hp StorageWorks Library and Tape Tools

Getting Started Guide

About This Guide

This Getting Started Guide is intended as an overview of installation and basic usage for HP StorageWorks Library and Tape Tools (L&TT). For detailed information on any procedure, refer to the user guide or online help.

The Microsoft® Windows® version of L&TT uses a graphical user interface (**GUI**), whereas the NetWare, HP-UX, Tru64, and Linux versions of the program use a command screen interface (**CSI**). Click the appropriate bookmark in the left panel to display the section of this guide that corresponds to your operating environment.

Supported Products and Operating Systems

For a complete listing of compatible products, refer to the HP Library and Tape Tools Compatibility Matrix found at:

http://www.hp.com/support/lttcompatibility

Finding Additional Information

The HP website provides the current version of L&TT for download, and general information about the tool. Access the website at:

http://www.hp.com/support/tapetools

You can quickly access this website by clicking the **L&TT Support** link in the navigation bar from any page in this Getting Started Guide.

Getting Support

E-mail support is available from ltt_team@hp.com. You should expect a response within 48 hours (usually sooner) during a normal business week.

Use this address to obtain support for L&TT, to report bugs, to provide feedback on this manual, to report any issues with the L&TT website, or to provide enhancement suggestions. HP appreciates feedback on how to make improvements for future versions of L&TT.

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

Installing L&TT for Windows

The Windows version of L&TT uses the InstallShield application. InstallShield lets you choose the installation directory and select other options. It also sets up shortcuts to launch the application in the Start menu and on the desktop. The Start menu shortcuts also provide access to the online help, the *readme* file, the report viewer, and the uninstaller.

Installation Procedure

To install the Windows version of L&TT:

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 Wizard** screen is displayed.
3. Click **Next**. Read the program license agreement. If you agree to the terms, select **I accept the terms in the license agreement** and click **Next >**. The **Customer Information** screen is displayed.
4. Enter your customer information and click **Next**. The **Setup Type** screen is displayed.
5. Select the desired setup type.

IMPORTANT: Windows 9x users must select the "Custom" type and select the ASPI component for installation. This component is required for Windows 9x installations, but it is not automatically installed, and it is not installed with the "Typical" setup type.

If you select "Custom," you can specify the installation directory along with other installation options. Windows NT 4.0, 2000, and XP users can optionally install Advanced SCSI Programming Interface (ASPI) support. With Windows 9*x* installations, the ASPI component is required and must be manually selected using the Custom setup type. Unless you are using Windows 9x, HP recommends that you not install ASPI support. ASPI support is beneficial, however, 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.

After selecting the setup type and appropriate options, click **Next**.

6. On the **Ready to Install the Program** screen, click **Install**. If you need to review or change installation settings, click **Back**.
7. When installation is complete, click **Finish** to close the InstallShield wizard.

Note: Under some circumstances, the installation process requires a reboot of the system. For more information, refer to the user guide or the online help.

GUI Starting L&TT

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 StorageWorks Library and Tape Tools**

GUI Using the Splash Screen

When L&TT is started, the splash screen opens. The splash screen gives you the opportunity to exit the application before any SCSI bus activity has taken place. This feature lets you exit the application if it was started unintentionally. This prevents the program from interfering with any backup or other storage applications that may currently be running.

The splash screen also allows you to select the SCSI I/O mode (if more than one option is available). If you are installing a hardware device, the **Installation Check** feature displays an HTML help screen that provides instruction on common setup and device verification steps.

I/O Mode

L&TT selects the input/output (I/O) mode that is most appropriate for the system it is running on. However, this initial screen allows for manual selection of the I/O mode in certain cases. L&TT currently operates in the following two I/O modes:

- **NT Miniport** uses an interface that is native to Windows NT 4.0, 2000, XP, and .NET. This is the preferred I/O mode on systems where it is 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 can make a device accessible.

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

- **ASPI** 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. It may require the installation or update of additional OS components, possibly requiring a reboot of the system during installation.

For information about other functionality of the splash screen, refer to the user guide or online help.

GUI Application Window Layout

After the I/O mode is selected, click **Continue** on the splash screen. The L&TT main screen is displayed. Figure 1 shows the L&TT main screen divided into three sections.
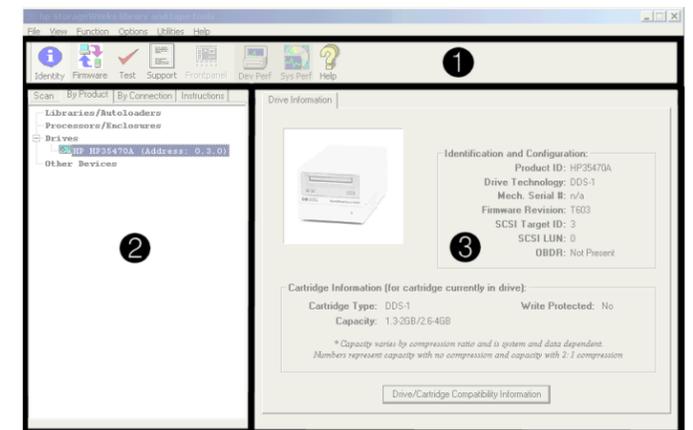

Figure 1: L&TT main screen

The three sections of the L&TT main screen are:

1. **Taskbar** contains buttons that provide quick access to the main functions of L&TT and to the online help system.

   Note: Above the Taskbar is the standard Windows menu bar that provides alternate navigation to tool functions, as well as access to a number of other features.

2. **Device List** is a multi-function window that offers several options on the following tabs:

   - **Scan** provides either a summary status or detailed information (depending on whether **Show Details** or **Hide Details** is selected) about the bus scanning process. If a problem is encountered during the scan, this information may help in determining the cause. When the scan completes successfully, the device list automatically switches to the **By Product** tab.

     The **Scan** tab also lets you rescan the bus. If any devices have been hot-swapped or powered on after the OS has booted, in most cases, the rescan feature can discover those devices without requiring a reboot of the system.

   Caution: Swapping SCSI devices, including connecting and disconnecting cables and/or terminators, can cause the system to hang or crash.

   Caution: On Windows NT 4.0, 2000, XP, and .NET, changing devices at a specific SCSI address can cause unpredictable behavior. Parts of the operating system may not detect that the device or device type has changed.

   - **By Product** shows a list of all the products connected to the system. The list is grouped into the following four categories:
     — Libraries and autoloaders
     — Drives
     — Enclosures and processors
     — Other devices

     The three number fields listed after the device represent the device address. Each field in the address is separated by a period: the first field represents the HBA channel, the second field represents the SCSI ID, and the third field represents the LUN.

     Note: When using the Miniport I/O mode, the HBA channel field is shown as "A/B," where A is the channel and B is the subchannel.

- **By Connection** shows all products connected to the system, grouped by the HBA they are connected to. This view makes it easy to see which devices are connected to the same bus as the device in question, and may help in understanding system I/O performance issues.
- **Instructions** contains brief instructions on how to use the selected screen. This view can be disabled in the software preferences.

3. **Device Information screen**—All the main functions of the program are displayed in this window. The content of this window depends on the device and tool function selected.

GUI Using the Device Information Screen

When you select a product from the device list, the **Device Information** screen displays information relevant to the device. The device list also changes to display instructions on this page (if the instructions preference is enabled). If another tool function is currently active, then clicking the **Identity** button on the toolbar opens the **Device Information** screen. The **Device Information** screen provides an overview of the selected hardware device and its current configuration and status.

When a standalone device is selected in the Device List, the **Device Information** screen contains a single tab labeled **Drive Information**. When a library or autoloader is selected in the device list, the **Device Information** screen displays two tabs: one for library information and one for the drives contained within the library.

To see information for the drives within the library, select the **Drive Information** tab. This tab displays a screen very similar to the one for standalone products, with the addition of the **Selected Drive** dropdown menu.

Because a library can contain multiple drives, you can select and view information for each drive using the **Selected Drive** dropdown menu. All of the drives in the library are available in the dropdown menu.

Note: Selecting individual drives within a library from the By Product/By Connection device list displays the drive as though it were a standalone product. The recommended method of diagnosing embedded drives is to first select the library they belong to, and then select the specific drive within each tool window.

GUI Support Ticket Generation

A major feature of HP StorageWorks Library and Tape Tools is the ability to generate a support ticket. In the event of a hardware problem, a support ticket can provide vital information to help in diagnosing and resolving the problem.

Accessing the Support Screen

To open the **Support** screen:

1. Click a device in the device list (**By Product** or **By Connection** tab) to select it.
2. Click the **Support** button on the main toolbar to display the **Support** screen.

Generating a Support Ticket

The **Support** screen presents three options for generating a support ticket. Each of the following three options has a corresponding button in the **Generate Support Ticket** section of the screen.

- **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 e-mail. For more information, see *Viewing a Support Ticket*.
- **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 e-mail. To view a saved support ticket, open it through Windows Explorer, or use the **Load** command on the **File** menu.
- **Send Support Ticket by E-mail**—Click this button to generate the support ticket and immediately send it via e-mail to an HP support center (or other destination). Clicking this button opens a form for

you to provide all the necessary information. Complete the form and click the **Send** button to send the e-mail. Using this option does not save a copy of the support ticket locally, so you are advised to click **Save Support Ticket to File** to save a copy for your own reference. For more information, see *Sending a Support Ticket by E-mail*.

Viewing a Support Ticket

After a support ticket is generated, it is displayed in the support ticket viewer. This viewer is built into the L&TT program. Information is displayed in a standard tree-view format. Click "+" and "–" to expand and collapse sections of the support ticket. Use the standard navigation keys (**Home**, **End**, **Page Up**, **Page Down**, and the arrow keys) and the Windows scroll bars to navigate through the document.

Using the Tabular View

Items in the support ticket that are preceded with the Tabular View icon ([icon]) have additional information that can be displayed in Tabular View. To view the additional information in Tabular View, click the icon. One of the following occurs:

- If only one view is available for the item you clicked, then a Tabular View window immediately opens.
- If more than one view is available for the item you clicked, a shortcut menu is displayed. Select the desired option and click **OK**. The Tabular View window opens.

The Tabular View window supports the following operations:

- **Sorting columns**—Click a column header to sort by that column. Repeatedly clicking the same column header toggles between ascending and descending sort order.
- **Filtering columns**—Right-click a column header and choose **Filter** from the context menu to filter a column. A dialog box prompts you for the filter value. Enter a value and click **Filter**. To remove the filter, right-click the column header again and choose **Clear Filter** from the context menu.
- **Exporting data**—The Tabular View data can be exported as a CSV (comma separated value) file. A CSV file is a text file in which values are separated by a comma (or other specified separator). Data in a CSV file can be imported by a variety of popular spreadsheet and database applications such as Microsoft Excel and Access. To export Tabular View data to a CSV file, choose **Export** from the **File** menu. Enter the path and filename for the CSV file in the dialog box and click **Save**.

Setting the Detail Level

The support ticket can display information in several different levels of detail, depending on the setting displayed in the **Current Detail Level** dropdown box. The following detail level settings are available:

- Highlights only
- Normal
- More detail
- Everything (the highest level the end user can view)
- Factory only (requires a factory password)

For more information about the information reported on a support ticket, refer to the user guide or online help.

Sending a Support Ticket by E-mail

From the **Support** screen, click **Send Support Ticket by E-mail** to generate the support ticket and immediately send it via e-mail to an HP support center (or other destination). When you click **Send Support Ticket by E-mail**, the **E-mail Support Ticket** dialog box is displayed.

Before L&TT can e-mail a support ticket, you must either have a MAPI-compliant e-mail program (such as Microsoft Outlook or Outlook Express), or you must set up an e-mail account using the Windows Control Panel or Internet Explorer. For more information about setting up an e-mail account, refer to the user guide or online help.

The **E-mail Support Ticket** dialog box is divided into three steps:

1. In **Step 1**, indicate whether this is a new support request or an existing case.

- If this is a new support request, select the **Send to support provider to request support by e-mail** option (this option is the default). Enter the product number and product serial number in the appropriate fields.
- If this is an ongoing support case, select the **Send to support provider in reference to an open case** option and enter the case reference number in the appropriate field.

2. In **Step 2**, enter the destination e-mail address. Use the dropdown box to select from a list of HP support providers, or enter the e-mail address manually.

3. In **Step 3**, specify the following additional information:

- **Contact information**—Enter your company name, contact name, contact phone, and contact e-mail address.
- **Attach Result Log**—Select this option to attach the support ticket to the e-mail for analysis by HP service personnel.
- **Attach additional Event Log (only if requested)**—Select this option if you have been requested by HP service personnel to send the event log. For more information about using the event log, refer to the user guide or online help.
- **Problem description**—Enter a detailed description of the problem you are having.

When you have completed the form, click **Send**.

GUI Firmware Management

The Firmware Management functionality of L&TT provides a convenient way to easily upgrade the firmware of connected devices. Library firmware and firmware of drives within the libraries can be upgraded as well. In many cases, multiple drives within the library can be updated simultaneously to save time.

L&TT uses special firmware files that associate the firmware with a particular product. This feature prevents the user from downloading the wrong image and ensures that the downloaded firmware is the same as or a newer revision than the current device firmware.

Accessing the Firmware Management Screen

To access the **Firmware Management** screen, click the device you want to update in the device list, then click the **Firmware** button on the main toolbar.

Acquiring Firmware Files

L&TT firmware files are stored in the `Firmware` directory. This directory is a subdirectory of the `HP Library & Tape Tools` installation directory. Before upgrading any firmware, you must acquire the firmware image file or files and copy them to the `Firmware` directory. Firmware files can be obtained in three ways:

1. Select the device in the device listing and click the **Firmware** button on the main toolbar. On the **Firmware** screen, click the **Local Files** tab, and then click the **Get Files from Web** button at the bottom of the tab. The downloaded files are automatically placed in the `Firmware` directory.

2. From the L&TT menu bar, select **Get Files From Web** from the **File** menu. The software links to the L&TT firmware ftp site and lets you select firmware files to copy to your system. Downloaded files are automatically placed in the `Firmware` directory. This option is explained in detail in the following section.

3. Go to www.hp.com/support, choose the product family, then click **software updates and drivers**. The latest firmware file is available in L&TT format. For some products (such as standalone drives), firmware is available as a single file. For other products (such as tape libraries), the firmware is available in a self-extracting bundle that includes library and drive firmware.

Note: Do not use the **Get Firmware From Web** functionality within L&TT without an Internet connection. Doing so can cause the system to lock up until it has timed out in the operating system. This timeout value is operating system-specific.

Note: If **Check for Updates on Web** is enabled in the tool preferences, L&TT automatically informs the user when new firmware is available for any of the connected storage products. L&TT performs this check each time it is started (but not more than once per 24-hour period).

Using the Get Files from Web Functionality

The Windows version of L&TT offers comprehensive firmware management functionality that finds and downloads firmware from the HP website. This functionality obtains the most up-to-date information about all available firmware files directly from the HP website. It then compares this data set to the list of devices connected to the system and the current firmware revisions present in those devices. Depending on the selected filter options on the top of the screen, different subsets of firmware files are presented. Firmware files that are needed to bring the connected devices up to the latest firmware revisions are automatically selected.

Note: L&TT scripts are also obtained using the **Get Files from Web** dialog box. For more information on scripts, refer to the user guide or online help.

Accessing the Get Files from Web Dialog Box

You can access the **Get Files from Web** dialog box in two ways:

- Select **Get Files from Web** from the **File** menu

- or -

- Click the **Get Firmware** button on the **Firmware Update** screen

The **Get Files from Web** dialog box is displayed. Click the **Firmware (New Files Available)** tab if it is not already selected.

Selecting and Downloading Updated Firmware Files

The **Get Files from Web** dialog box has four filter options:

- **For devices on this system**—These two options only show firmware files matching devices that are currently connected to the system.
  - **Show latest firmware only** shows the most recent firmware revision for each device.
  - **Show all firmware** shows all firmware revisions for each of these firmware files.
- **For all supported devices**—These two options show firmware files for all devices supported by LTT, even if not currently connected to the system.
  - **Show latest firmware only** shows the most recent firmware revision for each device.
  - **Show all firmware** shows all firmware revisions for each of these firmware files.

Select the appropriate option, and then verify that the correct firmware files are selected. To download the selected files, click **Download**. The files are automatically downloaded to the current firmware directory on the local system. You can now use the firmware update functionality of L&TT to upload the latest firmware to your devices.

Uploading Firmware to Devices

Before attempting to update any firmware files, you must first acquire the latest firmware files and ensure that they are placed in the `Firmware` directory. If you have not yet done this, see *Acquiring Firmware Files*.

To upload firmware to a device:

1. Click the device you want to update in the device list.
2. Click the **Firmware** button on the main toolbar.
3. On the **Update Firmware** tab, click the checkbox next to the device name to select it. If firmware is currently available for that device, it is shown in the **Firmware File** dropdown box in the **File Selection** section of the screen.

Note: You can select multiple devices and update them simultaneously.

4. Click the **Start Update** button at the bottom of the screen to begin the update.

Caution: Make sure that no other programs attempt to access the device during the firmware update. Do not interrupt the firmware update. If the firmware update is interrupted, the device may not operate and require physical repair.

L&TT creates a log of all firmware update activity. To view this log, click the **Firmware Update Results** tab. Set the **Current Detail Level** setting to the appropriate level. The default is **Normal**. The firmware log is displayed in a standard tree-view format. If you want to clear the log, click the **Clear Log** button.

GUI Tests

L&TT provides numerous tests for analyzing storage hardware. These tests are grouped into two categories: diagnostic tests and performance tests. Several of the diagnostic tests are SCSI script-based. A SCSI script is a sequence of SCSI commands sent to a device, usually for the purpose of testing the device's functionality. SCSI scripts can also be used to perform non-diagnostic utility functions, such as rewinding a tape, recalibrating a tape head, or "exercising" a tape-moving robot arm. A main advantage of SCSI script-based tests is that they can be updated with new functionality and new tests can be added. For more information about available tests, refer to the user guide or online help.

Note: L&TT scripts are obtained using the **Get Files from Web** dialog box. For more information on scripts, refer to the user guide or online help.

Running the Diagnostic Tests

To select and run a test manually:

1. In the device listing (either the **By Product** or **By Connection** tab), click the device.
2. Click **Test** on the main toolbar. The **Tests** screen is displayed and the **Test Execution** tab is selected by default.
3. Click the checkbox to the left of the device name that you want to test. The **Test Group** dropdown box is enabled, listing all the tests available for the selected device.
4. In the **Test Group** dropdown box, select the test that you want to perform. A description of the selected test is displayed in the **Description** text box.
5. If any options are available for the test you selected, the **Options** button is enabled. Click the **Options** button to review and set the desired options.
6. Click the **Start Test** button to start the test.

Viewing Diagnostic Test Results

After the test has completed, click the **Test Results** tab to view the results. The results of the test are displayed in the **Test** text box. A more detailed Test Operation Log is displayed in the bottom section of the screen. The information is presented as a report in a standard tree-view format. Click "**+**" or "**–**" to expand or collapse a section of the report. Select an option in the **Current Detail Level** dropdown box to display more or less information in the Test Operation Log.

Using the Drive Performance Test

The Drive Performance test writes and reads data to/from the specified tape drive and calculates performance data for that drive. The results of the test are shown on the **Drive Performance Results** tab and also written to the event log.

To start the Drive Performance test:

Caution: This test is destructive to data on the tape. To avoid loss of data, use a blank tape when performing this test.

1. In the device listing (either the **By Product** or **By Connection** tab), click the drive to test.

2. Click **Dev Perf** on the main toolbar. The **Drive Performance** screen is displayed and the **Tape Drive Performance** tab is selected by default.
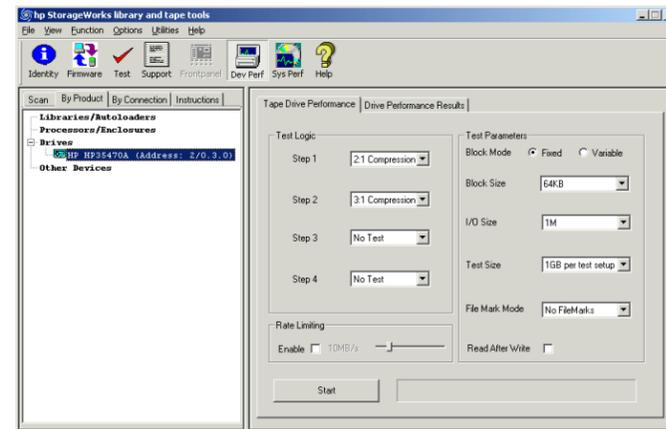

Figure 2: Drive Performance screen

3. In the **Test Logic** section of the screen, use the drop down boxes to select a data type for each of the four tests. The Drive Performance test is actually a series of four write/read subtests (labeled Step 1-4 on the **Drive Performance** screen) that measure performance using different types of data that you can specify.

The following data types can be selected:

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

You must specify a data type for Step 1, but you can choose not to perform Steps 2 through 4 by selecting **No Test** in the corresponding dropdown box.

4. Specify the following additional parameters:

- **Block Mode**—choose one of the following:
  - **Fixed** uses a fixed block size (length) that can be specified in the **Block Size** dropdown box.
  - **Variable** uses a different mode of data transfer. When this option is selected, the **Block Size** dropdown box is disabled.
- **Block Size**—if Block Mode is set to **Fixed**, specify the size of the data blocks used in the test. Data blocks can be from 16K to 256K. This dropdown box is disabled if Block Mode is set to **Variable**.
- **I/O Size**—specify the maximum amount of data to be transferred by a single read/write operation. This length is typically a multiple of the Block Size and ranges from the specified Block Size to 1MB.
- **Test Size**—specify the maximum amount of data written/read by the test. Valid choices range from 1GB to 15GB. Larger values increase the time required to perform the test, but they produce more accurate test results.
- **File Mark Mode**—indicate whether the test should write a filemark at the specified interval (1MB to 1GB). You can also instruct the test not to write any filemarks.
- **Read After Write**—when enabled, data is written to the tape and then the tape is read back. When disabled, only write performance is measured. The test evaluates two sets of metrics when enabled, and one when disabled.
- **Rate Limiting**—if rate limiting is enabled, the I/O rate is limited to the specified value.

5. Click **Start** to perform the test. Progress of the test is displayed in the status bar to the right of the **Start** button, and a dialog box informs you when the test is complete.

6. Click the **Drive Performance Results** tab to view the results of the test. The results are also written to the event log.

Using the System Performance Test

The System Performance test writes and reads data to/from the specified directory and calculates performance data for the backup server. The Restore Pre-Test (write) and Backup Pre-Test (read) portions of the tests are actually separate tests and are executed separately.

Performing the System Performance Restore Pre-Test (GUI)

1. Click **Sys Perf** on the main toolbar. The **System Performance** screen is displayed.
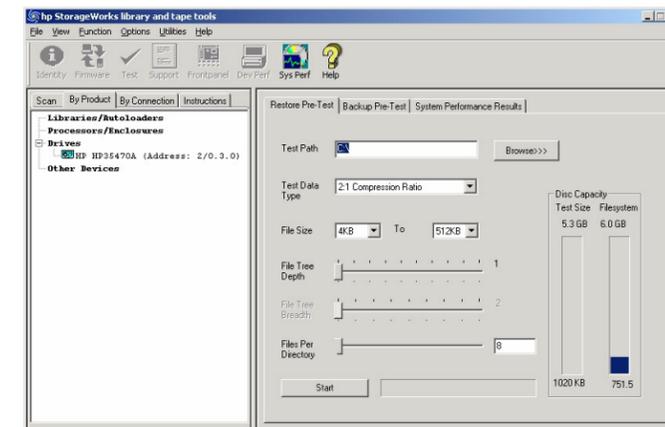2. Click the **Restore Pre-Test** tab.

Figure 3: Restore Pre-Test tab of the System Performance screen

3. Specify the following parameters:

- **Test Path**—enter the destination directory (or use the **Browse>>>** button to browse to the directory) that the test will write data to. This should be a directory on the backup server being tested.
- **Test Data Type**—select the type of data pattern to be written. Choose from the following options:
  - Fixed Byte
  - Incrementing
  - Random
  - Uncompressable Data
  - 2:1 Compression Ratio
  - 3:1 Compression Ratio
  - 4:1 Compression Ratio
- **File Size**—use the two dropdown boxes to specify a range of possible file sizes for the test data.
- **File Tree Depth**—specify the number of levels of subdirectories the program will create from the specified directory.
- **File Tree Breadth**—specify the number of directories to be created within each subdirectory.
- **Files Per Directory**—specify the number of files to be created within each subdirectory.

Note: The gauges in the **Disc Capacity** section of the screen show the amount of disk space required for the System Performance test using the current settings, and the amount of space available in the indicated filesystem. If the required space exceeds the available space, the Test Size gauge displays OVERFLOW, and you will be unable to start the test.

4. Click **Start** to perform the test. Progress of the test is displayed in the status bar to the right of the **Start** button, and a dialog box will inform you when the test is complete.

5. Click the **System Performance Results** tab to view the test results. The test results are also written to the event log.

Performing the System Performance Backup Pre-Test

This test reads the sample data files that were written in the System Performance Restore Pre-Test. You must perform the Restore Pre-Test before performing the Backup Pre-Test. If you have not yet performed the Restore Pre-Test, see Performing the System Performance Restore Pre-Test (GUI).

1. Click **Sys Perf** on the main toolbar. The **System Performance** screen is displayed.
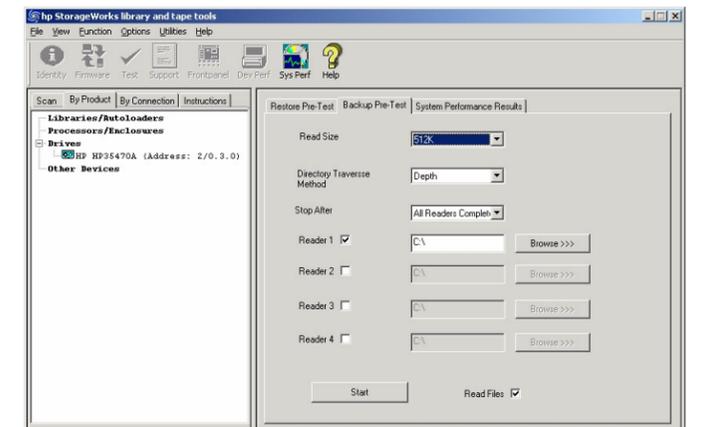2. Click the **Backup Pre-Test** tab.

Figure 4: Backup Pre-Test tab of the System Performance screen

3. Specify the following parameters:

- **Read Size**—enter the maximum block size (in bytes) to transfer.
- **Directory Traverse Method**—specify one of the following options:
  - Specify **Depth** to have the test read as far down the directory structure as possible before moving laterally to the next directory.
  - Specify **Breadth** to read all directories at the same level before moving down to the next subdirectory level.
- **Stop After**—specify a time limit for the test, or select "All Readers Complete" to continue testing until the test is complete.
- **Reader [1-4]**—enter up to four target directories (use the **Browse>>>** button to browse to each directory) that the test will read data from. For each Reader, you must have first performed a Restore Pre-Test. Use the same directory or directories that 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. Click **Start** to perform the test. A dialog box will inform you when the test is complete.
5. Click the **System Performance Results** tab to view the test results. The test results are also written to the event log.

hp StorageWorks Library and Tape Tools

Getting Started Guide

hp invent

About This Guide

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Getting Support

E-mail support is available from ltt_team@hp.com. You should expect a response within 48 hours (usually sooner) during a normal business week.

Use this address to obtain support for L&TT, to report bugs, to provide feedback on this manual, to report any issues with the L&TT website, or to provide enhancement suggestions. HP appreciates feedback on how to make improvements for future versions of L&TT.

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

CSI Installing L&TT for NetWare

To install the NetWare version of L&TT:

1. Download the L&TT for NetWare file to a temporary directory.

2. From a client workstation, use any standard unzip utility* 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: * The unzip NLM that comes with later versions of NetWare has not been tested and should not be used to unzip the archive.

CSI Installing L&TT for HP-UX, Tru64, and Linux

To install L&TT for HP-UX, Tru64, or Linux:

1. Log on 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`

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

   `./install_hpltt<xx>`

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`

CSI Starting L&TT

To start L&TT:

- For HP-UX, Tru64, and Linux:

  Log on as root and execute the following commands:

  `cd /opt/ltt`

  `./hp_ltt`

- For Novell NetWare:

  From the server console, execute the following command:

  `hp_ltt\hp_ltt`

When the CSI version of L&TT is started, an information screen is displayed that offers basic information about navigating the screens. Press any key to bypass this screen and start the device scan. L&TT scans the system for connected devices. When the scan is complete, the **Main** screen is displayed, as shown in Figure 1.

Figure 1: CSI Main screen

CSI Navigating the Screens

The top line of each screen displays the current screen name in hierarchical format. Each "level" of screens is separated by the ">" character. On each screen, some of the available commands take you to a lower level in the hierarchy. To move back to the previous level, use the `up` command. To exit L&TT, use the `exit` command.

On most of the screens, entering a blank command (pressing **Enter** without typing any other text) displays a **Command Help** screen. This screen contains a list of valid commands that can be executed on the original screen from which you accessed the **Command Help** screen. Figure 2 shows the **Command Help** screen accessed from the **Main** screen.

Figure 2: Command Help screen accessed from the Main screen

It is possible to enter a command directly from the **Command Help** screen. To do this, type either the number of the command or the name of the command and press **Enter**. Entering the number of the command only works on the **Command Help** screen. From any other screen, you must type the full name of the command. To exit the **Command Help** screen, enter a blank command (press **Enter**).

Some commands require an argument. For example, the `select` command requires a number that corresponds to the device you want to select in the device list. To select the first device in the list, the syntax is:

`select 1`

If you enter a command with an invalid or missing argument, an error message is displayed.

CSI Using the Device Information Screen

When you first select a product from the **Main** screen, the **Device Information** screen opens, showing information relevant to the device.

The main purpose of the **Device Information** screen is to provide an overview of the configuration and status of the selected hardware device.

From the **Main** screen, type the following command to access the **Device Information** screen:

`select <n>` (where *<n>* is the number of the device you want to examine)

Note: Alternatively, you can omit the `select` command and only enter the device number.

Standalone Devices

Figure 3 shows the **Device Information** screen for a standalone device.

Figure 3: Device Information screen for a standalone device

The following general information is displayed:

- Product ID (inquiry string)
- Drive technology
- Mech. serial # (drive serial number)
- Firmware revision
- SCSI target ID
- SCSI LUN

- OBDR capability (if present)

If a data cartridge was inserted in the drive when the **Device Information** screen was displayed, information regarding cartridge type, capacity, and write-protect status is shown.

To see a list of compatible media that can be used with this device, use the `inventory` command.

Library and Autoloader Products

Figure 4 shows the **Device Information** screen for a library.

```
Main > Identity >
-----------------------------------------------------------------------
The following is identity information for the selected device. You can use
commands to select functionality to perform on this device.

Product ID            : C7200
Model Name            : Tape Library 2/20
* Internal Serial Number : D01461M0279
Drive Technology      : LTO
Firmware Rev          : 1520
Target ID             : 0
Target LUN            : 0
Number of Drives      : 2
Number of Slots       : 19

* May not match external serial number


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

Figure 4: Device Information screen showing a library

Note: Selecting individual drives within a library from the device list displays the drive as though it were a standalone product. Embedded drives are best diagnosed by selecting the library they belong to, and then selecting the specific drive within each tool window.

From the **Device Information** screen for a library device, use the `inventory` command to display the slot inventory of the library. The `inventory` command shows which slots and drives currently have cartridges loaded, and the cartridge barcode if available and applicable.

CSI Support Ticket Generation

A major feature of HP StorageWorks Library and Tape Tools is the ability to generate a support ticket. In the event of a hardware problem, a support ticket can provide vital information to help in diagnosing and resolving the problem.

Generating and Viewing a Support Ticket

To generate and view a support ticket in the CSI environment:

1. From the **Main** screen, select the device that you want to create a support ticket for. The **Device Information** screen is displayed.

2. Enter the `support` command to access the **Support** screen.

3. From the **Support** screen, do one of the following:
   - Enter the `view` command to view the support ticket.
   - Enter the `save <filename>` command to save the support ticket with the specified filename. The support ticket can be viewed later using the `load` command from the **Main** screen.

When viewing the support ticket, use **Ctrl+U** and **Ctrl +D** to scroll up and down through the results. You can also use the `find` and `page` commands to quickly locate information. For more information about the information reported on a support ticket, refer to the user guide or online help.

CSI Firmware Management

The Firmware Management functionality of L&TT provides a convenient way to easily upgrade the firmware of connected devices. Library firmware and firmware of drives within the libraries can be upgraded as well. In many cases, multiple drives within the library can be updated simultaneously to save time.

L&TT uses special firmware files that associate the firmware with a particular product. This feature prevents the user from downloading the wrong image and ensures that the downloaded firmware is the same or a newer revision than the current device firmware.

Acquiring Firmware Files

L&TT firmware files are stored in the `firmware` directory, which is a subdirectory of the `HP Library & Tape Tools` installation directory. Before upgrading any firmware, you must acquire the firmware image file or files and copy them to the `firmware` directory.

To download the latest firmware files:

1. Go to www.hp.com/support, choose the product family, then click **software updates and drivers**. The latest firmware file is available in L&TT format. For some products (such as standalone drives), firmware is available as a single file. For other products (such as tape libraries), the firmware is available in a self-extracting bundle that includes library and drive firmware.

2. Download the file or files to the `firmware` directory.

3. If the downloaded files were self-extracting bundles, extract the contents to the `firmware` directory.

Uploading Firmware to Devices

To upload firmware to one or more devices:

1. From the **Main** screen, type the number corresponding to the device you want to update and press **Enter** to display the **Device Information** screen.

2. From the **Device Information** screen, enter the `firmware` command to display the **Firmware Update** screen. Devices that are available for update are listed on this screen.

3. Type the corresponding number of the device that you want to update and press **Enter** to mark the device "selected." If there are multiple devices, repeat this step for each device that you want to update.

4. When you have selected all of the devices that you want to update, enter the `start` command to begin the update process.

⚠ **Caution:** Make sure that no other programs attempt to access the device while the firmware is being updated. Do not interrupt the firmware update. If the firmware update is interrupted, the device may not operate and require physical repair.

L&TT creates a log of all firmware update activity. To view this log, enter the `review` command from the **Firmware Update** screen.

CSI Tests

L&TT provides numerous tests for analyzing storage hardware. These tests are grouped into two categories: diagnostic tests and performance tests. Several of the diagnostic tests are SCSI script-based. A SCSI script is a sequence of SCSI commands sent to a device, usually for the purpose of testing the device's functionality. SCSI scripts can also be used to perform non-diagnostic utility functions, such as rewinding a tape, recalibrating a tape head, or "exercising" a tape-moving robot arm. A main advantage of SCSI script-based tests is that they can be updated with new functionality and new tests can be added. For more information about available tests, refer to the user guide or online help.

Running the Diagnostic Tests

To select and run a test manually:

1. On the **Main** screen, enter the number corresponding to the device that you want to test. The **Device Information** screen is displayed.

2. On the **Device Information** screen, enter the `test` command. The **Test** screen is displayed. The **Test** screen displays the currently selected test, and lists the available devices to be tested.

3. To select a different test, enter the `picktest` command. On the **Selector** screen, enter the number of the test you want to perform. The **Test** screen is redisplayed and the currently selected test is updated.

4. To select or deselect devices to be tested, enter the corresponding device number to toggle the selected status of the device. To deselect all devices, enter the `clear` command.

5. Enter the `start` command to start the test.

6. When the test is complete a dialog is displayed showing preliminary results of the test. Press any key to return to the **Test** screen.

Viewing Diagnostic Test Results

To view detailed test results, enter the `review` command. Test results are displayed in a hierarchical format.

Use the `detail` command without any arguments to view the current detail level of the report. Use the `detail` command with a numeric argument to set the detail level. The available detail level arguments are:

- **1** — highlights only
- **2** — normal
- **3** — more details
- **4** — everything
- **5** — factory only (requires a factory password. To enter a password, use the `options` command.)

If necessary, use **Ctrl+U** and **Ctrl+D** to scroll up and down through the results. You can also use the `find` and `page` commands to quickly locate information in the report.

Using the System Performance Pre-Tests

To start the System Performance Pre-Test:

1. From the **Main** screen, enter the following command to display the **System Performance** screen:

   `sysperf`

2. Enter one of the following commands (depending on which pre-test you want to run):
   - `backup`—runs the Backup Pre-Test
   - `restore`—runs the Restore Pre-Test

3. If necessary, change the settings for one or more options. To change the settings, enter the number that corresponds with the option that you want to change. Enter the new value at the prompt.

   The following options are available for the Backup Pre-Test:
   - **Blocksize**—specify the blocksize, in bytes, to be read. Typical values are 32768 (32KB), 65536 (64KB). The default is 65536.
   - **Path**—specify the path to the directory to be read from.

   The following options are available for the Restore Pre-Test:
   - **Filesize**—specify the size, in bytes, of the test files to be created.
   - **Number of Files**—specify the number of files to be created.
   - **Directory path**—specify the path of the directory where the test files will be written.
   - **Pattern**—specify one of the following data 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

4. Use the `start` command to start the test.

Using the Drive Performance Test

To start the CSI version of the Drive Performance test:

1. From the **Main** screen, enter the following command to display the **Device Performance Tool** screen:

   `devperf`

   The Device Performance Tool screen displays several test options with their default settings.

2. If necessary, change the settings for one or more options. To change the settings, enter the number that corresponds with the option that you want to change. Enter the new value at the prompt. The five available options for this test are:
   - **Blocksize**—specify the blocksize, in bytes, to be written to the tape. Typical values are 32768 (32KB), 65536 (64KB). The default is 65536.
   - **Repetitions**—specify how many write/read operations to perform. The default is 4096.
   - **Readback**—specify whether to enable the readback test after writing data to the device. This option measures read performance in addition to write performance in MB/sec. This option is disabled by default.
   - **Count**—specify how many blocks to write to the tape device per write operation. The default is 16.
   - **Pattern**—specify the data pattern to be written to tape. Enter 2 for 2:1 compression ratio or 3 for 3.1:1 compression ratio. The default is 2.

3. Use the `start` command to start the test.

Viewing Performance Test Results

To view detailed test results, enter the `review` command. Test results are displayed in a hierarchical format.

Use the `detail` command without any arguments to view the current detail level of the report. Use the `detail` command with a numeric argument to set the detail level. The available detail level arguments are:

- **1** — highlights only
- **2** — normal
- **3** — more details
- **4** — everything
- **5** — factory only (requires a factory password. To enter a password, use the `options` command.)

If necessary, use **Ctrl+U** and **Ctrl+D** to scroll up and down through the results. You can also use the `find` and `page` commands to quickly locate information in the report.