Quest™

NetVault Backup & Amazon Gateway-VTL

Backing up to the Cloud with Amazon Web Services and Quest Software NetVault Backup

NetVault

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Legend

 WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death

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Updated – July 25, 2018

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Introduction

Abstract

This document describes how to implement cloud data protection using Quest NetVault Backup and the Amazon Web Services (AWS) Gateway-Virtual Tape Library (Gateway-VTL). Using the Amazon Gateway-VTL in conjunction with NetVault Backup enables seamless data protection of on premise data to the cloud. Storing NetVault backups in the cloud provides an easy and inexpensive alternative to other offsite solutions. With this solution, you can store data in Amazon S3 and seamlessly archive to Glacier for as little as $0.010 per GB.

The Amazon Gateway-VTL

The Gateway-VTL is an on premise disk cache that provides a low-cost, scalable and resilient virtual tape infrastructure. This VTL combines the functionality of a traditional tape library with the low-cost, off-site disk available in Amazon S3 and Glacier. Frequently accessed data is stored locally on the Gateway-VTL and on S3 to provide simple offsite disaster recovery. As data ages and access demands decline, data is moved from S3 to the Virtual Tape Shelf, which is backed by Glacier. Here data can reside for long periods of time for as little as $0.010 per GB/month.

The Gateway-VTL is a virtual machine that is deployed locally on either a VMware ESX or Microsoft Hyper-V server. The virtual machine is then configured with virtual disk space that is used as local cache and an upload buffer, allowing for fast access to active data and resilient uploads to the cloud.

The combined NetVault Backup/Amazon Gateway-VTL solution

The Gateway-VTL is presented to the NetVault Backup server by emulating a STK-L700 media changer with Sony tape drives via iSCSI. Once presented via iSCSI, the STK-L700 can be configured within NetVault Backup as a normal tape library.

Solution System requirements

Before using the NetVault Backup/Amazon Gateway-VTL solution, it is important to ensure compatibility in your environment. Below are the basic system requirements. More detailed system requirements and supported operating systems can be found in the NetVault Backup Compatibility Guide and AWS Storage Gateway Requirements.

- NetVault Backup versions: 12.0, 11.4.5
- Supported iSCSI initiators: RHEL 5, RHEL 6, Windows 7, and Windows Server 2008, 2008R2, 2012, 2012R2 and 2016. Note that the VMware ESX initiator provides an alternative to using initiators in the guest operating systems of your VMs. Use this option if you want to use an operating system whose iSCSI initiator is not supported by the Amazon VTL.
- Supported hypervisors: VMware™ vSphere 4.1, 5.0 ,5.1, 5.5, 6.0, 6.5, 6.7 and Microsoft™ Hyper-V 2008R2, 2012, 2012R2, 2016
- Amazon Gateway VTL version: Any release from 12-16-2014 and later
- Amazon Gateway emulation: STK-L700

Known solution limitations

Testing of the NetVault Backup with the Amazon Gateway-VTL has uncovered a few limitations, which are currently under investigation and should be resolved in future releases of the products:

- Auto configuration of the Gateway-VTL within NetVault Backup does not work on Windows and Linux operating systems.
- The Gateway-VTL does not support the 10 GB vmxnet3 network adapter. Only the E1000 network adapter is officially supported at the release of this document.

Planning, Installation and Initial Configuration

Planning, installing and configuring the Amazon Gateway-VTL is a simple process. Planning begins with two key considerations:

- Decide whether the Gateway-VTL will be attached to the NetVault Backup server or to a server with the NetVault SmartClient installed.
- Ensure the operating system that will be used is compatible with both NetVault Backup and the Gateway-VTL.

Sizing the cache and buffer

Local disk storage is a requirement for a Gateway-VTL. Local disk is used for the cache storage and the upload buffer to the cloud. Additionally, the cache storage provides low-latency access to protected data. The upload buffer is a staging area for data being uploaded to Amazon S3. This staging area is crucial for the creation of recovery points that are used for recovery of the Gateway-VTL.

Therefore, you need to determine how much data you want to back up to the Gateway-VTL, and then properly size the gateway storage cache and upload buffer to obtain optimal performance. For sizing guidance, please refer to Managing the Upload Buffer and Cache Storage.

Using multiple network interface cards (recommended)

To optimize backup and upload speeds, it is recommend to configure the Amazon Gateway-VTL with multiple network interface cards (NICs). Having at least two network interfaces allows for a primary interface to be used for uploading data to Amazon S3 and a secondary interface for iSCSI backup traffic. The procedure for configuring multiple interface cards can be found at Configuring Your Gateway for Multiple NICs.

Amazon Gateway-VTL Installation and initial configuration

Installation and initial configuration is outside of the scope of this document. For detailed steps on how to install and configure the Gateway-VTL, please visit Setting Up Your Gateway-VTL. When deploying the Gateway-VTL, be sure to set the device type to **STK-L700** (see Figure 1).

Once the Gateway-VTL is installed, configured and attached via iSCSI to a Windows or Linux NetVault Backup server, proceed to the next section of this document.
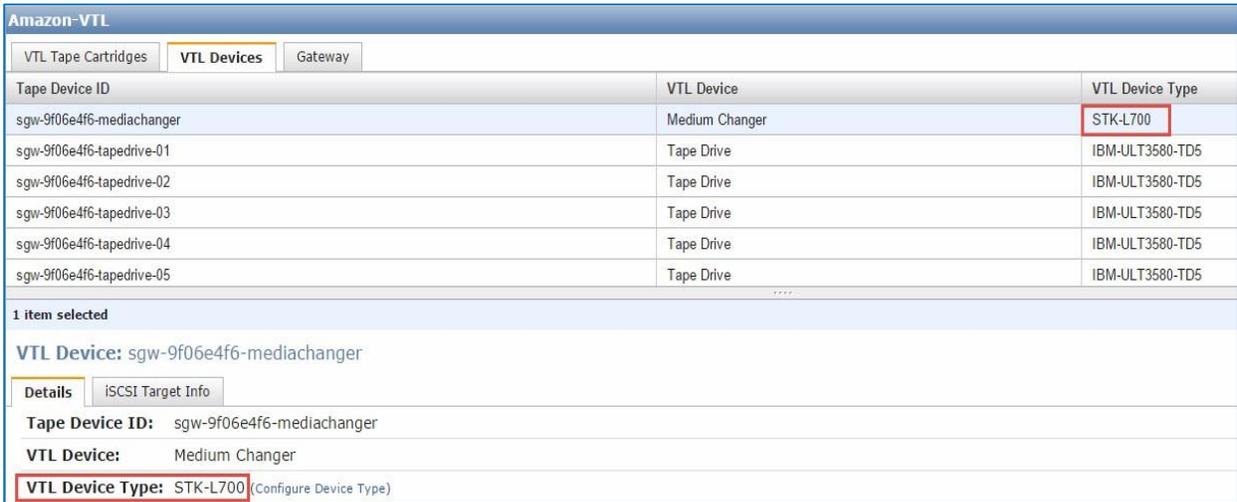
Figure 1. When deploying the Gateway-VTL be sure to set the device type to **STK-L700**.

Configuring the Amazon Gateway-VTL when using Windows

This section only applies those who have attached the Gateway-VTL to the Windows operating system; if you are using Linux, skip this section and proceed to Adding the Amazon VTL to the NetVault Backup server.

If you are using Windows operating systems with the Gateway-VTL, before you add the Gateway-VTL to NetVault Backup as a VTL device you must modify three registry entries:

- **MaxRequestHoldTime**
- **MaxRecvDataSegmentLength**
- **TimeoutValue**

Failure to do so may result in improper interoperability between the Gateway-VTL and NetVault Backup. Note that once you have modified the registry keys, you will need reboot the system for your changes to take effect.

Procedure

To modify the registry entries, take the following steps:

1. Start the Windows Registry Editor (Regedit.exe).

2. Navigate to the following globally unique identifier (GUID):

    HK_Local_Machine\SYSTEM\CurrentControlSet\Control\Class\{4D36E97B-E325-11CE-BFC1-08002BE10318}

3. Find the subkey for the Microsoft iSCSI initiator. This will be a four-digit number such as 0000 or 0001. In the example shown in Figure 2, it is 0003.

4. Expand the subkey.

5. Click **Parameters**, as shown in Figure 3. Then modify the first two of the registry entries you need to change:

    a. Right-click on the **MaxRecvDataSegmentLength** DWORD (32-bit) value and click **Modify**. Then set **Base** to **decimal** and set **value** to **262144**.

    b. Right-click **MaxRequestHoldTime** DWORD (32-bit) value and click **Modify**. Then set **Base** to **decimal** and set **value** to **600**.
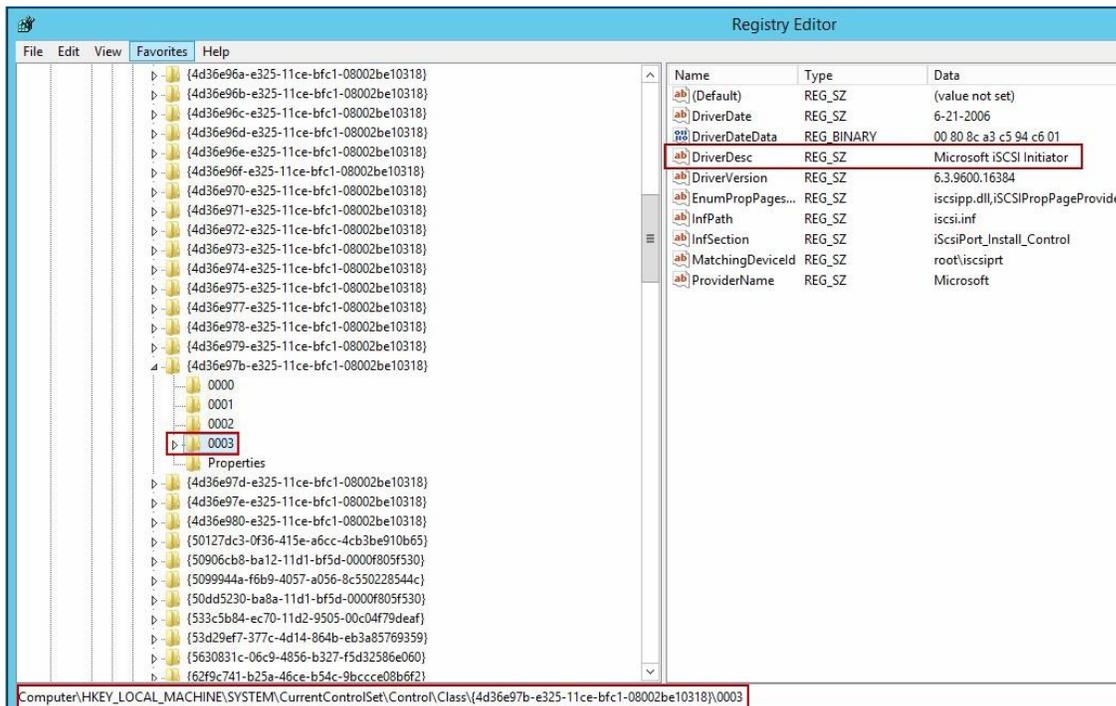
Figure 2. Finding the subkey for the Microsoft iSCSI initiator (in this example, it is 0003)
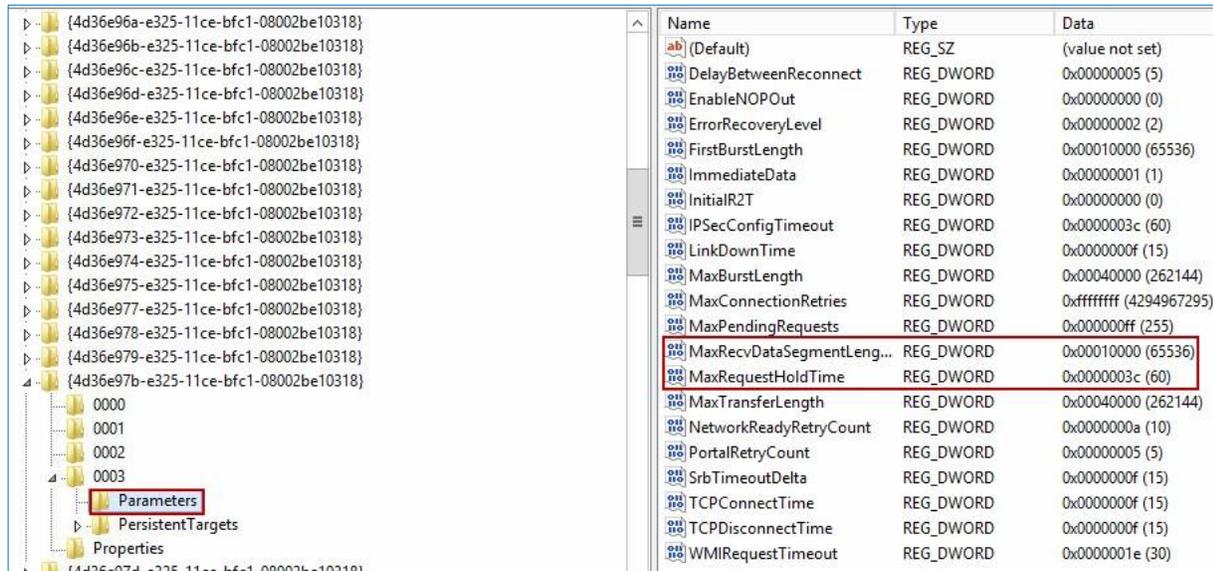
Figure 3. Modifying the registry entries for **MaxRequestHoldTime** and **MaxRecvDataSegmentLength**

6. Navigate to the disk subkey located at:

    HK_Local_Machine\SYSTEM\CurrentControlSet\Services\Disk

7. Right−click on the **TImeoutValue** DWORD (32−bit) value (see Figure 4) and click **Modify**. Then set **Base** to **decimal** and set **value** to **600**.

8. Reboot the system so your changes will take effect.
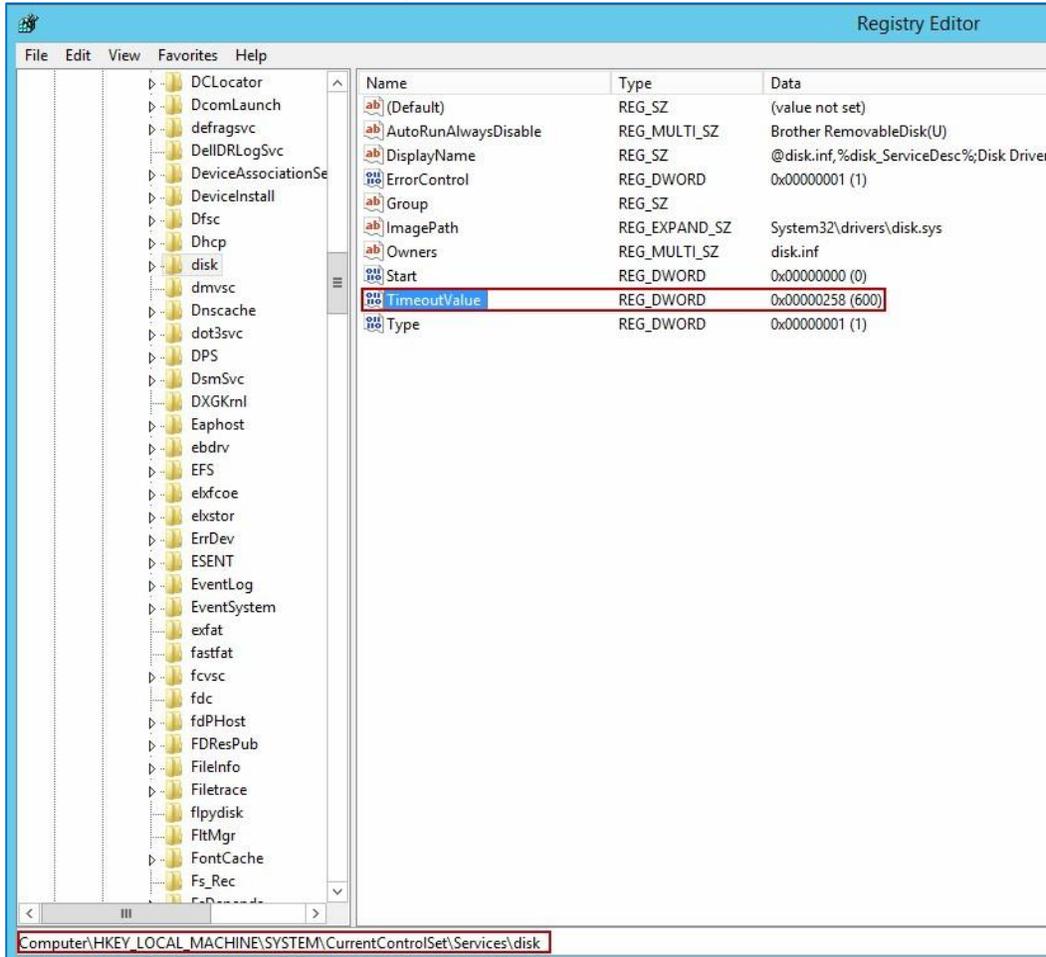
Figure 4. Modifying the registry entries for **TImeoutValue**

Adding the Amazon VTL to the NetVault Backup server

The steps in this section apply to both Windows and Linux NetVault Backup servers. These steps add the Gateway-VTL to a NetVault Backup server as a storage device, allowing for backups directly to the AWS cloud.

1. Open the NetVault Backup web console and go to **Guided Configuration**.

2. From the Guided Configuration screen, click **Add Storage Devices,** as illustrated in Figure 5.
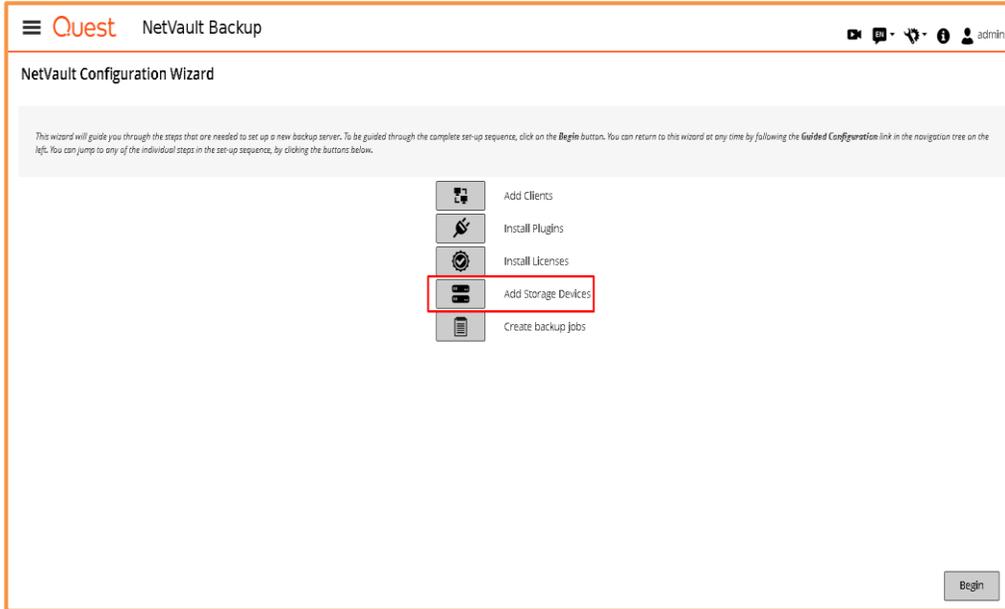
Figure 5. Clicking **Add Storage Devices** on the Guided Configuration screen

3. Select **Tape library / media changer** and then click **Next** (see Figure 6).
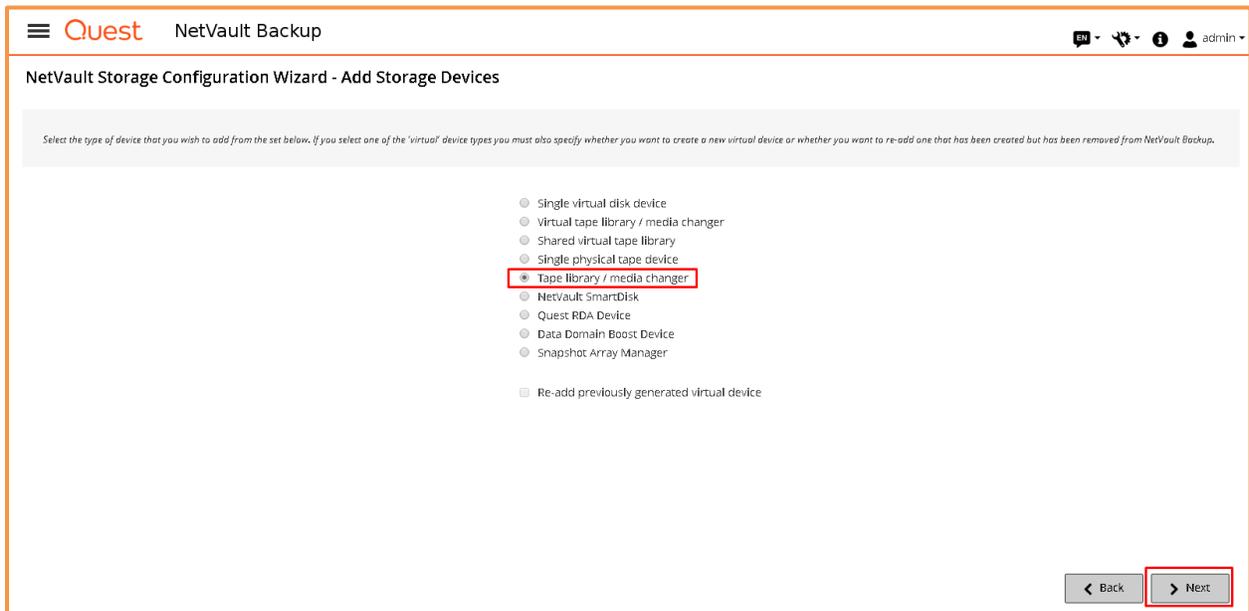
Figure 6. Selecting **Tape library / media changer**

4. Select the client that has the Amazon Gateway–VTL attached to it via iSCSI and click **Next**. In the example shown in Figure 7, the client is pune-tape-01.
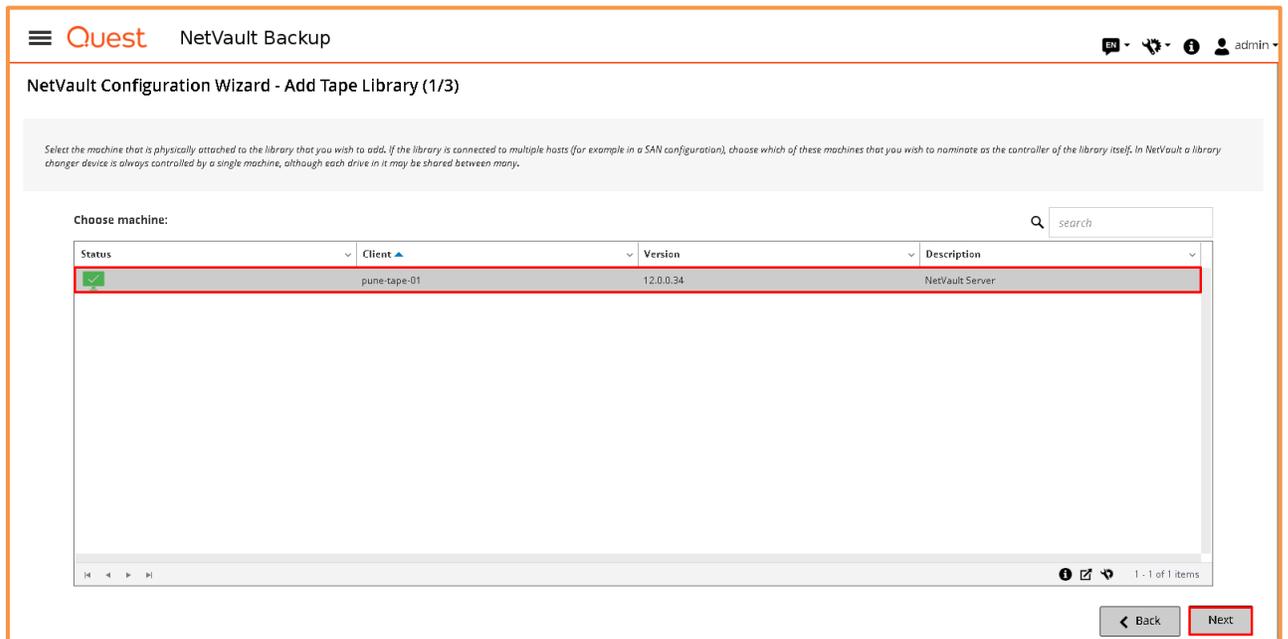
Figure 7. Selecting the client that has the Amazon Gateway–VTL attached to it via iSCSI

5. Select the STK-L700 device and click **Next** (see Figure 8).
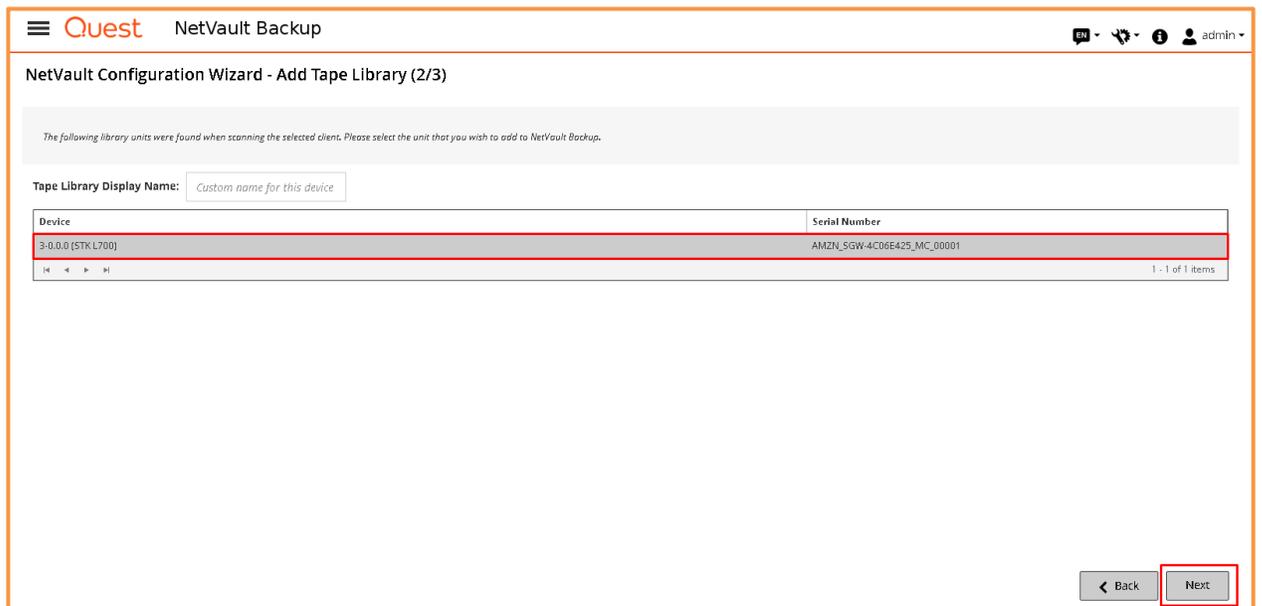
Figure 8. Selecting the STK-L700 device

6. If the drives cannot be configured automatically, click **Add drives manually…** (see Figure 9).
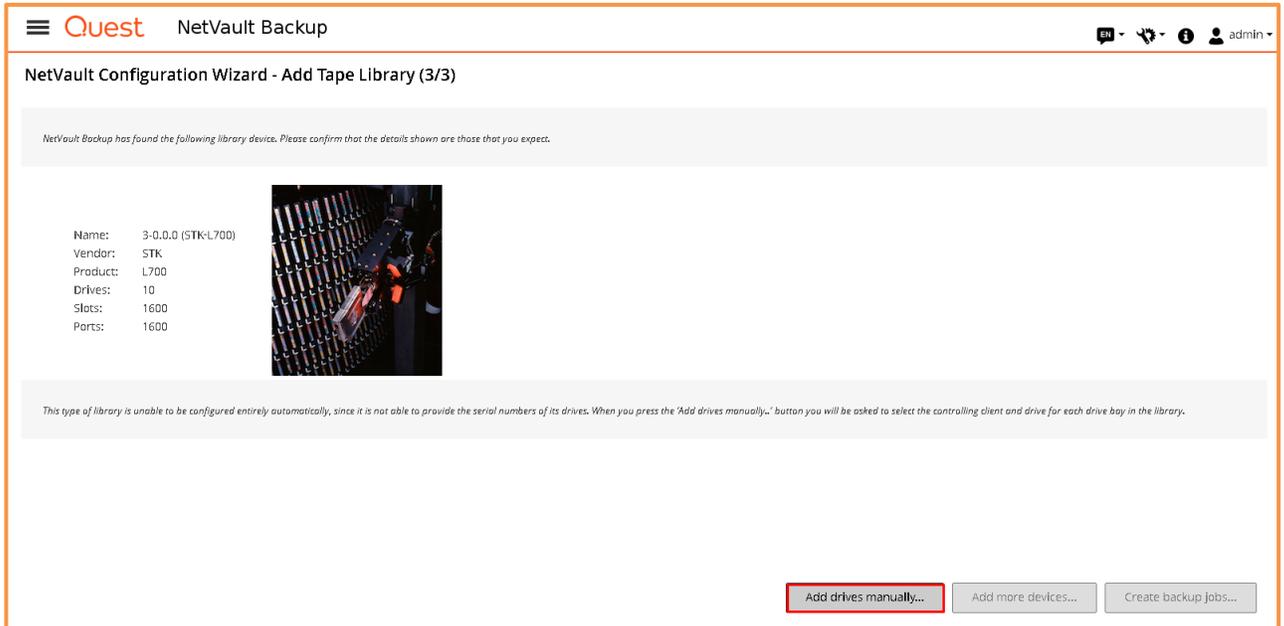
Figure 9. Adding drives manually

7. Select the server that has the Amazon Gateway–VTL attached to it and click **Next** (see Figure 10).
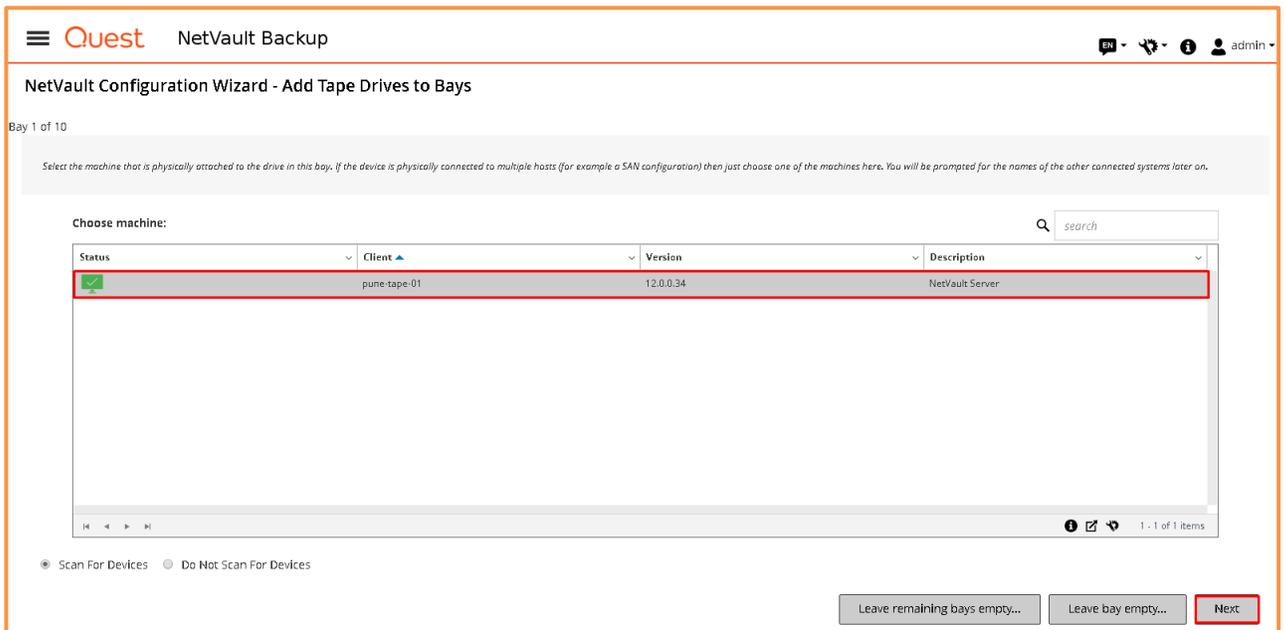
Figure 10. Selecting the server that has the Amazon Gateway–VTL attached to it

8. Select the drive number that corresponds to the bay that you are configuring (see Figure 11). That is, if you are adding a drive to drive bay 1, select drive 1; if you are adding to bay 2, select drive 2; and so on. Then click **Next**.
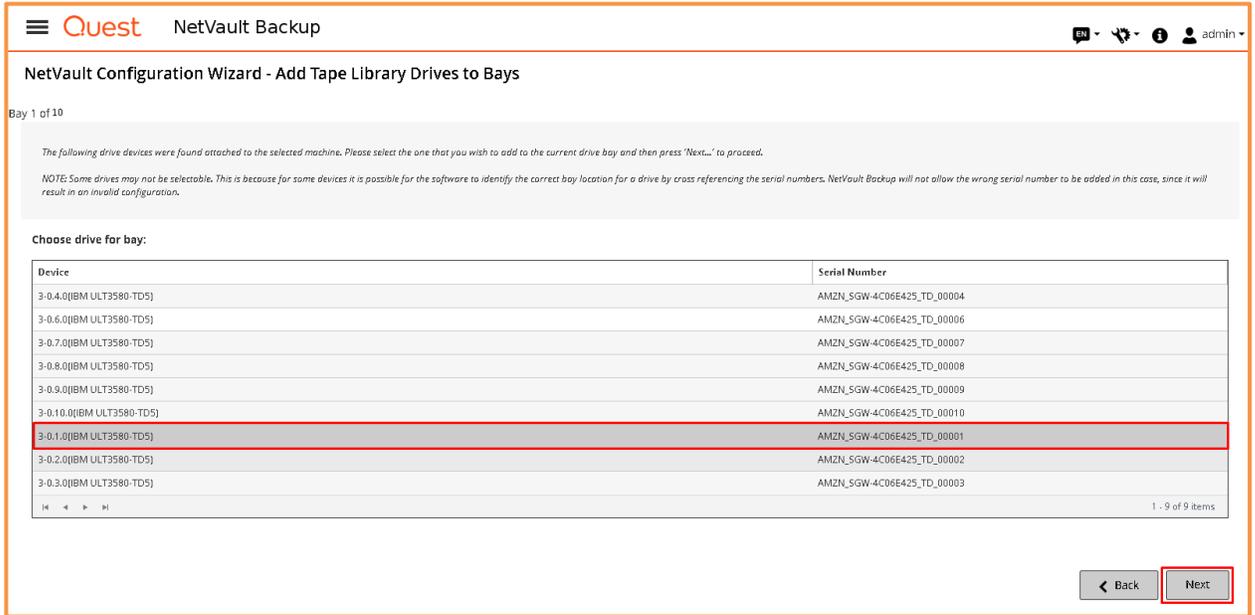
Figure 11. Selecting the drive number

9. If the Gateway-VTL is not shared with multiple NetVault Backup servers, do not select anything on the next screen in the wizard (see Figure 12). Instead, simply click **Next**.
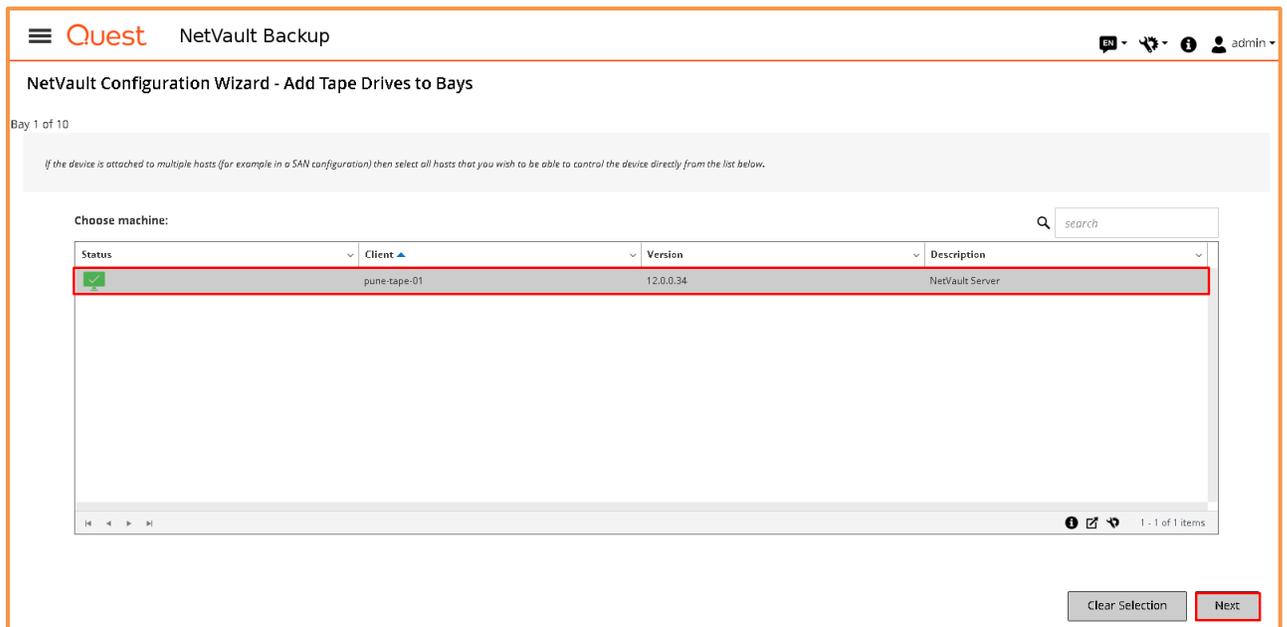
Figure 12. If the Gateway-VTL is not shared with multiple NetVault Backup servers, simply click **Next** on this screen.

10. Repeat steps 7-9 for all 10 drive bays.

Confirming the tape library configuration

When you have completed this procedure, you should see the screen shown in Figure 13.

Note - Be sure to click on one of the two options presented at the bottom right of this screen either 'Add more devices' or 'Create backup jobs' to successfully complete adding the library and drives.
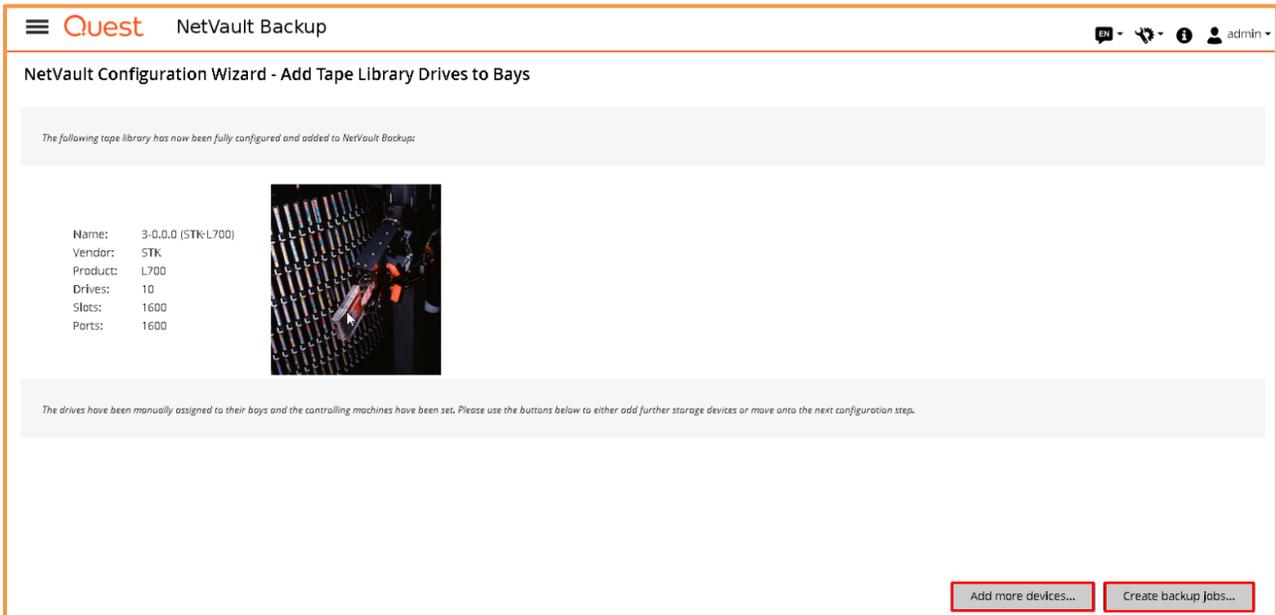
Figure 13. Confirming that the Gateway-VTL has been added to NetVault Backup as a storage device

Managing Amazon Gateway-VTL tapes in NetVault Backup

For detailed information on how to create, manage and delete Gateway-VTL tapes, please visit [Managing Tapes in the VTL](#).

Once you have created tapes via the Amazon console, they will automatically appear in the NetVault Backup console. The steps in this section explain how to label and export the Gateway-VTL tapes.

Labeling Gateway-VTL tapes

1. Click **Manage Devices** and then click the gear next to the Amazon Gateway-VTL, as illustrated in Figure 14.
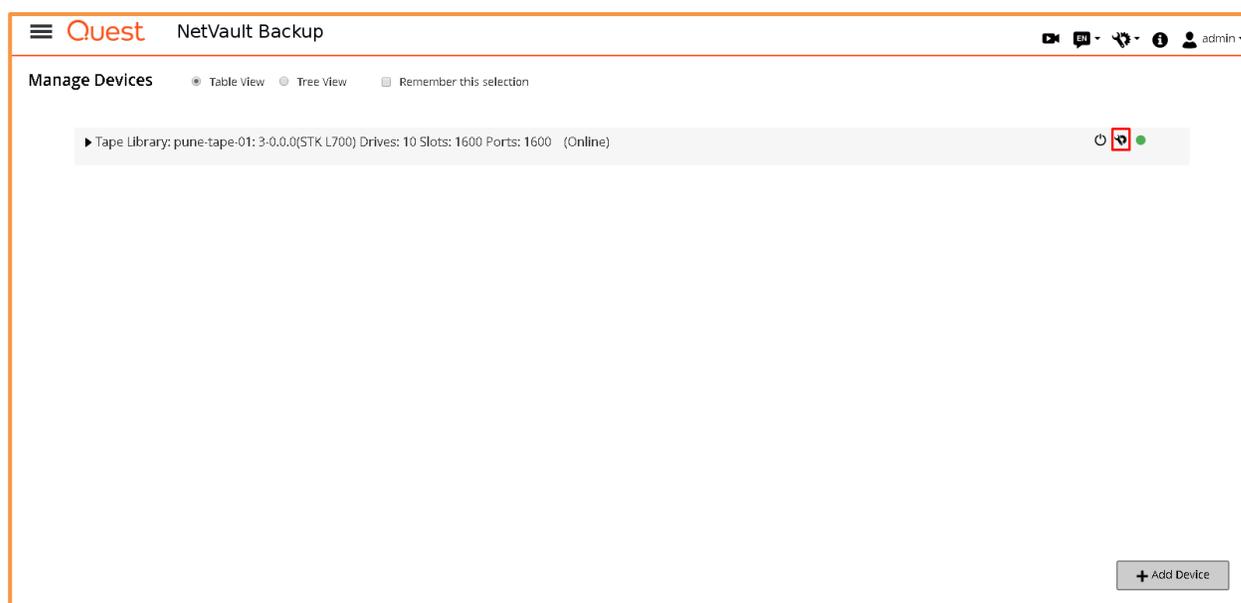
Figure 14. Clicking the gear next to the Amazon Gateway-VTL

2. Click **Media Label**, as shown in Figure 15.
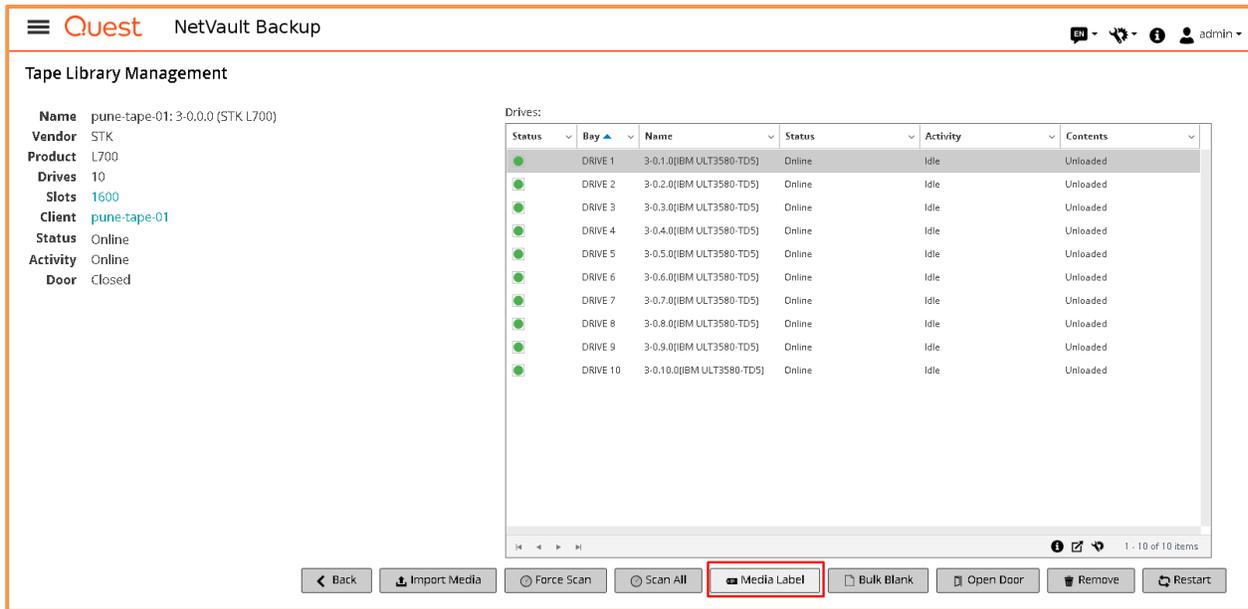
Figure 15. Clicking **Media Label**

2. When naming Amazon Gateway–VTL tapes, use **Barcode** as the label type. Give the media a group label, and then confirm the request by clicking **Ok** (see Figure 16).
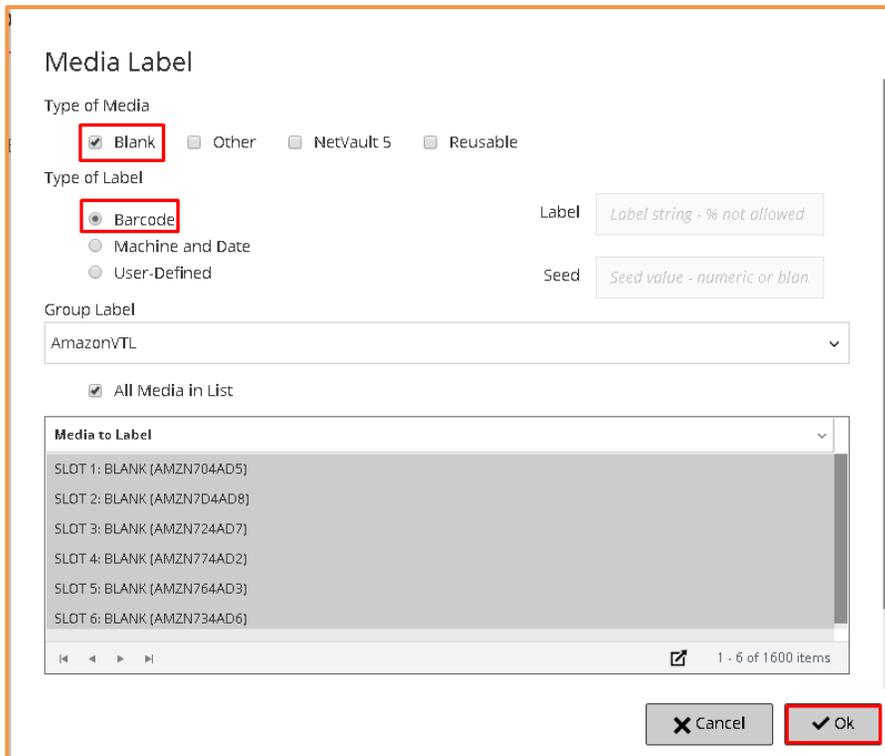
Figure 16. Choosing **Barcode** as the label type and specifying a group label

Exporting Gateway-VTL tapes

Tapes that are present in the Gateway-VTL reside on your local Gateway-VTL's storage and Amazon S3. Exporting these tapes within NetVault Backup automatically sends the tapes to the Amazon virtual tape shelf (VTS) which is backed by Amazon Glacier. Amazon Glacier is a slower, inexpensive storage tier that is ideal for long-term archival, but requires up to 24 hours to bring tapes back to the VTL from the VTS. Data that needs to be accessed quickly should be stored in the VTL and not exported to the VTS. Additionally, once tapes have been exported to the VTS they are no longer writeable and become read only when brought back to the VTL. Therefore, if your recovery time objectives (RTOs) are less than 24 hours, it is a good idea to keep data on your VTL and not export it to the VTS.

Follow these steps to send data to the virtual tape shelf with NetVault Backup:

1. Open the NetVault Backup console and go to **Manage Devices.** Then expand the Gateway-VTL and click the cog next to **Slots** (see Figure 17).
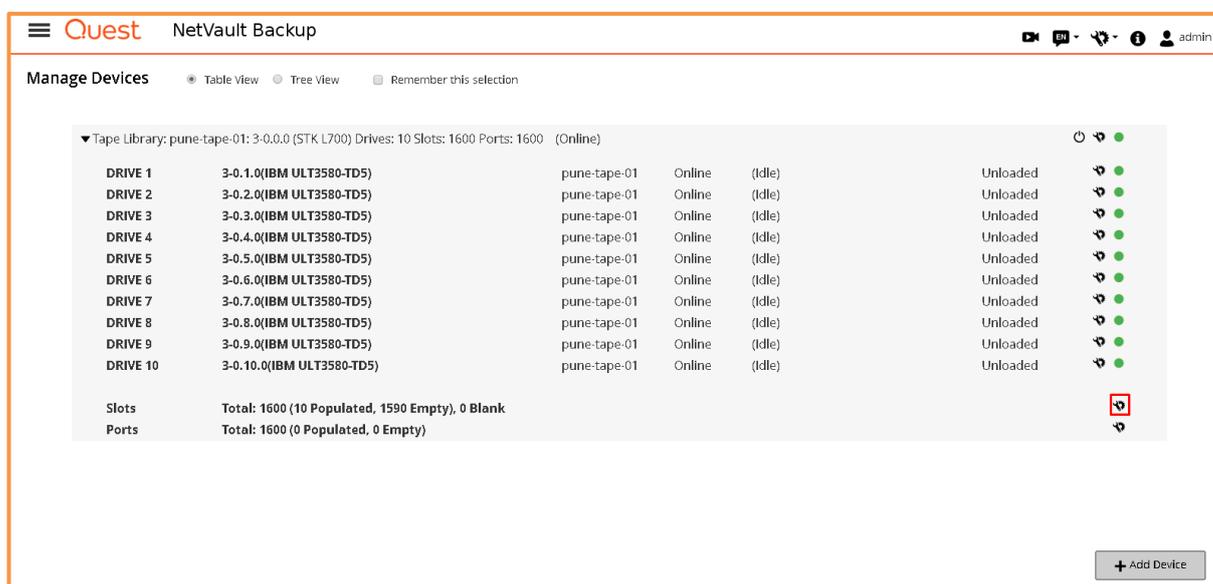
Figure 17. Expanding the Gateway-VTL and clicking the cog next to **Slots**

2. You will now see a list of all tapes in the Gateway-VTL. Select one or more tapes and click **Export** to automatically start the process of moving the tapes from S3 to Glacier (see Figure 18).
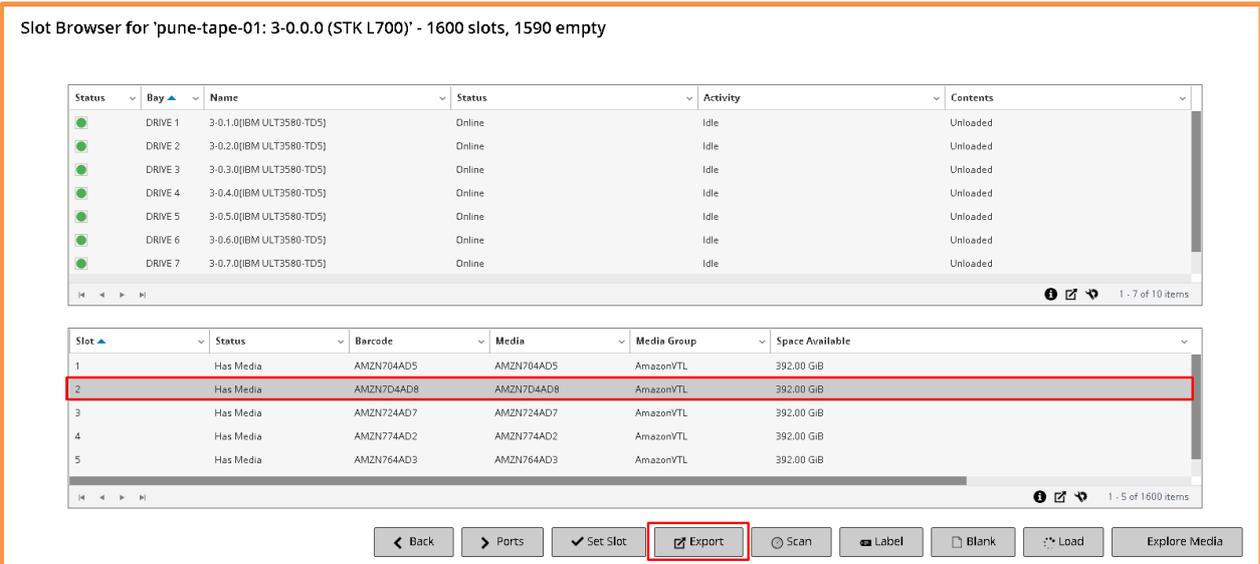
Figure 18. Exporting a tape from VTL to VTS

Once the tapes have been exported, they will appear offline in NetVault, as shown in Figure 19.

Figure 19. Virtual tape offline after being exported

In order to make the tapes appear online again, you must manually retrieve them from the Amazon VTS (see Figure 20). You can do this using the AWS console. More information on how to manage the VTS can be found [here](#).
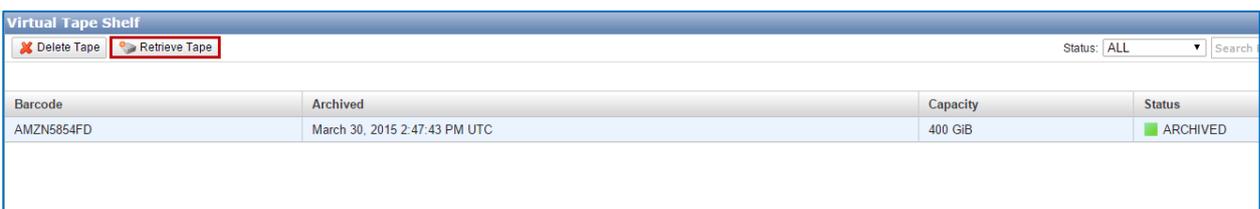
Figure 20. The Amazon virtual tape shelf

Conclusion

The combined NetVault Backup/Amazon Gateway-VTL solution enables seamless, cost-effective data protection of on-premise data to the cloud. As this guide has explained, the solution is quick and easy to implement: simply present the Gateway-VTL to the NetVault Backup server by emulating a STK-L700 media changer with Sony tape drives via iSCSI and configuring it as a normal tape library. Then you can store data in Amazon S3 or Glacier for as little as $0.010 per GB.

For more information

Please use the following resources:

- **More guides like this** — The Resources tab at quest.com/products/netvault-backup/

- **NetVault Backup user guides** —support.quest.com/netvault-backup/technical-document

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