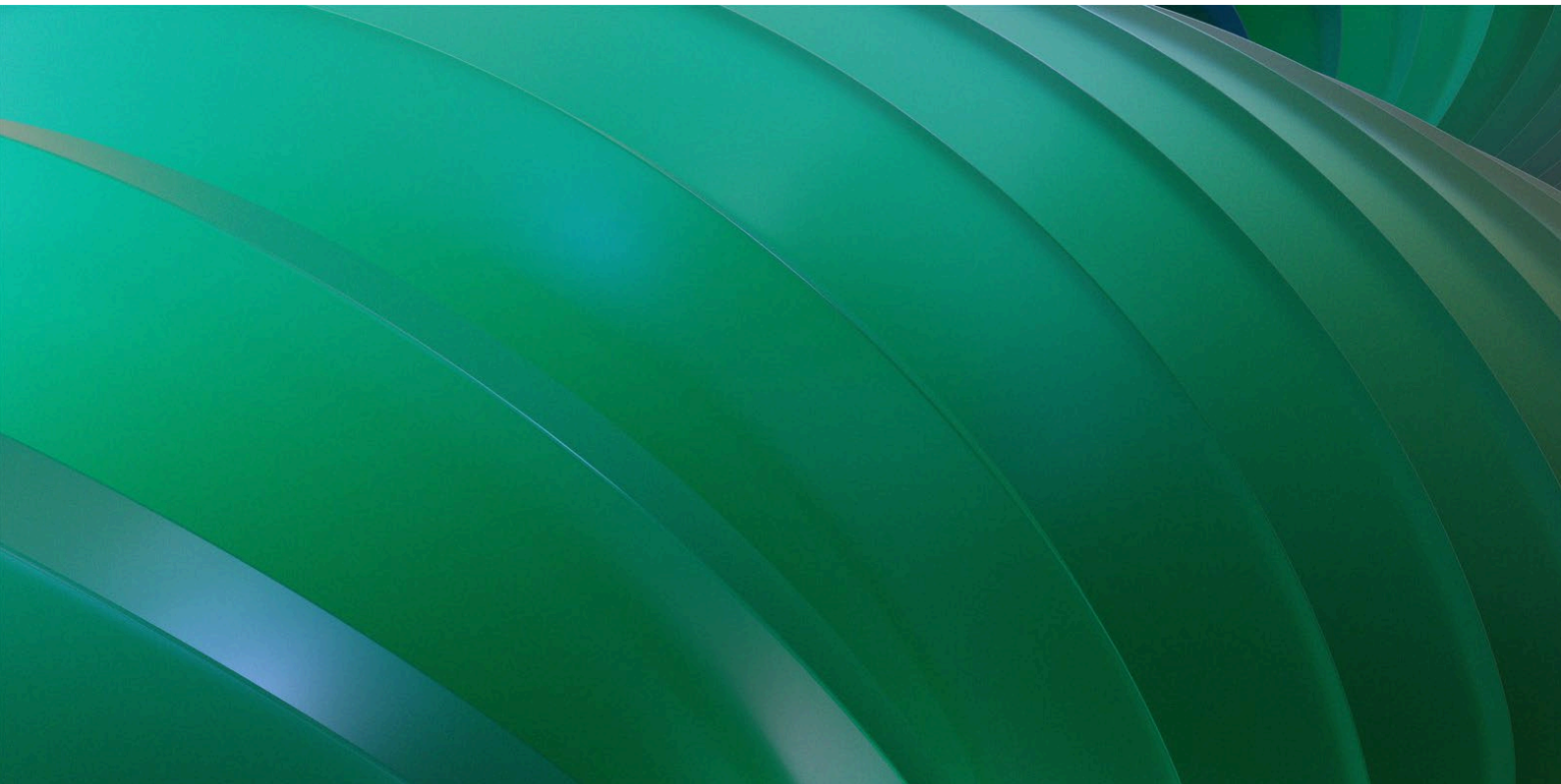
Using HPE Alletra arrays with Commvault IntelliSnap

Protecting data stored on primary storage arrays using snapshots and copies to secondary storage.

HPE GreenLake



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Executive summary

In today's world, doing business requires uninterrupted service for organizations and their customers. With more stringent service-level agreements (SLAs), uptime requirements, and less tolerance for downtime, organizations are forced to modernize data protection processes to align with business objectives. Yet, rapid data growth, increasingly distributed workloads, and budgetary pressures complicate today's legacy backup and recovery methods.

Data protection is no longer just about backing up data and restoring data but also about recovering business applications and restoring critical services for users. Implementing a tiered data protection strategy is fundamental to modernizing data protection. It includes three steps:

1. Use snapshots to create application-consistent, point-in-time copies of data for the fastest data recovery method.
2. Add an external disk-based deduplication solution and optionally tape for increased restore points and long-term retention.
3. Align different applications with the tiered protection strategy and manage a complete data lifecycle for application data.

The Hewlett Packard Enterprise storage portfolio consisting of HPE Alletra primary storage, HPE StoreOnce backup appliances, and HPE StoreEver tape libraries deliver mission-critical application resilience, reliable data protection, enhanced data recovery, and complete data management with Commvault software throughout the lifecycle to improve operational efficiencies.

The benefits of HPE storage and Commvault Backup & Recovery software integration for the three-tiered data protection strategy include:

- HPE Alletra primary storage snapshots
  - Application-integrated snapshots that provide consistent point-in-time recovery copies for enterprise applications while incorporating hardware snapshots into the complete data protection process without requiring complex scripting.
  - Rapid recovery that helps meet demanding business-critical application SLAs with scalable protection for recovery point and time objectives of minutes while delivering accelerated application-level recovery with granular protection and retention options.
- HPE StoreOnce backup appliance
  - Reliable and faster backup and recovery that enable backups to complete despite unexpected hardware failures and allow for faster backup and recovery due to deduplication.
  - Automated disaster recovery with greater flexibility by replicating backups to an HPE StoreOnce system at a secondary location using low-bandwidth replication, thus saving precious network bandwidth and associated costs.
- HPE StoreEver tape library
  - Seamless archiving and retrieving backups provide the right balance of economics, durability, and reliability needed for long-term backup retention.
  - Sophisticated tape lifecycle management includes inventory and tracking tapes sent off-site for long-term storage.

Target audience: Presales consultants, solution architects, and backup administrators designing and implementing a holistic data protection solution with HPE Alletra storage, HPE StoreOnce, and Commvault Backup & Recovery software.

Document purpose: This paper describes a solution that includes setup and configuration guidance for technical audiences. It provides information for protecting the data stored on HPE Alletra arrays using Commvault Backup & Recovery software by first taking a snapshot of the volume, leveraging Commvault IntelliSnap® technology, and then saving a copy to a different location.

Adding an HPE Alletra array to Commvault as a storage resource

To leverage Commvault IntelliSnap's capabilities, it is essential to integrate the storage array into Commvault. This integration relies on the native API provided by the storage array. The specific connection method varies depending on the HPE Alletra array in use.

Connecting an HPE Alletra 9000 Array

The HPE Alletra 9000 array, an evolution of the HPE 3PAR StoreServ arrays, is still identified as such within the Commvault **Array Management** window. Here is how to access and configure it from the Commvault command center:

1. Expand the **Manage** tab in the Commvault command center.
2. Click the **Infrastructure** tab, and you will get access to the **Arrays** tab.

Figure 1 shows the HPE Alletra 9000 array listed with the Snap vendor identified as "HPE 3PAR StoreServ" The array's name is represented by its Worldwide Name (WWN) — a combination of numbers and letters.

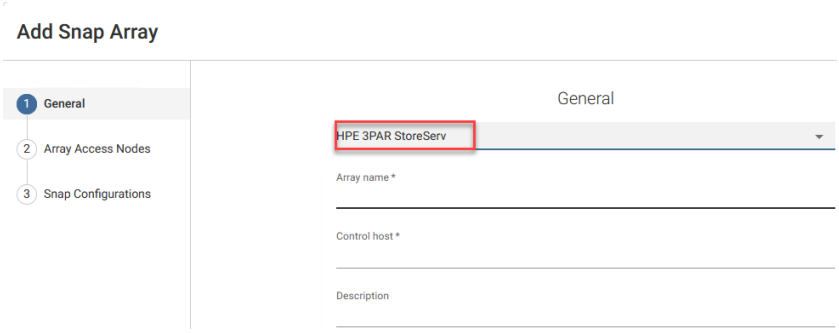

Figure 1. HPE Alletra 9000 is listed as "HPE 3PAR StoreServ" in Commvault Array management.

Calculating the Array Name (WWN) for HPE Alletra 9000

Before connecting or configuring the HPE Alletra 9000 array with Commvault, you must calculate this WWN. Here is how to do it:

1. Access the HPE Alletra UI.
2. As shown in Figure 2, in the HPE Alletra dashboard, navigate to **Storage** and select **Volumes**.

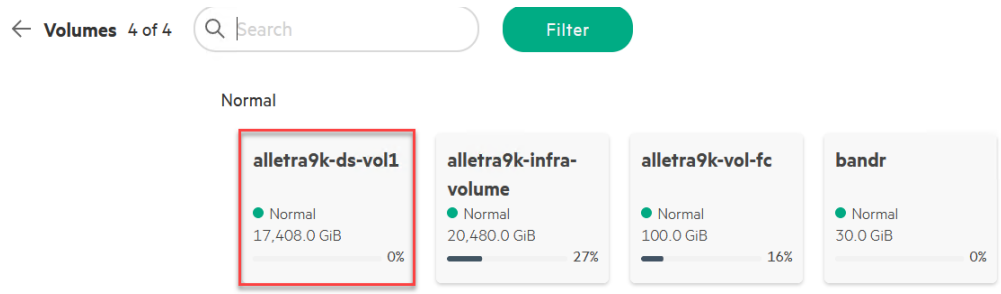

Figure 2. Volumes listed on HPE Alletra 9000 UI

Determining the WWN Format on HPE Alletra

The WWN (Worldwide Name) on the HPE Alletra array can be in either an 8-byte or 16-byte format. In Figure 3, you can observe an example of a 16-byte WWN.

To calculate the storage array name based on the WWN format, follow these steps:

Determine an 8-byte WWN:

If the WWN is in the 8-byte format, apply the following formula:

2FF7000 + WWN. Substitute (4,3) + 00 + WWN. Substitute (12,4)

Where:

- WWN. Substitute (4,3) refers to the three digits immediately following the fourth digit of the WWN identifier.
- WWN. Substitute (12,4) refers to the four digits immediately following the twelfth digit of the WWN identifier.

Example of an 8-byte WWN:
Given WWN = 50002AC0012B0B95

Calculate as follows:

2FF7000 + 2AC + 00 + 0B95

The storage array name is 2FF70002AC000B95.

Determine a 16-byte WWN:
If the WWN is in the 16-byte format, use the following formula:

2FF7000 + WWN. Substitute (4,3) + WWN. Substitute (26,6)

Where:

- WWN. Substitute (4,3) refers to the three digits immediately following the fourth digit of the WWN identifier.
- WWN. Substitute (26,6) refers to the six digits immediately following the twenty-sixth digit of the WWN identifier.

Example of a 16-byte WWN:
Given WWN = 60002AC000000000000000AF00025A95

Calculate as follows:

2FF7000 + 2AC + 000B95

The storage array name is 2FF70002AC025A95, as shown in Figure 3.

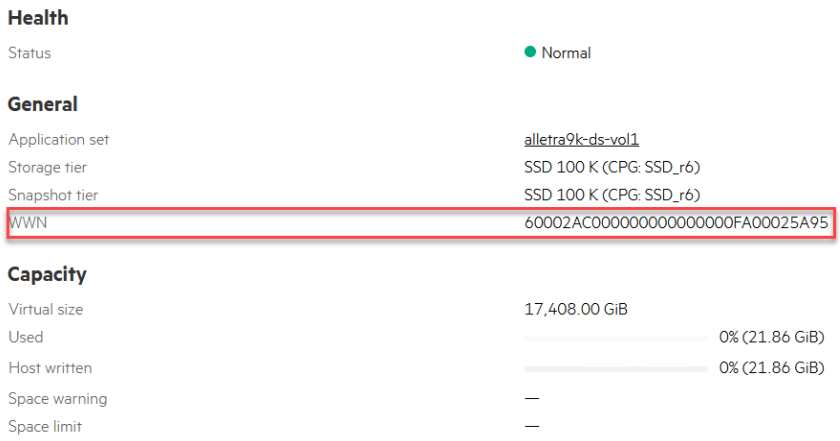

Figure 3. Volume properties from HPE Alletra 9000 UI showing the WWN name used to create the array name in Commvault.

Connecting HPE Alletra 5000 and 6000 Arrays to Commvault

When integrating an HPE Alletra 5000 or 6000 array with Commvault IntelliSnap, the process is simplified and does not require obtaining an array name from the WWN of the volume. However, there are distinct requirements for both Fibre Channel (FC) and IP-based volumes/arrays.

Here are the steps to connect an HPE Alletra 5000 or 6000 array to Commvault from the Commvault Command Centre web interface:

1. Access the Commvault Command Center:
   a. Select **Manage** from the main menu.
2. Navigate to **Infrastructure**:
   a. Under **Manage**, select **Infrastructure**.
3. Access **Arrays**:
   a. Click **Arrays** within the infrastructure section, as shown in Figure 4.

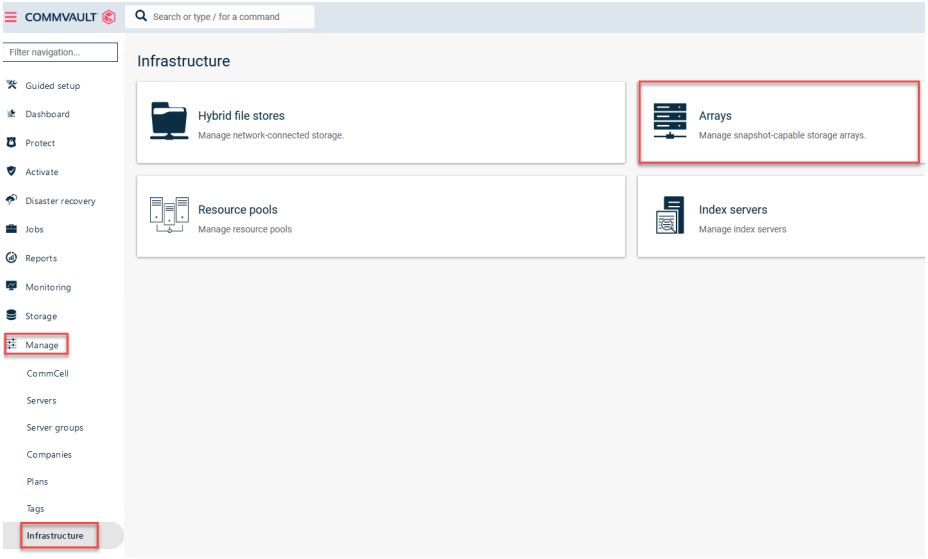

Figure 4. Array management in Commvault Command Center

Adding HPE Alletra 5000 and 6000 arrays to Commvault

After you are on the **Arrays** page within the Commvault Command Center, the next procedure is to add the HPE Alletra 5000 or 6000 array. Note that the snap vendor for these arrays is identified as "HPE Nimble Storage."

Follow these steps to add the array (Figure 5 is an example):

1. Enter Array Information:
   a. In the **Array name** field, enter either an array name, the IP address, or the Fully Qualified Domain Name (FQDN) of the management address of the array.
2. Specify Control Host (based on connection method):

   Depending on how the array is connected to the storage network, select the appropriate option for the **Control host** field:

   a. For HPE Nimble Storage FC arrays, enter the management IP address of the storage array.
   b. For HPE Nimble Storage iSCSI arrays, enter the iSCSI Discovery IP associated with the subnet responsible for carrying data traffic.
3. Log-on credentials:

   You must enter the appropriate log-on credentials to establish a connection between Commvault and the HPE Alletra 5000 or 6000 array.

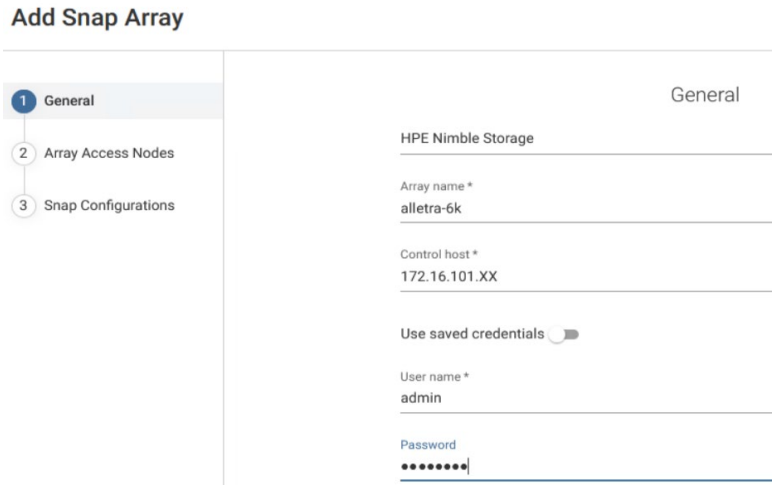

Figure 5. Adding an HPE Alletra 6000 Array to Commvault IntelliSnap

With these configurations in place, you can now add snapshots of the array to your storage policies.

Enabling IntelliSnap for sub-clients

After you have added your HPE Alletra 5000 or 6000 array to Commvault and configured the necessary settings, the last step is to ensure that the sub-client you intend to protect has IntelliSnap enabled. Follow these steps:

1. Access Sub-Clients:
   a. Navigate to the sub-client you want to protect within the Commvault Command Center.
2. Enable IntelliSnap:
   a. Locate the IntelliSnap settings or options within the sub-client configuration.
   b. Make sure that IntelliSnap is enabled for this specific sub-client.

By enabling IntelliSnap for the sub-client, you are setting up the necessary configuration to take advantage of Commvault's snapshot capabilities for your chosen data.

With this additional step, you have completed the setup process for protecting your data using IntelliSnap with HPE Alletra 5000 or 6000 arrays in Commvault.

Taking snapshots as part of a protection policy

Integrating the HPE Alletra array into Commvault enables the incorporation of snapshots as a fundamental component of your data protection strategy. Snapshots offer a swift and efficient initial layer of data protection. After capturing a snapshot, you can replicate it to secondary storage solutions such as HPE StoreOnce, HPE LTO tape libraries, or the cloud.

One of the key advantages of employing Commvault is its ability to manage the entire data protection process seamlessly within a single software suite. You can configure a data protection plan that captures snapshots and orchestrates the creation of copies of those snapshots as part of your comprehensive data protection strategy.

Protecting VMs and datastores

Snapshots safeguard volumes and associated files created with virtual machines (VMs), such as VMDK for VMware® or VHD/VHDX for Hyper-V. Commvault seamlessly integrates with most hypervisors and utilizes their Virtual Server Agent (VSA) to ensure smooth integration.

Here is how to set it up:

1. Access the Commvault Command Center:
   a. Navigate to the **Protect** section within the Commvault Command Center.
2. Select virtualization:
   b. Select the **Virtualization** option.
3. Add hypervisor:
   a. In the **Hypervisor** tab, select **Add Hypervisor**.
   b. Enter the necessary log-on credentials and validate them.
   c. Commvault will automatically install the Virtual Server Agent (VSA) and import the VMs within the hypervisor environment (Figure 6).

Commvault follows an agnostic approach to protect VMs and their associated datastores. It also automatically imports and configures the array backing the datastores, making it ready for snapshot operations using the snapshot mechanism provided by the hypervisor.

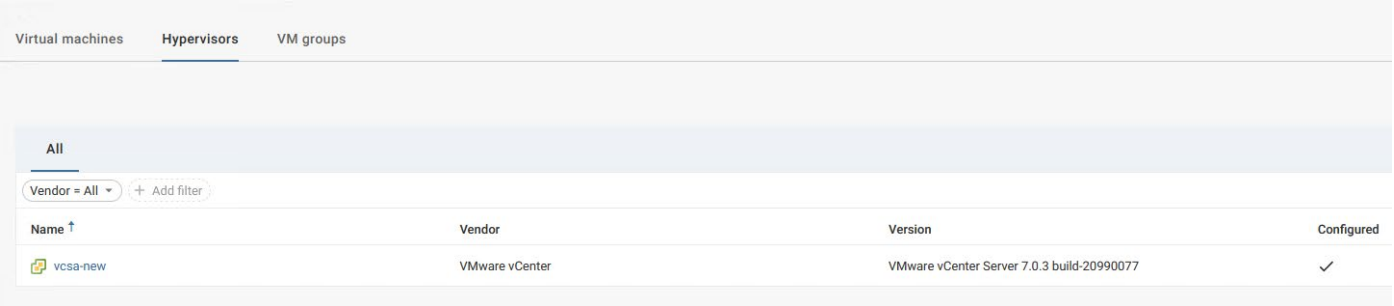

Figure 6. Virtual environments added to Commvault.

Protecting volumes or VMs

After you have added arrays or hypervisors to Commvault, the next step is to protect volumes or VMs by incorporating them into a storage protection plan. Commvault simplifies this process through its user-friendly web-based Command Center. You can use the guided setup, making the entire process straightforward.

Using guided setup

Adding a hypervisor, creating a VM group, and including them in a protection plan or policy can be easily accomplished using the guided setup. Guided setup is available when the Commvault web console is accessed for the first time, as shown in Figure 7.

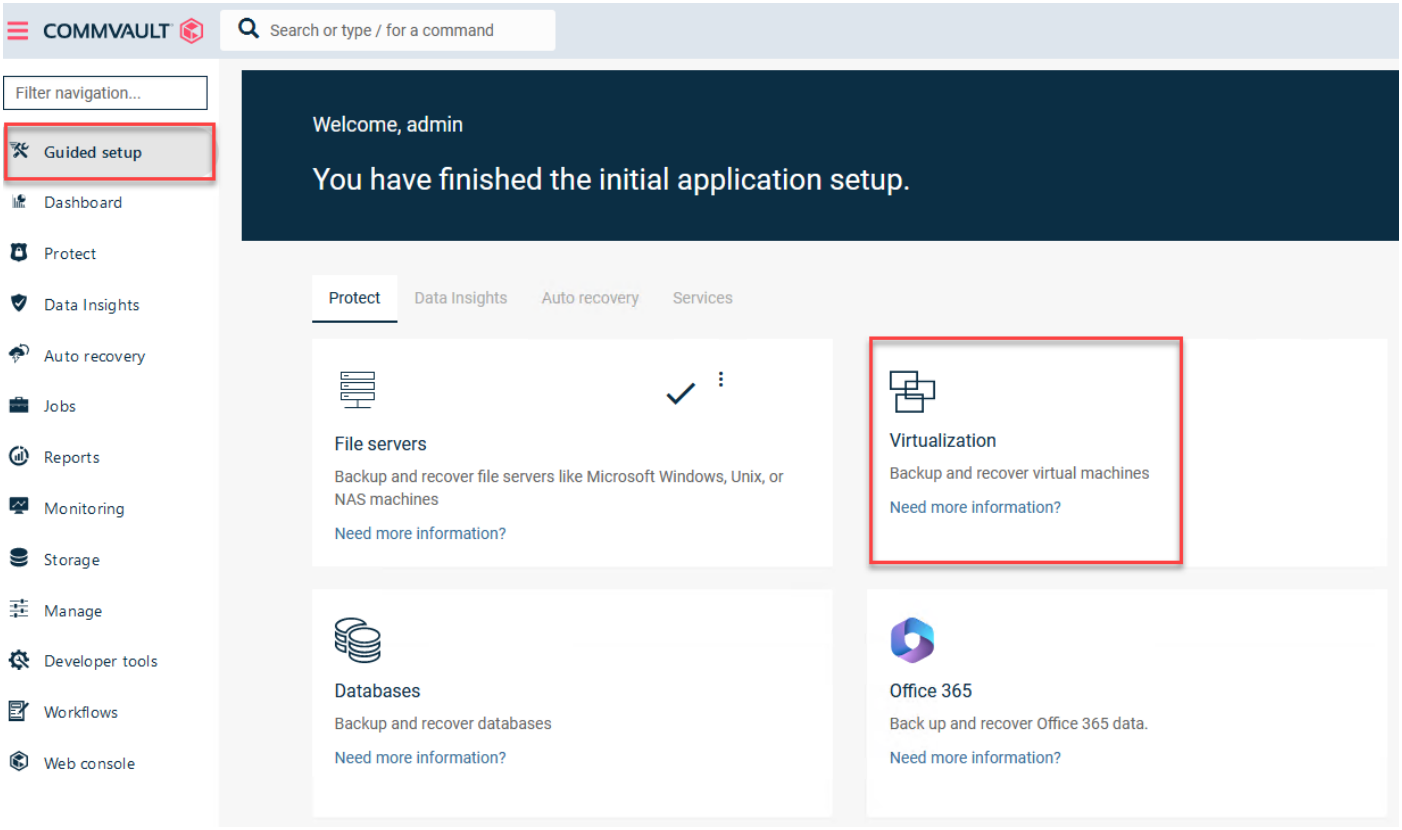

Figure 7. "Guided setup" option in Commvault

Manual setup option
If you prefer not to use the guided setup and want to add a hypervisor, create a VM group, and plan their protection manually, follow these steps:

1. Access the Commvault Command Center:
   a. Expand the **Protect** option.
2. Select virtualization:
   a. Select **Virtualization** from the left-hand menu.
3. Access options:
   a. In the top left-hand corner of the page, you can find options to **Add Hypervisor** and **Add VM group**, as shown in Figure 8.

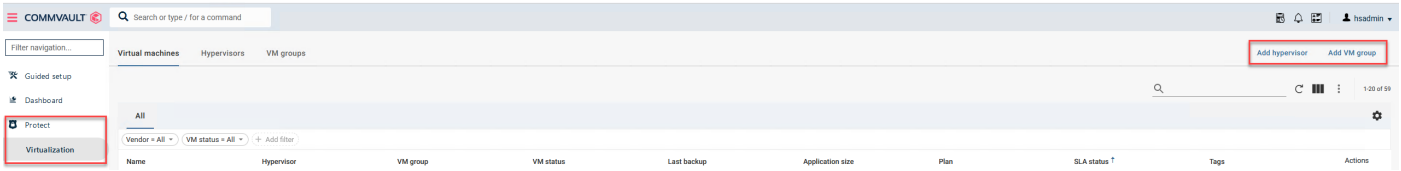

Figure 8. Adding hypervisor and VM group to Commvault

Commvault integration with hypervisors

When you add a hypervisor to Commvault, the Commvault Virtual Server Agent (VSA) is automatically installed on the hypervisor. This action creates a "System 0Create Array" in the array management pane, displaying the name of the local hypervisor. Commvault can then seamlessly interact with the datastores that serve as the backend for the virtual environment, as well as the virtual disks created to support VMs.

Commvault leverages the native APIs provided by the virtual environment, such as the VMware API for VMDKs or the Microsoft Hyper-V API for VHD(X) files. This integration allows Commvault to perform snapshot or checkpoint operations. With access to these APIs, Commvault can use advanced features like Changed Block Tracking (CBT) in VMware or Resilient Change Tracking (RCT) in Hyper-V.

By utilizing these native APIs and advanced tracking mechanisms, Commvault can automatically protect datastores and virtual disks without manual setup or importation into the Commvault Command Center.

Adding snapshots to a protection plan

After an array is integrated into Commvault, you can protect its data, whether hosting a database or serving as the backend for a VM environment. The Virtual Server Agent handles VM protection by interacting with the hypervisor and the array to secure virtual disk volumes.

If a volume attached to a physical server contains any critical data, it is essential to include IntelliSnap in a protection plan. Adding a snapshot or snap copy to a plan via the Commvault Command Center is a straightforward process:

1. Access the Command Center:
   a. Select the desired protection plan.
2. Add snap copy:
   a. Expand the **Add** drop-down menu within the **Backup destinations** pane, as illustrated in Figure 9.
3. Configure snap copy:
   a. As shown in Figure 9, Select the **SNAP COPY** option in the **ADD** drop-down menu.
   b. Select the appropriate storage and source to use for the snapshot.
   c. Define the retention rules for the snapshot, specifying how long the snapshot should be retained.

With these configurations in place, your protection plan is now set up to take snapshots of the array.

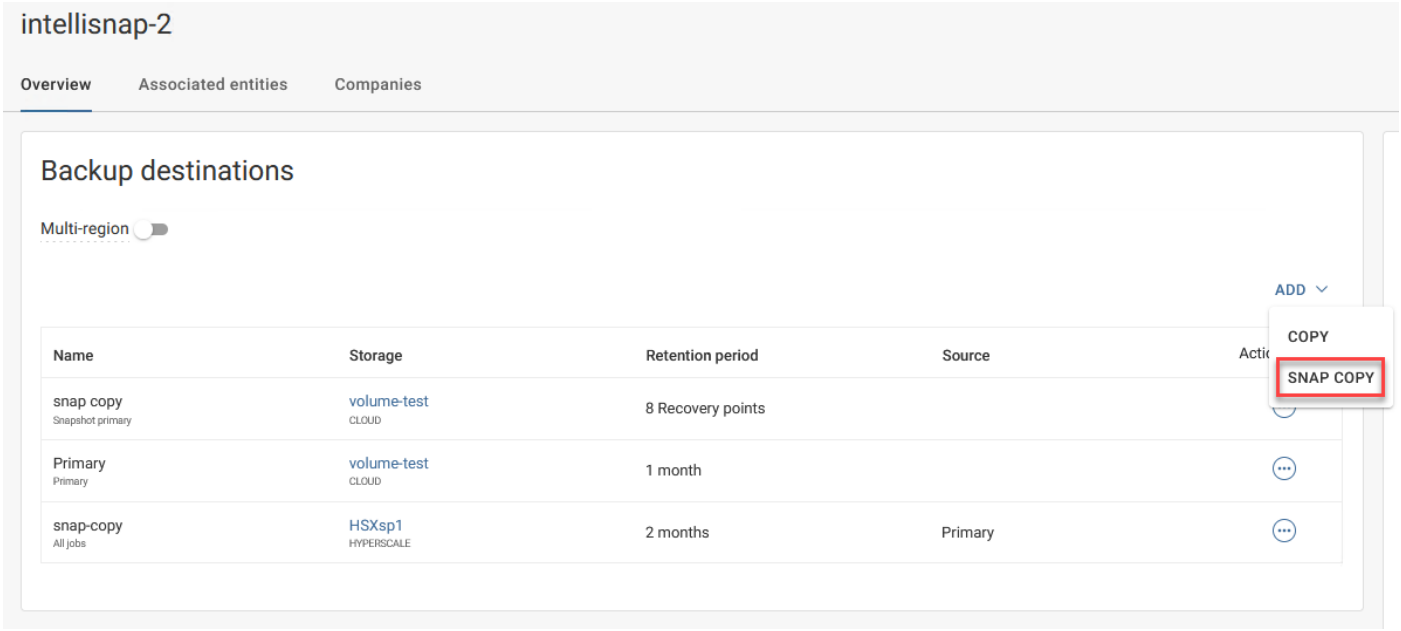

Figure 9. Adding a snap copy to a protection plan

When adding a protection plan, Commvault has some predefined options available on the dashboard.

Click the **Protect** button, and then select one of the available options:

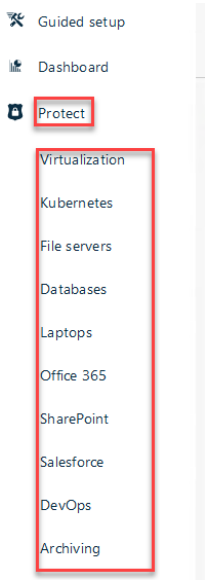

Figure 10. Protection options

Using one of these options automatically populates entities that fall into each category already defined in Commvault.

With these configurations in place, your protection plan is now configured to take snapshots of the array and store them in the designated storage location.

Link the protection plan to an entity

After completing the snap copy configurations, it is essential to link the protection plan to a specific entity. An entity can encompass various elements within your infrastructure, such as:

- Individual VMs
- Groups of VMs
- Physical servers with attached volumes
- Databases

By associating the protection plan with a specific entity, you define the scope of data protection, ensuring that the plan covers the right resources.

Assign servers to the protection plan

1. To assign a server to the protection plan, select the server from the Commvault Command Center.
2. Navigate to the **Overview** tab of the selected server.
3. Add the server to the protection plan.

In Figure 11 example, a volume (E:\) was created on the HPE Primera array and exported to the Windows Server. Because the array has already been added to **Array Management**, Commvault IntelliSnap can capture snapshots of this volume seamlessly.

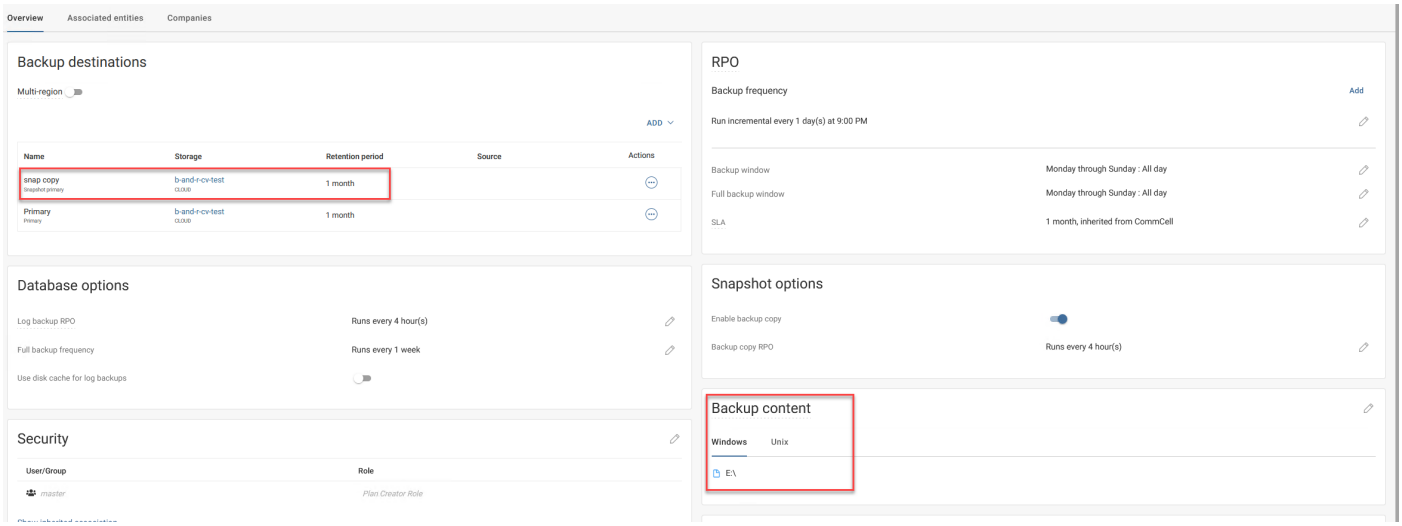

Figure 11. Ensuring that an attached volume is snapped as part of a protection plan and adding the data source.

A snapshot copy has been added, and backup copy functionality has been enabled in the **Snapshot options**. To view or list snapshots, you can access the array management screen by navigating to **Manage → Infrastructure → Arrays**, and then selecting **List Snapshots**.

Within this interface, you have the following actions at your disposal.

Snapshot Management

- Snapshots can be mounted or deleted.
- A hardware revert operation can also be initiated using the available actions.

When opting for the "mount" operation, the volume can be mounted to its original location or an entirely different server, depending on your specific requirements. Conversely, when selecting the "hardware revert" operation, the currently mounted volume is reverted to the state captured by the snapshot, effectively overwriting any data changes made since the snapshot was taken.

These operations serve as valuable recovery tools, mainly when dealing with corrupted volumes or unexpected data issues.

Saving copies of snapshots

Snapshots provide a quick and straightforward means of creating data copies stored on an array, whether it is a volume attached to a server or the data disk of a virtual machine. However, it is crucial to remember that snapshots are not backups. Saving a copy of the snapshot to secondary storage is essential to ensure data protection and availability in disaster recovery scenarios.

This secondary storage can take various forms, such as a disk-based purpose-built backup appliance like HPE StoreOnce, tape-based storage like HPE LTO or MSL libraries, or even Commvault HyperScale X® deployed on HPE Apollo 4200 or HPE ProLiant DL Servers. Regardless of the chosen medium, the process for safeguarding these snapshots within Commvault remains the same.

Here is the process to protect snapshots in Commvault.

Configure a Storage Target

1. Access the **Storage** section of the Commvault Command Center.
2. Set up a storage target for your secondary storage device.

Add a copy step to the protection plan

1. Within the protection plan, add a copy step.
2. Set the source to the Snap-copy containing the snapshots you want to protect.

Select secondary storage as the destination

During the copy step configuration, select a secondary storage device as the destination for the copied snapshots.

This process closely resembles the steps outlined earlier for adding snapshots. However, you select a secondary storage device as the target for your snapshot copies in this case.

Note

If you are using the Commvault Command HPE StoreOnce Catalyst, it is listed in the **Cloud** section of the **Storage** tab. For more detailed information on using HPE StoreOnce Catalyst with Commvault, see Data Protection with HPE StoreOnce Catalyst and Commvault.

Following these steps ensures that your snapshots are correctly captured and securely stored in a secondary location, enhancing data protection and disaster recovery readiness.

Figure 12 shows several HPE StoreOnce Catalyst Stores configured in Commvault. The “volume-test” Catalyst store is added to the “intellisnap-2” plan in this example.

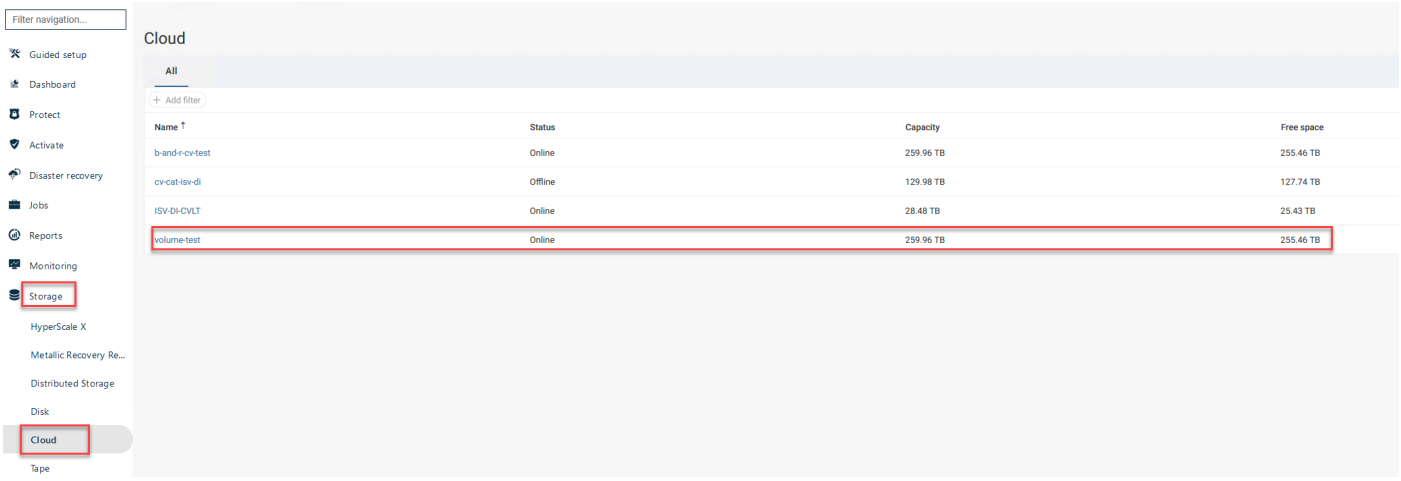

Figure 12. Protecting snapshots to secondary storage, which is an HPE StoreOnce Catalyst Store

The following step-by-step process should be performed for adding a backup copy to a snap-copy plan in Commvault.

1. Navigate to the **Plans** section within the Commvault Command Center.
2. Select the specific plan to which you want to add the backup copy.
3. Click **ADD** in the **Backup destinations** pane:
4. Select **Copy** as the backup type to create a backup copy.
5. Provide a name for this backup copy, which helps identify it within the plan.
6. Select the source for the backup copy. In this case, it should be the "snap-copy."
7. Select the destination for the backup copy. In your scenario, the "catalyst store" is named "volume-test."
8. Specify the backup copy schedule by defining how often the backup copy should run. You can configure it to run after all jobs or based on your preferred schedule.
9. Set the retention period by defining the retention period for the backup copy, specifying how long the backup copies should be retained.
10. Click the **SAVE** button.

Following these steps, as shown in Figure 13, add a backup copy to the plan in Commvault. This process mirrors the one used for adding snapshots to the plan, but the source is the "snap-copy," and the destination is set to the specified "catalyst store."

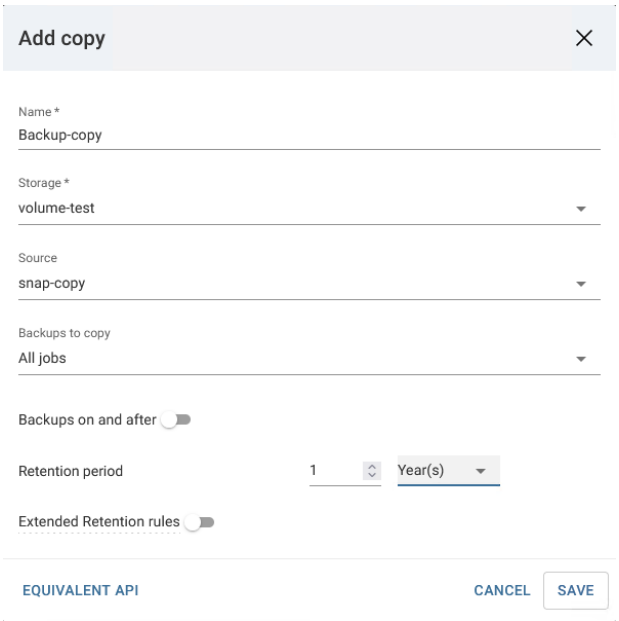

Figure 13. Retention rules to ensure that copies are retained for the correct period.

The snapshots will now be saved after every snap operation, with a copy going to the HPE StoreOnce Catalyst Store, which is retained for one year.

If the backup copy is to be saved to a tape library or a Commvault HyperScale X storage pool, the process is the same as described previously, except the selection would be either tape or HyperScale X.

Restore from snapshots

The primary purpose of taking snapshots and performing backups of those snapshots is to facilitate data restoration. This restoration can be necessary in various scenarios, including disaster recovery events or environments requiring a production system or database copy.

Restoring data from snapshots:
To initiate the restoration of data from snapshots, follow these steps.

1. List available snapshots:
   a. Begin by navigating to the array that has been previously snapped.
   b. Access this through the **Manage → Infrastructure → Arrays** tab.
   c. Select the specific array you are interested in, and you will see the **List Snapshots** option in the top right-hand corner.
2. View and manage snapshots:
   a. Click **List Snapshots**, all available snapshots are displayed.
   b. Utilize the **Actions** menu to perform operations such as:
      I. Mounting the snapshot
      II. Performing a hardware revert
      III. Deleting the snapshot
3. Snapshot mounting:
   a. When you opt to mount a snapshot, you have the flexibility to choose the location for the mount:
      I. The original location
      II. A different location on the same server
      III. An entirely different location
4. Data copy/restoration:
   a. After the snapshot is mounted, the data stored within it can be copied or restored like any other backup.
5. Alternative restoration method:
   a. Additionally, you can restore snapshots by selecting the entity that has been previously backed up.
   b. Access the **Restore** option from the restore menu and select the desired snapshot.
   c. Like the earlier method, you have options for the restoration process.

Following these steps, you can effectively restore data from snapshots, offering flexibility and reliability in various recovery scenarios.

Summary

Organizations are increasingly turning to rapid and highly efficient storage snapshots to safeguard their growing volumes of data — both for physical and virtual applications. Traditional streaming backups are still essential for long-term retention. However, the process needs to integrate storage snapshots more seamlessly to enhance efficiency and cohesiveness across data protection operations.

Commvault's software technology offers a solution by combining comprehensive data protection lifecycle management features with primary and secondary HPE Storage tiers. By leveraging Commvault IntelliSnap technology alongside the native HPE Alletra snapshot engine, organizations can ensure consistent point-in-time recovery copies for critical enterprise applications. This integration streamlines the data protection process, eliminating the need for complex scripting.

While snapshots serve as the initial line of defense, augmenting protection with external backups brings several benefits, including increased restore points, extended retention periods, and mitigating risks associated with corruption or storage array failures. Key factors such as deduplication and high-performance backup and recovery play pivotal roles in managing data footprints and providing holistic data protection.

Resources

Introducing the HPE Storage Integration Pack for VMware vCenter® (SIP4VC) version 12.0
community.hpe.com/t5/around-the-storage-block/introducing-the-hpe-storage-integration-pack-for-vmware-vcenter/ba-p/7196661

What's New with vSphere 8 Core Storage?
core.vmware.com/resource/whats-new-vsphere-8-core-storage

What's New in vSphere 8 Update 2?
core.vmware.com/resource/whats-new-vsphere-8-update-2

vVols with NVMe - A Perfect Match
core.vmware.com/blog/vvols-nvme-perfect-match

Technical deep dive: HPE GreenLake for Block Storage built on HPE Alletra Storage MP
community.hpe.com/t5/around-the-storage-block/technical-deep-dive-hpe-greenlake-for-block-storage-built-on-hpe/ba-p/7187957

HPE Alletra 9000 Architecture
HPE.com/psnow/doc/a00113422enw

HPE Primera Architecture
HPE.com/psnow/doc/a00115999en_us

HPE GreenLake Block Storage: VMware ESXi Implementation Guide
support.hpe.com/hpesc/public/docDisplay?docId=sd00002428en_us&page=index.html

HPE Alletra 9000 VMware ESXi Implementation Guide
support.hpe.com/hpesc/public/docDisplay?docId=a00115274en_us&docLocale=en_US

HPE Primera VMware ESXi Implementation Guide
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VMware and HPE
vmware.com/partners/work-with-partners/global-partners/hpe.html

HPE Active Peer Persistence
HPE.com/psnow/doc/a00115612enw

Implementing vSphere Metro Storage Cluster (vMSC) using HPE Primera Peer Persistence
kb.vmware.com/s/article/77061

VMware vVols QoS
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