

WHITE PAPER

# SEAGATE CLOUD SYSTEMS WHITE PAPER

Integration and Best Practices Guide for  
Veeam Backup Repository

**veeam**

Technology Alliance Partner  
Access



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## Introduction

Seagate is a worldwide leader in data storage products and Veeam® is a leader in backup software and data protection. Seagate and Veeam have teamed up to create world-class data storage solutions for the Veeam Backup Repository.

### Summary

This document provides a detailed explanation of how Seagate® storage products integrate with Veeam Backup and Replication software. It also provides detailed information about configuration and best practices, as well as guidance on storage sizing.

### Recommended Audience

This document is intended for backup and storage administrators, as well as technical sales and support professionals, who are looking to gain a better understanding of the process for integrating Seagate RAID products with the Veeam Backup Repository.

## Veeam Ready – Repository

As a Veeam Alliance Partner, Seagate has tested the Exos® X series of iSCSI RAID storage systems for inclusion in the Veeam Ready Program.



Figure1: Veeam Ready Repository



## Supported Seagate Hardware

The following Seagate hardware was tested for the Veeam Ready submission:

- Seagate Exos X 2U12 with twelve 12TB HDDs and Exos 3005 controllers
- *Configuration: RAID 6 (8+2) with two spares and 128K chunk size*

Additionally, all models and configurations of the Exos X Series with specifications equivalent to or greater than what's listed above are included with the qualification. This means the following systems are also supported:

- Exos X 2U12 Enclosure with Exos X 3005/4005/5005 iSCSI RAID Controllers
- Exos X 2U24 Enclosure with Exos X 3005/4005/5005 iSCSI RAID Controllers
- Exos X 5U84 Enclosure with Exos X 4005/5005 iSCSI RAID Controllers

*Note: Minimum configuration RAID 6 (8+2)*

Compatible systems are listed in the Veeam Ready database, which can be accessed directly through this link: <https://www.veeam.com/ready.html>

You can also access information about Seagate Systems directly using this link:

<https://www.veeam.com/kb3249>

## Storage Sizing

Before calculating the amount of raw storage required to support a Veeam Backup Repository, it's important to know several key backup software concepts. Further, one must understand how to use the publicly available Veeam sizing tool. Both the type of backup and the frequency of backup jobs, along with the number of clients and data change rate, will have a direct impact on the amount of storage that is ultimately needed.

### RPO and RTO

When making decisions about backup frequency and type, backup administrators refer to established requirements known as recovery point objective (RPO) and recovery time objective (RTO). Both the frequency and type will affect the overall storage requirements for backup.

**Recovery Point Objective (RPO):** A recovery point objective defines the point to which the data must be recovered. Sometimes, this is conceptualized as the amount of acceptable data loss in terms of time; for example, a day, an hour, a minute, or close to none.

**Recovery Time Objective (RTO):** The recovery time objective defines the maximum amount of time it should take to perform a recovery to the point in time that is defined by the recovery point objective.



## The 3-2-1 Rule

The United States Computer Emergency Readiness Team (US-CERT) put forth recommendations that all computer users, whether they're casual home users or professional information security officers, should follow for protecting critical data. This is known as the 3-2-1 rule, and you can learn about it in depth by clicking the following link: [https://us-cert.cisa.gov/sites/default/files/publications/data\\_backup\\_options.pdf](https://us-cert.cisa.gov/sites/default/files/publications/data_backup_options.pdf)

As a best practice, Veeam endorses the 3-2-1 rule, which is defined by US-CERT below:

- 3 – Keep three copies of any important file: one primary and two backups.
- 2 – Keep the files on two different media types to protect against different types of hazards.
- 1 – Store one copy off site—i.e., outside your home or business facility.

The important takeaway is to keep multiple copies of data across multiple sites. This will have a direct impact on overall storage sizing.

## Sizing the Servers and Storage

The Veeam Backup and Replication software suite includes an array of components, some of which are required and others that are optional. Each of these components will have its own compute system requirements, and many of the components can be run together on a single Windows server. Seagate Exos X storage devices are used directly with the Veeam Backup Repository component as direct-attached iSCSI storage. When sizing the Veeam Backup Repository server, which runs on Windows, sizing the server itself is separate from sizing the physical storage needed for the repository.

### Sizing the Backup Repository Server

When sizing the server or servers that will be used to run one or more Veeam Backup Repositories, it's best to follow Veeam's recommendations directly.

Veeam has outlined this information in an online book titled *Veeam Backup & Replication Best Practices*, which can be found here: <https://bp.veeam.com/vbr/>

Click the following link to access the section on *Repository Design*: [https://bp.veeam.com/vbr/VBP/2\\_Design\\_Structures/D\\_Veeam\\_Components/D\\_backup\\_repositories/](https://bp.veeam.com/vbr/VBP/2_Design_Structures/D_Veeam_Components/D_backup_repositories/)

### Storage Sizing and the Veeam Storage Calculator

Veeam relies on the use of a publicly available online calculator to estimate the amount of storage space that will be required for the backup repository. The backup administrator should work with Veeam to fill out the online form and come up with the projected storage requirements. The resulting storage capacity requirements can then be provided to Seagate for capacity-based system sizing.

You can access the calculator here: <http://rps.dewin.me/>



# Provisioning Storage on the Array

This section describes how to create a disk pool and volume on a Seagate Exos X array and present it to the iSCSI initiator on a Windows host. All steps in this section are carried out on the Exos X storage array, using either the command line interface (CLI) or the Seagate Storage Management Console (SMC). The user account on the array must include a minimum role of Manage to complete the following tasks.

## Accessing the CLI

Users can access the CLI on the Exos controller one of two ways: directly via serial cable or over the network by IP address. Each controller in the storage array has the CLI. Before the CLI can be accessed over the network, an IP address must be assigned to each controller, using the serial cable to access the CLI.

1. Open a console to the Exos X array via  
Network: Use HTTPS, HTTP, SSH, or Telnet on a management host that is remotely connected through a LAN to a controller module's network port  
*or*  
Serial Cable: Use a terminal emulator on a management host that is directly connected to a controller module's serial CLI port
2. Log in at the prompt with an account that was assigned either the Standard or Manage role.

For more detailed information about accessing the CLI and using it to manage the array, please refer to the *Getting Started* section in the *5005/4005/3005 Series CLI Reference Guide*:  
[https://www.seagate.com/files/www-content/support-content/raid-systems/\\_shared/documentation/83-00007048-13-01\\_G265\\_CLI.pdf](https://www.seagate.com/files/www-content/support-content/raid-systems/_shared/documentation/83-00007048-13-01_G265_CLI.pdf)

## Accessing the SMC

The SMC is a web-based interface that is accessed via IP address. Each controller in the storage array has a web server onboard which can be accessed by logging into the SMC. Before the SMC can be accessed on any controller, an IP address must first be assigned to the controller. This is usually done at the CLI using a serial cable at the time of initial array setup.

To access the SMC on the Exos X array:

1. Open a web browser and navigate to: `https://<host name or IP address of storage controller>`
2. Log in at the prompt with an account that was assigned either the Standard or Manage role.

For more detailed information about accessing the SMC and using it to manage the array, please refer to the *Getting Started* section in the *Seagate 5005/4005/3005 Series Storage Management Guide*:  
[https://www.seagate.com/files/www-content/support-content/raid-systems/\\_shared/documentation/83-00007047-13-01\\_G265\\_SMG.pdf](https://www.seagate.com/files/www-content/support-content/raid-systems/_shared/documentation/83-00007047-13-01_G265_SMG.pdf)



# Configuring and Presenting Seagate iSCSI Volumes

This section outlines how to create an iSCSI volume on the Seagate Exos X storage array and then present it to a Veeam Backup Repository server running on Microsoft Windows Server.

## Data Protection with RAID and ADAPT

While Veeam and multiple copies of the data help protect against data loss, a level of protection for the backup data itself is still required. This will ultimately span multiple disk drives that make up the Veeam Backup Repository storage target. There are several data protection options available in the Exos X storage controllers, two of which stand out as best options for use with the Veeam Backup Repository. Both RAID 6 and Seagate ADAPT allow for up to a two-disk failure while offering similar levels of performance.

### Minimum Storage Building Blocks for Veeam

When planning to use a Seagate Exos X array as a storage target for the Veeam Backup Repository, it's important to consider both performance and data protection. Regardless of which specific Seagate Exos X storage array is used, the minimum storage configuration for Veeam requires 12 disks. A 12-disk configuration was used to meet the requirements of the Veeam Ready Repository program.

There are two minimum configurations that can meet the performance demands of the backup repository server:

1. RAID 6 (8+2) with two hot spares – 12 disks total in the storage pool
2. ADAPT – 12 disks total in the storage pool

While any Seagate Exos X array can be used, the 2U12 is an ideal entry-level storage device. The Exos X 2U12 can be expanded with up to three additional Exos E 2U12 enclosures for a total of 48 drives. Similarly, the Exos X 2U24 can be expanded with the addition of three Exos E 2U24 enclosures for a total of 96 drives. And finally, the Exos X 5U84 can be expanded with three additional Exos E 5U84 enclosures for a whopping total of 336 drives.



# Creating Disk Groups

The first step in provisioning storage to the Veeam Backup Repository is to create a disk group from a pool of disks on the array. The number of disks and the level of data protection will be defined when the disk group is created. A disk group can be created using the SMC or the CLI.

There are several options available when creating disk groups. In addition to RAID and ADAPT, there are different *linear* and *virtual* storage technologies.

## ADAPT and RAID 6

While RAID6 and Seagate ADAPT offer similar levels of data protection, they accomplish this in different ways. RAID 6 is a traditional RAID configuration in which the data is striped across a minimum of two disk drives and two parity drives.

Seagate ADAPT is a RAID-based level of data protection that maximizes flexibility, provides built-in spare capacity, and allows for fast rebuilds, large storage pools, and simplified expansion.

ADAPT disk groups use all available space to maintain fault tolerance, and data is spread evenly across all the disks.

ADAPT offers several advantages over RAID 6, including:

- Significantly faster rebuild times
- The ability to use up to 128 drives compared to RAID 6's limit of 16
- Easier expansions with up to 68 disks at a time versus RAID 6's limit of one to four disks at a time
- Built-in spare capacity that eliminates the need for spare disks

When new data or new disks are added, or the system recognizes that data is not distributed across disks in a balanced way, it will move the data to maintain balance across the disk group.

Because disk space that is dedicated to sparing is spread across all disks in the system, spare capacity for ADAPT disk groups is automatically reserved. In the case of a disk failure, data will be moved to many disks in the disk group, allowing for quick rebuilds and minimal disruption to input/output (I/O).

## About Virtual and Linear Storage

Seagate Exos X arrays use two different storage technologies that share a common user interface. One uses the virtual method while the other uses the linear method.

Virtual storage is a method of mapping logical storage requests to physical storage (i.e., disks). It inserts a layer of virtualization such that logical host I/O requests are mapped onto pages of storage. Each page is then mapped onto physical storage. Within each page, the mapping is linear; but there is no direct relationship between adjacent logical pages and their physical storage.



A page is a range of contiguous logical block addresses (LBA) in a disk group, which is one of up to 16 RAID sets that are grouped into a pool. Thus, a virtual volume as seen by a host represents a portion of storage in a pool. Multiple virtual volumes can be created in a pool, sharing its resources. This allows for a high level of flexibility, as well as the most efficient use of available physical resources.

Some advantages of using virtual storage include:

- Allowing performance to scale as the number of disks in the pool increases
- Virtualizing physical storage, allowing volumes to share available resources in a highly efficient way
- Allowing a volume to be comprised of more than 16 disks

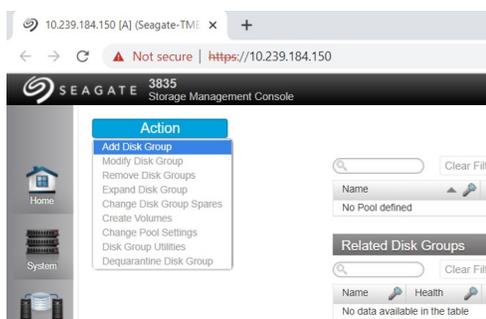
The legacy linear method maps logical host requests directly to physical storage. In some cases, the mapping is one to one, while in most cases the mapping is across groups of physical storage devices—or slices of them. This linear method of mapping is highly efficient. The negative side of linear mapping is a lack of flexibility. This makes it difficult to alter the physical layout after it is established.

Virtual storage provides the foundation for data management features such as thin provisioning, automated tiered storage, read cache, and the quick rebuild feature. More in-depth information on these technologies is available in the *Seagate 5005/4005/3005 Series Storage Management Guide*.

To gain maximum flexibility and ease of expansion, the use of virtual storage is recommended.

## Using the SMC

1. Open a web browser session to the SMC as described earlier in this section.
2. Select the *Pools* tab, click *Action*, and then select *Add Disk Group*.

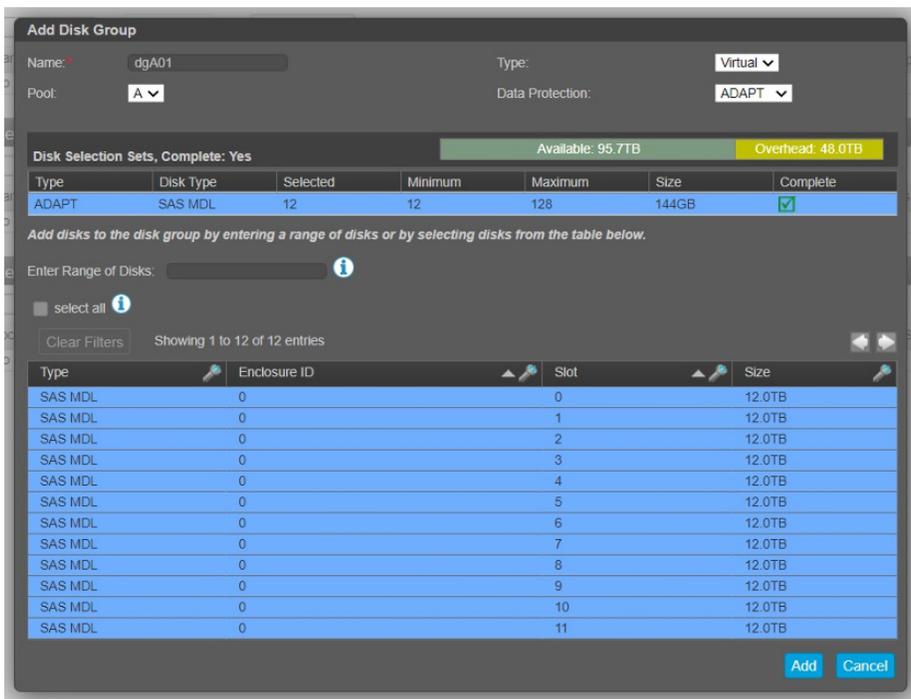


3. When the *Add Disk Group* wizard appears, select the storage technology *Type* as *Virtual* or *Linear*, and then select the *Data Protection* type. RAID 6 or ADAPT are recommended for use with Veeam.

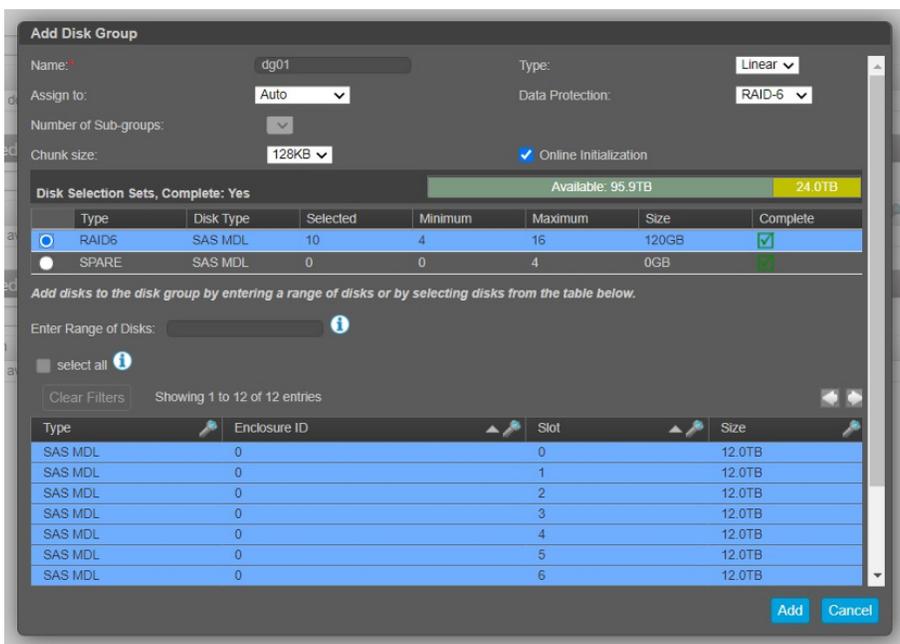
Veeam recommends setting a chunk or stripe size at the storage level of 128 kilobytes (kB). The chunk size is set automatically, and it's not adjustable when using ADAPT or when using RAID 6 with the *Type* set to *Virtual*. The chunk size can, however, be changed when using RAID 6 with the *Type* set to *Linear*.



In this example, a 12-disk ADAPT disk group is created.



In this example, a RAID 6 disk group with 10 disks (8+2) is created using the Linear storage Type.



Once *Add* is clicked, it'll take a few minutes to process before there's a confirmation of completion. Once the disk group has been created, it'll be listed on the *Pools* tab of the SMC.

Name	Health	Pool	RAID	Class	Disk Type	Size	Free	Current Job	Status	Disks
dgA01	OK	A	ADAPT	Virtual	SAS MDL (Archive)	95.8TB	95.8TB	INIT (1%)	FTOL	12

Please note that once a new disk group has been created, it will take some time for the disk group to initialize. While it will have a health status of Fault Tolerant and On-Line (FTOL), the initialization process will take some time to finish. Peak performance on the array will not be observed until the initialization is complete.

## Using the CLI

The CLI command for creating new disk groups is called: ***add disk-group***

To add a new disk group using the CLI, proceed as follows:

1. Open a CLI session via serial cable or SSH to one of the Seagate controllers in the Exos X array and log in.
2. For example, to create a new disk group using 12 disks and ADAPT for data protection, as in the SMC example above, use the following command:

***add disk-group type virtual disks 0.0-11 level adapt pool a***



In the following example, the command to display any existing disk groups is used, and then a disk group is created. The command to display existing disk groups is then run a second time.

```

10.239.184.150 - PuTTY

#####

System Version: GT265R009-03
OS Version: GPM265R011-01
MC Version: GXM265R019-01
Serial Number: 00C0FF3B442B
10.239.184.150 login: manage
Password:

3835
System Name: Seagate-TME
System Location: Fremont, CA
Version: GT265R009-03
# show disk-groups
Name Size Free Pool Tier % of Pool Own RAID Disks Status Current Job
Job% Sec Fmt Health Reason Action
-----
Success: Command completed successfully. (2020-09-21 12:36:04)
# add disk-group type virtual disks 0.0-11 level adapt pool a
Success: Command completed successfully. (2020-09-21 12:36:22)
# show disk-groups
Name Size Free Pool Tier % of Pool Own RAID Disks Status
Current Job Job% Sec Fmt Health Reason Action
-----
dgA01 95.8TB 95.8TB A Archive 100 A ADAPT 12 FTOL INIT
0% 512e OK
-----
Success: Command completed successfully. (2020-09-21 12:36:48)
# █

```

To create a new disk group using 10 disks and RAID 6 (8+2) for data protection, as in the SMC example above, use the following command:

***add disk-group type linear chunk-size 128k disks 0.0-11 level r6 dg01***



In the following example, the command to display any existing disk groups is used, and then a disk group is created. The command to display existing disk groups is then run a second time.

```

10.239.184.150 - PuTTY

#####

System Version: GT265R009-03
OS Version: GPM265R011-01
MC Version: GXM265R019-01
Serial Number: 00C0FF3B442B
10.239.184.150 login: manage
Password:

3835
System Name: Seagate-TME
System Location: Fremont, CA
Version: GT265R009-03
# show disk-groups
Name Size Free Pool Tier % of Pool Own RAID Disks Status Current Job
Job% Sec Fmt Health Reason Action
-----
Success: Command completed successfully. (2020-09-21 13:53:30)
# add disk-group type linear chunk-size 128k disks 0.0-11 level r6 dg01
Success: Command completed successfully. (2020-09-21 13:53:45)
# show disk-groups
Name Size Free Pool Tier % of Pool Own RAID Disks Status Current Job
Job% Sec Fmt Health Reason Action
-----
dg01 119.8TB 119.8TB dg01 N/A 100 A RAID6 12 FTOL INIT
0% 512e OK
-----
Success: Command completed successfully. (2020-09-21 13:53:59)
# █

```

Please note that once a new disk group has been created, it will take some time for the disk group to initialize. While it will have a health status of Fault Tolerant and On-Line (FTOL), the initialization process will take some time to finish. Peak performance on the array will not be observed until the initialization is complete. Current status can be observed by issuing the command: **show disk-groups**

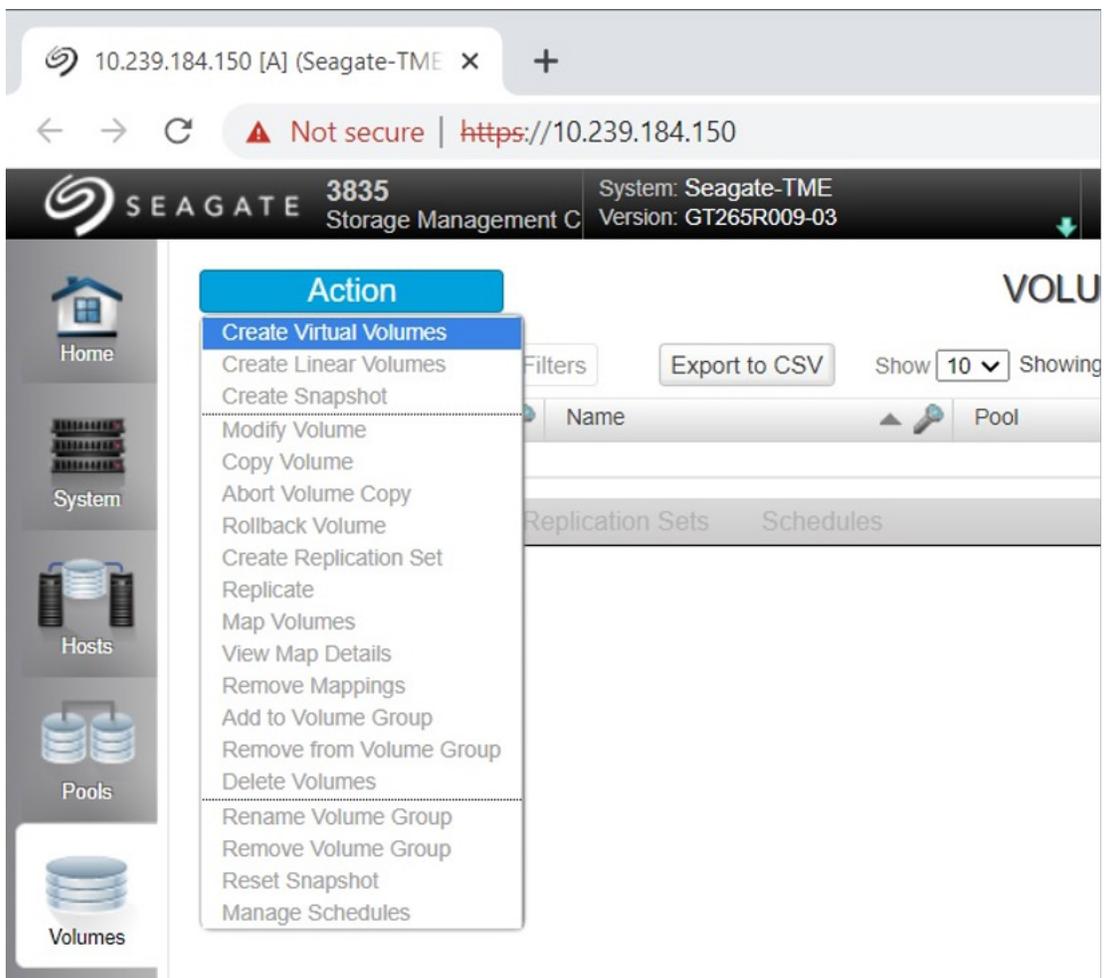


# Creating Volumes

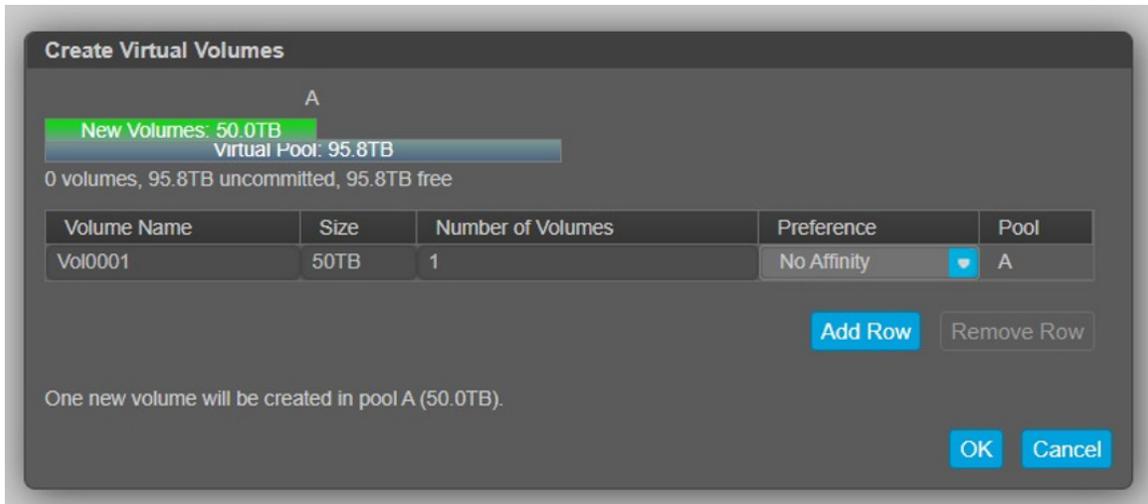
Once a disk group has been created, a volume can then be provisioned from the disk group with the desired size. A volume can be provisioned using the SMC or the CLI.

## Using the SMC

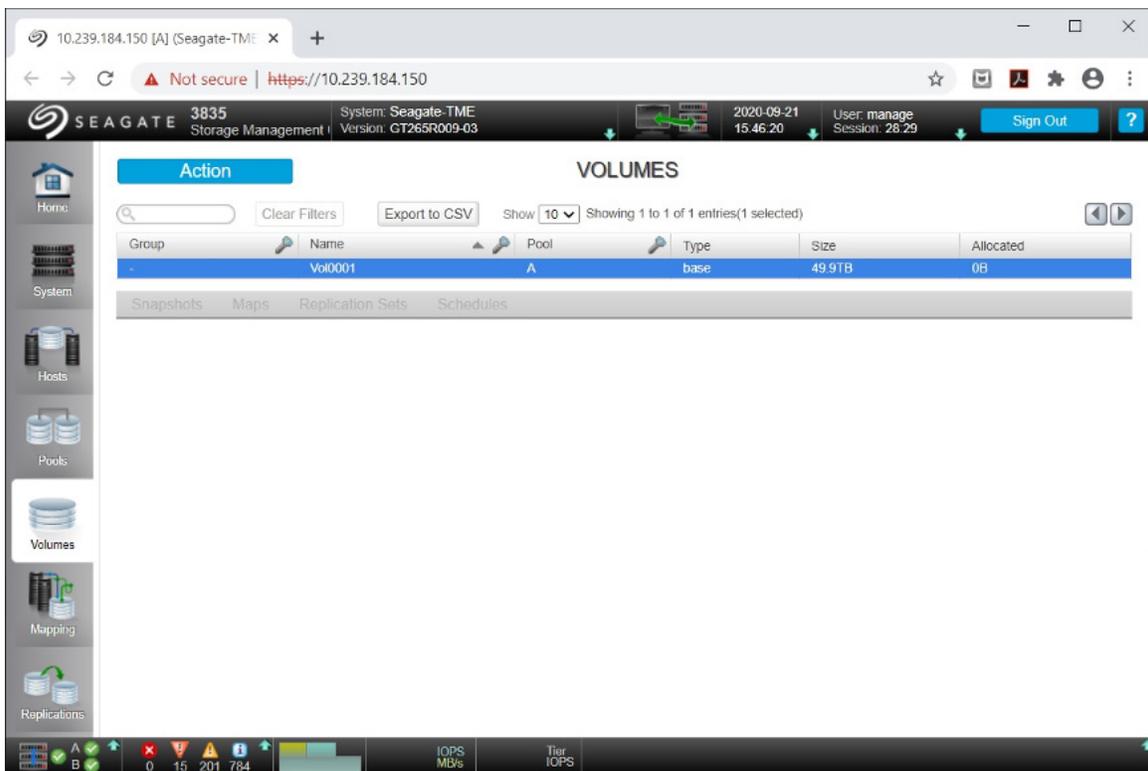
1. Open a web browser session to the SMC as described earlier in this section.
2. Select the Volumes tab, click Action, and then select Create Virtual Volumes.



- When the *Create Virtual Volumes* wizard appears, enter a *Volume Name* and *Size*, and then click OK.



- The operation will complete and the new volume will be listed.



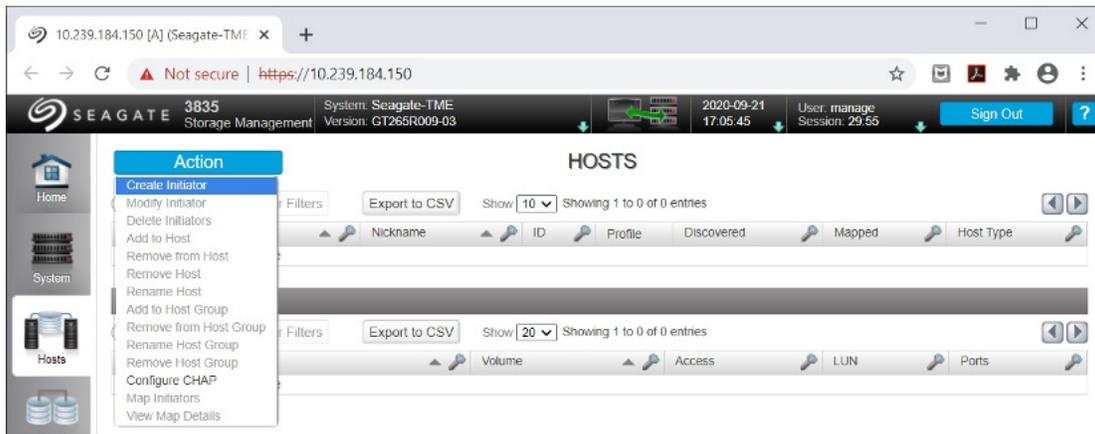


# Creating Host Initiators

After new volumes have been created, iSCSI host initiators must be created on the array so the new volume can be mapped to them in the next step. As with the other operations, creating a host initiator can be performed using the SMC or the CLI.

## Using the SMC

1. Open a web browser session to the SMC as described earlier in this section.
2. Select the *Hosts* tab, click *Action*, and then select *Create Initiator*.



3. When the *Create Initiator* wizard appears, enter the iSCSI Qualified Name (IQN) for the initiator, as well as a name.

**Create Initiator**

Create an initiator by specifying a WWN or IQN and a nickname.

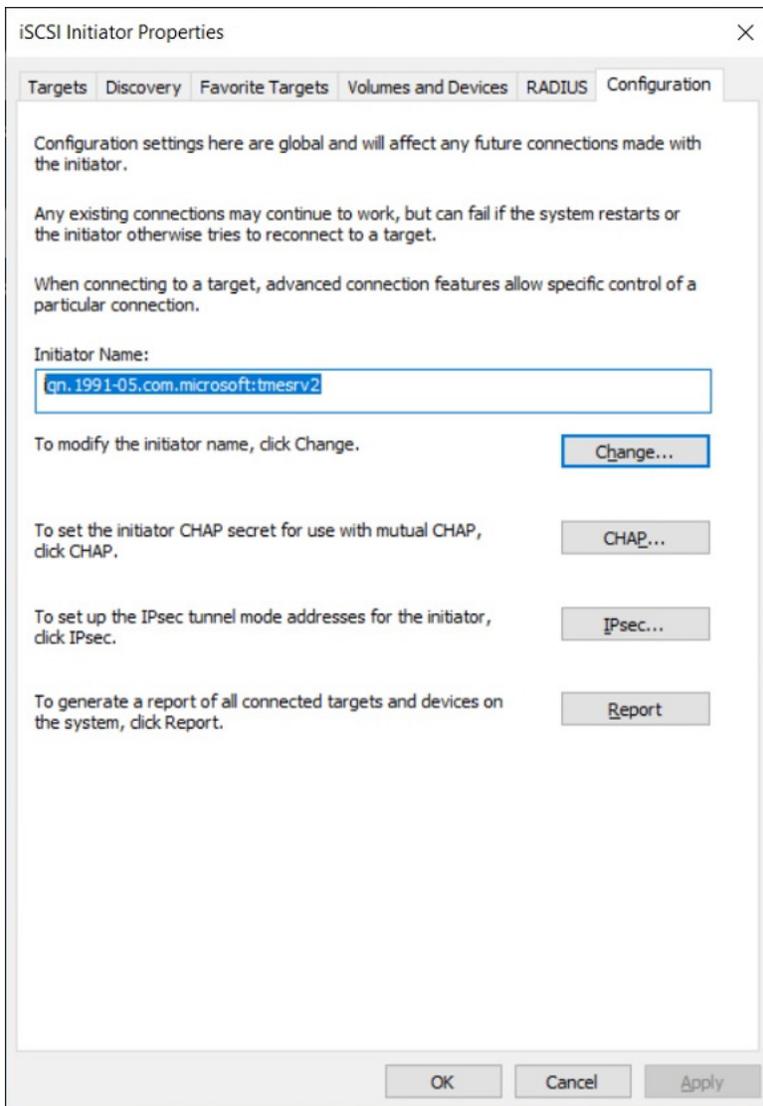
Initiator ID (WWN/IQN):\*

Initiator Name:\*

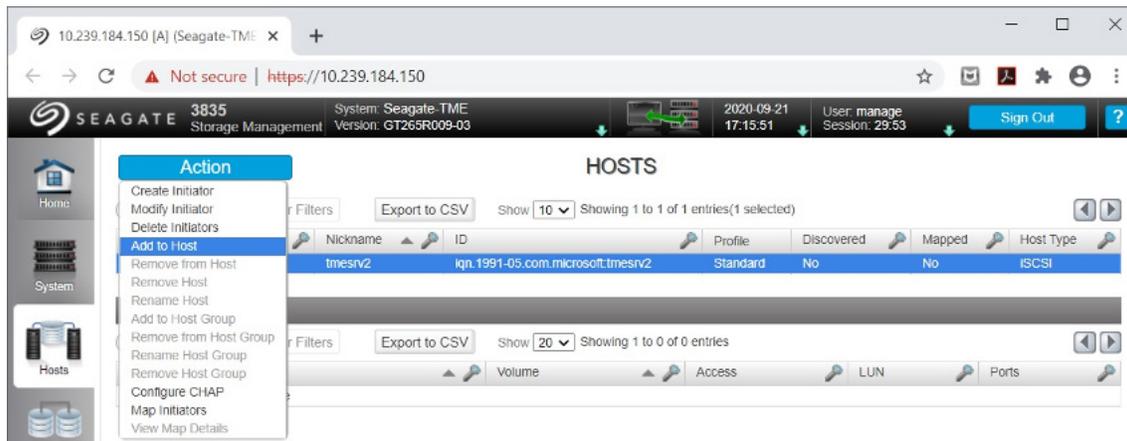
Profile:



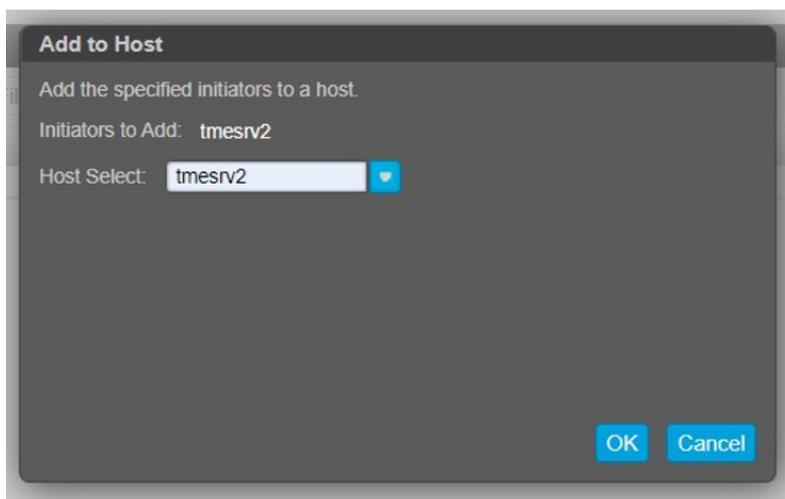
The initiator name can be found on the Windows Server running the Veeam Backup Repository. Launch the iSCSI application and select the *Configuration* tab. The initiator name will be found there.



- Select the newly created initiator. Then, from the action menu, select *Add to Host*.

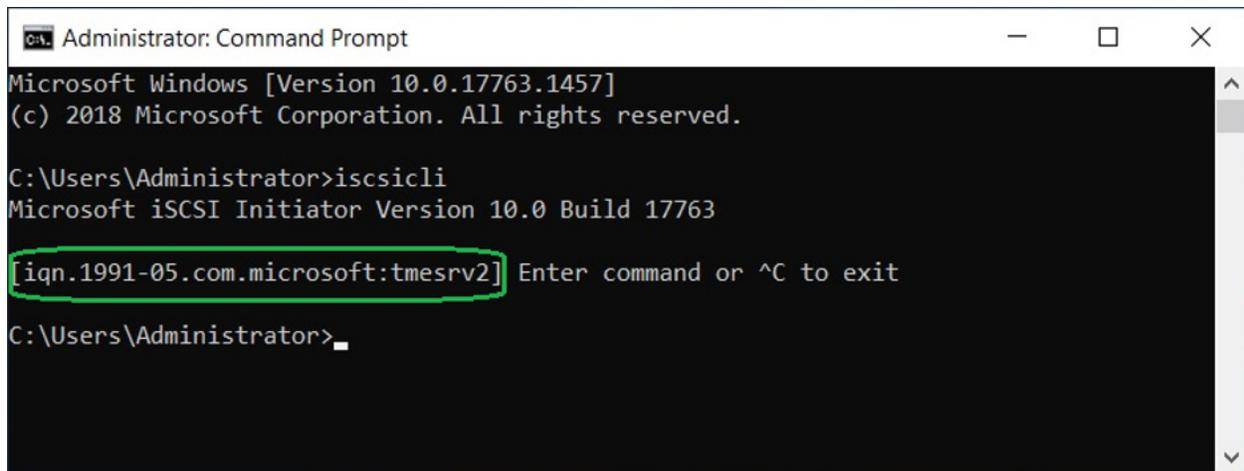


When the *Add to Host* wizard appears, type in the host name and click *OK*.





**Please Note:** On a Windows Server, the IQN can be obtained at the Windows Command Prompt using the unqualified command: **iscsicli**



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.1457]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>iscsicli
Microsoft iSCSI Initiator Version 10.0 Build 17763
[iqn.1991-05.com.microsoft:tmesrv2] Enter command or ^C to exit
C:\Users\Administrator>
```

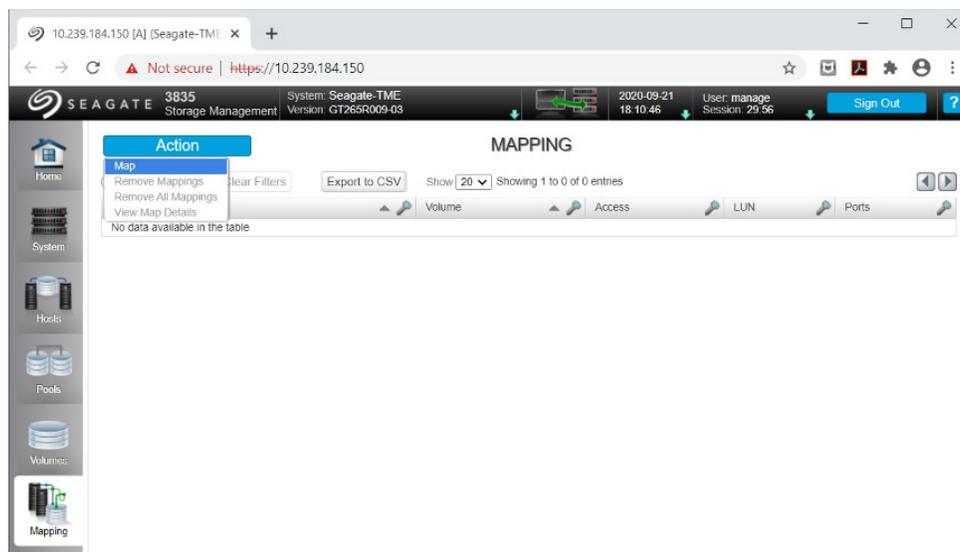


# Mapping Volumes to Hosts

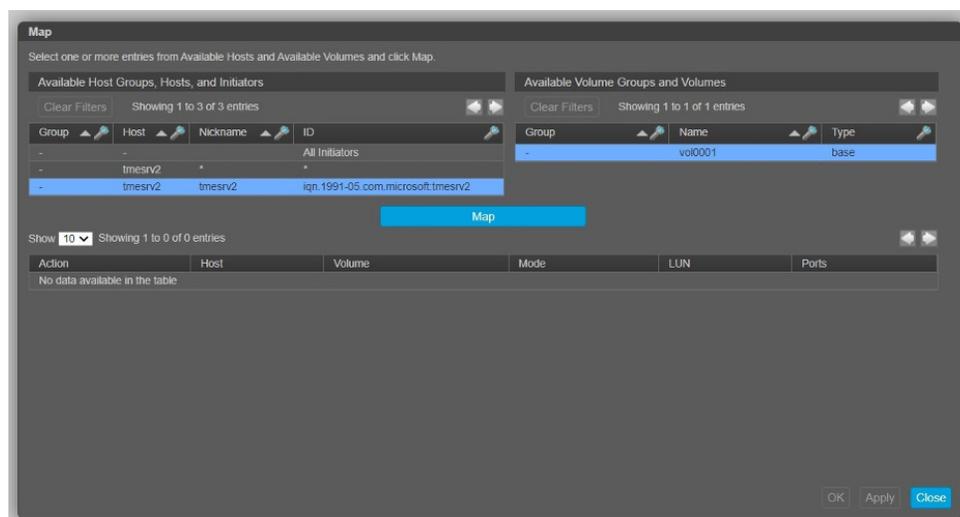
With all the prerequisites in place, iSCSI volumes can be mapped to host systems. This is the last step that must be carried out on the storage array. It can be done at the CLI or by using the SMC.

## Using the SMC

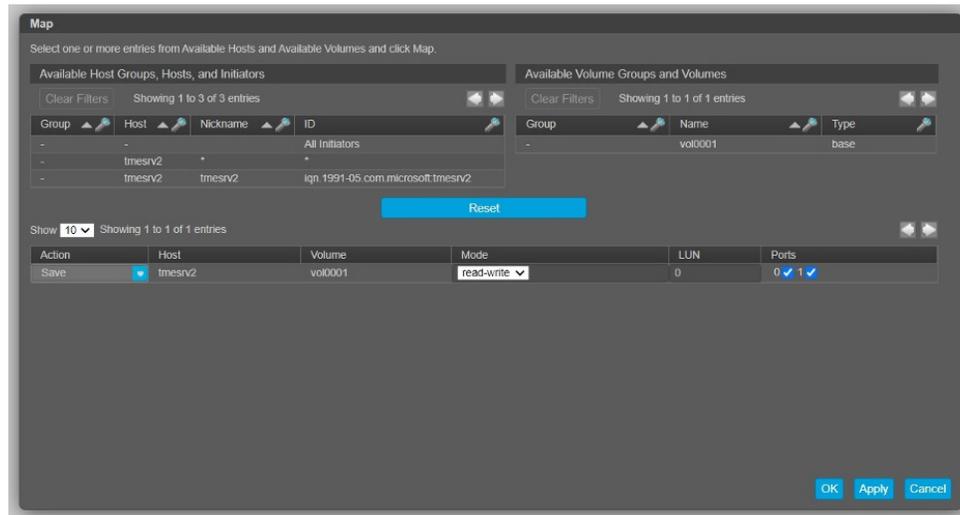
1. Open a web browser session to the SMC as described earlier in this section.
2. Select the *Mapping* tab, click *Action*, and then select *Map*.



3. When the *Map* wizard appears, click on a host with the IQN in the left pane and click on an available volume. Click *Map* and the mapping will show up in the list below.



Once the mapping is done, click *OK*.



When prompted, click *Yes* to confirm creation of the mapping.

## Using the CLI

1. The CLI command for mapping a new volume is called: ***map volume***

To map a volume using the CLI, proceed as follows:

2. Open a CLI session via serial cable or SSH to one of the Seagate controllers in the Exos X array and log in.
3. To map the volume *vol0001* to the initiator named *tmesrv2* over ports *a1* and *b1* on LUN ID 0, use the following command:

***map volume ports a1,b1 lun 0 initiator tmesrv2 vol0001***



In the following example, several commands are run. The first three commands display lists of existing mappings, initiators, and volumes. Then the *map volume* command is run. And finally, the *show maps* command is run again to confirm the new mapping.

```

10.239.184.150 - PuTTY
#####

System Version: GT265R009-03
OS Version: GEM265R011-01
MC Version: GXM265R019-01
Serial Number: 00C0FF3B442B
10.239.184.150 login: manage
Password:

3035
System Name: Seagate-TME
System Location: Fremont, CA
Version: GT265R009-03
# show maps
Success: Command completed successfully. (2020-09-21 19:26:12)
# show initiators
Nickname Discovered Mapped Profile Host Type ID
-----
tmesrv2 No No Standard iSCSI iqn.1991-05.com.microsoft:tmesrv2
Success: Command completed successfully. (2020-09-21 19:26:17)
# show volumes
Pool Name Total Size Alloc Size Class Type Large Virtual Extents Health Reason Action
-----
A vol0001 49.9TB 0B Virtual base Disabled OK
Success: Command completed successfully. (2020-09-21 19:26:30)
# map volume ports a1,b1 lun 0 initiator tmesrv2 vol0001
Info: Mapping succeeded. Initiator iqn.1991-05.com.microsoft:tmesrv2 was mapped for volume vol0001 with LUN 0. (vol0001)
Success: Command completed successfully. (vol0001) - Mapping succeeded. Initiator iqn.1991-05.com.microsoft:tmesrv2 was mapped for volume vol0001 with LUN
0. (2020-09-21 19:26:37)
# show maps

Volume View [Serial Number (00c0ff3b442b0000b6d1685f01000000) Name (vol0001) | Mapping:
-----
Ports LUN Access Identifier Nickname Profile
-----
1 0 read-write 00c0ff3b442b000054e8685f01010000 tmesrv2.* Standard
Success: Command completed successfully. (2020-09-21 19:26:44)
#

```



## Configuring Windows

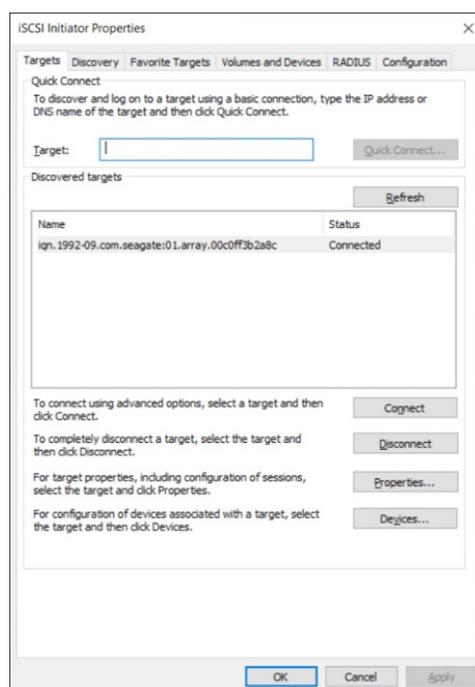
When the storage volumes have been created on the Exos X array and presented to the iSCSI initiator on a Windows host running the Veeam Backup Repository component, additional steps must be taken to prepare the volume so that it can be used as a storage target by the Veeam Backup Repository. This section describes the additional steps required to prepare access to a new volume so it can be used by the Backup Repository as a new backup target.

### iSCSI

The Microsoft Windows operating system includes a built-in iSCSI software initiator for block-level storage access over an IP network. While the iSCSI feature is installed by default, the service is not running by default and may need to be started. Depending on the version of Windows, the user will be prompted to start the service automatically when the iSCSI application is launched.

Adding a new iSCSI target to Windows is a simple task. Take the following steps to connect an iSCSI initiator on a Veeam Backup Repository Server to a Seagate Exos X iSCSI target.

1. Run the Windows iSCSI Initiator application. It can be found under: *Windows Administrative Tools > iSCSI Initiator*
2. Select the *Targets* tab and enter the IP address for one of the ports on the array into the *Target:* field. Click the *Quick Connect* button to add the array port.



3. Repeat the previous step for each additional controller port on the array.



## MPIO

Multipath I/O (MPIO) is an additional Microsoft software feature that is required for path management when there are multiple network paths to the same storage device. It is not installed by default and must be installed separately as an optional Windows Server feature.

### Installing MPIO

The MPIO feature is installed through the Windows Server Manager. To install it, proceed as follows:

1. Launch the Server Manager and then select *Add Roles and Features* from the *Manage* menu.
2. When the *Add Roles and Features Wizard* launches, click *Next* and skip through the wizard to the *Select Features* page.
3. Scroll down the list until *Multipath I/O* appears and select it.
4. Click *Next* and then *Finish*. Windows will then prompt a reboot for the changes to take effect.

### Obtaining the Vendor Name and Product ID for MPIO

To configure MPIO, the *Vendor Name* and *Product ID* must be determined for the hardware being used. There are at least two ways that this information can be obtained. One way is through the Seagate array's CLI and the other is using Windows PowerShell. Launch the Server Manager and then select Add Roles and Features from the Manage menu.

#### Obtaining the Vendor Name and Product ID via the Seagate CLI

1. Open a console session to the management port via serial cable or SSH
2. Log in to the session
3. Run the command: **show inquiry**

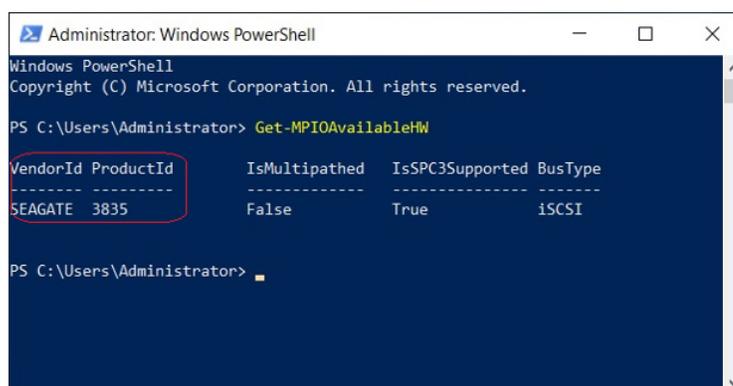
A lot of information will be displayed by the command. The **iSCSI Vendor ID** and the **iSCSI Product ID** are going to be listed near the top. This information will be used in a later step.

```
# show inquiry
Product Information
-----
Vendor Name:
Product ID: 3835
SCSI Vendor ID: SEAGATE
SCSI Product ID: 3835
```

#### Obtaining the Vendor Name and Product ID via Windows PowerShell

1. On the Windows Server, open a PowerShell prompt
2. Run the command: **Get-MPIOAvailableHW**

The *VendorID* and *ProductID* will then be displayed.



```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Users\Administrator> Get-MPIOAvailableHW

VendorId ProductId IsMultipathed IsSPC3Supported BusType
-----
SEAGATE 3835 False True iSCSI

PS C:\Users\Administrator>
```

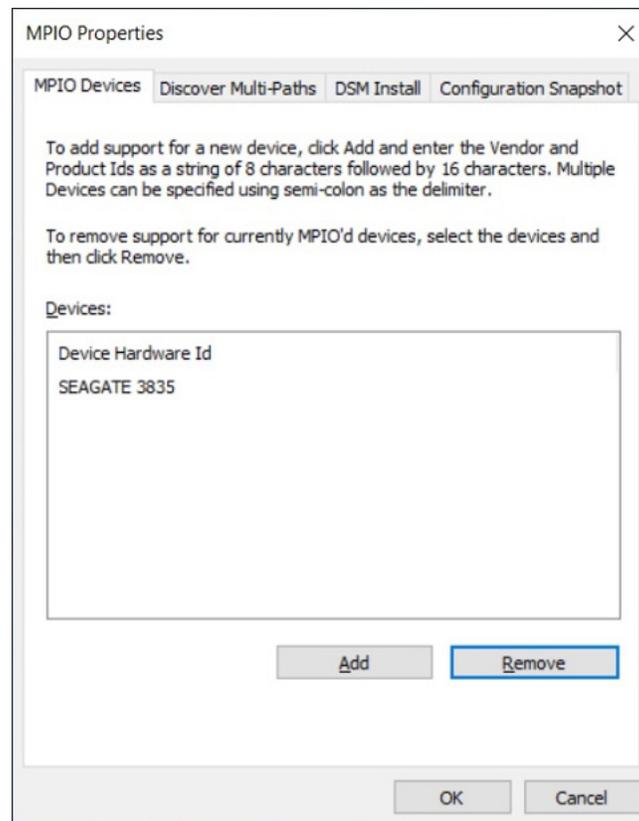
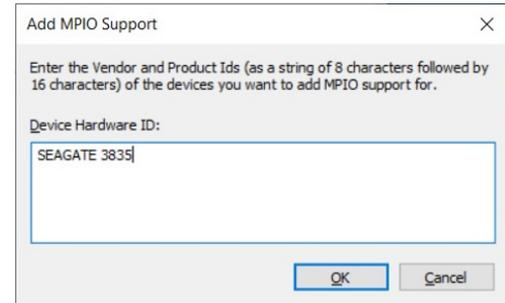


## Configuring MPIO

Once the MPIO feature has been installed and the *VendorID* and *ProductID* have been determined, this information must be entered into the MPIO configuration. There are at least two ways to accomplish this.

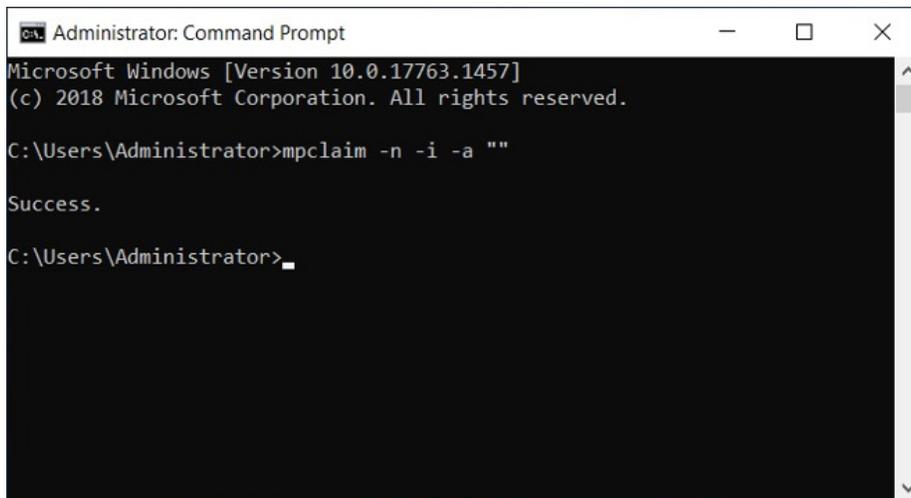
### Using the Windows GUI

1. Run the MPIO app by typing *MPIO* into the Windows Search field before clicking *Enter*. The MPIO app will launch.
2. Click *Add* to add a new MPIO hardware device. When the dialog appears, enter the *VendorID* and *ProductID* together as a single string with one space between the word and the number. For example: "SEAGATE 3835"
3. Click *OK* to return to the main menu where the new entry can be verified.



## Using the Windows Command Line

1. On the Windows Server, open a Windows Command Prompt.
2. Run the command: ***mpclaim -n -i -a ""***



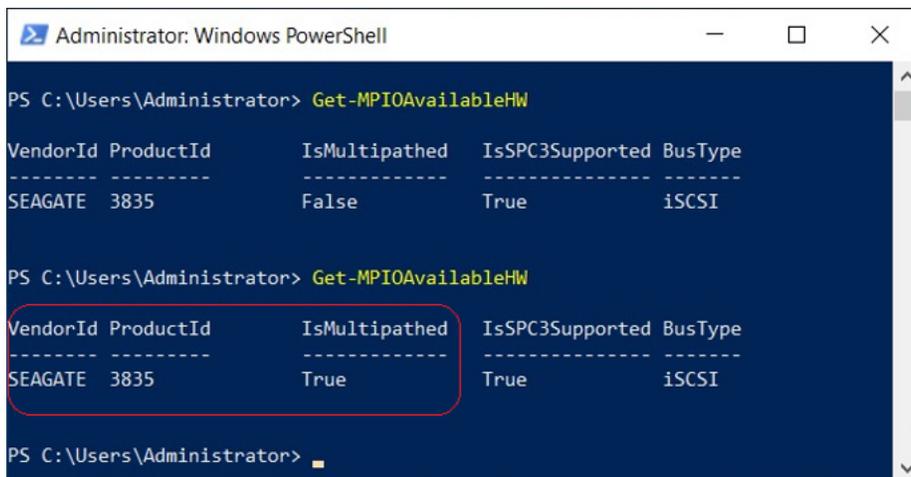
```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.1457]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>mpclaim -n -i -a ""

Success.

C:\Users\Administrator>
```

3. Open a PowerShell prompt.
4. To verify the device is multipathed, run the command again: ***Get-MPIOAvailableHW***



```
Administrator: Windows PowerShell

PS C:\Users\Administrator> Get-MPIOAvailableHW

VendorId ProductId      IsMultipathed  IsSPC3Supported BusType
-----
SEAGATE  3835              False         True            iSCSI

PS C:\Users\Administrator> Get-MPIOAvailableHW

VendorId ProductId      IsMultipathed  IsSPC3Supported BusType
-----
SEAGATE  3835              True          True            iSCSI

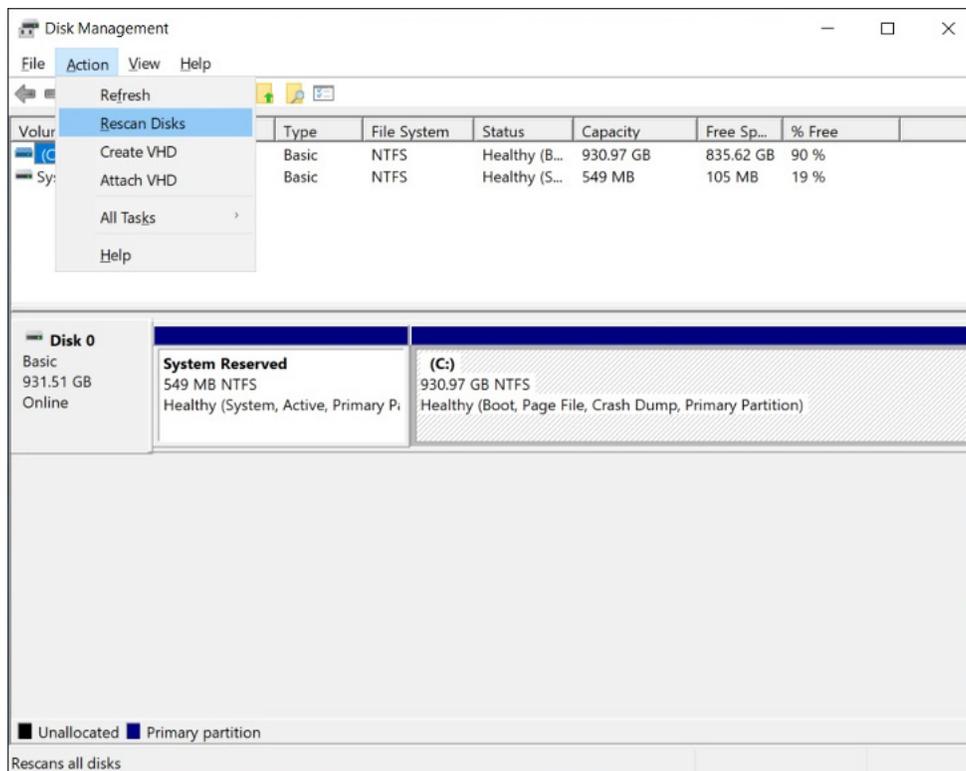
PS C:\Users\Administrator>
```



## Preparing New Volumes for Veeam

Once a volume on the Exos X has been created and mapped to the Veeam Backup Repository server, the raw volume must be brought online and formatted for use by Windows Server.

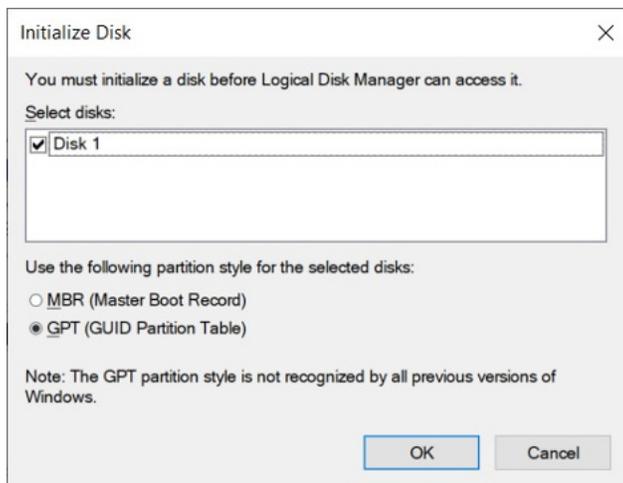
1. Run the Windows Disk Manager Control Panel app by typing **diskmgmt.ms** into the Windows *Search* and then click *Enter* to launch the Windows Disk Manager.
2. Newly presented iSCSI volumes may not appear in Disk Manager right away. The disks can be rescanned manually. From the *Action* menu, select *Rescan Disks* and the newly created volumes will appear. If a single volume on the Exos X array is displayed multiple times, this would indicate that there are multiple paths to the volume and MPIO is not configured.



- Once the new iSCSI disk or disks are displayed, right click on the left pane and select *Online* to bring each disk online. Right click the left pane again and select *Initialize* to initialize the new disk.



Select the GPT partition style for target volumes greater than 2TB



Click OK.



4. Once the new iSCSI disk has been brought online and initialized, a new volume must be created. Right click on the unallocated disk space and select *New Simple Volume*. Go through the pages of the *New Simple Volume Wizard* to the *Format Partition* page.

For best results, Veeam recommends using the ReFS file system with the allocation unit size set to 64K. NTFS can also be used.

**New Simple Volume Wizard**

**Format Partition**  
To store data on this partition, you must format it first.

Choose whether you want to format this volume, and if so, what settings you want to use.

Do not format this volume

Format this volume with the following settings:

File system: ReFS

Allocation unit size: 64K

Volume label: Seagate Exos X

Perform a quick format

Enable file and folder compression

< Back   Next >   Cancel

Click *Next* and then *Finish* to complete the operation. Once the disk is formatted, it will be ready to use as a target for the Veeam Backup Repository.

Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free
(C:)	Simple	Basic	NTFS	Healthy (Boot, Page File, Crash Dump, Primary Partition)	930.97 GB	835.62 GB	90 %
Seagate Exos X (D:)	Simple	Basic	ReFS	Healthy (Primary Partition)	13969.81 GB	13901.99 GB	100 %
System Reserved	Simple	Basic	NTFS	Healthy (System, Active, Primary Partition)	549 MB	105 MB	19 %

Disk	Layout	Type	File System	Status
<b>Disk 0</b> Basic 931.51 GB Online	System Reserved	549 MB NTFS	(C:)	930.97 GB NTFS
	Healthy (System, Active, Primary Par	Healthy (Boot, Page File, Crash Dump, Primary Partition)		
<b>Disk 1</b> Basic 13969.82 GB Online	Seagate Exos X (D:)	13969.82 GB ReFS		Healthy (Primary Partition)

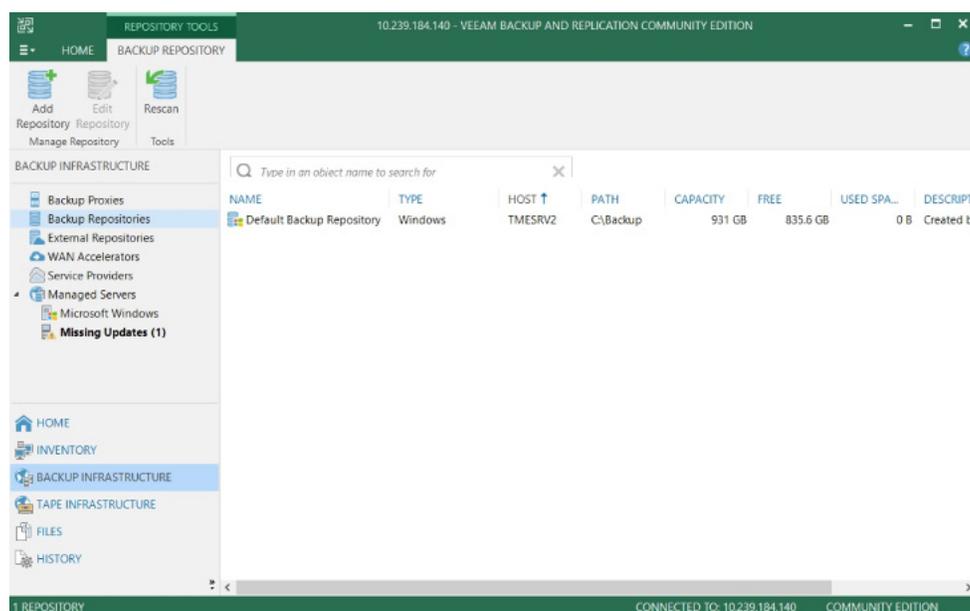
■ Unallocated ■ Primary partition



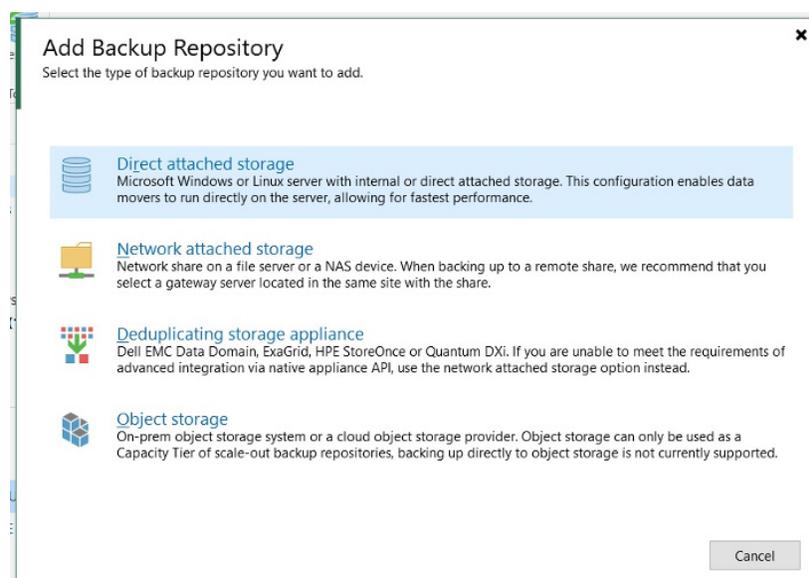
## Adding New Storage to the Backup Repository

Once a new iSCSI disk has been created and exported on the array and then brought into Windows and formatted, it can be configured as a backup target for the Backup Repository. This procedure is performed using the Veeam Backup and Replication management console.

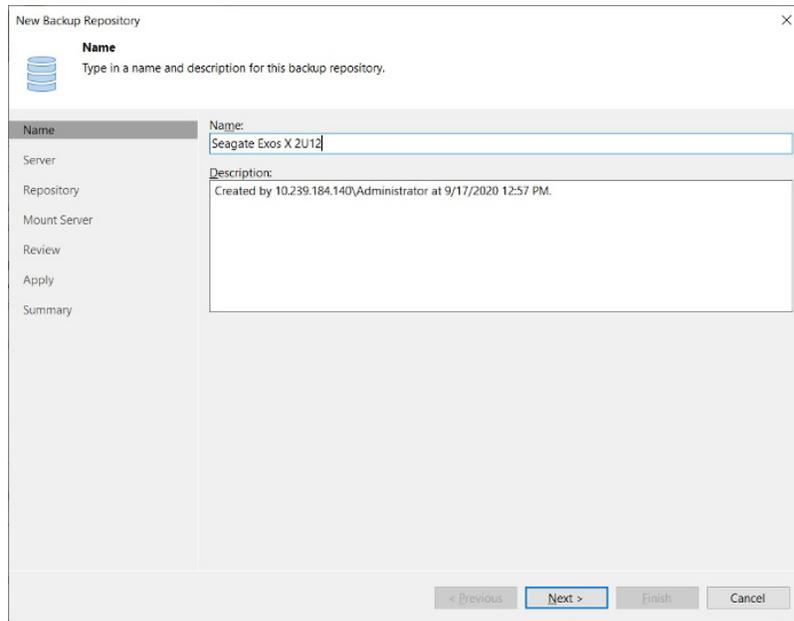
1. Launch the Veeam Backup and Replication management console and log in to the Backup Repository server that will be using the newly provisioned iSCSI storage.
2. Once the management console has launched, click on *BACKUP INFRASTRUCTURE* in the lower left pane and then click *Backup Repositories*.



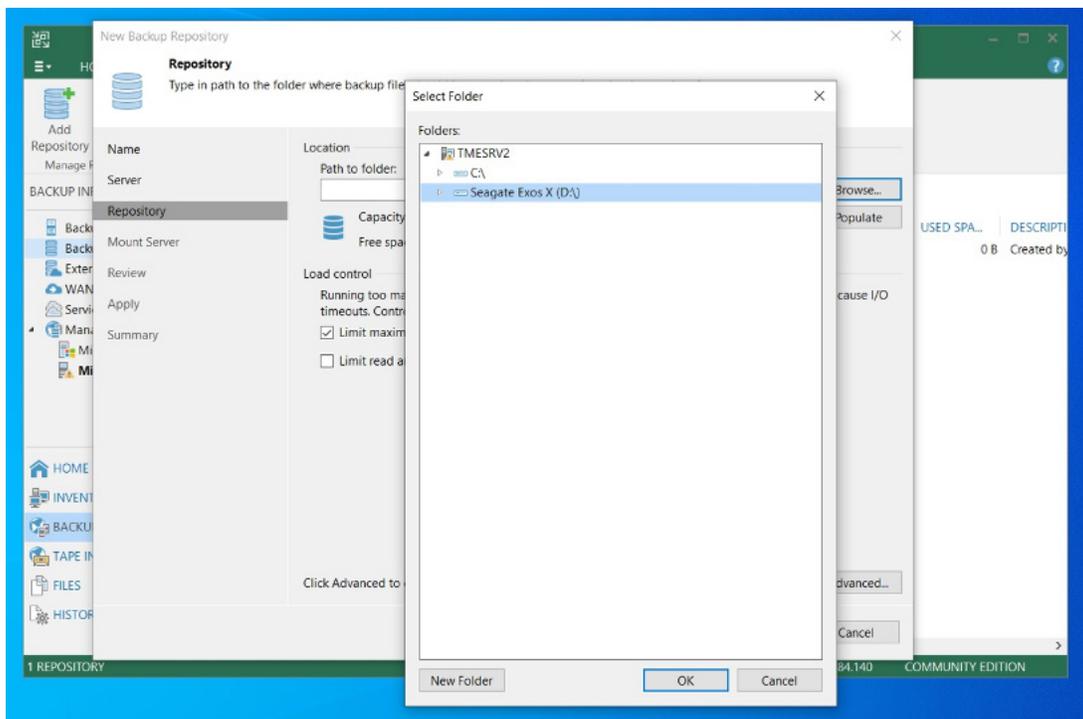
3. Click on *Direct Attached* and then, on the next screen, click *Microsoft Windows*.



- The *New Backup Repository* wizard will then appear. Choose a name for the new repository and then click *Next*.



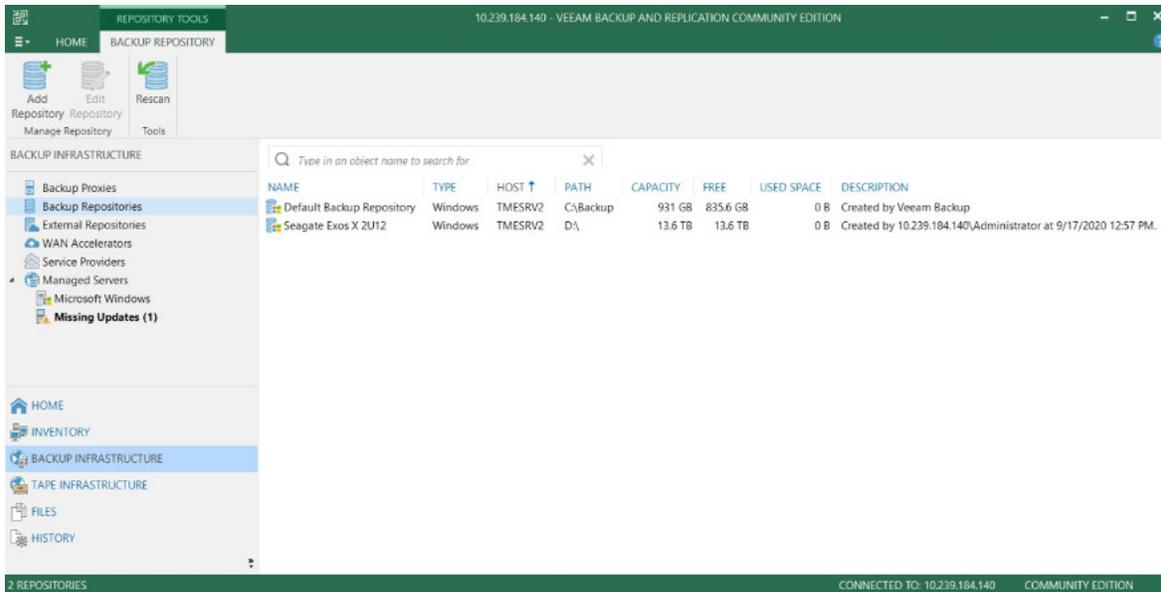
- Click through to the *Repository* selection and then select the new volume.



Click through the wizard pages and then click *Finish*.



- Once the *New Backup Repository* wizard has completed, verify that the new target is listed. The new Seagate iSCSI volume is now ready for use as a Veeam Backup Repository storage target.



## Identifying Bottlenecks

To ensure all its resources are used efficiently, Veeam Backup and Replication software collects detailed statistics from its backup and recovery operations and uses it to isolate sources of potential bottleneck throughout the data path. Several key areas are monitored as potential sources, including networking and Veeam proxy agents, as well as source and target.

Veeam states in their documentation that the indication of a bottleneck does not necessarily mean there is a problem with the backup infrastructure. Veeam intends to inform the administrator about the weakest component in the data path. However, if it is believed that job performance is low, it may warrant taking some measures to analyze and repair the bottleneck.

If there is a problem with the Seagate Exos array or its configuration, it will show up as a bottleneck with the target (storage). And even when the Exos array is performing at its maximum performance, it may still be indicated as a bottleneck if the backup source is on faster storage and there are no other bottlenecks.

### References

Seagate 5005/4005/3005 Series Storage Management Guide

[https://www.seagate.com/files/www-content/support-content/raid-systems/\\_shared/documentation/83-00007047-13-01\\_G265\\_SMG.pdf](https://www.seagate.com/files/www-content/support-content/raid-systems/_shared/documentation/83-00007047-13-01_G265_SMG.pdf)

Seagate 5005/4005/3005 Series CLI Reference Guide

[https://www.seagate.com/files/www-content/support-content/raid-systems/\\_shared/documentation/83-00007048-13-01\\_G265\\_CLI.pdf](https://www.seagate.com/files/www-content/support-content/raid-systems/_shared/documentation/83-00007048-13-01_G265_CLI.pdf)

Veeam Backup & Replication Best Practices

<https://bp.veeam.com/vbr/>

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