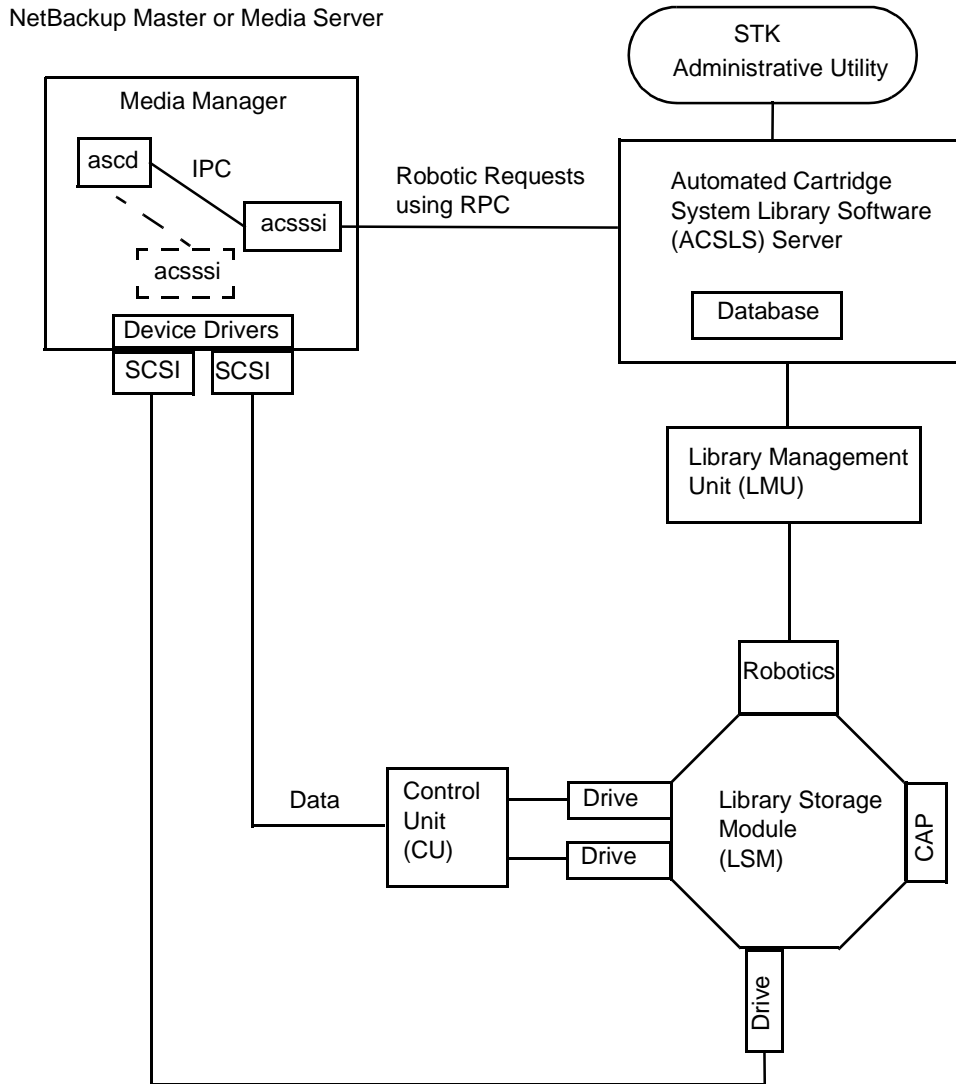


Table 66. Automated Cartridge System Components

Component	Description
Media Manager server	Acts as a client to the ACSLS server. The ACS robotic daemon (<code>acsd</code>) formulates requests for mounts, unmounts, and inventories. An API then routes these requests to the ACS Server System Interface (<code>acsssi</code>) using IPC communications. The requests are converted into RPC-based communications and sent to the ACSLS server.
Automated Cartridge System Library Software (ACSL) server	Receives robotic requests from Media Manager and uses the Library Management Unit to find and mount, or unmount the correct cartridge on requests involving media management. If desired, you can configure ACSLS and Media Manager on the same system.
Library Management Unit (LMU)	Provides the interface between the ACSLS server and the robot. A single LMU can control multiple ACS robots.
Library Storage Module (LSM)	Contains the robot, drives, and/or media.
Control Unit (CU)	The Media Manager server connects to the drives through its device drivers and a Control Unit (tape controller). The Control Unit may have an interface to multiple drives. Some Control Units also allow multiple hosts to share these drives. Most drives do not require a separate Control Unit. In these cases, the Media Manager server connects directly to the drives.
CAP	Cartridge Access Port.

Media Requests

A request for media in an ACS robot begins in the same manner as other media requests. The Media Manager device daemon, `ltid`, receives the request for a specific tape volume and drive density, and queries the Media Manager volume daemon, `vmd`, for the location of the media. `vmd` returns only the robot number and media type, since Media Manager does not manage slot information for media in an ACS robot.

`ltid` verifies that the requested volume's media type and density are compatible. Next, `ltid` checks its internal tables (these tables are based on the device databases) to determine if there is an available drive and sends a mount request to the ACS daemon, `acsd`.



`acsd` formulates the request and uses Internal Process Communications (IPC) to send it to the ACS Server System Interface (`acsssi`). The request is then converted into RPC-based communications and sent to the ACSLS server.

The ACSLS server locates the media and sends the necessary information to the Library Management Unit, which directs the robotics to mount the media in the drive. When `acsssi` (on the Media Manager server) receives a successful response from the ACSLS server, it returns the status to `acsd`.

`acsd` waits for `avrd` to scan the drive. When the drive is ready, `acsd` sends a message to `ltid` that completes the mount request and enables the requesting application (for example, NetBackup) to start sending data to the drive.

Configuring ACS Robotic Control

When adding an ACS robot, specify the robot number, robot type, and the host name of the ACSLS server. A device file is not used. The robotic control path is through the ACSLS server, and requests are handled by LibAttach (on Windows NT/2000 servers) or go over the network through RPC (on UNIX servers).

Also see Chapter 2 for information on configuring ACS robots.

Configuring ACS Drives

The ACS robot uses DLT or 1/2-inch cartridge tape drives, usually with a SCSI interface.

If an ACS robot contains more than one type of DLT or 1/2-inch cartridge tape drive, you can configure an alternate drive type (see Table 68). This means that there can be up to three DLT and three 1/2-inch cartridge drives in the same robot. In you are using alternate drive types, it is important that the volumes are configured using the same alternate media type. A total of six drive types is possible, as follows:

- ◆ DLT
- ◆ DLT2
- ◆ DLT3
- ◆ HCART
- ◆ HCART2
- ◆ HCART3

Use the same methods to create or identify device files for these drives as for other drives. If the drives are SCSI and connect to the robot through a control unit, you must specify the logical unit number (lun) for each drive, as they share the same SCSI ID. Refer to the



system documentation for your platform and operating system for details on configuring drives and logical unit numbers. The NetBackup Media Manager device configuration guide also has information on configuring device files.

Although device file configuration is essentially the same as for other robot controlled drives, you must include the following additional information when defining the drives to Media Manager as robotic:

- ◆ ACS number - The index, in ACSLS terms, that identifies the robot that has this drive.
- ◆ LSM number - The Library Storage Module that has this drive.
- ◆ Panel number - The panel where the drive is located.
- ◆ Drive number - The physical number of the drive, in ACSLS terms.

Also see Chapter 2 for information on configuring ACS drives.

Figure 30 shows how this additional information is used.



- ◆ Update the volume configuration as explained in “Updating the Volume Configuration for a Robot” on page 128.
- ◆ Add new volumes as explained in “Adding New Volumes” on page 99.

Since the ACS volume IDs and barcodes are the same, Media Manager also has the barcodes for the media. Note that you do not enter slot location because that information is managed by the Automated Cartridge System.

3. Use Show Contents and Compare Contents with Volume Configuration from the Media and Device Management Robot Inventory dialog to verify your configuration.

Removing ACS Volumes

If you remove media from an ACS robot, for example, through the Cartridge Access Port using the STK ACSLS administrative utility, you must logically move the media to standalone in the Media Manager volume database. To accomplish this, do one of the following:

- ◆ Update the volume configuration, as explained in “Updating the Volume Configuration for a Robot” on page 128.
- ◆ Move volumes, as explained in “Moving Volumes” on page 106.

If you do not, Media Manager will not be aware that the media is missing and may issue mount requests for it. The result is an error such as Misplaced Tape.

It does not matter, however, if you move media from one location to another within the robot. The ACSLS server will find the requested media if its database is current.

Robot Inventory Operations

Note An `INVENTORY_FILTER` entry is required in the `vm.conf` file if you are doing a robot inventory for an ACS robot and the ACSLS host is an STK Library Station.

Media Manager considers an ACS robot as one that supports barcodes. The following sequence explains what occurs when you select an operation that requires a robotic inventory for an ACS robot:



1. Media Manager requests volume information from the ACSLS server.
2. The server responds by providing a listing of the volume IDs and media types from its database. The following table is an example of the information that Media Manager receives:

Table 67. Example ACS Information

ACS Volume ID	ACS Media Type
001200	3480
001201	3480
066000	3490E
066003	3490E
100010	DLTIII
100011	DLTIV
100020	DLTIIIIXT
200201	DD3A
202201	DD3B
203201	DD3C
300210	DD3D
412840	STK1R
412999	STK1U
900100	EECART
900200	UNKNOWN

3. Media Manager translates the volume IDs into media IDs and barcodes. For example, in Table 67, volume ID 001200 becomes media ID 001200 and the barcode for that media ID is also 001200.
4. Media Manager maps the ACS media types into the Media Manager media types, as explained in step 5 or step 6.
5. If the operation does not require updating the volume configuration, Media Manager uses the media type defaults for ACS robots (Table 36 on page 152) when it creates its report. Figure 7 on page 123 is an example Show Robot Contents report.
6. If the operation requires updating the volume configuration, Media Manager selects the media type as follows:



- a. Media Manager tries to use mappings that you have set for this update by using the Change Media Mappings dialog box (click Media Type Mappings in the Update Options dialog box). See “To Change the Update Options” on page 143.
- b. If you have not set any mappings in this dialog box, Media Manager tries to use the settings in the `vm.conf` file (see “vm.conf Map Entries for ACS Robots” on page 423).
- c. If the `vm.conf` file does not exist or if it does not map the media type, Media Manager uses the default for ACS robots (see Table 68).

Figure 12 on page 134 shows an example Update Volume Configuration report.

vm.conf Map Entries for ACS Robots

See “Media Manager Configuration File (vm.conf)” on page 302 for an overview of the `vm.conf` file.

The second column in Table 68 shows the defaults that Media Manager uses when assigning media types in ACS robots.

The third column shows the media types to which you can change the defaults by creating map entries in the media mappings dialog or the `vm.conf` file.

Table 68. Default and Allowable ACS Media Types

ACS Media Type	Default Media Manager Media Type	Allowable Media Types through Mappings
3480	HCART (1/2-inch cartridge)	HCART, HCART2, HCART3
3490E	HCART (1/2-inch cartridge)	HCART, HCART2, HCART3
DD3A	HCART2 (1/2-inch cartridge 2)	HCART, HCART2, HCART3
DD3B	HCART2 (1/2-inch cartridge 2)	HCART, HCART2, HCART3
DD3C	HCART2 (1/2-inch cartridge 2)	HCART, HCART2, HCART3
DD3D	HC2_CLN (1/2-inch cartridge cleaning tape 2)	HC_CLN, HC2_CLN, HC3_CLN
DLTIII	DLT (Digital Linear Tape)	DLT, DLT2, DLT3
DLTIIIXT	DLT (Digital Linear Tape)	DLT, DLT2, DLT3
DLTIV	DLT (Digital Linear Tape)	DLT, DLT2, DLT3
STK1R	HCART (1/2-inch cartridge)	HCART, HCART2, HCART3
STK1U	HC_CLN (1/2-inch cartridge cleaning tape)	HC_CLN, HC2_CLN, HC3_CLN



Table 68. Default and Allowable ACS Media Types

ACS Media Type	Default Media Manager Media Type	Allowable Media Types through Mappings
EECART	HCART (1/2-inch cartridge)	HCART, HCART2, HCART3
JLABEL	HCART (1/2-inch cartridge)	HCART, HCART2, HCART3
UNKNOWN ¹	HCART2 (1/2-inch cartridge 2)	HCART, HCART2, HCART3, HC_CLN, HC2_CLN, HC3_CLN, DLT, DLT2, DLT3, DLT_CLN, DLT2_CLN, DLT3_CLN

¹Unknown ACS media types map to HCART2.

If the defaults do not provide the desired mapping, you can change the defaults by creating a `/usr/opensv/volmgr/vm.conf` file and adding `ACS_mediatype` entries.

For example, the following `vm.conf` entry maps the ACS media type 3490E to the HCART2 media type:

```
ACS_3490E = HCART2
```

Without this entry, Media Manager assigns HCART to 3480 and 3490E ACS media types.

The following entry maps ACS DLTIV to the DLT2 media type:

```
ACS_DLTIV = DLT2
```

Without this entry, Media Manager assigns DLT to all ACS DLT media types, including DLTIV.

The third column in the table shows the media types that you can specify in `ACS_mediatype` entries. For example, you can specify

```
ACS_DD3A = HCART
```

But, you cannot specify either of the following:

```
ACS_DD3A = DLT
```

```
ACS_DD3A = HCART4
```

Advanced ACS Robot Topics

The following sections cover the following advanced topics:

- ◆ ACS Daemon (`acsd`)
- ◆ ACS Server System Interface (`acsssi`)
- ◆ ACS SSI Event Logger (`acsse`)
- ◆ ACS Robotic Test Utility (`acstest`)



- ◆ Making ACS Robotic Configuration Changes
- ◆ Multiple ACS Robots with One ACSLS Server
- ◆ Multiple ACS Robots and ACSLS Servers
- ◆ Robotic Inventory Filtering

ACS Daemon (`acsd`)

`acsd` provides robotic control for mounting and dismounting volumes, and requesting inventories of volumes in a robotic library that is under the control of ACSLS or Library Station. `acsd` interacts with and is started by `ltid`. You can also start `acsd` manually, if `ltid` is already running.

`acsd` requests SCSI tape unloads through the system's tape driver before using the ACS API to request tape dismounts. This matches other types of Media Manager robotic control, and accommodates configurations involving SCSI multiplexors. Loaded tapes are not forcibly ejected when a dismount operation occurs.

When `acsd` is started, it starts `acsssi` and `acssel`. One copy of `acsssi` is started for each ACSLS Host that appears in the Media Manager device configuration for a given server.

See “ACS Server System Interface (`acsssi`)” on page 425 and “ACS SSI Event Logger (`acssel`)” on page 427 for information about these processes.

ACS Server System Interface (`acsssi`)

`acsssi` is the server system interface (SSI) for a particular ACSLS Host. All RPC communications from `acsd` or the ACS robotic test utility intended for the ACSLS or Library Station server are handled by `acsssi`.

One copy of `acsssi` must be running for each unique ACSLS host that is configured on a Media Manager server. `acsd` tries to start copies of `acsssi` for each host, but these `acsssi` processes fail during initialization if an `acsssi` process for a particular ACSLS host is already running.

In normal operations, `acsssi` should be started to run in the background. Log messages for `acsssi` are sent to `acssel`. `acssel` should be started before `acsssi`. See “ACS SSI Event Logger (`acssel`)” on page 427 for more information.

The socket name (IP port) used by `acsssi` can be specified in any of the following ways:

- ◆ On the command line, when starting `acsssi`.
- ◆ Using an environment variable (`ACS_SSI_SOCKET`).
- ◆ Through the default value.



Note If you configure `acsssi` to use a non-default socket name, the ACS daemon and ACS test utility also must be configured to use the same socket name. If this is not done, successful IPC communications cannot be established.

The ACSLS host name is passed to `acsssi` using the environment variable `CSI_HOSTNAME`.

`acsssi` is based on the SSI provided by STK and supports features, such as use of environment variables to affect most aspects of operational behavior. See “Optional Environment Variables” on page 427, for a list of environment variables that are supported.

Using the `ACS_SSI_SOCKET` Environment Variable

By default, `acsssi` listens on unique, consecutive socket names starting at 13741. To specify socket names on a ACSLS host basis, you can add a configuration entry in `vm.conf`.

Use the following format:

```
ACS_SSI_SOCKET = ACSLS_host socket_name
```

For example,

```
ACS_SSI_SOCKET = einstein 13750
```

Starting `acsssi` Manually

Note This is not the recommended method to start `acsssi`.

1. Start the event logger, `acssel`.
2. Start `acsssi`.

The usage format is `acsssi socket_name`. The `CSI_HOSTNAME` environment variable is required.

The following is a Bourne shell example:

```
CSI_HOSTNAME = einstein
export CSI_HOSTNAME
/usr/opensv/volmgr/bin/acsssi 13741 &
```

Optional Environment Variables

If you want individual `acsssi` processes to operate differently, you can set environment variables before the `acsssi` processes are started manually or from a custom-designed script.

The following are the optional environment variables:

`SSI_HOSTNAME` - Specifies the host where ACSLS/LibStation RPC return packets are routed for ACS network communications. By default, the local host name is used.

`CSI_RETRY_TIMEOUT` - Set this to a small positive integer. The default is 2 seconds.

`CSI_RETRY_TRIES` - Set this to a small positive integer. The default is 5 retries.

`CSI_CONNECT_AGETIME` - Set this in the range of 600-31536000 seconds. The default is 172800 seconds.

ACS SSI Event Logger (`acsse1`)

`acsse1` is modeled after the `mini_el` event logger provided by StorageTek, so its functional model differs slightly from other robotic test tools provided with Media Manager.

If ACS robots have been configured, the event logger is automatically started by `acsd`. Event messages are logged to the file, `/usr/openv/volmgr/debug/acsssi/event.log`.

Note `acsse1` should be running for optimum ACS SSI performance, since `acsssi` tries to connect on the event logger's socket for its message logging. If `acsssi` cannot connect to `acsse1`, ACSLS request processing is delayed. This leads to retries and error recovery situations. VERITAS recommends that `acsse1` be kept running for best results.

`acsse1` can be started automatically or manually, but only stopped using the `kill` command (such as is done in the NetBackup `bp.kill_all` utility).

The full path to the event logger is `/usr/openv/volmgr/bin/acsse1`. The usage format is:

```
acsse1 [-d] -s socket_name
```

where

`-d` Will display debug messages (by default, there are no debug messages).

`socket_name` is the socket name (or IP port) to listen on for messages.



Using `acsssel` with a Different Socket Name

If there is no `ACS_SEL_SOCKET` entry in `vm.conf`, `acsssel` listens on socket name 13740 by default. This default can be changed using one of the following methods:

Modifying the Media Manager Configuration File

1. Edit `vm.conf` and add an `ACS_SEL_SOCKET` entry.

For example:

```
ACS_SEL_SOCKET = 13799
```

2. Use `/usr/opensv/netbackup/bin/goodies/bp.kill_all` to stop the `acsd`, `acsssi`, and `acsssel` processes. (This script stops all NetBackup and Media Manager processes.)
3. Restart the NetBackup/Media Manager daemons.

```
/usr/opensv/volmgr/bin/ltd
```

```
/usr/opensv/netbackup/bin/initbprd
```

Using Environment Variables

This method assumes there is one ACS robot configured and the SSI default socket name has not been changed with an `ACS_SEL_SOCKET` entry in `vm.conf`.

1. Use `/usr/opensv/netbackup/bin/goodies/bp.kill_all` to stop the `acsd`, `acsssi`, and `acsssel` processes. (This script stops all NetBackup and Media Manager processes.)
2. Set the desired socket name in an environment variable and export it.

```
ACS_SEL_SOCKET = 13799
```

```
export ACS_SEL_SOCKET
```

Note `acsssel` also has a command line option to specify the socket name. However, since the ACS Server System Interface (`acsssi`) needs to know the event logger socket name, setting an environment variable is preferred.

3. Start the event logger in the background.

```
/usr/opensv/volmgr/bin/acsssel &
```

4. Set the ACSLS Host name for `acsssi`, in an environment variable.

```
CSI_HOSTNAME = einstein
export CSI_HOSTNAME
```

5. Start `acsssi`.

```
/usr/opensv/volmgr/bin/acsssi 13741 &
```

6. If desired, start `acstest` using `robtest` or by using the following command line:

```
/usr/opensv/volmgr/bin/acstest -r einstein -s 13741
```

Note If you request SCSI unloads, you must also specify drive paths on the `acstest` command line (see “ACS Robotic Test Utility (`acstest`)” on page 429). This is done automatically by `robtest`, if ACS drives have been configured.

7. Start `ltid`, which starts `acsd`. You can use the `-v` option for verbose message output.

```
/usr/opensv/volmgr/bin/ltid
```

During initialization, `acsd` obtains the SSI Event Logger socket name from `vm.conf` and sets `ACS_SEL_SOCKET` in the environment, before starting `acsse1`. If `acsssi` is started manually, it has to use (listen on) the same SSI socket that `acsd` is using to send data.

ACS Robotic Test Utility (`acstest`)

`acstest` allows you to verify ACS communications and provides a remote system administrative interface to an ACS robot. It can also be used to query, mount, unload, and dismount volumes. In addition, `acstest` allows you to define, delete, and populate ACSLS scratch pools.

This utility does not support STK CAP-related commands (such as, `enter` or `eject`). If you need these commands, you can use the STK ACSLS administrative interface. If ACS drives have been added to the device configuration, the recommended interface to `acstest` is through the `robtest` utility.

`acstest` depends on `acsssi` being started successfully. You can use the system command, `netstat -a`, to verify there is a process listening on the SSI socket. `acstest` attempts to communicate with ACSLS using `acsssi` and connects on an existing socket.

`acstest` should not be used while `acsd` is servicing requests. Communication problems may occur if the ACS daemon and `acstest` are making ACS requests at the same time.

The usage format follows. You can pass the socket name on the command line. Otherwise, the default socket name (13741) is used.

```
acstest -r ACSLS_host [-s socket_name]
[-d drive_path ACS, LSM, panel, drive] ... [-C sub_cmd]
```



The following example assumes that `acsssi` has been started using socket name 13741:

```
/usr/openv/volmgr/bin/acstest -r einstein -s 13741
```

Making ACS Robotic Configuration Changes

After making any ACS robotic configuration changes, you should follow the correct steps so that `acsssi` can successfully communicate with `acsd`, `acstest`, and the ACSLS or STK Library Station.

Any `acsssi` processes must be killed after your changes are made and before the Media Manager device daemon, `ltid`, is restarted. Also in order for the `acstest` test utility to function, `acsssi` for the selected robot must be running.

The easiest way to do this is to

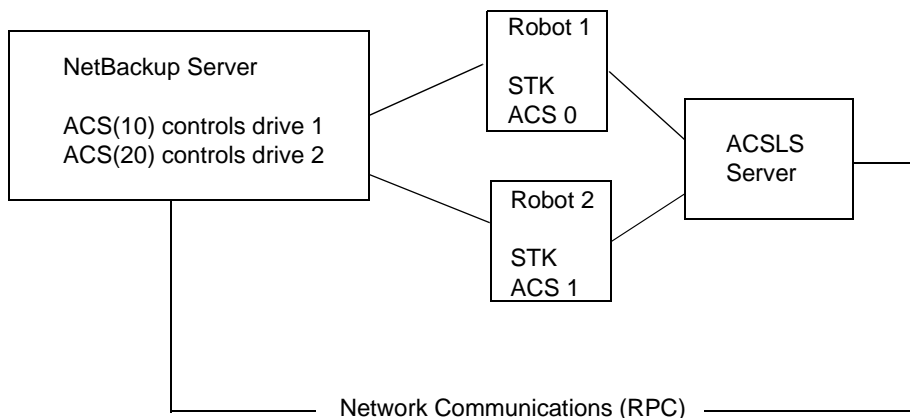
1. Make your configuration changes.
2. Use `bp.kill_all` to stop all running processes.
3. Restart all processes.

```
/usr/openv/volmgr/bin/ltid
```

```
/usr/openv/netbackup/bin/initbprd
```

Multiple ACS Robots with One ACSLS Server

NetBackup supports configurations where a NetBackup server is connected to drives in multiple ACS robots and these robots are controlled from a single ACSLS server. See the following example:



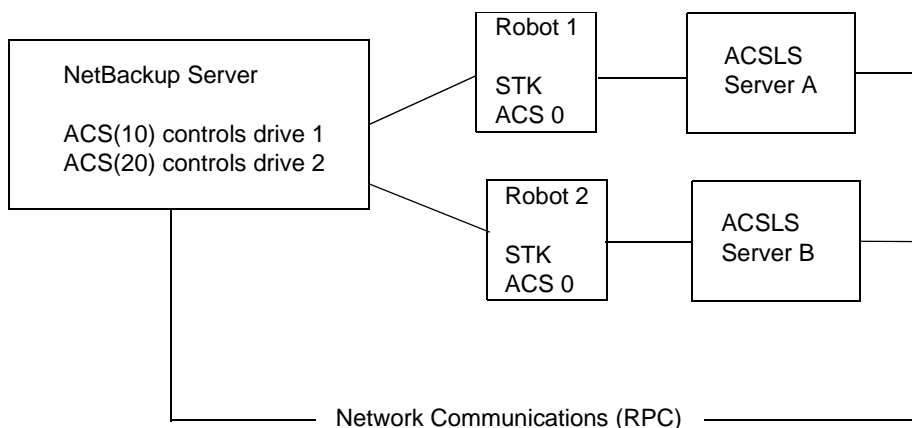
Inventory requests for a robot will include those volumes configured on the ACSLS server which are resident to the ACS robot (ACS 0 or ACS 1) that is designated in the drive address.

In the example, assume that drive 1 has an STK address (ACS, LSM, panel, drive) of 0,0,1,1 in the Media Manager device configuration and is under control of robot number 10 (ACS(10)). If any other drives configured under robot number 10 have a different ACS drive address (for example, 1,0,1,0) it is considered an invalid configuration.

Configurations consisting of multiple LSMs in a single ACS robot are supported, if a pass-through port exists.

Multiple ACS Robots and ACSLS Servers

NetBackup supports configurations where a NetBackup server is connected to drives in multiple ACS robots and these robots are controlled from separate ACSLS servers. See the following example:



Inventory requests for a robot will include those volumes configured on the ACSLS server (in the example, Server A for Robot 1 and Server B for Robot 2) which are resident to the robot (ACS 0 for each) that is designated in the STK drive address.

In the example, assume drive 1 has an STK address (ACS, LSM, panel, drive) of 0,0,1,1 in the Media Manager device configuration and is under control of robot number 10 (ACS(10)). If any other drives configured under robot number 10 have a different ACS drive address (for example, 1,0,1,0) it is considered an invalid configuration.

Configurations consisting of multiple LSMs in a single ACS robot are supported, if a pass-through port exists.



Robotic Inventory Filtering

If your site has many volumes configured under ACSLS, but you only want NetBackup to use a subset of them, you may be able to use inventory filtering.

Note An `INVENTORY_FILTER` entry is required if you are doing a robot inventory for an ACS robot and the ACSLS host is an STK Library Station.

Partial inventory functionality for ACS is accomplished by creating an ACSLS scratch pool or set of scratch pools which NetBackup can use for backups, as in the following example:

1. Use the STK Administrative interface to create a scratch pool, ID 4, with 0 to 500 as the range for the number of volumes.

```
ACSSA> define pool 0 500 4
```

2. Use the STK Administrative interface to define the volumes in pool 4.

```
ACSSA> set scratch 4 600000-999999
```

3. On the Media Manager server where the inventory request will be initiated, add an `INVENTORY_FILTER` entry in the `vm.conf` file.

```
INVENTORY_FILTER = ACS robot_number BY_ACS_POOL  
acs_scratch_pool1 [acs_scratch_pool2 ...]
```

where

robot_number is the number of the robot as configured in Media Manager.

acs_scratch_pool1 is the scratch pool ID as configured in ACSLS.

acs_scratch_pool2 is a second scratch pool ID (up to 10 scratch pools are allowed).

The following entry causes ACS robot number 0 to query scratch volumes from STK pool IDs 4, 5, and 6.

```
INVENTORY_FILTER = ACS 0 BY_ACS_POOL 4 5 6
```

The list of volumes returned in an ACS partial inventory includes the volumes that currently exist in the ACS scratch pool. ACS library software moves volumes out of the scratch pool after they have been mounted.

Therefore, a partial inventory *also* includes those volumes in the Media Manager volume database which Media Manager can validate exist in the robotic library, whether or not the volumes are in the ACS scratch pool. This complete list of volumes that exist in the robotic library is returned to prevent losing track of previously mounted volumes.



IBM Automated Tape Library (ATL)

G

Media Manager provides support for robotics under control of the IBM Automated Tape Library (ATL), including the IBM Magstar 3494 Tape Library.

Under Media Manager, robotic support for ATL robots is classified as Tape Library Half-inch (TLH) and these robots are considered API robots (the robot manages its own media). Support for these devices is different than for other types of Media Manager robotic control. This appendix provides an overview of those differences.

The next two figures show two possible ATL configurations. Table 69 on page 436 explains the major components in these configurations.



Figure 31. Robotic Control Host Connects Directly to Robot

Media Manager Server

This server can be AIX, HP-UX, IRIX, Windows NT (Intel only), or Solaris; and also can be a NetBackup master or media server.

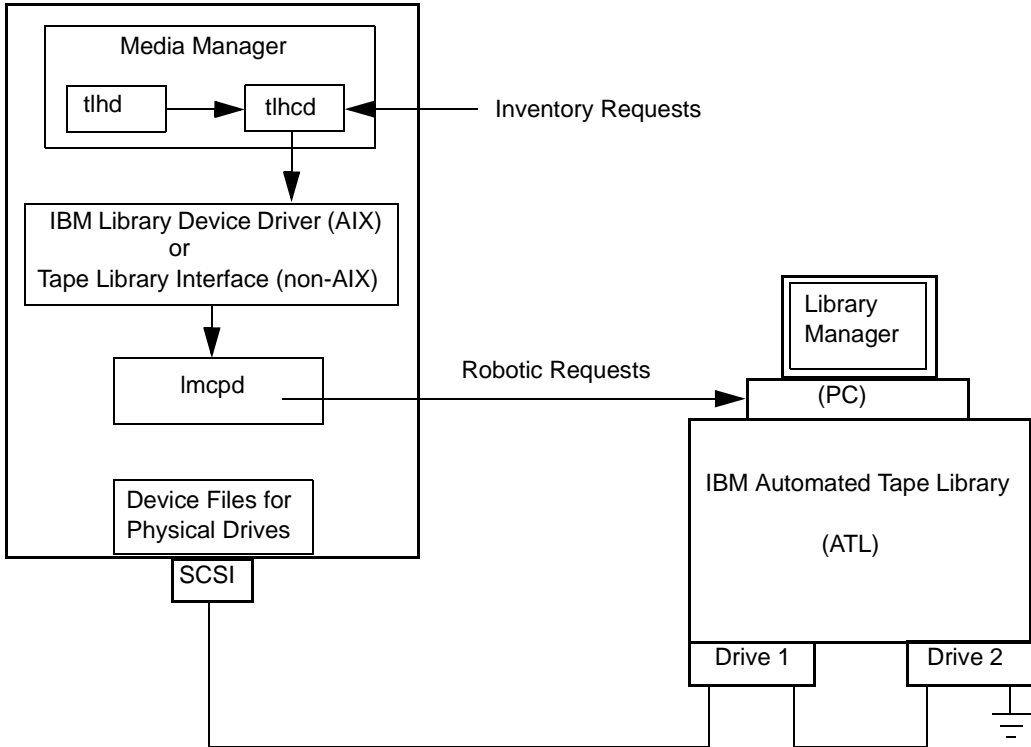


Figure 32. Robotic Control and Robot Connection on Separate Media Manager Hosts

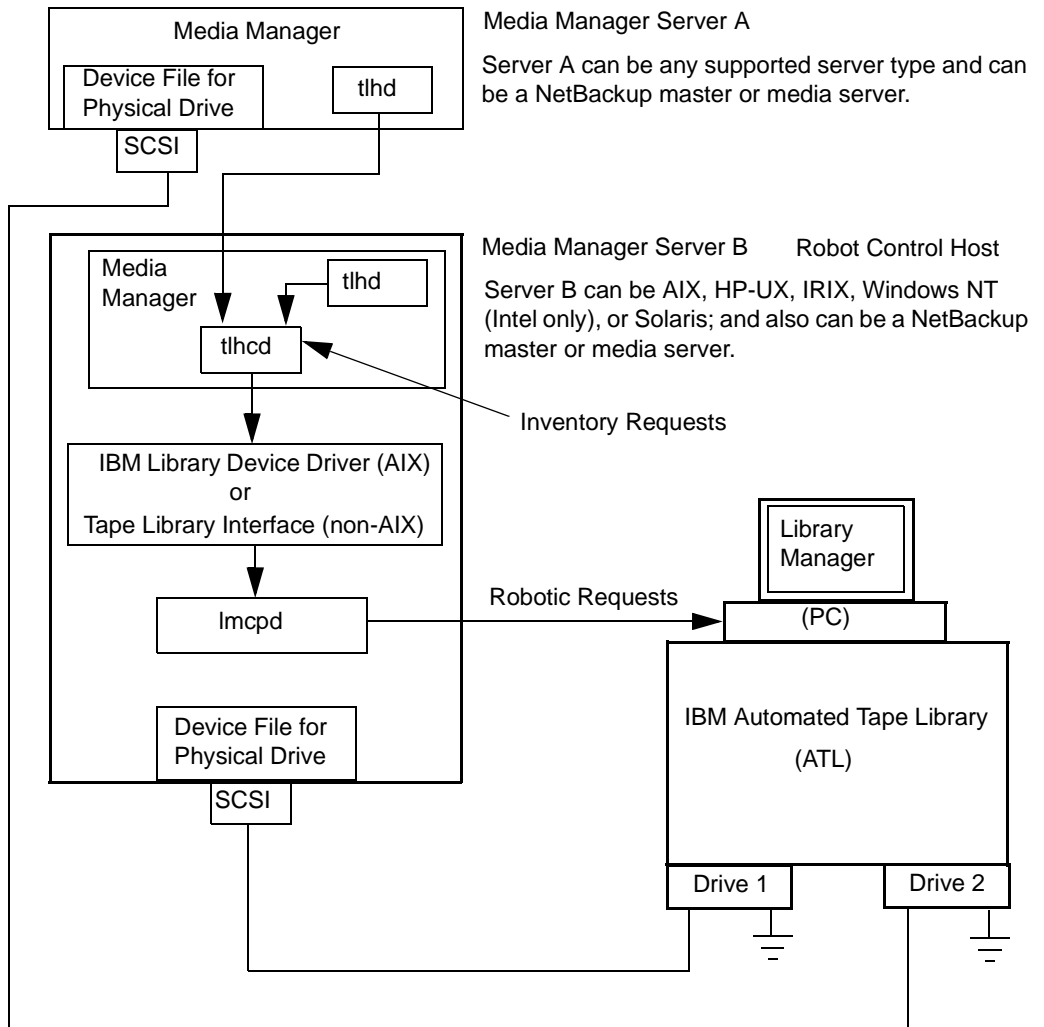


Table 69. Automated Tape Library Components

Component	Description
Media Manager Server	This host has Media Manager software and acts as a client to the ATL through the Library Manager Control Point daemon (<code>lmcpd</code>). Media Manager's device daemon, <code>ltid</code> , forwards mount and dismount requests to the Tape Library Half-inch daemon (<code>tlhd</code>).
Tape Library Half-inch daemon (<code>tlhd</code>)	This daemon resides on a Media Manager server and passes mount and dismount requests to the Tape Library Half-inch control daemon (<code>tlhcd</code>) on the robotic control host.
Tape Library Half-inch control daemon (<code>tlhcd</code>)	This daemon receives mount or dismount requests from <code>tlhd</code> , or robot inventory requests through an external socket interface. <code>tlhcd</code> must reside on the same system that communicates with <code>lmcpd</code> by using the IBM Library Device Driver interface (on AIX) or IBM Tape Library system calls (on non-AIX).
Library Manager Control Point daemon (<code>lmcpd</code>)	A component of IBM ATL support. This software handles all communications with the Library Manager and must be running on any system from which the Automatic Tape Library is directly controlled.
Library Manager	A component of IBM ATL support that provides control of the robotics and robotic library. This is a PC that is usually located within the robot cabinet.
IBM Automated Tape Library (ATL)	An IBM name representing a physical library under automated robotic control, including the IBM Magstar 3494 Tape Library.

Media Requests for a TLH Robot

A request for media in a TLH robot in an IBM Automated Tape Library begins in the same manner as other media requests. The Media Manager device daemon (`ltid`) receives the request and queries the Media Manager volume daemon (`vmd`) for the location of the media. The volume daemon, in this case, returns only the robot number and type for the TLH robot, since Media Manager does not manage slot information for media in a TLH robot.

`ltid` verifies that the type and density of the requested volume are compatible. Next, `ltid` checks its internal tables (these tables are based on the device databases) to determine if there is an available drive and sends a mount request to the TLH daemon (`tlhd`). This daemon passes the request to the TLH control daemon (`tlhcd`).



`tlhd` resides on the host that has the Automatic Tape Library. This can be the same host where `tlhd` is running or another host. If the Media Manager server is an AIX system, the control daemon communicates with the Library Manager Control Point daemon (`lmcpd`) by using the Library Device Driver interface. If the Media Manager server is a non-AIX system, such as Solaris, the control daemon communicates with `lmcpd` through Tape Library system calls from an application library interface.

`lmcpd` passes the information to the Library Manager, which then locates the media and directs the TLH robotics to mount the media in the drive. When the Media Manager host receives a success response from the Library Manager, it allows NetBackup to start sending data to the drive.

Configuring TLH Robotic Control

When adding Tape Library Half-inch robotic control to Media Manager, first ensure that the IBM Automated Tape Library (that is, the IBM 3494) has been physically connected and configured.

For information on initially configuring the IBM components of the Automated Tape Library, see the IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers Installation and User's Guide (or related publications). For information on platform support for TLH robotic control, see the NetBackup release notes.

Robotic Control on an AIX System

The following topics explain the steps for configuring robotic control when the Media Manager server is an AIX system.

Determine the Path to the LMCP Device File

Use the Library Manager Control Point (LMCP) device file as the robotic device file in Media Manager. This file is set up when the Automated Tape Library is first configured.

Use the `lsdev` command (or `smit`) to determine the LMCP device file.

The following example uses the `lsdev` command:

```
/etc/lsdev -C | grep "Library Management"
```

The following is the output from this command:

```
lmcp0          Available          LAN/TTY Library Management Control Point
```



Verify Library Communications

After you determine the path to the LMCP device file, verify library communications through the IBM-provided `mtlib` interface. Resolve all errors before attempting to configure IBM 3494 support in Media Manager.

To verify communications with a specific library, specify the Library Manager Control Point device file with the `mtlib` command. For example, if the LMCP device path is `/dev/lmcp0`, the following command verifies communication with the library:

```
/usr/bin/mtlib -l /dev/lmcp0 -qL
```

The following is the output from this command:

```
Library Data:
  state..... Automated Operational State
                    Dual Write Disabled
  input stations.....1
  output stations.....1
  input/output status.....ALL input stations empty
                    ALL output stations empty
  machine type.....3494
  sequence number.....11398
  number of cells.....141
  available cells.....129
  subsystems.....2
  convenience capacity.....30
  accessor config.....01
  accessor status.....Accessor available
                    Gripper 1 available
                    Gripper 2 available
                    Vision system operational
  comp avail status.....Primary library manager installed.
                    Primary library manager available.
                    Primary hard drive installed.
                    Primary hard drive available.
                    Convenience input station installed.
                    Convenience input station available.
                    Convenience output station installed.
                    Convenience output station available.
  avail 3490 cleaner cycles..0
  avail 3590 cleaner cycles..92
```

Configure the Robotic Device File

Configure the robotic path as explained in Chapter 2. When the configuration is complete you can view the robotic device information.



The following example uses `tpconfig -d` to view the robotic device information. In this example, the first two drives shown are standalone drives. The drive with drive index 31 is under TLH robotic control and the drive with drive index 78 is under TL4 control.

```
# /usr/openv/volmgr/bin/tpconfig -d
```

Index	DriveName	DrivePath	Type	Multihost	Status
*****	*****	*****	****	*****	*****
5	DRIVE0	/dev/rmt4.1	hcart	No	DOWN
13	DRIVE2	/dev/rmt8.1	hcart	No	DOWN
31	DRIVE1	/dev/rmt12.1	hcart	No	DOWN
	TLH(8) Definition	DRIVE=1			
78	DRIVE1	/dev/rmt11.1	4mm	No	UP
	TL4(77) Definition	DRIVE=1			

Currently defined robotics are:

```
TL4(77)    robotic path = /dev/ovpass0, volume database host = maui
TLH(8)    LMCP device path = /dev/lmcp0, volume database host = maui
Standalone drive volume database host = maui
```

In this example, note the following line:

```
TLH(8)    LMCP device path = /dev/lmcp0, volume database host = maui
```

Where `/dev/lmcp0` is the path to the robotic device file and `maui` is the volume database host for this robot.

Robotic Control on a Solaris System

The following topics explain the steps for configuring robotic control when the Media Manager server is a Solaris system.

Determine the Library Name

On a Solaris system, use the library name instead of the robotic device file when configuring in Media Manager. This name is set up when the Automated Tape Library is first configured (see your IBM system documentation). The library name is configured in the `/etc/ibmatl.conf` file and you determine the library name by viewing the file.

The following is an example entry in that file:

```
3494AH          176.123.154.141          ibmctl
```

Where:

- ◆ 3494AH is the library name.
- ◆ 176.123.154.141 is the IP address of the PC workstation that is running the Library Manager software.



- ◆ `ibmpc1` is the host name of the PC workstation that is running the Library Manager software.

Verify Library Communications

After you determine the library name, verify library communications through the IBM-provided `mtlib` interface. Resolve all errors before attempting to configure IBM 3494 (TLH) support in Media Manager.

To verify communications with a specific library, specify the library name with the `mtlib` command. For example, if the library name is `3494AH`, the following command verifies communications with the library:

```
/usr/bin/mtlib -l 3494AH -qL
```

The following is the output from this command:

```
Library Data:
state.....Automated Operational State
                Dual Write Disabled

input stations.....1
output stations.....1
input/output status.....ALL input stations empty
                ALL output stations empty

machine type.....3494
sequence number.....11398
number of cells.....141
available cells.....129
subsystems.....2
convenience capacity.....30
accessor config.....01
accessor status.....Accessor available
                Gripper 1 available
                Gripper 2 available
                Vision system operational

comp avail status..... Primary library manager installed.
                Primary library manager available.
                Primary hard drive installed.
                Primary hard drive available.
                Convenience input station installed.
                Convenience input station available.
                Convenience output station installed.
                Convenience output station available.

avail 3490 cleaner cycles..0
avail 3590 cleaner cycles..92
```



Configure the Robotic Device File

Configure the robotic path as explained in Chapter 2. When the configuration is complete you can view the robotic device information.

The following example uses `tpconfig -d` to view the robotic device information. This example has one TLH drive and one TLD drive.

```
/usr/openv/volmgr/bin/tpconfig -d
```

Index	DriveName	DrivePath	Type	Multihost	Status
6	DRIVE2 TLH(0) Definition	/dev/rmt/17cbn DRIVE=2	dlt	No	UP
55	DRIVE1 TLD(5) Definition	/dev/rmt/15cbn DRIVE=1	dlt	No	UP

Currently defined robotics are:

```
TLH(0)    library name = 3494AH, volume database host = grozer
TLD(5)    robotic path = /dev/sg/c2t0l0, volume database host =
                                                grozer
```

Standalone drive volume database host = grozer

In this example, note the following line:

```
TLH(0)    library name = 3494AH, volume database host = grozer
```

Where 3494AH is the library name and grozer is the volume database host for this robot.

Configuring Drives for TLH Robots

The TLH robot has half-inch cartridge tape drives, usually with a SCSI interface, and you use the same methods to create or identify device files for these drives as for other drives. Refer to the system documentation for your platform and operating system for details on physically adding drives to your robots. The Media Manager device configuration guide has information on configuring device files.

See Chapter 2 for instructions on adding drives to your Media Manager configuration.

Caution When adding drives to Media Manager, it is important to assign the correct robot drive number to each drive. If the robot drive number is incorrect, tape mounts or backups may fail.

Use the Media Manager TLH test utility to determine the mapping between the Media Manager drive designations and the TLH drive designations. The following example uses `tlhstest` and shows which drives in the robot are under Media Manager control:

```
/usr/openv/volmgr/bin/tlhstest -r /dev/lmcp0
```



The following is the output from `tlhtest` (the user entered the `drstat` command on the third line). You would use drive number 1 and 2 when adding these drives in Media Manager.

```
Opening /dev/lmcp0
Enter tlh commands (? returns help information)
drstat
Drive 1 information:
  drive number:          1
  device name:           003590B1A00
  device number:         0x156700
  device class:          0x10 - 3590
  device category:       0x0000
  mounted volser:        <none>
  mounted category:      0x0000
  device states:         Device installed in ATL.
                        Dev is available to ATL.
                        ACL is installed.

Drive 2 information:
  drive number:          2
  device name:           003590B1A01
  device number:         0x156600
  device class:          0x10 - 3590
  device category:       0x0000
  mounted volser:        <none>
  mounted category:      0x0000
  device states:         Device installed in ATL.
                        Dev is available to ATL.
                        ACL is installed.

QUERY DEVICE DATA complete
```

If the robotic control is configured on Solaris, by using the IBM Sun Automated Tape Library support, use the library name as configured in `/etc/ibmatl.conf` in place of the LMCP device path on the call to `tlhtest`.

Cleaning TLH Drives

The IBM ATL interface does not allow applications to request or configure drive cleaning. For this reason, you cannot assign cleaning tapes to a TLH robot in the Media Manager volume configuration. You must configure drive cleaning by using an IBM administrative interface.



Adding TLH Volumes

For TLH robots in an Automated Tape Library, the preferred method for adding media is as follows:

1. Add barcode labels and then insert the media into the robot using the access port.
The Library Manager reads barcodes and classifies the media by media type. A category is assigned to each volume. Some volume categories will restrict application access to certain volumes. Volume locations are tracked by the Library Manager.
2. Define the media to Media Manager by using the ATL volume IDs as media IDs. To accomplish this, do one of the following:
 - ◆ Update the volume configuration, as explained under “Updating the Volume Configuration for a Robot” on page 128.
 - ◆ Add new volumes, as explained under “Adding New Volumes” on page 99.Because the ATL volume IDs and barcodes are the same, Media Manager has the barcodes for the media. Notice that you do not enter slot location because that information is kept by the ATL software.
3. Use Show Contents and Compare Contents with Volume Configuration from the Media and Device Management Robot Inventory dialog to verify your configuration.

Removing Tapes from the Robot

1. Physically remove the media from the library using an IBM Library Manager interface or the `eject` command from the Media Manager utility, `tlhrest`.
2. Update the Media Manager volume database to indicate the new location of the media as being standalone. To accomplish this, do one of the following:
 - ◆ Update the volume configuration, as explained under “Updating the Volume Configuration for a Robot” on page 128.
 - ◆ Move volumes, as explained under “Moving Volumes” on page 106.

Otherwise, Media Manager is not aware that the media is missing and may issue mount requests for it. The result is an error such as “Misplaced Tape”.

It does not matter, however, if you physically move media from one location to another within the robot. The Automated Tape Library will find the media when Media Manager requests it.



Robot Inventory Operations

Media Manager considers a TLH robot as one that supports barcodes. The following sequence explains what occurs when you select an operation that requires a robotic inventory for a TLH robot:

1. Media Manager requests volume information from the Library Manager through the Library Manager Control Point daemon.
2. The Library Manager responds by providing a list of volume IDs and volume attributes from its database. Media Manager then filters out volume categories that cannot be used and displays a list of volumes obtained along with a translated version of the volume's media type. The media type is based upon the attributes that were returned.

The following table shows an example of the types of information that Media Manager receives:

TLH Volume ID	TLH Media Type
PFE011	3480
303123	3490E
CB5062	3590J

3. Media Manager translates the volume IDs into media IDs and barcodes. In the example table above, volume ID PFE011 becomes media ID PFE011 and the barcode for that media ID is also PFE011.
4. Media Manager maps the TLH media types into the Media Manager media types as explained in step 5 or step 6.
5. If this is an operation that does not require updating the volume configuration, Media Manager uses the media type defaults for TLH robots (Table 39 on page 153) when it creates its report.
6. If this is an operation that requires updating the volume configuration, Media Manager selects the media type as follows:



- a. Media Manager tries to use mappings that you have set for this update by using the Change Media Mappings dialog box (to access this dialog box, click Media Type Mappings in the Update Options dialog box). See “To Change the Update Options” on page 143.
- b. If you have not set any mappings in the dialog box, Media Manager tries to use the settings in the `vm.conf` file (see “vm.conf Map Entries For TLH Robots” on page 445).
- c. If the `vm.conf` file does not exist or it does not map the media type, Media Manager uses the default for TLH robots (see Table 70).

The Update Volume Configuration report for a TLH robot is similar to Figure 11 on page 133.

Robotic Inventory Filtering

If your site has many volumes configured, but you only want NetBackup to use a subset of them, you may be able to use inventory filtering.

The IBM Library Manager maintains the concept of a volume category, which can be used to classify volumes into pools, including pools by application.

On the Media Manager server where the inventory request will be initiated, you can add an `INVENTORY_FILTER` entry in the `vm.conf` file. The format for this entry follows:

```
INVENTORY_FILTER = robot_type robot_number filter_type value1 [ value2 . . . ]
```

where

robot_type is the robot type (TLH in upper case).

robot_number is the robot number.

filter_type is the keyword (BY_CATEGORY).

value1 is a filter value of type IBM category (if *filter_type* = BY_CATEGORY).

value2 is a second filter value (up to 10 filter values are allowed).

For example:

```
INVENTORY_FILTER = TLH 0 BY_CATEGORY 0xcdb0
```

vm.conf Map Entries For TLH Robots

See “Media Manager Configuration File (vm.conf)” on page 302 for an overview of the `vm.conf` file.



The second column in Table 70 shows the defaults that Media Manager uses when assigning media types in TLH robots. The third column shows the media types to which you can change the defaults by creating map entries in the `vm.conf` file.

Table 70. Default and Allowable TLH Media Types

TLH Media Type	Default Media Manager Media Type	Allowable Media Types Through Mappings
3480	HCART (1/2-inch cartridge)	HCART, HCART2
3490E	HCART (1/2-inch cartridge)	HCART, HCART2
3590J	HCART (1/2-inch cartridge)	HCART, HCART2
3590K	HCART (1/2-inch cartridge)	HCART, HCART2
UNKNOWN ¹	HCART2 (1/2-inch cartridge 2)	HCART, HCART2

¹ Used for unknown TLH media types and maps to HCART2.

If the defaults do not provide the desired mapping, you can change the defaults by creating a `vm.conf` file and adding `TLH_mediatype` entries.

For example, the following `vm.conf` entry maps the TLH media type 3490E to the HCART2 media type:

```
TLH_3490E = HCART2
```

Without this entry, Media Manager assigns HCART to TLH 3490E media types.

The third column in Table 70 shows the media types that Media Manager allows in `TLH_mediatype` entries. For example, you can specify

```
TLH_3590J = HCART2
```

But you cannot specify the following:

```
TLH_3590J = HCART3
```

ADIC Distributed AML Server (DAS)

Media Manager provides support for robotics under control of an ADIC Distributed AML Server (DAS), including those in the ADIC Automated Media Library (AML) family.

Under Media Manager, robotic support for DAS robots is classified as Tape Library Multimedia (TLM) and these robots are considered API robots (the robot manages its own media). Support for these devices is different than for other types of Media Manager robotic control and this appendix provides an overview of those differences.

The following figure shows a possible DAS configuration. Table 71 explains the major components in this sample configuration.

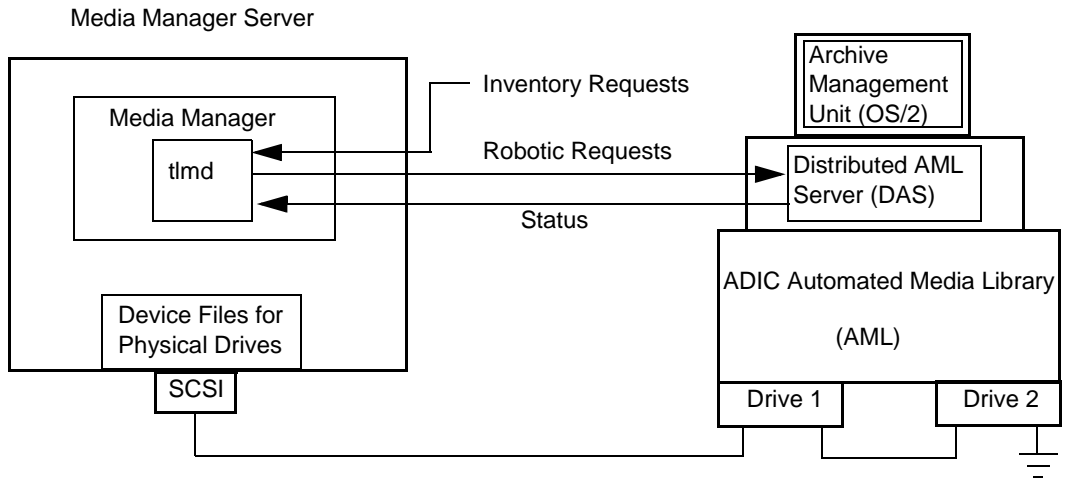


Table 71. Distributed AML Server Configuration

Media Manager Server	<p>A host that has Media Manager software and acts as a client to the Distributed AML Server. This client relationship pertains only to the Distributed AML Server client/server model and is not related in any way to the concept of NetBackup servers or clients.</p> <p>Media Manager's device daemon, <code>ltid</code>, forwards mount and dismount requests to the TLM daemon (<code>tlmd</code>).</p>
TLM daemon (<code>tlmd</code>)	<p>A Media Manager daemon that passes mount and dismount requests to the Distributed AML Server and handles return status. <code>tlmd</code> also receives and handles robot inventory requests.</p>
Archive Management Unit (AMU)	<p>A personal computer running IBM OS/2, usually located in or near the AML cabinet. The Distributed AML Server software runs on the AMU.</p>
Distributed AML Server (DAS)	<p>A client/server software product that resides in the Archive Management Unit (AMU) and provides shared access to the family of ADIC Automated Media Libraries (AMLs).</p> <p>As mentioned earlier, the Media Manager robotic daemon or TLM daemon acts as a client to the Distributed AML Server.</p>
Automated Media Library (AML)	<p>An ADIC multimedia robotic library.</p>

Media Requests Involving a TLM Robot

A request for media in a TLM robot begins in the same manner as other media requests. The Media Manager device daemon, `ltid`, receives the request and queries the Media Manager volume daemon, `vmd`, for the location of the media. The volume daemon, in this case, returns only the robot number and type TLM robot. The Media Manager volume database does not store slot information for media in a TLM robot.

`ltid` verifies that the type and density of the requested volume are compatible. Next, `ltid` checks its internal tables (these tables are based on the device databases) to determine if there is an available drive and sends a mount request to the TLM daemon, `tlmd`. This daemon forwards the request to the Distributed AML Server software (which resides in the Archive Management Unit).



The Distributed AML Server locates the media and directs the robotics to mount the media in the drive. When the Media Manager host receives a success response from the Distributed AML Server, it allows the requesting application (for example, NetBackup) to start sending data to the drive.

Note With TLM robotic control, the Media Manager server is actually a DAS client and sends robotic control requests to the DAS server. This relationship pertains only to the DAS client/server model and is not related in any way to the concept of NetBackup servers or clients.

Configuring TLM Robotic Control

When adding TLM robotic control to Media Manager, first ensure that the ADIC Automated Media Library has been physically connected and configured.

For information on initially configuring the ADIC components of the Automated Media Library, see the ADIC documentation. Pay close attention to the DAS component, which is described in the DAS installation and administration guide (an ADIC document).

For information on platform support for TLM robotic control, see the NetBackup release notes.

Allocating TLM Drives to Media Manager

Before configuring drives in Media Manager, you must configure the DAS server to allocate the desired drives to a specific DAS client (Media Manager server). The following are some topics pertaining this configuration.

Note See the ADIC documentation for detailed instructions on configuring the DAS server.

Configuring the DAS Client Name

The DAS client name for the Media Manager server is configured in the DAS configuration file on the DAS server. It is important that this name is the same as the one being used by Media Manager and that it is a valid DAS client name.

By default, the Media Manager server uses, as its DAS client name, the host name that it obtains from the `gethostname()` system call. This name is usually the one that you want to use for the DAS client name in the configuration on the DAS server.



However, if this name happens to be one that is invalid for DAS clients you will have to use another name. For example, DAS 1.30C1 has a restriction on having hyphens in DAS client names. If the Media Manager host name happens to have a name such as dolphin-2, the DAS server will not recognize it.

A similar problem exists if a Media Manager server's short host name is used as the DAS client name, but `gethostname()` returns the long host name.

In either of these instances, you can resolve the problem as follows:

1. Substitute a valid DAS client name on the DAS server. For example, use dolphin2.
2. Use this same name in a `DAS_CLIENT` entry in the `/usr/opensv/volmgr/vm.conf` file on the Media Manager server. These entries are of the form:

```
DAS_CLIENT = DASclientname
```

Where *DASclientname* is the name that you want Media Manager to use as its DAS client name. In this example, this entry would be

```
DAS_CLIENT = dolphin
```

3. Stop and start the `ltid` daemon to enable the TLM daemon to use the new DAS client name.
4. When the client names are correct, restart DAS with the latest version of its configuration file and then reallocate the drives to Media Manager.

Use DASADMIN to Allocate Drives

When the client names are correct, allocate the drives to the Media Manager server by using the `DASADMIN` administrative command. The DAS administrative drive allocation commands are not available from the Media Manager TLM test utility interface. You must use a DAS administrative interface on the DAS server or the DAS client administrative interface.

The following example shows how `DASADMIN` can be used to allocate drives, by using a DAS administrative interface:

```
LD_LIBRARY_PATH=/usr/local/aci/lib
export LD_LIBRARY_PATH
DAS_SERVER=dasos2box
export DAS_SERVER
DAS_CLIENT=grouse
export DAS_CLIENT
cd /usr/local/aci/admin
./dasadmin listd
```

The following is output from this command:



```

==>listd for client:  successful
    drive: DN1  amu drive: 01  st: UP  type: N  sysid:
        client: grouse  volser:   cleaning 0  clean_count: 17
    drive: DN2  amu drive: 02  st: UP  type: N  sysid:
        client: mouse   volser:   cleaning 0  clean_count: 4
./dasadmin allocd

```

The following is output from this command:

```

==> usage: dasadmin allocd drive-name UP|DOWN clientname

```

(First allocate it DOWN on one client, then UP on another as in the following:)

```

./dasadmin allocd DN2 DOWN mouse
./dasadmin allocd DN2 UP  grouse

```

Configuring Drives for TLM Robots

The TLM robot can have several different types of drives, usually with a SCSI interface, and you use the same methods to create device files for these drives as for other drives. If the drives are SCSI and connect to the robot through a control unit, you must specify the logical unit number (lun) for each drive, as they share the same SCSI ID.

Refer to the system documentation for your platform and operating system for details on configuring drives and logical unit numbers. The Media Manager device configuration guide also has information on configuring device files.

See Chapter 2 for instructions on how to add the drives to a Media Manager configuration.

Caution When adding drives to Media Manager, it is especially important to assign the correct robot drive number to each drive. If the robot drive number is incorrect, tape mounts or backups may fail.

Use the Media Manager TLM test utility to determine the mapping between the Media Manager drive designations and the DAS drive designations. The following example uses `tlmtest`:

```

/usr/opensv/volmgr/bin/tlmtest -r dasos2box

```

The following is the output from this utility (the user entered the `drstat` command on the third line).

```

Current client name is 'grouse'.
Enter tlm commands (? returns help information)
drstat
Drive 1: name = DN1, amu_name = 01, state = UP, type = N,
        client = grouse, volser = , cleaning = NO, clean_count = 17
Drive 2: name = DE3, amu_name = 03, state = UP, type = E,

```



```
client = grouse, volser = , cleaning = NO, clean_count = 480
Drive 3: name = DE4, amu_name = 04, state = UP, type = E,
client = grouse, volser = , cleaning = NO, clean_count = 378
DRIVE STATUS complete
```

The output indicates that Media Manager drives 1 through 3 are DAS drives DN1, DE3, and DE4. It also shows that grouse is the client name that is being used for the Media Manager server.

Providing Common Access to Volumes

If you use the same volume database for all Media Manager servers (recommended), each of them must have access to the same sets of volumes (volser) in the DAS configuration. Otherwise, when you perform an update volume configuration from one of the servers, the volumes that are not configured for that server will be logically moved to a standalone residence.

As a test, you can inventory a TLM robot from each Media Manager server and compare the results. If all the inventory reports are not the same, correct the DAS configuration. Then, perform a DAS shutdown and restart.

Adding TLM Volumes

The normal method for adding media in or for a TLM robot is as follows:

1. Add barcode labels and then insert the media into the library using an insert area.

Issue the DAS insert directive from either a DAS administrative interface or from the Media Manager utility, `tlmtest`. You can obtain the insert area name from the DAS configuration file.

The AMU Archive Management Software reads barcodes, classifies the media by media type, and maintains storage cell locations for all media.

2. Define the media to Media Manager by using the DAS volser as media IDs.

To accomplish this, do one of the following:

- ◆ Update the volume configuration, as explained under “Updating the Volume Configuration for a Robot” on page 128.
- ◆ Add new volumes, as explained under “Adding New Volumes” on page 99.

Because the DAS volser and barcodes are the same, Media Manager now also has the barcodes for the media. Notice that you do not enter slot location because that information is kept by the DAS software.



3. Use Show Contents and Compare Contents with Volume Configuration from the Media and Device Management Robot Inventory dialog to verify your configuration and maintain consistency between the DAS database and the Media Manager volume configuration. That is, update the Media Manager configuration when media has moved or may have moved.

Removing Tapes from the Robot

1. Physically remove the media from the library by using a DAS administrative interface or the `eject` command in the Media Manager utility, `tlmtest`.
2. Update the Media Manager volume database to indicate the new location of the media as being standalone. To accomplish this, do one of the following:
 - ◆ Update the volume configuration, as explained in “Updating the Volume Configuration for a Robot” on page 128.
 - ◆ Move volumes, as explained in “Moving Volumes” on page 106.

Otherwise, Media Manager will not be aware that the media is missing and may issue mount requests for it. The result will be an error such as “Misplaced Tape”.

It does not matter if you physically move media from one location to another within the robot. The DAS AMU will find the media when Media Manager requests it.

Robot Inventory Operations

Media Manager considers a TLM robot as one that supports barcodes. The following sequence explains what occurs when you select an operation that requires a robotic inventory for a TLM robot:

1. Media Manager requests volume information from the Distributed AML Server through a DAS application library call.
2. The Distributed AML Server responds by providing a list of volume IDs and associated information from its database. Media Manager filters out volumes that are not occupied in their home cell locations or in drives, then displays a list of volumes obtained along with their media types, according to the Distributed AML Server.



The following table indicates an example of information displayed by Media Manager:

Table 72. Example TLM Information

TLM Volser	TLM Media Type
A00250	3480
J03123	3590
DLT001	DECDLT
MM1200	8MM
NN0402	4MM
002455	UNKNOWN

3. Media Manager translates the volsers directly into media IDs and barcodes. In Table 72, volser A00250 becomes media ID A00250 and the barcode for that media ID is also A00250.
4. Media Manager maps the TLM (DAS) media types into the Media Manager media types as explained in step 5 or step 6.
5. If this is an operation that does not require updating the volume configuration, Media Manager uses the media type defaults for TLM robots (Table 40 on page 153) when it creates its report.
6. If this is an operation that requires updating the volume configuration, Media Manager selects the media type as follows:
 - a. Media Manager tries to use mappings that you have set for this update by using the Change Media Mappings dialog box (to access this dialog box, click Media Type Mappings in the Update Options dialog box). See “To Change the Update Options” on page 143.
 - b. If you have not set any mappings in the Change Media Mappings dialog box, Media Manager tries to use the settings in the `vm.conf` file (see “vm.conf Map Entries For TLM Robots” on page 455).
 - c. If the `vm.conf` file does not exist or if it does not map the media type, Media Manager uses the default for TLM robots (see Table 73).

The Update Volume Configuration report for a TLM robot is similar to Figure 12 on page 134.



vm.conf Map Entries For TLM Robots

See “Media Manager Configuration File (vm.conf)” on page 302 for an overview of the vm.conf file.

The second column in Table 73 shows the defaults that Media Manager uses when assigning media types in TLM robots. The third column shows the media types to which you can change the defaults by creating map entries in the vm.conf file.

Table 73. Default and Allowable TLM Media Types

TLM Media Type	Default Media Manager Media Type	Allowable Media Types Through Mappings
3480	HCART (1/2-inch cartridge)	HCART, HCART2
OD_THICK	none ¹	none ¹
OD_THIN	none	none
DECDLT	DLT (Digital Linear Cartridge)	DLT, DLT2, DLT3
8MM	8MM	8MM
4MM	4MM	4MM
D2	none	none
VHS	none	none
3590	HCART (1/2-inch cartridge)	HCART, HCART2
CD	none	none
TRAVAN	none	none
DTF	DTF	DTF
BETACAM	none	none
UNKNOWN ²	HCART2 (1/2-inch cartridge 2)	HCART, HCART2, DLT, DLT2, DLT3

¹ OD_THICK is translated to the Media Manager media type REWR_OPT for Robot Contents reports. OD_THICK is ignored for all other robotic inventory operations.

² Used for unknown TLM media types and will map to HCART2.

If the defaults do not provide the desired mapping, you can change the defaults by creating a vm.conf file and adding `TLM_mediatype` entries to it.

For example, the following vm.conf entry maps the TLM media type 3480 to the HCART2 media type:

```
TLM_3480 = HCART2
```

Without this entry, Media Manager assigns HCART to TLM 3480 and 3590 media types.



The third column in Table 73 shows the media types that Media Manager allows you to specify in `TLM_mediatype` entries. For example, you can specify

```
TLM_DECDLT = DLT2
```

You *cannot* specify

```
TLM_3590 = DLT2
```

This entry is illegal because Media Manager does not permit you to map TLM 3590 to the DLT2 media type.

You also *cannot* specify

```
TLM_3480 = HCART3
```

This entry is illegal because Media Manager does not recognize HCART3 as a valid media type for TLM robots.



Fujitsu Library Management Facility (LMF)

Media Manager provides support for robotics under control of the Fujitsu Library Management Facility (LMF), including the Fujitsu F6458/M2498 Magnetic Tape Library.

Under Media Manager, robotic support for Library Management Facility robots is classified as LMF and these robots are considered API robots (the robot manages its own media). Support for these devices is different than for other types of Media Manager robotic control. This appendix provides an overview of those differences.

The following figures show possible LMF configurations. In these configurations, the Media Manager servers and the server where LMF is installed (shown in Figure 35) must be Sun Solaris systems.

Table 74 defines the major components in these sample configurations.



Figure 33. Robotic Control Host Connecting Directly to Robot

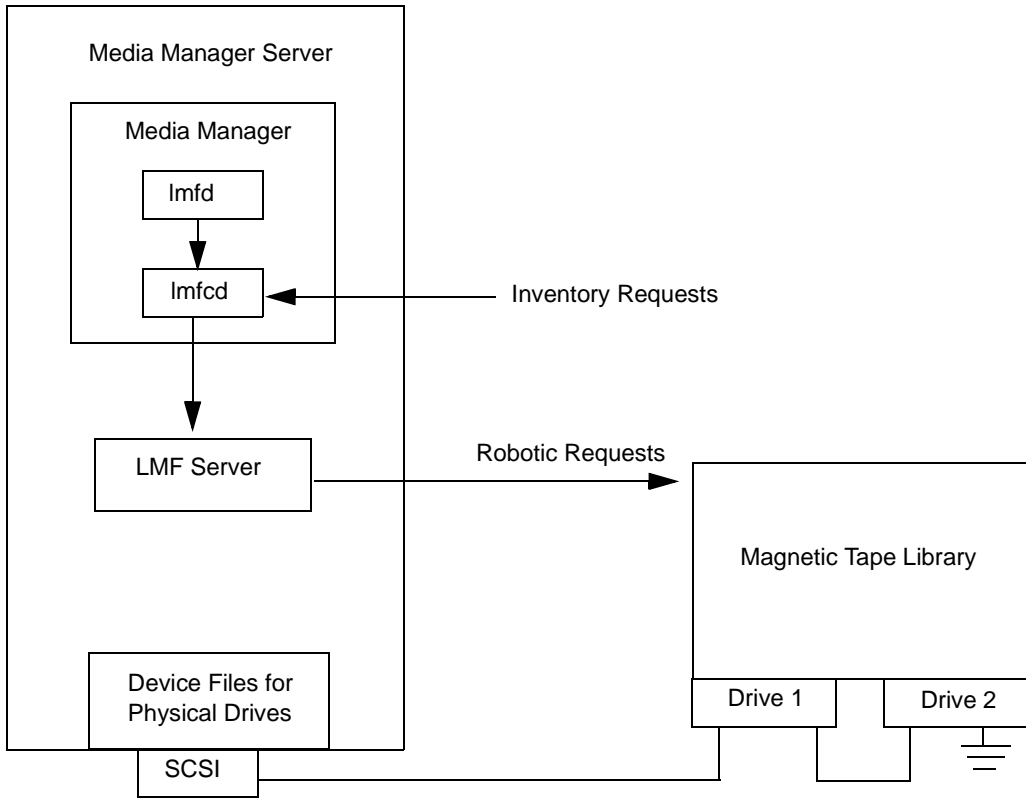


Figure 34. Robotic Control and Robot Connection on Separate Media Manager Hosts

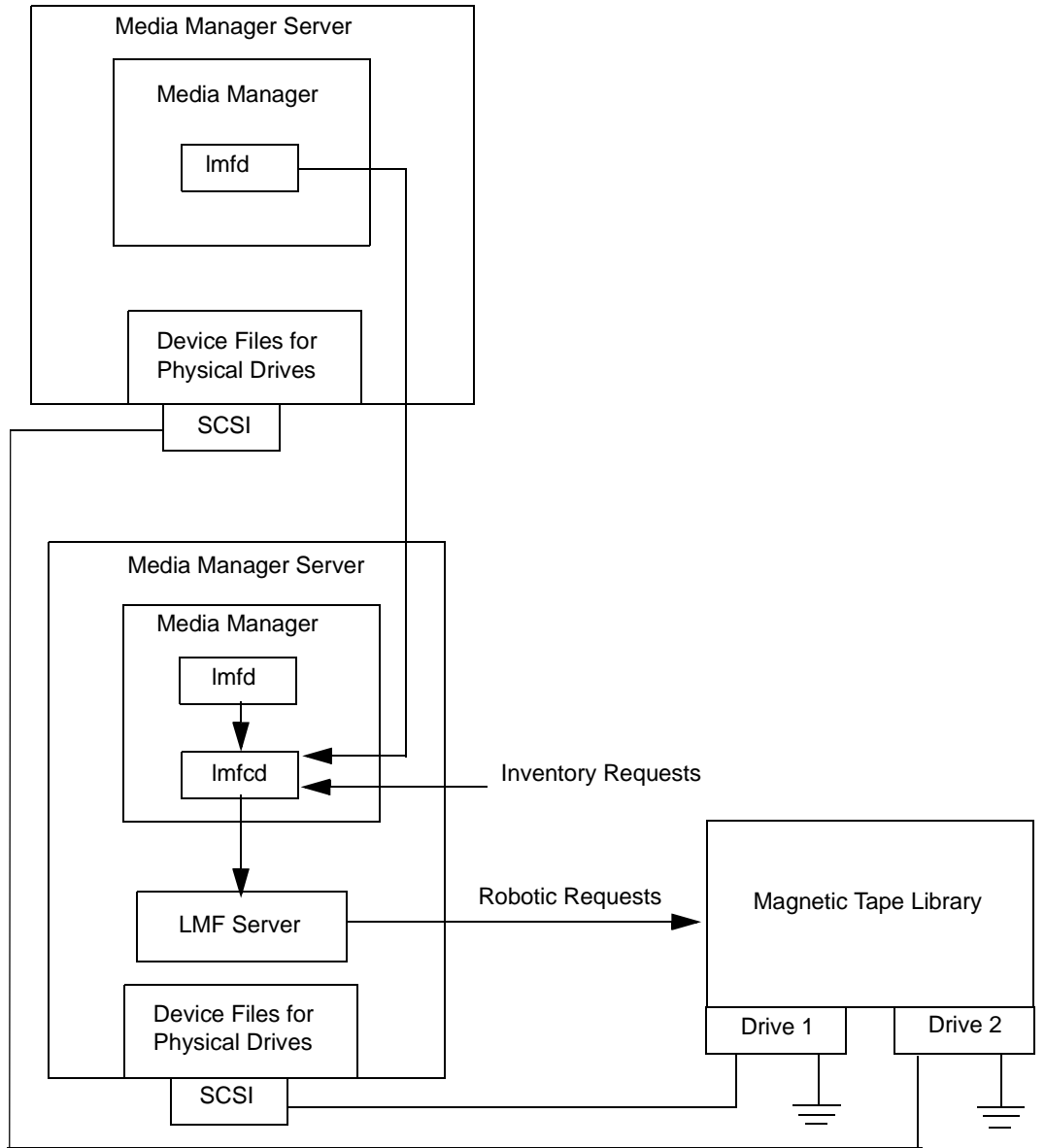


Figure 35. Robotic Control on Host with LMF Client

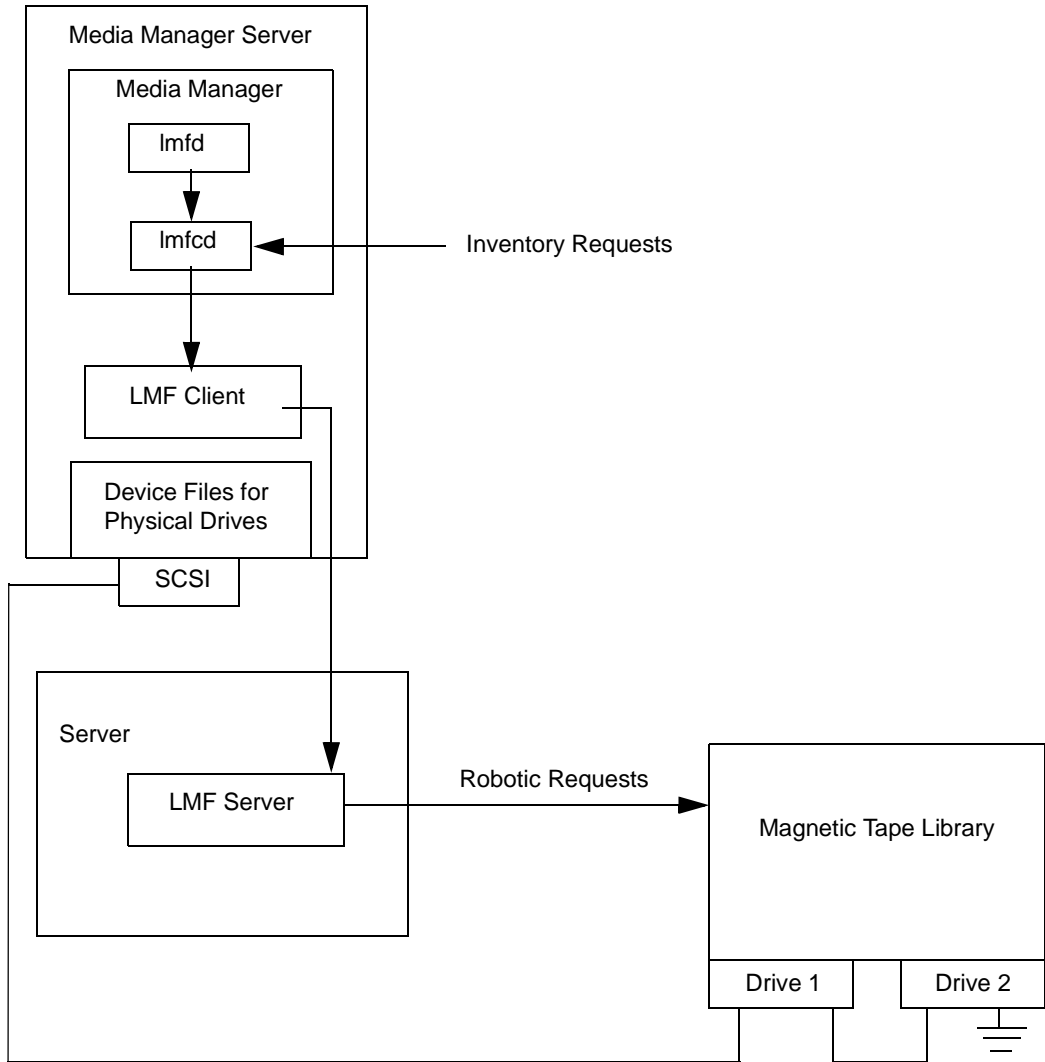


Table 74. Distributed LMF Server Configuration

Media Manager Server	A host that has Media Manager software and accesses the Library Management Facility through the LMF Server or LMF Client. The Media Manager device daemon, <code>ltid</code> , forwards mount and dismount requests to the LMF daemon (<code>lmfd</code>).
LMF daemon (<code>lmfd</code>)	This daemon resides on a Media Manager server and passes mount and dismount requests to the LMF control daemon (<code>lmfcd</code>).
LMF control daemon (<code>lmfcd</code>)	This control daemon receives mount or dismount requests from <code>lmfd</code> or robot inventory requests through an external socket interface. This daemon must reside on a host that is running the LMF Server or the LMF Client.
LMF Server	The LMF Server software sends mount and dismount requests to the Magnetic Tape Library.
LMF Client	The LMF Client software transfers mount and dismount requests to the LMF Server software.
Magnetic Tape Library	A physical library under automated robotic control, including the Fujitsu F6458/M2498 Magnetic Tape Library.

Media Requests Involving an LMF Robot

A request for media in an LMF robot in a Library Management Facility Magnetic Tape Library begins in the same manner as other media requests. The Media Manager device daemon, `ltid`, receives the request and queries the Media Manager volume daemon, `vmd`, for the location of the media. The volume daemon returns only the robot number and type, since the volume database does not store slot information for media in a LMF robot.

`ltid` verifies that the type and density of the requested volume are compatible. Next, `ltid` checks its internal tables (these tables are based on the device databases) to determine if there is an available drive and sends a mount request to the LMF daemon (`lmfd`). This daemon passes the request to the LMF control daemon (`lmfcd`).

The LMF control daemon resides on an LMF Server host or LMF Client host. This can be the host where `lmfd` is running or another host. The control daemon communicates with the Magnetic Tape Library through the LMF Server program interface or the LMF Client program interface.

The LMF Server passes information to the Magnetic Tape Library, which then locates the media and directs the robotics to mount the media in the drive. When the Media Manager host receives a successful response from the LMF Server or LMF Client, it allows the requesting application (for example, NetBackup) to start sending data to the drive.



Configuring LMF Robotic Control

The following topics explain the steps to configure LMF robotic control.

Robotic control can be through an LMF Server or LMF Client. Some functions (inject and eject) are not available when running through an LMF Client.

The library name is used to identify the robot, when configuring robotic control in Media Manager.

Determining the Library Name

The library name is set up when the robot is configured, using the Fujitsu `lmadmin` command. You can also list the library name using the `lmadmin -r` command.

Sample output from this command follows:

```

Displaying all parameters
system parameters
    times of load retry                = 3
    time of waiting for setting cartridge to entry(sec.) = 30
    polling interval of DEE operation(min.) = 30
    auto cleaning                      = enable
    network service name               = lmf
    journal of volume management database = disable

library name = KOALA0
library model          = F6458
library ID            = 0005
special file of the accessor = /dev/ftla/0
frame setup
FRAME Z      FRAME      DRIVE      HOST NAME /
CODE ADDRESS TYPE      NAME      LOGICAL DRIVE NAME SPECIAL FILE NAME
02  00      ACCESSOR    -         -         -
02  01      CAS          -         -         -
21  00      WALL CELL   -         -         -
21  01      DRIVE      drive#01  LIB001DRV001 /dev/rmt/3
                drive#02  LIB001DRV002 /dev/rmt/1
41  00      -           -         -         -
41  01      -           -         -         -

```

Verifying Library Communications

When you determine the library name, you can verify library communications using the following Fujitsu command. You should resolve any errors before attempting to configure Fujitsu F6458/M2498 Magnetic Tape Library (LMF) support in Media Manager.



```
lmdisplay -l KOALA0
```

Sample output from this command follows:

```

volume database                = normal
journal of volume
  management database          = not use
LMF log file                    = normal
library                         = KOALA0
  machine type                 = F6458
  library logical status       = available
  ACC status                   = active
  barcode reader               = normal
  ARC                           = active
  reserve cell #0              = cartridge not exist
  reserve cell #1              = cartridge not exist
  reserve cell #2              = cartridge not exist
  reserve cell #3              = cartridge not exist
  reserve cell #4              = cartridge not exist
  reserve cell #5              = cartridge not exist
  reserve cell #6              = cartridge not exist
  reserve cell #7              = cartridge not exist
  ACC SCSI path
    special file name(main)    = /dev/ftla/0
    logical status(main)       = available
CAS
  logical status
    entry                       = available
    exit                        = available
  entry
    status                      = empty
    entry No.1                  = normal
    entry No.2                  = normal
    entry No.3                  = normal
    entry No.4                  = normal
    entry No.5                  = normal
    entry No.6                  = normal
    entry No.7                  = normal
    entry No.8                  = normal
    entry No.9                  = normal
    entry No.10                 = normal
  exit
    status                      = empty
    exit No.1                   = normal
    exit No.2                   = normal
    exit No.3                   = normal
    exit No.4                   = normal

```



```

        exit No.5           = normal
        exit No.6           = normal
        exit No.7           = normal
        exit No.8           = normal
        exit No.9           = normal
        exit No.10          = normal
FES status                 = cartridge not exist
frame code                 = 02
frame code                 = 21
  cleaning cartridge No.10 = use count:7
  cleaning cartridge No.11 = use count:7
  cleaning cartridge No.12 = use count:7
  cleaning cartridge No.13 = use count:6
  cleaning cartridge No.14 = not exist
  cleaning cartridge No.15 = not exist
  cleaning cartridge No.16 = not exist
  cleaning cartridge No.17 = not exist
drive                      = drive#01
  logical drive name       = LIB001DRV001
  logical status           = available
  status                   = empty
drive                      = drive#02
  logical drive name       = LIB001DRV002
  logical status           = available
  status                   = empty
frame code                 = 41

```

Configuring Robotic Control

Configure the robotic path as explained in Chapter 2. When the configuration is complete you can view the robotic device information.

The following example uses `tpconfig` to view the robotic device information.

```
/usr/opensv/volmgr/bin/tpconfig -d
```

Sample output from this command follows. This example does not have any drives configured yet.

Currently defined robotics are:

```
LMF(47)    library name = KOALAO, volume database host = dill
```



Configuring Drives for LMF Robots

The LMF robot has half-inch cartridge drives and you use the same methods to create device files for these drives as for other drives. Refer to the system documentation for your platform and operating system for details on physically adding drives to your host. The Media Manager device configuration guide also has information on configuring device files.

See Chapter 2 for instructions on how to add the drives to a Media Manager configuration.

Caution When adding drives to Media Manager, it is especially important to assign the correct robot drive number to each drive. If the robot drive number is incorrect, tape mounts or backups may fail.

Use the Media Manager LMF test utility (`lmftest`) to determine the mapping between the Media Manager drive designations and the LMF drive designations.

The following example uses `lmftest` and shows which drives in the robot are under Media Management control:

```
/usr/openv/volmgr/bin/lmftest -r KOALA0
```

The following is the output from this utility (the user entered the `drstat` command on the fifth line). You would use drive number 1 and 2 when adding these drives in Media Manager.

```
Opening robotic library: KOALA0
Drive=1 Name=LIB001DRV001
Drive=2 Name=LIB001DRV002
Enter lmf commands (? returns help information)
drstat
WARNING: Only changes made to the drive status during
         this test session are shown below.
Drive 1 information:
  Logical drive name:    LIB001DRV001
  Library name:         KOALA0
  Special file name:    /dev/rmt/3
  Drive logical status: 00000000
  Drive type:           0000000e
  Name of loaded volume:
Drive 2 information:
  Logical drive name:    LIB001DRV002
  Library name:         KOALA0
  Special file name:    /dev/rmt/1
  Drive logical status: 00000000
  Drive type:           0000000e
  Name of loaded volume:
```



```
QUERY DEVICE DATA complete
```

The following example uses `tpconfig -d` to display the configuration. Sample output from this command shows these two drives configured in Media Manager.

Index	DriveName	DrivePath	Type	Multihost	Status
*****	*****	*****	****	*****	*****
0	DRIVE1 LMF(47) Definition	/dev/rmt/3cbn DRIVE=1	hcart	No	UP
1	DRIVE2 LMF(47) Definition	/dev/rmt/1cbn DRIVE=2	hcart	No	UP

Currently defined robotics are:

```
LMF(47)    library name = KOALAO, volume database host = dill
```

Cleaning LMF Drives

The Fujitsu Library Management Facility interface does not allow applications (such as Media Manager) to request or configure drive cleaning. For this reason, you cannot assign cleaning tapes to an LMF robot in a Media Manager volume configuration.

You must configure drive cleaning using a Fujitsu administrative interface. Media Manager is designed to work with the Fujitsu LMF auto cleaning feature, whether auto cleaning is enabled or disabled.

Adding LMF Volumes

For LMF robots, the preferred method for adding media is as follows:

1. Add barcode labels and then insert the media into the robot using the entry port.
2. Define the media to Media Manager using the LMF volume IDs as media IDs. To accomplish this, do one of the following:
 - ◆ Update the volume configuration, as explained under “Updating the Volume Configuration for a Robot” on page 128.
 - ◆ Add new volumes, as explained under “Adding New Volumes” on page 99.
3. Use Show Contents and Compare Contents with Volume Configuration from the Media and Device Management Robot Inventory dialog to verify your configuration.



Removing Tapes from the Robot

1. Physically remove the media from the library using a Fujitsu LMF administrative interface or the `eject` command from the Media Manager test utility, `lmftest`.
2. Update the Media Manager volume database to indicate the new location of the media as being standalone. To accomplish this, do one of the following:
 - ◆ Update the volume configuration, as explained under “Updating the Volume Configuration for a Robot” on page 128.
 - ◆ Move volumes, as explained under “Moving Volumes” on page 106.
 Otherwise, Media Manager will not be aware that the media is missing and may issue mount requests for it. The result will be an error such as Misplaced Tape.

Robot Inventory Operations

Media Manager considers a LMF robot as one that supports barcodes. The following sequence explains what occurs when you select an operation that requires a robotic inventory for a LMF robot.

1. Media Manager requests volume information from the library through the LMF Server or LMF Client.
2. The LMF Server or Client responds by providing a list of volume IDs and volume attributes from its database. Media Manager then filters out volumes that do not belong to the specified robot or have a volume ID longer than 6 characters. Media manager displays a list of volumes along with a translated version of the volume's media type. The media type is based upon the attributes that were returned.

The table below is an example of information displayed by Media Manager:

Table 75. Example LMF Information

LMF Volume ID	LMF Media Type
AJS147	18/36TRK
ZZ9999	128TRK

3. Media Manager translates the volume IDs directly into media IDs and barcodes. In Table 75, volume AJS147 becomes media ID AJS147 and the barcode for that media ID is also AJS147.
4. Media Manager maps the LMF media types into the Media Manager media types as explained in step 5 or step 6.



5. If this is an operation that does not require updating the volume configuration, Media Manager uses the media type defaults for LMF robots (See Table 76) when it creates its report.
6. If this is an operation that requires updating the volume configuration, Media Manager selects the media type as follows:
 - a. Media Manager tries to use mappings that you have set for this update by using the Change Media Mappings dialog box (to access this dialog box, click Media Type Mappings in the Update Options dialog box). See “To Change the Update Options” on page 143.
 - b. If you have not set any mappings in the Change Media Mappings dialog box, Media Manager tries to use the settings in the `vm.conf` file (see “vm.conf Map Entries for LMF Robots” on page 469).
 - c. If the `vm.conf` file does not exist or does not map the media type, Media Manager uses the default for LMF robots (see Table 76).

The Update Volume Configuration report for an LMF robot is similar to the one shown in Figure 12 on page 134.

Robotic Inventory Filtering

If your site has many volumes configured, but you only want NetBackup to use a subset of them, you may be able to use inventory filtering.

On the Media Manager server where the inventory request will be initiated, you can add an `INVENTORY_FILTER` entry in the `vm.conf` file. The format for this entry follows:

```
INVENTORY_FILTER = robot_type robot_number filter_type value1 [ value2 . . . ]
```

where

robot_type is the robot type (LMF in upper case).

robot_number is the robot number.

filter_type is the keyword (BY_PREFIX).

value1 is the prefix of the volume IDs you want to use.

value2 is a second volume ID prefix (up to 10 filter values are allowed).

For example:

```
INVENTORY_FILTER = LMF 47 BY_PREFIX AJS
```



vm.conf Map Entries for LMF Robots

See “Media Manager Configuration File (vm.conf)” on page 302 for an overview of the vm.conf file.

The second column in Table 76 shows the defaults that Media Manager uses when assigning media types in LMF robots. The third column shows the media types to which you can change the defaults, by creating map entries in the vm.conf file.

Table 76. Default and Allowable LMF Media Types

LMF Media Type	Default Media Manager Media Type	Allowable Media Types Through Mappings
36TRK	HCART (1/2-inch cartridge)	HCART, HCART2
128TRK	HCART (1/2-inch cartridge)	HCART, HCART2
UNKNOWN ¹	HCART2 (1/2-inch cartridge 2)	HCART, HCART2

¹Used for unknown LMF media types and maps to HCART2.

If the defaults do not provide the desired mapping, you can change the defaults by creating a vm.conf file and adding `LMF_mediatype` entries.

For example, the following vm.conf entry maps the LMF media type 128TRK to the HCART2 media type:

```
LMF_128TRK = HCART2
```

Without this entry, Media Manager assigns HCART (the default) to LMF 128TRK media types.

The third column in Table 76 shows the media types that Media Manager allows in `LMF_mediatype` entries. For example, you can specify the following mapping:

```
LMF_36TRK = HCART2
```

But, you *cannot* specify the following mapping, since HCART3 is not an allowable LMF media type.

```
LMF_36TRK = HCART3
```





Glossary

access control list (ACL)

Security information associated with files on some file systems.

ACS

Automated Cartridge System. This robot type is supported only by NetBackup DataCenter servers.

active job

A job for which NetBackup is currently processing backup or restore data.

activity logs

Logs that can be optionally enabled for specific NetBackup programs and processes and then used to investigate problems.

activity monitor

A NetBackup administration utility that displays information about NetBackup jobs and provides limited control over them.

administrator

A user that is granted special privileges to install, configure, and manage the operation of a system, network, or application

administration client

A Windows NT/2000 NetBackup client that has the administration interface software installed and can be used to administer NetBackup servers.

AIT

Sony Advanced Intelligent Tape, a type of tape drive or media type.



alternate-client restore

Restoring files to your client when they were originally backed up from a different client. The administrator using the interface on the master server can direct a restore to any client (this variation is called a server directed restore).

alternate-target restore

On a Novell NetWare server platform running the NetBackup target version of client software, this operation restores files to a different target than the one from which they were backed up.

alternate path restore

Restores files to a different directory than the one from which they were backed up.

archive

A special kind of backup where NetBackup backs up the selected files, and if the backup is successful, deletes the files from the local disk. In this manual, references to backups also apply to the backup portion of archive operations except where otherwise noted.

archive bit

A file-status bit that the Microsoft based operating system sets when it writes a file, thereby indicating that the file has changed.

attributes for a class

Configuration parameters that control the behavior of NetBackup during operations involving this class.

automatic backup

A scheduled backup by the master server.

back up

The act of copying and saving files and folders to storage media.

backup

Refers to the process of copying and saving files and directories to storage media. For example, "the backup is complete" This term can also refer to the collection of data that NetBackup saves for a client during a backup or archive. For example, "duplicate the backup."

Backup is two words when used as a verb. For example, "back up the file."



backup, archive, and restore interface

The name of the NetBackup Microsoft Windows and Java based user interfaces for clients. On servers, these interfaces can be started through the NetBackup Administration interface.

backup window

The period of time during which backups can begin.

block size

The number of bytes in each block of data written on the media during a backup.

bp

A backup, archive, and restore utility for users on NetBackup UNIX clients. It has a character-based, menu interface that can be run from terminals that do not have X Windows capabilities.

bpadm

An administrator utility that runs on NetBackup UNIX servers. It has a character-based, menu interface that can be run from terminals that do not have X Windows capabilities.

bp.conf file

A NetBackup configuration file on UNIX servers and also on UNIX, Macintosh, and OS/2 clients.

bp.ini file

NetBackup initialization file for Novell NetWare target clients.

bpcd

NetBackup Client service on Windows NT/2000 and the NetBackup Client daemon on UNIX.

bprd

NetBackup Request Manager service on Windows NT/2000 and NetBackup Request daemon on UNIX.

catalogs

Internal NetBackup and Media Manager databases. These catalogs contain information about configuration, media, devices, status, errors, and the files and directories in the stored backup images.



CDF

Context-dependent file, which is a type of directory structure on a Hewlett-Packard system.

class

Defines the backup policy for a group of one or more clients that have similar backup requirements.

client

The system with the files to back up, archive, or restore.

client-user interface

The program used to perform user backups, archives, and restores.

cluster

See master and media server cluster.

command lines

Commands that users can execute either from the system prompt or in scripts.

compression

The process of compacting data to enable more efficient transmission and storage.

configuration

The parameters that govern the behavior of an application. This term can also refer to the manner in which a network or system is laid out or connected (for example, a network configuration).

cpio

A UNIX command for formatting data on a tape.

ctime

The time that a UNIX inode was changed.

cumulative-incremental backup

A backup that is scheduled by the administrator on the master server and backs up files that have changed since the last successful full backup. All files are backed up if no prior backup has been done. Also see “differential-incremental backup.”



daemon

A program on a UNIX system that runs in the background and performs some task (for example, starting other programs when they are needed). Daemons are generally referred to as services or processes on Windows NT/2000 systems.

database-extension clients

Clients with additional NetBackup software that is designed to back up relational databases.

debug logs

See “activity logs.”

device delays

Delays caused by the device that are beyond the control of the storage application. An example is the time required to position tape under the read and write heads.

device host

A Media Manager host where a drive or robotic control is attached or is defined.

device monitor

A Media Manager administration utility that provides monitoring and manual control of Media Manager storage devices. For example, an administrator or computer room operator can use this utility to manually reset devices or set them to the UP or DOWN state.

DHCP

Dynamic host configuration protocol. This TCP/IP protocol automatically assigns temporary IP addresses to hosts when they connect to the network.

differential-incremental backup

Scheduled by the administrator on the master server and backs up files that have changed since the last successful incremental or full backup. All files are backed up if no prior backup has been done. Also see “cumulative-incremental backup.”

directory depth

The number of levels below the current directory level that the NetBackup interfaces show in their directory and file list displays.



directory tree

The hierarchical structure in which files are organized on a disk. Each directory lists the files and directories that are directly below it in the tree. On UNIX, the topmost directory is called the root directory.

disaster recovery

Recovering data from backups after a disk crash or other catastrophe.

disk

Magnetic or optical disk storage media.

disk-image backup

A bit-by-bit rather than a file system backup of a disk drive on Windows NT/2000.

DLT

Digital-linear tape or tape drive type.

Domain Name Service (DNS)

A program that handles name translation for network communications.

drive cleaning

The use of a special cleaning tape to clean the heads on a drive.

duplicate image

A copy of a backup image.

encryption

Provides additional security by encrypting backup data on the client. This capability is available only with the NetBackup Encryption option.

entry and exit ports

A slot or other opening in a robot where you can insert or remove a tape without having to access the interior of the robot. After inserting a tape, you move it to a slot by using an inject command. Prior to removing a tape, you move it to the port by using an eject command. The inject and eject commands are supported through the add and move screens in the Media Manager administration interface. Entry and exit ports are sometimes called mailslots, or inports and outports.



exclude list

A list that designates files or directories to exclude from automatic backups.

expiration (image)

The date and time when NetBackup stops tracking a backup image.

expiration (volume)

The date and time when the physical media (tape) is considered to be no longer usable.

EVSN

External volume serial number. This is an identifier written on a media cartridge or canister so the operator can identify the volume before inserting it into a drive or robot. For labeled media, the EVSN must be the same as the RVSN (identifier recorded on the media). For all media, the EVSN is the same as the media ID.

FastBackup

A special type of raw-partition backup that can be performed only on an Auspex client (this option is available only for NetBackup DataCenter).

FlashBackup

A special type of raw-partition backup that requires the NetBackup FlashBackup separately-priced option (this option is available only for NetBackup DataCenter).

flush level

Controls how often Netbackup clears its log files on a Novell NetWare or Microsoft Windows client platform.

fragment

A part of a backup or archive image. NetBackup can be configured to divide images into fragments when they exceed a certain size or span tapes.

frequency (backup)

How often NetBackup performs scheduled backups. For example, if the frequency is seven days then backups occur once a week.

FROZEN media state

If a volume is FROZEN, NetBackup keeps it indefinitely and can restore from it but not use it for further backups or archives.



full backup

A backup that copies, to a storage unit, all files and directories that are beneath a specified directory.

FULL media state

If this appears in a report or listing, it indicates the volume is FULL and cannot hold more data or be used for further backups.

global attributes

NetBackup configuration attributes that affect all classes.

Global Data Manager

A separately-priced option (for UNIX servers) that provides an interface with a tree view where the administrator can view and administer multiple master servers. The server where the option is installed is called a Master of Masters.

GNU tar

A public domain version of the UNIX tar program.

goodies directory

A directory containing programs, scripts, and other files that are not formally supported.

gravity stacker

A robot that relies on gravity to advance to the next required tape.

GUI

Graphical user interface.

hard link

On UNIX, a hard link is a pointer to the inode for the data.

heap level

A parameter for memory-heap debugging on a Novell NetWare or Windows NetBackup client.

hierarchical storage management

The process of automatically migrating selected files from a managed file system to specified migration levels on secondary storage, while maintaining transparent access to those files.



host

A computer that executes application programs.

host name

Name by which a host computer is identified by programs and other computers in the network.

HSM

See storage migrator.

image

The collection of data that NetBackup saves for an individual client during each backup or archive. The image contains all the files, directories, and catalog information associated with the backup or archive.

import

The process of recreating NetBackup records of images so the images can be restored.

include list

A list that designates files or directories to add back in from the exclude list.

incremental backup

See “cumulative-incremental backup” and “differential-incremental backup.”

inport

See “entry and exit ports.”

inode

A UNIX data structure that defines the existence of a single file.

install_path

Directory where NetBackup and Media Manager software is installed. The default on Windows NT/2000 is `C:\Program Files\VERITAS` and on UNIX it is `/usr/opensv`.

jbpSA

The Java-based NetBackup interface for performing user backups, archives, and restores.

jnbSA

The Java-based NetBackup interface for administrators.



job

A parcel of work submitted to a computer. NetBackup jobs are backups, archives, or restores.

kernel

The nucleus of an operating system.

keyword phrase

A textual description of a backup.

kill a job

Terminating a job and removing it from the job queue.

label

Identifier of a tape or optical disk volume. A recorded label includes a media ID.

A barcode label allows a barcode scanner to be used for media tracking.

library

Refers to a robot and its accompanying software. A library includes a collection of tapes or optical platters used for data storage and retrieval. For example, a Tape Library DLT (TLD) refers to a robot that has TLD robotic control.

link

See “hard link” or “symbolic link.”

LMF - Library Management Facility

A Media Manager designation for a category of robot. For the specific vendor types and models in this category, see the NetBackup release notes.

This robot type is supported only by NetBackup DataCenter servers.

load

(noun) Amount of work that is being performed by a system or the level of traffic on a network. For example, network load affects performance.

(verb) Copy data to internal memory. For example, load the installation program.

logs

Files where a computer or application records information about its activities.



mailslot

See “entry and exit ports.”

man pages

Online documentation provided with UNIX computer systems and applications.

Master and media server cluster

A NetBackup master server and the remote media servers that it is using for additional storage. It is possible to configure clusters only with NetBackup DataCenter servers. NetBackup BusinessServer supports only a single server, the master.

Master of Masters

A NetBackup host where Global Data Manager software is installed. When logging into this host, the interface has a tree view where the administrator can view and administer multiple master servers.

master server

The NetBackup server that provides administration and control for backups and restores for all clients and servers in a master and media server cluster. NetBackup BusinessServer supports only a single server and it is the master.

media

Physical magnetic tapes, optical disks, or magnetic disks where data are stored.

media host

NetBackup server to which the job (client) is sending the data.

media ID

An identifier that is written on a volume as part of the recorded label.

Media Manager

Software that is part of NetBackup and manages the storage devices and removable media.

Media Manager Host

A host where Media Manager software is installed.



media server

A NetBackup server that provides storage within a master and media server cluster. The master can also be a media server. A media server that is not the master is called a remote media server (or slave server). NetBackup BusinessServer does not support remote media servers.

menu interface

A character-based interface for use on terminals that do not have graphical capabilities.

MHD

See “multihosted drives.”

mount

Make a volume available for reading or writing.

mount point

The point where a file system on a disk logically connects to a system’s directory structure so the file system is available to users and applications.

MPX

See “multiplexing.”

mtime

The point in time when a UNIX or NTFS file is modified.

multihosted drives

A separately priced VERITAS option (Shared Storage Option or SSO) that allows tape drives (standalone or in a robotic library) to be dynamically shared among multiple NetBackup and Storage Migrator servers.

This option is supported only on NetBackup DataCenter servers.

multiplexing

The process of sending concurrent-multiple backups from one or more clients to a single storage device and interleaving those images onto the media.

multiplexed group

A set of backups that were multiplexed together in a single multiplexing session.



NDMP

Network data management protocol. NetBackup requires the NetBackup for NDMP separately-priced option to support NDMP.

NetBackup Client service

NetBackup Windows NT/2000 service that runs on clients and servers and listens for connections from NetBackup servers and clients in the network. When a connection is made, this service starts the necessary programs.

NetBackup configuration options

On UNIX servers and on UNIX and Macintosh, clients, these settings are made in the `bp.conf` file. On NetWare target and OS/2 clients, they are in the `bp.ini` file. On Windows NT/2000 servers and Microsoft Windows clients, these settings are called properties and are made through the Backup, Archive, and Restore interface or the Configure - NetBackup window in the administration interface.

NetBackup databases

See catalogs.

NetBackup Database Manager service

NetBackup Windows NT/2000 service that runs on the master server and manages the NetBackup internal databases (called catalogs). This service must be running on the master server during all NetBackup administrative operations.

NetBackup Device Manager service

The NetBackup Windows NT/2000 service that runs on a NetBackup server and starts the robotic control processes and controls the reservation and assignment of volumes. This service runs only if the server has devices under Media Manager control. The process is `ltid`.

NetBackup properties

Same as NetBackup configuration options but are called NetBackup properties on Microsoft Windows platforms.

NetBackup Request Manager service

The NetBackup Windows NT/2000 service that runs on the master server and starts the scheduler and receives requests from clients.



NetBackup Volume Manager service

A NetBackup Windows NT/2000 service that runs on a NetBackup server, allows remote administration of Media Manager, and manages volume information. The process is `vmd`.

NIS

Network information service.

NLM

NetWare loadable module.

NFS

Network file system.

nonrobotic

See “standalone.”

ODL

Optical disk library. This robot type is supported only by NetBackup DataCenter servers.

OSF and Motif

A set of specifications for user-interface design.

outport

See “entry and exit ports.”

partitions

The logical partitions into which a magnetic disk is divided.

patch

A program that corrects a problem or adds a feature to an existing release of software.

path length

Number of characters in a pathname.

pathname

The list of directories in the path to a destination directory or file.



PC clients

NetBackup clients that have Microsoft Windows (NT/2000, 98, 95), Macintosh, or IBM OS/2 operating systems.

peername

The name by which a computer identifies itself when establishing connections to other systems.

port

A location used for transferring data in or out of a computer.

primary copy

The copy of an image that NetBackup uses to satisfy restores. When NetBackup duplicates an image, the original is designated as the primary copy.

privileges

The tasks or functions that a user, system, or application is authorized to perform.

progress report

Log where NetBackup records events that occur during user operations.

proxy restore

A proxy restore allows the user to restore files, that he has write access to, on a machine other than his desktop. The files must be in a backup of the machine to which they are being restored.

QIC

Quarter-inch-cartridge tape.

queued job

A job that has been added to the list of jobs to be performed.

raw-partition backup

Bit-by-bit backup of a partition of a disk drive on UNIX. On Windows NT/2000, this is called a disk-image backup.

rbak

The program that Apollo clients use to read data from tape during a restore.



registry

A Microsoft Windows 2000, NT, 98, and 95 database that has configuration information about hardware and user accounts.

remote media server

A media server that is not the master. Note that only NetBackup DataCenter supports remote media servers. NetBackup BusinessServer supports only a single server, the master.

residence

In Media Manager, information about the location of each volume is stored in a volume database. This residence entry contains information, such as robot number, robot host, robot type, and media type.

resource

A Novell NetWare term that refers to a data set on the target. For example, in DOS, resources are drives, directories, and files. Also see “target service.”

restore

(verb) The act of restoring selected files and directories from a previous backup or archive and returning them to their original directory locations (or to an alternate directory).

(noun) The process of restoring selected files and directories from a previous backup and returning them to their original directory locations (or to an alternate directory).

retention level

An index number that corresponds to a user-defined retention period. There are 10 levels from which to choose (0 through 9) and the retention period associated with each is configurable. Also see “retention period.”

retention period

The length of time that NetBackup keeps backup and archive images. The retention period is specified on the schedule.

root

The highest level directory in a hierarchical directory structure. In MS-DOS, the root directory on a drive is designated by a backslash (for example, the root on drive C is C:\). On UNIX, the root directory is designated by a slash (/).

Also, a UNIX user name having administration capability.



RS-232

An industry-standard interface for serial communications and sometimes used for communicating with storage peripherals.

RSM Interface

Application in Windows 2000 used to manage Removable Storage Manager (RSM) devices.

RSM - Removable Storage Manager

A Media Manager designation for a category of robot.

Also, a component of the Windows 2000 operating system that manages storage devices.

RVSN

Recorded volume serial number. This is an identifier recorded as part of the label on a volume and used by Media Manager to ensure that the correct volume is mounted. The RVSN is the same as the media ID.

schedules

Controls when backups can occur in addition to other aspects of the backup, such as: the type of backup (full, incremental) and how long NetBackup retains the image.

SCSI

Small computer system interface. This is a type of parallel interface that is frequently used for communicating with storage peripherals.

slave server

See Remote media server.

server directed restore

Using the client interface on the master server to restore files to any client. Only the administrator can perform this operation.

server independent restore

Restoring files by using a NetBackup server other than the one that was used to write the backup. This feature is available only with NetBackup DataCenter.



server list

The list of servers that a NetBackup client or server refers to when establishing or verifying connections to NetBackup servers. On a Windows NT/2000 server and Microsoft Windows clients, you update the list through a dialog box in the interface. On a UNIX server and UNIX and Macintosh clients, the list is in the `bp.conf` file. On NetWare target and OS/2 clients, the list is in the `bp.ini` file.

service

A program on a Windows NT/2000 system that runs in the background and performs some task (for example, starting other programs when they are needed). Services are generally referred to as daemons on UNIX systems.

session

An instance of NetBackup checking its schedules for backups that are due, adding them to its worklist, and attempting to complete all jobs in the worklist. For user backups and archives, a session usually consists of a single backup or archive.

Shared Storage Option (SSO)

See “multihosted drives.”

SMDR

Storage management data requestor, a Novell NetWare program that provides its services transparently to all SMS modules and lets remote and local modules communicate with one another.

SMS

Novell NetWare storage management services.

standalone

A qualifier used with drives and media to indicate they are not associated with a robot. For example, a standalone tape drive is one where you must manually find and insert tapes before using them. A standalone volume is one that is located in a standalone drive or is stored outside of a drive and designated as standalone in the volume configuration.

status code

A numerical code, usually accompanied by a message, that indicates the outcome of an operation.



storage migrator

Refers to the VERITAS Storage Migrator line of hierarchical storage management products for UNIX and Windows NT/2000. These products make extra room on a disk by transparently moving data to other storage and then transparently retrieving the data when it is needed by a user or application.

Storage Migrator is available only for NetBackup DataCenter servers.

storage unit

Refers to a storage device where NetBackup or Storage Migrator stores files. It can be a set of drives in a robot or consist of one or more single tape drives that connect to the same host.

SUSPENDED media state

If a volume is SUSPENDED, NetBackup can restore from it but cannot use it for backups. NetBackup retains a record of the Media ID until the last backup image on the volume expires.

symbolic link

On a UNIX system, this is a pointer to the name of the file that has the source data.

tape format

The format that an application uses to write data on a tape.

tape marks

A mark that is recorded between backup images on a tape.

tape overhead

The space required for data that is not part of the backup images. For example, tape marks and catalogs of what are on the tape are considered overhead.

tape spanning

Using more than one tape to store a single backup image.

tar

Tape ARchive program that NetBackup uses to extract backup images during a restore.

target

See “target service.”



target service

A Novell NetWare service that needs storage management. The SMS views all services (for example, print services, communication services, workstations) as targets.

Target Service Agent

A Target-service agent is a Novell NetWare agent that prepares the target's data for SMS during a backup and for the target during a restore.

TLD - Tape Library DLT

A Media Manager designation for a category of robot. For the specific vendor types and models in this category, see the NetBackup release notes.

TLH - Tape Library Half-inch

A Media Manager designation for a category of robot. For the specific vendor types and models in this category, see the NetBackup release notes.

This robot type is supported only by NetBackup DataCenter servers.

TLM - Tape Library Multimedia

A Media Manager designation for a category of robot. For the specific vendor types and models in this category, see the NetBackup release notes.

This robot type is supported only by NetBackup DataCenter servers.

TL4 - Tape Library 4MM

A Media Manager designation for a category of robot. For the specific vendor types and models in this category, see the NetBackup release notes.

TL8 - Tape Library 8MM

A Media Manager designation for a category of robot. For the specific vendor types and models in this category, see the NetBackup release notes.

timeout period

The period of time that an application has allotted for an event to occur.

TIR

See "true image restore."



tpconfig

A Media Manager administration utility for configuring devices and is started from the command line. On UNIX, it has a character-based, menu interface that can be run from terminals that do not have X Windows capabilities.

transfer rate

The rate at which computer information is transferred between a source and a destination.

true image restore

Restores the contents of a directory to what it was at the time of any scheduled full or incremental backup. Previously deleted files are ignored.

TS8 - Tape Stacker 8MM

A Media Manager designation for a category of robot. For the specific vendor types and models in this category, see the NetBackup release notes.

TSA

“Target Service Agent.”

TSH - Tape Stacker Half-inch

A Media Manager designation for a category of robot. For the specific vendor types and models in this category, see the NetBackup release notes.

This robot type is supported only by NetBackup DataCenter servers.

user operation

A backup, archive, or restore that is started by a person on a client system.

verbose flag

Configuration file entry that causes a higher level of detail to be written in the logs.

verify

An operation that compares the list of files that are actually on a volume with what NetBackup has recorded as being on it. The data that is on the media is not verified.

vmadm

A Media Manager administrator utility for managing volumes. It runs on UNIX and has a character-based, menu interface that can be run from terminals that do not have X Windows capabilities.



vm.conf

A Media Manager configuration file with entries that include the servers that can manage local devices and default media ID prefixes for media that do not contain barcodes.

volume

Media Manager volumes are logical units of data storage or cleaning capability on media that have been assigned media IDs and other attributes, which are recorded in the Media Manager volume database.

volume configuration

Refers to configuration information that is stored in the Media Manager volume database.

volume database

An internal database where Media Manager keeps information about volumes. All Media Manager hosts have a volume database. However, the database is empty unless the host is designated as a volume database host.

volume database host

The Media Manager host that contains information about the volumes that Media Manager uses in a device. Because NetBackup BusinessServer supports only a single server, the volume database host is always the Media Manager host.

volume group

A set of volumes that are configured within Media Manager to reside at the same physical location (for example, in a specific robot).

volume pool

A set of volumes that are configured within Media Manager to be used by a single application and are protected from access by other applications and users.

wakeup interval

The time interval at which NetBackup checks for backups that are due.

wbak

The program that Apollo clients use to write data on tape.

wildcard characters

A character that can be used to represent other characters in searches.



WORM media

Write-once, read-many media for optical disks. NetBackup BusinessServer does not support WORM media.

Windows Display Console

A NetBackup-Java interface program that runs on Windows 2000, NT, 98, and 95 computers. Users and administrators can start this interface on their local system, connect to a UNIX system that has the NetBackup-Java software installed, and then perform any user and administrator operations that their permissions allow.

xbp

The X Windows-based backup, archive, and restore program for users on NetBackup UNIX clients.

xbpadm

The X Windows-based NetBackup administration interface on UNIX. This interface is available only with NetBackup DataCenter.

xbpmon

The X Windows-based NetBackup utility for monitoring jobs on UNIX. This utility is available only with NetBackup DataCenter.

xdevadm

The X Windows-based Media Manager utility for managing devices on UNIX. This interface is available only with NetBackup DataCenter.

xvmadm

The X Windows-based Media Manager utility for managing media on UNIX. This interface is available only with NetBackup DataCenter.





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