



Veeam Backup & Replication

Version 12

Tape Devices Support Guide

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Contacting Veeam Software

At Veeam Software we value feedback from our customers. It is important not only to help you quickly with your technical issues, but it is our mission to listen to your input and build products that incorporate your suggestions.

Customer Support

Should you have a technical concern, suggestion or question, visit the [Veeam Customer Support Portal](#) to open a case, search our knowledge base, reference documentation, manage your license or obtain the latest product release.

Company Contacts

For the most up-to-date information about company contacts and office locations, visit the [Veeam Contacts Webpage](#).

Online Support

If you have any questions about Veeam products, you can use the following resources:

- Full documentation set: veeam.com/documentation-guides-datasheets.html
- Veeam R&D Forums: forums.veeam.com

Tape Devices Support

Veeam provides native tape support that is fully integrated into Veeam Backup & Replication. You can administer all operations on tapes from your Veeam Backup & Replication console.

Long-term archiving and compliance are listed as primary reasons for using tape. Tape appears to be one of the most widely used media for offsite backup. Using backup to tape, you can implement the '3-2-1' backup approach (3 copies, 2 types of media, 1 offsite location) considered as a best practice for data protection and disaster recovery. Veeam Backup & Replication offers support for tape devices and allows you to archive your data to tape and restore it from tape whenever needed.

Storing data to tapes provides you with the same data managing options as disk repositories. In particular, you can store full and incremental backups, apply user-defined retention settings to the archived data, select restore points and so on. Compared to disk storage, tape archive requires more time to retrieve files for restore if the tapes are stored offsite.

Supported Devices and Configuration

Veeam Backup & Replication supports Linear Tape-Open (LTO) tape libraries:

- Physical libraries, standalone drives and virtual tape libraries.
- Partitions of the physical or virtual tape libraries presented to the Veeam backup server.

Within a library partition, only one generation of LTO drives are supported.

LTO tape versions that are released after this version of Veeam Backup & Replication reaches end-of-fix are not supported.

For more information on supported devices, see the System Requirements section in the Veeam Backup & Replication User Guide.

Limitations

VMware does not support tape drives connected directly to ESXi 5.x and later. For more information, see [this VMware KB article](#).

Veeam Backup & Replication will potentially work with such a configuration, but if there is a hardware-related issue, Veeam Support will not provide help to solve it. This functionality is vendor-supported.

Affecting 3rd Party Tape Solutions

Veeam Backup & Replication does not support sharing tape devices with other Veeam backup servers, with different tape servers of one Veeam Backup & Replication installation, or with 3rd party tape-recording software. If you plan to run both Veeam Backup & Replication and 3rd party tape-recording software (for example, in your evaluation lab), consider that Veeam Backup & Replication by default will periodically lock the drive to perform rescan, preventing other software from recording.

To share a tape device, configure a partition of the tape library that will be used only by Veeam Backup & Replication.

Consider the following limitations:

- Do not connect partitions presented to the 3rd party tape software to a Veeam tape server.
- Do not install any 3rd party tape-recording software or software components on Veeam tape server.

Driver Installation Mode

Veeam Backup & Replication supports both exclusive and non-exclusive driver installation.

NOTE

If you use standalone tape drives, it is recommended to install drivers in non-exclusive mode.

Path Failover

Veeam Backup & Replication supports path failover for tape devices with multiple drives that manage multiple paths over multiple SANs.

NOTE

Veeam does not supply MPIO drivers. To get proper MPIO drivers, request them from the tape device vendor.

Industry Format

Veeam Backup & Replication uses the MTF (Microsoft Tape Format) industry format to write data to tape.

Supported Connection Types

You can connect the tape device directly or remotely.

- Direct connection:
 - Fibre Channel (FC)
 - Serial Attached SCSI (SAS)
 - SCSI
- Remote connection:
 - iSCSI
 - Switched FC fabric

Data Block Size

Drives use hardware dependent block sizes to read/write the tape data. Generally, the drives support a range of block sizes and report this range to Veeam Backup & Replication.

If you use a tape library with multiple drives or you use multiple standalone drives, Veeam Backup & Replication uses a unified block size to write data to tapes. 256k data block size is used if all drives can support it. If any drive can support only a smaller block size, for example, 64k, then Veeam Backup & Replication uses the largest block supported by all drives. To understand block sizes supported by drives, Veeam Backup & Replication collects the block size ranges reported by each drive and compares them. Note that the reported range is additionally limited by storage controllers settings used in your infrastructure. You can check the resulting range of block sizes supported by Veeam Backup & Replication for a particular drive in the Drives properties. For more information, see [Working with Drives](#).

NOTE

If you connect the tape devices using HBA, Veeam Backup & Replication uses the block size configured for the HBA.

The block size is unified for:

- All drives in one library (if the drives support different block sizes).
- All standalone drives connected to one tape server.

To read data from tape, Veeam Backup & Replication requires that the tape is written with the block size from the supported range (shown in the drive properties).

Consider the block size range when working with the following tapes:

- Tapes with Veeam backups written by another tape library.
- Tapes with Veeam backups written on another tape server.
- Tapes written with other data transfer configuration settings.
- Tapes written on a 3rd party device.

IMPORTANT

You can restore from tapes written with block size that match the block size range set for the tape device.

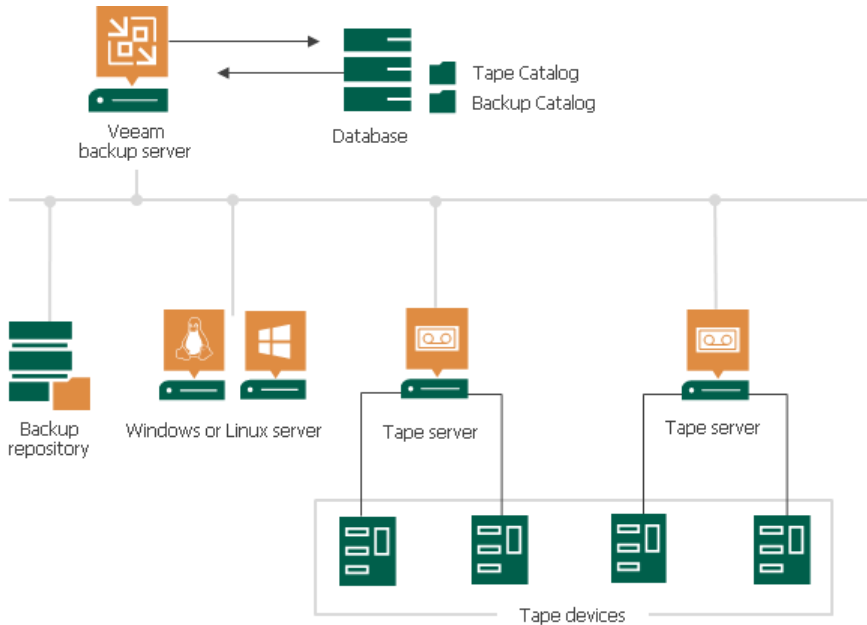
Unknown Medium Changers

Veeam supports medium changers that have no Microsoft Windows drivers available. Make sure that such device is recognized as an unknown medium changer in the Microsoft Device Manager list.

It is recommended that you use tape devices with original equipment manufacturer (OEM) drivers.

Tape Environment

To administer tape backup and restore procedures, you must add the tape server to your Veeam Backup & Replication console. Adding the tape server to the backup infrastructure makes possible to transfer data between the disk storage and the tape archive.



The tape backup and restore process involves the following components:

Veeam Backup Server

The Veeam backup server is the server running Veeam Backup & Replication. It is the core component in the backup infrastructure. The Veeam backup server tasks include the following operations:

- Recognizing all tape devices that are connected to it and managing all drives, slots and tapes.
- Administering tape archiving: scheduling and triggering tape jobs and initiating restore tasks.
- Communicating with the Veeam backup database.

Tape Device

When connected to the Veeam backup server, tape devices provide reading and writing capabilities, while all administration is performed by the Veeam backup server. You can connect multiple tape devices.

Tape Servers

To connect to the tape devices, Veeam Backup & Replication uses tape servers.

The tape server is a backup infrastructure component transferring data between data source and tape device. The tape server runs Veeam Data Mover that creates a communication point over which the data between the tape device and backup repositories or file servers is transferred.

The tape server deployment is fully automated: to create a tape server, you must assign the tape server role to a necessary server in the backup infrastructure. You can create a dedicated tape server or assign the tape server role to the Veeam backup server.

Veeam Backup Database

Veeam Backup & Replication catalogs information about all archived data and stores this information in the Veeam backup database.

The registered tapes stay in the database until you remove the information about them. You can always view details for each tape, for example, information about backups written to it, even if the tape is not inserted in the library.

The catalog lets you quickly detect location of the required items on tape. The catalog correlates the archived files and their restore points to the names of the corresponding tapes, both online or offline, and the names of the media sets within which the data was written. When you start restoring data, Veeam Backup & Replication prompts for the tapes you need to bring online. As a result, you can restore data from tape much quicker when necessary.

Veeam Backup & Replication uses the following catalogs for storing the tape-related data:

- **Tape Catalog** stores information about files/folders archived to tape media with file to tape jobs, as well as backup files produced by backup to tape jobs. The content of the Tape Catalog can be examined in the **Files** view.
- **Backup Catalog** stores information about machines whose backups are archived to tape media with backup to tape jobs. The content of the Backup Catalog can be examined under the **Backups > Tape** node in the **Backup & Replication** view.

Backup Repositories and File Servers

When retrieving data to back up, or restoring data to disk, Veeam Backup & Replication can connect to any machine that has been added as a managed server to the Veeam Backup & Replication console.

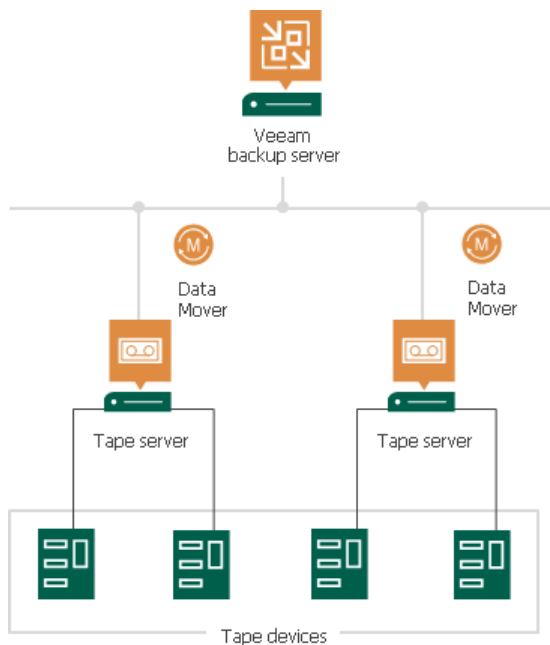
Tape Devices Deployment

To connect tape devices to Veeam Backup & Replication, you need to deploy a tape server. Tape servers are network appliances that connect tape libraries to the Veeam backup server and manage traffic between tape devices and Veeam backup server. The connected tape devices are recognized by the Veeam Backup & Replication automatically.

Data Movers

With Veeam Backup & Replication, the data transfer during archiving and restore processes is enabled with Veeam Data Movers. Veeam Data Movers run on tape servers and other components of backup infrastructure. They receive tasks from the Veeam backup server and communicate to each other to transfer the data.

Veeam Data Movers are light-weight services that take a few seconds to deploy. Deployment is fully automated: when you assign a tape server role to a server, Veeam Backup & Replication installs the necessary components on this server and starts the required services on it.



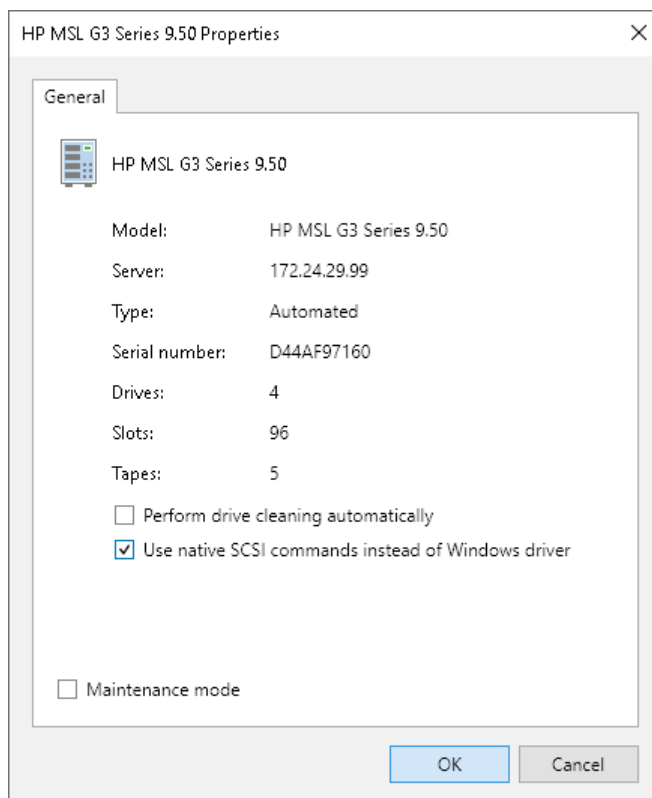
Connecting Tape Devices

To deploy a tape device, you must perform the following steps:

1. Choose a machine that will act as the tape server. You can choose between the following options:
 - Use the Veeam backup server as the tape server. This variant is sufficient for small environments with low traffic workloads.
 - Deploy a dedicated tape server. As a tape server, you can use a Microsoft Windows or Linux server, physical or virtual, accessible by Veeam Backup & Replication. For the tape server system requirements, see [System Requirements](#) the System Requirements section in the Veeam Backup & Replication User Guide.

A dedicated tape server is recommended for installations with intense data transferring. A dedicated tape server allows you to manage remote tape libraries.
2. Connect the tape device to the machine that will perform the role of the tape server. You can connect the tape device in two ways:
 - Directly over Fibre Channel (FC), Serial Attached SCSI (SAS), SCSI.
 - Remotely with iSCSI (you can use Microsoft iSCSI initiator to establish the connection).
3. Install an appropriate device driver on the tape server.
4. If the medium changer driver is not available, check that the tape device uses native SCSI commands.

Open the **Tape Infrastructure** view, expand the **Libraries** node and select the needed library. Click **Properties** on the ribbon. You can also right-click the necessary library in the working area and select **Properties**. Select the **Use native SCSI commands instead of Windows driver** check box.



IMPORTANT

Only media changers can use SCSI commands. Tape drives must use native OEM drivers.

5. Add the tape server to Veeam Backup & Replication. For more information, see [Adding Tape Servers](#). Veeam Backup & Replication will automatically scan connected tape devices and display all discovered tape libraries and tape drives under the **Libraries** node in the **Tape Infrastructure** view. Afterward, the auto-discovery process will be performed periodically every 3 minutes.

You can connect multiple tape devices to each tape server. The connected tape devices will appear as list under the **Libraries** node in the **Tape Infrastructure** view.

Veeam Backup & Replication allows deploying multiple tape servers. However, if you have multiple Veeam backup servers, you cannot connect one tape server to several Veeam backup servers simultaneously.

IMPORTANT

We strongly recommend not to connect each tape device to multiple tape servers at a time, as it may lead to conflicts.

TIP

If you have several Veeam backup servers, you can easily reconnect a tape server to another Veeam backup server without reconfiguring the tape device: Veeam backup server will recognize the library settings automatically. Note that when you reconnect the tape server, the tape jobs will not run with another Veeam backup server unless you copy the configuration.

Reconnecting Tape Devices to Another Tape Server

You can reconnect your tape devices to another tape server. For example, you can reconnect the tape devices from the Veeam backup server to a dedicated tape server. To do this, choose a tape server and perform steps for connecting tape devices above. When you add the new tape server to Veeam Backup & Replication, Veeam Backup & Replication will recognize the tape devices and all tape device settings.

Getting Started with Tapes

After you have connected tape devices, you need to complete the following steps:

1. [Add a tape server](#) to the Veeam backup server.
2. Load tapes to the tape device (if not yet loaded) and run the [importing procedure](#) for them.
3. Create one or more [media pool](#) or [GFS media pool](#) that will be used as targets for tape jobs.
4. Configure one or more [media vaults](#) to conveniently organize offline tapes.
5. Configure and run [backup to tape](#) or [file to tape jobs](#).
6. Restore [virtual machines to infrastructure](#) or [both virtual and physical machines to repository](#), or [restore files from tape](#).

Tape Servers

When you have deployed a tape server and connected the tape device to it, you need to add the tape server to the Veeam backup server. To do so, you must assign the role of the tape server to a Windows or Linux server that is already added to the list of managed servers.

You can add multiple tape servers to the same installation of Veeam Backup & Replication. But note that you cannot add one tape library to two different tape servers and write data to it from both tape servers.

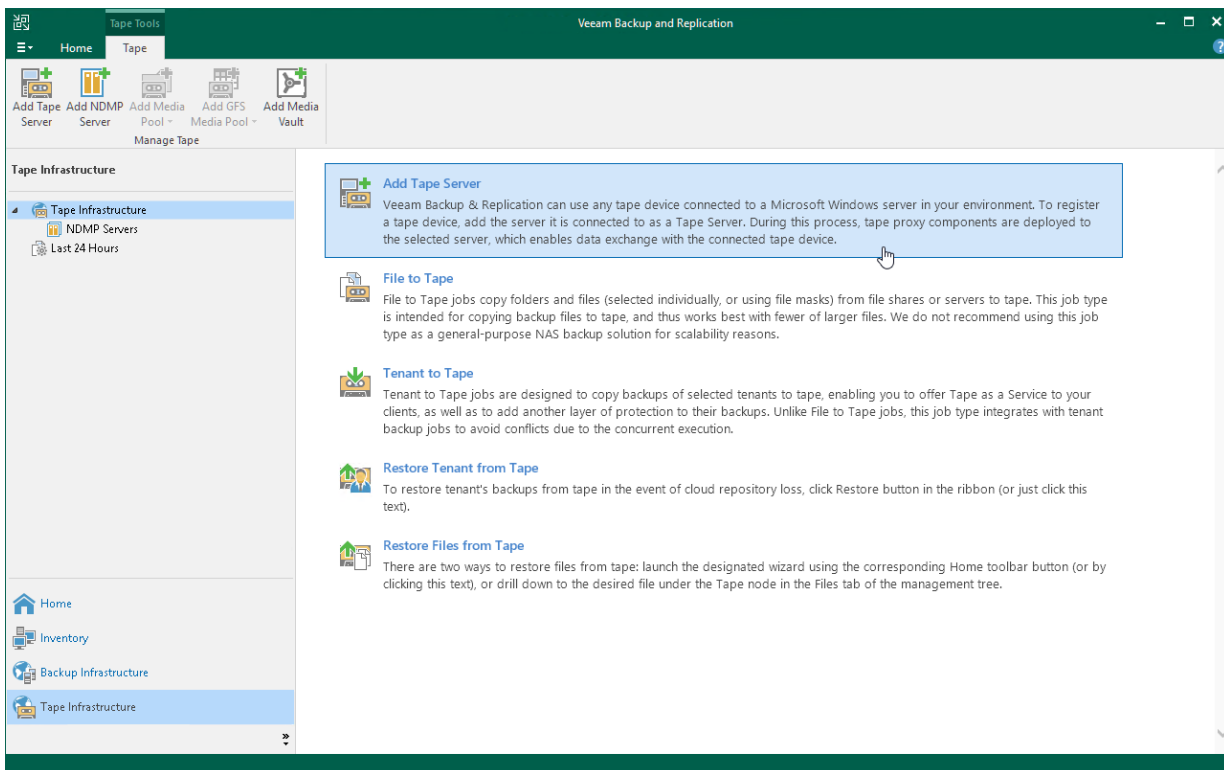
Adding Tape Servers

To add a tape server, follow the next steps:

Step 1. Launch New Tape Server Wizard

To launch the **New Tape Server** wizard:

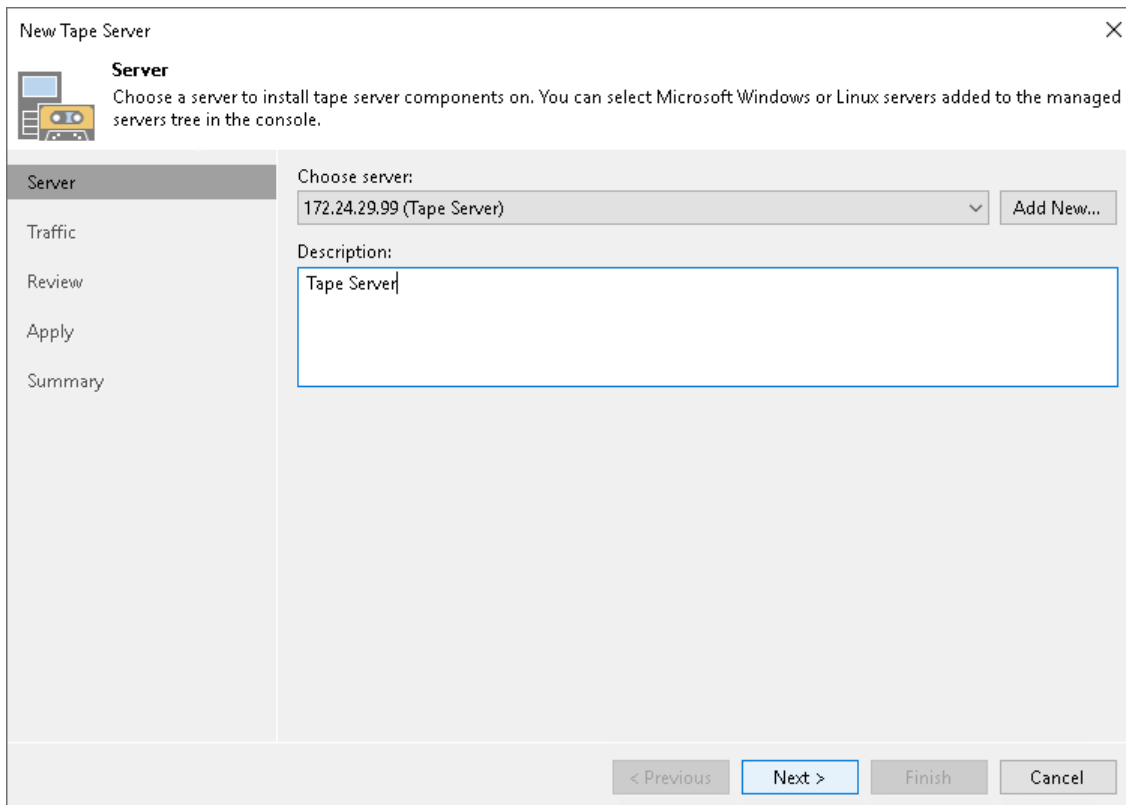
1. Open the **Tape Infrastructure** view.
2. Do one of the following:
 - In the inventory pane, right-click **Tape Servers** and select **Add tape server**.
 - In the inventory pane, select **Tape Servers** and click **Add Tape Server** on the ribbon.
 - In the inventory pane, select the **Tape Infrastructure** node and click **Add Tape Server** in the working area.



Step 2. Choose Server

At the **Server** step of the wizard, choose a physical or virtual server to which the tape devices are connected and that you want to add as the tape server.

1. From the **Choose server** list, select the server that you want to add as the tape server. As a tape server, you can use a Microsoft Windows or Linux server, physical or virtual, added to the Veeam Backup & Replication infrastructure. For the tape server system requirements, see the **System Requirements** section of the Veeam Backup & Replication User Guide.
 - If the devices are connected to the Veeam backup server, select **This server**. The tape server role will be assigned to the backup server.
 - If the devices are connected to a separate server, enter the server name. If the server is not added to Veeam Backup & Replication yet, you can click **Add New** to add a new Windows server or Linux server to the backup infrastructure. To learn how to add those servers to the backup infrastructure, see the **Adding Microsoft Windows Servers** and **Adding Linux Servers** sections of the Veeam Backup & Replication User Guide.
2. In the **Description** field, provide a description for future reference.



New Tape Server

Server
Choose a server to install tape server components on. You can select Microsoft Windows or Linux servers added to the managed servers tree in the console.

Server
Traffic
Review
Apply
Summary

Choose server:
172.24.29.99 (Tape Server) Add New...

Description:
Tape Server

< Previous Next > Finish Cancel

Step 3. Configure Traffic Throttling Rules

At the **Traffic** step of the wizard, configure throttling rules to limit the outbound traffic rate for the tape server. Throttling rules will help you manage bandwidth usage and minimize the impact of tape jobs on network performance. For more information, see the Veeam Backup & Replication User Guide, section *Enabling Traffic Throttling*.

The list of throttling rules contains only those rules that are applicable to the tape server you are adding. The rule is applied to the tape server if its IP address falls under the source IP range of the rule. To view the rule settings, select it in the list and click the **View** button on the right.

You can also open global throttling settings and modify them directly from the wizard by clicking **Manage network traffic throttling rules** at the bottom of the window.

New Tape Server [Close]

Traffic
Review the network traffic rules that apply to this server.

Server
Traffic
Review
Apply
Summary

Network traffic rules control encryption and throttling of network traffic based on the destination. Throttling is global, with set bandwidth split equally across all backup proxies falling into the rule.

The following network traffic rules apply to this proxy:

Name	Encryption	Throttling	Time period
Internet	Enabled	Disabled	

[View](#)

[Manage network traffic rules](#)

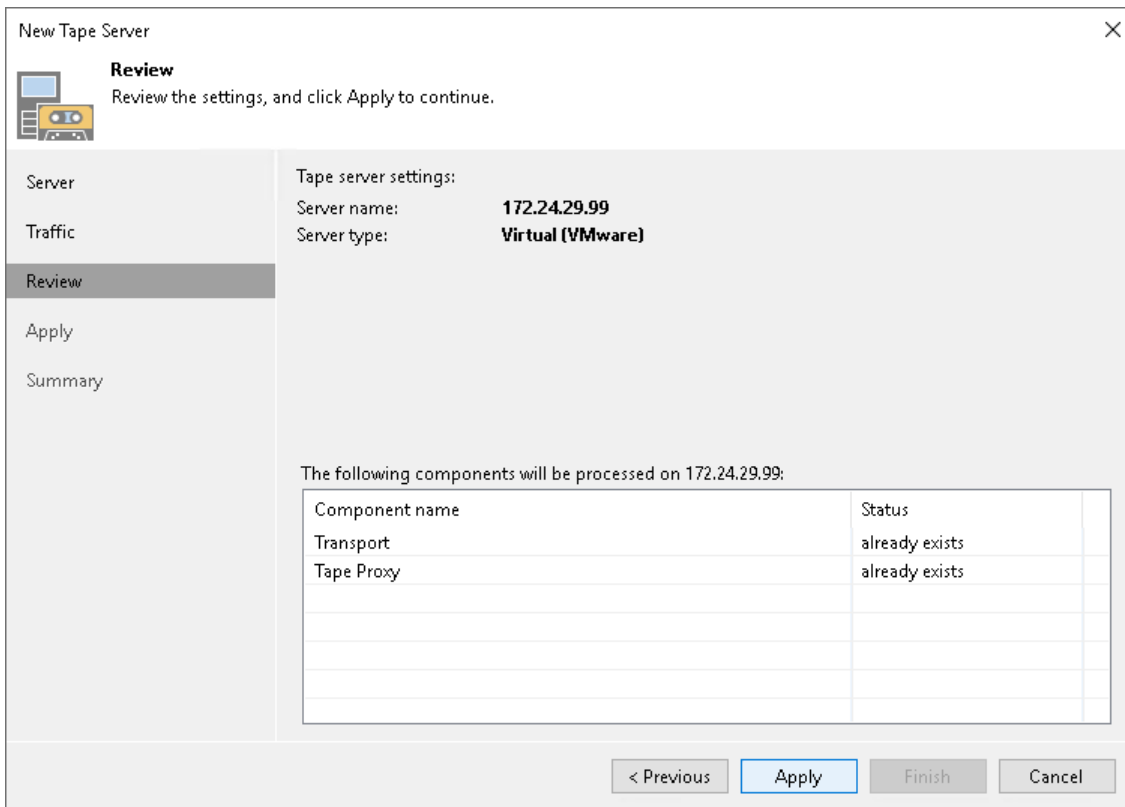
< Previous **Next >** Finish Cancel

Step 4. Review Components

At the **Review** step of the wizard, Veeam Backup & Replication will display the list of components required for work of the tape server:

- Veeam Transport
- Veeam Tape service

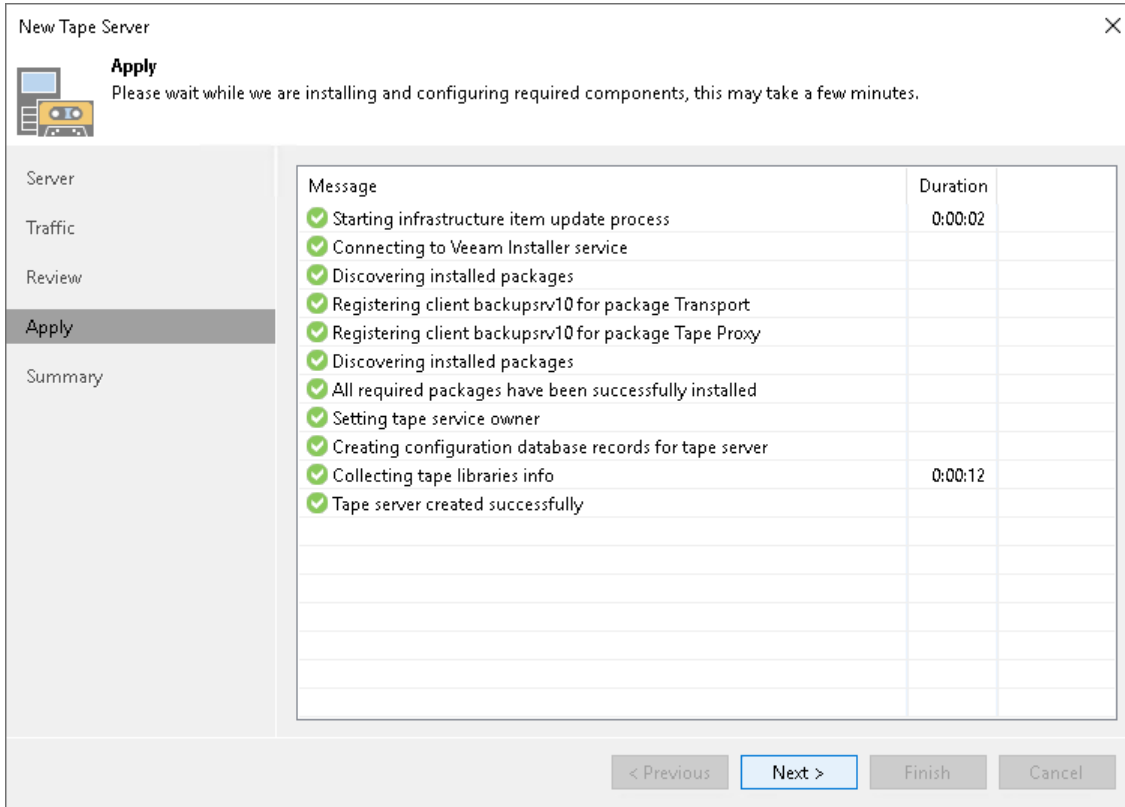
If any of them is missing, Veeam Backup & Replication will automatically install them on the selected server.



Step 5. Assess Results

At the **Apply** step of the wizard, Veeam Backup & Replication will add the tape server to the backup infrastructure in the real time mode.

If Veeam Backup & Replication detects an unknown media changer, the message will appear in the **Message** area.



New Tape Server [Close]

Apply
Please wait while we are installing and configuring required components, this may take a few minutes.

Server
Traffic
Review
Apply
Summary

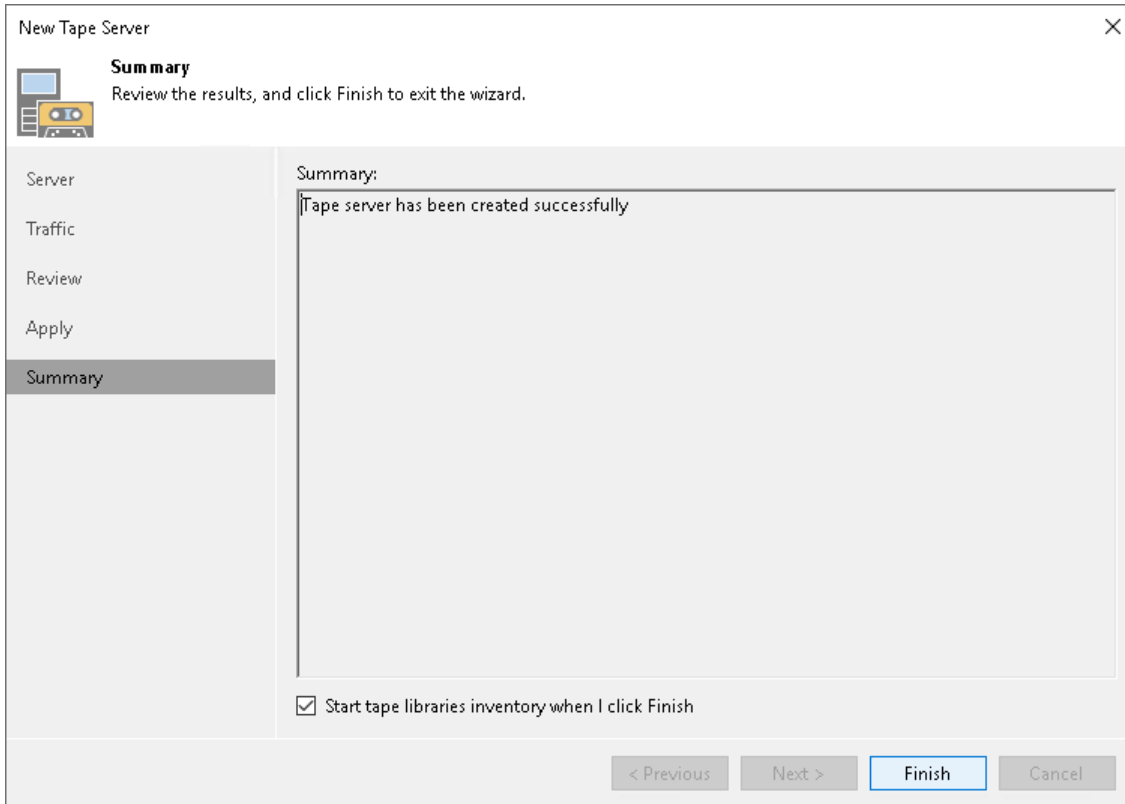
Message	Duration
✓ Starting infrastructure item update process	0:00:02
✓ Connecting to Veeam Installer service	
✓ Discovering installed packages	
✓ Registering client backupst10 for package Transport	
✓ Registering client backupst10 for package Tape Proxy	
✓ Discovering installed packages	
✓ All required packages have been successfully installed	
✓ Setting tape service owner	
✓ Creating configuration database records for tape server	
✓ Collecting tape libraries info	0:00:12
✓ Tape server created successfully	

< Previous **Next >** Finish Cancel

Step 6. Finish Working with Wizard

At the **Summary** step of the wizard, finalize the procedure of the tape server configuration. Review details of the added tape server.

To inventory tape libraries connected to the tape server, select the **Start tape libraries inventory when I click Finish** check box. Veeam Backup & Replication will start the inventory process when you finish working with the wizard. If you do not enable this option, you will have to inventory tape libraries manually. For more information, see [Inventorying Tapes](#).



Removing Tape Servers

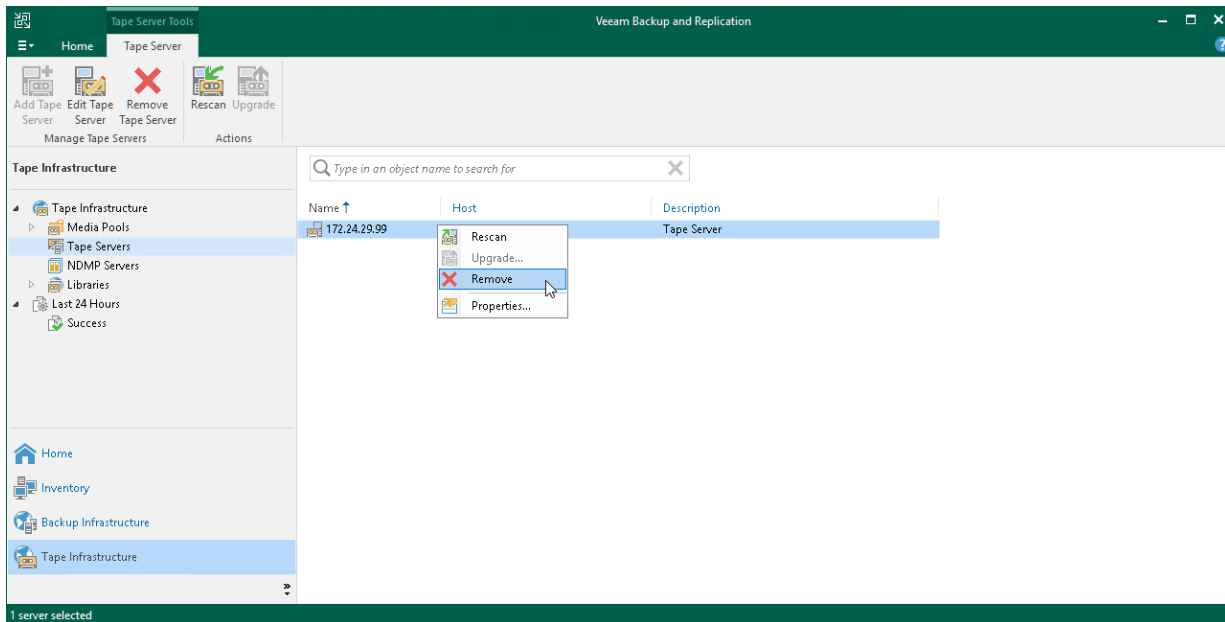
To remove a tape server:

1. Open the **Tape Infrastructure** view.
2. Select the **Servers** node in the inventory pane.
3. Select the tape server in the working area and click **Remove Tape Server** on the ribbon. You can also right-click the necessary tape server in the working area and select **Remove**.

When you remove a tape server, Veeam Backup & Replication unassigns the tape server role from it, so it is no longer used as a tape server. The actual server remains connected to Veeam Backup & Replication.

Limitations for Removing Tape Servers

You cannot remove a tape server while tape jobs are running. Before you remove the tape server, stop all tape jobs.

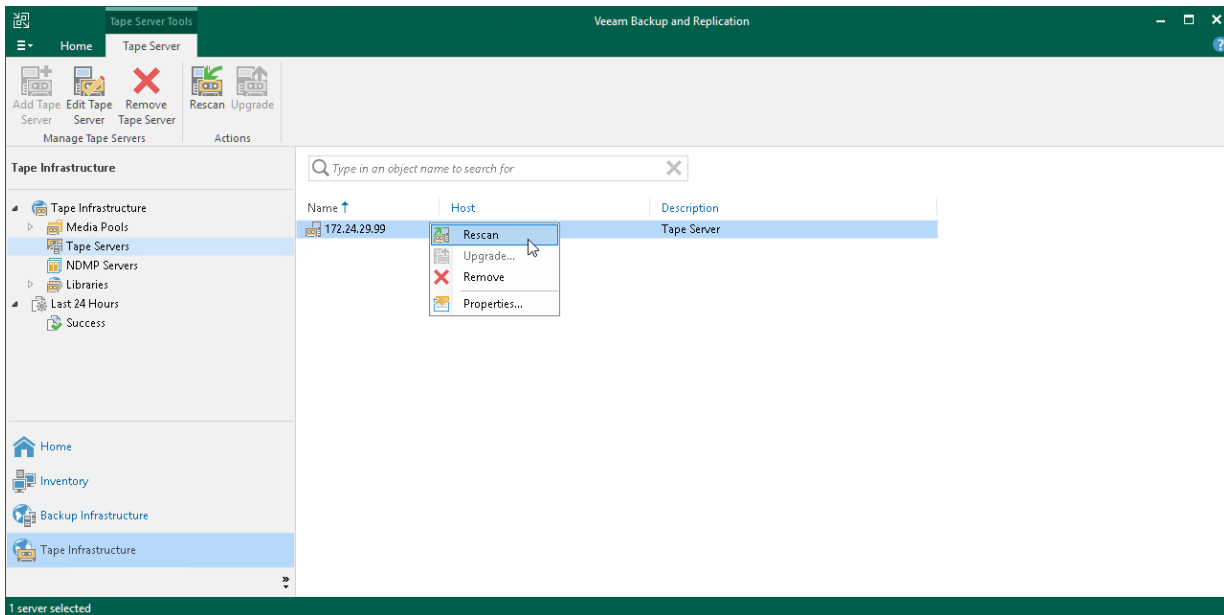


Rescanning Tape Servers

Veeam Backup & Replication automatically rescans the tape servers every 3 minutes. During the rescan, Veeam Backup & Replication updates the list of managed tape devices. You can perform manual rescan of a tape server, for example, if you want to implement the changes made to the tape infrastructure immediately.

To rescan a tape server:

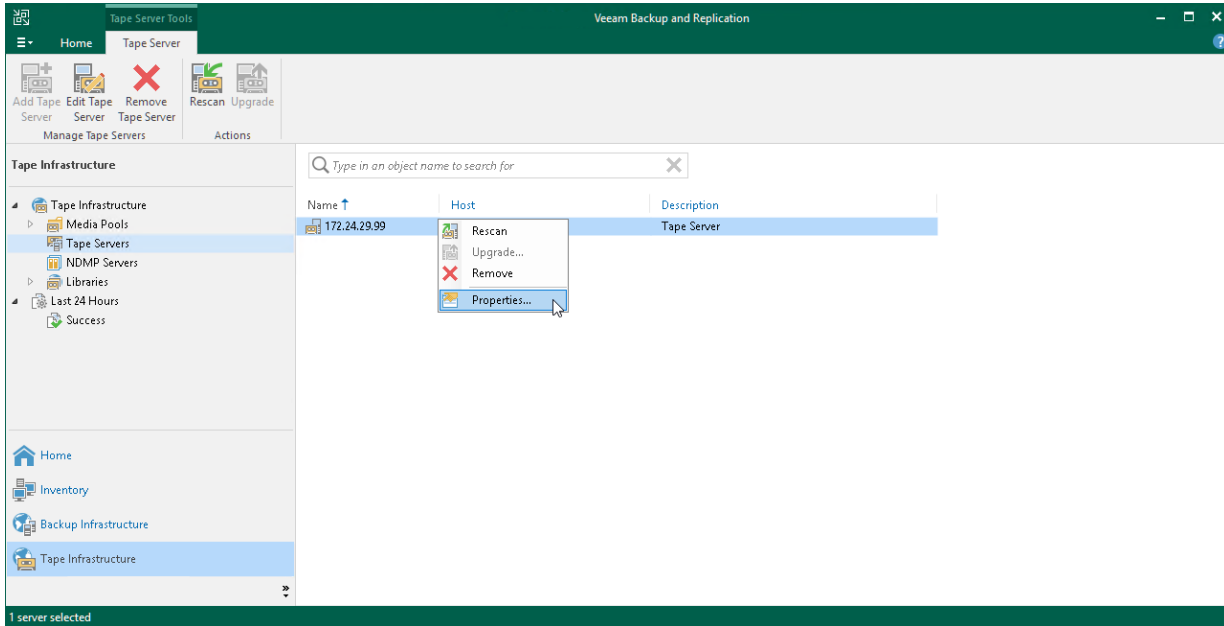
1. Open the **Tape Infrastructure** view.
2. To rescan all tape servers, right-click the **Servers** node and select **Rescan**.
3. To rescan a selected tape server, select the **Servers** node in the inventory pane. Select the necessary server in the working area and click **Rescan** on the ribbon. You can also right-click the necessary server in working area and select **Rescan**.



Modifying Tape Servers

To edit settings of an added tape server:

1. Open the **Tape Infrastructure** view.
2. Select the **Servers** node in the inventory pane.
3. Select the necessary server in the working area and click **Edit Tape Server** on the ribbon. You can also right-click the necessary server in working area and select **Properties**.
4. Then edit the tape server settings as required.



Replacing Tape Servers

You can replace the tape server with another tape server and continue to use the existing libraries and tapes with it.

To correctly replace a tape server:

1. Physically disconnect libraries from the old tape server or disable the tape changer device and drives in the Device Manager on this tape server.
2. Remove the old tape server from the tape infrastructure, as described in [Removing Tape Servers](#).
3. Add a new tape server, as described in [Adding Tape Servers](#).
4. Connect your existing tape devices to the new tape server, as described in [Connecting Tape Devices](#).

All the information about existing tapes will be preserved after switching to the new tape server.

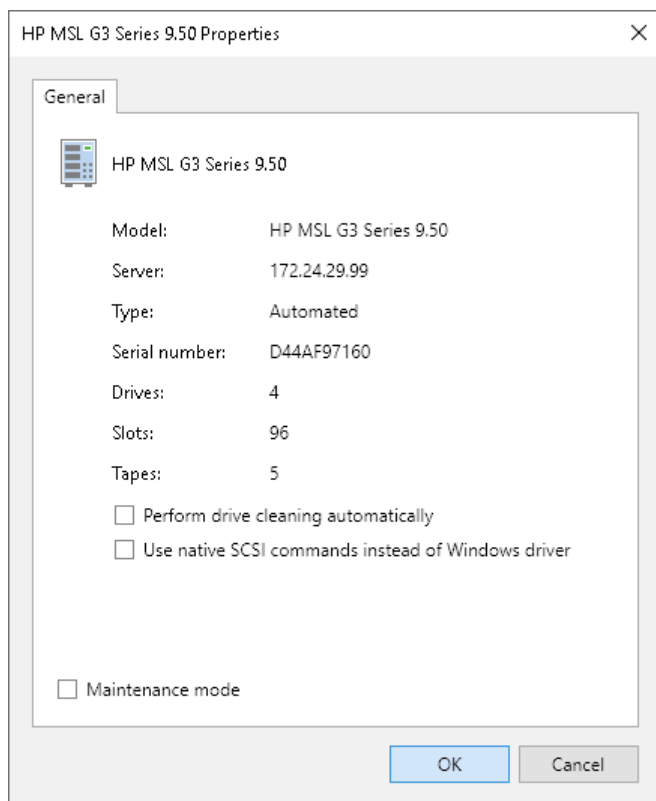
Tape Libraries

All tape libraries and standalone tape drives managed by Veeam Backup & Replication are shown in a list under the **Libraries** node in the **Tape Infrastructure** view. All connected devices are discovered automatically during the rescan procedure. When you add a new tape device to the tape server, it appears in your console after rescanning.

To view properties of a tape device, open the **Tape Infrastructure** view, expand the **Libraries** node and select the needed item. Click **Properties** on the ribbon. You can also right-click the necessary device in the working area and select **Properties**.

Select the **Perform drive cleaning automatically** check box if you want Veeam Backup & Replication to manage the tape library drive cleaning. For more information about automated drives cleaning, see [Automated Drive Cleaning](#).

[Available if the library is connected to a Windows-based tape server] Select the **Use native SCSI commands instead of Windows driver** check box if your library is an unknown media changer. For more information about unknown media changers, see [Supported Devices and Configuration](#).

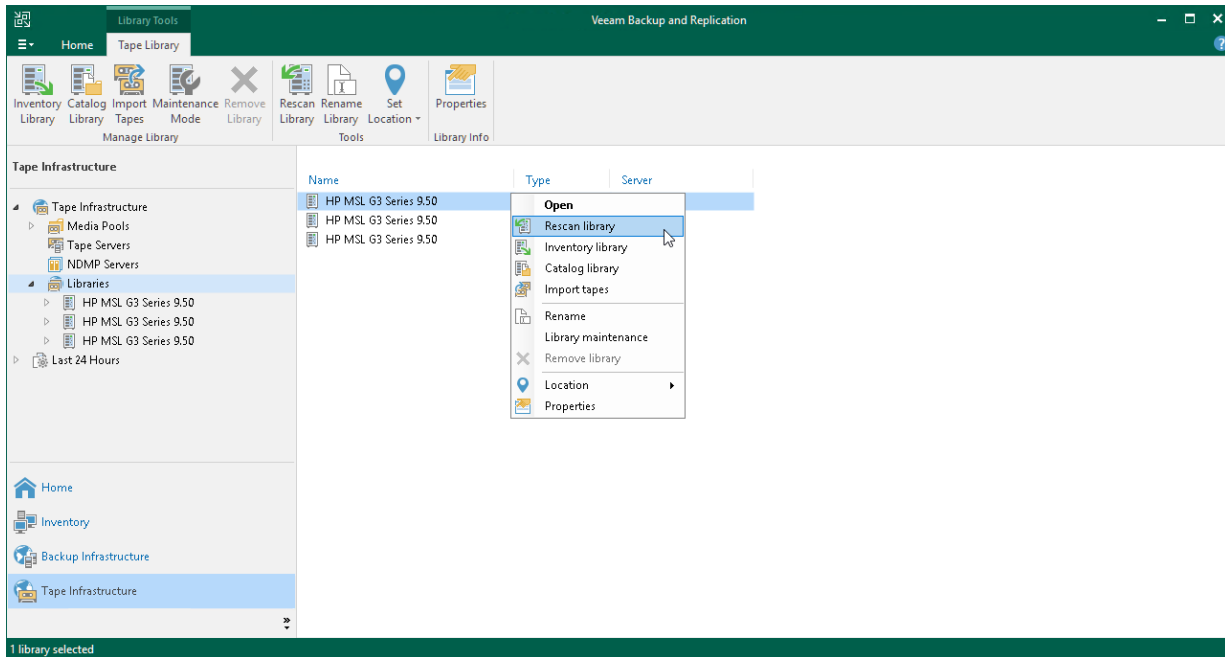


Rescanning Tape Devices

You can rescan a selected tape library or standalone tape drive to update its network status.

To rescan a tape device:

1. Open the **Tape Infrastructure** view.
2. Select the **Libraries** node in the inventory pane.
3. Select a necessary item in the working area and click **Rescan Library** on the ribbon. You can also right-click the necessary device in the working area and select **Rescan library**.

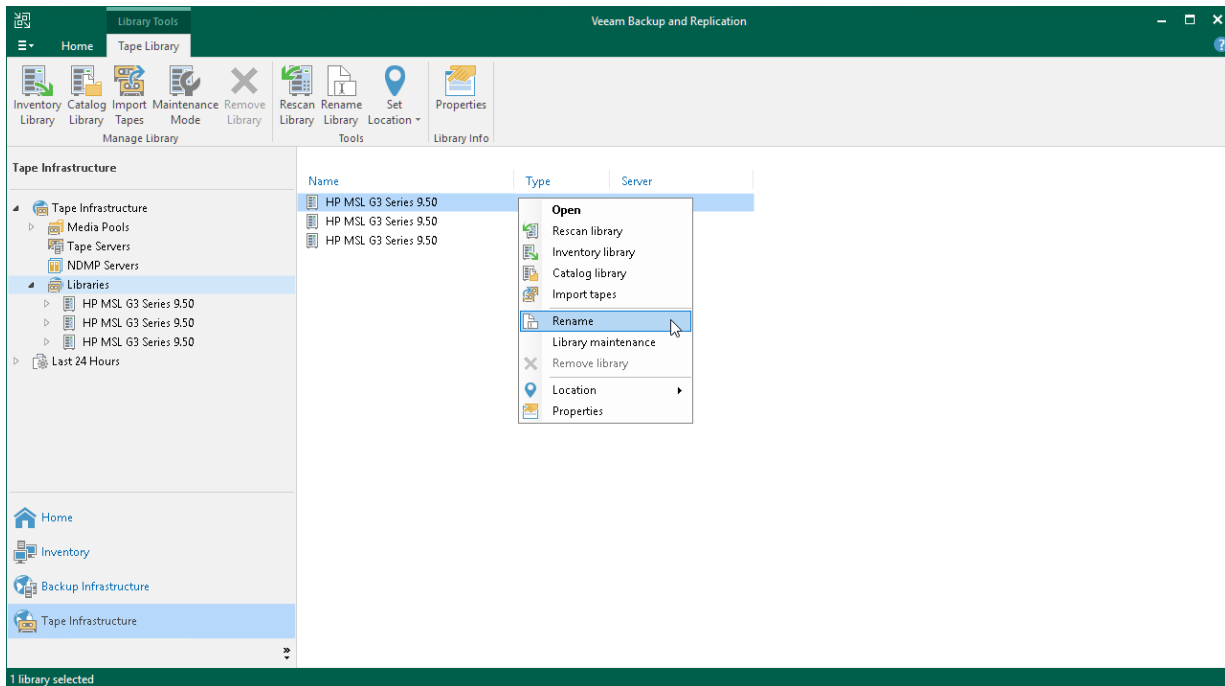


Renaming Tape Devices

The Veeam backup console shows all tape libraries and standalone tape drives under the list of libraries. By default, the connected devices are shown with their production model names. For clearer visibility, you can rename them.

To rename a tape device:

1. Open the **Tape Infrastructure** view.
2. Select the **Libraries** node in the inventory pane.
3. Select a necessary item in the working area and click **Rename Library** on the ribbon. You can also right-click the necessary device in the working area and select **Rename**.



Removing Tape Devices

If you want to stop using a tape library or standalone tape drive, you can remove it from your Veeam backup console.

Consider the following limitations:

- Only devices in the offline status can be removed. To remove a tape device, you need to physically disconnect it from the tape server first. Otherwise, the tape device will be discovered during the next rescan and reappear in the **Libraries** list. Alternatively, you can remove the tape server to which the tape device is connected.
- You cannot remove the tape device that is used in a media pool. Remove the device from all media pools first.

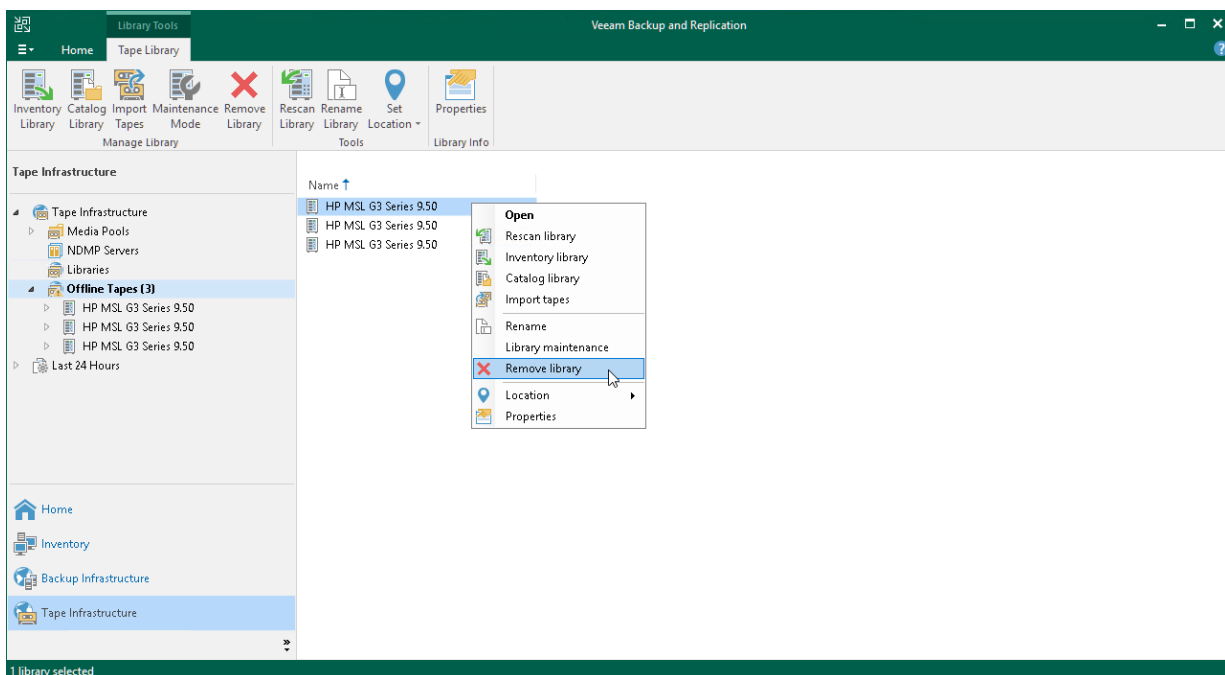
To remove a tape device:

1. Disconnect the tape device or the tape server.
2. Open the **Tape Infrastructure** view.
3. Select the **Libraries** node in the inventory pane.
4. Select a necessary item in the working area and click **Remove Library** on the ribbon. You can also right-click the necessary device in the working area and select **Remove library**.
5. In the displayed dialog box, click **OK** to confirm deletion.

TIP

If you remove the tape server, the tape devices remain connected to it. You can connect the tape server back to your console. In this case, Veeam Backup & Replication will recognize all tape devices that were previously added to it with tapes and media pools (in case they remain in the Veeam database).

You can also connect the tape server to another Veeam backup server. Veeam Backup & Replication will recognize the tape devices automatically, however you will need to create the media pools anew.



Replacing Tape Devices

You may want to stop using a tape library or a standalone tape drive, for example, because of breakdown or low efficiency, and replace it with a new tape device. To replace the device seamlessly and continue using the tapes within the same media pool, follow the instructions below.

To replace a tape device:

1. Connect the new tape device to the tape server. For more information, see [Connecting Tape Devices](#).
2. Add the tape device to the media pool to which the old tape device was added. Open the media pool settings and go to the **Tapes** step of the wizard. For more information, see [Modifying Media Pools](#). If the old tape device was added to several media pools, add the new tape device to the same media pools.
3. Remove the old tape device from the media pools. To do that, click **Manage**, select the tape, click **Remove**. If the old tape device was added to several media pools, remove the tape device from all of these media pools.
4. Disconnect the old tape device from the tape server.
5. Remove the old tape device from Veeam Backup & Replication. For more information, see [Removing Tape Devices](#).
6. Make sure that you do not remove the offline tapes from Veeam Backup & Replication.
7. Offload the tapes from the old tape device and load them to the new tape device.
8. Rescan the tape device.

To replace a standalone tape drive:

1. Offload the tape from the old standalone tape drive if it was loaded.
2. Add a new standalone tape drive.
3. Disconnect the old tape drive.
4. Add the tape device to the media pool to which the old tape device was added. Open the media pool settings and go to the **Tapes** step of the wizard. For more information, see [Modifying Media Pools](#). If the old tape device was added to several media pools, add the new tape device to the same media pools.
5. Remove the old tape device from the media pools. For more information, see [Removing Tape Devices](#).
Veeam Backup & Replication prompts to select a new tape drive.
6. Select the new tape drive.
The tapes in the media pool will now be associated with the new tape drive.
7. Repeat the procedure for each media pool where the old tape drive was used.

As a result, the tapes remain in the same media pools and the data is intact.

Loading Tapes

When you need to add free tapes, or if you need to restore data from offline tapes, you need to load these tapes into your tape device.

When you load tapes into the tape device, Veeam does not recognize them automatically. To start using tapes, you need to introduce them to Veeam Backup & Replication by running the importing procedure (**Tape Infrastructure** view > **Libraries** node > right-click *LibraryName* > **Import tapes**). The importing procedure conveys the tapes from the mail slot to the library working slots, scans them and sends information about them to Veeam backup database. After importing, Veeam Backup & Replication can use the tapes to read or write data.

Importing runs differently for tapes that are registered in the local Veeam backup database and those that are not. Choose an appropriate procedure for the following tapes:

- [Loading Empty Tapes](#)
- [Loading Tapes Written on This Backup Server](#)
- [Loading Tapes Written on Another Veeam Server](#)

Related Topics

[Loading Tapes Written with 3rd-Party Backup Solution](#)

Loading Empty Tapes

To load empty tapes, perform the following steps:

1. Load the tapes into the mail slot or directly into the tape library magazine.
2. If you loaded the tapes to the mail slot, import the tapes. To do this, open the **Tape Infrastructure** view, expand the **Libraries** node and select the library to which you have loaded the tapes. Click **Import Tapes** on the ribbon. You can also right-click the necessary library in the working area and select **Import Tapes**.
3. If you loaded tapes into the tape library magazine, rescan the tape library. To do this, click **Rescan Library** on the ribbon. You can also right-click the necessary library in the working area and select **Rescan library**.
4. The tapes will appear in the **Unrecognized** media pool.
5. Right-click the tapes and select **Inventory**.
6. The tapes will be moved to the **Free** media pool.

If you want to refill the free tape resources in your tape device, you can overwrite tapes containing outdated Veeam archives. For more information, see [Importing Tapes Written on This Backup Server](#).

TIP

To understand which of the tapes can be overwritten, you can check their expiration date. In the **Tape Infrastructure** view, open the **Media Pools** node and select the media pool that you want to replenish. Check the **Expires in** field in the working area. You can sort the tapes by the expiration date and get the list of tapes that can be reused.

Loading Tapes Written on This Backup Server

If the tapes that you load were written on the same Veeam backup server, the Veeam backup database has information about them. The procedure is different for tape libraries depending on whether they support barcodes or not.

Loading Tapes with Barcodes

To load tapes with barcodes written in the same tape library:

1. Load the tapes into the mail slot or directly into the tape library magazine.
2. If you loaded the tapes to the mail slot, import the tapes. To do this, open the **Tape Infrastructure** view, expand the **Libraries** node and select the library to which you have loaded the tapes. Click **Import Tapes** on the ribbon. You can also right-click the necessary library in the working area and select **Import tapes**.
3. If you loaded tapes into the tape library magazine, rescan the tape library. To do this, click **Rescan Library** on the ribbon. You can also right-click the necessary library in the working area and select **Rescan library**.
4. Veeam Backup & Replication will automatically move the tapes to their parent media pools. You can start working with them.

Moving Tapes with Barcodes Between Libraries

We strongly recommend that you do not move tapes with barcodes written in one library to another library, as that can result in various errors and return messages about barcode duplicates.

If you cannot avoid moving tapes with barcodes between the libraries, make sure you perform all the following steps:

1. Unload the tapes from the mail slot or from the magazine of the tape library.
2. Rescan the library that you remove the tapes from. To do this, open the **Tape Infrastructure** view, expand the **Libraries** node and select the library that you remove the tapes from. Click **Rescan Library** on the ribbon. You can also right-click the necessary library in the working area and select **Rescan library**.
3. Remove the tapes from the catalog. To do this, navigate to the list of tapes either under the **Media Pools** node or under the **Libraries** > *LibraryName* node > **Media** > **Offline** node. Select offline tapes you want to remove from the catalog and click **Remove from Catalog** on the ribbon. Alternatively, you can right-click selected tapes and choose **Remove from Catalog** from the shortcut menu. In the opened dialog box, click **Yes** to confirm removal.
4. Load the tapes into the mail slot or directly into the magazine of the tape library that you move the tapes to.
5. Catalog the loaded tapes in the new library. To do this, navigate to the list of tapes either under the **Media Pools** node or under the **Libraries** > *LibraryName* node > **Media** node. Select the necessary tapes in the list and click **Catalog** on the ribbon. Alternatively, you can right-click the selected tapes and choose **Catalog**.
6. Veeam Backup & Replication adds the tapes to the new library. You can start working with them.

Loading Tapes without Barcodes

To load tapes without barcodes:

1. Load the tapes into the mail slot or directly into the tape library magazine.

2. If you loaded the tapes to the mail slot, import the tapes. To do this, open the **Tape Infrastructure** view, expand the **Libraries** node and select the library to which you have loaded the tapes. Click **Import Tapes** on the ribbon. You can also right-click the necessary library in the working area and select **Import tapes**.
3. If you loaded tapes into the tape library magazine, rescan the tape library. To do this, click **Rescan Library** on the ribbon. You can also right-click the necessary library in the working area and select **Rescan library**.
4. The tapes will appear in the **Unrecognized** media pool.
5. Right-click the tapes and select **Inventory**.
6. Veeam Backup & Replication will move the tapes to their parent media pools. You can start working with them.

Note that if the tapes are expired, they will be overwritten by tape rotation scheme set for the tapes' parent media pool.

Loading Tapes Written on Another Veeam Server

Veeam Backup & Replication supports restoring data from tapes that were recorded on another Veeam backup server. To read data from such tapes, Veeam Backup & Replication must first catalog the tapes and store the information about them to the Veeam backup database.

To load tapes written on another Veeam backup server, follow the next steps:

1. Load the tapes into the mail slot or directly into the tape library magazine.
2. If you loaded the tapes to the mail slot, import the tapes. To do this, open the **Tape Infrastructure** view, expand the **Libraries** node and select the library to which you have loaded the tapes. Click **Import Tapes** on the ribbon. You can also right-click the necessary library in the working area and select **Import Tapes**.
3. If you loaded tapes into the tape library magazine, rescan the tape library. To do this, click **Rescan Library** on the ribbon. You can also right-click the necessary library in the working area and select **Rescan library**.
4. The tapes will appear in the **Unrecognized** media pool.
5. Right-click the tapes you want to import and select **Catalog**.
6. The tapes will be moved to the **Imported** media pool. The **Imported** media pool will be created automatically. When the tapes are imported, you can view and restore data written to them.

Loading Tapes Written with 3rd-Party Backup Solution

Veeam Backup & Replication does not support backups written with another backup solution even if they are written in the supported format.

IMPORTANT

You cannot restore data written with 3rd-party tape recording solutions.

If the tapes written with another backup solution contain valuable data, do not run any procedures against them, for example, inventory or catalog. Veeam Backup & Replication recognizes such tapes as writable and may use them for Veeam tape jobs.

If you do not need the data on these tapes, you can erase them and use for writing data with Veeam Backup & Replication.

To erase and re-use tapes containing non-Veeam data:

1. Load the tapes into the mail slot or directly into the tape library magazine.
2. If you loaded the tapes to the mail slot, import the tapes. To do this, open the **Tape Infrastructure** view, expand the **Libraries** node and select the library to which you have loaded the tapes. Click **Import Tapes** on the ribbon. You can also right-click the necessary library in the working area and select **Import Tapes**.
3. If you loaded tapes into the tape library magazine, rescan the tape library. To do this, click **Rescan Library** on the ribbon. You can also right-click the necessary library in the working area and select **Rescan library**.
4. The tapes will appear in the **Unrecognized** media pool.
5. Select tapes you want to erase and click **Erase** on the ribbon. Alternatively, you can right-click selected tapes and choose **Erase**. Choose **Short erase** and click **OK**. For more information, see [Erasing Tapes](#).
6. The tapes will be moved to the **Free** media pool.

Inventorying Tapes

When you load new tapes in your tape device for the first time, these tapes are presented to Veeam Backup & Replication as **Unrecognized**. To identify unrecognized tapes, you need to run tape inventory job against them.

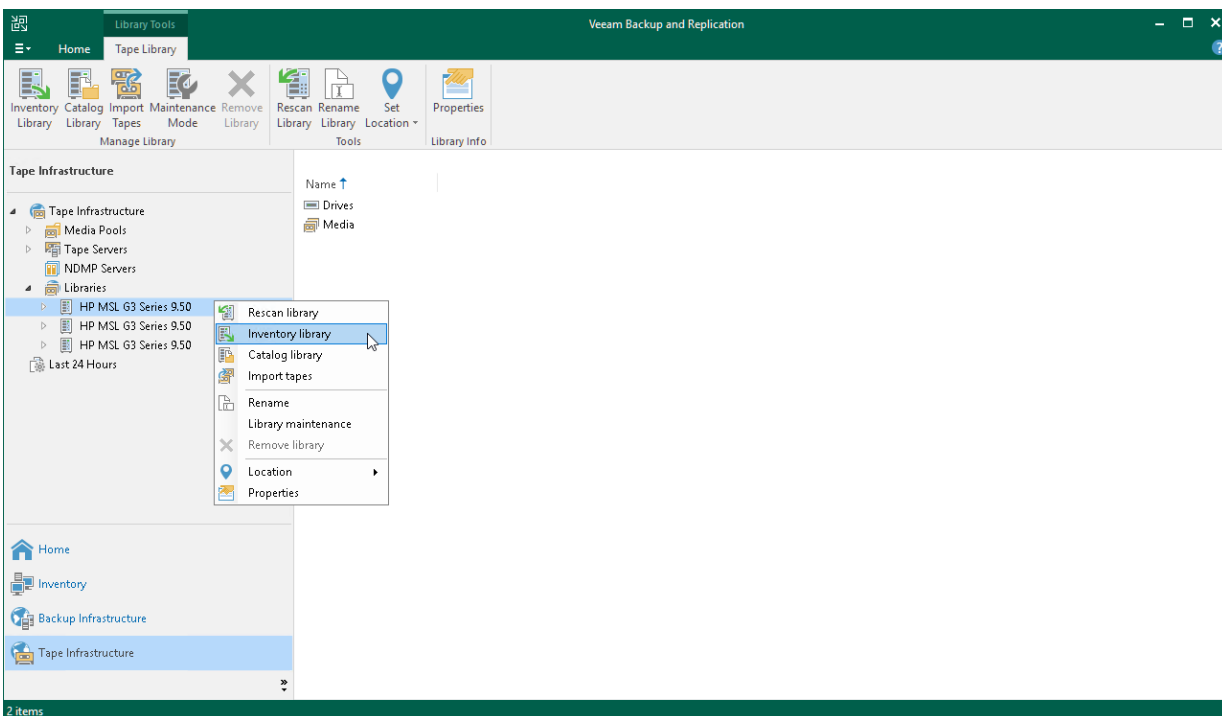
Tape inventory job is a comparatively fast process of reading metadata written on tape with the aim of detecting name of the media set and the sequence number for the tape. Tape inventory jobs helps Veeam Backup & Replication identify empty tapes and detect non-empty tapes belonging to specific media set.

You can perform tape inventory for a whole [tape library](#) or run the job against [selected tapes](#) only.

Inventorying Tape Libraries

To inventory a whole tape library:

1. Open the **Tape Infrastructure** view.
2. Expand the **Libraries** node and select the library you want to inventory.
3. Click **Inventory Library** on the ribbon. Alternatively, you can right-click the tape library and select **Inventory library** from the drop-down menu. Veeam Backup & Replication will perform inventory for all online tapes in the library.



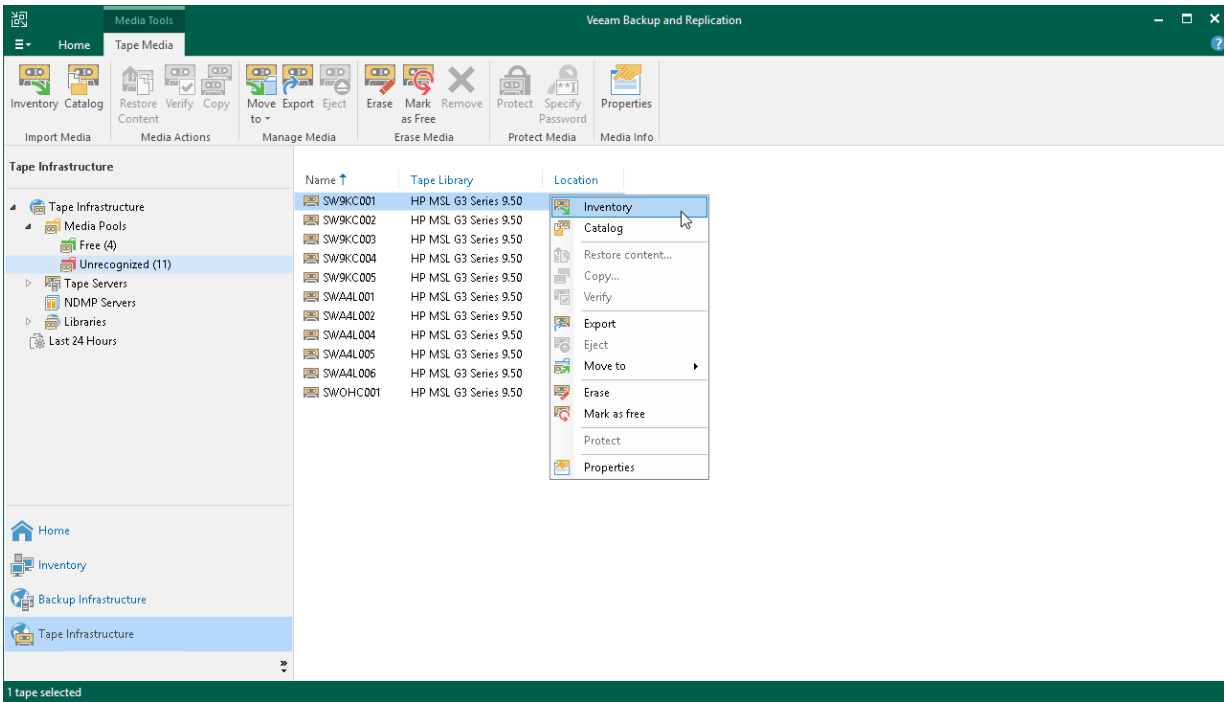
Inventorying Tapes

To inventory selected tapes:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under the **Media Pools** or under the **Libraries > LibraryName** node > **Media**.

3. Select the necessary tapes in the list and click **Inventory** on the ribbon. Alternatively, you can right-click the selected tapes and choose **Inventory**.

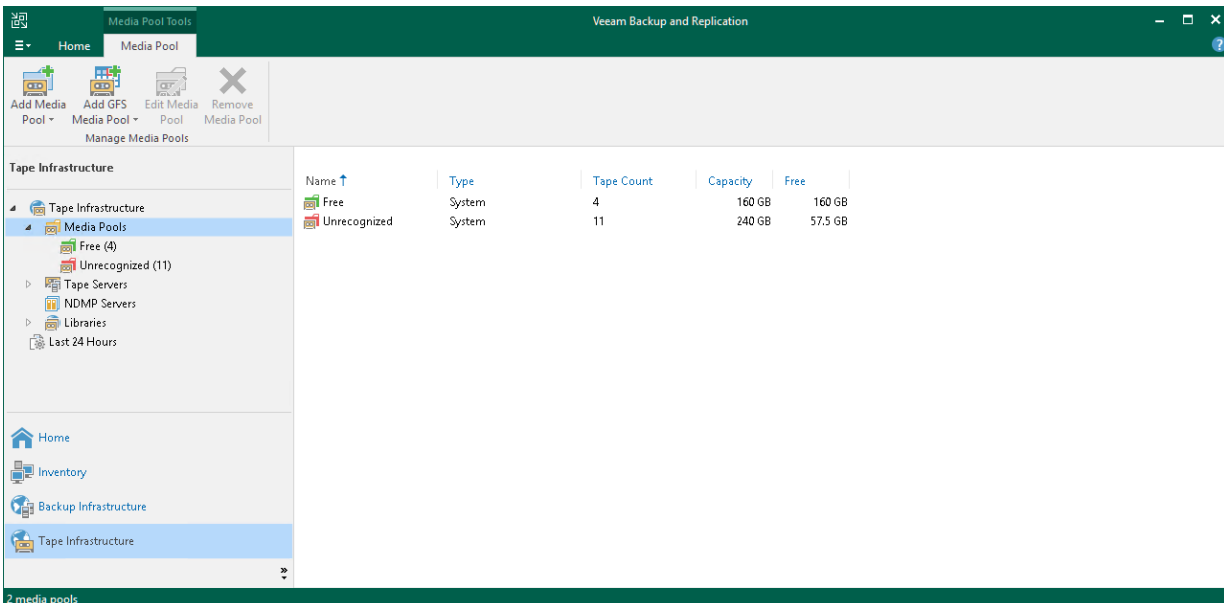
The inventory log will display job session results. To access the inventory session details, you can open the **History** view and locate the necessary session under the **Jobs > Tape** node.



Inventory Results

After the inventory, Veeam Backup & Replication places tapes in predefined pools:

- Empty tapes are moved to the **Free** pool. You can use these tapes for archiving backups and files.
- Tapes that contain data written on another Veeam backup server remain in the **Unrecognized** pool. Veeam Backup & Replication displays the detected media set name and sequence number for these tapes. If you want to restore data from a specific media set, you need to run the tape catalog job for all tapes in this media set.



Cataloging Tapes

Cataloging tapes is required for tapes that contain some data but are not registered in the Veeam database. For example, cataloging is required for tapes that were written on another Veeam backup server. After the cataloging procedure, you can restore data from the tapes.

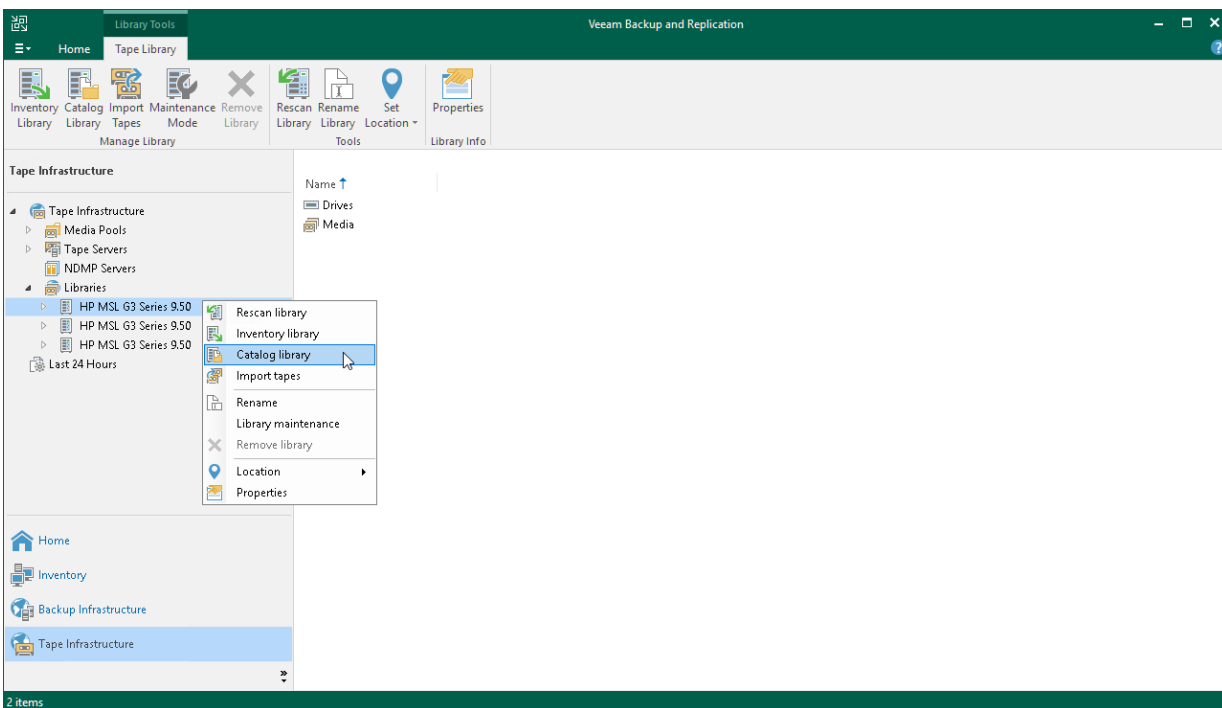
When a catalog job is performed, Veeam Backup & Replication first performs tape inventory, reads the information about backup contents on tape from the tape catalog information, scans tape contents and updates the database with details of new detected backup sets.

You can perform tape catalog job for a whole [tape library](#) or for [selected tapes](#).

Cataloging Tape Libraries

To catalog a whole tape library:

1. Open the **Tape Infrastructure** view.
2. Expand the **Libraries** node and select the library you want to catalog.
3. Click **Catalog Library** on the ribbon. Alternatively, you can right-click the tape library and select **Catalog Library**.



Cataloging Tapes

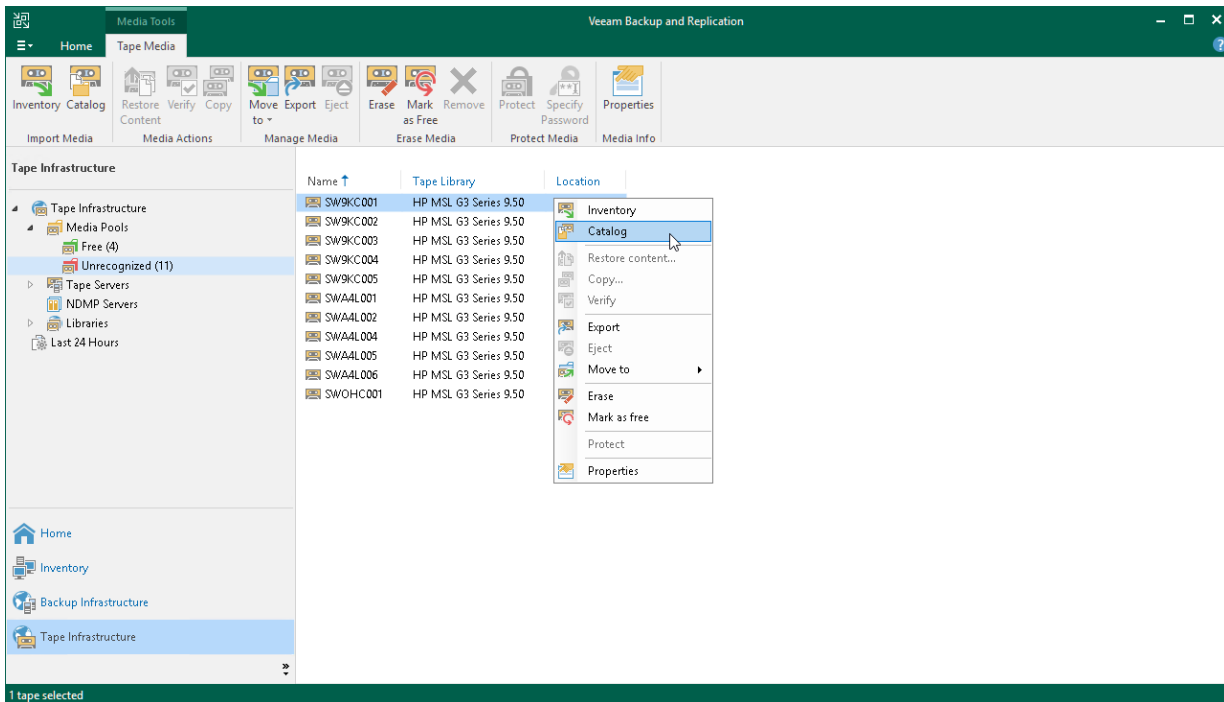
NOTE

We recommend to catalog in one session all the tapes written within the same backup set. Otherwise (if cataloging not all the tapes, or cataloging them in different sessions), not all the data may be correctly imported into the database and Veeam Backup & Replication may require cataloging the same tapes again.

To catalog selected tapes:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under the **Media Pools** or under the **Libraries > LibraryName > Media**.
3. Select the necessary tapes in the list and click **Catalog** on the ribbon. Alternatively, you can right-click the selected tapes and choose **Catalog**.

The catalog log will display job session results. To access the catalog session details, you can open the **History** view and locate the necessary session under the **Jobs > Tape** node.



Cataloging Tips

Rescanning of tapes during the catalog job may take a lot of time. To speed up the cataloging process, you can do one of the following:

- First, run inventory job to identify tape media sets and decide which tapes you want to catalog. Run the catalog job only against tapes in the necessary media set.
- If you work with a tape library, you can run the catalog job against the whole media set at once.
- If you work with a standalone drive, start cataloging from the last tape in the media set (as this tape usually stores on tape catalog information).

System Requirements for Large Number of Files on Tape

If the tape backup contains a large quantity of files, for example, more than 1 000 000 files in 1 000 folders, you must provide the following system resources:

- Backup server: 1.3 GB RAM per each 1 000 000 files
- Tape server: 800 MB RAM per each 1 000 000 files

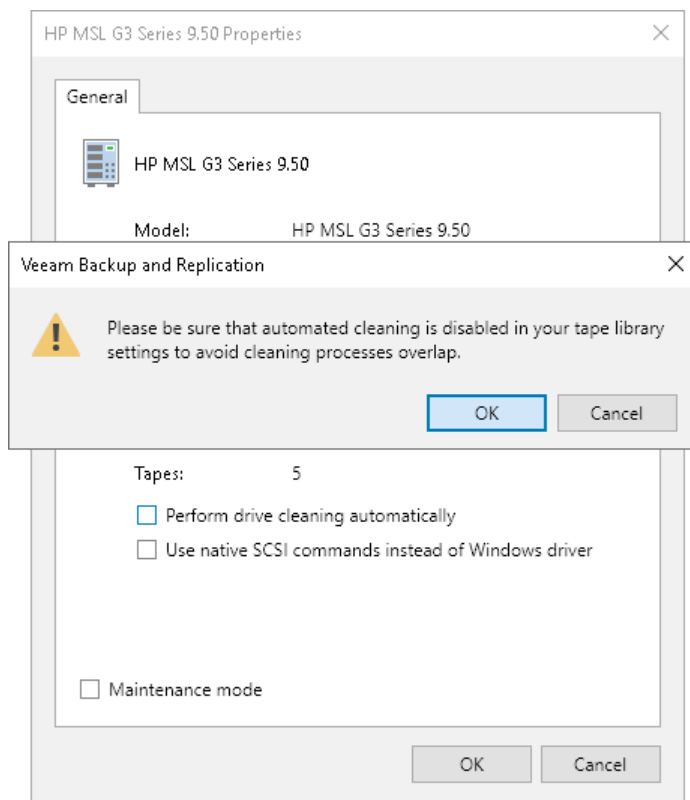
Automated Drive Cleaning

You can instruct Veeam Backup & Replication to automatically clean the tape library drives.

Assigning the automated cleaning to Veeam Backup & Replication prevents possible overlapping of cleaning tasks and tape jobs. Such overlapping may cause tape jobs failures.

To instruct Veeam Backup & Replication to automatically clean the drives:

1. Open the **Tape Infrastructure** view.
2. Expand the **Libraries** node and select the needed library. Click **Properties** on the ribbon. You can also right-click the necessary library in the working area and select **Properties**.
3. In the **Properties** window, select the **Perform drive cleaning automatically** option.



IMPORTANT

If you enable the automated drive cleaning option in Veeam Backup & Replication, make sure that you disabled the drive cleaning tasks on your tape library device.

How It Works

Veeam Backup & Replication cleans the drives at the beginning of backup to tape jobs or file to tape job run. The cleaning is not performed during other tape operations such as, for example, cataloging or export.

To clean the drives automatically, Veeam Backup & Replication performs the following actions:

1. The tape library alerts Veeam Backup & Replication on a drive that requires cleaning.
2. Veeam Backup & Replication waits for a tape job to start.

3. When the tape job locks necessary drives for writing data, Veeam Backup & Replication checks which of them requires cleaning.
4. Veeam Backup & Replication ejects the tape from the drive, inserts a cleaning tape and performs the cleaning.
5. Veeam Backup & Replication ejects the cleaning tape and inserts the tape that was reserved for the tape job.
6. The tape job writes the data on tape.

The cleaning process usually takes several minutes.

The cleaning tapes are located in the **Unrecognized** media pool. The worn-out cleaning tapes are moved to the **Retired** media pool automatically.

If a tape job locks multiple drives simultaneously for parallel processing, and one or more drives require cleaning, all drives wait until the cleaning is finished. After cleaning, all drives start writing simultaneously.

The automated drive cleaning does not affect creation of media sets.

Limitations for Automated Drive Cleaning

Consider the following limitations for automated drive cleaning:

- You cannot enable the automated drive cleaning on standalone tape drives.
- You cannot start the drive cleaning manually with Veeam Backup & Replication. The drive cleaning is fully automated.

Switching Libraries to Maintenance Mode

There can be situations where you need to lock a tape library or a standalone tape drive from being used by Veeam Backup & Replication, for example, to provide maintenance services to them.

Before switching the tape library to the maintenance mode, consider the following:

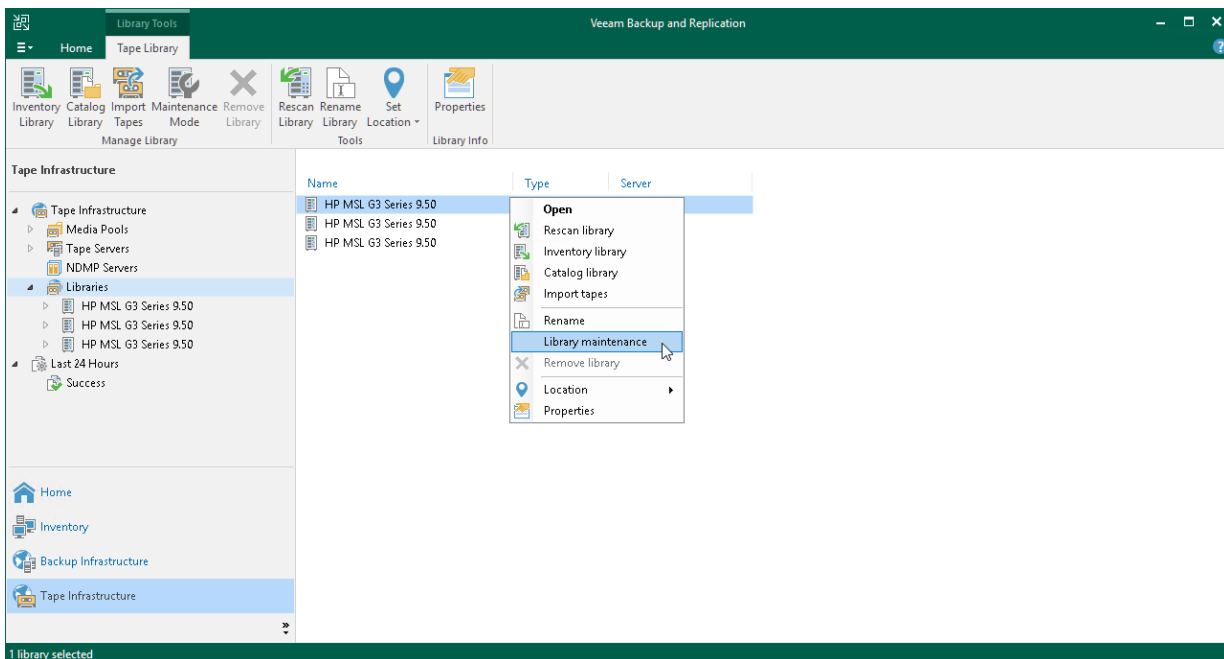
- You cannot enable the maintenance mode for the tape library if jobs that use it are running.
- After you enable the maintenance mode for the tape library, all jobs that use it will fail with an error when starting.

To switch a tape library to the maintenance mode:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tape libraries under **Libraries**.
3. Select a tape library you want to switch to the maintenance mode and click **Maintenance Mode** on the ribbon. Alternatively, you can right-click the selected tape library and select **Library maintenance** from the drop-down menu. Or you can open the tape library properties and select the **Maintenance mode** check box.

The tape library will stay in the maintenance mode until you manually disable it by performing the same actions like you did when enabling it.

After you disable the maintenance mode, Veeam Backup & Replication automatically starts a discovery job. However, it does not apply to standalone tape drives. To discover standalone drives, manually rescan the tape server, as described in [Rescanning Tape Servers](#).



Tape Drives

Drives of each connected library or standalone tape device are displayed in the **Tape Infrastructure** view under the **Libraries** > *LibraryName* > **Drives**.

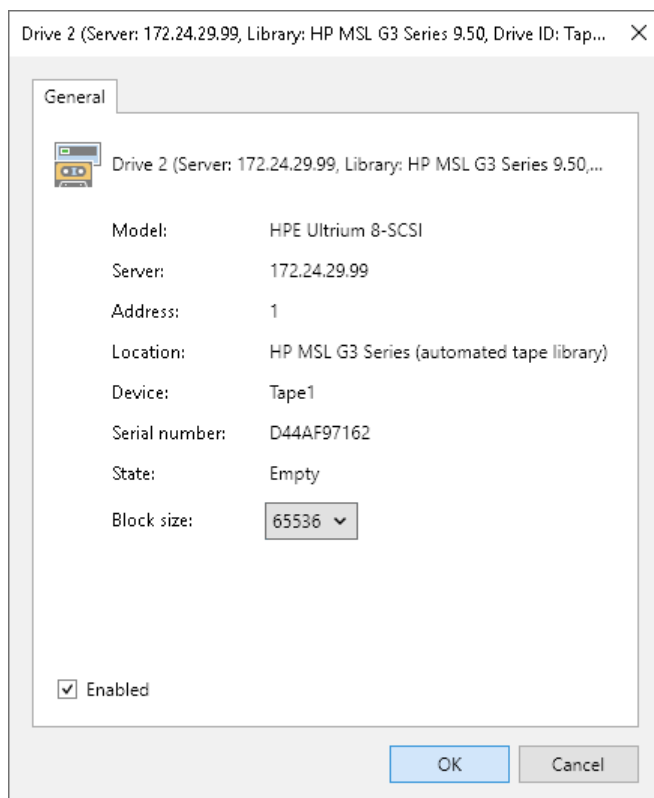
To view the drives properties, select **Drives** under the needed library. View the list and a short description of the drives in the working area. To view detailed information on a drive or to change its settings, click **Properties** on the ribbon. You can also right-click the necessary drive in the working area and select **Properties**.

To set block size for the drive manually, select a value from the **Block size** list in the drive properties.

NOTE

Veeam Backup & Replication uses uniform block size. Drive that is set manually to a particular block size may fail to read tape that was written with another block size. For more information on tape block size, see [Supported Devices and Configuration](#).

To disable a drive, clear the **Enabled** check box in the drive properties. To set the drive into working mode again, select the **Enabled** check boxes. You can disable a drive, for example, for maintenance. When you disable a drive, the library does not use this drive for read/write operations. If the library has multiple drives, other drives will be used for the read/write operations.



Tapes

All tapes managed by Veeam Backup & Replication belong to one of media pools. Generally, the new tapes are in the **Free** media pool. Tapes that were written by tape jobs stay in the media pools that are targets to these tape jobs.

If you offload tapes from your tape device, their status changes to Offline, but they stay visible in the console.

Tape media in Veeam Backup & Replication are displayed in the **Tape Infrastructure** view, either under the **Media Pools** or under the **Libraries** > *LibraryName* node > **Media**. You can work with both online and offline tapes:

- Tapes that are currently loaded to the tape device are available under the **Online** node.
- Tapes that have been unloaded from the tape device are shown under the **Offline** node.

NOTE

Before you start to use tapes loaded into the mail slot and tapes recently created in the virtual tape library (VTL), import them. To do that, open the **Tape Infrastructure** view, in the inventory pane click the **Libraries** node, select the required library, right-click it and select **Import tapes**.

All tapes are grouped to service or user-created media pools available under the **Tape Infrastructure** > **Media Pools** node. You can also view tapes under the **Tape Infrastructure** > **Libraries** > *LibraryName* node > **Media**.

Veeam Backup & Replication can use only online tapes for backup to tape and file to tape jobs. If you work with a standalone tape drive and all its tapes are offline, Veeam Backup & Replication will display a message informing that you need to insert a tape into the drive. At the same time, Veeam Backup & Replication will hint what tape has been recently used for archiving.

You can insert any tape into the tape drive:

- If the tape you have inserted is registered in the Veeam backup database and the current media set can still be used, Veeam Backup & Replication will continue writing to this media set and append the new content to the content recently written on the tape.
- If the tape you have inserted is not registered in the Veeam backup database, it will be processed according to the following algorithm:
 - A new empty tape will be placed to the **Free** media pool and used for writing data.
 - A tape containing any data written on another Veeam backup server or with another tape backup solution will be placed to the **Unrecognized** media pool. You need to catalog such tapes.

Viewing Tape Properties

You can view properties of each tape registered in Veeam database. The tapes may be online or offline. The **Properties** window shows location, capacity, name and other properties of the selected tape.

Tape Capacity

The capacity of the tape is identified by the tape device where the tape is located. You can also view the capacity of a tape in your tape device console (or in the Microsoft Windows Device Manager for tapes that are in drives).

Tape Name

The name of the tape is generated automatically during tape importing. If your tape device supports barcodes, Veeam Backup & Replication will use the barcodes to identify the tapes and display the barcode as the **Name** property of the tape. If a tape does not have a barcode, Veeam Backup & Replication will automatically create the tape name using the pattern '*Tape N*'.

IMPORTANT

"CLN" and "CLR" prefixes are reserved for cleaning tapes. Veeam Backup & Replication regards tapes with such prefixes as cleaning tapes.

Make sure that the regular tapes intended for writing data do not have barcodes starting with "CLN" or "CLR". If they do, rename the tapes and inventory the tape library.

If necessary, you can change the name of a tape:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries** > *LibraryName* > **Media** > **Online/Offline**.
3. Select the tape you want to rename and click **Properties** on the ribbon. Alternatively, you can right-click the tape and select **Properties**.
4. Change tape name and description as required.
5. Click **OK** to save changes.

NOTE

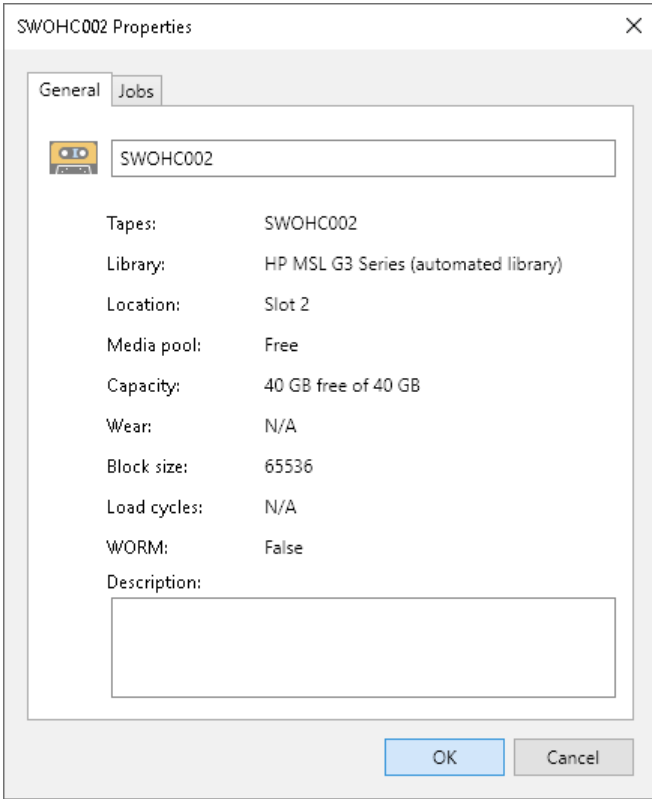
If you manage several tape libraries on the same Veeam backup server and use barcodes to identify tapes in these libraries, make sure that all barcodes are unique. If some tapes have identical barcodes, Veeam Backup & Replication may fail to manage them correctly.

Tape Usage Statistics

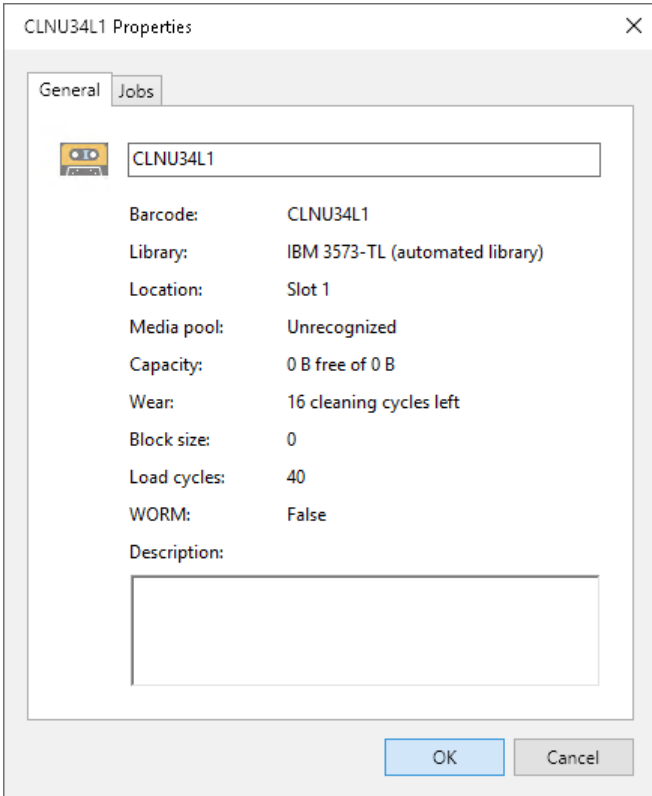
Tapes wear off gradually every time they are rewritten. When a tape reaches the maximum times of reuse (set by manufacturer), the tape becomes retired. Veeam Backup & Replication automatically moves retired tapes to the **Retired** media pool. For more information, see [Service Media Pools](#).

Veeam Backup & Replication creates tape usage statistics for each tape based on read and write activity and the size of the tape. When Veeam Backup & Replication selects a tape for a job, it considers the tape usage statistics among other criteria. For a job, a tape with minimal usage is selected.

You can view the tape usage statistics in the **Wear** field of the **Tape Properties** window.



For cleaning tapes, you can view the remaining cleaning cycles in the **Wear** field of the **Tape Properties** window.

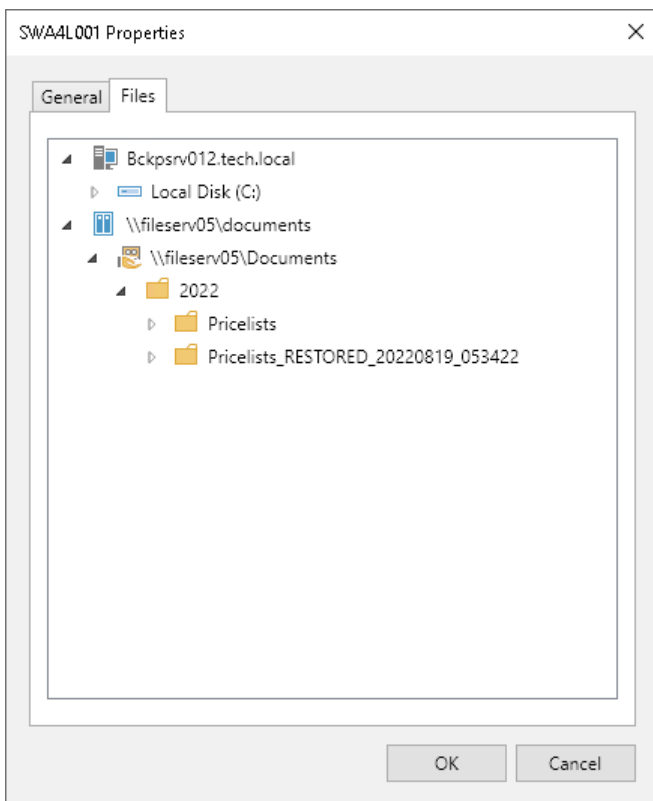


Viewing Data on Tapes

To view data contents that is currently stored on tape:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries > LibraryName > Media > Online**.
3. Select the necessary tape and click **Properties** on the ribbon. Alternatively, you can right-click the tape and select **Properties**.
4. Open the **Files** tab.

You will see a list of protected hosts, repository servers and file shares where the contents of the tape originate from. Under each name, you will see folders and files that the selected tape stores.



Removing Tapes from Catalog

If you do not want to store information about a tape and contents on this tape in Veeam Backup & Replication database, you can remove the tape from the catalog. For example, you can perform removal from catalog if a physical tape no longer exists, and the tape should no longer be displayed among media in the Veeam Backup & Replication console.

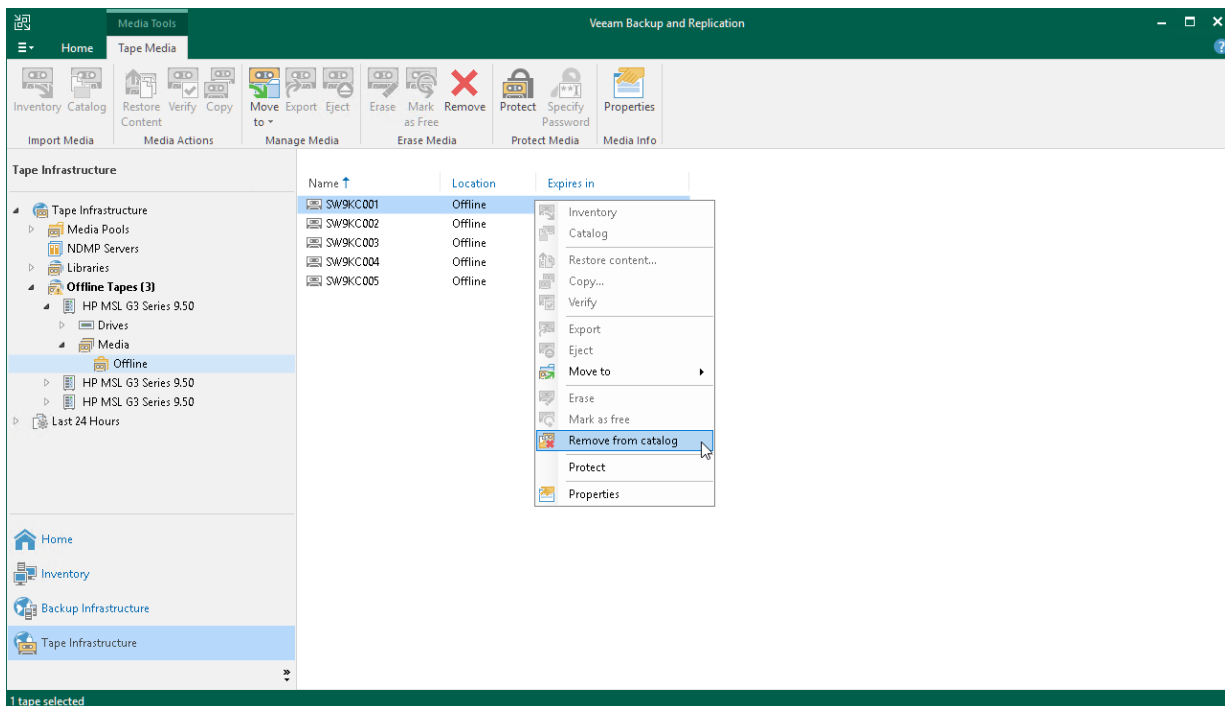
You can remove only tapes that are offline.

To remove one or more tapes from the catalog:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries > LibraryName node > Media > Offline**.
3. Select offline tapes you want to remove from the catalog and click **Remove** on the ribbon. Alternatively, you can right-click selected tapes and select **Remove from catalog** from the shortcut menu.
4. In the opened dialog box, click **Yes** to confirm removal.

IMPORTANT

You cannot remove protected tapes from the catalog. To remove such tapes, you need to switch the protection off first.



Erasing Tapes

If you do not need the contents stored on tape, you can erase tapes. Veeam Backup & Replication supports two options for erasing data:

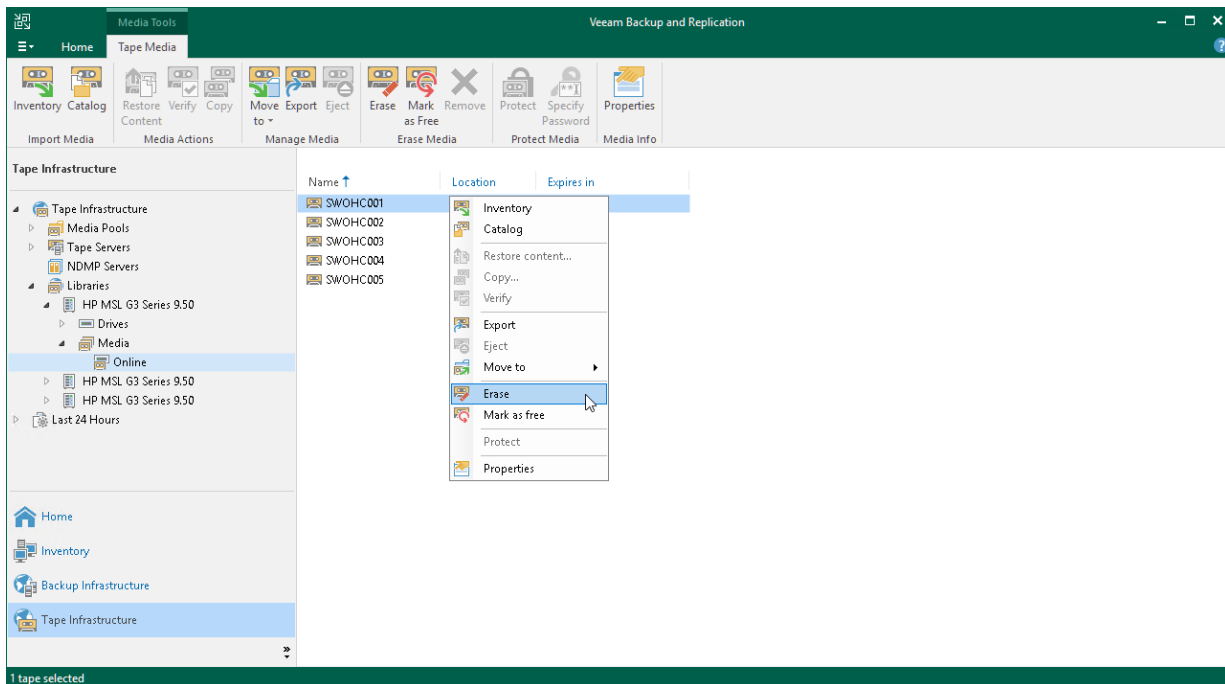
- **Short erase (fast)** – use this option to speed up the erase process. The short erase operation does not physically erase data written on the tape. It loads the tape to the drive and wipes the tape header. Note that short erase is not supported by some tape devices.
- **Long erase (slow)** – use this option to clear all data written to tape. The long erase operation loads the tape to the drive, rewinds the tape and physically erases all data written to the tape.

To erase tapes:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries > LibraryNameNode > Media > Online**.
3. Select tapes you want to erase and click **Erase** on the ribbon. Choose the type of erase and click **OK**. Alternatively, you can right-click selected tapes and select **Erase**. Next, choose how the tape should be erased and click **OK**.

IMPORTANT

You cannot erase protected tapes. To erase such tapes, you need to switch the protection off first.



Marking Tapes as Free

Instead of erasing tapes, you can mark tapes as free. During this operation, Veeam Backup & Replication deletes from backup and tape catalogs information about backup contents stored on tape. Data written to tape remains intact.

To mark tapes as free:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries > LibraryNameNode > Media > Online**.
3. Select tapes you want to mark as free and click **Mark as Free** on the ribbon. Alternatively, you can right-click selected tapes and select **Mark as free** from the drop-down menu.
4. In the displayed dialog box, click **Yes**.

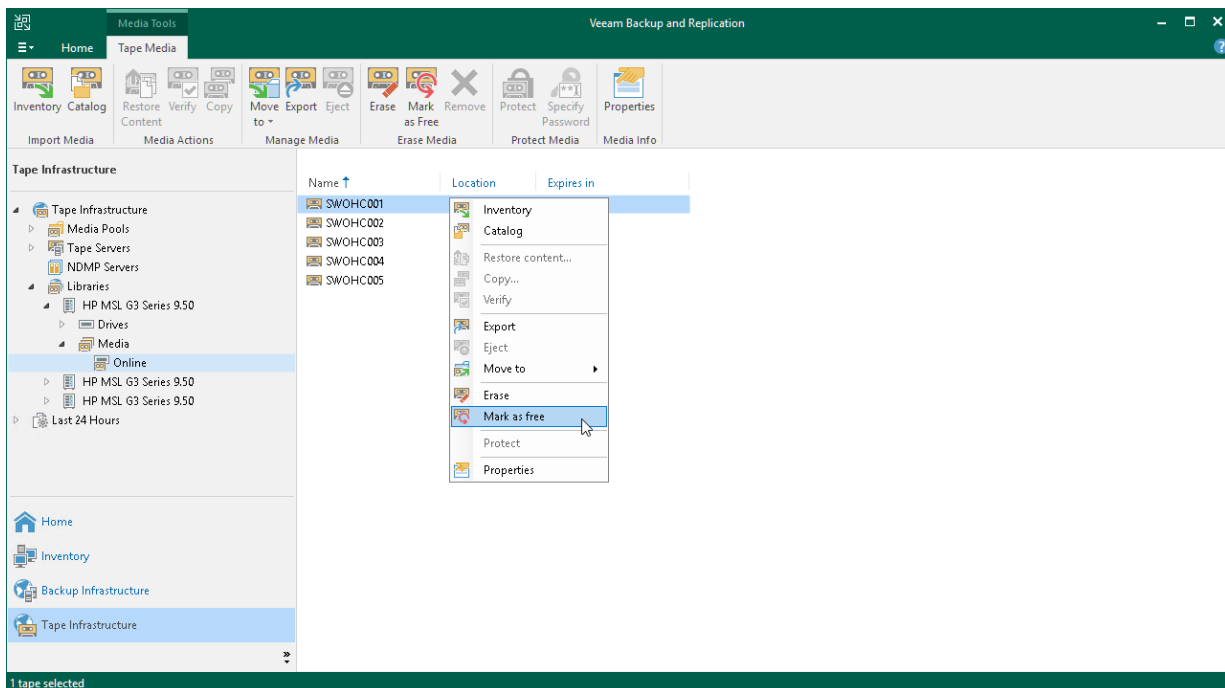
After a tape is marked as free, Veeam Backup & Replication removes from the catalog information about contents on this tape.

If you want Veeam Backup & Replication to automatically reuse the tape for storing new backups, instead of just marking it as free, move it to the **Free** media pool, as described in [Moving Tapes to Another Media Pool](#).

IMPORTANT

You cannot mark protected tapes as free. To mark such tapes as free, you need to switch the protection off first.

You cannot mark WORM tapes as free either.



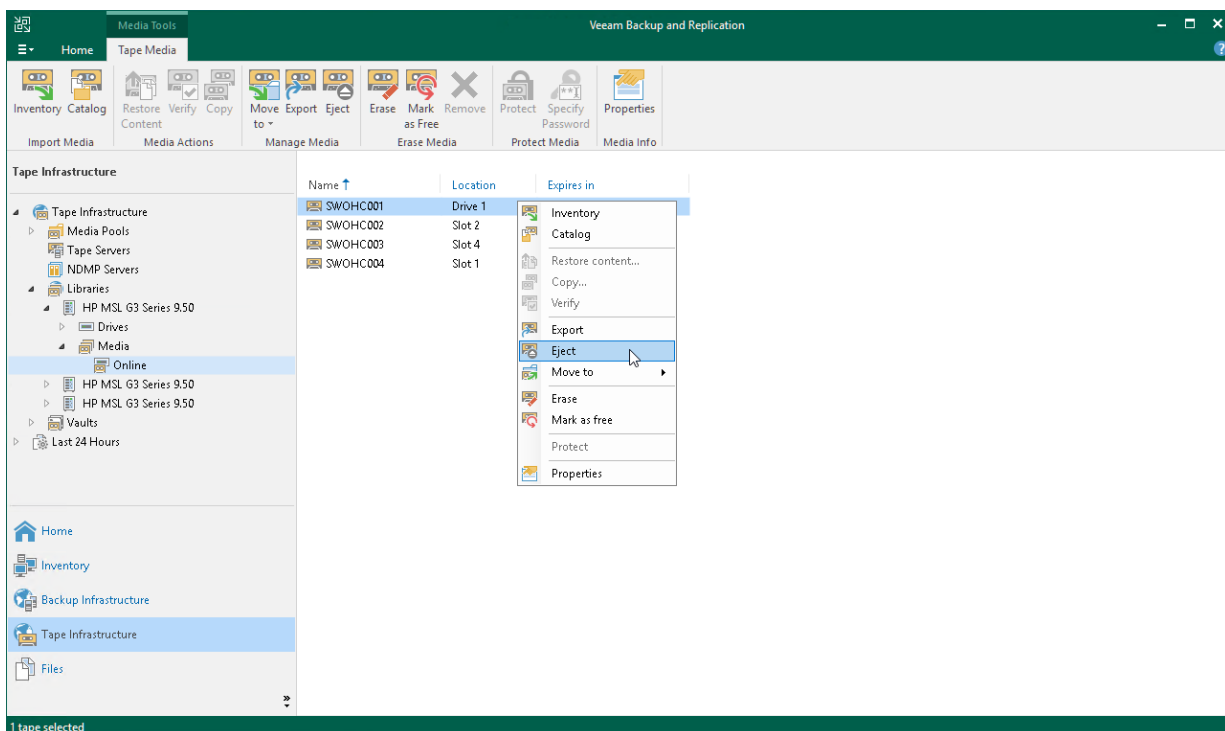
Ejecting Tapes

Ejecting moves the tape that is currently in drive to a library slot. The tape stays in the library and is online. Ejecting prevents tapes, for example, from being occasionally overwritten.

You can eject a tape, or eject a drive. Eject command is enabled only for tapes that are in drives or for drives with loaded tapes.

To eject a tape:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries > LibraryName node > Media > Online**.
3. Select a tape located in drive that you want to eject and click **Eject** on the ribbon. Alternatively, you can right-click selected tape and select **Eject**.

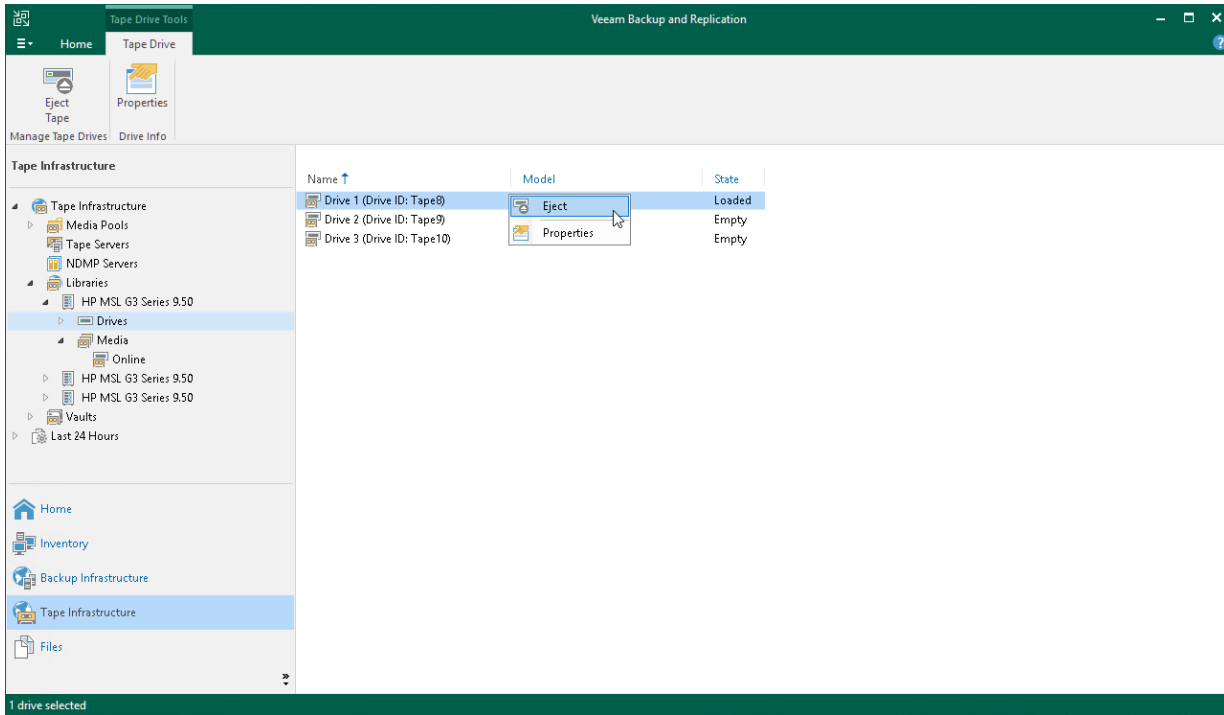


To eject a drive:

1. Open the **Tape Infrastructure** view.
2. Navigate to **Libraries > LibraryName node > Drives**.
3. Select a drive from where you want to eject the tape and click **Eject** on the ribbon. Alternatively, you can right-click selected tape and select **Eject**.

TIP

You can instruct your tape jobs to eject tape from drive after the job completes. To do so, navigate to the **Options** step of backup to tape job or file to tape job and select the **Eject media upon job completion** check box.



Exporting Tapes

If you want to take the tapes out of the tape device, you need to export them first. Exporting ejects the tapes from the slots in the tape device and moves them to the I/E slot (or Mail slot). When they are in the I/E slot, you can take them from the library and, for example, carry to a storing location.

NOTE

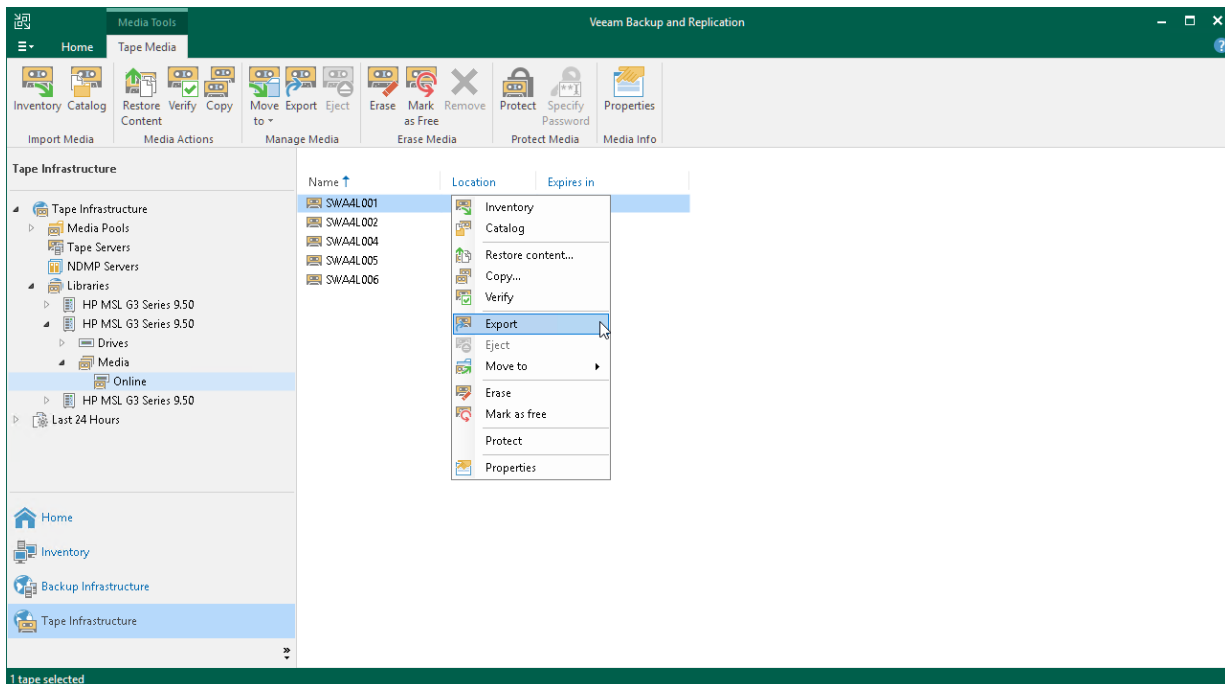
Export is available only for the devices that support such operations and include I/E slot.

To export a tape:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries > LibraryName > Media > Online**.
3. Select a tape you want to export and click **Export** on the ribbon. Alternatively, you can right-click selected tape and select **Export** from the shortcut menu.

TIP

You can instruct your tape jobs to export tapes automatically. To do so, navigate to the **Options** step of [backup to tape job](#) or [file to tape job](#) and select the **Export current media set upon job completion** check box.



Verifying Tapes

Veeam Backup & Replication offers a simple, yet efficient means to verify that your tapes are correctly read and consequently you can restore data stored on them in case of emergency.

NOTE

Consider the following:

- During the tape verification job, Veeam Backup & Replication only checks if the data on the tape can be read. It does not check the application consistency or infrastructure.
- You can skip verifying tapes in a virtual tape library as in this case Veeam Backup & Replication will retrieve no check sums for data blocks.

Reasons for Tape Verification

There can be different reasons to verify your LTO tapes:

- You want to check tapes before copying their data to new tapes.
- LTO has great durability, but it is still limited, and after some time you need to replace the tape media with a new one.
- Compliance reasons.

How Tape Verification Works

Veeam Backup & Replication performs tape verification in the following way:

1. Veeam Backup & Replication instructs the tape drive to sequentially read data blocks from the tape and compares their content with the Veeam Backup & Replication database: it checks offsets of backup files, the correspondence of the offsets with correct file headers and the length of full backup files.
2. If the data on the tape does not correspond to the data in the Veeam Backup & Replication database, the latter is reported as corrupted (in the session log or separate .CSV file).
3. The tape drive calculates the checksums for data blocks on the tape and compares them with the checksums already stored for these data blocks on the tape.
4. If the drive detects an error in some data block (checksums differ or the data block could not be read), Veeam Backup & Replication reports all files in the data block as corrupted (in the session log or separate .CSV file).

Prerequisites for Tape Verification

Before starting a tape verification job, check the following prerequisites:

- The tapes to verify must be online.
- The tapes to verify must be cataloged. Tapes in the **Unrecognized** media pool are not available for tape verification. For more information, see [Cataloging Tapes](#).
- All tapes to verify must be decrypted. Encrypted tapes cannot be read. For more information on decryption, see the Veeam Backup & Replication User Guide, section *Decrypting Tapes with Password*.

Besides, note that you cannot run tape verification for cleaning tapes and free tapes (tapes in the **Free** media pool).

Running Tape Verification

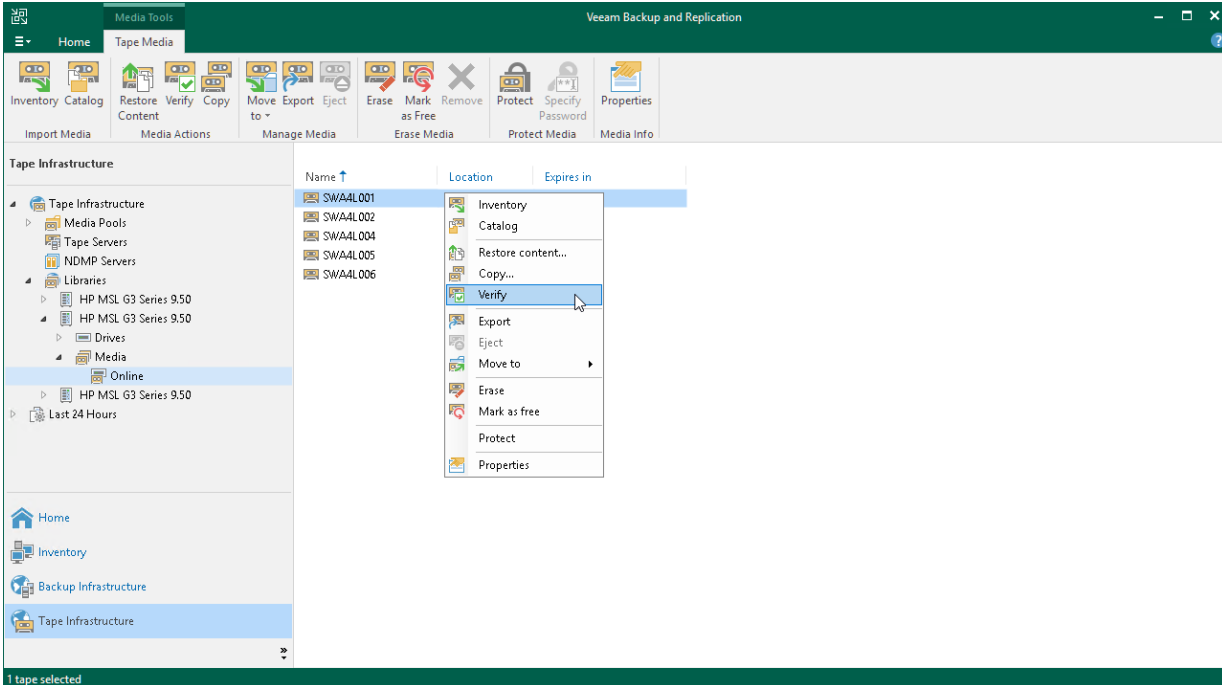
To start the tape verification job:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries > LibraryName > Media > Online**.
3. Select a tape you want to verify and click **Verify** on the ribbon. Alternatively, you can right-click the selected tape and select **Verify** from the drop-down menu.

If you want to simultaneously use several drives for tape verification, successively start separate tape verification jobs for different tapes.

When writing backup files to tapes, there can be situations where a file does not fit on a tape. Then it is divided into parts and written to several tapes, which are then considered dependent. When verifying tapes, Veeam Backup & Replication checks data on selected tapes only. It does not check data on dependent tapes if they are not selected for verification.

To get an email report about the results of the tape verification job processing, enable notifications as described in the Veeam Backup & Replication User Guide, section *Configuring Global Email Notification Settings*. If there are too many issues reported after verification, the job session log in Veeam Backup & Replication UI displays only first 10 files with errors. For a full list of read errors with detailed paths and tape IDs, open the detailed report in the CSV format stored in the folder where tape verification job logs are stored. For convenience, the path to this folder is specified in the job session log in UI and in the email report.



Copying Tapes

You can use the tape copy feature to migrate backups or files stored on previous generation tapes to newer ones.

You can also use this feature to make copies of tapes.

Before starting a tape copy job, check the following prerequisites:

- The tape server must have at least 1 GB of RAM per each tape drive used during a tape copy session.
- The tapes to copy must not be occupied by any other operations, such as backup, restore, cataloging. During the tape copy procedure, the tapes will be locked.
- The tapes to copy must be cataloged. Tapes in the **Unrecognized** media pool are not available for copying. For more information, see [Cataloging Tapes](#).
- All tapes to copy and machine backups on them must be decrypted. Encrypted tapes cannot be copied. Encrypted backups are skipped from copying. For more information, see [Add Optional Media Pool Settings](#).
- The source and target tape libraries must have at least one free tape drive each. If the tape copying is performed within one tape library, it must have at least two free drives.

NOTE

Due to hardware peculiarities, the speed of copying tapes is on average 15% lower than the speed of writing backups to tapes from the backup repository.

To copy content of a tape to another one, use the **Copy Tapes** wizard.

Step 1. Launch Copy Tapes Wizard

To launch the **Copy Tapes** wizard, do the following:

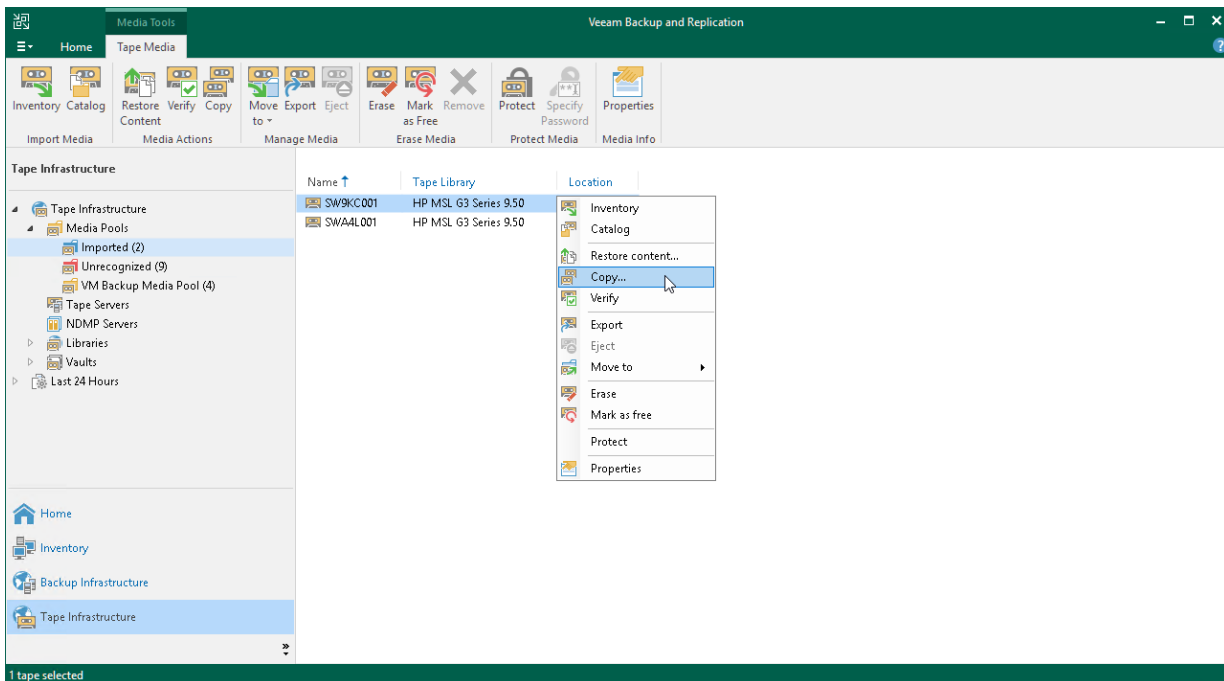
1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools > MediaPoolName** or under **Libraries > LibraryName** node > **Media > Online**.

NOTE

The following tapes cannot be copied:

- tapes in the **Unrecognized** media pool
- free tapes (tapes in the **Free** media pool)
- encrypted tapes
- cleaning tapes

3. Select the necessary tape and click **Copy** on the ribbon. Alternatively, you can right-click the tape and select **Copy**.



Step 2. Choose Source Tapes to Copy

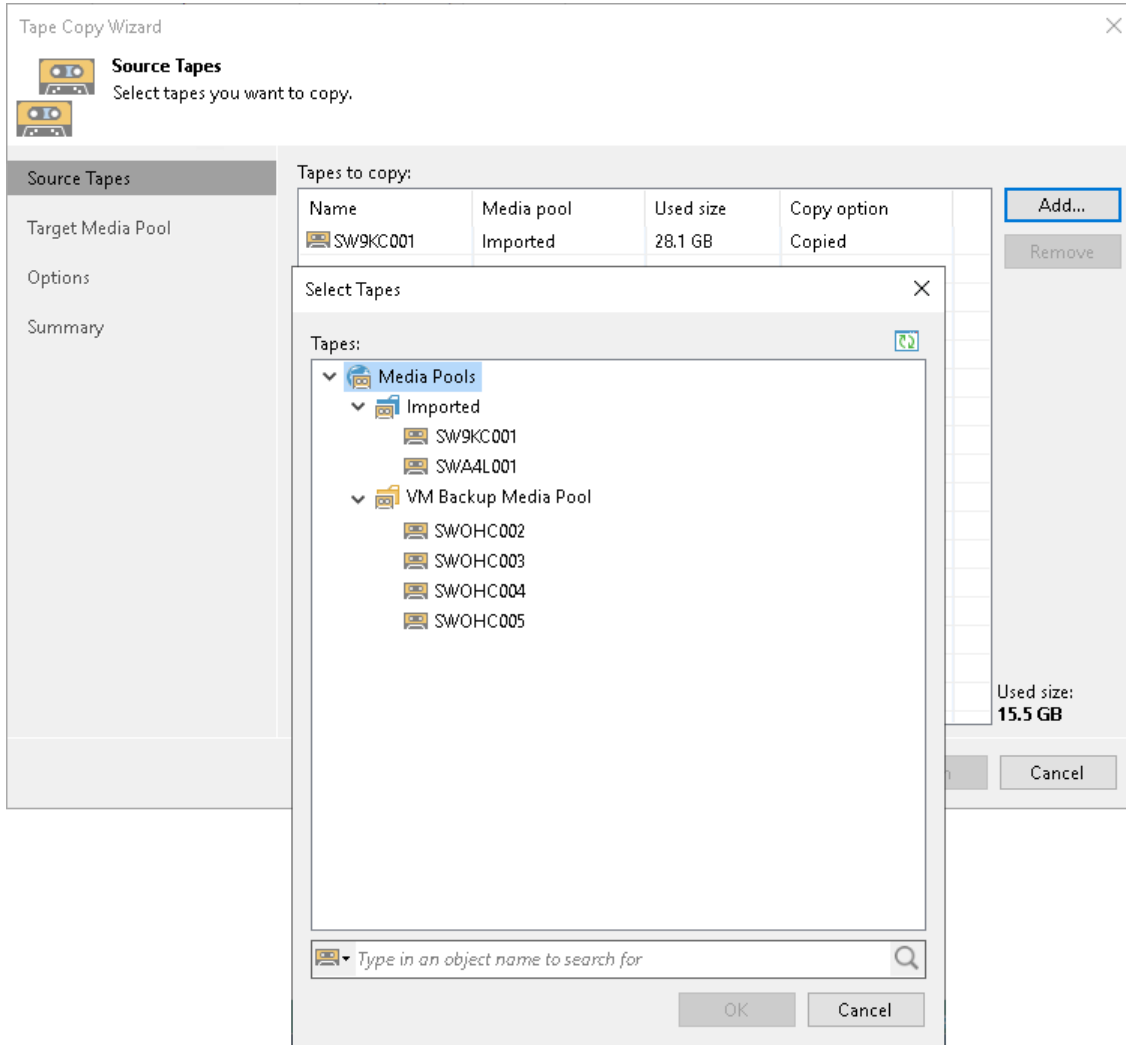
At the **Source Tapes** step of the wizard, select source tapes to copy. The tape that you selected when launching the wizard is added to the list of tapes to copy by default. To add other tapes to copy, do the following:

1. Click **Add**. Veeam Backup & Replication opens the **Select Tapes** window listing all media pools and tapes in them available for copying.
2. In the **Select Tapes** window, navigate to the required media pool and select the tape you want to copy.

Within one tape copy session, you can copy tapes of one type only: either tapes from a regular media pool, or tapes from a GFS media pool. You cannot combine them.

When writing backup files to tapes, there can be situations where a file does not fit on a tape. Then Veeam Backup & Replication divides it into parts and writes to several tapes, which are then considered dependent. Veeam Backup & Replication tracks this. When you are copying data from a tape that contains only one part of the backup file, Veeam Backup & Replication detects that. When you click **Next**, Veeam Backup & Replication informs you which tapes contain other parts of the file and prompts you to add these tapes to the list for copying complete content. You can agree to add these tapes to the job. Then Veeam Backup & Replication will copy these tapes marked as **Partially cloned** in the **Copy option** column only partially: it will copy only data required for cloning full content of the initially selected tapes in the consistent manner. Or you can refuse to add dependent tapes for copying. Then Veeam Backup & Replication will not copy files that are not complete from initially selected tapes. The **Used size** column shows the total size of the backups/files on each tape that will be copied. It does not include encrypted backups that are skipped when copying tapes or file parts that do not have accompanying file parts stored on dependent tapes.

To remove tapes from the copy list, select the tapes and click **Remove**.



Step 3. Choose Target Media Pool

At the **Target Media Pool** step of the wizard, specify where you want to copy the source tapes to.

NOTE

The target media pool must be of the same type as the source media pool: they both must be either regular media pools, or GFS media pools.

1. From the **Target library** drop-down list, select the tape library that will store copies of source tapes.
2. From the **Target media pool** drop-down list, select a target media pool to copy source tapes to.

If you have configured a media pool in advance, select it from the drop-down list. Otherwise, click **Add New** and add a media pool as described in [Creating Media Pools](#).

If the target media pool is the same as the source media pool, Veeam Backup & Replication prompts you to first close the existing media set, start a new media set and then copy the tape there.

The screenshot shows the 'Tape Copy Wizard' window at the 'Target Media Pool' step. The window title is 'Tape Copy Wizard' with a close button (X) in the top right corner. Below the title bar, there are three icons representing tape drives and the text 'Target Media Pool' followed by the instruction: 'Select the target media pool for tape copies. LTO generation of source and target tape medias do not have to match.'

The main area is divided into two columns. The left column contains a navigation pane with the following items: 'Source Tapes', 'Target Media Pool' (which is selected and highlighted), 'Options', and 'Summary'. The right column contains the configuration options:

- Target library:** A dropdown menu showing 'HP MSL G3 Series 9,50 (172.24.29.99)'.
- Target media pool:** A dropdown menu showing 'File Backup Media Pool (HP MSL G3 Series 9,50)' with an 'Add New...' button to its right.
- Tapes:** 1
- Free space:** 30 GB
- Media set:** On Monday at 12:00
- Retention:** Do not protect data (cyclically overwrite tapes as required)
- Parallel processing:** 2 drives, multiple backup chains
- Encryption:** Disabled
- Export to vault:** Do not export
- WORM:** False

At the bottom of the window, there are four buttons: '< Previous', 'Next >' (highlighted in blue), 'Finish', and 'Cancel'.

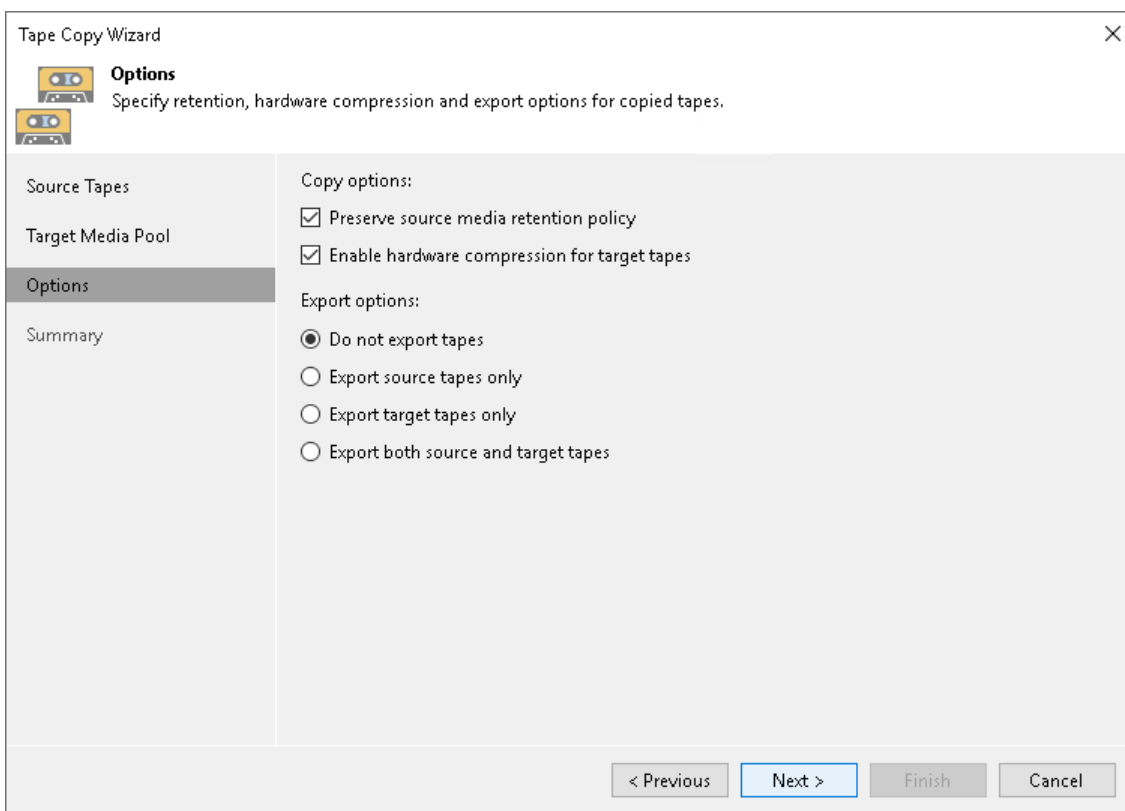
Step 4. Specify Tape Copy Options

At the **Options** step of the wizard, specify tape copy and tape export options.

- If you want to copy retention settings of the source tapes to the target tapes, select the **Preserve source media retention policy** check box.

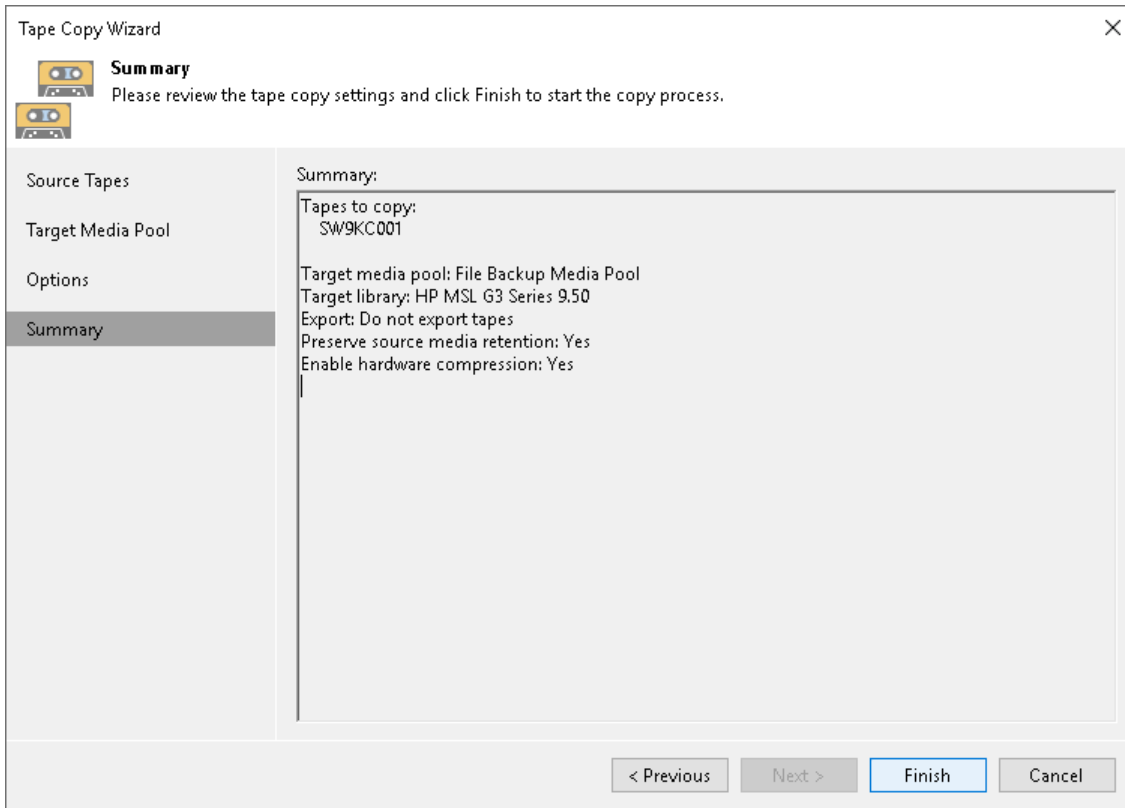
If you are copying several tapes with different retention settings, Veeam Backup & Replication will set retention policy for the target tapes to the maximum retention among the source tapes.

- If you want to enable hardware compression while writing new tapes, select the **Enable hardware compression for target tapes** check box.
- If you want to export source media, target media, or both after the tape copying finishes, change the default **Do not export tapes** option in the **Export options** section to the one that most suits your case. For details on tape export, see [Exporting Tapes](#).

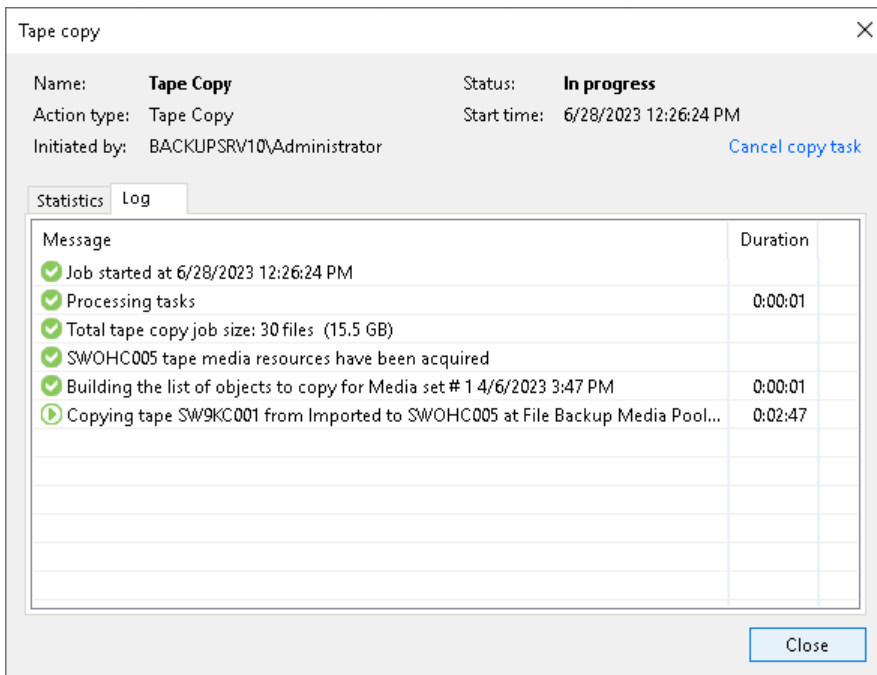


Step 5. Finish Working with Wizard

At the **Summary** step of the wizard, review the configuration and click **Finish**.



After that, the tape copy job will start. You can track its progress in the displayed **Tape Copy** window.



To get an email report about the results of the tape copy job processing, enable notifications as described in the Veeam Backup & Replication User Guide, section *Configuring Global Email Notification Settings*. If there are too many issues reported after the tape copy job, the job session log in Veeam Backup & Replication UI displays only first 10 files that failed to be copied. For a full list of errors with detailed paths and tape IDs, open the detailed report in the CSV format stored in the folder where tape verification job logs are stored. For convenience, the path to this folder is specified in the job session log in UI and in the email report.

Restoring Entire Tapes

A special case of file restore from tape described in [Restoring Files from Tape](#) is restoring content of entire tapes. That can be useful in various situations. For example:

- If a media set is damaged, you can use the entire tape restore to recover all available data stored on tapes in this media set.
- You want to check what content is stored on a particular tape.
- Audit requires checking the content of the tapes.

Before restoring tapes, consider the following:

- Restore of the content of entire tapes can be performed to a non-original location only.
- NDMP data is skipped from restore.
- The tapes to restore must be online.
- The tapes to restore must be cataloged. Tapes in the **Unrecognized** media pool are not available for restore. For more information, see [Cataloging Tapes](#).
- Backup files on tapes to restore must be decrypted. Encrypted backup files are skipped from restore. For more information, see [Add Optional Media Pool Settings](#).
- When restoring entire tapes, Veeam Backup & Replication creates a separate folder for each host whose files are backed up on the tapes.
- The entire restore tape job preserves the folder structure and restores all file and folder versions as is. If the tape stores several file versions of the same file or folder, older versions get date postfixes in the names.
- If some files on the tapes to restore have dependent file parts on other tapes, Veeam Backup & Replication will require these tapes to restore the full content of the selected tapes in the consistent manner.
- If you are restoring data from tapes that were previously copied, as described in [Copying Tapes](#), Veeam Backup & Replication will use the most recent online copy as a source for restore.

For information on how to restore entire tapes, see [Restoring Files from Tape](#).

Tapes Availability and Write-Protection

Before archiving data to tape media, Veeam Backup & Replication detects available tapes in the target media pool. Unavailable tapes are filtered out and are not used for writing data. A tape may be unavailable for one of the following reasons:

- The tape cannot be used according to the retention policy set for the media pool.
- The tape is offline.
- The tape has the write-protect switch set.

If your tape is write-protected and you want to write data to this tape, you must eject the tape from the drive and drag the write protection switch off. After you insert the tape back to the drive, you must inventory the tape to mark it as writable in the Veeam Backup & Replication database.

WORM Tapes

Veeam Backup & Replication supports WORM (Write Once Read Many) tapes for archiving backups to tape.

WORM Media Pools

As the WORM tapes cannot be overwritten, you need to treat them differently when using with Veeam Backup & Replication. These tapes cannot have retention period, and for this reason you cannot place them to the same media pool with the overwritable tapes.

For WORM tapes, you need to create separate media pools. In these media pools, only WORM tapes are used and they are not mixed with other tapes. The following media pools support the WORM media:

- WORM media pools
- WORM GFS media pools

In WORM media pools, retention settings are disabled. For more information, see [Media Pools](#) and [GFS Media Pools](#).

You can append new data to the same WORM tape cartridge until it is full as long as the media set containing this media is open. For more information about cases when Veeam Backup & Replication closes the current media set and starts a new one, see [Media Sets](#).

Identifying WORM Tapes

Veeam Backup & Replication identifies WORM tapes and marks them as WORM in the Veeam database. WORM tapes are never mixed with standard tapes.

To identify WORM and standard tapes, run the inventory job against them. For more information, see [Inventorying Tapes](#).

Requirements for WORM Tapes

Tape libraries must support reading/writing data on WORM tape cartridge memory chip.

Tape Barcode Labels

Library tapes can be marked with barcode labels that simplify identification of tapes and their types. Although the main source of information about the tape for Veeam Backup & Replication is a cartridge memory chip (LTO-CM), it can be read only when the media is inserted into the drive. Thus, correct labeling of tapes turns very useful for management of tape media.

IMPORTANT

If you have multiple libraries, ensure that the barcodes are unique throughout the infrastructure.

Each barcode label used for marking LTO tapes supported by Veeam Backup & Replication consists of eight characters: a six-character volume serial ID and a two-character media ID. The media ID defines the tape type. The labels use the uppercase letters A through Z and the numbers 0 through 9, for example: ABC123L8, where ABC123 is the volume serial ID, L8 is the media ID indicating LTO of generation 8.

LTO data tapes used in devices supported by Veeam Backup & Replication may have the following media ID:

Media ID	Description
L3	Generation 3
L4	Generation 4
L5	Generation 5
L6	Generation 6
L7	Generation 7
L8	Generation 8
L9	Generation 9
LT	Generation 3 WORM
LU	Generation 4 WORM
LV	Generation 5 WORM
LW	Generation 6 WORM
LX	Generation 7 WORM

Media ID	Description
LY	Generation 8 WORM
LZ	Generation 9 WORM
CU	Universal cleaning

Cleaning and diagnostic tapes use unique labels to distinguish them from data tapes. The first three alphanumeric characters in the volume ID indicate the tape type:

- Cleaning tapes use `CLNxxx` as volume ID plus the cleaning-specific media ID, for example: `CLN001CU`, where `CLN001` is the cleaning media ID, `CU` is the indicator of the cleaning media.
- Diagnostic tapes use `DG[space]xxx` as diagnostic tape serial ID plus the media ID, for example: `DG 001L8`, where `DG 001` is the diagnostic tape serial ID, `L8` is the media ID.

NOTE

If tapes have incorrect barcode labels, for example, labels on ordinary (non-WORM) tapes indicate that they are of WORM or cleaning type, Veeam Backup & Replication may incorrectly identify such tapes.

Relabeling Tapes

To change a barcode label on a tape, you must correctly perform tape relabeling. To do that:

1. Physically remove the tape from the library.
2. From the Veeam Backup & Replication console, rescan the library, as described in [Rescanning Tape Devices](#). Alternatively, you can wait for 3 minutes for the scheduled rescan to run.
After the library rescan, the tape becomes offline. That is indicated by a black and white icon for this tape.
3. Remove the tape from Veeam Backup & Replication, as described in [Removing Tapes from Catalog](#).
4. Physically change the label on the tape.
5. Insert the tape into the IO slot or into the tape library magazine and give the library a minute to discover the changes.
6. Import the tapes or rescan the library:
 - If you loaded the tapes into the IO slot, import the tapes. To do this, open the **Tape Infrastructure** view, expand the **Libraries** node and select the library into which you have loaded the tapes. Click **Import Tapes** on the ribbon. Alternatively, you can right-click the necessary library in the working area and select **Import Tapes**.
 - If you loaded tapes into the tape library magazine, rescan the tape library. To do this, click **Rescan Library** on the ribbon. Alternatively, you can right-click the necessary library in the working area and select **Rescan library**.
7. [Optionally] If you need data written to the inserted tape, catalog the appeared tape.

Media Pools

Media pools are logical containers created in Veeam Backup & Replication to organize and administer tapes.

Veeam Backup & Replication has the following types of media pools:

- [Service Media Pools](#) are created automatically and are used for automatic tape administration.
- [Media Pools](#) are created by user and contain tapes for backups.
- [GFS Media Pools](#) are created by user and contain tapes for GFS backups.

All Veeam media pools are global. They span tapes that belong to multiple libraries. In a global media pool, you can move tapes between the libraries without need to catalog them.

NOTE

Consider the hardware encryption. If the tapes are encrypted by native hardware means of a tape library, you cannot read them at tape device with another encryption standard or with hardware encryption turned off.

Placing Tapes to Media Pools

Veeam Backup & Replication works only with tapes that are placed to a media pool. To introduce tapes to Veeam Backup & Replication, you need to run importing procedure against all new tapes you load to your tape devices. Importing registers tapes in the Veeam Backup database after which Veeam Backup & Replication places tapes to one of the media pools. For more information, see [Loading Tapes](#).

Media Sets

Media set is a set of tapes used for continuously writing backup data. Media set is one of the parameters in media pool configuration.

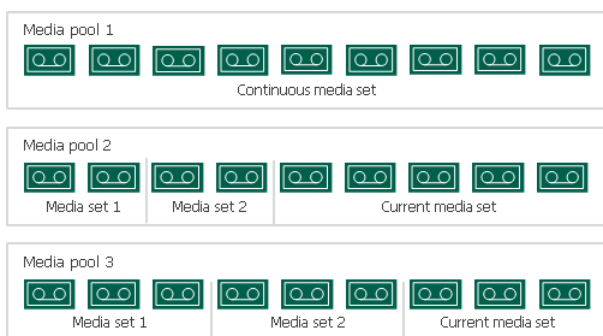
A new media set always starts with a free tape. Within one media set, the new data block is appended to a previous one on a tape. Veeam Backup & Replication stores information about all tapes that belong to each media set. You can view the list of names or barcodes of tapes that are associated with a particular media set.

Media sets are used to explicitly distinguish data recorded to particular sets of tapes. You can choose between the following configuration options:

- **Always continuing one media set.** Use this option if you do not need to split your tape archives into separate sets of tapes.
- **Creating a new media set for each backup session.** In this case, Veeam Backup & Replication will produce a separate set of tapes for each tape backup session.
- **Starting a new media set for a certain period of time**, for example, each week. As a result, you will have a separate set of tapes containing all backups that have been written to tape during a week.

When planning media sets configuration, you should balance between convenient viewing of data and efficiency of using the tapes. Media sets help create distinct packs of tapes, which will be convenient, for example, if you need to bring certain tapes from an offsite storage location to restore data. However, it may use the tapes ineffectively as the new media sets always require a new tape. This option is helpful when you have a lot of backups stored offsite.

Always continuing one media set option is most efficient in terms of tape capacity usage, for the new data will be written to the same tape until it is full. However, in this case the data will be split across tapes and you may require a larger number of tapes to get a particular backup set for restore. This option is usually used in environments where the tapes are not exported from libraries.



In some cases, Veeam forcibly starts a new media set, even if media pool settings do not instruct Veeam to do so. It happens when a job starts, but the tape that was planned for writing data cannot be used. In this situation, Veeam takes a new tape, and starts a new media set on it. For example, the situation may be as following:

1. The required tape is offline. If you bring such tape online before the tape job starts, it will be used as planned.
2. A backup to tape job is scheduled to export tapes from the media pool upon job completion. Exporting closes the current media set and starts a new one on the next job run.
3. The required tape is hardware or software protected.
4. In library failover on the following events: library is offline and all drives are busy. When a tape library is failed over on these events, Veeam Backup & Replication starts a new media set even if the global media pools are configured to always continue one media set.

Note that if a new media set is started, scheduled or forced, the previous media set cannot be resumed.

Media Set Names

Consistent naming of media sets makes the work with media pools easier. Therefore, we recommend to pay attention to configuring media set naming patterns when configuring [media pools](#) and [GFS media pools](#).

To automatically create media set names, use the following variables in the **Media set name** field:

- *%date%* – the date of the media set creation, default variable
- *%id%* – the number of the media set, default variable
- *%day%* – the numeric day in month, on which the media set is created
- *%dayofweek%* – the day of week, on which the media set is created
- *%job%* – the name of job, for which the media set is created
- *%month%* – the month of creation of the media set (the month is shown as a name, for example, 'January')
- *%monthnumeric%* – the month of creation of the media set (the month is shown as a number, for example, '01' for January)
- *%time%* – the time of creation of the media set
- *%year%* – the year of creation of the media set

The default variables are *##id%* (the number of the media set) and *%date%* (the date of creation of the media set). That will do if you use simple media pools. But, if you use a more sophisticated system of media sets, for example in a GFS media pool, you can configure media set naming patterns differently, for example:

- Daily

```
%job%_Daily_%dayofweek%_%date%
```

- Weekly

```
%job%_Weekly_%day%_%date%
```

- Quarterly

```
%job%_Quarterly_%month%_%date%
```

- Monthly

```
%job%_Monthly_%month%_%year%
```

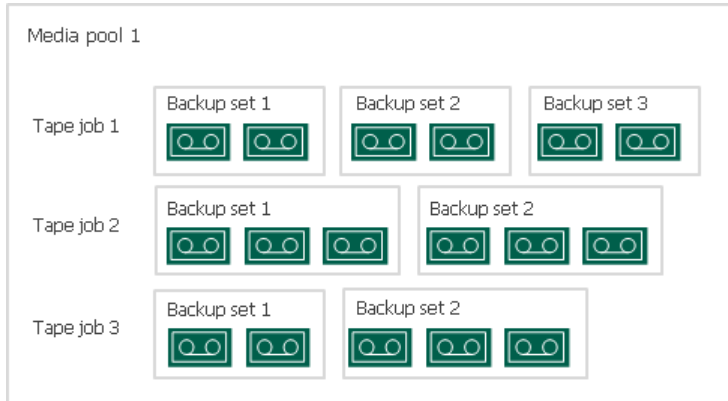
- Yearly

```
%job%_Yearly_%year%
```

Backup Sets

When a tape job runs, it analyzes disk storage and spots files that match the tape job parameters. The tape job queues the files and writes them to tape. The set of files that are archived to tape within one tape job session is a backup set.

Depending on size and number of archived files, a backup set may require different amounts of tape space. For example, if the amount of data is large, it may take several tapes.

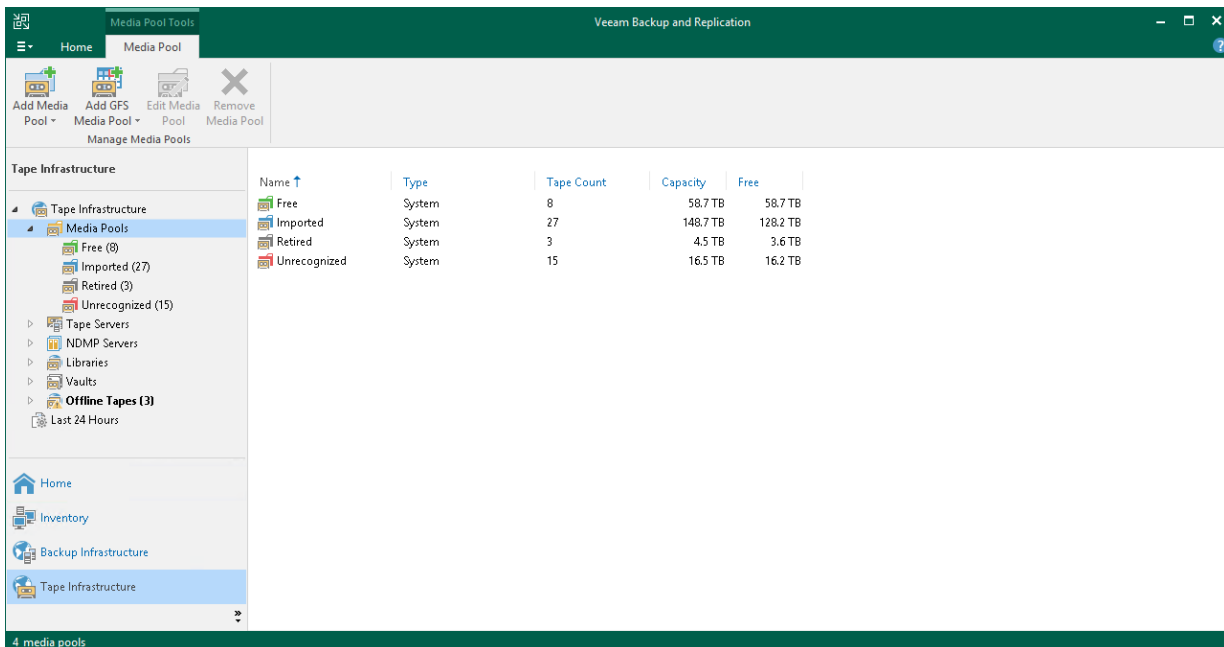


Service Media Pools

Service media pools sort tapes and manage their free capacity for writing data. Service media pools are automatically created by Veeam Backup & Replication when needed. The following predefined media pools can be created:

- **Free** – a media pool containing empty tapes. You can use this media pool to replenish user-created pools with new tapes when needed.
- **Imported** – a media pool containing non-empty tapes. These include tapes identified by the tape catalog job.
- **Retired** – a media pool containing retired tapes that reached the maximum number of re-writes. This media pool may also contain tapes with some hardware malfunction.
- **Unrecognized** – a media pool containing tapes that were loaded to tape device. They need further identification by user that can be done by running the inventory or catalog job. This media pool also contains cleaning tapes.

You cannot create, modify or delete service media pools.



Media Pools

Media pools are target destinations for backup to tape and file to tape jobs. The media pools manage empty (or available for overwriting) tapes to allow the tape jobs write data. You can create as many media pools as you need. One media pool can be target for unlimited number of tape jobs. The GFS jobs require GFS media pools. For more information, see [GFS Media Pools](#).

Tapes for Media Pools

For writing data, you can use rewritable tapes or WORM (Write Once Read Many) tapes. For more information, see [WORM Tapes](#). For using WORM tapes, you need to create separate media pools. The following types of media pools are available:

- Media pools
- WORM media pools

For more information on creating WORM media pools, see [Creating Media Pools](#).

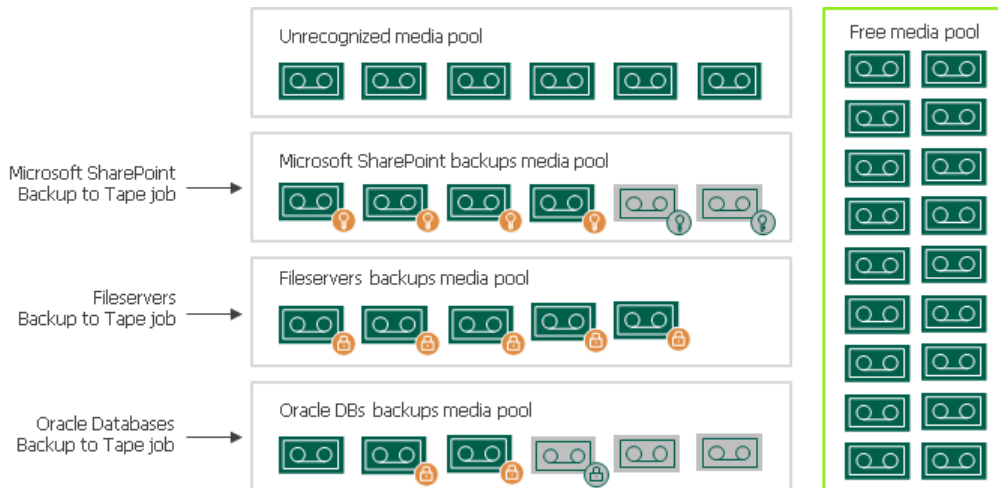
Media Pools Configuration

For each media pool, you can configure rules. Such rules are further applied to every tape that belongs to this media pool.

You can apply the following rules:

- Add tape libraries: select and manage tape libraries that will be used by the media pool.
- Configure tape replenishment: you can allocate some particular tapes or let the media pool take a free tape when required.
- Create media sets: media sets allow you to create sets of tapes with data for a particular time period.
- Set the data retention period: this setting lets you choose the period for which the data on tapes will be protected from overwriting (not applicable for WORM tapes).
- Enable parallel processing: you can allow the media pool to use multiple tape drives simultaneously for writing data to tape. With parallel processing enabled, the media pool can process simultaneously several tape jobs or split the data within one tape job across tape drives.
- Encrypt the data written to tapes.
- Export tapes to vault.

A tape allocated to a media pool will always be tied to its media pool. When you bring a tape with expired data online, Veeam Backup & Replication places it automatically to the media pool where the tape was written.



Creating Media Pools

To create a media pool, use the **New Media Pool** wizard or **New WORM Media Pool** wizard. This section will guide you through all steps of the wizard and provide explanation on available options.

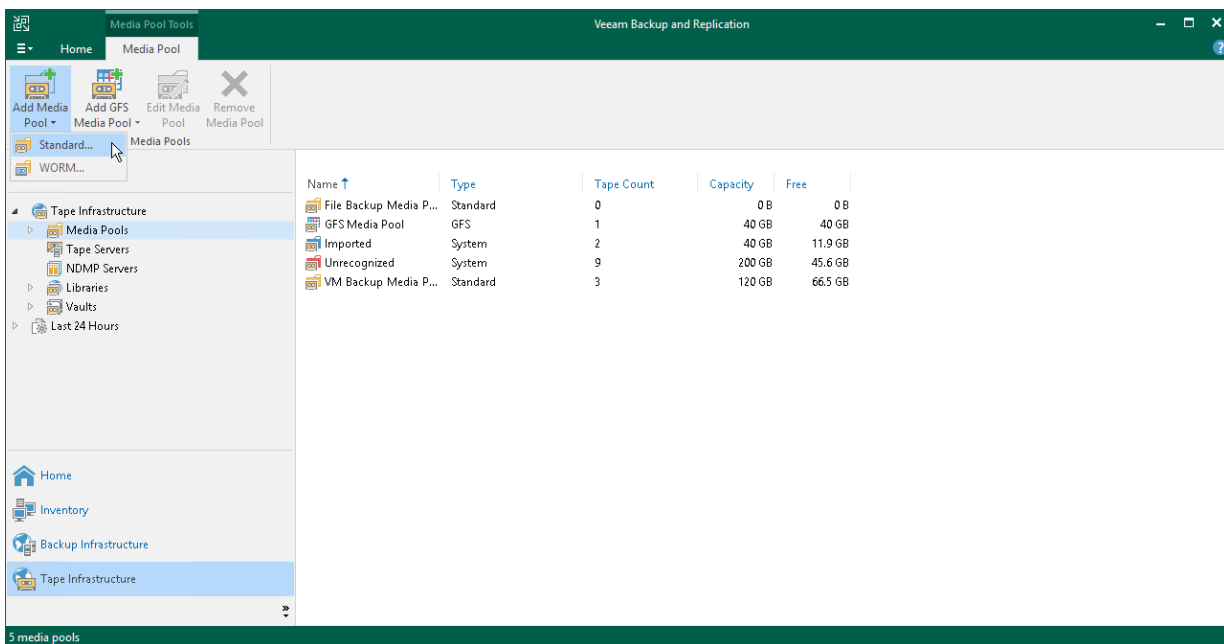
Step 1. Launch New Media Pool Wizard

To run the **New Media Pool** wizard:

1. Open the **Tape Infrastructure** view and click **Add Media Pool** on the ribbon. Alternatively, you can open the **Tape Infrastructure** view, right-click the **Media Pools** node and choose **Add Media Pool**.
2. Select **Standard** if you want to create a media pool for standard tapes or **WORM** if you want to create a media pool for WORM (Write Once Read Many) tapes.

TIP

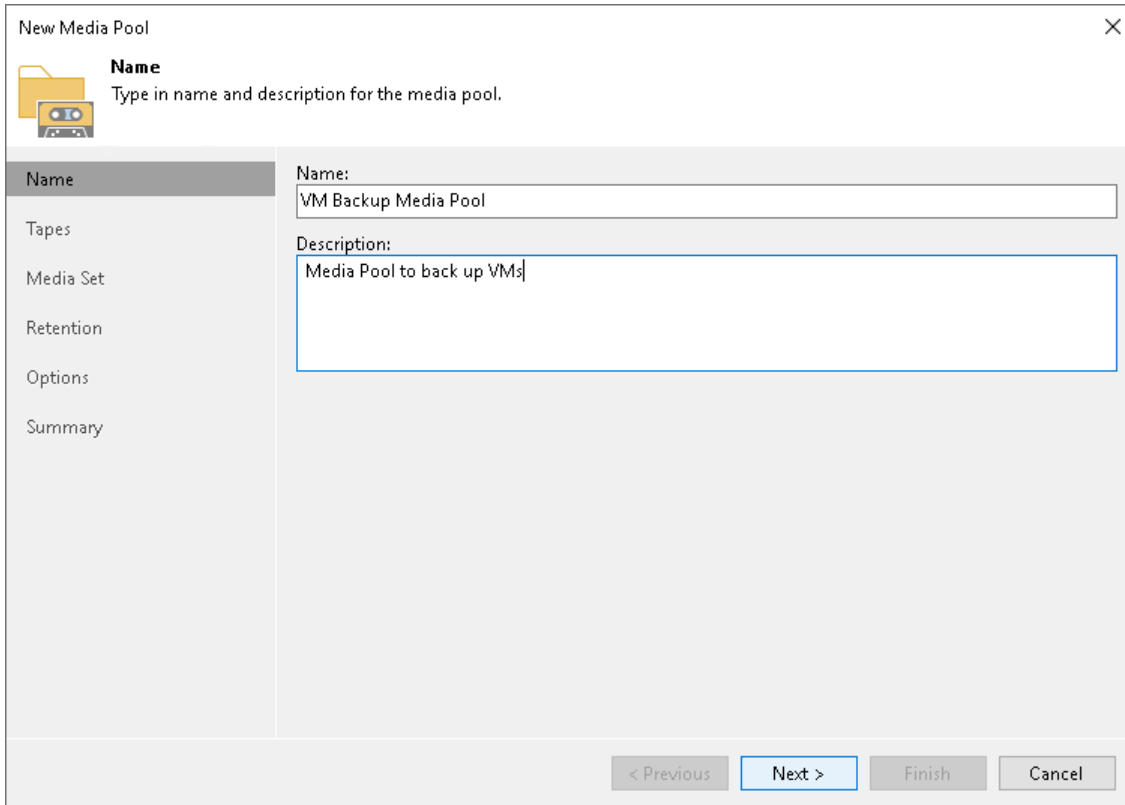
You can also launch the **New Media Pool** wizard when configuring tape jobs (that is, directly from the **New Backup to Tape Job** wizard and **New File to Tape Job** wizard). For more information, see [Creating Backup to Tape Jobs](#) and [Creating File to Tape Jobs](#).



Step 2. Specify Media Pool Name

At the **Name** step of the wizard, define basic description for the new media pool.

1. In the **Name** field, enter a name for the created media pool.
2. In the **Description** field, enter a description of the new media pool. The default description contains information about the user who created the media pool, date and time when the media pool was created.



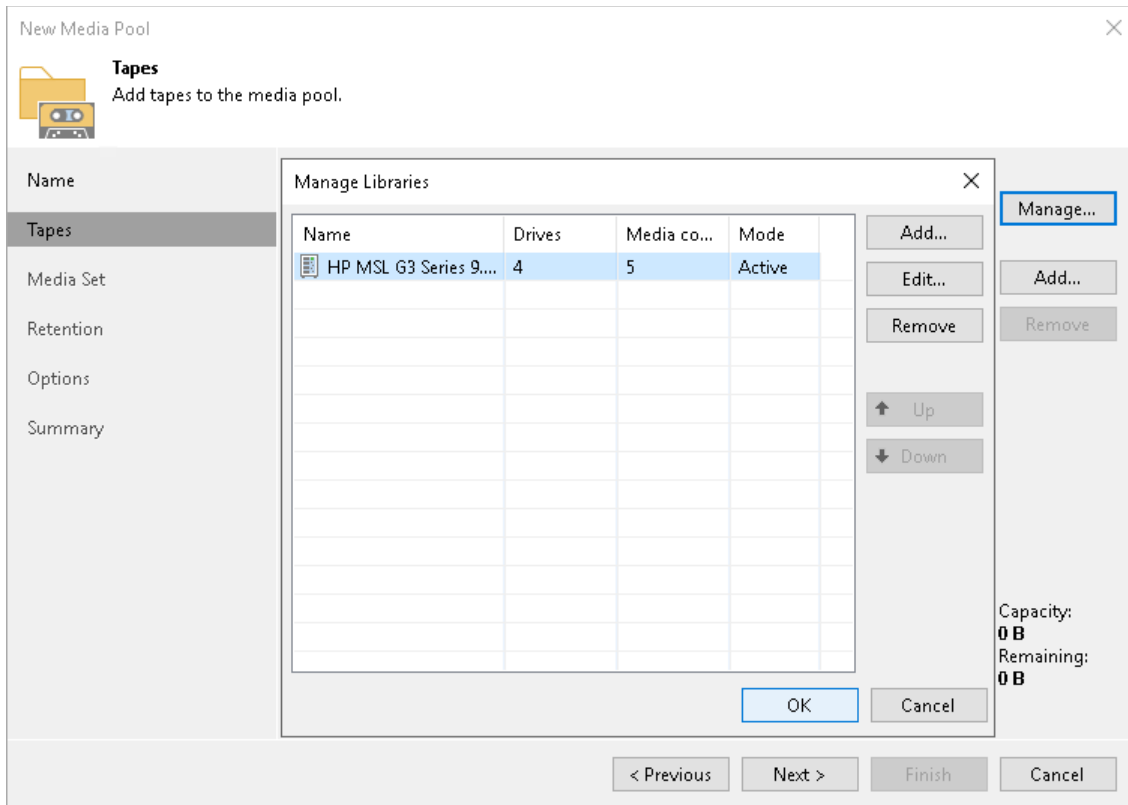
The screenshot shows a wizard window titled "New Media Pool" with a close button (X) in the top right corner. The window is divided into a left sidebar and a main content area. The sidebar contains a list of steps: "Name" (highlighted), "Tapes", "Media Set", "Retention", "Options", and "Summary". The main content area has a header with a folder icon, the word "Name", and the instruction "Type in name and description for the media pool." Below this, there are two text input fields. The first is labeled "Name:" and contains the text "VM Backup Media Pool". The second is labeled "Description:" and contains the text "Media Pool to back up VMs". At the bottom of the window, there are four buttons: "< Previous" (disabled), "Next >" (active), "Finish" (disabled), and "Cancel" (disabled).

Step 3. Add Tapes to Media Pool

At the **Tapes** step of the wizard, you can select tape libraries and allocate tapes for the pool.

1. From the list in the **Tape library** field, select the tape device that you want to use in this media pool. The list contains all tape libraries managed by this Veeam backup server.
2. To add more libraries, click **Manage**. For one media pool, you can select any tape devices that are managed by this Veeam backup server even if they are connected to different tape servers.

Click **Add** to add other tape libraries.



Configure the multiple libraries mode:

- Parallel processing: in this mode, tape jobs use drives in all libraries parallelly. For more information, see [Tape Parallel Processing](#).

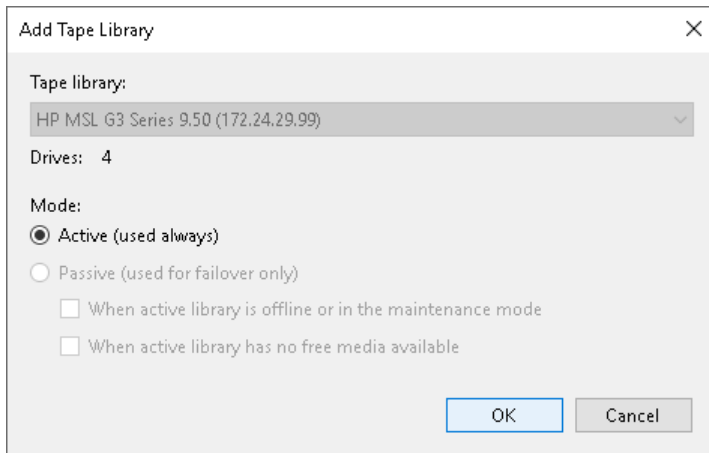
To enable the parallel processing mode, set all libraries role to **Active**. To do this, select a library and click **Edit**. Use **Up** and **Down** buttons to position the libraries in order they must be used.

- Failover: in this mode, the first library in the list is active and is primarily used for writing data. Other libraries added to this media pool are passive and are used for failover in the following events:
 - The primary library is unavailable.
 - The primary library has no media available.

To enable the failover mode, set the first library role to **Active** and all other libraries roles to **Passive**. To do this, select a library from the list and click **Edit**. Use **Up** and **Down** buttons to position the libraries in order they must fail over. Also ensure that you select at least one failover event.

On the next backup session, Veeam Backup & Replication will try to switch back to the primary library. If it is still not available, the media pool fails over to the next library as defined.

When using the failover mode, consider the risk of excessive usage of tapes, especially if you use WORM media pools. During the next backup session after the failover, switching back to the primary library may leave a tape in the reserve library not fully written. In the long run, that may result in excessive usage of tapes, which may be crucial if using WORM tapes.



NOTE

If you enable the failover mode, notifications can be sent when Veeam Backup & Replication switches to a passive tape library during failover. Notifications are sent under either of the following conditions:

- The **Notify on failure** check box is selected in the Veeam Backup & Replication global notification settings. For more information, see the Veeam Backup & Replication User Guide, section *Configuring Global Email Notification Settings*.
- The **Notify on error** check box is selected in the tape job notification settings. For more information, see [Notifications Settings](#).

If you enable the parallel processing mode, no email notifications are sent when Veeam Backup & Replication switches from one library to another.

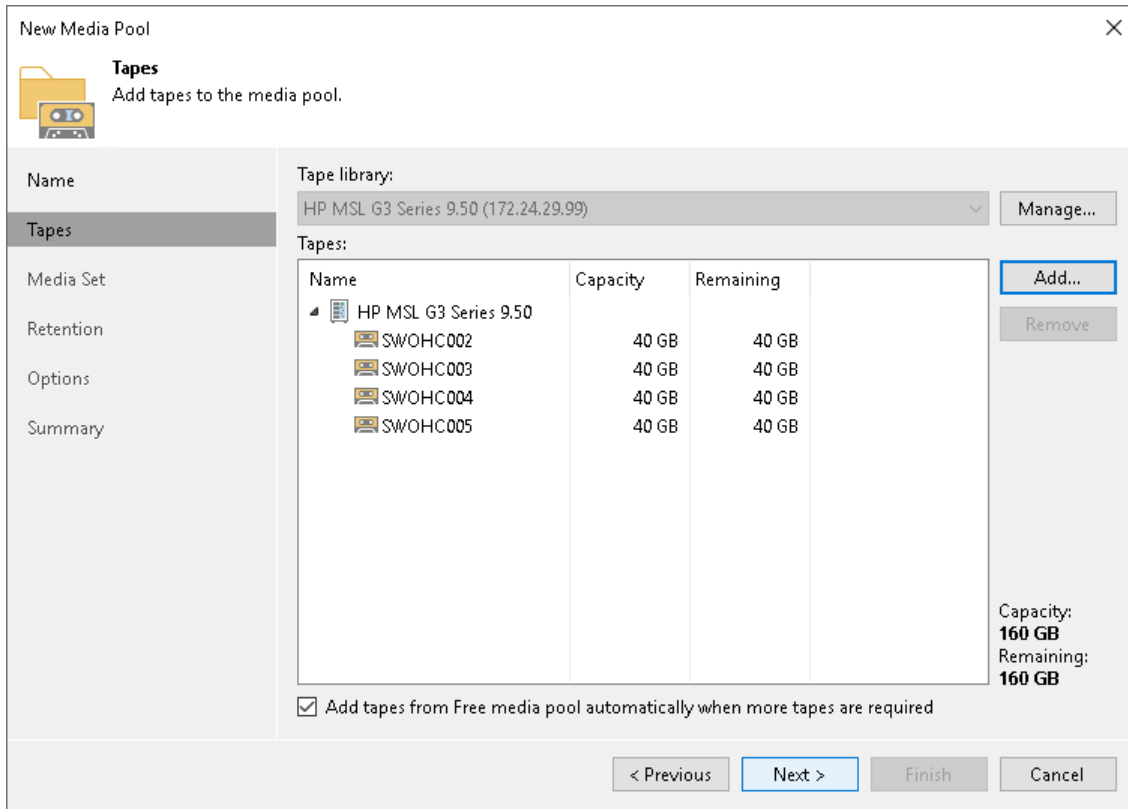
3. To allocate specific tapes from the library, click the **Add** in the **Tapes** field and select tapes that should be added to the media pool. Allocated tapes will be reserved for this media pool; other media pools will not be able to use these tapes. The capacity and free space on the allocated tapes will be displayed in the bottom right corner.

Allocate standard tapes to the standard media pool and WORM tapes to the WORM media pool. Do not mix standard and WORM tapes in one media pool.

4. To make the media pool replenishable, select the **Add tapes from Free media pool automatically when more tapes are required** check box.

With this option enabled, additional tapes will be allocated from the Free media pool when needed. That is, when a tape job uses all available tapes from this media pool, Veeam Backup & Replication will automatically add the required number of tapes from the Free media pool to let the job complete. If the option is disabled, the job will pause and prompt the backup administrator to add new tapes to the media pool.

To a standard media pool, Veeam Backup & Replication will add only standard tapes; to a WORM media pool Veeam Backup & Replication will add only WORM tapes.



Step 4. Specify Media Set Options

At the **Media Set** step of the wizard, specify rules for creating media sets. For more information, see [Media Sets](#).

In the **Media set name** field, define the pattern according to which created media sets will be named. For more information, see [Media Set Names](#).

In the **Automatically create new media set** section, specify conditions for creating new media sets on tapes allocated to the media pool. The following options are available:

- **Do not create, always continue using current media set.** If this option is selected, each subsequent backup session will write its backup set to the existing media set: it will append backup content to the content that was written to tape with a previous backup session. If, however, a backup set is started with a new tape, Veeam Backup & Replication will create a new media set for it.
- **Create new media set for every backup session.** If this option is selected, a new media set will be created for each new backup session. Each backup session will write its backup set starting with a new tape.
- **Daily at.** If this option is selected, you can specify day and time when new media sets should be created. For example, if at the end of the week you send weekly media sets to offsite storage, you can schedule creation of new media sets at the beginning of each week.

New Media Pool

Media Set
Specify media set name and how often a new media set should be automatically created.

Name
Media set name:
Media set # %id% %date%

Tapes

Media Set

Retention

Options

Summary

Automatically create new media set

Do not create, always continue using current media set

Create new media set for every backup session

Daily at 12:00 PM Everyday Days...

< Previous Next > Finish Cancel

Step 5. Specify Retention Settings

At the **Retention** step of the wizard, specify the retention settings and offline media tracking options for the tapes in this media pool. For more information, see [Tape Data Retention](#).

For WORM media pools, retention option is inapplicable; retention settings are inactive.

For standard media pools, you can select one of the following options:

- **Do not protect data (cyclically overwrite tapes as required)**. If this option is selected, tapes allocated to the pool will be overwritten, starting with the tape that stores the oldest archive.
- **Protect data for (time interval)**. If this option is selected, data on tapes will be preserved for the specified period. When this period is over, tapes will be overwritten, starting with the tape that stores the oldest archive. It is recommended to align this setting with the retention policy specified for the source backup chain:
 - For [forward incremental](#) and [reverse incremental](#) backup chains, you need to set the retention period for the tape archive at least twice longer than the retention period for source backups on disk.
 - For [forever forward incremental](#) backup chain, you can set any retention period for the tape archive.

For more information on tape data retention, see [Data Retention](#).

- **Never overwrite data**. If this option is selected, data on tapes will not be overwritten. If there is not enough tape capacity for the archiving job to complete, Veeam Backup & Replication will pause the job and prompt the backup administrator to add new tapes to the media pool.

NOTE

If at the previous step you selected the **Do not create, always continue using current media set** option, note that the retention period for such media sets starts after the first tape in the media set becomes full.

In the **Offline media tracking** section, you can set automatic moving tapes to a media vault when they are brought offline. For more information on vaults, see [Media Vaults](#).

To enable this option:

1. Select the **Move all offline tapes from this media pool into the following media vault** check box.
2. From the **Vault** list, select the media vault where you want to automatically move the tapes.

If the vault is not added yet, click **Add New** to open the **New Media Vault** wizard.

The screenshot shows the 'New Media Pool' wizard window. The title bar reads 'New Media Pool' with a close button (X) on the right. Below the title bar, there is a folder icon and the heading 'Retention' with the instruction 'Specify the tape retention settings for this media pool.' A left-hand navigation pane lists 'Name', 'Tapes', 'Media Set', 'Retention' (which is highlighted), 'Options', and 'Summary'. The main content area is divided into two sections: 'Data retention policy' and 'Offline media tracking'. Under 'Data retention policy', there are three radio button options: 'Do not protect data (cyclically overwrite tapes as required)', 'Protect data for' (which is selected), and 'Never overwrite data'. The 'Protect data for' option has a numeric spinner set to '5' and a dropdown menu set to 'Months'. Under 'Offline media tracking', there is a checked checkbox labeled 'Move all offline tapes from this media pool into the following media vault:'. Below this checkbox is a dropdown menu currently showing 'Veeam Media Vault' and an 'Add New...' button. At the bottom of the window, there are four buttons: '< Previous', 'Next >' (highlighted in blue), 'Finish', and 'Cancel'.

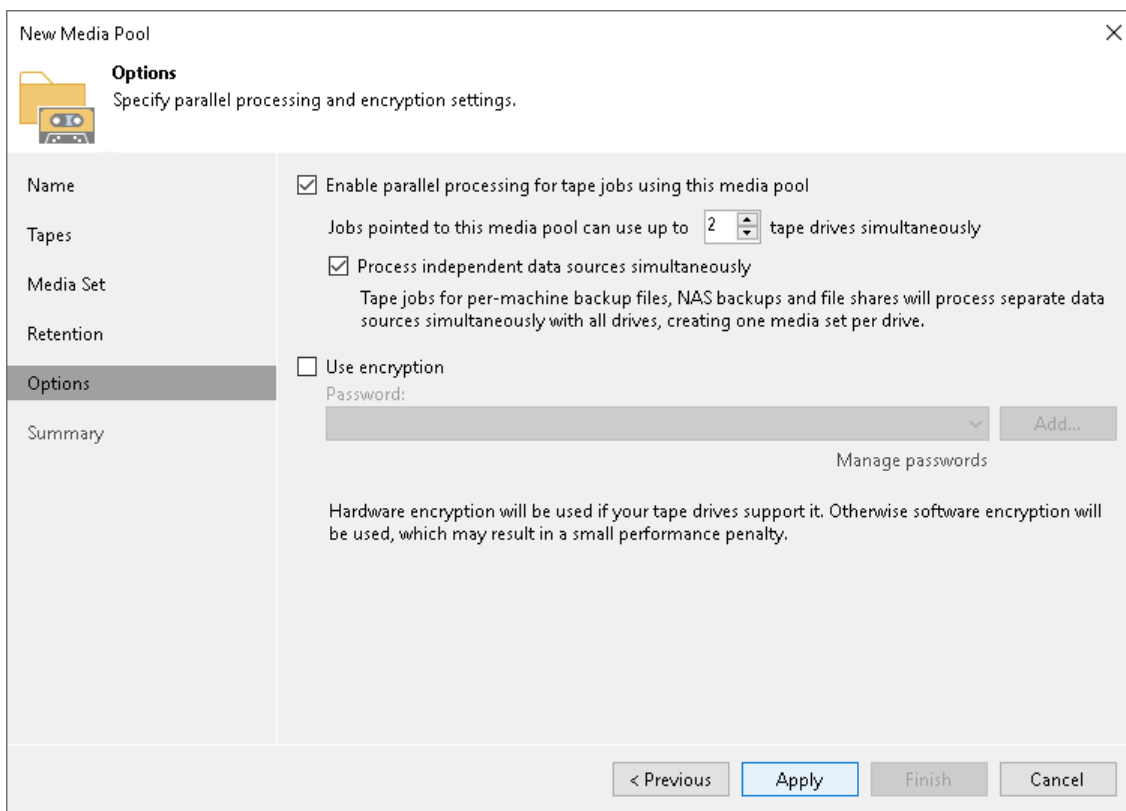
Step 6. Add Optional Media Pool Settings

At the **Options** step of the wizard, you can enable parallel processing and encryption.

1. Select the **Enable parallel processing for tape jobs using this media pool** check box if you want to process multiple tape jobs simultaneously. Set the maximum number of drives that the media pool can use in parallel.

If you want to use multiple drives simultaneously to process multiple source backup chains within the tape jobs, select the **Process independent data sources simultaneously** check box. For more information, see [Tape Parallel Processing](#).

2. To encrypt the content of files or backups archived to tapes in the media pool, select the **Use encryption** check box. Then, select a password you want to use to encrypt data written to tape from the **Password** field. You can also click **Add** or use the **Manage passwords** link to add a password. For more information, see section [Tape Encryption](#) in the *Veeam Backup & Replication User Guide*.

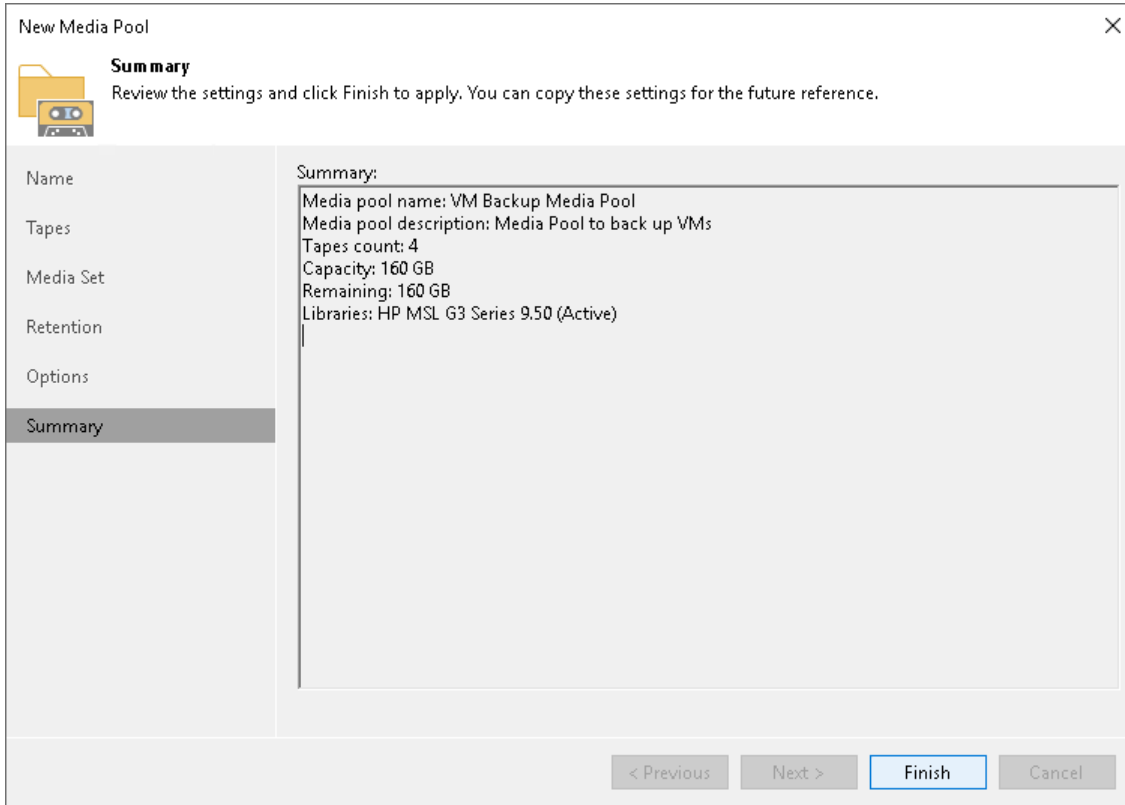


The screenshot shows the 'New Media Pool' wizard window, specifically the 'Options' step. The window title is 'New Media Pool' with a close button (X) in the top right corner. Below the title bar, there is a folder icon and the text 'Options' followed by 'Specify parallel processing and encryption settings.' The main area is divided into two columns. The left column contains a vertical list of steps: 'Name', 'Tapes', 'Media Set', 'Retention', 'Options' (which is highlighted with a dark background), and 'Summary'. The right column contains the configuration options for the 'Options' step. It starts with a checked checkbox 'Enable parallel processing for tape jobs using this media pool'. Below this is a text field 'Jobs pointed to this media pool can use up to' followed by a spinner box containing the number '2' and the text 'tape drives simultaneously'. The next option is a checked checkbox 'Process independent data sources simultaneously', with a sub-note: 'Tape jobs for per-machine backup files, NAS backups and file shares will process separate data sources simultaneously with all drives, creating one media set per drive.' Below that is an unchecked checkbox 'Use encryption'. Underneath is a 'Password:' label followed by a text input field and an 'Add...' button. Below the input field is a link that says 'Manage passwords'. At the bottom of the main area, there is a note: 'Hardware encryption will be used if your tape drives support it. Otherwise software encryption will be used, which may result in a small performance penalty.' At the bottom of the window, there are four buttons: '< Previous', 'Apply' (which is highlighted with a blue border), 'Finish', and 'Cancel'.

Step 7. Finish Working with Wizard

Review the media pool settings and click **Finish** to complete the wizard.

The new media pool will be available under the **Tape Infrastructure > Media Pools** node in the **Tape Infrastructure** view.



GFS Media Pools

The GFS media pools are special media pools that store data to tape according to the GFS, or Grandfather-Father-Son rotation scheme. The GFS media pools are targets for GFS tape jobs. For more information, see [GFS Backup to Tape](#).

Tapes for GFS Media Pools

For writing data, you can use rewritable tapes or WORM (Write Once Read Many) tapes. For more information, see [WORM Tapes](#). For using WORM tapes, you need to create separate media pools. The following types of media pools are available:

- GFS media pools.
- WORM GFS media pools.

For more information on creating WORM media pools, see [Creating GFS Media Pools](#).

GFS Media Sets

GFS media pool keeps five predefined media sets for storing the machine backups with a tiered retention policy scheme:

- Daily
- Weekly
- Monthly
- Quarterly
- Yearly

You can disable a media set or sets if you do not need them.

GFS Tape Jobs

A GFS media pool can be target for unlimited number of GFS tape jobs.

Creating GFS Media Pools

To create a GFS media pool, use the **New GFS Media Pool** wizard. This section will guide you through all steps of the wizard and provide explanation on available options.

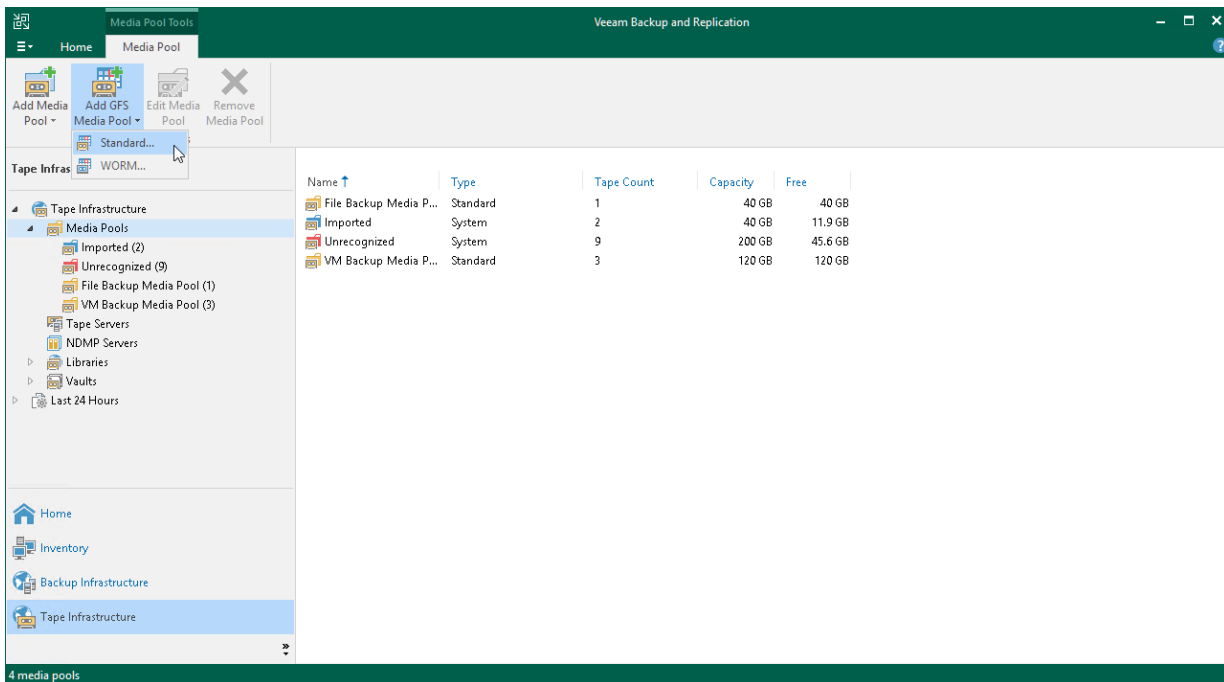
Step 1. Launch New GFS Media Pool Wizard

To run the **New GFS Media Pool** wizard:

1. Open the **Tape Infrastructure** view and click **Add GFS Media Pool** on the ribbon. Alternatively, you can open the **Tape Infrastructure** view, right-click the **Media Pools** node and choose **Add GFS Media Pool**.
2. Select **Standard** if you want to create a media pool for standard tapes or **WORM** if you want to create a media pool for WORM (Write Once Read Many) tapes.

TIP

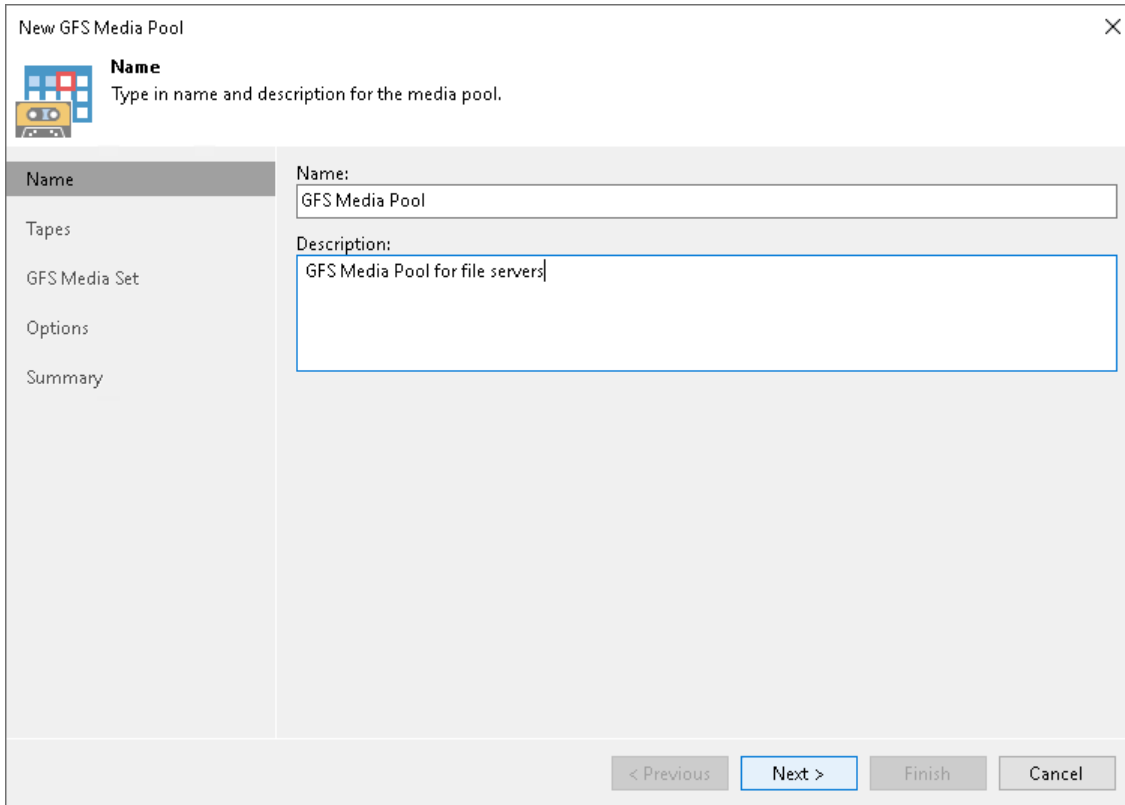
You can also launch the **New GFS Media Pool** wizard when configuring backup to tape jobs (that is, directly from the **New Backup to Tape Job** wizard. For more information, see [Creating Backup to Tape Jobs](#).



Step 2. Specify Media Pool Name

At the **Name** step of the wizard, define basic description for the new GFS media pool.

1. In the **Name** field, enter a name for the created media pool.
2. In the **Description** field, enter a description of the new media pool. The default description contains information about the user who created the media pool, date and time when the media pool was created.



New GFS Media Pool

Name
Type in name and description for the media pool.

Name: GFS Media Pool

Description: GFS Media Pool for file servers

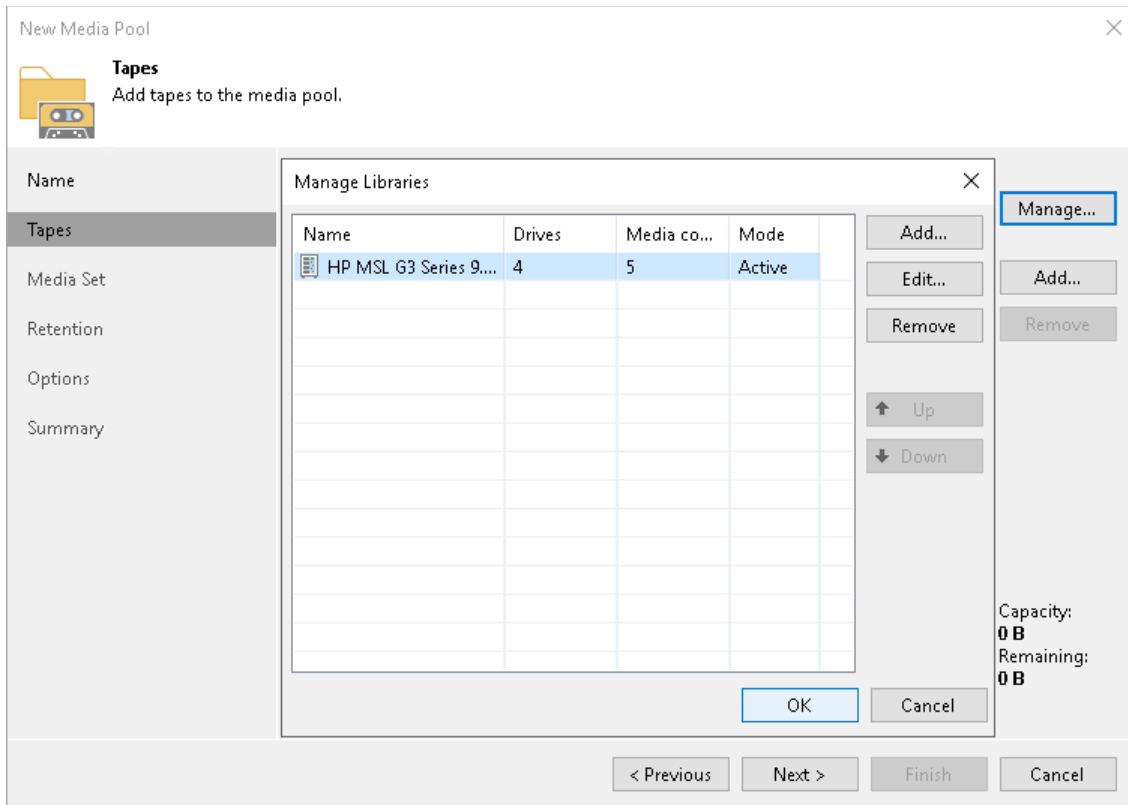
< Previous Next > Finish Cancel

Step 3. Add Tapes to Media Pool

At the **Tapes** step of the wizard, you can select tape libraries and allocate tapes for the pool.

1. From the list in the **Tape library** field, select the tape device that you want to use in this media pool. The list contains all tape libraries managed by this Veeam backup server.
2. To add more libraries, click **Manage**. For one media pool, you can select any tape devices that are managed by this Veeam backup server even if they are connected to different tape servers.

Click **Add** to add other tape libraries.



Configure the multiple libraries mode:

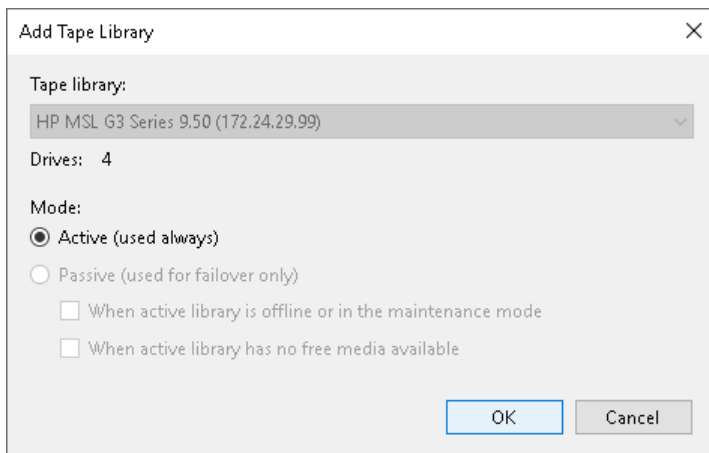
- Active: in this mode, tape jobs use drives in all libraries parallelly. For more information, see [Tape Parallel Processing](#).

To enable the parallel processing mode, set all libraries role to **Active**. To do this, select a library and click **Edit**. Use **Up** and **Down** buttons to position the libraries in order they must be used.

- Passive: in this mode, the first library in the list is active and is primarily used for writing data. Other libraries added to this media pool are passive and are used for failover in the following events:
 - The primary library is unavailable.
 - The primary library has no media available.

To enable the failover mode, set the first library role to **Active** and all other libraries roles to **Passive**. To do this, select a library from the list and click **Edit**. Use **Up** and **Down** buttons to position the libraries in order they must fail over. Also ensure that you select at least one failover event.

On the next backup session, Veeam Backup & Replication will try to switch back to the primary library. If it is still not available, the media pool fails over to the next library as defined.



NOTE

If you enable the failover mode, email notifications can be sent when Veeam Backup & Replication switches to a passive tape library during failover. Notifications are sent under either of the following conditions:

- The **Notify on failure** check box is selected in the Veeam Backup & Replication global notification settings. For more information, see the Veeam Backup & Replication User Guide, section *Configuring Global Email Notification Settings*.
- The **Notify on error** check box is selected in the tape job notification settings. For more information, see [Notifications Settings](#).

If you enable the parallel processing mode, no email notifications are sent when Veeam Backup & Replication switches from one library to another.

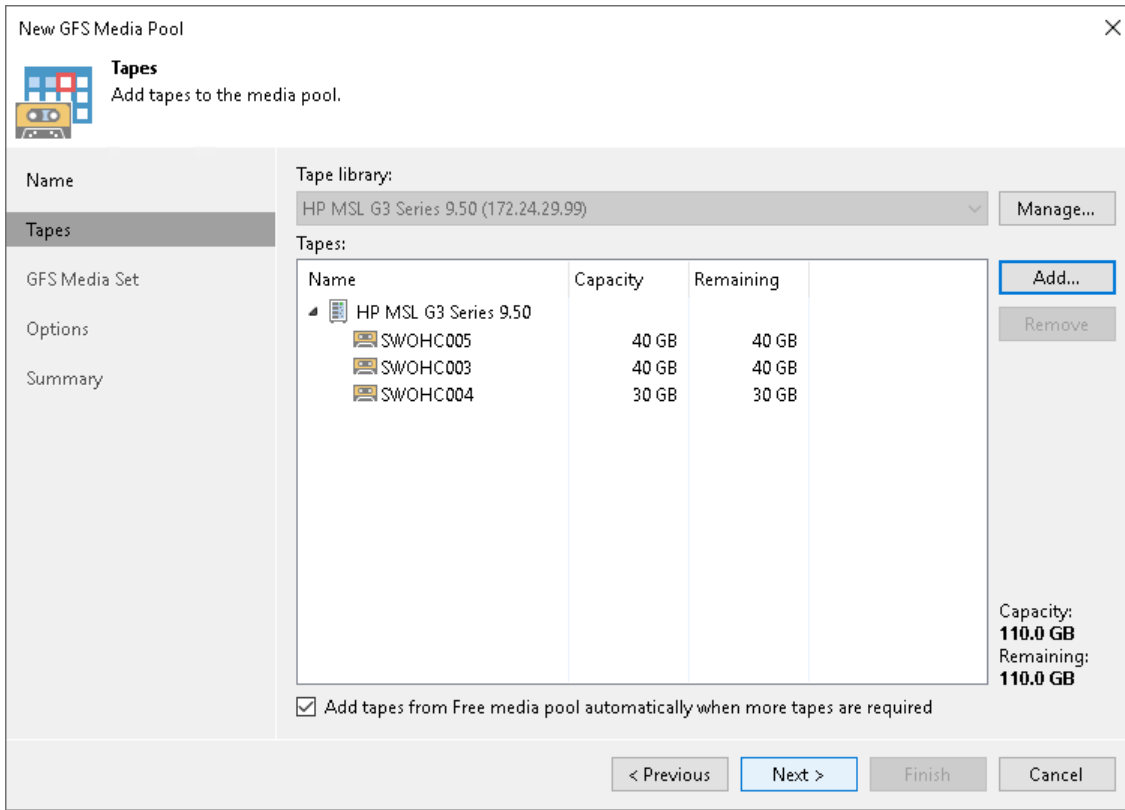
3. To allocate specific tapes from the library, click the **Add** in the **Tapes** field and select tapes that should be added to the media pool. Allocated tapes will be reserved for the created media pool; other media pools will not be able to use these tapes. The capacity and free space on the allocated tapes will be displayed in the bottom right corner.

Allocate standard tapes to the standard media pool and WORM tapes to the WORM media pool. Do not mix standard and WORM tapes in one media pool.

4. To make the media pool replenishable, select the **Add tapes from Free media pool automatically when more tapes are required** check box.

With this option enabled, additional tapes will be allocated from the Free media pool when needed. That is, when a backup to tape or file to tape job uses all available tapes from this media pool, Veeam Backup & Replication will automatically add the required number of tapes from the Free media pool to let the job complete. If the option is disabled, the job will pause and prompt the backup administrator to add new tapes to the media pool.

To a standard media pool, Veeam Backup & Replication will add only standard tapes; to a WORM media pool Veeam Backup & Replication will add only WORM tapes.



Step 4. Specify Media Set Options

In the GFS media pool, a separate media set is created for each backup cycle: daily, weekly, monthly, quarterly and yearly.

For each media set, you can set the data retention period. The retention period indicates for how long the data is protected from overwriting.

Usually, daily media sets do not contain full backups as daily backups are mostly used to keep day-to-day incremental changes. To complete the backup chain they use the periodic full backup stored in the weekly or monthly media set. We recommend to enable the usage of weekly media sets or carefully consider the retention plan.

Click **Advanced** to configure the advanced media set options.

New GFS Media Pool

GFS Media Set
Specify GFS media set settings.

Name	<input checked="" type="checkbox"/> Daily media set overwrite protection period: 14 days use any available media; append;do not export;
Tapes	
GFS Media Set	<input checked="" type="checkbox"/> Weekly media set overwrite protection period: 4 weeks use any available media; do not append;do not export;
Options	
Summary	<input checked="" type="checkbox"/> Monthly media set overwrite protection period: 12 months use any available media; do not append;do not export;
	<input checked="" type="checkbox"/> Quarterly media set overwrite protection period: 4 quarters use any available media; do not append;do not export;
	<input checked="" type="checkbox"/> Yearly media set overwrite protection period: 1 years use any available media; do not append;do not export;

Advanced media set settings include granular tape allocation, append options, export options and other settings. [Advanced...](#)

< Previous Next > Finish Cancel

Step 5. Specify Advanced Media Set Options

You can granularly configure rules for each media set.

At the **GFS Media Set** step of the wizard, click **Advanced**. Select the **Daily** tab to configure the daily media set.

1. If you want the **Daily** media set to span several selected tapes, click **Add** and select tapes that should be added to the media set. You can select from tapes added to the media pool at the **Tapes** step of the wizard. The selected tapes will be displayed in the **Daily media set** field.

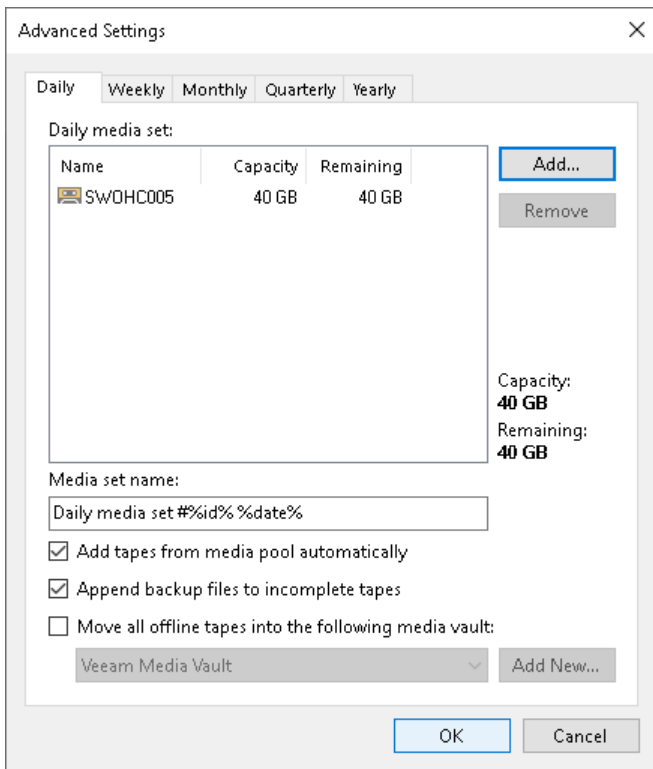
This option is useful if you want the media set to use some particular user-defined tapes. Otherwise, you can use the **Add tapes from media pool automatically** option.

2. In the **Media set name** field, define the pattern according to which the created media set will be named. For more information, see [Media Set Names](#).
3. Select the **Add tapes from media pool automatically** check box to allow the media set to take a tape from the media pool when required.
4. Select **Append backup files to incomplete tapes** check box if you want to write the next backup set to the tape where the previous backup set was written. Otherwise, the GFS tape job will use a new tape for each backup set.
5. You can set automatic moving tapes to a media vault when they are brought offline. To enable this option:
 - a. Select **Move all offline tapes into the following media vault** check box.
 - b. From the list of vaults, select the media vault where you want to automatically move the tapes.
 - c. If the vault is not added yet, click **Add New** to open the **New Media Vault** wizard. For more information, see [Creating Vaults](#).

NOTE

Tapes written in this media set will always be used by this media set. Other media sets will not be able to use these tapes even after the data expires.

Select the **Weekly**, **Monthly**, **Quarterly** or **Yearly** tabs to set the advanced media set options for weekly, monthly, quarterly and yearly media sets.



Step 6. Add Optional Media Pool Settings

At the **Options** step of the wizard, you can enable parallel processing and encryption.

1. Select the **Enable parallel processing for tape jobs using this media pool** check box if you want to process multiple tape jobs simultaneously. Set the maximum number of drives that the media pool can use in parallel.

If you want to use multiple drives simultaneously to process multiple source backup chains within the tape jobs, select the **Process independent data sources simultaneously** check box. For more information, see [Tape Parallel Processing](#).

2. To enable encryption, select the **Use encryption** check box. This option allows you to encrypt the content of files or backups archived to tapes in the media pool.

From the **Password** field, select a password you want to use to encrypt data written to tape. You can also click **Add** or use the **Manage passwords** link to add a password. For more information, see the Veeam Backup & Replication User Guide, section *Tape Encryption*.

If the source job produces encrypted backups, and you enable encryption in the properties of the media pool, the data on tape will be encrypted twice. To decrypt such tape backups, you will need to specify two passwords:

- Password for the GFS media pool.
- Password for the source backup job.

The screenshot shows the 'New GFS Media Pool' wizard in the 'Options' step. The window title is 'New GFS Media Pool' with a close button (X) in the top right corner. Below the title bar, there is a navigation pane on the left with tabs for 'Name', 'Tapes', 'GFS Media Set', 'Options' (selected), and 'Summary'. The main area contains the following settings:

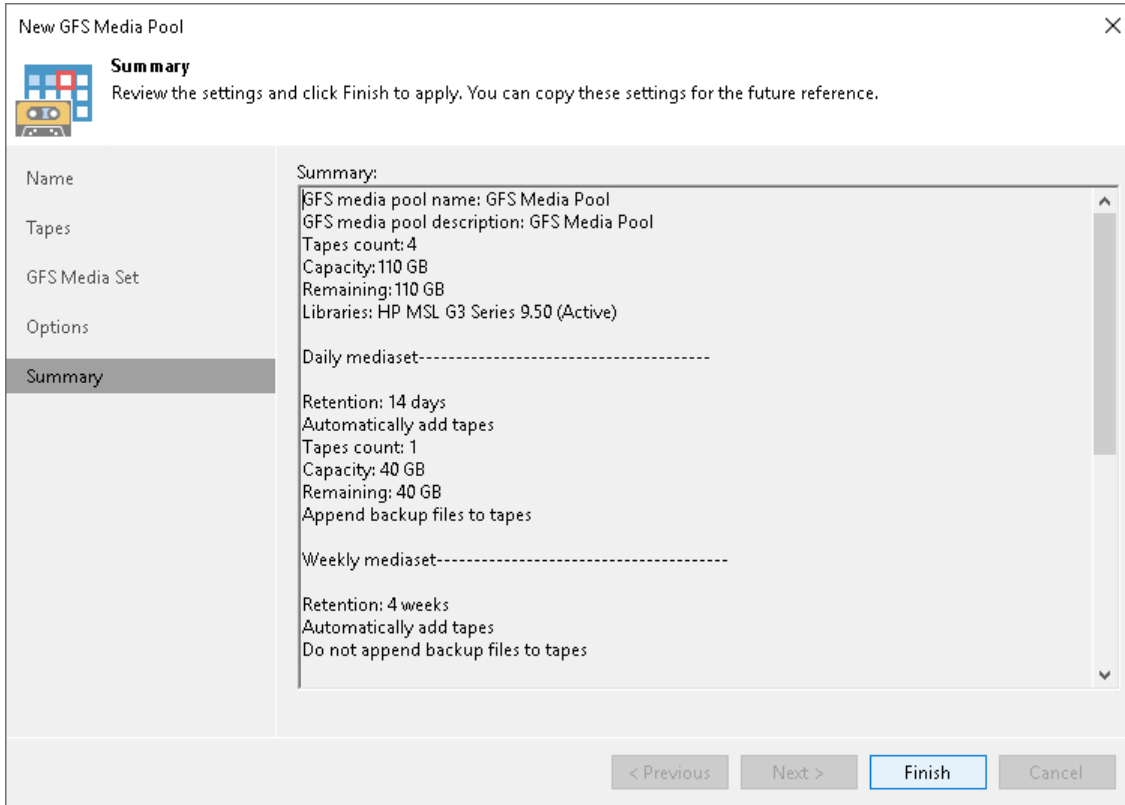
- Options**: Specify parallel processing and encryption settings for this media pool. Note that parallel processing of backup chains may increase tape media consumption by GFS media sets.
- Enable parallel processing for tape jobs using this media pool**
 - Jobs pointed to this media pool can use up to tape drives simultaneously
- Process independent data sources simultaneously**
 - Enabling parallel processing may increase tape media consumption.
- Use encryption**
 - Password:** [Dropdown menu] [Add...]
 - Manage passwords
 - Hardware encryption will be used if your tape drives support it. Otherwise software encryption will be used, which may result in a small performance penalty.

At the bottom of the window, there are four buttons: '< Previous', 'Apply' (highlighted in blue), 'Finish', and 'Cancel'.

Step 7. Finish Working with Wizard

Review the media pool settings and click **Finish** to complete the wizard.

A new media pool will be available under the **Tape Infrastructure > Media Pools** node in the **Tape Infrastructure** view.



Moving Tapes to Another Media Pool

Veeam Backup & Replication allows you to move tapes between media pools. You can move tapes between media pools and GFS media pools, and from and to the **Free** media pool. Veeam Backup & Replication uses tapes from the **Free** media pool to automatically add them to other media pools and write backups to them if there are no more free tapes available in those media pools.

You can move tapes between media pools only if the media pools span the same tape libraries.

You cannot manually move tapes to **Imported**, **Unrecognized** or **Retired** media pools.

IMPORTANT

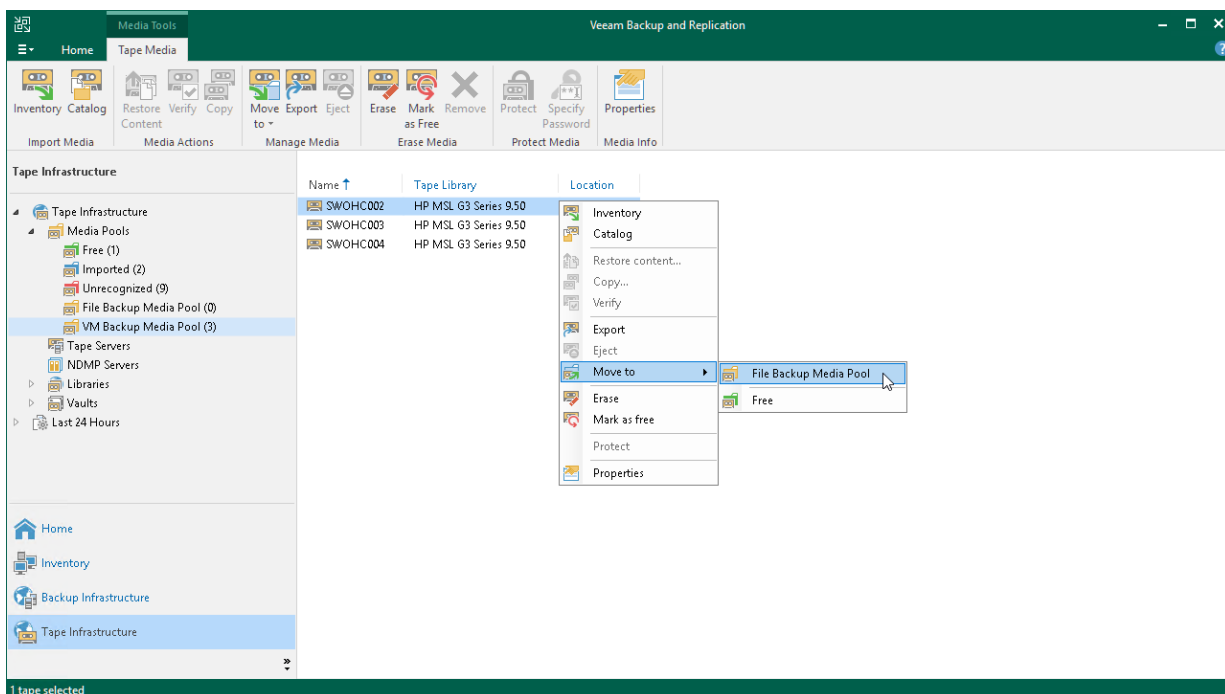
When you move a tape to any media pool, Veeam Backup & Replication marks this tape as free.

To move tapes from one media pool to another:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under the **Media Pools** or under the **Libraries > LibraryName > Media > Online**.
3. Select tapes you want to move and click **Move to** on the ribbon. Choose the target media pool from the list.
Alternatively, you can right-click selected tapes and choose **Move to Media Pool**. Next, choose the target media pool from the list.

NOTE

You cannot move tapes that are protected. To move such tapes, you need to switch the protection off first.



Modifying Media Pools

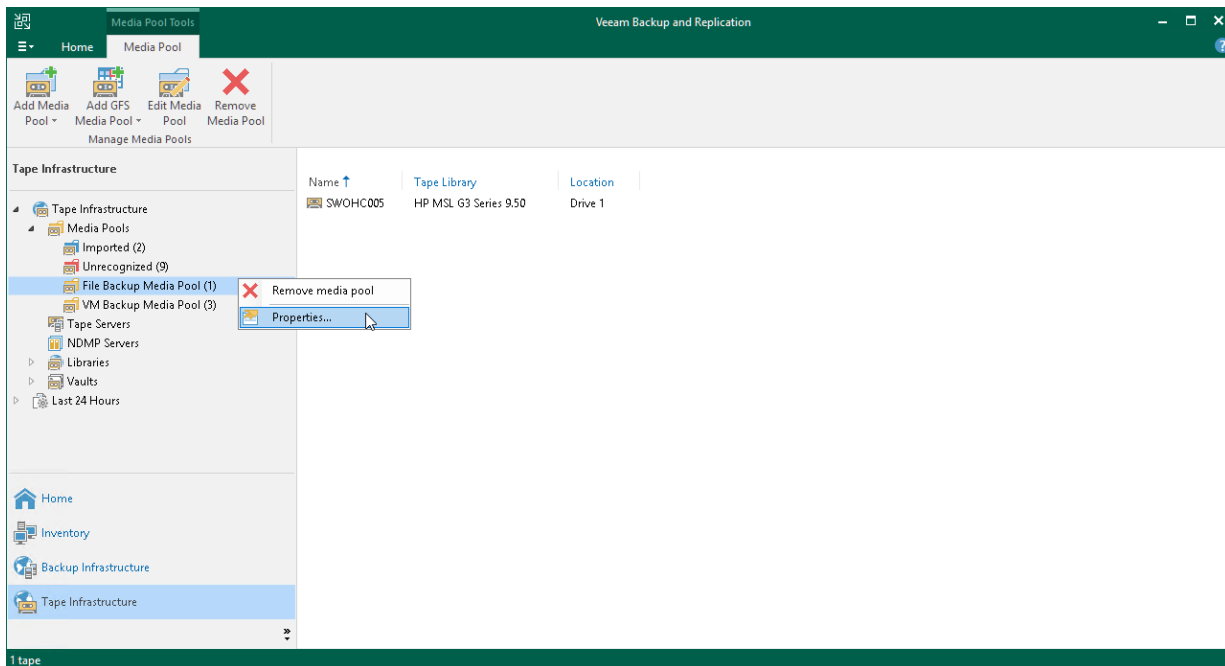
If necessary, you can modify settings of a media pool.

To modify media pool settings:

1. Open the **Tape Infrastructure** view.
2. Navigate to the **Media Pool** node.
3. Right-click the necessary media pool and choose **Properties**. Alternatively, select a media pool and click **Edit Media Pool** on the ribbon.
4. Go through the **Edit Media Pool** wizard to change the necessary settings.
5. Apply changes.

Limitations for Modifying Media Pools

You can modify only regular or GFS media pools; service media pools cannot be modified.



Removing Media Pools

If you no longer need a media pool or a GFS media pool, you can remove it:

1. Open the **Tape Infrastructure** view.
2. Navigate to the **Media Pool** node.
3. Right-click the necessary media pool and choose **Remove Media Pool** from the shortcut menu. Alternatively, select a media pool and click **Remove Media Pool** on the ribbon.
4. In the displayed dialog box, click **OK** to confirm deletion.

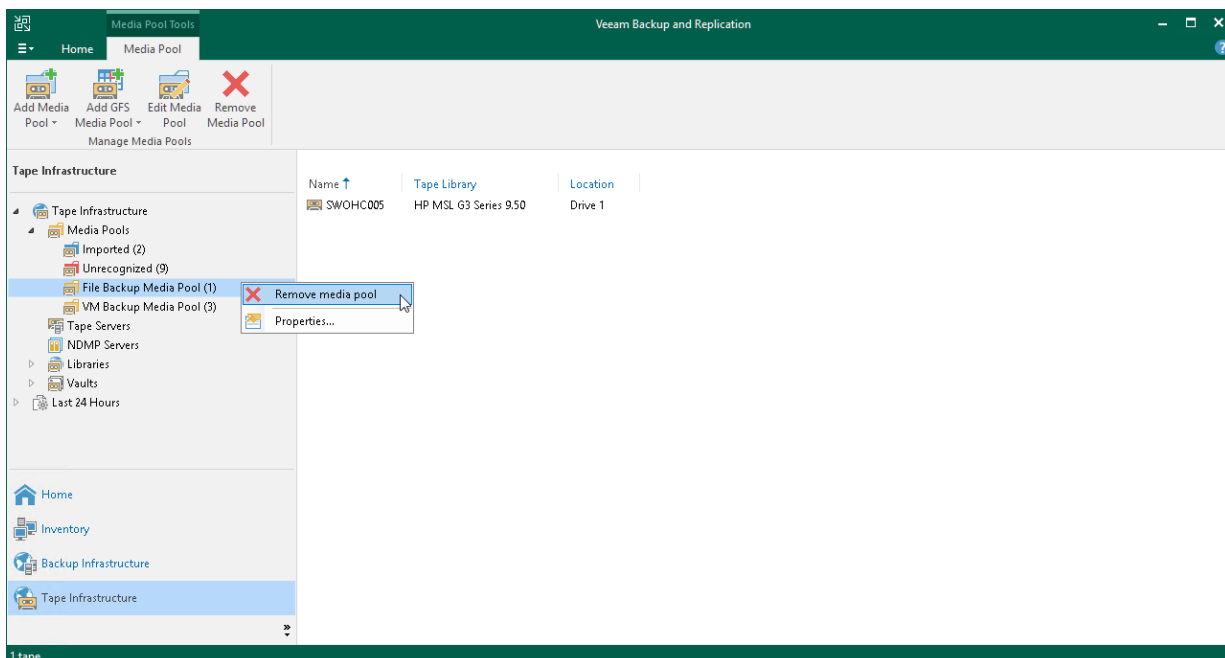
When you remove a media pool, its tapes are moved to the **Imported** media pool. The data on the tapes is not erased. You can use the tapes in the **Imported** media pool for restore operations.

The **Imported** media pool does not have any retention settings. The tapes in the **Imported** media pool are never overwritten as they are not used by any jobs. The media set number and the media set expiration date are inherited and remain for user information. The data will remain on tapes until you choose to erase it manually.

If you do not need the data on tapes, you can move the imported tapes to the **Free** media pool or any other media pool. In this case, the tapes will be marked as free. For more information, see [Moving Tapes to Another Media Pool](#).

Limitations for Removing Media Pools

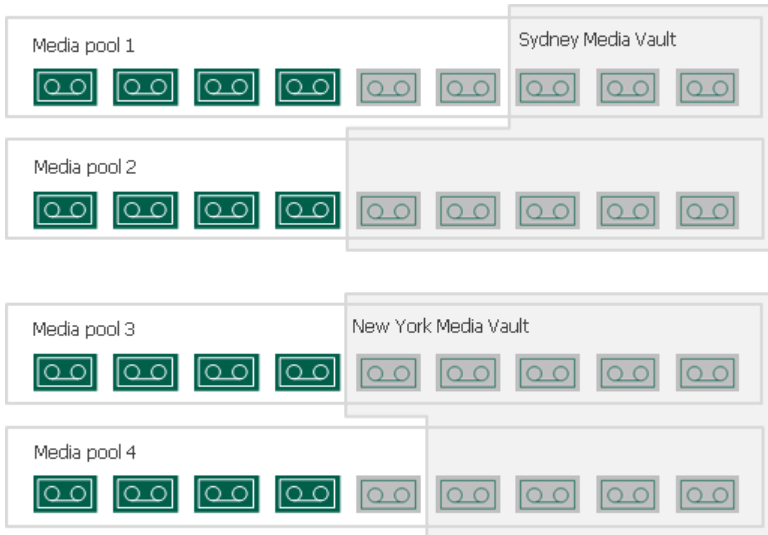
- You can remove only regular media pools or GFS media pools; service media pools cannot be removed.
- You cannot remove a media pool that is used in a backup to tape or file to tape job. To remove such media pool, you need to point the jobs to other media pools or GFS media pools.



Vaults

Vaults are logical containers that help you to additionally organize offline tapes. When the tapes are recorded and moved offsite, you need to have easy ways to manage data on such tapes.

Vaults visualize information about tapes. They store information about original location of tapes, such as library and media pool, data written to tapes and retention terms for it. Vaults are not limited to any original location of tapes: you can place tapes from different libraries and media pools to one vault.



You can virtually move tapes to the vaults grouping them by any criteria. For example, if you have several offsite storage locations for physical tapes, you can create a vault for each of them. When you transport the physical tapes to the offsite storage, you can move the offline tapes to a vault in your Veeam backup console mirroring the physical storage. This will allow you to have convenient representation of the list of tapes in each of your physical storage locations.

Tapes can be moved to a vault automatically if you instruct media pools to move tapes to a selected vault after the tapes go offline. You can also move the tapes from one vault to another. Tapes will not be shown in their vault when you bring them online. The tapes that have been moved to a vault stay visible in their media pools and under the **Offline** node. When you remove a tape from the Veeam backup server, it is automatically deleted from the vault.

To start working with vaults, you need to create one or more of them. Vaults are virtual container, and do not require any physical resources.

NOTE

You can work with tape vaults if Veeam Backup & Replication Enterprise license or higher is installed on the Veeam backup server.

Creating Vaults

Created vaults are shown under the **Vaults** node. If you have no vaults created, the **Vaults** node will not be shown.

To create a new vault, use the **New Media Vault** wizard. This section will guide you through all steps of the wizard and provide explanation on available options.

To add a vault, follow the next steps:

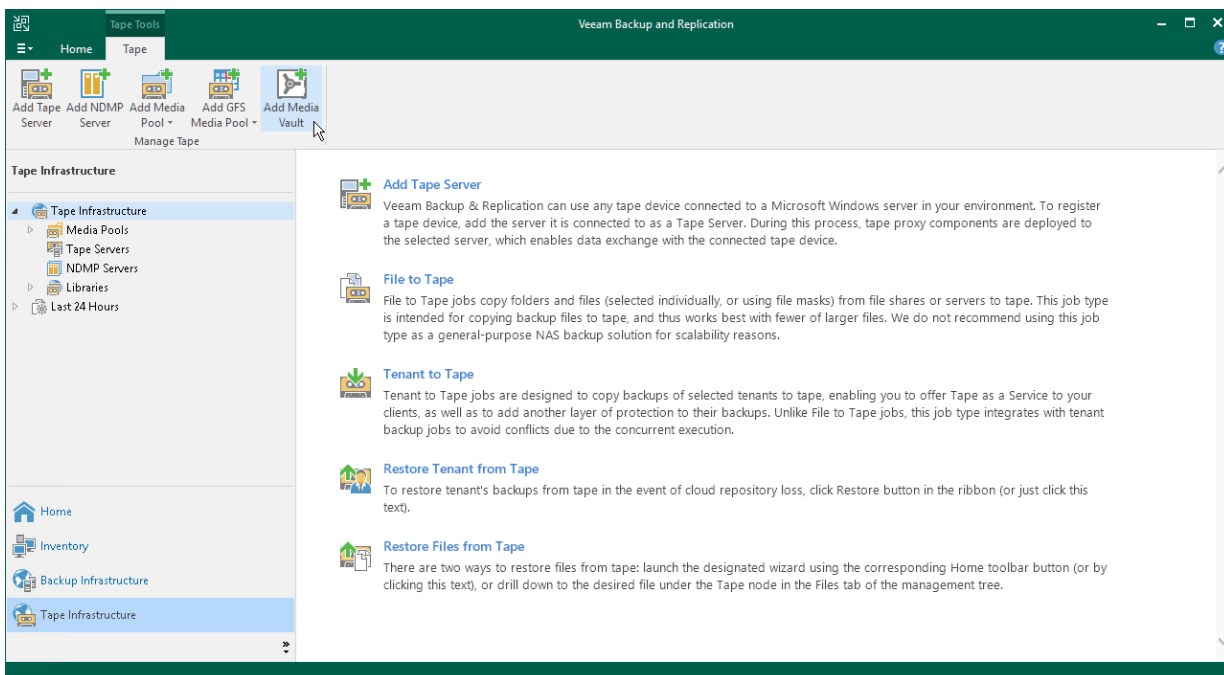
Step 1. Launch New Media Vault Wizard

To run the **New Media Vault** wizard, do either of the following:

- Open the **Tape Infrastructure** view and select the **Tape Infrastructure** node. Click **Add Media Vault** on the ribbon.
- Open the **Tape Infrastructure** view, right-click the **Tape Infrastructure** node and choose **Add Media Vault**.

TIP

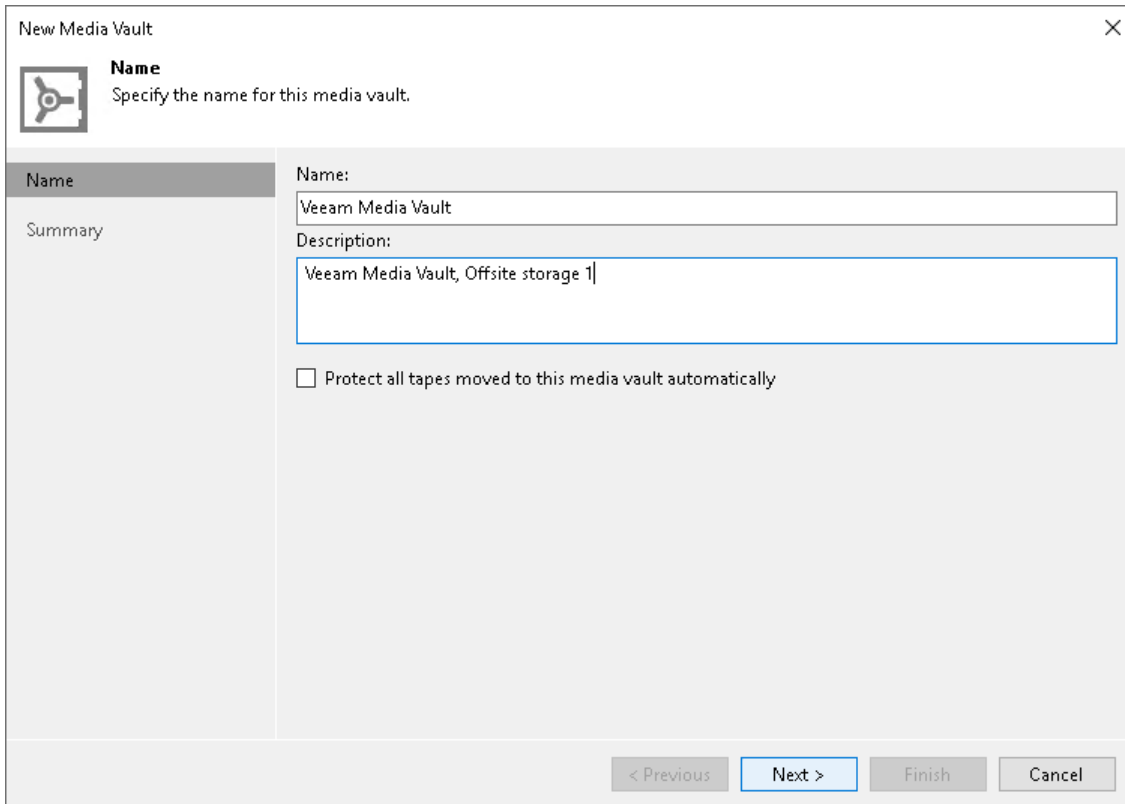
You can also launch the **New Media Vault** wizard when configuring media pools (that is, directly from the **New Media Pool** or **New GFS Media Pool** wizard. For more information, see [Creating Media Pools](#) or [Creating GFS Media Pools](#).



Step 2. Specify Media Vault Name

At the **Name** step of the wizard, you should define basic description for the new vault.

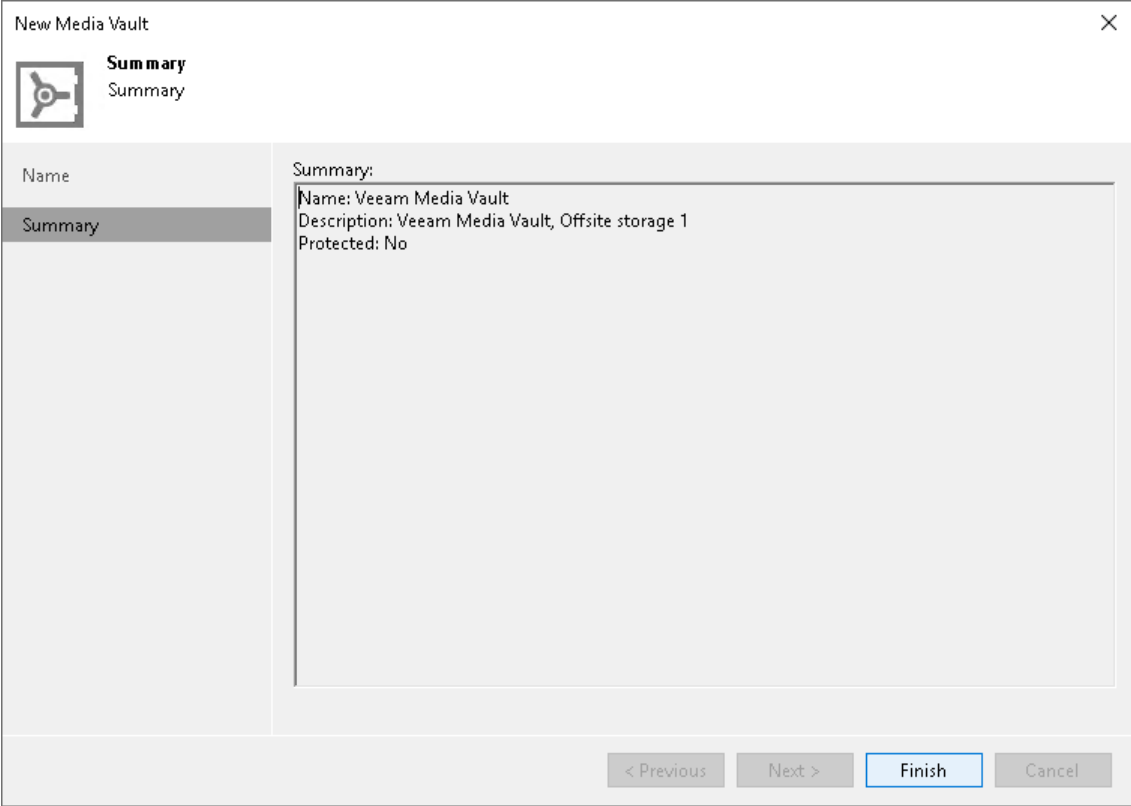
1. In the **Name** field, enter a name for the created vault.
2. In the **Description** field, enter a description of the new vault. The default description contains information about the user who created the vault, date and time when the vault was created.
3. If you want to set overwrite protection to all tapes in this vault, select the **Protect all tapes moved to this media vault automatically** check box. For more information, see [Tape Protection](#).



The screenshot shows a window titled "New Media Vault" with a close button (X) in the top right corner. On the left side, there is a navigation pane with two items: "Name" (which is selected and highlighted) and "Summary". Below the navigation pane, there is a sub-header "Name" followed by the instruction "Specify the name for this media vault." Below this, there are two text input fields: "Name:" containing "Veeam Media Vault" and "Description:" containing "Veeam Media Vault, Offsite storage 1". Below the description field, there is a checkbox labeled "Protect all tapes moved to this media vault automatically" which is currently unchecked. At the bottom of the window, there are four buttons: "< Previous" (disabled), "Next >" (active/highlighted), "Finish" (disabled), and "Cancel" (disabled).

Step 3. Finish Working with Wizard

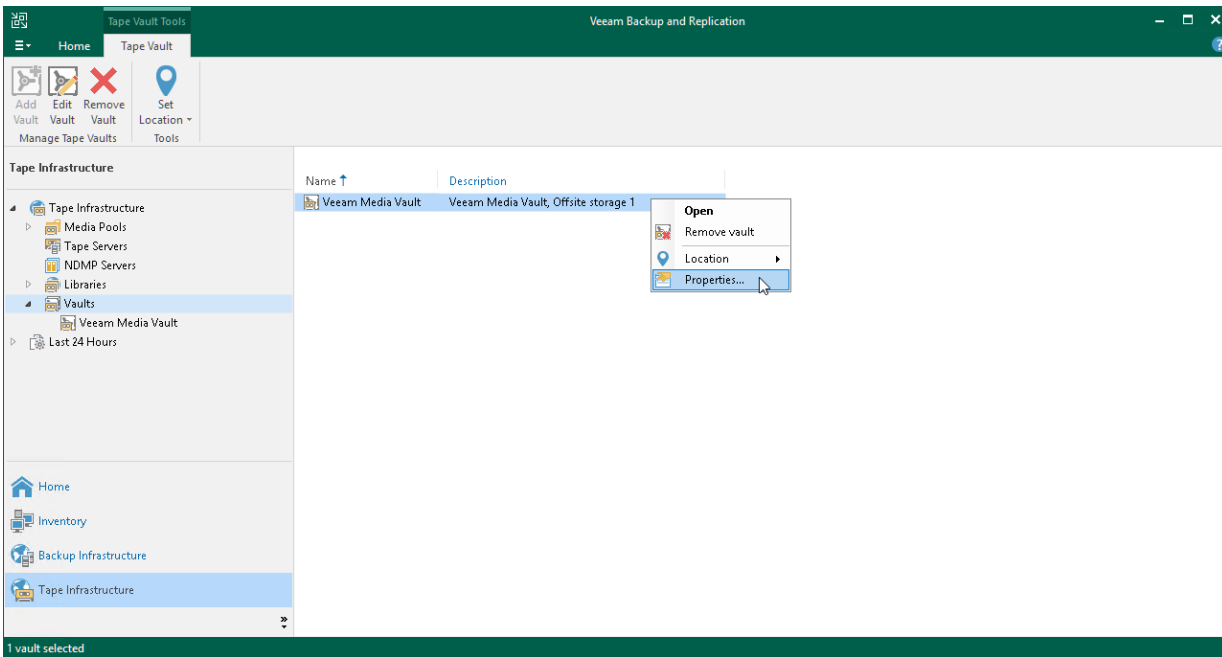
Review the media vault settings and click **Finish** to complete the wizard.



Modifying Vaults

To modify vault settings:

1. Open the **Tape Infrastructure** view.
2. Navigate to the **Vaults** node.
3. Right-click the necessary vault and choose **Properties**. Alternatively, select a vault and click **Edit Vault** on the ribbon.
4. Go through the **Edit Media Vault** wizard to change the necessary settings.
5. Apply changes.



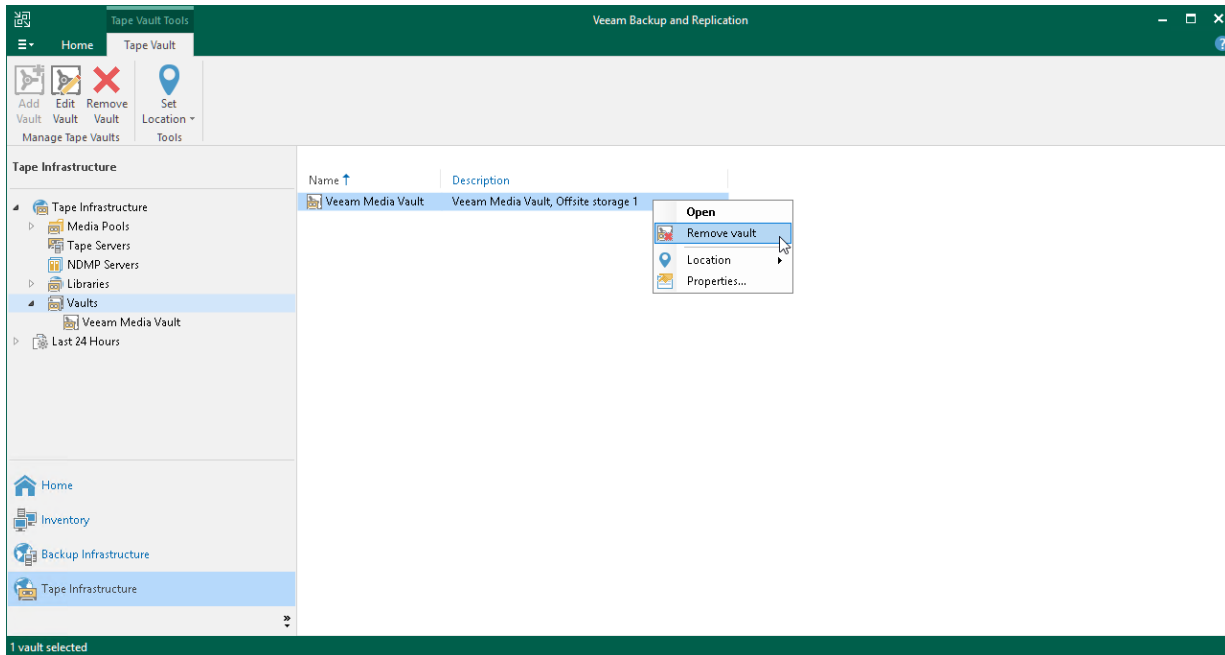
Removing Vaults

If you no longer need a vault, you can remove it. Consider the following limitations:

- You cannot remove a vault that contains tapes. To be able to remove such vault, first move tapes from this vault to other vaults or remove them from the vault. When you remove a tape from the vault, you can see it in its media pool or under **Media > Offline** node.
- You cannot remove a vault that has a reference to any media pool. To be able to remove such vault, first edit settings of the media pool and remove a reference to this vault.

To remove a vault:

1. Open the **Tape Infrastructure** view.
2. Navigate to the **Vaults** node.
3. Select a vault and click **Remove Vault** on the ribbon. Alternatively, you can right-click the necessary vault in the working area and choose **Remove Vault**.
4. In the displayed dialog box, click **OK** to confirm deletion.



Moving Tapes to Vault

Recorded tapes can be moved to a vault. In the vault, you can view tape information, including data written to tape and data retention settings.

If the tapes are placed to a vault, you can still view them under the **Offline** node or in the media pool.

You can move the tapes manually or instruct the relevant media pool to place the tapes to a vault automatically.

In This Section

- [Moving tapes to vault manually](#)
- [Automatic vaulting for media pools](#)
- [Automatic vaulting for GFS media pools](#)

Moving Tapes to Vault Manually

You can move only tapes that contain data and that are offline. To move the tapes manually:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under the **Media Pools** or under the **Libraries** > *LibraryName* node > **Media** > **Offline**.
3. In the working area, right-click the tapes you want to move and select **Move to Vault**. Choose the vault you need.

Automatic Vaulting for Media Pools

To set the automatic placing of tapes to a vault, you need to configure the media pool where the target tapes are recorded. To configure a media pool:

1. Open the **Tape Infrastructure** view.
2. Navigate to the **Media Pools** node.
3. Select the media pool you want to customize.
4. Click **Edit Media Pool** on the ribbon. Alternatively, you can right-click the media pool and select **Properties**.
5. Go to the **Retention** step of the **Edit Media Pool** wizard. In the **Offline media tracking** field, select **Move all offline tapes from this media pool into the following media vault**. Select the needed vault from the drop-down list.

Note that moving tapes to a vault automatically will not be available if you select **Do not protect data (cyclically overwrite tapes as required)** option as a data retention policy.

The screenshot shows a dialog box titled "Edit Media Pool VM Backup Media Pool" with a close button (X) in the top right corner. The main heading is "Retention" with a sub-heading "Specify the tape retention settings for this media pool." Below this is a left-hand navigation pane with options: Name, Tapes, Media Set, Retention (selected), Options, and Summary. The main area contains two sections: "Data retention policy" with three radio button options: "Do not protect data (cyclically overwrite tapes as required)", "Protect data for 1 Months" (selected), and "Never overwrite data". The "Protect data for" option includes a numeric spinner set to "1" and a dropdown menu set to "Months". The second section is "Offline media tracking" with a checked checkbox "Move all offline tapes from this media pool into the following media vault:" and a dropdown menu currently showing "Veeam Media Vault" with an "Add New..." button to its right. At the bottom of the dialog are four buttons: "< Previous", "Next >" (highlighted in blue), "Finish", and "Cancel".

TIP

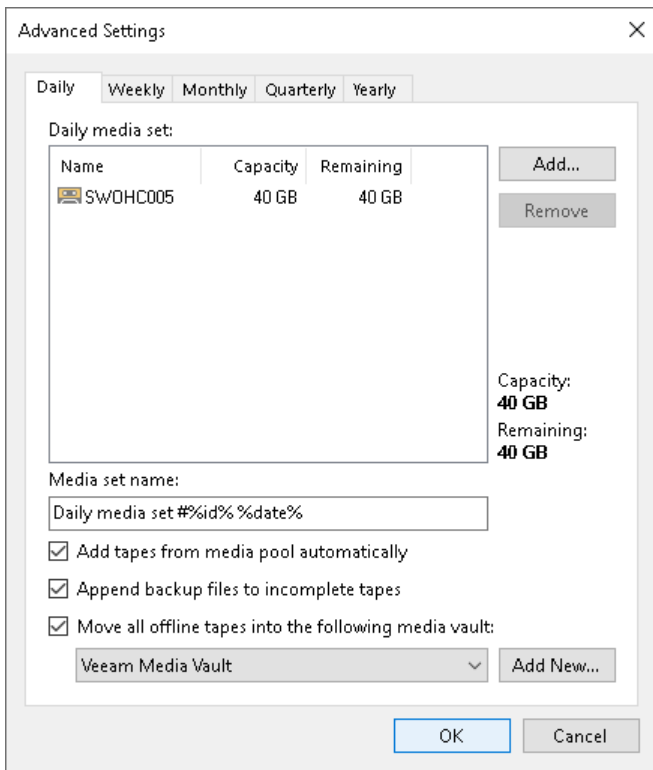
If you have not previously created a vault, you can click the **Add New** button and create a new vault without closing the job wizard. For more information, see [Creating Vaults](#).

Automatic Vaulting for GFS Media Pools

Vaulting of GFS tapes is set for media sets individually. To change a media set configuration:

1. Open the **Tape Infrastructure** view.
2. Navigate to the **Media Pools** node. Select the GFS media pool you want to customize.
3. Click **Edit Media Pool** on the ribbon. Alternatively, you can right-click the media pool and select **Properties**.

4. Go to the **GFS Media Set** step of the **Edit Media Pool** wizard and click **Advanced**. Select a tab with the needed media set and select **Move all offline tapes into the following media vault**. Select the needed vault from the drop-down list.



TIP

If you have not previously created a vault, you can click the **Add New** button and create a new vault without closing the job wizard. For more information, see [Creating Vaults](#).

Managing Tapes in Vault

When you have tapes placed to vaults, you can move them to another vault or remove from vault. When you remove tapes from a vault, they are still available in the **Offline** list or in their media pool.

To move tapes to another vault:

1. Open the **Tape Infrastructure** view and select the **Vaults** node. Select the vault where the needed tapes are stored.
2. In the working area, right-click the tapes you want to move and select **Move to Vault**. Select the target vault.

To remove tape from vault:

1. Open the **Tape Infrastructure** view and select the **Vaults** node. Select the vault you need.
2. In the working area, right-click the tapes you want to remove and select **Remove from Vault**.

The tapes are removed from vault automatically in the following situations:

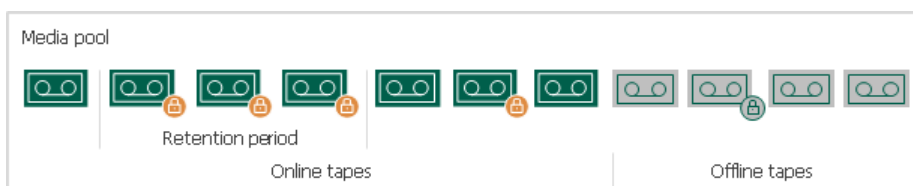
- A tape comes online. It will re-appear in the vault when it goes offline if it was not erased or overwritten.
- A tape is removed from catalog.
- A tape is marked as free.

Tape Protection

Tape protection is a software option that prohibits overwriting, erasing or appending data to protected tape. You can protect individual tapes that, for example, contain particularly valuable data.

Tape protection overrides retention settings of the media pool. The retention of other tapes in the media pool is not modified. You can remove the protection at any time. The tape will return to the retention period set by the media pool. If the media pool retention expired during the time the tape was protected, the tape will be queued for overwriting.

You can set protection for any tape, online or offline, that contains data. If the offline tape is in a media vault, the media vault will update the **Protected** status for this tape automatically.



When the tapes are protected, the following operations are prohibited for them:

- Appending data to tapes
- Erasing tapes
- Marking tapes as free
- Removing tapes from catalog

To perform these operations, you need to switch the protection off first.

Protecting Tapes

If you have tapes for which you need to change the retention to 'never overwrite', you can protect them. Protection option sets lifelong retention period for the selected tapes overriding the retention settings of the media pool.

You can set protection for both online or offline tapes that contain data.

IMPORTANT

You can protect only tapes that contain data. You cannot protect free (empty) tapes.

Switching On Protection

To enable protection:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under the **Media Pools** or under the **Libraries > LibraryName > Media > Online**.
3. Select tapes you want to protect and click **Protect** on the ribbon.

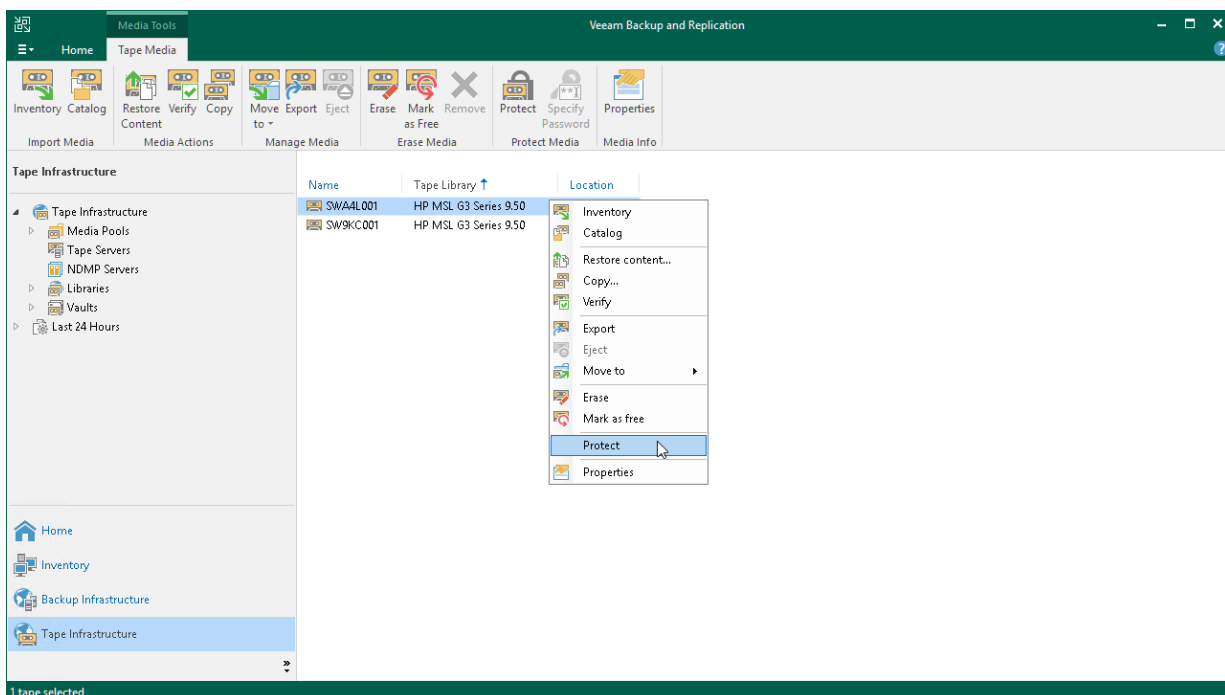
Alternatively, you can right-click selected tapes and choose **Protect** from the shortcut menu.

If the tape is a part of a media set, Veeam Backup & Replication will prompt you to protect the other tapes in this media set.

If the tapes are protected, they cannot be erased or marked as free by Veeam Backup & Replication or manually. To erase such tape, you need to switch the protection off first.

Switching Off Protection

You can switch off the protection at any time. The retention will return to the value set for the media pool.



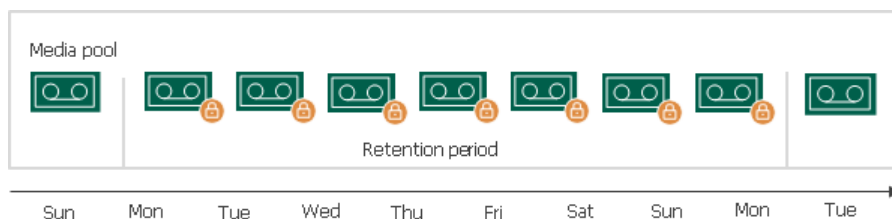
Tape Data Retention

Data retention period is a period of time when data written to tapes is protected from overwriting.

Retention period is set by user for media pool and is applied to all tapes in this media pool. To set the retention policy, you can choose between the following options:

- Never overwrite data.
- Protect data for a particular time interval.
- Do not protect data (cyclically overwrite tapes as required).

During the retention period, Veeam Backup & Replication will not overwrite data on tape. If a tape contains several backup sets, it will expire when the backup set with the longest retention period expires.



You can change the retention at any time. When you change the retention policy, you can select if this modification works for tapes that will be written after you apply this change or also to tapes that are already recorded. In the latter case, the retention settings of the recorded tapes will change immediately and will be applied to tapes that are both online and offline.

NOTE

If you choose to set a shorter retention period and apply the retention settings to all tapes, some of your tapes may immediately become outdated. Such tapes will be queued for overwriting. Be careful when applying a new retention policy in order not to lose any data you need, or use the protection option. For more information, see [Tape Protection](#).

Tape Retention and Disk Retention

For forward incremental and reverse incremental backup chains, it is strongly recommended that you set the retention period for the tape archive at least twice longer than the retention period for source backups on disk. The tape jobs analyze the existing tape archives and synchronize them with disk backups. If you have some restore points on disk and the tape archive misses them (for example, if the media pool retention allowed overwriting of these tapes), the tape job will re-write all missing restore points. For more information, see the Veeam Backup & Replication User Guide, section *Retention Policy*.

For example, there are 14 backup files in the backup repository that are kept for 14 days. The backup to tape job archives files once a week. The retention policy for the media pool is set to 7 days. In this case, Veeam Backup & Replication will first write 14 backup files from the backup repository to tape. After a 7-day interval, Veeam Backup & Replication will start recording the whole set of backup files from the backup repository to tape anew, overwriting backup files on tape with their copies from the backup repository.

When the source job produces a forever forward incremental backup chain, you can set any retention period for the tape archive. To back up such chains, the virtual full mechanism is enabled automatically. Note that the virtual full backup must be always newer than the full backup on the disk. Otherwise, the tape job will copy not only the full backup from the disk, but also the whole chain of incremental backups. That may result in excessive use of additional tapes and significant increase in the tape job processing time. For more information, see [Virtual Full Backup](#).

Managing Outdated Tapes

Veeam Backup & Replication will place outdated tapes to the media pools (the same media set for GFS media pools) where the tapes were originally written.

The tapes containing outdated data are handled in the following way:

- **If the expired tape is online**, it will be overwritten next time a tape job requires a free tape. The expired tape can be used only by the same media pool (or the same media set for GFS media pools) unless you erase the tape manually or move it to another media pool. The tapes are rewritten by the FIFO method.
- **If the expired tape is offline**, you can re-load it back to the library. Veeam Backup & Replication will place tapes to the media pools where the tapes were originally written. You can move tapes to another media pool or erase the tape manually.

You can erase tapes or move tapes to another media pool manually. For more information, see [Moving Tapes to Another Media Pool](#).

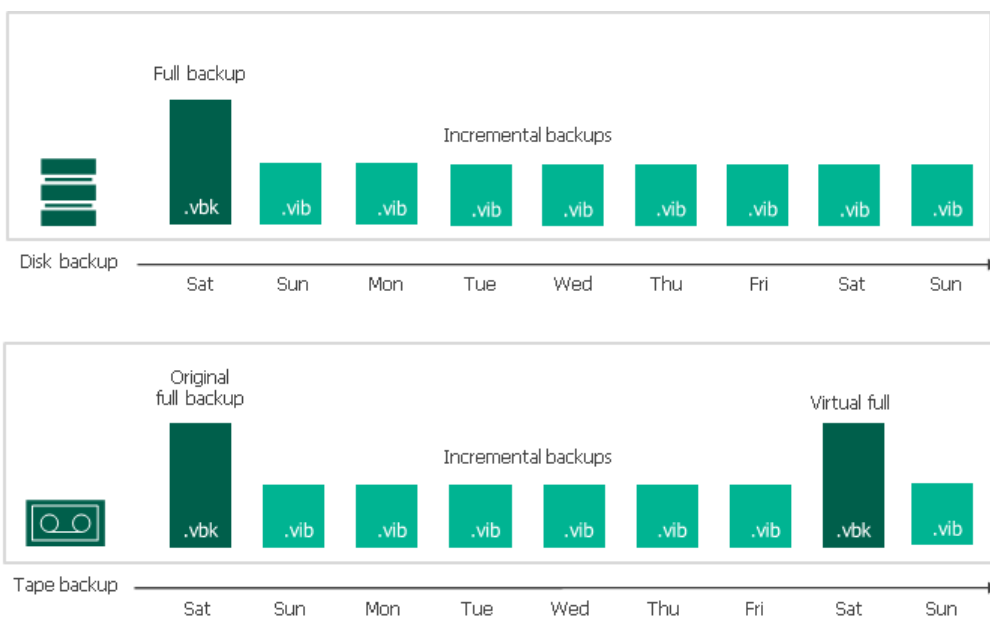
Virtual Full Backup

The virtual full method allows you to transform forever forward incremental backup chains created by source backup and backup copy jobs to save them to tapes. The forever forward incremental chain always keeps on disk one full backup followed by a fixed number of increments. The full backup is constantly rebuilt: as new increments appear, the older ones are injected into the full.

Unlike disk backups, tape archives are static: tape jobs cannot rebuild backups once they are written to tape. Also, the standard backup to tape scheme (archiving new restore points during each tape session) cannot be used: the tape archive would have one full backup and an endless chain of increments all of which would be required for restore. To adapt the forever forward incremental chains to tapes, Veeam Backup & Replication uses the virtual full.

The virtual full mechanism creates a periodic synthesized full backup on tape. The periodic fulls split the forever forward incremental backup chain into shorter series of files that can be effectively stored to tapes. Each series contains one synthesized full backup and a set of increments. Such series are convenient for restore: you will need to load to the tape device only those tapes that are part of one series.

The virtual full does not require additional repository disk space: it is synthesized directly on tape on the fly, when the tape job runs. To build such full backup, Veeam Backup & Replication uses backup files that are already stored in the backup repository.



The virtual full is enabled automatically if the source job has no scheduled full backups. You can schedule the virtual full on a specific day (or days) of week. This day indicates the day for which you want to synthesize full backup of the source machines.

The virtual full does not necessarily need to be scheduled on the day when the tape job runs. When the tape job starts, it synthesizes the source machines state as they were on the chosen day. For example, you can set Friday as the virtual full day, and schedule the tape job to run on Saturday. The tape job will not run on Friday. On Saturday, the tape job will copy blocks of data to reconstruct the state of the machines as they were on Friday (or, if no backup is available for Friday, the closest day preceding Friday).

You can customize the virtual full schedule according to your needs, although you cannot disable the virtual full if you back up the forever forward incremental backup chain. Also, you cannot create more than one virtual full a day.

NOTE

Consider the following:

- [For regular backup to tape jobs] The source job configuration must not have scheduled synthetic or active full backups. If it does, the virtual full will be disabled even if configured in the tape job.
- [For GFS backup to tape jobs] The source job configuration and the backup chain type do not have an impact on the virtual full backups. For more information, see [How GFS Backup to Tape Works](#).

How Virtual Full Backup Works

When the tape job archives the forever incremental backup chain, it copies the full backup from disk only once. After that, it copies new increments and creates virtual fulls regularly, or, if archiving of increments is disabled, creates only virtual fulls.

To create a virtual full backup, Veeam Backup & Replication uses a small temporary file of the VSB (Veeam Synthetic Backup) format. The VSB file does not contain backup data; it contains pointers to data blocks inside files of the backup chain on disk that are required to build a full backup as for the needed day. Using these pointers, the tape job detects these blocks and writes them to tape.

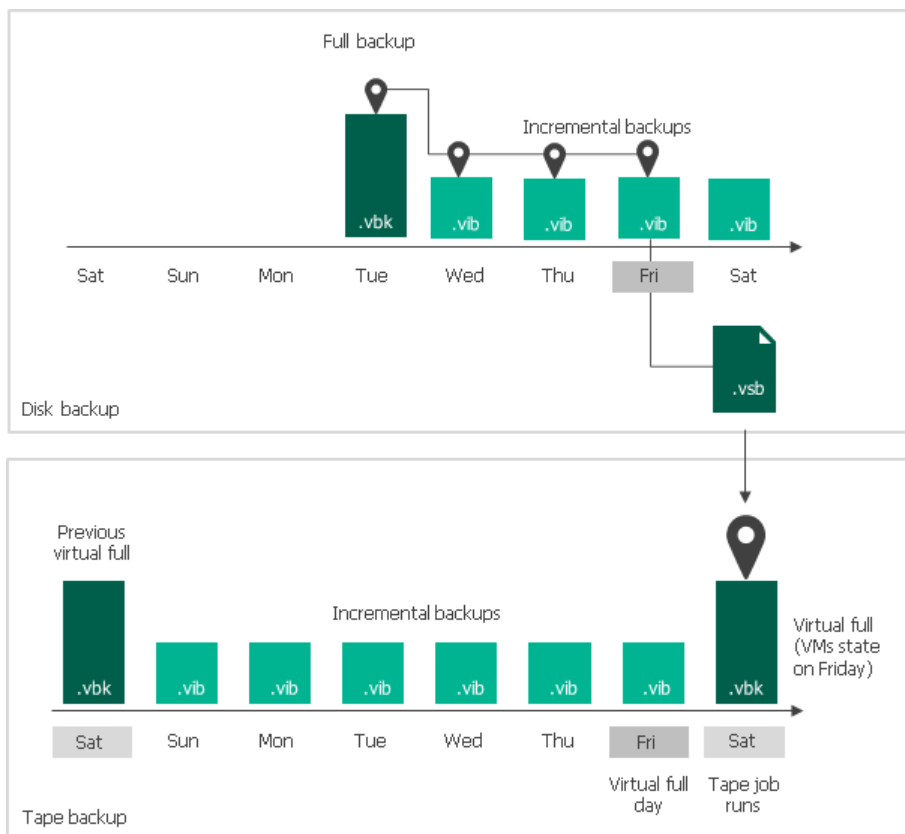
To create a virtual full backup, the tape job performs the following operations:

1. On the day the tape job runs, it creates a VSB file and stores it in the backup repository, next to restore points in the backup chain.
2. According to the VSB file pointers, the tape job detects what backup chain and what data blocks on disk are required to synthesize a full backup, and writes these blocks to tape as a full backup file (.vbk).
3. At the end of the tape job session, the VSB file is removed from the backup repository.

For example:

- The source backup job creates an increment every day.
- The tape job is scheduled on Saturday with a virtual full on Friday.

On Saturday, the tape job picks data blocks from the full backup on Tuesday and the subsequent increments up to Friday. Using these blocks, the tape job synthesizes a virtual full that represents the machine state as of Friday.



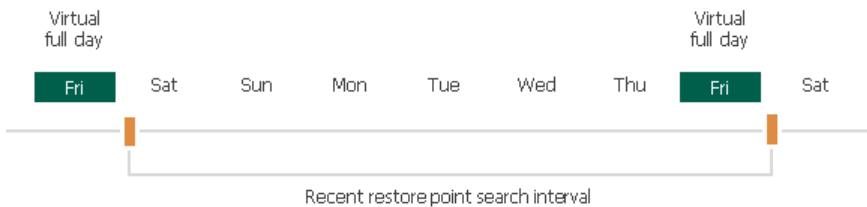
NOTE

If the source backup chain contains a full backup that was created on the virtual full day (for example, an active full backup created manually), the tape job will copy it and will not create a virtual full.

Virtual Full Intervals

When the tape job needs to create a new virtual full, it analyzes the tape archive and detects the date of the last virtual full on tape. To create a new virtual full, the tape job needs restore points that were created in the following interval:

- The start of the interval is midnight after the last virtual full was created (the end of tape writing session).
- The end of the interval is midnight after the virtual full day.



To synthesize a new virtual full, the tape job needs at least one increment created in this interval. If there are many increments, the tape job builds a virtual full up to the most recent increment within the interval.

Missing Source Backups

The source chain may not contain an increment on the virtual full day. In this case, the tape job uses a backup that is closest to the virtual full day within the virtual full interval. For example, if the source backup closest to the virtual full day was on Tuesday, the tape job will synthesize a virtual full that represents the machine state as of Tuesday.

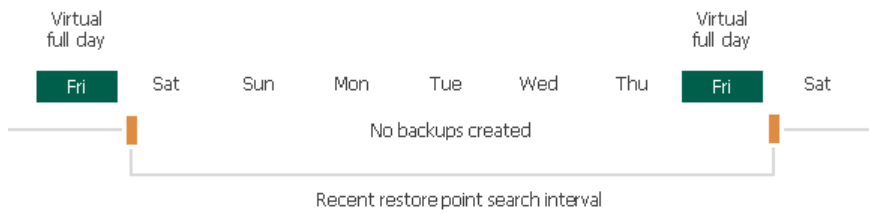


The source chain may have missing backups because of the following reasons:

- The source job does not run on the virtual full day.
- The tape job has multiple source jobs scheduled on different days. Some of the source jobs does not create a backup on the virtual full day.
- The source job fails to produce increments for several days, for example, because of a hardware breakdown, network inaccessibility or if the source job was disabled by the user for some time.
- Some machines in the source job have corrupted backups. The tape job will use the last valid backups for these machines and create the virtual full up to the latest valid restore point.

No Backups in the Virtual Full Interval

The source job may not produce any backups after the previous full backup day. In this case, the tape job will not create a virtual full for this period.



IMPORTANT

The virtual full cannot be forced before its scheduled day. For example, if you start the tape job manually off-schedule, it will not create the virtual full if the virtual full day is in future.

Tape Parallel Processing

You can use multiple drives simultaneously for writing data to tape. This option is useful if you have a lot of tape jobs running at the same time or you have a lot of data that must be written to tape in a limited backup window. You can configure multiple drives in the following ways:

- Use multiple drives of one tape library.
- Manage multiple tape libraries and use several or all drives across all managed libraries.

Parallel processing is enabled in [optional media pool settings](#). To use drives of multiple libraries, you must enable the parallel processing mode for the libraries that are managed by the media pool.

To process the tape data in parallel, you can split the data across drives in two ways:

- [Parallel processing for tape jobs](#).
- [Parallel processing for source chains of one \(or more\) tape jobs](#).

Tape jobs may simultaneously use less drives than configured in [optional media pool settings](#). That may happen under one of the following conditions:

- The number of tapes available is less than the number of drives assigned for this media pool.
- The number of drives available is less than the number of drives assigned for this media pool.

Processing Tape Jobs Simultaneously

When you process tape jobs in parallel, the media pool assigns a drive to each running tape job. For example, if you set three drives as the maximum, you can process up to three tape jobs at the same time. If you have more jobs running at the same time, they are queued. When one of the jobs finishes and releases its drive, the first queued job takes the drive.

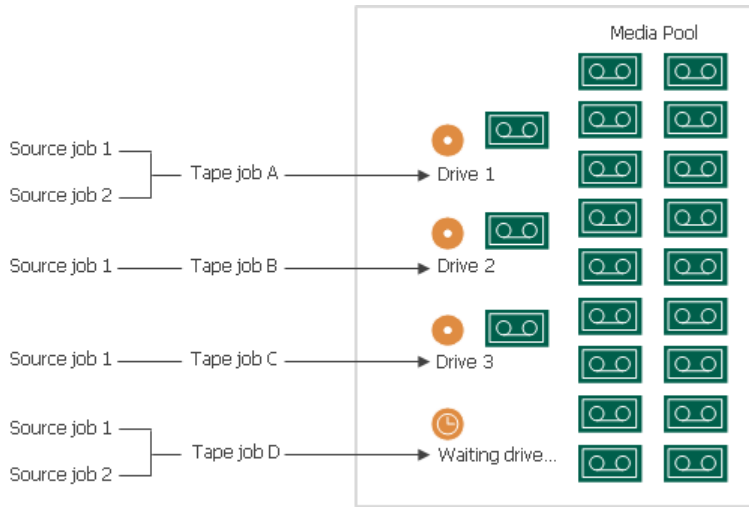
To enable this mode, select the **Enable parallel processing for tape jobs using this media pool** check box in [optional media pool settings](#). If this mode is enabled in media pool settings, for machine backup to tape jobs you can limit the number of drives the job can use, as described in [Specify Archiving Options](#).

This option is available for backup to tape and file to tape jobs.

For example:

- You set the maximum number of drives to three.
- Four tape jobs start at the same time.

The tape jobs start, and jobs A, B and C occupy three drives to write data to tape. Tape job D is queued and waits. When one of the jobs finishes and releases its drive, tape job D takes the drive and starts writing data.



Processing Backup Chains Simultaneously

When you select processing backup chains in parallel, the media pool processes several source jobs simultaneously.

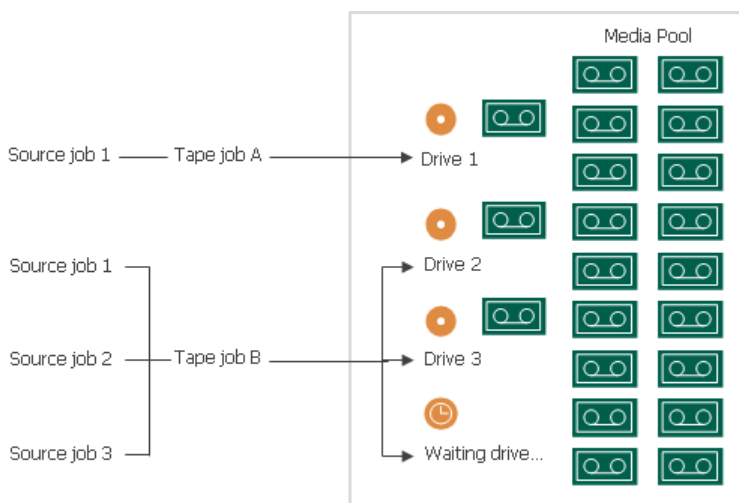
To enable this mode, select the **Enable parallel processing for tape jobs using this media pool** and **Process independent data sources simultaneously** check boxes in [optional media pool settings](#).

This option is available for backup to tape jobs only.

For example:

- You set the maximum number of drives to three.
- Tape job A has one source job; tape job B has three source jobs. Both tape jobs start at the same time.

Tape job A occupies drive 1. Tape job B occupies two other available drives and processes two source jobs. Tape job A finishes and releases drive 1, the third source job from tape job B occupies drive 1.



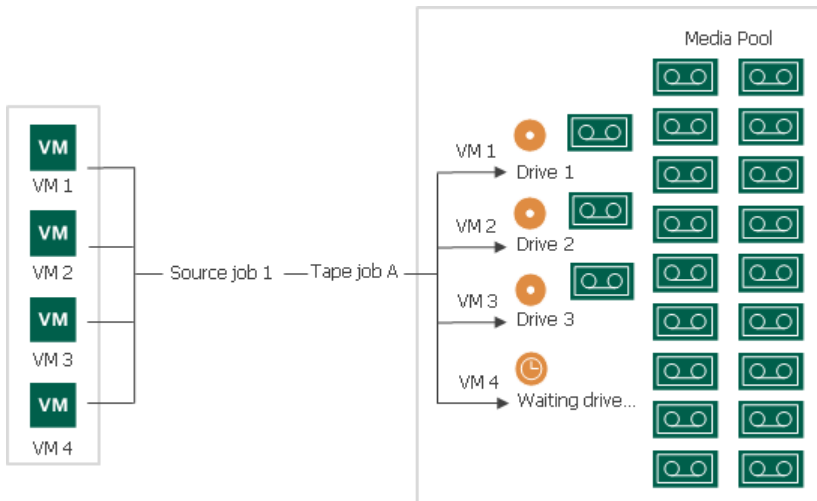
If a source job produces multiple per-machine backups, the media pool processes several per-machine backup chains simultaneously. For more information about per-machine backup files, see the *Veeam Backup & Replication User Guide*, section *Per-Machine Backup Files*.

For example:

- You set the maximum number of drives to three.
- Tape job A has one source job, the source job processes four VMs.

Tape job A starts and occupies all three available drives. It writes each separate VM of the source job by a separate drive. After tape job A finishes writing one of the current VMs and releases one of the three available drives, it occupies this drive with writing VM4. In other words, if a job with per-machine chains is configured to process more VMs than there are drives available, it occupies the entire media pool.

The order in which VMs are queued for processing is defined by the order of VMs within each source job, by the order of source jobs within each tape job and the schedule configured for running tape jobs.



Similarly, if the source job is an agent job with the configured backup policy (the **Managed by agent** option is selected) and produces backups for multiple machines/protection groups, the media pool processes backups for several computers simultaneously. For more information about agent backup jobs, see the Veeam Agent Management Guide, section *Working with Veeam Agent Backup Jobs and Policies*.

Media Sets Created with Parallel Processing

With parallel processing, a separate media set is opened per each drive used.

NOTE

The media pool must have an available tape for each drive.

The media sets are opened according to media set options configured for the media pool:

- [Parallel processing with Do not create, always continue using current media set option](#)
- [Parallel processing with Create new media set for every backup session option](#)
- [Parallel processing with Daily at option](#)

You can edit the media pool settings at any time, and increase or reduce the maximum number of drives:

- If you reduce the number of drives, the media pool will use fewer drives for the next writing session. The media sets that become excessive will be closed.
- If you increase the number of drives, the media pool will open new media sets per each added drive. Further, the media pool will use these media sets according to rules described above.

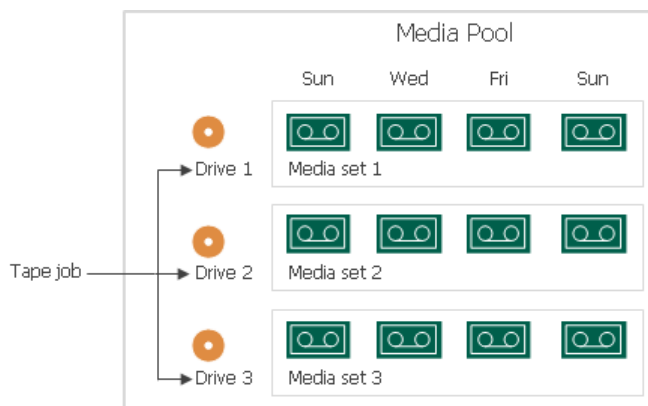
TIP

When multiple media sets open simultaneously, they may have identical sequence number and time of creation. To distinguish between the media sets easily, use the `%id%` variable in the media set name. This variable is added to the media set name by default.

Parallel Processing with Do Not Create, Always Continue Using Current Media Set Option

When the media pool is set to the **Do not create, always continue using current media set** option, a media set is opened per each drive during the first tape session. The next time a tape job starts, it chooses a tape that has most free space, and appends data to it.

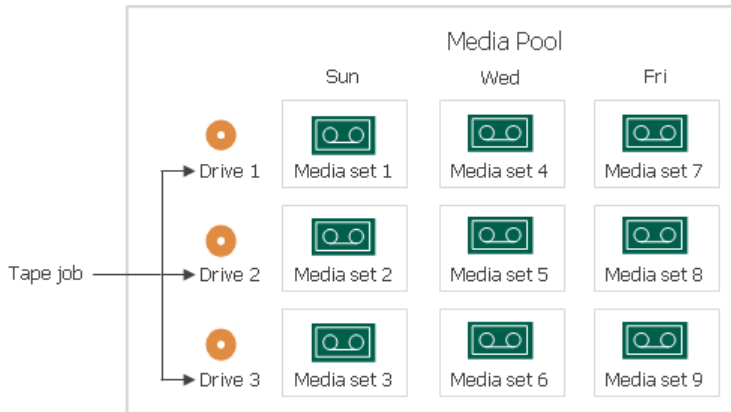
For example, you set the maximum number of drives to 3. The tape jobs that are first to run start 3 media sets. The following tape sessions continue these 3 media sets appending data to them.



Parallel Processing with Create New Media Set for Every Backup Session Option

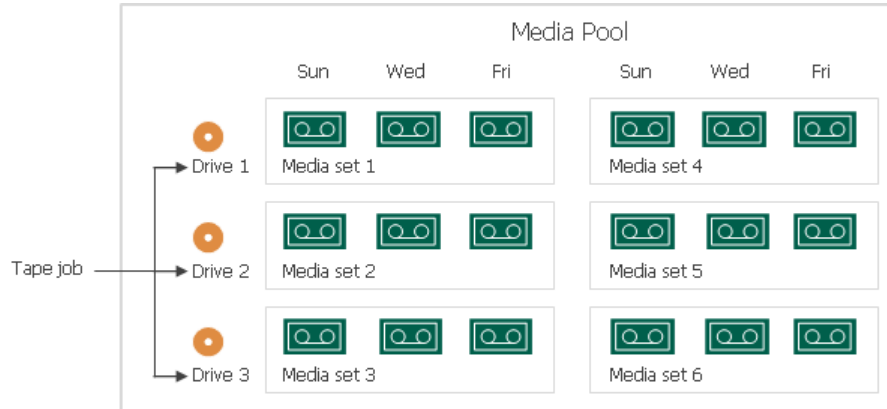
When the media pool is set to the **Create new media set for every backup session** option, a media set is opened per each drive for every writing session. When the jobs run the next time, they open several media sets anew.

Each media set uses a free tape. Note that this configuration is the most tape-consumptive.



Parallel Processing with Daily at Option

When the media pool is set to **Daily at** option, several media sets (per each drive) are opened on the scheduled day. If tape jobs run twice or more before the scheduled day, they continue these media sets – in this case, the jobs use tapes that have most free space first.



Backup to Tape

To back up data to tape, you need to create and run tape jobs. The backup to tape job is a dedicated job that archives to tape Veeam backups that were produced by Veeam backup jobs. Note that you cannot directly backup virtual machines to tapes.

NOTE

Support of the backup to tape is included in the Veeam Universal License. When using a legacy socket-based license, the Enterprise or Enterprise Plus edition of Veeam Backup & Replication is required. For details, see [Veeam Editions Comparison](#).

You can archive the following data to tape:

- VM backups
- NAS backups. For more details, see [Backup to Tape for NAS Backups](#)
- Veeam Agent backups
- Physical machine backups
- Backup repositories, including hardened repositories
- [For Veeam Cloud Connect] Tenants

The backups that can be archived to tapes also include those created with backup jobs that directly write backup data to object storage repositories.

When a backup to tape job runs, it does not create new backups: it locates already existing backups and copies them from backup repository to tape. You need to set the source of the tape job: jobs or backup repositories.

Sources of Backups for Backup to Tape Jobs

You can use several options for selecting backups that you want to write to tape with the tape job.

Jobs as Source

The following jobs can be source for tape jobs:

- VMware/Hyper-V/Nutanix AHV/RHV backup job
- VMware/Hyper-V/Nutanix AHV/RHV backup copy job
- NAS backup job
- Windows/Linux/Unix/Mac Veeam Agent backup job configured in Veeam Agent operating in the standalone mode
- Windows/Linux/Unix/Mac Veeam Agent standalone backup copy job
- Windows/Linux/Unix/Mac Veeam Agent backup job configured in Veeam Backup & Replication
 - Veeam Agent backup job managed by the backup server
 - Veeam Agent backup job managed by Veeam Agent (backup policy)
- Windows/Linux/Unix/Mac Veeam Agent backup copy job

- Cloud VM (Veeam Backup for Microsoft Azure/AWS/Google Cloud) backup copy job configured in Veeam Backup & Replication
- Kasten K10 policy
- Backup copy job for Kasten K10 policy

NOTE

Backup to tape jobs can process only agent backup jobs that are targeted to a Veeam backup repository.

When the tape job starts on its schedule, it picks the restore points that were produced by the source jobs in period since the last tape job run. If you change the configuration of the source jobs, the tape job is updated automatically: it adds new machines or folders and files to the list of entities to archive or stops archiving entities that were removed from source jobs.

The tape job will process its source jobs in alphabetical order.

Backup Repositories as Source

NOTE

When using backup repositories as a source for backup to tape, only [supported backup types](#) can be archived to tape.

When you add a repository as a source to a tape job, the tape job constantly scans the selected repository (or repositories) and writes the newly created backups to tape. The tape job monitors the selected repository in a background mode. You can set explicit backup windows for the tape job. In this case, the tape job will start on the set time and archive all new restore points that were created in the period since the last job run.

If you create or remove backup jobs that use this repository, or if you change the configuration of such backup jobs, you do not need to reconfigure the tape job that archives the repository.

Tenants as Source

This option is available for Veeam Cloud Connect service providers. Service providers can back up tenants backups from cloud repositories to tape. As the source to the backup to tape job, you can add tenants or cloud repositories. For more information, see the [Veeam Cloud Connect](#) guide.

For tenants backups, only GFS media pools are used. For more information, see [GFS Media Pools](#).

Mixed Jobs

To one tape job, you can link an unlimited number of sources. You can mix source jobs of different types (backup jobs, backup copy jobs, file backup jobs) and on different platforms (VMware, Hyper-V, Windows Agent, Linux Agent). You can add jobs and repositories as source to the same tape job.

Also, you can add an unlimited number of tenants to one tape job. However, you cannot mix tenants with backup jobs and backup repositories.

IMPORTANT

The tape job looks only for the Veeam backups that are produced by backup jobs running on your console. Other files will be skipped.

Linking Source Jobs

Linking tape jobs with source jobs is not obligatory when you create a tape job. You can add source jobs to tape jobs at any moment:

- If you already have backup jobs configured, you can choose the necessary jobs in the **Backup to Tape Job** wizard. For details, see [Creating Backup to Tape Jobs](#).
- Alternatively, you can link an "empty" tape job or an existing tape job as a secondary destination target for the source backup job. For details, see [Linking Backup Jobs to Backup to Tape Jobs](#).

Source Job Backup Methods

The source jobs that create backups to be archived to tapes may use any backup method, no matter whether you select jobs, backup repositories or tenants as a source:

- Forever forward incremental backup method

To backup the forever forward incremental chains to tape, the tape job uses the virtual full. The virtual full creates a synthetic full backup on tape regularly (for example, once a week) and splits the chain into short series of tapes which is more convenient for restore. For more information, see [Virtual Full Backup](#).

[For backup copies in periodic mode created in Veeam Backup & Replication versions earlier than 12] If the source job is a backup copy job in the periodic copy mode, note that the last restore point of the backup copy job stays active until the next restore point is created. The tape job does not copy such active points, because they may be updated. For this reason, the backup chain on tape will be always one restore point shorter than on disk.

- Forward incremental backup method

When the tape job backs up the forward incremental chain to tape, it creates a copy of the disk backup chain.

- Reverse incremental backup method

The last backup in the reverse incremental backup chain is always the full backup. If the source backup chain is reverse incremental, the tape job will copy the full backup each time the tape job runs. The increments are skipped.

Backup to Tape for NAS Backups

Backup to tape for NAS backups is a particular case of using backup to tape jobs to write to tapes backups and backup copies created by file backup jobs. For more information on the file share backup, see the NAS Backup section in the Veeam Backup & Replication User Guide.

NOTE

Backup to tape for NAS backups is a secondary backup as it additionally secures already backed up file share data. Thus, this functionality does not consume license instances.

Using backup to tape for NAS backups has the following benefits:

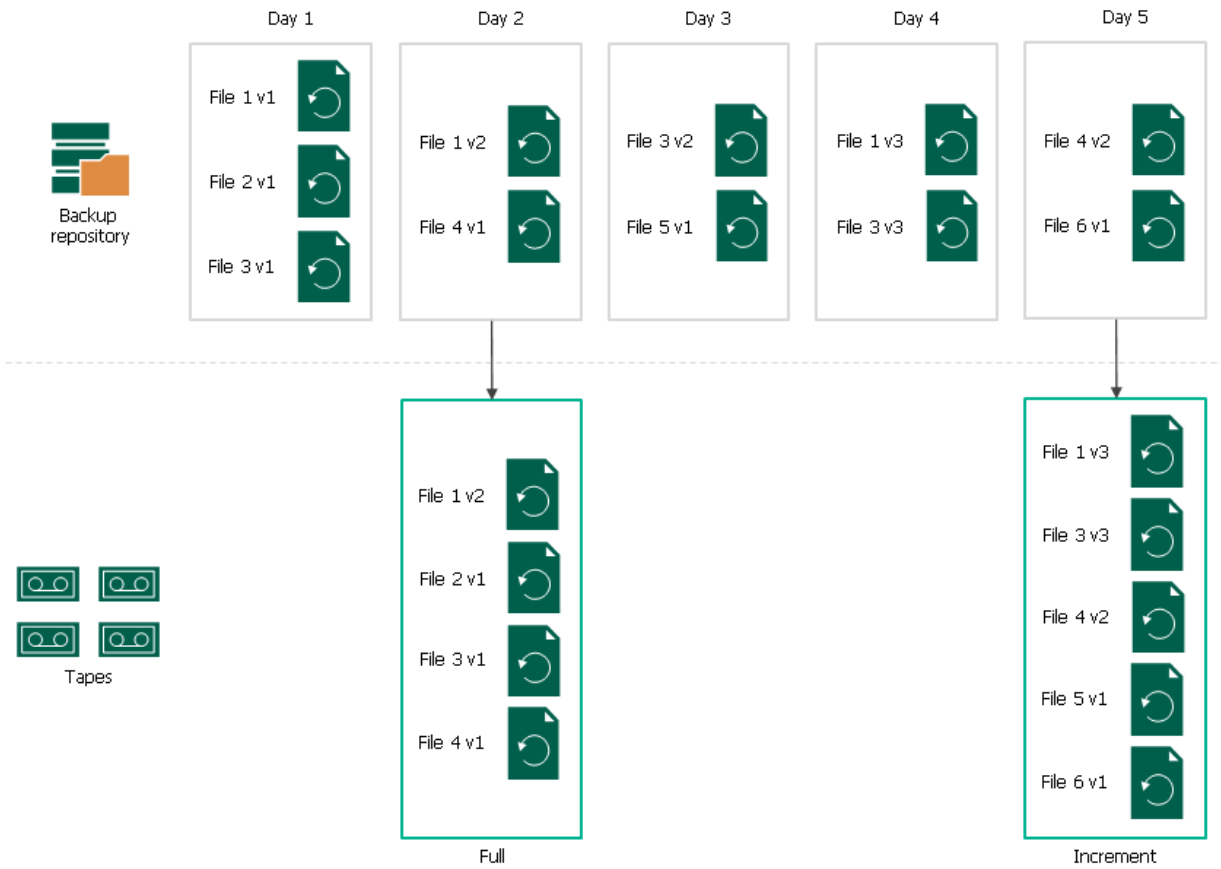
- It allows avoiding excessive load on the production NAS storage.
- It allows implementing the '3-2-1' backup approach (3 copies, 2 types of media, 1 offsite location) considered as a best practice for data protection and disaster recovery.

Just like with ordinary backup to tape jobs, as a source you can specify either file backup jobs or repositories that store NAS backups and their copies. For more information on sources of backup to tape jobs, see [Backup to Tape](#).

When creating a backup to tape job for additionally securing NAS backups, consider the following:

- Files on tapes are stored in the native format.
- NAS backup to tape does not support GFS.
- The tape job always writes to tapes the latest restore point (the state of file share backup files as of the backup to tape job run).
- When starting a backup to tape job for NAS backups, Veeam Backup & Replication checks if the backup chain stored on tapes is consistent. If it is not consistent, Veeam Backup & Replication creates a new full backup based on the latest backup point of the source NAS backup.

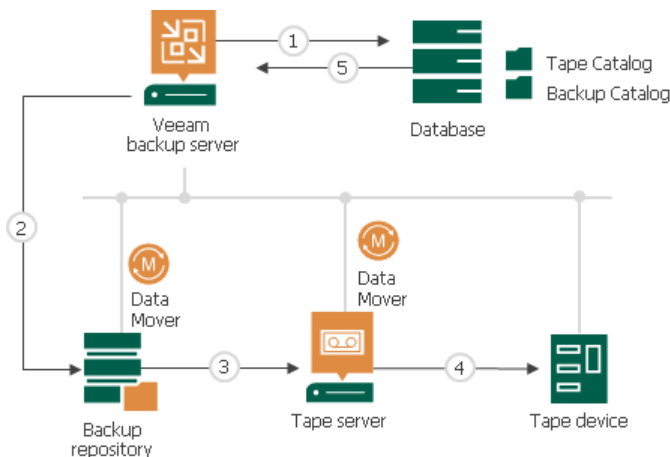
- In contrast to other backup to tape jobs, NAS backup to tape creates a virtual full backup in any case, even if a full backup was already created on the same day. For more information on virtual full backups, see [Virtual Full Backup](#).



How Backup to Tape Works

When Veeam Backup & Replication executes a backup to tape job (started manually or on schedule), it performs the following operations:

1. The backup to tape job addresses the Backup Catalog in the Veeam Backup & Replication database to detect backups that match the job criteria.
2. The files are queued for archiving.
3. Veeam Backup & Replication connects to Veeam Data Movers and starts the data transfer process. The source Veeam Data Mover retrieves data from the backup repository and target Veeam Data Mover sends data to tape.
4. The tape job addresses the media pool that is set for this job as target. The media pool allots tapes for writing data according to the following configuration options:
 - Tapes consumption
 - Media sets
 - Tape retention
5. While tape recording is performed, Veeam Backup service updates data in the Backup Catalog and Tape Catalog in Veeam Backup database. The Veeam Backup console displays refreshed information about backups archived to tape and shows job statistics.



Before You Begin

Before you configure a backup to tape job, complete the following prerequisites:

- You must have Veeam Backup & Replication Enterprise license or higher installed on the Veeam backup server.
- [For Veeam Cloud Connect service providers] To back up tenants to tape, you must have Veeam Cloud Connect service provider license installed on the Veeam backup server.
- You must check configuration of source backup job(s). Tape jobs have the following requirements for the restore points to keep setting:
 - A source job with **forever forward incremental** chain must keep not less than 3 restore points on disk.
 - A source job with **forward incremental** chain must keep not less than 3 restore points on disk.
 - A source **backup copy job in the immediate copy mode** must keep not less than 3 restore points on disk.
 - A source **backup copy job in the periodic copy mode** must keep not less than 3 restore points on disk. If this job was created in Veeam Backup & Replication versions earlier than 12, it must keep not less than 4 restore points on disk.
 - A **reverse incremental** chain has no required minimum.
- You must configure one or more media pools with the necessary media set and retention settings.
- You must load tapes to the tape device and configure the target media pool so that it has access to them. If the media pool has no available tape, the tape job will wait for 72 hours and then terminate.

Consider the following:

- The backup to tape job processes VBK (full backups), VIB files (forward incremental backups), and files and folders (if the source for the backup to tape job is a NAS backup job or repository that stores NAS backups).
- Protecting NAS backups with backup to tape jobs does not consume Veeam license instances.
- If you back up to tape a reverse incremental chain, the tape job will always copy the full backup. Reverse incremental backups (VRB) are skipped from processing.
- Microsoft SQL Server log files, Oracle log files and PostgreSQL log files (VLB) are skipped from processing.
- [For Veeam Cloud Connect service providers] The backup to tape job that backs up tenants to tape will not process backups created with previous versions of Veeam Backup & Replication or Veeam Agents. To avoid this, you must upgrade the tenants' backup server or agent machines to the last version. After the upgrade, the tenants' jobs must run at least once.
- If a job is unable to complete within 21 days period, it will be stopped with the 'Failed' status.

Creating Backup to Tape Jobs

To archive backups to tape, you should create a backup to tape job using the **New Backup to Tape Job** wizard. This section will guide you through all steps of the wizard and provide explanation on available options.

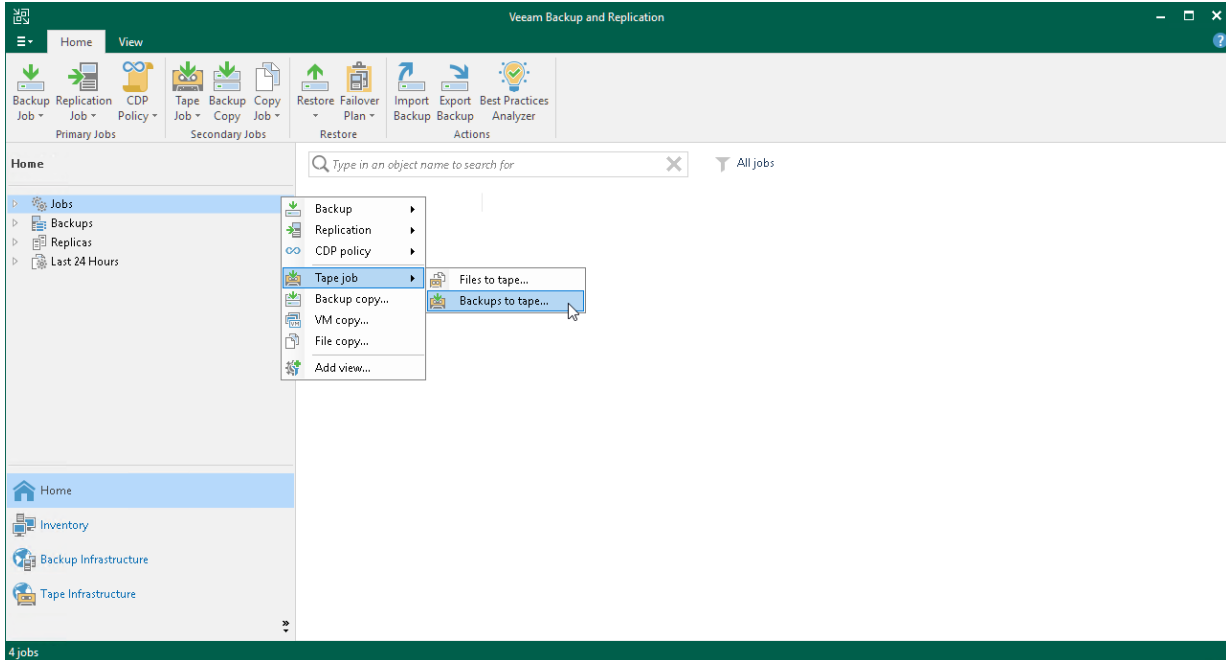
With this wizard, you can create a backup to tape job or a GFS job.

To create a backup to tape job, follow the next steps:

Step 1. Launch New Backup to Tape Job Wizard

To run the **New Backup to Tape Job** wizard, do either of the following:

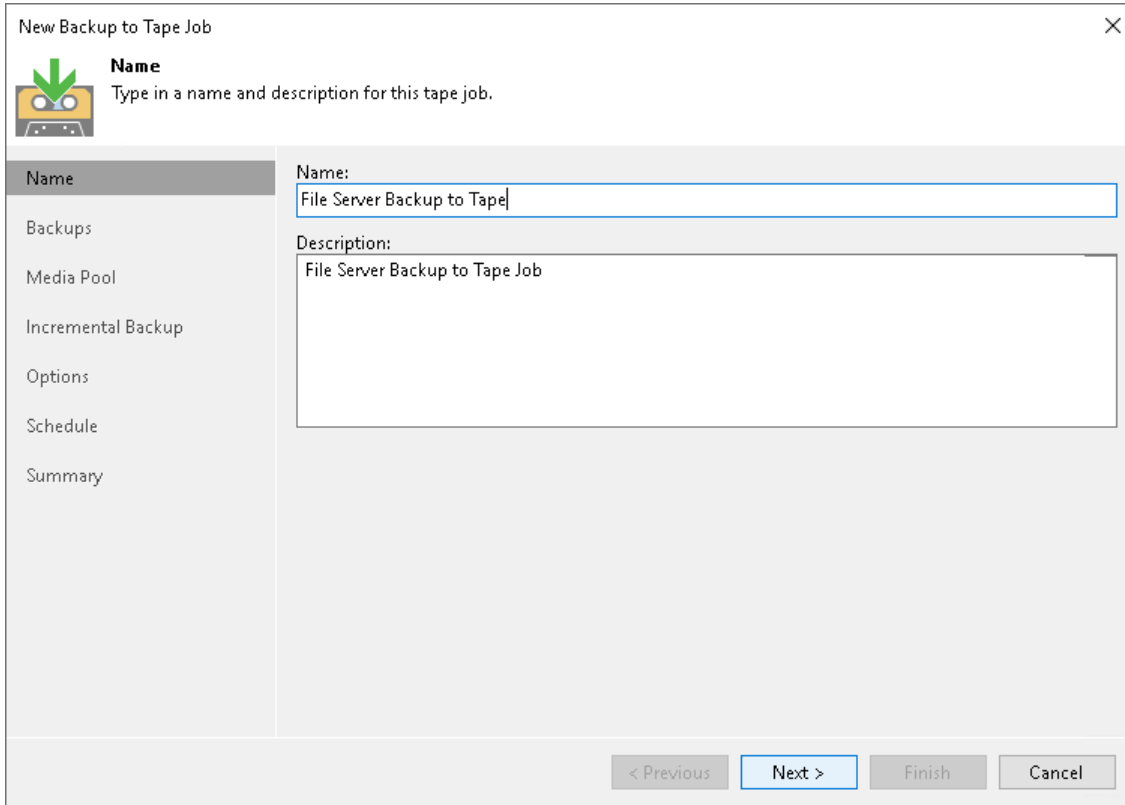
- On the **Home** tab, click **Tape Job** and select **Backups**.
- Open the **Home** view, right-click the **Jobs** node and select **Tape Job > Backups to Tape**.



Step 2. Specify Job Name and Description

At the **Name** step of the wizard, you should define basic settings for the backup to tape job.

1. In the **Name** field, enter a name for the job.
2. In the **Description** field, enter a description of the job. The default description contains information about the user who created the job, date and time when the job was created.



New Backup to Tape Job

Name
Type in a name and description for this tape job.

Name

Backups

Media Pool

Incremental Backup

Options

Schedule

Summary

Name:
File Server Backup to Tape|

Description:
File Server Backup to Tape Job

< Previous Next > Finish Cancel

Step 3. Choose Backups to Archive

At the **Backups** step of the wizard, select backups that you want to write to tape with the tape job.

Click **Add** and select the necessary backups. You can choose backups from the following sources:

- **Backup jobs.** You can select backups from available backup, backup copy, file share backup or agent backup jobs. When a backup to tape job runs, Veeam Backup & Replication searches and archives restore points from the backups created by the selected backup jobs.
- **Backup repositories.** Using this option, you can select whole backup repositories. When a backup to tape job runs, Veeam Backup & Replication searches and archives restore points from all backups stored in the chosen backup repositories.

If you choose to archive data from backup repositories, the backup to tape job will process only the backups that were created with backup jobs configured on this Veeam backup server. Imported backups and configuration backups will be skipped from processing.

- **Tenants.** This option is available for Veeam Cloud Connect service providers. With this option, you can select backups of your tenants or cloud repositories.

To learn more about sources to tape jobs, see [Machines Backup to Tape](#).

To remove a source from the list, select it and click **Remove** on the right.

The sources of the backup to tape job are processed in order they are displayed here. To move a source up or down in the list, use the **Up** and **Down** buttons on the right.

New Backup to Tape Job

Backups
Specify objects to be processed by this tape job.

Name	Type	Size
File Server Backup Job	VMware Backup	13.1 GB
Hyper-V Backup Job	Hyper-V Backup	14.8 GB
Backup Volume 01	Windows	30.3 GB

Full: **30.3 GB**
Incremental: **0 B**

< Previous Next > Finish Cancel

The total size of full backups added to the backup to tape job is displayed in the **Full** field. The total size of incremental backups added to the backup to tape job is displayed in the **Incremental** field.

TIP

This step is optional. You can create a backup to tape job without source. You can add the source later, or you can link this job to a backup job. For more information, see [Linking Backup Jobs to Backup to Tape Jobs](#).

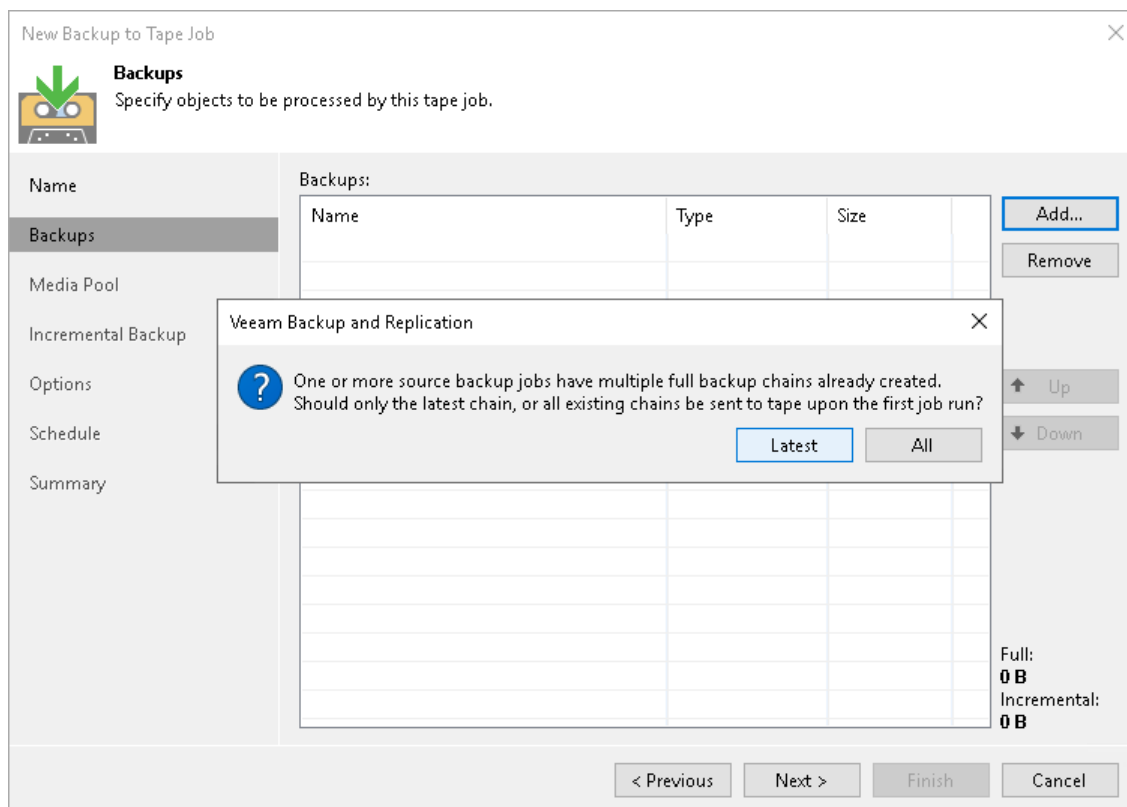
Selecting Backup Chains to Archive

On the first run, the tape job can copy all restore points or only the latest backup chain. This option is useful if the source backup job or the source backup repository has several backup chains. The backup chain here means a full backup file plus a set of incremental backup files following it.

To select what backup files you want to archive:

1. Click **Add** and select **Backup jobs** or **Backup repositories**.
2. Select the necessary backup job or repository you want to add to the tape job.
3. Veeam Backup & Replication will display a warning informing about backup chain options. Click **Latest** to archive only the latest backup chain to tape. This option lets you have only the latest restore points written to tape and use less tape for data archiving. Click **All** to archive all available backup files.

This option selects what backup chain will be copied on the first run of the job. You can instruct the job to copy only the latest backup chain on every tape job run. This option is available in the advanced settings of the job. For more information, see [Advanced Settings](#).



Step 4. Choose Media Pool for Full Backups

At the **Media Pool** step of the wizard, choose media pool for full backups.

1. From the **Media pool** list, choose a media pool that will be used for archiving full backup files.

You can select a media pool or a GFS media pool. Depending on the selected type, the job schedule will change to regular schedule or GFS schedule accordingly.

NOTE

Consider the following:

- For tenants backups, you can select only GFS media pools.
- Free space counter reflects the total remaining free space of all tapes open for appending data. Tapes closed for appending data due to media set settings and retention period are not included into the free space calculation.

The screenshot shows the 'New Backup to Tape Job' wizard at the 'Media Pool' step. The window title is 'New Backup to Tape Job'. Below the title bar, there is a green arrow icon pointing down and the text 'Media Pool' followed by 'Specify the media pool to perform backup to.' The main area is divided into two panes. The left pane is a navigation menu with the following items: 'Name', 'Backups', 'Media Pool' (which is highlighted), 'Incremental Backup', 'Options', 'Schedule', and 'Summary'. The right pane displays the configuration for the selected media pool. It includes a dropdown menu for 'Media pool:' with the selected value 'VM Backup Media Pool (HP MSL G3 Series 9.50)'. To the right of the dropdown are two buttons: 'Add New...' and 'Schedule...'. Below the dropdown, the following settings are listed: 'Tapes: 3', 'Free space: 119 GB', 'Media set: Do not create, always continue using current media set', 'Retention: Protect data for 24 Months', 'Parallel processing: 2 drives, multiple backup chains', 'Encryption: Disabled', 'Export to vault: Do not export', and 'WORM: False'. At the bottom of the window, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

TIP

If you have not previously created a media pool with the required settings, you can click the **Add New** button and create a new media pool or a GFS media pool without closing the job wizard. For more details, see [Creating Media Pools](#) or [Creating GFS Media Pools](#).

2. You can configure schedule for virtual full backup. This option is available only if you selected a regular media pool.

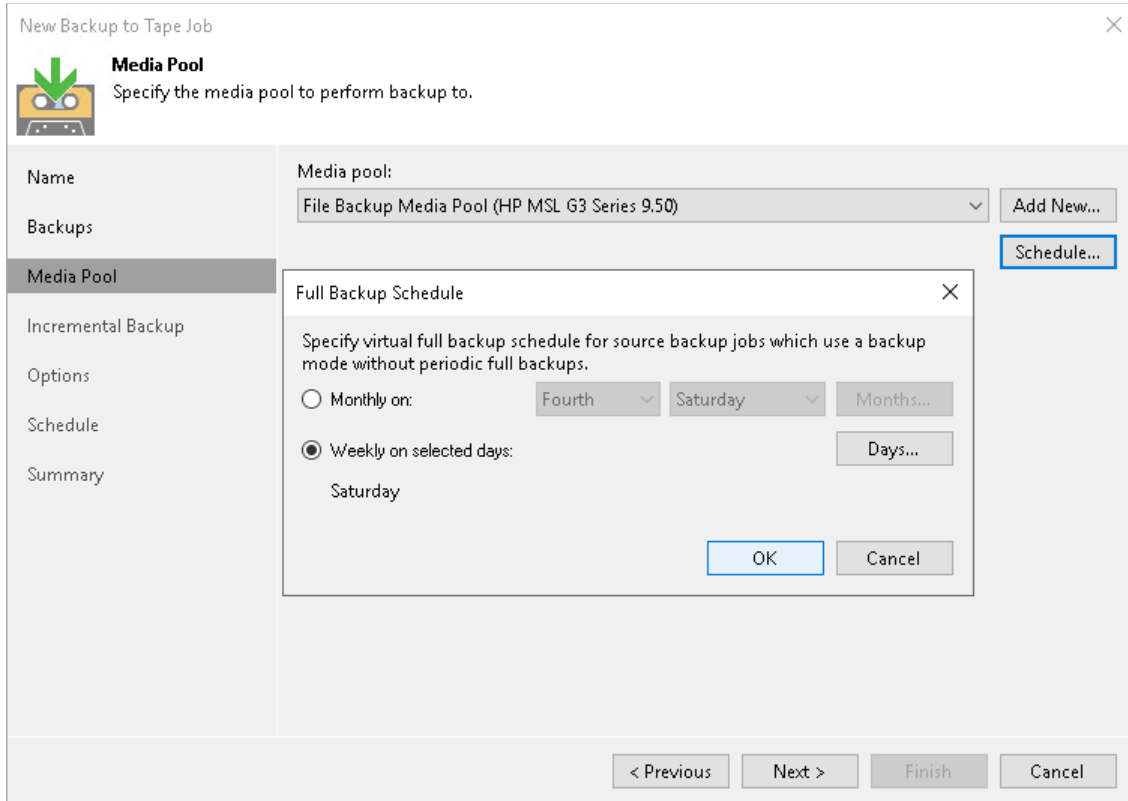
If the source job produces a forever incremental backup chain or is a backup copy job without GFS option enabled, Veeam Backup & Replication will periodically create a virtual full backup. You can configure the full backup schedule at this step of the wizard. The virtual full cannot be switched off; however, it is disabled automatically if the source job periodically creates active full or synthetic full backups.

The virtual full does not depend on the job settings for incremental backups. If you enable the virtual full for the job, it will be created in any case, no matter whether you enable or do not enable incremental backups. For more information, see [Virtual Full Backup](#).

NOTE

If the source job is a backup copy job with the GFS option enabled, Veeam Backup & Replication will not create a virtual full backup on tapes periodically, as this source job is considered forward incremental. For more information on methods of creating archive full backups, see the Veeam Backup & Replication User Guide, section Methods for Archive Backups Creation.

To configure the virtual full schedule, click **Schedule** and select the necessary scheduling options.



Step 5. Choose Media Pool for Incremental Backups

This step is available only if you selected a regular media pool as target for full backups.

At the **Incremental Backup** step of the wizard, you can enable or disable incremental backups processing and choose media pool for incremental backups.

If you want to back up incremental backups to tape, select the **Archive incremental backups to tape** check box. If this option is disabled, the backup to tape job will archive only VBK files and will skip VIB files from processing.

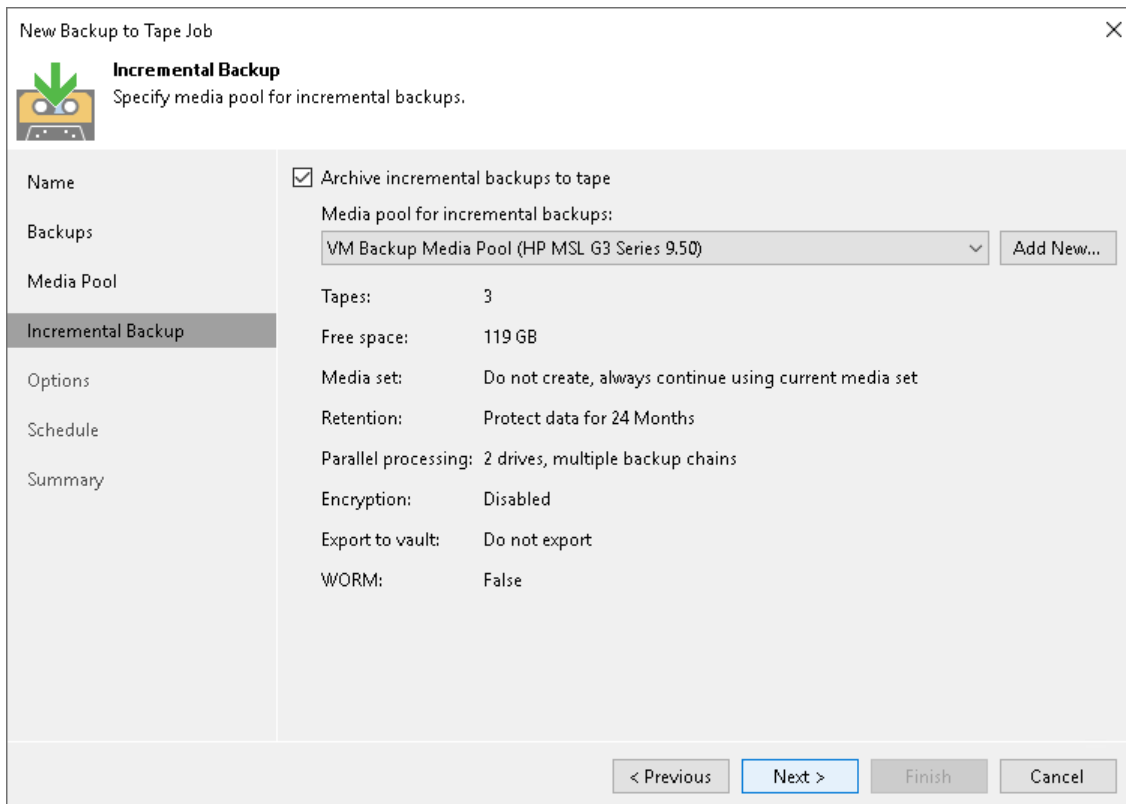
From the **Media pool for incremental backups** list, select a media pool that will be used for incremental backups.

Veeam Backup & Replication allows you to select different media pools for full backups and incremental backups. This can be required if you use different media set or retention settings for archiving full backups and increments.

You cannot select a GFS media pool to copy incremental backups to tape. Instead you can configure a daily media set in the GFS media pool to archive incremental points along with GFS points, combining normal and GFS functionality within a single job. For more details, see [Creating GFS Media Pools](#).

TIP

If you have not previously created a media pool with the required settings, you can click the **Add New** button and create a new media pool without closing the job wizard. For more details, see [Creating Media Pools](#).



Step 6. Specify Archiving Options

At the **Options** step of the wizard, specify archiving and media automation options. The options are different for regular backup to tape jobs and GFS tape jobs:

- [Options for Backup to Tape Job](#)
- [Options for GFS Tape Job](#)

Options for Backup to Tape Job

This step of the wizard is available if you selected a regular media pool at the **Full Backup** step of the wizard.

In the **Media Automation** section, specify options for automatic operations after finishing the job:

- If you want the tape to be automatically ejected from the tape drive after the job successfully finishes, select the **Eject media upon job completion** check box. The ejected tapes are placed into a free tape device slot. Note that if the job started and failed, the tape will remain in the drive.

This option does not prevent the tape job from appending data to this tape. If not configured otherwise in media pool settings, this tape will be placed into a drive on the next tape job run.

- If you want to pull out the tapes with the current media set from the tape device, select the **Export current media set upon job completion** check box. You can use this option, for example, to move tapes to another storage location. The tape device will eject the tapes that belong to the current media set when the media set is closed.

If you want to export tapes on specific days only (for example, every Saturday), click **Days** and schedule export on the necessary days.

Note that with this option selected, a new media set is started after each export.

- If the media pool, which is the target for the tape job, uses parallel processing, you can limit the number of drives to use for processing this tape job. To enable this, select the **Limit the number of drives this job can use to N tape drives** check box and specify the number of drives to use. For more information on how to enable parallel processing for the media pool, see [Add Optional Media Pool Settings](#).

- Click **Advanced** to configure the advanced job options.

Options for GFS Job

This step of the wizard is available if you selected a GFS media pool at the **Full Backup** step of the wizard. At this step, specify options for automatic operations after finishing the job and the drive usage limit:

- If you want the tape to be automatically ejected from the tape drive and placed into a free tape device slot when the job finishes, select the **Eject media upon job completion** check box.

This option does not prevent the tape job from appending data to this tape. If not configured otherwise in media pool settings, this tape will be placed into a drive on the next tape job run.

- If you want to pull out the tapes with some media sets from the tape device, select the **Export the following media sets upon job completion** check box. You can use this option, for example, to move tapes to another storage location. The tape device will eject the tapes that belong to the selected media set.

Click **Media sets** and select the media sets that you want to export.

- If the media pool, which is the target for the tape job, uses parallel processing, you can limit the number of drives to use for processing this tape job. To enable this, select the **Limit the number of drives this job can use to N tape drives** check box and specify the number of drives to use. For more information on how to enable parallel processing for the media pool, see [Add Optional Media Pool Settings](#).

- Click **Advanced** to configure the advanced job options.

The screenshot shows a dialog box titled "New Backup to Tape Job" with a close button (X) in the top right corner. On the left is a sidebar with a navigation menu containing: Name, Backups, Media Pool, Options (highlighted), Schedule, and Summary. Above the sidebar is a green arrow icon pointing down and a tape drive icon, with the text "Options Specify tape job options." To the right of the sidebar, the "Options" section is divided into two sub-sections: "Media automation" and "Drive usage". Under "Media automation", there are two checked checkboxes: "Eject tape media upon job completion" (with a sub-note: "This option makes the job automatically eject tape from drives upon completion, so that tape does not stay in the drive, which is a best practice.") and "Export the following media sets upon job completion" (with a "Media Sets" button to its right and a sub-note: "This option makes the job automatically close and export selected GFS media sets."). Under "Drive usage", there is one checked checkbox: "Limit the number of drives this job can use to: 2" (with a spinner box around the number 2) "tape drives". At the bottom of the main area, there is a note: "Advanced job settings include compression, notification settings, automated post-job activity and other settings." with an "Advanced..." button to its right. At the very bottom of the dialog box are four buttons: "< Previous", "Next >" (highlighted in blue), "Finish", and "Cancel".

Step 7. Specify Advanced Job Settings

You can specify the following advanced settings for the backup to tape job:

- [Notifications Settings](#)
- [Advanced Settings](#)

Notifications Settings

At the **Notifications** tab, you can specify notification settings for the backup to tape job.

At the **Options** step of the wizard, click **Advanced**. Then select the **Notifications** tab.

Select the **Send email notifications to the following recipients** check box if you want to receive notifications about tape job status. In the field below, specify a recipient's email address. You can enter several addresses separated by a semicolon.

IMPORTANT

To receive notifications about tape jobs status, you must enable general email notifications in Veeam Backup & Replication. For more information, see the Veeam Backup & Replication User Guide, section *Specifying Email Notification Settings*.

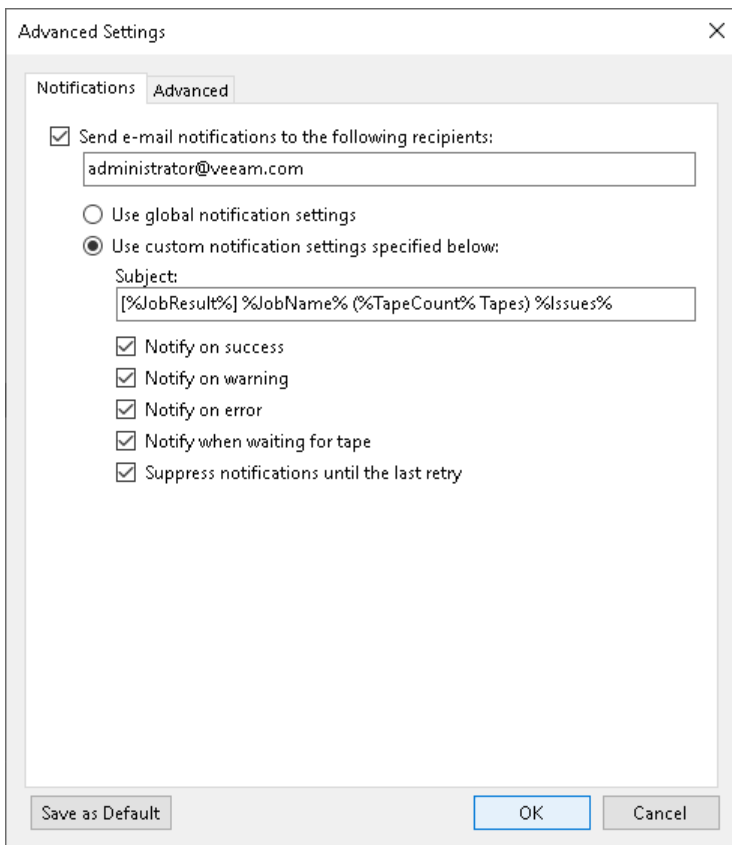
You can choose between the following options:

- **Use global notification settings:** Veeam Backup & Replication will notify you according to global email notification settings specified for the Veeam backup server.
- **Use custom notification settings specified below:** you can specify notification settings for tape jobs. In the **Subject** field, specify a notification subject. You can use the following variables in the subject:
 - *%Time%*: the time when the tape job finished.
 - *%JobName%*: the name of the tape job.
 - *%TapeCount%*: the number of tapes used for the tape job session.
 - *%JobResult%*: the job result.
 - *%VmCount%*: the number of machines in the job.
 - *%Issues%*: the number of machines in the job processed with Warning or Failed status.

Select the occasions on which you want to receive email notifications:

- **Notify on success:** Veeam Backup & Replication will notify you if the tape job finishes successfully.
- **Notify on warning:** Veeam Backup & Replication will notify you if the tape job finishes with a warning.
- **Notify on error:** Veeam Backup & Replication will notify you if the tape job fails.

- **Notify when waiting for tape:** Veeam Backup & Replication will notify you if the tape job cannot start because there are no available tapes.



TIP

After you specify necessary settings for the tape job, you can save them as default settings. To do this, click **Save as Default** at the bottom left corner of the **Advanced Settings** window. When you create a new backup to tape job, Veeam Backup & Replication will automatically apply the default settings to the new job.

Advanced Settings

At the **Advanced** tab, you can select what backups from the backup chain to copy, enable hardware compression or specify custom scripts that you want to run before and after the backup to tape job.

The advanced options are different for regular backup to tape jobs and GFS tape jobs:

- [Advanced Settings for Tape Job](#)
- [Advanced Settings for GFS Tape Job](#)

Advanced Settings for Backup to Tape Job

This step of the wizard is available if you selected a regular media pool at the **Full Backup** step of the wizard.

1. Select the **Process latest full backup chain only** check box if you want to copy only the last backup chain with each tape job run. The source backup chain consists of a full backup (active or synthetic) and subsequent increments. If you disable this option, the tape job will back up all restore points that are not on tape.

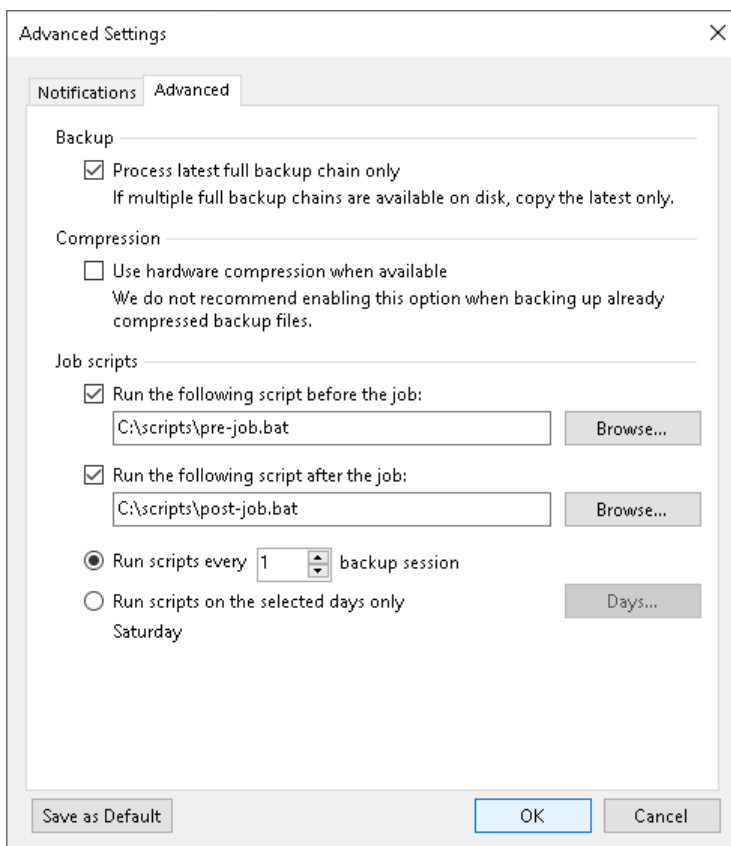
2. Disable the **Use hardware compression when available** check box.

Usually image-level backups of VMs are produced by Veeam Backup & Replication by using software compression. We strongly do not recommend to use the hardware compression when writing already compressed data to tapes.

3. Select the **Run the following script before the job** and **Run the following script after the job** check boxes and click **Browse** to choose executable files.

You can select to execute pre- and post-job actions after a number of job sessions or on specific week days.

- If you select the **Run every... backup session** option, specify the number of the job sessions after which the scripts must be executed.
- If you select the **Run on selected days only** option, click **Days** and specify week days on which the scripts must be executed.



TIP

After you specify necessary settings for the tape job, you can save them as default settings. To do this, click **Save as Default** at the bottom left corner of the **Advanced Settings** window. When you create a new backup to tape job, Veeam Backup & Replication will automatically apply the default settings to the new job.

Advanced Settings for GFS Tape Job

This step of the wizard is available if you selected a GFS media pool at the **Full Backup** step of the wizard.

1. Sometimes when the tape job starts there is no new daily backup on disk. Select the **Process the most recent restore point instead of waiting** check box if you want the tape job to copy the latest restore point instead of waiting. If this option is unselected, the tape job will wait for a new restore point.
2. Disable the **Use hardware compression when available** check box.

Usually image-level backups of VMs are produced by Veeam Backup & Replication by using software compression. We strongly do not recommend to use the hardware compression when writing already compressed data to tapes.

3. Select the **Run the following script before the job** and **Run the following script after the job** check boxes and click **Browse** to choose executable files.

You can select to execute pre- and post-job actions after a number of job sessions or on specific week days.

- If you select the **Run every... backup session** option, specify the number of the job sessions after which the scripts must be executed.
- If you select the **Run on selected days only** option, click **Days** and specify week days on which the scripts must be executed.

Advanced Settings

Notifications | Advanced

Backup

Process the most recent restore point instead of waiting
If today's backup is not yet created or its files are locked, process the previous most recent backup instead of waiting for the most current backup to become available.

Compression

Use hardware compression when available
We do not recommend enabling this option when backing up already compressed backup files.

Job scripts

Run the following script before the job:
C:\scripts\pre-job.bat Browse...

Run the following script after the job:
C:\scripts\post-job.bat Browse...

Run scripts every 1 backup session

Run scripts on the selected days only Days...
Saturday

Save as Default OK Cancel

TIP

After you specify necessary settings for the tape job, you can save them as default settings. To do this, click **Save as Default** at the bottom left corner of the **Advanced Settings** window. When you create a new backup to tape job, Veeam Backup & Replication will automatically apply the default settings to the new job.

Step 8. Define Job Schedule

At the **Schedule** step of the wizard, you can define a schedule for the job to run on a regular basis. The schedule settings are different for regular backup to tape jobs and GFS tape jobs:

- [Schedule for Backup to Tape Job](#)
- [Schedule for GFS Tape Job](#)

Schedule for Backup to Tape Job

This step of the wizard is available if you selected a regular media pool at the **Full Backup** step of the wizard.

To specify the job schedule, select the **Run the job automatically** check box. If this check box is not selected, the job is supposed to be started manually.

You can define the following scheduling settings for the job:

- **Daily at this time:** the tape job will run at specific time on defined week days.
- **Monthly at this time:** the tape job will run at specific time monthly.
- **After this job:** the tape job will start when a preceding backup job completes. Choose the preceding backup job from the list.

NOTE

Consider the following:

- This option will only start the tape or backup copy job if the source job is started automatically by schedule. If the source job is started manually you will choose to start it chained or not.
- This option is not available for agent backup jobs managed by agent or for standalone agent backup jobs.
- **As new backup files appear:** the tape job will monitor the source jobs. As soon as the source job creates a new backup, the job will write this backup to tape.

If necessary, you can limit the time when the backup to tape job can start with a schedule. You can restrict start of the backup to tape jobs when backup repositories are busy with other tasks (backup jobs writing to repositories or backup copy jobs reading from repositories). Schedule is set for backup to tape jobs start. Jobs that have started during the allowed time interval will continue working on restricted hours. To define prohibited time for the backup to tape job start, click the **Schedule** button and define the time when the job is allowed and prohibited to start.

If you have scheduled the job to run at the specific time daily or monthly, consider configuring wait timeout value. Select the **If some linked backup jobs are still running, wait for up to** check box and specify the new timeout. When a backup to tape job starts, Veeam Backup & Replication checks the status of the source jobs. If a source job is still writing data to the source repository, the backup to tape job will wait for the specified time interval.

If the timeout is disabled, the backup to tape job will terminate without waiting for the backup job to complete.

The timeout option is unavailable if you schedule the backup to tape job to run after a backup job or if you schedule the backup to tape job to start when new backups appear.

Sometimes, the source job may start when the tape job is still running. This may cause a conflict if the source job needs to perform the following operations:

- Merge of backup files

- Reverse incremental backup transformation
- Compact of full backup file
- Retention Policy maintenance.

By default, the source job has priority. In this case, the tape job terminates with error and no data is written to tape. Select the **Prevent this job from being interrupted by source backup jobs** option if you want to give the tape job a higher priority. If this option is selected, the tape job will not terminate and will finish writing the data. If the source job needs to perform the listed above operations, it will wait for the tape job to finish. Note that in this case the source job may finish with a significant delay.

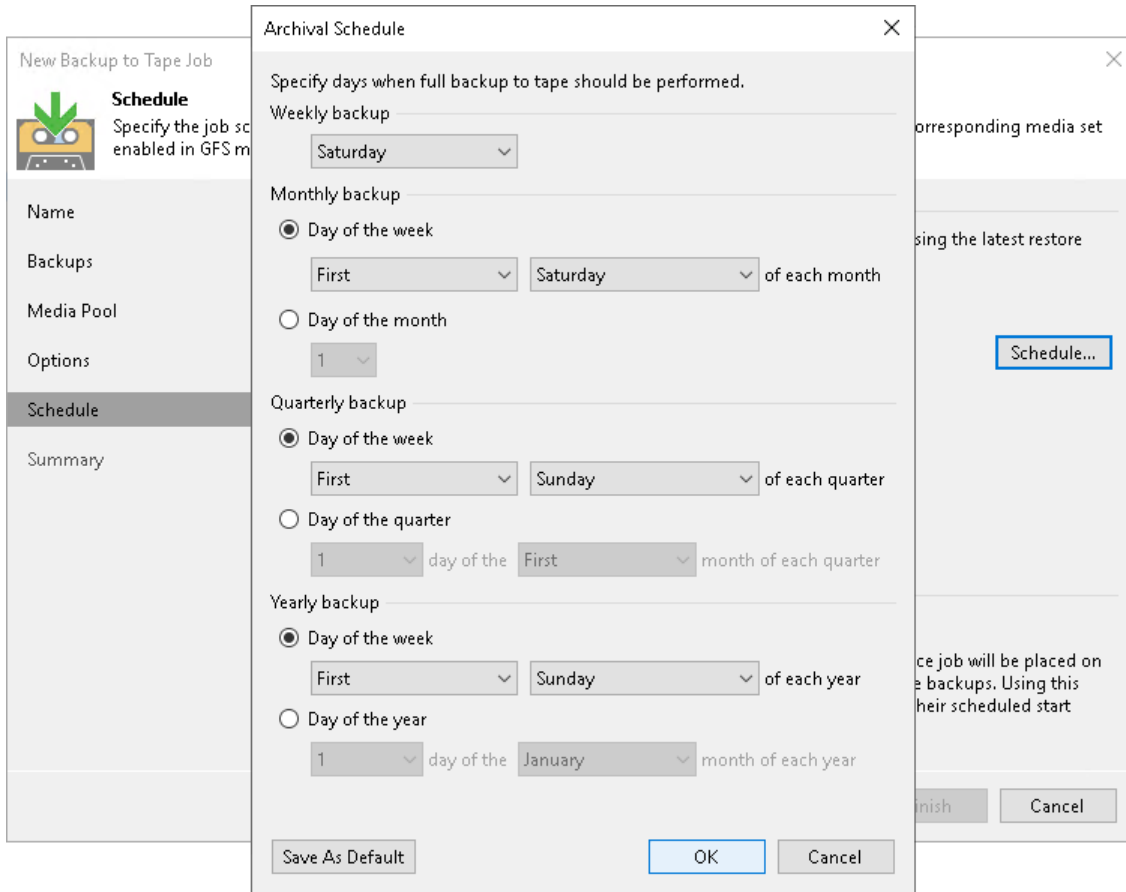
NOTE

If the source job creates per-machine backups, the tape job gets priority for each per-machine restore point separately. In this case, the source job will be able to lock other per-machine restore points and perform the needed operations. Make sure that you set sufficient timeout in the **If some linked backup jobs are still running, wait for up to** window to avoid the tape job failing.

Schedule for GFS Job

This step of the wizard is available if you selected a GFS media pool at the **Full Backup** step of the wizard.

Click **Schedule** to select days for each media set.



In the **Perform GFS scan daily at** field, specify the time when the GFS job must start.

TIP

After you specify necessary schedule settings, you can save them as default. To do this, click **Save as Default** at the bottom left corner of the **Archival Schedule** window. When you create a new GFS job, Veeam Backup & Replication will automatically apply default settings to the new job schedule.

Sometimes, the source job may start when the tape job is still running. By default, the source job has priority. In this case, the tape job terminates with error and no data is written to tape. Select the **Prevent this job from being interrupted by source backup jobs** option if you want to give the tape job a higher priority. If this option is selected, the source job will wait until the tape job finishes. Note that the source job may start with a significant delay.

For tenant to tape jobs, this option is active by default and cannot be disabled.

The screenshot shows a dialog box titled "New Backup to Tape Job" with a close button (X) in the top right corner. The "Schedule" tab is selected in the left-hand navigation pane. The main content area is titled "Schedule" and contains the following text: "Specify the job scheduling options. You can only set schedule for those media pools which have the corresponding media set enabled in GFS media pool's properties." Below this, there is a "Schedule" section with a description: "This Backup to Tape job will synthesize a full backup file to archive to tape using the latest restore point available in the source backup repository at the specified time." A "Start daily scan for GFS restore points at:" label is followed by a time selection dropdown menu showing "12:00 AM". To the right of this is a "Schedule..." button. Below the time selection, there are four backup frequency options: "Daily backup: Every day", "Weekly backup: Saturday", "Monthly backup: First Sunday of the month", and "Quarterly backup: First Sunday of the quarter". A "Yearly backup: First Sunday of the year" option is also present. Below these options is a "Tape job priority" section with a checkbox labeled "Prevent this job from being interrupted by source backup jobs". A descriptive paragraph follows: "If the source backup job starts while the tape job is still running, the source job will be placed on hold instead of interrupting the tape job and resulting in incomplete tape backups. Using this option may result in source backup jobs starting significantly later than their scheduled start time, thus potentially missing recovery point objectives." At the bottom of the dialog, there are four buttons: "< Previous", "Apply", "Finish", and "Cancel".

New Backup to Tape Job [X]

Schedule
Specify the job scheduling options. You can only set schedule for those media pools which have the corresponding media set enabled in GFS media pool's properties.

Name

Backups

Media Pool

Options

Schedule

Summary

Schedule

This Backup to Tape job will synthesize a full backup file to archive to tape using the latest restore point available in the source backup repository at the specified time.

Start daily scan for GFS restore points at: 12:00 AM [Dropdown]

Daily backup: Every day [Schedule...]

Weekly backup: Saturday

Monthly backup: First Sunday of the month

Quarterly backup: First Sunday of the quarter

Yearly backup: First Sunday of the year

Tape job priority

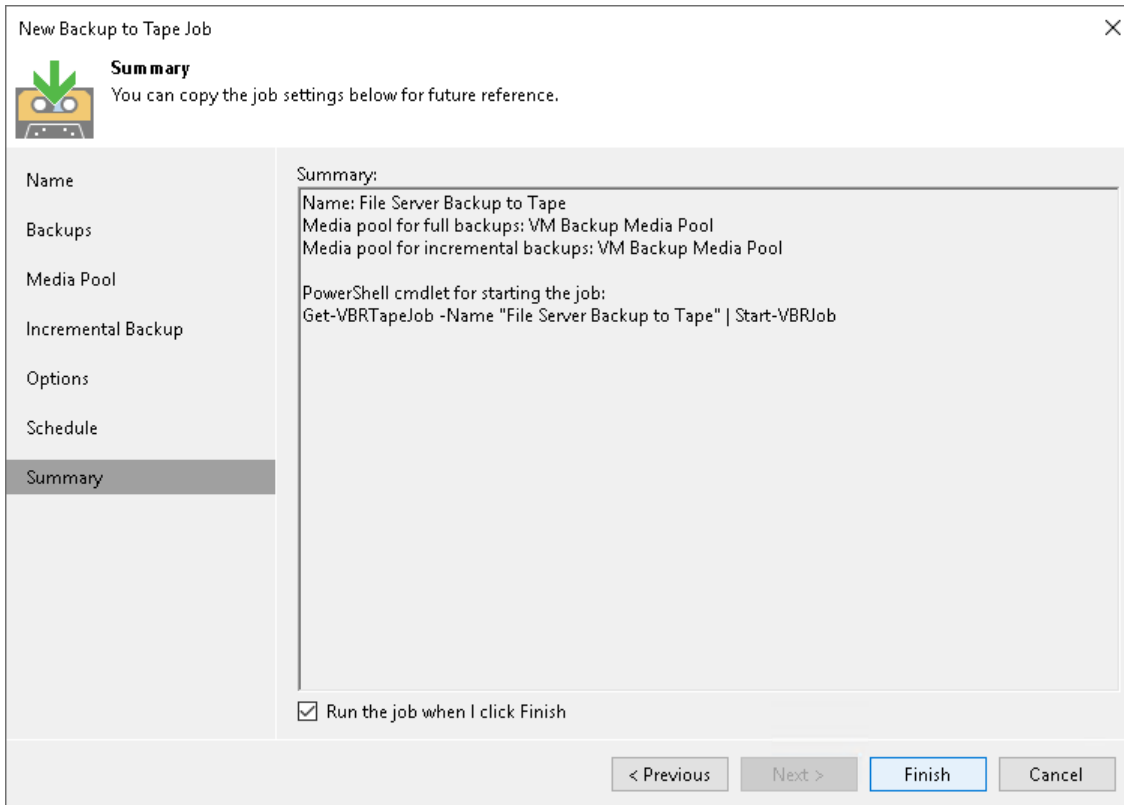
Prevent this job from being interrupted by source backup jobs

If the source backup job starts while the tape job is still running, the source job will be placed on hold instead of interrupting the tape job and resulting in incomplete tape backups. Using this option may result in source backup jobs starting significantly later than their scheduled start time, thus potentially missing recovery point objectives.

< Previous Apply Finish Cancel

Step 9. Finish Working with Wizard

After you have specified schedule settings, click **Create**. Select the **Run the job when I click Finish** check box if you want to start archiving backups to tape job right after you complete working with the wizard. Click **Finish** to close the wizard.

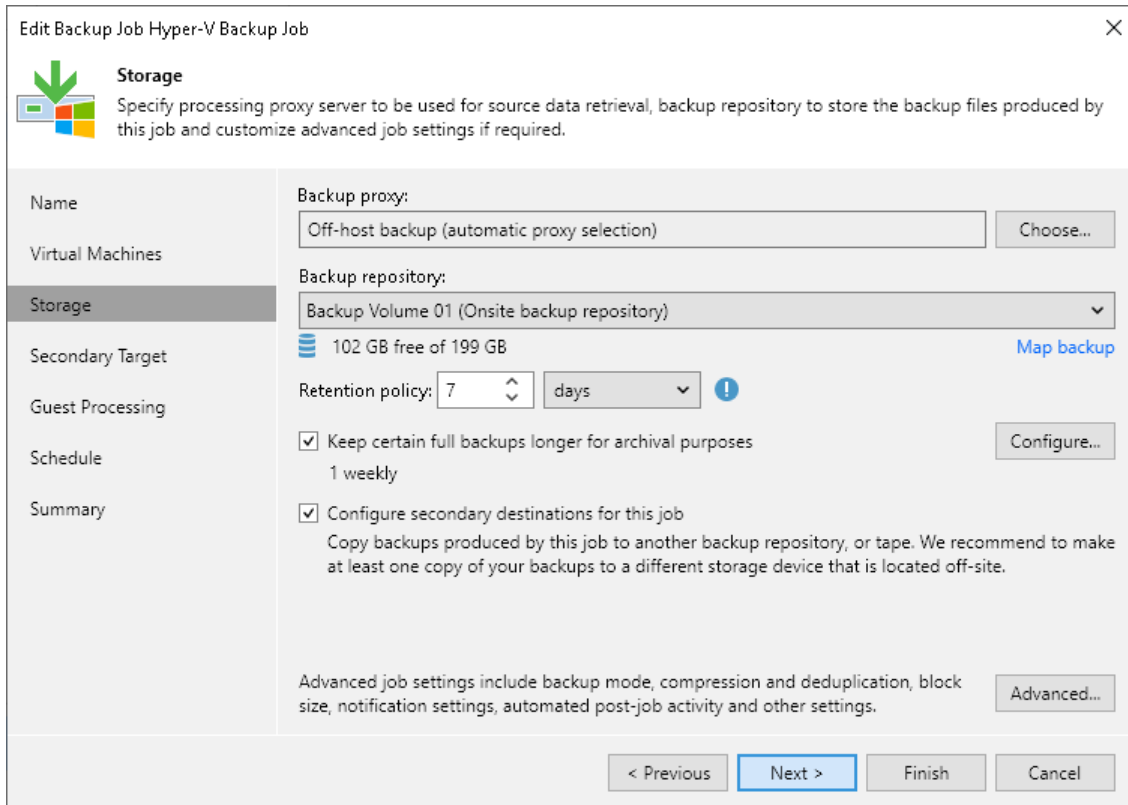


Linking Backup Jobs to Backup to Tape Jobs

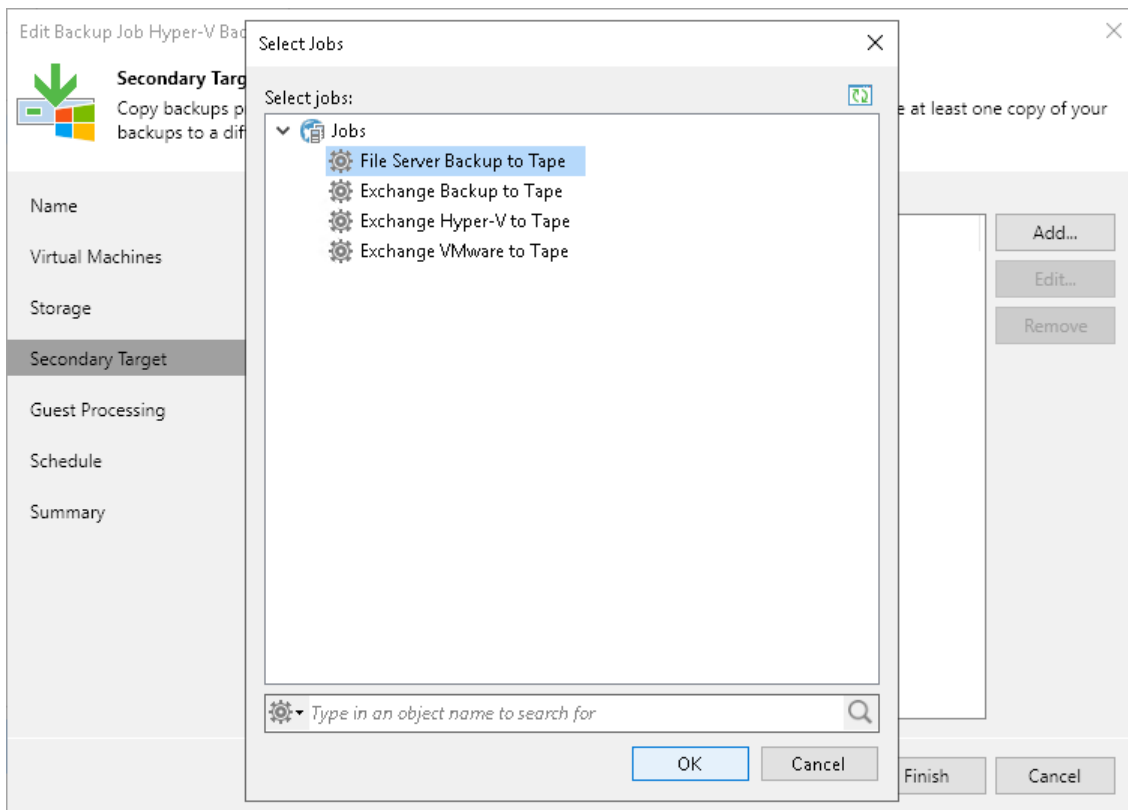
Apart from [creating a backup to tape job](#) for an existing backup job, you can link a backup job to an existing backup to tape job using the [Backup Job](#) wizard.

To point a backup job to an existing backup to tape job, perform the following steps:

1. Open the backup job settings and navigate to the **Storage** step. Select the **Configure secondary destination for this job** check box.



2. At the **Secondary Target** step, click **Add** and choose a backup to tape job to which the backup job should be linked.



3. Save settings. Veeam Backup & Replication will automatically update backup files settings of the chosen backup to tape job.

Related Topics

- [Backup to Tape](#)
- [Creating Backup to Tape Jobs](#)
- [Creating Backup Jobs](#)

GFS Backup to Tape

The GFS tape job creates yearly archive for source machines by the GFS (Grandfather-Father-Son) scheme. The GFS archive includes one yearly backup and several quarterly, monthly, weekly and daily backups.

You can create GFS backups for VMs and Veeam agent computers (physical machines) on tape.

The GFS tape job does not process source machines. The job uses backups created by machine-to-disk jobs.

NOTE

GFS backup to tape does not support NAS backup jobs or repositories storing NAS backups as a source. However, if the backup repository stores not only NAS backups, but also backups that can be processed by a GFS backup to tape job, you can add this repository to the GFS backup to tape job: NAS backups will be skipped from processing.

GFS Media Sets

To distinguish between the backup cycles, the GFS media pool has 5 predefined media sets: yearly, quarterly, monthly, weekly and daily.

Media Set	Restore Point Type
Yearly	Full backup or synthesized virtual full backup
Quarterly	
Monthly	
Weekly	
Daily	As on disk (for details, see How GFS Backup to Tape Works)

Individual Media Sets Configuration

You can configure each media set individually. You can set retention period, appending data to tape or other settings for each media set separately.

For example, the weekly backups must be stored for 4 weeks, data is appended, tapes may be overwritten. The yearly backups must be never overwritten, each backup on an individual tape (or set of tapes), tapes must be moved to vault.

Manual Active Full

You can manually create a restore point for any media set at any time with the **Active full** option. Veeam Backup & Replication will copy or synthesize the most recent full backup possible for the selected period. The manual active full is not available for the **Daily** media set.

Schedule Overlap

If the schedule for backup periods overlap, only the backup for the eldest media set will be archived. The media sets have the following priority: **Yearly, Quarterly, Monthly, Weekly, Daily**. For example, if "the first Sunday of January" is the date for the monthly, the quarterly and the yearly backup, the GFS job will create only the yearly backup; the monthly and the quarterly backups will be skipped.

How GFS Backup to Tape Works

To create a GFS archive, Veeam Backup & Replication performs the following operations:

1. The GFS job starts according to the GFS job schedule and checks which media set is scheduled for today.
2. For GFS jobs with the **Daily** media set disabled:
 - If the source job creates a full backup, the GFS job copies it.
 - If the source job creates an incremental backup, the GFS job synthesizes a virtual full backup.

If the source job created several restore points, the tape job will copy only the first one.

3. For GFS jobs with the **Daily** media set enabled:
 - If today some elder media sets are also scheduled, for example, the weekly media set, the GFS job archives the first restore point to the **Weekly** media set:
 - If the source job creates a full backup, the GFS job copies it.
 - If the source job creates an incremental backup, the GFS job synthesizes a virtual full backup.
 - If there is more than 1 restore point on disk available, the GFS job copies the rest of them to the **Daily** media set.
 - If only the **Daily** media set is due today, the GFS job copies all available restore points to the **Daily** media set.
4. If no backup appears on the disk till the end of the day, the GFS job waits for the source job to start. If the source job starts during the day, the GFS job waits till the source job finishes and copies the created backup to tapes. If the source job does not start, the GFS job stops at midnight. It starts again according to the configured schedule.

Consider the following:

- No restore point will be archived to the **Daily** media set when the daily backup overlaps elder media sets dates, and only one source restore point is available.
- Daily increment restore points are linked to a full restore point in any media set. For example, a full restore point from the **Weekly** media set is used. If there is no full restore point that can be used for linking the daily increments, the tape job will create a virtual full backup and put it to the **Daily** media set.
- The GFS job copies only new restore points. If the source job did not create a new point after the last GFS job run, the GFS job will not copy anything to tape. For example, if you want weekly backups in the tape GFS archive, make sure that the source job runs at least once a week.
- When you link a source job to a GFS job, the GFS job does not copy old restore points. The GFS job will copy only the restore point created on the day when the GFS job was linked to the source job or new restore points created later.
- If the restore point is available but locked (for example, if the source job is a backup copy job), the GFS job will wait for this restore point to become available for up to 7 days. If the restore point is still locked after 7 days, the GFS job will use the most recent restore point that is not locked.

If you do not want to wait, you can instruct the tape job to copy the most recent restore point instead of waiting. To do this, select the **Process the most recent restore point instead of waiting** check box in the settings of the tape job. For more details, see [Advanced Settings for GFS Tape Job](#).
- If you stop the tape job manually, it will start again the next day at the time scheduled.

- If you use the **Daily** media set, after creating or enabling a tape job it will be started within an hour even if the scheduled start time has already passed.
- If there is a technical problem, for example, the tape library is offline, or the backup server is down, the GFS job will not run. When the problem is fixed, the GFS job will archive one most recent missed full backup for each media set.
- If the GFS tape job was disabled manually for some period, it will skip all backups for this period after it is resumed.
- If the GFS job failed for some reason, it will try to restart every hour for 24 hours.
- If a job is unable to complete within a period of 21 days, it will be stopped with the 'Failed' status.

Creating GFS Tape Jobs

To create a GFS archive on tape, you need to create a GFS media pool and target a backup to tape job to it. Technically, a GFS tape job is a variant of backup to tape job. When you select a GFS media pool as target, the job schedule automatically changes to the GFS mode. For details, see [Creating Backup to Tape Jobs](#).

As a source, you can use a backup job with any backup method: forever forward incremental, forward incremental or reversed incremental.

NOTE

If you use a job with enabled GFS retention as a source for a GFS tape job, the GFS tape job writes restore points to tapes according to its own schedule. The schedule of the source job is not taken into account.

Tenant Backup to Tape

This option is available for Veeam Cloud Connect service providers.

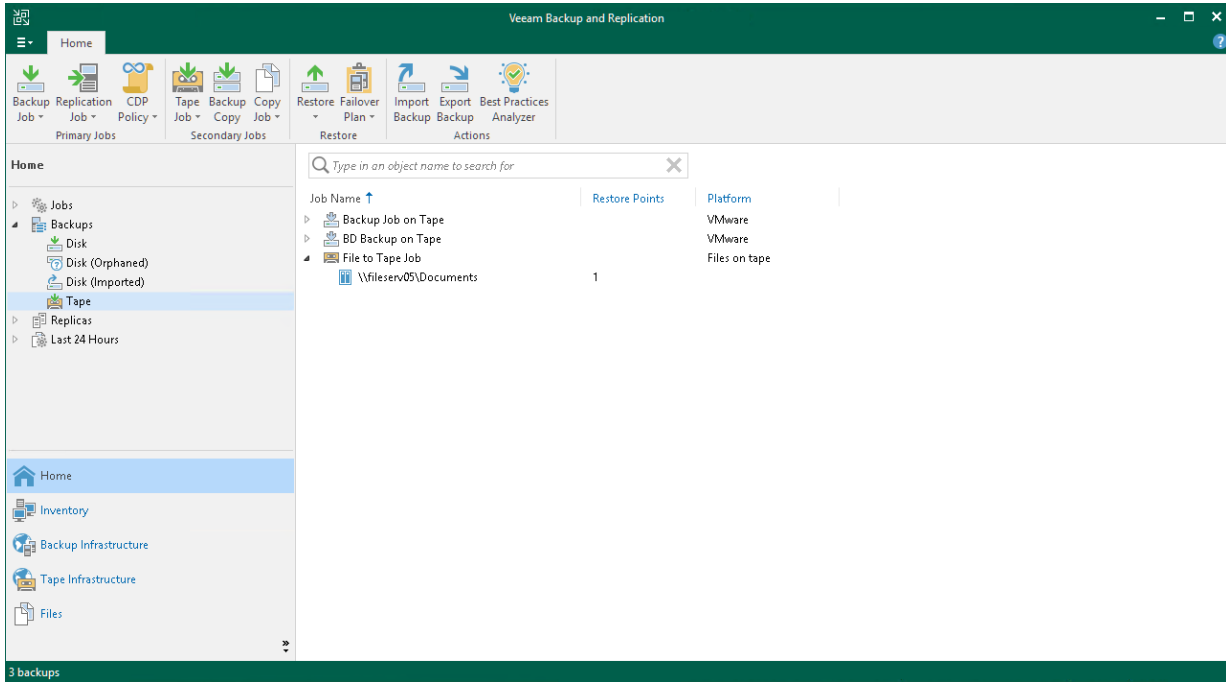
Service providers can back up their tenants' backups from cloud repositories. This allows for better protection of the tenants or for regulations compatibility. For more information, see the [Veeam Cloud Connect](#) guide.

To back up a tenant to tape, run a backup to tape job. For more information, see [Machines Backup to Tape](#).

Viewing Backups on Tape

After the backup to tape job completes, you can view the created archive on tape:

1. Open the **Home** view.
2. Expand the **Backups > Tape** node and locate the backup archive under the name of the job.



File Backup to Tape

File to tape job allows you to back up to tape any Microsoft Windows or Linux files. Also, you can back up volumes of storage devices that support the NDMP protocol. For more information, see [NDMP Servers Backup to Tape](#).

You can back up files to tape from the following storage devices:

- Windows servers, including physical boxes.
- Linux servers, including physical boxes.
- NAS devices (by specifying the path to the SMB (CIFS) or NFS file share).
- NDMP servers.

To back up Veeam backup files, you can use backup to tape jobs that are specially intended for this and offer more possibilities. However, you can archive backups as files using file to tape job.

When planning file to tape jobs, consider that the job performance depends more on the number of files to back up than on the amount of data. For example, writing a large number of small files with overall size of 10GB with one job will take more time than writing one 10GB file. If your job contains an extra-large number of files (like millions of files) with one job, the job performance will be affected significantly. To improve performance, consider creating several file to tape jobs.

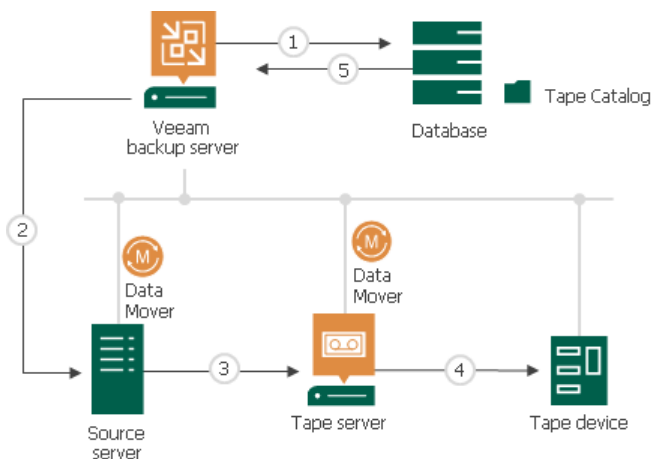
NOTE

If the file to tape job fails to complete in 3 weeks, it is terminated by timeout.

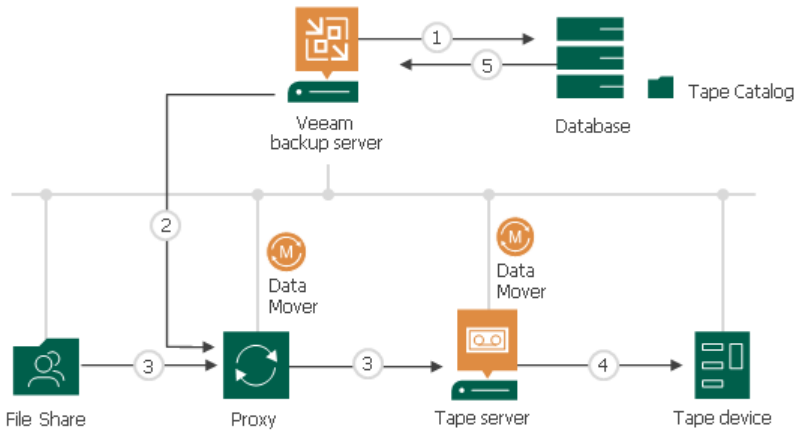
How File Backup to Tape Works

When Veeam Backup & Replication executes a file to tape job (started manually or on schedule), it performs the following operations:

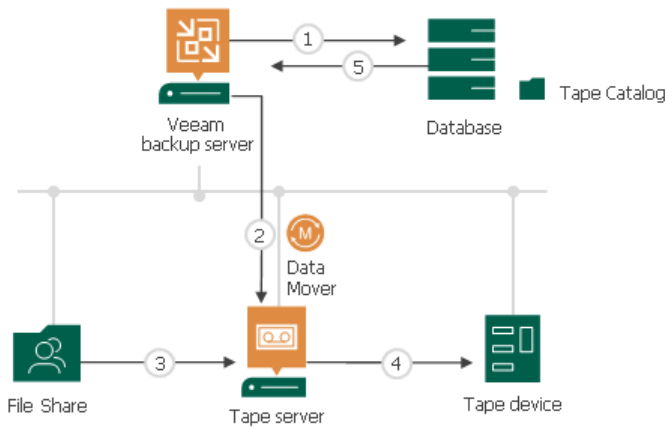
1. The file to tape job detects files that match the job criteria.
2. The files are queued for archiving. The following scenarios are used:
 - If it is a first job run or a scheduled full backup, all selected files are queued for archiving.
 - If it is an incremental backup run, Veeam Backup & Replication addresses the Tape Catalog in the Veeam Backup & Replication database to detect if any data has been modified since the latest backup. Detected changes are queued for archiving.
3. Veeam Backup & Replication connects to Veeam Data Movers and starts the data transfer process. The source Data Mover retrieves data from the source servers and target Data Mover sends data to tape.
4. The tape job addresses the media pool that is set for this job as target. The media pool allots tapes for writing data according to the following configuration options:
 - Tapes consumption
 - Media sets
 - Tape retention
5. While tape recording is performed, Veeam Backup service updates data in the Tape Catalog in Veeam Backup database. The Veeam Backup console displays refreshed information about files archived to tape and shows job statistics.



For file to tape jobs from file shares, Veeam Backup & Replication performs similar operations with an addition of a backup proxy server. If you explicitly [specify proxy servers](#), Veeam Backup & Replication performs file backup to tape in the following way:



In case the file share has automatic backup proxy server selection enabled, the tape server is added to the list of backup proxies and is used by default if it has access rights to the file share.



Before You Begin

Before you configure a file to tape job, consider the following:

- The file backup to tape functionality consumes Veeam instance licenses. However, if you upgrade to Veeam Backup & Replication 12 from the previous versions, you will have a grace period of 3 months during which your file to tape jobs will not consume license instances. For more information, see the **Instance Consumption for NAS Backup and File to Tape Jobs** section of the Veeam Backup & Replication User Guide.

Note that the NDMP servers backup to tape functionality does not consume Veeam instance licenses.

- You must configure one or more regular media pools with the necessary media set and retention settings.
- You must load tapes to the tape device and configure the target media pool so that it has access to them. If the media pool has no available tape, the tape job will wait for 72 hours and then terminate.
- Make sure that files and folders that you want to back up do not contain certain Unicode symbols, including but not limited to the symbols with the following codes: U+D800 - U+DFFF, U+FFFE, U+FFFF (55296 - 57343, 65534, 65535), U+007C (124). Also the file and folder names must contain only symbols that are supported by the source file system. Files and folders with unsupported names will be skipped from processing.
- Make sure that files and folders that you want to back up are not symlinks. Backup of symlinks is not supported.
- For SMB and NFS file share backup to tapes, make sure that the shared source does not contain folders with the same name entered in different letter case (for example, **Documents** and **documents**).
- To back up NDMP volumes, add a storage device that supports the NDMP protocol as an NDMP server. For more information, see [Adding NDMP Servers](#).

Note that if a job is unable to complete within 21 days period, it will be stopped with the 'Failed' status.

System Requirements for Large Number of Files in Job

If the file to tape job will process large quantities of files, you must provide additional system resources apart from those listed in system requirements for the [backup server/database server](#) and [tape server](#).

Backup Server

Amount of files	RAM	CPU Cores
1 million files	12 GB	8
10 million files	24 GB	12
100 million files	32 GB	24
1 billion files	64 GB	48

Database Server

For storing the configuration database, we recommend using a dedicated NVME drive that is not used for anything else. The recommended RAM size is the same as for the backup server. If the database server and the backup server are the same server, double the RAM. 8 CPU cores is the recommended minimum for the database server.

IMPORTANT

Do not back up to tape large number of files (over 1 000 000 files in 1 000 folders) in one tape job if your Veeam backup server uses Microsoft SQL Server Express edition. Processing a large number of files will result in considerable performance penalty. Note that the usage of Microsoft SQL Server Express Edition is limited by the database size up to 10 GB. If you plan to have larger databases, use other editions of Microsoft SQL Server or PostgreSQL.

NDMP Servers Backup to Tape

If your NAS device supports the NDMP protocol, you can back up data from it to tape. For this, you need to utilize the file to tape job.

NOTE

Support of NDMP servers backup to tape is included in the Veeam Universal License and does not consume Veeam licenses. When using a legacy socket-based license, the Enterprise Plus edition of Veeam Backup & Replication is required. For details, see [Veeam Editions Comparison](#).

To back up data from NAS devices by the NDMP protocol, you need to add the device as an NDMP server. For details, see [Adding NDMP Servers](#).

IMPORTANT

Even if the NAS device supporting NDMP protocol is already added to Veeam Backup & Replication, you need to add the NDMP server as a separate procedure. Otherwise you will not be able to perform file backup to tape.

Requirements for NDMP Servers

NDMP version 4 or higher is supported.

Number of Restore Points

For all NDMP devices, the backup chain stored on tapes will consist of 10 restore points maximum. On the 11th run, Veeam Backup & Replication will force an active full.

Limitations for NDMP Servers

- Only backup of whole volume is supported.
- Both the NetApp "SVM-scoped NDMP" mode and the NetApp Cluster Aware Backup (CAB) extension of the NDMP protocol are supported.

In SVM-scoped configuration, add each cluster node to the backup user interface on their own data LIF IP/DNS address. This is also known as "Node-scoped NDMP".

To support backup of NetApp CAB extension, add the NDMP server with IP address of the cluster management interface or with the NAS server name resolving to this IP address.

- The NDMP server performs its own backup consistency check for the NDMP volumes. To provide for the correct calculation of the delta of changes and to ensure the backup chain integrity, Veeam Backup & Replication does not allow adding one NDMP volume to more than one file to tape job.

See Also

[File Restore from Tape](#)

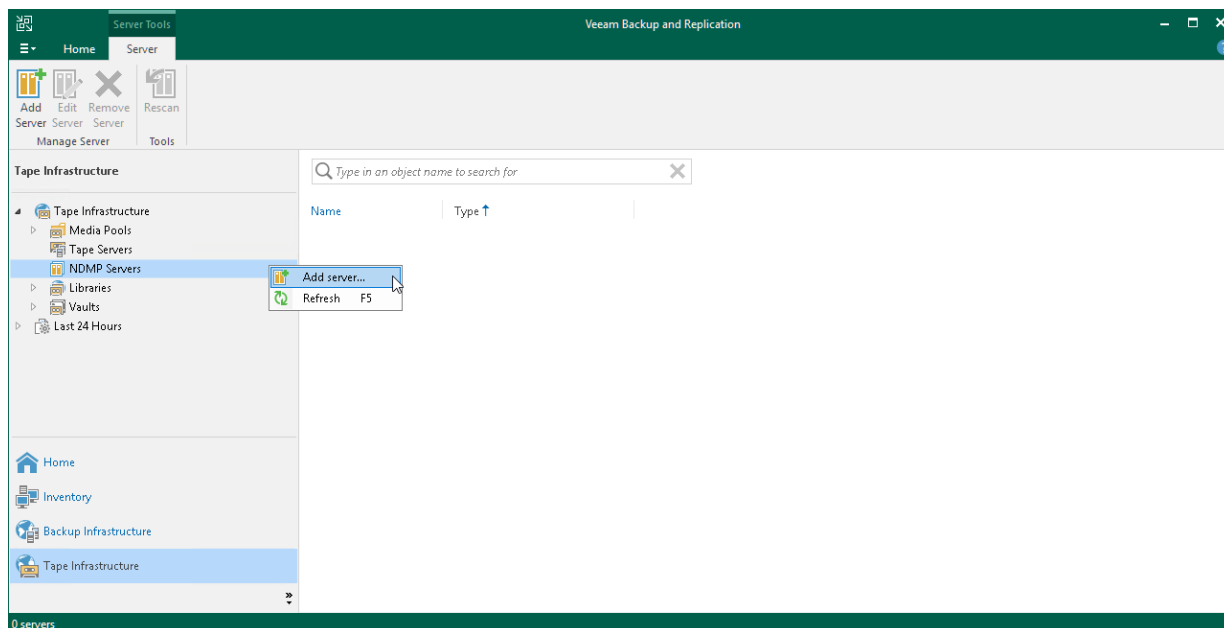
Adding NDMP Servers

To add an NDMP server, follow the next steps:

Step 1. Launch New NDMP Server Wizard

To launch the **New NDMP Server** wizard:

1. Open the **Tape Infrastructure** view.
2. Do one of the following:
 - In the inventory pane, right-click the **NDMP Servers** node and select **Add Server**.
 - In the inventory pane, select the **NDMP Servers** node and click **Add Server** on the ribbon.
 - In the inventory pane, select the **Tape Infrastructure** node and click **Add NDMP Server** on the ribbon.



Step 2. Specify NDMP Server Name and Location

At the **NDMP Server** step of the wizard, enter the name of the NDMP server and connection details.

1. In the **NDMP server name and port** field, enter the name or the IPv4 or IPv6 address of the NDMP server you want to connect to and the port for the connection. Note that you can use IPv6 addresses only if IPv6 communication is enabled as described in the **IPv6 Support** section of the Veeam Backup & Replication User Guide. Check your NAS device settings for details.
2. From the **Credentials** list, select credentials for the account that has administrator privileges on the NDMP server. If you have not set up credentials beforehand, click the Manage accounts link or click **Add** on the right to add the credentials. For more information, see the **Managing Credentials** section of the Veeam Backup & Replication User Guide.

Veeam Backup & Replication will use the provided credentials to deploy its components on the added server.

3. In the **Gateway server** section, specify settings for the gateway server:
 - If a network connection between the NDMP server and gateway server is fast, choose **Automatic selection**. In this case, Veeam Backup & Replication will automatically select a gateway server.
 - If you perform backup over WAN or slow connections, choose **The following server**. From the list below, select a Microsoft Windows server on the target site that you want to use as a gateway server. The selected server must have a direct access to the NDMP server and must be located as close to the NDMP server as possible.

New NDMP Server

NDMP Server
Specify name and location of an NDMP server. Please refer to your NAS documentation for connection settings details.

NDMP Server

Summary

NDMP server name and port:
172.24.145.116 10000

Credentials:
Administrator (Administrator, last edited: 5 days ago) Add...

[Manage accounts](#)

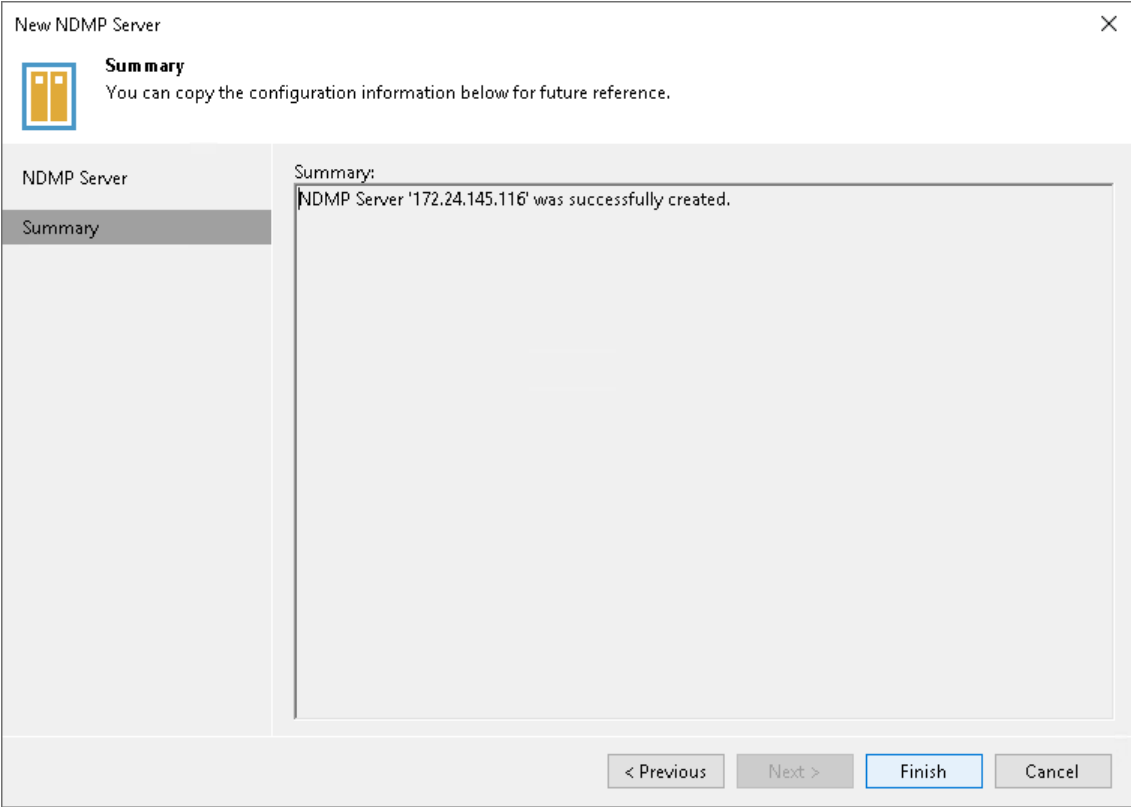
Gateway server:
 Automatic selection
 The following server:
backupsrv10.tech.local (Backup server)

Using a gateway server located in a remote site improves performance and reliability of backup.

< Previous Next > Finish Cancel

Step 3. Finish Working with the Wizard

Review the NDMP server settings and click **Finish** to complete the wizard.



Creating File to Tape Jobs

To write files to tape, you should create a file to tape job using the **New File to Tape Job** wizard. This section will guide you through all steps of the wizard and provide explanation on available options.

To create a file to tape job, follow the next steps:

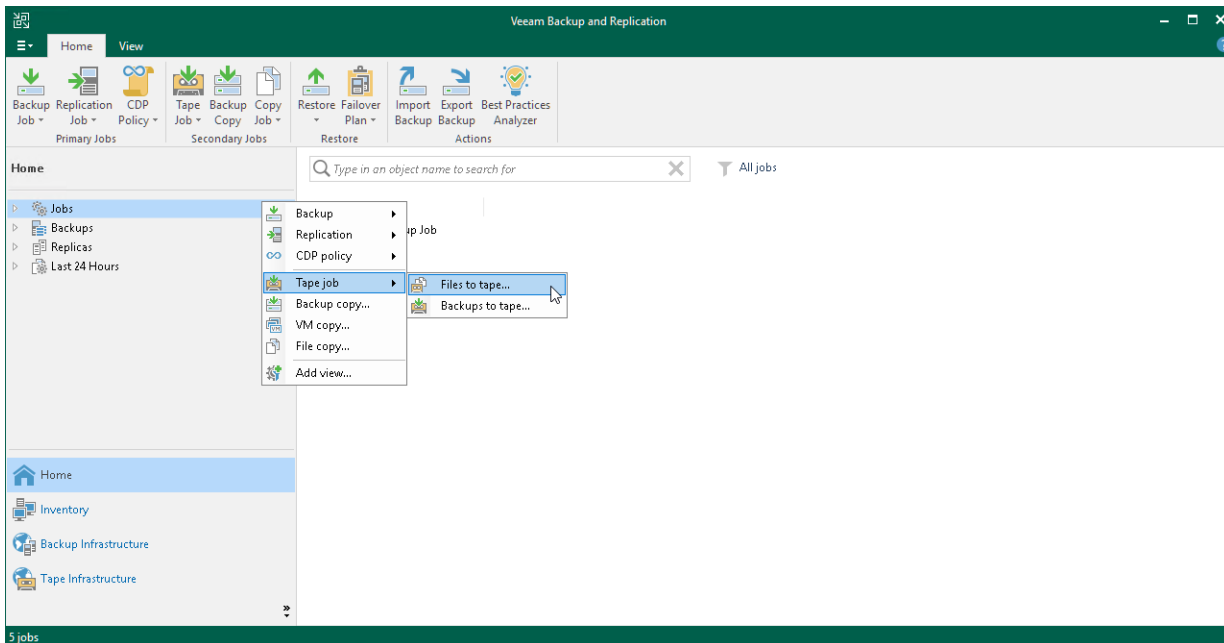
Step 1. Launch New File to Tape Job Wizard

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

- On the **Home** tab, click **Tape Job** and select **Files**.
- Open the **Home** view, right-click the **Jobs** node and select **Tape Job > Files to Tape**.

Alternatively, you can:

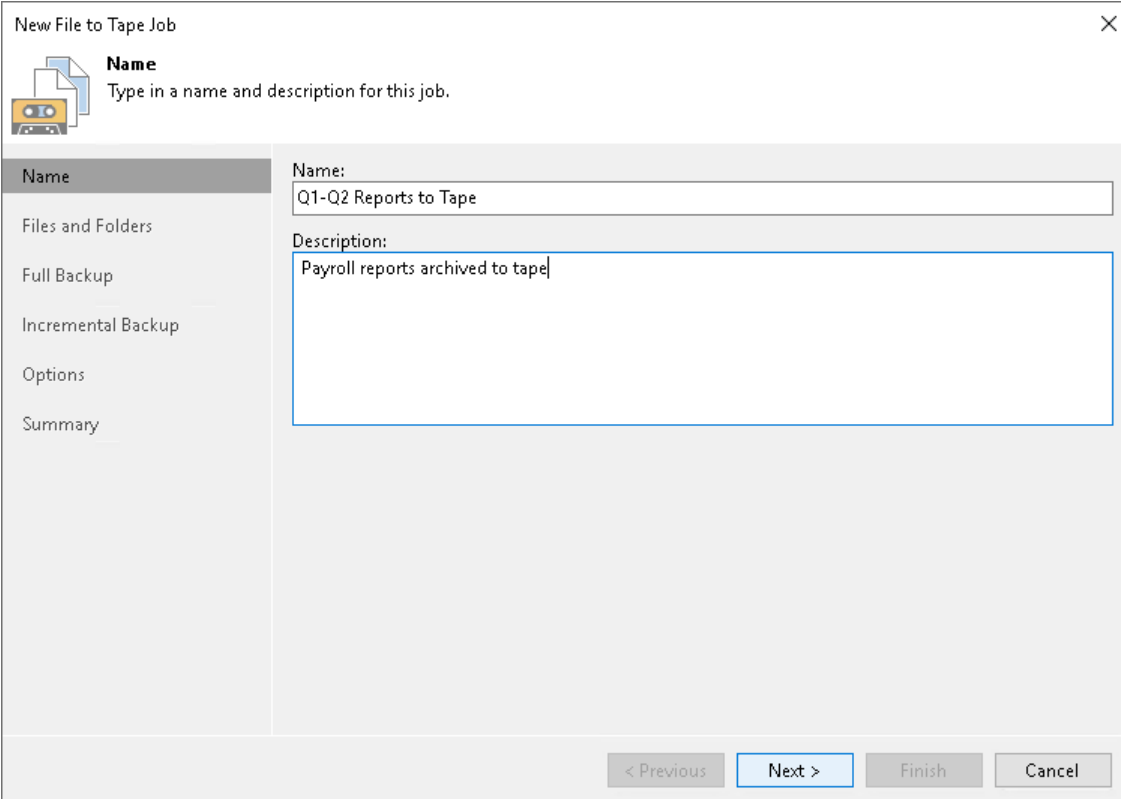
- Open the **Files** view, browse to the necessary files, select the files and choose **Add to Tape Job > New job** from the ribbon menu.
- Open the **Files** view, browse to the required files, right-click the necessary files and choose **Add to Tape Job > New job**.



Step 2. Specify Job Name and Description

At the **Name** step of the wizard, you should define basic settings for the created file to tape job.

1. In the **Name** field, enter a name for the created job.
2. In the **Description** field, enter a description of the created job. The default description contains information about the user who created the job, date and time when the job was created.



New File to Tape Job

Name
Type in a name and description for this job.

Name:
Q1-Q2 Reports to Tape

Description:
Payroll reports archived to tape

< Previous Next > Finish Cancel

Step 3. Choose Files and Folders to Archive

At the **Files and Folders** step of the wizard, select files and folders that you want to back up.

1. Click **Add**.
2. From the **Server** drop-down list, select a data source where the necessary files or folders reside:
 - If you plan to back up files and folders from a Windows or Linux server, make sure it is added as a managed server to the backup infrastructure. For details, see the Veeam Backup & Replication User Guide, sections *Adding Microsoft Windows Servers* and *Adding Linux Servers*.
 - If you plan to back up files and folders from an SMB or NFS share, make sure it is added as a file share to the inventory. For details, see the Veeam Backup & Replication User Guide, section *Adding File Share*.
 - If you plan to back up files and folders from a device supporting the NDMP protocol, make sure it is added as an NDMP server to the tape infrastructure. For details, see [Adding NDMP Servers](#).

The account you use to access the target server must have read permissions for the folder and all its child folders.

3. In the **Folders** tree, select folders you want to backup.

To select multiple folders, hold [Ctrl] and click necessary folders. Although different folders of the same share form separate records in the table, they will be processed by one job task.

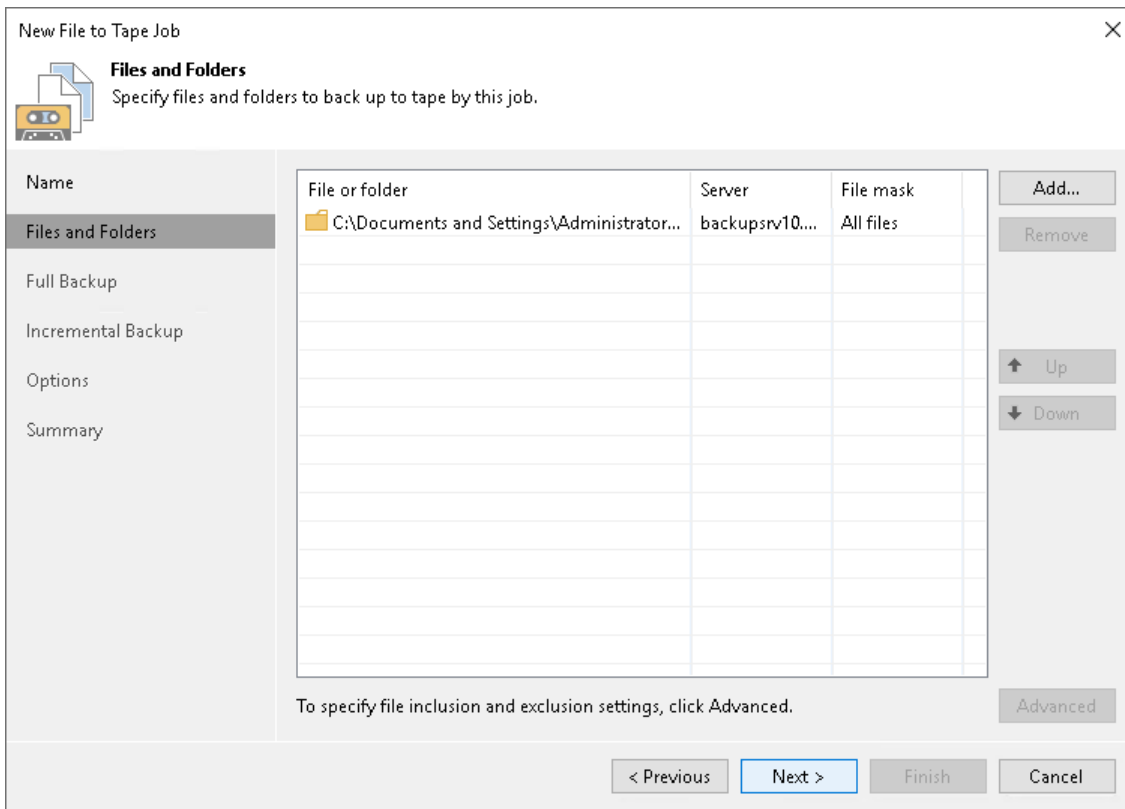
NOTE

On an NDMP server, you can select only volumes. You cannot back up separate files or folders. Also, you cannot use file masks.

Consider the following:

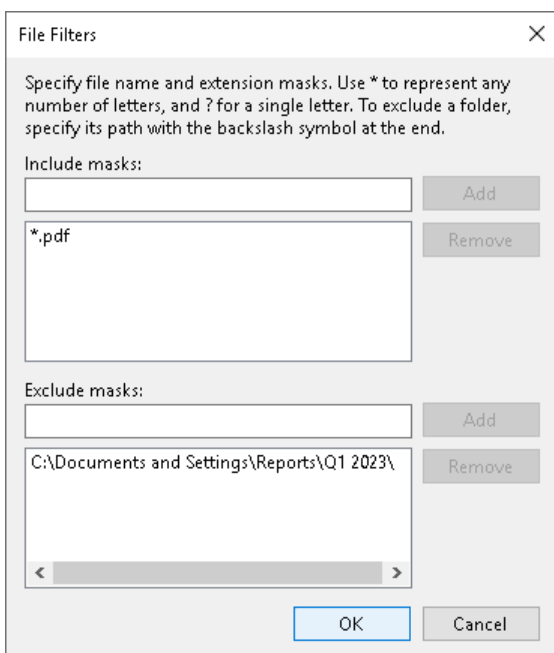
- Hard links are protected with content included.
- Symbolic links are protected as links, without the content they refer to.

- In the **Files and Folders** screen, use the **Up** and **Down** buttons on the right to move sources up or down. The sources of the job are processed in the order in which the list displays them.



If you add a folder to the job, all the folder contents will be processed. If necessary, you can choose only specific files from the added folder or exclude some subfolders. To do so, select a folder in the list and click **Advanced**. In the **File Filters** window, use **Include masks** and **Exclude masks** fields to filter the folder contents:

- To back up specific files, specify exact file names or create name masks (for example, ***.EVT** or ***.PDF**).
- To exclude folders and files within them from processing, specify the folder path with the backslash symbol at the end.



Step 4. Choose Media Pool for Full Backup

At the **Full Backup** step of the wizard, choose a media pool that will be used for archiving full backups of the selected files and create a schedule for full file backups.

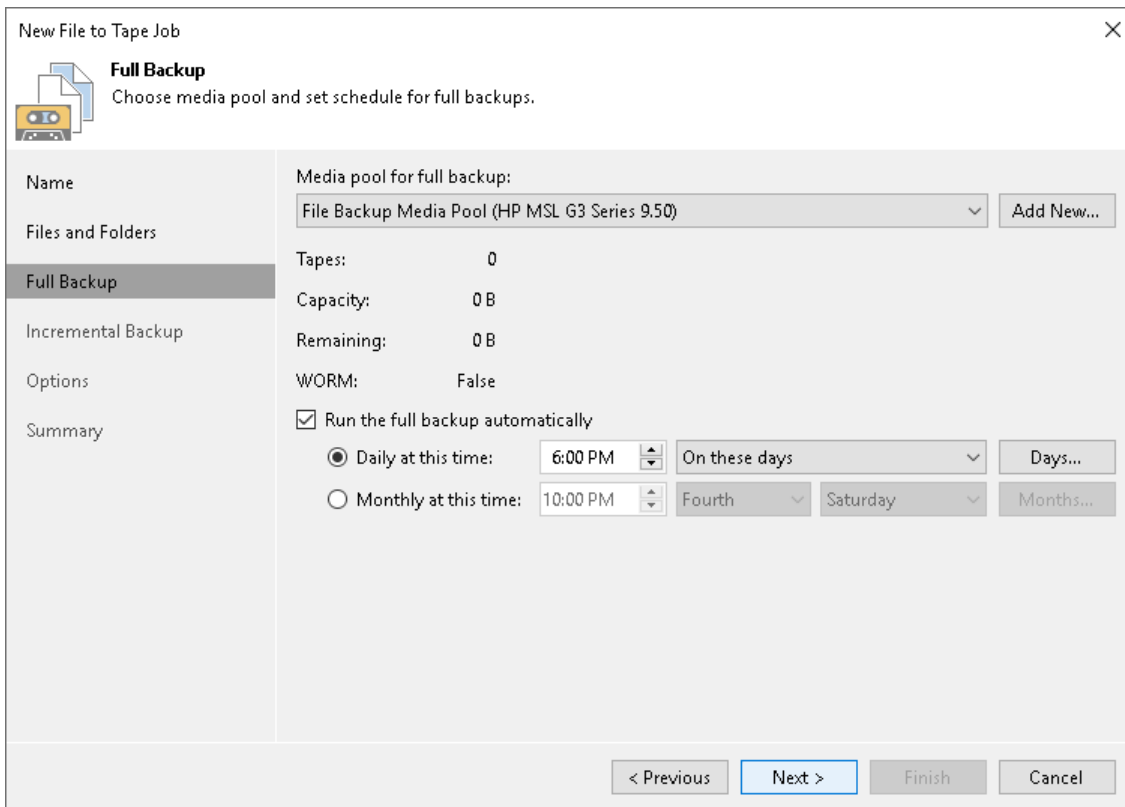
NOTE

You cannot use a GFS media pool as the target for file to tape jobs.

1. From the **Media pool for full backups** list, choose a media pool that will be used for full file backups.
2. To schedule periodic creation of full file backups, select the **Run the full backup automatically** check box and specify the schedule according to which the job will create full file backups. If this option is disabled, you will need to start the job manually to create full backups of files.

TIP

If you have not previously created a media pool with the required settings, you can click the **Add New** button and create a new media pool without closing the job wizard. For more details, see [Creating Media Pools](#).



The screenshot shows the 'New File to Tape Job' wizard window, specifically the 'Full Backup' step. The window title is 'New File to Tape Job' with a close button (X) in the top right corner. Below the title bar, there is a 'Full Backup' icon and the text 'Choose media pool and set schedule for full backups.' The main area is divided into two columns. The left column contains a navigation pane with the following items: 'Name', 'Files and Folders', 'Full Backup' (which is selected and highlighted), 'Incremental Backup', 'Options', and 'Summary'. The right column contains the configuration options for the full backup. At the top, it says 'Media pool for full backup:' followed by a dropdown menu showing 'File Backup Media Pool (HP MSL G3 Series 9.50)' and an 'Add New...' button. Below this, there are labels and values for 'Tapes: 0', 'Capacity: 0 B', and 'Remaining: 0 B'. The 'WORM:' option is set to 'False'. There is a checked checkbox for 'Run the full backup automatically'. Underneath, there are two radio button options for scheduling: 'Daily at this time:' with a time dropdown set to '6:00 PM' and a 'Days...' button; and 'Monthly at this time:' with a time dropdown set to '10:00 PM' and a 'Months...' button. The 'Monthly' option is currently selected, showing 'Fourth' and 'Saturday' as the chosen day and day of the week. At the bottom of the window, there are four buttons: '< Previous', 'Next >' (highlighted in blue), 'Finish', and 'Cancel'.

Step 5. Specify Media Pool for Incremental Backups

At the **Incremental Backup** step of the wizard, choose a media pool that will be used for archiving incremental backups of the selected files and create a schedule for incremental file backups.

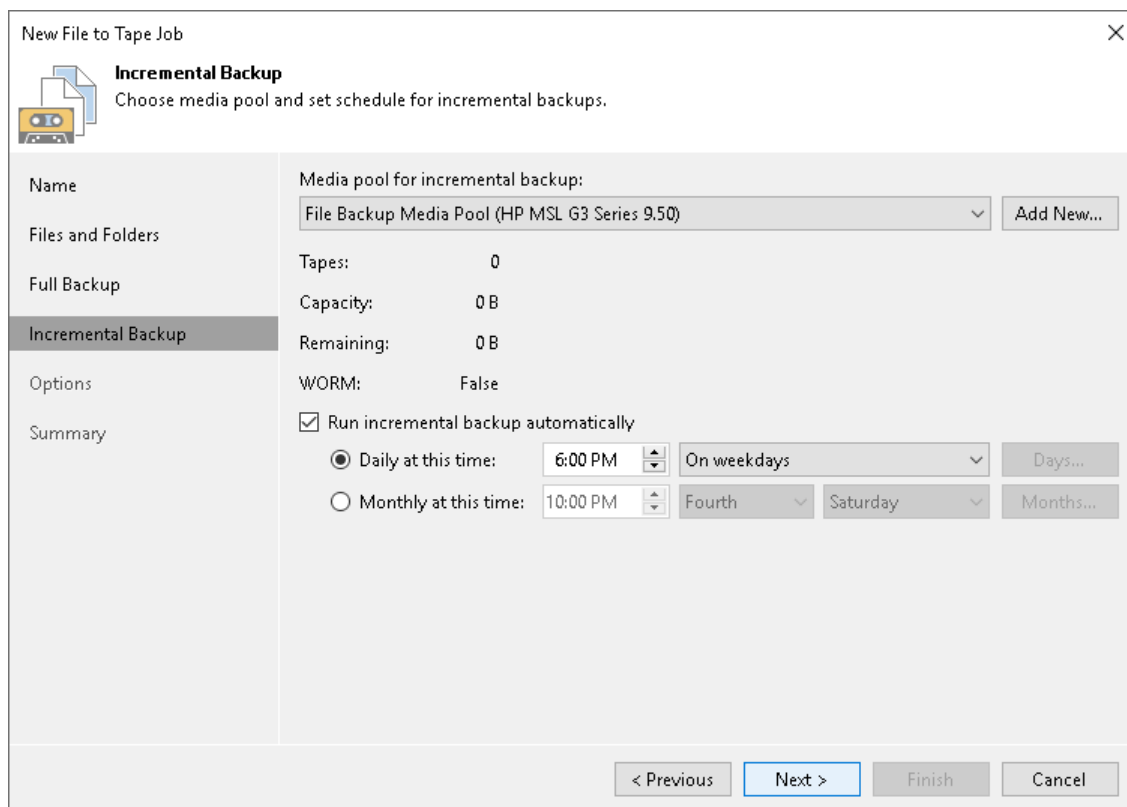
NOTE

You cannot use a GFS media pool as the target for file to tape jobs.

1. From the **Media pool for incremental backup** list, choose a media pool that will be used for incremental file backups.
2. To schedule periodic creation of incremental file backups, select the **Run incremental backup automatically** check box and specify the schedule according to which the job will create incremental file backups. If this option is disabled, you will need to start the job manually to create incremental backups of files.

TIP

If you have not previously created a media pool with the required settings, you can click the **Add New** button and create a new media pool without closing the job wizard. For more details, see [Creating Media Pools](#).



The screenshot shows the 'New File to Tape Job' wizard window, specifically the 'Incremental Backup' step. The window title is 'New File to Tape Job' with a close button (X) in the top right corner. Below the title bar, there is a sub-header 'Incremental Backup' and a description: 'Choose media pool and set schedule for incremental backups.' The main area is divided into two columns. The left column contains a navigation pane with the following items: 'Name', 'Files and Folders', 'Full Backup', 'Incremental Backup' (which is selected and highlighted), 'Options', and 'Summary'. The right column contains the configuration options for the incremental backup. At the top, it says 'Media pool for incremental backup:' followed by a dropdown menu showing 'File Backup Media Pool (HP MSL G3 Series 9.50)' and an 'Add New...' button. Below this, there are labels and values for 'Tapes: 0', 'Capacity: 0 B', and 'Remaining: 0 B'. The 'WORM:' option is set to 'False'. A checkbox labeled 'Run incremental backup automatically' is checked. Underneath, there are two radio button options for scheduling: 'Daily at this time:' and 'Monthly at this time:'. The 'Daily at this time:' option is selected. It includes a time dropdown set to '6:00 PM', a day dropdown set to 'On weekdays', and a 'Days...' button. The 'Monthly at this time:' option includes a time dropdown set to '10:00 PM', a day dropdown set to 'Fourth', a day-of-week dropdown set to 'Saturday', and a 'Months...' button. At the bottom of the window, there are four buttons: '< Previous', 'Next >' (which is highlighted in blue), 'Finish', and 'Cancel'.

Step 6. Specify Archiving Options

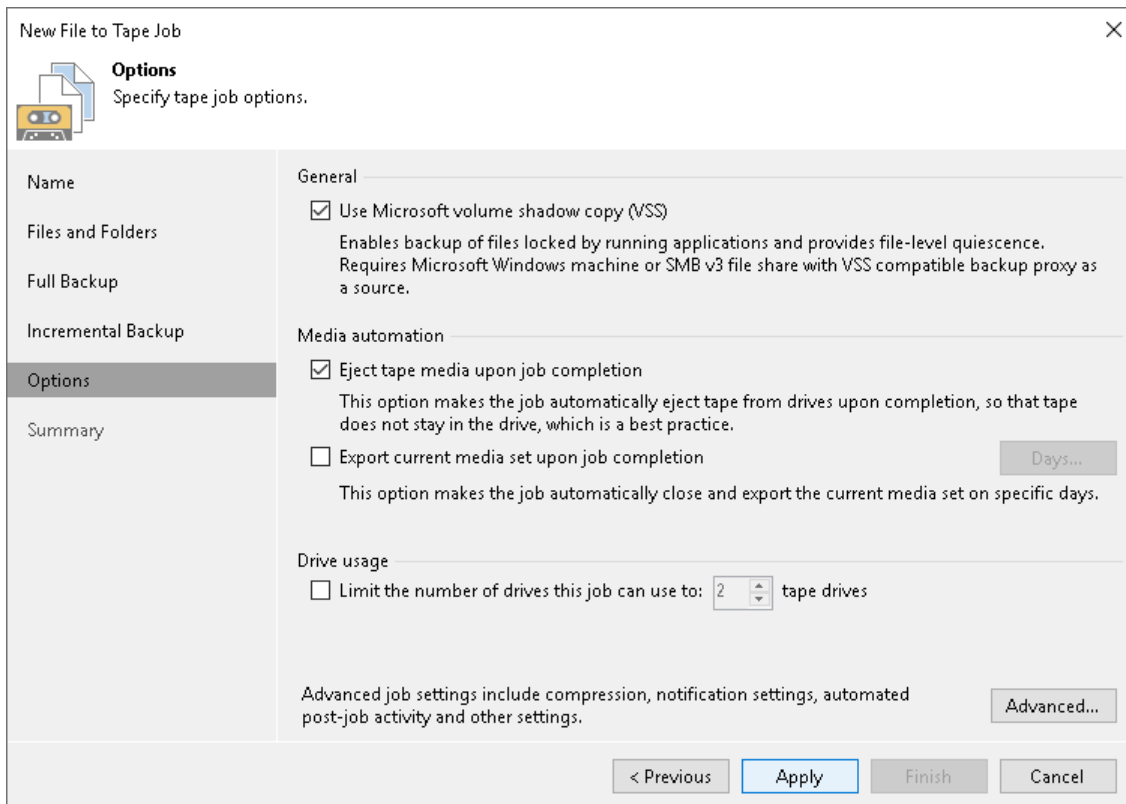
At the **Options** step of the wizard, specify archiving and media automation options:

- To enable backup of files with the help of Microsoft shadow volume copies, select the **Use Microsoft volume shadow copy (VSS)** check box. This option enables backup of files locked by application and provides file-level quiescence. This possibility can only be applied for files from servers running under Windows Server 2003 or later Windows-family OSes.
- If you want the tape to be automatically ejected from the tape drive and placed into a slot when the job finishes, select the **Eject media upon job completion** check box .
- If you want to pull out the tapes with the current media set from the tape device, select the **Export current media set upon job completion** check box. You can use this option, for example, to move tapes to another storage location. The tape device will eject the tapes that belong to the current media set when the media set is closed.

If you want to export tapes on specific days only (for example, every Saturday), click **Days** and schedule export on the necessary days.

Note that with this option selected, a new media set is started after each export.

- If the media pool, which is the target for the tape job, uses parallel processing, you can limit the number of drives to use for processing this tape job. To enable this, select the **Limit the number of drives this job can use to N tape drives** check box and specify the number of drives to use. For more information on how to enable parallel processing for the media pool, see [Add Optional Media Pool Settings](#).



Step 7. Specify Advanced Job Settings

At the **Options** step of the wizard, specify advanced settings for the file to tape job:

- [ACL Handling Settings](#)
- [Notifications Settings](#)
- [Advanced Settings](#)

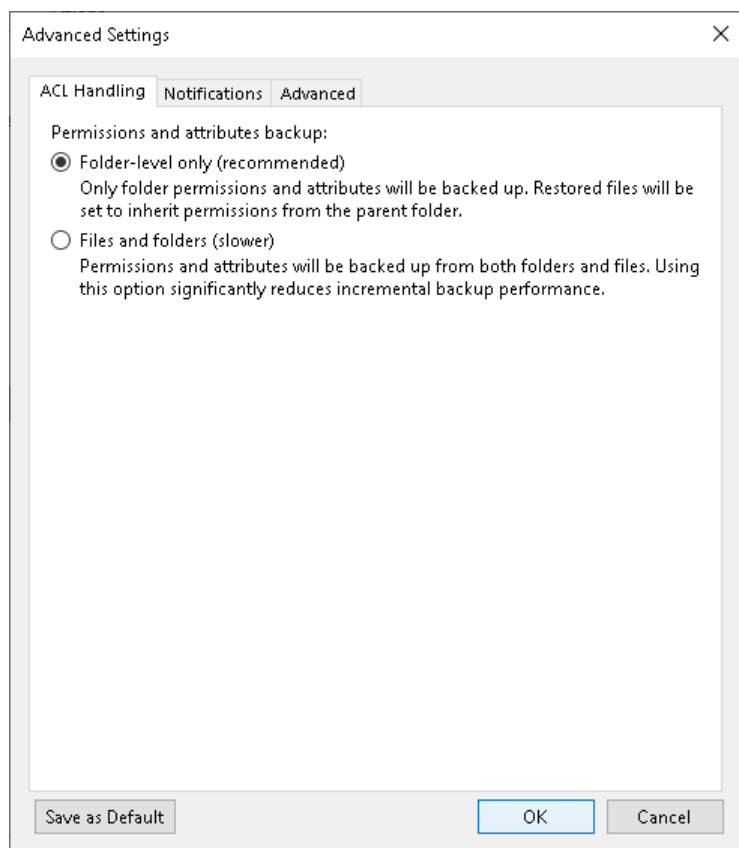
TIP

After you specify necessary settings for the file to tape job, you can save them as default settings. To do this, click **Save as Default** at the bottom left corner of the **Advanced Settings** window. When you create a new file to tape job, Veeam Backup & Replication will automatically apply default settings to the new job.

ACL Handling Settings

To specify how the file to tape job will process permissions and attributes:

1. At the **Options** step of the wizard, click **Advanced**.
2. On the **ACL Handling** tab, define the settings:
 - Select **Folder-level only (recommended)** to back up permissions and attributes from folders only. The restored files will inherit permissions from the target folder.
 - Select **Files and folders (slower)** to back up permissions and attributes from both folders and individual files. This option can significantly reduce the backup performance.



Notifications Settings

To specify notification settings for the backup job:

1. At the **Options** step of the wizard, click **Advanced**.
2. Click the **Notifications** tab.
3. Select the **Send email notifications to the following recipients** check box if you want to receive notifications about tape job status. In the field below, specify a recipient's email address. You can enter several addresses separated by a semicolon.

IMPORTANT

To receive notifications about tape jobs, you must enable general email notifications in Veeam Backup & Replication. For more information, see the Veeam Backup & Replication User Guide, section *Specifying Email Notification Settings*.

You can choose between the following options:

- **Use global notification settings:** Veeam Backup & Replication will notify you according to global email notification settings specified for the Veeam backup server.
- **Use custom notification settings specified below:** you can specify notification settings for tape jobs.

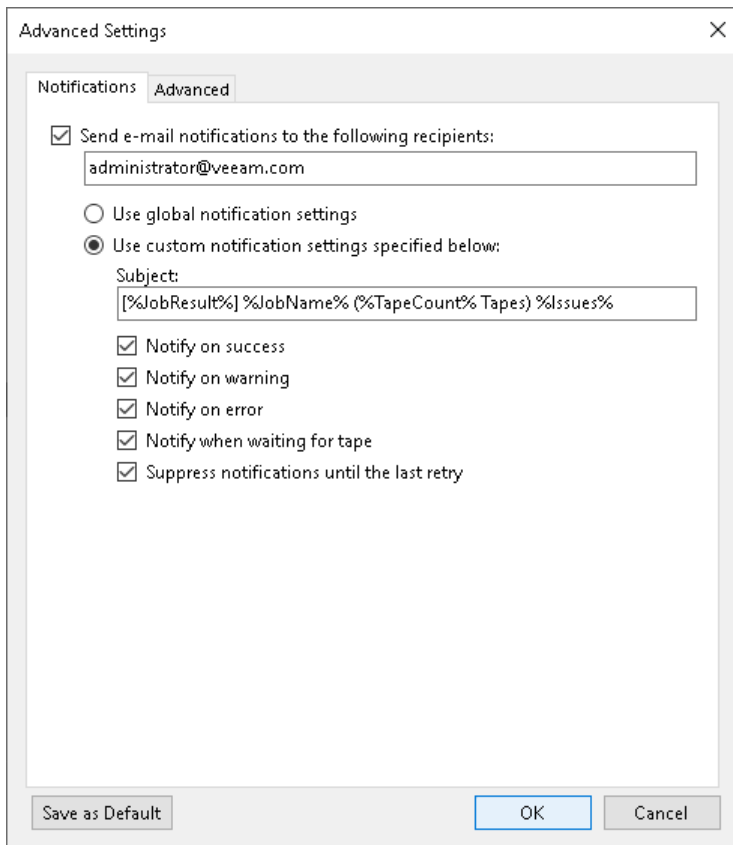
In the **Subject** field, specify a notification subject. You can use the following variables in the subject:

- *%Time%*: the time when the tape job finished.
- *%JobName%*: the name of the tape job.
- *%TapeCount%*: the number of tapes used for the tape job session.
- *%JobResult%*: the job result.
- *%VmCount%*: the number of machines in the job.
- *%Issues%*: the number of machines in the job processed with Warning or Failed status.

Select the occasions on which you want to receive email notifications:

- **Notify on success:** Veeam Backup & Replication will notify you if the tape job finishes successfully.
- **Notify on warning:** Veeam Backup & Replication will notify you if the tape job finishes with a warning.
- **Notify on error:** Veeam Backup & Replication will notify you if the tape job fails.
- **Notify when waiting for tape:** Veeam Backup & Replication will notify you if the tape job cannot start because there are no available tapes.

- **Suppress notifications until the last retry:** Veeam Backup & Replication will notify you on the selected events only after the last job retry.



Advanced Settings

To enable hardware compression or specify custom scripts that you want to run before and/or after the file to tape job:

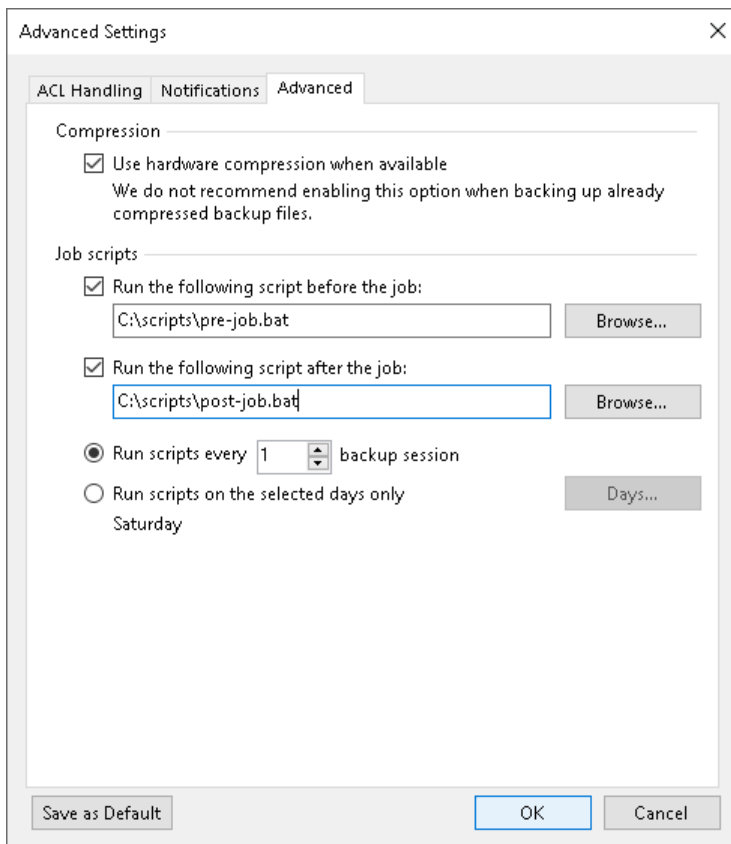
1. At the **Options** step of the wizard, click **Advanced**.
2. On the **Advanced** tab, define settings:
 - Select the **Use hardware compression if available** check box if the tape drive should compress data before writing it to tape.

Most manufacturers add the hardware compression feature to their tape drives. This allows performing data compression by a drive. Usually the declared compression ratio for magnetic tape drives is 2:1 or 2.5:1. But in practice this ratio depends on the type of the raw data. Regrettably, Veeam Backup & Replication cannot display the compressed tape capacity. You can learn the size of the compressed data written to tapes only by checking how much free space left on the tape after the tape job finished.

IMPORTANT

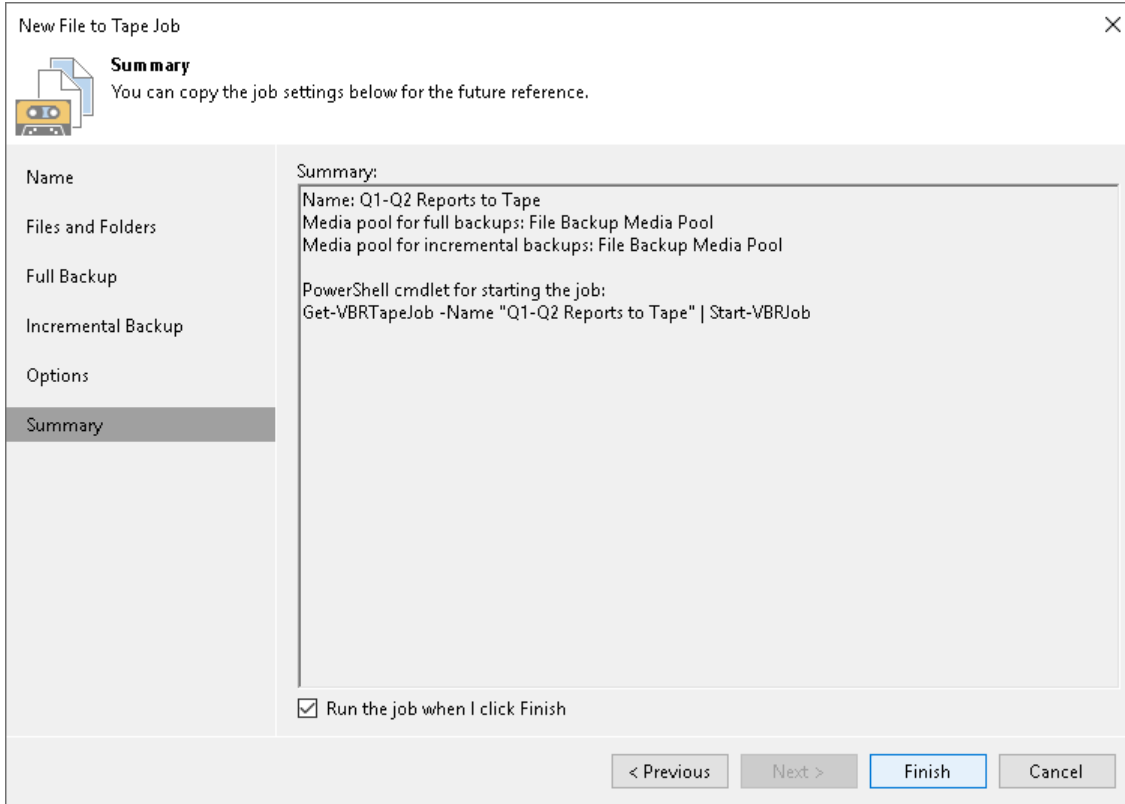
Enable the hardware compression only if your tape library provides support for hardware compression.
 - Select the **Run the following script before the job** and **Run the following script after the job** check boxes and click **Browse** to choose executable files. You can select to execute pre- and post-job actions after a number of job sessions or on specific week days.

- If you select the **Run every... backup session** option, specify the number of the job sessions after which the scripts must be executed.
- If you select the **Run on selected days only** option, click **Days** and specify week days on which the scripts must be executed.



Step 8. Finish Working with Wizard

After you have specified schedule settings, click **Create**. Select the **Run the job when I click Finish** check box if you want to start archiving file to tape job right after you complete working with the wizard. Click **Finish** to close the wizard.



Viewing Files on Tape

After the file to tape job completes, you can view the created archive on tape:

1. Open the **Files** view and press F5 to refresh it.
2. Expand the **Tape** node and locate the files archive.

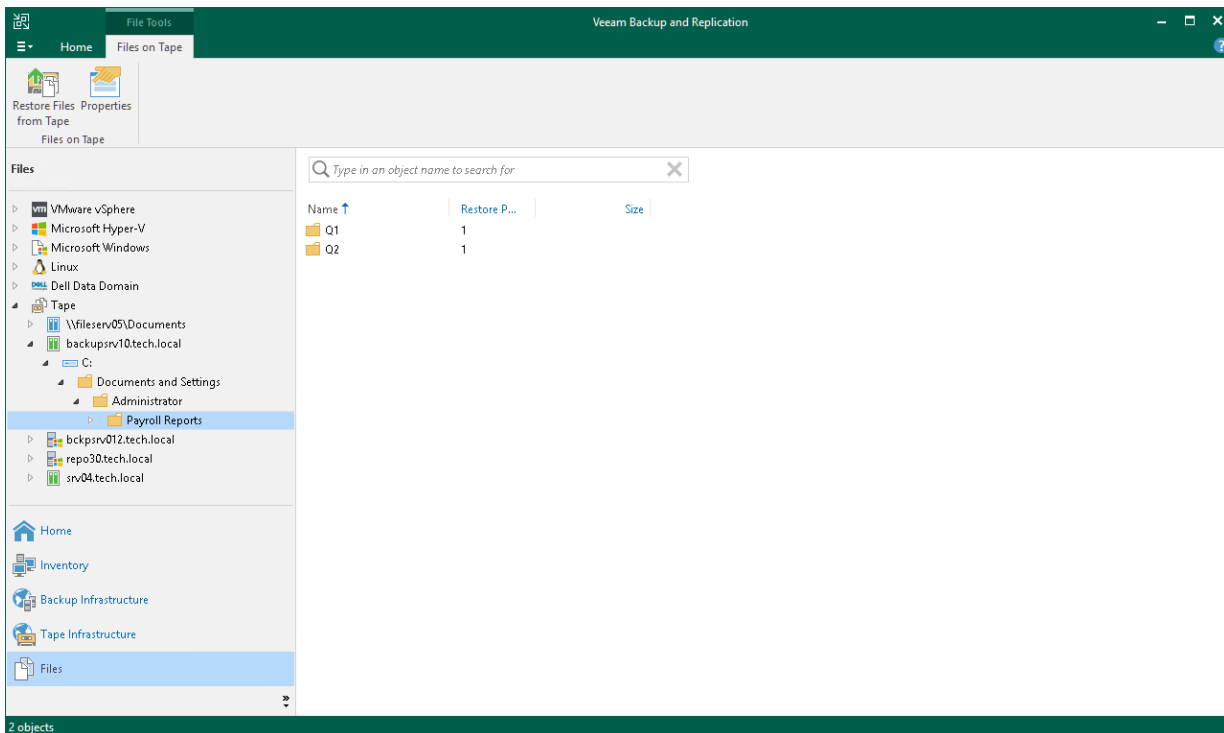
For Microsoft Windows and Linux file backups, Veeam Backup & Replication preserves the source hierarchy of folders for archived files.

For NMDP backups, you can view only volumes.

You can use the created archives for file recovery. For more information, see [File Restore from Tape](#).

NOTE

The **Files on Tape** view displays only first 1000 items. For archive folders with more than 1000 items, you can use the search field to display the items you are looking for.



VM Restore from Tape to Infrastructure

Restoring a VM from tape with Veeam Backup & Replication is a lot like restoring a VM from disk. For example, you can choose a desired restore point, select the target location or change the configuration of the restored VM.

To restore a VM from tape, you can choose between the following options:

- Restore VMs directly to infrastructure.
- Restore VMs through a staging repository.

To choose the needed option, select **Restore directly to the infrastructure** or **Restore through the staging repository** at the **Backup Repository** step of the **Full VM Restore** wizard. For more information, see [Choose Backup Repository](#).

You can restore only backups of VMware and Hyper-V virtual machines from tape to infrastructure. For backups of virtual machines running on other platforms and physical machine backups, use [Backup Restore from Tape to Repository](#) with further VM restore to infrastructure/VM file restore if necessary.

Restore Directly to Infrastructure

When you restore VMs from tape directly to the infrastructure, the restore process publishes the VMs to the virtual infrastructure copying the VM data directly from tape. This option is recommended if you want to restore one VM or a small number of VMs from a large backup that contains a lot of VMs. In this case, you do not need to provide a staging repository for a large amount of data most of which is not needed to you at the moment.

This option is not recommended in the following cases:

- If you want to restore a large number of VMs.
- If you used parallel processing to record the VM backup.

In these cases, the restore may be very slow because the required blocks of data may be located on tapes randomly. The restore process may require a lot of rewinding of tapes as tapes do not provide random access to data.

NOTE

If the list of proxies to use for direct restore contains a Linux proxy, only the Appliance mode (HotAdd) is available for the source VM disks that will be processed using this Linux proxy. The Appliance mode (HotAdd) has a number of requirements and limitations described in [this KB article](#).

If disks cannot be processed in the Appliance mode (HotAdd), the VM restore fails.

Restore Through Staging Repository

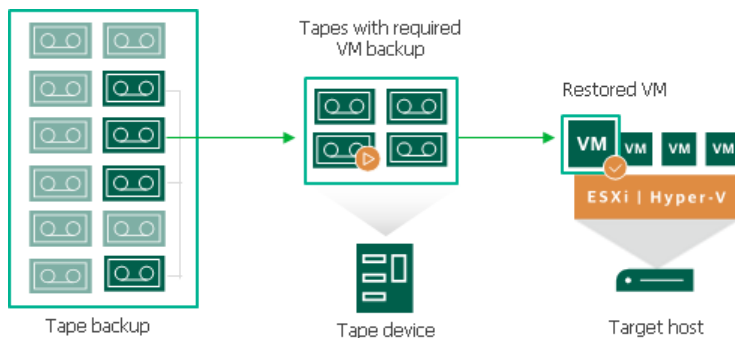
When you restore VMs from tape through a staging repository, the restore process temporarily copies the whole restore point to a backup repository or a folder on disk. After that Veeam starts a regular VM restore.

This option is recommended if you want to restore a lot of VMs from a backup as the disk provides a much faster access to random data blocks than tape.

How Restoring VM from Tape to Infrastructure Works

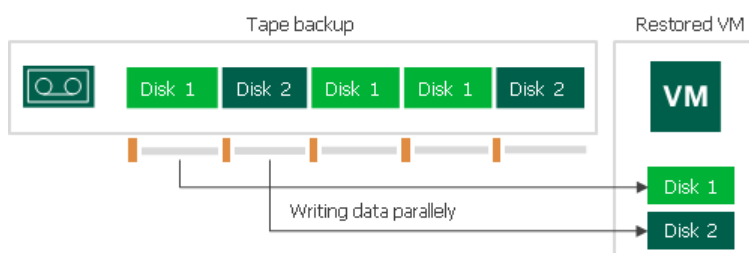
Restore Directly to Infrastructure

For each VM, Veeam starts a separate restore job. However, you can select multiple VMs to restore: in this case, Veeam will queue the restore jobs and run them one after the other.



For restoring a VM directly to the infrastructure, Veeam Backup & Replication performs the following steps:

1. The VM from tape restore job checks the Backup Catalog in the Veeam Backup & Replication database to discover the tapes containing the needed backup files. If the tapes are offline, Veeam Backup & Replication prompts the user to insert the required tapes.
Veeam needs to load and read the selected tapes for 3 times.
2. Veeam loads the tapes for the 1st time.
3. Veeam reads metadata and caches it on the tape server. This requires approximately 100Mb of disk space per 1TB of tape data for the default data block size.
4. Using the cached data, Veeam builds a map of data blocks. The map contains referenced to the data blocks of the VM you restore: the VM configuration file and the VM disks data.
5. Veeam loads the tapes for the 2nd time.
6. Veeam restores the VM configuration:
 - To restore to original location, Veeam synchronizes the VM configuration file up to the backup state.
 - To restore to another location, Veeam copies the VM configuration file and registers the VM on the target host.
7. Veeam loads the tapes for the 3rd time.
8. Veeam restores the VM disks. Multiple disks are restored parallelly. Veeam reads the tape consequently and, using the map of data blocks, copies the VM disks data.



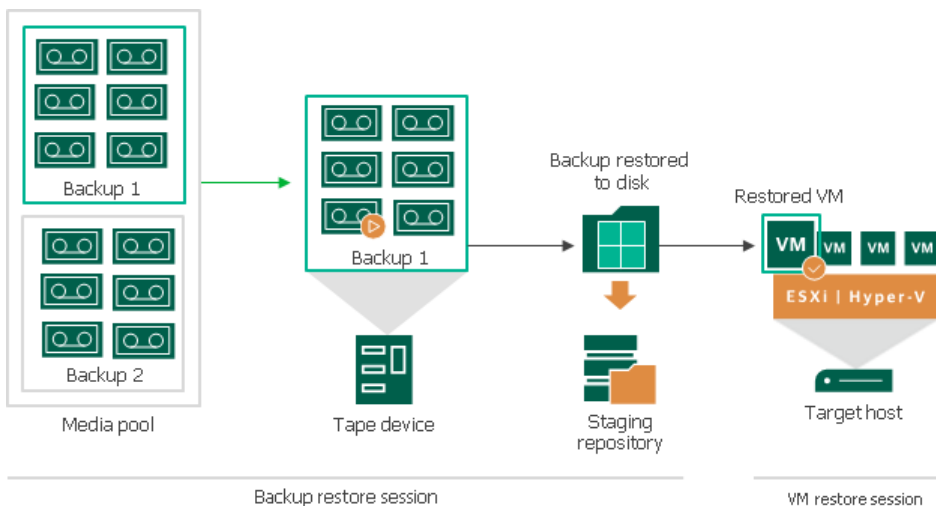
Restore Through Staging Repository

For restoring through a staging repository, Veeam Backup & Replication performs the following steps:

1. Veeam starts 2 jobs at background:
 - Backup restore job: temporarily restores the backup to the repository.
 - VM restore job: restores the VM to the infrastructure.

The jobs start simultaneously. The VM restore job starts and remains pending until the backup restore completes.

2. The backup restore job checks the Backup Catalog in the Veeam Backup & Replication database to discover the tapes containing the needed backup. If the tapes are offline, Veeam Backup & Replication prompts the user to insert the required tapes.
3. The backup restore job reads the tapes consecutively and copies the backup to the selected staging repository or folder.
4. When the backup is copied, Veeam registers it temporarily as an imported backup.
5. The backup restore job finishes.
6. The VM restore job receives information about the backup restored successfully and launches a standard VM restore process. For more information, see the Veeam Backup & Replication User Guide, section *Full VM Recovery*.
7. When the VM is successfully restored, the VM restore process finishes.
8. Veeam deletes the backup from the staging repository and from disk.



Before You Begin

For restoring VMs from tape, you must provide the following system resources:

- Tape server: 200 MB RAM for each restored VM disk.

Note that if a job is unable to complete within 21 days period, it will be stopped with the 'Failed' status.

Restoring VM from Tape to Infrastructure

To restore VMs from tape to virtual infrastructure, use the **Entire VM Restore** wizard. This section will guide you through all steps of the wizard and provide explanation on available options.

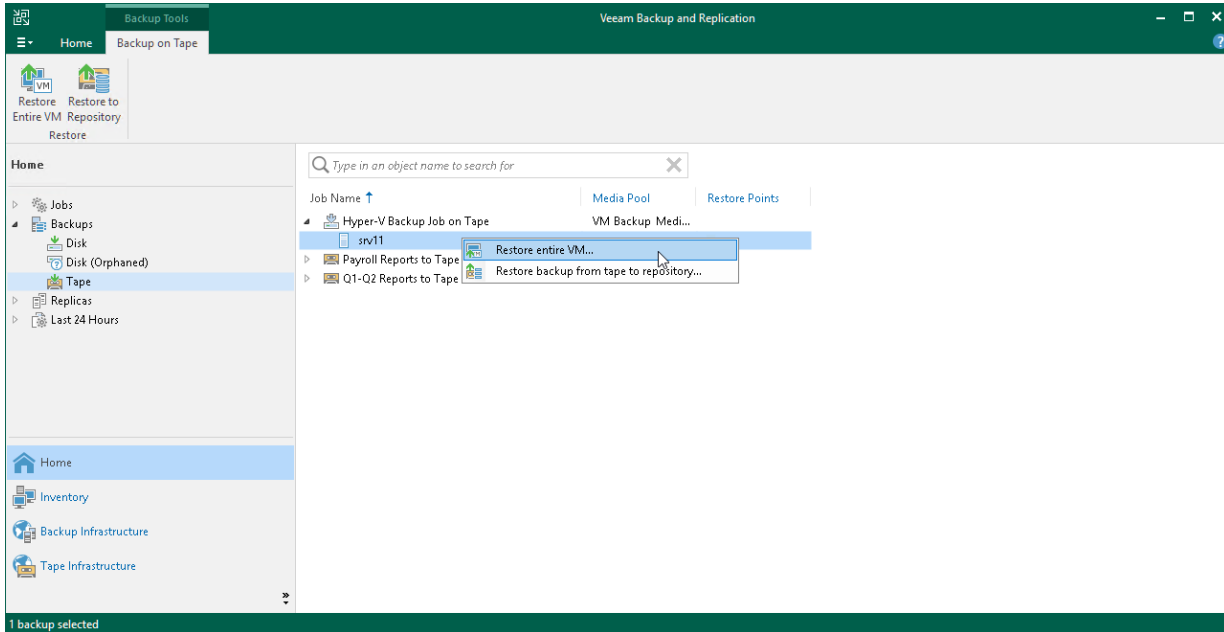
If the tapes are online in your tape device, Veeam Backup & Replication will get the needed data automatically. If the tapes are offline, Veeam Backup & Replication will list the names of the required tapes.

To restore VMs from tape, follow the next steps:

Step 1. Launch Entire VM Restore Wizard

To run the **Entire VM Restore** wizard, do one of the following:

- Open the **Home** view, expand the **Backups > Tape** node. Choose and expand the tape backup you need. Select the necessary VMs in the tape backup and click **Restore Entire VM** on the ribbon.
- Open the **Home** view, expand the **Backups > Tape** node. Choose and expand the tape backup you need. Right-click the necessary VMs in the tape backup and choose **Restore entire VM**.



Step 2. Choose Virtual Machines to Restore

At the **Virtual Machines** step of the wizard, review VMs that should be restored. To add one or more VMs to the list, click **Add VM** and select where to browse for the machines:

- **From infrastructure** – this option is available for VMs only. Browse the virtual environment and select VMs to restore. If you choose a VM container, Veeam Backup & Replication will expand it to a plain VM list. To quickly find a VM, use the search field at the top of the list: enter the VM name or a part of it and click the search button on the right or press [ENTER].

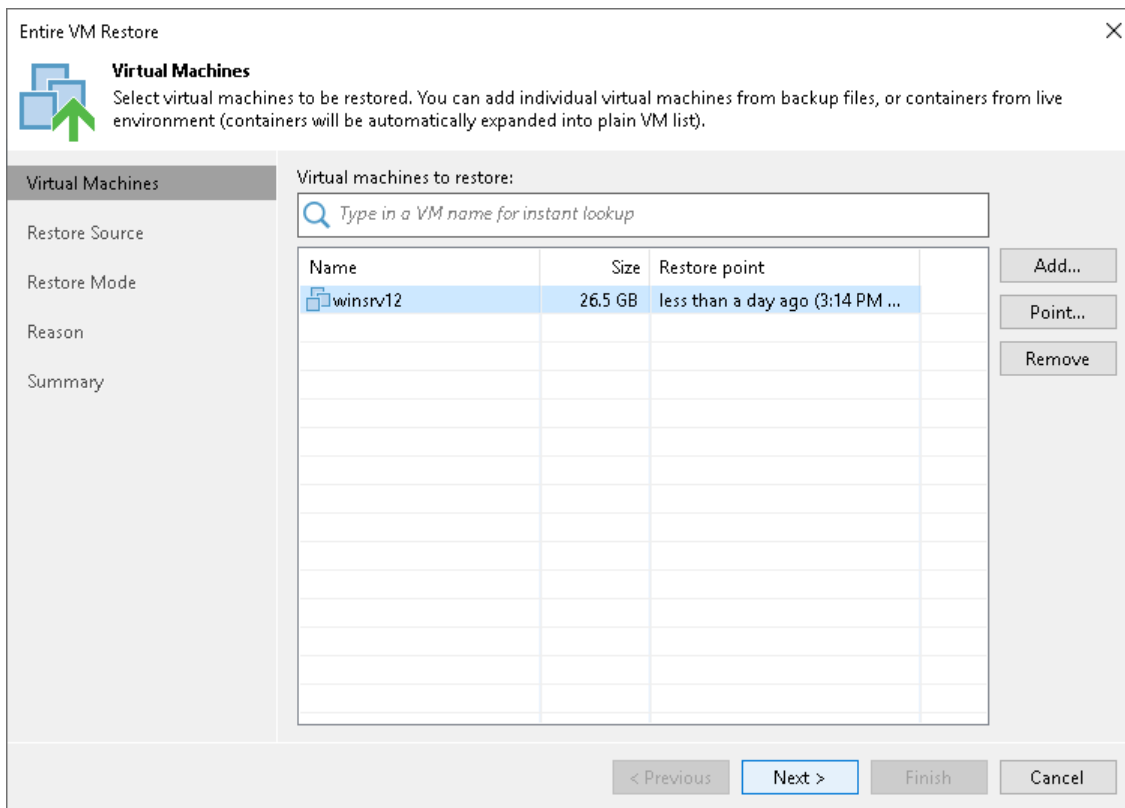
Make sure that VMs you select from the virtual environment have been successfully archived to tape at least once.

- **From backup** – browse existing backups and select VMs under backup to tape jobs. To quickly find VMs, use the search field at the bottom of the **Select Objects** window: enter a VM name or a part of it and click the **Start search** button on the right or press [ENTER]. Full Restore from backups

NOTE

You can add VMs only of the same virtualization platform.

To remove a VM, select it in the list and click **Remove** on the right.



Entire VM Restore

Virtual Machines
Select virtual machines to be restored. You can add individual virtual machines from backup files, or containers from live environment (containers will be automatically expanded into plain VM list).

Virtual Machines

Restore Source

Restore Mode

Reason

Summary

Virtual machines to restore:

Type in a VM name for instant lookup

Name	Size	Restore point
winsrv12	26.5 GB	less than a day ago (3:14 PM ...)

Add...

Point...

Remove

< Previous

Next >

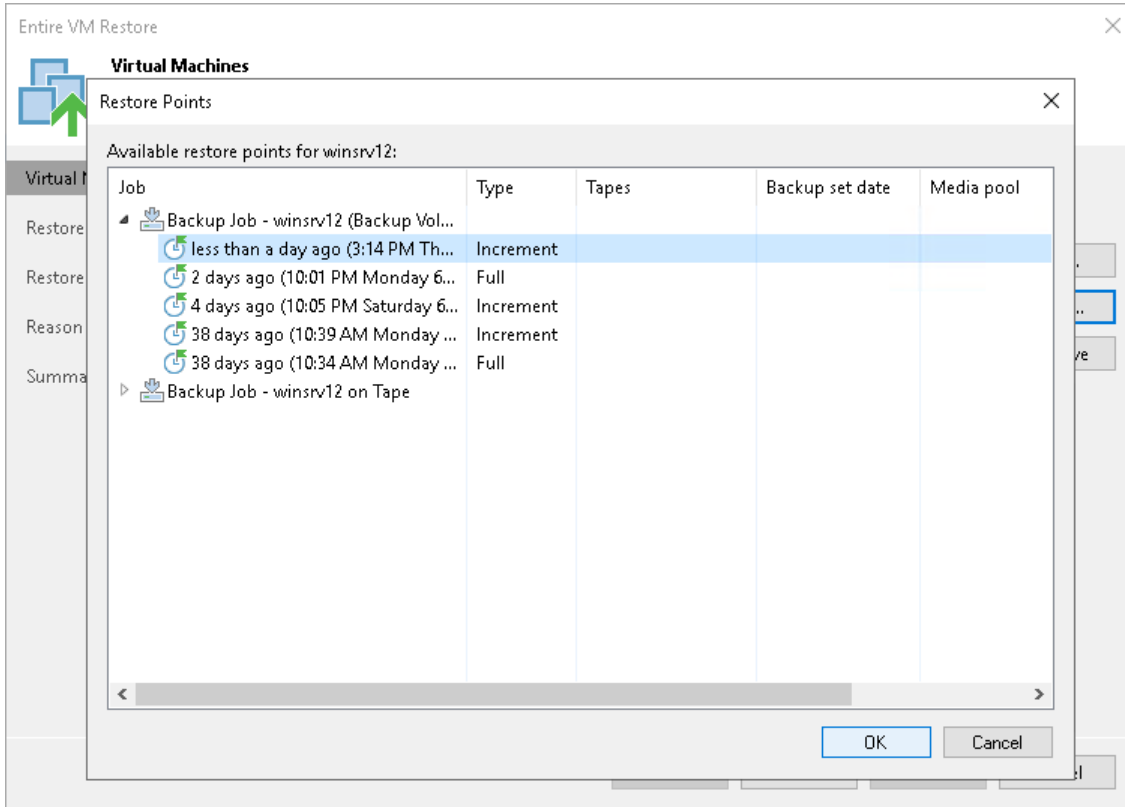
Finish

Cancel

Step 3. Select Restore Point

By default, Veeam Backup & Replication will restore VMs to their latest state archived to tape. However, if you want to restore a VM to an earlier state, select a VM in the list and click Point on the right. In the **Restore Points** section, select a restore point that should be used for full VM recovery.

If you have chosen to restore multiple VMs, you can select a different restore point for every VM specifically.



Step 4. Choose Restore Source

At the **Restore Source** step of the wizard, choose the restore mode:

- Select **Restore directly from tape** if you want to restore a VM without a staging repository. In this case, the restore job will read data directly from tape.

Note that restoring VMs directly to the infrastructure is recommended for restore of 1 VM at a time. The process may be slow if you restore a lot of VMs simultaneously.

- Select **Restore through a staging repository** if you want to temporarily copy the tape backup to a repository or a folder first. The restore job will copy the backup to the selected destination and launch a standard restore VM from disk process.

From the **Backup repository** list, select the repository that should be used as a temporary storage (staging area) for machine backup before the VM is restored to the virtual infrastructure.

You can also select a target folder on any server connected to Veeam Backup & Replication. To do so, choose the **Select folder** option from the **Backup repository** list and choose the location to which backups should be restored before full VM recovery.

If you choose to restore files to a shared folder, make sure that the account under which Veeam Backup Service runs has write permissions to the target folder. If the account does not have sufficient permissions, Veeam Backup & Replication will prompt you to enter credentials for the account that can be used for writing to the target folder.

NOTE

If you plan to restore a VM directly from tape using NBD transport mode, make sure that the VM has 28 disks maximum. To restore a VM with more than 28 disks, use HotAdd mode or restore through a staging repository.

Entire VM Restore

Restore Source
Choose whether restore should be performed directly from tape, or using a staging repository.

Virtual Machines

Restore Source

Restore Mode

Reason

Summary

Restore directly from tape
This option is recommended when restoring a single VM. Consider using a staging backup repository if you are restoring multiple VMs from the same backup file.

Restore through a staging backup repository
Use this option when restoring multiple VMs from the same backup file.

Backup repository:
Backup Repository 01 (SMB Share Repository)

48.9 GB free of 49 GB
Required space: 17.5 GB

If you select this option, all required backup files will be copied from tape to the selected backup repository first, allowing multiple VMs located in the same backup files to be restored faster while reducing stress on tape hardware and media.

< Previous Next > Finish Cancel

Step 5. Specify Restore Mode and Other Recovery Options

Go through the remaining steps of the **Full VM Restore** wizard. The procedure is identical to full VM recovery. For more information, see the Veeam Backup & Replication User Guide, section *Performing Full VM Restore*.

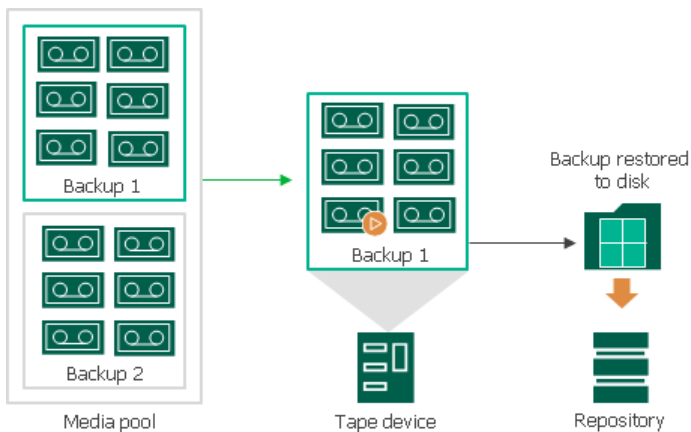
Backup Restore from Tape to Repository

This option allows you to copy machines backups from tape to repository. This is helpful if you need some backups on disk for later use, or also for machines guest OS files restore. You can restore full backups or incremental backups to a repository or any location of your choice. The restored backup is registered in the Veeam Backup & Replication console as an imported disk backup so that you can use it for any restore from disk scenario later on. For one restore session at a time, you can choose one restore point available on tape.

How Restoring Backups from Tape to Repository Works

For restoring machine backups to a repository or a folder on disk, Veeam Backup & Replication performs the following steps:

1. Veeam checks the Backup Catalog in the Veeam Backup & Replication database to discover the tapes containing the required backup. If the tapes are offline, Veeam Backup & Replication prompts the user to insert the required tapes.
2. The backup restore job locks one tape drive to process the restore of the whole backup.
3. The tape drive loads the required tapes one by one, reads them and copies the backup data to the selected repository or folder.
4. When the backup is copied, Veeam registers it as an imported backup.



Before You Begin

Before you start restoring backups from tape to repository, consider the following:

- [Item restore](#) in the Enterprise Manager from backups restored from tapes to the repository is not supported.
- Restore from tapes to object storage repositories is not supported.

Restoring Backups from Tape to Repository

To restore backups from tape, use the **Restore Backup from Tape to Repository** wizard. This section will guide you through all steps of the wizard and provide explanation on available options.

If the tapes are online in your tape device, Veeam Backup & Replication will get the needed data automatically. If the tapes are offline, Veeam Backup & Replication will list the names of the required tapes.

Note that if a job is unable to complete within 21 days period, it will be stopped with the 'Failed' status.

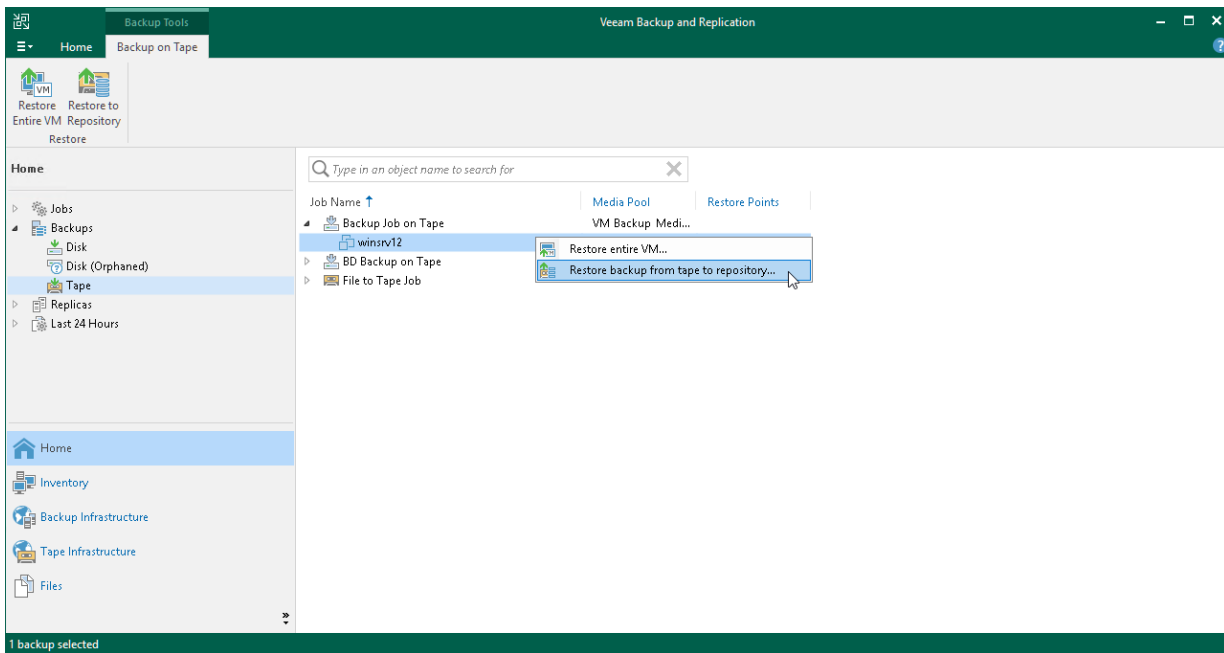
To restore files from tape, follow the next steps:

Step 1. Launch Restore Backup from Tape to Repository Wizard

To run the **Restore Backup from Tape to Repository** wizard, on the **Home** tab, click **Restore** and choose **Tape > Restore Backups**.

Alternatively, you can:

- Open the **Home** view, expand the **Backups > Tape** node. Select the necessary machines in backup and click **Restore to Repository** on the ribbon.
- Open the **Home** view, expand the **Backups > Tape** node. Right-click the necessary machines in backup and choose **Restore backup from tape to repository**.



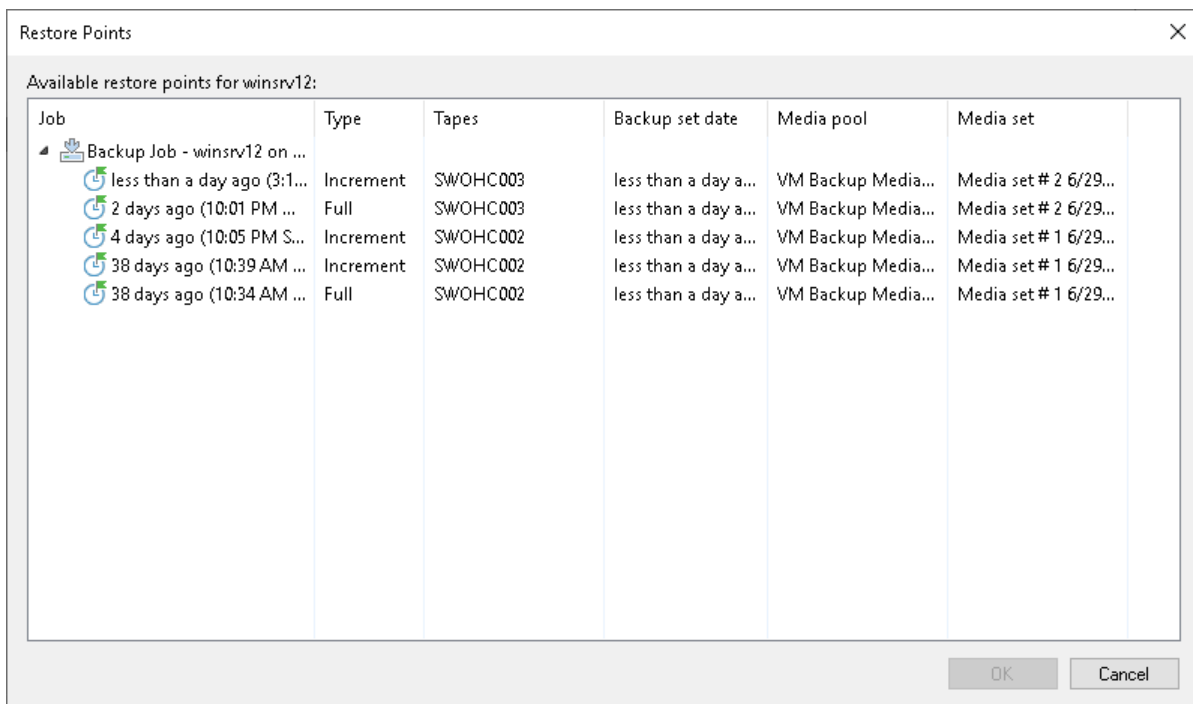
Step 3. Select Restore Point

By default, Veeam Backup & Replication will restore backup with the latest state of the archived machine. However, if you want to restore a backup for the machine to an earlier state, select a machine in the list and click **Point** on the right. In the **Restore Points** section, select a restore point that should be used to restore machine backup.

NOTE

If you choose a full backup point in the list, Veeam Backup & Replication will restore only this full backup. If you choose an increment, Veeam Backup & Replication will restore a chain consisting of a full backup and forward increments, necessary to restore machines to the required point-in-time.

If you have chosen to restore multiple machines, you can select a different restore point for every machine specifically.



Restore Points

Available restore points for winsrv12:

Job	Type	Tapes	Backup set date	Media pool	Media set
Backup Job - winsrv12 on ... less than a day ago (3:1...	Increment	SWOHC003	less than a day a...	VM Backup Media...	Media set # 2 6/29...
2 days ago (10:01 PM ...	Full	SWOHC003	less than a day a...	VM Backup Media...	Media set # 2 6/29...
4 days ago (10:05 PM S...	Increment	SWOHC002	less than a day a...	VM Backup Media...	Media set # 1 6/29...
38 days ago (10:39 AM ...	Increment	SWOHC002	less than a day a...	VM Backup Media...	Media set # 1 6/29...
38 days ago (10:34 AM ...	Full	SWOHC002	less than a day a...	VM Backup Media...	Media set # 1 6/29...

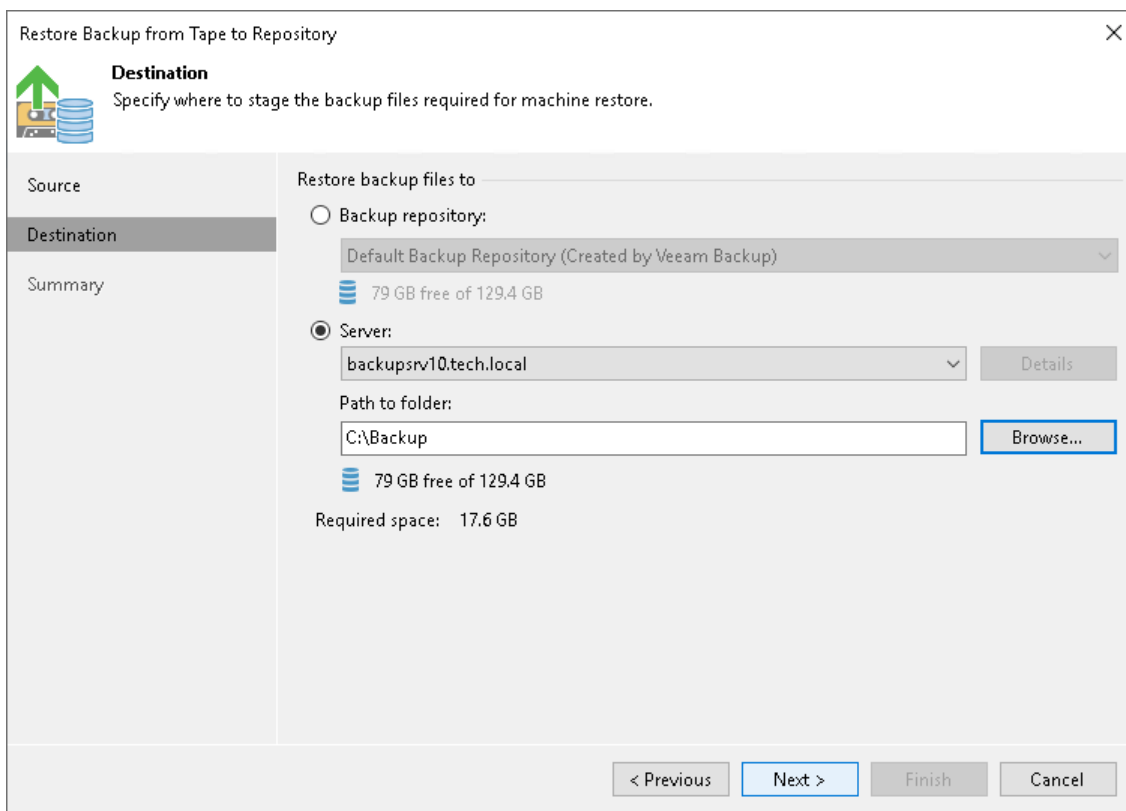
OK Cancel

Step 4. Choose Backup Destination

At the **Destination** step of the wizard, select where the backup files for the selected machines should be restored:

- To restore machine backup files to a repository, select the **Backup repository** option and choose the necessary repository from the list.
- To restore machine backup files to the Veeam backup server, shared folder or to any Microsoft or Linux server connected to Veeam backup server, select the **Server** option. Choose the necessary server from the list and specify path to the target folder in the **Path to folder** field.

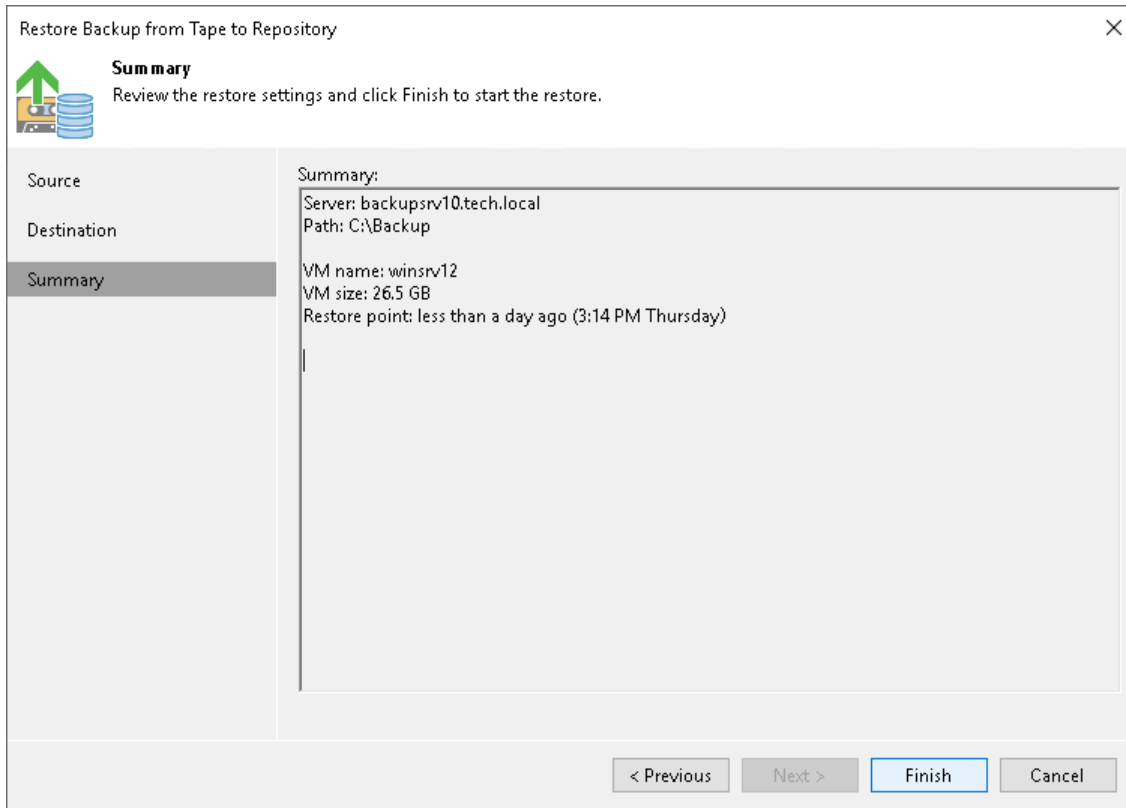
If you choose to restore files to a shared folder, make sure that the account under which Veeam Backup Service runs has write permissions to the target folder. If the account does not have sufficient permissions, Veeam Backup & Replication will prompt you to enter credentials for the account that can be used for writing to the target folder.



The screenshot shows the 'Restore Backup from Tape to Repository' wizard, specifically the 'Destination' step. The window title is 'Restore Backup from Tape to Repository' with a close button (X) in the top right corner. Below the title bar is a green arrow icon pointing up and a blue database icon. The main heading is 'Destination' with the instruction 'Specify where to stage the backup files required for machine restore.' On the left side, there is a navigation pane with three items: 'Source', 'Destination' (which is selected and highlighted), and 'Summary'. The main area is titled 'Restore backup files to' and contains two radio button options: 'Backup repository:' and 'Server:'. The 'Backup repository:' option is currently unselected. Below it, a dropdown menu shows 'Default Backup Repository (Created by Veeam Backup)' with a downward arrow. Below the dropdown, a blue bar indicates '79 GB free of 129.4 GB'. The 'Server:' option is selected. Below it, a dropdown menu shows 'backupsrv10.tech.local' with a downward arrow and a 'Details' button to its right. Below the dropdown, a text field contains 'C:\Backup' and a 'Browse...' button to its right. Below the text field, a blue bar indicates '79 GB free of 129.4 GB'. At the bottom of the main area, it says 'Required space: 17.6 GB'. At the bottom of the window, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'. The 'Next >' button is highlighted with a blue border.

Step 5. Finish Working with Wizard

Review the settings and click **Finish** to restore selected machines backups.



Viewing Restored Backups

After backups are restored from tape, they are displayed as imported backups in the **Home view > Backups > Imported**. You can use the restored to disk backup for regular data recovery, including full recovery, recovery of machine files, guest OS file restore and other.

Tenant Restore from Tape

This option is available only for Veeam Cloud Connect service providers.

Service providers can restore their tenants' backups from tape. For more information, see the [Veeam Cloud Connect](#) guide.

File Restore from Tape

You can restore data previously archived with file to tape jobs and with backup to tape jobs where the sources are NAS backup jobs or repositories that store NAS backups. You can restore the following data:

- Microsoft Windows files and folders.
- Linux files and folders.
- Files and folders on SMB (CIFS) and NFS file shares.
- NDMP volumes.
- Content of entire tapes.

The file restore process allows you to restore files to any restore point available on tape.

Limitations for NFS File Share Restore

If you restore files to the NFS file share running the NFS protocol version different from the NFS version of the source file share, Veeam Backup & Replication does not restore security attributes.

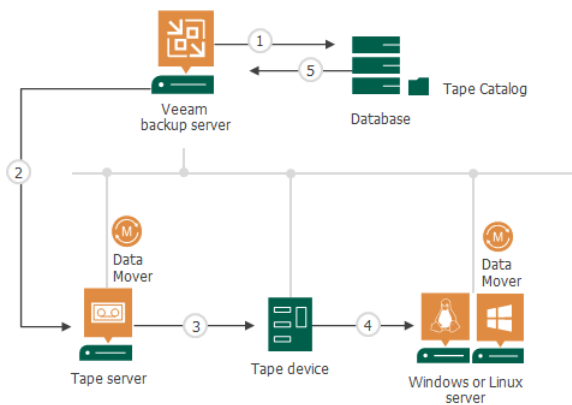
Limitations for NDMP Volumes Restore

- Only restore of whole volume is supported.
- Only restore to original location or to a similar NDMP server is supported.

How Restoring Files from Tape Works

When Veeam Backup & Replication restores files archived to tape, it performs the following operations:

1. Veeam Backup & Replication checks the Tape Catalog in the Veeam Backup & Replication database to discover the tapes containing the needed restore point of the files. If the tapes are offline, Veeam Backup & Replication prompts the user to insert the required tapes.
2. Veeam Backup & Replication connects to Veeam Data Mover deployed on a tape server.
3. Veeam Data Mover copies the relevant files from the tapes.
4. The copied files are transferred to a chosen target location, same or new one.
5. Veeam Backup & Replication updates the Tape Catalog in the Veeam Backup database.



Before You Begin

Before you start the file restore from tape, consider the following:

- If the tape backup contains a large quantity of files, for example, more than 1 000 000 files in 1 000 folders, you must provide the following system resources for restore: backup server – 2.6 GB RAM per each 1 000 000 files.
- If a job is unable to complete within 21 days period, it will be stopped with the 'Failed' status.
- Restore to the original location is not supported for backups to tape from NAS filers (NetApp Data ONTAP, Lenovo ThinkSystem DM Series, Dell PowerScale or Nutanix Files Storage).
- Veeam Backup & Replication does not support restore of symbolic links backed up on one file system type to a different file system type. For example, you cannot backup files and folders with symbolic links on a Windows system and restore them to a Linux system.

Restoring Files from Tape

To restore files or NDMP volumes backed up to tape, use the **Files from Tape Restore** wizard.

If the tapes are online in your tape device, Veeam Backup & Replication will get the needed data automatically. If the tapes are offline, Veeam Backup & Replication will list the names of the required tapes.

NOTE

The **Files from Tape Restore** wizard allows you to restore files and folders archived to tape. You cannot restore VM guest OS files using this wizard. To restore VM guest OS files, restore a machine backup from tape to a backup repository and perform VM guest OS files restore. For more information, see [Backup Restore from Tape to Repository](#).

Restoring Entire Tapes

For information about restoring entire tapes, see [Restoring Entire Tapes](#).

This section will guide you through all steps of the wizard and provide explanation on available options for restoring files from tapes and for restoring entire tapes.

To restore files from tape or to restore entire tapes, follow the next steps:

Step 1. Launch Restore from Tape Wizard

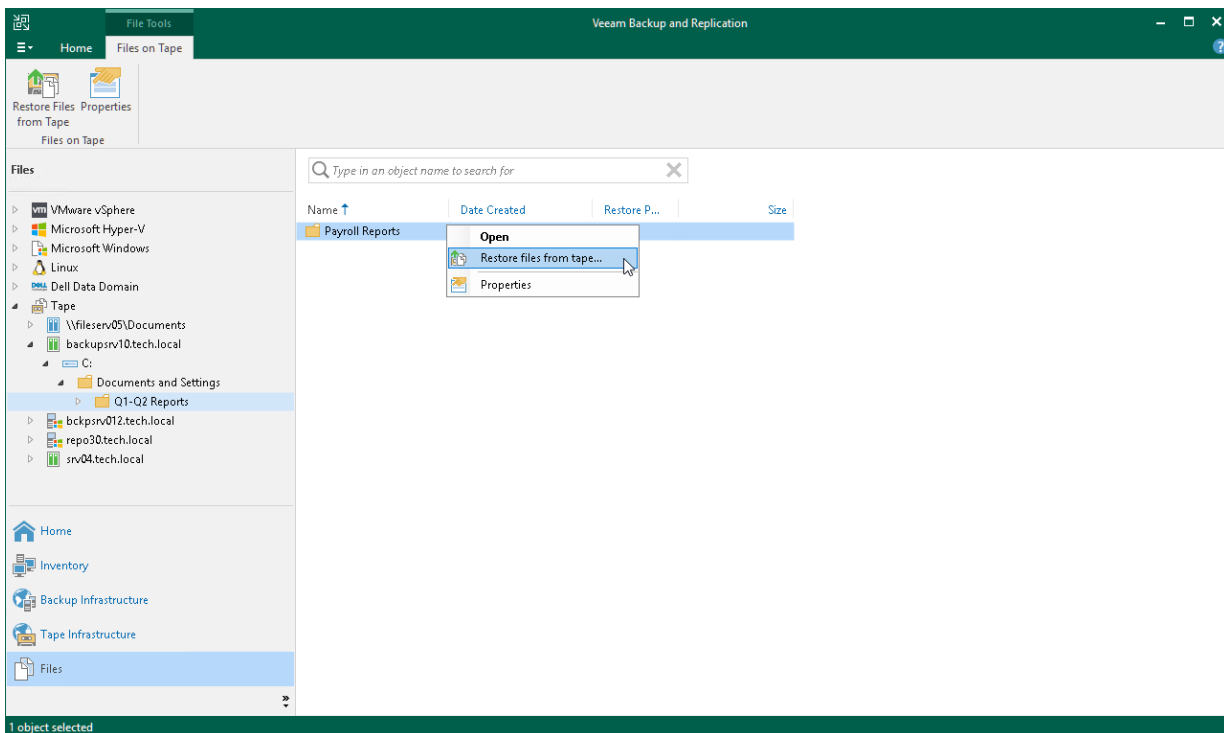
The wizard may work in one of the two following modes:

- [Restoring files from tape](#)
- [Restoring entire tapes](#)

Restoring Files from Tape

To run the **Restore from Tape** wizard, do either of the following:

- Open the **Home** tab and click **Restore** on the ribbon. Choose **Tape > Restore Files**.
- Open the **Files** view, expand the **Tape** node and browse to the necessary files on tape. Select the files and click **Restore Files from Tape** on the ribbon. Alternatively, you can right-click the files and choose **Restore files from tape**.



Restoring Entire Tapes

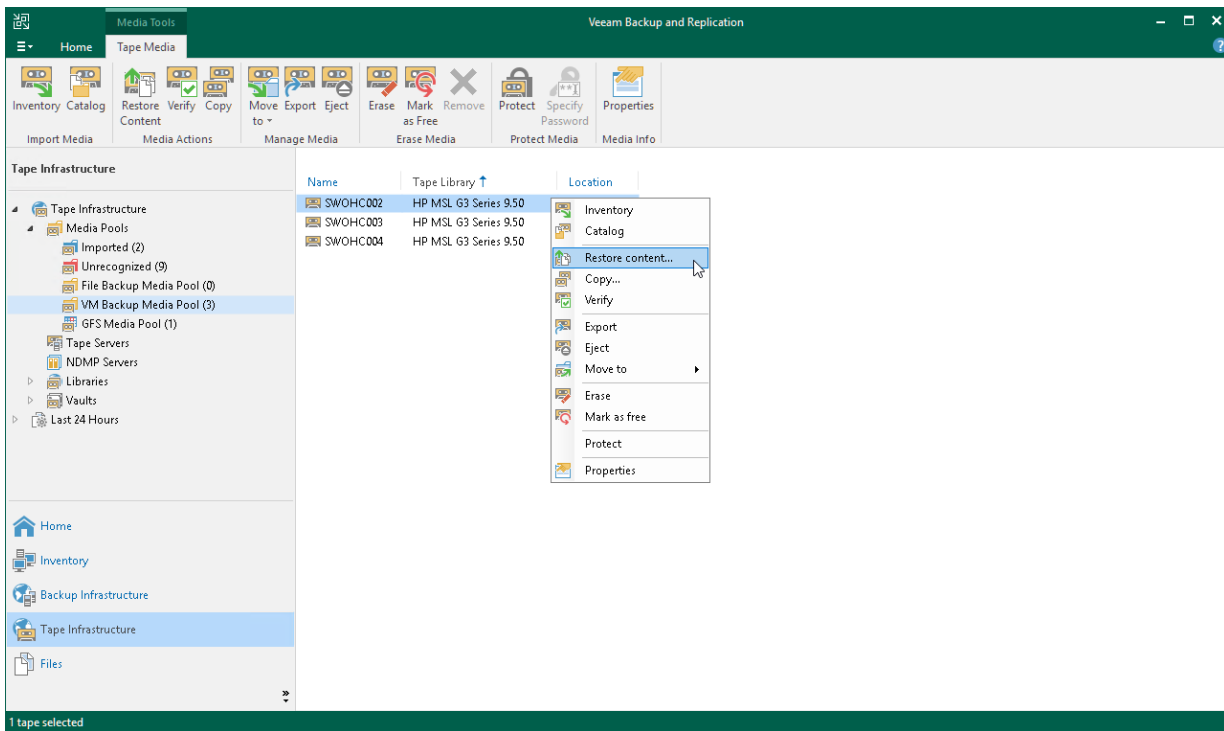
To launch the **Restore from Tape** wizard for restoring entire tapes, do the following:

1. Open the **Tape Infrastructure** view.
2. Navigate to the list of tapes either under **Media Pools** or under **Libraries > LibraryName > Media > Online**.

NOTE

Tapes in the **Unrecognized** media pool are not available for data restore.

3. Select the necessary tapes and click **Restore Content** on the ribbon. Alternatively, you can right-click the tape and select **Restore content**.



Step 2. Choose Files to Restore

The objects to restore depend on the mode that the wizard is working in:

- [Restoring files from tape](#)
- [Restoring entire tapes](#)

Restoring Files from Tape

At the **Objects to Restore** step, choose data that you want to restore.

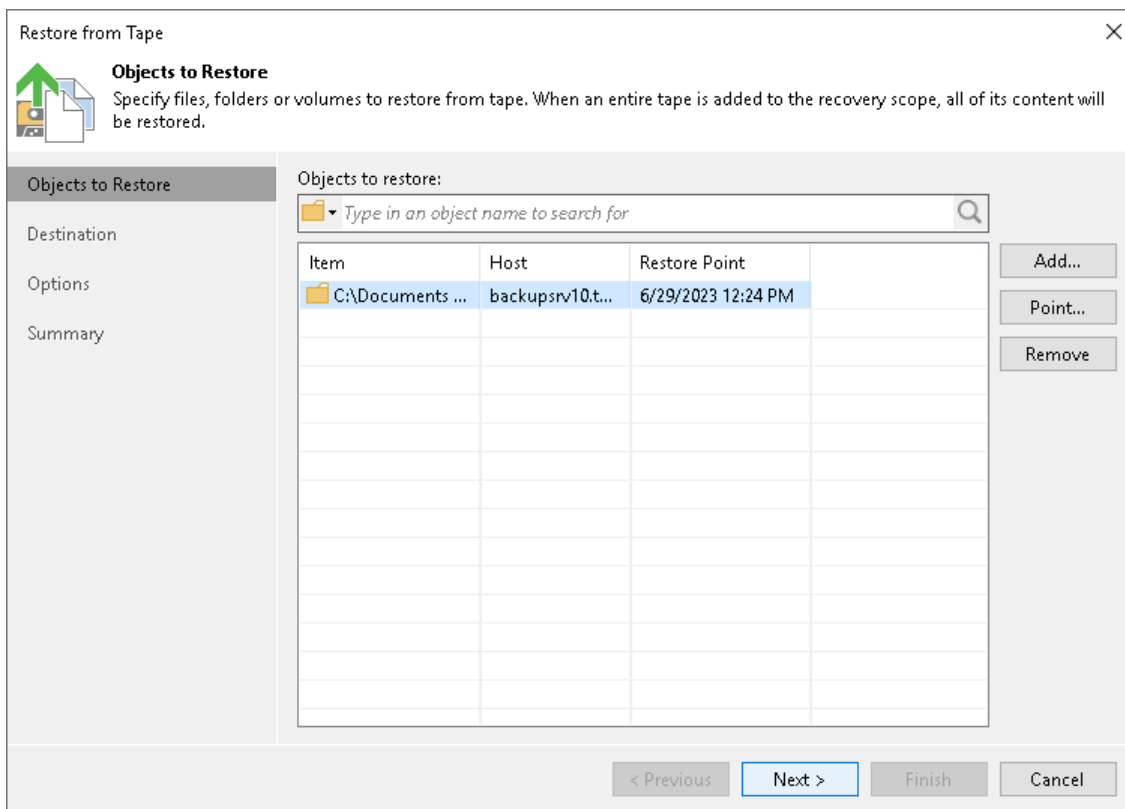
Click **Add** and browse to the file or folder, NDMP volume, or entire host (except for Linux) that you want to restore. The selected item will be added to the list. To quickly find file, folder or volume, use the search field at the top of the list: enter an object name or a part of it and click the search button on the right or press **[ENTER]**.

If you have chosen files to restore in the **Files** view, the list of objects to restore will be populated with selected files.

To remove a file or folder from the list, select it and click **Remove**.

NOTE

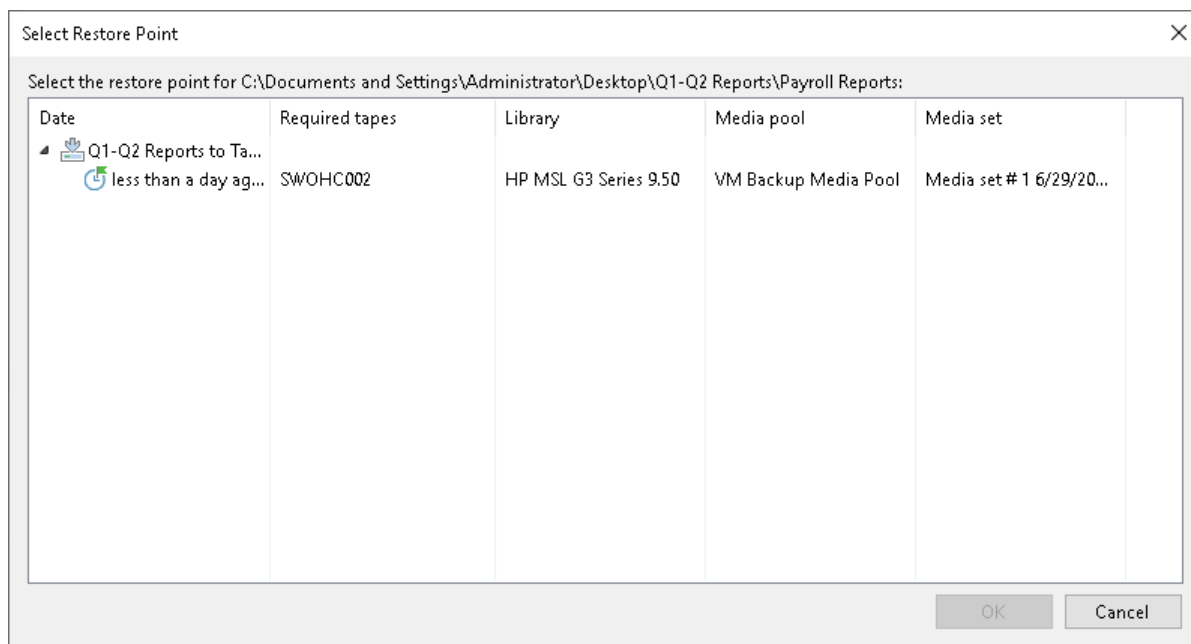
For one restore session, you can select only Microsoft Windows and Linux files, or NDMP volumes.



By default, Veeam Backup & Replication will restore the latest version of files or folders available on tape. If you want to restore files or folders from another restore point, select the necessary file or folder and click **Point**. In the list of available restore points, select the required one and click **OK**. If the file or folder are protected with more than one file to tape job, the restore points are grouped by jobs.

NOTE

For backups created with Veeam Backup & Replication 9.5 Update 3a and earlier: when you restore an entire folder from tape, Veeam Backup & Replication restores all files that have ever existed in the folder and been archived to tape. To restore files in the folder, Veeam Backup & Replication scans the selected backup set and backup sets that were created previously. If a file is not found in the selected backup set, Veeam Backup & Replication will restore the most recent version of the file from a backup set preceding the selected backup set.



NOTE

Files written to tapes can be further removed from the source backup repository. Information about these removed files (about the fact that they are removed) is also written to tapes. If the tapes that store this information are rewritten as expired or erased by some reason, during the file restore from tape, Veeam Backup & Replication tries to restore the files removed from the source backup repository. Therefore, Veeam Backup & Replication can require even older tapes that store the copy of these removed files.

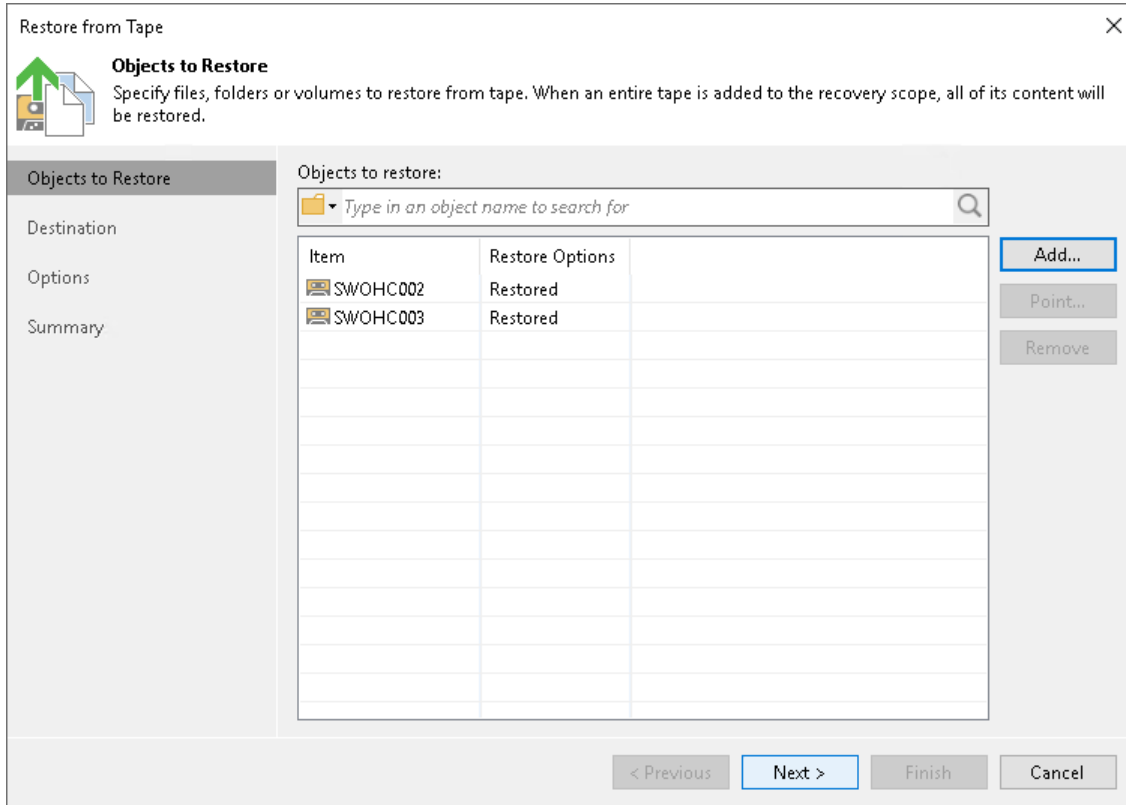
Restoring Entire Tapes

At the **Objects to Restore** step of the wizard, select tapes to restore. The tape, which you selected when launching the wizard, is added to the list of tapes to restore by default. To add other tapes to restore, do the following:

1. Click **Add**. Veeam Backup & Replication opens the **Select Tapes** window listing all media pools and tapes in them available for restore.
2. In the **Select Tapes** window, navigate to the required media pool and select the tapes you want to restore.

When writing backup files to tapes, there can be situations when a file does not fit on a tape. Then it is divided into parts and written to several tapes, which are then considered dependent. Veeam Backup & Replication tracks this. When you are restoring data from a tape that contains only one part of the backup file, Veeam Backup & Replication detects that. It also informs you what tapes contain other parts of the file and prompts you to add these tapes to the list for restoring the full content. Note that tapes marked as **Restored partially** in the **Restore Options** column will be restored by Veeam Backup & Replication only partially: it will restore only data required for restoring full content of the initially selected tapes in the consistent manner.

To remove tapes from the restore list, select the tapes and click **Remove**.



Step 3. Specify Restore Destination

At the **Destination** step of the wizard, specify destination where the archived files will be restored. You can use one of the following options:

- **Original location.** Use this option to restore data to the location where the original file resides (or resided): Microsoft Windows server, Linux server, or NDMP server. This type of restore is only possible if the original machine is connected to Veeam Backup & Replication and powered on.

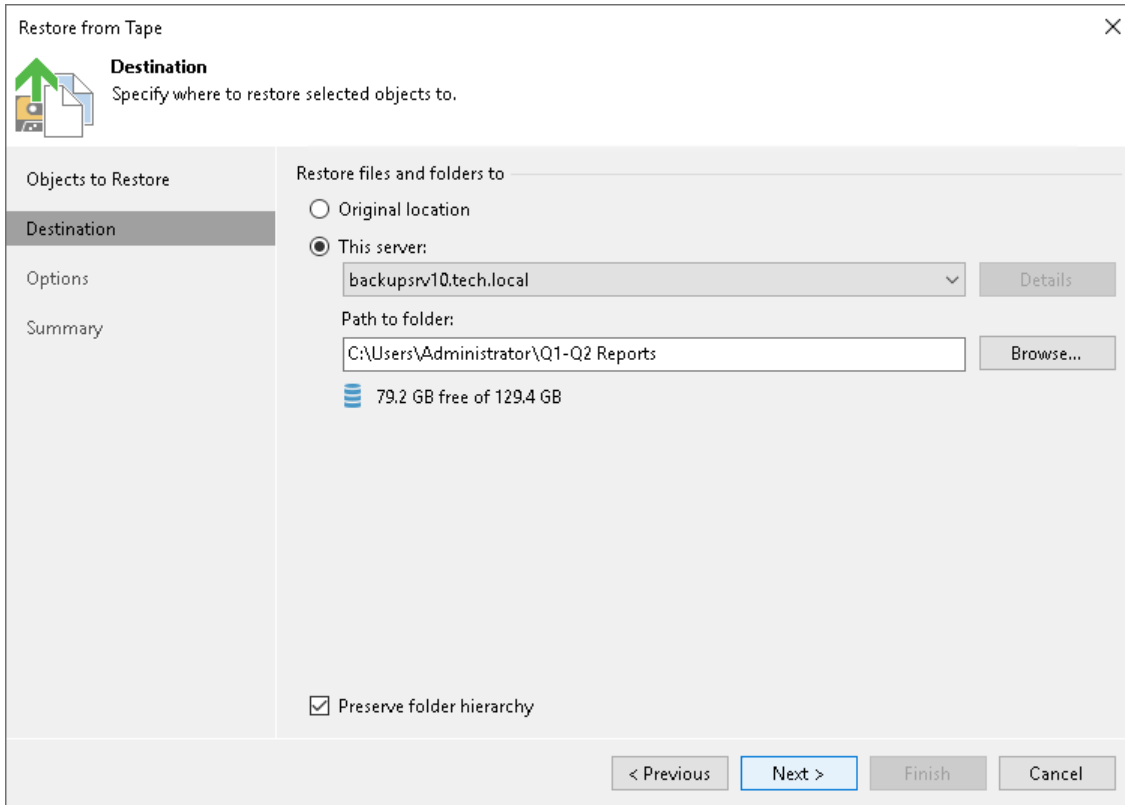
NOTE

Consider the following:

- If you are restoring content of the entire tapes, the Original location option is not available.
 - Restore to the original location is not supported for backups from NAS filers (NetApp Data ONTAP, Lenovo ThinkSystem DM Series, Dell PowerScale or Nutanix Files Storage).
- **This server.** Use this option if you want to restore data to another server. The following options are available:
 - Microsoft Windows or Linux files: you can restore files to the Veeam backup server, shared folder or to any other machine added to Veeam Backup & Replication. From the server list, choose a machine to which files should be restored and specify path to the target folder.

If you choose to restore files to a shared folder, make sure that the account under which Veeam Backup Service runs has write permissions to the target folder. If the account does not have sufficient permissions, Veeam Backup & Replication will prompt you to enter credentials for the account that can be used for writing to the target folder.
 - NDMP volumes: you can restore data to another NDMP server added to Veeam Backup & Replication. From the server list, select an NDMP server added to Veeam Backup & Replication. In the **Path to folder** field, specify the volume to which you want to restore the archived volume.
 - NAS file shares: you can restore data to an SMB (CIFS) or NFS file share. From the server list, select a NAS file share added to Veeam Backup & Replication. In the **Path to folder** field, specify the folder to which you want to restore the archived files and folders.

When restoring files to a location other than original, Veeam Backup & Replication preserves the folder hierarchy. To restore files to the specified target folder without keeping the folder structure, clear the **Preserve folder hierarchy** check box. This option is unavailable for restore of NDMP volumes.



Step 4. Specify Restore Options

At the **Options** step of the wizard, specify overwrite options in case the file already exists in the target folder:

- **Leave the existing file.** Select this option if you do not want to overwrite the existing file with the restored one.
- **Overwrite the existing file if older than the backed up file.** Select this option if you want to overwrite the existing file only if it is older than the restored file.
- **Always overwrite the existing file.** Select this option if you want to overwrite the existing file with the restored file in all cases.

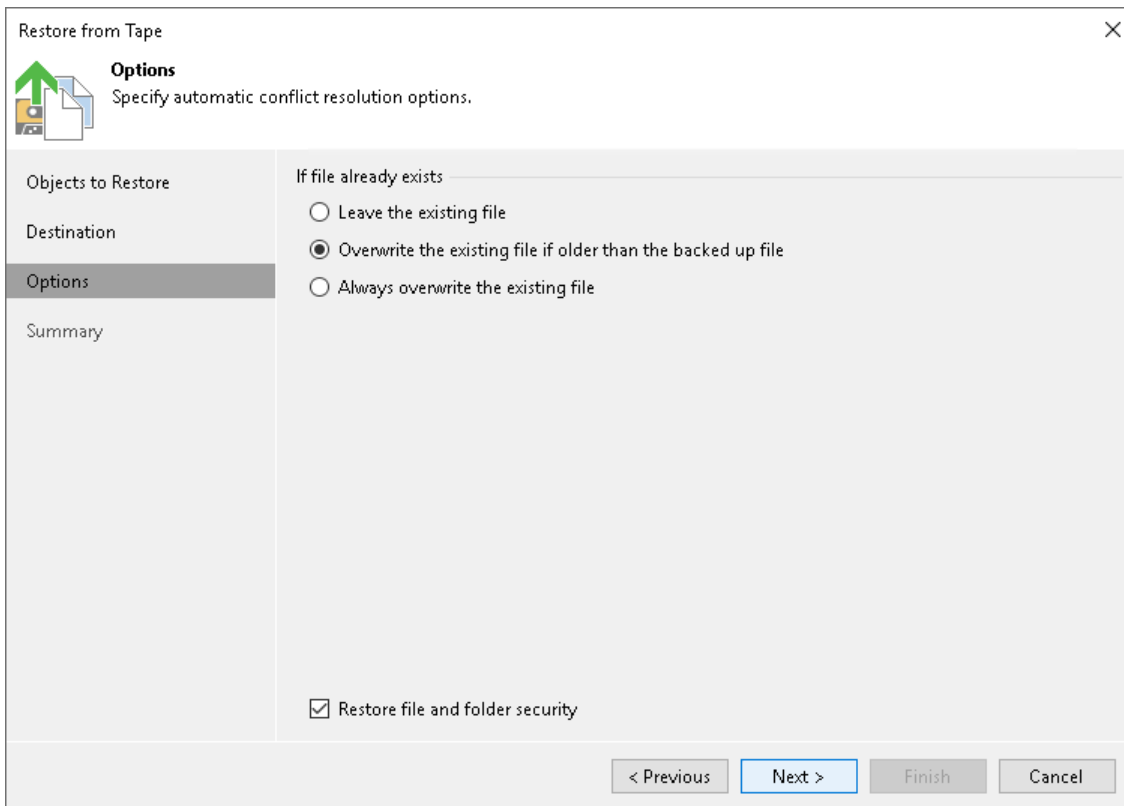
NOTE

Overwrite options are not available when restoring content of entire tapes.

Select the **Restore file and folder security** check box if you want the restored files to keep their original ownership and security permissions. In the opposite case, Veeam Backup & Replication will change security settings: the user account under which the Veeam Backup Service runs will be set as the owner of the restored objects, while access permissions will be inherited from the target folder to which the objects are restored.

NOTE

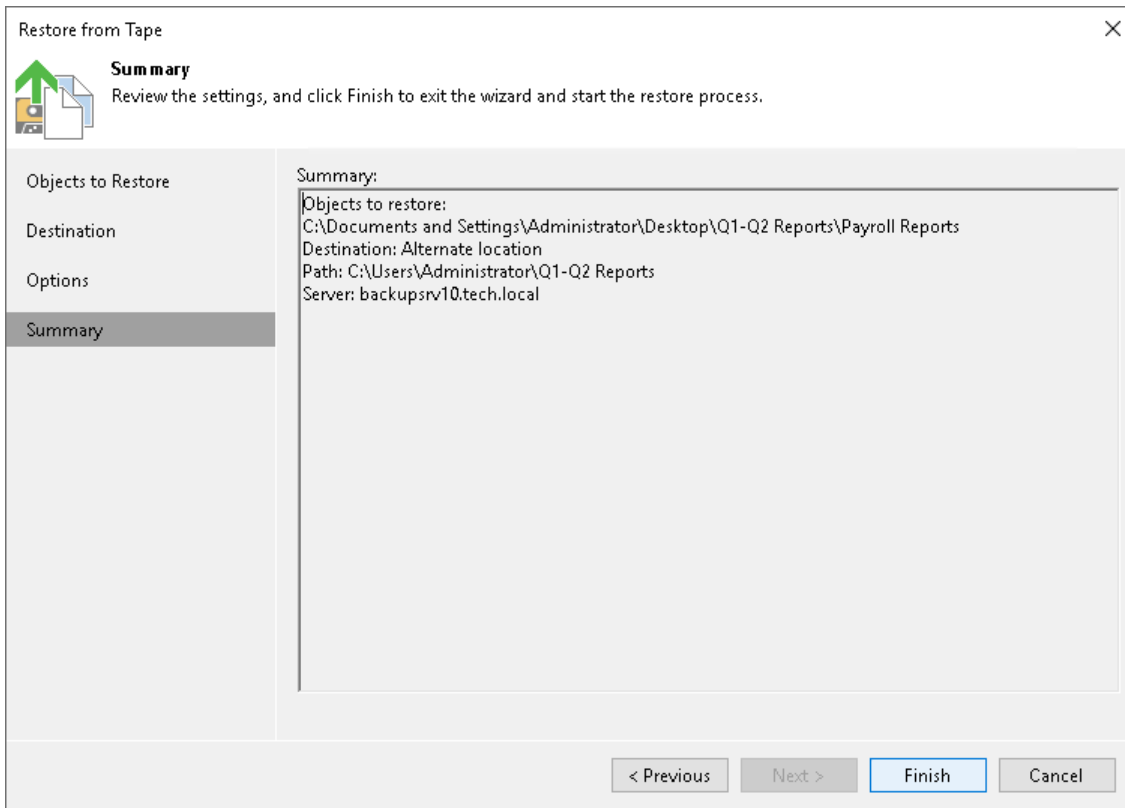
This step is inapplicable for NMDP restore. If you restore NMDP volumes, these options will be skipped. The NMDP volumes will be restored according to the hardware settings.



The screenshot shows the 'Restore from Tape' wizard window, specifically the 'Options' step. The window title is 'Restore from Tape' and it has a close button (X) in the top right corner. The main area is titled 'Options' and contains the instruction 'Specify automatic conflict resolution options.' Below this, there are three tabs: 'Objects to Restore', 'Destination', and 'Options' (which is selected and highlighted). Under the 'Options' tab, there is a section titled 'If file already exists' with three radio button options: 'Leave the existing file', 'Overwrite the existing file if older than the backed up file' (which is selected), and 'Always overwrite the existing file'. At the bottom of the main area, there is a checked checkbox labeled 'Restore file and folder security'. At the bottom of the window, there are four buttons: '< Previous', 'Next >' (highlighted in blue), 'Finish', and 'Cancel'.

Step 5. Finish Working with Wizard




At the **Summary** step of the wizard, review the restore settings and click **Finish** to restore selected files, folders, or tapes.




Tape States Indicators

The user interface indicates on states of the tape infrastructure components.






Tape Libraries

Icon	Component state
	Connected tape library
	Tape library connected over SCSI
	Tape library in the maintenance mode

Drives








Icon	Component state
	Enabled drive
	Disabled drive
	Drive in the maintenance mode

Media Pools






Icon	Component state
	Free media pool
	Imported media pool
	Unrecognized media pool
	Retired media pool
	Media pool



Icon	Component state
	GFS media pool
	WORM media pool
	WORM GFS media pool

Online Tapes

Icon	Component state
	Tape
	Retired tape
	Encrypted tape
	Software protected tape
	Hardware protected tape
	Software protected and encrypted tape
	Hardware protected and encrypted tape



Online WORM Tapes

Icon	Component state
	WORM tape
	Retired WORM tape
	Encrypted WORM tape
	Software protected WORM tape
	Hardware protected WORM tape





Icon	Component state
	Software protected and encrypted WORM tape
	Hardware protected and encrypted WORM tape

Offline Tapes

Offline indication does not differ for standard and WORM tapes.

Icon	Component state
	Tape
	Retired tape
	Encrypted tape
	Hardware protected tape
	Software protected tape
	Software protected and encrypted tape
	Hardware protected and encrypted tape

Cleaning Tape

Icon	Component state
	Online cleaning tape
	Offline cleaning tape
	Retired online cleaning tape
	Retired offline cleaning tape

Tape Alerts

Tape drive and tape changer alerts are informational, warning or critical notifications designed to provide real-time monitoring of the hardware operation status. They ensure quick detection and troubleshooting of various issues with devices.

In This Section

- [Tape Drive Alerts](#)
- [Tape Changer Alerts](#)

Tape Drive Alerts

There are 3 types of error flags:

Severity	Urgent User Intervention	Risk of Data Loss	Explanations
Critical	X	X	
Warning		X	X
Information			X

You may get one of the following tape drive alerts when working with Veeam Backup & Replication:

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
1	0x01	Read warning	Warning	The tape drive is having problems reading data. No data has been lost, but there has been a reduction in the performance of the tape.	The drive is having severe trouble reading.
2	0x02	Write warning	Warning	The tape drive is having problems writing data. No data has been lost, but there has been a reduction in the capacity of the tape.	The drive is having severe trouble writing.
3	0x03	Hard error	Warning	The operation has stopped because an error has occurred while reading or writing data that the drive cannot correct.	The drive had a hard read or write error.
4	0x04	Media error	Critical	Your data is at risk: <ol style="list-style-type: none"> 1. Copy any data you require from this tape. 2. Do not use this tape again. 3. Restart the operation with a different tape. 	Media can no longer be written/read, or performance is severely degraded.
5	0x05	Read failure	Critical	The tape is damaged or the drive is faulty. Call the tape drive supplier helpline.	The drive can no longer read data from the tape.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
6	0x06	Write failure	Critical	The tape is from a faulty batch or the tape drive is faulty: <ol style="list-style-type: none"> 1. Use a good tape to test the drive. 2. If problem persists, call the tape drive supplier helpline. 	The drive can no longer write data to the tape.
7	0x07	Media life	Warning	The tape cartridge has reached the end of its calculated useful life: <ol style="list-style-type: none"> 1. Copy data you need to another tape. 2. Discard the old tape. 	The media has exceeded its specified life.
8	0x08	Not data grade tape	Warning	The tape cartridge is not data-grade. Any data you back up to the tape are at risk. Replace the cartridge with a data-grade tape.	The drive has not been able to read the MRS stripes.
9	0x09	Attempted backup to write-protected tape	Critical	You are trying to write to a write-protected cartridge. Remove the write-protection or use another tape.	Write command is attempted to a write protected tape.
10	0x0a	Tape drive is in use	Information	You cannot eject the cartridge because the tape drive is in use. Wait until the operation is complete before ejecting the cartridge.	Manual or s/w unload attempted when prevent media removal on.
11	0x0b	Attempted backup/restore to cleaning tape	Information	The tape in the drive is a cleaning cartridge.	Cleaning tape is loaded into drive.
12	0x0c	Unsupported cartridge type	Information	You have tried to load a cartridge of a type which is not supported by this drive.	Attempted loaded of unsupported tape format, for example, DDS2 in DDS1 drive.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
13	0x0d	Detected snapped tape	Critical	The operation has failed because the tape in the drive has experienced a mechanical failure: <ol style="list-style-type: none"> 1. Discard the old tape. 2. Restart the operation with a different tape. 	Tape snapped/cut in the drive where media can be ejected.
14	0x0e	Detected snapped tape	Critical	The operation has failed because the tape in the drive has experienced a mechanical failure: <ol style="list-style-type: none"> 1. Do not attempt to extract the tape cartridge. 2. Call the tape drive supplier helpline. 	Tape snapped/cut in the drive where media cannot be ejected.
15	0x0f	Cartridge memory chip failure	Warning	The memory in the tape cartridge has failed, which reduces performance. Do not use the cartridge for further write operations.	Memory chip failed in cartridge.
16	0x10	Forced eject	Critical	The operation has failed because the tape cartridge was manually de-mounted while the tape drive was actively writing or reading.	Manual or forced eject while drive actively writing or reading.
17	0x11	Read-only format	Warning	You have loaded a cartridge of a type that is read-only in this drive. The cartridge will appear as write-protected.	Media loaded that is read-only format.
18	0x12	Tape directory corrupted in the cartridge memory	Warning	The tape directory on the tape cartridge has been corrupted. File search performance will be degraded. The tape directory can be rebuilt by reading all the data on the cartridge.	Tape drive powered down with tape loaded, or permanent error prevented the tape directory being updated.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
19	0x13	Nearing media life	Information	<p>The tape cartridge is nearing the end of its calculated life. It is recommended that you:</p> <ol style="list-style-type: none"> 1. Use another tape cartridge for your next backup. 2. Store this tape in a safe place in case you need to restore data from it. 	Media may have exceeded its specified number of passes.
20	0x14	Clean now	Critical	<p>The tape drive needs cleaning:</p> <ol style="list-style-type: none"> 1. If the operation has stopped, eject the tape and clean the drive. 2. If the operation has not stopped, wait for it to finish and then clean the drive. <p>Check the tape drive user's manual for device specific cleaning instructions.</p>	The drive thinks it has a head clog, or needs cleaning.
21	0x15	Clean periodic	Warning	<p>The tape drive is due for routine cleaning:</p> <ol style="list-style-type: none"> 1. Wait for the current operation to finish. 2. Then use a cleaning cartridge. <p>Check the tape drive user's manual for device specific cleaning instructions.</p>	The drive is ready for a periodic clean.
22	0x16	Expired cleaning media	Critical	<p>The last cleaning cartridge used in the tape drive has worn out:</p> <ol style="list-style-type: none"> 1. Discard the worn out cleaning cartridge. 2. Wait for the current operation to finish. 3. Then use a new cleaning cartridge. 	The cleaning tape has expired.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
23	0x17	Invalid cleaning cartridge	Critical	The last cleaning cartridge used in the tape drive was an invalid type: <ol style="list-style-type: none"> 1. Do not use this cleaning cartridge in this drive. 2. Wait for the current operation to finish. 3. Then use a new cleaning cartridge. 	Invalid cleaning tape type used.
24	0x18	Request retention	Warning	The tape drive has requested a retention operation.	The drive is having severe trouble reading or writing, which will be resolved by a retention cycle.
25	0x19	Dual-port interface error	Warning	A redundant interface port on the tape drive has failed.	Failure of one interface port in a dual-port configuration, for example, Fibrechannel.
26	0x1a	Cooling fan failure	Warning	A tape drive cooling fan has failed.	Fan failure inside tape drive mechanism or tape drive enclosure.
27	0x1b	Power supply	Warning	A redundant power supply has failed inside the tape drive enclosure. Check the enclosure user's manual for instructions on replacing the failed power supply.	Redundant PSU failure inside the tape drive enclosure or rack subsystem.
28	0x1c	Power consumption is outside the specified range	Warning	The tape drive power consumption is outside the specified range.	Power consumption of the tape drive is outside specified range.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
29	0x1d	Preventative maintenance is required	Warning	Preventive maintenance of the tape drive is required. Check the tape drive user's manual for device specific preventive maintenance tasks or call the tape drive supplier helpline.	The drive requires preventative maintenance (not cleaning).
30	0x1e	Drive hardware fault	Critical	The tape drive has a hardware fault: <ol style="list-style-type: none"> 1. Eject the tape or magazine. 2. Reset the drive. 3. Restart the operation. 	The drive has a hardware fault that requires reset to recover.
31	0x1f	Drive hardware fault	Critical	The tape drive has a hardware fault: <ol style="list-style-type: none"> 1. Turn the tape drive off and then on again. 2. Restart the operation. 3. If the problem persists, call the tape drive supplier helpline. 	The drive has a hardware fault which is not read/write related or requires a power cycle to recover.
32	0x20	Host interface fault	Warning	The tape drive has a problem with the application client interface: <ol style="list-style-type: none"> 1. Check the cables and cable connections. 2. Restart the operation. 	The drive has identified an interfacing fault.
33	0x21	Eject media request	Critical	The operation has failed: <ol style="list-style-type: none"> 1. Eject the tape or magazine. 2. Insert the tape or magazine again. 3. Restart the operation. 	Error recovery action.
34	0x22	Firmware download fault	Warning	The firmware download has failed because you have tried to use the incorrect firmware for this tape drive. Obtain the correct firmware and try again.	Firmware download failed.
35	0x23	Humidity specification exceeded	Warning	Environmental conditions inside the tape drive are outside the specified humidity range.	Drive humidity limits exceeded.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
36	0x24	Temperature specification exceeded	Warning	Environmental conditions inside the tape drive are outside the specified temperature range.	Drive temperature limits exceeded.
37	0x25	Voltage specification exceeded	Warning	The voltage supply to the tape drive is outside the specified range.	Drive voltage limits exceeded.
38	0x26	Tape device predicted to fail	Critical	A hardware failure of the tape drive is predicted. Call the tape drive supplier helpline.	Predictive failure of drive hardware.
39	0x27	Drive hardware fault	Warning	The tape drive may have a hardware fault. Run extended diagnostics to verify and diagnose the problem. Check the tape drive user's manual for device specific instructions on running extended diagnostic tests.	The drive may have had a failure which may be identified by stored diagnostic information or by running extended diagnostics (for example, Send Diagnostic).
40	0x28	Autoloader communication fault	Critical	The changer mechanism is having difficulty communicating with the tape drive: <ul style="list-style-type: none"> 1. Turn the autoloader off then on. 2. Restart the operation. 3. If problem persists, call the tape drive supplier helpline. 	Loader mechanism is having trouble communicating with the tape drive.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
41	0x29	Detected stray tape in autoloader	Critical	<p>A tape has been left in the autoloader by a previous hardware fault:</p> <ol style="list-style-type: none"> 1. Insert an empty magazine to clear the fault. 2. If the fault does not clear, turn the autoloader off and then on again. 3. If the problem persists, call the tape drive supplier helpline. 	Stray tape left in loader after previous error recovery.
42	0x2a	Autoloader mechanism fault	Warning	There is a problem with the autoloader mechanism.	Loader mechanism has a hardware fault.
43	0x2b	Autoloader door open	Critical	<p>The operation has failed because the autoloader door is open:</p> <ol style="list-style-type: none"> 1. Clear any obstructions from the autoloader door. 2. Eject the magazine and then insert it again. 3. If the fault does not clear, turn the autoloader off and then on again. 4. If the problem persists, call the tape drive supplier helpline. 	Tape changer door open.
44	0x2c	Autoloader hardware fault	Critical	<p>The autoloader has a hardware fault:</p> <ol style="list-style-type: none"> 1. Turn the autoloader off and then on again. 2. Restart the operation. 3. If the problem persists, call the tape drive supplier helpline. <p>Check the autoloader user's manual for device specific instructions on turning the device power on and off.</p>	The loader mechanism has a hardware fault that is not mechanically related.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
45	0x2d	Autoloader cannot operate without magazine	Critical	The autoloader cannot operate without the magazine: 1. Insert the magazine into the autoloader. 2. Restart the operation.	Loader magazine not present.
46	0x2e	Autoloader predicted to fail	Warning	A hardware failure of the changer mechanism is predicted. Call the tape drive supplier helpline.	Predictive failure of loader mechanism hardware.
47 - 49	0x2f - 0x31			These codes are reserved for future use.	
50	0x32	Media statistics is lost	Warning	Media statistics have been lost at some time in the past.	Drive or library powered down with tape loaded.
51	0x33	Tape directory is corrupted	Warning	The tape directory on the tape cartridge just unloaded has been corrupted. File search performance will be degraded. The tape directory can be rebuilt by reading all the data.	Error prevented the tape directory being updated on unload.
52	0x34	Tape system area write failure	Critical	The tape just unloaded could not write its system area successfully: 1. Copy data to another tape cartridge. 2. Discard the old cartridge.	Write errors while writing the system log on unload.
53	0x35	Tape system area read failure	Critical	The tape system area could not be read successfully at load time: 1. Copy data to another tape cartridge. 2. Discard the old cartridge.	Read errors while reading the system area on load.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
54	0x36	Start of data not found	Critical	<p>The start of data could not be found on the tape:</p> <ol style="list-style-type: none"> 1. Check you are using the correct format tape. 2. Discard the tape or return the tape to your supplier. 	Tape damaged, bulk erased, or incorrect format.
55	0x37	Load failure	Critical	<p>The operation has failed because the media cannot be loaded and threaded:</p> <ol style="list-style-type: none"> 1. Remove the cartridge, inspect it as specified in the product manual, and retry the operation. 2. If the problem persists, call the tape drive supplier help line. 	Media could not be loaded/threaded.
56	0x38	Medium unload failure	Critical	<p>The operation has failed because the medium cannot be unloaded:</p> <ol style="list-style-type: none"> 1. Do not attempt to extract the tape cartridge. 2. Call the tape driver supplier help line. 	Unrecoverable unload failed.
57	0x39	Interface failure	Critical	<p>The tape drive has a problem with the automation interface:</p> <ol style="list-style-type: none"> 1. Check the power to the automation system. 2. Check the cables and cable connections. 3. Call the supplier help line if problem persists. 	Automation interface failure.
58	0x3a	Firmware failure	Warning	<p>The tape drive has reset itself due to a detected firmware fault. If problem persists, call the supplier help line.</p>	Firmware failure.

Tape Changer Alerts

There are 3 types of error flags:

Severity	Urgent User Intervention	Risk of Data Loss	Explanations
Critical	X	X	
Warning		X	X
Information			X

You may get one of the following tape changer alerts when working with Veeam Backup & Replication:

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
0	0x00		Information	Unknown changer alert.	
1	0x01	Library Hardware A	Critical	The library mechanism is having difficulty communicating with the drive: <ol style="list-style-type: none"> 1. Turn the library off then on. 2. Restart the operation. 3. If the problem persists, call the library supplier help line. 	Changer mechanism is having trouble communicating with the internal drive.
2	0x02	Library Hardware B	Warning	There is a problem with the library mechanism. If problem persists call the library supplier help line.	Changer mechanism has a hardware fault.
3	0x03	Library Hardware C	Critical	The library has a hardware fault: <ol style="list-style-type: none"> 1. Reset the library. 2. Restart the operation. 3. Check the library users manual for device specific instructions on resetting the device. 	The changer mechanism has a hardware fault that requires reset to recover.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
4	0x04	Library Hardware D	Critical	<p>The library has a hardware fault:</p> <ol style="list-style-type: none"> 1. Turn the library off then on again. 2. Restart the operation. 3. If the problem persists, call the library supplier help line. 4. Check the library users manual for device specific instructions on turning the device power on and off. 	The changer mechanism has a hardware fault that is not mechanically related, or requires a power cycle to recover.
5	0x05	Library Diagnostics Required	Warning	<p>The library mechanism may have a hardware fault:</p> <ol style="list-style-type: none"> 1. Run extended diagnostics to verify and diagnose the problem. 2. Check the library users manual for device specific instructions on running extended diagnostic tests. 	The changer mechanism may a hardware fault which can be identified by extended diagnostics (for example, SCSI Send Diagnostic).
6	0x06	Library Interface	Critical	<p>The library has a problem with the host interface:</p> <ol style="list-style-type: none"> 1. Check the cables and connections. 2. Restart the operation. 	The library has identified an interfacing fault.
7	0x07	Predictive Failure	Warning	<p>A hardware failure of the library is predicted.</p> <p>Call the library supplier help line.</p>	Predictive failure of library hardware.
8	0x08	Library Maintenance	Warning	<p>Preventive maintenance of the library is required.</p> <p>Check the library users manual for device specific preventative maintenance tasks, or call your library supplier help line.</p>	Library preventative maintenance required.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
9	0x09	Library Humidity Limits	Critical	General environmental conditions inside the library are outside the specified humidity range.	Library humidity limits exceeded.
10	0x0a	Library Temperature Limits	Critical	General environmental conditions inside the library are outside the specified temperature range.	Library temperature limits exceeded.
11	0x0b	Library Voltage Limits	Critical	The voltage supply to the library is outside the specified range. There is a potential problem with the power supply or failure of a redundant power supply.	Library voltage limits exceeded
12	0x0c	Library Stray Tape	Critical	A cartridge has been left inside the library by a previous hardware fault: <ol style="list-style-type: none"> 1. Insert an empty magazine to clear the fault. 2. If the fault does not clear, turn the library off and then on again. 3. If the problem persists, call the library supplier help line. 	Stray cartridge left in library drive after previous error recovery.
13	0x0d	Library Pick Retry	Warning	There is a potential problem with the drive ejecting cartridges or with the library mechanism picking a cartridge from a slot. No action needs to be taken at this time. If the problem persists, call the library supplier help line.	Operation to pick a cartridge from a slot had to perform an excessive number of retries before succeeding.
14	0x0e	Library Place Retry	Warning	There is a potential problem with the library mechanism placing a cartridge into a slot. No action needs to be taken at this time. If the problem persists, call the library supplier help line.	Operation to place a cartridge into a slot had to perform an excessive number of retries before succeeding.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
15	0x0f	Library Load Retry	Warning	There is a potential problem with the drive or the library mechanism loading cartridges, or an incompatible cartridge.	Operation to load a cartridge into a drive had to perform an excessive number of retries before succeeding.
16	0x10	Library Door	Critical	The library has failed because the door is open: <ul style="list-style-type: none"> 1. Clear any obstructions from the library door. 2. Close the library door. 3. If the problem persists, call the library supplier help line. 	Changer door open prevents library functioning.
17	0x11	Library Mailslot	Critical	There is a mechanical problem with the library media import/export mailslot.	Mechanical problem with import/export mailslot
18	0x12	Library Magazine	Critical	The library cannot operate without the magazine: <ul style="list-style-type: none"> 1. Insert the magazine into the library. 2. Restart the operation. 	Library magazine not present.
19	0x13	Library Security	Warning	Library security has been compromised.	Library door opened then closed during operation.
20	0x14	Library Security Mode	Information	The library security mode has been changed. The library has either been put into secure mode, or the library has exited the secure mode. This is for information purposes only. No action is required.	Library security mode changed.
21	0x15	Library Offline	Information	The library has been manually turned offline and is unavailable for use.	Library manually turned offline.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
22	0x16	Library Drive Offline	Information	<p>A drive inside the library has been taken offline.</p> <p>This is for information purposes only. No action is required.</p>	Library turned internal drive offline.
23	0x17	Library Scan Retry	Warning	<p>There is a potential problem with the bar code label or the scanner hardware in the library mechanism.</p> <p>No action needs to be taken at this time.</p> <p>If the problem persists, call the library supplier help line.</p>	Operation to scan the barcode on a cartridge had to perform an excessive number of retries before succeeding.
24	0x18	Library Inventory	Critical	<p>The library has detected an inconsistency in its inventory.</p> <ol style="list-style-type: none"> 1. Redo the library inventory to correct inconsistency. 2. Restart the operation. 3. Check the applications users manual or the hardware users manual for specific instructions on redoing the library inventory. 	Inconsistent media inventory.
25	0x19	Library Illegal Operation	Warning	<p>A library operation has been attempted that is invalid at this time.</p>	Illegal operation detected.
26	0x1a	Dual-Port Interface Error	Warning	<p>A redundant interface port on the library has failed.</p>	Failure of one interface port in a dual-port configuration, for example, Fibrechannel.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
27	0x1b	Cooling Fan Failure	Warning	A library cooling fan has failed.	One or more fans inside the library have failed. Internal flag state only cleared when all fans are working again.
28	0x1c	Power Supply	Warning	A redundant power supply has failed inside the library. Check the library users manual for instructions on replacing the failed power supply.	Redundant PSU failure inside the library subsystem.
29	0x1d	Power Consumption	Warning	The library power consumption is outside the specified range.	Power consumption of one or more devices inside the library is outside specified range.
30	0x1e	Pass-through mechanism failure.	Critical	A failure has occurred in the cartridge pass-through mechanism between two library modules.	Error occurred in pass-through mechanism during self test or while attempting to transfer a cartridge between library modules.
31	0x1f	Cartridge in pass-through mechanism	Critical	A cartridge has been left in the pass-through mechanism from a previous hardware fault. Check the library users guide for instructions on clearing this fault.	Cartridge left in the pass-through mechanism between two library modules.

Alert Code (Dec)	Alert Code (Hex)	Flag	Severity	Description	Cause
32	0x20	Unreadable bar code labels	Information	The library was unable to read the bar code on a cartridge.	Unable to read a barcode label on a cartridge during library inventory/scan.