

## Application Note

# Installing an SDLTtape or DLTtape Drive into a Sun Solaris 2.X System (versions 2.6 and above)

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## Notes

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# Installing an SDLTtape or DLTtape Drive into a Sun Solaris 2.X System (versions 2.6 and above)

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## 1. Introduction

This document provides instructions for integrating a Quantum® SuperDLTtape™ or DLTtape™ drive into a Sun™ SPARCstation™ workstation, an Ultra™ server, or an Enterprise™ server running Solaris™ 2.X.

**Note:** This document applies to Sun Solaris 2.6 and above. Sun no longer supports Solaris 2.6. Solaris 2.8 is Sun's preferred operating system.

### 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.  
**Note:** The Super DLT1 tape drive is currently known as the SDLT 220 tape drive.
- **Mini-libraries:** DLT 2500, DLT 2500XT, DLT 2700, DLT 2700XT, DLT 4500, and DLT 4700.

This document includes the following sections:

- [“Installation” on page 4](#) describes how to install an SDLTtape or DLTtape drive in a Sun SPARCstation workstation, Ultra server, or Enterprise server running Solaris 2.X.
- [“Data Cartridge Compatibility” on page 11](#) provides information about SDLTtape and DLTtape data cartridges 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 Solaris operating system to recognize and communicate with the tape drive. The operating system includes a driver to communicate efficiently with SCSI devices, such as an SDLTtape or DLTtape drive.

### 2.1 Before You Begin

Before you install the tape drive, follow these steps:

1. If you have a DLT 2000, DLT 2500, or DLT 2700 product, make sure it uses version V10 (or higher) controller firmware.

**Note:** The DLT 2000XT, DLT 2500XT, DLT 2700XT, DLT 4000, DLT 7000, DLT 8000, SDLT 220, and SDLT 320 tape drives do not have a firmware revision restriction.

2. 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. 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.** Order Numbers for Tape Drive Manuals

Manual Title	Order Number
<i>DLT 2000/DLT 2700 Product Manual</i>	81-109132
<i>DLT 2500 Owner's Manual</i>	81-109374
<i>DLT 2000XT/DLT 2500XT/DLT 2700XT Product Manual</i>	81-109253-03
<i>DLT 4000 Product Manual</i>	81-60043-04
<i>DLT 7000 Product Manual</i>	81-60000-06
<i>DLT 8000 Product Manual</i>	81-60118-04
<i>SDLT 220 and SDLT 320 Product Manual</i>	81-85002-01

## 2.2 Installing the Tape Drive

To install the tape drive, follow these steps:

1. Shut down your workstation or server and remove AC power from the system.
2. Follow instructions in your tape drive's product manual to install the tape drive and set the SCSI ID.

## 2.3 Installing Required Patches

For each Solaris configuration (2.6 and above) Sun requires/recommends installing specific patches to ensure proper functionality of your tape drive. You can download these patches at <http://sunsolve.sun.com/pub-cgi/show.pl?target=patches/patch-access&nav=patchpage>.

- Notes:**
- The patches in this section are tiered as pre-requisites.
  - Because patches are updated, the patches listed in this section do not specify a version number, for example 123456-xx. Be sure to download the latest available patch.

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**IMPORTANT:** You may use a recommended Solaris Patch Cluster for all patches marked with a red asterisk (\*).

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### Solaris 2.6

	Required Patch	Description
<b>sparc</b>	105847-xx*	SunOS 5.6: /kernel/drv/st.conf and /kernel/drv/st patch
<b>x86</b>	105505-xx*	SunOS 5.6_x86: /kernel/drv/st.conf and /kernel/drv/st patch

### Solaris 2.7

	Required Patch	Description
<b>sparc</b>	107460-xx*	SunOS 5.7: st driver patch
<b>x86</b>	107461-xx	SunOS 5.7.x86: st driver patch

## Solaris 2.8

	Patch	Description
<b>sparc</b>	108725-xx*	SunOS 5.8: st driver patch
	108528-xx*	SunOS 5.8: kernel update patch
	108987-xx*	SunOS 5.8: patch for patchadd and patchrm
	112396-xx*	SunOS 5.8: /usr/bin/fgrep patch
	111111-xx*	SunOS 5.8: /usr/bin/nawk patch
	111310-xx*	SunOS 5.8: /usr/lib/libdhcpage.so.1 patch
<b>x86</b>	108726-xx*	SunOS 5.8_x86: st driver patch
	108529-xx*	SunOS 5.8_x86: kernel update patch
	108988-xx*	SunOS 5.8_x86: patch for patchadd and patchrm
	112397-xx*	SunOS 5.8_x86: /usr/bin/fgrep patch
	111112-xx*	SunOS 5.8_x86: /usr/bin/nawk patch
	111307-xx*	SunOS 5.6_x86: boot.bin, bootconf.exe, bootenv.rc and nbp patch
	111311-xx*	SunOS 5.6_x86: /usr/lib/libdhcpage.so.1 patch
	110610-xx	SunOS 5.8_x86: cdio.h and commands.h USB patch cdio.h commands.h USB new defines SCSI Quantum SDLT

## Solaris 2.9

	Patch	Description
<b>sparc</b>	113277-xx*	SunOS 5.9: patch st driver
	112233-xx*	SunOS 5.9: kernel patch
	112834-xx*	SunOS 5.9: patch scsi
<b>x86</b>	114243-xx*	st driver patch

## 2.4 Verifying the Installation

To verify the installation, follow these steps:

1. Load a data cartridge into the tape drive following the instructions in your manual.
2. Change the directory to `/`.
3. Enter `shutdown -i0 -g0` to shut down the system.
4. Enter `boot -rv` to reboot the system.

The `r` switch in the boot command recompiles the kernel and creates a special device file for communicating with the tape drive.

**Note:** The device files created for the tape drive are located in the `/dev/rmt/` path and are discussed in [“Device File Assignments” on page 9](#).

The `v` switch enables verbose mode display during system bootup. With verbose mode, the system indicates that the tape drive is attached by displaying the Vendor ID and Product ID strings.

5. To verify that you installed the tape drive and that a data cartridge is loaded, enter `mt -f /dev/rmt/0 status`.

`mt` responds with a display similar to the following:

```
QUANTUM DLT7000 tape drive:
  sense key(0x6)= Unit Attention residual= 0  retries= 0
  file no= 0  block no= 0
```

Installation is complete.

## 2.4.1 Device File Assignments

When you issue a `boot -rv` command, Solaris recompiles the kernel and creates a special device file used for communicating with the tape drive. This file, located in the `/dev/rmt` path, has the following form:

```
[0-127] [l, m, h, c, u] [b] [n]
```

[Table 2](#) lists and defines the values within this file.

**Table 2.** Device File Values and Definitions

Device File Value	Definition
[0-127]	The target tape drive designation as assigned by Solaris during <code>boot -rv</code> (see <a href="#">"Target Tape Drive Designations" on page 10</a> ).
[l, m, h, c, u]	The tape density the tape drive uses during write operations. The first four letters map to the four density assignments in the <code>&lt;DLTtape data&gt;</code> line in the <code>st.conf</code> file. If these letters are not in the device file, the tape drive uses the default density designated by the last parameter in the <code>&lt;DLTtape data&gt;</code> line in the <code>st.conf</code> file. This is the highest density with compression for this configuration.  The following list defines each letter: <ul style="list-style-type: none"> <li>• l - low density</li> <li>• m - medium density</li> <li>• h - high density</li> <li>• c - compressed (same density as u)</li> <li>• u - ultra (same density as c).</li> </ul>
[b]	The BSD behavior. See <code>mtio</code> man page for more information.
[n]	The rewind behavior. The tape drive will not rewind the tape when the command is complete.

For example, listing the device files in `/dev/rmt` for the first drive assigned by Solaris may look similar to the following:

```
ls /dev/rmt/0*

/dev/rmt/0      /dev/rmt/0cbn  /dev/rmt/0hn   /dev/rmt/0m    /dev/rmt/0u
/dev/rmt/0b    /dev/rmt/0cn  /dev/rmt/0l    /dev/rmt/0mb   /dev/rmt/0ub
/dev/rmt/0bn   /dev/rmt/0h   /dev/rmt/0lb   /dev/rmt/0mbn  /dev/rmt/0ubn
/dev/rmt/0c    /dev/rmt/0hb  /dev/rmt/0lbn  /dev/rmt/0mn   /dev/rmt/0un
/dev/rmt/0cb   /dev/rmt/0hbn /dev/rmt/0ln   /dev/rmt/0n
```

### **Target Tape Drive Designations**

The target drive designations assigned by Solaris may take on values higher than those established in the `/dev/rmt/` path. This is not a problem; however, during a `boot -rv`, Solaris does not remove the tape device files for tape drives no longer attached to the system. As a result, you may find it more difficult to locate the device file for the configured tape drive. To minimize this problem, initially delete the tape device files (`rm /dev/rmt/*`), then either boot the system with a `boot -rv` or issue the following at the command line prompt:

```
drvconfig -i st; tapes
```

If the DLTape drive is the only drive on the system, its target assignment should be 0. The Solaris man pages have more information about `drvconfig` and `tapes`.

### 3. Data Cartridge Compatibility

Table 3 provides information about data cartridge and tape drive compatibility. Use this matrix when determining 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 3.** Data Cartridge and Tape Drive Compatibility (Native/Compressed)

Data Cartridge	Drive Type						
	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 (CompactTape III™)	10/20 GB	10/20 GB	10/20 GB	10/20 GB	10/20 GB		
DLTtape™ IIIXT (CompactTape IIIXT)		15/30 GB	15/30 GB	15/30 GB	15/30 GB		
DLTtape™ IV (CompactTape 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

## **4. Using a DLTtape Mini-Library**

The Solaris operating system does not support SCSI-2 media changer 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](#).