

Deployment and Configuration

Implementing the Dell PowerMax Veeam Plugin for Veeam Backup & Replication

Snapshot storage integration for backup and recovery with Dell PowerMax in a VMware Infrastructure.

Abstract

This white paper discusses how to implement and operate the PowerMax Veeam® Plug-in for Veeam Backup & Replication[™] in a VMware infrastructure. It covers the most common customer use cases.

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Dell PowerMax Engineering

Revisions

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June 2024	V1.1.6 support for REST 10
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Introduction

This paper will detail how to use the PowerMax Veeam Plug-in for Veeam Backup & Replication software version 1.1.6. Veeam Backup & Replication is a data protection and disaster recovery (DR) solution developed for virtual, physical and cloud environments. The PowerMax Plug-in¹ provides direct integration with Veeam Software by taking advantage of the local replication array technology known as TimeFinder. Specifically, the PowerMax Plug-in makes REST API calls to take SnapVX crash-consistent copies of datastores for the purposes of backup and recovery.

This paper will not replicate Veeam documentation, but it will focus on the storage array integration for backups on PowerMax. Some topics will still be covered for completeness, however, like application consistency in backups. In addition, Veeam offers virtual machine (VM) replication, but that capability is a host-based solution and is no way related to Dell SRDF and will not be covered. The Veeam documentation, in particular the "User Guide for VMware vSphere", should be consulted for information on these advanced topics.

Note: The PowerMax Plug-in supports VMware environments and the Veeam Agent for Microsoft Windows (physical Windows server). It does not support Microsoft Hyper-V environments.

¹ The remainder of the document will abbreviate the official name "PowerMax Plug-in with Veeam Backup & Replication" to "PowerMax Plug-in".

1 Veeam Backup & Replication

The following sections walk through the installation and configuration of the Veeam software followed by the PowerMax Plug-in installation as it is a separate download. Note that while the PowerMax Plug-in does not require a license, Veeam itself does.

1.1 Installation

Install Veeam Backup & Replication version 12.x software. While Dell recommends following the Veeam installation guide included in the Veeam reference section, an example is provided here for completeness. This particular installation version 12.1.

1.2 Veeam software setup

Veeam's software is provided as an ISO. Veeam runs on Windows (see the user guide for supported versions) in either a physical or virtual environment. In the following setup, Windows Server 2022 is employed. Be aware that this is only an example, and depending on a user's particular situation and environment, their screens may not appear in the exact order shown below, or even at all.

Here, the ISO is mounted from a content library in vCenter. The version is noted in Figure 1.

VeeamBackup&Replication_12.1.2.172_20240515.iso

Figure 1. Veeam Backup & Replication software version

Begin by executing Setup.exe in the root directory shown in Figure 2.

\leftarrow \rightarrow \checkmark \uparrow 🔀 \rightarrow This PC \rightarrow DV	/D Drive (E:) Veeam Backup and Replication 12 $$ >
V 🔮 Ouick access	Name
 Culick access Desktop Downloads Documents Pictures Local Disk (C:) SanRescan 	AIR Backup Catalog Cloud Portal EnterpriseManager EULA Explorers Packages
✓	Plugins Redistr
Desktop Documents Documents	Setup 圖 autorun.inf 認 Setup.exe
 Music Fictures 	
Videos Local Disk (C:)	
> DVD Drive (E:) Veeam Backup an	d Replication 12

Figure 2. Veeam Backup & Replication setup

The user is presented with a number of software options for installation. Here, in Figure 3, select **Install Veeam Backup & Replication**.



Figure 3. Veeam Backup & Replication wizard: Step 1

Accept the Veeam license agreement in Figure 4 and then supply the license file for Veeam in Figure 5.

범명 변고 Veeam Backup & Replication	-	\times
License Agreement		
Read the license agreements and accept them to proceed.		
Please view, print or save the documents linked below.		
By clicking "I Accept" button, I hereby accept the following:		
 Agree and consent to the terms of Veeam License Agreement and licensing policy 		
 Agree and consent to each of the license agreements of 3rd party components used 		
 Agree and consent to each of the license agreements of required software 		
Back I Accept	Cano	el

Figure 4. Veeam Backup & Replication wizard: Step 2

ਮੋਹ ਇਹ Veeam Backup & Replication	-	×
License		
Provide license file for Veeam Backup & Replication.		
Select license provisioning method:		
La Sign in with Veeam Browse license file		
License details:		
Community edition, 10 instances, limited functionality & personal use only		
Update license automatically (enables usage reporting)		
Download and install new license automatically when you renew or expand your contract. This re sending the license ID, the installation ID, and workload usage counters to Veeam servers period Successful usage reporting doubles the number of workloads you can exceed your installed licen	equires lically. 1se by.	
Veeam EULA prohibits using Community Edition to provide any services to third parties. In part you may not install, configure or manage such backup servers at your client's environment as consultant or an MSP.	ticular, a	
Back Next	Cance	ł

Figure 5. Veeam Backup & Replication wizard: Step 3

In the background, Veeam will now check prerequisites. If these prerequisites are satisfied, the screen shown in Figure 6 will appear; otherwise resolve the missing features before continuing.

Veeam Backup & Replication		-	×
Ready to Install			
Installation will begin with the fo	llowing settings.		
Installation folder:	C:\Program Files\Veeam\Backup and Replication		
vPower cache folder:	C:\ProgramData\Veeam\Backup\IRCache		
Guest catalog folder:	C:\VBRCatalog		
Service account:	LOCAL SYSTEM		
Database engine:	PostgreSQL		
SQL server:	dsib2117:5432		
Database name:	VeeamBackup		
Catalog service port:	9393		
Service port:	9392		
Secure connections port:	9401		
REST API service port:	9419		
Check for product updates:	Automatically		
A Customize Settings	Real. Install	Cara	
🖌 Customize Settings	Back Install	Canc	ei

Figure 6. Veeam Backup & Replication wizard: Step 4

Veeam will install the necessary software and display Figure 7 when complete.



Figure 7. Veeam Backup & Replication wizard: Complete

To access the console, find the icon on the desktop and double-click. The fields shown in Figure 8 should self-fill, including the checkbox entitled "Use Windows session authentication." Select **Connect.** Figure 9 shows the result.

		×	
Veeam Backup & Replication 12			
Type in a backup server name or IP and user credentials to connect with localhost	address, backup servi h. ~	ee port number, 9392	
DSIB2117\Administrator			
Password			
✓ Use Windows session authentic	ation		
Save shortcut	Connect	Close	

Figure 8. Veeam console login



Figure 9. Veeam console

Next, install the PowerMax Plug-in.

1.3 PowerMax Plug-in software setup

After the installation of the Veeam Backup & Replication software, download the Dell PowerMax Plug-in for Veeam Backup & Replication from Veeam's website at <u>https://www.veeam.com/data-center-availability-suite-download.html</u> and under the **Storage Plug-ins** tab. The PowerMax Plug-in is delivered as a ZIP file. Unzip the single EXE file on the same host as the Veeam software. Double-click on the EXE file to begin the installation.

The InstallShield Wizard is straightforward and requires little input. Hit Next as shown in Figure 10.



Figure 10. PowerMax Plug-in setup wizard: Step 1

The following screen is the generic license for the storage Plug-ins. Change the radio button to accept the license and then click Next as shown in Figure 11.



Figure 11. PowerMax Plug-in setup wizard: Step 2

The Plug-in is now ready for installation. Hit Install as shown in Figure 12.

😥 Dell PowerMax Plug-In for Veeam Backup & Replication	×	
Ready to Install the Program	Dell	
The wizard is ready to begin installation.	Technologies	
This plug-in enables Veeam Backup & Replication to perform backup and restore of VMware vSphere VMs directly from storage snapshots of Dell PowerMax arrays. This software is developed by Dell Technologies.		
Click Install to begin the installation, or Cancel to exit the wizard.		
InstallShield		
< Back Install Ca	ancel	

Figure 12. PowerMax Plug-in setup wizard: Step 3

As the program copies over some DLLs into the Windows directory ...\Plugins\Storage\Dell PowerMax, it will complete quickly and present the final screen as shown in Figure 13.



Figure 13. PowerMax Plug-in setup wizard: Step 4

1.4 Upgrades

New versions of the PowerMax Plug-will be posted to the Veeam website as they are developed. The setup program will automatically upgrade this software.

When upgrading from version 1.0.x of the PowerMax Plug-in to 1.1.x, there is an important change in functionality which may impact some customers. As part of the configuration instructions, users are required to create a masking view for any proxies or ESXi hosts (from registered vCenters) with a storage group name prefixed with "VEEAM_". The 1.0.x version of the PowerMax Plugin is case insensitive, just like Unisphere, so capital letters are not required. Version 1.1.x of the PowerMax Plug-in, however, IS case sensitive (Unisphere is still case insensitive). Therefore, if there are any Veeam storage groups that do not use capitalized letters for the prefix (VEEAM_), they must be updated prior to the upgrade, otherwise Veeam operations using these groups will fail. This is a two-step process because while you can rename a storage group online either in Unisphere or CLI, neither the UI nor CLI will permit simply changing lower case to upper case as it views them the same (case insensitive). Instead, rename the group to a temporary name, then change it back to "VEEAM_", using all capital letters.

2 Adding VMware vCenter

Begin configuring Veeam by adding the vCenters that will be involved in backup and restore. First, navigate to the **INVENTORY** screen in the Veeam console. Highlight **Virtual Infrastructure** in the left-hand panel and select **Add Server** as shown in Step 1.



Figure 14. Adding vCenter in Veeam Console: Step 1

Next in Figure 15, select **VMware vSphere** as shown in Step 2. Note that the other listed servers are not integrated with the PowerMax Plug-in.



Figure 15. Adding vCenter in Veeam Console: Step 2

There are two options for vSphere, either the vCenter (vSphere) or Cloud Director as shown in Figure 16. The environment described in this paper uses only vCenters so that is selected in Step 3.

Ì	VMware vSphere Select the type of a VMware server you want to add to the inventory.	×
l vm	vSphere Adds vCenter Server (recommended), or standalone vSphere Hypervisor (ESXi) to the inventory.	
	Cloud Director Adds VMware Cloud Director server to the inventory.	
		Cancel

Figure 16. Adding vCenter in Veeam Console: Step 3

In Step 4, with either the IP or the FQDN, enter the vCenter. Veeam will automatically populate the description with **Created by <user> at <date/timestamp>**. Adjust the description if desired as shown in Figure 17.

New VMware Server		Х
Name Specify DNS name o	r IP address of VMware server.	
Name	DNS name or IP address:	
	dsib2226.drm.lab.emc.com	
Credentials	Description:	
Apply	Recovery vCenter	
Summary		
	< Previous Next > Finish Cancel	

Figure 17. Adding vCenter in Veeam Console: Step 4

Step 5 in Figure 18 covers adding the credentials for vCenter. Select **Add** to specify the credentials according to how vCenter is configured for authentication. The pop-up dialog in uses the administrator user for the vCenter. Once again, the description can be adjusted as desired. Select **Apply**.

New VMwa	are Server					\times
v m	Credentials Select server	administra	itor's credent	tials. If required, specify additional connection se	ttings including v	web-service port number.
Name		Credenti	Select an acco	ount with local administrator privileges on the se	erver you are add	ling. Use DOMAIN\USER
Credentia	ls	Credenta	313		~	
Apply			Username:	administrator	Browse	✓ Add
Summary			Password:	••••••		ccounts
			Description:			
			credentials			
				ОК	Cancel	
			Default VMwa customization Port: 443	are web services port is 443. If connection canno n in the vCenter Server or ESXi server settings.	t be established,	check for possible port
				< Previous A	pply Fi	inish Cancel

Figure 18. Adding vCenter in Veeam Console: Step 5

Veeam will attempt to validate the credentials against vCenter in Step 6 as shown in Figure 19. A certificate warning may appear depending on the environment. In this lab, the certificate is untrusted and must be accepted to continue.

New VMware Server			×
Credentials Select server ad	ministrator's credentials. If required, specify additional connection settings i	ncluding web-serv	ice port number.
Name	Select an account with local administrator privileges on the server yo	ou are adding. Use	DOMAIN\USER
Credentials	Certificate Security Alert	×	
Apply	An untrusted certificate is installed on	~	Add
Appiy Summary	dsib2226.drm.lab.emc.com and secure communication cannot be guaranteed. Connect to this server anyway? Remote certificate chain errors: PartialChain (A certificate chain could not be built to a trusted root authority.) RevocationStatusUnknown (The revocation function was unable to check revocation for the certificate.) OfflineRevocation (The revocation function was unable to check revocation because the revocation server was offline.) View Continue Cancel	nage accounts	
	Default VMware web services port is 443. If connection cannot be est customization in the vCenter Server or ESXi server settings. Port: 443	tablished, check fo	r possible port
	< Previous Apply	Finish	Cancel

Figure 19. Adding vCenter in Veeam Console: Step 6

In step 7 in Figure 20, Veeam collect information about the environment before providing the summary.

New VMware Server		×
Apply Please wait while req	uired operations are being performed. This may take a few minutes	
Name	Message	Duration
Credentials	Starting infrastructure item update process	0:00:02
	Creating database records for server	
Apply	Collecting disks and volumes info	0:00:12
Summary	VMware server saved successfully	
	< <u>P</u> revious <u>N</u> ext >	<u>F</u> inish Cancel

Figure 20. Adding vCenter in Veeam Console: Step 7

Select **Finish** to complete adding the vCenter in Figure 21. Adding vCenter in Veeam Console: Summary. Repeat the wizard for any additional vCenters that need to be added to Veeam for backup and recovery purposes.

New VMware Server		×
You can copy the cor	figuration information below for future reference.	
Name Credentials Apply Summary	Summary: VMware vCenter server 'dsib2226.drm.lab.emc.com' was successfully saved. Host info: VMware vCenter Server 8.0.2 build-23504390 Connection options: User: administrator Port: 443	
	< Previous Next > Finish Cancel	

Figure 21. Adding vCenter in Veeam Console: Summary

2.1 Viewing VMs

Much like in vSphere Client, Veeam will show all the VMs in vCenter arranged in a hierarchy. Figure 22 shows the VMs at the cluster level and provides some general information about each one. From this view, the user executes activities like backups and restores.

超 王・ Home View		Veeam Backup and Repl	ication			- ¤ ×
Backup Replication CDP Job * Job * Policy Primary Jobs	Failover Plan + Restore	Security & Compliance Actions				Veeam Al Online Assistant
Inventory		${\sf Q}$ Type in an object name to search for)	K		
 Malware Detection Wirtual Infrastructure Wirtual Infrastructure Wicenter Servers Wicenter Servers Windon Cluster Windon Cluster		Name 1 disb0110.dm.lab.emc.com disb0125.dm.lab.emc.com disb0199.dm.lab.emc.com disb0199.dm.lab.emc.com disb0199.dm.lab.emc.com disb028.dm.lab.emc.com disb025.dm.lab.emc.com disb1055.dm.lab.emc.com disb1066.dm.lab.emc.com disb1066.dm.lab.emc.com disb1066.dm.lab.emc.com disb1066.dm.lab.emc.com disb1066.dm.lab.emc.com disb1023.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com disb1025.dm.lab.emc.com	Used Size 601.1 G8 48.1 G8 58.6 G8 60.2 G8 48.3 G8 90 G6 282.3 G8 282.3 G8 282.3 G8 1.7 T8 1.7 T8 1.7 T8 1.7 76 120.4 G8 120.4 G8 120.7 G8 58.3 G6 116.1 G8 37.7 1 G8 198.2 G8 0 8 75 G8 122.3 G8 122.4 G8 122.5 G8	Host disib1197.drm.lab.emc disib0031.drm.lab.emc disib0073.drm.lab.emc disib0073.drm.lab.emc disib1197.drm.lab.emc disib1197.drm.lab.emc disib1197.drm.lab.emc disib1196.drm.lab.emc disib1196.drm.lab.emc disib10027.drm.lab.emc disib10027.drm.lab.emc disib10027.drm.lab.emc disib10027.drm.lab.emc disib10027.drm.lab.emc disib10027.drm.lab.emc disib10027.drm.lab.emc disib10027.drm.lab.emc disib10027.drm.lab.emc disib10037.drm.lab.emc disib10037.drm.lab.emc disib10051.drm.lab.emc disib10197.drm.lab.emc disib1197.drm.lab.emc disib1197.drm.lab.emc disib1197.drm.lab.emc	Guest OS VMware Photon OS (64-bit) VMware Photon OS (64-bit) Ubuntu Linux (64-bit) SUSE Linux Enterprise 15 (64-bit) Oracle Linux 8 (64-bit) Red Hat Enterprise Linux 8 (64-bit) SUSE Linux Enterprise 15 (64-bit) SUSE Linux Kenterprise 15 (64-bit) SUSE Linux Enterprise 15 (64-bit) SUSE Linux Enterprise 15 (64-bit)	Last Backup never never never never never never never never never never never never never never never never never never never never never never
Ca Backup Infrastructure	📾 🖹 🍏 La »	sidsib2188.drm.lab.emc.com dsib2189.drm.lab.emc.com dsib2199.drm.lab.emc.com dsib2190.drm.lab.emc.com	132.3 GB 132.3 GB 2.6 TB 2.6 TB 2.6 TB	dsib0049.drm.lab.emc dsib0049.drm.lab.emc dsib1196.drm.lab.emc dsib1197.drm.lab.emc	SUSE Linux Enterprise 15 (64-bit) SUSE Linux Enterprise 15 (64-bit) SUSE Linux Enterprise 15 (64-bit) SUSE Linux Enterprise 15 (64-bit)	never never never never
1 virtual machines		s	Connecter	d to: localhost Build: 12	.1.2.172 Enterprise Plus Edition	Evaluation: 30 days remaining

Figure 22. vCenter hierarchy in Veeam

2.2 Viewing history

To view running or completed jobs, access the **History** panel as shown in Figure 23. The system jobs will be the host and storage discovery while other jobs are broken into backup or storage snapshot jobs. The latter refers to manual snapshots that were taken against a device.

원 로 Home View	Veea	m Backup and Replicat	ion			- = ×
Backup Replication CDP Job Y Job Policy Primary Jobs	Import Backup Compliance Actions					Veeam Al Online Assistant
History	Q Type in an object name to	search for	\times			
System	Job Name Host Discovery Shell run DatabaseMaintenance Catalog Cleanup Host Discovery Audit Logs Archiving Host Discovery Audit Logs Archiving Host Discovery DatabaseMaintenance Catalog Cleanup Host Discovery	Status Success Working Success Working Success Success Success Success Success Success Success Success Success	Start Time ↓ 6/6/2024 12:21 PM 6/6/2024 12:20 PM 6/6/2024 12:10 PM 6/6/2024 12:10 PM 6/6/2024 12:10 PM 6/6/2024 12:10 PM 6/6/2024 12:10 PM 6/6/2024 11:33 AM 6/6/2024 11:33 AM 6/6/2024 11:33 AM	End Time 6/6/2024 12:21 PM 6/6/2024 12:21 PM 6/6/2024 12:10 PM 6/6/2024 12:10 PM 6/6/2024 12:10 PM 6/6/2024 12:10 PM 6/6/2024 12:10 PM 6/6/2024 11:34 AM 6/6/2024 11:34 AM	Initiated by SYSTEM SYSTEM DSIB2117/Administr SYSTEM SYSTEM SYSTEM SYSTEM SYSTEM SYSTEM SYSTEM SYSTEM SYSTEM SYSTEM	
A Home						
Inventory						
Backup Infrastructure						
Storage Infrastructure	»					
13 sessions	97		Connected to: localho	st Build: 12.1.2.172	Enterprise Plus Edition	Evaluation: 30 days remaining

Figure 23. History panel

3 PowerMax Plug-in configuration

The PowerMax Plug-in is built on the Veeam Backup & Replication software. Therefore, the PowerMax Plugin relies on prerequisites for the Veeam Backup & Replication software which include, but are not limited to, VMware platform, ESXi host version, and vCenter version. The PowerMax Plug-in itself also has a number of prerequisites which must be satisfied. These prerequisites are enumerated below.

3.1 PowerMax Plug-in prerequisites

The following sections cover the necessary perquisites to use the PowerMax Plug-in.

Note: Any restrictions described herein are specific to the proper functioning of the PowerMax Plug-in and are not meant to apply to a generic PowerMax environment.

3.1.1 Unisphere for PowerMax (REST API)

Unisphere for PowerMax version 10.0.1.0 is the minimum version necessary to use the PowerMax Plug-in. A user with storage administrator privilege in Unisphere (e.g., smc), is required.

The PowerMax Plug-in will prevent the user from adding a Unisphere instance that does not meet the minimum version requirements. An example of the error is seen in Figure 24.



Figure 24. Incorrect Unisphere version error message

Additional details about this error can be found in Appendix A.

3.1.2 TimeFinder

The TimeFinder software that provides local replication on the array must be licensed.

3.1.3 NTP server

In order to avoid timestamp skew when querying the snapshots through different management hosts (e.g., Veeam, Unisphere for PowerMax, etc.), ensure that all hosts are synchronized to an NTP server. If using embedded management for Unisphere for PowerMax, it is preconfigured for NTP.

For example, the following screenshot contains the timestamp of a storage group as seen by two different Unisphere for PowerMax implementations for the same array. Note the significant time skew in Figure 25.

Storage Groups > testing_veeam_sg									
DETAILS	COMPLIANCE	VOLUMES	PERFORMANCE	DATA PROTECTION					
SNAPSHOT	S SNAPSHOT F	POLICIES	SRDF						
Create	Create Modify Restore Link								
Snapshot			Creation Time 🔻						
Veeam-45	50		Wed Mar 03 2021 08:13:	10					
Veeam-45	50		Wed Mar 03 2021 08:13:10						
Storage Gro	ups > testing_ve	eeam_sg							
DETAILS	COMPLIANCE	VOLUMES	PERFORMANCE	DATA PROTECTION					
SNAPSHOT	S SNAPSHOT P	POLICIES	SRDF						
Create	ModIfy Re	estore	ink						
Snapshot			Creation Time 🔻						
Veeam-45	50		Wed Mar 03 2021 08:02:25						
Veeam-45	50		Wed Mar 03 2021 08:02:25						

Figure 25. Time skew in multiple Unisphere instances

The clocks must be synchronized for proper operation.

3.2 Arrays and PowerMaxOS

A minimum of PowerMaxOS code level 5978.711.711 is required. When using earlier versions of PowerMaxOS like 5978.711.711, the user must install an external instance of Unisphere for PowerMax at the proper version as the embedded version will be unsupported.

4 Export hosts

An export host refers to the server to which you export data while running a Veeam task, though it is not the same as the proxy server which facilitates a backup from the Dell PowerMax. A customer might use an export host when restoring a VM from a backup. Veeam would present the backup device(s) to the export host (e.g., ESXi host) and perform VMware activities such as resignaturing.

In order to present the PowerMax snapshots (i.e., linked targets) to export hosts, a masking view must exist for each host. This masking view will consist of the zoned ports (i.e., host initiator to a PowerMax front-end port), a storage group prefixed with "VEEAM_" and containing a small device (required for the masking view), and a host initiator group. This process is done externally to the PowerMax Plug-in to ensure that the storage administrator is able to control zoning and mapping. The following sections will detail how to create this masking view.

Note: As detailed below, one masking view per export host is required. Dell does NOT support sharing a storage group among multiple masking views, nor does it support using a host (i.e., parent) initiator group, though an individual host may still be part of a host group. This means it is NOT possible to have a "cluster-wide" masking view. For example, if a customer has a vCenter with 16 hosts and wants to have the ability to export snapshots to any of those hosts, they must create 16 masking views, one for each host.

Note: There is no support for NVMeoF.

4.1 Fibre Channel exports

For each Fibre Channel export host, complete the following steps, if required:

- 1. Zone the export host(s) to the PowerMax array front-end ports. These could be proxy hosts or hosts to which the restored snapshots will be exported. There is no requirement that all initiators be zoned.
- 2. Create a host (i.e., initiator group) on the PowerMax for each export host(s) that contain the port WWNs that belong to the adapters that are zoned. The initiator group should only contain initiators from a single host.
- 3. Create a port group on PowerMax that comprises the zoned ports from Step 1.
- 4. Create a storage group with the starting prefix "VEEAM_". Note that while Unisphere is not case sensitive, the Plug-in is case sensitive. It is essentially to use all CAPS for the prefix or the Plug-in will not function. The group must contain at least one device or Step 5 will fail. A single, small, three-cylinder device is sufficient. The group must be assigned an SRP of None, which will also set the service level to None.
- 5. Create a masking view on the PowerMax with the host group, port group and the new storage group that was created in the Steps above. There must be one masking view created for each export host. Do NOT use the same storage group in more than one masking view.

4.2 iSCSI exports

For each iSCSI export host, complete the following steps, if required:

- 1. Create a host (i.e., initiator group) on the PowerMax for each export host(s) which contains the IQN. The initiator group should only contain initiators from a single host.
- 2. Create a port group on PowerMax that includes the iSCSI ports that are going to be used.
- 3. Create a storage group with the starting prefix "VEEAM_". Note that while Unisphere is not case sensitive, the Plug-in is case sensitive. It is essentially to use all CAPS for the prefix or the Plug-in will not function. The group must contain at least one device or Step 5 will fail. A single, small, three-cylinder device is sufficient. The group must be assigned an SRP of None, which will also set the service level to None.
- 4. Create a masking view on PowerMax with the host group, port group and the new storage group that was created in the Steps above. There must be one masking view created for each export host. Do NOT use the same storage group in more than one masking view.

4.3 Unisphere for PowerMax

The following section walks through adding the required components for the PowerMax Plug-in via Unisphere for PowerMax for a Fibre Channel and iSCSI host. Two wizards are used in this process:

Host wizard Storage provisioning wizard

It is also possible to use Solutions Enabler or a REST API to create the necessary objects.

4.3.1 Host wizard

In the following example, host **dsib1189** is identified as the export host. Begin by logging into Unisphere for PowerMax at: https://<IP_or_FQDN>:8443. The default login is smc/smc. Once logged in, click on the array, which in this case 000120001473 as shown in Figure 26.

D∜	LLEMC	(j) C ⁴	Q 💼 💪 🕸					
습	Overview			_				
88	Dashboard		Overview	SG Compliance	Capacity	Performance	ce	Protection
	Storage	>	100	40	8	Host IOs/sec 2762 Latency 317	2.48 7.11 µs	12
÷	Hosts	>		SGS	%	Throughput 219	0.86 MB/s	SGS
V	Data Protection	>	Health Score		Updated Frida	ay, June 14, 2024 9:05:05 AM	Act	tions
Ø	Performance	>	100 Total Issues	Total Issues			Viev	v System Properties
8	System	\sim	100 Configuration		I health checks were successful		Viev	v Other Hardware
	Hardware		100 Capacity	A	i nearth checks were succession.		Run	Health Check
	System Properti	es	100 Performance				Viev	v SAN Health
	Physical View		00 Data Protection					
	iSCSI + NVMe							

Figure 26. Unisphere for PowerMax home

From the left-hand menu, expand the **Hosts** menu and select **Hosts**. Then select the **Create** button to start the wizard in Figure 27.

DE LEMC	Unisphere fo	or PowerMax > 0001	20001473 -		
습 Overview		Hosts and Host Groups			
Dashboard		Create Modify Pro	vision Storage To Host		84 Items 🝸 土 🛈
Storage	>	□ Name ↑	Masking Views	Initiators	Last Update 🗮
Hosts	\sim	> all_hosts_ig (16)	1	32	2024-02-03 16:15:58
Hosts		> dsib0027_0049 (6)	4	12	2023-11-30 09:23:50
Masking View	vs	dsib0046_iscsi_ig	1	1	2024-05-16 09:35:12
Port Groups		dsib0127_iscsi_ig	1	2	2024-06-07 09:06:39
Initiators		> dsib0180_0182 (6)	11	12	2024-02-22 09:58:55
PowerPath		dsib0180_tcp_ig	0	1	2023-08-19 13:39:45
		dsib0182_tcp_ig	0	1	2023-08-19 13:39:34
Data Protection	n >	dsib0184_tcp_ig	0	1	2023-08-19 13:39:26

Figure 27. Host wizard

In the next screen, for Fibre Channel supply a host name (e.g., dsib1189_ig). The radio button defaults to Fibre Channel so leave it as is. Select the HBA initiators from the left-hand panel and move them over to the right. Then select **Run Now** in Figure 28.

Create Host						
Host Name * dsib1189_fc_host						
Initiator Type Fibre iSCSI NVMe/TCP 						
Select Initiators						
Available Initiators	1 Items 🝸		Initiators in Host	2 Items	Đ	T
□ Name ↑	=		Name ↑			=
21fd88947141814d			5000097200170404			*
		-	5000097200170440			
		<				*
Set Host Flags						
(?)				Cancel	Run Now	~

Figure 28. Add Fibre Channel initiators

For iSCSI, supply a host name (e.g., dsib1189_iscsi_ig), select the iSCSI radio button under "initiator type", select the plus button to manually enter the initiator name or simply move an existing initiator from the left-hand panel to the right. Then click **Run Now**, as shown in Figure 29.

Create Host				
Host Name * dsib1189_iscsi_host				
Initiator Type				
Select Initiators Available Initiators 2 Items	T	Initiators in Host	1 Items	Y
□ Name ↑ IP Addresses	=	□ Name ↑	IP Addresses	≡
iqn.1994-05.com.redhat:777€ > (1) iqn.2006-07.com.veeam.veea (1)	× > <	iqn.1994-05.com.redhat.281c	> (1)	×
0			Cancel Ru	n Now 🗸 🗸

Figure 29. Add iSCSI initiators

With the Fibre Channel or iSCSI host added, run the masking view wizard which includes creating the port group and storage group.

4.3.2 Storage provisioning wizard

In the same **Hosts** screen from Figure 27, check the box next to the newly created host and select **Provision Storage To Host** as shown in Figure 30.

D∜		Unisphere	for PowerMa	ax > O	00120001473	•			
습	Overview		Hosts and	d Host Grou	ps				
	Dashboard		Create	Modify	Provision Storage To Hos	st 🕴		85 Items 🍸 上	i
	Storage	>	📄 Nar	ne ↓	Masking Views		Initiators	Last Update	≡
Ŧ	Hosts	\sim		vcenter224_v (1	12) 1		24	2023-10-24 16:06:54	
	Hosts			proxmox_iscsi_ig	1		1	2024-05-06 21:51:51	
	Masking View	s		dswib0186_vvol_t	ср 1		1	2023-11-15 13:28:38	
	Port Groups			dsib1195_tcp_ig	0		1	2023-08-19 13:39:09	
	Initiators			dsib1194_tcp_ig	0		1	2023-08-19 13:39:18	
	PowerPath			dsib1189_fc_host	0		2	2024-06-14 09:19:42	
				dsib1188_vvol_tcp	p 1		1	2023-11-14 19:40:48	
U	Data Protection	>		dsib1187_vvol_tcp	p_ig 0		1	2023-11-14 19:01:17	

Figure 30. Provision storage to host wizard: Step 1

In the first screen of the wizard, type in a name for the storage group. Recall that this name <u>must</u> start with "**VEEAM_**" (must be UPPERCASE). Use the drop-down to select **None** for **Storage Resource Pool**. A warning will appear indicating that without an SRP, data reduction is disabled. Select **OK**.

Provision Storage		
Create Storage Group	Create Storage Group	
Select Port Group	Storage Group Name * Storage Resource Pool VEEAM_dsib1189_fc_sg	
	Service Level Volumes Volume Capacity	
	An SRP is required for enabling Data Reduction. Data Reduction will consequently be deselected and disabled. Continue with change?	
	Total Capacity 0 GB Total Service Levels 1	
	Select Snapshot Policies	
	Enable Data Reduction	
0		Cancel Next

Figure 31. Provision storage to host wizard: Step 2

When the screen returns, enter in **1** for the number of volumes and **3 CYL** for the volume capacity and then **Next**, as shown in Figure $32.^2$

² A three-cylinder device is used because the storage group requires at least one device for the masking view. The size is arbitrary, however, as any size can be used. It is not possible to create a masking view with an empty storage group.

Provision Storage		
Create Storage Group	Create Storage Group	
Select Port Group	Storage Group Name * Storage Resource Pool VEEAM_dsib1189_fc_sg	
Summary	Service Level Volumes Volume Capacity	
	<u>None ▼ 1 3 ▼ CYL ▼</u>	
	Total Capacity 3 GB Total Service Levels 1	
	Select Snapshot Policies	
	Enable Data Reduction	
<.		•
?	Car	ncel Next

Figure 32. Provision storage to host wizard: Step 3

In the next screen, create a new port group or use an existing one for the masking view. Do this by providing a name and selecting the desired ports. Select **Next** as shown in Figure 33.

Provision Storage								
Create Storage Group 🗸	Select Port Group							
Select Port Group								
Summary	Port Group Type *	Port Group Name ▼ VEEAM_dsib	 1189_pg	_	Ŧ			
	Dir-P ↑ Ider	ntifier Init	PGs	Ma	% Busy	=		
	OR-1C:0 500	0097 29	3	64	2.7461	L .		
	OR-1C:1 500	0097 4	0	0	0			
	OR-1C:2 500	0097 0	0	0	0			
	OR-1C:4 500	0097 9	2	15	0.1765			
	OR-1C:5 500	0097 1	0	0	0			
	OR-1C:6 500	0097 0	0	0	0			
	Include ports not visib	le to host	^	**	0.7070			
0			Са	ncel Bac	k Next			

Figure 33. Provision storage to host wizard: Step 4

In the final screen, provide a masking view name and complete the wizard in Figure 34.

Export hosts

						_
Provision Stora	ge					
Create Storage Group	~	Summary				
Select Port Group	~	Masking View *	Storage Group	Host	Port Group	
Summary		VEEAM_dsib1189_fc_mv	VEEAM_dsib1189_fc_sg	dsib1189_fc_host	VEEAM_dsib1189_pg	
		Host I/O Limit	Set Host I/O Limits	Enable Compliance Alerts		
		Performance Impact				
		Performance Impact is not avai	ilable, all storage groups must hav	ve a Service Level set.		
		1				
?					Cancel Back Run Now V	

Figure 34. Provision storage to host wizard: Step 5

The export host is now ready.

4.4 Restrictions

Both PowerMax and Veeam have a number of restrictions that apply to the PowerMax Plug-in. Veeam's restrictions are fully documented in their user guide. A few of the more common restrictions for both Veeam and PowerMax are noted below:

- The PowerMax Plug-in does not support adding two Unisphere servers that have the same array(s) set as "local". Doing so will cause issues with discovery and can lead to undesirable results.
- Veeam does not support VMware Virtual Volumes (vVols) with the PowerMax Plug-in.
- Veeam does not support backing up Raw Device Mappings (RDMs) with the PowerMax Plug-in³
- There is no support for NVMeoF on PowerMax.
- There is no support for NFS on PowerMax.

4.5 Known Issues

The following are known issues with the PowerMax Plug-in:

- There can be only one storage group prefixed '**VEEAM**' (must be UPPERCASE) presented to each export host in a masking view. If the PowerMax Plug-in finds more than one masking view with a storage group prefixed '**VEEAM**' presented to the same export host, the job will fail.
- The PowerMax Plug-in does not support the use of parent/child storage groups for exports. Export operations are done at the host level, not the cluster level.
- A storage group may not be shared across multiple export hosts/masking views. This will lead to failures when attempting to restore a set of VMs from the same snapshot to more than one export host.

³ VMs with RDMs can still be backed up because Veeam simply skips the RDMs. See the section Backup and restore for more detail.

- The PowerMax Plug-in does not support the use of SRPs/service levels with export host storage groups.
- A set of host initiators may not be divided between two different initiator groups. While the PowerMax Plug-in does not require all host initiators to be present in an initiator group, they cannot be split into multiple initiator groups to be used in different masking views or host groups.
- While it is possible to use both iSCSI and Fibre Channel on the same export host, the only way to control which one Veeam will use is to designate one or the other when setting up the storage the Proxies section.

5 Proxies

Veeam will automatically create a file Proxy and VMware Proxy during the installation. These are shown in Figure 35. VMware Backup Proxy is sufficient to create production VM backups and restores, but if desired the additional proxies (i.e., hosts) can be added. For example, when taking a manual snapshot Veeam will attempt to scan it for existing VMs. In order to do this, Veeam must be able to export the snapshot from PowerMax to a backup proxy which either has iSCSI or Fibre Channel connectivity to the storage. This is covered in some detail below.



Figure 35. Backup proxies

5.1 Host setup for use as proxy

If there is a need to back up a VM to disk with the PowerMax Plug-in, or to scan manual snapshots for VMs to be used in backup and restore, an additional physical or virtual host must be set up. This host will need to access the PowerMax array through Fibre Channel or iSCSI. When using a VM, the most common setup is direct iSCSI from the Guest OS. This is the example shown below. Note that even if the user is familiar with setting this up, there is a Veeam requirement that must be followed, so please review this section.

In this example, the VM host **dsib0127.drm.lab.emc.com** has iSCSI access to array 000120001473 through the Microsoft software initiator. It also has a direct iSCSI connection to PowerMax array 000120001473 within the GuestOS on the VM. It uses the Microsoft software iSCSI adapter, so there is a single initiator, though it is mapped through four ports on the array. The initiator group is shown in Figure 36.

D∜		Unisphere	for PowerMax	> 000120001473	•	
ŝ	Overview		dsib0127_iscs	si_ig > Initiators		
	Dashboard		Add Initiators	Remove		2 Items 🍸 上 🥡
	Storage	>	Initiator		Alias	Protocol
Ŧ	Hosts	\sim	iqn.1991-0	05.com.microsoft:dsib0127	—	iSCSI
	Hosts					
	Masking Views					
	Port Groups					
	Initiators					
	PowerPath					_

Figure 36. Initiator group for backup proxy dsib0127.lss.emc.com

A single storage group was created with a small device, **VEEAM_dsib0127_sg**, per the requirement for export hosts in iSCSI exports. This and the initiator group, along with the iSCSI ports, were bundled into a single masking view as shown in Figure 37.

DØL	LEMC Unisphere for PowerMax > 00012000	1473 👻		
습	VEEAM_dsib0127_sg > Masking Views			
88	Create Rename View Path Details		1 Items 🝸	<u>↓</u> ()
	Name ↑ Host/Host Group	Port Group	Storage Group	≡
Ē	veeam_dsib0127_mv dsib0127_iscsi_ig	iscsi_pg	VEEAM_dsib0127_sg	*

Figure 37. Masking view for backup proxy dsib0127.drm.lab.emc.com

5.1.1 Veeam iSCSI/Fibre Channel initiator

When using the server as a backup proxy for disk backups, the single Microsoft initiator is sufficient. However, this initiator is not sufficient for manual snapshots. When taking manual snapshots, Veeam will attempt to record any VMs on the source device. To do this, the PowerMax Plug-in links the manual snapshot to a target device and presents it to the backup proxy to be read by Veeam. When it does this, Veeam queries for its own initiator in the initiator group. This is a proprietary initiator that Veeam names and is in addition to the iSCSI or Fibre Channel initiators in the group. Unfortunately, the only way to determine the initiator name is to run a manual snapshot and review the log file from the failure to mount to the backup proxy. In the following example shown in Figure 38, a manual snapshot was taken of device 124 on PowerMax 000120001473 when the initiator group of host dsib0127.drm.lab.emc.com only contained the Microsoft initiator.

Name: Action type: nitiated by:	Create storage snapshot Storage Snapshot Creation DSIB2117\Administrator	Status: Start time: End time:	Success 6/14/2024 6:35:36 AM 6/14/2024 6:35:55 AM	
Parameters	Log			
Message Sending Storage	request to create storage snapshot snapshot created successfully, and	Snapshot_Test will now be scann	ed for content	Duration 0:00:02
LUN 000	120001473:00104 configuration refr	esh completed suc	cessfully	0.00.04
Storage	bb Failed to obtain list of VMs on L +0000) from snapshot DailyDefa volume 000120001473:00104 Err sna (000120001473:00104:DailyDefa	UN test (00:12:29 7 ault (00:12:29 Thu, 0 for: The selected Sto ult:1717632749) doe	hu, 06 Jun 2024 +0000) 6 Jun 2024 +0000) of rage Group s not have the required	0:00:07

Figure 38. Manual snapshot before Veeam initiator added

This job fails because Veeam was unable to find its initiator in a masking view containing a storage group prefixed with **VEEAM_**. Unfortunately, Veeam does not include the initiator in the error message. Reviewing the log file **Util.SanRescan.All.log** on the Veeam server located in the directory

C:\ProgramData\Veeam\Backup\SanRescan, reveals the following for LUN 00104 as shown in Figure 39:

Util.SanRescan.All.log - Notepad		-		×
File Edit Format View Help				
[09.06.2024 04:01:05.206]	Info (3)	[PublicPlugin] Volume '000120001473:00104', '000120001473:00104' has following LUNs:		^
[09.06.2024 04:01:05.206]	Info (3)	LUN 'Name '000120001473:00104', Id '000120001473:00104', SCSIUniqueId '60000970000120001473533030313034', VolumeId '0001200014	73:001	04'
[09.06.2024 04:01:05.206]	Info (3)	[San] Updating SAN volume LUN '000120001473:00104(000120001473:00104)'. Size [Old: '6291456', New: '6291456'], Name [Old: '000120001473	3:0010	4',
[09.06.2024 04:01:05.206]	Info (3)	[DbScope] Updating SanVolumeLUNInfo '000120001473:00104(000120001473:00104)'		
[09.06.2024 04:01:05.237]	Info (3)	Volume '000120001473:00104', '000120001473:00104' has following snapshots:		
[09.06.2024 04:01:05.393]	Info (3)	[PowerMax] Input 10.228.246.28 is a valid IP address		
[09.06.2024 04:01:05.393]	Info (3)	[PowerMax] Dell PowerMax plugin version 1.1.6.0		
[09.06.2024 04:01:05.487]	Info (3)	[PowerMax] Getting LUNs that may be accessed by iSCSI host dsib0127.drm.lab.emc.com_Rescan/iqn.2006-06.com.veeam:dsib0127.drm.lab.emc.	com	
[09.06.2024 04:01:11.847]	Info (3)	[PowerMax] Host dsib0127_iscsi ig associated with masking views 'veeam_dsib0127_mv'		
[09.06.2024 04:01:43.082] Wa	arning (3)	[PowerMax] Adapter is not in an initiator group. No PowerMax host record found for initiator iqn.2006-06.com.veeam:dsib0127.drm.lab.em	c.com	
[09.06.2024 04:01:43.098]	Info (3)	[PublicPlugin] Checking Host '10.228.246.28' ('45dc48f5-9df8-40e0-8e1f-15326893b7ee') accessibility from SAN initiator 'Id: 'c90c5ab4	f64e-4	20e
[09.06.2024 04:01:43.098]	Info (3)	Fixing credentials to down-level format.		
[09.06.2024 04:01:43.113]	Info (3)	[RPC] Loading options.		
[09.06.2024 04:01:43.129]	Info (3)	[SNetworkAddressResolver] Host not joined to domain. Using NTLM only strategy.		
[09.06.2024 04:01:43.129]	Info (3)	[SHostNameResolver] Using hostnames resolving policy: UseOnlyOriginalHostNames		
[09.06.2024 04:01:43.129]	Info (3)	[SNetworkAddressResolver] Resolved ['10.228.244.127'] by NTLM strategy IP addresses and host names. IPAddressKind: [All]. Result: ['10	.228.2	44.
[09.06.2024 04:01:43.160]	Info (3)	[SNetworkAddressResolver] Resolved ['10.228.244.127'] by NTLM strategy IP addresses and host names. IPAddressKind: [All]. Result: ['10	.228.2	44. ၂
[00 0C 0004 04:01:40 170]	T-C- (3)	[CDDT -] DT [C40C0FC2] L LL L- [40 330 344 437.6460]		>
-		La 10097 Col 90 100% Windows (CRLS) LITE	0	-
		En 10007, COLSO Mindows (CREF) On-	•	

Figure 39. Log file before Veeam initiator was added

Veeam is looking for **iqn.2006-06.com.veeam:dsib0127.drm.lab.emc.com** since this is an iSCSI host. Add this initiator to the initiator group in Figure 40.

D&L	LEMC Unisphere for PowerMax >	000120001473	•					
ŝ	dsib0127_iscsi_ig > Initiators							
88	Add Initiators Remove				2 Items	T	<u> </u>	i
	Initiator	Alias		Protocol				≡
Ē	iqn.1991-05.com.microsoft:dsib0127	—		iSCSI				-
U	iqn.2006-06.com.veeam:dsib0127.drm.lab.emc.com	—		iSCSI				
Û								

Figure 40. Initiator group with Veeam initiator

Now rerun the manual snapshot for device 00104. With the Veeam initiator present it now succeeds as shown in Figure 41.
Storage snapsh	not					×
Name: Action type: Initiated by:	Create Storag DSIB21	e storage snapshot e Snapshot Creation 17\Administrator	Status: Start time: End time:	Success 6/14/2024 7:35:16 AIV 6/14/2024 7:35:35 AIV	1	
Parameters	Log					
Message					Duration	1
Sending	request	to create storage snapshot	Snapshot_Test		0:00:02	
Storage :	snapshot	created successfully, and	will now be scanne	ed for content		
💙 LUN 000	12000147	3:00104 configuration refr	esh completed suc	cessfully		
💙 LUN 000	12000147	3:00104 from volume 0001	20001473:00104 is	not a VMFS LUN, or	0:00:04	
🛛 🕗 Volume	00012000	1473:00104 rescan comple	ted			
Storage :	snapshot	is ready for restore operat	ions			
🛛 Job finis	hed at 6/	14/2024 7:35:35 AM				
						-
					Close	

Figure 41. Manual snapshot after Veeam initiator was added

Reviewing the new log file after the successful job, note the initiator is now found in Figure 42.

Util.SanSnapshot.000120001473_00)104.log - Notepad	×	(
File Edit Format View Help			
[14.06.2024 07:35:26.641]	Info (3)	[San] End VC and ESX discover for volume: '000120001473:00104' VMs.	
[14.06.2024 07:35:26.676]	Info (3)	[San] Lease '386bfb91-acca-4df8-b36a-8ec99a414d12' for VMFS rescan host '10.228.246.28' created.	
[14.06.2024 07:35:26.676]	Info (3)	[LeaseKeeper] Created. LeaseId: 386bfb91-acca-4df8-b36a-8ec99a414d12, TTL: [200 sec], ignoreExceptions: [False].	
[14.06.2024 07:35:26.688]	Info (3)	[San] Starting 'VMFS connect' discover for volume: '000120001473:00104'.	
[14.06.2024 07:35:26.688]	Info (3)	[San] Creating discover lock for volume: '000120001473:00104'(000120001473:00104)	
[14.06.2024 07:35:26.704]	Info (3)	[San] Starting 'VMFS connect' discover for volume LUN: '000120001473:00104' ('ad845207-60ba-489f-a5b8-645a12194bbb').	
[14.06.2024 07:35:26.720]	Info (3)	[San] VMs found in infrastructure for volume LUN or NFS '000120001473:00104', Count [0]	
[14.06.2024 07:35:26.720]	Info (3)	[San] Getting valid proxies for performing rescan VMFS volumes.	
[14.06.2024 07:35:26.720]	Info (3)	[SanHost] Accessing role-specific options of host 10.228.246.28 (45dc48f5-9df8-40e0-8e1f-15326893b7ee). Roles: 'ViBackup'. Accessor: Veeam.Backup.Core.SanPl	lugi
[14.06.2024 07:35:26.782]	Info (3)	[TransportService] Connecting to transport service, host '10.228.244.127', addresses ['10.228.244.127'], port '6162'.	
[14.06.2024 07:35:26.798]	Info (3)	[RPC] Loading options.	
[14.06.2024 07:35:26.798]	Info (3)	[SNetworkAddressResolver] Host not joined to domain. Using NTLM only strategy.	
[14.06.2024 07:35:26.813]	Info (3)	[SHostNameResolver] Using hostnames resolving policy: UseOnlyOriginalHostNames	
[14.06.2024 07:35:26.813]	Info (3)	[SNetworkAddressResolver] Resolved ['10.228.244.127'] by NTLM strategy IP addresses and host names. IPAddressKind: [All]. Result: ['10.228.244.127'].	
[14.06.2024 07:35:26.829]	Info (3)	[CProxyRpcInvoker] RpcInvoker [28152706] has been created. Host: [10.228.244.127:6162]	
[14.06.2024 07:35:26.845]	Info (3)	[TransportService] Network is available	
[14.06.2024 07:35:26.845]	Info (3)	[CProxyRpcInvoker] RpcInvoker [28152706] was disposed	
[14.06.2024 07:35:26.845]	Info (3)	[San] Proxy '10.228.244.127'('b0943459-251e-423e-9d6b-2992281a53ed') is valid for rescan SAN volumes. Transport installed: True	יר
[14.06.2024 07:35:26.876]	Info (3)	[San] Accessible san initiators for '000120001473:00104'. Count '1'	- P
[14.06.2024 07:35:26.876]	Info (3)	Id: 'c90c5ab4-f64e-420e-a0cb-0a453a385361', ProxyId: 'b0943459-251e-423e-9d6b-2992281a53ed', IqnOrWWN: 'iqn.2006-06.com.veeam:dsib0127.drm.lab.emc.c	om
[14.06.2024 07:35:26.876]	Info (3)	[PowerMax] Input 10.228.246.28 is a valid IP address	_
[14.06.2024 07:35:26.876]	Info (3)	[PowerMax] Dell PowerMax plugin version 1.1.6.0	
[14.06.2024 07:35:26.926]	Info (3)	[PowerMax] Found matching snapshot created on (14:34:46 Fri, 14 Jun 2024 +0000:	
[14.06.2024 07:35:26.926]	Info (3)	StorageVolumeSnapshot {	
<			
		Ln 111. Col 71 100% Windows (CRLF)	U

Figure 42. Log file after Veeam initiator was added

5.2 Backup proxy

In order to mount snapshots so they can be scanned for VMs during storage discovery or backups made to disk, a backup proxy with direct access to the array is required. This backup proxy can be a physical or virtual host, but the main requirement is that it has direct access to the array through Fibre Channel or iSCSI, in the same way ESXi hosts do. When the backup to disk is initiated, the PowerMax Plug-in is called to create a snapshot of the source device(s), create a snapshot of the source device(s), target devices and the link between them. These target devices are then placed in the "**VEEAM_**" storage group that was previously

configured⁴ for the proxy host in question. This presents the target devices to the backup proxy where they can be read by Veeam for the disk backup. Note that Veeam is able to read the device on the host directly, without the aid of a vCenter or ESXi host. This proprietary method avoids having to mount the target devices as datastores.

As mentioned previously, Veeam creates a VMware backup and file proxy automatically on the Veeam software server. It may be possible to use the default VMware backup it creates if that host is attached to PowerMax through Fibre Channel or iSCSI; however, Dell recommends creating a separate backup proxy for disk backups facilitated with a snapshot.

In the following example, a VM is used which has iSCSI access to one of the PowerMax arrays. Be sure that the initiator group contains the Veeam IQN as explained in the section Host setup for use as proxy.

Like the backup repository, start the wizard from the **Backup Infrastructure** screen. Right-click on the **Backup proxies** in the left-hand panel and select **Add VMware backup proxy...** as shown in Figure 43.

원 Proxy Tools	Veeam Backup and Replication	×
Add Edit Disable Remove Proxy Proxy Proxy Manage Proxy Upgrade Proxy Upgrade		Veeam Al Online Assistant
Backup Infrastructure	Q Type in an object name to search for	
 Backup Proxies Backup Repositories External Repositories Scale-out Repositories WAN Accelerators Service Providers SureBackup Managed Servers 	Name Type Host ↑ Image: Backup Proxy Agent dsib2117 Image: VMware Backup Proxy VMware dsib2117	Description Created by Veeam Backup & Replication Created by Veeam Backup & Replication
A Home		
Inventory		
Backup Infrastructure		
Storage Infrastructure		
🍘 🗅 🏦 🗣 🗧		

Figure 43. Add backup proxy - Step 1

Select VMware backup proxy in Figure 44.

⁴ See Export hosts for instructions on creating the necessary storage group and masking view for the backup proxy. The procedure is the same as for an ESXi host.



Figure 44. Add VMware backup proxy - Step 2

In Step 3, select Add New... next to the Choose server field in Figure 45.

New VMware Proxy		×
Server Choose a server for VI Managed Servers whi	Mware backup proxy. You can choose between any Microsoft Windows or Linux servers ad ich are not assigned a VMware backup proxy role already.	lded to the
Server	Choose server:	
	dsib2117 (Backup server) 🗸	Add New
Traffic Rules	Proxy description:	
Review	Created by DSIB2117\Administrator at 6/6/2024 1:34 PM.	
Annhy		
Арру		
Summary		
	Transport mode:	
	Automatic selection	Choose
	Connected datastores:	
	Automatic detection (recommended)	Choose
	Max concurrent tasks:	
	< Previous Next > Finish	Cancel

Figure 45. Veeam backup server – Step 3

In Step 4, select the operating system of the host that's being added, as shown in Figure 46. Note that Veeam does not require the user to designate that the server is physical or virtual, only that the OS is pertinent. This example uses Microsoft Windows.

Add Select th found u	Server he type of a server you want to add to your backup infrastructure. All already registered servers can be inder the Managed Servers node on the Backup Infrastructure tab.	×
	Microsoft Windows Adds a Microsoft Windows server to the inventory.	
	Linux Adds a Linux server to the inventory.	
		Cancel

Figure 46. Add backup proxy: Step 4

Supply a DNS or IP in Step 5 as shown in Figure 47.

Proxies

New Windows Server	>
Name Specify DNS name of	r IP address of Microsoft Windows server.
Name	DNS name or IP address:
Credentials	10.228.244.127 Description:
Review	Windows Proxy
Apply	
Summary	
	< Previous Next > Finish Cancel

Figure 47. Add backup proxy: Step 5

For credentials, this environment does not use a domain. So, choose **Add** in Step 6 and then supply the local administrator credentials as shown in Figure 48.

New Windows Server	×
Credentials Specify serve	r credentials.
Name	Select an account with local administrator privileges on the server you are adding. Use DOMAIN\USER
Credentials Review Apply Summary	Username: administrator Browse Counts
	Click Ports to customize network ports to be used by individual components. Ports
	< Previous Next > Finish Cancel

Figure 48. Add backup proxy: Steps 6

Veeam will automatically determine the necessary components in Step 7 which then are applied as shown in Figure 49.

New Windows Server	Jew Windows Server			
Review Please review your s	ettings and click Apply to conti	inue.		
Name Credentials Review Apply Summary	Due to these modifications to Component name Transport	the following components will be installed or removed on the target host: Status will be installed g components will be installed on the target host.		
		< Previous Apply Finish Cancel]	

Figure 49. Add backup proxy: Step 6

Veeam outputs the result of the component installation(s) in Step 7 as shown in Figure 50, before providing a summary in Figure 51.

Proxies

New Windows Server		×
Apply Please wait while rec	uired operations are being performed. This may take a few minutes	
Name	Message	Duration
Credentials	Package VeeamGuestAgent_x64.msi has been uploaded	^
Credentials	Package VeeamLogBackupService_x86.msi has been uploaded	
Review	Package VeeamLogBackupService_x64.msi has been uploaded	
Apply	Package VeeamSQLService.msi has been uploaded	
CKKA	📀 Installing package Transport	0:00:09
Summary	Oeleting temporary folder	
	Registering client dsib2117 for package Transport	
	Oiscovering installed packages	
	All required packages have been successfully installed	
	Creating database records for server	
	Oetecting server configuration	
	Creating configuration database records for installed packages	
	Collecting disks and volumes info	0:00:04
	Microsoft Windows server saved successfully	
		¥
	< Previous Next >	Finish Cancel

Figure 50. Add backup proxy: Step 7

New Windows Server		Х
You can copy the con	figuration information below for future reference.	
Name Credentials Review Apply Summary	Summary: Microsoft Windows server '10.228.244.127' was successfully saved. OS version: Microsoft Windows Server 2022 Datacenter Evaluation 64-bit (10.0.20348 build:20348). User: administrator Hardware info: Chassis type: Virtual (VMware) Cores count: 4 Components: Installer using port 6160 Transport using port 6162	
	< Previous Next > Finish Cancel	

Figure 51. Add backup proxy: Summary

6 Adding PowerMax storage in Veeam

The PowerMax Plug-in executes commands through the REST API provided by Unisphere. Adding new PowerMax storage, therefore, involves providing the IP address of Unisphere and storage administrator credentials. The following walks through the wizard.

Note: The terms "volumes" and "devices" will be used interchangeably when discussing storage with Veeam. They both refer to a thin device on the PowerMax array.

Begin by opening up the Veeam Console. Navigate to **Storage Infrastructure** option in the left-hand panel. Then select **Add Storage** on the right-hand side as shown in Figure 52.



Figure 52. Adding PowerMax storage: Step 1

The different Plug-ins are displayed in the next screen as shown in Figure 53. Select Dell Technologies.

Add Select a on the S	Storage vendor of your primary storage system. You can see and manage all already registered storage systems Storage Infrastructure tab.	×
altalta cisco	Cisco HyperFlex Adds Cisco HyperFlex systems (HX-Series).	
Destructions	Dell Technologies Adds Dell PowerScale (formerly Isilon), Dell PowerMax, Dell PowerStore, Dell SC Series or Dell Unity storage array.	
	Hewlett Packard Enterprise Adds HPE Alletra, HPE Primera, HPE Nimble, HPE XP or HPE StoreVirtual storage.	
	IBM Spectrum Virtualize Adds IBM FlashSystem (Storwize), IBM SAN Volume Controller (SVC), and systems based on IBM Spectrum Virtualize software, including IBM/Cisco VersaStack.	
П	NetApp Adds NetApp ONTAP or NetApp Element (SolidFire) storage.	
Lenovo	Lenovo Adds Lenovo Storage V Series and Lenovo ThinkSystem DM Series storage systems.	
-	DataCore	
	Cancel	

Figure 53. Adding PowerMax storage: Step 2

In Step 3 in Figure 54 select **Dell PowerMax**.

(€	Add Dell storage Select your Dell storage model.	×
	Dell	Dell PowerMax Adds Dell PowerMax storage. Fibre Channel (FC) and iSCSI connectivity is supported.	
	DéLL	Dell PowerScale Adds Dell PowerScale (formerly Isilon) storage. NAS backup integration supports SMB and NFS protocols.	
	Déll	Dell PowerStore Adds Dell PowerStore storage. Fibre Channel (FC) and iSCSI connectivity is supported.	
	Déll trindqui	Dell SC Series Adds Dell SC Series storage. Fibre Channel (FC) and iSCSI connectivity is supported.	
	Dét.L.	Dell Unity (VNX) Adds Dell Unity XT/Unity, VNXe, VNX (block), VNX (file) storage. Fibre Channel (FC), iSCSI and NFS connectivity is supported.	
		Cancel	

Figure 54. Adding PowerMax storage: Step 3

In Figure 55, specify the IP or hostname for the Unisphere for PowerMax environment. This contains the REST 10 API that the PowerMax Plug-in will call. The Unisphere environment can either be the embedded installation or an external implementation but must meet the minimum version requirement. Note that the PowerMax Plug-in will discover only local arrays, but not remote ones. Be sure the proper **Role** check box is selected for VMware vSphere.

Note: The PowerMax Plug-in does not prevent the user from adding a secondary Unisphere for PowerMax environment that manages the same local array. Adding a second environment, however, <u>is not</u> recommended.

New Dell PowerMax Storage	×
Name Register Dell PowerM	1ax storage by specifying its DNS name or IP address.
Name	DNS name or IP address:
6 I KI	10.228.246.28
Credentials	Description:
VMware vSphere	Unisphere 10.1
Apply	
Summary	Role: Block or file storage for VMware vSphere Block storage for Microsoft Windows servers
	< Previous Next > Finish Cancel

Figure 55. Adding PowerMax storage: Step 4

Next, add credentials for Unisphere, as shown in Figure 56. The user must have storage administrator privilege. This example uses the default of **smc**.

New Dell PowerMax St	orage X
Technologies Credential Specify acc	s :ount with storage administrator privileges.
Name	Credentials:
Credentials	Credentials X V Add
VMware vSphere Apply Summary	Username: smc Browse Password: ••• Description: smc user OK Cancel
	< Previous Next > Finish Cancel

Figure 56. Adding PowerMax storage: Steps 5

At this point, with the addition of the credentials, Veeam will save the storage in the database. This means that even if **cancel** is chosen here, the Unisphere instance will be added with the default settings for the remainder of the screens. It can be edited to make changes, however.

New Dell PowerMax Storage			\times
Credentials Technologies Specify account with	n storage administrator privileges.		
Name Credentials VMware vSphere	Credentials: R smc (smc user, last edited: 7 days ago) Port: 8443	✓ Manage accounts	Add
Apply Summary	Please wait Saving storage to configuration		
	< Previous Next	> Finish	Cancel

Figure 57. Saving PowerMax configuration - Step 6

In Step 7 in Figure 58, change the options as needed for the chosen environment. Generally, the only necessary change here is which protocol to use. The PowerMax Plug-in supports both Fibre Channel and iSCSI. Both can be used, though most customers will only use one protocol. If an export host has a masking view for Fibre Channel and iSCSI, and both boxes are checked, there is no way to control which masking view Veeam will use. Note that NFS is grayed-out.

New Dell PowerMax Storage					
VMware vSphere Specify how this storage can be accessed by VMware vSphere backup jobs.					
Name Credentials VMware vSphere	Protocol to use: Fibre Channel (FC) Signal				
Apply	Volumes to scan: All volumes Boolumes B	Choose			
Summary	Automatic selection Mount server:	Choose			
	dsib2117 (Backup server) ✓	Add New			
	< Previous Apply Finish	Cancel			

Figure 58. Adding PowerMax Storage: Step 7

By default, the PowerMax Plug-in discovers all devices on all local arrays. If that is desired, no further action is required; simply select **Apply** or **Finish**. Veeam will do an initial discovery of all the devices on the array as shown in Figure 59Figure 60, whether or not they are currently host-accessible, regardless of the protocol(s) chosen and regardless of whether they're associated with a snapshot or not. Devices are displayed in the format **<array_id>:<device_id>:<identifier>**. In addition, if a snapshot exists and a viable backup proxy host is configured as shown in Figure 58, Veeam will attempt to mount the snapshot (with a temporary snapshot target device) and record the VMs if any exist. In Figure 60Figure 59, the red box highlights that Veeam discovered a viable backup proxy and will be able to mount devices. Note both the successes and failures in the log messages.



Figure 59. Veeam array discovery - Complete

Note: Veeam will not discover virtual volumes (vVols) because they are not supported and cannot be manipulated by the REST API.

3 Storage Tools	
∃ ▼ Home Storage	
Add Edit Remove Storage Storage Manage Storage	
Storage Infrastructure	
Ge Storage Infrastructure	^
Dell PowerMax	
▲ IIIII 10.228.246.28	
Image: bit is a constrained of the second	1
000120001473:00101	1
Image: 000120001473:00102	2
000120001473:00103	}
000120001473:00104	ł –
Ø 000120001473:00105	j
000120001473:00106	j
Ø 000120001473:00107	1
000120001473:00108	3
000120001473:0010E	
▷ ☐ 000120001473:0010F	×
Thome Home	
Inventory	
Backup Infrastructure	
Storage Infrastructure	
	🍘 🗗 🚮 🗟 👻

Figure 60. Storage discovery

6.1 Connection options

6.1.1 Edit storage

If a change to the protocol in use, Fibre Channel or iSCSI, is required, navigate to **Storage Infrastructure** and expand the **Dell PowerMax** icon to reveal registered Unisphere for PowerMax environments. Right-click on an instance and select **Edit storage...**



Figure 61. Edit storage to add protocol: Step 1

Click on the **VMware vSphere** selection on the left-hand side. In Step 2, the box for iSCSI is not checked. Check the box and select **Apply** as shown in Figure 62.

Edit Dell PowerMax Storage				
VMware vSphere Specify how this stor	age can be accessed by VMware vSphere backup jobs.			
Name Credentials VMware vSphere	Protocol to use: Fibre Channel (FC) iSCSI iSCSI NFS Volumes to scan:			
Apply	All volumes	Choose		
Summary	Backup proxies to use:			
	Automatic selection	Choose		
	Mount server:			
	dsib2117 (Backup server) 🗸	Add New		
	< Previous Apply Finish	Cancel		

Figure 62. Add iSCSI protocol: Step 2

New changes are saved. Click Finish in Figure 63 to complete with a new storage discovery.

Edit Dell PowerMax Storage		>	
Please wait while r	required operations are being performed. This may take a few minutes		
Name	Message	Duration	
Condentials	Starting infrastructure item update process	0:00:02	
Credentials	Oiscovering installed packages		
VMware vSphere	Registering client dsib2117 for package Transport		
	Registering client dsib2117 for package Mount Server		
Apply	O Discovering installed packages		
	All required packages have been successfully installed		
Summary	Otecting server configuration		
	Creating configuration database records for installed packages		
	Creating database records for storage		
	< Previous Next >	Finish Cancel	

Figure 63. Add iSCSI protocol: Finish

6.1.2 Backup proxy

Once a backup proxy is set up, if it will be the sole proxy used with PowerMax or a particular Unisphere instance, it is a best practice to update the PowerMax Plug-in to use it. To do this, navigate to **Storage Infrastructure** and expand the Unisphere instance. Right-click on the instance and select **Edit storage...** as shown in Figure 64.

回れ	Storage Tools
∃ • Home	Storage
Add Edit Storage Storage Manage Sto	Remove Storage rage Actions
Storage Infrastr	ucture
 Storage In Multi Dell Por Multi Dell 10. 	nfrastructure owerMax 228.246.
	0001200
	0001200 🧐 Rescan storage
	000120001473:00103
	000120001473:00104
	000120001473:00106
	000120001473:00107
	000120001473:00108
	000120001473:00109 000120001473:0010A

Figure 64. Update backup proxy for PowerMax: Step 1

In Step 2 select **VMware** vSphere in the left-hand menu. Next click **Choose** next to **Backup proxies to use** and select the backup proxy desired. In this example, **dsib0127.drm.lab.emc.com** is chosen as it will be used in the next section with disk backups. Then select **finish** as shown in Figure 65.

Edit Dell Power	/lax Storage					×
Technologies	ware vSphere tify how this storage o	can be accessed by VMware vSphe	re backup jobs.			
Name Credentials VMware vSpher Apply Summary	re Pr Vo R Ba 11 M d	otocol to use:] Fibre Channel (FC)] ISCSI] NFS plumes to scan: escan all volumes except selected ackup proxies to use: 0.228.244.127 jount server: sib2117 (Backup server)				Choose Choose Add New
	Backup Proxy Choose backup prosent select at least two pro- performed on per- load. ○ Automatic select The job will autor available backup ④ Use the selected The job will autor following list of Name ○ 10.228.244.1 ○ VMware Bac	oxy servers for this job. For redund proxies. When multiple proxies are VM basis, taking into account pro: ction omatically select the most suitable p proxy servers. d backup proxy servers only omatically select the most suitable proxy servers. 27 ckup Proxy	lancy, we recom e available, selec xy connectivity e backup proxy s e backup proxy s	× mend to tion will be and current server from all server from the Select All Clear All Cancel	Finish	Cancel

Figure 65. Update backup proxy for PowerMax: Steps 2

Veeam will then run a rescan on all the devices as shown in Figure 66. Note that if a snapshot cannot be exported to the backup proxy (**dsib0127.drm.lab.emc.com**), it will show a white 'x in a red box, while a success will show a white check mark in a green box.



Figure 66. Update backup proxy for PowerMax: Scan

6.2 Filtering PowerMax arrays and/or volumes from Veeam

If there are multiple local arrays in the Unisphere environment but not all are necessary or required, it is possible to limit the arrays and/or specific volumes. There are two different ways to achieve this: Through the Veeam GUI or the PowerMax Plug-in.

6.2.1 Veeam GUI

It is possible to change what arrays or volumes Veeam can use for backup and restore, either during the initial addition of the storage or by editing the existing storage. In this example, the filtering will be done during the addition of the array. In Figure 58 from the section on Adding PowerMax storage in Veeam, there is a **Choose...** button next to **Volumes to scan:** Select this in Step 1. The screen is repeated in Figure 67.

Edit Dell PowerMax Storage		×
VMware vSphere Specify how this store	age can be accessed by VMware vSphere backup jobs.	
Name Credentials VMware vSphere	Protocol to use: Fibre Channel (FC) isCSI NFS	
Apply	All volumes	Ch <u>o</u> ose
Summary	Backup proxies to use: Automatic selection Mount server:	<u>C</u> hoose
	dsib2117 (Backup server)	<u>A</u> dd New
	< <u>P</u> revious App <u>ly</u> <u>F</u> inish	Cancel

Figure 67. Filter arrays/volumes: Step 1

In the screen that pops-up, options are available for volume inclusion or exclusion. This example will demonstrate excluding volumes, but the process is exactly the same for including volumes as well. In Figure 68 change the radio button to **All volumes except**: and then select **Add...**. Then, two options are presented: **From infrastructure...** or **By wildcard...**. Begin by selecting the infrastructure option.

Edit Volu	mes		×	
Select st Limiting	orage volumes to analyze for th the number of volumes reduce	ne presence of newly a es the storage load.	dded VMs.	
O All vo All V infra	olumes MFS and NFS volumes found d structure rescan will be analyze	uring the periodic stor d.	age	
All vo	olumes except: me		Add	
_			From infr	astructure
	the following volumes:			
Nar	me		Add	
			Remove	
		ОК	Cancel	

Figure 68. Volumes for inclusion/exclusion: Step 2

In Step 3, expand the Unisphere for PowerMax server and select the devices for exclusion. In this example, device 01 is selected. Select **OK** to return to the **Edit Volumes** screen.

Select Volumes	×	Edit Volumes	×
Volumes: Volumes: 000120001473:00001 000120001473:00101 000120001473:00102 000120001473:00103 000120001473:00104 000120001473:00104	 (2) (2) 	Select storage volumes to analyze for the presence of new Limiting the number of volumes reduces the storage load All volumes All VMFS and NFS volumes found during the periodic infrastructure rescan will be analyzed. All volumes except: Name	ily added VMs. storage
000120001473:00105 000120001473:00106 000120001473:00107 000120001473:00108 000120001473:00108 000120001473:0010A 000120001473:0010B		000120001473:00001 Only the following volumes:	Remove
000120001473:0010C 000120001473:0010D 000120001473:0010E 000120001473:0010F 000120001473:00110	~	Name	Add Remove
Type in an object name to search for	Cancel	ОК	Cancel

Figure 69. Volumes for inclusion/exclusion: Steps 3

Now select **Add...** once again but choose the wildcard option instead. In the pop-up box, enter in the wildcard string to match for exclusion as shown in Figure 70. Note the entire array 000120001473 is excluded from the search.

	Edit	Volumes	×
	Sele Lim	ect storage volumes to analyze for the presence of new iting the number of volumes reduces the storage load All volumes All VMFS and NFS volumes found during the periodic infrastructure rescan will be analyzed. All volumes except:	vly added VMs. I. storage
Add Volume Name X		Name	Add
Volume name to match: 000120001473* Use * to represent any number of letters, and ? for a single letter. OK Cancel	0	000120001473:00001 000120001473*	Remove
		Name	Add
			Remove
		ОК	Cancel

Figure 70. Volumes for inclusion/exclusion: Steps 4-5

This process may be repeated for any additional volumes or arrays. It is not possible to both exclude and include volumes or arrays. Only one option may be used.

6.2.2 PowerMax Plug-in option

In addition to the exclusion/inclusion in Veeam, the PowerMax Plug-in itself can remove an entire array from Unisphere. This works in a similar manner to an option in Dell Solutions Enabler. The PowerMax Plug-in uses a file called **symavoid.txt** which is stored in the PowerMax Plug-in directory (e.g., ...,**Plugins\Storage\Dell PowerMax**) on the Veeam server. This text file should have a one-line entry for each array the user wants to remove. In Figure 71, there are two PowerMax arrays listed, so both will be left out of discovery. Unlike in Veeam filtering, individual devices cannot be filtered.

<u> </u>	symavo	oid.txt - No	otepad							-	-		×
File	Edit	Format	View	Help									
000	19760	0358											^
000	19760	0855											
													~
						Wir	ndows (CRLF)	Ln 13, C	ol 1	100	%	

Figure 71. symavoid.txt file

6.2.2.1 Differences

The following are differences between the two filtering options.

The Veeam GUI offers the ability to completely remove arrays and devices from any use by the application, but filtering is performed <u>after</u> the REST API calls are made. The symavoid.txt file has the benefit of filtering <u>before</u> the REST API calls are made but does not offer the specificity of excluding or including individual volumes.

6.2.2.2 Recommendations

It is best to use the filtering features as they're designed. Therefore, if the entire local array must be excluded, use the symavoid.txt file. Otherwise, the Veeam GUI is the most efficient.

SRDF/Metro is a specific use case that has particular handling. Please see the section SRDF/Metro with Veeam GUI filtering or symavoid.txt.

6.3 PowerMax storage volumes

As mentioned above, Veeam displays PowerMax volumes in the following format: <array_id>:<device_id>:<identifier>. In Figure 72, volumes from array 000120001473 are listed. In a red box is one of those volumes, which has a volume identifier assigned (veeam_tag).

記 Storage Tools					
E → Home Storage					
Add Edit Remove Storage Storage Actions					
Storage Infrastructure					
Generation Storage Infrastructure Dell PowerMax					
▲ IIIII 10.228.246.28					
000120001473:00001					
000120001473:00101:veeam_tag					
000120001473:00102					
000120001473:00103					
000120001473:00104					
000120001473:00105					
Ø 000120001473:00106					
000120001473:00107					

Figure 72. Veeam storage format display

To see the field where Veeam pulls this information, open Unisphere for PowerMax and navigate to the **volumes** screen under **storage**. In Figure 73, note the highlighted volume matches the one in Figure 72. The field that stores "veeam_tag" is called **volume identifier** and can be assigned to any device.

D&LL	EMC Unisphere f	for PowerMax	> 000120001473	•			(j) C	Q 🛱	Ţ,
â	Volumes								
88	Create Expand	i :			107 Items 🝸 🤅	00101			
	Name	Туре	Allocated %	Capacity (GB)	=	Masking Info		24	
Ŧ	00001	TDEV	0%	0.01		Storage Groups			
~	00101:veeam_tag	TDEV	0%	0.01		SRP		I	
V	00102	TDEV	0%	0.01		EBA Front End Path		>	
\odot	00103	TDEV	0%	0.01		RDF Info		-	
	00104	TDEV	0%	0.01		Volume Name		0101:000	am tag
E	00105	TDEV	0%	0.01				0101.veea	am_tay
5=	00106	TDEV	0%	0.01		Physical Name		_	
	00107	TDEV	0%	0.01		Volume Identifier		/eeam_tag	

Figure 73. PowerMax volume format in Unisphere for PowerMax

6.3.1 Assign a volume identifier

To set a volume identifier on a volume, left-click on the three dots next to the garbage can (not displayed in Figure 74). Select **Set Volumes** and then **Identifier**. Then add a new identifier name and click **Run Now**. This name will now appear in Veeam and can be used as a tag to help Veeam users (e.g., a VM administrator) choose the correct device to snapshot if, for example, it's not otherwise identified by a VMFS.

D&L	D≪LLEMC Unisphere for PowerMax > 000120001473 -						
â	Volumes						
88	Create Expand						
	Name	Create SG	1%		Set Volum		
Ŧ	00001			%	Volume Identifier Name Veeam_Identifier_Te	est	
-	00101:veeam_tag	Set Volumes	Emulation	%			
V	00102	Replication •	Attribute	%	Volume HP Identifie	er Name	
\odot	00103	1		%			
a	00104	Allocate/Free/Reclaim 🕨	Identifier	%	Volume VMS Identi	fier Name	
E	00105	Configuration	Mobility ID	%			
3-	00106	1		%			
	00107	TDEV	Status	%	?	Cancel Run Now 🗸	
	00108	TDEV		0%			

Figure 74. Setting volume identifier in Unisphere

Once set, right-click on the volume in Veeam and choose **Rescan volume**. The new identifier will appear as shown in Figure 75.

비 민고	Volume Tools			
∃ • Home	Volume			
Create Delete Snapshot Snapsh Manage Volume	Rescan ot Actions			
Storage Infrastru	icture			∐ → Type in an object
 Storage In 	frastructure		^	Name 🕇
Dell Po	werMax			
▲ IIIII 10.2	228.246.28			
	00120001473:00001			
	00120001473:00101:vee	am_tag		
	00120001473:00102:Vee	eam_Identifier_Test	3	
	00120001473:00103		1011	reate snapshot
	00120001473:00104		R	escan volume
	00120001473:00105			
▶ A (00120001473:00106			
	00120001473:00107			

Figure 75. Volume identifier in Veeam

6.3.2 Storage detail

In the storage detail, view right-hand panel shown in Figure 76. Veeam will list all existing snapshots for the array devices. Unless filtering was employed, Veeam will list all array devices. However, Veeam does not make any attempt to validate whether devices are in use by any registered VMware vCenter before displaying, nor will it filter snapshots based on their use in Veeam. Veeam permits the use of existing snapshots, regardless of whether or not they were initiated from within Veeam or through another UI or CLI.

원회 Storage Tools 로 Home Storage			Veeam Ba	ckup and Replication	i.
Add Edit Remove Storage Storage Manage Storage Actions					
Storage Infrastructure		Type in an object name	e to search for		Q
 Storage Infrastructure Dell PowerMax IIIII 10.228.246.28 	î	Name ↓ 000120001672:00141 000120001672:00140	Reported Size 150 GB 150 GB	Snapshots Count 0 0	Last Snapshot <no snapshots=""> <no snapshots=""></no></no>
Image: Constraint of the system of the sy	~	000120001672:0013F 000120001672:0013E 000120001672:0013D 000120001672:0013C 000120001672:0013A 000120001672:0013A 000120001672:0013A 000120001672:0013B 000120001672:0013B 000120001672:0013B 000120001672:0013B 000120001672:0013B 000120001672:0013A 000120001672:0013B 000120001672:0013A 000120001672:0013B 000120001672:0013B 000120001672:0013B 000120001672:0013B 000120001672:0013B	400 GB 15 GB 10 GB 20 GB 30 GB 6 MB 6 MB 6 MB 6 MB 6 MB 100 GB 16 TB 16 TB		<no snapshots=""> <no snapshots=""></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no></no>
Home Inventory Backup Infrastructure Storage Infrastructure		000120001672:0012E 000120001672:0012D 000120001672:0012C 000120001672:0012B 000120001672:0012A 000120001672:0012A 000120001672:0012B 000120001672:0012A 000120001672:0012B 000120001672:0012A 000120001672:0012B 000120001672:0012B 000120001672:0012B	16 TB 16 TB 16 TB 16 TB 16 TB 6 MB 6 MB 6 MB	0 0 0 0 0 0 0	<no snapshots=""> <no snapshots=""> <no snapshots=""> <no snapshots=""> <no snapshots=""> <no snapshots=""> <no snapshots=""> <no snapshots=""> <no snapshots=""></no></no></no></no></no></no></no></no></no>
- 6 D M G	»	000120001672:00126 000120001672:00125	600 GB 1 TB	0	<no snapshots=""> <no snapshots=""></no></no>

Figure 76. Veeam storage volume detail

To view the snapshot detail as shown in Figure 77, select the arrow next to one of the volumes in the lefthand panel. In this example, the snapshots are actually system-generated by a snapshot policy in Unisphere.

원과 Storage Tools ■ Home Storage		Veeam Ba	ckup and Replication	
Add Edit Remove Storage Storage Manage Storage Actions				
Storage Infrastructure	∐ ▼ Type in an object nan	ne to search for		Q
 ▷ □ 000120001473:0012F ▷ □ 000120001473:00130 ▷ □ 000120001473:00131 	Name ↓ 000120001473:00136 000120001473:00135	Reported Size 4 TB 4 TB	Snapshots Count 0 0	Last Snapshot <no snapshots=""> <no snapshots=""></no></no>
 ▷	000120001473:00134	16 TB 16 TB	14	6/13/2024 5:12 PM 6/13/2024 5:12 PM
▲	000120001473:00132	16 TB 16 TB	14 16	6/13/2024 5:12 PM 6/13/2024 5:12 PM
်မှာ DailyDefault (00:12:15 Thu, 13 Jun 2024 +0000) မြာ DailyDefault (00:12:19 Wed, 12 Jun 2024 +0000)	000120001473:00130 000120001473:0012F	16 TB 16 TB	14 14	6/13/2024 5:12 PM 6/13/2024 5:12 PM
[\$; bailyDefault (00:12:14 Tue, 11 Jun 2024 +0000) [\$; bailyDefault (00:12:18 Mon, 10 Jun 2024 +0000)	000120001473:0012E	16 TB 16 TB	14 14	6/13/2024 5:12 PM 6/13/2024 5:12 PM
[0] DailyDefault (00:12:22 Sun, 09 Jun 2024 +0000) [0] DailyDefault (00:12:16 Sat, 08 Jun 2024 +0000)	000120001473:0012C	2 TB 2 TB	0	<no snapshots=""> <no snapshots=""></no></no>
[] DailyDefault (00:12:16 Fri, 07 Jun 2024 +0000) [] DailyDefault (00:12:19 Thu, 06 Jun 2024 +0000)	000120001473:0012A	6 TB 3 TB	0 2	<no snapshots=""> 6/7/2024 7:18 AM</no>
[] DailyDefault (00:12:14 Wed, 05 Jun 2024 +0000) [] DailyDefault (00:12:18 Tue, 04 Jun 2024 +0000)	000120001473:00128	3 TB	0	<no snapshots=""></no>
DailyDefault (00:12:23 Mon, 03 Jun 2024 +0000) DailyDefault (00:12:17 Sup. 02 Jun 2024 +0000)	000120001473:00126	100 GB	0	<no snapshots=""></no>
[♣] DailyDefault (00:12:17 Sdi, 02 Jdi 2024 +0000) [♣] DailyDefault (00:12:22 Sat, 01 Jun 2024 +0000) ▷ ☐ 000120001473:00135	000120001473:00123 000120001473:00124	50 GB 50 GB 6 MB	0	<no snapshots=""> <no snapshots=""> <no snapshots=""></no></no></no>
	000120001473:00122	100 GB 100 GB	0 0	<no snapshots=""> <no snapshots=""></no></no>
Home	000120001473:00120 000120001473:0011F	10 GB 150 GB	0	<no snapshots=""> <no snapshots=""></no></no>
Backup Infrastructure	000120001473:0011E	10 GB 100 GB	0	<no snapshots=""> <no snapshots=""></no></no>
Storage Infrastructure	000120001473:0011C	100 GB 4 TB	0 14	<no snapshots=""> 6/13/2024 5:12 PM</no>
💼 🗗 🛍 🖡 🎽	000120001473:0011A	4 TB	14	6/13/2024 5:12 PM 6/13/2024 5:12 PM

Figure 77. Snapshot detail in Veeam

6.3.3 Manual snapshots

From the Veeam console, the user can execute crash-consistent manual snapshots. These snapshots, if executed on devices with VMFS, are then available for recovery with Veeam. Like Solutions Enabler, Veeam has the advantage of being able to take snapshots of individual devices, which is not available within Unisphere for PowerMax.

To take a snapshot, highlight the desired device and right-click. Select **Create snapshot...** in Step1 in Figure 78.

	Volume Tools		
≣ + Home	Volume		
Create Delete Snapshot Snapsho	Rescan		
Manage Volume	Actions		
Storage Infrastru	cture		∐ - Type in an
4 😭 Storage Inf	rastructure	^	Name 🕇
▲ Dell Pov	verMax		
▲ IIIII 10.22	28.246.28		
▷ 🖯 00	00120001473:00001		
▶ 🖯 00	00120001473:00101:veeam_tag	Create snap	shot
▷ 🖯 00	00120001473:00102:Veeam_Identif	Rescan volu	me
▷ 🖯 00	00120001473:00103	nescan volu	
▷ 🖯 00	00120001473:00104		
	00120001473:00105		

Figure 78. Creating a manual snapshot: Step 1

In Step 2, Figure 79 type in a **snapshot name**. The **snapshot description** is optional because PowerMax will not store the information. However, Veeam will keep this information in the history which is available as shown in Figure 82.

New Storage Snapshot		×
<u>V</u> olume name:	000120001473:00101:veeam_tag	
<u>S</u> napshot name:	Veeam_Test_Snapshot	
Snapshot description:	Veeam_Test	
	<u>O</u> K <u>C</u> ancel	

Figure 79. Creating a manual snapshot: Step 2

Note that there cannot be spaces in the snapshot name, or the following error will be generated, as shown in Figure 80.



Figure 80. Snapshot naming error

Step 3, Figure 81 is the result of the creation. The snapshot job succeeded and is listed in the left-hand panel as "Veeam_Test_Snapshot". Note that in this example, the device is not used in the VMware environment, however the user can still take a snapshot of it.

Storage snapsh	ot			>
Name: Action type: Initiated by:	Create storage snapshot Storage Snapshot Creation DSIB2117\Administrator	Status: Start time: End time:		
Message Sending i Storage s LUN 0001 LUN 0001 Failed to Volume 0 Storage s	request to create storage snapshot Veeam_Test_Snapshot napshot created successfully, and will now be scanned 120001473:00101:veeam_tag configuration refresh comp 120001473:00101 from volume 000120001473:00101:veea obtain list of VMs on LUN Veeam_Test_Snapshot (19:40: 100120001473:00101:veeam_tag rescan completed napshot is ready for restore operations ned at 6/14/2024 12:41:06 PM	ot for content leted success m_tag is not 15 Fri, 14 Jun	sfully a VMFS LUN, or the corresponding 2024 +0000) from snapshot Veeam	Duration 0:00:02 0:00:04 0:00:07
L				Close

Figure 81. Creating a manual snapshot: Step 3

In order to see the description that's provided in Figure 79 when the snapshot was taken, navigate to the **history** screen. Under **jobs > storage snapshots**, find the **create storage snapshot** job name. Because a manual snapshot is not executed through the job wizard, there is no unique job name. Each manual snapshot is listed as a **create storage** snapshot. Right-click on the job and select **statistics**. Under the **Parameters** tab are the details of the snapshot creation, including the highlighted description.

記 Session Tools	Veeam Backup and Replication
∃- Home View Session	
Stop Statistics Report	
Actions Decans	
History	C Type in an object name to search for
4 Das Jobs	Job Name
Backup	Create storage snapshot
C Storage Snapshots	Storage spanshot
A Restore	III Statistics
D∰ Instant Recovery D∰ System D∰ Malware Detection	Name: Create storage snapshot Status: Success Action type: Storage Snapshot Creation Start time: 6/14/2024 12:40:47 PM Initiated by: DSIB2117\Administrator End time: 6/14/2024 12:41:06 PM Parameters Log V Snapshot Description Veeam Test Snapshot name Veeam_Test_Snapshot Volume Storage 10.228.246.28
	Volume name 000120001473:00101:veeam_tag
A Home	
Inventory	Close
Backup Infrastructure	
Storage Infrastructure	
	💼 🗗 ᡝ 🚾 💐 🗸

Figure 82. Snapshot history

6.4 Snapshot deletion

In addition to taking snapshots, it is possible to delete snapshots in Veeam.

Note: Since Veeam displays all snapshots for all devices, whether or not they are in use by VMware or Veeam, it is entirely possible to delete a snapshot on a device that is used elsewhere in a customer environment. Users should therefore take care before manually removing snapshots.

For this example, navigate to **Storage Infrastructure** and locate the device that contains the snapshot the user wishes to delete. Expand the device and highlight the snapshot. Right-click and select **Delete snapshot...**, to confirm the selection. Steps 1 is displayed in Figure 83.



Figure 83. Manual snapshot deletion: Step 1

Veeam will display the log file as the snapshot is deleted. The process shown in Figure 84 takes seconds.

torage snapshot Maria Ma			Please wait		
Name: Delete storage snapshot Status: Success Action type: Storage Snapshot Removal Start time: $6/14/2024$ 12:48:43 PM Initiated by: DSIB2117\Administrator End time: $6/14/2024$ 12:48:49 PM Parameters Log Message Duration © Preparing to delete snapshots 0:00:02 © Storage snapshot Veeam_Test_Snapshot (19:40:15 Fri, 14 Jun 2024 +0000) has been 0:00:02 © Finished processing for all snapshots 0:00:02 © Job finished at 6/14/2024 12:48:49 PM 0:00:02		Removing sn	napshot		
Name: Delete storage snapshot Removal Status: Success Action type: Storage Snapshot Removal Start time: 6/14/2024 12:48:43 PM initiated by: DSIB2117\Administrator End time: 6/14/2024 12:48:49 PM Parameters Log Message Oreparing to delete snapshots Storage snapshot Veeam_Test_Snapshot (19:40:15 Fri, 14 Jun 2024 +0000) has been 0:00:02 Finished processing for all snapshots Job finished at 6/14/2024 12:48:49 PM	snapsho	,t			
Action type: Storage Snapshot Removal Start time: 6/14/2024 12:48:43 PM nitiated by: DSIB2117\Administrator End time: 6/14/2024 12:48:49 PM Parameters Log Message Duration © Preparing to delete snapshots © Storage snapshot Veeam_Test_Snapshot (19:40:15 Fri, 14 Jun 2024 +0000) has been 0:00:02 © Finished processing for all snapshots © Job finished at 6/14/2024 12:48:49 PM	5	Delete storage snapshot	Status:	Success	
nitiated by: DSIB2117\Administrator End time: 6/14/2024 12:48:49 PM Parameters Log Message Duration OPreparing to delete snapshots Storage snapshot Veeam_Test_Snapshot (19:40:15 Fri, 14 Jun 2024 +0000) has been O:00:02 Finished processing for all snapshots Job finished at 6/14/2024 12:48:49 PM	n type:	Storage Snapshot Removal	Start time:	6/14/2024 12:48:43 PM	M
Parameters Log Message Duration O Preparing to delete snapshots 0:00:02 Storage snapshot Veeam_Test_Snapshot (19:40:15 Fri, 14 Jun 2024 +0000) has been 0:00:02 Finished processing for all snapshots 0:00:02 Job finished at 6/14/2024 12:48:49 PM 0 Image: Comparison of the storage snapshot st	ed by:	DSIB2117\Administrator	End time:	6/14/2024 12:48:49 PM	N
Message Duration Image: Preparing to delete snapshots 0:00:02 Image: Storage snapshot Veeam_Test_Snapshot (19:40:15 Fri, 14 Jun 2024 +0000) has been 0:00:02 Image: Finished processing for all snapshots 0:00:02 Image: Job finished at 6/14/2024 12:48:49 PM 0	neters L	og			
 Preparing to delete snapshots Storage snapshot Veeam_Test_Snapshot (19:40:15 Fri, 14 Jun 2024 +0000) has been Prinished processing for all snapshots Job finished at 6/14/2024 12:48:49 PM 	sage				Duration
 Storage snapshot Veeam_Test_Snapshot (19:40:15 Fri, 14 Jun 2024 +0000) has been O:00:02 Finished processing for all snapshots Job finished at 6/14/2024 12:48:49 PM 	reparing	to delete snapshots			
Finished processing for all snapshots Job finished at 6/14/2024 12:48:49 PM	torage sn	apshot Veeam_Test_Snapshot	t (19:40:15 Fri, 14 Jun 20	024 +0000) has been	0:00:02
♥ Job finished at 6/14/2024 12:48:49 PM	nished p	rocessing for all snapshots			
	b finishe	ed at 6/14/2024 12:48:49 PM			
Close					Close

Figure 84. Manual snapshot deletion: Step 2

6.4.1 Linked snapshots

If a snapshot is currently linked to any target devices, deletion will fail. It is not possible to force an unlink first. In the following example, an attempt is made to delete one of the snapshots for device 50 on array 000197600450. The task then fails as shown in Figure 85, with Veeam passing along the error message that the snapshot has a linked target, even providing the linked target device (170).

Action type: Storage Snapshot Removal Start time: 5/20/2021 3:31:27 PM Initiated by: DSIB2012\Administrator End time: 5/20/2021 3:31:30 PM Parameters Log Message Duration © Preparing to delete snapshot 4 Using unsigned plugin for storage dsib2017.lss.emc.com © Finished processing for all snapshots Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: © Finished processing for all snapshots Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: © Finished processing for all snapshots Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error:	Vame:	Delete storage snapshot	Status: Failed	
Initiated by: DSIB2012\Administrator End time: 5/20/2021 3:31:30 PM Parameters Log Message Duration Message Duration Preparing to delete snapshot S Failed to remove storage dsib2017.lss.emc.com Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: The snapshot 000197600450:00050:SRA-SVX-05540_20210316175933:1615917533 cannot be deleted until the following linked target LUNs are unlinked: [000197600450:00170]	Action type:	Storage Snapshot Removal	Start time: 5/20/2021 3:31:27 PM	
Parameters Log Message Duration	Initiated by:	DSIB2012\Administrator	End time: 5/20/2021 3:31:30 PM	
Message Duration Preparing to delete snapshot Duration Duration Dising unsigned plugin for storage dsib2017.lss.emc.com S Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: S Finished processing for all snapshots Failed to remove storage snapshot 000197600450:00050:SRA-SVX- 2021 5:58:58 PM) Error: The snapshot 000197600450:00050:SRA-SVX- SVX- 05540_20210316175933:1615917538 cannot be deleted until the following linked target LUNs are unlinked: [000197600450:00170]	Parameters	Log		
Preparing to delete snapshot Image: Constraint of the storage disb2017.lss.emc.com Image: Constraint of the storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Image: Constraint of the storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Image: Constraint of the storage snapshot snapsho	Message			Duration
Using unsigned plugin for storage dsib2017.lss.emc.com S Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Finished processing for all snapshots Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: The snapshot 000197600450:00050:SRA-SVX-05540_20210316175933:1615917538 cannot be deleted until the following linked target LUNs are unlinked: [000197600450:00170]	🕑 Preparin	g to delete snapshot		
 Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: Finished processing for all snapshots Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Error: The snapshot 000197600450:00050:SRA-SVX-05540_20210316175933:1615917538 cannot be deleted until the following linked target LUNs are unlinked: [000197600450:00170] 	🛕 Using ur	nsigned plugin for storage dsi	b2017.lss.emc.com	
♥ Finished processing for all snapshots Failed to remove storage snapshot SRA-SVX-05540_20210316175933 (3/16/ 2021 5:58:58 PM) Error: The snapshot 000197600450:00050:SRA-SVX- 05540_20210316175933:1615917538 cannot be deleted until the following linked target LUNs are unlinked: [000197600450:00170]	😳 Failed to	remove storage snapshot SR	A-SVX-05540_20210316175933 (3/16/2021 5:58:58 PM) Erro	or:
	V Finished	processing for all snapshots	Failed to remove storage snapshot SRA-SVX-05540_202 2021 5:58:58 PM) Error: The snapshot 000197600450:000 05540_20210316175933:1615917538 cannot be deleted u linked target LUNs are unlinked: [000197600450:00170]	10316175933 (3/16/ 50:SRA-SVX- intil the following

Figure 85. Snapshot deletion failure

The link can be confirmed either in Unisphere for PowerMax or with Solutions Enabler. Shown in Figure 86 is the Solutions Enabler output where the linked target for the snapshot in question is shown for device 50. Notice that there are actually two linked targets for device 50, but only one is for the snapshot that is being deleted.





7 Backup

Veeam and the PowerMax Plug-in support both Fibre Channel and iSCSI protocols. When taking a backup that uses the snapshot process with the PowerMax Plug-in, there is no difference between Fibre Channel and iSCSI. REST API calls are made to Unisphere over TCP/IP and the backup process appears the same in Veeam for either Fibre Channel or iSCSI so it is unnecessary to show both. This example uses Fibre Channel. As restore presents new devices over a particular protocol, both Fibre Channel and iSCSI will be included.

Note: All snapshots taken with the PowerMax Plug-in are crash consistent. Note, however, that if a VM has vmdks on more than one datastore, the PowerMax Plug-in will take separate snapshots of each device backing the datastores so consistency is not maintained across the entire VM. To guarantee that type of consistency, VM quiescing should be utilized. Veeam also integrates with applications like Oracle to ensure database consistency. Application consistency is covered in the section Application consistency.

7.1 VMFS with FC/iSCSI

Note: Within Veeam, there are many navigation paths one can use to execute the same task. For example, backing up a VM can be done from the backup infrastructure tab, the inventory tab, the home tab or from the menu bar at the top of the console. All paths are valid, but this document will only show one of the paths when explaining functionality. This is because any subsequent walkthrough wizards will always be the same.

From the banner menu, select **Backup Job -> Virtual machine...** as shown in Figure 87 to complete Step 1.



Figure 87. Backing up a VM: Step 1

In Step 2 provide a name for the backup job and a description if desired as shown in Figure 88. The backup name is not only used to reference the job in Veeam but is also the name of the Windows folder where the log files are stored on the host or VM where Veeam is installed.

New Backup Job	×
Name Type in a name and	description for this backup job.
Name	Na <u>m</u> e:
Victory Markings	Backup_veeam_fc_vm
virtual Machines	Description:
Storage	Backup a VM attached through Fibre Channel
Guest Processing	
Schedule	
Summary	
	☐ <u>High</u> priority
	Backup infrastructure resources are offered to high priority jobs first. Use this option for jobs sensitive to the start time, or jobs with strict RPO requirements.
	< Previous Next > Einish Cancel

Figure 88. Backing up a VM: Step 2

Like in Figure 89, use the **Add...** button in Step 3 to search for and add the VMs one wants to back up. If multiple VMs are selected that span more than one datastore, whether on the same array or different arrays, the PowerMax Plug-in will take separate snapshots of each device. In other words, placing multiple VMs in the same backup job does not guarantee consistency across devices since more than one snapshot is taken.

New Backup Job				×			
Virtual Machines							
Select virtual machines to process via container, or granularly. Container provides dynamic selection that automatically changes as you add new VMs into the container.							
Name	Virtual machines to backup:						
Virtual Machinar	Name	Туре	Size	<u>A</u> dd			
Sterror				Remove			
Guat Deservice				Exclusions			
Schedule							
Schedule				↑ <u>U</u> p			
Summary							
				Re <u>c</u> alculate			
				Total size:			
				08			
		< <u>P</u> revious	<u>N</u> ext >	inish Cancel			
	Add Objects		×				
	Select objects:	eo 📑 🖶	= 🔗 🌮				
	dsib1232	2.drm.lab.emc.com	^				
	sib123	6.drm.lab.emc.com					
	dsib2187	7.drm.lab.emc.com					
	dsib2188	8.drm.lab.emc.com					
	dsib2189	9.drm.lab.emc.com 0.drm.lab.emc.com					
	dsib219	1.drm.lab.emc.com					
	dsib2225	5.drm.lab.emc.com					
	vidm-pri	imary					
	vrava-pr	imary	~				
	★ Type in an object name t	o search for	Q				
		Add	Cancel				
New Backup Job				×			
Virtual Machines							
Select virtual mach changes as you add	ines to process via container, or gr d new VMs into the container.	anularly. Container provides	dynamic selection	that automatically			
Name	Virtual machines to backup:	Type	Size	Add			
Virtual Machines	testing_veeam	Virtual machine	e 32.0 GB	Remove			
Storage				Kennove			
Guest Processing				Exclusions			
Schedule							
Summary				✤ Down			
				Recalculate			
				Total size: 32.0 GB			
		< Previous	Next >	inish Cancel			

Figure 89. Backing up a VM: Step 3
Like in Figure 90, the **Backup repository** will default to **Dell PowerMax Snapshot**. Additional options are available through the **Advanced** button.

New Backup Job	×
Storage Specify this job	e processing proxy server to be used for source data retrieval, backup repository to store the backup files produced by and customize advanced job settings if required.
Name	Backup proxy:
	Automatic selection Choose
Virtual Machines	Backup repository:
Storage	Dell PowerMax Snapshot (Primary storage snapshot only)
Guest Processing Schedule Summary	Retention policy: 7
	Advanced job settings include backup mode, compression and deduplication, block size, notification settings, automated post-job activity and other settings.
	< Previous Next > Finish Cancel

Figure 90. Backing up a VM: Step 4

Figure 91 shows the resulting screen when selecting the **Advanced** button in Step 4. There are three tabs for different functions: **notifications**, **vSphere** and **scripts**.

Backup



Figure 91. Backing up a VM: Step 5

By default, the check box is not checked in Figure 92, but it's checked here to highlight the options that can handle the Guest OS. This could be used to enable consistent backups of a Windows OS using the VSS Provider. See the section Application consistency before for more detail.

Backup

New Backup Job		×
Guest Processing Choose guest OS p	processing options available for running VMs.	
Name Virtual Machines Storage	Enable application-aware processing Detects and prepares applications for consistent backup, performs transaction logs configures the OS to perform required application restore steps upon first boot. Customize application handling options for individual machines and applications Guest interaction proxy:	processing, and Applications
Guest Processing	Automatic selection	Choose
Schedule	Guest OS credentials:	
Summer and	Select existing credentials or add new	Add
Summary	Manage accounts	
	Customize guest OS credentials for individual machines and operating systems	Credentials
	Verify network connectivity and credentials for each machine included in the job	Test Now
	< Previous Next > Finish	Cancel

Figure 92. Backing up a VM: Step 6

The final option is the ability to schedule the job for a future run with some error handling. The check box **Run the job automatically** is not checked by default as shown in Figure 93.

New Backup Job						×
Schedule Specify the job sche	duling options. If you do not se	t the schedule, t	he job will need	to be controlled	manually.	
Name	Run the job automatically	/				
Virtual Machiner	Daily at this time:	10:00 PM 🗘	Everyday		~	Days
virtual Machines	O Monthly at this time:	10:00 PM 🗘	Fourth ~	Saturday	~	Months
Storage	O Periodically every:	1 ~	Hours		~	Schedule
Guest Processing	O After this job:					~
Schedule	Automatic retry					
Summary	 Retry failed items pro Wait before each retry 	cessing: 3 / attempt for: 1	times	es		
	Backup window					
	Terminate the job out	side of the allow	ved backup wind	ow		Window
	Long running or accie on your production ir	fentally started j ifrastructure dur	obs will be termi ing busy hours.	nated to prevent	impact	
		< F	Previous A	Apply Fi	inish	Cancel

Figure 93. Backing up a VM: Step 7

The summary screen shown in Figure 94 provides information about the options for the backup. In addition, it shows the user how to run the job through the CLI.

New Backup Job	X
You have successfully	/ created the new backup job.
Name Virtual Machines Storage Guest Processing Schedule Summary	Summary: Configuration has been successfully saved. Name: Backup_veeam_fc_vm Target Path: Dell PowerMax Storage Type: VMware Backup Source items: testing_veeam (dsib2226.drm.lab.emc.com) PowerShell cmdlet for starting the job: Get-VBRJob -Name "Backup_veeam_fc_vm" Start-VBRJob
	< Previous Next > Finish Cancel

Figure 94. Backing up a VM : Step 8

The summary of the job run is shown in Figure 95.

Backup_veeam_fc_vr	n (Storage Snapshot)							\$
Job progress:			1	00%				1 of 1 VMs
SUMMARY		DATA		STATUS				
Duration:	00:18	Processed:	N/A	Success:	1	0		
Processing rate:	N/A	Read:	N/A	Warnings:	0			
Bottleneck:	N/A	Transferred:	N/A	Errors:	0			
THROUGHPUT (ALL TIM	E)							
Name	Status	Action					0	Duration
testing_veeam	Success	 Job started at Building list of Queued for pr 	6/14/2024 12:58:23 f machines to proces ocessing at 6/14/20	3 PM is 24 12:58:31 PM			C	0:01
		 Required back All VMs have b Primary storag 	up infrastructure res been prepared for sto je snapshots created	ources have been assig orage snapshot successfully	ned		C	0:04
		🥑 Job finished at	t 6/14/2024 12:58:4	2 PM				
Hide Details								ОК

Figure 95. Backing up a VM: Summary

7.1.1 Application consistency

Veeam relies on application consistency through VSS on Windows GuestOS or quiescing on other platforms. Consistency is enabled as part of the backup job in the screen shown in Figure 96 (or like in Figure 92). Check the box labeled Enable application-aware processing (unchecked by default) and then the **Applications...** button.

New Backup Job		×
Guest Processing Choose guest OS pro	cessing options available for running VMs.	
Name Virtual Machines Storage	 Enable application-aware processing Detects and prepares applications for consistent backup, performs transaction logs processing, and configures the OS to perform required application restore steps upon first boot. Customize application handling options for individual machines and applications 	
Guest Processing	Guest interaction proxy: Automatic selection Choose	
Schedule	Guest OS credentials:	
Summary	Add Manage accounts Customize guest OS credentials for individual machines and operating systems Verify network connectivity and credentials for each machine included in the job Test Now	
	< Previous Next > Finish Cancel	

Figure 96. Adding application consistency to a backup

In this backup job, two VMs were selected and one, **dsib2016.lss.emc.com**, is a Linux (Ubuntu) OS. The other, **dsib2035.lss.emc.com**, is a Windows OS. Note that in Figure 97, Veeam starts with assuming both VMs are Windows OSes.

Application-Aware Processing Options				×	
Specify application-aware proc	cessing settings for i	ndividual items:			
Object	VSS	Transaction logs	Scripts	Add	
🔓 dsib2016.lss.emc.com	Require success	SQL: Truncate, Exchange: Tr	No	Edit	
dsib2035.lss.emc.com	Require success	SQL: Truncate, Exchange: Tr	No	Luitin	
Windows	Ubuntu	\supset		Remove	
<			>		
			OK	Cancel	

Figure 97. VMs for application consistency

Since VM dsib2035.lss.emc.com is Windows, it will not be adjusted. There are options that can be changed, but the default is sufficient for this setup. The other VM, dsib2016.lss.emc.com, requires changes to enable application consistency since it has a Linux OS. Again, in this one example, highlight the VM and select **Edit...** Then select the radio button to **Disable application processing** as shown in Figure 98.

Backup



Figure 98. Disabling application processing

For this VM, a pre-script will be used to quiesce the application before the snapshot, then a post-script will be used to take it out of quiesce. Select the **Scripts** tab as shown in Figure 99 and select the appropriate scripts from the local backup server.

Processing Settings	×
General Scripts	
Script processing mode	
Ignore script execution failures	
O Disable script execution	
Windows scripts	
Pre-freeze script:	Province
Post-thaw script:	DIOWSE
Post-thaw script.	Browse
Linux scripts	
Pre-freeze script:	
C:\pre_freeze.sh	Browse
Post-thaw script:	
C:\post_freeze.sh	Browse
ОК	Cancel

Figure 99. Pre- and post-thaw scripts

After selecting **OK**, the correct options appear as shown in Figure 100. The VMs will now be consistent when they are backed up.

ecify application-aware pro	cessing settings for i	ndividual items:		
Object	VSS	Transaction logs	Scripts	<u>A</u> dd
🕞 dsib2016.lss.emc.com	Disabled	Copy only	Yes	Edit
sdsib2035.lss.emc.com	Require success	SQL: Truncate, Exchange: Tr	No	Laten
				<u>R</u> emove
6			>	

Figure 100. Processing options for each VM in a Veeam backup

8.1 VMFS with Fibre Channel

For continuity, the backed-up VM in the previous section will be restored first. For the restore, navigate to the **Inventory** on the left panel, highlight **Virtual Infrastructure** in the top left panel and select **Restore** in the right panel as shown in Figure 101.



Figure 101. Restoring a VM with Fibre Channel: Step 1

In Step 2, Figure 102, select Restore from backup.

Rest Choose	O re whether you want to restore from backup or replica.	×
-	Restore from backup Performs restore from a backup file.	
	Restore from replica Performs restore from a replica VM.	
		Cancel

Figure 102. Restoring a VM with Fibre Channel: Step 2

In Step 3, select **Entire VM restore** as shown in Figure 103. The other options here are possible, but they will not be covered.

E	Restore from Backup Select the type of restore you want to perform.	×
VM	Entire VM restore Restores the entire VM.	
-	Disk restore Restores the content of individual disks and volumes.	
	<u>G</u> uest files restore Restores individual guest files from an image-level backup.	
Q	Application items restore Restores individual application items from an image-level backup.	
	Database restore Restores databases to a point in time back to the original or to a different server.	
	Cancel	

Figure 103. Restoring a VM with FC: Step 3

The only type of restore on this page that is used with the PowerMax Plug-in is **Instant recovery** in Step 4. Select this option as shown in Figure 104. The second item listed, **Entire VM restore**, will not recognize snapshot backups, only traditional file backups.

E	Restore from Backup Select the type of restore you want to perform.	,
	Instant recovery Instantly recovers a virtual machine by running it directly from backup. Remember to finalize the restore by moving the VM to your production storage.	
ß	Entire VM restore Restores entire VM to the original or a new location, and registers it with the vSphere infrastructure.	
	Restore to public cloud Restores any backup as a public cloud virtual machine. Amazon EC2, Google Compute Engine and Microsoft Azure IaaS are supported.	
	Cancel	
	Figure 104. Restoring a VM with Fibre Channel: Step 4	

Next in step 5, choose Instant recovery to VMware vSphere in Figure 105.

¢	Instant Recovery Select the type of restore you want to perform.	×
	Instant recovery to <u>V</u> Mware vSphere Instantly recovers any image-level backup as a vSphere VM by running it directly from a repository. Remember to finalize the restore by moving the VM to your production storage.	
	Instant recovery to Microsoft Hyper-V Instantly recovers any image-level backup as a Hyper-V VM by running it directly from a repository. Remember to finalize the restore by moving the VM to your production storage.	
	Cancel	

Figure 105. Restoring a VM with Fibre Channel: Step 5

Select the VMs the user wants to restore. This can be done by typing in the beginning of the VM name and Veeam will list them in Step 5, Figure 106. Double-click the VM to add it to the list.

Instant Recovery to VMware vSpł	here	×
Machines Select machines to be (containers will be au	e restored. You can add individual machines from backup files, or containers from li Itomatically expanded into plain list).	ive environment
Machines	Machines to restore:	
Restore Mode	Q test	×
Host	testing_veeam 32 GB	Add
Folder		Point
Datastore		Remove
Secure Restore		
Reason		
Summary		
	< Previous Next > Fini	sh Cancel

Figure 106. Restoring a VM with Fibre Channel: Step 5

If there is more than one restore point available (i.e., snapshot backup), select the **Point...** button in Step 6 in Figure 107 will list all existing restore points, regardless of how those snapshots were taken (i.e., Veeam, manually, a snapshot policy, etc.). Veeam, however, does not include the snapshot name in this view. To see the snapshot name associated with these points, navigate to the **Storage Infrastructure** screen and expand the volume in question (e.g. 149). There, the snapshot names are included with the timestamps as shown in Figure 108.

Instant	Recovery to VMware vSph	ere				×
vm	Machines Select machines to be (containers will be aut	restored. You can add individual tomatically expanded into plain li	machines fro ist).	om backup files, or containers from	n live envi	ronment
Mach	ines	Machines to restore:				
Resto	re Mode	Q testing_veeam			×	
Destir	ation	Name	Size	Restore point		Add
Beese		testing_veeam	32 GB	less than a day ago (12:58 PM		Point
Reaso	Restore Points				×	Remove
Sumi	Available restore points fo	or testing_veeam:			-	
	Job		Ţ	уре		
	O00120001473:001 O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O	49 (TESTING_VEEAM)		nanchot		
	(5 7 days ago (7:3	1 AM Friday 6/7/2024)	S	napshot		
	5 days ago (6:4	14 AM Friday 6/7/2024)	S	napshot		
	🕒 7 days ago (5:5	8 AM Friday 6/7/2024)	S	napshot		
	🕑 7 days ago (5:5	6 AM Friday 6/7/2024)	S	napshot		
				OK Cano	el	
			< 1	Previous Next > F	inish	Cancel

Figure 107. Restoring a VM with Fibre Channel: Step 6



Figure 108. Snapshot name detail for restore points

If the machine name is unknown, one can select the **Add...** button. Then the user can navigate through the VMware infrastructure or review existing snapshots that have VMs and choose one or more as seen as shown in Figure 109.



Figure 109. Restoring a VM with FC – alternate options to choose VMs

Once the VMs are selected by the user's chosen methodology, use the radio buttons as shown in Step 7, Figure 110, to restore the VM(s) to either the original location or a new location. If the original VM is lost, select the first radio button which will use the original VM name in the original vCenter and ESXi host. Otherwise select the second radio button, which lets the user rename the VM and choose where to restore it.

Instant Recovery to VMware vSp Restore Mode Specify whether sele	here X
Machines Restore Mode Destination Reason Summary	 Restore to the original location Quickly initiate the restore of selected VM to its original location, with the original name and settings. This option minimizes the chance of user input error. Restore to a new location, or with different settings Customize the restored VM location, and change its settings. The wizard will automatically populate all controls with the original VM settings as the defaults.
	Restore VM tags
	< Previous Next > Finish Cancel

Figure 110. Restoring a VM with Fibre Channel: Step 7

If the original VM still exists and an attempt is made to restore to the original location, the error message as shown in Figure 111 will appear.



Figure 111. Restoring a VM with Fibre Channel: Original VM warning

Proceeding with the restore through the second option, rename the VM to prevent the previously mentioned conflict as in Step 8, Figure 112, and hit **Next** and then **Finish** in Figure 113. Note that if the BIOS UUID needs changing, select the **Advanced** button.

Instant Recovery to VMware vSph	ere	×
Choose ESXi server to adjust VM settings firs	run the recovered virtual machine on. You can choose to power on VM automatically, u t (such as change VM network).	nless you need to
Machines	Restored VM name:]
	testing_veeam_restore	
Restore Mode	Host:	1
Destination	dsib1197.drm.lab.emc.com	Choose
D	VM folder:	
Keason	vm	Choose
Summary	Resource pool:	
	Resources	Choose
Advanced	×	
Preserve BIOS UUID		
Preserving system UUID for applications that match syst	the restored VM prevents issues with tem by UUID.	
○ Generate new BIOS UUID		
Generating new UUID preve restored clone and the origi	nts possible conflicts between the nal machine.	
	OK Cancel	Advanced
	< Previous Next > Finish	Cancel

Figure 112. Restoring a VM with FC: Step 8

Instant Recovery to VMware vSpł	here >
You can copy this co	nfiguration information for the future reference.
Machines Restore Mode Destination Reason Summary	Summary: Original machine name: testing_veeam New machine name: testing_veeam_restore Restore point: less than a day ago (12:58 PM Friday 6/14/2024) Target host: dsib1197.drm.lab.emc.com Target resource pool: Resources Target VM folder: vm
	<u>C</u> onnect VM to network <u>Power on target VM after restoring</u>
	< Previous Next > Finish Cancel

Figure 113. Restoring a VM with FC: Summary

The output of this session is immediately available as shown in Figure 114.

estore Session					
Name: Restore type: Initiated by:	testing_veeam Instant VM Recovery DSIB2117\Administrator	Status: Start time:	In progress 6/14/2024 5:56:20 PN	1	
Reason Para	meters Log				
Message Connectir	ng to host dsib1197.drm.lab.em	ic.com		Duration 0:00:01	^
Checking St Checking	torage snapshot availability of storage snapsho clone 000120001473:00149:Vee	t Veeam-Backupveeam am-Backupveeamf-17	nf-1718395117597 (0:00:02	
Binding 0	00120001473:00149:Veeam-Bac	kupveeamf-171839511 dsib1197.drm.lab.emo	7597:0:00327 to FC	0:00:20	
Cooking u	p SCSI LUN for snapshot clone p datastore for SCSI LUN EMC	000120001473:00149:\ Fibre Channel Disk (n	/eeam-Backupveea aa.60000970000120		
 Initiating Updating 	snapshot datastore resignaturir VM configuration	ng for SCSI LUN naa.60	00009700001200014	0:00:02	
 Registerin Registerin 	g VM testing_veeam_restore o g VM	n host dsib1197.drm.la	b.emc.com	0:00:02	
No VM tag Updating	gs to restore session history			0:00:01	
Vesting_ve Waiting fo	eam_restore has been recovere or user to start migration	ed successfully			-

Figure 114. Restoring a VM with Fibre Channel: Log

The restore process creates a target device for the SnapVX snapshot and places it in the VEEAM_xxx storage group as shown in Figure 115, which is presented to the ESXi host through Fibre Channel connectivity.

Note: When using both Fibre Channel and iSCSI, depending on the chosen restore host, it is possible for the snapshot device to be presented through a different protocol than the original datastore device.

EEAM_dsib119	97_sg > SG A	All Details					
Details	Volum	es Perf	ormance	Data Protection			
Create	Ind Add Volu	mes To SG Remo	ove Volumes	:		2 Items 🝸 🛓	
Name	Туре	Allocated (%)	Capacity	Unreduc	Emulation	Status	
00165	TDEV	0%	0.01	0	FBA	Ready	
_	TDEV	0%	100	0	FRA	Ready	

Figure 115. SnapVX target device mapped through Fibre Channel ports

Veeam completes the restore process by rescanning the ESXi host, resignaturing the VMFS on the device and registering the VM with the name previously provided. The resignatured datastore is shown in Figure 116. By default, VMware adds the "**snap_xxxx**" prefix to the datastore. This can be changed in the advanced options but is not recommended since it avoids unintended conflicts.



Figure 116. Snapshot device presented through Fibre Channel

Note that upon reaching this step, Veeam has completed the automated portion of the restore process and waits for the user. The last line of the log in Figure 114 refers to this: "Waiting for the user to start migration." Veeam has no knowledge of what the user wishes to do with the restored VM shown in Figure 117 and so it idles until the user initiates another Veeam action.

Ξ							
	<	🗇 testing_veeam_restore 🛛 Þ 🗖 🛃 🐼 🕴 Астіоня					
[]]	ē) = 🛛	Summary Monitor Configure Permissions Datastores Networks Snapshots					
	dsib0138.drm.lab.emc.com dsib0199.drm.lab.emc.com dsib0199.drm.lab.emc.com dsib01228.drm.lab.emc.com	Quick Filter × Enter value					
	dsib0228.drm.lab.emc.com	Name ↑ Status Type Datastore Cluster					
	dsib1255.drm.lab.emc.com	□ I II Snap-7ccd01fe-TESTING VEEAM VMFS 6					
	dsib2011.drm.lab.emc.com						
	🔂 dsib2028.drm.lab.emc.com						
	🗄 dsib2030.drm.lab.emc.com						
	dsib2035.drm.lab.emc.com						
	dsib2036.drm.lab.emc.com						
	dsib2225.drm.lab.emc.com						
	D testing_veeam						
	 						

Figure 117. Restored VM veeam_fc_vm_restore

After the user is finished with the restored VM, the session can be ended. This is covered in the next section.

8.2 VMFS with iSCSI

The restore wizard for iSCSI proceeds the same as for Fibre Channel so it will not be covered in its entirety here. Instead, the summary of the iSCSI restore is shown in Figure 118. This example demonstrates the snapshot target being presented to host dsib0180.lss.emc.com through iSCSI.

Name:	veeam_iscsi_vm	Status:	In progress	
Restore type:	Instant VM Recovery	Start time:	4/27/2021 10:35:56 A	М
nitiated by:	DSIB2012\Administrator			
_	in the second			
Reason Para	meters Log			
Message				Duration
Starting V	M veeam_iscsi_vm_restore rec	overy		
Connectir	ng to host dsib0180.lss.emc.co	m		
Locking b	ackup file			
Checking 🛛	availability of storage snapsho	t Veeam-Backup_Veea	m_iscsi_vm (4/27/2	
Snapshot 💟	clone 000197600450:0009E:Vee	am-Backup_Veeam_is	csi_vm:1619524670:	0:00:05
Binding 0	00197600450:0009E:Veeam-Bac	:kup_Veeam_iscsi_vm:1	1619524670:00146 t	0:00:05
Adding iS	CSI static target (iSCSI server: 1	92.168.1.101, iSCSI nar	me: iqn.1992-04.co	
Rescannir	ng iSCSI adapter vmhba68 on h	ost dsib0180.lss.emc.c	om	0:00:02
Looking u	up SCSI LUN for snapshot clone	e 000197600450:0009E:	Veeam-Backup_Vee	
Looking u	up datastore for SCSI LUN EMC	iSCSI Disk (naa.600009	97000019760045053	
Initiating	snapshot datastore resignaturi	ng for SCSI LUN naa.60	00009700001976004	0:00:08
Updating	VM configuration			0:00:18
Registerin	g VM veeam_iscsi_vm_restore	on host dsib0180.lss.e	mc.com	0:00:02
Registerin	ig VM			
Vo VM ta	gs to restore			
Updating	session history			
Veeam_iso	csi_vm_restore has been recove	ared successfully		
Waiting fo	or user to start migration			

Figure 118. Restoring a VM with iSCSI: Log

The resignatured datastore is displayed in Figure 119. Note that the original datastore that the snapshot is based upon is presented through Fibre Channel, but since the snapshot target device is a net-new one, it can be presented through a different protocol as well like here.

snap-334c2b2c-\	/EEAM2 Actions Y	
Summary Monitor Con	figure Permissions Files Hosts VMs	
Alarm Definitions	Device Backing	
Scheduled Tasks	Extent Name (Device name:Partition number) T Capacity	
General	EMC iSCSI Disk (naa.60000970000197600450533030313436) : 1 1.2 TB	
Device Backing		
Connectivity and Multipathing		
Hardware Acceleration		
Capability sets		
	Device Deteile	
	Device: EMC iSCSI Disk (naa.60000970000197600450533030313436)	
	Capacity 1.2 TB	
	Partition Format: GPT	
	Drive Type Flash	
	Sector format Sizin	
	Name v Capacity	 Partition Type
	VMFS 1.2 TB	Logical

Figure 119. Snapshot device presented through iSCSI

8.3 End restore

A restore is considered an ongoing session. After the VM is moved from the snapshot datastore or its purpose has been served, the user needs to end the restore session. When a session is stopped, Veeam and the PowerMax Plug-in will:

Unregister the VM Unmount the datastore Remove the device from the storage group Delete the device

Begin by selecting the **History** option at the bottom left-hand side and then **Instant Recovery** in the top lefthand side of the screen. Find the job name, which in this case **testing_veeam**, and right-click on it in Figure 120. Choose **Stop session**, and then select **Yes**.

Session Tools	Veeam Backup and Replication		- ¤ ×
E Home View Session Stop Statistics Report Details Image: Comparison of the second secon	Image: Stop session Image: Stop session	Session Type Sta Instant VM Rec Wo Instant VM Rec Fail	Vecam Al Online Assistant Urs Start Time ↓ Es rking 6/14/2024 5:56 PM ccess 6/7/2024 7:36 AM 6, led 6/7/2024 7:36 AM 6,
Home Inventory Constructure Storage Infrastructure	<		•

Figure 120. Stop restore session: Step

Once started, the vCenter will show the associated tasks as shown in Figure 121.

✓ Recent Tasks Al	arms							
Task Name 🛛 🕈	Target Y	Status	т	Queued For	Start Time 🛛 🕈	Completion Time 🕆 🔻	Server	т.
Unregister virtual machine	a testing veeam restore	⊘ Completed		6 ms	06/15/2024, 5:58:05 AM	06/15/2024, 5:58:05 AM	dsib2226.drm.lab.emc.com	
Unmount VMFS volume	dsib1197.drm.lab.emc.com	⊘ Completed		3 ms	06/15/2024, 5:58:06 AM	06/15/2024, 5:58:14 AM	dsib2226.drm.lab.emc.com	

Figure 121. Stop restore session: vCenter

Double-click on the job name in the Veeam console (**testing_veeam**) and the log is displayed, which contains the detailed information from the session. Note that stopping the session appends the log information to the initial restore process. The red box as shown in Figure 122 is the end of the restore session, and the blue box is the start of the stop session.

Restore Session		×
Name: testing_veeam Status: Success Restore type: Instant VM Recovery Start time: 6/14/2024 5:56:20 PM Initiated by: DSIB2117\Administrator End time: 6/15/2024 5:58:39 AM Reason Parameters Log	1 1	
Message Waiting for user to start migration Starting testing yeeam restore dismount	Duration	^
Connecting to host dsib1197.drm.lab.emc.com Unregistering VM testing_veeam_restore from snapshot clone datastore	0:00:01	
 Dismounting VMFS volume snap-7ccd01fe-TESTING_VEEAM from host dsib1197 Unbinding 000120001473:00149:Veeam-Backupveeamf-1718395117597:0:00327 fro 	0:00:08 0:00:08	
Rescanning FC adapter vmhba2 on host dsib1197.drm.lab.emc.com Rescanning FC adapter vmhba5 on host dsib1197.drm.lab.emc.com Undating storage information	0.00.02	
 Opdating storage information Deleting snapshot clone volume 000120001473:00149:Veeam-Backupveeamf-1718 Unlocking storage snapshot 	0:00:02	
testing_veeam_restore has been unmounted successfully	Clos	✓

Figure 122. Stop restore session: Log

9 Proxy file backup to disk with snapshot

The previous discussion in the Backup section dealt with taking PowerMax snapshots as backups themselves. There are no files in that case, just a reference in Veeam to a snapshot on the array which can be used for restoring or other backup procedures. Veeam can back up a VM to disk by using a temporary array snapshot and avoid impact to the production VM. The PowerMax Plug-in can already do this feature, so once the Veeam software is properly configured to run a disk backup, it will take advantage of the snapshot.

9.1 Backup repository

Begin by ensuring that there is a backup disk repository where the VM will be backed up. Veeam offers a number of options from NFS to S3. The example below show a user adding a Windows-based repository with what Veeam calls direct-attached storage. In reality, the storage is a vmdk on a datastore located on a different array than where the production VM is stored.

Navigate to **Backup Infrastructure** and highlight **Backup Repositories**. Right-click and select **Add backup repository...** as shown in Figure 123.

记 Repository Tools		Veeam Backup and	d Replication			- - ×
E + Home Backup Repository						0
Add Edit Repository Repository Manage Repository Tools						Veeam Al Online Assistant
Backup Infrastructure	Q Type in an object name to	search for	×			
 Backup Proxies Backup Repositor Keternal Repositor Rescan Scale-out Repositor Rescan WAN Accelerators Service Providers SureBackup Application Groups Virtual Labs Managed Servers WMware Sphere More soft Windows 	Name 1	Type Windows	Host dsib2117	Path F:\Backup	Capacity Free 100 GB 91.4 GB	Used Space Desc 0 B Creat
······································	<					>

Figure 123. Adding backup repository: Step 1

In Step 2 in Figure 124 select **Direct attached storage**, then in Figure 125 select the operating system, Windows or Linux. In this example, Microsoft Windows is chosen.



Figure 124. Adding a backup repository: Step 2

E	Direct Attached Storage Select the operating system type of a server you want to use as a backup repository.	×
-	Microsoft Windows Adds local storage presented as a regular volume or Storage Spaces. For better performance and storage efficiency, we recommend using ReFS.	
۵	Linux Adds local storage or locally mounted NFS share. For better performance and storage efficiency, we recommend using XFS. The Linux server must use bash shell, and have SSH and Perl installed.	
<u>C</u> a	Linux (Hardened Repository) Requires a Linux server with internal or direct attached storage. This configuration enables protection against cybersecurity threats with immutable backups. The Linux server must use bash shell and have SSH installed. For reduced attack surface, minimal Linux installation is highly recommended.	
	Cancel	

Figure 125. Adding a backup repository: Step 3

In Step 4, provide a name and description as shown in Figure 126.

New Backup Repository	×
Name Type in a name and o	lescription for this backup repository.
Name	Name:
Course .	Disk Backup
Server	Description:
Repository	For use with PowerMax snapshots
Mount Server	
Review	
Apply	
Summary	
	< Previous Next > Finish Cancel

Figure 126. Adding a backup repository: Step 4

As shown in Figure 127 choose the drive where the user's backups will be placed. In order to see what is available on the server, select **Populate** in Step 6. The Windows drives (vmdks) are shown. Drive E is selected which has a capacity of 2 TBs.

New Backup Repository				×
Server Choose repository set	rver. You can select server from the list of managed servers	added to the co	onsole.	
Name	Repository server:			
Canvar	dsib2117 (Backup server)		~	Add New
JEIVEI	Path	Capacity	Free	Populate
Repository	● C:\	89.4 GB	44.3 GB	
Mount Server		100 GB	91.4 GB	
Review				
Apply				
Summary				
	< Previous	Next >	Finish	Cancel

Figure 127. Adding a backup repository: Steps 6

Veeam will automatically create and use a folder called **Backups** on the drive. If the drive is a standard NTFS format, an error message appears as shown in Figure 128.

New Backup Repository		×
Repository Type in path to t	he folder where backup files should be stored, and set repository load control options.	
Name	Location	
	Path to folder:	
Server	F:\Backups	Browse
Repository	Capacity: <unknown></unknown>	Populate
Mount Server	Free space: <unknown></unknown>	
Review	Load control Running too many concurrent tasks against the repository may reduce overall perforn cause I/O timeouts. Control storage device saturation with the following settings:	mance, and
Apply	☑ Limit maximum concurrent tasks to: 4	
Summary	☐ Limit read and write data rate to: 1 (♠) MB/s	
	Veeam Backup and Replication X	
	The file system on the specified volume does not support fast cloning. We recommend using ReFS volume formatted with 64 KB cluster size. Proceed anyway? Yes No	
	Click Advanced to customize repository settings.	Advanced
	< Previous Next > Finish	Cancel

Figure 128. Adding a backup repository: Step 8

Once again, in Figure 129, Veeam provides the default entries that can be used. If this is the first drive configured, the cache folder will be the same as the one chosen in Figure 128.

New Backup Repository		×		
Mount Server Specify a server to me Instant recoveries req	ount backups to when performing advanced restores (file, application item and instant VM uire a write cache folder to store changed disk blocks in.	recoveries).		
Name	Mount server:			
	dsib2117 (Backup server) \checkmark	Add New		
Server	Instant recovery write cache folder:			
Repository F:\ProgramData\Veeam\Backup\IRCache\				
Mount Server	Ensure that the selected volume has sufficient free disk space to store changed disk block recovered machines. We recommend placing the write cache folder on an SSD drive.	cs of instantly		
Review	Enable vPower NFS service on the mount server (recommended)	Ports		
Apply	Unlocks instant recovery of any backup (physical, virtual or cloud) to a VMware vSph vPower NFS service is not used for instant recovery to a Microsoft Hyper-V VM.	ere VM.		
Summary				
	< Previous Next > Finish	Cancel		

Figure 129. Adding a backup repository: Step 9

Review the options in Step 10. The status of the components as shown in Figure 130 is **already exists**, but if this was the first drive configured, the status would indicate the components will be installed. Note that if the chosen drive was used previously with Veeam and may have backups, check the box that allows Veeam to search for them.

New Backup Repository		×
Review Please review the set	tings, and click Apply to continue.	
Name	The following components will be processed on server dsib2117:	
	Component name	Status
Server	vPower NFS	already exists
Repository	Mount Server	already exists
	VMware VDDK	already exists
Mount Server		
Review		
Apply		
Summary		
2		
	_	
	Search the repository for existing backups and import them aut Import guest file system index data to the catalog	omatically
	< Previous Apply	Finish Cancel

Figure 130. Adding backup repository: Step 10

Finally, apply the changes and check the messages shown in Figure 131 for success.

ne	Mercana	Duration
	Message	Duration
/er	Starting infrastructure item update process	0:00:03
	Creating repository folder	
ository	Discovering installed packages	
int Server	Registering client dsib2117 for package vPower NFS	
III SEIVEI	Registering client dsib211/ for package Mount Server	
ew	Registering client dsib211/ for package VMware VDDK	
26-13-F	Discovering installed packages	
ly	All required packages have been successfully installed	
	Optecting server configuration	
imary	Reconfiguring vPower NFS service	0:00:07
	Creating configuration database records for installed packages	
	Collecting backup repository info	
	Creating database records for repository	
	Backup repository has been saved successfully	

Figure 131. Adding backup repository: Step 11

Once complete, the summary shown in Figure 132 is displayed.

New Backup Repository		×
Summary You can copy the co	nfiguration information below for future reference.	
Name	Summary:	
Server	Windows backup repository 'Disk Backup' was successfully saved.	
Repository	Mount host: dsib2117 Backup folder: F:\Backups Write throughput: unlimited	
Mount Server	Max parallel tasks: 4	
Review	Veeam Backup and Replication X	
Apply	Change the configuration backup location to the newly created repository?	
Summary	Yes No	
	< Previous Next > Finish Canc	el

Figure 132. Adding backup repository: Summary

The repository is now available for use as shown in Figure 133.



Figure 133. Backup repositories

9.2 Disk backup with PowerMax Plug-in

With one or more backup proxies in place, it is now possible to back up to disk with snapshots. The following example will use backup proxy dsib0127.drm.lab.emc.com.

9.2.1 VM backup

The process will back up VM **testing_veeam** which is located on datastore **TESTING_VEEAM**. The device ID is 149.

Begin the wizard from the **home** screen, and from the drop-down options for **Backup job**, select **Virtual machine...** as shown in Step 1, Figure 134.

Proxy file backup to disk with snapshot

		Veeam Backup	o and Replication					- • ×
 Flome View Flome View Flome View Flome View File share File share File share 	up Copy SureBackup y Job + Job Secondary Jobs M Backup Job es a new VM backup job.	Import Export Security & Backup Backup Compliance Actions name to search for Type m VMware Backup	Objects 1	T All jobs Status Stopped	Last Run 11 hours ago	Last Result Success	Next Run 6/15/2024 10:00 PM	Veeam Al Online Assistant Target Dell PowerMax Sna
Home Inventory Backup Infrastructure Storage Infrastructure								

Figure 134. Disk backup with snapshot: Step 1

Begin by providing a backup name and a description if desired, as shown in Figure 135.

New Backup Job	×
Name Type in a name and	description for this backup job.
Name	Name:
	Disk backup using storage snapshot
Virtual Machines	Description:
Storage	This backup will use the PowerMax Plug-in to take a snapshot, present it to a backup proxy, and copy
Guest Processing	the data to a disk repository.
Schedule	
Summary	
	High priority Backup infrastructure resources are offered to high priority jobs first. Use this option for jobs sensitive to the start time, or jobs with strict RPO requirements.
	< Previous Next > Finish Cancel

Figure 135. Disk backup with snapshot: Step 2

In the next screen shown in Step 3, select **Add...** and choose the VM(s) the user wants to back up. There are multiple ways to search for the desired objects as shown in Figure 136.

New Backu	dof di	Add Objects	×	×
Vm	Virtual Machines Select virtual mach changes as you ad	Select objects:	€] 🗐 🗗 🛢 🔗 🌮 Type	ion that automatically
Name Virtual Ma	achines	□	Virtual machine	Add
Storage Guest Pro	cessing			Exclusions
Schedule Summary	6.			 ✤ Up ♣ Down Recalculate
		* ∼ test	×	Total size: 0 B
			Add Cancel	Finish Cancel

Figure 136. Disk backup with snapshot: Step 3

Under the **Storage** step, start by adjusting the **Backup proxy** to a previously created server that has Fibre Channel or iSCSI access to the array that backs the datastore that contains the VM. Note in the inset the backup proxy that was created in the section Backup proxy. Then choose the backup repository created in the section Backup repository. Both these steps are demonstrated in Figure 137.

New Backup Job	×
Storage Specify this job	e processing proxy server to be used for source data retrieval, backup repository to store the backup files produced by and customize advanced job settings if required.
Name	Backup proxy:
	10.228.244.127 Choose
Virtual Machines	Backup repository:
Storage	Disk Backup (For use with PowerMax snapshots)
Guest Processing	Default Backup Repository (Created by Veeam Backup) Dell PowerMax Snapshot (Primary storage snapshot only)
Schedule	Disk Backup (For use with PowerMax snapshots)
Summary	Keep certain full backups longer for archival purposes Configure GFS retention policy is not configured Configure
	Configure secondary destinations for this job
	Copy backups produced by this job to another backup repository, or tape. We recommend to make at least one copy of your backups to a different storage device that is located off-site.
	Advanced job settings include backup mode, compression and deduplication, block size, notification settings, automated post-job activity and other settings.
	< Previous Next > Finish Cancel

Figure 137. Disk backup with snapshot: Steps 4

If desired, there are advanced parameters available in the **Storage** step that can be adjusted. One setting of note is shown in Figure 138 under the **Integration** tab. By default, the checkbox for **Enable backup from storage snapshots** is selected. This should not be changed but is included here for reference.

Advanced Settings	×							
Backup Maintenance Storage Notifications vSphere Integration Scripts								
 Primary storage integration Image: Enable backup from storage snapshots Use storage snapshots (instead of VM snapshots) as the data source for this job. Using storage snapshots reduces impact on the production environment from VM snapshot commit. 								
 Limit processed VM count per storage snapshot to By default, the job will process all included VMs located on the same datastore from a single storage snapshot. Failover to standard backup Perform standard backup from VM snapshot if backup from storage snapshot fails. Failover to primary storage snapshot Use primary storage snapshot sas the data source if backup from storage snapshot fails. 								
Save As Default OK Cancel								

Figure 138. Disk backup with snapshot: advanced settings

Figure 139 offers options for the GuestOS. In this example, no changes are made.

New Backup Job		×
Guest Processi Choose guest C	ng DS processing options available for running VMs.	
Name	Enable application-aware processing Detects and prepares applications for consistent backup, performs transaction logs configures the OS to perform required application restore steps upon first boot.	processing, and
virtual machines	Customize application handling options for individual machines and applications	Applications
Storage	Enable guest file system indexing and malware detection	
Guest Processing	Indexing enables global file search functionality, automatic detection of suspicious activity and known malware files.	file system
Schedule	Customize advanced guest file system indexing options for individual machines	
	Guest interaction proxy:	
Summary	Automatic selection	Choose
	Guest OS credentials:	
	Select existing credentials or add new	Add
	Manage accounts Customize guest OS credentials for individual machines and operating systems	Credentials
	Verify network connectivity and credentials for each machine included in the job	Test Now
	< Previous Next > Finish	Cancel

Figure 139. Disk backup with snapshot: Step 5

The final option available for the wizard in Figure 140, is to schedule the backup. The backup can also be tied to another job if there is a dependency between one or more VMs.

New Backup Job							×
Schedule Specify the job s	cheduling options. If you do not se	et the schedule, t	he job will i	need t	to be controlled	manually.	
Name	Run the job automatically	/					
Vietual Machines	Daily at this time:	10:00 PM 🔶	Everyday			~	
virtual Machines	O Monthly at this time:	10:00 PM 🔶	Fourth	~	Saturday	~	Months
Storage	O Periodically every:	1 ×	Hours			~	Schedule
Guest Processing	O After this job:	Backup_veeam	_fc_vm (Bac	kup a	VM attached the	rough Fibr	e Channel] 🗸
Schedule	Automatic retry						
Summary	Retry failed items pro Wait before each retry	v attempt for: 1	0 0 n	imes ninute	5		
	Backup window						
	Terminate the job out	tside of the allow	ved backup	windo	WW.		Window
	Long running or accid on your production in	dentally started j nfrastructure dur	obs will be ing busy ho	termir ours.	nated to prevent	impact	
		< F	Previous	A	pply Fi	nish	Cancel

Figure 140. Disk backup with snapshot: Step 6

Click **Finish** as shown in Figure 141 to complete the backup setup. Here, the checkbox is selected to run the job immediately in order to test its viability before setting a schedule.

New Backup Job	×
You have successful	y created the new backup job.
Name Virtual Machines Storage Guest Processing Schedule	Summary: Configuration has been successfully saved. Name: Disk backup using storage snapshot Target Path: F:\Backups Type: VMware Backup Source items: testing_veeam (dsib2226.drm.lab.emc.com) PowerShell cmdlet for starting the job:
Summary	Get-VBRJob -Name "Disk backup using storage snapshot" Start-VBRJob
	< Previous Next > Finish Cancel

Figure 141. Disk backup with snapshot: Summary

As part of the job, the 100 GB linked target device is placed in the storage group so the backup proxy (dsib0127.drm.lab.emc.com) can have access to it. Veeam is then able to read the device's contents to back up the VM. The device is seen as Disk 3 in Figure 142. Do not make any changes to the device during the backup process. It is displayed here only for completeness.

🌆 Computer Management										
File Action View Help										
🗢 🄿 🖄 🖬 😰 🖬 🖾										
🔝 Computer Management (Local	Volume		Layout	Туре	File System	Status	Capacity	Free Space	% Free	
System Tools	- (C:)		Simple	Basic	NTFS	Healthy (Boot, Page File, Crash Dump, Basic Data Partition)	89.37 GB	71.39 GB	80 %	
> 🕗 Task Scheduler	💻 (Disk 0 partition	1)	Simple	Basic		Healthy (EFI System Partition)	100 MB	100 MB	100 %	
> 🛃 Event Viewer	💻 (Disk 0 partition	4)	Simple	Basic		Healthy (Recovery Partition)	524 MB	524 MB	100 %	
> 👸 Shared Folders	SSS_X64FREE_EI	1-US_DV9 (D:)	Simple	Basic	UDF	Healthy (Primary Partition)	4.70 GB	0 MB	0 %	
> 🌆 Local Users and Groups										
> 🔕 Performance										
Device Manager										
V 🔄 Storage										
> 🚯 Windows Server Backup										
Disk Management										
Services and Applications										
	ODisk 3									^
	Basic									
	100.00 GB	100.00 GB								
	Offline 🚺	Healthy (Pri	mary Par	tition)						
	DVD	SSS X64FR	EE EN.LIS		(D•)					
	4.70 GB	4.70 GB UDF	:		(0.)					
	Online	Healthy (Pri	mary Parl	tition)						

Figure 142. Disk backup with snapshot: Backup proxy server

To view the snapshot and linked target in Solutions Enabler run the symsnapvx list command as shown in Figure 143.

dsib2(dsib2028:~ # symsnapvx list -sid 1672 -linked -detail -file dev.txt														
Device Device	e File 1 e's Symr	Name netr:	ix ID		: dev. : 0001	txt 200016 [.]	72	(Micro	ocode '	Version:	6079)				
Sym Dev	Snapsho	ot Na	ame				Gen	Link Dev	Flgs FCMDS	Snapshot	Timestamp		Remaining (Tracks)	Do	one (%)
00142	VeeamAU	JX-D	iskba	cku-1	718491	837411	0	00144	.D.X.	Sat Jun	15 18:49:56	2024	1	0	100
Flgs: (F) a (C) a (M) a (D) a (S) r	<pre>VeeamAUX-Diskbacku-1718491837411 0 00144 .D.X. Sat Jun 15 18:49:56 2024 0 100</pre>														
dsib20	028:~ #														



Job progress is available in the Veeam GUI as shown in Figure 144. Note that the job takes a couple minutes to complete.

😺 Disk backup using st	orage snapshot (Full)					×
Job progress:			10	0%		1 of 1 VMs
SUMMARY		DATA		STATUS		
Duration:	02:38	Processed:	32 GB (100%)	Success:	1 🔘	
Processing rate:	121 MB/s	Read:	4.4 GB	Warnings:	0	
Bottleneck:	Source	Transferred:	2.6 GB (1.7x)	Frrors:	0	
	-		2.0 00 ()			
THROUGHPUT (ALL TIM	E)					Speed: 146 MB/s
Name	Status	Action				Duration
🛅 testing_veeam	Success	Job started at	5/15/2024 3:49:51 PM			
		Building list of	machines to process			00:02
		🕑 VM size: 32 GB				
		Changed block	tracking is enabled			
		Queued for pr	ocessing at 6/15/2024	3:50:05 PM		
		Required back	up infrastructure resour	rces have been assigned	1	
		All VMs have b	een prepared for storad	ge snapshot		00:24
		Creating stora	ge snapshots for backup	D		00:04
		Processing tes	ting_veeam			01:23
		O Unmounting s	torage snapshots			00:13
		O Deleting stora	e snapshots			00:07
		O Load: Source	6% > Proxy 16% > Net	twork 17% > Target 0%		
		Primary bottle	neck: Source			
		Job finished at	6/15/2024 3:52:30 PM	4		
		1 VM processe	d successfully			00:23
Hide Details						OK



The backup files can be seen on the backup proxy server as shown in Figure 145.

Name	Date modified	Туре	Size	
testing_veeam.vm-53016D2024-06-15T154951_F2A7.vbk	6/15/2024 3:52 PM 6/15/2024 3:52 PM	Veeam full backup Veeam backup ch	2,571,032 KB 11 KB	

Figure 145. Disk backup with snapshot: Backup files on backup proxy server

10 Backup and restore Raw Device Mappings (RDM)

Veeam does not support backing up RDMs as part of a VM. This holds true for the PowerMax Plug-in, despite the fact that the array snapshots are taken at the device level. The lack of support, however, does not prevent Veeam from backing up the VM disks (vmdks) that are not RDMs. The backup of a VM with an RDM proceeds in the same manner as one without an RDM. The following will walk through the difference between a strictly VMFS backup and a VMFS and RDM backup.

The following VM as shown in Figure 146, **testing_veeam**, has two disks, one VMFS highlighted in blue and one DM highlighted in red, all on PowerMax array 000120001672.

Edit Settings testing_veeam							
Virtual Hardware VM Option	ns Advanced Parameter	'S					
		ADD NEW DEVI	ICE ~				
> CPU	_4 v (i)						
> Memory	16	✓ <u></u>					
> Hard disk 1	32	GB ~	÷				
∨ Hard disk 2	39.999		1 E				
VM storage policy	Datastore Default ~						
Sharing	No sharing \vee						
Physical LUN	vml.0200080000600009	97000012000167253303031323453594d4d4554					
Compatibility Mode	Physical 🗸						
Disk File	[TEST_VEEAM] testing_v	eeam/testing_veeam_1.vmdk					
Virtual Device Node	SCSI controller 0 V	il(0:1) Hard disk 2 \vee					
		CANCEL	ок				

Figure 146. VM with VMFS and RDM

Within the Veeam console, navigate to the resource pool or the folder where the VM is stored and right-click on the VM in the right-hand panel. Select **Add to backup job -> New job...** as shown in Figure 147.

전 역 VM Tools 국내 Home View Virtual Machine	Veeam Backup	o and Replication	- □ ×
VeeamZIP Quick Quick Restore Disable Install Management Backup Migration - processing Agent	Add to Add to Backup * Replication * VM Copy * Failover Plan * Jobs		Veeam Al Online Assistant
Inventory	Q Type in an object name to search for	×	
Malware Detection Virtual Infrastructure Interview VSphere Interview VS	Name ↓ Use Second Second Seco	ed Size Host Guest OS 246 GB dsib1197.drm.lab.emc Other 3.x Linux (64-bit) 100 GB dsib1197.drm.lab.emc Other 3.x Linux (64-bit) 32 GB dsib1197.drm.lab.emc Oracle Linux 8 (64-bit) 52.7 GB dsib0049.drm.lab.emc Oracle Linux 8 (64-bit) 2.6 TB dsib1197.drm.lab.emc SUSE Linux Enterprise 15 (64-bit) 2.6 TB dsib1197.drm.lab.emc SUSE Linux Enterprise 15 (64-bit) New job In Enterprise 15 (64-bit) In Enterprise 15 (64-bit) Backup_veeam_fc_vm In Enterprise 15 (64-bit) In Enterprise 15 (64-bit) 132.3 GB dsib1197.drm.lab.emc SUSE Linux Enterprise 15 (64-bit) 132.3 GB dsib1197.drm.lab.emc Ubuntu Linux (64-bit) 0 B dsib1197.drm.lab.emc Ubuntu Linux (64-bit) 132.3 GB dsib1197.drm.lab.emc Ubuntu Linux (64-bit) 0 B dsib1197.drm.lab.emc Ubuntu Linux (64-bit)	Last Bac less thar less th

Figure 147. VM with VMFS and RDM backup: Step 1

Provide a name for the backup job and a description in Step 2, Figure 148.

New Backup Job	×
Name Type in a name and	description for this backup job.
Name	Name:
Mar Martinez	RDM_backup
Virtual Machines	Description:
Storage	Backup VM with an RDM
Guest Processing	
Schedule	
Summary	
	High priority Backup infrastructure resources are offered to high priority jobs first. Use this option for jobs sensitive to the start time, or jobs with strict RPO requirements.
	< Previous Next > Finish Cancel

Figure 148. VM with VMFS and RDM backup: Step 2

In Step 3, Figure 149 Veeam provides the user with the option of adding more VMs and/or changing aspects of individual VMs. For example, individual disks can be removed from backup. Note that Veeam at this point does not have the RDM listed in exclusions as it was not manually excluded as part of the backup.

New Backup Job				×
Virtual Machines Select virtual mac changes as you a	s hines to process via container, or gra dd new VMs into the container.	nularly. Container provides dyr	namic selection th	nat automatically
Name	Virtual machines to backup:			
	Name	Туре	Size	Add
Virtual Machines	testing_veeam	Virtual machine	32.0 GB	Remove
Storage				
Guest Processing				Exclusions
Schedule				
Summary				♣ Down
				Recalculate
				Total size: 32.0 GB
		< Previous Ne	ext > Fin	ish Cancel

Figure 149. VM with VMFS and RDM backup: Step 3

Step 4 will default to the PowerMax Plug-in as the repository of choice and set the backup proxy as **Automatic selection** which cannot be altered. The other options in Figure 150 were discussed previously in the Backup section.

New Backup Job	×				
Specify process this job and cu	sing proxy server to be used for source data retrieval, backup repository to store the backup files produced by stomize advanced job settings if required.				
Name	Backup proxy:				
	Automatic selection Choose				
Virtual Machines	Backup repository:				
Storage	Dell PowerMax Snapshot (Primary storage snapshot only)				
Guest Processing	Retention policy: 7 🗘 restore points 🗸				
Schedule	Configure secondary destinations for this job				
Summary	Copy backups produced by this job to another backup repository, or tape. We recommend to make at least one copy of your backups to a different storage device that is located off-site.				
	Advanced job settings include backup mode, compression and deduplication, block size, notification settings, automated post-job activity and other settings.				
	< Previous Next > Finish Cancel				

Figure 150. VM with VMFS and RDM backup: Step 4

As Steps 5 and 6 were detailed earlier in the paper, and as there is nothing specific to RDMs, they are simply included here for completeness in Figure 151 and Figure 152.
New Backup Job		×
Guest Processin Choose guest O	ig S processing options available for running VMs.	
Name Virtual Machines	Enable application-aware processing Detects and prepares applications for consistent backup, performs transaction logs configures the OS to perform required application restore steps upon first boot. Customize application handling options for individual machines and applications	processing, and Applications
storage	Guest interaction proxy:	
Guest Processing	Automatic selection	Choose
Schedule	Guest OS credentials:	
Commence	Select existing credentials or add new	Add
Summary	Manage accounts Customize guest OS credentials for individual machines and operating systems Verify network connectivity and credentials for each machine included in the job	Credentials Test Now
	< Previous Next > Finish	Cancel

Figure 151. VM with VMFS and RDM backup: Step 5

New Backup Job							
Schedule Specify the job	scheduling options. If you do not se	t the schedule, t	he job will n	ieed t	to be controlled	manually.	
Name	Run the job automatically	(
Virtual Machiner	Daily at this time:	10:00 PM 🗘	Everyday			~	
VIItual Machines	O Monthly at this time:	10:00 PM 🗘	Fourth	~	Saturday	\sim	Months
Storage	O Periodically every:	1 ~	Hours				
Guest Processing	O After this job:	Backup_veeam	_fc_vm (Back	kup a	VM attached the	rough Fibr	e Channel]
Schedule	Automatic retry						
Summary	✓ Retry failed items pro Wait before each retry	cessing: 3 / attempt for: 1	0 0 m	mes inute	5		
	Backup window						
	Terminate the job out	Terminate the job outside of the allowed backup window					
	Long running or accie on your production in	dentally started j nfrastructure dur	obs will be t ing busy ho	ermir urs.	nated to prevent	impact	
		< F	Previous	A	pply Fi	nish	Cancel

Figure 152. VM with VMFS and RDM backup: Step 6

In Step 7 in Figure 153 check the box Run the job when I click Finish and select Finish.

New Backup Job		×
You have successful	lly created the new backup job.	
Name	Summary:	_
Virtual Machines	Configuration has been successfully saved. Name: RDM_backup Tarrote Path: Dell PowerMay Storage	
Storage	Type: VMware Backup Source items:	
Guest Processing	testing_veeam (dsib2226.drm.lab.emc.com)	
Schedule	PowerShell cmdlet for starting the job: Get-VBRJob -Name "RDM_backup" Start-VBRJob	
Summary		
	✓ Run the job when I click Finish	
	< Previous Next > Finish Cancel	

Figure 153. VM with VMFS and RDM backup: Step 7

Since this was a snapshot using PowerMax technology, it will complete quickly. Navigate to the **History** section to see if the job was successful. In Figure 154 the job is successful.

🖳 RDM_backup (Storag	je Snapshot)						×
Job progress:				100%			1 of 1 VMs
				a secondaria			
SUMMARY		DATA		STATUS			
Duration:	00:22	Processed:	N/A	Success:	0		
Processing rate:	N/A	Read:	N/A	Warnings:	1 🔺		
Bottleneck:	N/A	Transferred:	N/A	Errors:	0		
THROUGHPUT (ALL TIM	E)						
Name	Status	Action				Durat	ion
🛅 testing_veeam	🔥 Warning	🥝 Job started at 6	6/16/2024 1:04:54	PM			
		Building list of	machines to proce	SS		00:02	1
		Oueued for pro	ocessing at 6/16/20)24 1:05:05 PM			
		C Required backu	up infrastructure re	sources have been assigned	t i	00:00	,
		O All VIVIS have b	een prepared for st	orage snapsnot		00:04	,
		Primary storage	ith warping at 6/16	/2024 1:05:16 DM		00:05	'
		Job Inished wi	ith warning at 0/10	72024 1:03:10 PM			
Hide Details							ОК

Figure 154. VM with VMFS and RDM backup: Complete

Since there are no additional messages, the assumption is that the VM was completely backed up. However, since there is an RDM, the logs need to be consulted. The logs by default are located on the Veeam Windows server in c:\ProgramData\Veeam\Backup\<backup_job_name>.

Reviewing the log in Figure 155 the expected entries are found which indicate that Veeam skipped the RDM. Note that Veeam views that job as successful since the VMFS disks were backed up.

Job.RDM_backup.Backup.log - Note	epad		- 0	×
File Edit Format View Help				
[16.06.2024 13:05:15.240]	<01>	Info (3)	ProxyPort: '0'	^
[16.06.2024 13:05:15.240]	<01>	Info (3)	ManagedThreadId: '1'	
[16.06.2024 13:05:15.240]	<01>	Info (3)	is disposing	
[16.06.2024 13:05:15.249]	<01>	Warning (3)	Disk testing_veeam_1.vmdk has been skipped due to an unsupported type (raw device mapping disk in physical compatibility mode)	
[16.06.2024 13:05:15.257]	<01>	Info (3)	[TimeSync]Client synchronization process was created	
[16.06.2024 13:05:15.277]	<01>	Info (3)	[0ib] Create [vmname=testing_veeam:object_id=8c59c49d-170d-44d4-8216-0c386eee201c:creation_time=6/16/2024 1:04:28 PM:creation_time_utc	=6/
[16.06.2024 13:05:15.306]	<01>	Info (3)	[SanVm] Created multihomed oib '[vmname=testing_veeam:object_id=8c59c49d-170d-44d4-8216-0c386eee201c:creation_time=6/16/2024 1:04:28 P	M:c
6.drm.lab.emc.com\London_C	luster<,	/Location> <oij< td=""><td>Id>00000000-0000-0000-0000-0000000000000</td><td>×/V</td></oij<>	Id>00000000-0000-0000-0000-0000000000000	×/V
[16.06.2024 13:05:15.306]	<01>	Info (3)	<type _type="ParaVirtualSCSIController"></type>	
[16.06.2024 13:05:15.306]	<01>	Info (3)	testing_veeam.vmdk <flatfilename>testing_veeam-flat.vmdk</flatfilename>	<ch< td=""></ch<>
43037b70-8cf9-34800d504b16-	<td>tastoreUuid><v< td=""><td>/mxDiskPaths><vmxdiskpath>testing_veeam.vmdk</vmxdiskpath><vmxdiskpath>testing_veeam_1.vmdk</vmxdiskpath><storagesnapshotj< td=""><td>obN</td></storagesnapshotj<></td></v<></td>	tastoreUuid> <v< td=""><td>/mxDiskPaths><vmxdiskpath>testing_veeam.vmdk</vmxdiskpath><vmxdiskpath>testing_veeam_1.vmdk</vmxdiskpath><storagesnapshotj< td=""><td>obN</td></storagesnapshotj<></td></v<>	/mxDiskPaths> <vmxdiskpath>testing_veeam.vmdk</vmxdiskpath> <vmxdiskpath>testing_veeam_1.vmdk</vmxdiskpath> <storagesnapshotj< td=""><td>obN</td></storagesnapshotj<>	obN
[16.06.2024 13:05:15.309]	<01>	Warning (3)	Disk testing_veeam_1.vmdk has been skipped due to an unsupported type (raw device mapping disk in physical compatibility mode)	
[16.06.2024 13:05:15.312]	<01>	Info (3)	[DbScope] Creating SanViDiskDbInfo: 'Id: cfc65aaf-276d-4e4c-9044-4451c6dc6ded, OibId: 22a61e89-a14a-4fbd-aa8d-a5cce1980a2c, Key: 2000,	Un
[16.06.2024 13:05:15.317]	<01>	Info (3)	[DbScope] Creating SanViDiskFileDbInfo: 'Id: 970ec0dc-f38b-45e7-83c3-6bedb3bc8e1a, SanViDiskInfoId: cfc65aaf-276d-4e4c-9044-4451c6dc6d	ed,
[16 06 202/ 13.05.15 328]	2015	Info (3)	[sanchanchtsollnca]====================================	```
			Ln 350, Col 109 100% Windows (CRLF) UTF-8	

Figure 155. VM_VMFS_RDM_backup job log

If the VM is then restored, the configuration file (vmx) is adjusted to remove reference to the RDM. This is highlighted in Figure 156.

estore Session							×
Name: Restore type: Initiated by:	testin Instan DSIB21	g_veeam t VM Rec 117\Adm	overy inistrator	Status: Start time:	In progress 6/16/2024 1:13:45 PN	И	
Reason Para	meters	Log					
Message Binding 00	0012000	1672:001	42:Veeam-RDMb	ackup-17185683125	i11:0:00145 to FC a	Duration 0:00:20	^
Cooking u Looking u	p SCSI I p datas	LUN for s tore for S	napshot clone 00 CSI LUN EMC Fil	0120001672:00142:\ ore Channel Disk (n:	/eeam-RDMbacku aa.60000970000120	0.00.02	
Updating 9	VM con	figuratio	n	101 3031 2014 1148.04		0:00:02	
Registerin Registerin	g VM te g VM	esting_vee	eam_rdm on hos	t dsib1197.drm.lab.	emc.com	0:00:02	-
No VM tags to restore Updating session history							-
testing_veeam_rdm has been recovered successfully Waiting for user to start migration							

Figure 156. Veeam_rdm_vm restore

Looking at the restored VM, the RDM is gone as shown in Figure 157. Since Veeam allows the use of preand post-scripts, a manual snapshot could be executed against the RDM device in a pre-script, and then readded in a post-script. However, the VMFS and RDM devices would not be consistent if that's required.

Intual Hardware VM Op	tions Advanced Parameters	ADD NEW DEVICE
> CPU	<u>4 v</u> (1)	
> Memory	16 <u>GB v</u>	
> Hard disk 1	32 GB ~	:
> SCSI controller 0	VMware Paravirtual	:
> Network adapter 1	VM Network V	:
> CD/DVD drive 1	Host Device v Connect At Power On	:
> Video card	Specify custom settings $ \smallsetminus $	
> Other	Additional Hardware	

Figure 157. Veeam_rdm_vm post-restore

11 SRDF replication

Symmetrix Remote Data Facility, or SRDF, is Dell's premier replication technology for the PowerMax array. It offers asynchronous, synchronous and active configurations. In this release of PowerMax Plug-in, there is no direct integration with SRDF. Any replication relationship on the backend is unknown to the PowerMax Plug-in, but since the snapshot process is designed to work on both the R1 (local read/write) and R2 (remote write disabled) independently (i.e., snapshots are not replicated) the PowerMax Plug-in works without issue. For SRDF modes other than active mode (SRDF/Metro), there are no special considerations. SRDF/Metro will be addressed below.

Snapshots taken against an R2, when an appropriate backup proxy is set, will be scanned for VMs, though they will have no association with a VMware environment. Yet, these VMs can be used for restores. The next section will detail how this is accomplished.

11.1 Restoring VMs from R2 snapshots

Using the example in Figure 158, an asynchronous SRDF pair, A9 and 14B, exists between arrays 000120001473 and 000120001672.

D&L	LEMC	Unisphere for Pov	werMax > 0001	20001473 🗸			
ŝ	5 > SI	RDF Pairs - vm_infr0	00 (5)				
	Î						
	Ξ	Name	Configuration	Remote Array ID	Remote SRDF Group	Remote Volume	Pair State
Ŧ		0010F	RDF1+TDEV	000120001672	5 (4)	0010D	Consistent

Figure 158. SRDF/A pair in Veeam environment

A backup of device **10F** was completed in Veeam, which backs datastore **VM_DEV_10F_SID_1473** with two VMs.

Volume Tools		Veeam Backup and Replication			×
Image: Provide state Forme Volume Image: Provide state Polete Rescan State Polete Actions	O. Turns in an object name to co	and for	2		Veeam Al Online Assistant
▷ 000120001473:00109 ▷ 000120001473:0010A ▷ 000120001473:0010C ▷ DailyDefault (00:12:15 Sat, 15 Jun 2024 +0000) ▷ DailyDefault (00:12:19 Fri, 14 Jun 2024 +0000) ▷ DailyDefault (00:12:19 Kin, 13 Jun 2024 +0000) ▷ DailyDefault (00:12:19 Wert 12 lun 2024 +0000) ▷ DailyDefault (00:12:19 Wert 12 lun 2024 +0000)	 Name ↑ Bib0199.drm.lab.emc.com dsib2235.drm.lab.emc.com 	Host dsib0027.drm.lab.emc.com dsib0049.drm.lab.emc.com	State Crash-consistent snapshot Crash-consistent snapshot	Size Protected 58.6 GB 116.6 GB	by
Poine Inventory Gaskup Infrastructure					
Storage Infrastructure					
	* <				>

Figure 159. Backup of R1 device with 10F

Now as the R2 device, 10D, is write-disabled, it is not possible to use the backup workflow in Veeam. Therefore, the only option is a manual snapshot. Since this wizard was demonstrated in section Manual snapshots, only an abbreviated display is shown in Figure 160.

	New Storage Snapshot		×		
	Volume name:	000120001672:0010D			
	Snapshot name:	Manual_R2_10D_1672			
	Snapshot description:	R2 manual snapshot			
Storage snapshot		ОК	Cancel		×
Name: Create storage snapshot		Status: Succes	5	_	
Action type: Storage Snapshot Creation		Start time: 6/16/20	24 2:45:34 PM		
Initiated by: DSIB2117\Administrator		End time: 6/16/20	24 2:46:22 PM		
Parameters Log					
Message					Duration
Sending request to create storage snapshot Manual_R2_10	D_1672				0:00:02
Storage snapshot created successfully, and will now be sca	anned for content				
UN 000120001672:0010D configuration refresh completed	l successfully				
UN 000120001672:0010D from volume 000120001672:0010	D is not a VMFS LUN, or f	the corresponding VMware host is not regi	stered with Veeam	Backup and Replication	0:00:04
List of VMs on LUN Manual_R2_10D_1672 (21:44:54 Sun, 16	Jun 2024 +0000) from sn	apshot Manual_R2_10D_1672 (21:44:54 Sun,	, 16 Jun 2024 +000	0) of volume 000120001672:0010D obtained successfully	0:00:35
Volume 000120001672:0010D rescan completed					
Storage snapshot is ready for restore operations					
Job finished at 6/16/2024 2:46:22 PM					
٢					>
					Close

Figure 160. Manual snapshot of R2 device with datastore

In the log file above, a red box highlights two important outputs from Veeam. The first is that Veeam recognizes the device is not part of a VMware host or registered. Being an R2 write-disabled device, even if it is presented to the ESXi hosts, it does not have a mountable datastore. The second line of output, however, informs the user that Veeam has discovered VMs on the device. Since Veeam uses a proprietary process to read the device, it does not need a mounted datastore to discover the VMs. However the **Host** is empty since the VM is not registered.



Figure 161. Manual snapshot with recorded VM

Since Veeam has recognized that there is a VM on the R2 device via the snapshot, it is possible to use the snapshot to restore the VM to the existing infrastructure.

11.1.1 R2 VM restore

When restoring the VM from the R2 snapshot, because the VM has no original location in the vCenter, it must be restored to a new location.

Instant Recovery to VMware	vSphere X
Restore Mode Specify whether	selected VMs should be restored back to the original location, or to a new location or with different settings.
Machines	Restore to the original location Quickly initiate the restore of selected VM to its original location, with the original name and
Restore Mode	settings. This option minimizes the chance of user input error.
Host	Restore to a new location, or with different settings Customize the restored VM location, and change its settings. The wizard will automatically populate
Folder	all controls with the original VM settings as the defaults.
Reason	
Summary	
	Restore VM tags
	< Previous Next > Finish Cancel

Figure 162. Restore R2 VM: Step 1

To demonstrate this, initially all locations are empty as shown in Figure 163. Update them with the appropriate locations and be sure to rename the VM if the user is restoring to the same location as the R1 VM. Both Host and Resource Pool must be selected before proceeding.

	Instant Recovery to VMware vSphere > Host Select the host to recover machine to. Machines VM location:								
	Restore Mode	Name dsib0199.drm.lab.emc.com dsib2235.drm.lab.emc.com	n n	Host dsib1195.drm.lab.emc.c dsib1195.drm.lab.emc.c	Resource Pool Resources				
	riosi.			_					
	Folder								
	Reason								
	Summary								
		Select multiple VMs and click I	Select multiple VMs and click Host to apply changes in bulk. Host Pool						
				< Previous Next >	Finish	Cancel			
Select Host		×	Sele	ect Resource Pool			×		
Select host:		(5)	Sel	lect resource pool:			<u>C</u> 2		
V 😭 Host	ts		~	 Hosts and Clusters 					
	dsib2224.drm.lab.emc.com			> 🚽 dsib1195.drm.lab.emc.co	om				
	✓ 📴 Boston_Cluster		Type in an object name to search for						
	dsib0180.drm.lab.emc.co	om							
	dsib0184.drm.lab.emc.co	om			OK	Car	icei		
	dsib0186.drm.lab.emc.co	om							
	dsib1194.drm.lab.emc.co	om							
> 🔣 c	dsib2226.drm.lab.emc.com								
Type in	an object name to search for	Q							
	[OK Cancel							

Figure 163. Restore R2 VM: Step 2

In Figure 164, **Customize...** the VMs with new BIOS UUID and prefixes.

SRDF replication

istant Recovery to VMware v	/Sphere		
Folder By default, origin clicking Folder. U	al VM folder is selected as restore destina se multi-select (Ctrl-click and Shift-click)	ation for each VM. You can chang) to select multiple VMs at once.	e folder by selecting desired VM a
Machines	VM settings		
Destant Marke	New Name	BIOS UUID	Folder
(estore Mode	dsib0199.drm.lab.emc.com	Preserve	vm
Host	dsib2235.drm.lab.emc.com	Preserve	📫 vm
Folder			
older			
Reason			
Summary			
VM Settings	×	1	
vivi Settings			
Set name to:			
dsib0199.drm.lab.emc.co	m		
Add prefix:			
R2_			
Add suffix:			
_restored		gs - gein bella	Customize Folder
BIOS UUID:			
O Preserve BIOS UUID		< Previous Next >	Finish Cancel
Preserving system UL with applications tha	JID for the restored VM prevents issues it match system by UUID.		
Generate new BIOS UI	JID		
Generating new UUID the restored clone ar) prevents possible conflicts between id the original machine.		
	OK Cancel		

Figure 164. Restore R2 VM: Step 3

Review the summary before finishing as shown in Figure 165.

Instant Recovery to VMware	Sphere ×
You can copy this	configuration information for the future reference.
Machines	Summary:
Restore Mode	New machine name: R2_dsib0199.drm.lab.emc.com Restore point: less than a day ago (2:44 PM Sunday 6/16/2024)
Host	Target host: dsib1195.drm.lab.emc.com Target resource pool: Resources
Folder	Target VM folder: vm
Reason	Original machine name: dsib2235.drm.lab.emc.com New machine name: R2_dsib2235.drm.lab.emc.com
Summary	Restore point: less than a day ago (2:44 PM Sunday 6/16/2024) Target host: dsib1195.drm.lab.emc.com
	Target resource pool: Resources Target VM folder: vm
	Connect VMs to network
	Power on target VMs after restoring
	< Previous Next > Finish Cancel

Figure 165. Restore R2 VM: Summary

The restore completes. Review in the log file as shown in Figure 166.

estore Session				
Name: dsib0199 Restore type: Instant V Initiated by: DSIB2117	9.drm.lab.emc.com M Recovery ∿Administrator	Status: Start time:	In progress 6/17/2024 7:26:55 AN	И
Reason Parameters L	og			
Message Starting R2_dsib019	9.drm.lab.emc.com reco	very		Duration
Connecting to host	dsib1195.drm.lab.emc.co	om		0:00:01
Locking storage sna	pshot			
🕑 Using existing snap	shot clone of volume 000	0120001672:0010D:	Manual_R2_10D_16	
📀 Using already mour	ted datastore snap-1086	b934-VM_DEV_108	_SID_1473 on host	
💟 Updating VM config	juration			0:00:14
🛛 Registering VM R2_0	dsib0199.drm.lab.emc.co	m on host dsib11	95.drm.lab.emc.com	0:00:02
Registering VM				0:00:01
💟 No VM tags to resto	re			0:00:01
🕑 Updating session hi	story			
💟 R2_dsib0199.drm.lal	emc.com has been reco	overed successfull	у	
🛛 Waiting for user to s	tart migration			

Figure 166. Restore R2 VM: Summary

The restored VM is now available in the vCenter as shown in Figure 167.

🗎 snap-1086b93	4-VM_DI	EV_10F_SI	D_1473	3 : AC	TIONS
Summary Monitor	Configure	Permissions	Files	Hosts	VMs
Virtual Machines VM	Templates]			
Quick Filter V Ente	r value				
Name			\uparrow	State	
🗌 🗏 🛱 <u>R2 dsib0199</u>	.drm.lab.emc.c	<u>com</u>		Powered (Off
□ □ □ □ <u>R2 dsib2235</u>	5.drm.lab.emc.o	com		Powered (Off

Figure 167. Restore R2 VM: vCenter

11.2 SRDF/Metro

The behavior of SRDF/Metro snapshots with the PowerMax Plug-in depends on the presentation of devices. The key to the configuration is to only add the array to the infrastructure that will be used for snapshots. This will not limit the ability to use uniform configurations if required, though Dell recommends non-uniform. While the ESXi hosts can see both paths with uniform, as long as Veeam is only configured for either the R1 or R2, this is where the snapshot will be taken. If both arrays are needed in the Veeam configuration for other reasons, then the exact R2 volumes in the Metro pair(s) should be excluded with the previously explained filtering mechanism. Figure 168 shows an example of excluding the R2 device 4C in the SRDF/Metro pair.

Edit Volumes	X
Select storage volumes to analyze for the presence of new Limiting the number of volumes reduces storage load. All existing volumes All VMFS and NFS volumes found during the periodic	vly added VMs. : storage
infrastructure rescan will be analyzed. All volumes except:	
Name	Add
000197600357:0004C	Remove
	-
	-
 Only the following volumes: 	
Name	Add
	Remove
ОК	Cancel

Figure 168. Exclude R2 SRDF/Metro device

If both arrays are configured in Veeam and filtering is not present on one of the devices, Veeam may choose either of the arrays for the snapshot, potentially causing issues during backup and restore. For example, in the image shown in Figure 169 in the blue box, Veeam automatically discovered the datastore VM_INFRA_3 and its VMs on device 117 on array 000197600355 (R1). Yet, when a manual backup was executed against VM dsib2235.lss.emc.com, Veeam took a snapshot of device 133 on array 000197600450 in the red box, which is the R2. Filtering is critical to prevent these situations.

JOB NAME	CREATION TIME	RESTORE POINTS	REPOSITORY	PLATFORM
000197600450:00214	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
000197600450:00213	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
000197600450:00211	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
000197600450:00179	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
000197600450:00160	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
000197600450:00151 (iSCSI_1)	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
000197600450:0014E	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
000197600450:00147	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
📩 dsib2235.lss.emc.com	6/9/2021 12:16 PM	1		
📩 dsib2018.lss.emc.com	6/9/2021 12:16 PM	1		
📩 dsib2014.lss.emc.com	6/9/2021 12:16 PM	1		
🚰 dsib2013.lss.emc.com	6/9/2021 12:16 PM	1		
B 200197600450:0009E (VEEAM2)	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
^b ^b ^b ^c	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
B 200197600450:00052 (TRANSFER_450)	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
\u00e9 000197600450:00050 \u00e9 \u0e9 \u00e9 \u00e9 \u00e9 \u00e9 \u0e9 \u00e9 \u0e9	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
& 000197600450:0003A (TEST_iSCSI_VEEAM)	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
8 200197600357:00551 (SRA_551_161)	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
Image: Book and Amage: Book	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
O00197600355:00117 (VM_INFRA_3)	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
dsib2235.lss.emc.com	6/8/2021 9:00 PM	14		
dsib2134.lss.emc.com	6/8/2021 9:00 PM	14		
dsib2032.lss.emc.com	6/8/2021 9:00 PM	14		
📩 dsib2018.lss.emc.com	6/8/2021 9:00 PM	14		
dsib2014.lss.emc.com	6/8/2021 9:00 PM	14		
dsib2013.lss.emc.com	6/8/2021 9:00 PM	14		
dsib2012.lss.emc.com	6/8/2021 9:00 PM	14		
🖆 dsib2010.lss.emc.com	6/8/2021 9:00 PM	14		
🚰 dsib0227.lss.emc.com	6/8/2021 9:00 PM	14		
Maintoine 2001 10 10 10 10 10 10 10 10 10 10 10 10	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware
Lagrandow March 20197600355:00061 (VM_INFRA_1)	4/21/2021 3:15 PM		dsib2017.lss.emc.com	VMware

Figure 169. SRDF/Metro pair underlying VM_INFRA_3 datastore

11.2.1 SRDF/Metro with Veeam GUI filtering or symavoid.txt

As previously explained, the use of the symavoid.txt file allows the user to exclude a local array from discovery. While this improves performance for that activity, it may not prevent an unwanted action. The following situation illustrates the point:

User configures vCenter A with an SRDF/Metro device that is only presented from the R2 array (i.e., there are only paths to the R2 device).

A datastore is created on the R2 and then on a VM.

The user configures the symavoid.txt file to contain the R2 array and rescans, which removes the R2 array from Veeam. Presumably this will prevent any snapshot operation against the R2 device. An attempt is made to back up a VM that is on the SRDF/Metro datastore (R2) and it succeeds, taking a snapshot of the <u>R1 device</u> instead.

The reason it succeeds is that Veeam looks at the device ID (external WWN) which is from the R1 array. Since the R1 array is configured, it makes a call to the REST API to take a snapshot of the R1. Now, technically the data on the R1 and R2 is the same, of course, but if the user then tries to run a restore of the VM, it is executed on the R1 array. If the Veeam masking view only exists on the R2 and not the R1, the restore is going to fail. It speaks to the importance in SRDF/Metro of using filtering.

If there are specific requirements in the customer environment that dictate the snapshot must be taken solely from either the R1 or the R2, use the Veeam GUI to exclude the actual device(s) on the R1 or R2. This guarantees the PowerMax Plug-in cannot take a snapshot on that array for that device.

12 Conclusion

This paper demonstrated how to use the PowerMax Plug-in with Veeam Backup & Replication software to take backups of VMware VMs on the PowerMax array. The array snapshot integration provides a far more efficient way to back up a virtual environment by reducing CPU, memory and network resources that are inherent in a host-based solution. The PowerMax Plug-in is able to use existing snapshots for restore, taking advantage of objects created or manipulated outside of the Veeam interface and providing more options to the VMware administrator.

A Error/warning messages

The following sections detail some known issues when using the PowerMax Plug-in. Although these situations are uncommon, they are included to avoid confusion for the user should they encounter one.

A.1 Unisphere version

If an attempt is made to connect to a Unisphere instance that does not meet the version requirements, the following error shown in Figure 170 is received.

New Dell PowerMax Storage		\times
Credentials Technologies Specify account with	n storage administrator privileges.	
Name	Credentials:	44
Credentials	Manage accounts	.aa
VMware vSphere Apply Summary	Veeam Backup and Replication X Failed to connect to storage 10.228.244.99: Unsupported Unisphere version 'V9.2.4.9'. Version 10.0.1.0 or later is supported. OK	
	< Previous Next > Finish C	ancel

Figure 170. Unisphere version connection error

The log file **Console_<host>_<user>.log** in C:\ProgramData\Veeam\Backup\Console\localhost can be queried, though it offers similar information. However, if the IP/FQDN does not refer to a Unisphere instance, then the error shown in Figure 171 is returned.



Figure 171. Generic connection error

The log file reports the same error as the GUI.

[28.06.2021 09:55:31] <01> Info Response from storage 10.228.244.240: <?xml
version="1.0"?><ValidateConnectionResponce><error>Failed to connect to storage
10.228.244.240: Error calling GetVersion: Unable to connect to the remote
server</error><status>False</status></ValidateConnectionResponce>

A.2 Cleanup failures

A.2.1 Failure to remove snapshot

When a significant number of backup jobs to the Veeam repository are running, it is possible for the PowerMax Plug-in to fail to unlink the target device from the snapshot during cleanup. If this occurs, the PowerMax Plug-in will rename the snapshot to **VeeamAUX-DeletePending-<timestamp>**. This renaming will then allow the PowerMax Plug-in to retry operations at a later time. Therefore, this condition can be ignored.

If a significant number of these devices are present, their use of array cache could limit future operations. In such circumstances, the user should execute a rescan of the storage show in Figure 172 which will automatically remove the snapshot devices in question.



Figure 172. Rescan storage

A.2.2 Failure to remove linked target device

If the PowerMax Plug-in is unable to delete the linked target device during cleanup, it will rename the identifier of the device to **VeeamAUX-DeletePending**. An example of this is shown in Figure 173.

VEEAM_dsib1197_	_ <mark>sg</mark> ≻ SG All Details					
Details	Volumes	Data Protection				
Create Expand	Add Volumes To SG	Remove Volumes	0 0 0			
Name	Туре	сарасі	ty (GB)	Unreducible (GB)	Emulation	Status
00145	TDE	/	0.01	0	FBA	Ready
0014A:VeeamAUX-	DeletePending TDE	/	50	0	FBA	Ready
0014B:VeeamAUX-	DeletePending TDE	/	50	0	FBA	Ready

Figure 173. Undeleted linked targets

Again, this renaming signals the PowerMax Plug-in to clean up the devices at a later time. It is also possible to manually remove these devices if desired, though they may first have to be removed from the **Veeam_xxx** storage group.

A.3 Multi-writer flag

Veeam cannot back up VMs that have the multi-writer flag enabled on a device when dependent mode is set. This is because VMware does not support snapshotting a dependent mode vmdk. The VM dsib2019.lss.emc.com shown in Figure 174 is an Oracle RAC database, and so it requires multi-writer. Notice that Veeam errors out immediately when it discovers the flag, but also provides the workaround that setting the mode to independent would allow Veeam to skip the disks.

Job progress: 00% 0 of 0 V SUMMARY DATA STATUS Duration: 00:05 Processed: N/A Success: 0 Processing rate: N/A Read: N/A Warnings: 0 Bottleneck: N/A Transferred: N/A Errors: 0	🗼 test (Storage Snapshot)								
SUMMARY DATA STATUS Duration: 00:05 Processed: N/A Success: 0 Processing rate: N/A Read: N/A Warnings: 0 Bottleneck: N/A Transferred: N/A Errors: 0	Job progress:				100%				0 of 0 VMs
SUMMARY DATA STATUS Duration: 00:05 Processed: N/A Success: 0 Processing rate: N/A Read: N/A Warnings: 0 Bottleneck: N/A Transferred: N/A Errors: 0									
Duration: 00:05 Processed: N/A Success: 0 Processing rate: N/A Read: N/A Warnings: 0 Bottleneck: N/A Transferred: N/A Errors: 0	SUMMARY		DATA		STATUS				
Processing rate: N/A Read: N/A Warnings: 0 Bottleneck: N/A Transferred: N/A Errors: 0	Duration:	00:05	Processed:	N/A	Success:	0			
Bottleneck: N/A Transferred: N/A Errors: 0	Processing rate:	N/A	Read:	N/A	Warnings:	0			
THROUGHPUT (ALL TIME)	Bottleneck:	N/A	Transferred:	N/A	Errors:	0			
	THROUGHPUT (ALL TIME)								
Name Action Duration	Name	Action							Duration
O Job started at 6/17/2024 8:08:05 AM		Job started	d at 6/17/2024 8:08:05 A	M					
Building list of machines to process 00:01		Suilding li	ist of machines to process						00:01
Will testing-veeam has dependent mode disks with multi-writer option enabled, skipping (set multi-writer disks mode to independent)		VM testing	g_veeam has dependent	mode disks with mu	Iti-writer option enabled, s	skipping (set multi-w	riter disks mode	to independent)	
A Nothing to process all machines were excluded from task list		Nothing to	ed with warning at 6/17/	ere excluded from ta	SK IIST				
		100 milisine	ed with warning at 0/ 17/1	1024 0.00.11 AM					
Hide Detaile	Hide Details								OK

Figure 174. Multi-writer flag

A.4 VMware Virtual Volumes (vVols)

Veeam does not support backing up vVol VMs. An attempt is made to back up the following VM, vVol_355_VM_1, in Figure 175, which is located on a vVol datastore.

vr	n vSphere Client	Menu 🗸	Q Search in all environments		
[]]	B 🖹 👰		₽ vVol_355_VM_1	D 🗆 🔂 🖗	actions V
	> 🕢 UNMAP > 🕢 Veeam > 🖉 VMs		Summary Monitor Con	figure Permission	s Datastores
	✓ Ø vVol_VMs		Name 🗸 🗸 🗸	Status ~	Type ~
	[⊕] vVol_355_VM_1	l.	355_vVol	✓ Normal	vVol

Figure 175. Veeam backup of a vVol VM

The Veeam log file records the result of the backup as shown in Figure 176. Note in particular the highlighted portion where Veeam recognizes the datastore is neither on SAN (VMFS) nor NAS (NFS), and therefore determines it is not snapshot-compatible.

Job.vVol_355_VM_1_backup.Backup.log - Notep	ad			-		×
File Edit Format View Help						
[18.05.2021 14:02:20] <01> Info	Got 1 processing entries					^
[18.05.2021 14:02:20] <01> Info	[VM name: 'vVol_355_VM_1', Host	name: 'dsib2224.lss.emc.	com' Source job ids: []]			
[18.05.2021 14:02:20] <01> Info	Allowed repositories: All					
[18.05.2021 14:02:20] <01> Info	[ViTaskBuilder] Prepare SAN availabilit	y information for VMs				
[18.05.2021 14:02:20] <01> Info	[ViTaskBuilder] Prepare SAN availabilit	y information for VM: 'vV	o1_355_VM_1'			
[18.05.2021 14:02:20] <01> Info	[ViVmStorageIntegrationChecker] Detecti	ng storage snapshot compa	tibility for datastores o	n 'vVol_355_V	1_1' V	м
[18.05.2021 14:02:20] <01> Info	[VirtualMachine] Obtaining list of data	stores that the next snap	shot will use			
[18.05.2021 14:02:20] <01> Warning	[TryOverrideApiVersion] The native API	version [7.0.2] for VC [d	sib2224.lss.emc.com] was	changed to cur	rrent r	max
supported [7.0.1]						
[18.05.2021 14:02:20] <01> Info	[VirtualMachine] Snapshot directory was	not specified or equals	VMX directory			
[18.05.2021 14:02:20] <01> Info	[VirtualMachine] Considering all datast	ores on which VM's disks	are located as snapshot h	older datasto	res	
[18.05.2021 14:02:20] <01> Info	[ViVmStorageIntegrationChecker] Checkin	ng storage snapshot compat	ibility for '355_vVol' da	tastore.		
[18.05.2021 14:02:20] <01> Info	[DatastoreSANInfo] Datastore '355_vVol'	('datastore-10010') LUNs	and NFS information from	1		
'dsib2224.lss.emc.com', '0ad2ad96-2	21ae-4fa7-b38a-39313a5cec37'.					
[18.05.2021 14:02:20] <01> Info	[ViVmStorageIntegrationChecker] Datasto	re '355_vVol', 'datastore	-10010' storage informati	on from DB:		
[18.05.2021 14:02:20] <01> Info	[ViVmStorageIntegrationChecker] Datasto	re '355_vVol', 'datastore	-10010' is not on SAN or	NAS volumes.		
[18.05.2021 14:02:20] <01> Info	[ViVmStorageIntegrationChecker] Can't f	ind datastore LUNs or inf	ormation in Backup Infras	tructure for		
'355_vVol' datastore.						
[18.05.2021 14:02:20] <01> Info	[ViVmStorageIntegrationChecker] 'vVol_3	55_VM_1' VM is not storag	e snapshot compatible.			
[18.05.2021 14:02:20] <01> Info	[ViTaskBuilder] Launch snapshot transfe	er discovering				
[18.05.2021 14:02:20] <01> Info	[ViTaskBuilder] Update VM backup from s	napshot transfer status				
[18.05.2021 14:02:21] <01> Info	[Crypto] Encrypted DB entities will be	saved				~
		Windows (CRLF)	Ln 1, Col 1	100%		

Figure 176. vVol VM backup

A.5 Duplicate extents

A condition can exist where a restore operation will fail because more than one copy of a VMFS datastore is presented to a recovery host. This may be the result of previously failed Veeam restores or operations that take place outside of Veeam. The failure will appear similar to Figure 177 which lists multiple devices that are not the ones that need resignaturing.

Name: veeam_rdm_v	m	Status:	Failed		
Restore type: Instant VM Rec	overy	Start time:	4/25/2021 2:58:12 PM	1	
nitiated by: DSIB2012\Adm	inistrator	End time:	4/25/2021 2:59:27 PM	I	
Reason Parameters Log					
Message				Duration	^
Snapshot clone 000197600	355:0007E:Veeam	-VM_VMFS_RDM_b	ackup:1619373724:	0:00:04	
Binding 000197600355:000	7E:Veeam-VM_VI	MFS_RDM_backup:	1619373724:0015B t	0:00:05	
Sescanning FC adapter vm	hba2 on host ds	ib0186.lss.emc.com	1	0:00:02	
SCSI LUN for s	napshot clone 00	00197600355:0007E:	Veeam-VM_VMFS		
S Looking up datastore for S	CSI LUN EMC Fil	bre Channel Disk (n	aa.60000970000197	0:00:15	
😢 Initiating snapshot datasto	re resignaturing	for SCSI LUN naa.6	00009700001976003	0:00:02	
💙 Unbinding 000197600355:0	Initiating spans	WMES PDM back	1610272724-0015	0.00.04	_
🥝 Rescanning FC adapter vm	naa.6000097000	01976003555330303	13542:1.naa.600009700	00019760035	553
💙 Cleaning up VM mount	0313336:1,naa.6	00009700001976003	355533030313335:1 on I	host	
Deleting snapshot clone version	dsib0186.lss.em	c.com Error: There	are one or more device	es on host	
Canceling backup file lock	trying to restore	e from. Please detai	belong to any VMFS da th these devices.	stastore you	are
Pailed to publish VM veear	in juit vit leston	E LITUL THE ODEIAL			ы

Figure 177. Failed restore operation due to multiple extents

The message itself is not explicit but reviewing the log file shown in Figure 178, Veeam notes that it cannot resignature a volume that has multiple extents. However, there aren't multiple extents, rather there are multiple devices, each with an extent.

IR.veeam_rdm_vm.Mount.log - Notepad			-		\times			
File Edit Format View Help								
<pre>VM_VMFS_RDM_backup:1619373723:0015B', InternalId: '000197600355:0007E:Veeam-VM_VMFS_RDM_backup:1619373723:0015B', Snapshot: 'Snapshot: 'Name: '000197600355:0007E:Veeam-VM_VMFS_RDM_backup:1619373723:0015B', InternalId: '000197600355:0007E'Veeam- VM_VMFS_RDM_backup:1619373723:0015B', CreationTimeUtc: '', Volume: 'Name: '000197600355:0007E', InternalId: '000197600355:0007E''' was successfully created for SAN snapshot LUN: 'Veeam-VM_VMFS_RDM_backup (4/25/2021 6:02:03 PM)' [25.04.2021 14:42:40] <01> Info [San] Mounting created clones for VM 'veeam_rdm_vm' [25.04.2021 14:42:40] <01> Info [San] Mounting clones to ESX 'dsib0186.lss.emc.com': [25.04.2021 14:42:40] <01> Info '000197600355:0007E:Veeam-VM_VMFS_RDM_backup:1619373723:0015B' ('000197600355:0007E'Veeam-VM_VMFS_RDM_backup:1619373723:0015B') [25.04.2021 14:42:40] <01> Info '000197600355:0007E:Veeam-VM_VMFS_RDM_backup:1619373723:0015B' ('000197600355:0007E'Veeam-VM_VMFS_RDM_backup:1619373723:0015B')</pre>								
6df18769d7d1'								
<pre>[25.04.2021 14:43:10] <01> Error Failed to mount clones of snapshots for 'EsxHostId '47fefe72-ablc-426e-a101-27805ca7f9e5', VmName 'veeam_rdm_vm', MountInfos: [SanSnapshotLUNId 'aa6ab982-c7f2-4bf6-b78-1942c27f5b89', EsxHostId '47fefe72-ablc-426e-a101- 27805ca7f9e5', SnapshotCloneInfo: 'Name: '000197600355:0007E:Veeam-VM_VMFS_RDM_backup:1619373723:0015B', InternalId: '000197600355:0007E:Veeam-VM_VMFS_RDM_backup:1619373723:0015B', Snapshot: 'Snapshot: 'Snapshot: 'Name: '000197600355:0007E:Veeam- VM_VMFS_RDM_backup:1619373723:0015B', InternalId: '000197600355:0007E:Veeam-VM_VMFS_RDM_backup:1619373723:0015B', CreationTimeUtc: ''', Volume: 'Name: '000197600355:0007E', InternalId: '000197600355:0007E'''', VmName 'veeam_rdm_vm']'</pre>								
[25.04.2021 14:43:10] <01> Error Failed to resign volumes that span extents								
//wmts/devices/disks/naa.600009/000019/600355533030313542:1,/vmts/devices/disks/naa.600009/000019/600355533030313336:1,/vmts/devic es/disks/naa.60000970000197600355533030313335:1'. Destination host: 'host-14107'. (Veeam.Backup.Common.CRegeneratedTraceException)								
[25.04.2021 14:43:10] <01> Error Server stack trace:					~			
	Windows (CRLF)	Ln 1, Col 1	100%					

Figure 178. Restore log file with failed multiple extents listed

In ESXi in the red box as shown in Figure 179, these extents can be listed with the command esxcli storage vmfs snapshot list. Here two different datastores have multiple copies. These extra devices/extents might be the result of Veeam operations or SnapVX linked targets performed through a different interface, i.e. Unisphere for PowerMax.



Figure 179. esxcli listing of multiple extents

Using the **naa** numbers listed in Figure 178, the devices for the **VEEAM** datastore are found to be 135 and 136, and these are devices from failed restores in the Veeam storage group shown in Figure 180. This is an unexpected state, indicating something went wrong previously with a cleanup. But because these devices have the identifier of **VeeamAUX-DeletePending**, they can be safely removed from the storage group and deleted.

Storage Groups > VEEAM_backup										
DETAILS	VOLUMES	PER	FORMANCE	DATA PROTECTION	DATA PROTECTION					
Create	Expand	Add Vol	umes To SG	Remove Volumes	:			2 it	ems \Xi	()
🗌 Name 🕶			Туре	Allocated	(%)		Capacity (GB)	Emulation	Status	=
00136:Vee	amAUX-DeletePe	ending	TDEV			6%	200.00	FBA	Ready	^
00135:Vee	amAUX-DeletePe	ending	TDEV			6%	200.00	FBA	Ready	
00055			TDEV			0%	0.01	FBA	Ready	

Figure 180. Devices from failed Veeam restore operations

Once the devices are removed, the extents for the volume name **VEEAM** are no longer listed in escli as shown in Figure 181 and the restore will succeed. Only the datastore **UNMAP_150** remains.



Figure 181. esxcli listing of multiple extents removed

A.6 Copy Session source

When conducting a backup, the user receives the following error message about a Copy Session source in Figure 182:

Backup job: PROD Created at 31/05/2024 20:46.								Warning 8 of 8 VMs processed	
22 October 2024 07:33:35									
Success	1	Start time	07:33:35	Total size	2.4 TB	Backup size	49.8 GB	Creating storage snapshots for backup. 10010B Details: Error calling CreateVolumeSnapshot: ("message";"A problem occurred creating the snapshot resource: Cannot use the device for this function because it is a Copy Session source"). Failed to create snapshot for UN 0002; HoldODC Details: Error calling CreateVolumeSnapshot: ("message";"A problem occurred creating the pailed to create snapshot for UN 0002; HoldODC Details: Error calling CreateVolumeSnapshot: ("message";"A problem occurred creating the snapshot resource: Cannot use the device for this function because it is a Copy Session source").	
Warning	7	End time	07:39:19	Data read	50 GB	Dedupe	42.3x	Imagehot resource: Cannot use the device for this function because it is a Copy Session source") Processing wurgb3one001 Processing wurgb3ofx001 Processing wurgb30001 Processing wurgb300	
Error	0	Duration	0:05:43	Transferred	16.4 GB	Compression	0.8x	Processing wupdb?dtg0010 Processing wupdb?dtg001 Proce	



Further review of the symapi.log file contains similar errors:

10/22/2024 06:35:26.769 3236 16822 EMC:UNIVMAX svx_control The SNAPVX 'Establish' operation FAILED on device: [010B - N/A] (SID: 000220001234 with: Cannot use the device for this function because it is a Copy Session source

10/22/2024 06:35:27.003 3236 16822 EMC:UNIVMAX svx_control The SNAPVX 'Establish' operation FAILED on device: [010C - N/A] (SID: 000220001234) with: Cannot use the device for this function because it is a Copy Session source

The error means that the devices, 10B and 10C, are actively being used by another process that does extent copying like SnapVX. In the case of VMware this is the VAAI primitive XCOPY. VMware issues VAAI primitives to the array to offload certain activities such as cloning or Storage vMotion. As backups are typically run during maintenance windows or low activity, there is normally no conflict between these two operations; however, if Storage DRS (SDRS) is configured, particularly at an aggressive setting, these errors in Veeam are possible. In such circumstances, care must be taken to minimize the overlap between the specific VMware activities that use XCOPY and Veeam backups.

B Technical support and resources

Dell.com/support is focused on meeting customer needs with proven services and support.

B.1 Related resources

B.1.1 Dell

The Dell PowerMax and VMware vSphere Configuration Guide https://infohub.delltechnologies.com/t/dell-powermax-and-vmware-vsphere-configuration-guide-1/

Unisphere for PowerMax https://support.emc.com/products/44740_Unisphere-for-PowerMax/Documentation/

Using VMware vSphere Storage APIs for Array Integration with Dell PowerMax <u>https://www.delltechnologies.com/asset/en-us/solutions/infrastructure-solutions/technical-support/h8115-powermax-vmware-vaai-wp.pdf</u>

B.1.2 Veeam

Backup and Replication Guides <u>https://www.veeam.com/documentation-guides-</u> datasheets.html?productId=8&version=product%3A8%2F221

https://helpcenter.veeam.com/docs/backup/vsphere/overview.html?ver=120

B.1.3 VMware

VMware vSphere https://docs.vmware.com/