Hewlett Packard Enterprise

Data Protection of Virtual Machines with HPE StoreEver Tape Storage

Using Veeam Backup & Replication software

Contents

Technical white paper

Executive summary

Many organizations are looking for ways to reduce power consumption, cooling requirements, and server footprint. Sufficient storage capacity is another major concern for organizations today. Moving to virtualized environments mitigates these concerns by enabling organizations to consolidate their data centers. Likewise, moving virtual data from expensive disk-based storage to a less resource-intensive tape-based solution is a complementary strategy.

Hewlett Packard Enterprise (HPE) Tape Storage provides dependable, secure, and scalable tape storage. Copying data to tape reduces storage costs by moving data off expensive disk storage media. Tapes can then be vaulted at an off-site repository for security and disaster recovery.

Protecting virtualized data can present unique challenges. Veeam Backup & Replication is built specifically for backup and long-term retention of virtual environments. Starting with Veeam Backup & Replication v7, administrators can create an automated solution for moving virtual data from the disk storage tier[1] to inexpensive and dependable tape storage, greatly simplifying data management.

This document provides general guidelines and information for configuring disk-based backup copies to tape by using Veeam Backup & Replication and HPE Tape Storage.

Technology overview

HPE StoreEver Tape Storage key features and benefits

HPE StoreEver Tape Storage products protect data longer, for less. As the worldwide leader[2] in tape drives and automation, HPE StoreEver solutions provide tape storage that is critical to comprehensive data protection and archiving. HPE StoreEver also addresses long-term retention needs and supports Linear Tape-Open 7 (LTO-7). With one of the broadest and most advanced portfolios in the industry, HPE StoreEver includes tape media, stand-alone tape drives, and tape libraries that accommodate up to 8.4 PB[3] in a single system.

HPE StoreEver tape automation libraries supported with Veeam Backup & Replication software are the HPE StoreEver 1/8 G2 Tape Autoloaders and HPE StoreEver MSL Tape Library families. HPE StoreEver:

- **Reduces the total cost of ownership and management burden**—Efficiently protects and retains rapidly growing data.

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

  The HPE StoreEver MSL6480 Tape Library offers up to 195 TB (equivalent to 13 LTO-7 tape cartridges) per 1U of rack space using LTO-7 drives. It also provides the highest tape drive density per module of any midrange tape library and flexible options to consider for your business. HPE Command View for Tape Libraries is single-console management software that eases data protection with remote management, diagnostics, and configuration of all StoreEver MSL Tape Libraries through a single console.

- **Is reliable**—Protects and retains data over the long-term.

  HPE StoreEver Data Verification software ensures a successful restore of critical business data from infrequently accessed LTO tape cartridges by periodically scanning tapes to validate the data quality on each tape. HPE StoreEver TapeAssure Advanced technology provides enhanced reliability, extreme durability, and proactive monitoring. This allows you to store essential but less-frequently accessed data with confidence.

  StoreEver TapeAssure Advanced software makes managing, fine-tuning, and archiving data faster and easier with comprehensive reports on status, performance, utilization, and health of all tape drives and media. The advanced analytics feature of StoreEver TapeAssure Advanced uses predictive analytics to forecast 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 HPE Command View for Tape Libraries software.

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

---

[1] For information about setting up the primary backup-to-disk environment, see HPE Complete Veeam Software or Availability for the Always-On Enterprise with HPE and Veeam and select the appropriate manual for your hypervisor.

[2] According to the IDC Custom Tape Tracker 2016 H2, HPE is the worldwide market share leader in total units for open systems tape drives, tape autoloaders, and tape automation (21-500 slots).

[3] This figure is based on 2.5:1 compression and a fully populated HPE StoreEver MSL6480 Tape Library.

- **Is secure**—Enables a vital last line of defense.

  – Tape removable media is inherently offline, which protects against viruses, hackers, and cyber-attacks that threaten online data on disk. It is also a logically clean copy that cannot be accidentally overwritten by mirroring software.

  – LTO-7, LTO-6, and LTO-5 Ultrium tape drives include hardware-based data encryption to prevent unauthorized access to data at rest.

  – LTO-7, LTO-6, and LTO-5 cartridges are available with write-once, read-many (WORM) capability to prevent accidental overwriting of data archived on the tape.

- **Delivers enormous scalability**—Answers data growth challenges.

  The StoreEver MSL6480 Tape Library is the gold standard for midrange tape automation, delivering best-in-class scalability and density. The unique modular design of the StoreEver MSL6480 Tape Library includes a continuous robotics feature to provide in-box scaling for advanced performance, greater scalability, and better reliability. Upgrades are fast and nondisruptive. Scale vertically from 80 to 560 cartridge slots to store up to 8.4 PB in a single 19-inch rack. Performance scaling from 1 to 42 LTO half-height (HH) tape drives and transfer rates of 300 MB/s (native) per LTO-7 tape drive serial-attached SCSI (SAS) or Fibre Channel are possible.

HPE 3PAR StoreServ Storage key features and benefits

HPE 3PAR StoreServ Storage products optimize storage quickly to improve capacity utilization while delivering high service levels. HPE 3PAR StoreServ Storage is a family of storage systems ranging from Tier-1 mission-critical solutions with the highest performance and scalability capable of supporting cloud and IT-as-a-service environments to storage solutions with enterprise-class features at a midrange price, designed for the virtualized data center.

HPE 3PAR StoreServ Storage is:

- **Efficient**—Reduce capacity requirements by 50%—guaranteed.[4]

- **Autonomic**—Simplify, automate, and expedite storage management by handling storage provisioning, tiering, and change management intelligently, at a subsystem level, and without administrator intervention. This approach reduces administration time by up to 90%.

- **Federated**—Meet the needs of today's data center by moving data and workloads between arrays without impacting applications, users, or services. Simply and nondisruptively shift data between HPE 3PAR StoreServ systems without additional management layers or appliances.

Veeam Backup & Replication

Veeam Backup & Replication is a data protection and disaster recovery solution for VMware vSphere and Microsoft Hyper-V virtual environments of any size and complexity. Combining all necessary functions in one intuitive interface, Veeam Backup & Replication solves the most critical problems of virtualized infrastructure management and protects mission-critical virtual machines (VMs) from both hardware and software failures.

Primary backups

HPE and Veeam offer a protection solution optimized for vSphere and Hyper-V for virtual data center administrators. HPE and Veeam worked together to solve the problems inherent in the traditional agent-based backup model with a solution that is simple to license and implement at a low price point. The solution has been tested and proven to optimize VM backup when used together with HPE Storage disk arrays and the HPE StoreOnce Backup system family of disk-to-disk backup appliances. The HPE and Veeam data protection solution complements existing physical system backup tools.

For more information, visit: HPE Complete Veeam Software or Availability for the Always-On Enterprise with HPE and Veeam

Long-term retention to tape

With Veeam Backup & Replication, backup files stored in backup repositories and regular files (such as Windows and Linux files) can be written to tape for long-term retention or disaster recovery. Veeam Backup & Replication supports file backup from any Windows or Linux server that

---

[4] Reducing capacity requirements by 50% requires HPE 3PAR Thin Conversion software and HPE 3PAR Thin Provisioning software. For details, refer to the HPE 3PAR Get Thinner Guarantee terms and conditions. More information is available at HPE 3PAR StoreServ Storage.

has been added as a managed server to the Veeam backup console—including physical servers. You can also back up files to tape that are residing on a NAS device.

Integrating HPE StoreEver Tape Storage with Veeam Backup & Replication

Installation and configuration

HPE has joined with leading software companies to develop a comprehensive approach to ensure 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 resources:

- The HPE Backup, Recovery and Archive (BURA) Solutions design guide provides extensive information needed to design, configure, and implement a variety of data protection and archiving solutions that are fully supported and certified with StoreEver storage in homogeneous and heterogeneous environments.

- The StoreEver section of the HPE Data Agile BURA Compatibility Matrix provides a single point of reference for the latest 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 independent software vendor partner compatibility.

- The HPE SAN Design Reference Guide 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 the servers, host bus adapters (HBAs), Fibre Channel switches, HPE Command View for Tape Libraries, tape drives, and library robots at the minimum supported firmware revisions specified in the current HPE Data Agile BURA Compatibility Matrix?

- Is the minimum patch level support for each operating system installed?

- Are the minimum supported drivers specified in the HPE Data Availability, Protection and Retention Compatibility Matrix installed (HBA and tape drives)?

- Are the StoreEver tape libraries or partitions online?

- Is the Veeam backup server HBA correctly logged in to the Fibre Channel switch?

- If the Fibre Channel switches are cascaded or meshed, are all inter-switch 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 Veeam backup server HBA, tape, and robotic devices in the same switch zones?

Note

HPE strongly recommends creating zones by HBA port. For more detailed information on creating zones by HBA port, refer to the HPE BURA Solutions design guide.

- Does the Veeam backup server detect all the tape and robotic devices that will be used?

- Are all HPE StoreEver Storage devices seen by Command View for Tape Libraries?

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

- Is the primary disk-based Veeam backup environment correctly configured? (To set up the primary backup environment with Veeam Backup & Replication, refer to the HPE 3PAR StoreServ and Veeam Backup & Replication solution brief.)

Discovering the tape library with Veeam Backup & Replication

After the devices are properly zoned and logged in to the SAN, start Veeam Backup & Replication on the backup server. Veeam performs auto-discovery of the tape devices and tape media. After initial discovery, the auto-discovery process occurs every 30 seconds.

If traditional backup software is also installed on the SAN to manage backups to the tape library, HPE recommends simplifying the management of complex environments with library partitioning.

Important

If the Veeam Backup & Replication backup server has SAN access to HPE tape storage, but Veeam is not being used for tape integration purposes, you might want to modify the rescan interval to ensure that Veeam Backup & Replication does not interfere with other data protection software. To modify the rescan interval, first make sure that Veeam Backup & Replication is at patch level #2 and then refer to the Veeam Backup & Replication product guide for recommended registry edits to the Veeam backup server.

Configuring Veeam Backup & Replication software

With Veeam, backups occur by moving VM data to a disk-based backup repository. Backups can then be copied to another disk-based storage device or to a tape-based storage device for data copy purposes.

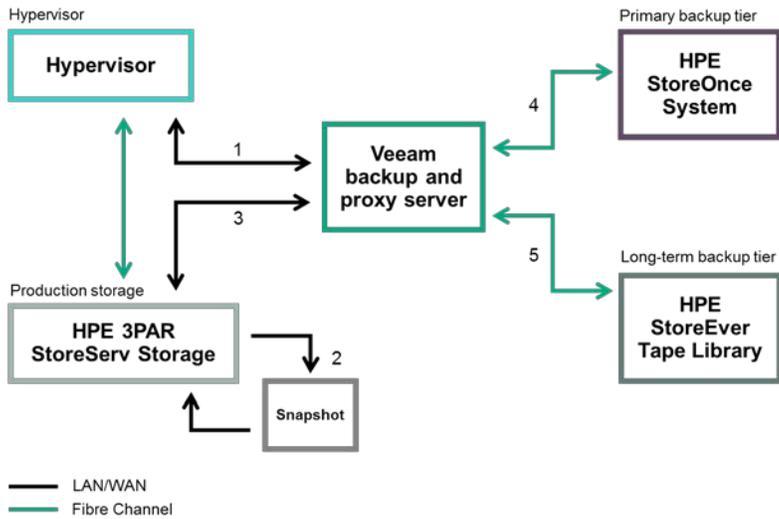**The backup-to-tape portion of the backup stream**

Figure 1. Veeam Backup & Replication data flows to HPE storage tiers

To test the concepts in this white paper, the following components were manually installed and configured in the order listed on a single, physical Windows host:

- **Veeam backup server**—The Veeam backup server is a Windows-based physical or virtual machine on which Veeam Backup & Replication is installed. It is the core component in the backup infrastructure that fills the role of the "configuration and control center."

- **Veeam proxy server**—A backup proxy is an architecture component that sits between the data source and target. It is used to process jobs and deliver backup traffic. The role of a backup proxy can be assigned to a dedicated Windows server (physical or virtual) in the virtual environment. The primary role of the backup proxy is to provide an optimal route for backup traffic and enable efficient data transfer.

- **Veeam backup repository**—A backup repository is a location used by Veeam Backup & Replication jobs to store backup files, copies of VMs, and metadata for replicated VMs. A backup repository is a folder on the backup storage. The following repository types are supported:

  - Windows server with local or directly attached storage such as a disk array

  - Linux server with local, directly attached storage or mounted NFS and Common Internet File System (CIFS) share

Figure 1 illustrates the Veeam Backup & Replication architecture[5] with the following data movement:

1. The Veeam backup server sends a request to the Veeam proxy server, which in turn requests a VM snapshot from the hypervisor.

2. Veeam integration with HPE StoreServ storage allows the backup server to communicate directly with the production storage to request a snapshot, which is performed by the StoreServ production storage.

3. The Veeam backup server retrieves snapshots from production storage. After the backup server receives the snapshot, it deletes the original snapshot from the hypervisor.

4. VM data is copied from the production storage snapshot and stored to a Veeam backup file on the primary backup tier, according to the backup job policy.

5. The backup is sent to HPE tape storage according to backup policies set by the administrator.
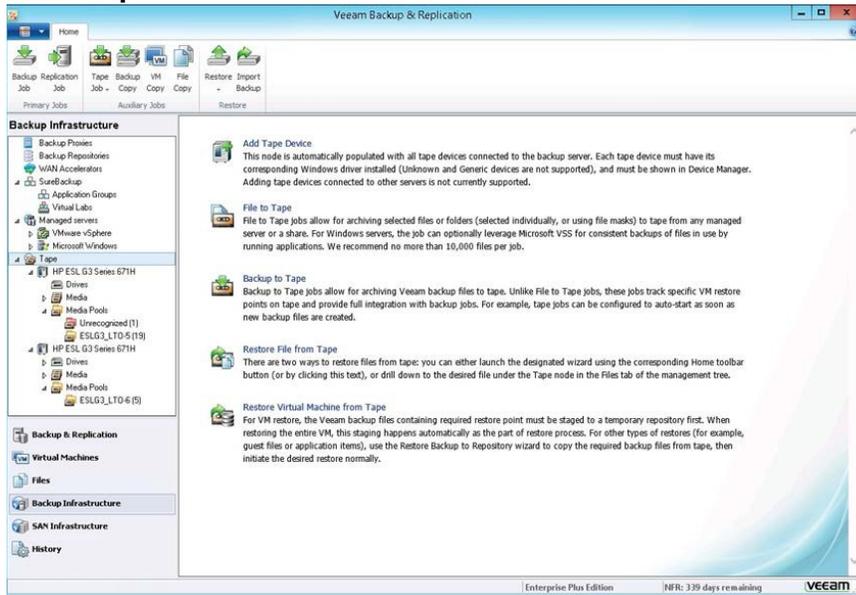
Initial setup

Figure 2. Veeam auto-discovers tape devices (left) and provides configuration wizards (right)

Before you can configure a backup-to-tape job, you must first create a primary backup to a disk-based repository.[6]

Tape libraries and drives are displayed under the Tape node in the Backup Infrastructure view, as illustrated in the left pane of Figure 2. From the right pane of the same view, several configuration wizards can be initiated:

- File to Tape wizard

- Backup to Tape wizard

- Restore File from Tape wizard

- Restore Virtual Machine from Tape wizard

---

[5] Figure 1 depicts data flow for a VMware vSphere environment. Storage tiers remain the same in a Hyper-V environment, but the Veeam transport methods differ. See the Veeam user guide for Hyper-V for details on Hyper-V data flow.
[6] For initial setup and configuration of the software for Hyper-V and VMware environments, read the Veeam user guide for Hyper-V or Veeam user guide for VMware.

Note

The Add Tape Device heading is for information only and does not initiate a configuration wizard.

Tape library discovery is automatic when you start Veeam Backup & Replication software as long as the backup server is attached to the StoreEver tape library through SAS or Fibre Channel SAN. Refer to the "Installation checklist" section of this document for tape library connectivity recommendations.

Media management

Before you set up individual tape jobs, you must review media management and media pools. Veeam initially discovers media. Expand the **Tape → Media** node in the Backup Infrastructure view to display media.

When devices and tapes are first discovered or when new tapes are loaded into the tape library, they are presented as unrecognized. Use the tape inventory feature to identify unrecognized tapes. After inventory, tapes are displayed in a free media pool.
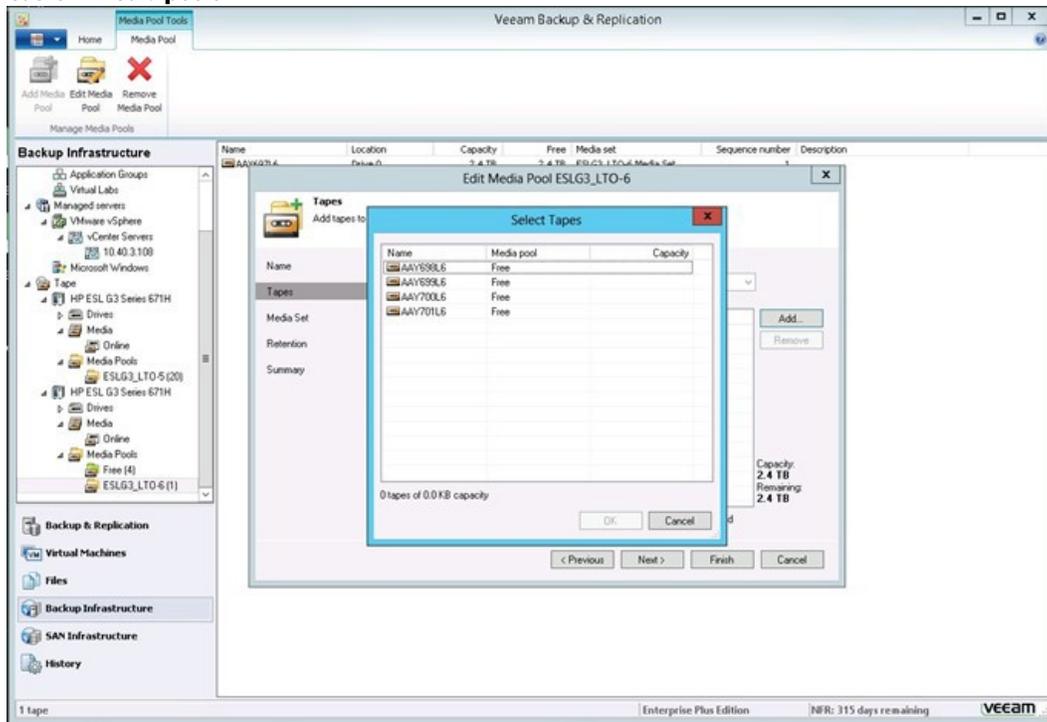
Custom media pools

Figure 3. Select tapes to move from the free media pool to a custom pool

Moving tapes to a custom media pool can make it easier to track tapes and their usage. To move tapes:

1. To create a custom media pool, go to the **Tape** node in the Backup Infrastructure view and navigate to **Media → Media Pools**. Alternatively, you can select tapes from the **Media → Online** view and right-click to move them to another pool.

2. Right-click **Media Pools** and select the **Add Media Pool** wizard to set up a custom pool and its attributes.

3. When adding media to the custom media pool, you can only move tapes in the free media pool to a custom pool by using the wizard, as shown in Figure 3.

4. After adding tapes to the pool, name the media set and set a retention policy according to administrator requirements to complete the setup.

5. After the custom media pool is set up, it is located in the Tape node in the Backup Infrastructure view. Navigate to **Media → Media Pools**, as shown in the left pane of Figure 3.

Back up to tape

Data protection using Veeam Backup & Replication software is a method of moving existing primary backups to tape. Both Veeam backup jobs and entire Veeam backup repositories can be selected for copy to tape.

There are two options in Veeam for performing a copy to tape:

• Performing a new backup-to-tape operation allows the user to manually configure jobs for copying existing backups or repositories.

• Linking backups to tape allows the user to set a secondary target for archiving purposes during the initial backup configuration, thus automating the backup and archive workflow.

To run a new backup-to-tape job, follow these steps:

1. Run the **Backup to Tape Job** wizard. From the Home tab, click **Tape Job** and select **Backups**.

2. Specify the name of the job and an optional description.

3. Select the backups or backup repositories to copy.

4. Select **Media Pool**. If you have already created custom media pools (as described in the "Custom media pools" section of this document), they are presented as an option in the wizard.

5. Specify **Options**.

Note

If you are using a tape library for any type of backup-to-tape job, select the **Eject media once the job finishes** check box in the Options window. This must be selected to ensure that Veeam sends a command to unload the tape from the tape drive and replace it in the media slot.

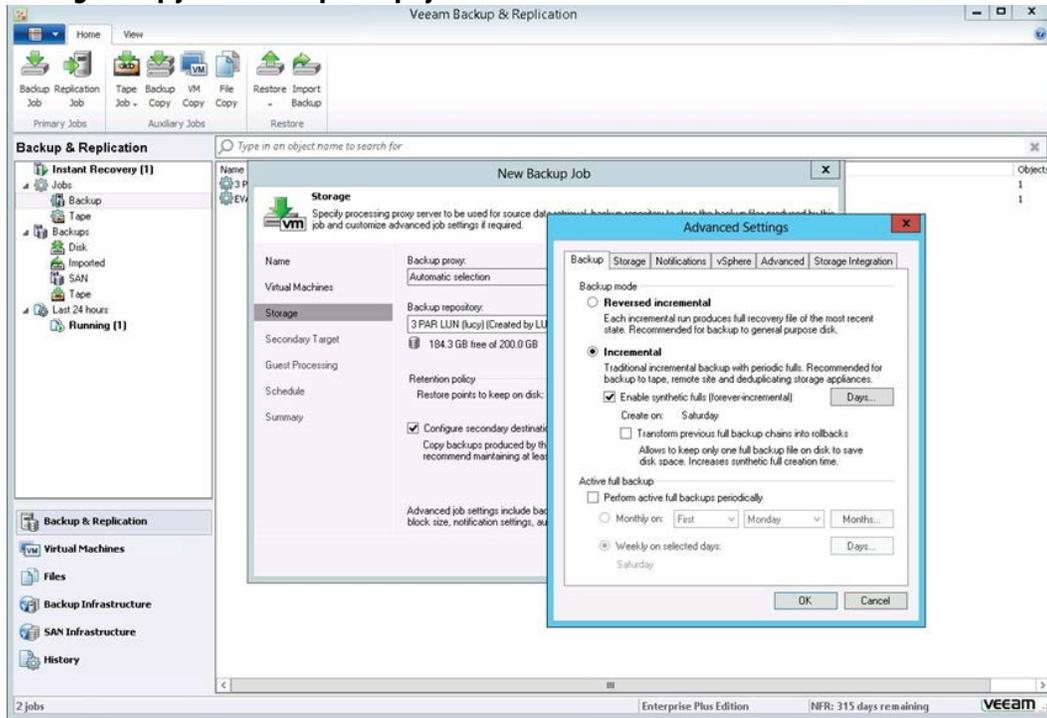### Linking backup jobs to backup-to-tape jobs

Figure 4. Link primary disk backups to tape copy in the Veeam backup-to-tape policy

A tape copy can be linked to a primary backup in Veeam Backup & Replication by creating a secondary destination for the primary backup job setup as shown in Figure 4.

Important
Using this option allows the administrator to automate both the primary backup to disk and the secondary copy to tape functions.

To link a backup job to a backup-to-tape job, follow these steps:

1. From the Backup & Replication view, select a backup job from the right navigation pane, right-click it, and select **Edit** to open the Edit Backup Job wizard.

    – Alternatively, when you are setting up a new backup job, different settings are available. From the left navigation pane in the dialog box, click **Storage**. Select the **Configure secondary destinations for this job** check box. To open the Advanced Settings dialog box, click the **Advanced reduce the time required to move backups to tape** button on the lower right.

2. Ensure that the **Incremental** radio button is selected. Veeam recommends that incremental backup be used for disk-to-disk-to-tape to reduce the time required to move backups to tape.

    – Other settings are available as well.

New file to tape
File-to-tape jobs allow the administrator to either copy specific files from the Veeam backup server to tape, or send files from Windows and Linux servers that can be accessed by the Veeam backup server to tape, much like a traditional backup application. However, the movement of files occurs first across the LAN to the Veeam backup server, and then to SAS or SAN-attached tape.

Note
File-to-tape backup speeds are throttled by data movement over the LAN to the backup server. This might cause extended backup times.

To launch the New File to Tape Job wizard, do either of the following:

*   On the Home tab, click **Tape Job** and select **Files**.

*   Open the **Backup & Replication** view, right-click the **Jobs** node and select **Tape Job → Files**.

Alternatively, use the following procedure:

1. Open the **Files** view, browse to the necessary files, and select them. From the ribbon menu, select **Add to Tape Job → New job**

2. Open the **Files** view, browse to the necessary files, and right-click them. Select **Add to Tape Job → New job**

Restores from tape
Three options for restoring VMs or files from tape with Veeam Backup & Replication are:

*   Restoring full backups or backup chains from a tape copy to disk

*   Performing full VM recovery from a tape copy to the virtual infrastructure

*   Restoring files and folders to their original location or any folder of your choice

Restore backup from tape copy to disk
To restore backups from tape copy to disk:

1. Run the **Restore Backup from Tape to Repository** wizard. From the Home tab, click **Restore** and select **Tape → Restore Backups**.

2. From the prepopulated list of VMs copied to tape in the wizard, select the VMs to restore.

3. Select a restore point. If you select a full backup point in the list, Veeam restores only this full backup. If you select an increment, Veeam restores a chain consisting of a full backup and forwards the increments necessary to restore VMs to the required point in time. You can make different choices for each VM you want to restore during a specific session.

4. Select a backup destination. Because you are restoring from a tape copy, Veeam sends the data to this intermediate storage destination. The wizard allows you to put the data on an existing backup repository, on a server that can be accessed by the Veeam backup server, or on a network share.

5. After the backup is restored from tape copy to a disk destination, it is displayed as an "imported backup" in the Backup & Replication → Backups → Imported view. From this point, you can select various data recovery methods described in the appropriate Veeam Backup & Replication user guide for your hypervisor.

Restoring virtual machines from tape copy to the virtual infrastructure

The process for restoring full VMs from tape copy has two stages. During Stage 1, copied VMs are restored to an intermediate staging destination. The destination can be a backup repository or a folder. The second stage restores the VM into the virtual infrastructure. After Stage 2 is complete, the backup is deleted from the staging destination.

Stage 1

1. Run the Full VM Restore wizard by using one of two methods:

   – Open the **Backup & Replication** view and expand the **Backups → Tapes** node. Select the necessary VMs in the backup. Right-click **Backup on Tape** and then click **Restore entire VM**.

   – Alternatively, open the **Backup & Replication** view and expand the **Backups → Tapes** node. Right-click the necessary VMs in the backup and select **Restore entire VM**.

2. Follow the wizard. The same steps defined in the "Restore backup from tape copy to disk" section apply.

Stage 2

For VMware:

1. Launch the Restore wizard by opening the **Backup & Replication** view.

2. Expand the **Backups → Tapes** node.

3. Right-click the necessary VMs in the backup and select **Restore entire VM**.

4. Refer to the "Restoring Entire VM" section of the <u>Veeam Backup & Replication User Guide for VMware vSphere</u> for instructions on how to use the Full VM Restore wizard to complete the restore to the virtual infrastructure.

For Hyper-V:

1. Launch the Restore wizard and do one of the following:

   – On the Home tab, click **Restore** and select **Hyper-V**. In the Restore from backup section, select **Entire VM (including registration)**.

   – Alternatively, open the **Backup & Replication** view and select the **Backups** node. In the working area, expand the necessary backup job, select the VMs you want to restore, and click **Entire VM** on the ribbon.

2. Refer to the "Restoring Entire VM" section of the <u>Veeam Backup & Replication User Guide for Hyper-V</u> for instructions on how to use the Full VM Restore wizard to complete the restore to the virtual infrastructure.

Restoring files from tape

Restoring files from tape works more like a traditional backup application in that you choose a file for restore and destination. That file is then restored to the destination directly from tape. Similar to the process of backing up files to tape, the file movement first occurs over the LAN to the Veeam backup server. Long restore times are possible due to LAN bottlenecks.

To restore files from tape:

1. Run the Files from Tape wizard. From the Home tab, click **Restore**, and then select **Tape → Restore Files**.

2. Use the wizard to select the objects to restore, specify a destination, and specify restore options.

Note

When you use the Restore files from tape option, restore speeds are throttled by data movement over the LAN to the backup server. This might cause extended restore times.

Performance and tuning

To analyze speed and performance, you must examine the entire backup and archive process as a system. Many factors contribute to overall system performance, but to determine the maximum performance in any situation, you must thoroughly understand four main factors:

- **Storage connection**—For BURA solutions with HPE StoreEver MSL Tape Libraries, this is the Fibre Channel connection.

- **File (data) compression ratio**—The amount of compression directly impacts the rate at which a tape drive can read or write data.

- **Source disk and file systems**—Considerations are the 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 the HPE StoreEver Storage system.

Note

To achieve the best results, first optimize the environment by installing the latest drivers and firmware, optimizing the network, and so on. Refer to the "Installation checklist" section of this document.

File (data) compression ratio

HPE 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 a backup is many small files due to system overhead of file accession.

- **Data compressibility**—Uncompressible data backs up more slowly than more readily 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**—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, 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 is the disk access method. As a result, the backup takes longer. If the system has a defragmentation utility, HPE recommends running it before full backups or on a regularly scheduled basis to ensure that files are contiguously arranged on the disk.

Tape drive

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

Table 2. Tape drive throughput speed (native)

Tape drive	Native throughput MB/s
Ultrium 15750 (LTO-7 full height [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 1760 (LTO-4 HH)	80
Ultrium 920 (LTO-3 HH)	60

Conclusion

Enterprise server customers demand an efficient, reliable virtual data backup and archiving solution while keeping costs under control. HPE Storage provides a variety of reliable data storage solutions that address such requirements.

HPE StoreEver Storage with Veeam Backup & Replication can provide a complete 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. HPE StoreEver Tape systems integrate easily with Veeam Backup & Replication and are a critical component for comprehensive data protection and archiving of mission-critical applications.

Resources

HPE Storage products

HPE Data Availability, Protection and Retention Compatibility Matrix

HPE Data Agile BURA Compatibility Matrix

Veeam and HPE

Veeam Backup & Replication

VMware vSphere

Microsoft Hyper-V

Learn more at:
hpe.com/us/en/storage/storeever-tape-storage.html

hpe.com/us/en/product-catalog/storage/complete-storage-solution/pip.complete-partner-program.1009482334.html

veeam.com/vm-backup-recovery-replication-software.html

Sign up for updates