Please Read

The L&TT Support Guide (End User edition) is intended to be used as an interactive help file, allowing access to topics, email addresses, web sites, searching, and so on. The help file is a compiled Microsoft® HTML Help system and requires Internet Explorer 4.X or later to view and run it on your computer. This browser is included with most Windows® operating systems. Windows 95 and Windows NT® users need to install it.

Access the help file at:

ftp://ftp.hp.com/pub/information_storage/software/ltt/LTT_Support_GuideEUE.chm.

If you do not have the browser installed, use this PDF. Note, however that this **PDF does not provide interactive functionality.**

L&TT Support Guide
(End User Edition)

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Welcome

Welcome to the L&TT v3.5 SR1 Support Guide (End User Edition)

Welcome to the L&TT Support Guide (End User Edition). This document has been developed to provide assistance and guidance to those using the HP Library & Tape Tools (L&TT) diagnostic to investigate and resolve user problems with HP nearline products.

Note: Before you use L&TT, ensure that any backup applications or other services that try to access the drive or library you are about to test are disabled or shut down. See Device access issues for further details.

Within this support guide you will find information on:

- Supported OS platforms
- Installation Requirements (for HP-UX, Linux, Linux Advanced Server, Novell NetWare, OpenVMS, Tru64 UNIX®, and Microsoft® Windows®), as well as the L&TT application download link.
- Typical Installation Sequences (for HP-UX, Linux, Linux Advanced Server, NetWare, OpenVMS, Tru64 UNIX, and Windows)
- Getting Started on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX and Windows. This section also includes information on Setting software preferences and passwords, Using L&TT in SAN environments, Using the Skip-Scan feature, Running installation checks, and Device access issues.
- Firmware Functions (such as downloading/updating firmware files on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX and Windows).
- Available Test Functions (Diagnostic tests and Performance tests)
- Support tickets
- Common questions and scenarios (Device and media support/compatibility, L&TT installation and usage, and so on)
- Miscellaneous L&TT issues (Useful links, Windows links, Backup software support links, L&TT change highlights per version, Support for the L&TT tool, and Restricted Mode)

Note: Information is structured in a Help file format and is designed to be used as an online document. It has numerous document links to facilitate finding the desired information quickly and easily. To determine the actual URL of an external link, right-click the hyperlink in the support guide, and then click **Properties**. If you want a hard copy of the support guide, a PDF is available for download. If you only want to print a particular section of the support guide, you can do so directly from the online help file. To print a single section, expand any links in the section you are going to print to be sure the hidden information is visible prior to printing. Then, click the **Print** button on the main menu bar, select a topic or select to include all subtopics, and then click **OK**.

! IMPORTANT: As a user of the Support Guide, you have an opportunity to make it more useful by sending comments and information you believe would benefit others. You should also send feedback if you note any problems in the Support Guide, such as a broken link, so that we can correct the problem. To send feedback, click here. For proper routing of your feedback, please make sure to include the words "L&TT Support Guide" in the subject line of your email.

Legal Notice

HP StorageWorks Library and Tape Tools v3.5 SR1 Support Guide (End User Edition)
Third Edition (September 2004)
Part Number: 5697-5211

Alerts and updates

This support guide will be updated periodically to include new device support, new L&TT application features, and so on. To ensure that you are made aware of new Support Guide releases, HP recommends that you sign up for driver, patch, security and support alerts by clicking http://h30046.www3.hp.com/subprofile.php?SUBS=DRIVERSIGNUP>. If you have already signed up for these notifications, you need not sign up again.

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HP StorageWorks Library and Tape Tools v3.5 SR1 Support Guide (End User Edition)

Third Edition (September 2004)

Part Number: 5697-5211

Operating System Platforms Support

Operating system platforms support

- HP-UX 11.x
- Linux RedHat 7.2
- Linux RedHat 7.3
- Linux RedHat 8.0
- Linux RedHat 9.0
- Linux RedHat Advanced Server 2.x
- NetWare 5x
- NetWare 6.x
- OpenVMS
- Tru64 UNIX 5.x
- Windows 95 SE, Windows 98, Windows ME
- Windows NT4 (SP 3 required, SP 6 recommended)
- Windows 2000
- Windows XP
- Windows Server 2003

Installation Requirements

About OS installation requirements

Click the links below to access installation details on the following supported operating systems:

- HP-UX
- Linux
- Linux Advanced Server
- NetWare
- OpenVMS
- Tru64 UNIX
- Windows

Installation requirements for HP-UX

HP-UX installation requirements

Item	Description
Download link	http://www.hp.com/support/tapetools
Download size	17.6 MB (HPUX Depot format)
Download time (typical)	<3 minutes (T1) to 50 minutes (56K)
Install time (typical)	<3 minutes
Reboot requirements	None
Software dependencies / prerequisites	▪ Devices do not need to be claimed by the operating system with ioscan for L&TT to access them. ▪ The sctl driver must be installed for L&TT to access the device you want to test ***(more info)***. *L&TT builds its own pass-through SCSI device files using the sctl driver, so that driver must be installed; however, L&TT does not need the operating system to list any of the devices as "CLAIMED." They may be listed that way (if the appropriate driver is installed), but they don't need to be for L&TT to fully access them (beginning with L&TT v3.3).* ▪ Devices must NOT be listed as "NO HARDWARE" in ioscan ***(more info)***. *If the device you want to test with L&TT is listed as "NO HARDWARE" in ioscan, the communication path between the host and the device is not working and must be fixed before L&TT will be able to communicate with the device.*
Installation problems	None
Typical installation sequence	See Typical installation sequences for an example of a typical installation sequence with screen shots.

Installation requirements for Linux

Linux 7.x, 8.x, 9.x installation requirements

Item	Description
Download link	http://www.hp.com/support/tapetools
Download size	6.1 MB
Download time (typical)	1 minute (T1) to 20 minutes (56K)
Install time (typical)	<3 minutes
Reboot requirements	None
Software dependencies / prerequisites	▪ Device should be recognized by proc/SCSI subsystem. ▪ Device drivers for the connected tape devices/libraries or default device driver should be present.
Installation problems	None
Typical installation sequence	See Typical installation sequences for an example of a typical installation sequence with screen shots.

Installation requirements for Linux Advanced Server

Linux Advanced Server installation requirements

Item	Description
Download link	http://www.hp.com/support/tapetools
Download size	7.2 MB
Download time (typical)	1 minute (T1) to 25 minutes (56K)
Install time (typical)	<3 minutes
Reboot requirements	None
Software dependencies / prerequisites	▪ Device should be recognized by proc/SCSI subsystem. ▪ Device drivers for the connected tape devices/libraries or default device driver should be present.
Installation problems	None
Typical installation sequence	See Typical installation sequences for an example of a typical installation sequence with screen shots.

Installation requirements for NetWare

NetWare installation requirements

Item	Description
Download link	http://www.hp.com/support/tapetools
Download size	5.7 MB
Download time (typical)	1 minute (T1) to 20 minutes (56K)
Install time (typical)	<2 minutes
Reboot requirements	None
Software dependencies / prerequisites	▪ Device should be recognized by NWPA subsystem. ▪ Device drivers for the connected tape devices/libraries or default device driver should be present. ▪ L&TT on NetWare currently does not support clustering configurations.
Installation problems	None
Typical installation sequence	See Typical installation sequences for an example of a typical installation sequence with screen shots.

Installation requirements for OpenVMS

OpenVMS installation requirements

Item	Description
Download link	http://www.hp.com/support/tapetools
Download size	19.6 MB
Download time (typical)	<3 minutes (T1) to 55 minutes (56K)
Install time (typical)	<4 minutes
Reboot requirements	None

Software dependencies / prerequisites	Installation of the initial release of L&TT v3.5 was supported on OpenVMS v7.3-2 only. If you attempted to install on v7.3-1 you would either get "pthread" errors, or be informed of the incompatibility when attempting to install on OpenVMS v7.3-1. This problem was solved with an update to v3.5 posted on the web July 9, 2004 which supports both OpenVMS versions. If you are running on v7.3-1 and haven't tried to download and install L&TT since that date, you should do so now.
	
	The Terminfo database must be installed, and the Terminfo environment set up prior to installing L&TT, otherwise L&TT will not install properly. If you downloaded and installed L&TT from the HP web site after June 17, 2004 the Terminfo database was automatically installed during the L&TT installation. If you downloaded and installed prior to this date, download and install the latest version to ensure that the Terminfo database is correctly installed.
	
	If you are using GNV, click ***here*** for instructions on setting up the environment variable.
	
	▪ *Set the Term to vt100 using the following command at the bash prompt:*
	
	`"export TERM=vt100"`
	
	▪ *Set the TERMINFO environment variable to indicate the directory path of the Terminfo database. If the Terminfo database is installed at /usr/local/share/terminfo, use the following command to set the TERMINFO variable:*
	
	`"export TERMINFO=/usr/local/share/terminfo"`
	
	If you are using DCL, click ***here*** for instructions on setting up the environment variable.
	
	▪ *Set the Term to vt100 using the following command:*

```
"set term  /dev=vt100"
```

- *If the Terminfo database is installed at sys$device:[usr.local.share.terminfo], use the following command to create a logical name USR:*

```
"define usr sys$device:[usr]"
```

Note: DCL is the abbreviation for DIGITAL Command Language which is the default command interpreter for OpenVMS. GNV was developed to provide a "UNIX-like" environment on OpenVMS to make it easier for Unix users to use OpenVMS. GNV is a separate installation that the user must install explicitly.

Installation problems	None
Typical installation sequence	See Typical installation sequences for an example of a typical installation sequence with screen shots.

Installation requirements for Tru64 UNIX

Tru64 UNIX installation requirements

Item	Description
Download link	http://www.hp.com/support/tapetools
Download size	7.4 MB
Download time (typical)	1 minute (T1) to 25 minutes (56K)
Install time (typical)	<3 minutes
Reboot requirements	A reboot occurs only if hardware manager failed to recognize the connected device.
Software dependencies / prerequisites	▪ Device should be recognized by hardware manager and SCU subsystem. ▪ Device drivers for the connected tape devices/libraries or default device driver should be present. ▪ L&TT on Tru64 UNIX currently does not support clustering configurations.
Installation problems	None
Typical installation sequence	See Typical installation sequences for an example of a typical installation sequence with screen shots.

Installation requirements for Windows

Windows installation requirements

Item	Description
Download link	http://www.hp.com/support/tapetools
Download size	10.6 MB (InstallShield bundle for v3.4 SR1)
Download time (typical)	<2 minutes (T1) to 30 minutes (56K)
Install time (typical)	1-5 minutes
Reboot requirements	▪ If you select and install the ASPI component, you are prompted to reboot. ASPI is required with Windows 9x, but is not generally recommended for other Windows versions. ▪ If you are running a version of Internet Explorer other than 4 SP2 or later, a reboot occurs to update Windows Common Control Library.
Software dependencies / prerequisites	Device drivers for the connected tape devices/libraries or default device driver should be present. **Note:** L&TT can be run from the CD ROM.
Installation problems	Beginning with L&TT v3.4 SR1, the installation will not proceed if a previous version of L&TT is detected. If this occurs, go to the L&TT product page, click the link for the Windows operating system you are running, and then click the "HP StorageWorks Library and Tape Tools Install Support Setup link" to download the hp_ltt_install_support.exe utility. Once downloaded, run this utility to clean up all old install files, and then retry the L&TT installation procedure. When downloading the L&TT application from the web to your local system, make sure you name the download folder to something other than "HP StorageWorks Library and Tape Tools" or the installation will fail if you attempt to install from that folder. The failure error will indicate that a different instance of the installer is already running.
Typical installation sequence	See Typical installation sequences for an example of a typical installation sequence with screen shots.

Installation Sequences

Typical installation sequence for HP-UX

This section contains sample screen captures of a typical installation on an HP-UX operating system.

To install L&TT for HP-UX:

1. Log in as root.
2. Navigate to the temporary directory:

   ```
   cd /tmp
   ```

3. Download or copy the L&TT tar file (hp_ltt<xx>.tar, where <xx> is the version number) to this directory. If you are copying the file from a different location, enter the following (substitute the directory in which the file currently resides for <directory name>):

   ```
   cp /<directory name>/hp_ltt<xx>.tar /tmp
   ```

4. Untar the L&TT tar file:

   ```
   tar -xvf hp_ltt<xx>.tar
   ```

   (show me)

5. Run the install script in the /tmp directory:

   ```
   ./install_hpltt<xx>
   ```

   (show me)

```
# ./install_hpltt
Installing HP Library and Tape Tools...

Install requires approximately 10MB of free space under /opt
Beginning swinstall process of HP_LTT to /opt/ltt/

=======  03/25/04 14:33:59 IST  BEGIN swinstall SESSION
         (non-interactive) (jobid=bhpux-0091)

       * Session started for user "root@bhpux".

       * Beginning Selection
       * Target connection succeeded for "bhpux:/".
       * Source:                /tmp/HP_LTT35.depot
       * Targets:               bhpux:/
       * Software selections:
            HP_LTT35.HP_LTT35,r=3.5.0.0,a=S700/800_HPUX_10/11,v=HP
       * Selection succeeded.


       * Beginning Analysis and Execution
       * Session selections have been saved in the file
         "/.sw/sessions/swinstall.last".
       * The analysis phase succeeded for "bhpux:/".
       * The execution phase succeeded for "bhpux:/".
       * Analysis and Execution succeeded.


NOTE:    More information may be found in the agent logfile using the
         command "swjob -a log bhpux-0091 @ bhpux:/".

=======  03/25/04 14:34:11 IST  END swinstall SESSION (non-interactive)
         (jobid=bhpux-0091)

#
```

6. After the software is successfully installed, enter the following commands to remove the /tmp/ltt directory and its contents:

```
cd /tmp
rm -rf ltt
rm -rf install_hpltt
```

Typical installation sequence for Linux

This section contains sample screen captures of a typical installation on a Linux operating system.

To install L&TT for Linux:

1. Log in as root.
2. Navigate to the temporary directory:

   ```
   cd /tmp
   ```

3. Download or copy the L&TT tar file, hp_ltt<xx>.tar (where <xx> is the version number) to this directory. If you are copying the file from a different location, enter the following (substitute the directory in which the file currently resides for <directory name>):

   ```
   cp /<directory name>/hp_ltt<xx>.tar /tmp
   ```

4. Untar the L&TT tar file:

   ```
   tar -xvf hp_ltt<xx>.tar
   ```

   (show me)

5. Run the install script in the /tmp directory:

   ```
   ./install_hpltt<xx>
   ```

   (Show me)

6. After the software is successfully installed, enter the following commands to remove the /tmp/ltt directory and its contents:

```
cd /tmp
rm -rf ltt
rm -rf install_hpltt
```

Typical installation sequence for NetWare

To install L&TT for NetWare:

1. Download the L&TT for NetWare file to a temporary directory.
2. From a client workstation, use any standard unzip utility (subject to condition described in the note below) to extract the file to the SYS:System\ directory on the NetWare server. Make sure that the option to create a directory is enabled in the archiving software.

Note: Use WinZip to unzip the archive, as it has been used extensively in L&TT testing. Do not use the unzip NLM that comes with later versions of NetWare, as it has not been tested and approved.

Typical installation sequence (OpenVMS)

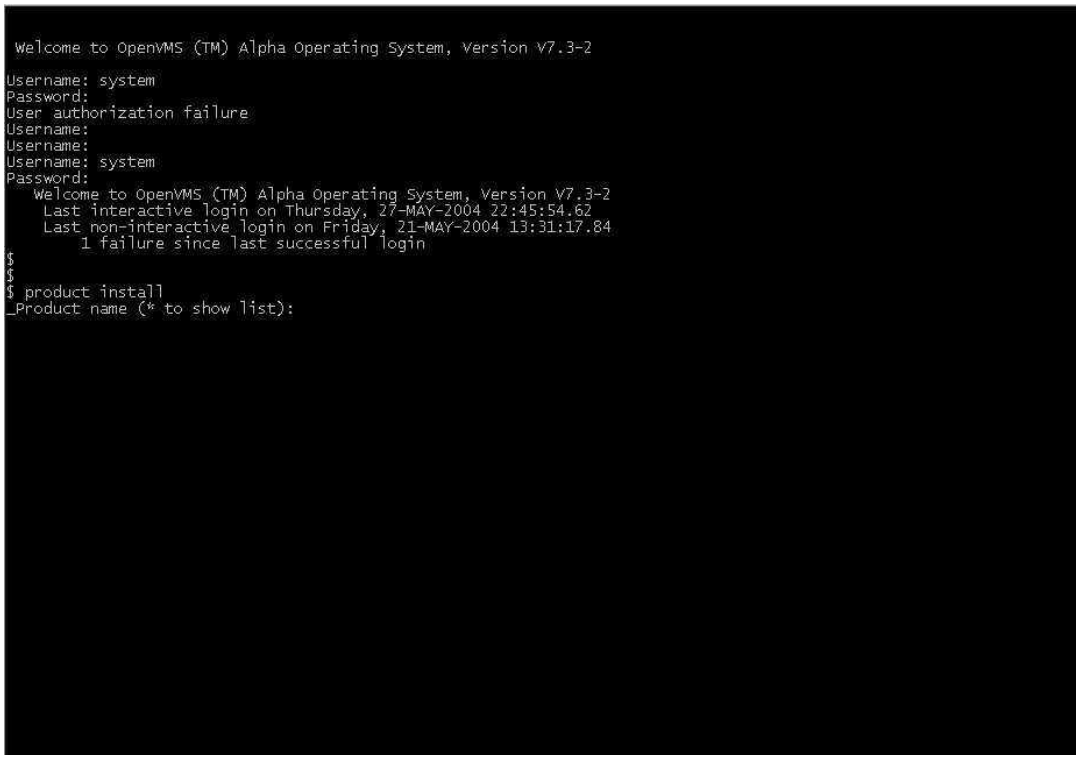
This section contains sample screen captures of a typical installation on an OpenVMS operating system.

To Install L&TT for OpenVMS:

1. Log in as "system" (if not already logged in).
2. After you have downloaded *hp-axpvms-ltt-y<xx>-1.pcsi* (where <*xx*> is the version number) to a directory on your hard disk, navigate to that directory and enter the following command to start the installation:

   ```
   "product install"
   ```

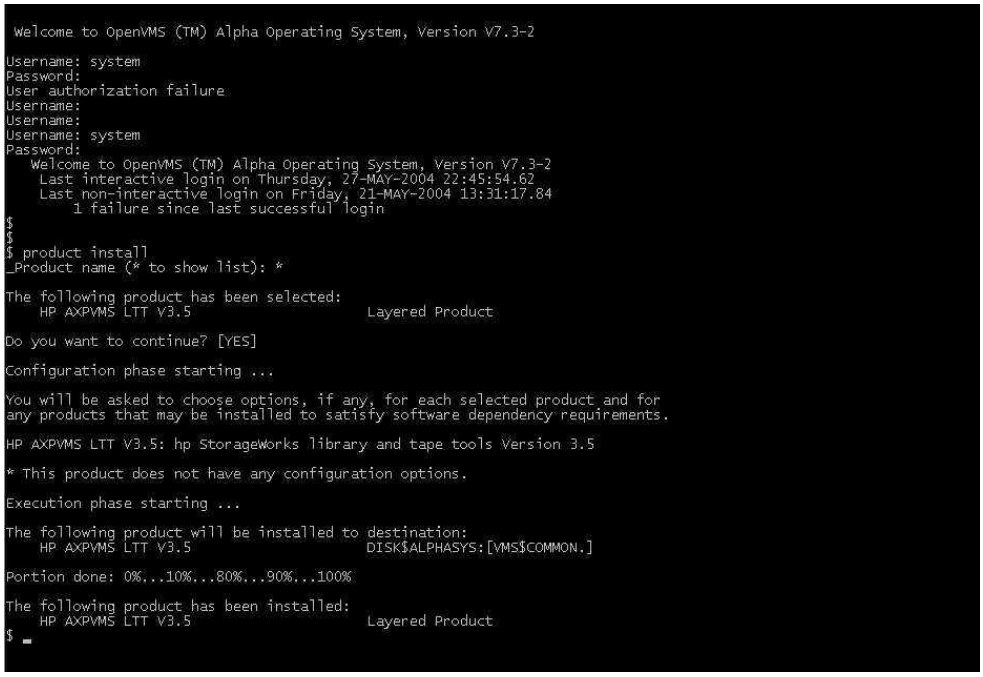
   The system responds with "_product name (* to show list)". ***(show me)***



3. Enter an asterisk (*****) to display a list of applications available for installation.

   The system displays "HP AXPVMS LTT Vx.x" and any other applications available for installation. The "x.x" displays the version of L&TT.

4. If "HP AXPVMS LTT Vx.x" is the only installation, it is indicated as being selected for installation, and you are asked to continue. Enter a **carriage return** for the default "yes" response. If more than one application is available for installation, each is listed along with a corresponding number. Enter the number associated with the L&TT installation to select it, and then enter **yes** to start the installation.
5. The L&TT installation begins. The progress is indicated ***(show me)***.



The installation process creates the directory structure *opt.ltt* in *sys$sysdevice:[vms$common]* in which all of the L&TT files are installed.

Typical installation sequence for Tru64 UNIX

This section contains sample screen captures of a typical installation on a Tru64 UNIX operating system.

To install L&TT for Tru64 UNIX:

1. Log in as root.
2. Navigate to the temporary directory:

   ```
   cd /tmp
   ```

3. Download or copy the L&TT tar file, hp_ltt<xx>.tar (where <xx> is the version number) to this directory. If you are copying the file from a different location, enter the following (substitute the directory in which the file currently resides for <directory name>):

   ```
   cp /<directory name>/hp_ltt<xx>.tar /tmp
   ```

4. Untar the L&TT tar file:

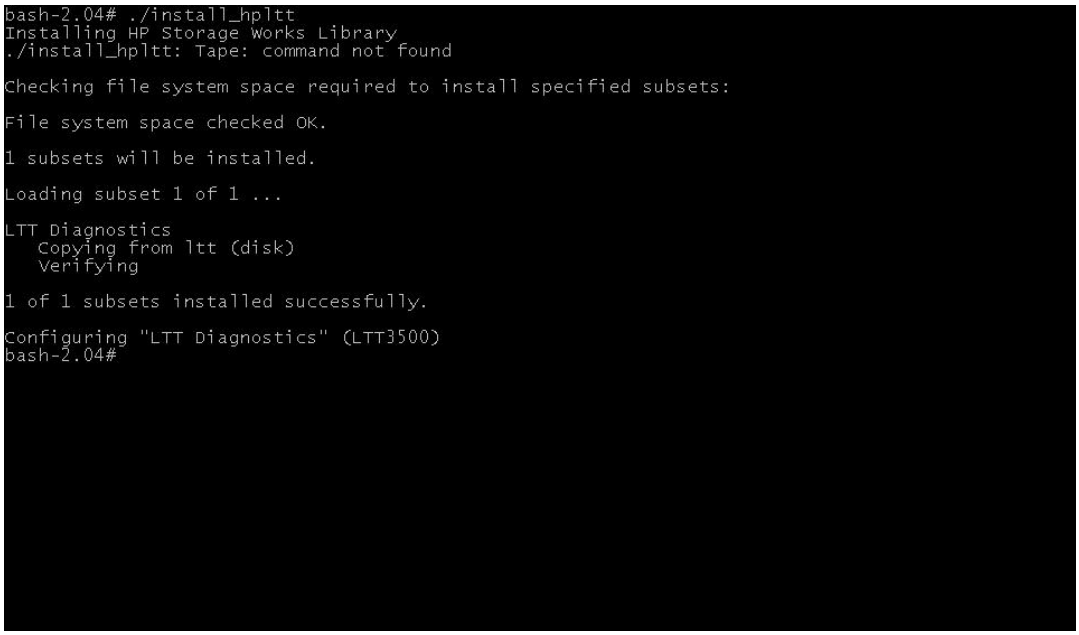
   ```
   tar -xvf hp_ltt<xx>.tar
   ```

   (show me)

5. Run the install script in the /tmp directory:

   ```
   ./install_hpltt<xx>
   ```

   (show me)



6. After the software is successfully installed, enter the following commands to remove the /tmp/ltt directory and its contents:

```
cd /tmp
rm -rf ltt
rm -rf install_hpltt
```

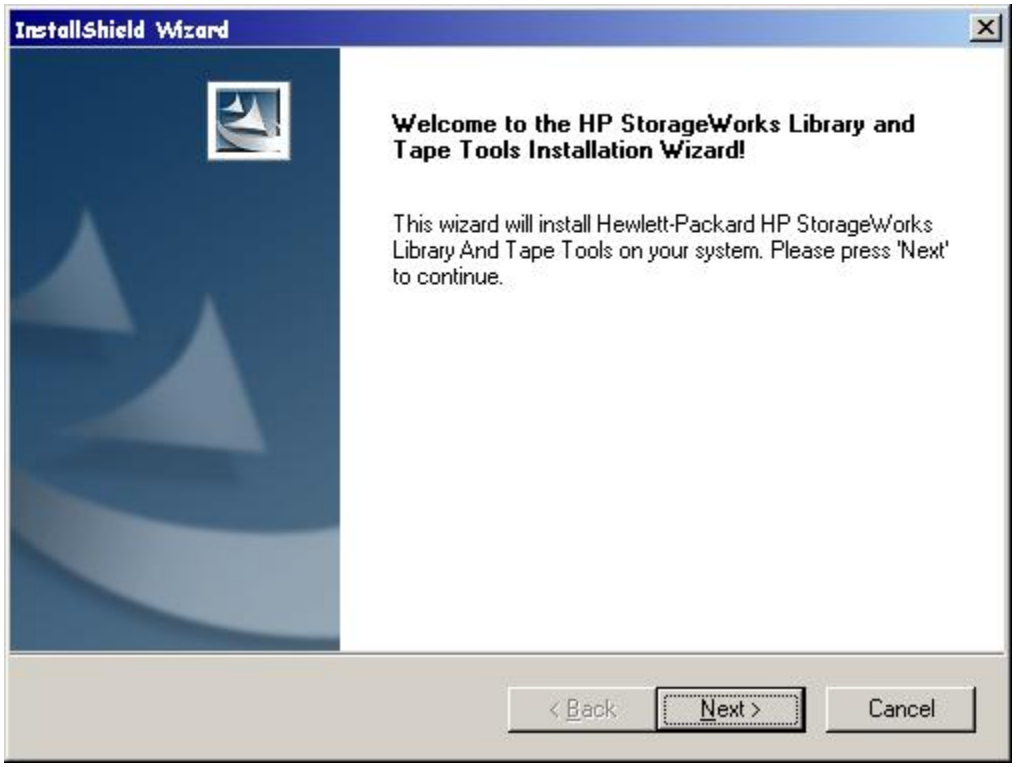
Typical installation sequence for Windows

This section contains sample screen captures of a typical installation on a Windows operating system.

To install L&TT for the current version of windows:

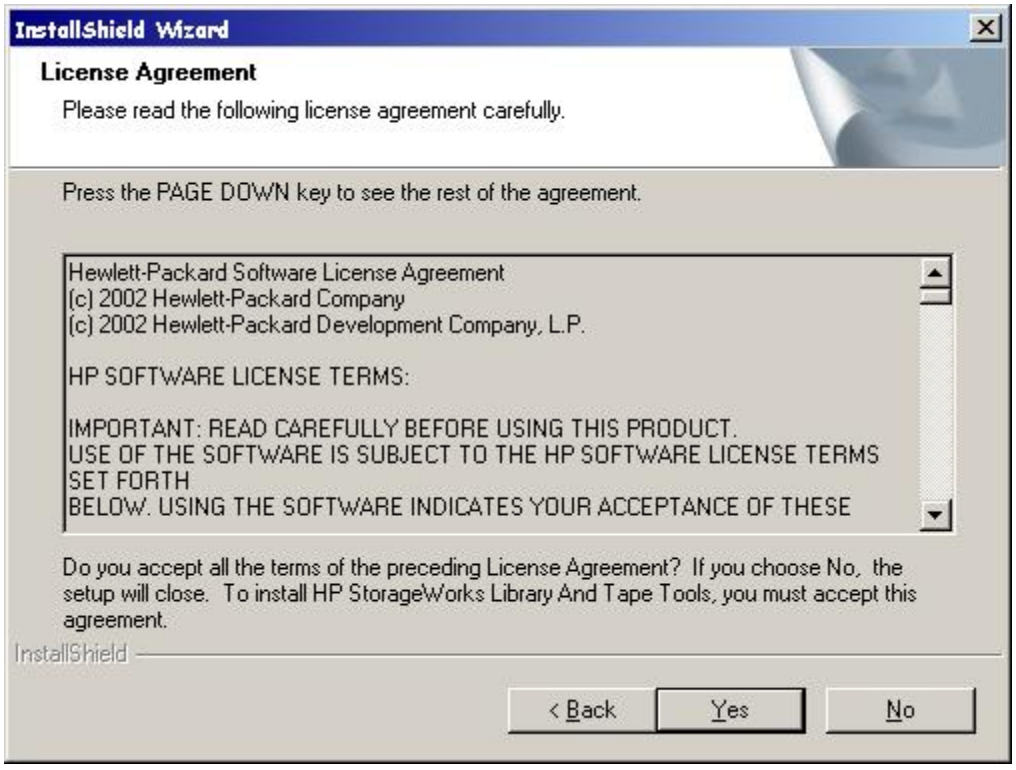
1. Download or copy the self-extracting executable file to a temporary location.
2. Double-click the self-extracting executable file to launch the installer.

   The ***InstallShield Welcome page*** opens.



3. Click **Next**.

   The ***License Agreement page*** opens.

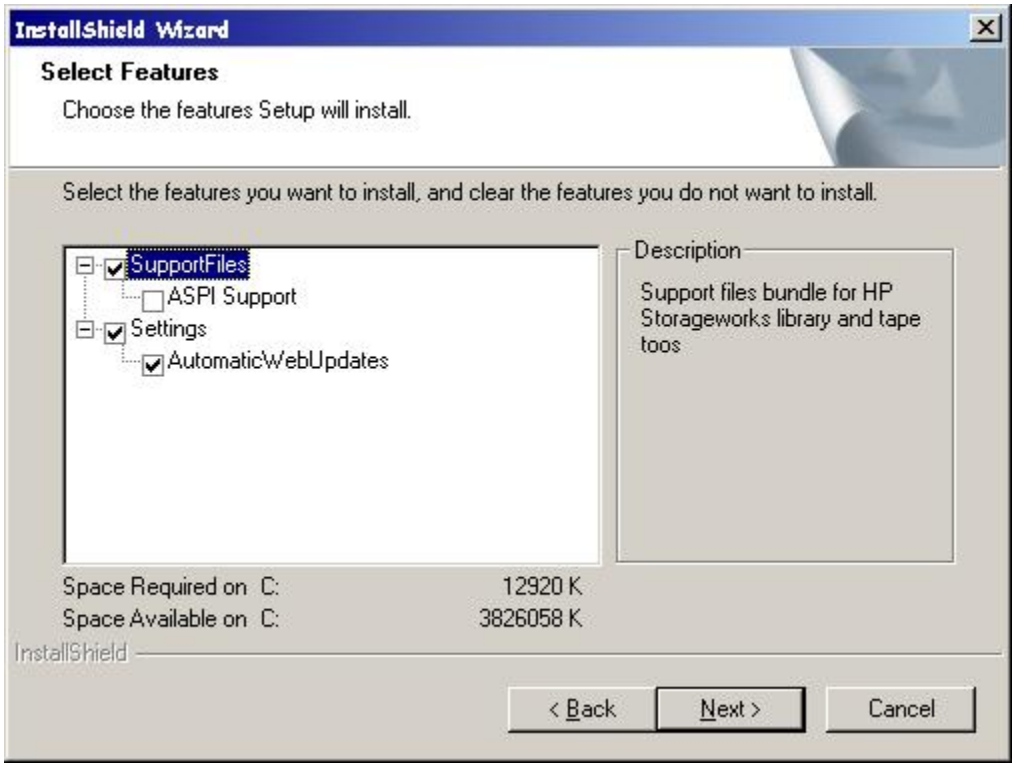


4. Read the program license agreement and click **Yes** if you agree to and accept the terms of the license agreement.

The ***"Read Me" File page*** opens.

5. Read the Read Me file for any last-minute changes to the documentation, and then click **Next**.

   The ***Select Features page*** opens.



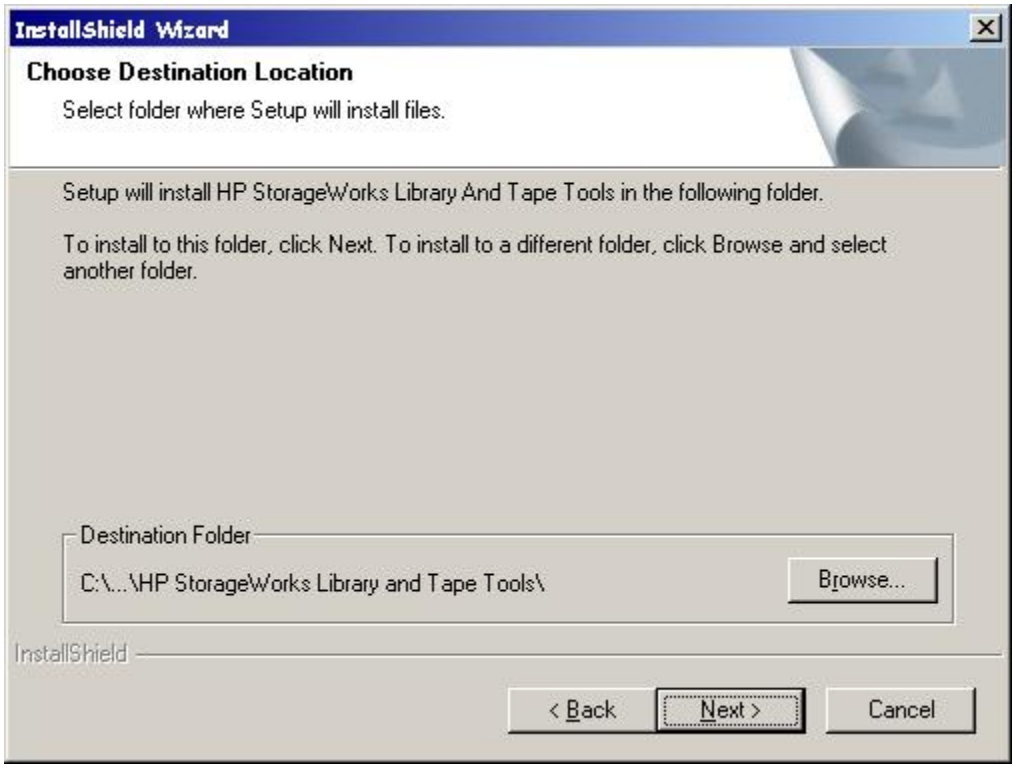
Notes:

- In most cases, the default settings of this page are adequate. Windows NT 4.0, Windows 2000, and Windows XP users have the option to install Advanced SCSI Programming Interface (ASPI) support. On Windows 2003, ASPI installation is not an available option from the L&TT install. This is due to the complex nature of the installation related to additional 64 bit restrictions for modifying the registry. However, you can acquire ASPI separately from Adaptec and install it per their installation process. If you do this, L&TT will be able to use it. With Windows 9x installations, the ASPI component is required and automatically included in the L&TT installation process. HP recommends that you not install ASPI support for other versions of Windows.

- ASPI support is beneficial when installed storage applications cannot be shut down and those applications have locked access to the device through the Miniport driver. If ASPI is installed, it is generally not necessary to shut down these applications to access devices through L&TT (although the applications should not be accessing the devices while L&TT is running). ASPI lets you run L&TT on a locked device without rebooting; however, a reboot is required after installing ASPI.

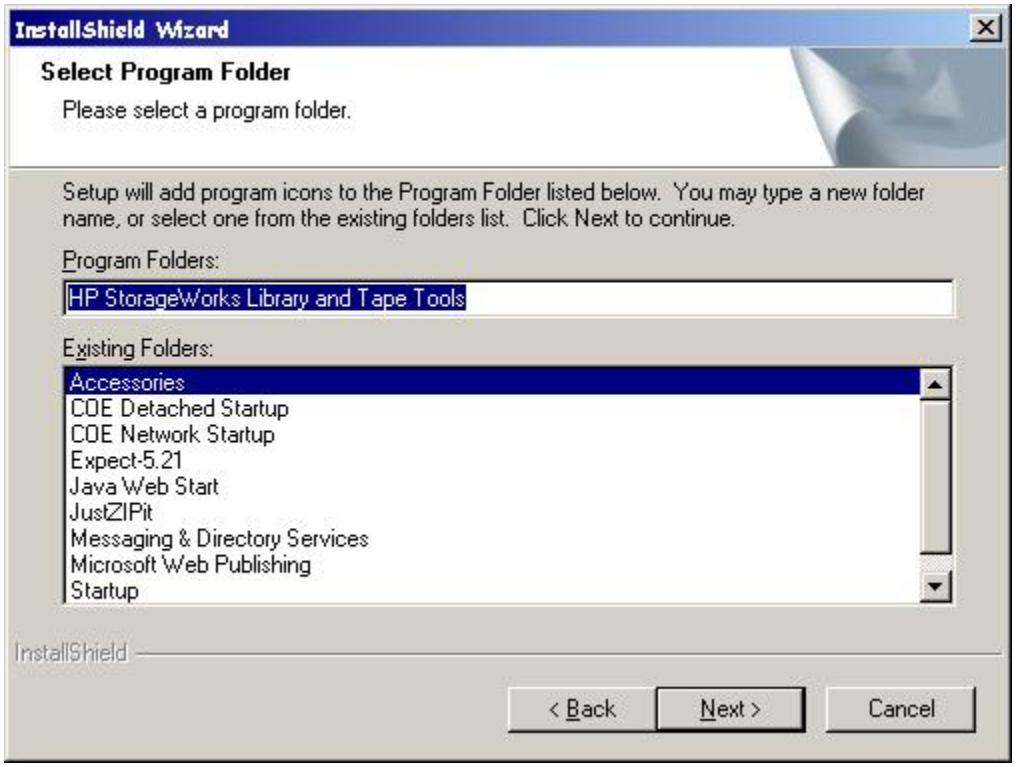
6. Select the desired components to install, and then click **Next**.

   The ***Choose Destination Location page*** opens.



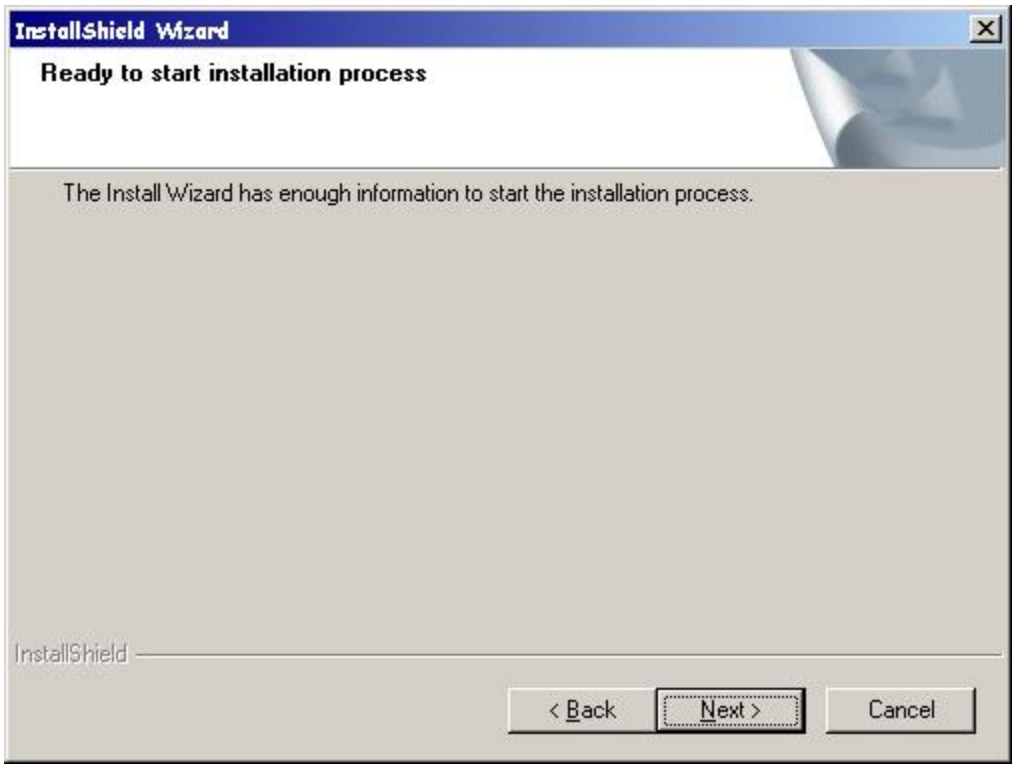
7. Select a destination location to install the program. You can accept the default location or click **Browse** to install to a different location. After choosing the destination location, click **Next**.

The ***Select Program Folder page*** opens.



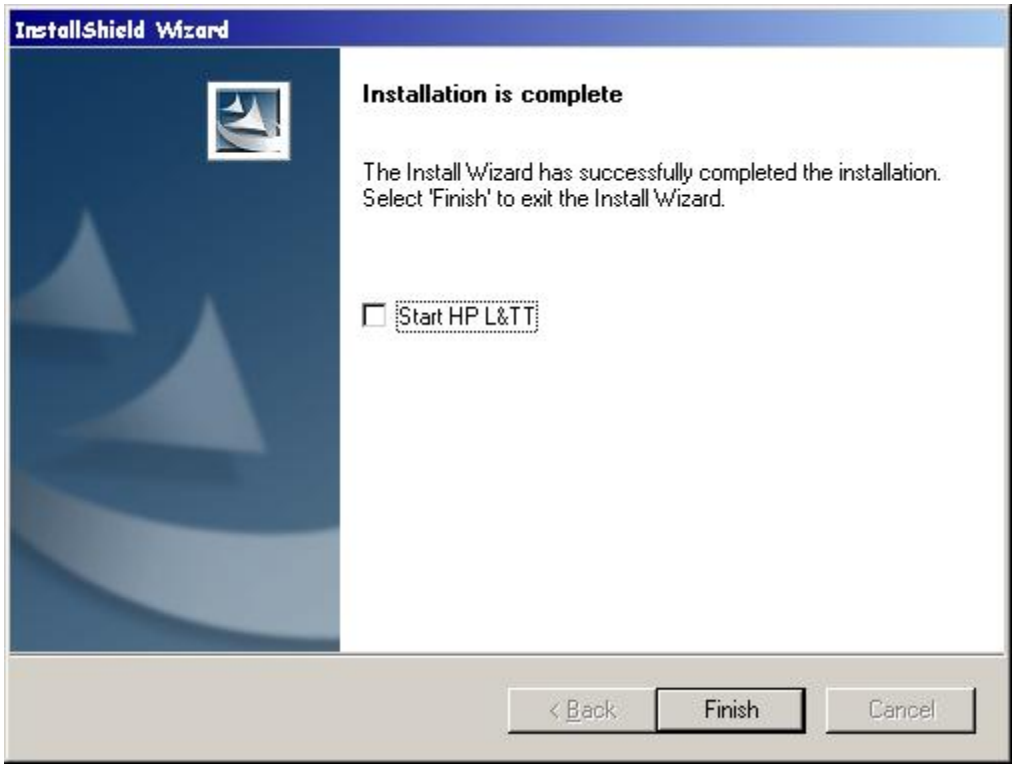
8. Indicate the program directory in which you want the setup program to create program icons. Click **Next**. The program directory is created in the Programs directory of the Start menu.

   The ***Ready to start installation process page*** opens.



9. Click **Next** to install L&TT. If you need to review or change installation settings, click **Back**.

10. The wizard installs L&TT, and then displays the ***Installation is Complete page*** to confirm the installation.



11. Click **Finish** to close the InstallShield wizard.

Getting Started (Setup and Problems)

Setup

Getting started on Windows

1. To start L&TT, double click the L&TT icon on the desktop (if present) or click **Start > Programs > HP StorageWorks Library and Tape Tools > HP L&TT**.

   The initial splash screen opens.

2. In the splash screen, you have a choice of selecting one of the two I/O modes that L&TT supports:

   - **NT Miniport:** This mode is the default and uses an interface that is native to Windows NT 4.0, 2000, XP, and Windows Server 2003. This is the preferred I/O mode when available because it does not require the installation of the ASPI interface. However, there are some limitations to the Windows NT Miniport I/O mode related to using devices that are "claimed" by other applications, or that are used with non-standard OS drivers. In those cases, selecting the ASPI I/O mode may make a device accessible.

   Note: The Windows NT Miniport I/O mode is not available on Windows 9x.

   - **ASPI:** This mode uses an optional I/O programming interface that is available on all versions of Windows. This I/O mode can be used with any Windows operating system. If you want to run in ASPI mode, and you are not running Windows 9x, you will need to install it. HP recommends that you not install ASPI unless running on Windows 9x, or unless directed to do so by HP support personnel. ASPI installation is not an option via L&TT with Windows 2003. For details on this and other ASPI installation information, click here.

Note: If running L&TT v3.5 or later, see Using the Scan Mode Selection feature to learn about scan options.

3. Make sure that the Windows Removable Storage Manager (RSM) service is disabled. RSM should only be enabled if you are using the Windows native backup application. If you are not using the Windows native backup application, disable RSM to avoid issues during testing.

4. Begin using L&TT.

Note: The various windows and dialog boxes for the Windows operating systems are self-explanatory, so they are not included here.

Getting started on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

Note: The screen captures that appear in this section were taken on a Linux system, but apply to HP-UX, NetWare, OpenVMS, and Tru64 UNIX, unless otherwise specified. Note that the screen captures are examples only; the content of user windows varies.

To launch L&TT on HP-UX, Linux, or Tru64 UNIX:

Log on as root and execute the following commands:

```
cd  /opt/ltt
./hp_ltt
```

Note: If running L&TT v3.5 or later, see Using the Scan Mode Selection feature.

To launch L&TT on NetWare:

Execute the following command from the server console:

```
hp_ltt\hp_ltt
```

Note: If running L&TT v3.5 or later, see Using the Scan Mode Selection feature.

To launch L&TT on OpenVMS:

1. Use the following command to define the logical name USR so that it points to the directory *sys$sysdevice:[vms$common.opt.ltt.misc.usr]*:

   ```
   define usr sys$sysdevice:[vms$common.opt.ltt.misc.usr]
   ```

2. Navigate to the *sys$sysdevice:[vms$common.opt.ltt]* directory and execute the following command:

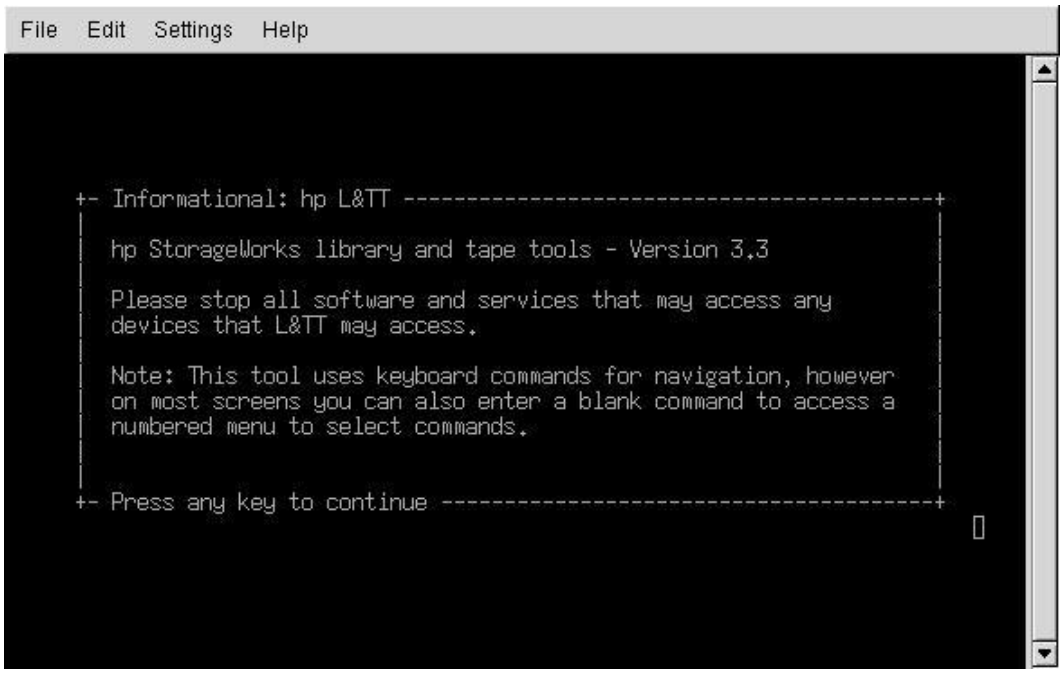
   ```
   run HP_LTT.EXE
   ```

Note: If running L&TT v3.5 or later, see Using the Scan Mode Selection feature.

To navigate L&TT on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

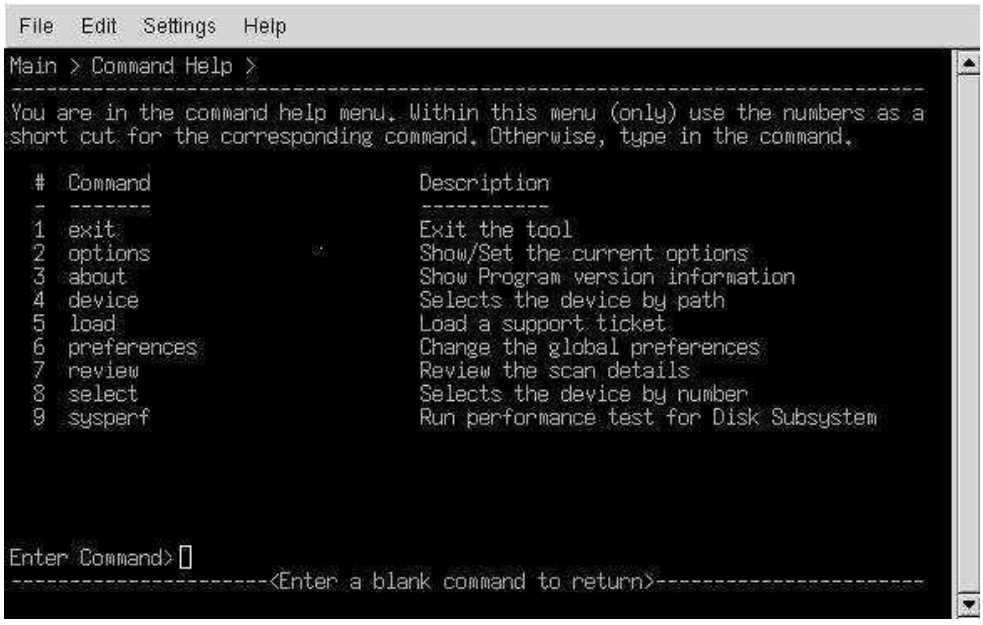
Note: If running L&TT v3.5 or later, see Using the Scan Mode Selection feature.

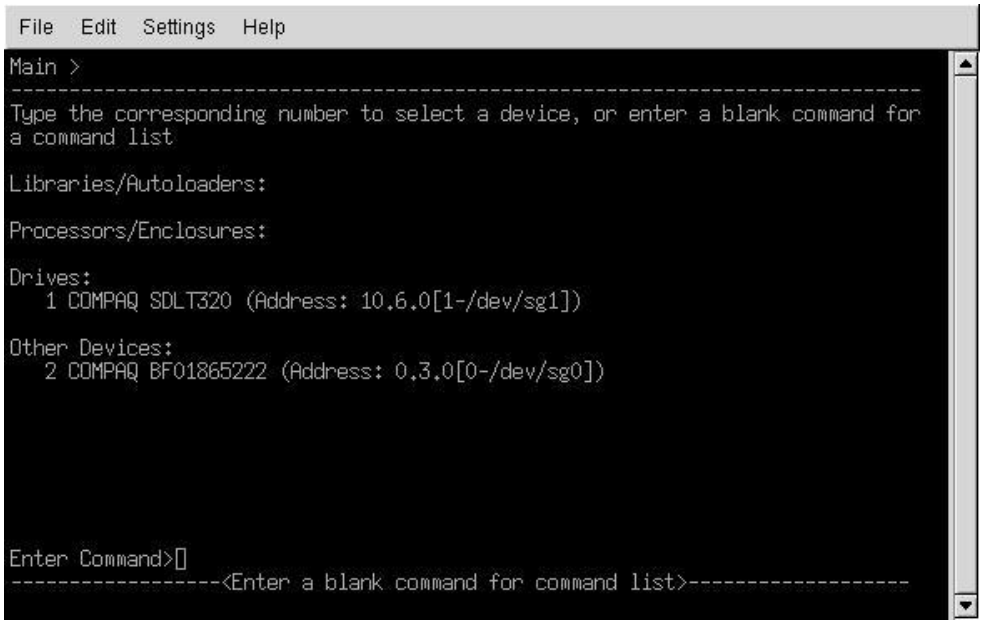
1. After L&TT launches, an ***Information screen*** is displayed, offering basic information about navigating the screens.



2. Press any key to proceed beyond this screen and start the device scan. L&TT then scans the system for connected devices.

3. When the scan is complete, the ***Main screen*** is displayed. The top of each screen displays the current screen name in hierarchical format, with each screen level separated by the ">" character. On most screens, pressing **Enter** without typing other text (blank command), displays a ***Command Help screen***.





4. On the Command Help screen, enter an available command by entering the number of the command, or by entering the name of the command and pressing **Enter**. Entering the number of a command only works from a Command Help screen. To exit a Command Help screen, enter a blank command (press **Enter**).

Note: Some commands require an argument. If you enter a command that requires an argument and you do not include one, or if you use an invalid argument, an error message opens.

Example 1: Selecting the first device

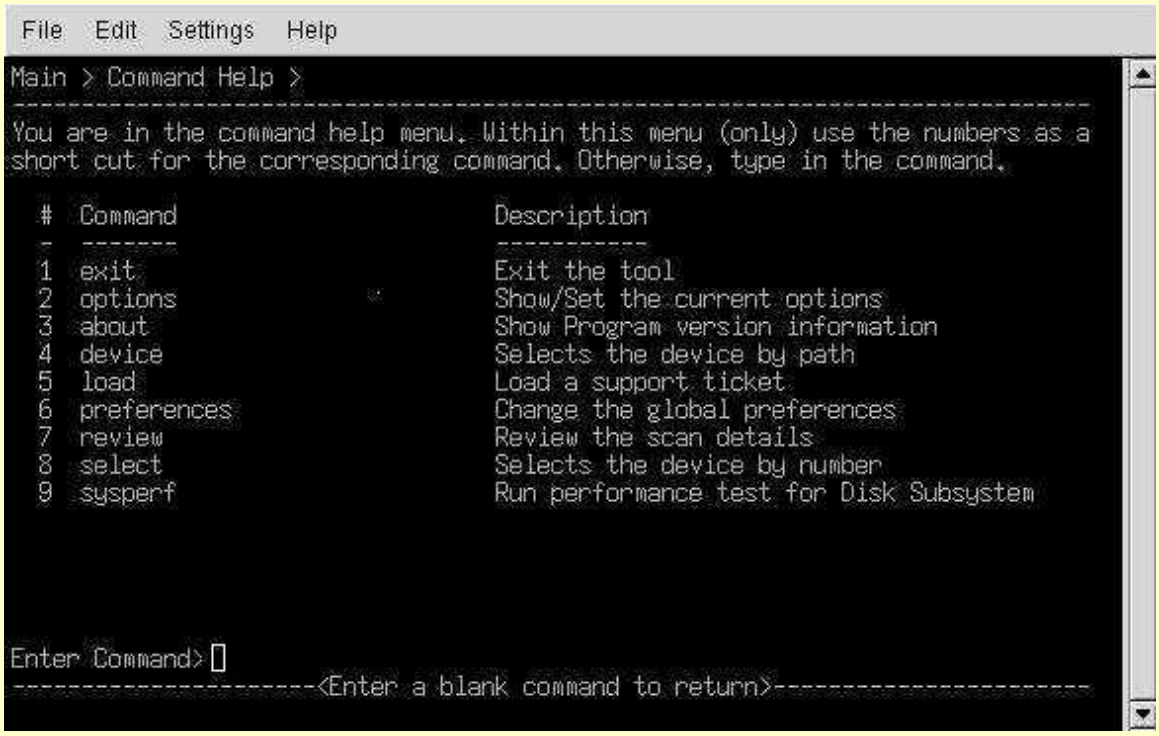
If you want to select the first device from the device list, the syntax is:

```
select 1
```

As an example, if you enter **select 1** in the ***Command Help screen*** or in the previous ***Main screen*** after the scan, the following ***Device Information screen*** is displayed. Alternatively, you can omit the select command and only enter the device number from the main screen.

```
File   Edit   Settings   Help
Main > Drive Information >
--------------------------------------------------------------------------------
The following is identity information for the selected device. You can use
commands to select functionality to perform on this device.

Product ID                : SDLT320
Drive Technology          : SDLT
Mech. Serial Number       : PMC05Y0434
Firmware Rev              : V046/CPQ2
Target ID                 : 6
Target LUN                : 0
OBDR Capability           : Not Present

Cartridge Information (for cartridge currently in drive):
There is no media in this drive.




Enter Command>
------------------<Enter a blank command for command list>-------------------
```

```
File   Edit   Settings   Help
Main >
--------------------------------------------------------------------------------
Type the corresponding number to select a device, or enter a blank command for
a command list

Libraries/Autoloaders:

Processors/Enclosures:

Drives:
   1 COMPAQ SDLT320 (Address: 10.6.0[1-/dev/sg1])

Other Devices:
   2 COMPAQ BF01865222 (Address: 0.3.0[0-/dev/sg0])




Enter Command>
------------------<Enter a blank command for command list>-------------------
```

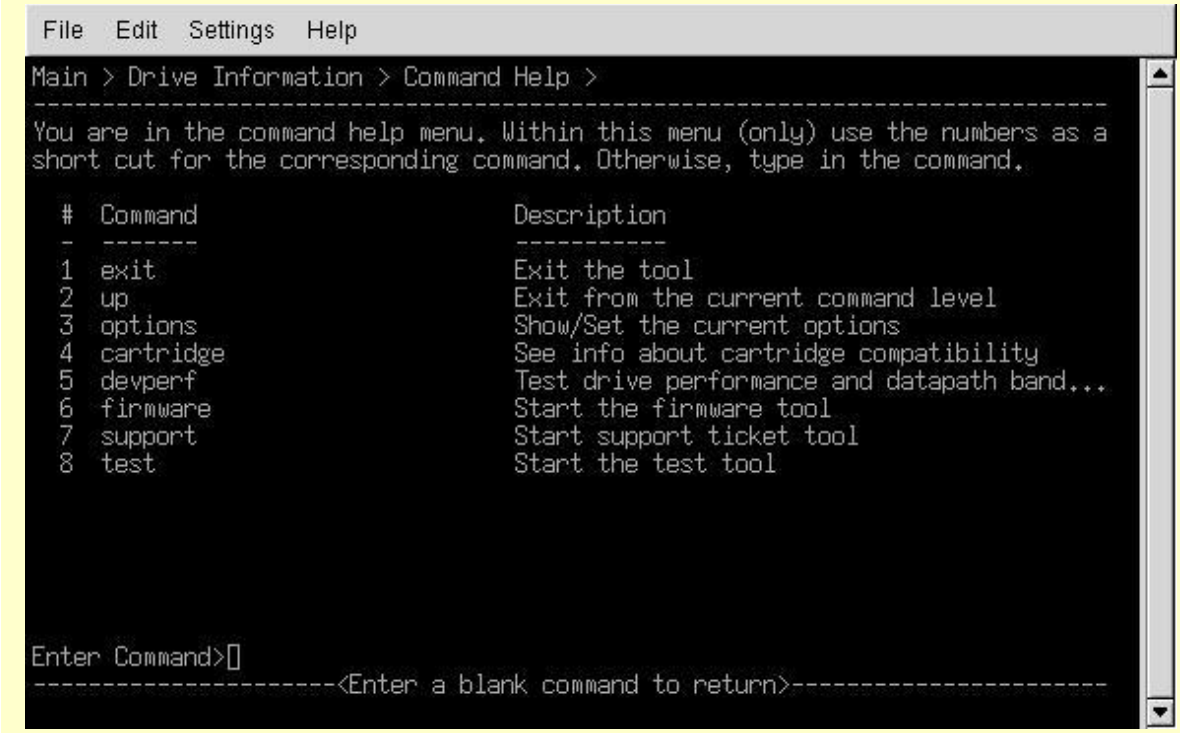


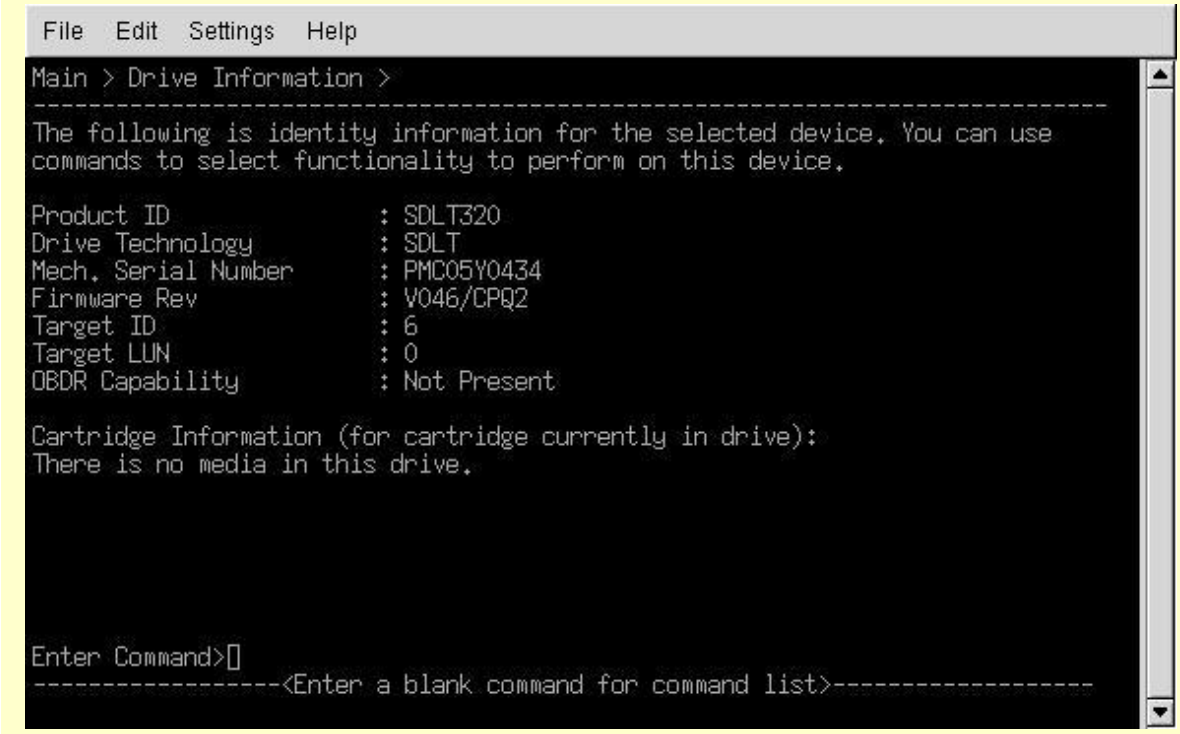
In this particular example, the drive did not have a tape loaded so there was no cartridge information to display. If a data cartridge had been loaded, information regarding cartridge type, capacity, and write-protect status would have been displayed. To see a list of compatible media that can be used with this device, use the cartridge command.

If the device you selected was an automation device (library or autoloader) rather than a standalone device, a similar screen opens. However, instead of displaying “Drive Information” in the top of the screen, it displays “Identity.” Other differences are the addition of “Model Name,” “Number of Slots,” and “Number of Drives” information, and the lack of “OBDR Capability” status in the automation screen. Also, with an automation device, the cartridge command displays the slot inventory of the library. It displays which slots and drives currently have cartridges loaded, as well as the cartridge barcode, if available and applicable.

Example 2: Entering a blank command

If you issue a blank command in the above standalone ***Device Information screen*** (press **Enter**), the ***Device Information Command Help screen*** is displayed, displaying the other available commands from this screen, in addition to the cartridge command.


File Edit Settings Help
Main > Drive Information > Command Help >
You are in the command help menu. Within this menu (only) use the numbers as a short cut for the corresponding command. Otherwise, type in the command.
Command Description
1 exit Exit the tool
2 up Exit from the current command level
3 options Show/Set the current options
4 cartridge See info about cartridge compatibility
5 devperf Test drive performance and datapath band...
6 firmware Start the firmware tool
7 support Start support ticket tool
8 test Start the test tool
Enter Command>
<Enter a blank command to return>


File Edit Settings Help
Main > Drive Information >
The following is identity information for the selected device. You can use commands to select functionality to perform on this device.
Product ID : SDLT320
Drive Technology : SDLT
Mech. Serial Number : PMC05Y0434
Firmware Rev : V046/CPQ2
Target ID : 6
Target LUN : 0
OBDR Capability : Not Present
Cartridge Information (for cartridge currently in drive):
There is no media in this drive.
Enter Command>
<Enter a blank command for command list>

Setting software preferences and passwords

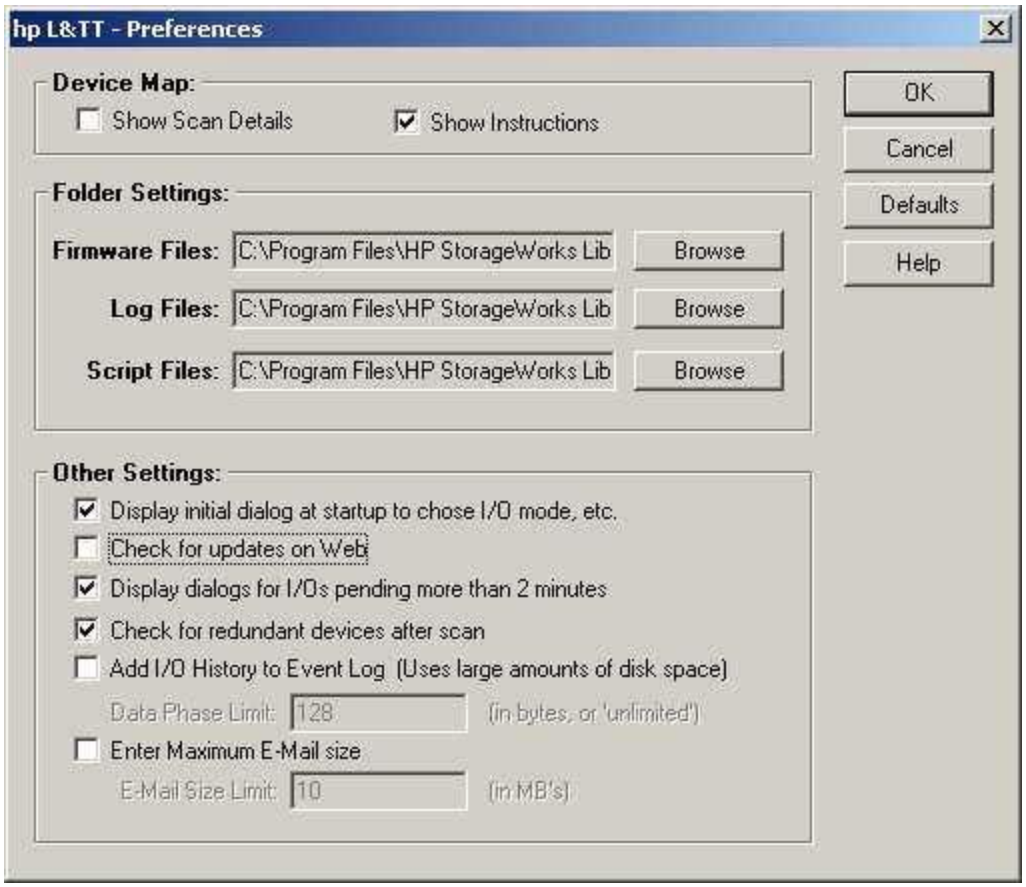
You can set certain software preferences to control various elements of L&TT. By choosing the preferences accordingly, you can configure L&TT to provide more or less interactive status as desired. Setting of software preferences is supported for both Windows and non-Windows environments, although certain parameters are only available for Windows.

Windows

To set preferences for L&TT on Windows:

1. Click **options > preferences** from the menu bar.

   The ***Preferences dialog box*** opens.



2. Configure the following preferences:

   - **Show Scan Details:** Displays SCSI bus scanning process in the device list screen when L&TT is first started. Disabled by default.
   - **Show Instructions:** Displays instructions in the device list screen. These instructions provide information corresponding to the function displayed in the Main screen. This can be helpful especially for novice users. More experienced users may want to disable this option.

- **Firmware File Path:** Displays the location where L&TT stores and accesses firmware files on your local system. When using Get Files From Web feature, firmware files are downloaded to this directory.
- **Log File Path:** Displays the location where L&TT stores and accesses log files on your local system. Support and event logs are stored here.
- **Script File Path:** Displays the location where L&TT stores and accesses device analysis rules files. There is also the default locations for SCSI scripts.

Note: For the above three "path" options, the default location of the directory is the L&TT installation directory.

- **Display initial dialog at startup to choose I/O mode etc.:** Displays the L&TT splash screen when started. I/O mode and other options can be selected from the splash screen.
- **Check for updates on the web:** L&TT uses an available internet connection to look for product updates such as firmware upgrades, new device analysis rules, and new versions of L&TT. L&TT performs this check once every 24 hours, when enabled and L&TT is running. This can be a valuable feature to automatically keep users informed of available updates when L&TT is started.
- **Display dialogs for I/O pending more than 2 minutes:** Displays a status update dialog box during long SCSI operations.
- **Check for redundant devices after scan:** Checks for redundant devices in the current configuration. This option is enabled by default.
- **Add I/O history to Event Log:** Logs all SCSI commands sent or received into a log file. This option requires a large amount of disk space and should only be used when requested by qualified HP personnel to aid in debugging of a potential L&TT issue. See also Generating event logs.
- **Data phase limit for I/O history:** Limits the amount of data recorded to the log file for each SCSI command to the number of bytes specified (default 128 bytes). To specify a different limit, enter any positive number. For no limit, enter **unlimited**.
- **Enter maximum e-mail size** and **E-mail size limit:** L&TT defaults to 10 MB for maximum size for any email. If your email setup will not permit email files as large as 10 MB, click the check box for maximum email size, and then enter a smaller number. If you attempt to email a support ticket using L&TT that is larger than the selected maximum email size, L&TT breaks the email into smaller, separate emails so that they do not exceed the maximum size limit.

To set a password for L&TT on Windows:

Note: Passwords are available only by contacting HP support, and should only be used under the direction of HP support personnel.

Click **options > enable factory overrides**, and then enter the password when prompted. This allows you to enter certain password-protected options. Passwords are available only by contacting HP support, and should only be used under the direction of HP support personnel.

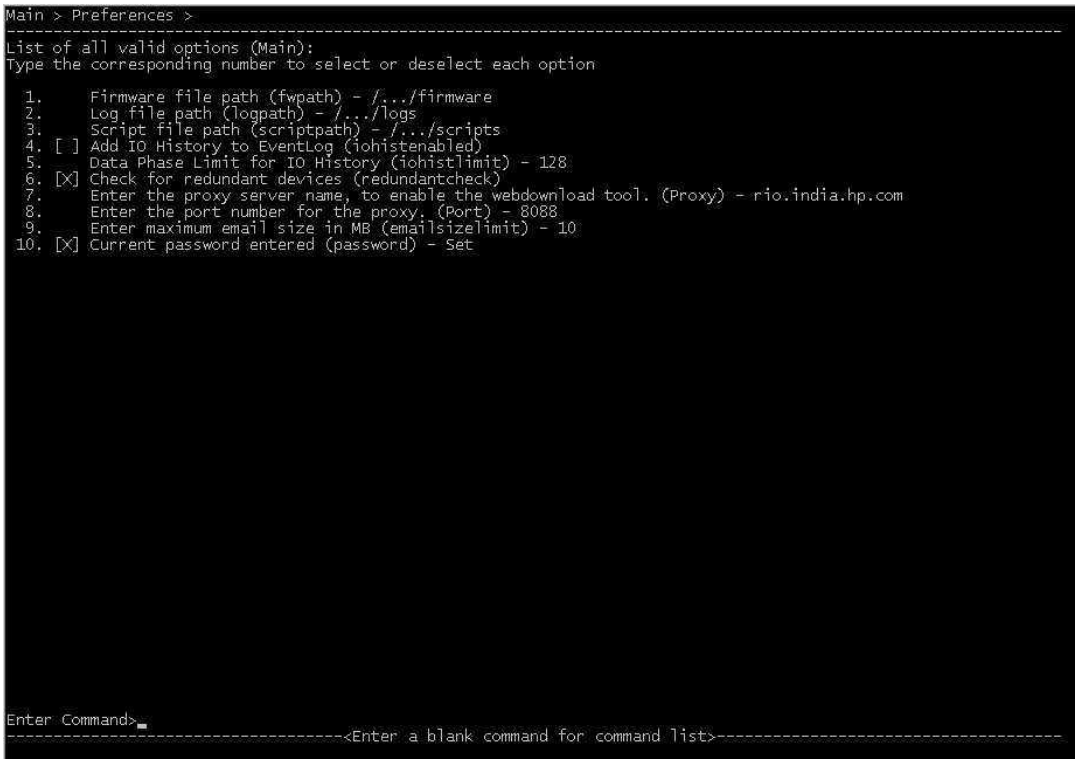
HP-UX, Linux, NetWare, OpenVMS, and Tru64 UNIX

Note: Passwords are available only by contacting HP support, and should only be used under the direction of HP support personnel.

To set preferences and passwords for L&TT on HP-UX, Linux, OpenVMS, NetWare, or Tru64 UNIX:

1. In the L&TT main screen, enter **preferences**.

   The ***Preferences screen*** is displayed.



2. Configure preferences. (Current values are shown for each preference option.) Preference options include:

   - **Firmware File Path:** Displays the location where L&TT stores and accesses firmware files on your local system. When using Get Files From Web feature, firmware files are downloaded to this directory.
   - **Log File Path:** Displays the location where L&TT stores and accesses log files on your local system. Support and event logs are stored here.
   - **Script File Path:** Displays the location where L&TT stores and accesses device analysis rules files. Also the default location for SCSI scripts.

   Note: For the above three "path" options, the default location of the directory is the L&TT installation directory.

   - **Add I/O history to Event Log:** Logs all SCSI commands sent or received into a log file. This option requires a large amount of disk space and should only be used when requested by qualified HP personnel to aid in the debugging of a potential L&TT issue. See also Generating event logs.
   - **Data phase limit for I/O history:** Limits the amount of data recorded to the log file for each SCSI command to the number of bytes specified (default 128 bytes). To specify a different limit, enter any positive number. For no limit, enter **unlimited**.
   - **Check for redundant devices (redundantcheck):** Checks for redundant devices in the current configuration. This is enabled by default.
   - Enter the proxy server name, to enable the webdownload tool. (Proxy): Displays the Proxy server name for Web downloads.
   - Enter the port number for the proxy. (Port): Displays the Port number for proxy.

- **Enter the maximum email size in MB (emailsizelimit):** L&TT defaults to 10 MB for maximum size for any email. If your email setup will not permit email files as large as 10 MB, enter a smaller number. If you attempt to email a support ticket using L&TT that is larger than the selected maximum email size, L&TT breaks the email into smaller, separate emails so that they do not exceed the maximum size limit.
- **Current password entered:** Lets you to enter the factory password. (Passwords are available only by contacting HP support, and should only be used under the direction of HP support personnel.) Currently entered password is displayed to the right of the option. If no password entered, “not set” is displayed.

Running installation check at L&TT launch

On Windows, L&TT can be run in *installcheck mode* to check the installation of specific devices. When run in this mode, L&TT performs several tests on each selected device to determine if the device is configured optimally. In addition, L&TT performs connectivity and configuration tests on all devices supported by L&TT that are configured on the system. These tests cannot be overridden. All tests performed during the installation check can also be run manually with L&TT.

The installation check feature is only supported on the following devices (as of L&TT v3.5):

- HP Ultrium drives (L&TT v3.4 and above)
- HP SDLT 320 drive (L&TT v3.5 and above)
- HP VS80 drive (L&TT v3.5 and above)

After conclusion of the installation check, the results of each test are displayed along with any recommendations.

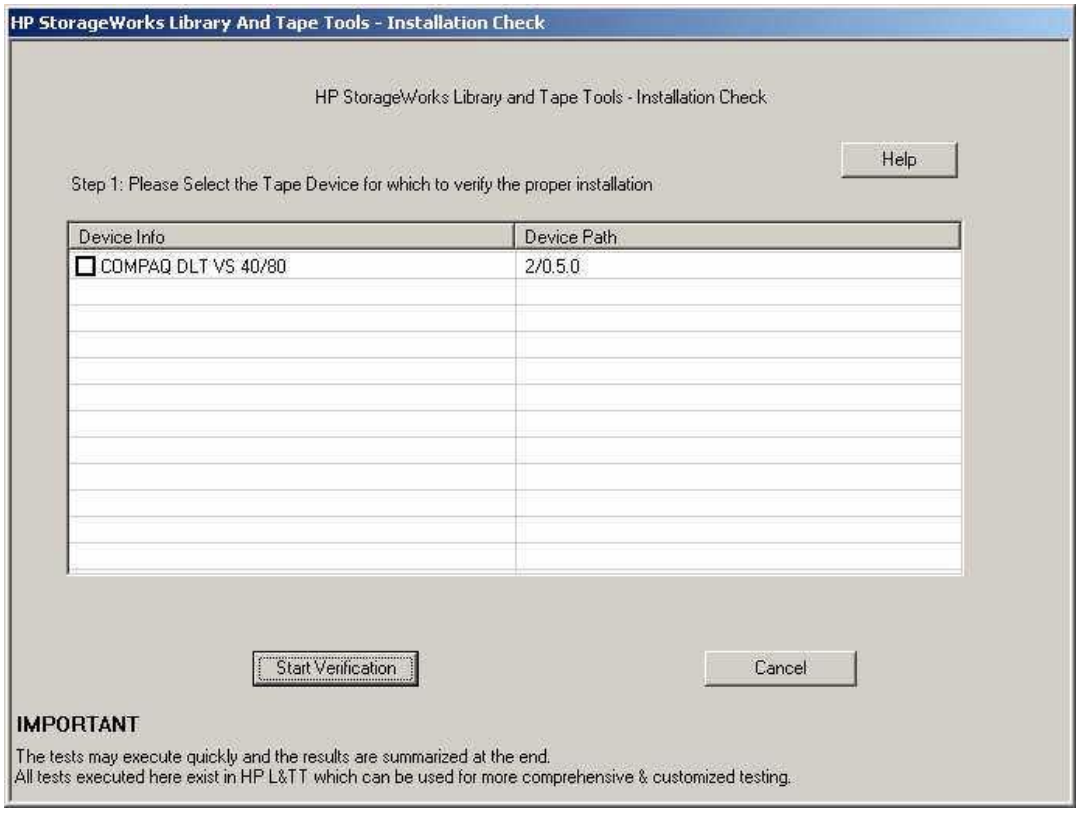
To enable installcheck mode:

1. Launch L&TT from a command prompt (**Start > Run)**, and then enter the following into the Run dialog box:

   ```
   "C:\Program Files\HP StorageWorks Library and Tape Tools\HP_LTT.exe"  -o
   mode=installcheck
   ```

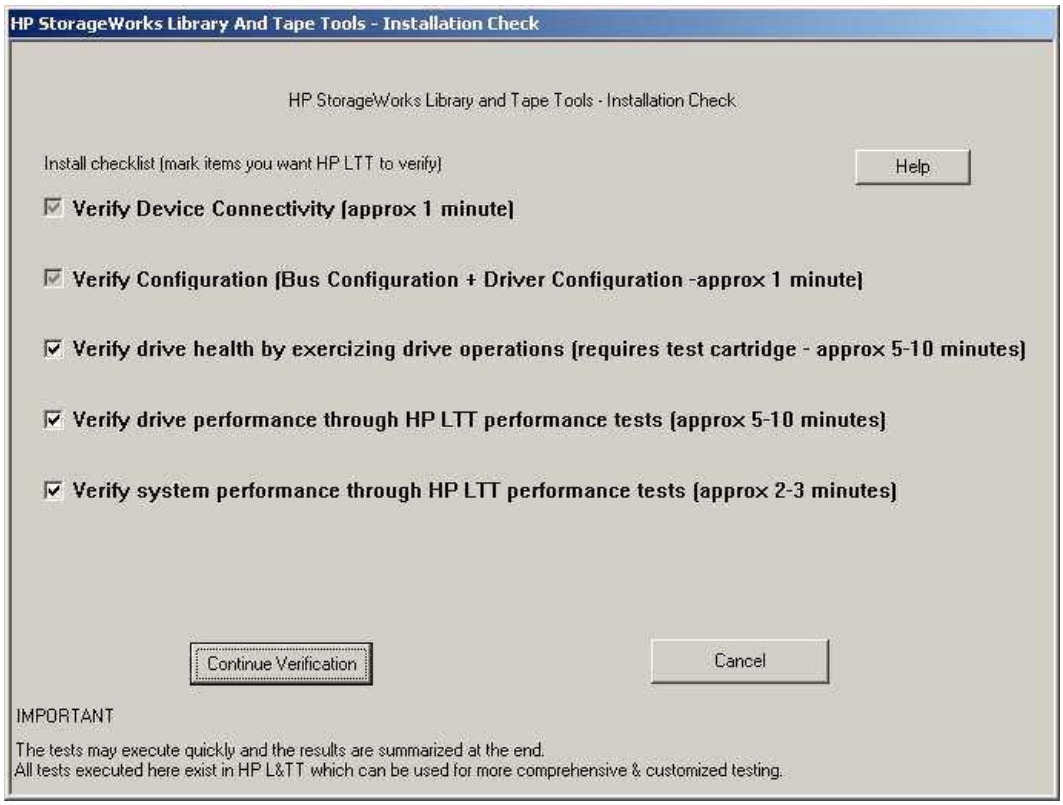
   Be sure to include the quotation marks as indicated in the command line.

   The ***Installation Check wizard*** opens.



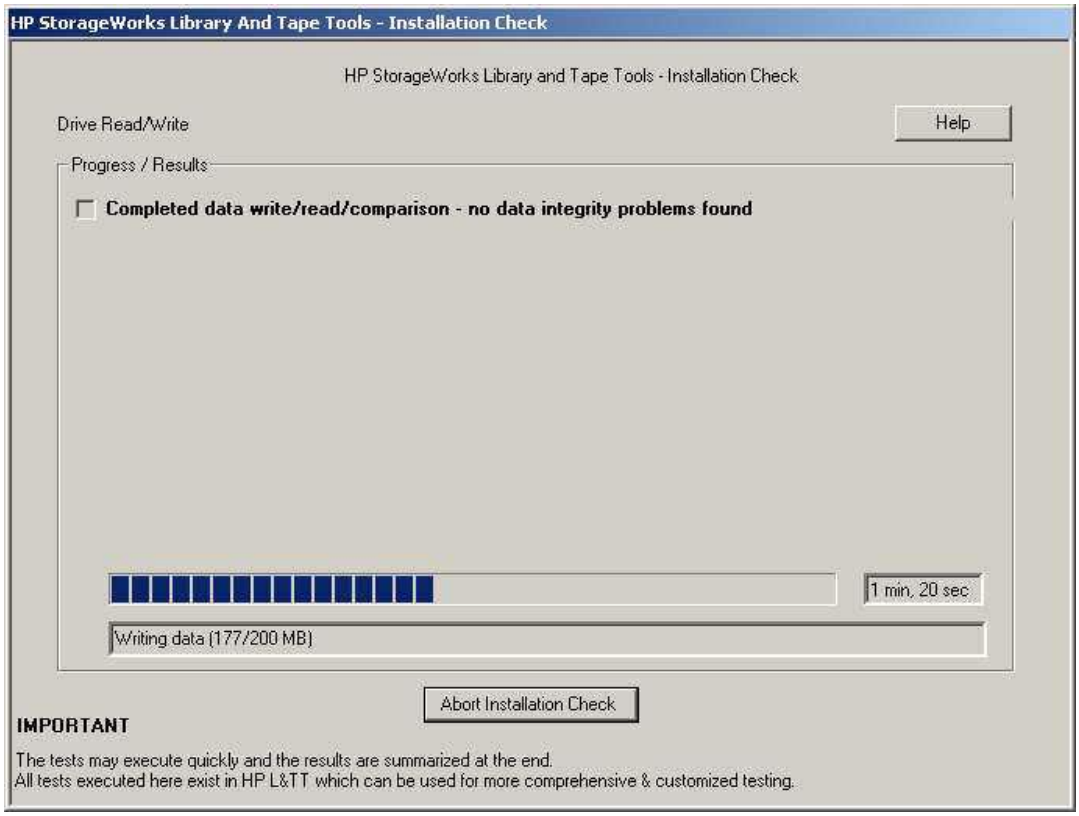
2. Select the device on which to run the installation check, and then click the **Start Verification** button to display the next screen of the installation check wizard.

3. Select any optional tests you want L&TT to perform ***(show me)***. Some tests may not be available for your configuration.

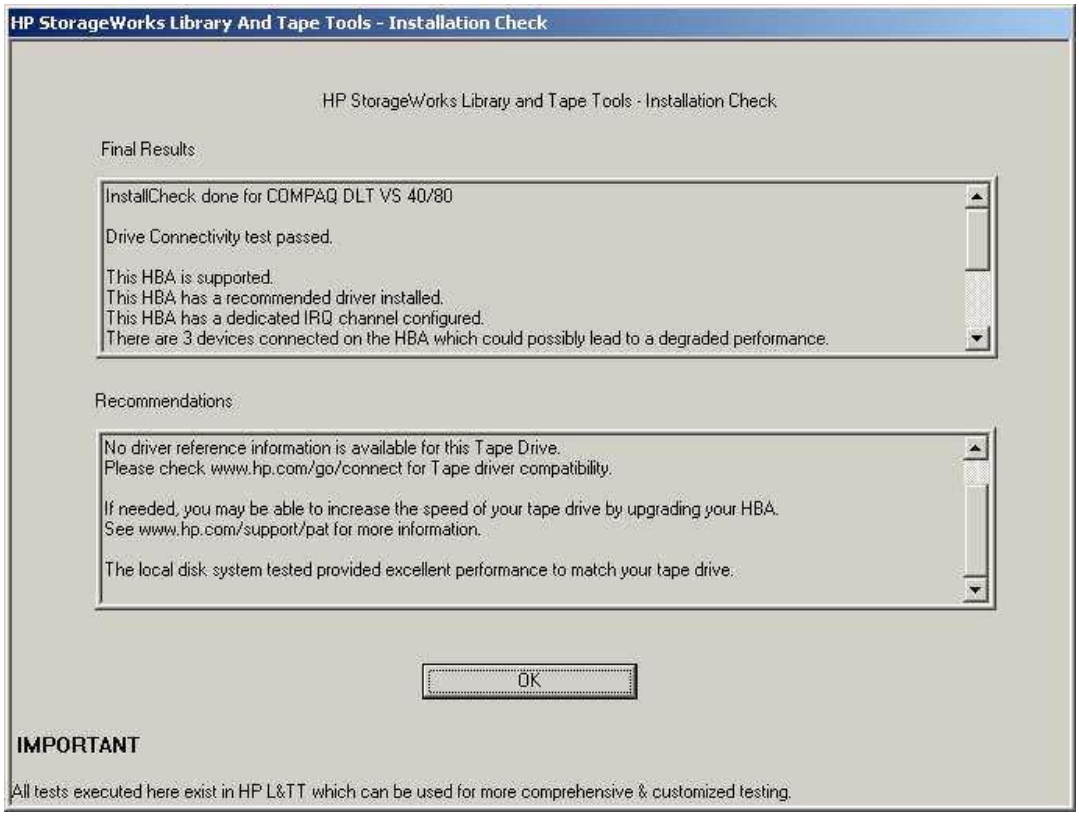


4. Click **Continue Verification** to begin the installation check.

The third screen of the Installation Check wizard indicates the progress of the installation check ***(show me)***. Selected tests are executed sequentially, and the progress of each test is displayed.



The ***final screen*** of the Installation Check wizard displays the results of the selected tests and any recommendations.



Note: If you need to stop the installation check, click **Abort Installation Check**. The test is aborted after completing the current phase of the test.

5. Click **OK** to close the installation check wizard. Closing the wizard also closes L&TT. If you want to restart L&TT, launch it as you normally would, without the “mode=installcheck” argument.

Miscellaneous configuration information

Because document locations and content often change, direct links to content are not provided here to minimize problems with obsolete links. Go to www.hp.com and follow the links to the support page for your particular device to access related documents.

Using L&TT in SAN Environments

About using L&TT in SAN environments

With L&TT v3.3, the *Skip-Scan* feature was introduced to allow the user to skip the initial scan of the entire subsystem that is done when L&TT is started up, and only scan the single device on which you wanted to run tests. This helped to eliminate problems in large SAN environments related to the large amount of time it took to complete the initial scan, and the disruption to scanned devices.

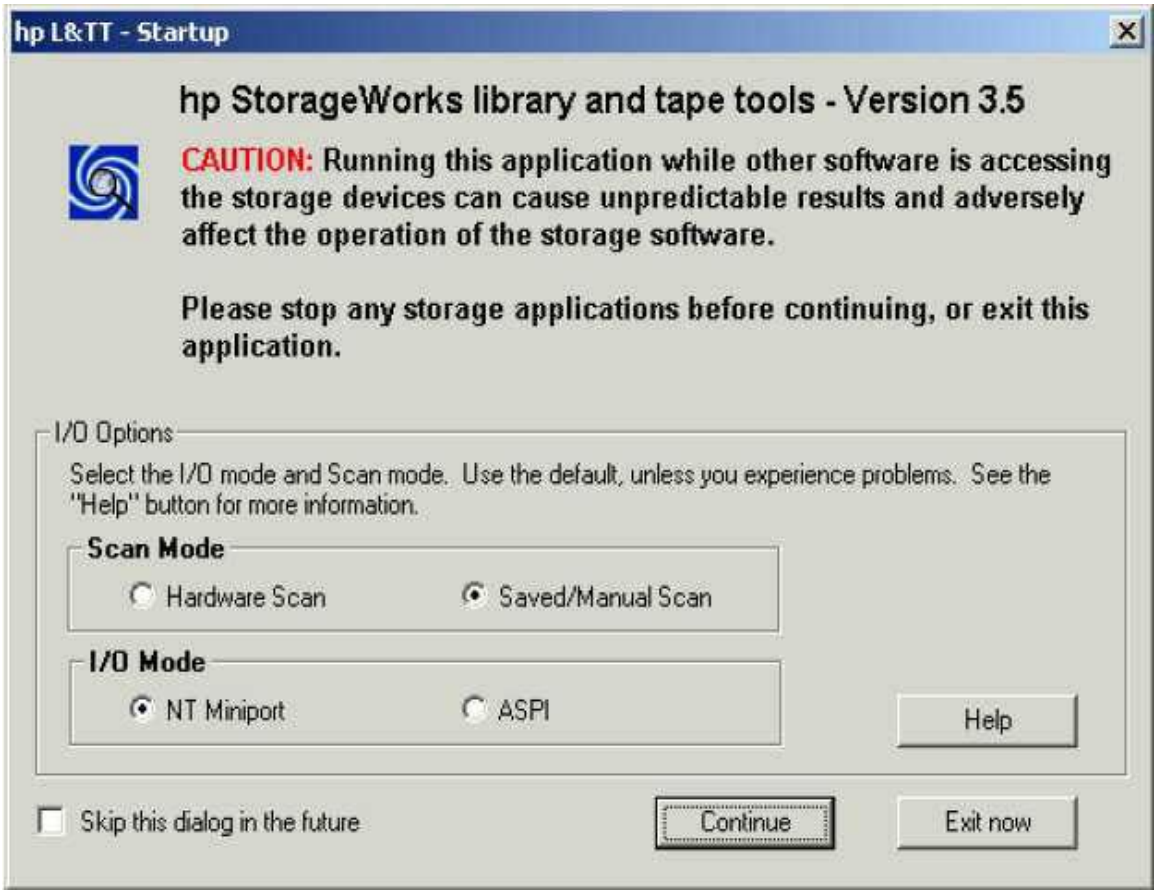
With the release of L&TT v3.5, there are two major changes that greatly improve the usability and functionality of the scanning operation via the new Scan Mode Selection feature.

- The Skip-Scan function is now incorporated into the user interface, making it easier to use. Additionally, the functionality is changed so that multiple devices can now be selected, eliminating the previous restriction of a single device only.
- L&TT now always saves the scan results and allows the user to utilize a saved scan rather than having to perform a hardware scan each time. This not only improves performance, but also the usability of the Skip-Scan function because the user can now select the hardware address of the device in question, rather than having to memorize it and enter it manually.

Using the Scan Mode Selection feature

Windows

Beginning with L&TT v3.5, when L&TT is first started, the initial splash screen is presented prior to any bus scanning activity taking place. Therefore, it launches quickly and does not interfere with any devices on your system. The ***initial screen*** now lets you choose whether to do a hardware scan, or use a previously saved/manual scan, in addition to giving you the opportunity to select I/O mode as it has in the past.



The first time you run L&TT, it must perform a full hardware scan (Hardware Scan option), and the Saved/Manual Scan option is disabled. This is because L&TT has no previous scan result information to access. However, now the results of the full hardware scan are automatically saved, so the next time L&TT is started, the Saved/Manual Scan option is available.

When L&TT performs its initial device scan, it identifies all the devices connected to the computer either directly, or through a SAN. In large SAN environments, this scan can take a long time. After the initial scan is complete and saved, future full system hardware scans become unnecessary in most cases. Exceptions are as follows and apply to Windows in NT Miniport I/O mode of operation:

- After the hardware configuration has been changed
- After power cycling more than one of the tape drives on the system
- After updating firmware in more than one of the tape drives on the system

You must perform a hardware scan after any of these actions have taken place. To perform a hardware scan, exit and restart L&TT. On the splash screen, select the "hardware scan" option rather than "saved scan." If you do not do this, the Windows operating system might get out of sync with the L&TT saved scan because Windows device rediscovery assigns new logical device names to the devices.

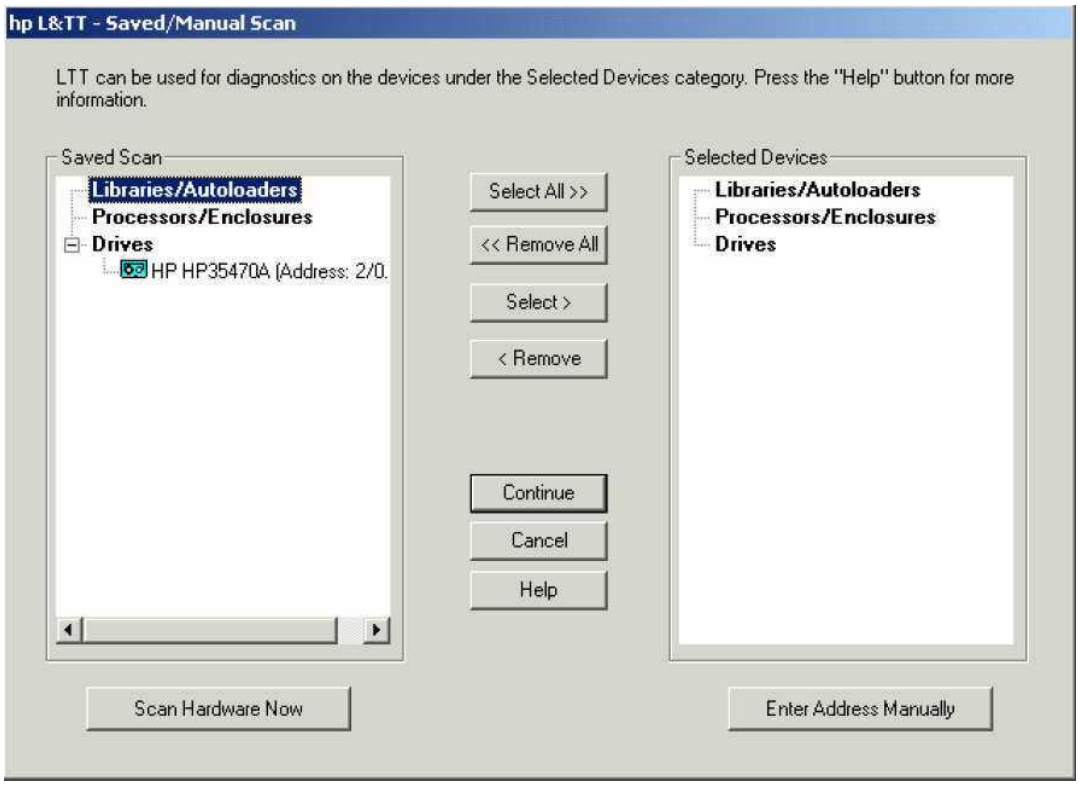
Also, if you power cycle or update firmware in a device while using a saved scan, the device may not be accessible until it is rediscovered by Windows. If you are running L&TT v3.5 (or later) and select the device before it is rediscovered, L&TT generates an error. Previous to v3.5, the device would not be identified in the scan, but because the scan is now saved, the device is displayed. After Windows has rediscovered the device, the device can be selected without causing an error.

If you are running in saved scan mode and want to rescan the bus for devices, clicking the **Rescan** button on the Scan tab of L&TT does not initiate a hardware scan. You must exit and restart L&TT, and then choose the hardware scan option on the splash screen to execute a hardware scan.

To enable the Saved/Manual Scan option on Windows:

1. Select the **Saved/Manual Scan** option, and then click **Continue**.

   The ***Saved/Manual Scan window*** opens.

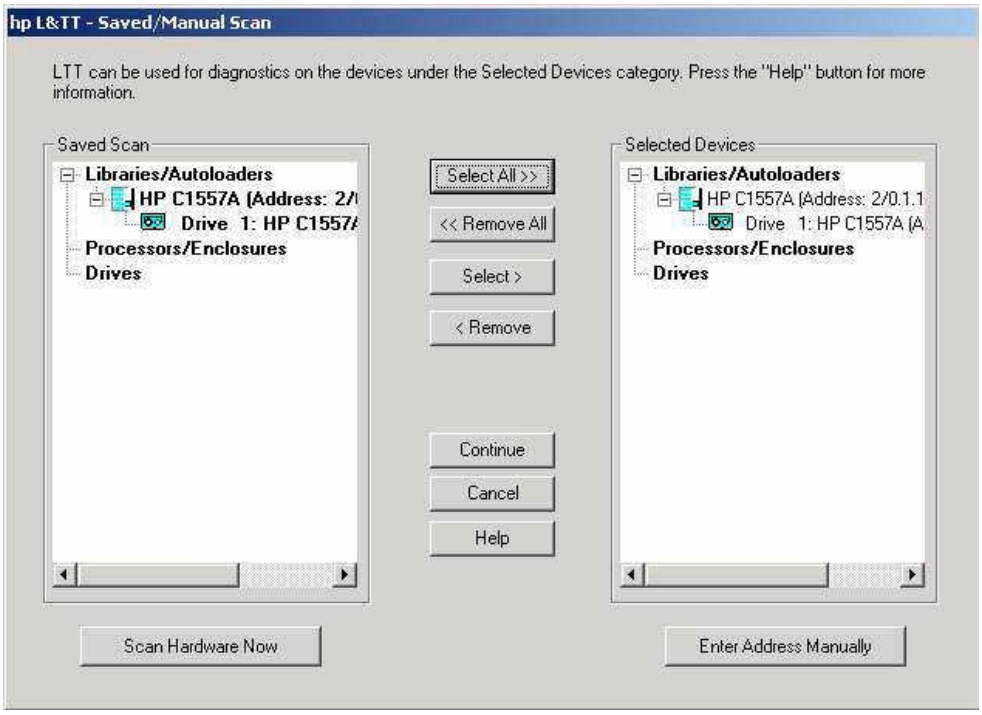


   The left panel of the Saved/Manual Scan screen displays the devices that were detected in the initial hardware scan (or the last saved scan). The right panel of the screen displays any selected devices. If this is the first time through the process, only the device type headings appear in the right panel because no devices have been selected at this point.

2. If the hardware configuration has changed since the last saved scan, click the **Scan Hardware Now** button to rescan the system for new devices. If you want to manually add a device to the list in order to avoid executing a full system hardware scan, click the **Enter Address Manually** button.

3. To select only the device(s) you want to scan, there are several buttons provided for selection and removal of devices from the selected devices list:

- **Select All:** Click to put all scanned devices from the Saved Scan list (left panel) into the Selected Devices list (right panel) ***(see example)***.



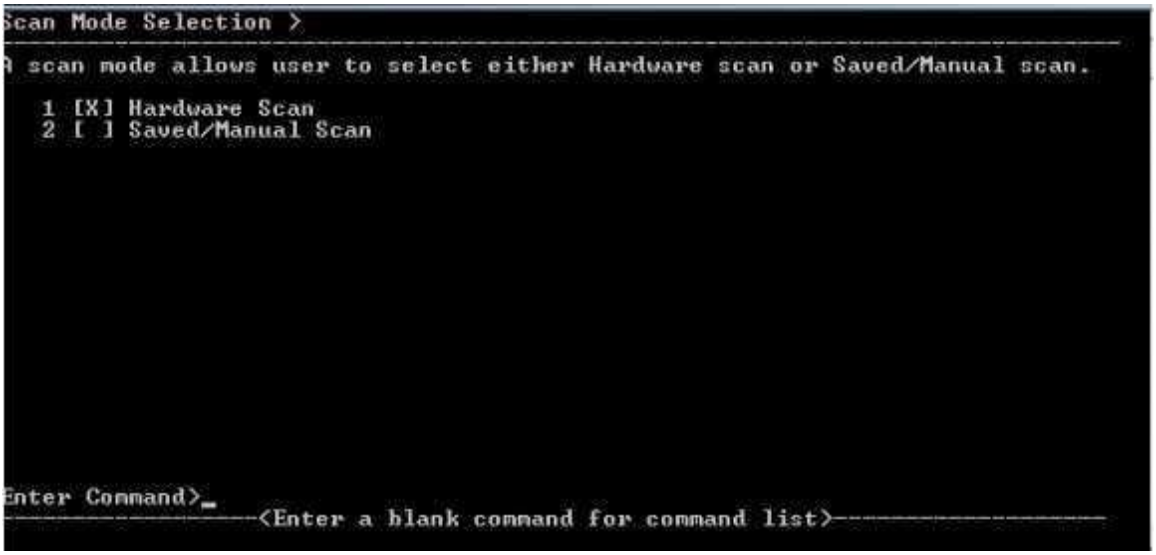
- **Remove All:** Click to remove all devices from the Selected Devices list.
- **Select:** Click after highlighting a device in the Saved Scan list to move it to the Selected Devices list.
- **Remove:** Click after highlighting a device in the Selected Devices list to remove it.
- **Continue:** Click to perform the scan of the selected devices, and proceed to the main L&TT window.
- **Cancel:** Click to close the dialog box and revert back to the previous window without making any changes.

Note: After at least one device is saved in the selected devices panel list, the Saved/Manual Scan option is available in the splash screen; if selected, L&TT only scans devices in that list.

HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

For instructions on how to launch L&TT, see Getting started on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX.

Beginning with L&TT v3.5, after you have launched L&TT, the ***Scan Mode Selection screen*** is displayed.



The first time you run L&TT, it must perform a full hardware scan (Hardware Scan option); the Saved/Manual Scan option is disabled. This is because L&TT has no previous scan result information to access. Commands available from this initial screen are as follows:

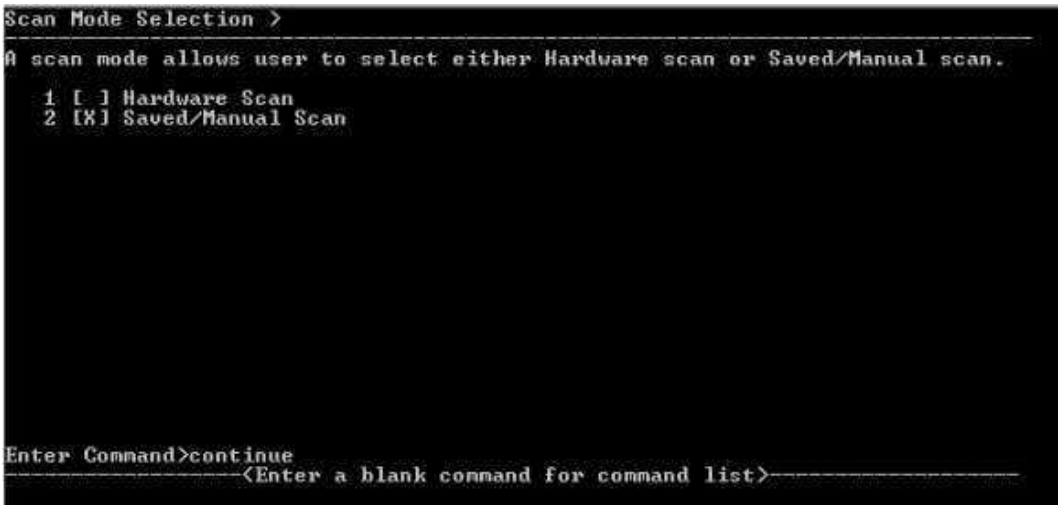
- **Exit:** Exits the L&TT application.
- **Clear:** Deselects the current scan mode.
- **Continue:** Starts the specified scan mode (enter this command to execute the initial full hardware scan in the above screen).
- **Select:** Selects the scan mode (Saved/Manual Scan mode will not be available until after an initial full hardware scan has successfully completed).

Beginning with L&TT v3.5 the results of the full hardware scan are automatically saved, so the next time L&TT is launched, the Saved/Manual Scan option is available.

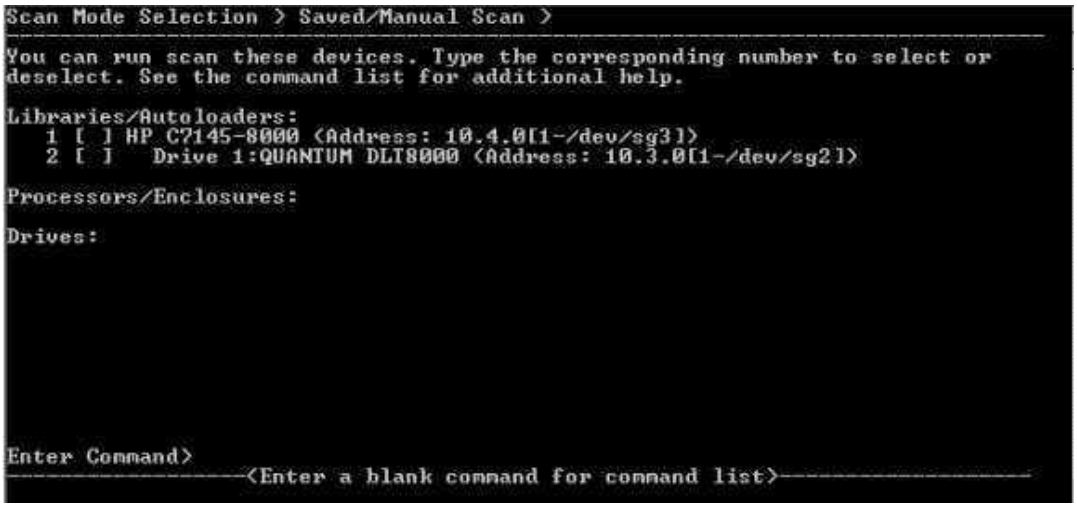
When L&TT performs its initial device scan, it identifies all the devices connected to the computer either directly, or through a SAN. After the initial scan is complete and saved, future full system hardware scans become unnecessary, unless the configuration is changed.

To enable the Saved/Manual Scan option on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

1. In the ***Scan Mode Selection screen***, select the Saved/Manual Scan option, and then enter **Continue** at the command prompt.



The ***Saved/Manual Scan screen*** is displayed. This screen enables you to select the devices that you want L&TT to scan and identify. This can save a lot of time in a large SAN environment if you want to test only one or two devices. Any devices that you don't select will not be scanned, and they will not be displayed in the device list.



2. The following commands are available from the Saved/Manual Scan screen:

   - **Select:** Scans the selected device(s).
   - **SelectAll:** Scans all devices.
   - **Clear:** Deselects the selected device(s) so they will not be scanned.
   - **UnselectAll:** Clears all devices. No devices will be scanned.
   - **EnterHWAddrManual:** Lets you manually enter the hardware address of a device to be scanned.
   - **Hardwarescan:** Performs a full hardware scan. Use this option to update the list of available devices on the Saved/Manual Scan screen.
   - **Continue:** Starts the indicated scan and proceeds to the Main screen.
   - **Up:** Exits the current command level.
   - **Exit:** Exits the L&TT application.

3. To continue navigating through subsequent screens to select devices for testing, and so on see To Navigate L&TT on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX and begin at step 3.

Using the Skip-Scan feature

Skip-Scan is a feature that was added with L&TT v3.3.

When the Skip-Scan feature is enabled, L&TT scans only for the device you specify. This is a useful feature when troubleshooting a device that is part of a SAN installation because it saves time and hangs or timeouts related to attempting to scan every device in the SAN.

Beginning with L&TT v3.5, the Skip-Scan functionality was enhanced with an improved user interface and a new initial splash screen that gives you an opportunity not to scan the hardware configuration when L&TT is first started. See Using L&TT in SAN environments for more details on the new functionality introduced with v3.5.

To use the Skip-Scan feature on Windows:

1. Click **Start > Run**, and then enter the following into the Run dialog box:

   ```
   C:\Program Files\HP StorageWorks Library and Tape Tools\HP_LTT.exe  -o skipscan
   ```

   The ***Skip-Scan dialog box*** is displayed when L&TT opens.

2. Enter the hardware address of the device you want to scan.

   - For NT Miniport I/O mode, the path is in the form <Port Number>/<Bus Number>.<Device Target ID>.<Device LUN>
   - For ASPI I/O mode, the path is in the form `<Bus Number>.<Device Target ID>.<Device LUN>`

To use the Skip-Scan feature on HP-UX, Linux, NetWare, or Tru64 UNIX:

1. Execute the following commands to launch L&TT with the Skip-Scan feature enabled:

   - **For HP-UX, Tru64 UNIX, and Linux –** Log on as root and execute the following commands:

   ```
   cd  /opt/ltt
   ./hp_ltt -o skipscan
   ```

   - **For Novell NetWare –** Execute the following command from the server console:

   ```
   hp_ltt\hp_ltt -o skipscan
   ```

2. At the prompt, enter the hardware address of the device you want to scan.

Problems

Device access issues (RSM on Windows, etc.)

Tape devices and tape libraries require exclusive access on many operating systems to avoid interference between multiple processes accessing the same device. While there are differences between operating systems regarding how services and applications run, how they are monitored, and which error messages are displayed by L&TT when a conflict is detected, the basic issue remains the same: devices may show as inaccessible in L&TT if they are still claimed by another process.

As a result, you cannot run L&TT and a backup application at the same time. If a backup application is still running, L&TT is unable to gain access to the tape drives, and functionality in L&TT is restricted. Similarly, if L&TT is running and a backup application tries to execute a scheduled job, the job may fail because it cannot access the drive. It should be noted that "backup applications" refers to service processes, drivers, or typical backup software applications. The Windows Removable Storage Management service (RSM) is an example of a process that blocks access to tape libraries and drives; it must be disabled or shut down before using L&TT. The L&TT splash screen contains a reminder of this. Click here for more information on RSM including how to disable and re-enable it, and so on.

On large SANs, it is often impossible to entirely close all software applications while trying to run L&TT on a single drive. In these situations, use the SAN awareness features to bypass conflicts on all other devices, and focus on a single robotics controller or tape drive. However, even in this scenario, this single device must be released from control of any other software via appropriate means.

On the Windows platform, there are two I/O modes available: *NT Miniport I/O mode* and *ASPI I/O mode*. The ASPI I/O mode has the ability to circumvent these exclusivity restrictions because it does not honor the security system built into the server variants of Windows, related to mutual exclusivity. This is also the reason that Microsoft views ASPI as a deprecated I/O model that should only be used when necessary. If you use ASPI to circumvent the exclusive access restriction, take extreme care to understand any interference that may occur, and interpret results accordingly.

Device performance issues

- ***Poor performance with HP DLT VS80 and CA Brightstor v11 on Windows***

  If backups are very slow and the hardware and media is believed to be ok, try the following to improve backup performance:

  - *Stop the "CA Brightstor Tape Engine" service and locate the following registry folder using Regedt32.exe:*

    ```
    HKLM/Software/Computer Associates/Brightstor ARCserve
    Backup/Base/TapeEngine/DEVICE#/
    ```

  - *Look at the Info value for the device# that corresponds with your DLT drive, then ADD DWORD value*

    ```
    data type=Reg_Dword

    valuename=DefaultBlockFactor

    data=7, HEX
    ```

  - *Restart the "CA Brightstor Tape Engine" service. File backup should now be much faster.*

- ***Poor performance on Windows 2003 Server systems with EBS installations***

  Many of the ISV Backup Applications supported by HP request or require that the RSM service be disabled. When the Windows 2003 server is rebooted, even though RSM is disabled, it continues to initiate the Test Unit Ready (TUR) SCSI command indefinitely on all connected removable devices. This can cause issues with performance in an environment with many shared tape devices. Refer to Microsoft Knowledge Base Article 842411 for instructions on how to work around this problem.

Firmware Functions

About firmware functions

If a newer firmware file than what you are currently running is available for one or more of your products, consider downloading and installing it. Updating to the latest firmware revision ensures that you have all the latest fixes and enhancements that are available for your device(s). If you are having problems with your device(s) currently, updating to the latest firmware may solve the problem.

NOTE: For ESL9000 Series with Command View ESL, ESL E-Series, and EML E-Series libraries, use of L&TT to update firmware is not supported. Unless otherwise instructed by HP support personnel, firmware update operations for these products must be performed using the Command View ESL GUI (for libraries running Interface Manager firmware v1.4 or later), or CLI (for libraries running Interface Manager firmware older than v1.4) as documented in the *HP StorageWorks Interface Manager and Command View ESL User Guide*. If standalone L&TT is used to update firmware on a managed library, the management station is not aware of the firmware update and reports a firmware mismatch. In addition, if the library is partitioned when the firmware update is attempted with standalone L&TT, it produces an invalid command error.

If you would like to verify that you have the latest firmware revision for your product, or review release notes for a particular revision of firmware prior to making a decision to update, see Accessing firmware revision and release note information.

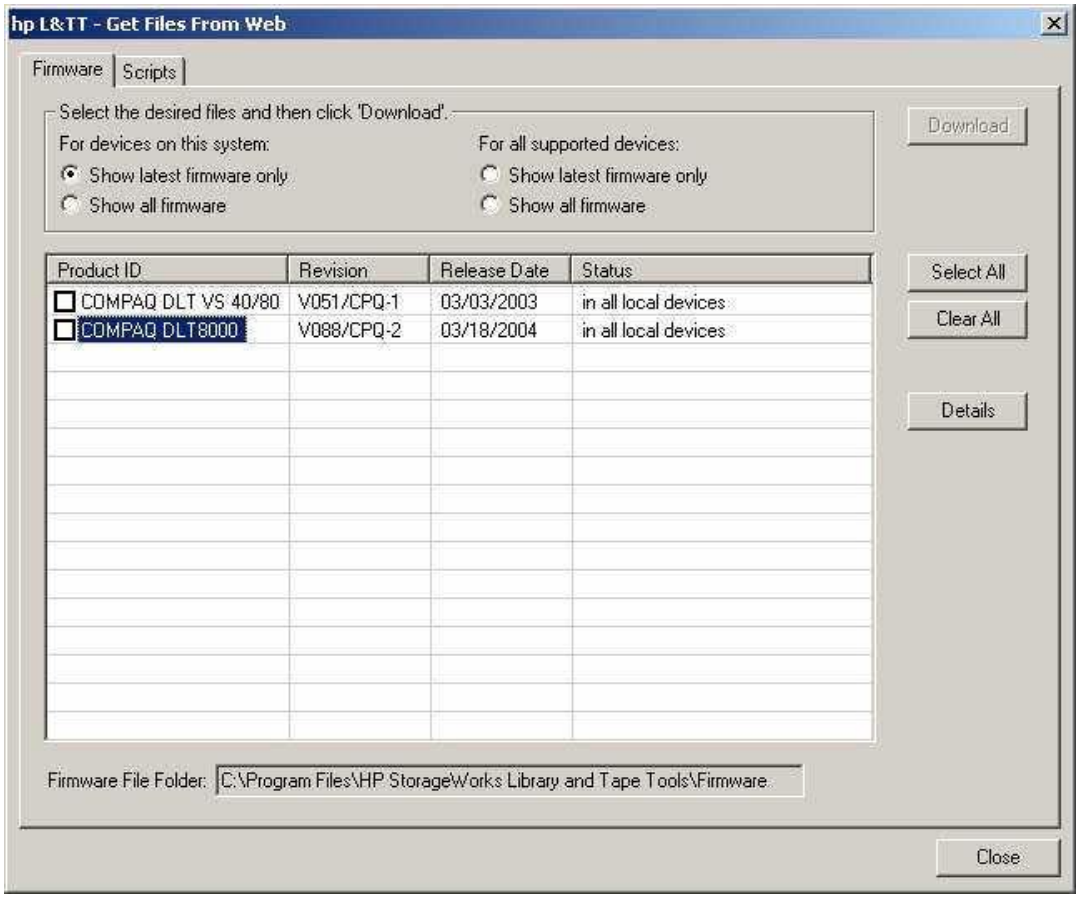
Accessing firmware revision and release note information

Verify that you have the latest firmware revision or learn about the changes between your current revision and the latest revision, using the L&TT application.

To Access firmware revision and release note information from the L&TT application (Windows):

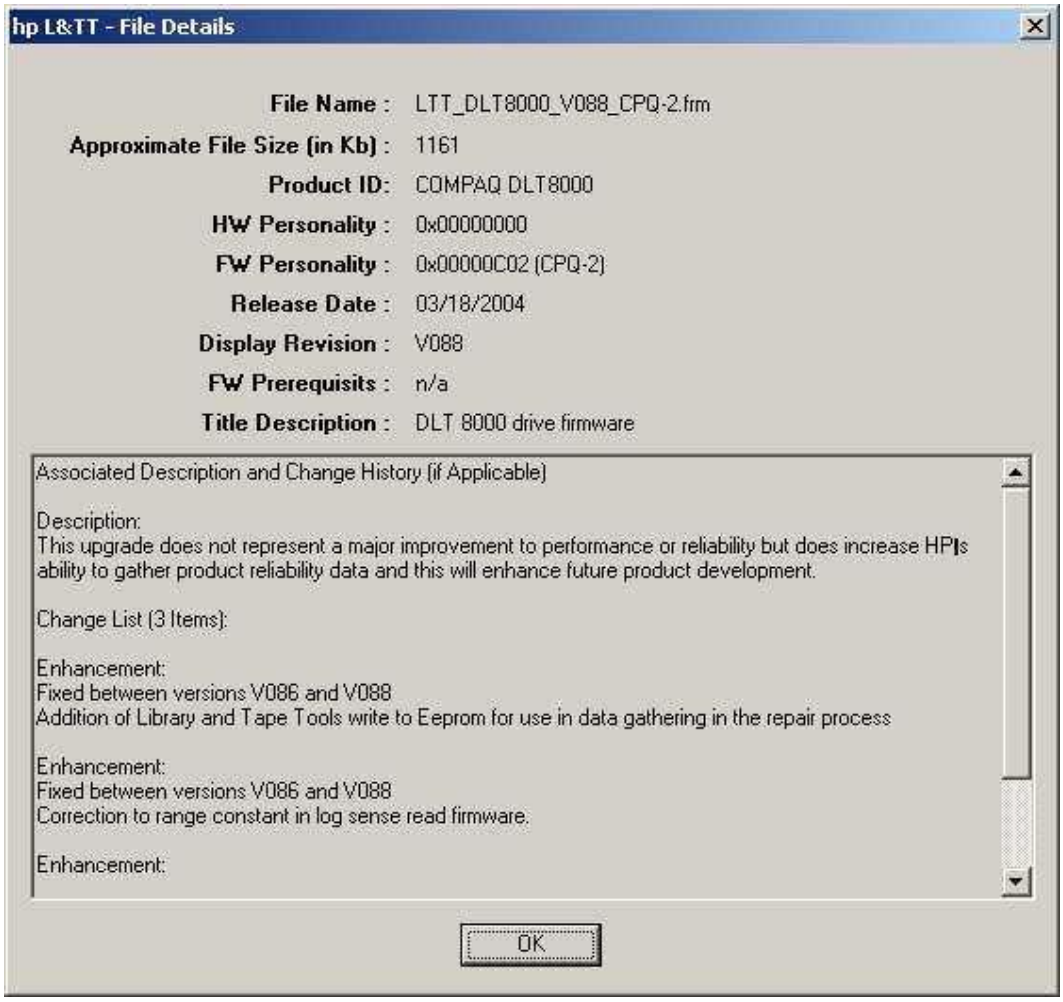
1. In the L&TT main screen, click **File > Get Files From Web**, or click the **Firmware** button on the menu bar, select the **Local Firmware Files** tab, and then click **Get Firmware From Web**.

   The ***Get Files From Web window*** opens.



2. To view the latest firmware revisions for devices on your system, or for all devices, click the **Firmware** tab (if not already displayed), and then click the appropriate radio button.

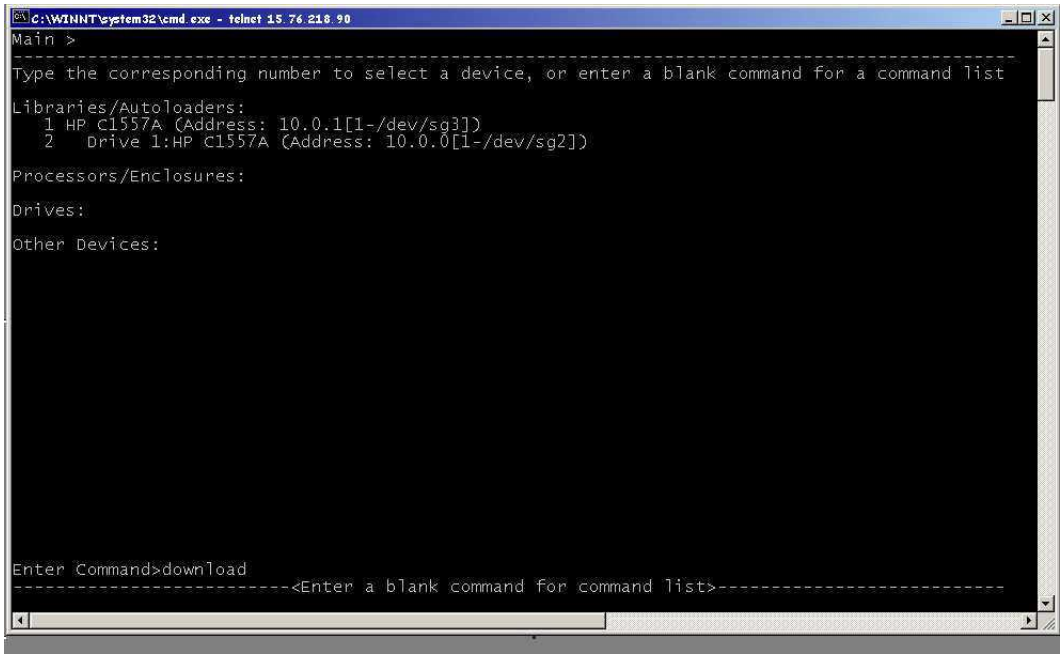
3. To view release note information, click the **product ID** of the firmware file whose information you want to view, and then click the **Details** button. If release notes are available, they are displayed in the ***File Details window***.



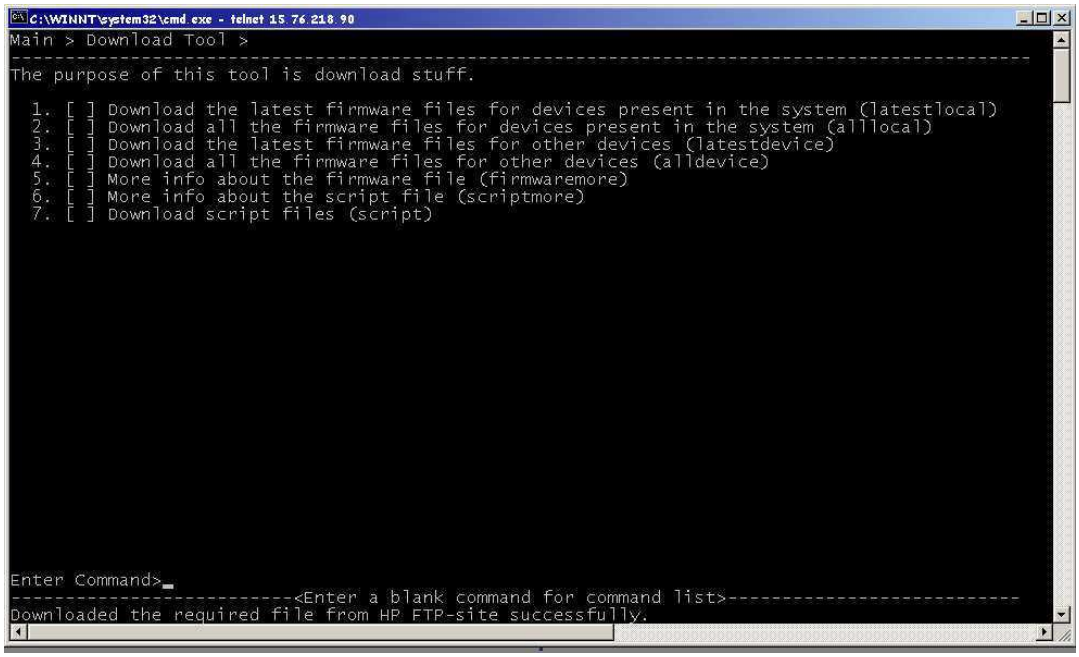
To access firmware revision and release note information from the L&TT application (HP-UX and Linux):

Note: The download function is not supported for NetWare, OpenVMS, or Tru64 UNIX; therefore, accessing firmware revision and release note information from the L&TT application is not supported.

1. In the L&TT main screen, enter **download**. Note that in the ***example screen***, only a library/autoloader device is configured. Your screen may list other devices and drives.

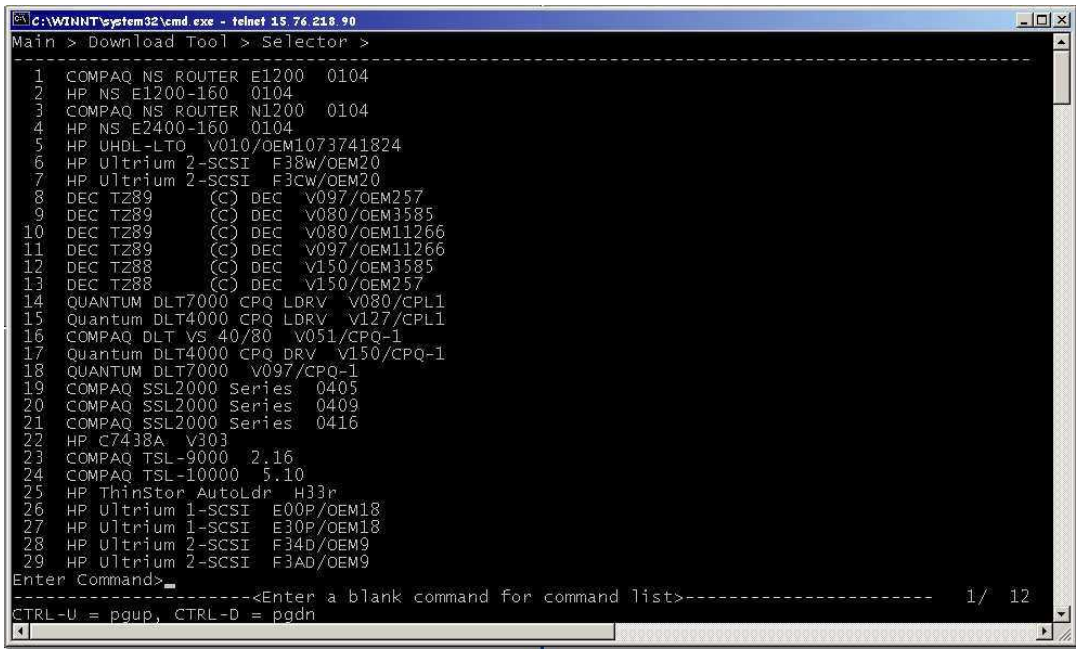


A required file from the HP ftp site is downloaded and the ***Download Tool screen*** opens. The status area at the bottom of the screen displays the progress of the download.



2. In the Download Tool area, enter **5** at the command prompt.

The ***Selector Screen*** opens, displaying the various firmware files. Review the list to note the latest firmware revision for your product.



3. To review release note information, enter the **number of the file** whose release note information you want to view. Use the **^U** or **^D** commands to page up or down through the screens to find the desired product and firmware file. Not all firmware files have release note information available.

Downloading/Updating

Downloading/updating firmware files on Windows

Typical firmware file download times range from less than 1 minute to 2 or 3 minutes. Upload or installation times to load the new firmware into the drive are typically less than 5 minutes.

This section covers downloading, and then updating device firmware electronically from firmware files. This is the preferred method. Device firmware can also be updated via use of a Firmware Update tape (FUP tape). Click here for information and guidelines on using firmware update tapes.

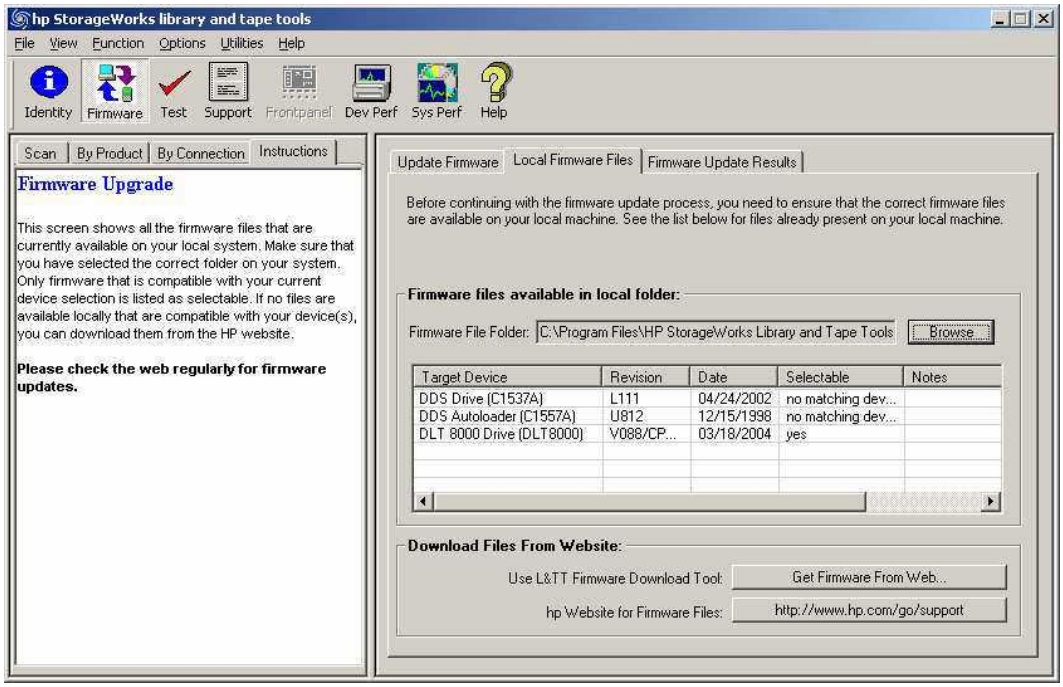
NOTE: For ESL9000 Series with Command View ESL, ESL E-Series, and EML E-Series libraries, use of L&TT to update firmware is not supported. Unless otherwise instructed by HP support personnel, firmware update operations for these products must be performed using the Command View ESL GUI (for libraries running Interface Manager firmware v1.4 or later), or CLI (for libraries running Interface Manager firmware older than v1.4) as documented in the *HP StorageWorks Interface Manager and Command View ESL User Guide*. If standalone L&TT is used to update firmware on a managed library, the management station is not aware of the firmware update and reports a firmware mismatch. In addition, if the library is partitioned when the firmware update is attempted with standalone L&TT, it produces an invalid command error.

Downloading firmware files

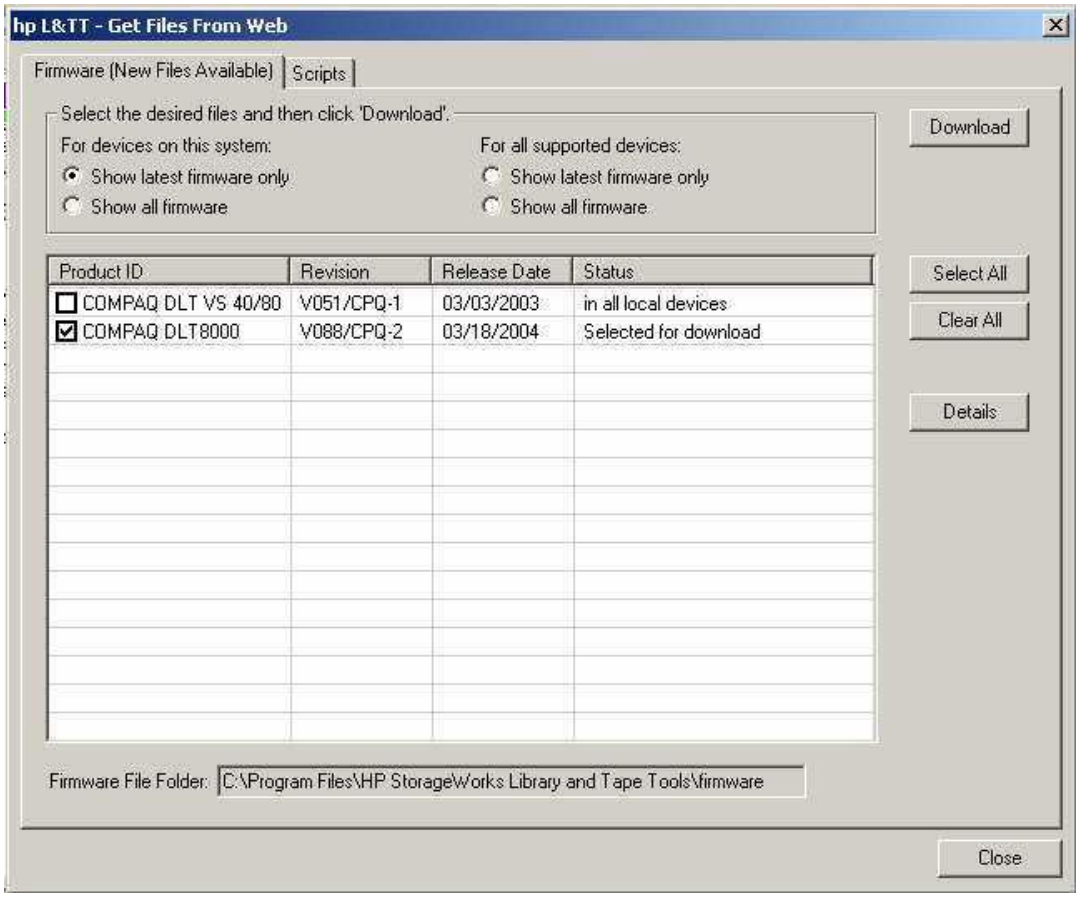
HP recommends that you use the *Get Files From Web* function to download firmware files under Windows. This is the simplest method, and it ensures that you only download files for devices you have on your system. You can also use the *Download Files From External Web* procedure, but you must ensure that you choose the correct product or you will download the wrong firmware file. In either case, L&TT checks to ensure that each product will be updated with the correct firmware update package.

To get files from web using L&TT (Windows):

1. In the L&TT main screen, click **File > Get Files From Web** or click the **Firmware** button on the menu bar, click the **Local Firmware Files** tab, and then click **Get Firmware From Web** ***(show me).***



A ***status window*** displays the supported storage products on your system related to the latest available firmware revisions. If new firmware files are available, the firmware tab will also include the "(New Files Available)" notation on the tab. If no new firmware files are available, only the word "Firmware" is displayed on the tab."



Note: In the above example screen capture (taken March 31, 2004), the VS 40/80 drive is already up-to-date, while the DLT 8000 is outdated. The updated firmware file for the DLT 8000 has been automatically selected as indicated by the checkbox, and the **Selected for download** status. To download this file to the local firmware directory, click the **Download** button. After the download completes successfully, the status changes to **Local Copy Available**.

To download firmware files from external Web (Windows):

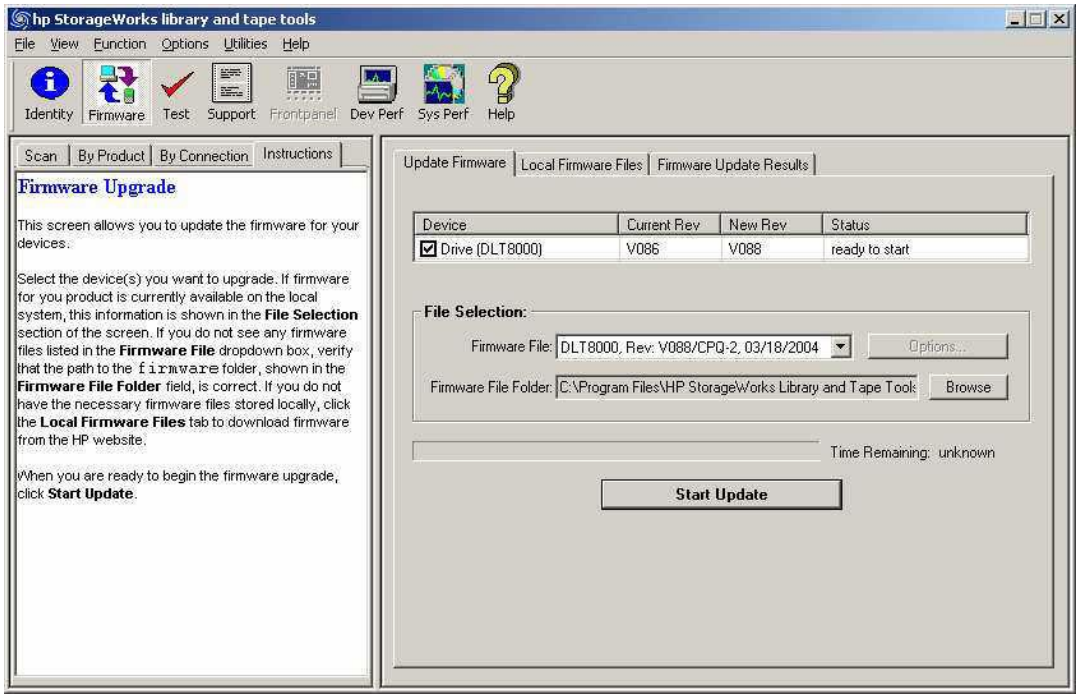
1. Go to www.hp.com/support, choose your region, and then select **storage** for the product category.
2. Select your product family, and then your particular product.
3. In the **I would like to** box, click **download drivers and software**.
4. Select your product and operating system, and then click the **download** button in the firmware section. The download file may be a single file (standalone drives) or a self-extracting bundle that includes both automation and standalone drive firmware.
5. Download the file or files to the firmware directory. If it's a self-extracting bundle, extract the contents to the firmware directory.

Updating device firmware

To update device firmware (Windows):

1. Download the firmware file (if you haven't already).
2. After the file has been downloaded, click the **firmware** button on the menu bar (if not already in the firmware window).
3. Click the **Update Firmware** tab.

   The ***Update Firmware window*** opens.



Note: In the above example screen capture, the current version is v086, the new version is v088, and the drive is ready to be updated with the new firmware. The v088 firmware file is already selected for update as indicated in the File Selection portion of the window. With several products, after the firmware file is selected, a message is displayed to inform you of certain requirements (such as important prerequisites for updating with the new firmware), or noteworthy functional changes (such as a new LED sequence). Be sure to read any such messages and take any appropriate actions. Click the **Start Update** button to initiate the firmware update process.

CAUTION : A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

Ensure that no other programs attempt to access the device while the firmware is being updated. Do not interrupt the firmware update; the device may not operate and will likely require physical repair.

4. When the firmware update is complete, the ***Firmware Update window*** opens, explaining what may happen related to the Windows plug-and-play implementation. It also explains how to make the drive visible to L&TT and the Windows operating system, so that it will operate properly.

5. If the device is not visible to L&TT and/or the operating system after you have successfully updated the firmware, follow the process indicated in the Firmware Update window (Step 4) to ensure the updated device is fully visible to and usable by the system. Please make sure you follow this entire procedure before calling HP customer support. If you have followed the procedure, and your device is still not accessible, call HP customer support for assistance.

Downloading/updating firmware files on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

Typical firmware file download times range from less than 1 minute to 2 or 3 minutes. Upload or installation times to load the new firmware into the drive are typically less than 5 minutes.

This section covers downloading, and then updating device firmware electronically from firmware files. This is the preferred method. Device firmware can also be updated via use of a Firmware Update tape (FUP tape). Click here for information and guidelines on using firmware update tapes.

NOTE: For ESL9000 Series with Command View ESL, ESL E-Series, and EML E-Series libraries, use of L&TT to update firmware is not supported. Unless otherwise instructed by HP support personnel, firmware update operations for these products must be performed using the Command View ESL GUI (for libraries running Interface Manager firmware v1.4 or later), or CLI (for libraries running Interface Manager firmware older than v1.4) as documented in the *HP StorageWorks Interface Manager and Command View ESL User Guide*. If standalone L&TT is used to update firmware on a managed library, the management station is not aware of the firmware update and reports a firmware mismatch. In addition, if the library is partitioned when the firmware update is attempted with standalone L&TT, it produces an invalid command error.

NOTE: The screen captures that appear in this section were taken on a Linux system, but apply to HP-UX, NetWare, OpenVMS, and Tru64 UNIX, unless otherwise specified. Note that the screen captures are examples only; the content of user windows varies.

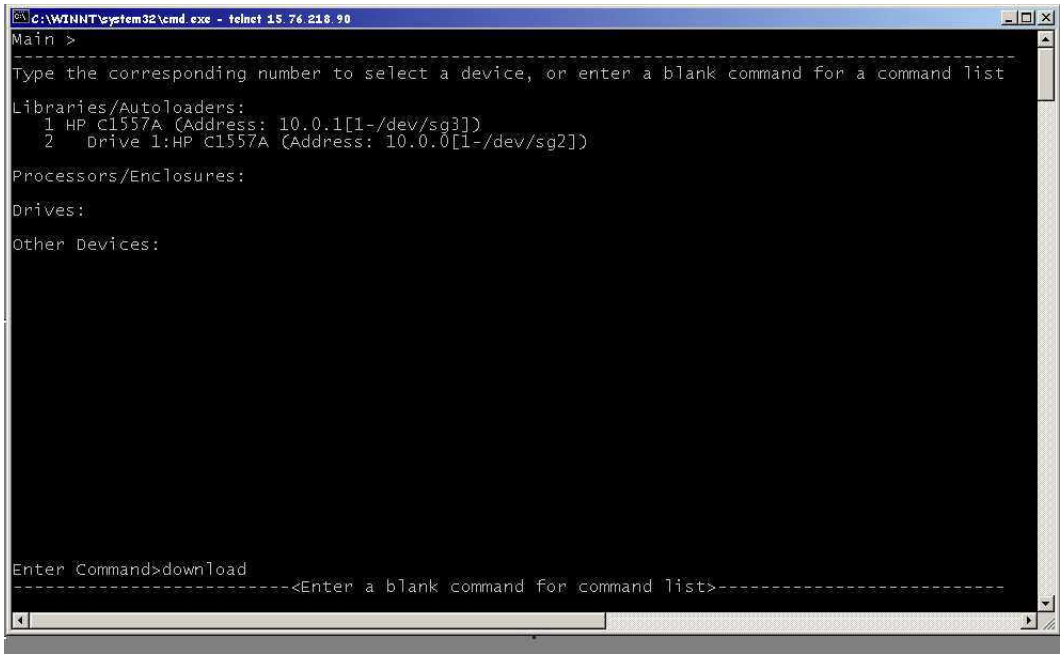
Downloading firmware files

HP recommends that you follow the process outlined in the To download firmware files from web using L&TT section to download firmware files for the various non-Windows platforms that support this feature. This ensures that you only download files for devices you have on your system. You can also use the procedure outlined in the To download files from external web section, but you must ensure that you choose the correct product. In either case, L&TT checks to ensure that each product will be updated with the correct firmware update package.

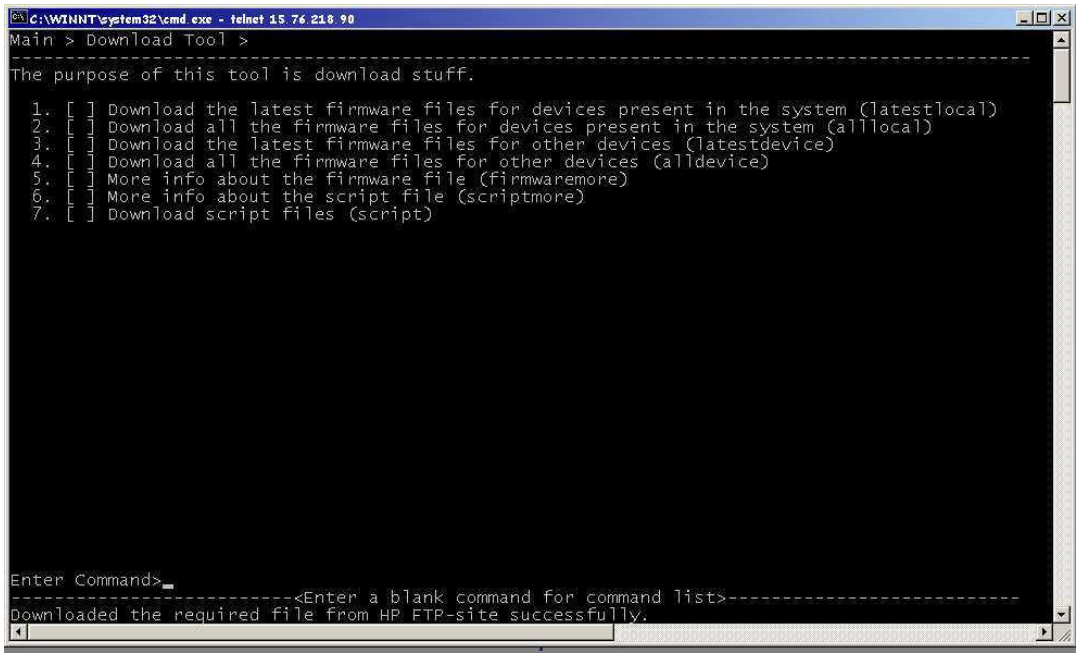
Note: Downloading firmware files from the Web using the L&TT application is not supported with NetWare, OpenVMS, or Tru64 UNIX.

To download firmware files from Web using L&TT (HP-UX and Linux):

1. In the L&TT main screen, enter **download**. Note that in the ***example screen***, there is only a library/autoloader device configured. Your screen may list other devices and drives.

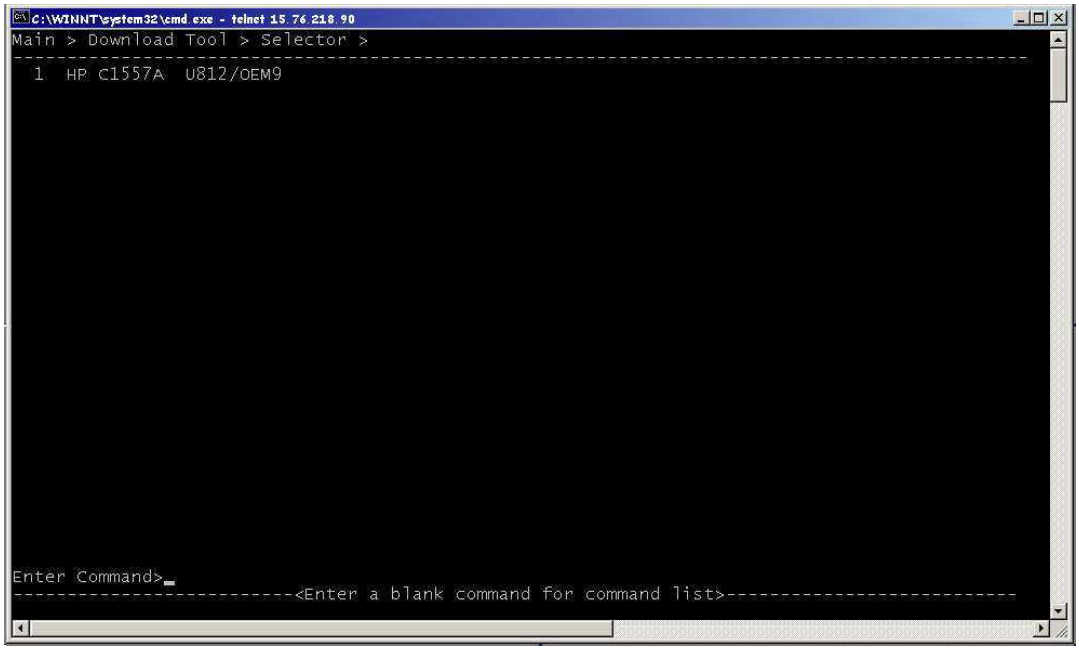


A required file from the HP ftp site is downloaded and the ***Download Tool screen*** opens. The status area at the bottom of the screen displays the progress of the download.



2. To download the latest firmware files for devices currently configured on the system, enter **1** at the command prompt.

The ***Selector screen*** opens, displaying the product(s) and the latest firmware file available for that product.



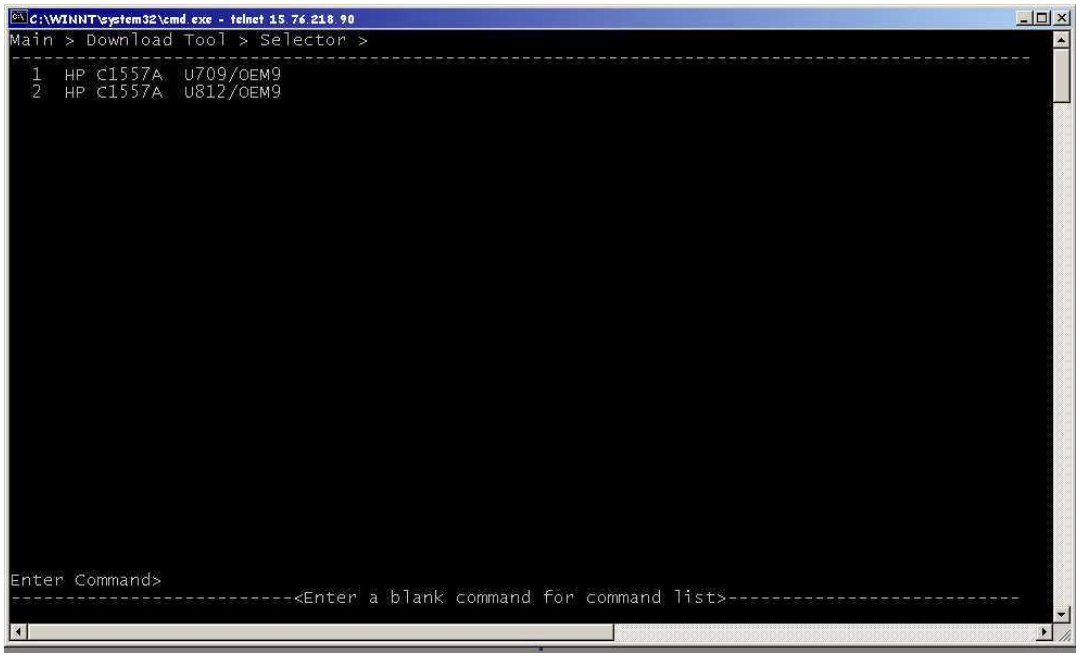
Note: In this example, there is only one supported device configured on the system, so only one item is displayed. The firmware file shown is the latest available revision for that device. If there had been other supported devices configured, they would have appeared in this screen with a number associated with each of them.

3. To download the latest firmware file, enter the number of the file for the device you are going to update. In this particular example you would enter the number **1** as that is the only choice available.

To download all the firmware files for devices present in the system (HP-UX and Linux):

1. In the Download Tool screen, enter **2** at the command prompt.

The ***Selector screen*** opens, displaying the device(s) and all of the firmware files available for each device.



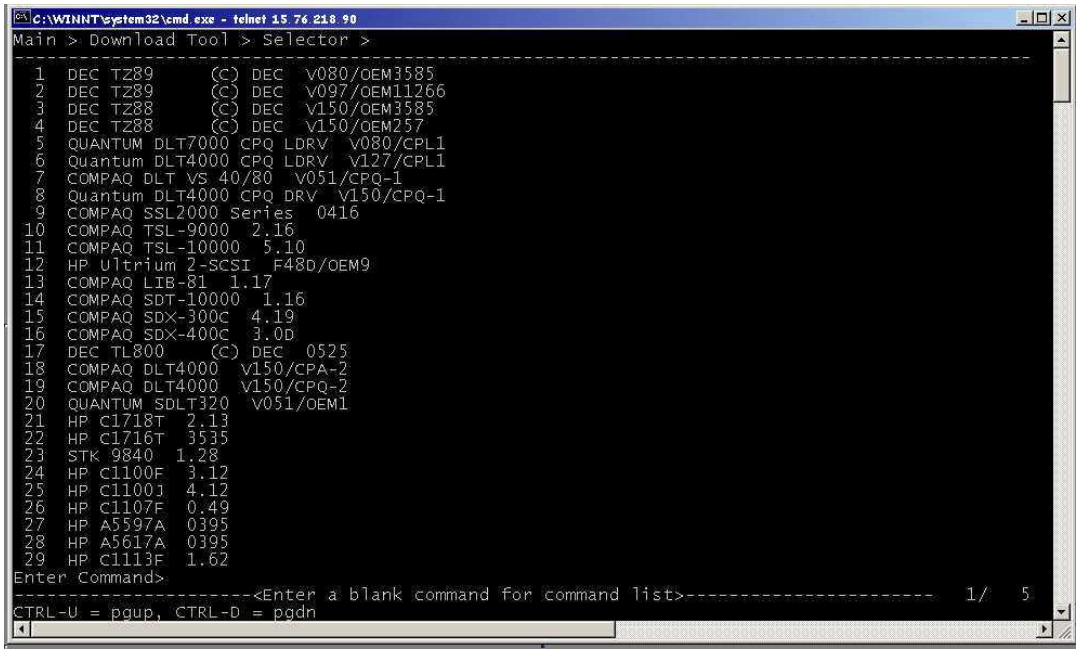
Note: In this example, there is a single supported device configured, and there are a total of two firmware files available for that device.

2. To download the desired firmware file, enter the number of the file you want to download. In this particular example you would enter the number **1** if you want the older U709/OEM9 file or **2** if you want the latest U812/OEM9 file.

To download the latest firmware files for other supported devices (HP-UX and Linux):

1. In the Download Tool screen, enter **3** at the command prompt.

   The ***Selector screen*** opens, displaying all the supported device(s) and latest firmware files available for each device.

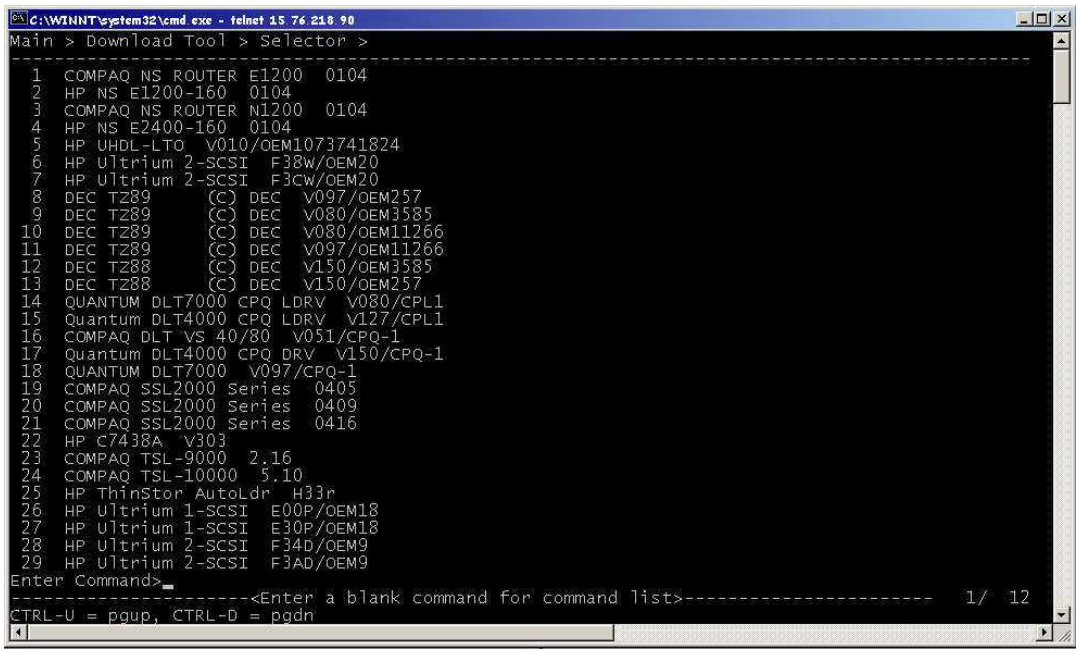


2. To download the firmware file, enter the number of the file you want to download. Note that you can use the ^U or ^D commands to page up or down through the screens to find the desired product and firmware file.

To download all the firmware files for other supported devices (HP-UX and Linux):

1. In the Download Tool screen, enter **4** at the command prompt.

   The ***Selector screen*** opens, displaying all the supported device(s) and firmware files available for each device.

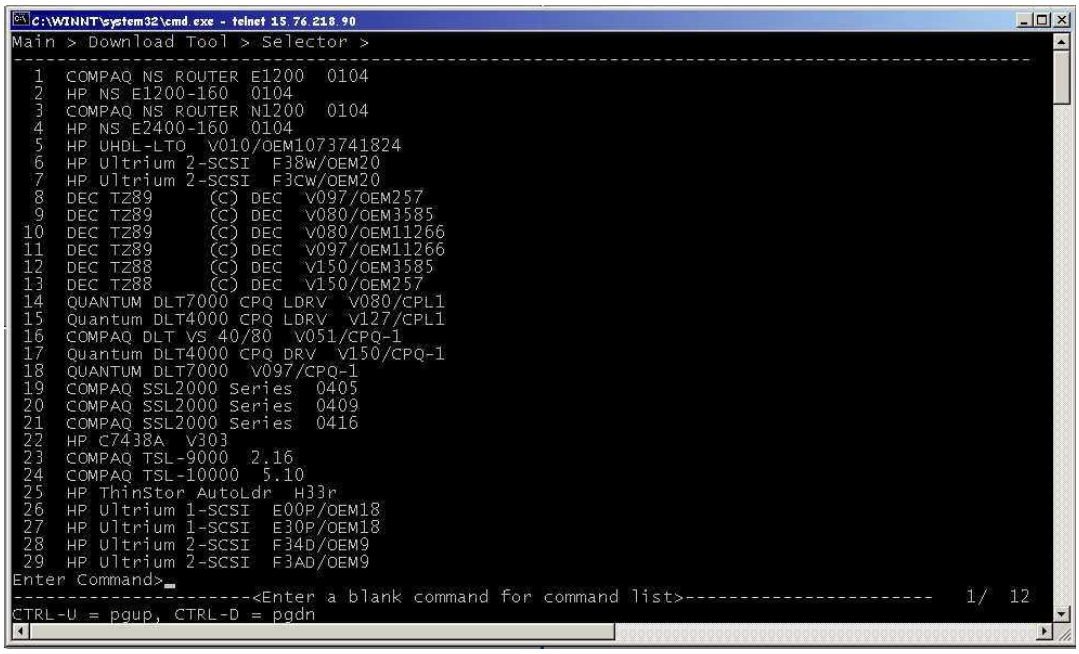


2. To download the firmware file, enter the number of the file you want to download. Note that you can use the ^U or ^D commands to page up or down through the screens to find the desired product and firmware file.

To get release note information about a firmware file (HP-UX and Linux):

1. In the Download Tool screen, enter **5** at the command prompt.

   The ***Selector Screen*** opens, displaying the various firmware files.



2. Enter the number of the file whose release note information you want to view. Note that you can use the ^U or ^D commands to page up or down through the screens to find the desired product and firmware file. Note also that not all firmware files will have release note information available.

To download firmware files from external Web (HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX):

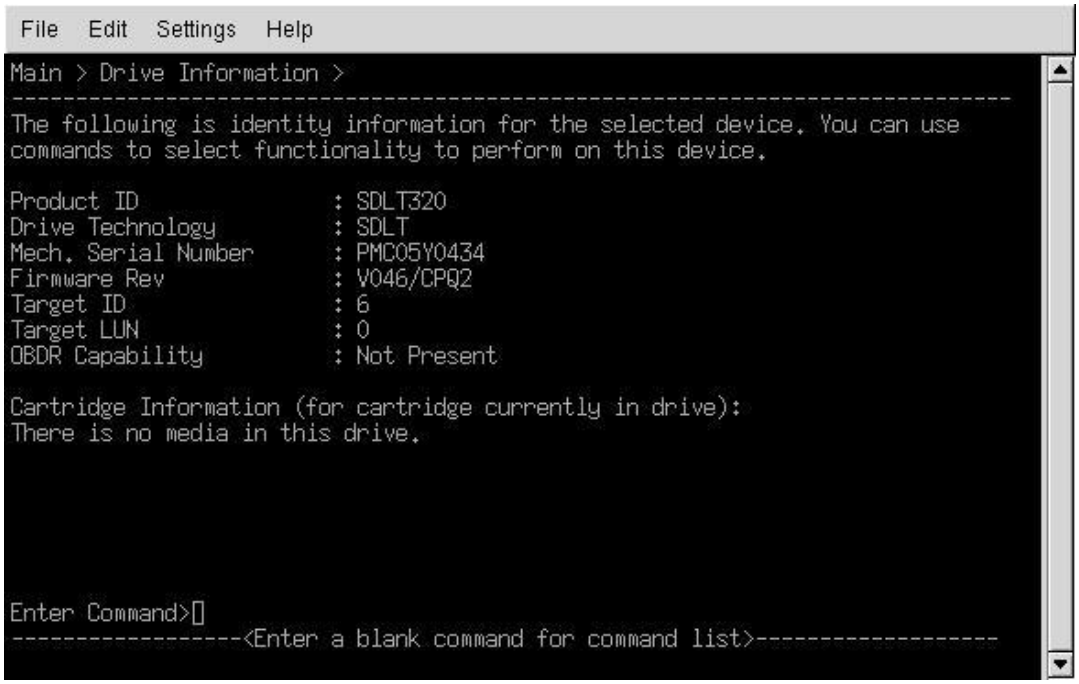
1. Go to www.hp.com/support, choose your region, and then select **storage** for the product category.
2. Select your product family, and then your particular product.
3. In the **I would like to** box, click **download drivers and software**.
4. Select your product and operating system, and then click the **download** button in the firmware section. The download file may be a single file (standalone drives) or a self-extracting bundle that includes both automation and standalone drive firmware.
5. Download the file or files to the firmware directory. If it is a self-extracting bundle, extract the contents to the firmware directory.

Updating firmware files

To update device firmware (HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX):

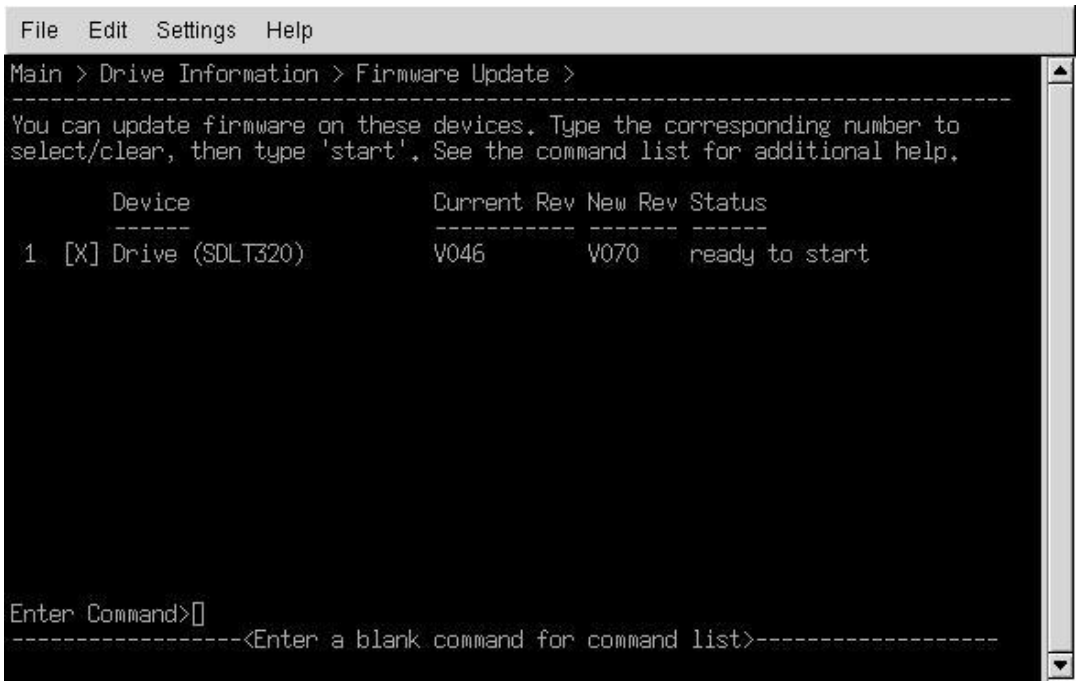
1. In the L&TT main screen, enter the number corresponding to the device to be updated, and then press **Enter**.

   The ***Drive Information screen*** opens.



2. Enter **firmware** for the command.

   The ***Firmware Update screen*** opens. Devices available for update are listed in this screen.



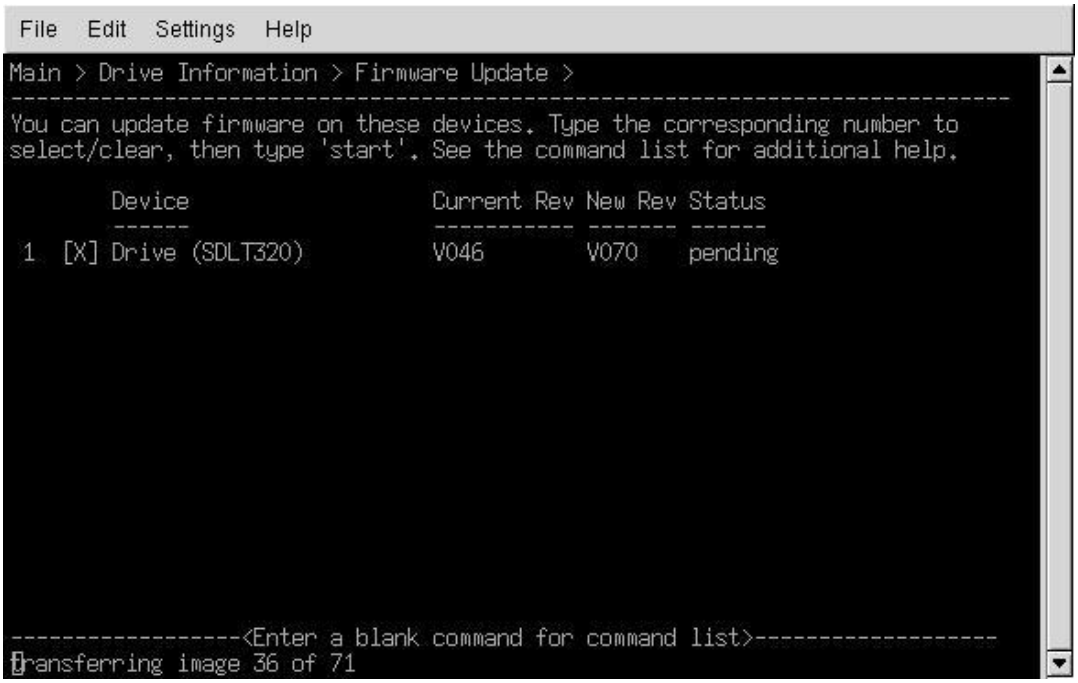
3. Enter the corresponding number of the device you want to update, and then press **Enter** to mark the device "selected." If multiple devices are available and you want to select them for update as well, repeat this process for each device you want to update.

CAUTION : A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

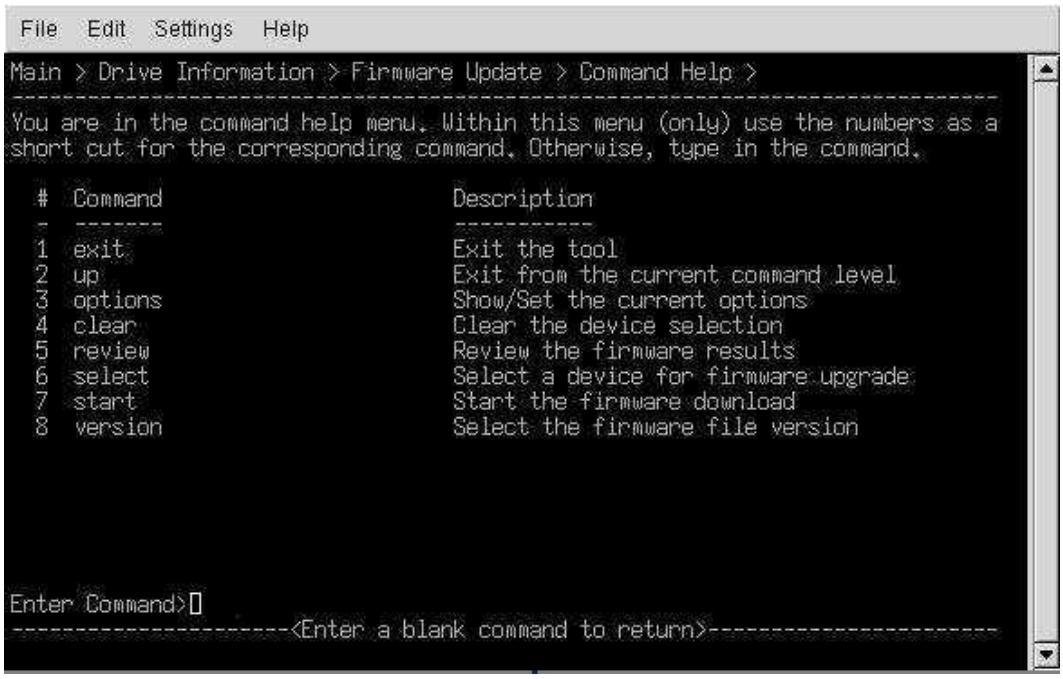
Ensure that no other programs attempt to access the device while the firmware is being updated. Do not interrupt the firmware update as the device may not operate and will likely require physical repair.

4. After selecting all the devices you want to update, enter **start** to begin the update process.

While the firmware update is in process, the ***Firmware Update screen*** displays the status ("pending" in this example) and the progress (image 36 of 71 in this example) of the update; the progress is displayed in the bottom margin of the window.



5. Entering a blank command (press **Enter**) displays the available commands, related to the firmware update function as shown in the ***following screen.***



Note: Entering **options** displays the current options, but you will not be able to change anything without the correct password. (Passwords are available only by contacting HP support, and should only be used under the direction of HP support personnel.)

Using a firmware update (FUP) tape

The preferred method for updating drive firmware is by using the L&TT application. Firmware can be updated on both Windows and non-Windows platforms. However, there are some cases where L&TT is not available, or otherwise cannot be used (for example, with an unsupported operating system). In these cases, a firmware update (FUP) tape can be created and used for the purpose of updating drive firmware. In most cases, FUP tapes can be created by HP and supplied to end users, or be created by the end users themselves.

When using L&TT to update firmware, there are protections in place to ensure that only the correct firmware is downloaded to the drive. There is no such protection mechanism with a FUP tape, so care must be taken to use the FUP tape only with the drive it is intended for. The tape will only update firmware if inserted into the correct hardware, but it could change a drive personality in some cases. For example, a FUP tape will overwrite OEM drive firmware if inserted into an OEM drive rather than a drive with HP personality.

Performing the update

The procedure for using a FUP tape varies depending on the drive type, and in some cases, whether or not the drive is in an autoloader or library. Click the appropriate drive type below to get the details associated with using a FUP tape for that drive.

SDLT

Standalone SDLT Drives

There is no hard coded limit as to how many times a given SDLT FUP tape can be used to update the firmware in a particular SDLT drive type. To update the firmware in an SDLT drive using a FUP tape, you first have to put the drive in "FUP tape mode." This is accomplished as follows:

1. *Unload any tape currently in the SDLT drive.*
2. *With no tape in the drive, push and hold the **eject** button. After approximately five seconds, the left LED begins to flash.*
3. *Release the **eject** button, and then push it again. The middle LED will also start flashing.*
4. *Release the **eject** button. The drive is now ready to accept the FUP tape.*
5. *Insert the FUP tape into the drive. It does not matter if the tape is write protected or write enabled.*

   ***Caution:** Do not power cycle or reset the drive. Make sure that no software attempts to access the drive during the firmware update process. Otherwise the drive may be damaged and need to be returned to HP for replacement.*

   ***Note:** If the drive is not put into FUP tape mode before you insert the FUP tape, it will not be recognized as a FUP tape. If the FUP tape is not write protected, you will be able to write over the FUP tape (but not append to it).*
6. *When the firmware update process is complete, the drive ejects the FUP tape and performs a self test.*
7. *Store, return, or dispose of the FUP tape as instructed by HP support personnel. See also Converting a firmware update (FUP) tape to a data tape.*

Libraries and Autoloaders

Use of FUP tapes in STK libraries works just like it does for standalone drives, so see the description above for that information.

For HP libraries:

1. *Ensure the target drive is empty. If a tape is in the target drive, use the front panel display to return the tape to a storage slot.*
2. *Load the FUP tape into an empty slot*
3. *From the main menu on the front panel, choose **Administration**, and then **Upgrade Firmware** to access the **Upgrade Drive Firmware** menu.*
4. *Use the [-] or [+] key to select the slot containing the FUP tape. Select [OK].*
5. *Monitor the front panel for status during the upgrade. The tape will return to the original slot when the procedure is complete.*
6. *Remove the FUP tape from the library, and then power cycle the library.*

DLT VS80/DLT1

Standalone DLT VS80/DLT1 Drives

There is no hard-coded limit as to how many times a given DLT VS80/DLT1 FUP tape can be used to update the firmware in a particular DLT VS80/DLT1 drive type. To update the firmware in a DLT VS80/DLT1 drive using a FUP tape, you first have to put the drive in FUP tape mode. To do this:

1. *Unload any tape currently in the DLT VS80/DLT1 drive.*
2. *With no tape in the drive, push and hold the **eject** button. After approximately five seconds, the leftmost and rightmost LEDs light.*
3. *Continue to hold the eject button depressed until all the LEDs go out.*
4. *Immediately release the **eject** button. The middle LED will light.*
5. *Push and release the **eject** button. All LEDs will start flashing. The drive is now ready to accept the FUP tape.*
6. *Insert the FUP tape into the drive. It does not matter if the tape is write protected or write enabled.*

> ***CAUTION**: Do not power cycle or reset the drive. Make sure that no software attempts to access the drive during the firmware update process. Otherwise the drive may be damaged and need to be returned to HP for replacement.*
>
> ***Note:** If the drive is not put into FUP tape mode before you insert the FUP tape, it will not be recognized as a FUP tape. If the FUP tape is not write protected, you will be able to write over the FUP tape (but not append to it).*

7. *When the firmware update process is complete, the drive ejects the FUP tape and performs a self test.*
8. *Store, return, or dispose of the FUP tape as instructed by HP support personnel. See also Converting a firmware update (FUP) tape to a data tape.*

Libraries and Autoloaders

Use of FUP tapes in STK libraries works just like it does for standalone drives, so see the description above for that information.

For HP libraries:

1. *Make sure that the target drive is empty. If a tape is in the target drive, use the front panel display to return the tape to a storage slot.*

2. *Load the FUP tape into an empty slot.*
3. *From the main menu on the front panel, choose **Administration**, and then **Upgrade Firmware** to access the **Upgrade Drive Firmware** menu.*
4. *Use the [-] or [+] key to select the slot containing the FUP tape. Select [OK].*
5. *Monitor the front panel for status during the upgrade. The tape will return to the original slot when the procedure is complete.*
6. *Remove the FUP tape from the library, and then power cycle the library.*

DLT 4000/7000/8000

Standalone DLT 4000/7000/8000 drives

There is no hard-coded limit as to how many times a given DLT 4000/7000/8000 FUP tape can be used to update the firmware in a particular DLT 4000/7000/8000 drive type. To update the firmware in a DLT 4000/7000/8000 drive using a FUP tape, you first have to put the drive in FUP tape mode. To do this:

1. *Unload any tape currently in the DLT 4000/7000/8000 drive, and then lower the operator handle.*
2. *With no tape in the drive, push and hold the **unload** button. After approximately five seconds, the Write Protect LED will begin to flash.*
3. *Release the **unload** button and immediately press it again. The Tape In Use LED will now also flash.*
4. *Release the **unload** button. The drive is now ready to accept the FUP tape.*
5. *Lift the operator handle, insert the FUP tape into the drive, and then lower the operator handle. It does not matter if the tape is write protected or write enabled.*

   ***CAUTION**: Do not power cycle or reset the drive. Make sure that no software attempts to access the drive during the firmware update process. Otherwise the drive may be damaged and need to be returned to HP for replacement.*

   ***Note:** If the drive is not put into FUP tape mode before you insert the FUP tape, it will not be recognized as a FUP tape. If the FUP tape is not write protected, you will be able to write over the FUP tape (but not append to it).*
6. *When the firmware update process is complete, the drive ejects the FUP tape and performs a self test. Lift the operator handle and remove the FUP tape.*
7. *Store, return, or dispose of the FUP tape as instructed by HP support personnel. See also Converting a firmware update (FUP) tape to a data tape.*

Libraries and Autoloaders

Use of FUP tapes in STK libraries works just like it does for standalone drives, so see the description above for that information.

For HP libraries:

1. *Make sure that the target drive is empty. If a tape is in the target drive, use the front panel display to return the tape to a storage slot.*
2. *Load the FUP tape into an empty slot.*
3. *From the main menu on the front panel, choose **Administration**, and then **Upgrade Firmware** to access the **Upgrade Drive Firmware** menu.*

4. *Use the [-] or [+] key to select the slot containing the FUP tape. Select [OK].*
5. *Monitor the front panel for status during the upgrade. The tape will return to the original slot when the procedure is complete.*
6. *Remove the FUP tape from the library, and then power cycle the library.*

Ultrium

Standalone Ultrium Drives

There is no hard-coded limit as to how many times a given Ultrium FUP tape can be used to update the firmware in a particular Ultrium drive type. To update an Ultrium drive with a FUP tape, insert the tape into the Ultrium drive. It does not matter if the tape is write protected or write enabled. HP Ultrium drives automatically recognize a valid FUP tape when inserted and begin updating the firmware. When the firmware update process has completed, the tape is ejected, and the drive executes a self test.

***CAUTION**: Do not power cycle or reset the drive. Make sure that no software attempts to access the drive during the firmware update process. Otherwise the drive may be damaged and need to be returned to HP for replacement.*

***Note:** Ultrium FUP tapes can be converted back to data tapes via the LTO Firmware to Data Tape Creator test. See that test description for details.*

Libraries and Autoloaders

Use of FUP tapes in STK libraries works just like it does for standalone drives, so see the description above for that information.

For HP libraries:

1. *Make sure that the target drive is empty. If a tape is in the target drive, use the front panel display to return the tape to a storage slot.*
2. *Load the FUP tape into an empty slot.*
3. *From the main menu on the front panel, choose **Administration**, and then **Upgrade Firmware** to access the **Upgrade Drive Firmware** menu.*
4. *Use the [-] or [+] key to select the slot containing the FUP tape. Select [OK].*
5. *Monitor the front panel for status during the upgrade. The tape will return to the original slot when the procedure is complete.*
6. *Remove the FUP tape from the library, and then power cycle the library.*

HP DDS/DAT

Standalone DDS/DAT Drives

DDS/DAT FUP tapes can typically be used up to 1000 times to update the firmware in a particular DDS drive type (depending on the limit used at the time of FUP tape creation). Drives that can be updated via an FUP tape are HP DDS4 (C5683A) and HP DAT72 (C7438A). Updating drive firmware via FUP tape is not supported on other HP DDS/DAT drives.

To update DDS/DAT drive firmware with a FUP tape, ensure that the tape is write enabled, and then insert it into the DDS/DAT drive. HP DDS/DAT drives automatically recognize a valid FUP tape when inserted, and begin updating the firmware. When the firmware update process has completed, the tape is ejected, and the drive executes a self test.

***CAUTION**: Do not power cycle or reset the drive. Make sure that no software attempts to access the drive during the firmware update process. Otherwise the drive may be damaged and need to be returned to HP for replacement.*

***Note**: DDS/DAT FUP tapes cannot be converted back to data tapes. After a FUP tape is created, it can only be used as a FUP tape and cannot be written to again.*

Autoloaders

Updating DDS/DAT autoloaders via FUP tape is not currently supported.

Compaq/Sony AIT & DDS

Standalone DDS/DAT Drives

There is no hard-coded limit as to how many times a given Compaq/Sony AIT/DDS FUP tape can be used to update the firmware in a particular drive type. To update AIT/DDS drive firmware with a FUP tape, ensure that the tape is write protected, and then insert it into the AIT/DDS drive. The drive automatically recognizes a valid FUP tape when inserted, and begins updating the firmware. When the firmware update process has completed, the tape is ejected, and the drive executes a self test.

***CAUTION**: Do not power cycle or reset the drive. Make sure that no software attempts to access the drive during the firmware update process. Otherwise the drive may be damaged and need to be returned to HP for replacement.*

***Note**: AIT/DDS FUP tapes cannot be converted back to data tapes. After a FUP tape is created, it can only be used as a FUP tape and cannot be written to again.*

Autoloaders

The process for updating drive/autoloader firmware via FUP tape is the same as documented above for standalone AIT/DDS drives.

Converting a firmware update (FUP) tape to a data tape

In many cases, FUP tapes can be converted back to a regular data tape. The method of doing this varies depending on the drive type.

- DLT 4K/7K/8K, SDLT, and VS80/DLT1 tapes can be converted back to data tapes by making sure they are write-enabled, inserting them into a drive, and then writing to them.
- LTO drives require the LTO Firmware to Data Tape Creator test to convert a FUP tape back to a data tape.
- HP StorageWorks and Surestore DDS, AIT, and Compaq/Sony DDS drives cannot convert FUP tapes back to data tapes.

Available Test Functions

L&TT Utility Functions

L&TT Utility Functions

Utility functions execute SCSI utility scripts (files with *.scc* extension) stored in the "scripts" directory. These scripts send various SCSI commands to the selected device, but they generally do not return any results. Utility functions are generally device-specific and intended only to remedy specific problems that may occur with a particular device.

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

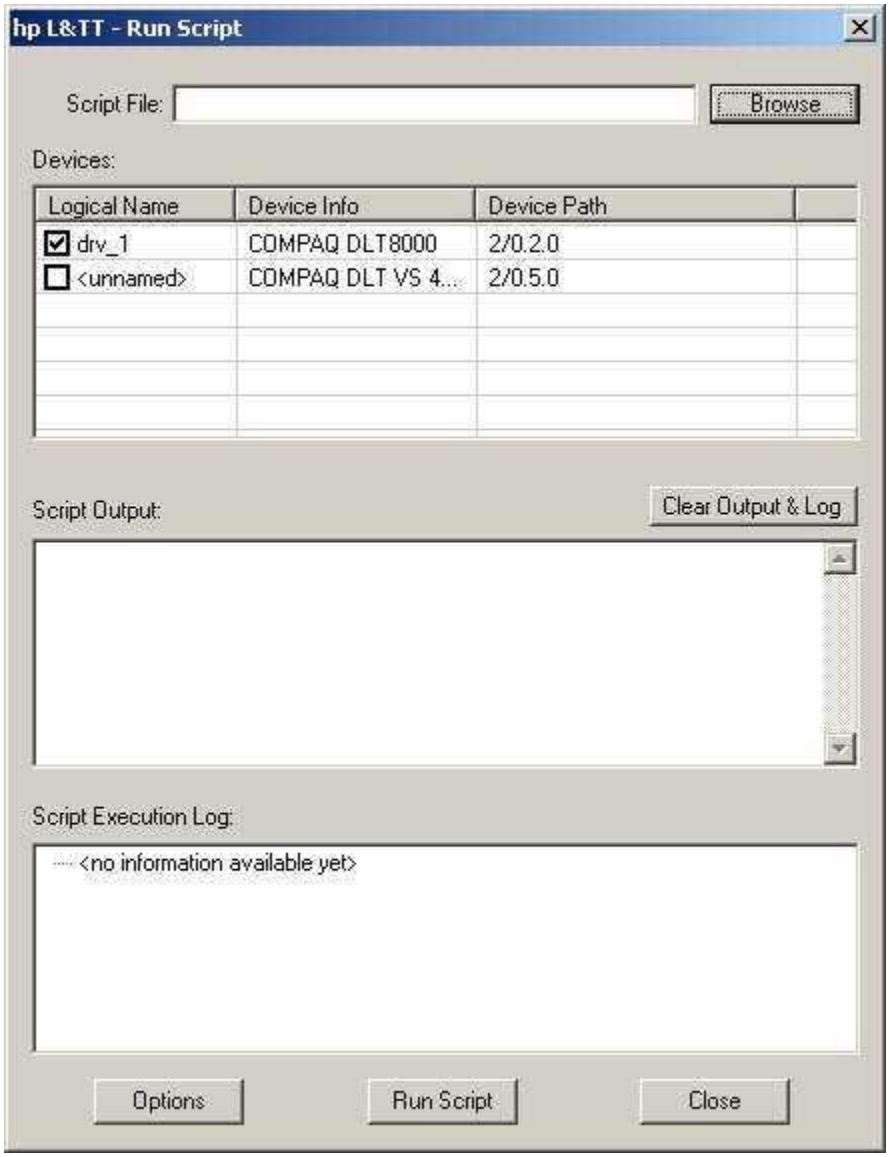
Using a script improperly or when it is not required can cause harm, possibly rendering a device inoperable. Do not attempt to use these utility functions unless you are very familiar with SCSI operation, or unless you have been advised to do so by an HP technical support representative or a Device Analysis script.

Note: The "ddswriterecal" script used to recalibrate HP DDS3 drives does not run on L&TT v3.5. Download and install L&TT v3.5 SR1 to correct the problem.

Windows

To use the utility function on Windows:

1. Select **Utilities > Run Script** from the main menu. The **Run Script** window opens.
2. In the "devices" section, click the check box next to the device on which you want to run the script. The device logical name is now assigned ***(show me)***.



3. Click **Browse** to select a script file to execute ***(show me)***. The utility scripts are located in the "scripts" directory and have an *.scc* extension.

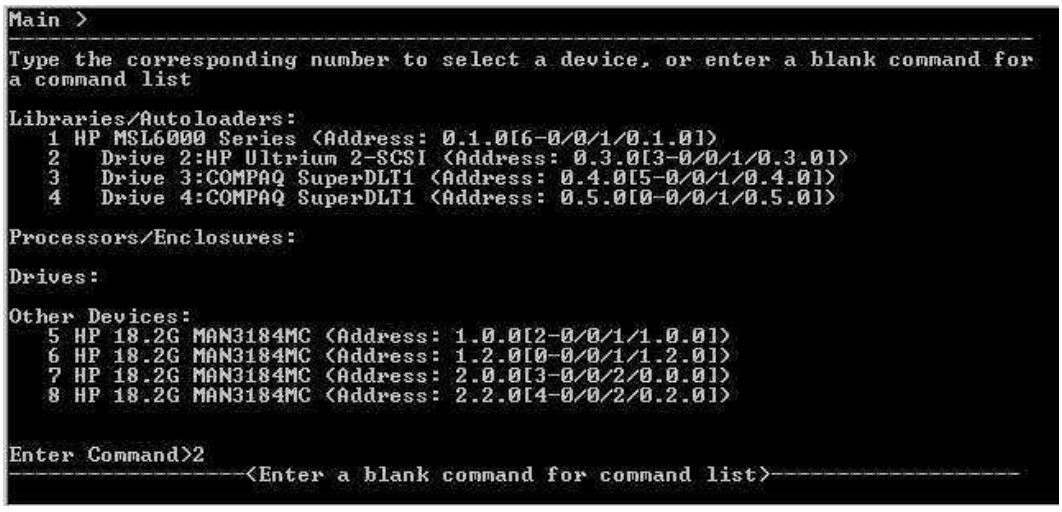
4. Select a **script**, and then click **Open** to return to the Run Script window.
5. Click **Run Script**.

When the script is complete, relevant information is displayed in the script output and script execution log text boxes.

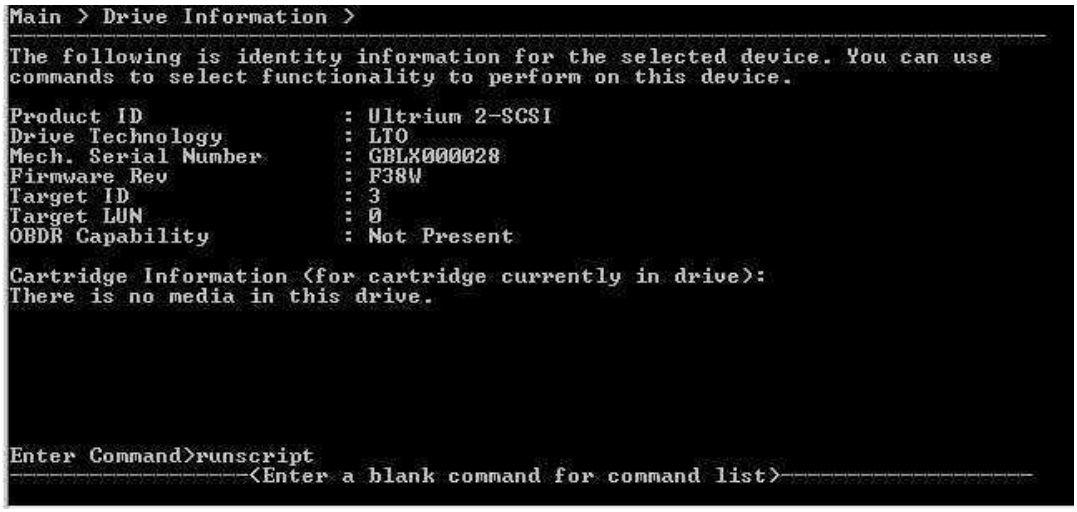
HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

To use the utility function on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

1. In the L&TT main screen, enter the number corresponding to the device you want to test ***(show me)***.

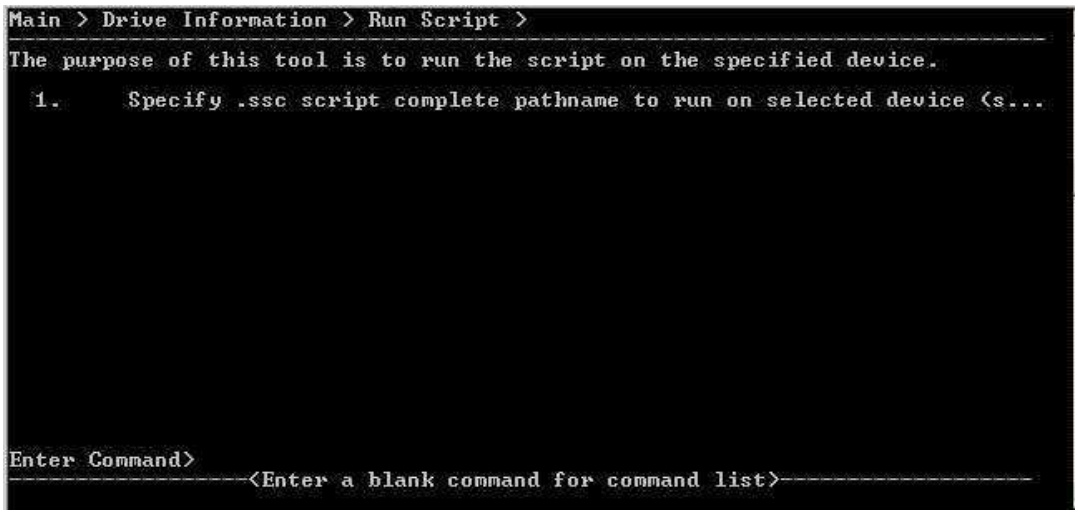


The ***Device Information screen*** is displayed for that device.

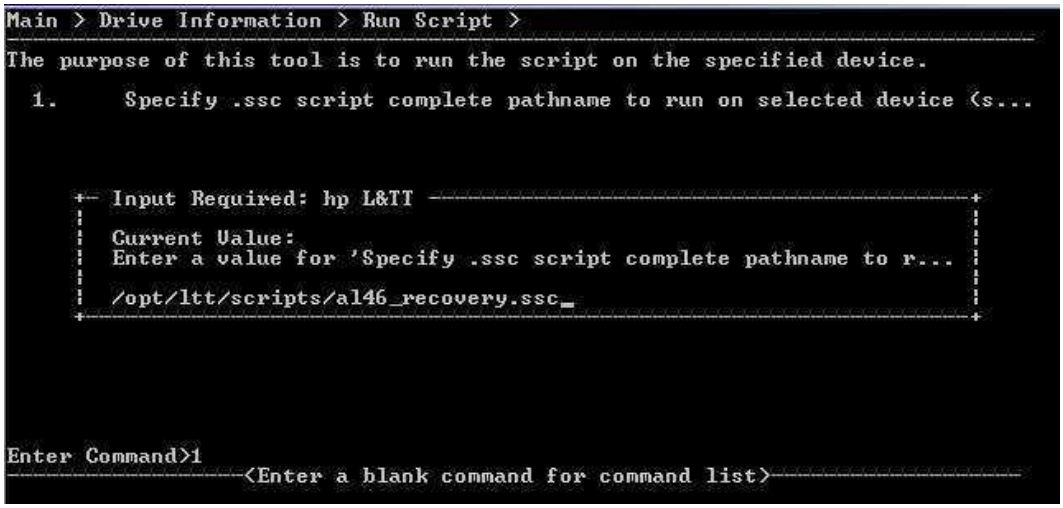


2. Enter the **runscript command**.

   The ***Run Script screen*** is displayed.



3. Enter **1** to specify the script path, and then enter the **path**, including the filename, of the script ***(show me)***. The utility scripts are located in the "scripts" directory and have an *.scc* extension.



4. Enter the **start command** to execute the selected script. The **Start** screen is displayed. When the script completes, you are requested to press any key to continue.
5. Enter additional information if required by the script (none required in this case).
6. Enter the **review command** to review the results of running the script.
7. Use the **Up** or **Exit** commands to exit the tool when the test is complete.

Diagnostic Tests

About diagnostic tests

Note: L&TT tests are constantly being updated to give improved test coverage and problem diagnosis. As new device issues are discovered, changes are made to the tests to properly diagnose those issues. Previous to L&TT v3.5 SR1, updates to some tests and test scripts were sometimes made available via the L&TT web site for download using the "get files from web" function. With the release of v3.5 SR1, test script updates are only available via a new release of L&TT or a hot fix distribution. In order to ensure you have the latest available test scripts, it is recommended that you keep your version of L&TT up to date, and download any hot fixes which are made available.

Available tests

Click any test below to view details about the test, including when to run the test, test duration, and so on. Not all tests are available for all products. For information on running the tests, click here for Windows and here for non-Windows.

- Autoloader Exerciser test
- Connectivity test
- Data Compression test
- Device Acceptance test
- Device Assessment test
- Device Analysis test
- Device self test
- DLT SRAM check (long)
- DLT SRAM check (short)
- ESL Vendor ID toggle
- Firmware Tape Creator
- Full Sweep test
- Initialize Element Status Test
- Library Exerciser test
- LTO Cooling check
- LTO Firmware to Data Tape Creator
- Media Analysis test
- Media Erase test
- Media Validation test
- Read SDLT Media IDs test
- Read/Write Stress test
- Read/Write test

- Restore Factory Settings test
- Tape Edge Damage (TED) test (SDLT)

Windows

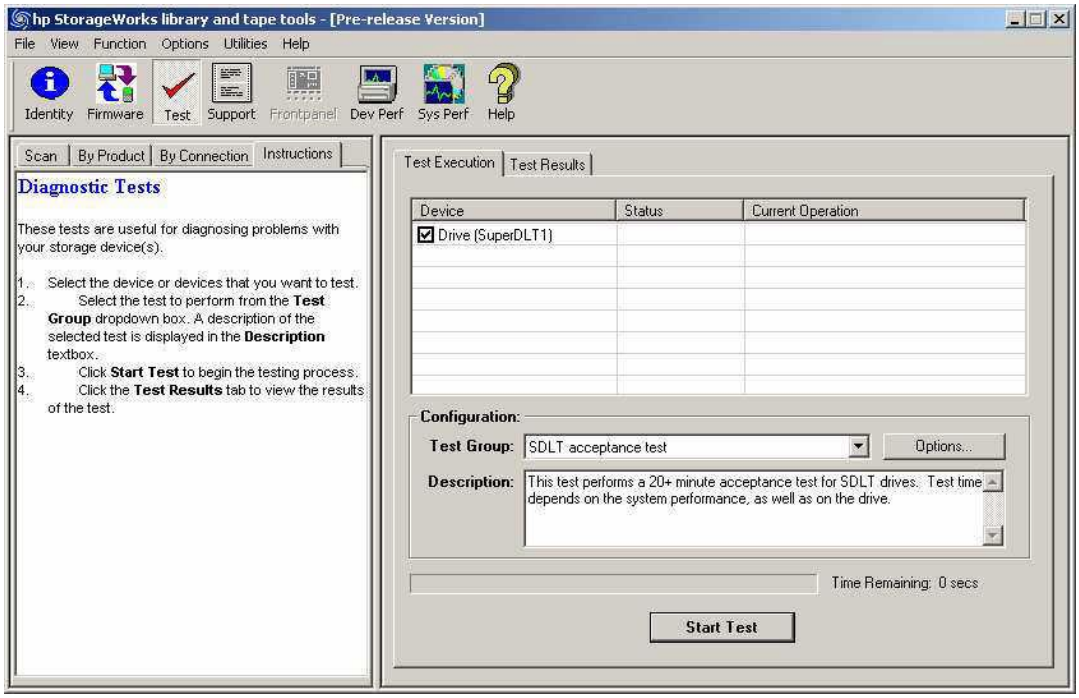
Running diagnostic tests on Windows

Downloading and updating scripts files is no longer supported by L&TT beginning with v3.5 SR1. When new scripts are available, they will be distributed in L&TT install bundles only as part of regular L&TT releases, service releases (such as v3.5 SR1), or hot fixes as necessary.

To run a diagnostic test on Windows:

1. After L&TT completes its device scan, select the device you want to test, and then click the **test** button.

   The ***Test window*** opens.



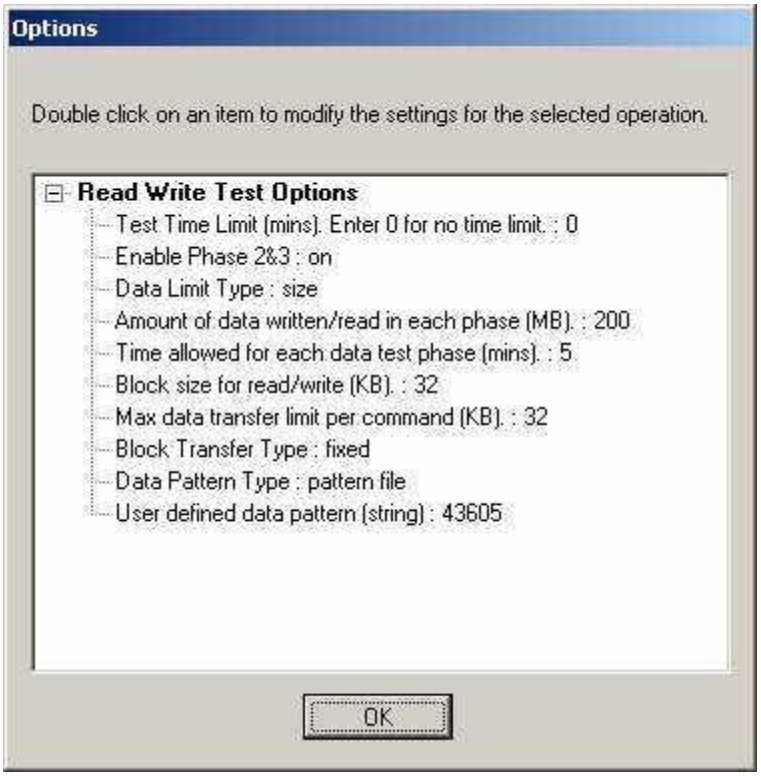
2. Click the check box of the device you want to test, and then click the Test Group drop-down arrow to display a list of the tests available for the selected device.

3. Select a **test** to run.

   The test description is displayed in the description area. For more information on a specific test, see About Diagnostic tests, and then click the test for which you want more information.

4. Some tests have certain option settings that can be viewed and/or revised:

   a. After you have selected a test, click the **Options** button to view optional settings for that test. If any test options are available for a given test, they are displayed in the **Options** dialog box when the **Options** button is clicked. Click ***here*** to see an example for the Read/Write test.



b. Double-click any setting you want to change. This puts the test into edit mode so you can enter a desired value.

c. Click **OK**, and then click **Start Test**.

Note: Only a few of the tests have configurable options.

HP-UX, Linux, NetWare, OpenVMS, and Tru64 UNIX

Running diagnostic tests on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

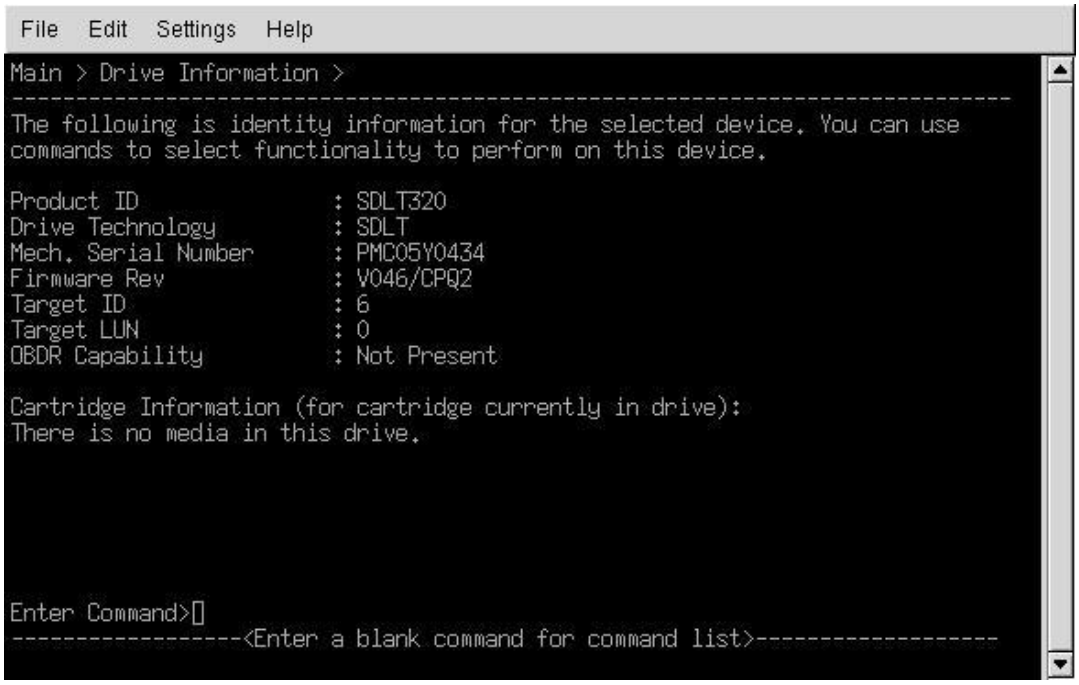
Notes:

- Downloading and updating scripts files is no longer supported by L&TT beginning with v3.5 SR1. When new scripts are available, they will be distributed in L&TT install bundles only as part of regular L&TT releases, service releases (such as v3.5 SR1), or hot fixes as necessary.
- The screen captures that appear in this section were taken on a Linux system, but apply to HP-UX, NetWare, OpenVMS, and Tru64 UNIX, unless otherwise specified. Note that the screen captures are examples only; the content of user windows varies.

To run a diagnostic test on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

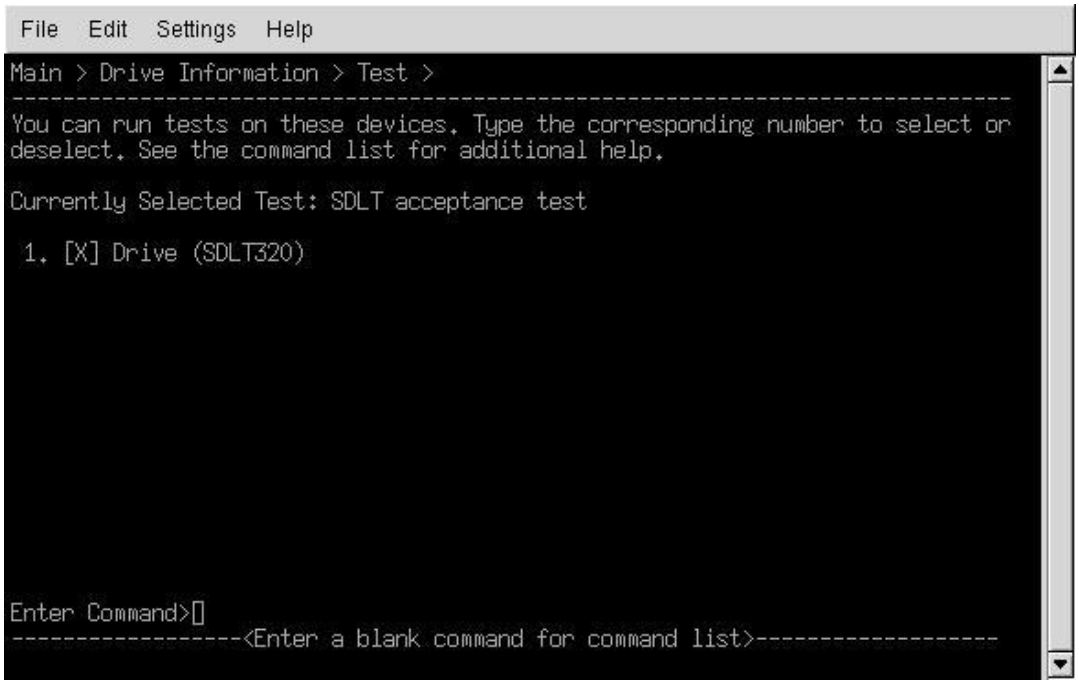
1. In the L&TT main screen, enter the number corresponding to the device that you want to test.

   The ***Device Information screen*** opens.

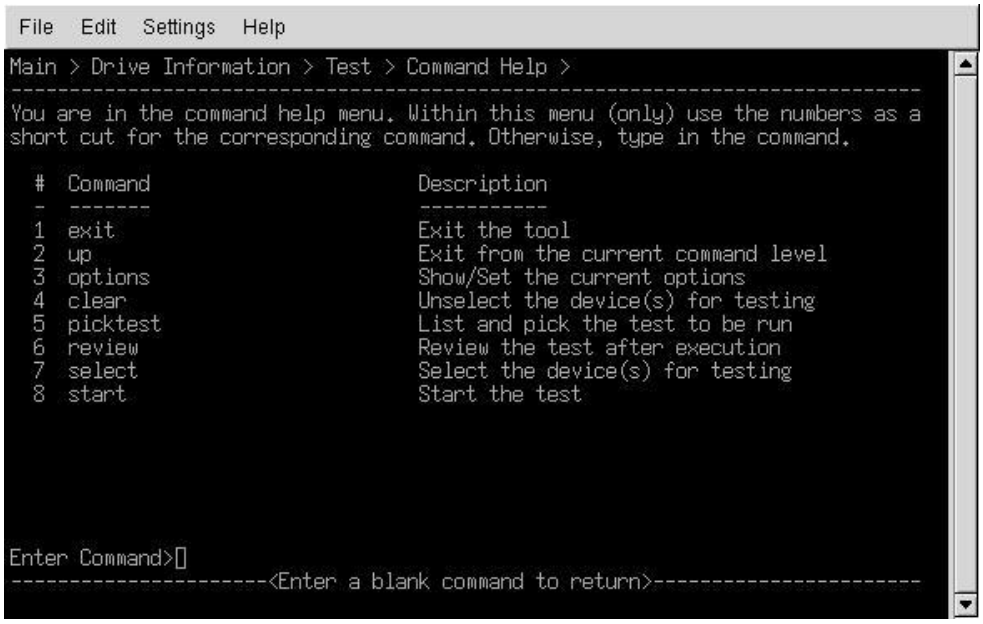


2. Enter **test** at the command prompt.

   The ***Test screen*** opens, displaying the currently selected test and the available devices to be tested. The currently selected device is indicated with an “X” in its checkbox.

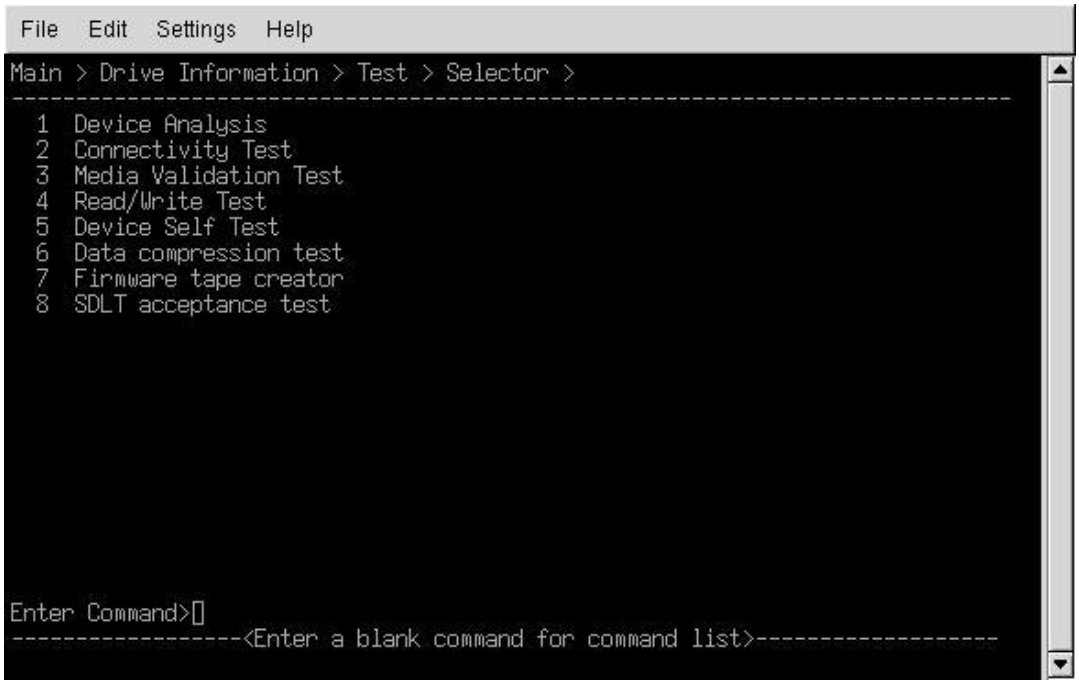


- To deselect one device and select another, enter the number of the device you want to deselect, and then enter the number of the device you want to select. You can deselect all devices by typing **clear**.
- To ***view a list of available test function commands***, enter a blank command (press Enter).



- If you want to select a different test, enter **picktest**.

The ***Selector screen*** opens, displaying the available tests for the selected device. Note that not all tests are available for any given device. Only tests available for the currently selected device are displayed. Type the number of the test you want to run. The Test screen reappears displaying the new test selection.

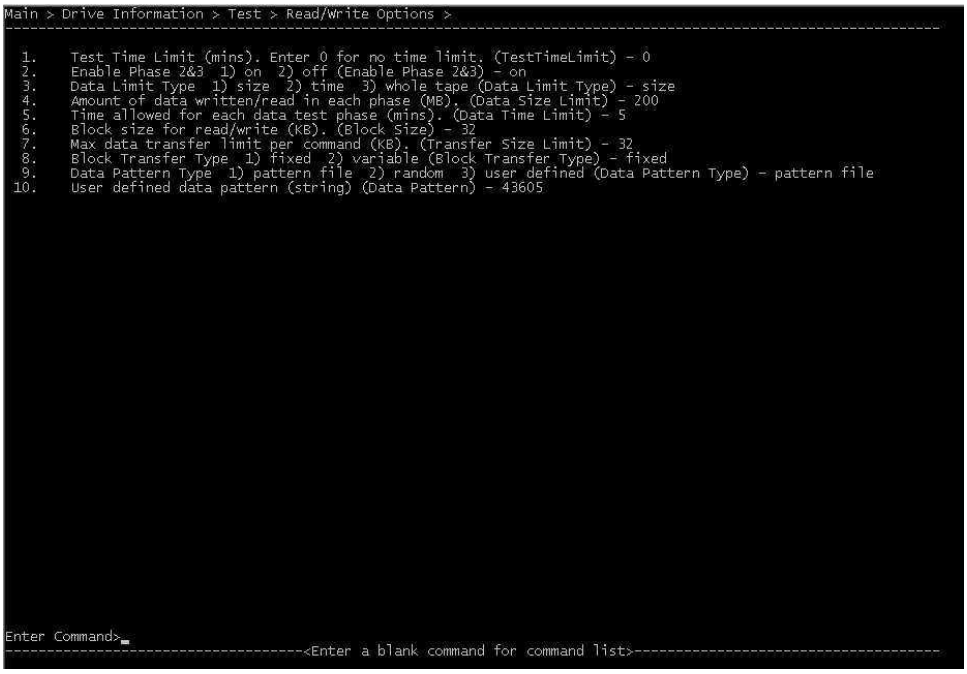


Note: For more information on the tests, see About Diagnostic tests.

3. To review or revise test options for any tests that support them:

    a. Review steps 1 and 2 above if you need info on how to navigate to the test screen.

    b. After you have selected a test and are in the test screen, enter the **testoptions** command. Click ***here*** for an example of test options for the Read/Write test. If you want to revise a particular option, enter the number of that option and provide the updated information. This same process is applicable for any test that has selectable options.



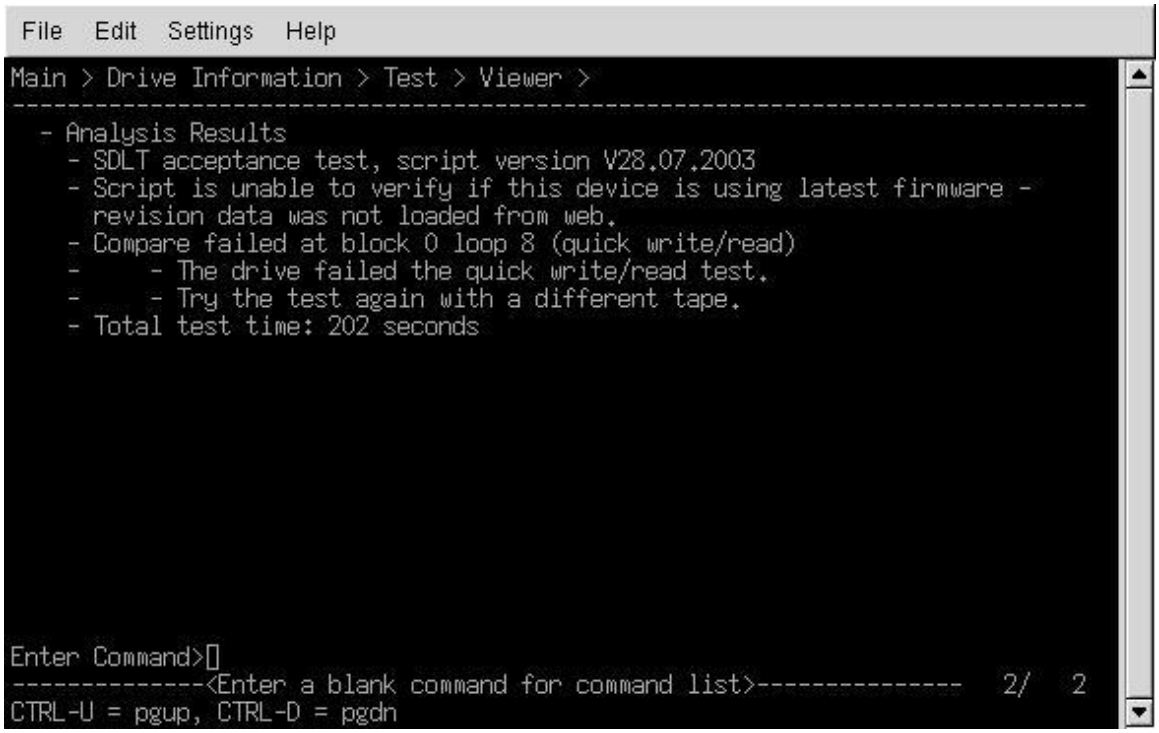
4. To start the test, enter **start**. When the test completes, a dialog box opens, displaying the preliminary results of the test. Press any key to return to the Test screen.

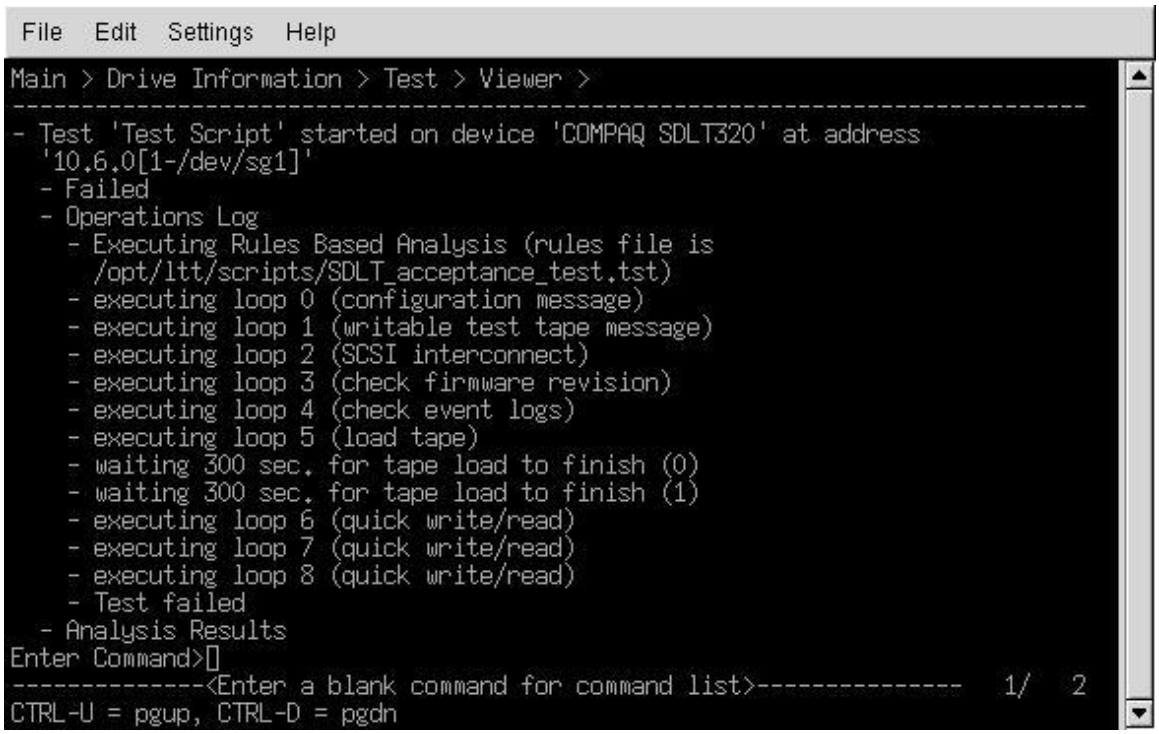
5. To view detailed test results, enter **review** at the command prompt. Use the `detail` command to determine the amount of detail to display. Available detail level arguments are:

   - 1 – highlights only
   - 2 – normal
   - 3 – more details
   - 4 – everything
   - 5 – factory only (requires password)

6. If necessary, use the ^U and ^D commands to scroll up and down through the test results.

The ***Viewer screen*** shows an example of the output from running the acceptance test on an SDLT drive (note that ***in this case***, the test failed).




File Edit Settings Help
Main > Drive Information > Test > Viewer >
- Test 'Test Script' started on device 'COMPAQ SDLT320' at address
'10,6,0[1-/dev/sg1]'
- Failed
- Operations Log
- Executing Rules Based Analysis (rules file is
/opt/ltt/scripts/SDLT_acceptance_test.tst)
- executing loop 0 (configuration message)
- executing loop 1 (writable test tape message)
- executing loop 2 (SCSI interconnect)
- executing loop 3 (check firmware revision)
- executing loop 4 (check event logs)
- executing loop 5 (load tape)
- waiting 300 sec. for tape load to finish (0)
- waiting 300 sec. for tape load to finish (1)
- executing loop 6 (quick write/read)
- executing loop 7 (quick write/read)
- executing loop 8 (quick write/read)
- Test failed
- Analysis Results
Enter Command>
<Enter a blank command for command list>
1/ 2
CTRL-U = pgup, CTRL-D = pgdn

Tests

Autoloader Exerciser test

Autoloader Exerciser test specifications

Item	Description
Description	Checks the mechanics of your DDS Autoloader.
When to run	When you want to verify that the mechanics of your DDS autoloader are working properly.
Average duration	~10 minutes
Other notes	Test will *not* overwrite any data on the media.
Available for	DDS Autoloaders.

Connectivity Test

Connectivity test specifications

Item	Description
Description	Writes data to the internal buffers in your product to verify that the physical connection between your host and the storage device is operational; No media is required.
When to run	When there is a question about the integrity of the bus connection from the device to the host computer.
Average duration	<1 minute
Other notes	Test will *not* overwrite any data on the media, should there be any present in the drive.
Available for	AIT, DDS, DLT, LTO, MO, STK 9840 drives and MSL libraries.

Data Compression test

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and will overwrite data on the media that is present in your product.

Data Compression test specifications

Item	Description
Description	Tests the hardware compression capability of your tape drive. You need a writable tape to complete this test. A file is created on tape that is designed to have a compression ratio of approximately 2:1– anything less than 2:1 could mean that your hardware compression is disabled. Compression ratios are reported to the user at the conclusion of the test. If the test finds that hardware compression has been disabled by the host or by a switch configuration, it reports this to the user.
When to run	When you want to verify that data compression is working properly.
Average duration	<10 minutes
Other notes	Test *will* overwrite all data on the media.
Available for	All tape products (drive and automation) supported by L&TT.

Device Acceptance test

Beginning with L&TT v3.5 SR1, the Device Acceptance Tests have been replaced with the Device Assessment Tests. If you are using any diagnostic tools or documentation that recommends running the Acceptance test, you should run the Assessment test instead.

Device Assessment test

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and will overwrite data on the media that is present in your product.

Device Assessment test specifications

Item	Description
Description	**Note**: In versions of L&TT prior to 3.5 SR1, this test was called the Device Acceptance test. Determines the overall pass/fail status of drive. If a drive fails, the drive should be replaced. If it passes, the problem is likely not drive hardware related. This test has a direct correlation to the repair center acceptance/validation tests. If it passes at the user site, it will pass at repair center, and can be captured as NTF and returned to spares stock for future shipment as a replacement drive. If this test passes, you should look elsewhere in the system for the problem solution. There are no supported options for this test, with the exception of the SDLT Assessment test, and the LTO Assessment test. If you want to test for tape edge damage on an SDLT 110/220 drive, enable the *Media Test* option (false by default). Tape edge damage has been shown to be caused by certain older SDLT 110/220 drives. Click ***here*** for information on the use of this test option. For the LTO test, four options are available. Click ***here*** for information on the LTO/Ultrium Assessment test options. ▪ ***Enable Device Analysis:*** *TRUE by default* ▪ ***Enable SCSI Controller Test:*** *TRUE by default* ▪ ***Enable Write/Read Test:*** *TRUE by default* ▪ ***Ignore Cleaning Requests:*** *FALSE by default* *If you enable this test, it will not run the standard Assessment test, but rather a specific test to analyze the tape by looking at data accumulated by the drive during writing. The objective of the test is to identify any tapes that may have edge damage. Beginning with L&TT v3.5, at the conclusion of the media test, L&TT may ask you to disable the Media Test option and rerun the Assessment test, dependent on the results of that test. This test option was formerly called Drive/media Interaction test.* For more information on viewing and setting options, see Running diagnostic tests on Windows or Running diagnostic Tests on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX. If the test is being run on an autoloader and it is configured in "circular" or "stacker" mode (dependent on the particular autoloader), when an `unload` command is received from the host (such as is issued with the assessment test), the autoloader moves the next available cartridge into the drive. If the magazine is not loaded with data cartridges and cleaning cartridges in the correct order to meet the needs of the test, the test will fail. HP recommends using the ***single cartridge process*** when running the assessment test on an autoloader. *To run the assessment test on an autoloader in single cartridge mode, start the test with a single data cartridge loaded in the magazine.* ***Caution****: The data cartridge is overwritten during the test.* *If the test requests a cleaning tape, eject the magazine and replace the data tape with*

a valid cleaning tape. When the test asks again for a data tape, eject the magazine again and replace the cleaning tape with a data tape. Some autoloaders (DDS for example) request a cleaning tape at some point during the test, while others may not. The single cartridge process works effectively with any autoloader type.

Click ***here*** for more details on the DLT, VS80 & SDLT Assessment test.

- *SCSI Interconnect test*
- *Review event log entries (which were present prior to running the test)*
- *Load the test tape*
- *Quick write/read test*
- *Soft unload/load test (DLT acceptance test only)*
- *Minimum block size test*
- *Diagnostic self test (built-in drive function)*
- *read/write tests using various data patterns*
- *bit error rate test*
- *Review new event log entries added during the test*
- *Unload the test tape*

Click ***here*** for more details on the Ultrium Assessment test.

- *Initial preparation*
- *Review event log entries (which were present prior to running the test)*
- *SCSI parity check (Ultrium 1 drives only)*
- *Cartridge load*
- *Quick read/write test*
- *Cartridge unload*
- *SCSI parity check*
- *Review new event log entries added during the test*

Note: There was a problem with a log sorting routine in the Device Analysis scripts and Acceptance test in the L&TT v3.5 initial release. The misleading results could make drives appear faulty when they are good, and vice-versa. HP recommends that you install L&TT v3.5 SR1 or later to avoid this problem.

Click ***here*** for more details on the DDS Assessment test.

- *Review event log entries (which were present prior to running the test)*
- *Check life data in serial EEPROM and the fault log*

- *Load check*
- *Perform a clean and write test*
- *Unload check*
- *MRS switch test*
- *Read check*
- *Review new event log entries added during the test*

Note: The DDS acceptance script was inadvertently excluded from the original L&TT v3.5 build. HP recommends that you install L&TT v3.5 SR1 or later to ensure that you have the DDS Drive Assessment test.

When to run	If the drive is suspected of failure, and you want to verify if the drive is good or bad. You should run the Media Test option if running an SDLT 220 drive and you suspect the drive may be damaging media, or if directed to do so by an HP tool or support person.
Average duration	20 minutes duration for healthy drive with good tape (on average). Marginal drive (or drive with marginal tape) may take substantially longer. Average duration for the SDLT Acceptance test Media Test option is 15 minutes, but can take longer with a bad tape.
Other notes	Requires "good" tape that *will* be overwritten as part of test.

Note: Running the Assessment test turns on compression in the drive, but does not restore the original drive configuration at the conclusion of the test. Therefore, if the customer configuration had compression disabled, after running the Assessment test, it will be enabled. If compression was enabled upon entering the Assessment test, it will still be enabled at the conclusion of the test. A future version of the Assessment test will note the drive configuration upon entering the test and will restore that configuration when exiting.

Available for	DLT 4000/7000/8000, VS80/DLT1, SDLT 220/320, Ultrium-1, Ultrium-2, DDS3, DDS4, and DAT72 (pre- and post-merger HP drives only).

Device Analysis test

Device Analysis test specifications

Item	Description
Description	Test varies by device, but always includes a check for latest firmware (this requires a network connection). It also examines all device log data and reports any significant problems. On some devices, information from running device analysis is stored back onto the device to improve the diagnostic information provided. This test also provides summary information, suggestions to the cause of certain errors, and any remedial actions the user should take.
When to run	When you want to verify that basic functions of the device are operating properly and have not logged any critical errors, and to verify that firmware is up-to-date.
Average duration	<1 minute
Other notes	Test does *not* change the configuration of the drive or media.
Available for	All devices supported by L&TT.

Device self test

Device self test specifications

Item	Description
Description	Performs the device internal power-on self-test to check the internal electronics of your product.
When to run	As a quick check of the integrity of the device.
Average duration	<1 minute
Other notes	Test will *not* overwrite any data on the media, should there be any present in the drive.
Available for	AIT, DDS, DLT, SDLT, VS80/DLT1, LTO autoloaders and drives. ESL, MSL, C7200, C7145, C5177, C1194F, C5151, C5173, C6280, SSL 1016 and STK libraries. STK 9840 drives, MO drives & libraries, and A6356A fibre channel management card.

DLT SRAM check (long)

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and will overwrite data on the media that is present in your product.

DLT SRAM check (long) specifications

Item	Description
Description	Performs a limited read/write test to determine if this drive exhibits symptoms of the FIFO (SRAM) CRC Errors.
When to run	When you suspect the drive may be responsible for CRC errors and want to run an extensive test to verify.
Average duration	Up to 1.5 hours
Other notes	You must have a write enabled tape in the drive and the drive must be ready before starting this test, or it will fail. Test *will* overwrite all data on the media.
Available for	DLT 8000.

DLT SRAM check (short)

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and will overwrite data on the media that is present in your product.

DLT SRAM check (short) specifications

Item	Description
Description	Performs a limited read/write test to determine if this drive exhibits symptoms of the FIFO (SRAM) CRC Errors.
When to run	When you suspect the drive may be responsible for CRC errors and want to do a quick test to verify.
Average duration	~20 minutes
Other notes	You must have a write enabled tape in the drive and the drive must be ready before starting this test, or it will fail. Test *will* overwrite all data on the media.
Available for	DLT 8000.

ESL Vendor ID toggle

ESL Vendor ID toggle specifications

Item	Description
Description	Toggles the Vendor ID in an ESL library between "HP" and "Compaq."
When to run	If you want to change the vendor ID, which is required for some applications to work properly.
Average duration	<1 minute
Other notes	Test requires firmware version 3.40 or later.
Available for	ESL Libraries.

Firmware Tape Creator (FUP tape)

Firmware Tape Creator specifications

Item	Description
Description	Lets you create a firmware update (FUP) tape on your drive. A FUP tape is a tape that is created when a firmware file for a particular drive type is written onto a blank tape. Click ***here*** for instructions on how to make a FUP tape for any drive for which this operation is supported (see "Available for" section). ***Steps to create a firmware update (FUP) tape using L&TT*** ***Note:*** *FUP tapes for AIT drives and Compaq/Sony DDS drives cannot be created using L&TT and are therefore generally not available. It is possible to make FUP tapes for these products, but only by special request as it requires a special utility only available to the product lab.* ***Note:*** *The sample screen shots in this section refer to the DLT VS80 drive. What you will see with other drive types will be somewhat different, but similar in content and process flow.* 1. *Navigate to the L&TT firmware folder (typically C:\Program Files\HP Library & Tape Tools\firmware) and locate the desired firmware file. Naming conventions for the firmware files will generally contain some form of the product name along with an indicator of the firmware revision. Some example filenames are:* ▪ *C1537A_L111.frm* ▪ *LTT_DLT8000_V088_CPQ-2.frm* ▪ *LTT_Ultrium_2-SCSI_F78V_OEM18.frm* ***Note:*** *On Windows, the .frm extension may or may not be visible on your system depending on folder settings. See step 4 for more information.* 2. *On Windows, if the desired firmware file is not available, use the L&TT get files from web for Windows feature to download the file from the web.* *If you are running HP-UX or Linux, use the L&TT get files from web for non-Windows feature. Download of firmware files is not supported using L&TT for NetWare, OpenVMS or Tru64 UNIX. For those operating systems, use the Download files from external web process.* 3. *Make a copy of the selected firmware file and paste it into the same folder.* 4. *Rename the copy of the firmware file per the following:* ▪ *If filename extensions are currently visible in the firmware folder (you will see the .frm extension on the files), rename the firmware file to firmware.frm.* ▪ *If filename extensions are not currently visible in the*

firmware folder, rename the firmware file to firmware.

Note: *On Windows, the .frm extension is automatically included in the filename, but may be hidden from view depending on user preference settings. If filename extensions are not visible and you rename to firmware.frm, the .frm extension will still be automatically added so the filename you see is firmware.frm, but because the extension is hidden, the actual filename is firmware.frm.frm which will not work.*

Note: *On Windows, you can verify that you have the correct firmware filename by configuring Windows to show all file extensions. Click* ***here*** *for instructions on how to do this.*

To configure Windows to display all file extensions:

1. *In the firmware folder (or any other Windows folder), select* ***Tools > Folder Options****.*
2. *Click the* ***View*** *tab.*
3. *Uncheck the* ***Hide extensions for known file types*** *option.*
4. *Click* ***OK****.*

5. *Start the L&TT application.*
6. *Select the drive you will use to make the FUP tape(s):*
   - *For Windows, select the drive you will use to make the FUP tape(s) in the L&TT device list.*
   - *For HP-UX and Linux, enter the number corresponding to the device you want to test in the L&TT main screen. The* ***Device Information*** *screen is displayed.*
7. *Access the L&TT* ***Test*** *screen:*
   - *For Windows, click* ***Test****.*
   - *For HP-UX and Linux, enter* `test` *at the command prompt.*
8. *Select the* ***Firmware Tape Creator*** *test:.*
   - *For Windows, click the checkbox next to the drive shown in the* ***Test Execution*** *tab. This activates the* ***Test Group*** *dropdown menu. Select the* ***Firmware Tape Creator*** *test in the dropdown list.*
   - *For HP-UX and Linux, enter the* `picktest` *command. On the resulting screen, enter the number corresponding to the Firmware Tape Creator test.*

9. *Start the test:*

   - *For Windows, click **Start Test**. A dialog box reminds you to copy the desired firmware file to firmware.frm in the L&TT firmware directory if you haven't already done so. Click **Yes** to close this dialog box. Another dialog might be displayed containing information about the compatibility of the FUP tape you are about to create. If so, click **Yes** to continue.*

     ***Note:** You can verify that you have the correct firmware filename by configuring Windows to show all file extensions. Click **here** for instructions on how to do this. See the notes in step 4 for more information.*

     To configure Windows to display all file extensions:

     1. *In the firmware folder (or any other Windows folder), select **Tools > Folder Options**.*
     2. *Click the **View** tab.*
     3. *Uncheck the **Hide extensions for known file types** option.*
     4. *Click **OK**.*

   - *For HP-UX and Linux, copy and rename the desired firmware file if you haven't already done so, then enter the `start` command to begin the test.*

1. *Click the drive type you are using for instructions on finishing the FUP tape creation process.*

   - ***SDLT, VS80/DLT1***

     SDLT, VS80/DLT1

     1. *Insert a write-enabled blank cartridge.*

        - *Standalone drives – Insert the tape and click **Yes** in the dialog box for Windows, or press **Enter** for HP-UX and Linux..*
        - *HP and STK libraries – Use the library front panel to load the tape into the selected drive, and then click **OK** in the dialog box for Windows, or press **Enter** for HP-UX and Linux.*

     2. *Wait for the FUP tape creation process to complete. You will be notified when the FUP tape process is complete. When complete, the tape is ejected on standalone drives. The libraries require a front panel unload.*

- ***LTO***

  LTO

  1. *Insert a write-enabled blank cartridge.*

     - *Standalone drives – Insert the tape and click **Yes** in the dialog box.*
     - *STK library drives – Open the library door, place the drive in standalone mode, and then insert the tape and click **OK** in the dialog box for Windows, or press **Enter** for HP-UX and Linux.*
     - *HP library drives – Use the library front panel to load the tape into the selected drive, and then click **OK** in the dialog box for Windows, or press **Enter** for HP-UX and Linux.*

  2. *Wait for the FUP tape creation process to complete. You will be informed when the process is complete. The tape will be ejected from standalone drives and drives in STK libraries. HP library drives will require a front panel unload.*

  ***Note**: The orange "Tape error" and "Clean" LEDs might be flashing at the end of this process. These can be safely ignored.*

- ***HP DDS/DAT***

  HP DDS/DAT

  ***Note**: DDS/DAT FUP tape creation is supported on HP DDS4 and DAT72 drives only (C5683A & C7438A respectively). If using a DDS4 drive to create the tape, it must have at least rev C305 firmware installed. FUP tape creation is not currently supported in DDS/DAT autoloaders. When making a FUP tape using L&TT, the tape will be made with an upgrade count of 1000, allowing for up to 1000 uses.*

  1. *Insert a write-enabled blank cartridge.*

     - *Standalone drives – Insert the tape and click **Yes** in the dialog box for Windows, or press **Enter** for HP-UX and Linux.*
     - *STK library drives – Open the library door, place the drive in standalone mode, and then insert the tape and click **OK** in the dialog box for Windows, or press **Enter** for HP-UX and Linux.*
     - *HP library drives – Use the library front panel to load the tape into the*

*selected drive, and then click **OK** in the dialog box for Windows, or press **Enter** for HP-UX and Linux.*

2. *Wait for the FUP tape creation process to complete. You will be notified when the process is complete. The tape will be ejected from standalone drives and drives in STK libraries. HP library drives will require a front panel unload.*

- ***DLT 4K/7K/8K***

  DLT 4K/7K/8K

  1. *Insert a write-enabled blank cartridge.*

     - *Standalone drives – Insert the tape and click **Yes** in the dialog box for Windows, or press **Enter** for HP-UX and Linux.*
     - *HP and STK libraries – Use the library front panel to load the tape into the selected drive, and then click **OK** in the dialog box for Windows, or press **Enter** for HP-UX and Linux.*

  2. *Wait for the FUP tape creation process to complete. You will be notified when the process is complete. When the "operate handle" LED lights, you can safely remove the cartridge from standalone drives. The libraries will require a front panel unload.*

When to run	When you need to create a firmware update (FUP) tape in order to update drive firmware.
Average duration	<2 minutes
Other notes	This utility expects to find a firmware image file (*firmware.frm*) in your firmware directory. You must create this file yourself by copying the file of the new firmware to *firmware.frm*.
Available for	DAT72 (C7438A), DDS4 (C5683A), DLT1, DLT 4000/7000/8000, LTO, SDLT, VS80.

Full Sweep test

Full Sweep test specifications

Item	Description
Description	Performs a full sweep run-in test (either 100 or 1000 full sweeps).
When to run	If the results of running device analysis recommend that you run this test. This recommendation is based on reviewing library log data for certain critical errors, including those related to issues with the brush tracks.
Average duration	Up to 2.5 hours, depending on whether the long or short test is selected.
Other notes	Test will *not* overwrite any data on the media. Data from this test is logged into the library for future use by support personnel.
Available for	C7145 and C7200 libraries.

Initialize Element Status test

Initialize Element Status test specifications

Item	Description
Description	Instructs the library to perform an inventory of all its elements.
When to run	To initialize the library in the event of cartridges being manually removed.
Average duration	Depending on the library, this test may take over 30 minutes.
Other notes	Test will *not* overwrite any data on the media.
Available for	All libraries supported by L&TT.

Library Exerciser test

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and can overwrite data on the media that is present in your product.

Library Exerciser test specifications

Item	Description
Description	General purpose test of the library. It includes tests for moving cartridges within the library, loading cartridges into each one of the drives, and performing a short test of the drive while the cartridge is loaded. Test options include test time limits, slot and drive ranges, drive type selection, barcode checking, cartridge memory checking (in the case of LTO drives within the library), options for drive, and cartridge loading, and test coverage. For more information on viewing and setting options, see Running Diagnostic Tests on Windows or Running Diagnostic Tests on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX. Click ***here*** for available test options. ▪ ***Test Time Limit*** *– Specify the time limit in minutes. Enter "0" for no time limit (default setting).* ▪ ***Move Command Timeout*** *– Specify the maximum time allotted, in seconds, for each move command before failure. The default is 600 seconds.* ▪ ***Active Slot Range*** *– Specify a range of slots to be tested. Enter a range of slot numbers separated with a dash (for example: 2-5), or enter "all" to specify all slots. The default is "all."* ▪ ***Drive Type Option*** *– Specify the type of drives to be tested (in libraries that have mixed drive types). Enter the type of drive (for example: LTO or DLT), or enter "all" to test all drive types. The default is "all."* ▪ ***Check Inventory Mode*** *– Specify whether to perform an active inventory check at beginning of the test. The active inventory check can take a long time to perform. The default is "on."* ▪ ***Barcode Mode*** *– Specify how barcodes are handled. Choose one of the following options* o *Show all – Shows all barcodes.* o *Show suspect– Shows only suspect barcodes (default).* o *Off – Does not show barcodes.* o ***Slot-to-slot moves*** *– Select one of the following options for the slot-to-slot test*

- *All – Moves all cartridges.*
- *Random – Moves randomly selected cartridges (default).*
- *Off – No cartridges are moved.*

- ***Random coverage*** *– When slot-to-slot moves is set to "random," specify the percentage of units covered during random test. The default is 20%.*
- ***Drive load test*** *– Specify whether or not to perform the drive load test. The default setting is "on."*
- ***Drive test option*** *– If the drive load test is enabled, specify one of the following options*
  - *Off*
  - *Data loop back (default)*
  - *Read-only*
  - *Read/write*
- ***Cartridge load test*** *– Specify one of the following options for the cartridge load test*
  - *Off (default)*
  - *Single drive*
  - *Multiple drives*
  - *All drives*
- ***CM integrity test*** *– Specify whether to enable the CM integrity check option for LTO drives. The default setting is "on."*

When to run	Whenever you want to verify the library is functioning properly.
Average duration	Highly dependent on the library being tested.
Other notes	Test *can* overwrite data on the media, depending on which test options are selected.
Available for	All libraries supported by L&TT.

LTO Cooling check

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and will overwrite data on the media that is present in your product.

LTO Cooling check specifications

Item	Description
Description	Monitors the internal temperature of your Ultrium drive and measures any temperature change after writing data. If the cooling is found to be inadequate, the test outputs recommendations.
When to run	When you want to verify the cooling requirements are being met for your Ultrium drive, particularly when installed in a server.
Average duration	30 minutes
Other notes	Test *will* overwrite all data on the media. Data from this test is logged onto the drive in order to enable better user recommendations when the test is run again in the future.
Available for	LTO drives only.

LTO Firmware To Data Tape Creator

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and will overwrite data on the media that is present in your product.

LTO Firmware To Data Tape Creator specifications

Item	Description
Description	Lets you to convert a previously created firmware upgrade tape back to a normal data tape on your Ultrium drive.
When to run	When you want to convert an Ultrium FUP tape back to a data tape.
Average duration	<2 minutes
Other notes	Test *will* overwrite all data on the media.
Available for	LTO drives only.

Media Analysis test

Media Analysis test specifications

Item	Description
Description	Reads all valid data on the cartridge, verifies the readability and quality of the cartridge, and displays statistics about the data present on the cartridge. Also runs a self test and cleaning check, and prompts for cleaning cartridge if it deems necessary.
When to run	When you want to verify the integrity of the data on a particular piece of media, as read by a particular drive.
Average duration	< 5 minutes, using default test options.
Other notes	Test is non-destructive and will *not* overwrite any data on the media. Supports several test options to limit the data (size, time, and so on) or verify the entire tape (whole tape option).
Available for	LTO, DDS, AIT, DLT, SDLT, VS80/DLT1, and STK 9840 drives.

Media Erase test

Media Erase test specifications

Item	Description
Description	Converts an LTO or DDS data tape to a blank tape. There are ***three options*** for this test: ▪ ***Quick erase:*** *Removes the tape directory and writes EOD at the start of the tape but doesn't overwrite data on the remainder of the tape* ▪ ***Full erase:*** *Erases the tape directory and also overwrites all data on the tape* ▪ ***Secure erase:*** *Performs a full erase followed by a rewind. Repeats this cycle a total of 5 times.* For more information on viewing and setting options, see Running Diagnostic Tests on Windows or Running Diagnostic Tests on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX.
When to run	When you want to erase a tape that has been previously written.
Average duration	Quick erase takes about one minute. Full erase takes from 2 to 4 hours. Secure erase takes between 10 to 25 hours.
Other notes	Any data on tape will no longer be accessible after this test. See above description for more details.
Available for	DDS, Ultrium 1 and 2.

Media Validation test

Media Validation test specifications

Item	Description
Description	Reads data on the tape cartridge or MO media in your storage device. No writes are performed so data contents of media are not changed in any way. Supports several test options for MO media (data limit options, starting block, block size, failure threshold, and so on), but none for tape. Also runs a self test and cleaning check, and prompts for cleaning cartridge if it deems necessary (tape only).
When to run	When you suspect a problem with your MO or other media.
Average duration	<5 minutes (using default test options)
Other notes	Test requires that a minimum amount of data is already written on the media, otherwise the test will fail. The amount of data varies depending on drive technologies and options (in the case of MO media).
Available for	AIT, DDS, DLT, SDLT, VS80/DLT1, LTO, and STK 9840 tape drives, and MO optical drives.

Read SDLT Media IDs test

Test specifications

Item	Description
Description	Non-destructive test that loads each tape in the library into a drive and reads the media ID. At the conclusion of the test, click the **Test Results** tab to see the media ID, slot number, and barcode of each piece of media in the library. Normal usage for the Read SDLT Media IDs test is in conjunction with the SDLT Tape Edge Damage Test to identify the location of tapes in a library with tape edge damage (see also "Other notes" below). **Note**: The drives must be unloaded and the picker empty at the start of this test, or the test will fail with the message: "This test requires that all drives and the picker start out empty."
When to run	After the SDLT Tape Edge Damage Test has identified that one or more tapes in the library need to be replaced.
Average duration	45 to 50 seconds per tape (typical)
Other notes	This test assumes that the SDLT tapes have the proper barcode labels with "S" as the 7th character, that the SDLT drives have the latest firmware, and that the library is configured to show all barcode labels. Otherwise, the tapes may not be recognized with this test. Additionally, the library must be configured to automatically unload the tape when it is being moved from a drive. For MSL libraries, the **Unload Mode** option (under the Library Options screen) must be set to `implicit`. For ESL9000 libraries, the **Auto Drive Unload** option (under operator/configure options) must be enabled.
Available for	ESL9000 and MSL libraries with SDLT 220 or SDLT 320 drives

Read/Write stress test (LTO)

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and will overwrite data on the media that is present in your product.

Read/Write Stress test specifications

Item	Description
Description	Performs a self-test on the LTO drive, then an extensive write-read media test, and a load/unload test and cleaning tape check. Test options allow the user to select some options for amount of data written and read, whether a load/unload test is performed, and whether a cleaning tape check is performed. Click ***here*** for available test options. For more information on viewing and setting options, see Running diagnostic tests on Windows or Running diagnostic tests on HP-UX, Linux, NetWare, OpenVMS or Tru64 UNIX. • ***Enable 32GB Test*** *(default is* ***on****)— when used together with the "Enable 4GB Test" option, tests 36GB. This option can be disabled if a shorter duration test is desired.* • ***Enable Load/Unload Test*** *(default is:* ***off****)—used to test the load/unload function in standalone drives. This option must be "off" for automation products, or if you want to run unattended as the unload and load takes place towards the middle of the test .* • ***Enable 4GB Test*** *(default is* ***on****)—when used together with the "Enable 32GB Test" option, tests 36GB.* • ***Ignore Cleaning Requests*** *(default is* ***off****)—if this option is "on," the test initially requests a cleaning, and it also requests one during the testing if it determines one is needed. When this option is "off," the drive never requests a cleaning during the entire test.*
When to run	This is a very extensive test and would not normally be run except as directed by HP support engineers.
Average duration	>4 hours
Other notes	Test *will* overwrite all data on the media.
Available for	LTO drives only.

Read/Write test

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This test is destructive and will overwrite data on the media that is present in your product.

Read/Write test specifications

Item	Description
Description	Performs a self-test on the drive device, then a write-read media test to verify the ability to read and write data to and from the removable media in your storage device. This test also checks error rates and fails if allowable limits are exceeded. Test options allow the user to select the amount of data or length of test time, the amount of data transferred per command, and the data pattern. Click ***here*** for available test options. For more information on viewing and setting options, see Running diagnostic tests on Windows or Running diagnostic Tests on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX. ▪ ***Test time limit:*** *Specifies the time limit in minutes. Enter "0" for no time limit.* ▪ ***Enable phase 2 and 3:*** *Enables more extensive read/write sequence. Note that this will impact the length of time it takes to complete the test.* ▪ ***Data limit type:*** *Specifies one of the following options to limit the amount of data written/read in each phase:* o ***Time:*** *Limits the amount of data tested based on the time specified in "data time limit."* o ***Size:*** *Limits the amount of data tested based on the size specified in "data size limit."* o ***Whole tape:*** *Limits the amount of data tested based on the size of the tape.* ▪ ***Amount of data written/read in each phase (MB):*** *Specifies the size limit in megabytes of data to be written/read in each phase.* ▪ ***Time allowed for each data test phase (mins):*** *Specifies the time limit, in minutes, for each phase of the test.* ▪ ***Block size for read/write (KB):*** *Specifies the block size, in kilobytes, to be used in the test.* ▪ ***Max data transfer limit per command (KB):*** *Specifies the maximum data transfer limit, in kilobytes, per command.* ▪ ***Block transfer type:*** *Specifies whether to use a fixed or variable block length.* ▪ ***Data pattern type:*** *Indicates the type of data pattern used*

in the test. Specify one of the following data pattern types:

- ***Pattern file:*** *Uses a preset pattern.*
- ***Random:*** *Generates random patterns.*
- ***User defined:*** *Uses a user-defined string.*

- ***User-defined data pattern (string):*** *Specifies a string value to use as a data pattern if the "data pattern type" is set to "user defined."*

When to run	To verify the integrity of a particular piece of media, as written and read by a particular drive, and to verify the ability of the drive to read and write data independent of the storage application.
Average duration	<10 minutes, using default test options
Other notes	Test will overwrite all data on the media.
Available for	All devices supported by L&TT.

Restore Factory Default Settings test

Restore Factory Default Settings test specifications

Item	Description
Description	Checks current configuration parameters of an MO drive and identifies any that differ from factory defaults. If any differences are detected, the test can reset to factory defaults.
When to run	Device analysis results will recommend running this test if abnormal (not default) settings are detected. Abnormal settings do not necessarily mean there is a need to set them to default values. For example, the user may want certain drive settings to be different from the default values, so in that case it is better to not run this test. However, you may also want to try restoring defaults when you suspect configuration parameters that could be adversely impacting operation may have been changed.
Average duration	<1 minute
Other notes	None.
Available for	4X, 8X, and 14X MO drives.

Tape Edge Damage (TED) test (SDLT)

TED test specifications

Item	Description
Description	Non-destructive test to determine if any SDLT cartridges with tape edge damage are present in an ESL9000 or MSL library. If the test passes, there are no tapes in the library with TED symptoms. If it fails, evidence of tapes with TED has been found, and a message is displayed indicating that the user should run the Read SDLT Media IDs test to locate the specific tapes with TED in the library. The message also instructs the user to contact HP support to identify if any of the drives have the potential to cause tape edge damage, and to have them replaced if any are identified. If the TED test fails, do the following: 1. Click the **Test Results** tab to view the analysis results. 2. Record the IDs of any tapes identified for replacement. Note that one or more IDs may be listed more than once because the same tape may be identified as needing replacement in more than one drive in the library. 3. Run the Read SDLT Media IDs test. This test provides a list of each tape in the library along with its location and barcode information. Match the IDs you recorded previously to the list to identify which tapes to replace.
When to run	Whenever you suspect symptoms of tape edge damage, or as directed by HP support personnel
Average duration	< 1 minute (see Read SDLT Media IDs test for duration of that test)
Other notes	This test assumes that the SDLT tapes have the proper barcode labels with “S” as the 7th character, that the SDLT drives have the latest firmware, and that the library is configured to show all barcode labels. Otherwise, the tapes may not be recognized with this test. If this test is run on a library with no SDLT 220 or SDLT 320 drives, it will not fail, nor will it check anything. It will return “There were no errors identified” in this case. Although primarily intended for libraries, this test is also supported on SDLT 220 and 320 standalone drives. For standalone drive testing, run Device Analysis on the drive to get the media ID of the currently loaded tape.
Available for	ESL 9000 and MSL libraries with SDLT 220 or SDLT 320 drives, and SDLT 220 and SDLT 320 standalone drives

Performance Tests

About performance tests

There are two types of performance tests integrated within L&TT (beginning with L&TT v3.3):

- **Drive performance test:** This test is designed to help identify performance issues with a drive. The test is available on HP-UX, Linux, NetWare, OpenVMS, Tru64 UNIX, and Windows.
- **System performance test:** This test is designed to identify performance issues within the system. The test is available on HP-UX, Linux, NetWare, OpenVMS, Tru64 UNIX, and Windows.

Performance-related information/recommendations

The following link may be helpful when troubleshooting performance-related issues, or otherwise enhancing performance:

- www.hp.com/support/pat: contains information on performance troubleshooting, troubleshooting tools, device transfer rates, and so on.

Windows

Running drive performance tests on Windows

The drive performance test is designed to help identify performance issues with a drive. This test writes and reads data to/from the specified tape drive, and calculates performance data for that drive.

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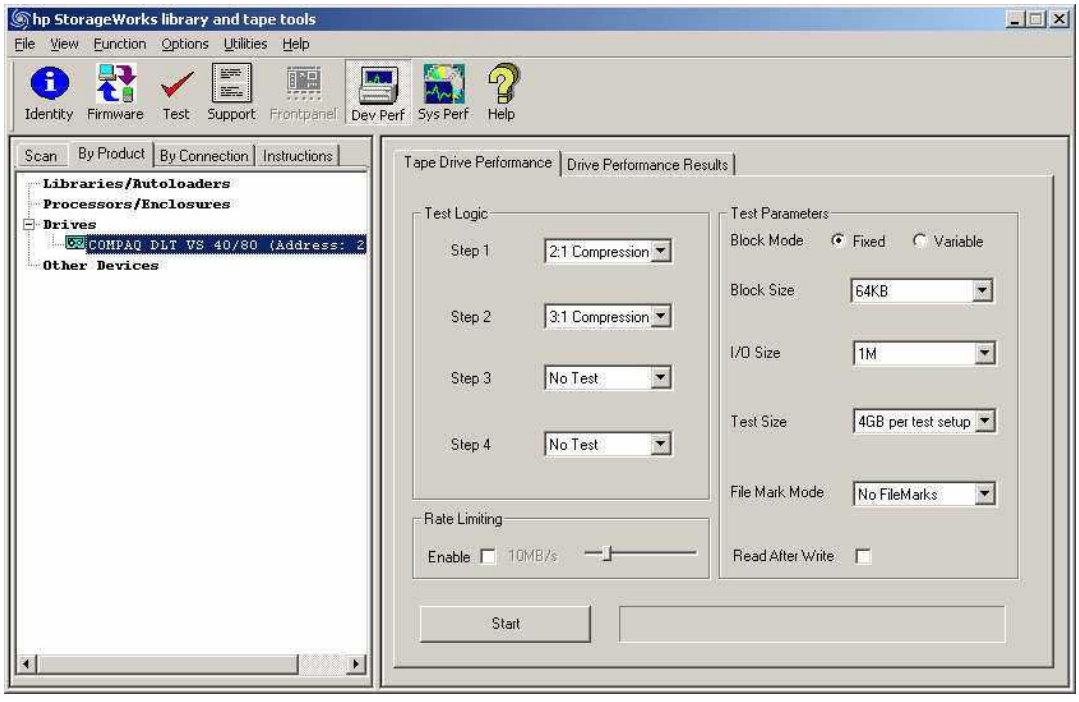
This test is destructive and will overwrite data on the tape. To avoid loss of data, use a blank tape when performing this test.

Note: The drive performance test is unavailable in ASPI I/O mode. You must use NT Miniport I/O mode to perform this test.

To run a drive performance test on Windows:

1. After L&TT has completed the initial scan, click either the **By Product** or **By Connection** tab.
2. Click the drive to test.
3. On the main toolbar, click the **Dev Perf** button.

The ***Drive Performance window*** opens, displaying the **Tape Drive Performance** tab by default.



Note: This test actually consists of four subtests (Step1-4) as shown in the Test Logic section of the window. You must chose to perform Step 1, but can choose to skip Steps 2 through 4 by selecting **No Test** in the corresponding drop-down boxes.

4. In the **Step 1** drop-down list, select a data type. You can select from the following data types:

   - Zeros
   - 1.6:1 Compression
   - 2:1 Compression
   - 3:1 Compression
   - 4:1 Compression

Note: If you choose to perform the other subtests (Steps 2-4), select one of the above data types in each of the corresponding drop-down list. Otherwise, select **No Test**.

5. Specify the following parameters:

   - Block Mode
     - Fixed: Test uses fixed block size, which you specify in the Block Size drop-down box.
     - Variable: Test uses different data transfer mode; Block Size drop-down box is disabled.
   - **Block Size:** Available only if Block Mode is Fixed. Supported sizes are 16 K to 256 K
   - **I/O Size:** Maximum amount of data transferred by single read/write operation. Typically a multiple of the Block Size and ranges from the specified Block Size to 1 MB.
   - **Test Size:** Maximum amount of data written/read by the test. Choices range from 1 GB to 15 GB. The larger the size, the more accurate the test, but the longer the test will run as well.
   - **File Mark Mode:** Writes a filemark at the specified interval (1 MB to 1 GB), or will write no filemarks.
   - **Read After Write:** When enabled, data is written to tape and then read back. Test measures both write and read performance. When disabled, only write performance is measured.
   - **Rate Limiting:** When enabled, the I/O rate is limited to the specified value

6. To begin the test, click the **Start** button. Progress is indicated in the status bar; a dialog box informs you when the test is complete.

7. To view the results of the test, click the **Drive Performance Results** tab. Results are also written to the Event Log.

Note: See Performance-related information and recommendations for ideas on how to resolve performance issues and enhance performance.

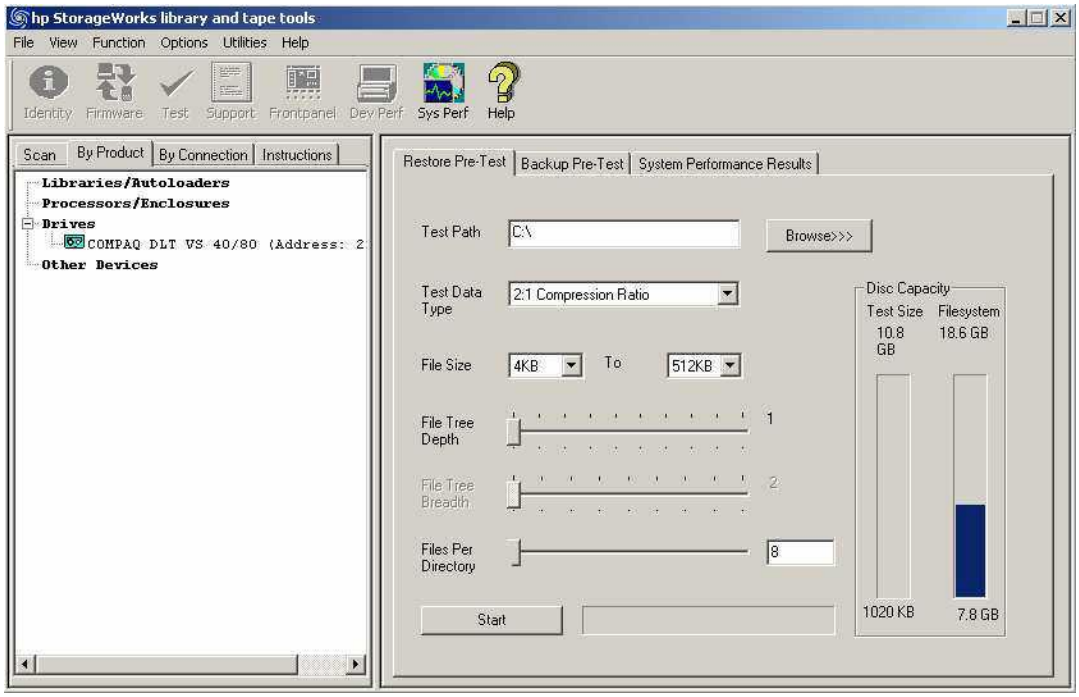
Running system performance tests on Windows

The system performance test is designed to identify performance issues within the system. This test writes and reads data to/from the specified directory, and then calculates performance data for the backup server.

To run a system performance test on Windows:

1. On the main toolbar, click the **Sys Perf** button.

   The ***System Performance window*** opens.



Note: This test actually split into two separate tests:

- **Restore pre-test:** Writes to disk simulating a restore operation. (See To run a Restore pre-test).
- **Backup pre-test:** Reads from disk simulating a tape backup operation. The Restore pre-test must be run before the Backup pre-test can be run. (See To run a Backup pre-test).

To run a Restore pre-test on Windows:

1. Click the **Restore pre-test** tab (if it is not already displayed).
2. Specify the following parameters:

   - **Test Path:** Enter the destination directory for the write data or browse using the **Browse** button. It is important for this to be a directory on the server tested.
   - **Test Data Type:** Select the type of data pattern to be written. You can choose from the following:

     - Fixed byte

- Incrementing
- Random
- Uncompressable
- 2:1 compression ratio
- 3:1 compression ratio
- 4:1 compression ratio

- **File Size:** Use the two drop-down boxes to specify a range of file sizes, or specify the same in both for fixed file size.
- **File Tree Depth:** Specify the number of levels of subdirectories to create from the specified directory.
- **File Tree Breadth:** Specify the number of directories to create within each subdirectory.
- **Files Per Directory:** Specify the number of files to create within each subdirectory.

Note: The Disc Capacity gauges on the Restore pre-test tab display the amount of disk space required for the System Performance test with current settings, along with the amount of space available in the indicated filesystem. If required space exceeds available space, the Test Size gauge displays OVERFLOW, and you will be unable to start the test.

3. To begin the test, click **Start**. Progress is indicated in the status bar; a dialog box informs you when the test is complete.
4. To view the results of the test, click the **System Performance Results** tab. Results are also written to the Event Log.

To run a Backup pre-test on Windows:

1. If you haven't already, run the Restore pre-test.
2. Click the Backup Pre-test tab.
3. Specify the following parameters:

- **Read Size:** Specify the maximum block size in bytes to transfer.
- **Directory Traverse Method:** Specify one of the following two options:

  - Depth: Test reads as far down the directory structure as possible before moving laterally to the next directory.
  - Breadth: Test reads all directories at the same level before moving down to the next subdirectory level.

- **Stop After:** Specify the time limit for the test or select “All Readers Complete” to continue testing until complete.
- **Reader [1-4]:** Use the Browse button to locate and enter up to four target directories from which the test will read data. For each Reader, you must have first performed a Restore pre-test. Use the same directory or directories you specified in the Restore pre-test(s).
- **Read Files:** Specify whether the files must be read back from the tape after the write completes.

4. To begin the test, click **Start**. A dialog box informs you when the test is complete.

5. To view the results of the test, click the **System Performance Results** tab. Results are also written to the Event Log.

Note: See Performance-related information and recommendations for ideas on how to resolve performance issues and enhance performance.

HP-UX, Linux, NetWare, OpenVMS, and Tru64 UNIX

Running drive performance tests on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

The drive performance test is designed to help identify performance issues with a drive. This test writes and reads data to/from the specified tape drive, and calculates performance data for that drive.

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

This test is destructive and will overwrite data on the tape. To avoid loss of data, use a blank tape when performing this test.

Note: The screen captures that appear in this section were taken on a Linux system, but apply to HP-UX, NetWare, OpenVMS, and Tru64 UNIX, unless otherwise specified. Note that the screen captures are examples only; the content of user windows varies.

To run a drive performance test on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

1. Use the **select** command to select the drive to be tested.
2. In the L&TT main screen, enter **devperf**.

   The ***Device Performance Tool screen*** opens.

3. To change any of the settings, enter the number that corresponds with the option you want to change. At the prompt, enter the new value. The available options for this test are:

   - **Blocksize:** Specifies the blocksize in bytes to be written to tape. Typical values are 32768 (32 KB) & 65536 (64 KB). Default is 65536.
   - **Repetitions:** Specifies the number of write/read operations to perform. Defaults to 4096.

- **Readback:** Specifies whether to perform a read of the data after it is written. When enabled, it will measure both read and write performance. When disabled (default) it will only measure write performance.
- **Count:** Specifies how many blocks to write to tape per each write operation. Default is 16.
- **Pattern:** Specifies the data pattern to be written to tape as follows:
  - 2 = 2:1 Compression (default)
  - 3 = 3:1 Compression

4. To start the test, enter **start**.

Note: See Performance-related information and recommendations for ideas on how to resolve performance issues and enhance performance.

Running system performance tests on HP-UX, Linux, OpenVMS, or Tru64 UNIX

The system performance test is designed to identify performance issues within the system. This test writes and reads data to/from the specified directory, and then calculates performance data for the backup server. The system performance pre-tests are not available for NetWare.

Note: The screen captures that appear in this section were taken on a Linux system, but apply to HP-UX, OpenVMS, and Tru64 UNIX, unless otherwise specified. Note that the screen captures are examples only; the content of user windows varies.

To run a system performance test on HP-UX, Linux, OpenVMS, or Tru64 UNIX:

1. In the L&TT main screen, enter **sysperf**.

   The System Performance screen opens.

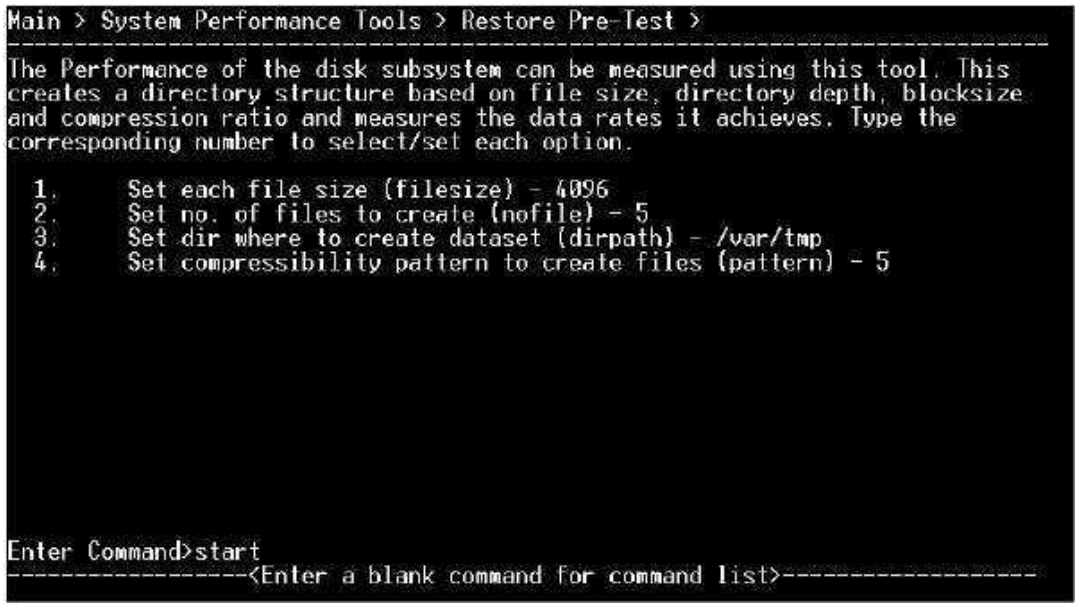
Notes: This test splits into two separate tests:

- **Restore pre-test:** Writes to disk simulating a restore operation (See To Run a Restore pre-test).
- **Backup pre-test:** Reads from disk simulating a tape backup operation. The Restore pre-test must be run before the Backup pre-test can be run (See To run a Backup pre-test).

To run a Restore pre-test on HP-UX, Linux, OpenVMS, or Tru64 UNIX:

1. In the System Performance Screen, enter **restore**.

   The ***Restore Pre-Test screen*** opens.



2. To change any of the settings, enter the number that corresponds with the option you want to change. At the prompt, enter the new value. The available options for this test are:

   - **Filesize:** Specifies the size in bytes of the test files to be created.
   - **Number of Files:** Specifies the number of files to be created.

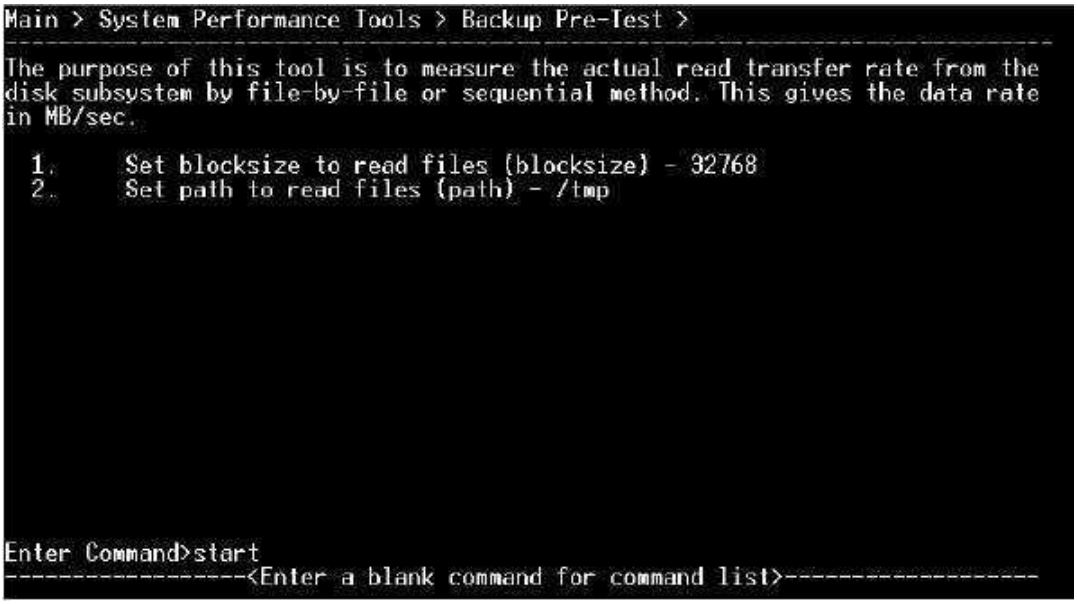
- **Directory Path:** Specifies the path of the directory where the test files will be written.
- **Pattern:** Enter the number of one of the following patterns:
  - 1 – Fixed byte
  - 2 – Incrementing byte
  - 3 – Random data
  - 4 – 1.6:1 Compressible data
  - 5 – 2:1 Compressible data
  - 6 – 3.1:1 Compressible data
  - 7 – 4.3:1 Compressible data

3. To start the test, enter **start**.

To run a Backup pre-test on HP-UX, Linux, OpenVMS, or Tru64 UNIX:

1. If you haven't already, run the Restore pre-Test.
2. On the System Performance screen, enter **backup**.

   The ***Backup Pre-Test screen*** opens.



3. To change any of the settings, enter the number that corresponds with the option you want to change. At the prompt, enter the new value. The available options for this test are:

   - **Blocksize:** Specify the blocksize in bytes to be read. Typical values are 32768 (32 KB) and 65536 (64 KB). Default is 65536.
   - **Path:** Specify the path to the directory from which to read.

Note: See Performance-related information and recommendations for ideas on how to resolve performance issues and enhance performance.

Downloading test script files

Beginning with the release of L&TT v3.5 SR1, downloading test script files from the web using the "Get Files From Web" function is no longer supported. This function was not widely used and was found to cause problems with script version management. Script updates will be distributed in L&TT install bundles only as part of regular L&TT releases, service releases (such as v3.5 SR1), or hot fixes as necessary.

Note: On non-Windows systems, the **Download Tool** screen still indicates an option 6 (for more info about the script file), and an option 7 (to download script files). However, beginning with L&TT v3.5 SR1, if you select one of these two options, the resulting screen is blank. In the future, a message will be displayed to inform you that these functions are no longer available.

Support Tickets

About support tickets

A major feature of L&TT is the ability to generate a support ticket. In the event of a hardware problem, a support ticket can provide vital information to help diagnose and resolve the problem. Support ticket generation is supported by each of the operating systems supported by L&TT.

Note: With ESL9000 Series with Command View ESL, ESL E-Series, and EML E-Series libraries, if L&TT is used to generate a support ticket, it will not include the IM and IFC logs. Unless otherwise instructed by HP support personnel, support tickets should be generated using the Command View ESL GUI or CLI, as documented in the *HP StorageWorks Interface Manager and Command View ESL User Guide*, to ensure that all log data is captured. When the libraries are partitioned, extra care should be taken in interpreting support tickets because the values in the logs are based on the actual physical library, not the partitioned library, so drive and slot numbers do not directly match those numbers reported by the backup application.

When you generate a support ticket, L&TT collects configuration information and executes a Device Analysis test on the selected device. This information can then be viewed, saved, and printed, compared to another support ticket, or emailed. A support ticket is saved as a log file containing the *.ltt* extension. By default, log files are saved to the “logs” directory.

Notes:

- Regardless of the selected detail level, the log file always contains all the information collected from the product. The support ticket viewer filters this information, depending on the detail level selected.
- Viewing support tickets is cumbersome in non-Windows operating systems. Comparing or printing of support tickets is only supported on Windows. Emailing support tickets is supported on all L&TT supported operating systems with the exception of NetWare. HP recommends that you view support tickets on Windows to provide unrestricted analysis.

Support tickets can get quite large, especially in the case of libraries that support more than a single drive. L&TT supports certain size management facilities that help ensure support ticket size is manageable. See Support ticket size management for more information.

Support ticket size management

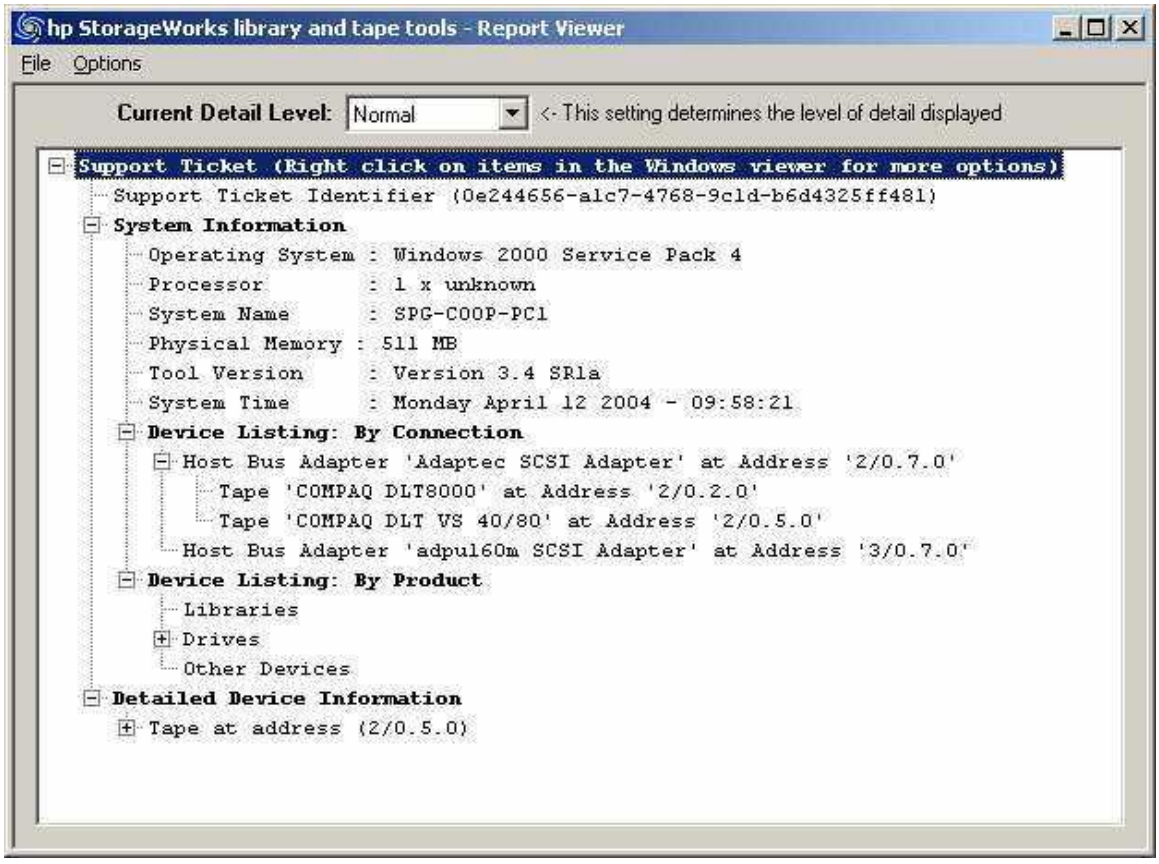
Two primary changes were introduced with L&TT v3.4 regarding support ticket size management. They are:

- Compression of support tickets.
- Support for splitting large support tickets into smaller, more manageable chunks (Windows only). L&TT v3.5 added support for splitting support tickets for non-Windows platforms.

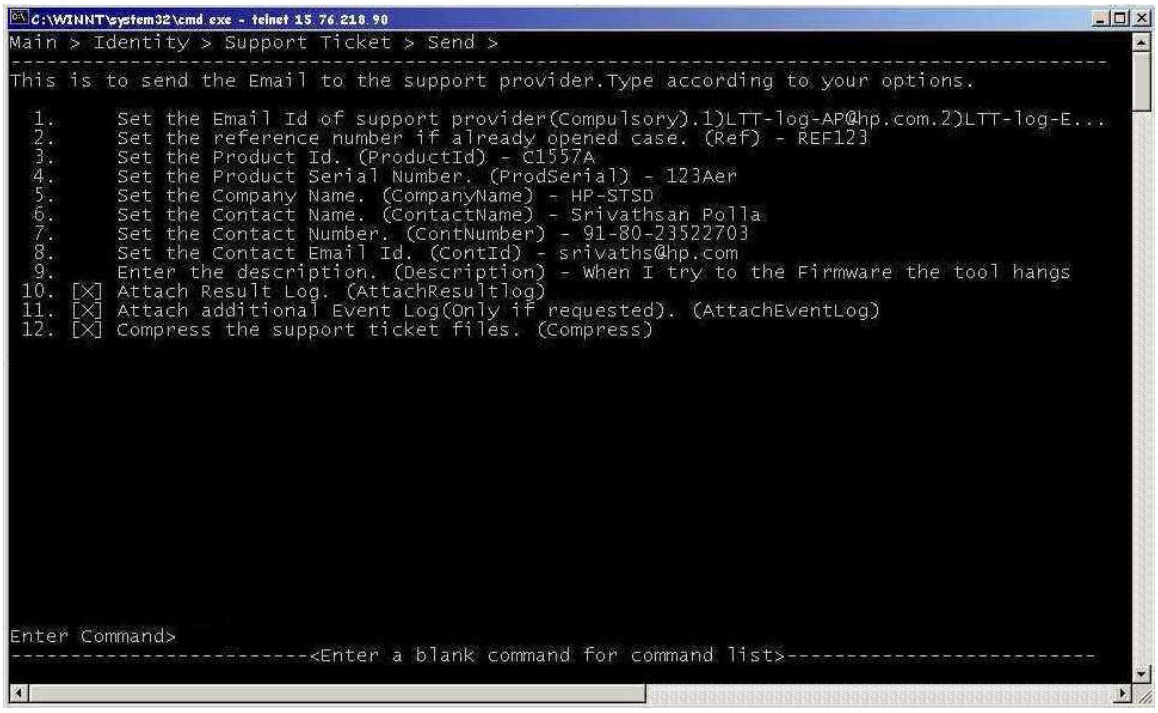
These changes were made primarily to eliminate problems associated with emailing very large files.

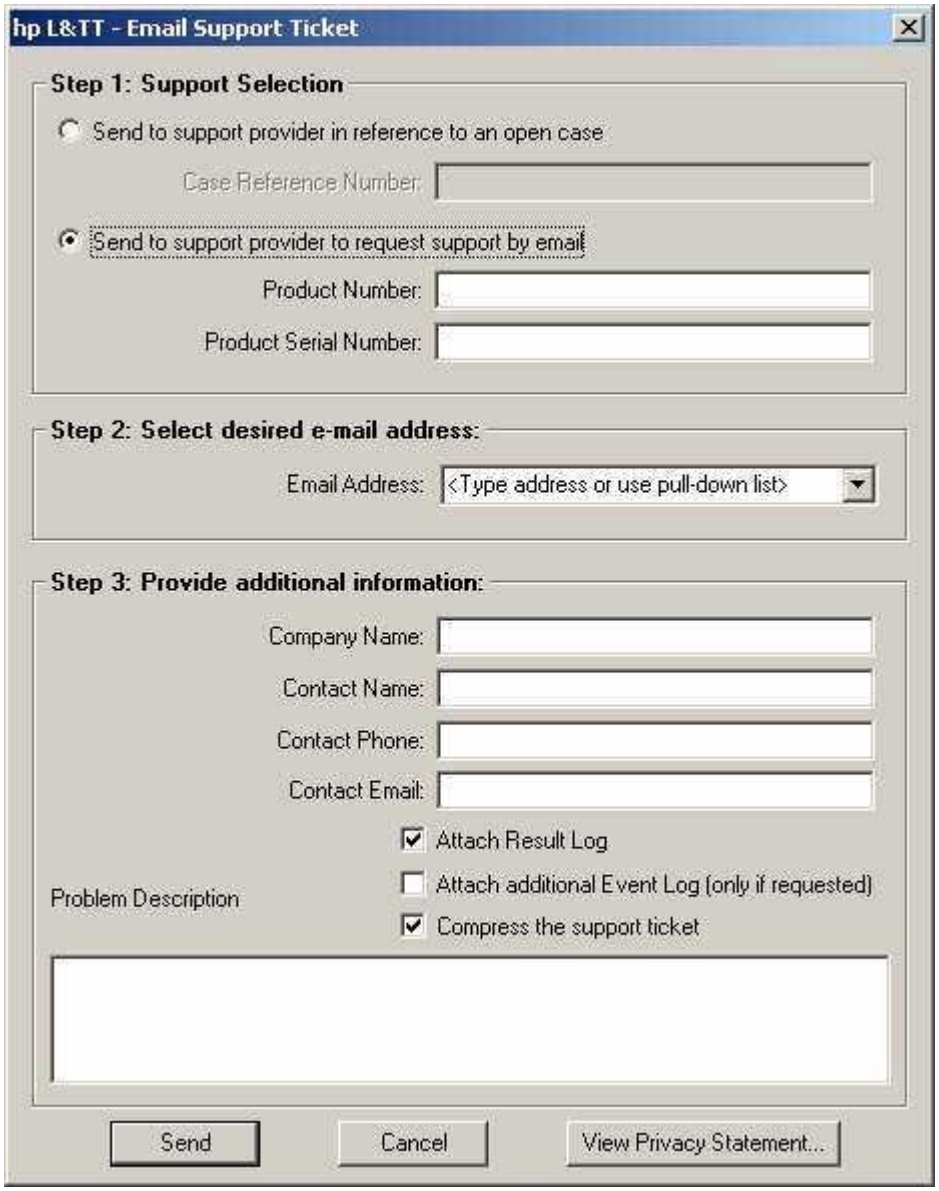
Support ticket compression

As of L&TT v3.4, support ticket compression is now supported for both Windows and non-Windows platforms, making them easier to handle. Support ticket compression is enabled on Windows by default, and disabled on non-Windows. In both cases, compression ratio averages 5:1 when enabled. Compressed support tickets cannot be saved in L&TT. However, when a compressed support ticket is emailed, it can be extracted from the email and saved if desired. If you extract the compressed file and check the file extension, notice that it has an *.ltt.lzo* extension rather than the usual *.ltt* extension. Click ***here*** to see what a support ticket of this type looks like when it is opened in the L&TT Support Ticket Viewer. Compressed support ticket files are not viewable on non-windows platforms. Regardless of platform, compressed support tickets are created during the send/email process only.



If you have a concern about transferring binary files, there is a check box in the ***Email Support Ticket dialog box*** that lets you disable support ticket compression on Windows so that it will not compress the support ticket files. Compression can be later re-enabled if desired via the same dialog box. For non-windows platforms compression is disabled by default. If you wish to enable, use option 12 from the "***send screen***" (click here for instructions on how to get to the support ticket screen, and type "send" from that screen). This same screen can also later be used to disable compression if desired.

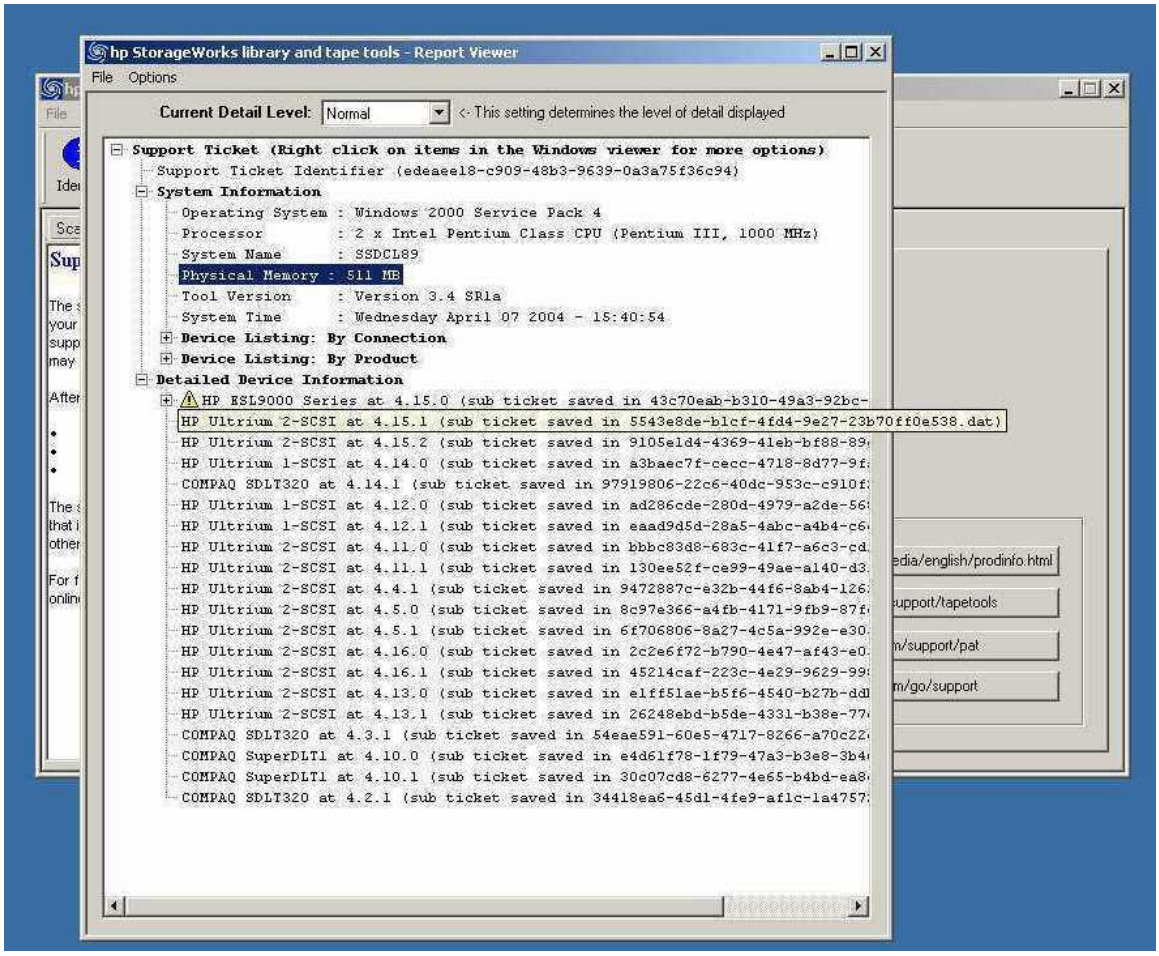

C:\WINNT\system32\cmd.exe - telnet 15.76.218.90
Main > Identity > Support Ticket > Send >
This is to send the Email to the support provider.Type according to your options.
1. Set the Email Id of support provider(Compulsory).1)LTT-log-AP@hp.com.2)LTT-log-E...
2. Set the reference number if already opened case. (Ref) - REF123
3. Set the Product Id. (ProductId) - C1557A
4. Set the Product Serial Number. (ProdSerial) - 123Aer
5. Set the Company Name. (CompanyName) - HP-STSD
6. Set the Contact Name. (ContactName) - Srivathsan Polla
7. Set the Contact Number. (ContNumber) - 91-80-23522703
8. Set the Contact Email Id. (ContId) - srivaths@hp.com
9. Enter the description. (Description) - When I try to the Firmware the tool hangs
10. [X] Attach Result Log. (AttachResultlog)
11. [X] Attach additional Event Log(Only if requested). (AttachEventLog)
12. [X] Compress the support ticket files. (Compress)
Enter Command>
<Enter a blank command for command list>



Splitting large support tickets on Windows

As mentioned, this support was first implemented in L&TT v3.4, and is designed to avoid problems that can occur when you attempt to email very large files. A normal standalone drive support ticket consists of a single file with the *.ltt* file extension. The ticket is displayed in standard tree view format. The user or support person can change the detail level by clicking the **+** and **-** signs, and then selecting the desired **current detail level** setting in the drop-down box.

With a "split" support ticket, a file with an *.ltt* extension is still created, but several additional files are also created. Each of these additional files has a *.dat* file extension and represents a sub-ticket. When you open the *.ltt* file in the usual way for viewing, the additional sub-ticket files are accessible via hyperlinks. After the ticket is opened in the L&TT viewer, you can observe the hyperlinks ***(Show me)***.

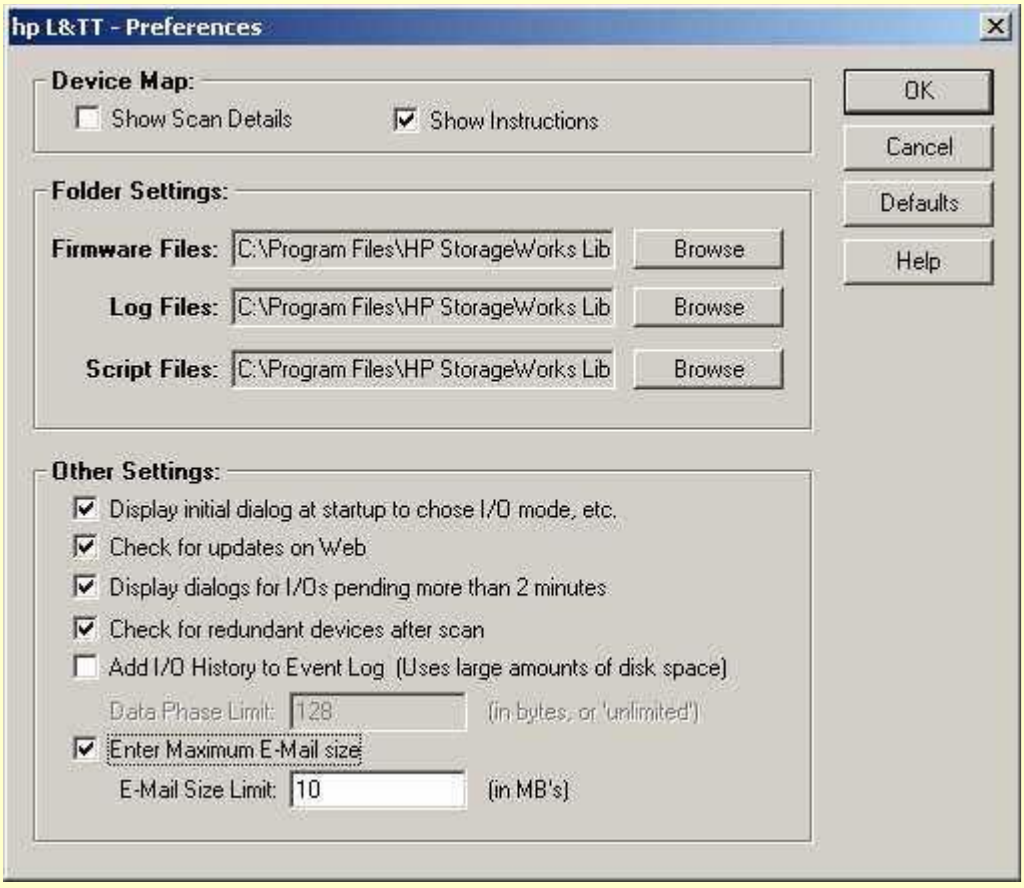


In the above split support ticket example screen shot, there are several hyperlinks to .dat files under the **Detailed Device Information** section. When the cursor is positioned over one of these hyperlinks, it is highlighted (as shown in the 2nd line of the screen shot). After you click the hyperlink, the respective *.dat* file is located and loaded into memory, and can then be expanded for detailed viewing. In the example, the first line in the Detailed Device Information section has already been clicked and loaded into memory. Note that it has a **+** to allow expansion of the file details.

Notes:

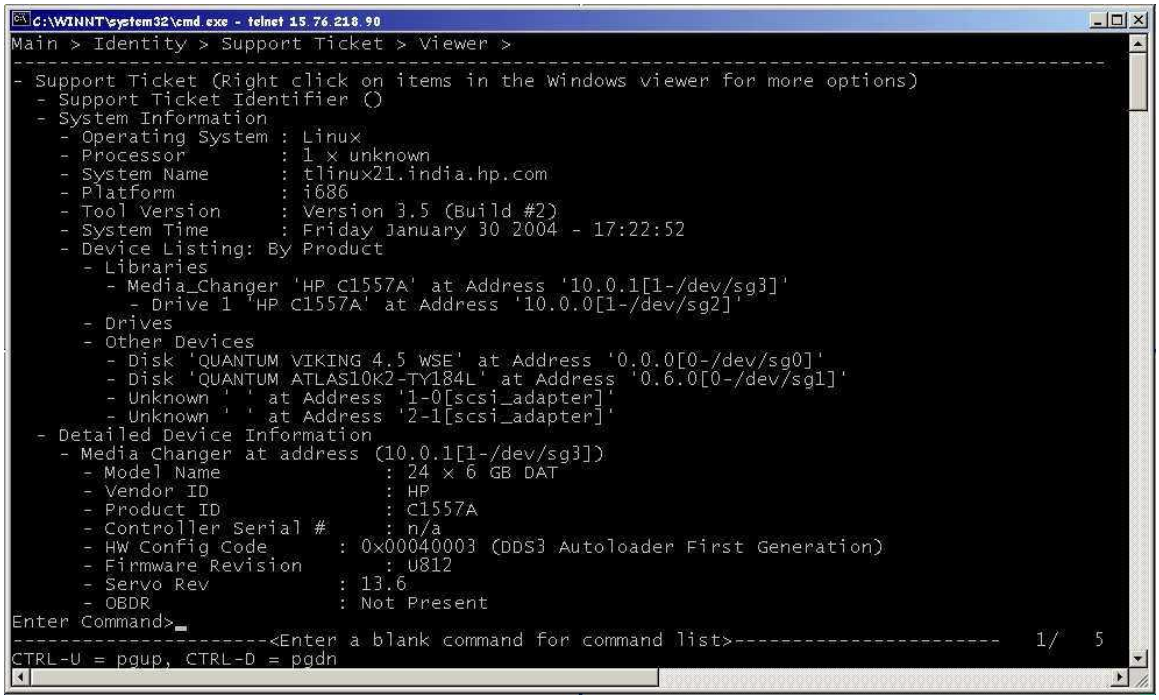
- All support tickets for libraries that can have more than one drive (whether or not they actually have more than one drive configured) are split into multiple files. Autoloaders and standalone drives will not have split support tickets. The additional files created with a split support ticket MUST be included when the ticket is sent for analysis. If the ticket is emailed from within L&TT, the additional *.dat* files are included in the email automatically. If the support ticket is sent using an email external to the L&TT application, you need to manually attach all of the associated .dat files to the email. Otherwise, HP support personnel will not have the information they need to do a proper analysis.

- If the *.ltt* and *.dat* files associated with a split support ticket exceed the 10 MB default value for maximum email size, L&TT automatically generates separate email messages to keep the size below the threshold. (This maximum email size limit only pertains to emails sent from within L&TT.) The default value for maximum email size is 10 MB, but is configurable using the ***Preferences dialog box***.



Splitting large support tickets on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

For the non-Windows platforms, support for split support tickets was first implemented in L&TT v3.5, and is designed to avoid problems that can occur when you attempt to email very large files. A normal standalone drive support ticket consists of a single file with the *.ltt* file extension. Click ***here*** to see what a support ticket of this type looks like when it is opened in the L&TT Support Ticket Viewer.



Use the ^U and ^D commands to scroll up or down respectively to view the contents of the support ticket.

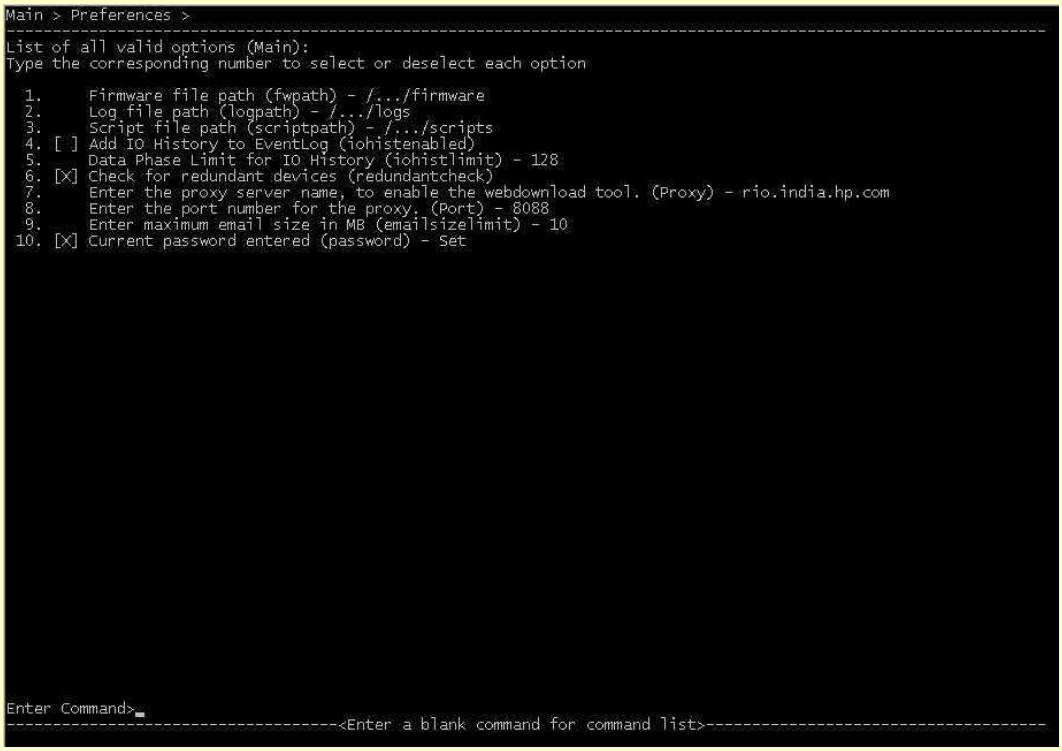
When you enter a **view**, **save**, or **send** command from the L&TT Support Ticket screen, it automatically generates a split support ticket. With a “split” support ticket, a file with an *.ltt* extension is still created, but several additional files are also created. Each of these additional files has a *.dat* file extension and represents a sub-ticket ***(show me)***.

In the above example screen shot, the a5617a.ltt file is the primary support ticket file that was created for the A5617A library, and the three *.dat* files that begin with “88” are the associated additional files for that support ticket. You will not be able to view the additional support ticket information contained in the *.dat* files through the Support Ticket Viewer on non-Windows platforms. However, you can transfer the *.ltt* file and all associated *.dat* files to a Windows platform machine and view all the data there.

Notes:

- All support tickets for libraries that can have more than one drive (whether or not they actually have more than one drive configured) are split into multiple files. Autoloaders and standalone drives will not have split support tickets. The additional files created with a split support ticket MUST be included when the ticket is sent for analysis. If the ticket is emailed from within L&TT, the additional *.dat* files are included in the email automatically. If the support ticket is sent using an email external to the L&TT application, you need to manually attach all of the associated *.dat* files to the email. Otherwise, HP support personnel will not have the information they need to do a proper analysis.

- If the *.ltt* and *.dat* files associated with a split support ticket exceed the 10 MB default value for maximum email size, L&TT automatically generates separate email messages to keep the size below the threshold. (This maximum email size limit only pertains to emails sent from within L&TT.) The default value for maximum email size is 10MB, but is configurable using the ***preferences option***.



Windows

Generating support tickets on Windows

Generate a support ticket to provide vital information to help diagnose and resolve a problem. When you generate a support ticket, L&TT collects configuration information and executes a Device Analysis test on the selected device.

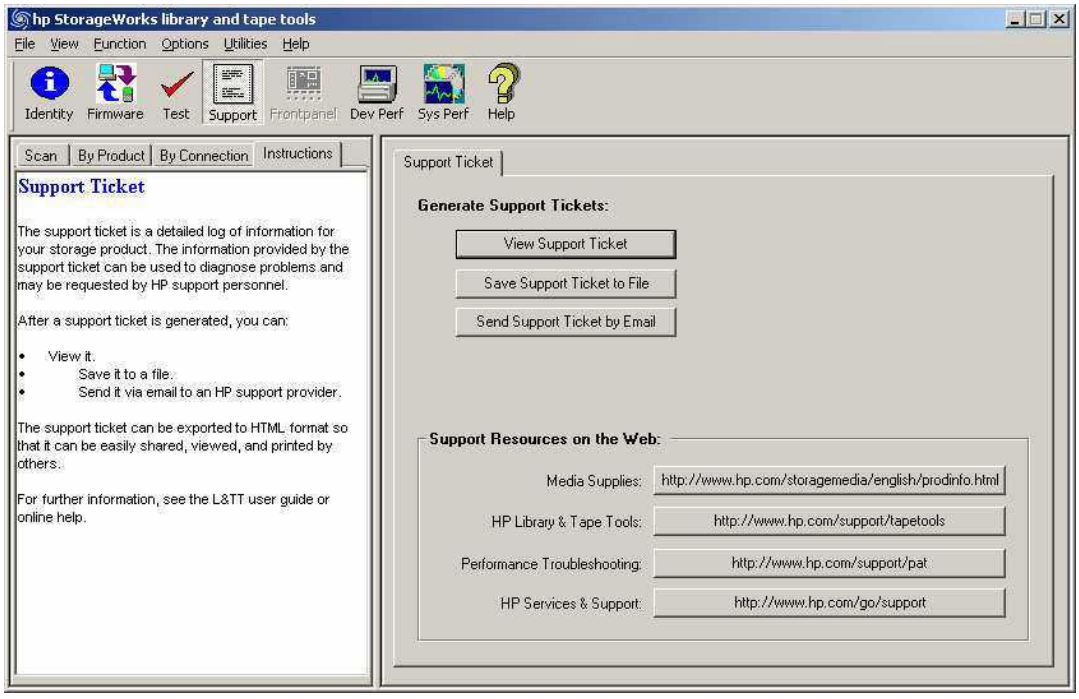
Note: When generating a support ticket for standalone devices, HP recommends you keep the media that was present in the drive when the failure occurred in the drive. This allows error rate and other information relevant to that cartridge to be examined. When media is removed, many devices automatically clear this information. For tape automation products, it is generally better to have the drives empty of media to force the library drive/media log to be updated.

Note: With ESL9000 Series with Command View ESL, ESL E-Series, and EML E-Series libraries, if L&TT is used to generate a support ticket, it will not include the IM and IFC logs. Unless otherwise instructed by HP support personnel, support tickets should be generated using the Command View ESL GUI or CLI, as documented in the *HP StorageWorks Interface Manager and Command View ESL User Guide*, to ensure that all log data is captured. When the libraries are partitioned, extra care should be taken in interpreting support tickets because the values in the logs are based on the actual physical library, not the partitioned library, so drive and slot numbers do not directly match those numbers reported by the backup application.

To generate a support ticket on Windows:

1. Select a device in the device list (using By Product or By Connection tab), and then click the **Support** button on the Main toolbar.

   The ***Support window*** opens.



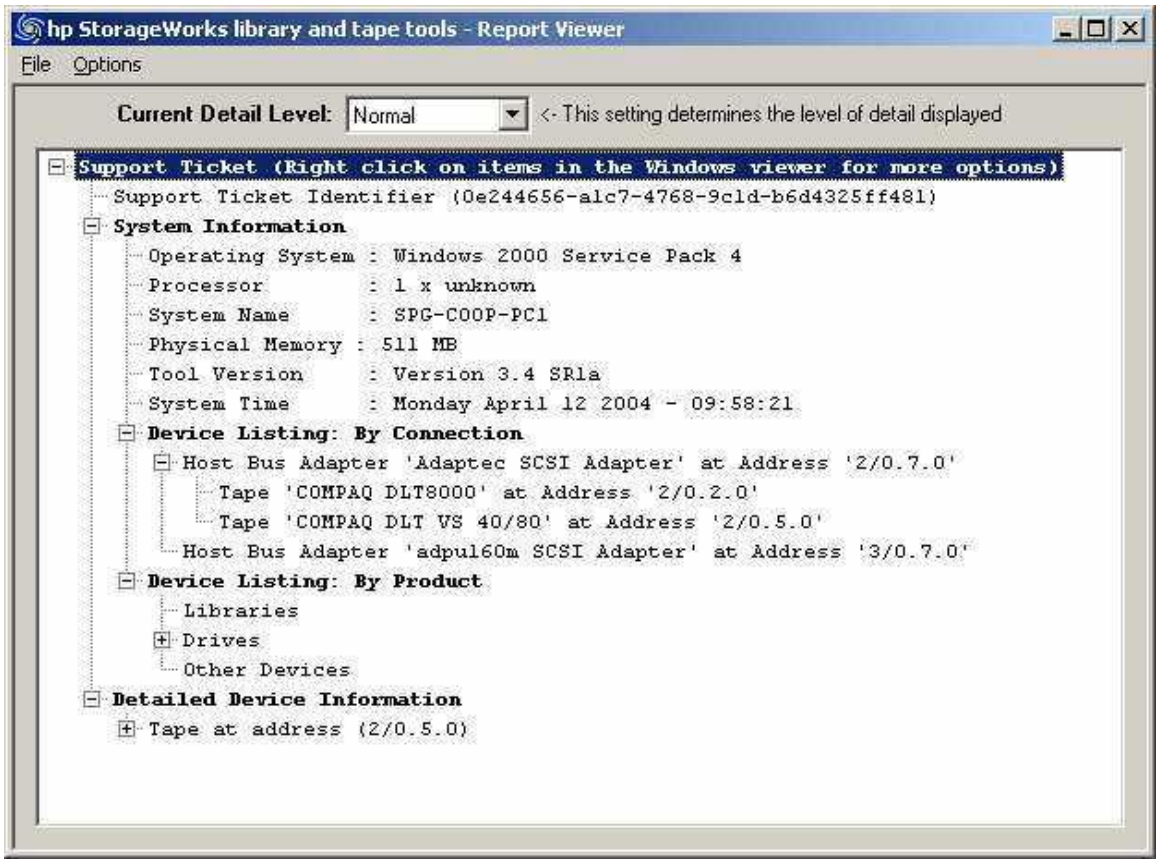
Note: The bottom section of the Support window provides resources for finding support on the Web. Click any of the buttons in the **Support Resources on the Web** section to display the corresponding web site in a browser window.

2. The Support window displays three options for generating a support ticket. Each of the following three options has a corresponding button in the Generate Support Tickets section:

- **View Support Ticket:** Click this button to generate the support ticket and immediately view it in the support ticket viewer. The support ticket can later be saved or sent via email.
- **Save Support Ticket to File:** Click this button to generate and save the support ticket. The support ticket is saved as a log file with the *.ltt* extension. The support ticket can later be viewed or sent via email. To view a saved support ticket, open it through Windows Explorer, or use the Load command on the File menu.
- **Send Support Ticket by Email:** Click this button to generate the support ticket and immediately send it via email to an HP support center (or other destination). Clicking this button opens a form that allows you to provide all the necessary information. Complete the form and click the Send button to send the email. Using this option *does not save a copy of the support ticket locally;* click **Save Support Ticket to File** to save a copy for future reference.

Viewing, saving, and printing support tickets on Windows

L&TT support tickets are created in a proprietary format and therefore require the ***Support Ticket Viewer***.



The Support Ticket viewer is built into the L&TT application. The viewer enables viewing of detailed device information and general information on the system to which it is connected. This information is displayed in a standard Tree view format. The user, or support person, can change the detail level of the support ticket, browse through the support ticket information, and expand or collapse specific sections of the support ticket as required.

To view a support ticket on Windows:

1. Click the "**+**" and "**-**" signs to expand and collapse sections of the support ticket.
2. Use the standard navigation keys (**Home**, **End**, **Page Up**, **Page Down**), the **arrow keys**, or the **Windows** scroll bars to navigate through the ticket.
3. You can display support ticket information in several different levels of detail, dependent on the setting displayed in the **Current Detail Level** drop-down list within the Support Ticket viewer. The following detail levels are available:
    - Highlights only
    - Normal (shown in above example screen shot from "current detail level")
    - More detail
    - Everything (the highest level an end user can view)
    - Factory only (requires factory password; available to HP support personnel only)

4. You can right-click any node (line) in the support ticket viewer to display a context menu that exposes additional functionality. Depending on the node that was clicked, the following items may or may not be available (unavailable items will be dimmed):

   - **Expand all:** Select this item to expand all subitems in the node.
   - **Event explanation:** Select this item to open the "event" window, displaying additional information about the event. You can view the data in either ASCII or hexadecimal format. This feature is available for items preceded with the blue information icon ( ).
   - **Event data:** Select this item to open the "event data" window, displaying L&TT specific information about the event.
   - **Copy:** Select this item to copy the current line to the Windows clipboard
   - **Reference data:** Select this item to open the "reference data" window, displaying reference information pertinent to the current line, such as valid ranges and applicable values.

To save a support ticket on Windows:

Click the **Save Support Ticket to File** button to save a local copy of the file. HP recommends saving a copy locally.

To print a support ticket on Windows:

From the **Support Ticket Viewer** menu, click **File > Print**.

Note: When running L&TT on Windows, you can also convert a support ticket to HTML format using the currently selected detail level. Do so by clicking **File > Generate HTML Report** while viewing the support ticket. The HTML version can easily be printed or viewed by other users without the support ticket viewer.

If sending to HP support personnel, HP recommends that the HTML format *NOT* be used unless otherwise instructed by an HP support representative. After an HTML support ticket has been generated, the detail level within the HTML file cannot be changed. Make sure that the detail level is set to the desired level before generating the HTML report.

Emailing support tickets on Windows

You can generate a support ticket and immediately send it via email to an HP support center (or other destination).

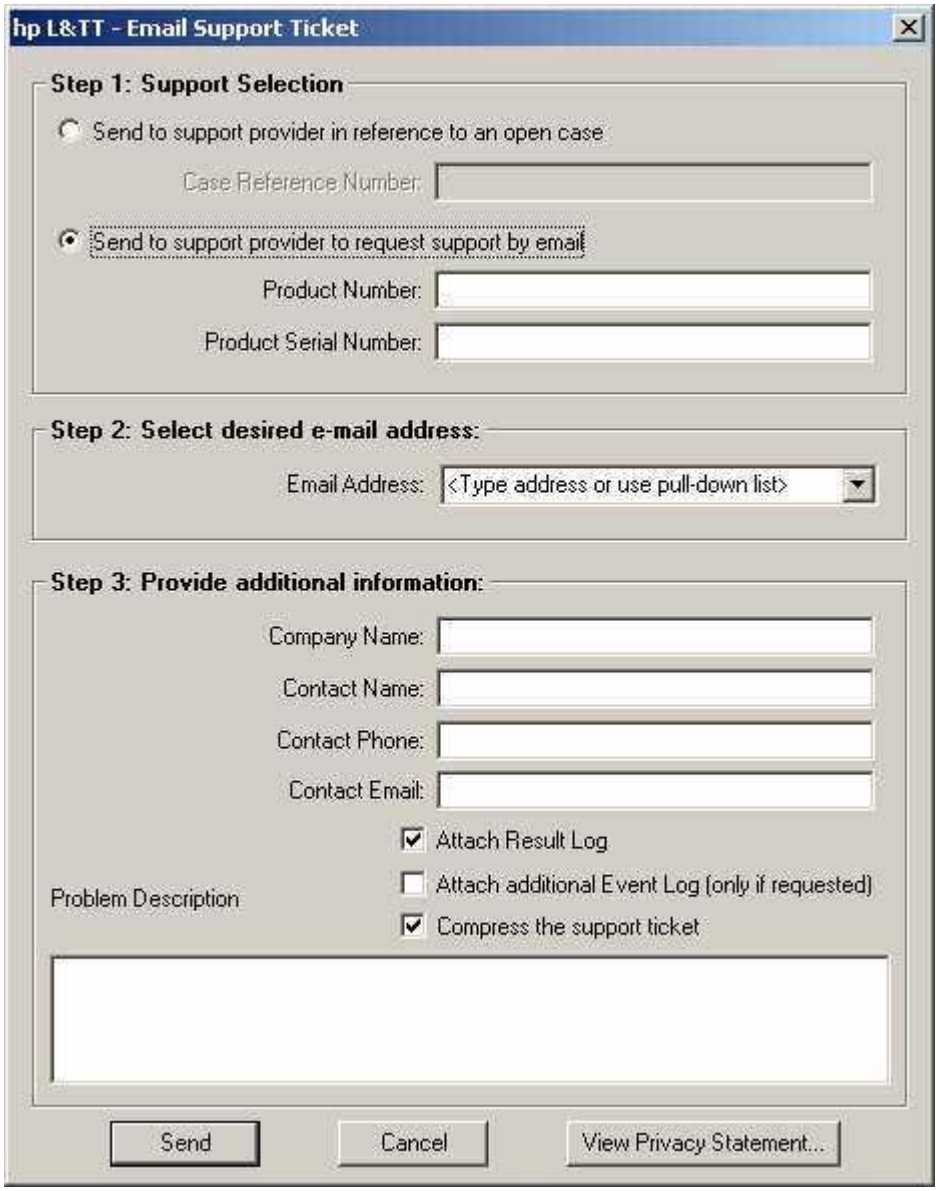
Note: Before L&TT can email a support ticket, you must either have a MAPI-compliant email program (such as Microsoft Outlook or Outlook Express), or you must set up an email account through the Windows Control Panel or Internet Explorer.

To email a support ticket on Windows:

Note: L&TT defaults to 10 MB for maximum size for any email. If your email setup will not permit email files as large as 10 MB, click L&TT **Options > Preferences**, click the check box for maximum email size, and then enter a smaller number. If you attempt to email a support ticket using L&TT that is larger than the selected maximum email size, L&TT breaks the email into smaller, separate emails so that they do not exceed the maximum size limit.

1. In the Support window, click **Send Support Ticket by Email**.

   The ***Email Support Ticket dialog bo***x opens.



2. Enter the appropriate information, and then select the email address to which you want to send the support ticket. If you are using a version of L&TT prior to v3.5, do not use the regional email addresses; these addresses are no longer monitored. Beginning with v3.5, two valid email addresses are offered, both for the North American region:

   - LTT North America Support Call Center (for all North America except 3rd party outsourcer use)
   - LTT North America Support Call Center 20 (for 3rd party outsourcer use)

Note: Customer support personnel typically provide an email address to users who are emailing a support ticket as a result of a support call request. In this case, the user should enter the email address exactly as provided by the support person. In the European region this will usually be provided in the form: "xxxxxxxxxx@cases.brussels.hp.com" where "xxxxxxxxxx" is the actual assigned case number. This associates the support case number with the support ticket making resolution and tracking more manageable.

To set up an email account on Windows:

Even if email software (such as Outlook or Outlook Express) is not installed, you can configure a simple email account using the Internet Connection Wizard that comes with Internet Explorer. To access the Internet Connection Wizard:

1. Launch Internet Explorer. If this is the first time to launch Internet Explorer on this machine, the Internet Connection Wizard opens automatically. Follow the instructions until you reach the step that asks whether an Internet email account should be set up. Answer **Yes** and skip to Step 5. If this is not the first time to launch Internet Explorer on this machine, proceed with Step 2.

2. Click **Tools > Internet Options**.

3. Click the **Connections** tab.

4. Click **Setup** at the top of the dialog box.

   The Internet Connection Wizard opens.

5. Enter a display name (this is the “From” name in the email), and then click **Next**.

6. Enter the return email address, and then click **Next**. If there are no email accounts on this system that will be monitored, use your regular email address at which you can be contacted by the recipient of the support ticket.

7. Enter **bogus** as the address for the incoming mail server.

8. In the **SMTP mail server** box, enter the address of any SMTP mail server within the firewall of your organization that accepts SMTP send requests, and then click **Next**. If you do not know which address to use, contact your local system administrator or check the mail account settings on your regular email account.

9. If your SMTP server requires a logon to send email (most sites only require a logon for incoming mail), you must provide proper account information. Otherwise, you can enter **bogus** in both fields. Click **Next**.

Note: Your email is now configured for outgoing mail delivery.

Comparing support tickets on Windows

L&TT can compare two support tickets and generate a report containing the differences. This can be helpful when troubleshooting a problem because it highlights the changes since a previous support ticket was generated.

To compare support tickets on Windows:

1. Generate or open the first support ticket to be compared.
2. In the support ticket viewer, click **File > Compare**.

   The Open dialog box opens.
3. Select the support ticket to which you want to compare the first ticket, and then click **Open**. A new window opens with the comparison results.

Generating event logs on Windows

L&TT can generate a detailed event log that captures all L&TT diagnostic interaction with the product, all SCSI commands sent and received by the program, and any software interactions or issues. By default, the event log is not accessible until the factory password has been entered, and therefore is unavailable to end users. Its content is intended for use by L&TT programmers as a tool for debugging software issues within the program itself.

To generate an event log on Windows:

1. Run L&TT.
2. Click **Options > Preferences**.
3. Click the **Add I/O History to Event Log** option, and then click **OK**.

   Note: Disable the Add I/O History to Event Log option as soon as you send the email; it can use hundreds of megabytes of disk space. To disable it, return to L&TT, click **Preferences** on the Options menu, clear the **Add I/O History to Event Log** option, and then click **OK**.

4. Exit L&TT, and then restart it.
5. Reproduce the problem encountered.
6. Navigate to the logs directory in the L&TT installation directory, and then locate the *Eventlog.ltt* file.
7. Attach the file to an email, and then send it to the L&TT team for diagnosis.
8. Return to L&TT, and then click **Options > Preferences**.
9. Clear the **Add I/O history to event log** option, and then click **OK**.

Note: Because the event log stores a SCSI trace of the interaction between the product and the L&TT software, it can be used as a simple SCSI analyzer. You may be directed by HP support personnel to generate an event log with the "Add I/O history to event log" option enabled.

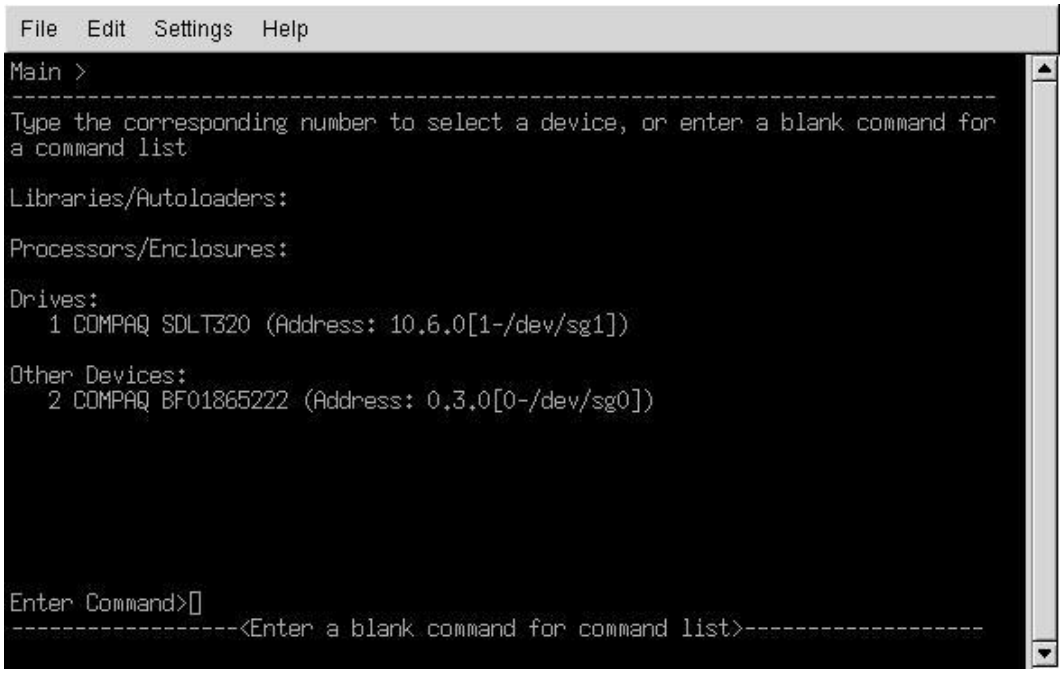
HPUX, Linux, NetWare, OpenVMS, and Tru64 UNIX

Navigating to a Support Ticket screen

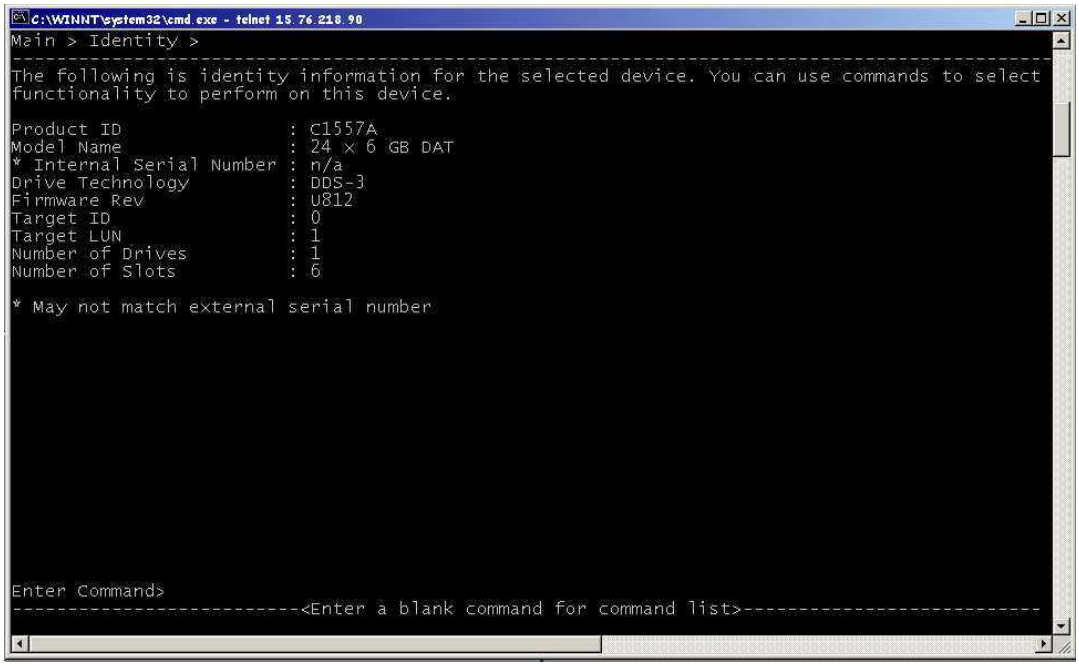
You can generate a support ticket that provides vital information to help diagnose and resolve a problem. When you generate a support ticket, L&TT collects configuration information and executes a Device Analysis test on the selected device.

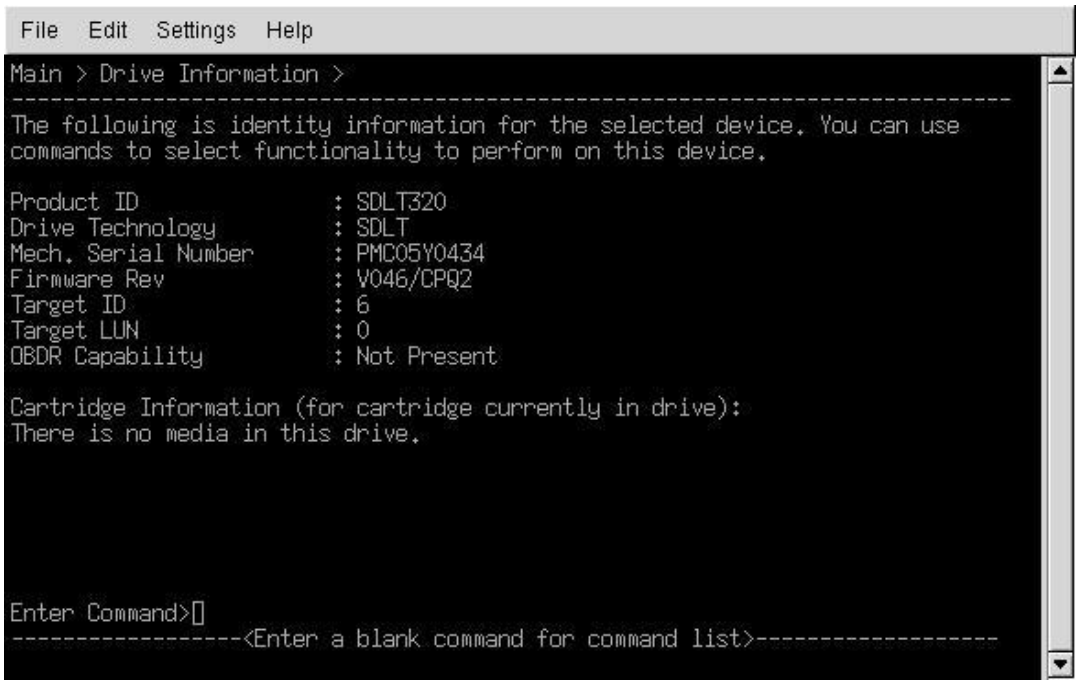
To navigate to an initial Support Ticket screen:

1. In the L&TT ***main screen***, select the device for which you want to create a support ticket. In our example, you would enter **select 1**.



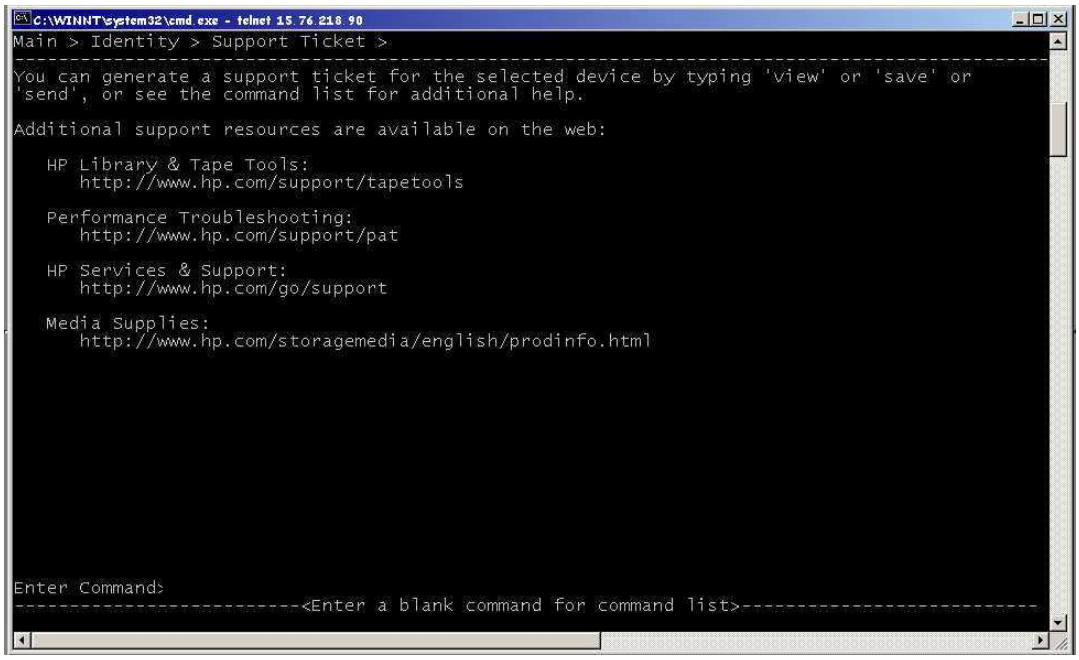
If the selected device is a standalone drive, the ***Drive Information screen*** opens. If the selected device is an autoloader or library, the ***Device Identity screen*** opens.





2. Enter **support**.

The ***Support Ticket screen*** opens.



Note: If the support ticket is for a standalone drive, the Support Ticket screen menu bar displays **main > drive information > support ticket** rather than **main > identity > support ticket**.

3. After the support ticket screen opens, you can generate and then view, save or email a support ticket.

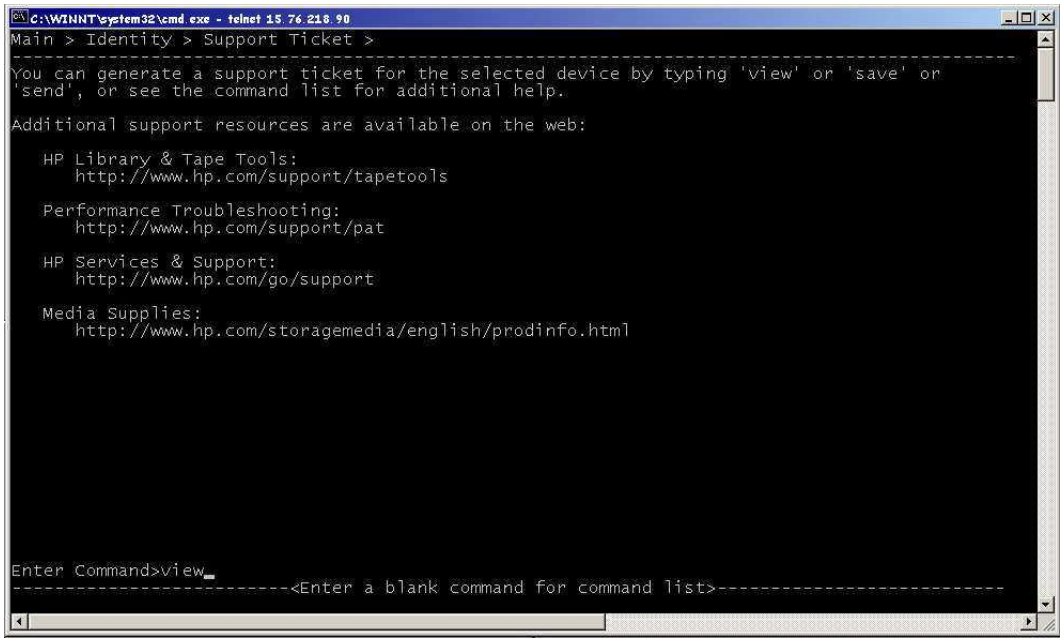
Generating and viewing support tickets on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

Note: When generating a support ticket for standalone devices, HP recommends that you keep the media in the drive on which it was present when the failure occurred. This allows error rate and other information relevant to that cartridge to be examined. When media is removed, many devices automatically clear this information. For tape automation products, it is generally better to have the drives empty of media to force the library drive/media log to be updated.

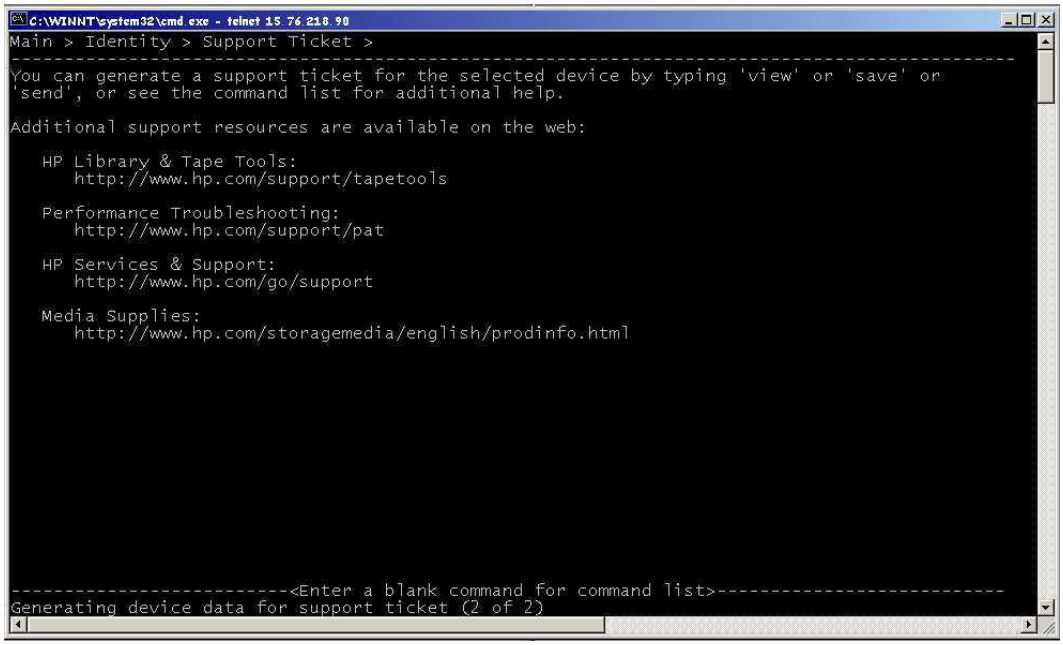
Note: With ESL9000 Series with Command View ESL, ESL E-Series, and EML E-Series libraries, if L&TT is used to generate a support ticket, it will not include the IM and IFC logs. Unless otherwise instructed by HP support personnel, support tickets should be generated using the Command View ESL GUI or CLI, as documented in the *HP StorageWorks Interface Manager and Command View ESL User Guide*, to ensure that all log data is captured. When the libraries are partitioned, extra care should be taken in interpreting support tickets because the values in the logs are based on the actual physical library, not the partitioned library, so drive and slot numbers do not directly match those numbers reported by the backup application.

To generate and view a support ticket on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

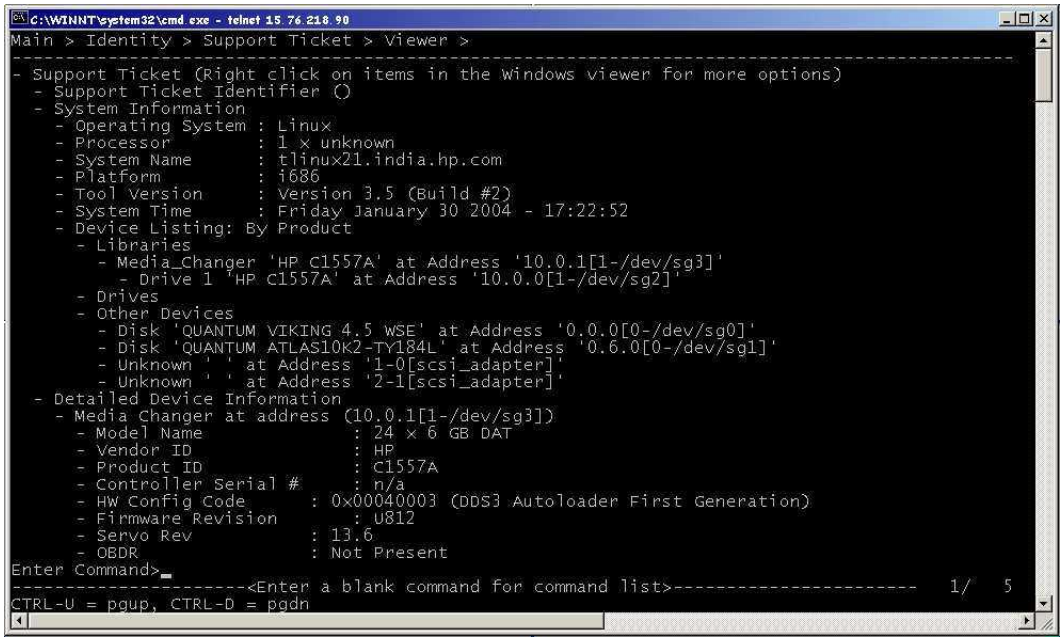
1. Navigate to the Support Ticket screen.
2. In the Support Ticket screen, enter **view** to generate a support ticket for viewing. ***(Show me)***



3. After you enter the view command, L&TT generates the support ticket. The status area at the bottom of the screen informs you that the support ticket data is being generated. ***(Show me)***



4. After the support ticket is generated, the ***Viewer screen*** opens.



5. Use the ^U and ^D commands to scroll up or down respectively to view the entire support ticket.

Generating and emailing support tickets on HP-UX, Linux, or Tru64 UNIX

Note: When generating a support ticket for standalone devices, HP recommends that you keep the media in the drive on which it was present when the failure occurred. This allows error rate and other information relevant to that cartridge to be examined. When media is removed, many devices automatically clear this information. For tape automation products, it is generally better to have the drives empty of media to force the library drive/media log to be updated.

Note: With ESL9000 Series with Command View ESL, ESL E-Series, and EML E-Series libraries, if L&TT is used to generate a support ticket, it will not include the IM and IFC logs. Unless otherwise instructed by HP support personnel, support tickets should be generated using the Command View ESL GUI or CLI, as documented in the *HP StorageWorks Interface Manager and Command View ESL User Guide*, to ensure that all log data is captured. When the libraries are partitioned, extra care should be taken in interpreting support tickets because the values in the logs are based on the actual physical library, not the partitioned library, so drive and slot numbers do not directly match those numbers reported by the backup application.

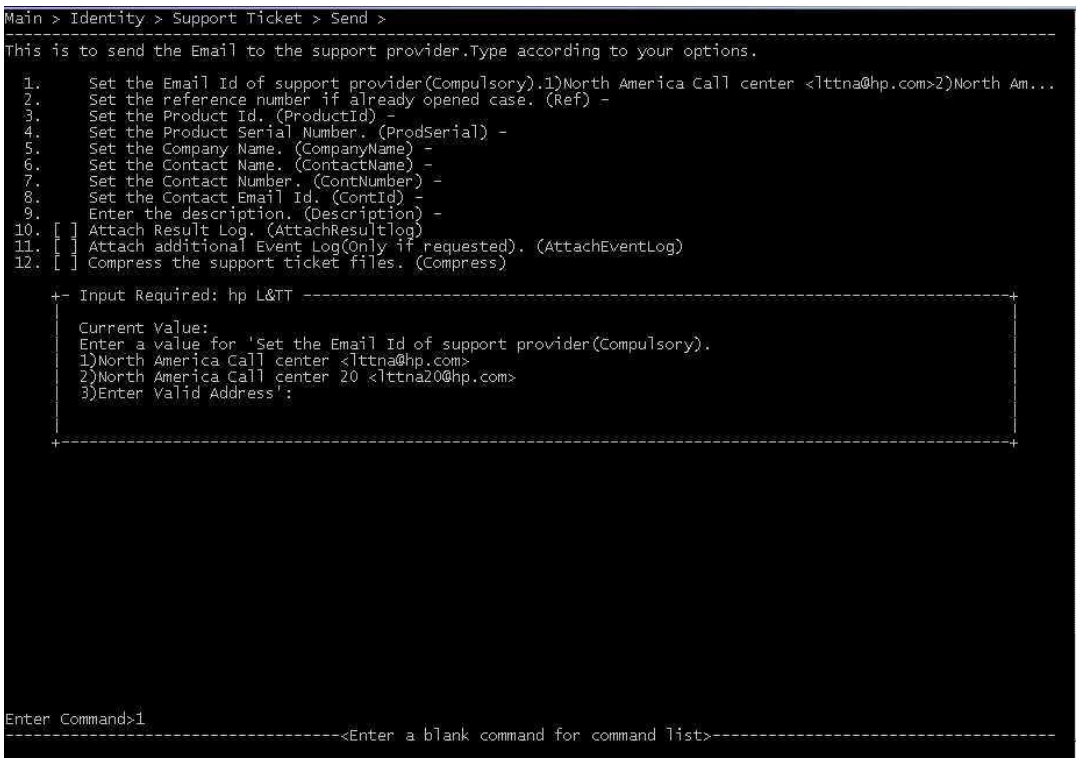
You can generate a support ticket and immediately send it via email to an HP support center (or other destination). Emailing a support ticket is supported on HP-UX, Linux, and Tru64 UNIX beginning with L&TT v3.4, but is not supported on NetWare or OpenVMS.

To generate and email a support ticket on HP-UX, Linux, or Tru64 UNIX:

Note: L&TT defaults to 10 MB for maximum size for any email. If your email setup will not permit email files as large as 10 MB, you can change this value (see To set preferences and passwords for L&TT on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX). If you attempt to email a support ticket using L&TT that is larger than the selected maximum email size, L&TT breaks the email into smaller, separate emails so that they do not exceed the maximum size limit.

1. Navigate to the Support Ticket screen.
2. In the Support Ticket screen, enter **send** to generate a support ticket.

   The ***Send screen*** opens to email the support ticket. Enter **1** to begin entering information for the support ticket.

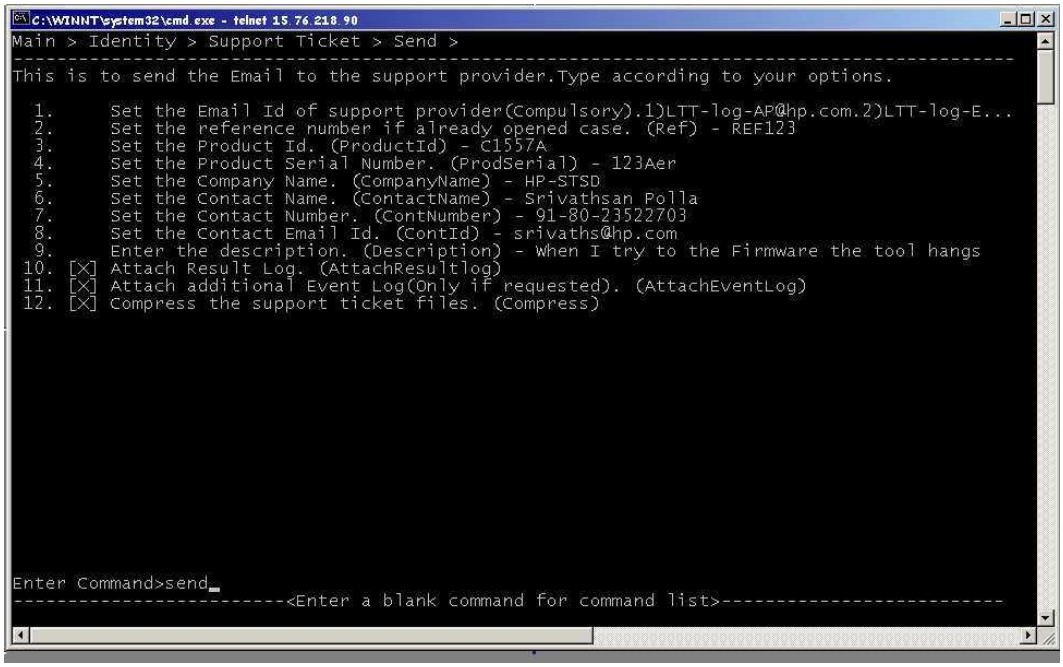


3. Select an email address. If you are using a version of L&TT prior to v3.5, do not use the regional email addresses; these addresses are no longer monitored. Beginning with v3.5, two valid email addresses are offered, both for the North American region:

   - LTT North America Support Call Center (for all North America except 3rd party outsourcer use)
   - LTT North American Support Call Center 20 (for 3rd party outsourcer use)

   Note: Customer support personnel typically provide an email address to users who are emailing a support ticket as a result of a support call request. In this case, the user should enter the email address exactly as provided by the support person. In the European region this will usually be provided in the form: "xxxxxxxxxx@cases.brussels.hp.com" where "xxxxxxxxxx" is the actual assigned case number. This associates the support case number with the support ticket making resolution and tracking more manageable.

4. After selecting an email address, if this is a currently open case, enter **2**, and then enter the reference number at the prompt. If this is not a currently open case, proceed to the next step.
5. Enter **3**, and then enter the product ID when prompted.
6. Enter **4**, and then enter the serial number of the selected device when prompted.
7. Enter **5**, and then enter your company name when prompted.
8. Enter **6**, and then enter your contact name when prompted.
9. Enter **7**, and then enter your phone number when prompted.
10. Enter **8**, and then enter your email address when prompted.
11. Enter **9**, and then enter a brief description of the problem when prompted.
12. Enter **10** and select the option to attach the result log when prompted.
13. Enter **11** and select the option to attach the event log only if requested by HP Support. The event log does not typically need to be sent.
14. Enter **12** and select the option to compress the support ticket files. After all of the above steps have been completed, the screen should look similar to this ***screen shot***.



15. Enter the **send** command to send the support ticket. When the support ticket is being generated and sent, the status bar at the bottom of the screen indicates the progress.

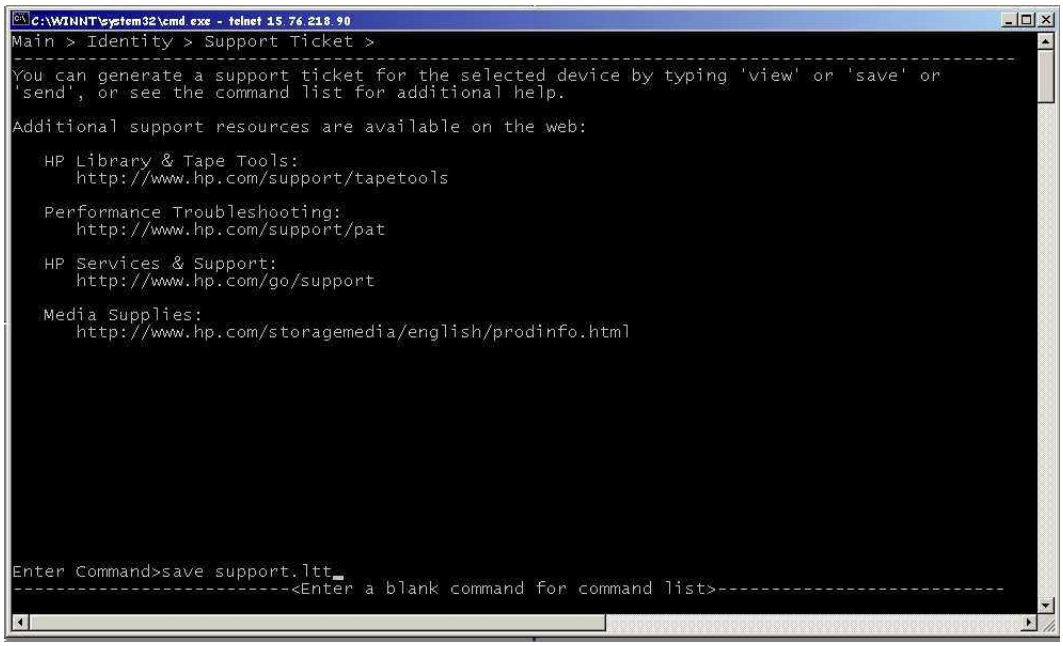
Generating and saving support tickets on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

Note: When generating a support ticket for standalone devices, HP recommends that you keep the media in the drive on which it was present when the failure occurred. This allows error rate and other information relevant to that cartridge to be examined. When media is removed, many devices automatically clear this information. For tape automation products, it is generally better to have the drives empty of media to force the library drive/media log to be updated.

Note: With ESL9000 Series with Command View ESL, ESL E-Series, and EML E-Series libraries, if L&TT is used to generate a support ticket, it will not include the IM and IFC logs. Unless otherwise instructed by HP support personnel, support tickets should be generated using the Command View ESL GUI or CLI, as documented in the *HP StorageWorks Interface Manager and Command View ESL User Guide*, to ensure that all log data is captured. When the libraries are partitioned, extra care should be taken in interpreting support tickets because the values in the logs are based on the actual physical library, not the partitioned library, so drive and slot numbers do not directly match those numbers reported by the backup application.

To generate and save a support ticket on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

1. Navigate to the Support Ticket screen.
2. In the Support Ticket screen, enter **save** and a **name** for the saved file. ***(Show me)***



In the example screen shot, the command **save support.ltt** was entered to generate and save the support ticket with the name *support.ltt.*

3. After you enter the save command, L&TT generates and saves the support ticket. The status area at the bottom of the screen informs you that the support ticket data is being generated.

After the support ticket is saved, you are returned to the command prompt screen.

Printing support tickets on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

Support ticket printing is not supported on non-Windows platforms. To print a support ticket, transfer the file to a Windows system, and then print the ticket. (See Viewing, saving, and printing support tickets on Windows.)

Comparing support tickets on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

Support ticket comparing is not supported on non-Windows platforms. To compare support tickets, transfer the file(s) to a Windows system, and then compare the tickets. (See Comparing support tickets on Windows.)

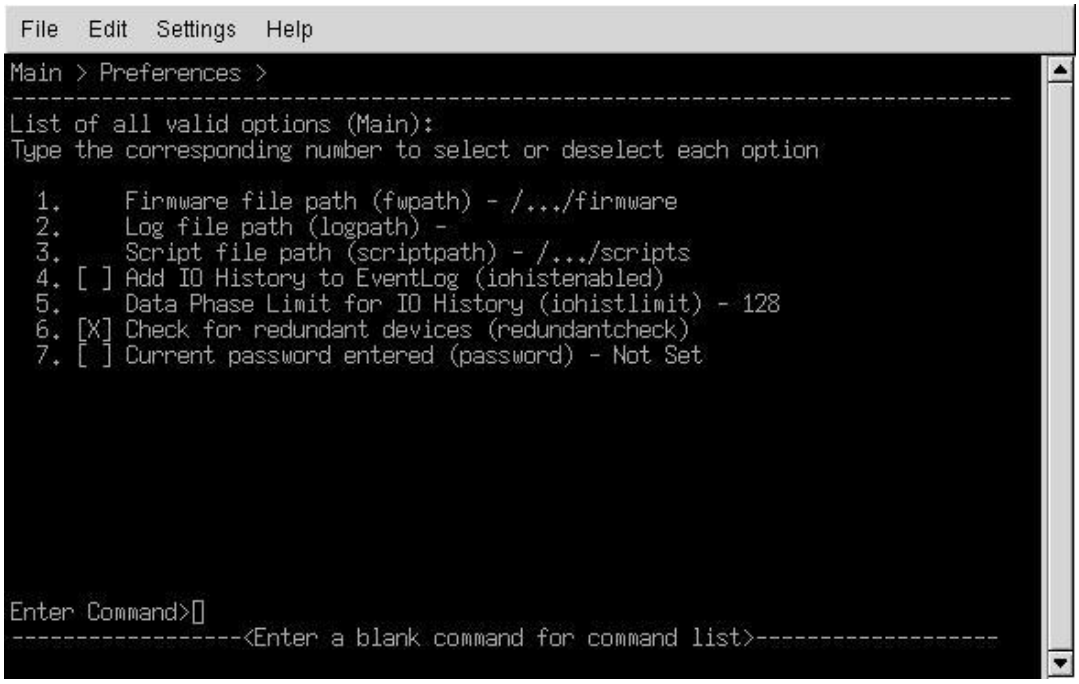
Generating event logs on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

L&TT can generate a detailed event log that captures all L&TT diagnostic interaction with the product, all SCSI commands sent and received by the program, and any software interactions or issues. By default, the event log is not accessible until the factory password has been entered, and is therefore unavailable to end users. Its content is intended for use by L&TT programmers as a tool for debugging software issues within the program itself.

To generate an event log on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

1. Run L&TT.
2. In the L&TT main screen, enter **preferences**.

   The ***Preferences screen*** opens.



3. Enter the number associated with the **Add IO History to Eventlog** option to enable it.

Note: Disable the Add I/O History to Event Log option as soon as you send the email; it can use hundreds of megabytes of disk space. To disable it, return to L&TT Preferences window, and then enter the number associated with the **Add IO History to Eventlog** option.

4. Exit L&TT, and then restart.
5. Reproduce the problem encountered.
6. Navigate to the "/opt/ltt/logs" directory and enter **ls** to locate the *eventlog.ltt* file.
7. Attach the file to an email, and then send to the L&TT team for diagnosis.

Common Questions/Scenarios

Why should I generate and/or email support tickets

Support Ticket Statement: Much of the information stored within the device related to operation characteristics is used by the tests themselves to analyze the health of the device. However, not all information can be used in this automated fashion. Some information requires review by qualified HP personnel to fully diagnose the user situation. It is for this reason a support ticket should be generated and emailed for further analysis when requested.

Support ticket email addresses

Support varies somewhat depending on the region. If you are using a version of L&TT prior to v3.5, do not use the regional email addresses. These address are no longer monitored. Beginning with v3.5, two valid email addresses are offered, both for the North American region.

- LTT North America Support Call Center (for all North America except 3rd party outsourcer use)
- LTT North America Support Call Center 20 (for 3rd party outsourcer use)

Note: Customer support personnel typically provide an email address to users who are emailing a support ticket as a result of a support call request. In this case, the user should enter the email address exactly as provided by the support person. In the European region this will usually be provided in the form: "xxxxxxxxxx@cases.brussels.hp.com" where "xxxxxxxxxx" is the actual assigned case number. This associates the support case number with the support ticket making resolution and tracking more manageable. For more information on support tickets, please see About support tickets.

Why should I install L&TT

Installation Statement: HP StorageWorks L&TT is a robust tape & optical diagnostic utility that helps ensure proper problem diagnosis and installs in just a few minutes.

- I am concerned it may take a long time to install (see HP-UX, Linux, Linux-64, NetWare, OpenVMS, Tru64 UNIX, and Windows).
- I am concerned that if I install it will cause a reboot to occur (see HP-UX, Linux, Linux-64, NetWare, OpenVMS, Tru64 UNIX, and Windows).
- I have previously had a bad experience with an L&TT installation (see HP-UX, Linux, Linux-64, NetWare, OpenVMS, Tru64 UNIX, and Windows).
- My management will not allow me to install applications on the server, or I'm nervous to install L&TT on my server.
- I have an older version of L&TT installed, so why should I update?

Why should I run L&TT tests

L&TT Test Statement: HP StorageWorks L&TT tests are specifically designed to ensure proper diagnosis of user problems with tape and optical devices. The tests interrogate internal drive registers for logged data from normal operations, as well as data-gathering during operations performed by the test. This helps to pinpoint the user problem and prevents a drive swap that won't resolve the issue.

- I am concerned that L&TT tests take too long to run
- I am concerned that L&TT tests never show anything and are a waste of time
- I cannot run tests because L&TT is in restricted mode

I have tape compatibility questions

- I am unclear what data tapes are compatible with my DDS drive

  Note: The recommended media for each type of drive is its native media. For example, DDS-1 media is recommended for DDS-1 drives, DDS-2 media for DDS-2 drives, and so on.

- I am unclear what data tapes are compatible with my DLT drive
- I am unclear what data tapes are compatible with my LTO drive
- I am unclear what data tapes are compatible with my AIT drive
- I am unclear what cleaning tapes are compatible with my drive:
  - DLT
  - LTO
  - DDS: Standard DDS cleaning cartridge is supported.
  - AIT

I have device compatibility/support questions

- What hardware is my drive supported on?
- What software is my drive supported on?
- Is my device supported by L&TT?
- What hardware/software is my library/autoloader supported on?
- Is there a matrix that cross references a drive's product name, format, and part number?

Note: Click here to access general information about tape product compatibility.

I have tape drive cleaning questions

- What are cleaning requirements for my SDLT drive?
- What are cleaning requirements for my DLT or VS80/DLT1 drive?
- What are cleaning requirements for my LTO drive?
- What are the cleaning requirements for my DDS drive?

Note: Click here to access the combined tape cleaning matrix for all tape drive types. In case of any conflicting information, this matrix is the final reference.

Miscellaneous L&TT

L&TT change highlights per version

This section highlights the major changes implemented with each version of L&TT. It is best to always run the latest version possible to take advantage of the latest tests and functionality. If you need information related to installing the latest version, see Installation requirements.

Click on a heading below to view release details:

L&TT Version 3.5 SR1 (released September 2004)

- ***Various test/script enhancements***
  - *Added SDLT Tape Edge Damage (TED) detect test to test for TED in libraries, and the Read SDLT Media IDs test to help locate any cartridges determined to have TED by the TED test or other log entries*
  - ***ESL E-Series library test/script enhancements***
    - *Event text for ESL E-Series libraries now read from firmware instead of shipped with L&TT to improve synchronization with newly released firmware*
    - *Added Device Analysis content for ESL E-Series library*
  - ***Updated LTO Device Analysis test***
    - *Added new rule for detection of stuck tapes*
    - *Where appropriate, updated messaging to recommend HP media, recommend running the LTO Assessment test, and indicate the rule number*
    - *Enhanced interpretation of the Tape Usage log*
    - *Removed firmware revision check (see also LTO Assessment test)*
  - ***Various Acceptance test enhancements***
    - *Renamed Acceptance test family to Assessment test family*
    - *Added 1/8 Autoloader Assessment test*
    - *Updated LTO Assessment test*
    - *Check added to avoid long execution time (end test if first 10 writes exceed two minutes in duration)*
    - *Change made to always report sense data during write errors*
    - *Added firmware revision check test option to accommodate sites having firmware upgrade policies*
    - *Updated SDLT Assessment test*
    - *Removed MAM information which was causing problems and not required for the test*

- *Updated DLT1/VS80 Assessment test*
- *Added support for COMPAQ DLT1 drive*

- ***Removed "Get Files From Web" feature to update L&TT script files***
  - *This function saw low usage and caused problems with script version management. Script updates now distributed as L&TT install bundles only.*
- *Added DLT 7000 support to DLT SRAM Check tests (long and short)*

- ***Fixed several L&TT defects***
  - *Fixed problem where DDS4 support tickets did not report correct OBDR support*
  - ***Fixed various 1/8 autoloader problems with SDLT 320 and Ultrium 460 drives***
    - *Fixed problem where log pages were not properly decoded*
    - *Fixed problem where firmware revisions were not decoded correctly and could become unselectable*
  - *Fixed problem where devices on certain HP-UX HBAs were not recognized by L&TT*
  - *Fixed Assessment test problem where DDS3 drive may fail load sequence*
  - *Fixed Tape Erase test failures where erase pass counter may be incorrect and EOD is incorrectly determined*

L&TT Version 3.5 (released May 2004)

- *Added support for OVMS 7 (Alpha platform), and NetWare 6.5.*
- *Added device support for the UDO drive and libraries, and support for ESL E-Series Tape Library with native FC drives and FC - FC bridge.*
- ***Various test/script enhancements.***
  - *L&TT Install Check functionality now supports SDLT 320 and VS80 drives.*
  - ***Revised Acceptance test (new device support, rules updates, and so on).***
    - *Added support for DDS drives.*
    - *Updated LTO Acceptance test with latest version of LTO Device Analysis rules.*
    - ***Updated SDLT Acceptance test.***
      - *Added library specific messaging.*
      - *Divided write portion of error-rate test into sections to improve test time for poor-performing drives.*
      - *Changed "Drive/Media Interaction test" option name to "Media test," and changed test option messaging.*
  - ***Revised Firmware Tape Creator test (new device support).***

- *Added support for DDS (DDS4 & DAT72 only).*

- ***Revised Device Analysis test (new device support, rules updates, and so on)**.*

  - *Revised order of rule evaluation in DDS Device Analysis test, and added support for fault log error 0x54 for rule U1.*

  - *Added capacity loss rule, and SCSI performance rule to LTO Device Analysis test.*

  - *Updated SDLT Device Analysis test to add output for compression data, and Media ID and clean count information.*

  - *Added UDO Device Analysis test.*

- *Added support for Sony DDS3/DDS4 to Compression test, and improved messaging if compression was disabled prior to running test.*

- *Added secure erase test option to Tape Erase test, and changed messaging to use test options rather than dialog pop-ups.*

- ***Improved performance of L&TT in SAN environments.***

  - *Now saves device scans by default to eliminate the need to scan hardware every time L&TT started.*

  - *Integrates this improved functionality into the user interface for ease of use.*

  - *Can now select more than one device to be scanned.*

- *Tool Status Reports now available for non-Windows platforms, as well as Windows platforms.*

- *Split support tickets now enabled on non-Windows platforms, as well as Windows platforms.*

- *Removed inactive L&TT Call Center e-mail addresses for regions outside North America.*

- ***Fixed several L&TT defects.***

  - *Fixed problem running Library Exerciser test on C7200 library where wrong error message displayed. When drive is full, running Library Exerciser test displays meaningless error message.*

  - *Fixed problem where firmware updates fail on DAT 40x6 autoloader running H310 (or later) firmware.*

  - *Addressed "specified file not found" error running device performance tool on Win9x/ME or other Windows OS running ASPI I/O mode by disabling the test when running in ASPI I/O mode. The performance tool is not supported on Win9x or other Windows OS running ASPI I/O mode due to lack of NT Miniport support.*

  - *Improved messaging implemented in Acceptance test results log to prevent displaying some messages out of order, making it hard to interpret.*

  - *Fixed problem introduced in v3.4 SR1 with DAT72 media displaying as DDS1/60m in DAT72 drive and autoloader.*

  - *Improved error logging/messaging on HP-UX I/O scan when errors occur during scan.*

  - *Fixed problem with Media Analysis test failures with large block sizes. If data block encountered that exceeds OS transfer size, new error message now flags this rather than looking like a test failure.*

  - *Fixed problem on Linux where Get Files From Web would fail if non-standard folder used.*

  - ***Various support ticket related fixes.***

- *Fixed problem introduced in v3.4 SR1 losing "newlines" when saving support ticket attached text logs, making them difficult to read. Problem on ESL, ESL-E with CommandView generated support tickets on Windows.*
- *Fixed Support Ticket Viewer crash problem on split support tickets on Windows after expanding a ticket and clicking on an anchor line for various libraries.*
- *Fixed problem introduced in v3.4 SR1 where Bin Pick and Place retry counts not decoded in support ticket for ESL-E library.*
- *Improved SCSI Cmd history formatting in LTO support ticket.*
- *Fixed problem introduced in v3.2 where support ticket wasn't decoding timestamps in the fault and cmd history logs to the sub-second level for LTO2.*
- *Fixed problem where library support tickets reporting multiple LTO drives contain duplicates of last drive trace logs for all drives.*

L&TT Version 3.4 SR1a (released February 2004)

- *Added support for Red Hat Linux 9.0.*
- *Added device support for ESL E-Series Tape Library, DAT 72x6 autoloader and 1/8 autoloader with SDLT320 drives.*
- ***Various test/script enhancements:***
  - *Improved firmware update message boxes on Windows 2K to set user expectations and give instructions to eliminate the need to call support.*
  - *Updated DDS autoloader rules for correct revdata info and consistent device analysis messaging.*
  - *Miscellaneous compression test changes - Addressed interaction issue with compression test and Windows backup, and eliminated "compression disabled/enabled" messages that occurred during compression test. Also added support for DLT 4000 CPQ DRV and decreased DDS test time.*
  - *Updated DLT drive rules to change compression messaging.*
  - *Updated DLT firmware tape creator test to support DLT 4000 CPQ DRV.*
  - *Revised SDLT acceptance test to add specific messaging for library drives, split write error rate section to provide quicker exit with poor performing drive, and added "drive/media interaction test" option to help determine goodness of drive vs. tape, and help flag tape with edge damage.*
  - *Revised Ultrium acceptance test so that device analysis is run first after initial tape load. Also corrected a capacity loss issue, updated device analysis portion, and added frequent status updates during write section.*
  - *Updated Ultrium drive rules to publish LTO-1 230 SCSI config information in factory-only detail level, and cartridge serial number in "everything" detail level (if cartridge currently loaded).*
- *L&TT Windows installer now requires uninstall of previous version before new install to avoid reliability problems during upgrades. In some rare cases the install may still fail and a separate cleanup utility will need to be run to completely uninstall the old version and allow the new version to be successfully installed. If this occurs, go to the L&TT product page, click the link for the Windows operating system you are running, and then click the "HP StorageWorks Library and Tape Tools Install Support Setup" link to download the hp_ltt_install_support.exe utility. Once downloaded, run this utility to clean up all old install files, then retry the L&TT installation procedure.*
- ***Fixed several L&TT defects:***
  - *Removed Media Validation test whenever Media Analysis test available to eliminate confusion.*

- *Added valid content to System Performance test instructions window.*
- *Support ticket fixes including a change to switch decode of log sense pages based on firmware rev to avoid wrong information in support ticket, a change to fix timestamp information for device analysis history log for LTO, and a fix to handle split support tickets from custom folders.*
- *Added message on firmware update for SSL2020 library to notify that you need to enable firmware update via front panel for revs older than 4.09.*
- *Fixed various L&TT crash problems including 1/8 autoloader when using Manual Product ID on Windows, selecting discovered library that can't be opened, selecting firmware update options on Linux, and crash after running "Media Analysis" or "Read/Write" tests, or generating support tickets on Ultrium 2 SCSI.*
- *Fixed "permission denied" problem on PA-RISC systems preventing L&TT from running.*
- *Fixed "get files from web" problems, including no local firmware files showing on UNIX, unable to update cached revdata files on Windows preventing "Get files from web" from working, and erroneous update prompt for Ultrium EEPROM decoder on Windows, Linux, and HP-UX.*
- *Changed NSR router firmware version decode to hex to handle alpha characters to enable 5.3.0b download.*
- *Fixed L&TT hang with DLT acceptance test during loop 26 on HP-UX and Linux.*
- *Fixed problem in support ticket for Ultrium 230 1/8 autoloader with H43r (and later) firmware where robotics errors would get displayed as "Error Type: Unknown."*

L&TT Version 3.4 (released November 2003)

- *Added device support for Universal VS80 and Autoloader 1/8 with Ultrium-2 drive.*
- *Added new install and performance check functionality for Ultrium-1 and Ultium-2 drives for Windows 2K, XP, and 2003.*
- *Internet connectivity added for Linux and HP-UX so features such as "get files from web" to download scripts and firmware, and the ability to send support tickets via email, are now available for these operating systems.*
- ***Various test/script enhancements:***
  - *Acceptance test is now the default whenever available for the device under test.*
  - *Added second generation test user interface for non-Windows platforms to provide test algorithm parameter options.*
  - *Added MO media validation test, and updated logic and messaging for setting Force Verify on MO Restore Factory Settings test.*
  - *Added tape stress test and acceptance test for Ultrium-1 and Ultium-2.*
  - *Device analysis drive rules improvements for Ultrium, DDS, DLT, MO, and ThinStor LTO 1/8.*
  - *FUP tape generation improvements for DLT products.*
  - *Revised Ultrium tape erase test to add support for DDS, and renamed test "Tape Erase Test."*
- *Support ticket size management enhancements, including support for compression of support tickets, and splitting large library tickets to smaller, separate files to facilitate emailing and analysis.*
- *Added capability to run .ssc script files on non-Windows platforms.*

- *Improved format of Ultrium logs to improve readability.*
- *Improved capability to "skip-scan" on non-Windows platforms.*
- ***Fixed several L&TT defects:***
    - *Performance tool messaging on Windows 9x.*
    - *Library exerciser test timeouts.*
    - *Device analysis test failures on Compaq DLT1, support for blocks >64KB and not being able to identify if latest firmware was present.*
    - *Support ticket generation issues with Ultrium phase 5 FW, DAT 72 drives & MSL with 4.21 firmware. Also added test names to support ticket rather than just numbers (problem was introduced in V3.3).*
    - *L&TT crash fix when 1 or more library drives not recognized during scan (problem was introduced in V3.3).*
    - *TZ89 drives added to FUP creator script.*
    - *Acceptance test failures on non-Windows platforms.*

L&TT Version 3.3 SR1 (released September 2003)

- *Fix for issue on some HP-UX systems where L&TT would fail, referencing a missing liby.2 library file.*
- *Fix for issue on NetWare where NWASPI.CDM would be loaded if available leading to possible server abends.*

L&TT Version 3.3 (released August 2003)

- ***Several platform related changes:***
    - *Added support for Itanium CPU on all HP operating system platforms that support it (Windows Server 2003, HP-UX v11.x, Linux).*
    - *Integrated new I/O layer for NetWare based on Novell's API's rather than the previously used ASPI I/O layer, which improves reliability & discovery of devices.*
    - *HP-UX v10.20 no longer supported beginning with L&TT v3.3.*
    - *Added capability for parallel firmware updates on non-Windows platforms (HP-UX, Linux, and Tru64 UNIX). Windows version has always had this feature.*
    - *Updated InstallShield for Windows for better support of newer Windows versions, and to improve compliance with software installation process required by Microsoft.*
    - *Integrated Skip-Scan function so user can limit scan to single device to avoid problems with other devices particularly in SAN environments.*
    - *Fix for problem on Tru64 UNIX that prevented L&TT from running on systems with older versions of C++ system libraries.*
- ***Several changes related to support tickets:***
    - *Enhancement for easier printing and comparison of support tickets created or viewed on Windows platforms.*
    - *Improved support ticket content for MSL5000 and MSL6000 running v4.18 or later firmware. Log contents now easily located in support ticket viewer with other data.*
    - *Fix for HTML version of support ticket to display ticket identifier.*

- *Fix for C7200 support ticket when fibre board present in library so it won't be truncated.*
- *Improved messaging for issues opening support tickets on Windows platforms.*

- ***Several changes in the test & scripts area:***
  - *Integrated several standalone performance tools into L&TT (HPTapePerf, HPCreateData, HPReadData, and PAT).*
  - *Released 2nd generation test functionality for library exerciser test and read/write test for Windows platforms. This allows the user to modify test parameters via the "Options" button in order to tailor it to a specific situation.*
  - *Fix for TSL-9000 device analysis failure on NetWare due to filename issue of rules file.*
  - *Several enhancements to scripts for SDLT220/320, DLT4000, Ultrium-1 and Ultrium-2, and MO drives.*
  - *Media migration utility has been discontinued with L&TT v3.3.*

- ***Miscellaneous device support changes and fixes:***
  - *Added support for universal VS80 and DDS drives*
  - *Added write back function for Ultrium drives for HP data retrieval & monitoring on returned drives for certain usage parameters (firmware updates, L&TT tests run, and so on).*
  - *Fix so L&TT correctly identifies OBDR support on Ultrium drives.*
  - *New firmware file format to handle SDLT220 requirement for upgrade based on drive serial number. New format will only be used with drives that have a requirement for such complex advance checks.*
  - *Fix to enable front panel function on C6280 autoloader.*
  - *Fix for firmware download hangs for DLT1 on NetWare (fixed with new I/O layer).*

L&TT Version 3.2 SR1 (released June 2003)

- ***Miscellaneous test/script changes:***
  - *Added Acceptance test for VS80.*
  - *Added or enhanced several rules for Ultrium-1 device analysis scripts.*
  - *Updated full sweep test for C7200 and C7145 with firmware v1.60 to write test completion results back into picker assembly to help track usage and test data.*
  - *Fixed problem running device analysis test on Windows with more than one device selected that would give "parser error."*
  - *Fix for problem where device analysis test would falsely prompt for drive exchange on early Ultrium-2 drives.*

- ***Miscellaneous support ticket changes:***
  - *Added log decoding to support ticket for Windows viewer for Ultrium non-volatile EEPROMs.*
  - *Added decoding for C7200 & C7145 event codes 29, 30, and 31.*
  - *Fixed problem where trace banks were not included in Ultrium support tickets in "factory only" detail level.*

- *Added personality code to all DDS firmware files to fix problem where Compaq personality was getting overwritten with SureStore personality on firmware download.*

- *Fixed problem where L&TT was unable to read cartridge memory in drives with pre-released phase 5 firmware by revising command sequence to avoid timing problem.*

L&TT Version 3.2 (released May 2003)

- *Added Linux support (RedHat 7.2, 7.3 & 8.0)*
- ***Added support for various libraries and routers:***
  - *Support added for MSL 6000.*
  - *Support added for ESL 9000 and SSL 1016 with Ultrium-2 SCSI drives.*
  - *Support added for NS 1200-160, NS E1200-160, and NS E2400-160 routers.*
- ***Made several changes related to support tickets:***
  - *Added post decoding capabilities to support tickets (factory use only).*
  - *Changed support tickets saved in command shell to add .ltt extension.*
  - *Added temporary workaround to prevent L&TT hang or other abnormal behavior when reading data or support ticket with Ultrium-1 drives with E33Wor later firmware with cartridge loaded.*
- ***Several test/script changes:***
  - *Added Move Media functionality to Windows and command shell interfaces.*
  - *Added beta version of 2nd generation library exerciser test.*
  - *Added new device analysis script for Ultrium drives including device history log.*
  - *Added full release version of DLT acceptance test.*
  - *Updated Ultrium thermal analysis script.*
  - *Fixed device analysis script for DLT7000 that caused script error on Windows NT/2000 systems.*
  - *Fixed problem where device analysis firmware revision check for Ultrium-1 drives erroneously suggested invalid firmware upgrades.*
  - *Fixed problem where media validation test issued unnecessary unload command to DDS4 autoloaders leaving cartridge in indeterminate state.*
  - *Fixed problem where status after running a 2nd test indicates wrong information.*
  - *Modified DLT FUP creation script to recognize all premerger Compaq drives & support VS80 drives.*
- *Removed dependency on /usr/lib/liby.2 file on HP-UX 11.00 systems that caused L&TT core dump.*
- ***Fixed several L&TT defects:***
  - *Fixed cartridge information screen which showed unknown cartridge type for VS80.*
  - *Fixed L&TT crash caused by catalog file in wrong location.*
  - *Fixed problem where L&TT wouldn't allow AIT firmware upgrade to v3.0G without factory password.*
  - *Fixed problem where drives in autoloaders were not properly associated with autoloaders on Tru64 UNIX.*
  - *Fixed problem where firmware updates would timeout prematurely on Tru64 UNIX.*

- *Fixed problem where L&TT did not discover devices connected via fibre channel HBA on Tru64 UNIX.*

L&TT passwords

A number of tool features are available only when enabled with a password. The password is intended to prevent inexperienced users from accessing functionality that may be particularly harmful to their system if used improperly. These features include:

- **Firmware downgrade:** Lets you downgrade firmware revisions. The device product ID and revision string sequence must match in order for the downgrade to take place
- **Override/update product ID:** Lets you select any firmware file (which matches the same device type) and update the product ID string (for devices which support this capability).
- **Manual product identification:** Lets you override the tool mapping to associate a specific device (independent of Product ID) to a specific device family supported by the tool. This is most often used when the Product ID (SCSI Inquiry) string is incorrect because it has been changed, corrupted, or the device is running on boot code.
- **Factory details:** Lets you select factory details anywhere it is an option. The most common use is in viewing additional device details in the support ticket
- **Advanced scripting:** Disables signature checking and allows you to select "unsupported" devices and run scripts on them.
- **View event log** — Lets you load (and view) an event log.

Note: Two different types of passwords are used in L&TT: Temporary passwords and Support Personnel passwords. Temporary passwords enable users to downgrade firmware, and override/update product ID and manual product identification (mapping override). Support Personnel passwords are for internal hp use only and enable all the above options.

To set passwords on Windows:

Note: Passwords are only available by contacting HP support, and should only be used under the direction of HP support personnel.

1. Select **Options > enable factory overrides**.

   The Factory Password dialog box opens.

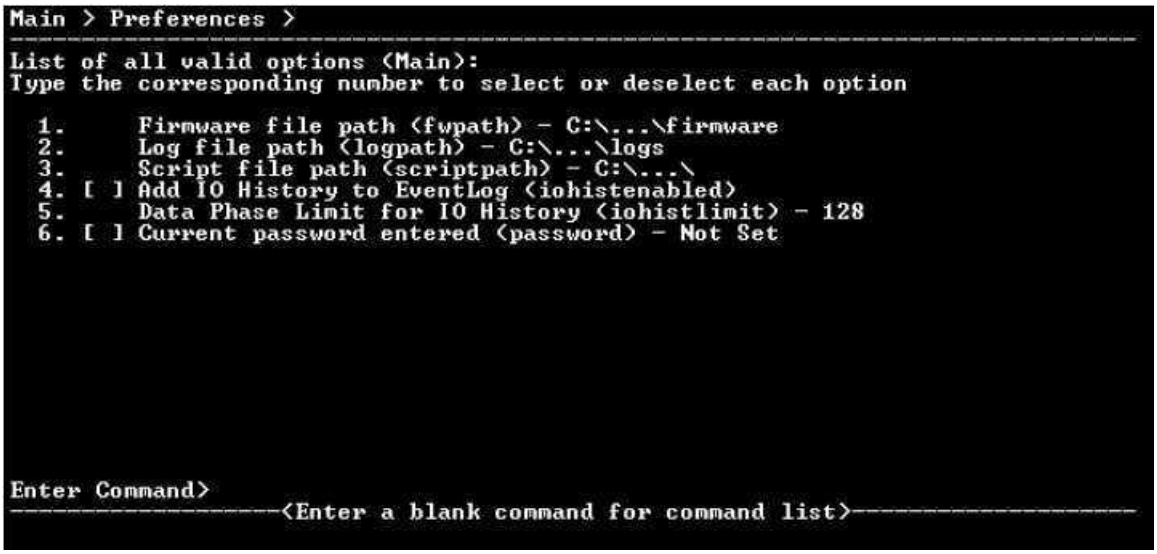
2. Enter the password, and then click **OK**. Assuming the password is valid, you can now access the password-protected functions of L&TT, subject to the above details

To set passwords on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

Note: Passwords are only available by contacting HP support, and should only be used under the direction of HP support personnel.

1. From the main screen, enter the **preferences** command.

   The ***Preferences screen*** opens.



2. Enter **6**.

   L&TT prompts you for the current password.

3. Enter the password.

   If the password is valid, L&TT returns you to the Preferences screen. You are now able to access the password-protected functions of L&TT.

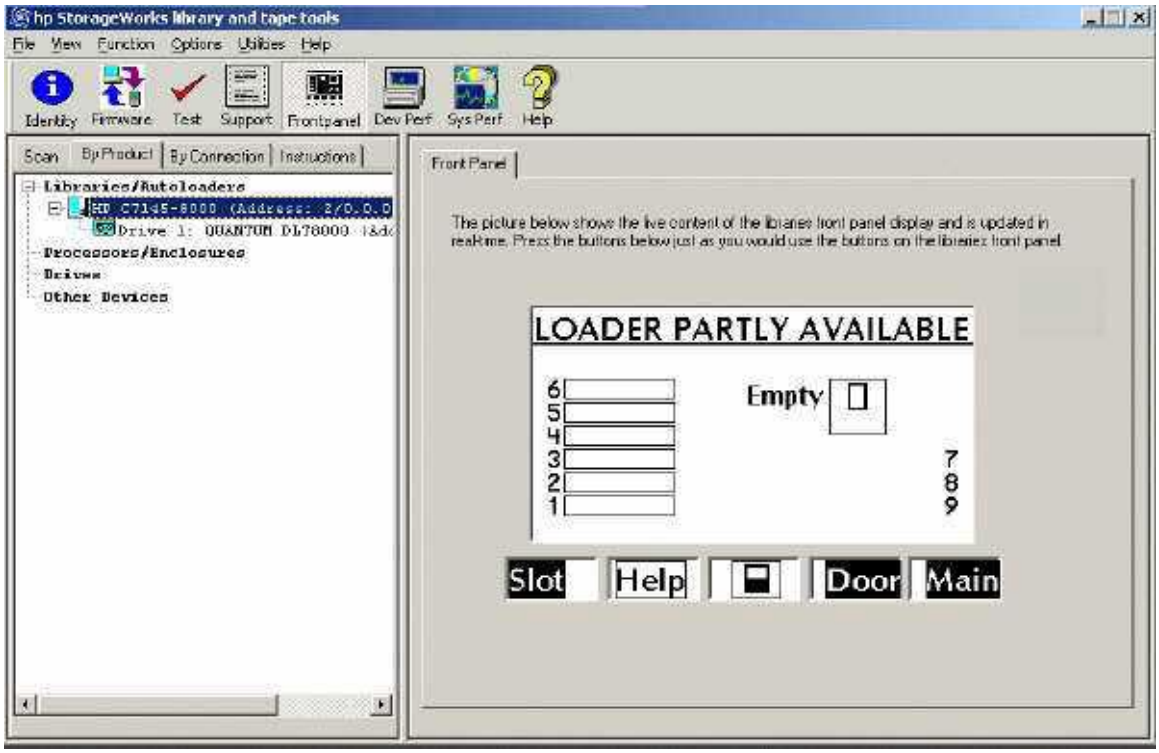
Library Front Panel function

L&TT provides remote control of the front panel of selected library devices. It reads the contents of the front panel at regular intervals and displays the contents of the L&TT window either in graphic or text form. In addition, L&TT displays a representation of the library's front panel buttons. Clicking a button simulates pressing the corresponding button on the library's front panel.

To access the Library Front Panel function:

1. Select the library in the device list, and then click **Frontpanel** on the main toolbar.

   The ***Front Panel window*** opens.



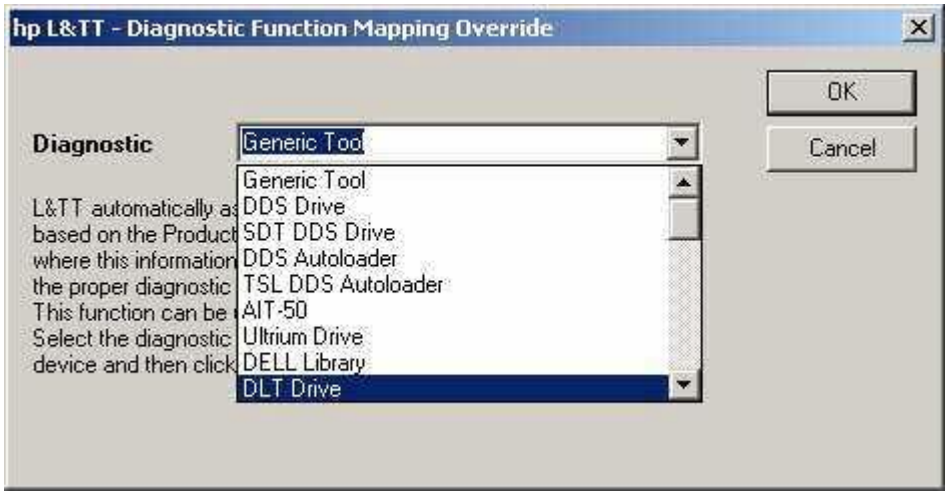
Manual product identification

This feature (which requires a password) allows an arbitrary device to be mapped as a specific device family within L&TT. This is most commonly used when the product ID (SCSI Inquiry string) does not match the string expected by L&TT. The string may have been changed or corrupted, or the product is operating in “boot code” mode. Passwords are only available by contacting HP support, and should only be used under the direction of HP support personnel.

To manually identify a device:

1. Click a product in the device list.
2. Click **Function > Manual Product Identification**.
3. Choose the product family that best matches the selected device ***(show me)***. Click ***here*** to view all product family choices:
    - *Generic Tool*
    - *DDS Drive*
    - *SDT DDS Drive*
    - *DDS Autoloader*
    - *TSL DDS Autoloader*
    - *AIT-50*
    - *Ultrium Drive*
    - *DELL Library*
    - *DLT Drive*
    - *DLT Library*
    - *DLT1 Library*
    - *MO Drive*
    - *MO Library*
    - *STK 9840 Drive*
    - *STK Library*
    - *ESL Library*
    - *Crossroads Bridge*
    - *4Runner Bridge*
    - *Safe-TE Enclosure*
    - *Fibre Channel Interface*
    - *LTO Library*
    - *Neo Series Library*

- *AIT Drive*
- *UHDL Autoloader*
- *TL895 Library*
- *DLT/SDLT/DLT1 Drive*
- *DLT/Ultrium Library*
- *1/8 DLT Autoloader*
- *1/16 DLT Autoloader*
- *1/8 Ultrium Autoloader*
- *AIT Library*
- *AIT Autoloader*
- *MSL Library*
- *TL89x Library*
- *SCSI-FC Bridge*
- *Interface Manager*
- *ESL E-Series*



Note: For L&TT versions prior to v2.7 SR2a, manual product identification (previously called override mapping) was performed by right-clicking the device in the device list and choosing the appropriate product family.

When manual product identification is enabled, L&TT automatically operates in a restricted mode. In this mode, the firmware update options are pre-selected to enable selection of firmware for any product ID; the “Update Product ID” option is also enabled. To update the product ID, select the proper firmware file and click the **Start Update** button.

Move Media function

Most supported libraries and autoloaders support a set of commands for moving media from one location to another within the device. Whenever possible, L&TT takes advantage of this functionality to provide a convenient way to move media within a library or autoloader. This functionality is supported in both Windows and non-Windows configurations.

Windows

On the Windows version of L&TT, the Move Media functionality is incorporated into the Front Panel window.

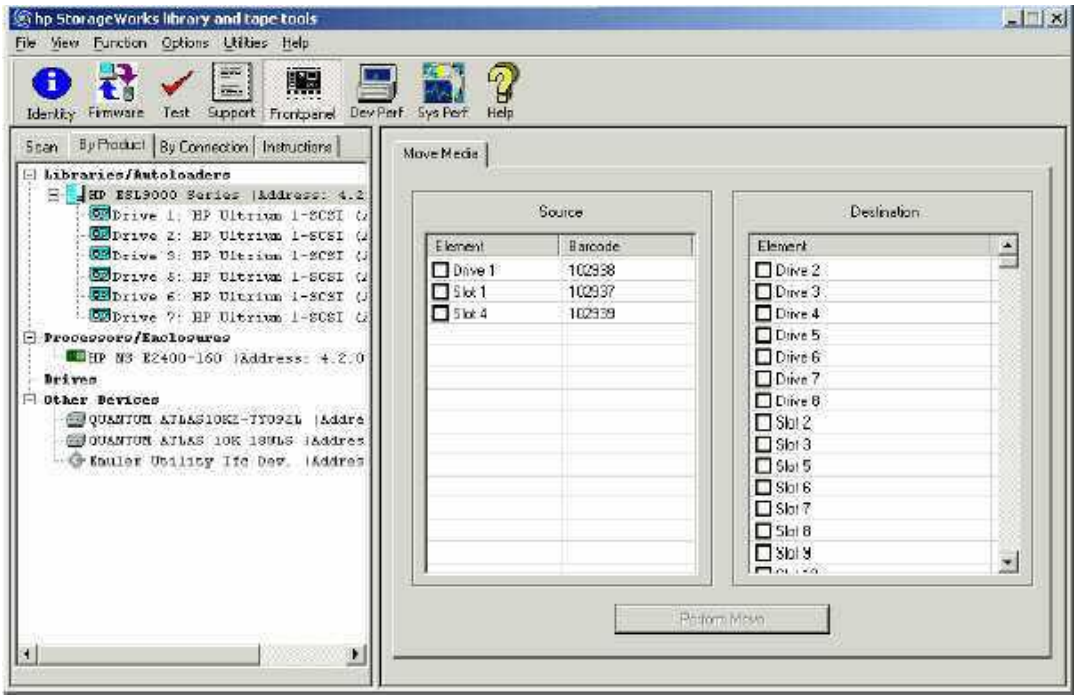
To access the Move Media function on Windows:

1. select a supported library or autoloader from the device list, and then click **Frontpanel** on the main toolbar.

   Note: If both the Move Media and Front Panel functions are dimmed, these functions are not supported for the selected device).

2. In the Front panel window, click the **Move Media** tab.

   The ***Move Media window*** opens. The Move Media window is divided into two sections showing all available source and destination drives, slots, and mailslots.



3. To move media from one location to another, select the desired source and destination locations, and then click **Perform move**.

   Note: You can only move one item at a time, so it is not possible to select multiple source or destination locations. The Perform move button is dimmed until a valid source and destination have been selected.

HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

To access the Move Media function on HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX:

1. In the Device Information screen, enter the movemedia command.

   The Move Media screen is displayed. This screen is identical to the cartridge inventory screen accessed with the inventory command, with the exception of the screen name shown in the top line.

2. Use the ^U and ^D commands to scroll through the list.

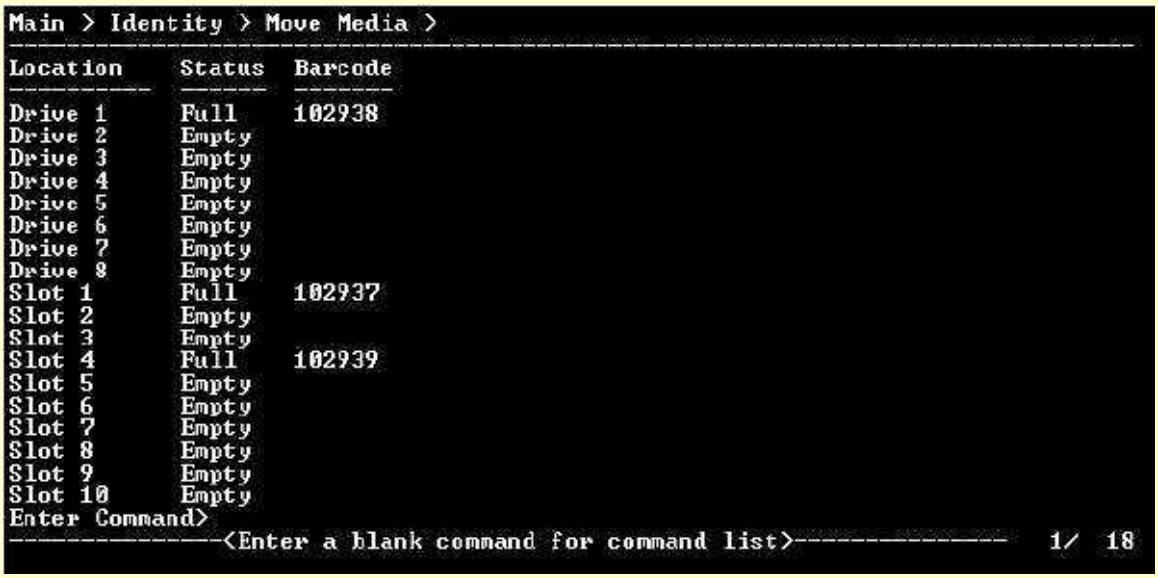
3. To perform the move, use the move command as follows:

   ```
   Move  <source>  <destination>
   ```

   The values used for “source” and “destination” are a combination of the letter “s” for slot, “d” for drive, or “m” for mailslot, and then the number of the device. Observe the following examples:

Example 1:

Observe the following ***Move Media screen*** and note the status of slots 3 and 4.



Now issue the following move media command:

```
move s4  s3
```

If you view the ***Move Media screen*** again, the status of these two slots has changed in accordance with the issued command.

```
Main > Identity > Move Media >
--------------------------------------------------------------------------------
Location     Status   Barcode
----------   ------   -------
Drive 1      Full     102938
Drive 2      Empty
Drive 3      Empty
Drive 4      Empty
Drive 5      Empty
Drive 6      Empty
Drive 7      Empty
Drive 8      Empty
Slot 1       Full     102937
Slot 2       Empty
Slot 3       Full     102939
Slot 4       Empty
Slot 5       Empty
Slot 6       Empty
Slot 7       Empty
Slot 8       Empty
Slot 9       Empty
Slot 10      Empty
Enter Command>_
---------------<Enter a blank command for command list>--------------   1/  18
```

T

Example 2:

If you use the same library as in Example 1, and want to move media from Drive 1 to Mailslot 3, use the following command:

```
move  d1  m3
```

The following ***Move Media screen*** is displayed.

```
Main > Identity > Move Media >
--------------------------------------------------------------------------------
Slot 314     Empty
Slot 315     Empty
Slot 316     Empty
Slot 317     Empty
Slot 318     Empty
Slot 319     Empty
Slot 320     Empty
Slot 321     Empty
Slot 322     Empty
Mailslot 1   Empty
Mailslot 2   Empty
Mailslot 3   Full     n/a
Mailslot 4   Empty
Mailslot 5   Empty
Mailslot 6   Empty
Mailslot 7   Empty
Mailslot 8   Empty


Enter Command>
---------------<Enter a blank command for command list>--------------   18/  18
CTRL-U = pgup, CTRL-D = pgdn
```

Possible Move Media Error Situations

The following errors may be encountered when attempting to move media through L&TT:

Note: these errors are less common with the Windows version of L&TT because the user interface reduces the number of possible error situations

- Source is empty.
- Destination is full.
- Picker is full with some other media.
- Source and destination are the same.
- Invalid arguments were provided (for example, the slot number is too high or no mail slots on the system).
- Slot to slot is not supported with this device (you must move slot to drive or drive to slot).
- Command was acceptable, but there was a SCSI error performing the move. L&TT provides the SCSI error message along with the sense data

Quiet mode

When L&TT is run in Quiet mode, warning and error dialog boxes are not displayed, depending on the quiet mode argument that you specify. Quiet mode has two possible arguments:

- **Warning:** When the warning argument is specified, L&TT does not display any warning dialogs. L&TT assumes a "yes" response to all warning dialogs and proceeds with execution.
- **Error:** When the error argument is specified, L&TT does not display warning or error dialogs. L&TT assumes a "yes" response to all warning and error dialogs and proceeds with execution.

CAUTION: A filing cabinet is a good analogy for a database structure. The file *room* is where all the file cabinets are stored; this to be the **database**. The file cabinets each hold specifically organized information (for example, one cabinet may store employee information, another may house equipment information); these file cabinets are the **tables**. Within each file cabinet, there are file folders, each containing very specific parcels of information (for example, employee resumes or equipment receipts); these are the **fields**. Put it all together and you have the basic structure for a database.

HP Does not recommend using quiet mode unless you are thoroughly familiar and experienced with L&TT. Quiet mode makes using L&TT more convenient by suppressing warning, error, and confirmation dialogs. However, these same warning, error, and confirmation dialogs are intended to provide an extra level of security to prevent you from accidentally doing something that you did not intend to do. Using quiet mode sacrifices this extra level of security for convenience.

To enable Quiet mode:

1. Launch L&TT from a command prompt using the "quietmode=[error|warning]" argument.
   - To launch the Windows version of L&TT with quiet mode enabled, click **start > run** and enter the following into the run dialog box:

```
"C:\Program Files\HP StorageWorks Library and Tape Tools\HP_LTT.exe"  -o
quietmode=[error|warning]
```

Note: Be sure to include the quotation marks as indicated, or the pathname will be invalid.

   - For HP-UX, Linux and Tru64 UNIX, log on as root and execute the following:

```
cd  /opt/ltt
./hp_ltt  -o quietmode=[error|warning]
```

   - For Novell NetWare, execute the following from the server console:

```
hp_ltt\hp_ltt  -o quietmode=[error|warning]
```

   - For OpenVMS, log in as "system," and then execute the following:
     - Navigate to the "[000000.sys0.syscommon.opt.ltt] directory, and then enter the following:

```
"run HP_LTT.EXE  -o quietmode=[error|warning]
```

Restricted mode

When running in restricted mode, only a few L&TT features are available. Running in restricted mode is not a user option, but rather a condition that exists automatically if L&TT recognizes a supported device that has a problem with firmware, and requires a firmware upgrade. There are two basic scenarios that can cause this to happen.

- L&TT recognizes the device, but the device is in "brain dead" mode. This usually indicates that the device firmware is corrupt and the device is responding via boot code only.
- L&TT recognizes the device by means of the product ID code, but L&TT does not recognize the "personality" codes of the device.

Restrictions

If one of these scenarios exist, L&TT displays a message stating that it is running in restricted mode when it is started. The functionality of L&TT is then restricted as follows:

- All features are disabled except for firmware update and support ticket.
- The support ticket shows basic information only and excludes device details.
- For firmware upgrades, L&TT enforces the "allow all files to be selected" option and the Options button is unavailable because all options are preset.

Exiting Restricted Mode

To exit restricted mode, exit and restart L&TT. Please note that L&TT will continue to start in restricted mode until the problem with the offending device is resolved, or the device is disconnected.

One way to get more details about what is causing restricted mode operation is to turn on I/O history, then generate and send the event log to hp support for analysis. If it is suspected that the issue is related to product ID, see also Manual product identification. If it is suspected that the drive is "brain dead" or the firmware is otherwise corrupt, try reflashing drive firmware.

Running L&TT from CD-ROM (Windows only)

If the user insists on not installing L&TT and is running Windows NT or 2000, inform them they can run L&TT from the CD-ROM without reboot, rather than install it on their server.

- If another Windows system is available with a CD burner, install L&TT on that Windows system. Beginning with L&TT v3.5 SR1 you can no longer get script updates from the web. Make sure to install the latest available version of L&TT as well as any pertinent hot fixes or other updates to ensure that you have the latest scripts. You should also obtain any available firmware updates prior to burning the CD-ROM, because you cannot obtain these updates when running from CD-ROM.
- Remove logs directory from L&TT install directory.
- Write content of L&TT install directory to root directory of CD-ROM and close CD-ROM.
- Put CD-ROM into any Windows system and run HP_LTT.exe from the root directory.
- Can also run from CD-ROM on other windows systems, but will need ASPI installed, which will cause a reboot.

Note: Running from CD-ROM is not currently supported on other operating systems.

Note: The "run from CD-ROM" feature does not work with L&TT v3.5. Download and install L&TT 3.5 SR1 to correct this problem.

Support for the L&TT tool

Email support is available from ltt_team@hp.com for the L&TT tool. You can expect a response within 24 hours (usually sooner) during a normal business week. Use this address to obtain support for L&TT, to report bugs, to report any issues with the L&TT web site, or to provide L&TT enhancement suggestions.

The HP L&TT team appreciates feedback on how to make improvements for future versions of L&TT. If submitting information on a problem, please include problem details and L&TT Event Logs in the email message. Click here for information on generating event logs for Windows, and here for information on generating event logs on other supported operating systems.

Note: This address is intended to provide support for L&TT software only. This address is NOT for assistance in troubleshooting hardware products. Users should refer to the documentation that comes with their hardware for support options for that product.

Tool Status Report

The Tool Status Report (TSR) is a feature of L&TT that is used to help understand and debug problems with the L&TT tool. Contents of the TSR include configuration info, stack trace, other system info, and so on. It is automatically generated any time the L&TT application is unexpectedly shut down, but can also be manually generated if necessary to get more information about system config, and so on.

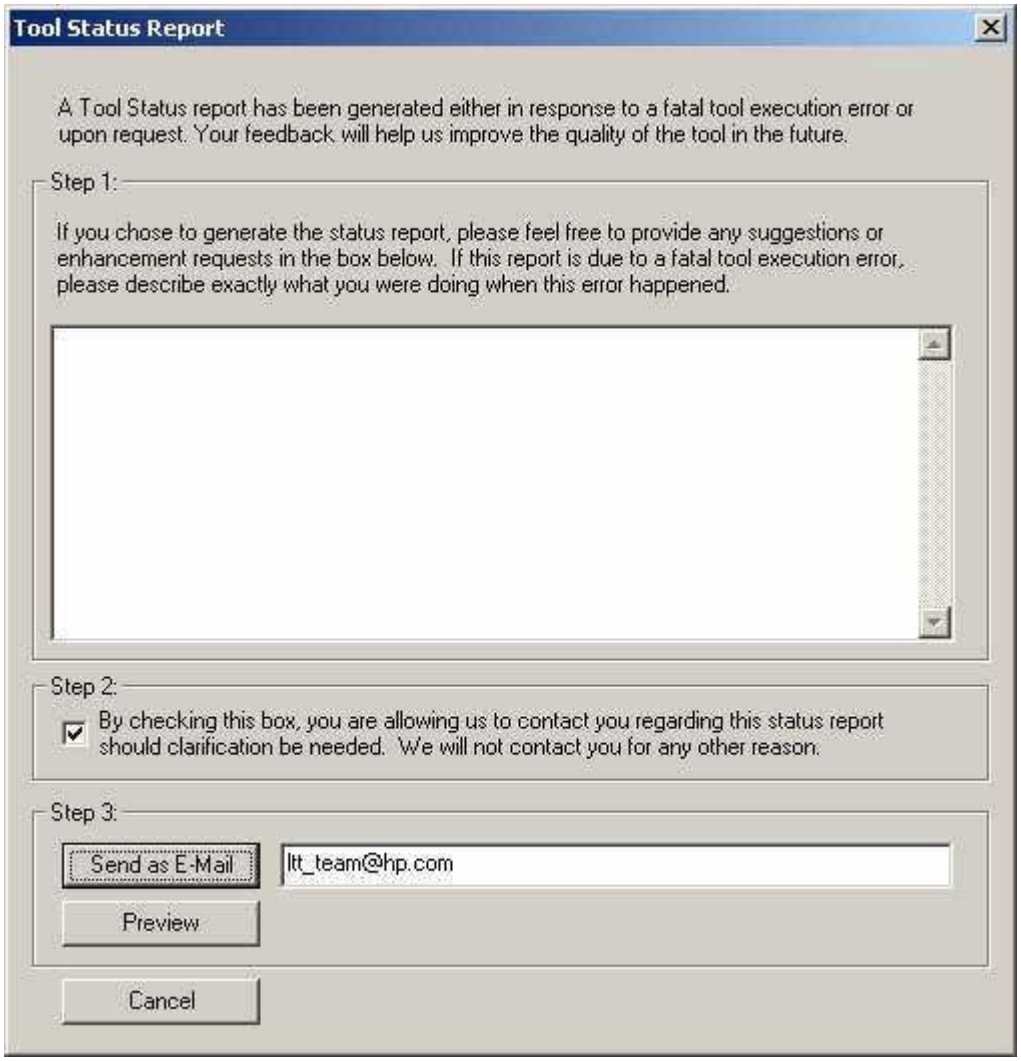
The only difference in the contents of manually-generated and automatically-generated reports is that the manually generated report contains no stack trace (at the time of generation) or register values. The TSR feature is supported on Windows and non-Windows platforms.

Windows

To manually generate a Tool Status Report on Windows:

1. From the L&TT main window, click **Help > Tool Status Report**.

   The ***Tool Status Report window*** opens.



   b. **Step 1:** Enter any details that may help the L&TT team.

c. **Step 2:** Click the check box to allow the L&TT team to contact you if they need further details. They will not contact you for any other reason.

d. **Step 3:** Click the **Send as E-Mail** button to send to the default L&TT team address, unless otherwise directed by HP support personnel. If you want to view the report prior to emailing it, click the **Preview** button before clicking **Send**.

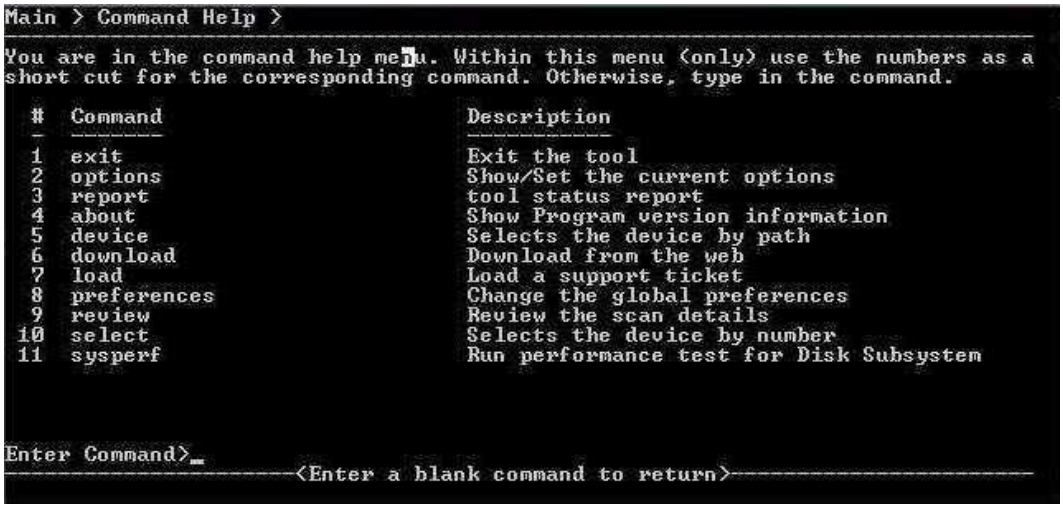
Note: Before L&TT can email a TSR, you must either have a MAPI-compliant e-mail program (such as Microsoft Outlook or Outlook Express), or you must set up an email account through the Windows Control Panel or Internet Explorer. For more information about setting up an email account, see To set up an email account on Windows.

2. If for some reason you decide not to send the report, click **Cancel** to return to the L&TT main screen.

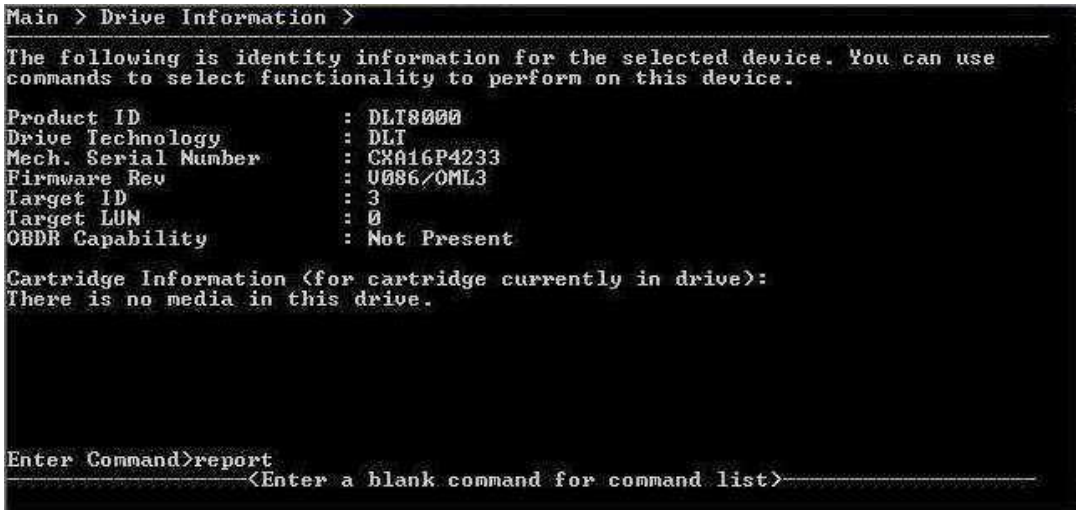
HP-UX, Linux, NetWare, OpenVMS, or Tru64 UNIX

To manually generate a Tool Status Report on HP-UX, Linux, NetWare, OpenVMS, or Tru 64 UNIX:

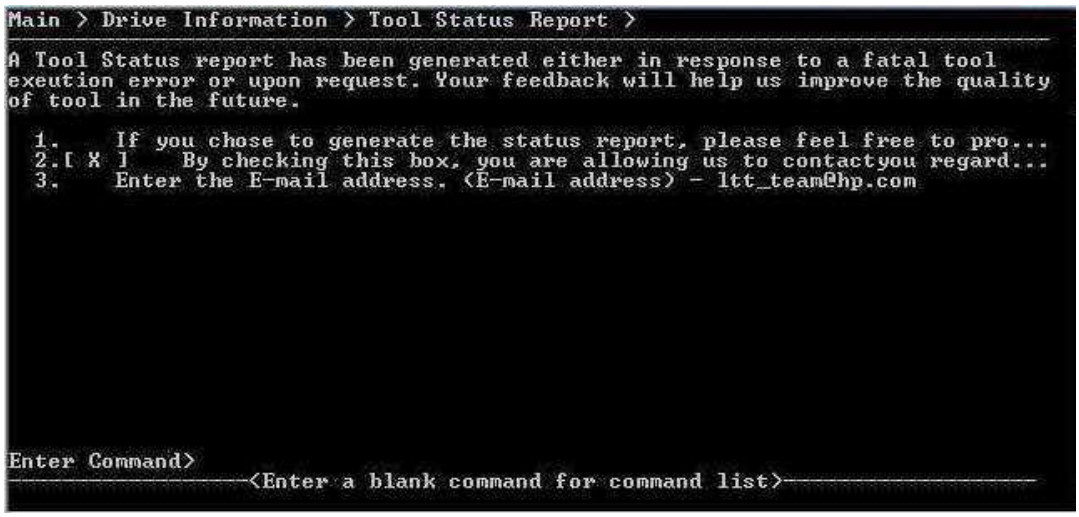
1. In the L&TT Main screen, enter the **report** command or press **Enter** to launch the ***Command Help*** screen (showing all available commands), and then enter the **report** command from there.



Note: You can also enter the **report** command from the Device Identity or Device Information screens (***show me***).

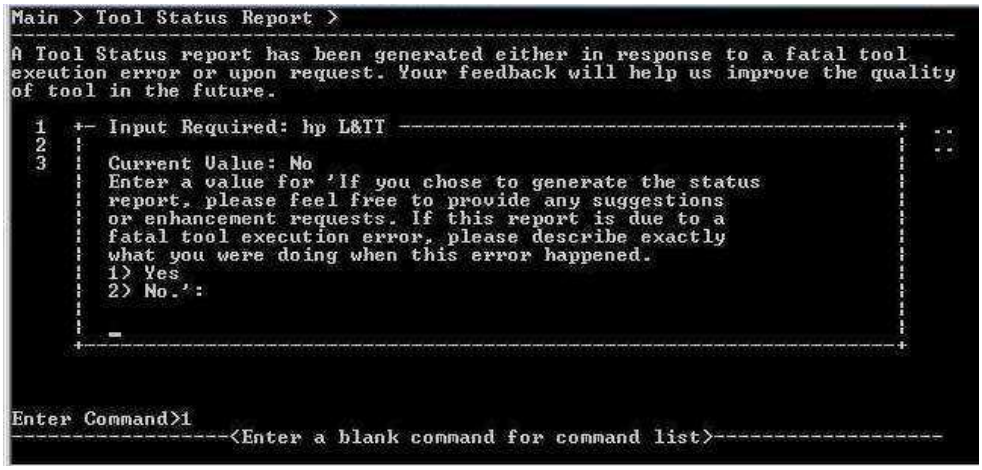


This generates a TSR and displays the ***Tool Status Report screen***.

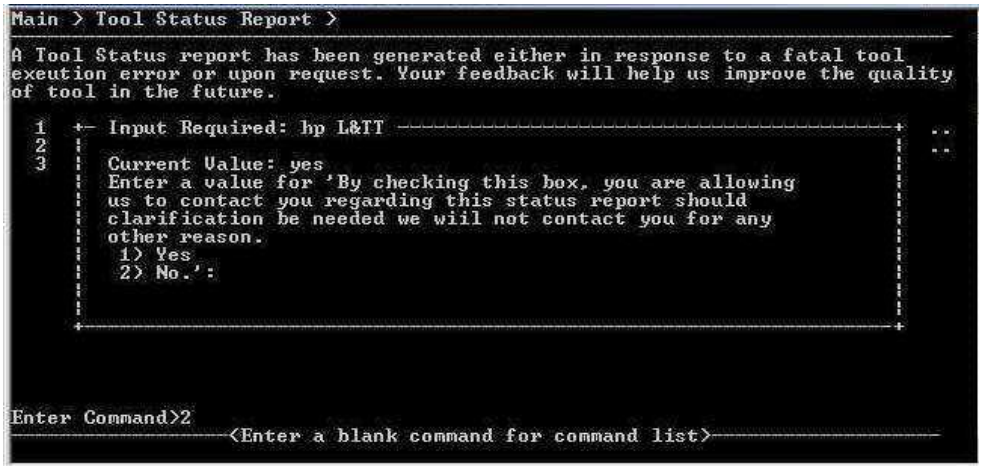


2. Complete the items in the Tool Status Report screen:

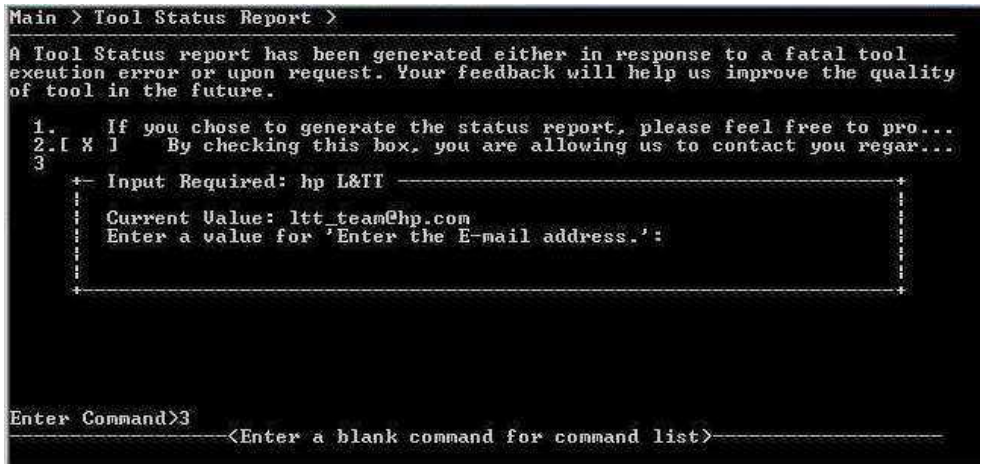
   - Enter **1** if you want to enter additional details to the L&TT support team. After entering 1, a ***new screen*** opens containing the entire text string for option 1, as well as an option to enter text by typing **yes** or **no**.



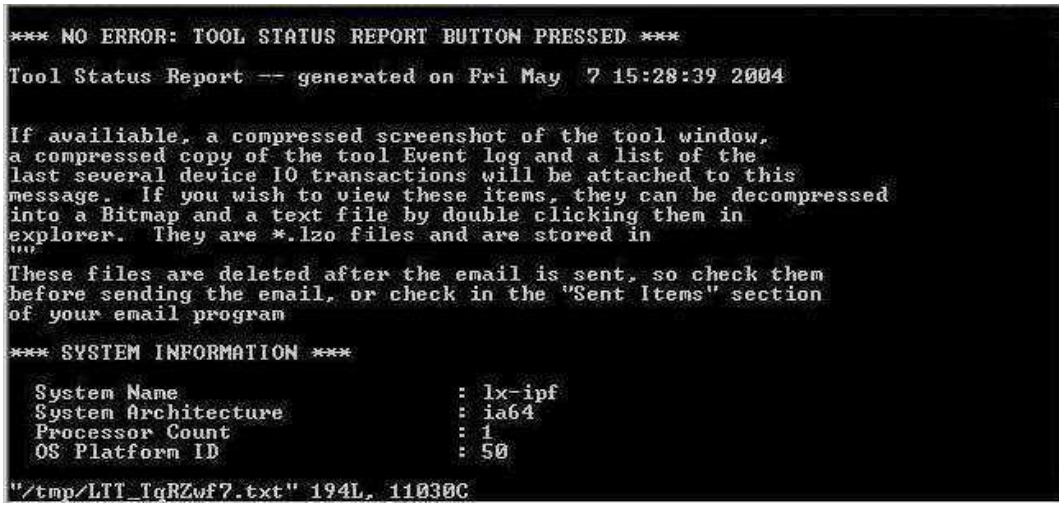
- Enter **2** if you want to allow the L&TT support team to contact you if they need further details. After entering 2, a ***new screen*** opens containing the entire text string for option 2, as well as an option to give permission (**yes**) or not (**no**) to contact you. The L&TT support team will not contact you for any other purpose than to get more information on the report.



- Enter **3** if you want to send the status report to an email address other than the default L&TT support team address (ltt_team@hp.com) (***show me***). Use the default address unless otherwise instructed by HP support personnel.



3. To view the report prior to emailing it, enter the ***Preview*** *command*. When previewed, the Tool Status Report is opened in the "vi" editor so it can be edited with normal commands of "vi," if necessary.



4. To send the TSR via email, return to the previous TSR screen and enter **sende-mail**. This sends the TSR to the default email address of ltt_team@hp.com (unless you have previously changed it). After the email has been sent, the device identity screen appears once again.

5. As you can see, this TSR was not generated as a result of an L&TT crash as indicated by the "no error" text in the TSR heading.

Miscellaneous Information

Backup software support links

Click the links below to view support information for the various backup software applications. The main application support web site is provided for each of the applications, along with links to some specific known application issues, when available.

Veritas (Backup Exec and Netbackup)

- *general support @www.veritas.com/support*
- *specific issue information:*
  - *CRC errors with Backup Exec*

Computer Associates (ARCserve/Brightstor)

- *general support @www.ca.com/support*
- *specific issue information:*
  - ***Poor backup performance with HP DLT VS80 and Brightstor v11***

    If backups are very slow and the hardware and media is believed to be ok, try the following to improve backup performance:

    - *Stop the "CA Brightstor Tape Engine" service and locate the following registry folder using Regedt32.exe:*

      ```
      HKLM/Software/Computer Associates/Brightstor ARCserve
      Backup/Base/TapeEngine/DEVICE#/
      ```

    - *Look at the Info value for the device# that corresponds with your DLT drive, then ADD DWORD value*

      ```
      data type=Reg_Dword
      valuename=DefaultBlockFactor
      data=7, HEX
      ```

    - *Restart the "CA Brightstor Tape Engine" service. File backup should now be much faster.*

Legato (NetWorker)

- *general support @www.legato.com/support*
- *specific issue information:*
  - *If links to information are determined in the future, they will be provided in a subsequent release of the support guide.*

Yosemite (Tapeware)

- *general support @www.tapeware.com/support*
- *specific issue information:*
  - *If links to information are determined in the future, they will be provided in a subsequent release of the support guide.*

Tivoli

- *general support @www.tivoli.com/support*
- *specific issue information:*
  - *If links to information are determined in the future, they will be provided in a subsequent release of the support guide.*

NovaStor (Novaback)

- *general support @www.novastor.com/techsupt.html*
- *specific issue information:*
  - *If links to information are determined in the future, they will be provided in a subsequent release of the support guide.*

HP Data Protector

- *General support @ http://www.hp.com/cgi-bin/hpsupport/index.pl*
- *Specific issue information*

Device-specific information

Product-specific information links are occasionally changed or removed, so to avoid broken links, no product-specific links are provided here. For online documents that contain information pertaining to specific products, go to www.hp.com and navigate to the support page for the product.

Attention UDO users running HP-UX: The UDO drive (AA961A) reports a blank check condition when attempting to read blank sectors. The HP-UX file system does not know how to respond to a blank check condition. As a result, any attempt to perform a "newfs" on a new piece of UDO media results in an error message ("mkfs failed"). To resolve this issue, a script is available to revise the UDO mode page. To obtain this script, contact the L&TT team at ltt_team@hp.com. After this script (UDO_Blank_Config.tst) has been run, the UDO drive no longer reports a blank check condition when attempting to read blank sectors, but it will return the data as being all zeroes for the blank sector.

Note: This script should only be used on HP-UX file systems in which native file system support will be used. Do not run the script if the UDO drive will be run with ISV software because it is likely to cause that software to fail. This issue is applicable to R/W media only (WORM media is not impacted). The UDO drive must be empty when the script is run (the script issues a prompt to remind you). Settings resulting from running the script are retained unless the page is explicitly reset via the "Reset factory settings test."

Miscellaneous useful links

- Product bulletin web site link

Miscellaneous Windows links

- Tape Drive Detection and Other Considerations in Windows NT 4 and 2000 operating systems

Miscellaneous product troubleshooting reference information

External interactive troubleshooting content:

- Ultrium 215
- Ultrium 230
- Ultrium 460
- DAT 8, DAT 24, DAT 40 & DAT 72
- DAT autoloaders
- SDLT 220/320

Other miscellaneous product troubleshooting information:

For online documents that contain information that may be helpful in troubleshooting problems with a particular product, go to www.hp.com and follow the links for your specific product.

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