Hewlett Packard Enterprise

HPE StoreEver Tape Libraries with Symantec Backup Exec

Contents

Introduction

In today's business environment, small and medium-sized business customers rely on the most efficient, high performing, and reliable data protection and archiving systems. Customers need to protect increasing levels of data while keeping costs under control. In particular, businesses today are concerned about the costs of backing up and archiving important data from mission-critical servers.

Tape storage is a critical component of a comprehensive, tiered and converged data protection and archiving solution that balances cost and performance. The ideal approach to data protection and archiving is to match the access, retention and cost requirements for a business with the right storage technology. Most often, the result is a multi-tier strategy that blends the access speeds of disk with the low cost, offline and long shelf-life benefits of tape.

When paired with HPE StoreVirtual Storage and HPE StoreEasy Storage—which incorporate Hewlett Packard Enterprise innovations such as storage federation, scale-out architecture, and adaptive optimization—HPE StoreEver Tape lowers costs while increasing data security and reliability. HPE Storage enables businesses to efficiently respond to new and ever changing demands.

Technology overview

HPE StoreEver Tape key features and benefits
HPE StoreEver Tape products protect your data longer, for less
As the worldwide leader[1] in tape drives and automation, HPE StoreEver Tape provides tape storage that is critical to comprehensive data protection and archiving. HPE StoreEver addresses all your long term retention needs. With the broadest and most advanced portfolio in the industry, HPE StoreEver now features support for LTO-7.

HPE StoreEver:

- **Reduces TCO and management burden—efficiently protect and retain rapidly growing data**

   With support for LTO-7, HPE StoreEver offers significant cost, energy and footprint advantages. Lowest cost per gigabyte for longer term storage with limited power or energy requirements as the less frequently accessed data is stored or as media become full.

   The HPE MSL6480 Tape library offers up to 195 TBs (equivalent to 13 LTO-7 tape cartridges) per 1U of rack space using LTO-7 drives, while providing the highest tape drive density per module of any mid-range tape library, providing flexible options to consider for your business.

   HP Command View for Tape Libraries software is a single-pane-of-glass management software which eases data protection with remote management, diagnostics, and configuration of all your MSL tape libraries through a single console.

- **Is reliable—protect and retain data over the long term**

   With enhanced reliability, extreme durability and proactive monitoring by HP StoreEver TapeAssure Advanced technology, you can store essential but less frequently accessed data with confidence.

   Tape Assure Advanced makes managing, fine-tuning, and archiving faster and easier with comprehensive reports on status, performance, utilization, and health of all tape drives and media. The advanced analytics feature of TapeAssure Advanced makes use of predictive analytics to predict the likelihood of failures, bottlenecks, and load balancing issues in the tape infrastructure. This data can be exported on demand or at scheduled times through HP Command View Tape Library software.

   HPE StoreEver Tape is ideal for archiving cold or active data with a media shelf-life of up to 30 years in normal ambient conditions.

- **Is secure—enable a vital "last line of defense"**

   Hardware-based data encryption, WORM protection, and removable storage that are offline to threats make HPE StoreEver a highly reliable safety net and an optimal platform for long-term digital archive.

- **Delivers enormous scalability and high availability—answer data growth challenges**

   The HPE StoreEver MSL6480 Tape library has scale-out architecture which allows you to pay as you grow—simply add in new modules to boost capacity and performance without investing in a whole new library. When needed, upgrades are fast and non-disruptive.

   An MSL6480 can scale vertically from 80 to 560 cartridge slots to store up to 8.4 PB in a single 19-inch rack; add between 1 and 42 LTO-5 and newer half-height SAS or FC drives for speeds of up to 113.4 TB/hour (assumes LTO-7 with 2.5:1 data compression) which can save you lots of time.

[1] According to the IDC Branded Tape Tracker CQ4 2012, Hewlett Packard Enterprise is the worldwide market share leader in total units.

HPE StoreVirtual Storage key features and benefits
Scale-out storage for virtualized environments that's affordable, agile and loaded with features

Whether you are a small or midsize business looking for simpler storage or an independent cloud provider deploying to scale, HPE StoreVirtual Storage meets your virtualization needs. HPE StoreVirtual is affordable storage designed for a virtualized infrastructure that's easy to manage, supports continuous data growth, and keeps your business up and running. Intuitive, common management and storage federation meet the need for simplicity and flexibility in today's virtual centers. It allows data mobility across tiers, locations, and between physical and virtual storage.

HPE StoreVirtual 4000 is a scale-out storage platform that's designed to meet the fluctuating needs of virtualized environments. The StoreVirtual 4000 provides affordable enterprise-class functionality with a comprehensive feature set.

HPE StoreVirtual VSA is the first software-defined storage appliance to support all major industry-standard servers and multiple hypervisors. StoreVirtual VSA is affordable storage that starts small and grows to whatever scale you need—now with flexible product offerings ranging from 4-to-50 TB capacity.

HPE StoreVirtual:

- **Reduce costs**

  HPE StoreVirtual's all-inclusive licensing includes enterprise-class storage features, management, and value-add tools—eliminating the need for additional software purchases. This affordable platform lets you buy only what storage you need today and grow your storage non-disruptively in the future.

- **Increase agility**

  The scale-out architecture of HPE StoreVirtual delivers storage that linearly scales in both capacity and performance. Adjust and respond quickly to changing demands: Scaling storage is as simple as adding nodes to the cluster letting you seamlessly and non-disruptively grow as your business grows.

- **Boost efficiency**

  Platform integration with VMware® and Microsoft® increases storage functionality and ease of use while application integration streamlines storage management for applications. Manage hundreds of nodes in your environment with the same simplicity as your first two; no matter if they are on the same site or across multiple sites. The Centralized Management Console lets you configure, manage, and monitor your storage easily, making everyday operations simple and efficient.

- **Reduce risks**

  With proven 99.999 percent high availability and reliability the storage cluster can sustain multiple concurrent failures and still keep data online and accessible to applications. This solution provides worry-free storage for your centralized datacenters as well as for remote and branch offices.

HPE StoreEasy Storage key features and benefits
File and application storage made easy

HPE StoreEasy is a new breed of efficient, secure, and highly available storage to simply address file and application storage challenges for small to medium business, branch office, and workgroup environments. You can easily and economically support large numbers of users and accommodate their demands to store growing volumes of files such as business documents, images, audio files, and videos. HPE StoreEasy has non-intrusive data deduplication that provides an average 50–60 percent in space savings. StoreEasy is a very robust platform for demanding 24x7 environments.

HPE StoreEasy 1000 Storage provides simple storage for small business or branch offices.

HPE StoreEasy 5000 Storage for mid-sized environments provides turnkey, active-active clustered storage.

HPE StoreEasy 3000 Gateway Storage is a cluster capable file gateway for use with SANs of any size.

HPE StoreEasy:

- **Efficient**

  Supporting hundreds to thousands of concurrent users, multiple diverse workloads, deduplication and offering a straight-forward, consistent management experience that optimizes resource use saves money and time.

- **Secure**

  HPE StoreEasy always keeps your data protected with built-in encryption, sophisticated access control and the ability to run endpoint protection and backup software onboard keeps data secure whether it's at rest, in flight or mobile.

- **High availability**

  Active-active clustering, transparent failover and non-disruptive upgrades ensure continuous availability of data to users, physical and Hyper-V servers, and applications which prevent business and user disruption.

Integrating HPE StoreEver Tape with Symantec Backup Exec

Symantec Backup Exec is a backup and recovery solution for small and medium-sized businesses. Its architecture is designed for virtual and physical environments and recovers data or systems at any scale, from an individual item to an entire server. Backup Exec delivers disk and tape data protection for Windows®, VMware, Hyper-V, Linux®, and Mac environments. Sophisticated application protection is also available, with support for Exchange, SharePoint, SQL Server, Active Directory, Oracle, and others. A list of compatible operating systems, platforms, and applications can be found on the Symantec support website: support.symantec.com

Installation and configuration

Hewlett Packard Enterprise has joined with leading software companies to develop a comprehensive approach to ensuring that all hardware, firmware, driver, and software components are properly fitted into certified and supported data protection and archiving solutions. Before configuring and implementing a data protection and archiving solution, refer to the following:

- The HPE StoreEver information held within the HPE Backup, Recovery and Archive (BURA) Solutions Design Guide— hp.com/go/buracompatibility

  Extensive documentation to design, configure and implement a broad selection of data protection and archiving solutions that are fully supported and certified with HPE StoreEver Storage in homogeneous and heterogeneous environments.

- The StoreEver section of the HPE Data Agile BURA Compatibility Matrices—hp.com/go/buracompatiility

  A single point of reference for the latest HPE StoreEver interoperability and device compatibility details. It contains tape device connectivity details including supported servers, operating systems, controllers and infrastructure components, as well as Backup and Archival ISV partner compatibility.

- SAN Design Guide—hp.com/go/san

  Explains how HPE Storage systems, storage management tools, and Fibre Channel products can be used in open heterogeneous SANs.

Installation checklist

If the answer to each of the following questions is "yes", then all components on the SAN are logged in and configured properly:

- Are all of the following hardware components at the minimum supported firmware revisions specified in the current Data Agile BURA Compatibility Matrix: servers, HBAs, Fibre Channel switches, Command View Tape Library, tape drives, and library robots?
- Is the minimum patch level support for each operating system installed?
- Is the minimum supported drivers specified in the Data Agile BURA Compatibility Matrix installed (HBA, tape drives)?
- Is the HPE StoreEver tape library or partition(s) online?
- Are all of the host HBAs correctly logged into the Fibre Channel switch?
- If the Fibre Channel switches are cascaded or meshed, are all Interswitch Link (ISL) ports correctly logged in?
- Are all tape and robotic devices zoned, configured and presented to each host from the Fibre Channel switch?
- Are the host(s) HBAs, tape and robotic devices in the same switch zone(s)? See the following note.

- Do the hosts detect all of the tape and robotic devices intended to be used?

- Are all HPE StoreEver storage devices seen by HP Command View Tape Library?

- Has connectivity been verified using HP Library and Tape Tools or operating system specific tools (for example, the SG utility in Linux)?

Note

Hewlett Packard Enterprise strongly recommends creating zones by HBA port. For more detailed information on creating zones by HBA port, refer to the BURA Solutions Design Guide: hp.com/go/buracompatibility

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Installing Symantec Backup Exec

After all components on the SAN are logged in and configured, the hosts are ready for installation of Symantec Backup Exec. Refer to the Symantec Backup Exec Step by Step guide to download and install Backup Exec or contact Symantec customer support for detailed installation procedures and requirements.

Symantec provides several wizards to help you ensure that the installation process can complete as well as install and configure the Backup Exec media server(s) and servers with Backup Exec agents.

Before installing Backup Exec, you should complete the following tasks:

- Hewlett Packard Enterprise recommends that you remove any other backup software currently configured on your computer before installing Backup Exec. Other backup software, tape device applications that are part of the OS, and SAN or system management software can negatively affect how Backup Exec installs and functions.

- Run the Backup Exec Environment Check on all computers which you want to install Backup Exec. The Environment Check analyzes the computer to make sure that the installation process can complete.

- Check your Windows security settings to make sure that they work properly with the Backup Exec service account.

- Check the name of the computer on which you want to install Backup Exec. It should only use standard ANSI characters. You may receive errors if you install Backup Exec on a computer with a name that uses non-standard characters.

- Proper Backup Exec licensing is required to run the application beyond the trial period and to enable all options. Licensing information can be found at: licensing.symantec.com

Installing Symantec Backup Exec Software

Figure 1 on page 7 shows the Symantec Backup Exec architecture. Hewlett Packard Enterprise strongly recommends installing the Symantec drivers for all HPE storage products. A typical installation is designed for small or uncomplicated environments and HPE storage should be auto-discovered and configured by Backup Exec. In a typical installation, Backup Exec makes many decisions for you, based on common installation scenarios. If you prefer to set all of your options, you should use the custom installation option. You can learn more about Backup Exec, including installation options, in the product documentation available within the Getting Started portion of the Backup Exec installation DVD. Symantec recommends that you install in the following order:

1. Primary media server

2. Secondary media servers—if you want to manage all media servers from the primary media server, the Central Admin Server Option must be installed on the primary media server (requires the custom installation option and the required Backup Exec licenses). Once the Central Admin Server Option is installed on the primary media server, all secondary media servers must have Managed Backup Server selected during the installation (requires the custom installation option and the required Backup Exec licenses)

3. Any Backup Exec add-on products (such as Backup Exec remote agents)

Note

Run Live Update before and after each Backup exec installation or upgrade. Push-install the Remote Agent for Windows Systems to remote computers after you install any service packs that include Remote agent updates. Live update does not update the Remote Agent on remote computers. For additional information on running Live Update, visit the Symantec support website: support.symantec.com


Creating backup jobs

A backup or restore job must be manually created using the Backup and Restore tab within the Symantec Backup Exec graphical user interface. An inventory should be performed on all storage devices to update the Backup Exec database with information about the media in the storage devices. If media in the storage devices contains data, an inventory and catalog of the media should be performed. The process of cataloging the media can take several hours depending on the number of media containing data. If all media are blank or can be overwritten, just performing an inventory on all storage is sufficient.

- Backup type must be selected (Back Up to Tape)

- Server/client credentials are verified (logon account)

- Backup options and schedule can be edited

- After creating any backup jobs, run a manual backup to test the policy

Best practices in using Backup Exec

For a complete list of all Backup Exec 2012 Best Practices documents about installation, disaster recovery, LiveUpdate, Central Admin Server option and other topics, refer to the Backup Exec 2012 Best Practices list.
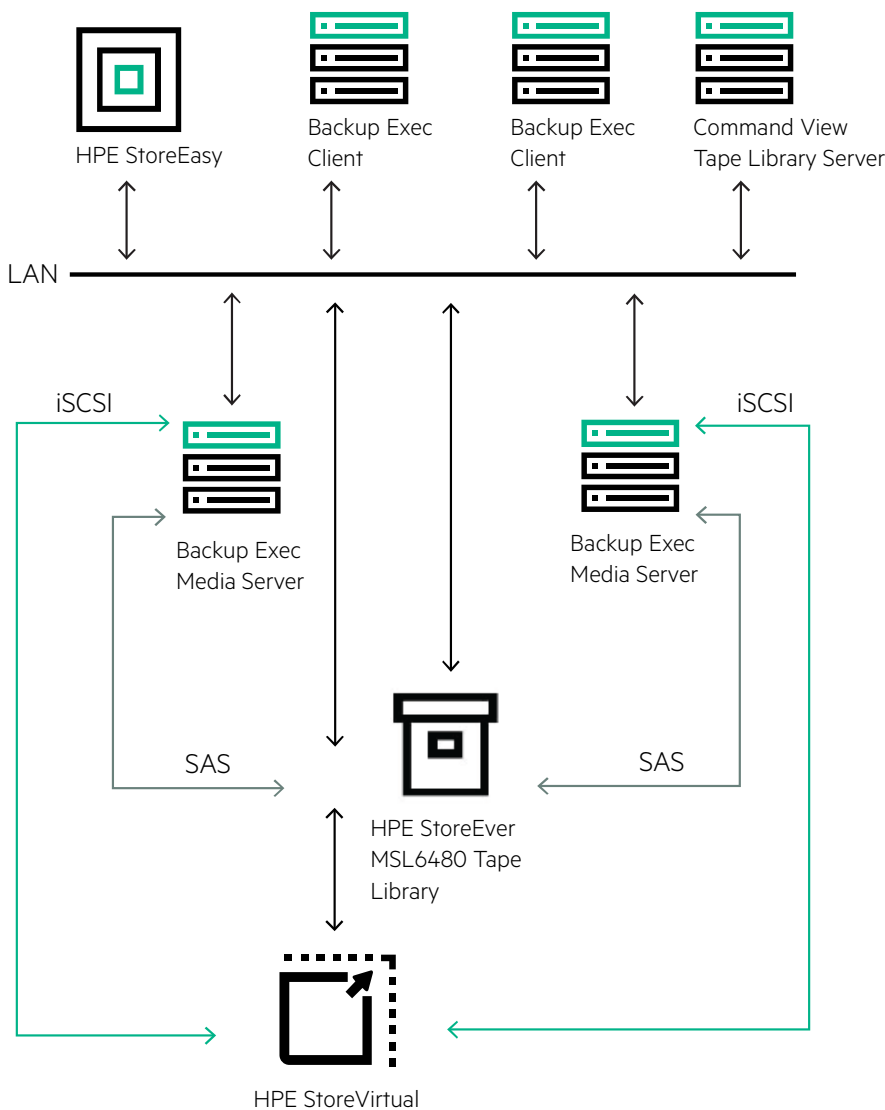
Figure 1. Symantec Backup Exec architecture with an HPE StoreEver MSL6480 tape library, an HPE StoreVirtual system, and an HPE StoreEasy system

Performance and tuning

To analyze speed and performance, it is necessary to examine the entire backup and archive process as a system. Although many factors contribute to the overall performance of the system, there are five main factors that must be thoroughly understood to determine the maximum performance in any specific situation. These factors are:

- **Storage connection**—For Backup, Recovery and Archive (BURA) Solutions with HPE StoreEver tape libraries, this is the Fibre Channel connection.

- **Buffer and block size allocation**—BURA Solutions with Symantec Backup Exec supports configurable buffer sizes. See "Buffer and block size allocation" for specific details.

- **File (Data) compression ratio**—the amount of compression has a direct impact on the rate at which a tape drive can read/write data.

- **Source disk and file systems**—Data source, local disk, RAID array storage, file system type, and volume type.

- **Tape drive**—In BURA Solutions, these are the various types of tape drives in HPE StoreEver storage.

Buffer and block size allocation

The Symantec Backup Exec default values for buffer allocation are the preferred values for data sent to the drive on each read or write request. The buffer size must be an even multiple of the block size.

You can change the block size, buffer size, buffer count, and high water count by right-clicking on a specific drive, choosing **Details**, and then select another size from the scroll list, and then click **Apply**. Depending on the amount of memory in your system, modifying these values may improve drive performance. Each type of drive requires a different buffer size to achieve maximum throughput. Refer to Symantec documentation for detailed information.

File (Data) compression ratio

Hewlett Packard Enterprise tests show that not all data can be compressed equally. The compression ratio affects the amount of data that can be stored on each tape cartridge, as well as the speed at which the tape drives can read or write the data. Table 1 shows typical compression ratios of various applications.

Table 1. Typical file compression ratios

DATA TYPE	TYPICAL COMPRESSION
CAD	3.8:1
Spreadsheet/Word Processing	2.5:1
Typical File/Print Server	2.0:1
Lotus Notes Databases	1.6:1
Microsoft Exchange/SQL Server Databases	1.4:1
Oracle/SAP® Databases	1.2:1

Source disk and file systems

In the past, tape performance was typically identified as a bottleneck. However, tape performance has now surpassed many of the source systems available today. Items to consider when calculating desired throughput and performance metrics include:
- Source hardware (disk subsystems)

- Source file system status

- Server configuration

The following factors critically affect the speed of backup from disk to tape:

- **Data file size**

  The larger the number of smaller files, the larger the overhead associated with backing them up. The worst-case scenario for backup is large numbers of small files due to system overhead of file accession.

- **Data compressibility**

  Incompressible data will back up slower than higher compressible data. For example, JPEG files are not very compressible, but database files can be highly compressible. The accepted standard for quoting tape backup specifications revolves around an arbitrary figure of 2:1 compressible data.

- **Disk array performance**

  It is often overlooked that data cannot be put onto tape any faster than it can be read from disk. Backup is more sequential in nature than random (from a disk array access perspective). Disk array performance depends on the number of disks, RAID configuration, the number of Fibre Channel ports accessing the array, and queue depth available, for example.

- **Fragmentation**

  The more fragmented the files are on disk, the more random will be the disk access method, hence the backup will take longer. If the system has a defragmentation utility, it is advisable to run it before full backups or on a regular scheduled basis to ensure that files are contiguously arranged on the disk.

Tape drive

The tape drives is the fifth factor in determining backup and restore performance. HPE StoreEver tape drives have varying levels of performance. Factors such as file size (larger is better), directory depth, and data compressibility all affects system performance. Data interleaving during backup also affects restore performance. Table 2 shows performance information for various HPE StoreEver tape drives.

Table 2. Tape drive throughput speed (native)

TAPE DRIVE	NATIVE THROUGHPUT MB/s
Ultrium 15750 (LTO-7 FH)	300
Ultrium 15000 (LTO-7 HH)	300
Ultrium 6650 (LTO-6 FH)	160
Ultrium 6250 (LTO-6 HH)	160
Ultrium 3280 (LTO-5 FH)	140
Ultrium 3000 (LTO-5 HH)	140
Ultrium 1840 (LTO-4 FH)	120
Ultrium 1760 (LTO-4 HH)	80
Ultrium 920 (LTO-3 HH)	60

Conclusion

Small and medium-sized business customers demand an efficient, reliable data growth management backup and archiving solution while keeping costs under control. Hewlett Packard Enterprise Storage provides a comprehensive range of reliable data protection storage solutions which allow small and medium-sized business customers to maximize the value from their data over its entire lifecycle while minimizing total cost of ownership. HPE StoreEver Storage with Backup Exec can provide a complete solution in itself or be used as a major constituent of a disk-to-disk-to tape implementation. HPE StoreEver Tape systems offer significant cost, energy and footprint advantages, while addressing data growth by adding drives and capacity on-demand as needed. In all, HPE StoreEver Storage systems integrate easily with Backup Exec and are a critical component for comprehensive data protection and archiving of mission-critical applications.

Useful links

HPE Backup, Recovery and Archive Solutions

HPE StoreEver MSL6480 Tape manuals

HPE StoreEver MSL G3 Tape manuals

HPE StoreVirtual 4000 Storage manuals

HPE StoreVirtual VSA Software manuals

HPE StoreEasy 1000 Storage manuals

HPE StoreEasy 5000 Storage manuals

HPE StoreEasy 3000 Gateway Storage manuals

Symantec Backup Exec support (Supported software/hardware, Installing, Get the latest service packs and patches, Configure the Backup Exec environment, Find best practices in using Backup Exec, Troubleshooting, Known Issues and Documentation)

Learn more at
hp.com/go/StoreEver

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