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Application Note

Installing a DLTtape™ Drive into an AIX System

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Revision History

Revisions made to this document are listed below in chronological order.

Document Release	Date	Summary of Changes
A	February 2, 2004	Initial Release on ECO C009135.

Installing a DLTtape™ Drive into an AIX System

1. Introduction

This document provides instructions for integrating a Quantum® Super DLTtape™ or DLTtape™ tape drive into an IBM® RISC System/6000 running AIX® 3.2, 4, or 5L.

1.1 Purpose and Scope

This document pertains to the following products:

- **Tape drives:** DLT 2000, DLT 2000XT, DLT 4000, DLT 7000, DLT 8000, SDLT 220, and SDLT 320. (The SDLT 220 tape drive was formerly known as the Super DLT1.)

  Note: The instructions in this document do not apply to DLT 7000 and DLT 8000 series tape drives and all Super DLTtape products, if being used on AIX 3.2. In this case, you need to obtain a specific patch from IBM in order install the tape drives. The patch will allow you to attach wide SCSI devices such as the DLT 7000 and the DLT 8000 to narrow host adapters on RS/6000. To obtain the patch (PTF U429285), go to IBM's Tech Support web site: http://service.software.ibm.com.

- **Mini-libraries:** DLT 2500, DLT 2500XT, DLT 2700, DLT 2700XT, DLT 4500, and DLT 4700.

  Note: Some of these library products are no longer supported by Quantum. Information on such products is included for historical purposes only.

This document includes the following sections:

- "Installation" on page 4 describes how to install a DLTtape drive in an IBM RS/6000 running AIX 3.2, 4, or 5L.
- "Optional Attribute Settings" on page 8 provides information about setting the DLTtape device attributes.
- "Special Device Files" on page 10 provides a list of special device files that can be used to select tape drive options (re-tensioning, rewinding, and density settings).
- "Data Cartridge Compatibility" on page 11 provides information about SDLT and DLTtape cartridge and tape drive compatibility.
- "Using a DLTtape Mini-Library" on page 12 provides information about using a DLTtape mini-library.

2. Installation

This section describes how to install the tape drive and how to configure the AIX operating system to recognize and communicate with the tape drive.

2.1 Before You Begin

Before you install the tape drive, follow these steps:

1. Make sure that your controller firmware version is V10 or greater. DLTtape controller firmware must have OEM-1 controller firmware installed.
2. Obtain the appropriate manual for your tape drive as listed in Table 1. These manuals provide detailed hardware installation instructions, including switch and jumper settings and information about SCSI bus termination.

Note: To view these manuals online, go to: http://www.quantum.com/AM/support/DLTtapeDrivesMedia/Manuals/Default.htm.

Table 1. Part Numbers for Tape Drive Manuals

Manual Title	Order Number
DLT 2000/DLT 2700 Product Manual	81-109132
DLT 4000 Product Manual	81-60043-04
DLT 7000 Product Manual	81-60000-06
DLT 8000 Product Manual	81-60118-04
SDLT 220 and SDLT 320 Product Manual	81-85002-01

2.2 Installing the Tape Drive

To install the tape drive, follow these steps:

1. Shut down the AIX system and disconnect the AC power cable.
2. Attach the tape drive to the SCSI interface. Make sure that the hardware has the appropriate SCSI interface for the tape drive. If you have a SCSI single-ended (SE) tape drive, you need a SCSI SE interface; if you have a SCSI low-voltage differential (LVD) or high-voltage differential (HVD) tape drive, you need a SCSI LVD or HVD interface.
3. Power on the tape drive.
4. Power on and restart the AIX system.

Restarting the system adds the tape drive you are installing to its customized configuration table as a `Defined` tape drive. To verify that the tape drive has successfully connected to your operating system, follow these steps:

1. At the command line, type `smit` and press Enter.
2. Select `Devices`.

3. Select `Tape Drives`.

4. Select `List All Supported Tape Drives`.

5. The Output window displays a list of tape drives similar to the following table:

```
type          subclass    description
1200mb-c      SCSI        1200 MB 1/4-inch Tape Drive
150mb         SCSI        150 MB 1/4-inch Tape Drive
525mb         SCSI        525 MB 1/4-inch Tape Drive
8mm           SCSI        2.3 GB 8mm Tape Drive
8mm5tgb       SCSI        5.0 GB 8mm Tape Drive
9trk          SCSI        1/2-inch 9-trk Tape Drive
ost           SCSI        Other SCSI Tape Drive
```

6. Select `Done` to return to the previous `Tape Drive` menu.

7. Select `List All Defined Tape Drives`.

   The system displays the tape drives connected to SCSI I/O controller(s) as shown below:

```
name        status*      location         description
rmtl        Defined      00-00-0S-50      Other SCSI Tape Drive
```

   *. The system may report a status of either `Defined` or `Available`.

   Where:

`name`	the logical name of the DLTtape drive (rmtl)
`status`	the tape drive is defined (not ready for use) or available (ready for use)
`location`	the SCSI ID of the DLTtape drive (**`5`**) and the address of the SCSI I/O controller (**`0`** after the **`5`**)
`description`	a description of the tape drive type (**`Other SCSI Tape Drive`**)

8. If the status is reported as `Available`, the installation is complete.

If the status of your tape drive is not yet listed as `Available`, and is still listed as `Defined`, your tape drive is not ready for use. Follow these steps to make your tape drive available:

1. In the `smit` utility, select `Devices`.

2. Select `Tape Drive`.

3. Select `Configure a Defined Tape Drive`. A list of defined tape drives will be displayed similar to the following table:

```
rmt0        Available      30-58-00-3,0 SCSI DLT Tape Drive
rmt1        Defined        30-58-00-4,0 Other SCSI Tape Drive
rmt2        Defined        30-58-00-6,0 SCSI DLT Tape Drive
rmt3        Available      30-58-00-5,0 Other SCSI Tape Drive
```

4. Select the tape drive that you are installing from the displayed list. You should be able to identify your tape drive by its location code.

   For example, in the sample list of tape drives above, `rmt2` would be the tape drive at Drawer `30`, I/O Bus `58`, Adapter Connector `00` and SCSI ID `6`.

5. Click **OK**. The system reports the status of the command.

6. Select `List All Supported Tape Drives` to verify that the system has changed the device status to `Available`. For example, the system would display the following:

```
rmtl Available
```

7. If the status reported is `Available`, the installation is complete.

   If the status is not reported as `Available`, contact Quantum Technical Support for assistance. For specific contact information, visit the Contact Support page on our website at: http://www.quantum.com/am/service_support/contact/default.htm.

3. Optional Attribute Settings

The following information describes optional DLTtape drive attribute settings. These optional settings include attributes such as `Fixed vs. Variable Blocks`, `Variable Length Block Size`, `Device Buffer Usage` and `Density Settings`. To examine and/or modify these attributes, follow these steps:

1. Under Devices, Tape drive selection in `smit`, select `Change/Show Characteristics of a Tape Drive`. The system displays a table of defined tape drives.

2. Select the tape drive via its logical address and location. The system displays the attributes assigned to the tape drive. The tape drive attributes may be changed from the those listed in Table 2 on page 8.

   Note: Recommended settings are in bold.

   - BLOCK size (0 = variable length): **0**
   - BLOCK SIZE for variable length support: **0**
   - Use DEVICE BUFFERS during writes: **yes**

   Table 2 lists density settings and density value descriptions for DLTtape drives.

Table 2. Density Settings, Values, and Descriptions

Tape Drive	Density Setting	Value	Description
All DLT 2000 series units	DENSITY setting #1	**128**	80h is the vendor-unique density code for 10 GB, 62500 bpi, uncompressed mode
	DENSITY setting #2	**129**	81h is the vendor-unique density code for 20 GB, 62500 bpi, compressed mode
All DLT 4000 series units	DENSITY setting #1	**130**	82h is the vendor-unique density code for 20 GB, 81633 bpi, uncompressed mode
	DENSITY setting #2	**131**	83h is the vendor-unique density code for 40 GB, 81633 bpi, compressed mode
DLT 7000	DENSITY setting #1	**132**	84h is the vendor-unique density code for 35 GB, 85937 bpi, uncompressed mode
	DENSITY setting #2	**133**	85h is the vendor-unique density code for 70 GB, 85937 bpi, compressed mode

Table 2. Density Settings, Values, and Descriptions (*continued*)

Tape Drive	Density Setting	Value	Description
DLT 8000	DENSITY setting #1	**136**	88h is the vendor-unique density code for 40 GB, 98250 bpi, uncompressed mode
	DENSITY setting #2	**137**	89h is the vendor-unique density code for 80 GB, 98250 bpi, compressed mode
SDLT 220 (SuperDLT1)	DENSITY setting #1	**144**	90h is the vendor-unique density code for 110 GB, 133000 bpi, uncompressed mode
	DENSITY setting #2	**145**	91h is the vendor-unique density code for 220 GB, 133000 bpi, compressed mode
SDLT 320	DENSITY setting #1	**146**	92h is the vendor-unique density code for 160 GB, 190000 bpi, uncompressed mode
	DENSITY setting #2	**147**	93h is the vendor-unique density code for 320 GB, 190000 bpi, compressed mode
Note: The recommended DLTtape drive device density settings may cause problems with tape drive access when using third party applications. In these cases, set density values to zero (0).			

4. Special Device Files

Special device files can be used to select tape drive options. These options include the following: re-tensioning the tape, rewinding the tape, and selecting the appropriate density setting for the operation. These special device files are located in the `/dev` directory. Table 3 lists the special device files.

Note: Re-tensioning is not necessary for cartridges loaded in DLTtape drives.

Table 3. Special Device Files and Values

Special File	Rewind On Close	Retension On Open	Density Setting
`/dev/rmt1`	Yes	No	#1
`/dev/rmt1.1`	No	No	#1
`/dev/rmt1.2`	Yes	Yes	#1
`/dev/rmt1.3`	No	Yes	#1
`/dev/rmt1.4`	Yes	No	#2
`/dev/rmt1.5`	No	No	#2
`/dev/rmt1.6`	Yes	Yes	#2
`/dev/rmt1.7`	No	Yes	#2

5. Data Cartridge Compatibility

Table 4 provides information about data cartridge and tape drive compatibility. Use this matrix when determining which data cartridges to use in your tape drive.

Note: The SDLT 220 and SDLT 320 tape drives can read, but not append data to, DLTtape IV data cartridges that were previously written by a DLT 4000, DLT 7000, or DLT 8000 tape drive.

Table 4. Data Cartridge and Tape Drive Compatibility (Native/Compressed)

	Drive Type						
Data Cartridge	**DLT 2000 DLT 2500 DLT 2700**	**DLT 2000XT DLT 2500XT DLT 2700XT**	**DLT 4000 DLT 4500 DLT 4700**	**DLT 7000**	**DLT 8000**	**SDLT 220**	**SDLT 320**
DLTtape™ III (CompacTape III™)	10/20 GB	10/20 GB	10/20 GB	10/20 GB	10/20 GB		
DLTtape™ IIIXT (CompacTape IIIXT)		15/30 GB	15/30 GB	15/30 GB	15/30 GB		
DLTtape™ IV (CompacTape IV™)			20/40 GB	20/40 GB 35/ 70 GB	20/40 GB 35/70 GB 40/80 GB	20/40 GB 35/70 GB 40/80 GB	20/40 GB 35/70 GB 40/80 GB
Super DLTtape I						110/220 GB	110/220 GB 160/320 GB
CleaningTape III		20 uses	20 uses	20 uses	20 uses	20 uses	20 uses
SDLT CleaningTape						20 uses	20 uses

6. Using a DLTtape Mini-Library

The IBM AIX operating system does not support DLTtape media library device commands. Therefore, you cannot use a DLT 2500, DLT 2500XT, DLT 2700, DLT 2700XT, DLT 4500, or DLT 4700 in random access mode. You can access the mini-library in sequential mode only.

For a detailed description of these access modes, refer to the appropriate product manual for your DLTtape mini-library. See Table 1 on page 5.