



TECH TIP

ACSLs: Managing the Same Type of Media Recorded in Different Densities

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Overview

This Tech Tip discusses describes how to manage the same type of media recorded in different densities.

Often, new tape drives are introduced that use existing tape media, but record at a higher density. The new drives can often read tapes recorded in the old density, but they cannot write at the old density. The older tape drives can neither read nor write in the higher density.

Because of these restrictions, you can encounter these problems:

- When a tape written in the new format is mounted on an older drive, the old drive cannot read the tape.
- Storage management applications often fill up partially used tapes by appending additional files at a later time. This will fail if the tape was written in a different format than the one that the drive uses to record data. When a storage management application tries to append additional files to a tape that was originally initialized in an incompatible format, the attempt may fail. In addition, if you load the wrong cartridge in a drive, there is the possibility of overlaying data already on the cartridge.

If you have a mix of both older and newer tape drives in your libraries, you need to manage your tape cartridges that are the same media type. This document describes how to separate cartridges written in the old format from cartridges written in the new format.

Examples

The following examples show tape drives that record on the same media in different formats:

- **T10000 Media that is used by both T10000A and T10000B Tape Drives**

The T10000B tape drive uses the same media as the T10000A, but writes data at double the T10000A's density. The T10000B can read T10000A media and can reformat it for writing T10000B density data, but it cannot append data to a previously written T10000A cartridge.

The T10000A drive can reformat a T10000B cartridge for writing T10000A density data, but can neither read from nor append data to a T10000B cartridge.

- **9840 Media used by T9840A & T9840B, T9840C, and T9840D Tape Drives**

The T9840A and T9840B tape drives use the same media and record in the same format. The T9840C also uses the same media, but records at double the density. The T9840D writes at almost double the T9840C drive's density. You must manage 9840 media when a combination of T9840A/T9840B, T9840C, and/or T9840D drives are present.

- **9940 Media is used by both T9940A and T9940B Tape Drives**

The T9940B tape drive uses the same media as the T9940A, but writes data at double the T9940A's density. The T9940B can read T9940A media and can reformat it for writing double density data, but it cannot append data to a previously written T9940A cartridge.

The T9940A drive can reformat a T9940B cartridge for writing single density data, but can neither read from nor append data to a T9940B cartridge.

Solution

ACSL S has tools that you can use to manage common media on which two or more types of drives can write, but are in incompatible recording techniques. The client application must use these facilities to manage the read/append data incompatibilities.

You can manage drives that record on common media in different formats within an ACS by either:

- Replacing all of the older drives in an ACS with the new drives at the same time.

This is the simplest and safest strategy

Do not append files to any tapes written in the old format after replacing the old drives with the new drives. With Veritas NetBackup, this is done by “suspending” the tapes.

- Gradually replacing the older drives with the new drives.

This requires you to manage the common media recorded in different formats. You can do this by:

- Using the recording format information returned when the cartridge is dismounted in SL8500 and SL3000 libraries to manage media. This is described below.
- Creating separate ACSLS pools for each format. This is described in the ACSLS 7.3 Administrator's Guide in the “Media Management” Appendix.
- Using the facilities of a backup application (for example, Veritas NetBackup, Legato NetWorker, IBM Tivoli, or CA BrightStor) to manage media pools.

Managing Common Media with Recording Formats Reported by ACSLS

When a cartridge is dismounted from a modern tape drive in a modern library, the recording format of the cartridge is reported to ACSLS. ACSLS saves the recording format in its database. You can use the “display volume” command to display this information.

Recording format is reported by:

- Libraries:
 - SL3000
 - SL8500 with 4.x firmware (available soon)
- Tape Drives:
 - All T10000 tape drives (with 1.38 and later firmware)
 - T9840A, T9840C, and T9840D (All T9840 tape drives except the T9840B.) – 1.4.2 and later firmware
 - T9940A and T9940B tape drives (1.4.2 and later firmware)

The example below describes how to manage T10000 media recorded in both T10000A and T10000B formats. This procedure applies to all cases where different tape drives record on common media in different formats. Use the following table to apply the procedure to your specific case:

Old Format Drive(s)	New Format Drive(s)
T10000A	T10000B
T9940A	T9940B
T9840A/T9840B, or T9840C	T9840C or T9840D

Note: The discussion below uses the following syntax conventions for commands and utilities:

- Commands and Utilities entered as is are in **bold**.
- Variables (you must enter the specific value) are in *bold italics*.

Procedure

After the T10000B drives are installed, use the recording format information to mount cartridges on compatible tape drives. Again, cartridges written at T10000A density can be read by either T10000A drives or T10000B drives, but only T10000A drives can append data written in a T10000A format. Only T10000B drives can read or append to cartridges written in a T10000B format.

No special processing is necessary when mounting scratch cartridges. When you write the cartridge from beginning-of-tape, the previous recording format does not matter.

To select a drive to read or append to a cartridge with data already recorded on it, follow this procedure. The following commands identify drives that can read and write a cartridge's recording format.

Mounting Non-scratch Cartridges

1. Display the recording format of the cartridge.

```
display volume vol_id -f recording_format_family recording_format_model
```

The recording format for this volume is displayed.

2. Use the following query command to identify a compatible drive.

```
query mount vol_id
```

Drives compatible with a cartridge are displayed. You must select the correct drive type before mounting the cartridge. This query command returns both T10000A and T10000B drives (because both drive types are compatible with T10000 media). Use drive type to separate T10000As from T10000Bs. Selecting the first compatible drive in the list minimizes pass-thru and improves library performance.

3. Mount the cartridge on a drive compatible with the recording format.

```
mount vol_id drive_id
```

Migrating to the New Recording Format

When all the data on the cartridge has expired, you can re-write the cartridge from beginning-of-tape in a new recording format.

After all T10000A drives are converted to or replaced by T10000B drives, all T10000 media can be used by T10000B drives as long as data is not appended to cartridges written in T10000A format

Managing Common Media Recorded in Different Densities with ACSLS Pools

The example below describes how to manage 9940 media recorded in both T9940A and T9940B formats. The following procedure applies to all cases where different tape drives record on a common media in different formats. Use the following table to apply the procedure to your specific case:

Old Format Drive(s)	New Format Drive(s)
T10000A	T10000B
T9940A	T9940B
T9840A or T9840B, or T9840C	T9840C or T9840D
SDLT 220	SDLT 320

Note: The discussion below uses the following syntax conventions for commands and utilities:

- Commands and Utilities entered as is are in **bold**.
- Variables (you must enter the specific value) are in **bold italics**.

Perform the following:

1. Before installing T9940B drives in an ACS that has T9940A drives, identify all 9940 data (non-scratch) cartridges in the ACS and assign them to a T9940A pool. Assign 9940 scratch cartridges to either the T9940A or T9940B pool.
 - a. Define T9940A and T9940B media pools:

```
define pool pool_id
```

- b. Report all 9940 media.

You can do this by using either the **display volume** command (option 1) or a custom **volrpt** (option 2) as shown below:

Results are written to a file.

- Option 1

Use the **display volume** command to write the results to a file.

```
display volume * -media STK2P > filename
```

where:

All 9940 tape cartridges (media STK2P) are reported.

filename is the filename to which the output is written. The **ACS ID** in which the cartridge is located is also listed.

Read the output, selecting cartridges from specific ACS(s), if desired.

If you want cartridges from one ACS, use the **-home** operand to only select cartridges from this ACS.

```
display volume * -home acs_id.*,*,* -media STK2P> filename
```

- Option 2

Use the custom **volrpt** for all volumes in the ACS. The results are written to a file:

```
volrpt -d -f custom_volrpt_file -a acs_id > filename
```

where:

custom_volrpt_file is the filename specifying the fields reported in a custom **volrpt**. The following fields are reported:

```
VOLUME_ID 6 2
MEDIA_TYPE 7 2
VOLUME_TYPE 4 2
```

acs_id is the ID of the ACS that you are managing.

filename is the filename to which the output is written.

Read the output, selecting only the volumes with a media type of STK2P.

c) Assign the selected volumes to the appropriate pools.

Assign all non-scratch (**VOLUME_TYPE** = “D”) cartridges to the T9940A pool.

```
set scratch off pool_id vol_id
```

Assign the scratch cartridges (**VOLUME_TYPE** = “S”) to either the T9940A or T9940B pools.

```
set scratch pool_id vol_id
```

2. After the T9940B drives are installed, use the pools to mount cartridges on compatible tape drives. Again, cartridges written at T9940A density can be read by either T9940A drives or T9940B drives, but only T9940A drives can append data on 9940A media. Only T9940B drives can read or append to cartridges written at 9940B density.

The following commands can be used to identify, select and mount cartridges from the pool appropriate for a T9940A or T9940B drive. Use the pools to ensure you are mounting cartridges on the correct drive.

If you want to mount a scratch cartridge on the correct drive type, follow procedure A. If you want to mount a non-scratch cartridge with data already recorded on it, follow procedure B.

Procedure A - Mounting Scratch Cartridges

a. Query the drive(s) to identify drive types.

```
query drive drive_id | all
```

b. Identify the correct pool (media type) for the cartridges to be mounted on the desired drive.

c. Mount scratch cartridges to a drive from the specified pool.

```
mount * drive_id pool_id
```

Procedure B - Mounting Non-scratch Cartridges

- a. Display the status of drives compatible with a cartridge.

display volume *vol_id* **-f pool**

The pool for this volume is displayed.

- b. Use the following query command to identify a compatible drive.

query mount *vol_id*

Drives compatible with a cartridge display. You must select the correct drive type before mounting the cartridge. This query command returns both T9940A and T9940B drives (because both drive types are compatible with 9940 media). Use drive type to separate T9940As from T9940Bs.

- c. Mount the cartridge on the selected drive.

mount vol_id *drive_id*

3. When all the data on the cartridge has expired, you can migrate the scratch cartridges to the pool for the new recording format. Because T9940A and T9940B drives can re-initialize cartridges in their density, scratch cartridges can be reassigned to a different pool.

set scratch *pool_id vol_id*

4. After all T9940A drives are converted to or replaced by T9940B drives, all 9940 media can be used by T9940B drives as long as data is not appended to cartridges written in T9940A format.