

HP StorageWorks

Implementing *Mixed Media* in HP StorageWorks Tape Libraries

implementation guide

© Copyright 2003-2007 Hewlett-Packard Development Company, L.P.

Hewlett-Packard Company makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Hewlett-Packard shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

This document contains proprietary information, which is protected by copyright. No part of this document may be photocopied, reproduced, or translated into another language without the prior written consent of Hewlett-Packard. The information is provided "as is" without warranty of any kind and is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft, Windows, Windows NT, and Windows XP are U.S. registered trademarks of Microsoft Corporation.

UNIX® is a registered trademark of The Open Group.

Implementing Mixed Media in HP StorageWorks Tape Libraries

Contents

About this guide	4
Intended audience	4
Prerequisites	4
Related documentation	4
Document conventions and symbols	5
HP technical support	6
HP-authorized reseller	6
Helpful websites	6
1 Overview	7
Configurations	7
Tape libraries	8
Tape drives	9
Supported library and drive configurations	9
Tape media	12
Supported media and drive compatibility	12
Supported backup applications	13
2 Implementation	14
Implementing mixed media on ESL E-Series and ESL9000 Series tape libraries using library partitioning . . .	14
Implementing mixed media on ESL, EML, and MSL Series tape libraries using backup application software .	15
HP Data Protector	15
Symantec Veritas NetBackup	16
IBM Tivoli Storage Manager	17
Symantec Backup Exec	18
Computer Associates ARCserve	19
EMC NetWorker	20
NetWorker backups and restores with mixed media	20
A Additional resources	21
Enterprise Backup Solutions	21
Hardware	21
Software	21
HP Data Protector	21
Symantec Veritas NetBackup and Backup Exec	21
Computer Associates ARCserve	21
IBM Tivoli Storage Manager	21
EMC NetWorker	21

About this guide

This guide describes how to implement mixed media functionality in an HP StorageWorks Enterprise Backup Solution (EBS) environment using HP hardware and several of today's leading data protection software applications.

Intended audience

This guide is intended for customers who want to mix drive technologies and media types in the same HP tape automation library.

Prerequisites

Before implementing a mixed media configuration, be sure you have:

- Reviewed the EBS Compatibility Matrix
- Properly installed and configured your EBS hardware per the *HP StorageWorks EBS design guide*
- Properly installed your backup application per vendor documentation and recommendations

NOTE: The EBS documents listed above are available on the HP website: <http://www.hp.com/go/ebs>.

Related documentation

- EBS Compatibility Matrix
- *HP StorageWorks EBS design guide*
- *HP StorageWorks Partitioning in an EBS Environment Implementation Guide*

Additional documentation, including white papers and best practices documents, can be found on the HP website: <http://www.docs.hp.com>.

Document conventions and symbols

Convention	Element
Medium blue text: Figure 1	Cross-reference links and e-mail addresses
Medium blue, underlined text (http://www.hp.com)	Website addresses
Bold font	<ul style="list-style-type: none">• Key names• Text typed into a GUI element, such as into a box• GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
<i>Italics font</i>	Text emphasis
Monospace font	<ul style="list-style-type: none">• File and directory names• System output• Code• Text typed at the command line
<i>Monospace, italic font</i>	<ul style="list-style-type: none">• Code variables• Command-line variables
Monospace, bold font	Emphasis of file and directory names, system output, code, and text typed at the command line



WARNING! Indicates that failure to follow directions could result in bodily harm or death.



CAUTION: Indicates that failure to follow directions could result in damage to equipment or data.



IMPORTANT: Provides clarifying information or specific instructions.



NOTE: Provides additional information.



TIP: Provides helpful hints and shortcuts.

HP technical support

Telephone numbers for worldwide technical support are listed on the HP website:
<http://www.hp.com/support/>.

Collect the following information before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

For continuous quality improvement, calls may be recorded or monitored.

HP strongly recommends that customers sign-up online using the Subscriber's choice website at
<http://www.hp.com/go/e-updates>.

- Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest versions of drivers, firmware documentation updates, and instant access to numerous other product resources.
- After signing up, you can quickly locate your products by selecting **Business support > Storage** under Product Category.

HP-authorized reseller

For the name of your nearest HP-authorized reseller:

- In the United States, call 1-800-282-6672.
- Elsewhere, visit <http://www.hp.com> and click **Contact HP** to find locations and telephone numbers.

Helpful websites

For third-party product information, see the following vendor websites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- <http://www.hp.com/support/>
- <http://www.docs.hp.com>

1 Overview

The merging of diverse backup solutions, data and infrastructure consolidation, and the assurance that data stored on differing technologies will always be accessible are a few of the many challenges facing IT professionals today. Therefore, it is imperative to have a data protection solution that supports new generations of tape drives with greater media capacities as well as different drive technologies within the same tape library frame. HP understands the need to easily increase backup capacity and protect the ability to choose between drive technologies as the IT strategy evolves.

Several HP enterprise and mid-range libraries support multiple generations of LTO and DLT drive technologies within the same library frame. The customer's investment is further protected because they are not locked into a specific drive technology. HP tape libraries use partition capabilities in the hardware and media pooling features within the backup application to deliver a best-in-class mixed media solution.

HP Data Protector software allows the mixing of different drive technologies and media types. Additionally, there are many Independent Software Vendor (ISV) backup applications that also support this feature. This guide describes how to implement mixed media in an Enterprise Backup Solution (EBS) environment using HP hardware and several of today's leading data protection applications.

Configurations

The hardware and software components of an HP EBS configuration may consist of:

- Server(s) containing Fibre Channel Host Bus Adapter(s)
- RAID Array Storage
- Fibre Channel SAN Switch(es)
- Router(s), such as the HP StorageWorks e2400 FC-FC Interface Controller, HP StorageWorks e2400-160 FC-SCSI Interface Controller, or the HP StorageWorks Network Storage Router E1200-160
- HP StorageWorks tape libraries
- HP EBS supported operating systems:
 - HP-UX
 - Microsoft® Windows® Server 2003
 - Microsoft Windows 2000
 - Novell NetWare
 - Tru64 UNIX™
 - SuSE Linux and RHEL Linux
 - Sun Solaris
 - IBM AIX

- One of the following backup applications:
 - HP Data Protector
 - Symantec Veritas NetBackup
 - IBM Tivoli Storage Manager
 - Symantec Backup Exec
 - Computer Associates ARCserve
 - EMC NetWorker

Tape libraries

HP StorageWorks tape libraries that support mixed media and mixed drive technologies include:

- ESL E-Series*
- EML E-Series*
- ESL9000 Series*
- MSL2024/4048/8096 tape library
- MSL6000/5000 Series*

* Supports full-height drives only

The ESL E-Series tape library family was introduced with support for SDLT and Ultrium LTO drives. The previous generations of DLT7000, DLT8000, SDLT 220, and Ultrium 230 are not supported by the ESL E-Series tape library. For mixed media configurations that included SDLT and LTO, it is recommended that Secure Manager for Tape Libraries library partitioning software be used to separate the drives and media into separate logical libraries. See the *HP StorageWorks Partitioning in an EBS Environment Implementation Guide*.

The EML E-Series tape library family was first introduced in mid-2006 with support for Ultrium 460 LTO only. Later, support for Ultrium 960 and 1840 drives were added. SDLT drives are not supported in the EML libraries.

The ESL9000 Series tape libraries were first introduced in mid-1999 with the DLT7000 drive. Subsequently, this library has been qualified with DLT8000, SDLT, and Ultrium drives. All of these drive types, with the exception of the DLT7000 and the Ultrium LTO 1840, are currently supported in this library family.

The MSL5000 Series tape libraries were first introduced with SDLT drives in mid-2001. Since that time, the MSL6000 was added to the series. The MSL libraries support DLT8000, SDLT, and Ultrium drives.

The MSL2024/4048/8096 Series tape libraries were introduced in 2006 with support for half-height and full-height LTO drives. SDLT is not supported in these libraries.

Tape drives

Tape drives supported in HP StorageWorks mixed media libraries include:

- Ultrium 1840, full-height
- Ultrium 960, full-height
- Ultrium 460, full-height
- Ultrium 230, full-height
- Ultrium 920, half-height*
- Ultrium 448, half-height*
- SDLT 600
- SDLT 320
- SDLT 220
- DLT8000

* MSL2024/4048/8096 only

Supported library and drive configurations

Table 1 shows the mixed media support in each model of the ESL and EML E-Series tape libraries. Table 2 shows the mixed media support in each model of the ESL9000 Series tape libraries. Table 3 shows the mixed media support in each model of the MSL Series tape libraries.

Table 1 ESL and EML E-Series tape libraries

Base library	SDLT 320/600	Ultrium 460/960/1840	Mixed SDLT and Ultrium
ESL712e/322e*	Supported	Supported	Supported**
ESL630e/286e*	Supported	Supported	Supported**
EML tape libraries	Not supported	Supported	Not supported

* To be supported in a mixed media environment, the ESL322e and ESL286e tape libraries must have the capacity upgrade kit to enable all six panels and the back wall bins of the library.

** For ESL E-Series tape libraries there are mixed media kits that consist of three panels to be installed on the left side of the library—one left upper panel, one left middle panel (including magazines), and one left lower panel for either SDLT or LTO, depending on the original library configuration. One to three panels can be converted to the new technology at any time and will be installed on the left side of the library. In addition, Secure Manager ESL with the partitioning will manage the configuration.



IMPORTANT: Mixing SDLT and Ultrium in the same drive cluster is not supported in ESL E-Series tape libraries.

NOTE: The HP StorageWorks ESL and EML E-Series libraries support a mixture of Ultrium 460/960/1840 (LTO 2/3/4) media. Media pools for each must be segregated, either by the backup application or through use of library partitioning via Secure Manager Tape Library Software.

Table 2 ESL9000 Series tape libraries

Base library	DLT8000 & SDLT*	Ultrium 230/460/960	Ultrium 960	SDLT* and Ultrium*
ESL9198DLX	Supported (LVD only)	Supported	Not supported	Supported (LVD only)
ESL9198SL	Supported (LVD only)	Supported	Not supported	Supported (LVD only)
ESL9326D/DX	Supported (HVD only)	N/A	Not supported	N/A
ESL9326SL	Supported (LVD only)	Supported	Not supported	Supported (LVD only)
ESL9595 (Ultrium 230/460/960)	N/A	Supported	Supported	Supported (LVD only)
ESL9322 (Ultrium 230/460/960)	N/A	Supported	Supported	Supported (LVD only)
ESL9595 (SDLT 220)	Supported (LVD only)	Supported	Supported	Supported (LVD only)
ESL9595 (SDLT 320)	Not supported	Supported	Supported	Supported (LVD only)
ESL9322 (SDLT 320)	Not supported	Supported	Supported	Supported (LVD only)

* Includes all drive generations, e.g. SDLT 220/320/600, Ultrium 230/460/960 (LTO 1,2,3).

Table 3 MSL tape libraries

Base library	DLT8000* SDLT 220 SDLT 320 SDLT 600 (single unit)	Ultrium 230/460/960 (single unit)	Ultrium 1840 (single unit)	SDLT** (stacked unit)	Ultrium** (stacked unit)
MSL5026DLX (Opal)	Supported	N/A	N/A	Supported	N/A
MSL5026SL (Opal)	Supported	N/A	N/A	Supported	N/A
MSL5026SL (Graphite)	Supported	N/A	N/A	Supported	N/A
MSL5052SL (Graphite)	Supported	N/A	N/A	Supported	N/A
MSL5026 (SDLT 230)	Supported	N/A	N/A	Supported	N/A
MSL5052 (SDLT 320)	Supported	N/A	N/A	Supported	N/A
MSL5030	Supported ⁴	Supported ¹	Supported ¹	N/A	Supported
MSL5060	Supported ⁴	Supported ¹	Supported ¹	N/A	Supported
MSL6030 (Legacy)	Supported ⁴	Supported ²	Supported ²	N/A	Supported
MSL6060 (Legacy)	Supported ⁴	Supported ²	Supported ²	N/A	Supported
MSL6026	Supported	Supported ⁴	Supported ⁴	Supported	N/A
MSL6052	Supported	Supported ⁴	Supported ⁴	Supported	N/A
MSL6030 (New)	Supported ⁴	Supported ³	Supported	N/A	Supported
MSL6060 (New)	Supported ⁴	Supported ³	Supported	N/A	Supported
¹ MSL5K units have an I/O hotplug board that limits I/O throughput to 80 MB/sec. ² MSL6K units have an I/O hotplug board that limits I/O throughput to 160 MB/sec. ³ MSL6K has no throughput limiting I/O board. Throughput is limited to the drive capabilities. ⁴ Need to change to appropriate magazine type. *Includes all drive generations, e.g. SDLT 220/320/600, Ultrium 230/460/960/1840. **SDLT and Ultrium drives cannot be mixed within the same MSL units.					

Table 4 shows the mixed media support in each model of the MSL G3 tape libraries.

Table 4 MSL G3 tape libraries

Base library	Ultrium 448 half-height drive	Ultrium 920 half-height drive	Ultrium 960 full-height drive	Ultrium 1840 full-height drive
MSL8096	Supported	Supported	Supported	Supported
MSL4048	Supported	Supported	Supported	Supported
MSL2024	Supported	Supported	Single drive only	Single drive only

For additional information about supported drive upgrades, go to the HP website:

<http://h18006.www1.hp.com/products/storageworks/tapecompatibility.html>, and click **Enterprise class libraries drive upgrade matrix** for ESL and EML series libraries or **Business class libraries drive upgrade matrix** for MSL series libraries.

Tape media

Media supported in a mixed media configuration are limited to three types:

- Ultrium 1/2/3/4 media with a native capacity of 100/200/400/800 GB. These tapes can be written and read only by Ultrium drives. Ultrium 3/4 also supports WORM media.
- DLT IV media with a native capacity of 20 GB, 35 GB, or 40 GB per cartridge, depending on the format written. These tapes can be read by the backward-read compatible SDLT drives.
- SDLT type I and II media with a native capacity of 110/160 and 300 GB per cartridge. These tapes can be written and read only by SuperDLT drives.

For additional media compatibility information, see the HP website:

<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00517361/c00517361.pdf>.

Supported media and drive compatibility

Ultrium drives do not format media. Ultrium drives use Ultrium 1, 2, 3, and 4 media. Table 5 provides a backward read and write compatibility reference for Ultrium tape drives and media:

Table 5 Backward read and write compatibility

	Ultrium 1 drive	Ultrium 2 drive	Ultrium 3 drive	Ultrium 4 drive
Ultrium 1 media	Read/Write	Read/Write	Read-only	Not compatible
Ultrium 2 media	Not compatible	Read/Write	Read/Write	Read-only
Ultrium 3 media	Not compatible	Not compatible	Read/Write	Read/Write
Ultrium 4 media	Not compatible	Not compatible	Not compatible	Read/Write

DLT8000 drives use DLT IV media only. SDLT 220 and 320 drives both use one type of SDLT media. Each drive formats media differently and has varying capabilities when reading or writing to non-native media. [Table 6](#) provides an easy reference for tape compatibility:

Table 6 DLT IV and SDLT media and drive compatibility

	SDLT II 600 media not formatted	SDLT media not formatted	SDLT media formatted by SDLT 220	SDLT media formatted by SDLT 320	DLT IV media formatted by DLT8000
SDLT 600	Read/Write	Not compatible	Read-only	Read-only	Not compatible
SDLT 320	Not compatible	Read/Write	Read/Write	Read/Write	Read-only
SDLT220	Not compatible	Read/Write	Read/Write	Not compatible	Read-only
DLT8000	Not compatible	Not compatible	Not compatible	Not compatible	Read/Write

CAUTION: The Density Select application is not recommended for use with autoloaders and libraries because the density select setting is only valid for the current tape in the drive. Unloading a tape or power-cycling the drive resets the drive to use the 160/320 density setting. Therefore, using the Density Select application is not practical for the autoloader/library environment to force an SDLT 160/320 drive to write in the SDLT 110/220 density, because it would have to be run before each new tape is inserted.

NOTE: If an SDLT 160/320 drive appends to a tape that was previously written by an SDLT 110/220 drive, the appended data on that tape will continue to be in the SDLT 110/220 density. Therefore, the easiest way to ensure that a SDLT 160/320 tape drive writes with the SDLT 110/200 density in a mixed media library is to only use SDLT 110/220 drives to perform the software format of tapes, and then append to those tapes with the SDLT 160/320.



NOTE: The orange light on an SDLT 320 drive illuminates when reading media formatted by an SDLT 220 drive.

Supported backup applications

The backup applications that can be used to implement mixed media with HP StorageWorks tape libraries are:

- HP Data Protector
- Symantec Veritas NetBackup
- IBM Tivoli Storage Manager
- Symantec Backup Exec
- Computer Associates ARCserve
- EMC NetWorker

2 Implementation

Implementing mixed media on ESL E-Series and ESL9000 Series tape libraries using library partitioning

Mixed media configurations are supported in the ESL E-Series and ESL9000 Series tape libraries. Partitioning a physical library with mixed drive and media types allows the different types of media and drives to be logically separated. This hardware separation reduces the complexity of configuration within the backup application. Keeping the media and drives separated also greatly reduces the chance for media to be inserted or used in the wrong drive. See the *HP StorageWorks Partitioning in an EBS Environment Implementation Guide*.

All ESL tape libraries must meet the following minimum configuration requirements to operate in a mixed media environment:

- Library partitioning is recommend when mixing SDLT and LTO.
- The library must have Secure Manager Tape Library Software, which is needed to create partitions and to manage host mapping.
- Each partition and panel must have homogenous drive and media types. While drives can be mixed within a physical library, there must be only one drive interface type per drive cluster (i.e. SCSI vs. Fibre Channel).
- Both left and right loadports must be upgraded to have removable loadport capability prior to installing the mixed media conversion kit. This prevents libraries from having a combination of fixed and removable loadports.
- The backup application must be configured to interface with each partition as though it were a separate physical library. There is no need to configure the application to associate drives with corresponding media pools, as described in the next section of this document.

Implementing mixed media on ESL, EML, and MSL Series tape libraries using backup application software

The remainder of this chapter provides information on implementing mixed media using backup application software.

HP Data Protector

To configure an HP tape library with HP Data Protector in a mixed media environment:

- Configure several sub-libraries for the library. One library definition per media type.
- Configure at least one media pool (or use the default pool) per media type.
- Configure the library robotics once per media type, including the slot range for the media type. Make sure that only one host is controlling the robot, that is, ensure the robotic control for each of the sub-library robotic definitions are identical.
- Configure all the drives for a media type and link them to the related library robotic and media pool. Make sure the drive index is unique for each physical device, regardless of media type.

The Autoconfigure Devices wizard is not supported for mixed media operation. To configure mixed media operation, you must create and configure the sub-libraries manually, using the following steps:

1. Create the first sub-library by selecting the **Devices and Media** context. Right-click **Devices**, and then click **Add Device**.
2. Enter the library name in **Device Name**. The device name should reference the media type.
3. Select the Device Type, which is **SCSI-II library**.
4. Select the server you want to use as the robotic host. This should be the same for other sub-libraries. Click **Next** to continue.
5. Enter the SCSI address of the library robotic, if known. You can also let Data Protector discover the robotic address by clicking the down arrow. Select the proper robotics address from the list. Click **Next** to continue.
6. The next page displays all the slots available from the library (MSL or ESL). Delete the slots or a range of slots for the different media type. Click **Next** to continue.
7. Select the proper media type for this sub-library. Click **Finish** to continue.
8. You will be prompted to configure the drives. Configure the drives for this media type.
9. When all the drives are configured for this sub-library, repeat step 1 for the next sub-library.

Symantec Veritas NetBackup

To configure an HP tape library with Symantec Veritas NetBackup in a mixed media environment:

1. Set up the SAN components. Ensure operating system correctly recognizes the tape and robotic devices.
2. Install NetBackup and any necessary patches.



NOTE: If installing NetBackup for the first time, there is a wizard that launches to configure NetBackup. Auto Inventory is a step in this wizard and should be skipped, unless steps 4 through 6 have already been performed.

3. Configure tape and robotic devices with the Device Configuration wizard. For each different drive type, there should be a corresponding storage unit created. Verify that all devices were properly detected and configured, multi-hosted (if applicable), and that the corresponding storage units were created.
4. Each piece of media must be physically labeled with a barcode. Each type of media (LTO-1,2,3,4 (Ultrium-1,2,3,4), SDLT (SDLT Type 1), SDLT-2 (SDLT Type 2), and 40/80 (DLT Type 4)) should have the same first 3 letters in their barcode and be different from the other labeled media types. Each type of media will have a unique barcode family. For example, all Ultrium-4 tape barcodes would start with BJZ (for example, BJZ001, BJZ002...), and all Ultrium-3 tape barcodes would start with AJK (for example, AJK001, AJK002...).
5. Create a volume pool for each different type of media that is present:
 - a. In the navigation pane (left pane) of the NetBackup Management window, expand the "Media" section under "Media and Device Management."
 - b. Right-click **Volume Pools**.
 - c. Select **New Volume Pool**.
 - d. Create volume pools for each different type of media present. In this example, one pool is for Ultrium-4, and another pool is for Ultrium-3.
6. Set up barcode rules.
 - a. In the navigation pane, click **Volume Pools** once to highlight it, then select **Actions** from the NetBackup management window menu bar.
 - b. Select **New Volumes**.
 - c. Select the corresponding media type in the Type field. Select **1/2" cartridge tape** for Ultrium-4 and **1/2" cartridge tape 2** for Ultrium-3.
 - d. Select the appropriate robot and enter the number of volumes being used for that particular pool.
 - e. Enter the first three letters of the barcode for one of the media types in the Media ID field.
 - f. Select the proper pool for that media type in the Volume Pool field. Set a barcode rule for each unique barcode/media type, as well as one for the cleaning tapes (CLN).
 - g. Select the appropriate Volume group.
7. Inventory the robot. The tapes should be recognized as the correct type and be placed into the correct volume pool, as defined by the barcode rules.
8. Set up a backup policy that specifies the storage unit and corresponding media pool to be used for that backup job.

IBM Tivoli Storage Manager

To configure an HP tape library with IBM Tivoli Storage Manager in a mixed media environment:

1. Define the library as an “Automated Library” to TSM and create a device path for the library robot.
2. Define the drives as “Automated Drives” to TSM and create device paths for each drive.
3. Define separate device classes, one for each drive type. Assign each device class to the library.
4. Define sequential-access storage pools for each drive type and assign the previously created device classes to the corresponding storage pool.
5. Define separate policy domains and assign the corresponding storage pool within each domain's backup copy group. TSM client nodes can then be assigned to one or the other policy domain.

For example, a single ESL tape library with four LTO4 drives and four SDLT2 drives would be defined in TSM as an automated library:

- The four LTO4 drives would be defined within the library, belonging to a device class that utilized the LTO4 drive format.
- The LTO4 device class would be assigned to a storage pool to manage only the LTO4 tapes.
- The four SDLT2 drives would be defined within the same library but would belong to a device class that utilized the SDLT2 drive format.
- The SDLT2 device class would be assigned to a storage pool to manage only the SDLT2 tapes.



IMPORTANT: For more detailed information on the configuration of mixed media libraries with TSM, see the TSM Administrator's Guide section, “Mixing Device Types in Libraries.”

Symantec Backup Exec

To configure an HP tape library with Symantec Backup Exec in a mixed media environment:

1. Set up SAN components. Ensure that the operating system correctly recognizes the tape and robotic devices.
2. Install Backup Exec and any necessary patches.
3. Configure tape and robotic devices with the Device Configuration wizard.
4. Each piece of media must be physically labeled with a barcode. Each type of media (LTO-1,2,3,4 (Ultrium-1,2,3,4), SDLT (SDLT Type 1), SDLT-2 (SDLT Type 2), and 40/80 (DLT Type 4)) should have the same first 3 letters in their barcode and be different from the other labeled media types. Each type of media will have a unique barcode family. For example, all Ultrium-4 tape barcodes would start with BJZ (for example, BJZ001, BJZ002...), and all Ultrium-3 tape barcodes would start with AJK (for example, AJK001, AJK002...).
5. Set up barcode rules:
 - a. On the Tools menu, select **Options**.
 - b. In the Properties pane, under Settings, select **Bar Code Rules**.
 - c. Click **Add**.
 - d. Select a media type.
 - e. Enter the library vendor (HP).
 - f. Type in a barcode prefix that corresponds to the physical barcode labeling scheme from step 4.
6. Verify that the barcode rules are enabled for the robotic library. The barcode rules do not go into effect until you enable them for the robotic library.
7. Each drive must have the correct media type enabled for read/write access. To configure:
 - a. In the Devices window, right-click the drive.
 - b. Click **Properties**.
 - c. Select the **Media Types** tab
 - d. Enable or disable read and write access for the appropriate media types.



NOTE: Symantec Backup Exec supports mixed media in a homogeneous Windows environment only.

Computer Associates ARCserve

To configure an HP tape library with Computer Associates ARCserve in a mixed media environment:

1. When installing ARCserve, select **Tape Library Option (TLO)** from the ARCserve products list. Select the Storage Area Network option, if applicable.
2. After setting up TLO and SAN options, run the ARCserve Device Configuration.
3. Select the Virtual Library option, and click **Next**.
4. From the Virtual Library configuration screen, click **New**, and select the number of drives you want to assign to the virtual library from the list of drives displayed.
5. Select the number of slots assigned to the previously selected drives.
6. Assign the remaining slots to remaining drives accordingly.

The key to correctly creating virtual libraries is to remember that the first library to be created using the Virtual Library option in the Device Configuration utility uses the first “n” slots in the library. This means that the first “n” slots must contain the correct type of tapes for the drives that are assigned to this virtual library. Subsequently created virtual libraries use the next “m” slots, and these slots must contain the correct type of tapes for the type of drives that are assigned to this virtual library.



NOTE: Refer to the library owner's manual for both slot and drive numbering and identification.

EMC NetWorker

To configure an HP tape library with EMC NetWorker in a mixed media environment:

1. Execute NetWorker Administrator on the NetWorker Management Console.
2. From the Devices tab, click **Library**, and disable the Auto Media Management attribute in the configuration tab.
3. From the Media tab, click **Media Pools**, and create a media pool for each media type assigning the specific devices that pool will use.
4. Also, while creating each pool, set Recycle to other pools and Recycle from other pools to No.

NetWorker backups and restores with mixed media

Disabling auto media management prevents the NetWorker software from inadvertently labeling a tape. If you are sure that all of the unlabeled media are scratch media, you can safely enable auto media management for a library that has mixed media, for example, LTO3 and LTO4 drives.



NOTE: During a backup, the NetWorker software first checks for available drives. If there are multiple drives available, the NetWorker software uses the drive with the least number of mounts. The NetWorker software has an internal counter for the number of tape mounts on each drive. This internal counter is subsequently used to evenly distribute mount requests among the drives in a library.

Pools can be used to restrict what device and media type the NetWorker software uses for a backup. However, the NetWorker software ignores those restrictions for restores, because a restore is designed to use the first drive it finds.



IMPORTANT: A restore attempts to load the required cartridge into the first drive found, regardless of the drive type, which could lead to unexpected results. Therefore, to perform a restore operation with mixed media, the operator must manually mount the required cartridges before initiating the restore.

For more information on managing storage devices, see the *EMC NetWorker Administrator's Guide*.

A Additional resources

For additional information on implementing mixed media in an HP StorageWorks tape library, see the following websites:

Enterprise Backup Solutions

<http://www.hp.com/go/ebs>

Select from the Quick Links to access the EBS design guide, the EBS Compatibility Matrix, and implementation guides.

Hardware

<http://www.hp.com/go/tape>

Click on any product to view its specifications and other technical documentation.

Software

HP Data Protector

<http://www.hp.com/go/dataprotector>

Symantec Veritas NetBackup and Backup Exec

<http://www.symantec.com>

Computer Associates ARCserve

<http://www.ca.com>

IBM Tivoli Storage Manager

<http://www.ibm.com/support/us>

EMC NetWorker

<http://www.software.emc.com>