HPE Alletra Storage

Technical white paper

Deploying VMware Cloud Foundation with HPE Alletra Storage MP B10000 for workload domains

For HPE Alletra Storage MP B10000, HPE Alletra Storage 5000/6000/9000, or HPE Nimble/Primera Storage

HPE GreenLake

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Introduction

This white paper presents a how-to guide that describes the steps for deploying HPE Storage for VMware Cloud Foundation™ (VCF) workload domains using VMware vSphere® Virtual Volumes™ (vVols) over Fibre Channel (FC).

VCF provides a complete set of software-defined services for compute, storage, network, container, security, and cloud management. Hewlett Packard Enterprise and VMware® collaborate to help customers bring these software-defined services to life. VCF drastically simplifies data center operations by deploying a standardized and validated architecture with built-in lifecycle automation of the software-defined data center (SDDC) stack.

Using HPE Storage for VCF workload domain principal storage enables the use of vVols. Hewlett Packard Enterprise and VMware recommend using vVols with principal storage workload domain environments that need to eliminate the requirement to provision large datastores for VMware vSphere Virtual Machine File System (VMFS) volumes. With vVols, storage can be provisioned on a per-VM basis by using Storage Policy-Based Management (SPBM). This methodology makes it possible to manage your storage capabilities through storage policies—at the VM level rather than for the entire datastore—which is helpful because managing LUNs or volumes and storage capabilities manually at scale is difficult.

This paper provides guidance and information for deploying VCF VI Workload Domain Principal storage with supported HPE Storage arrays (**HPE Alletra Storage MP B10000, HPE Alletra Storage 5000/6000/9000** or **HPE Nimble/Primera Storage**). The intended audience includes solution architects, vSphere administrators, and storage administrators.

Prerequisites

The following components are prerequisites for using HPE Storage as VI Workload Domain Principal storage with VCF 5.1:

- VCF version 5.1, which includes the prerequisite components listed in Table 1

Table 1. Prerequisite components of VCF 5.1 build 22688368

Release	GA date	Cloud Builder	SDDC Manager	VMware vCenter®	VMware ESXi™	VSAN Witness Appliance	NSX	Aria Suite Lifecycle
Version: 5.1 Build: 22688368	07 Nov 2023	5.1–22688368	5.1–22688368	8.0 U2a–22617221	8.0 U2–22380479	8.0 U2–22443122	4.1.2.1.0–22667789	8.14–22630473

- A minimum of three ESXi hosts for the workload domain

Note
HPE servers supported with VCF (most recently validated by HPE):
HPE Firmware and Software Compatibility Matrix for VMware Cloud Foundation 5.1 on HPE ProLiant Gen10 Plus and Gen11 servers
HPE Synergy Gen10 Firmware and Software Compatibility Matrix for VMware Cloud Foundation 5.1

- At least one HPE Storage array

Note
HPE storage supported for VCF VI Workload Domains (any array certified for VMware vSphere with corresponding VCF protocol support):
Supported Storage Types for VMware Cloud Foundation
VMware Compatibility Guide (HPE Storage/SAN)

Procedures

This section lists the high-level tasks that are required to add HPE Storage as VCF VI Workload Domain Principal storage, using vVols over FC in this example. The step-by-step procedures are described in detail in the following sections.

1. Register the HPE Storage VASA Provide with SDDC Manager.
2. Create a network pool with SDDC Manager.
3. Commission hosts with SDDC Manager for the workload domain.

4. Create a workload domain with the vVol storage type.
5. Verify the workload domain with SDDC Manager.
6. Verify the storage provider and vVols datastore in VMware vCenter.

Register the HPE Storage VASA Provider with SDDC Manager

To register the HPE Storage VASA Provider with SDDC Manager, complete the following steps:

1. From the SDDC Manager, select **Administration** → **Storage Settings**.
2. From the Add VASA Provider window, enter the following information:
   - Name of the VASA Provider
   - URL of the VASA Provider
   - User name and password of the HPE Storage array
   - Container name
   - Container type
3. Click **Save**.

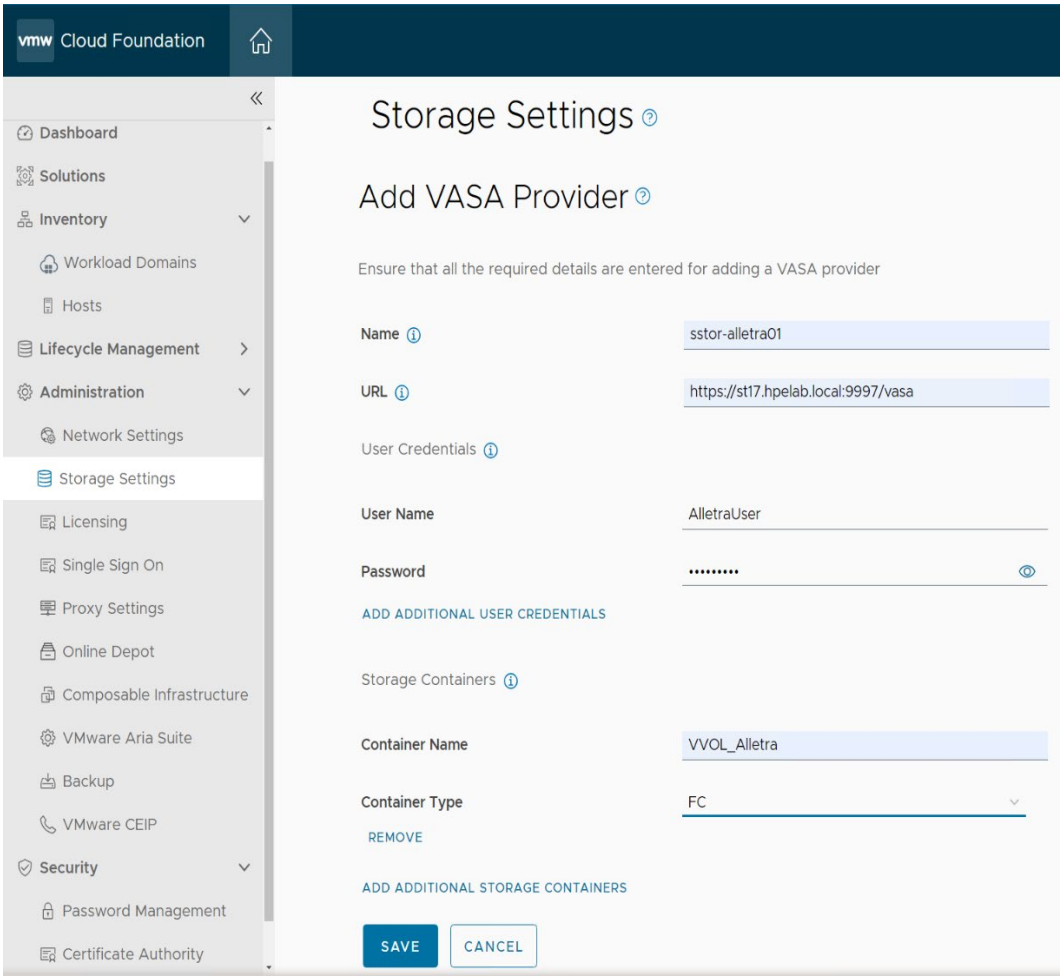

Figure 1. Storage Settings Add VASA Provider

Create a network pool with SDDC Manager

The second task is to create the network pool with SDDC Manager:

1. From SDDC Manager, select **Administration** → **Network Settings**.
2. From the Create Network Pool window, enter the following information:
   - Network pool name
   - Network type: Select **vMotion**.
3. For the vMotion network, enter the following information and then click **Add**:
   - VLAN ID
   - MTU
   - Network
   - Subnet mask
   - Default gateway
   - Included IP address ranges
4. Click **Save**.

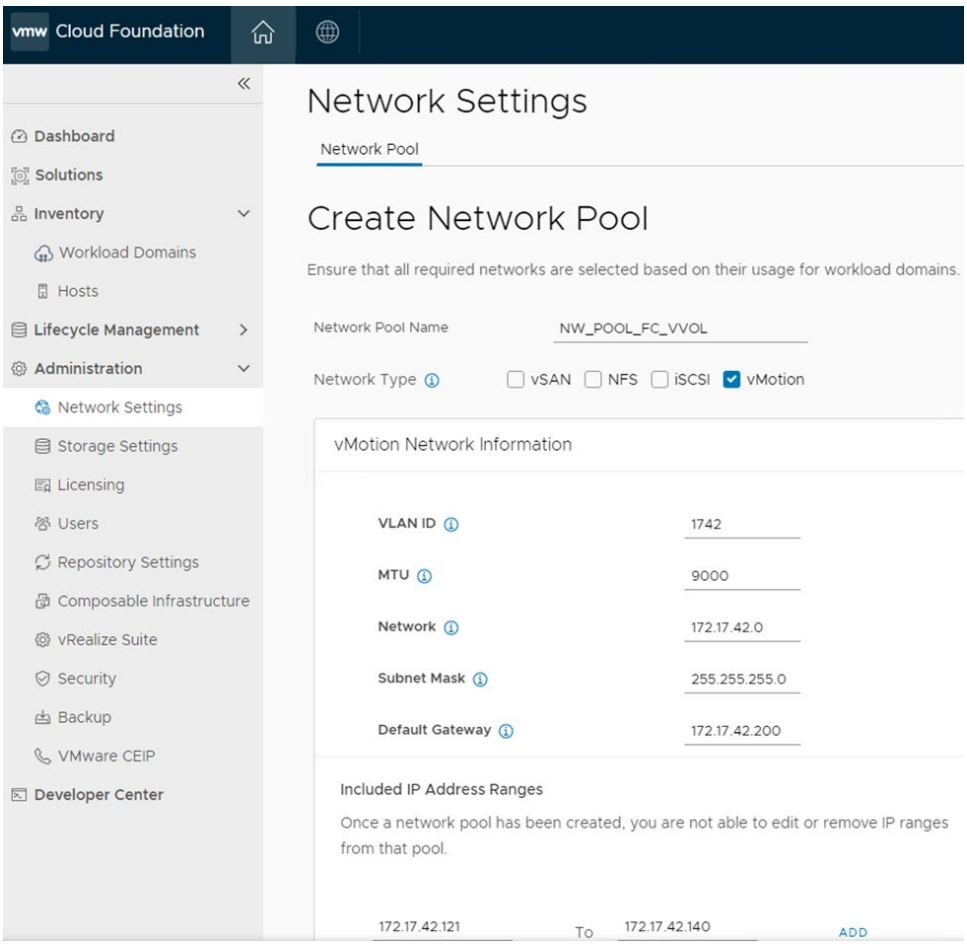

Figure 2. Create the network pool

Commission hosts with SDDC Manager for a workload domain

The third task is to commission the hosts with SDDC Manager.

1. From SDDC Manager, select **Inventory** → **Hosts**.

2. Click **Commission Hosts**.

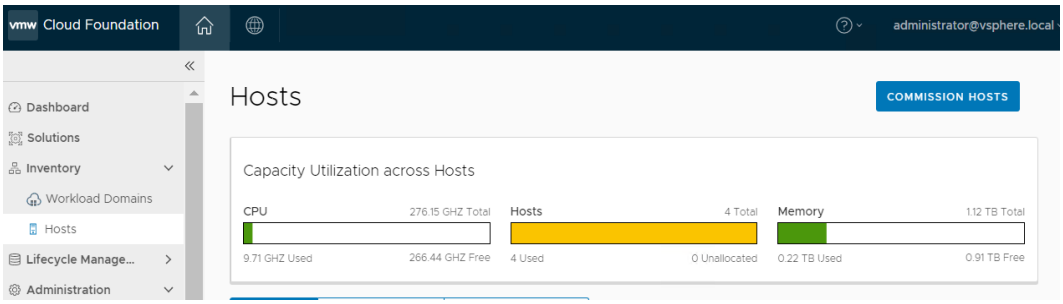

Figure 3. Commissioning hosts

3. Verify the host checklist and click **Proceed**.

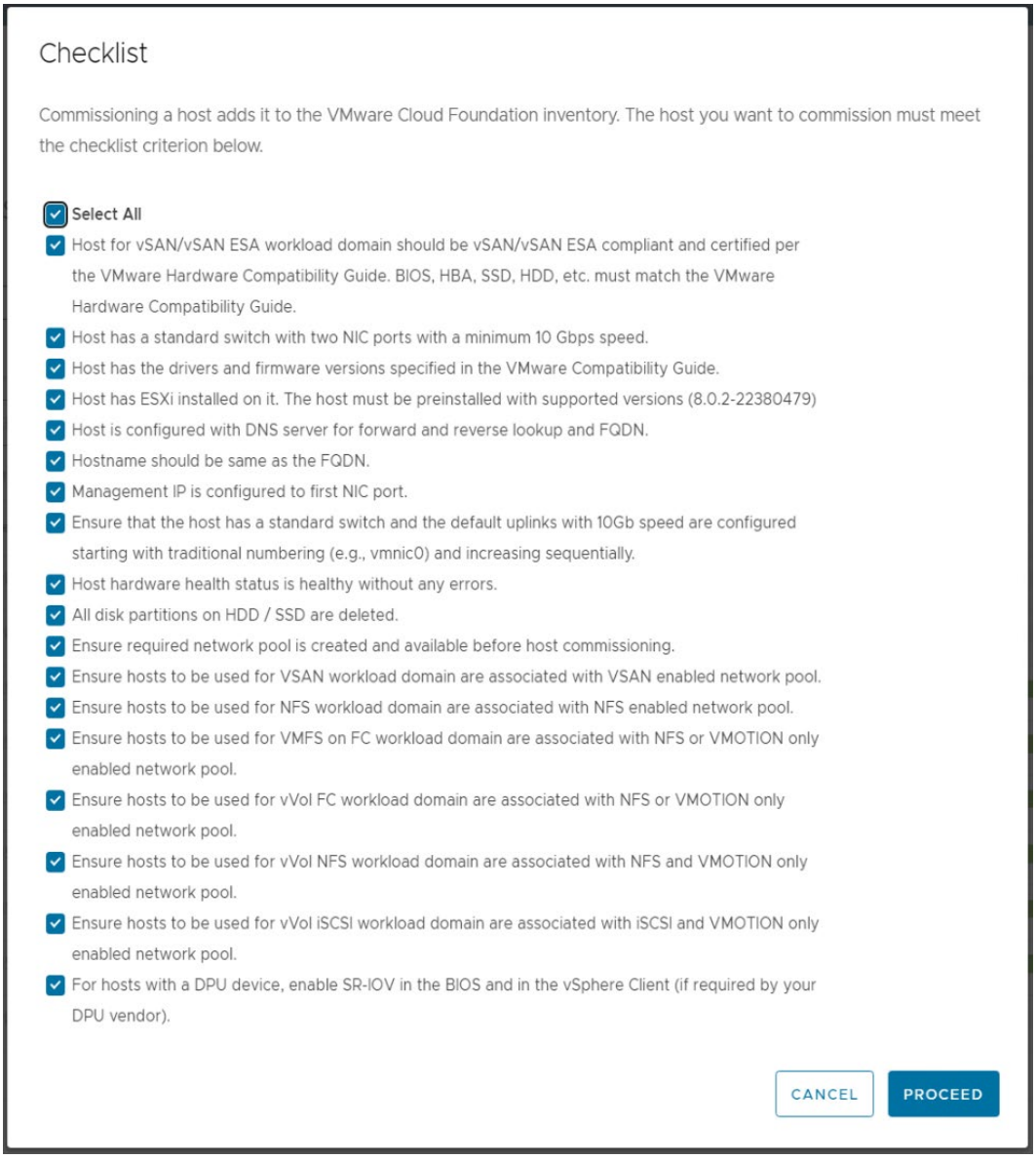

Figure 4. Host checklist

4. In the Host Addition and Validation window, select the **Add new** radio button. Enter the information as shown in Figure 5 and then click **Add**:
   a. For the ESXi Host FQDN, enter the Host Fully Qualified Domain Name (FQDN).
   b. For storage type, select **vVol**.
   c. For the vVol storage protocol type, select **FC**.
   d. Select the network pool name created previously.
   e. Enter the user name and password for the ESXi host.
5. Repeat Steps a through e for any additional ESXi hosts that must be added. Then click **Add**.

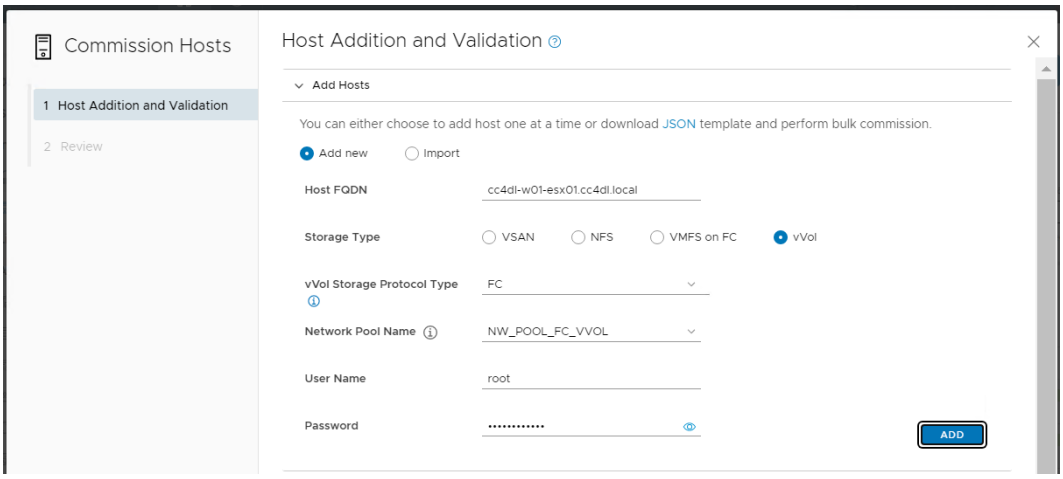

Figure 5. Host addition

6. From the Hosts Added section, select the hosts from the FQDN column.
7. Select the **Confirm FingerPrint** radio button.

8. Click **Validate All** for the ESXi hosts that need to be commissioned.

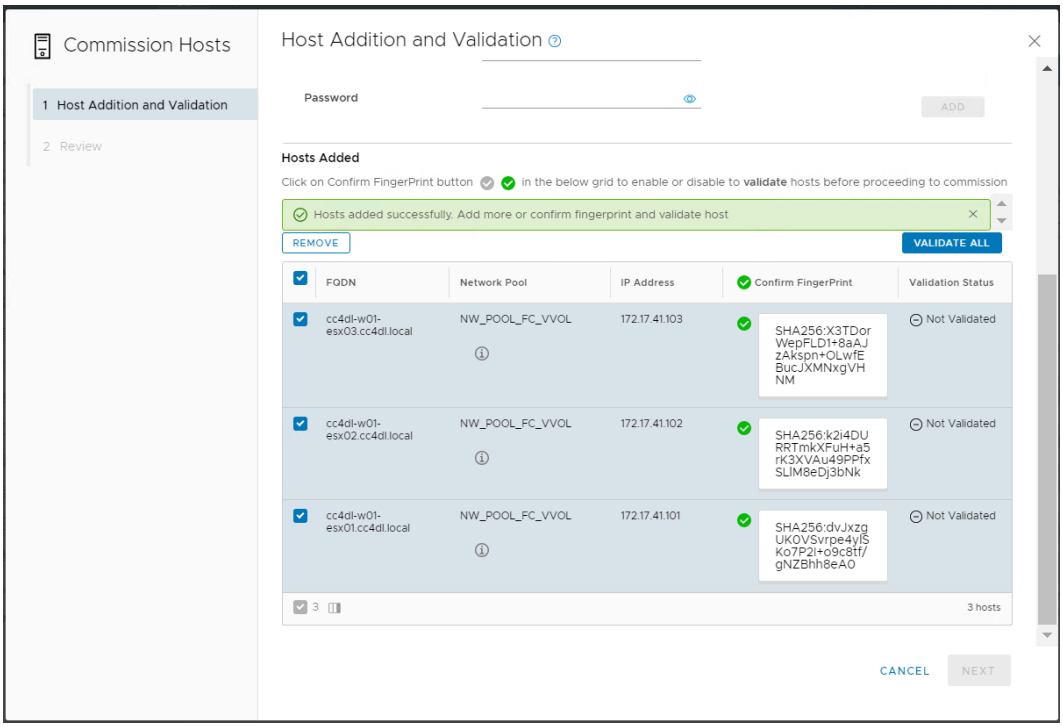

Figure 6. Host validation

9. After the hosts have been validated, click **Next**.

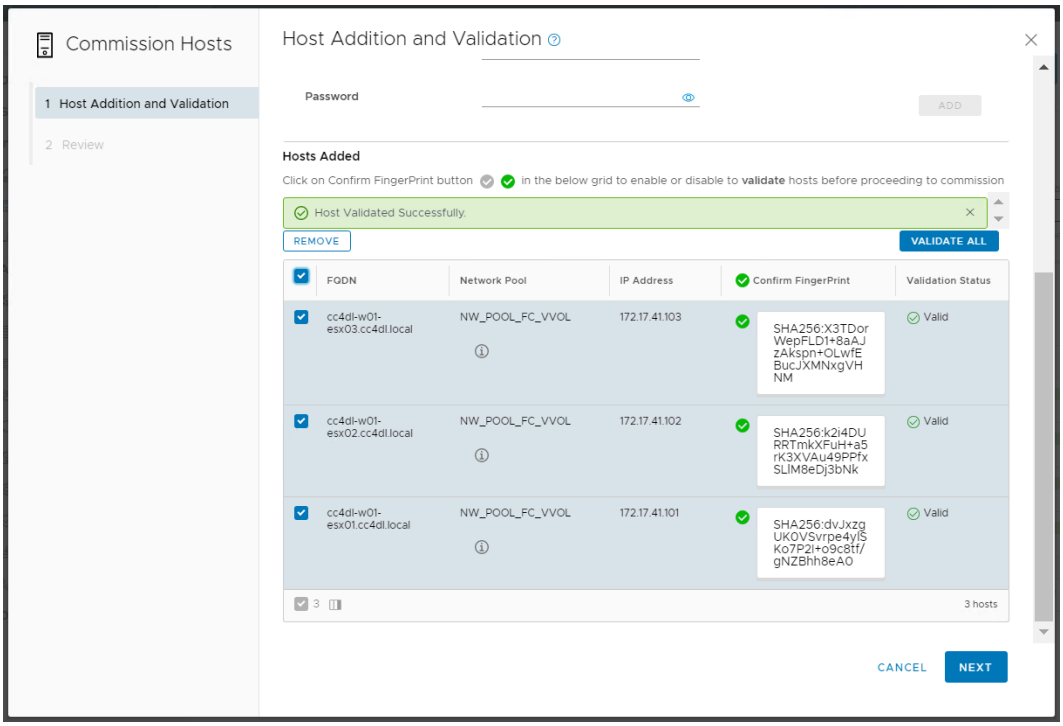

Figure 7. Host successfully validated

10. Review the validated hosts and click **Commission**.

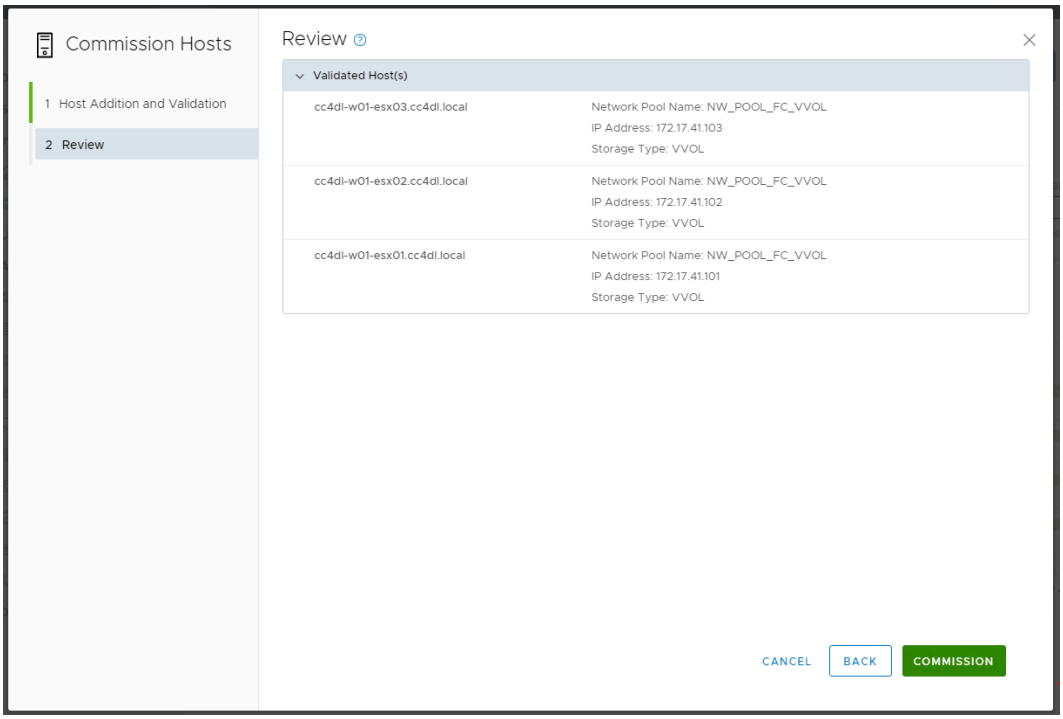

Figure 8. Commission the validated hosts

Create the workload domain with the vVol storage type

The next task is to create the vVol workload domain.

1. From the SDDC Manager, select **Inventory** ⟶ **Workload Domains**.
2. Click **+ Workload Domain** ⟶ **VI – Workload Domains**.

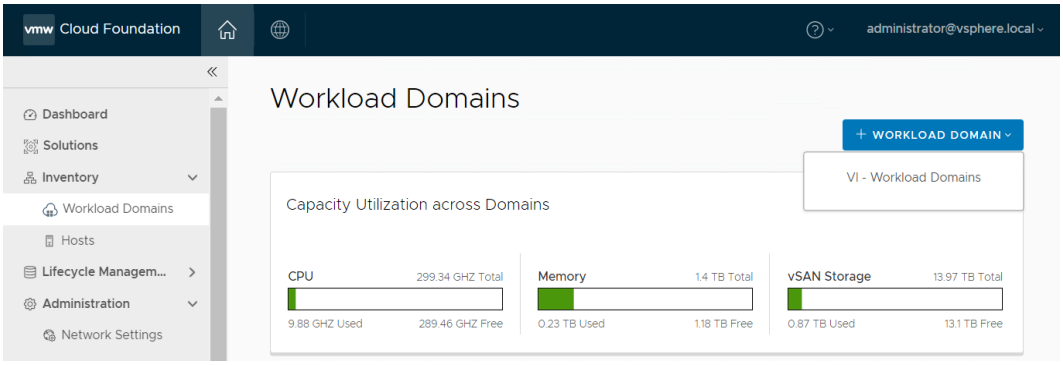

Figure 9. Create a VI workload domain

3. Select the **vVol** radio button and click **Begin**.

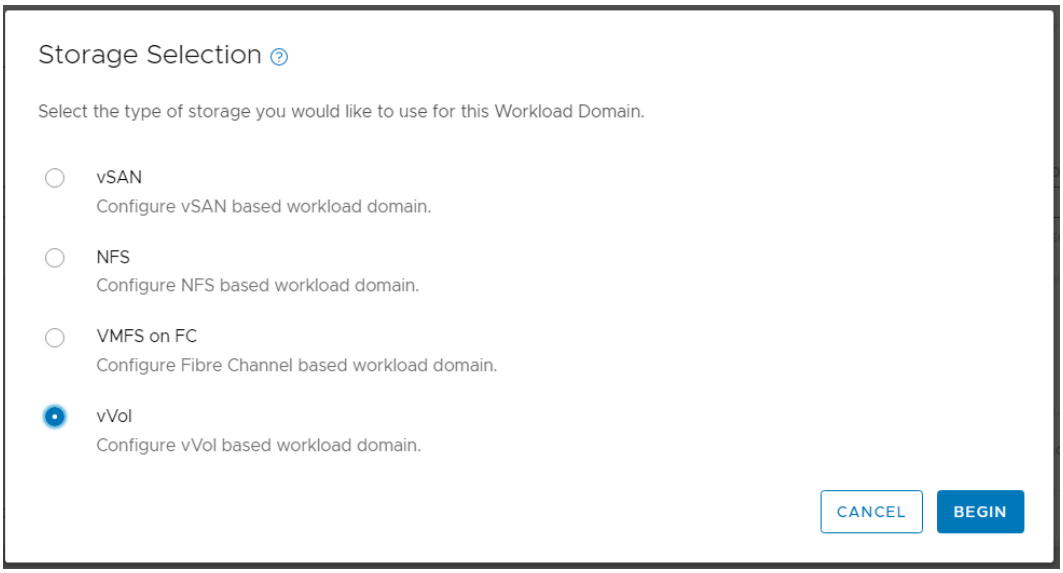

Figure 10. Storage type selection for workload domain

4. Enter the virtual infrastructure (VI) name and organization name. Then click **Next**.

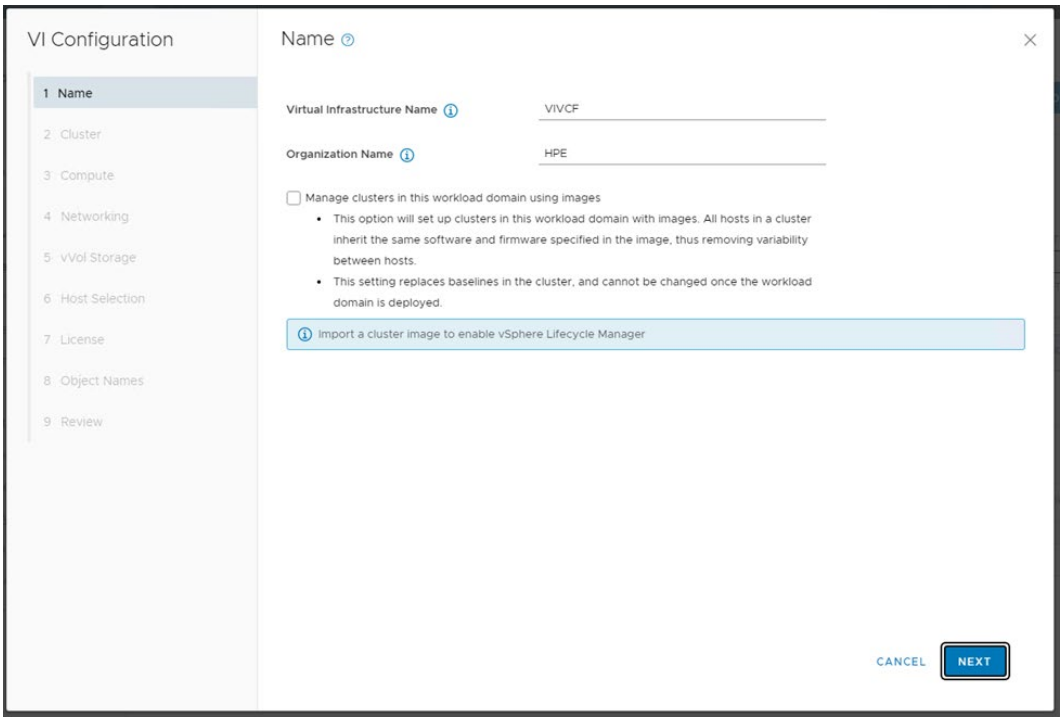

Figure 11. Virtual infrastructure configuration

5. Enter a cluster name as shown in Figure 12 and then click **Next**.

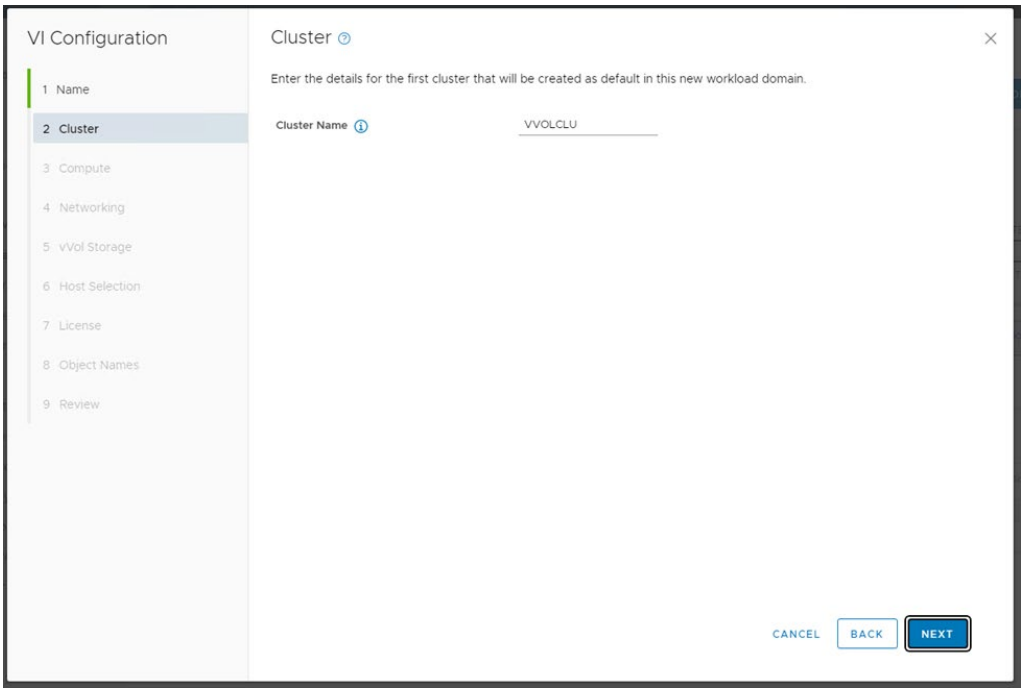

Figure 12. Enter the cluster name

6. Enter the vCenter FQDN.

   The vCenter IP Address, Subnet Mask, and Default Gateway fields auto-populate, as shown in Figure 13.

7. Enter the vCenter root password and click **Next**.

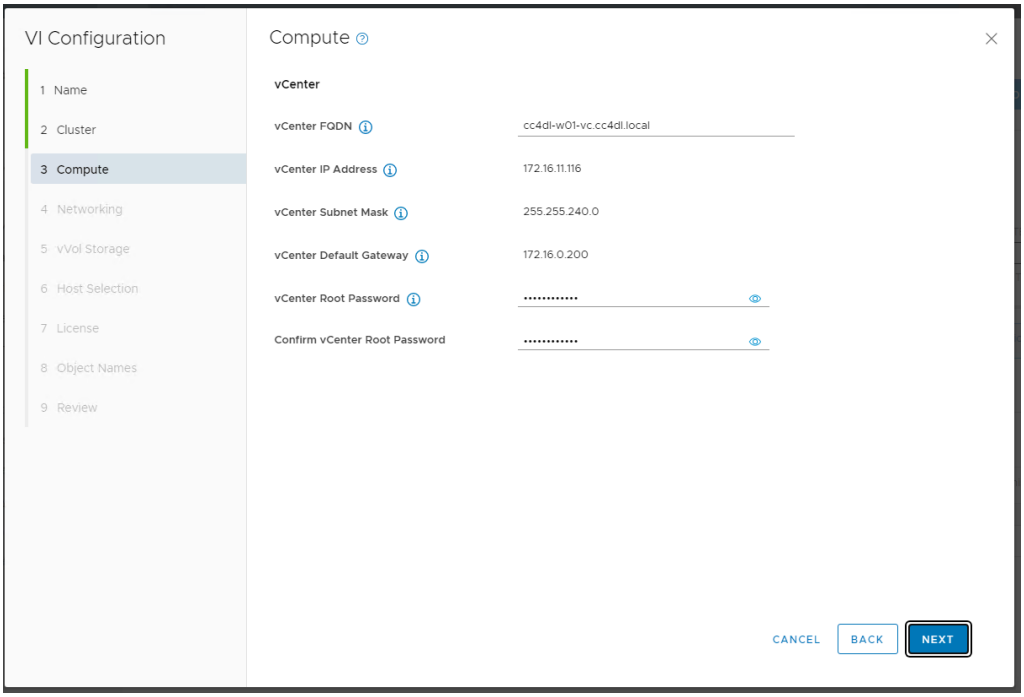

Figure 13. Enter the workload vCenter details

8. Enter the cluster FQDN.

   The Cluster IP auto-populates.

9. Enter the FQDNs for the NSX-T components.

   The IP addresses also auto-populate.

10. Enter the admin password and scroll down in the window to continue configuring the VI network.

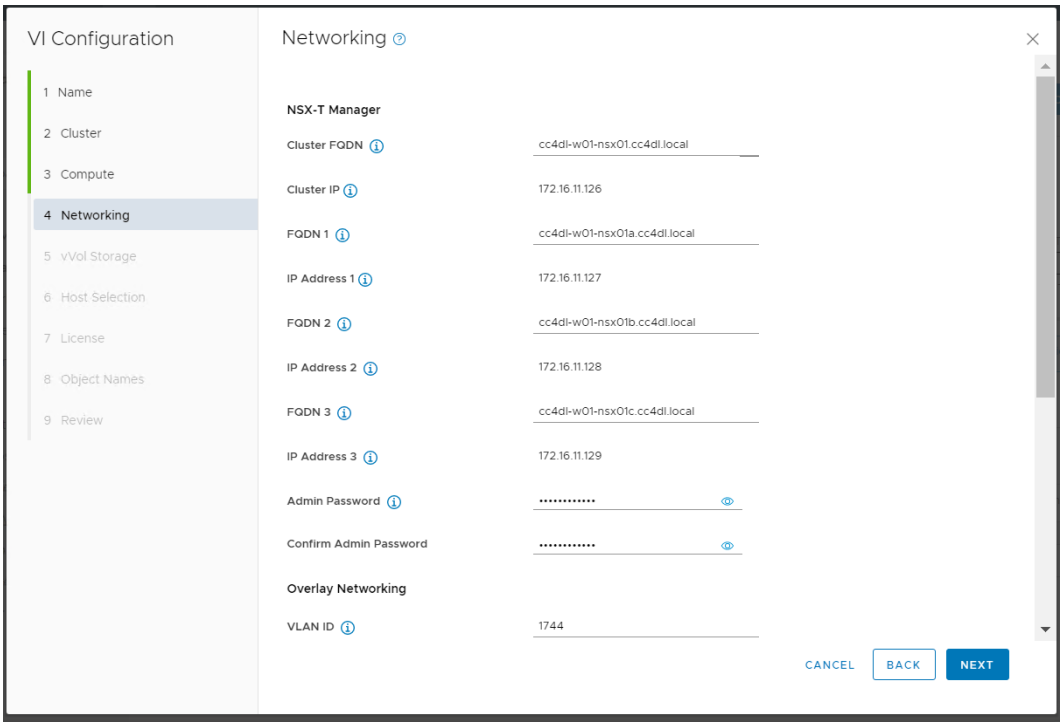

Figure 14. Enter the networking details

11. In the Overlay Networking section, specify the required information and then click **Next**:

    a. Enter the VLAN ID.

    b. For IP Allocation, select **Static IP Pool** and select the **Create New Static IP Pool** radio button.

    c. Enter a pool name, a description (optional), the CIDR, the IP address range, and the gateway IP address, as shown in Figure 15.

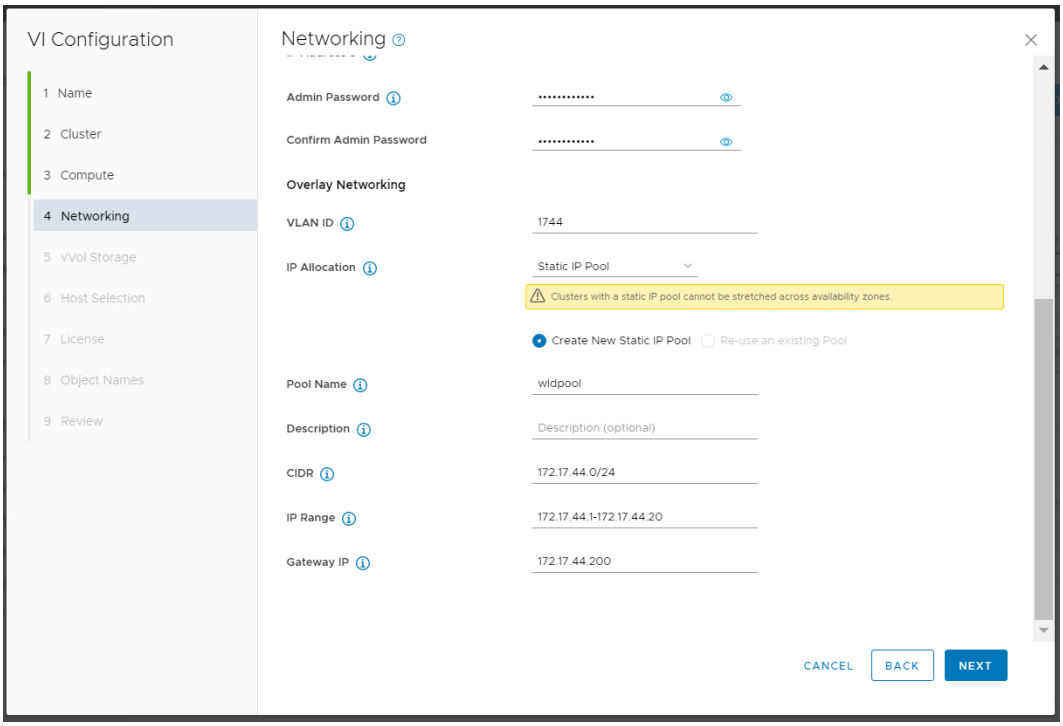

Figure 15. Enter the Overlay Networking details

12. In the vVol Storage Details window, enter the information created earlier in the Register the HPE Storage VASA Provider with SDDC Manager section:
    a. Select a VASA protocol type.
    b. Select a VASA provider.
    c. Select a storage container.
    d. Select a VASA user.
    e. Enter a datastore name for the workload domain and click **Next**.

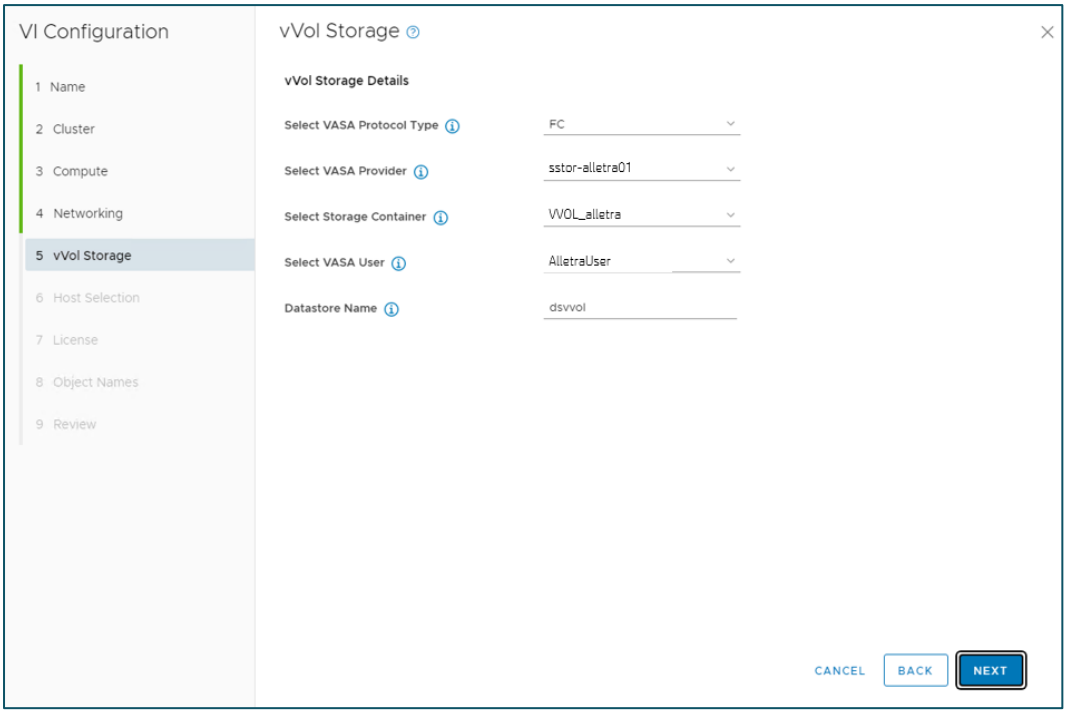

Figure 16. Enter the vVol datastore

13. Check the FQDN box to select the hosts created previously in the Commission hosts with SDDC Manager for a workload domain section and then click **Next**.

    The minimum number of hosts for vVol Storage is three.

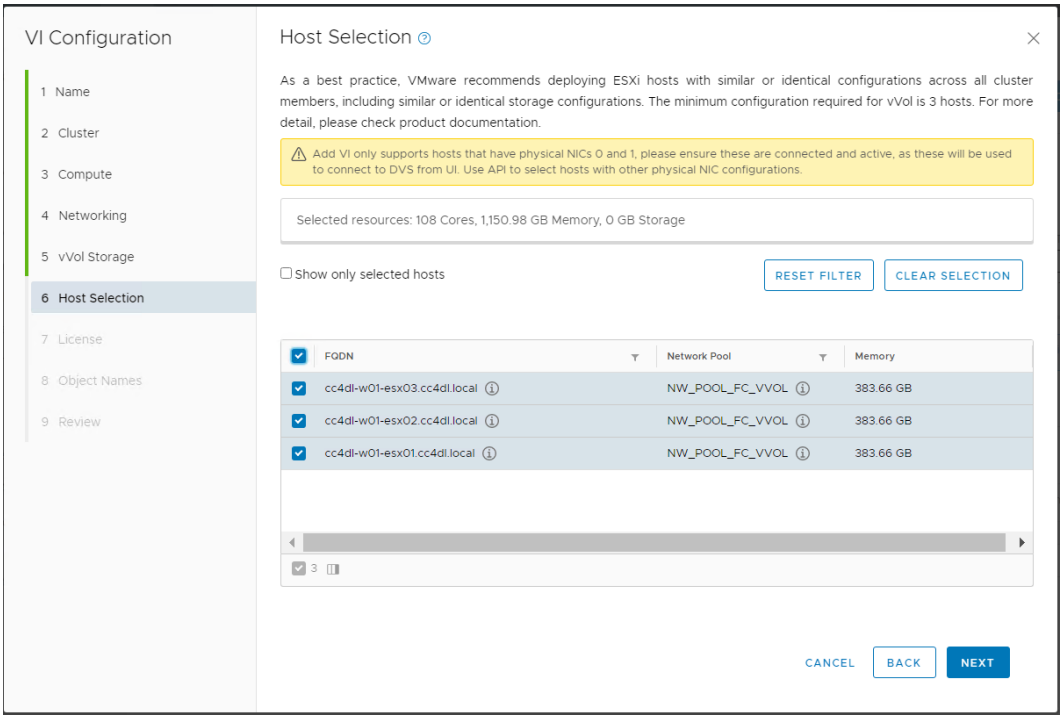

Figure 17. Host selection

14. Select the NSX-T Data Center and VMware vSphere licenses. Then click **Next**.

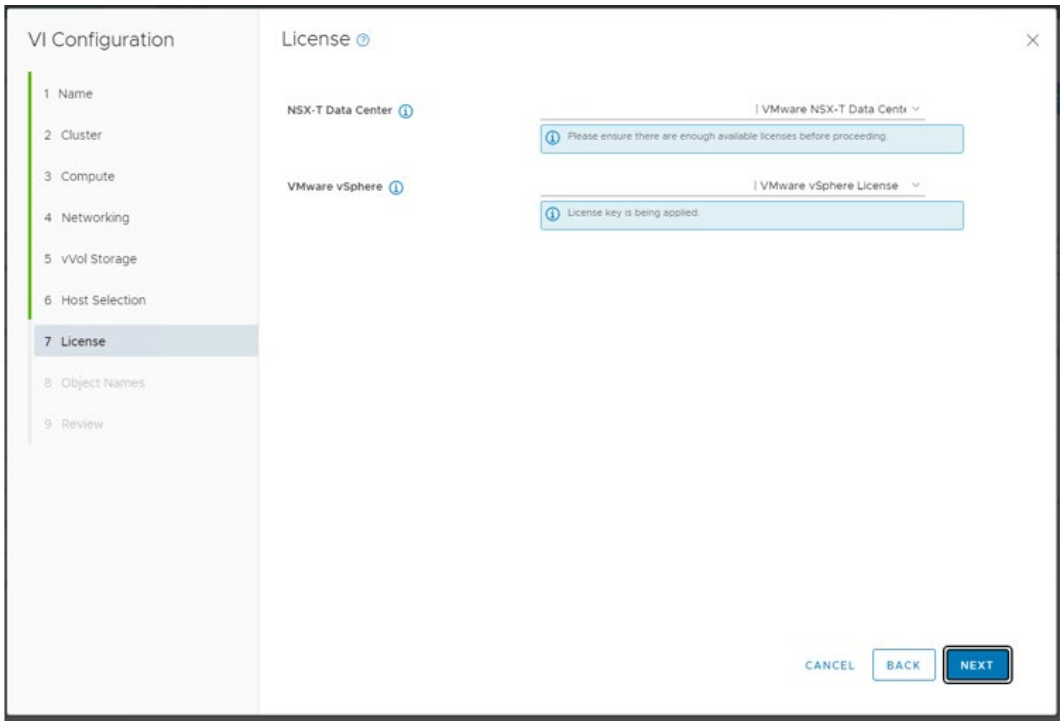

Figure 18. Select the licenses

15. Verify the object names and then click **Next**.

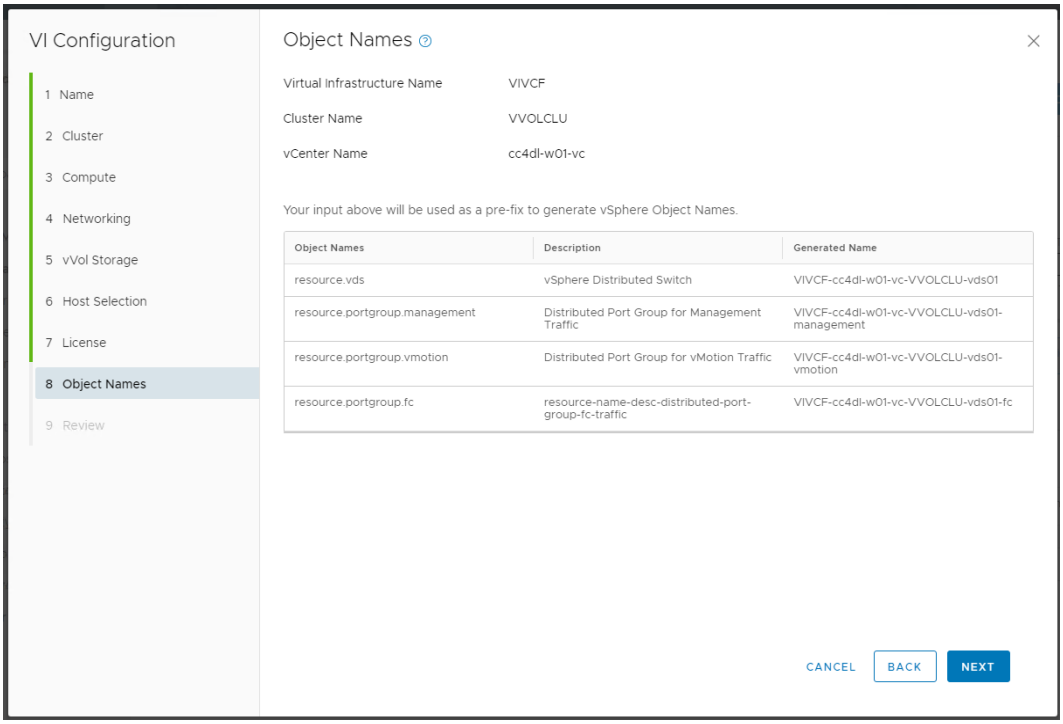

Figure 19. Verify object name details

16. Review the final VI configuration data entered and then click **Finish**.

    The workload domain deployment begins.

Figure 20. Review final configuration data

Note
The workload domain deployment might take an hour to complete.

Verify the workload domain with SDDC Manager

The next task is to verify that the workload domain has been created within SDDC Manager.

Note

On the SDDC Manager Dashboard, the number **1** by the label **VI Domain** indicates that a VI workload domain was created.

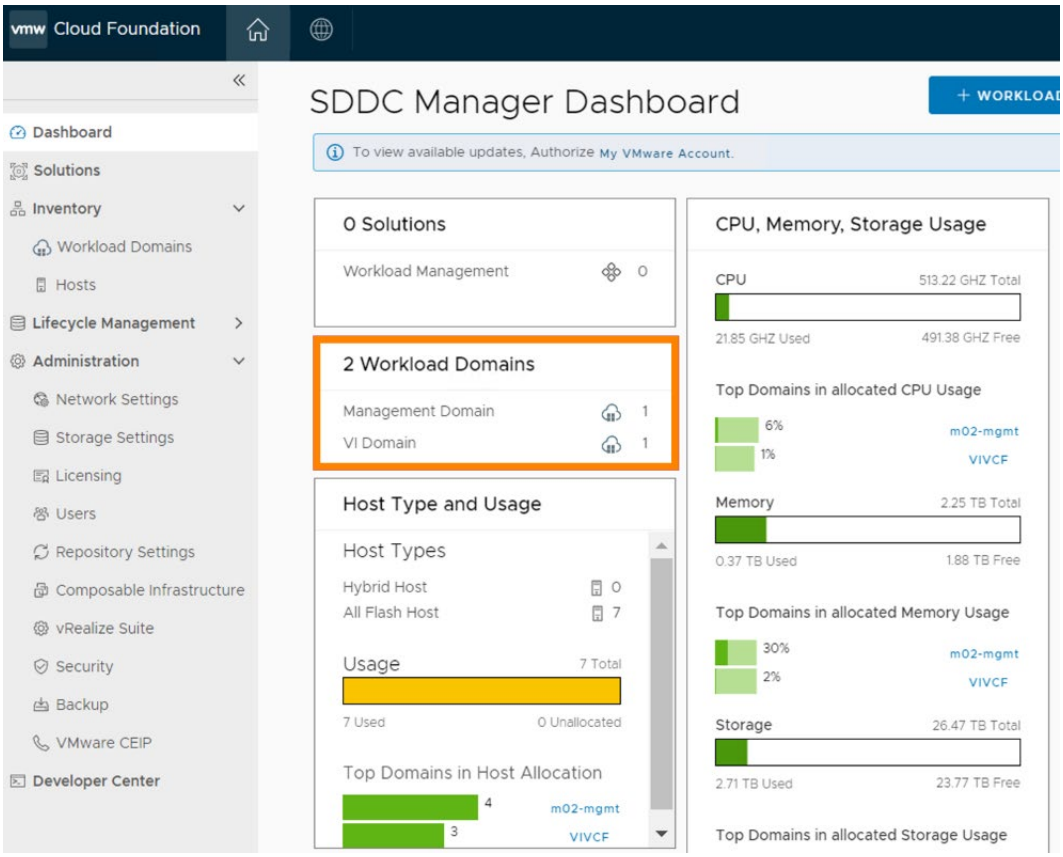

Figure 21. SDDC Manager Dashboard

1. To view the VIVCF workload domain, select **Inventory** →**Workload Domains**.
2. Click the **VIVCF** workload domain.

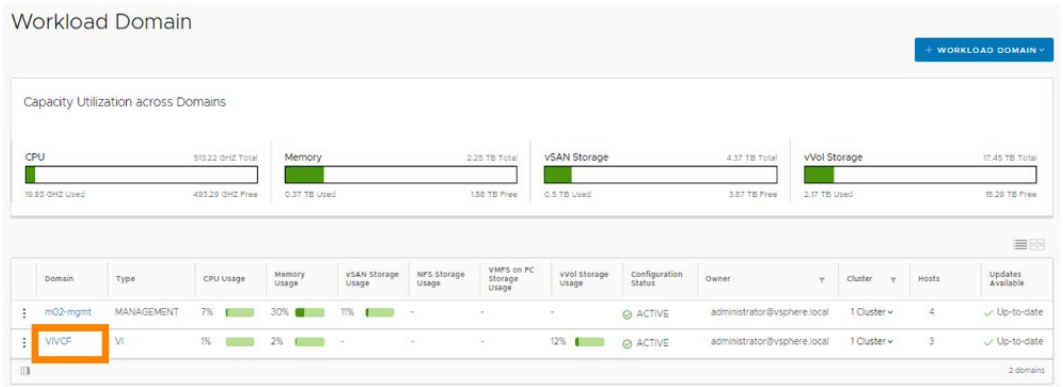

Figure 22. Highlighted workload domain

3. Verify that the vVol column contains a checkmark.

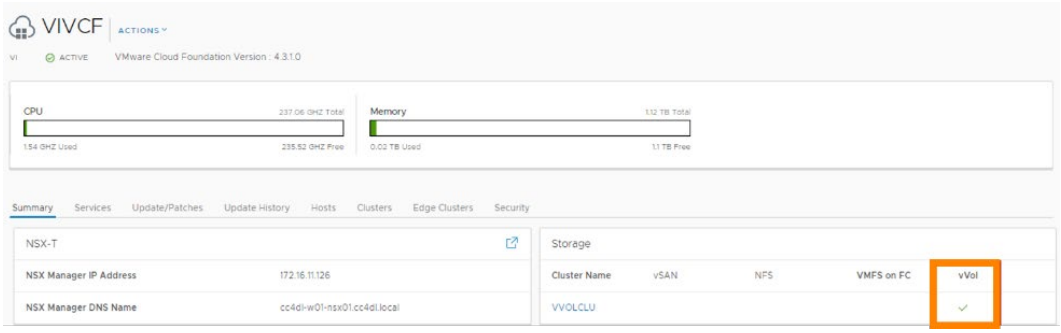

Figure 23. Highlighted storage type vVol

4. To verify the commissioned hosts, click the **Hosts** column.

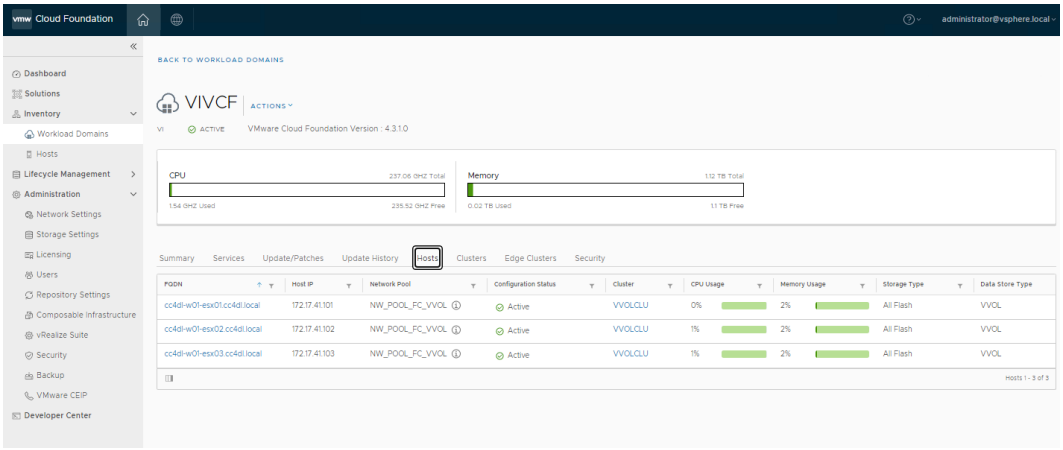

Figure 24. Workload domain host view

5. To verify the VVOLCLU cluster information, click the **Clusters** column.
6. Locate **VVOLCLU** and click it to view the information.

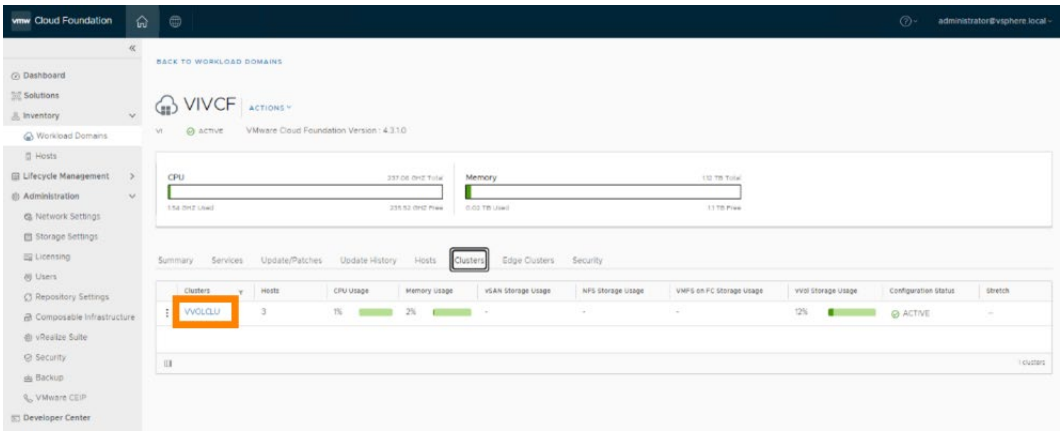

Figure 25. Workload domain cluster view

7. View the information about the VVOLCLU cluster, noting the vVol designations as shown in Figure 26.

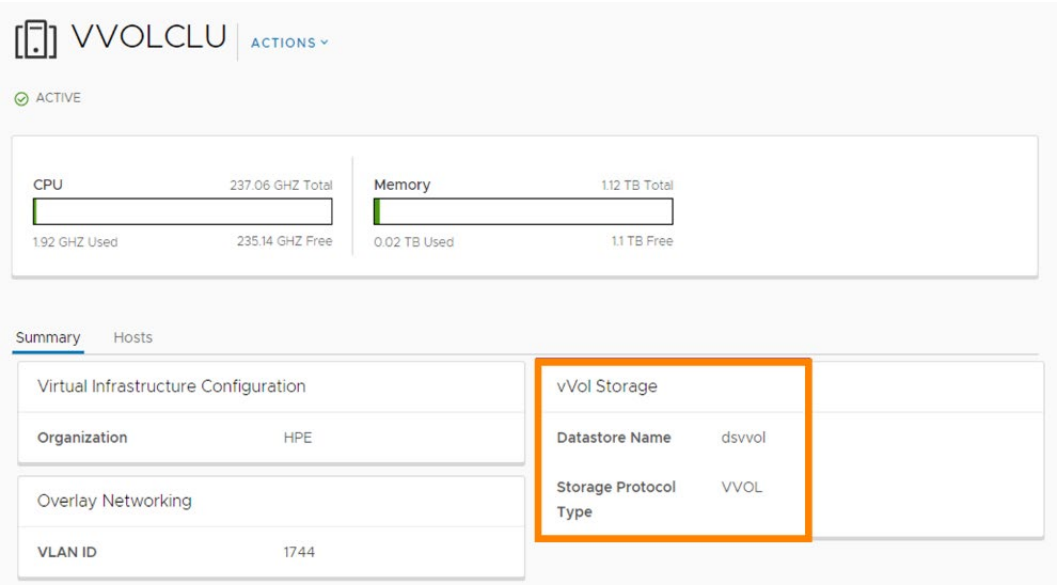

Figure 26. Cluster summary

8. To verify the commissioned hosts from the VVOLCLU cluster, click the **Hosts** column.

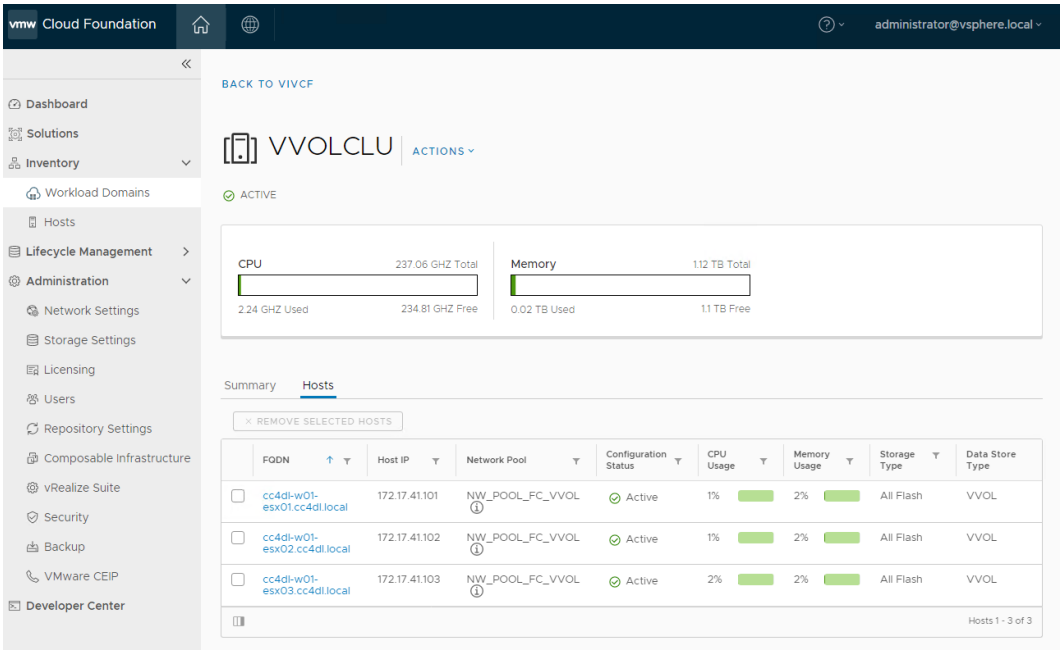

Figure 27. Cluster host view

Verify the storage provider and vVol datastore in vCenter

The final task is to view and verify the storage provider and vVol datastore from within vCenter.

1. Log in to the vSphere Client and select the appropriate vCenter.

   This is the vCenter you selected earlier in the Create the workload domain with the vVol storage type section of this paper.

2. Select **Configure** → **Storage Providers** → **sstor-alletra01**.
3. Review the displayed information.

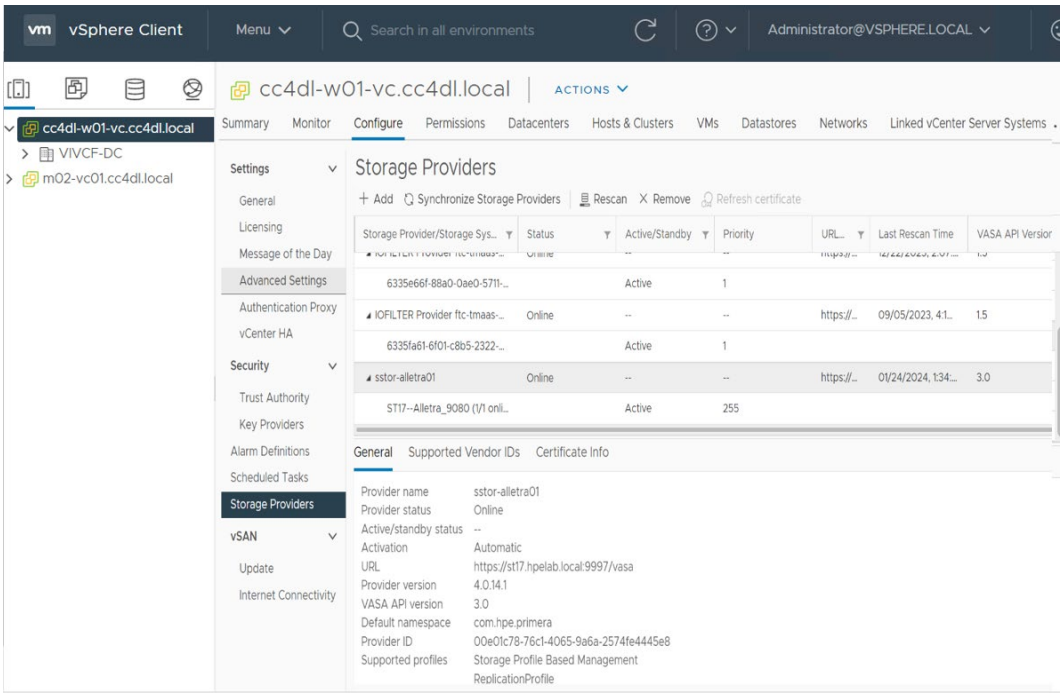

Figure 28. vCenter storage providers information

4. For more details about the storage provider, select the highlighted area and review the information displayed there.

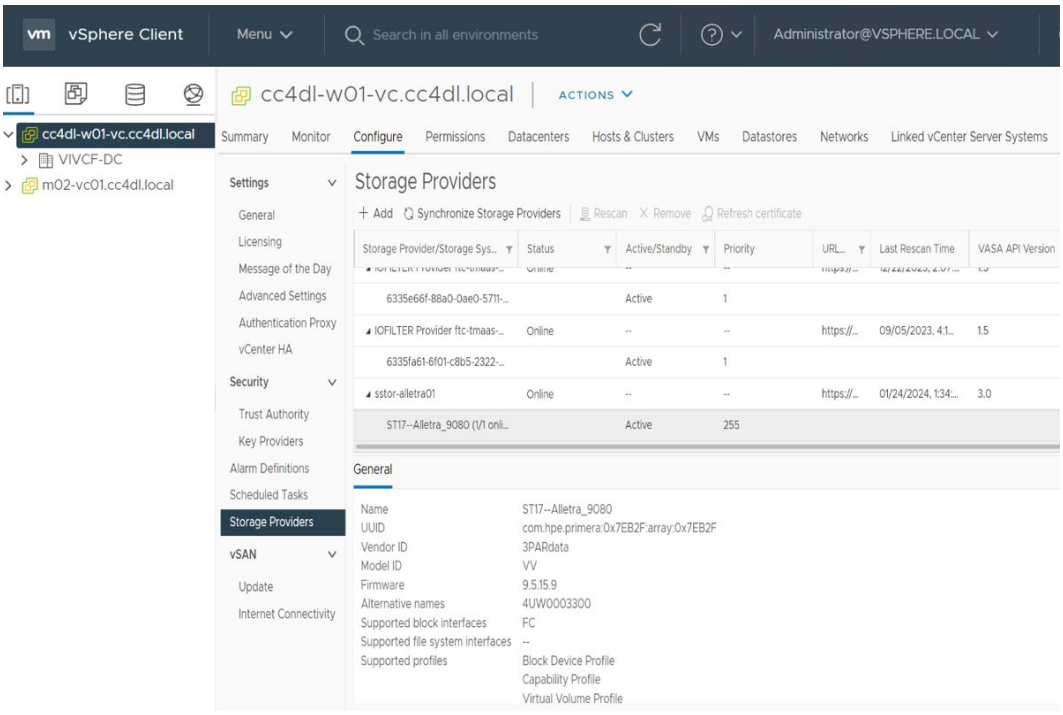

Figure 29. Detailed vCenter storage providers information

5. To view the datastore created, from vCenter, click the **Storage** icon and then click the **dsvvol** datastore.

   Note the vVol type for the datastore.

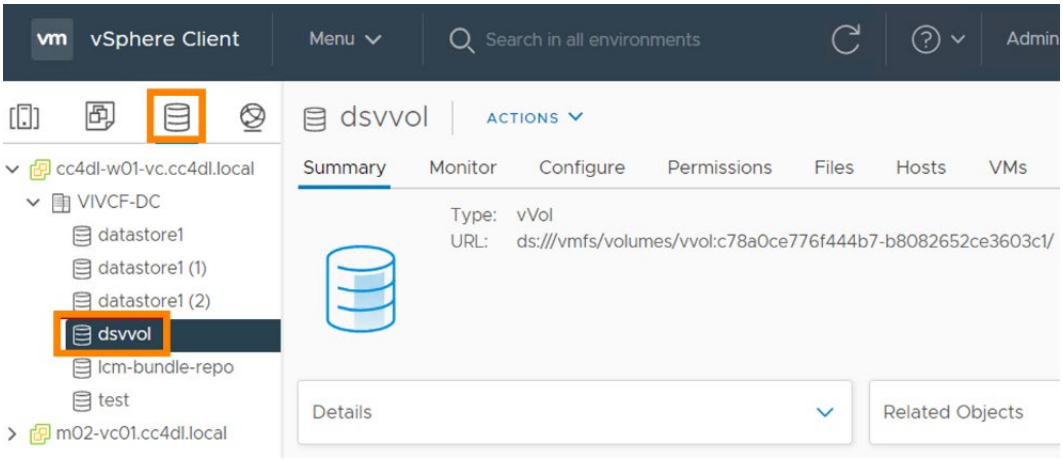

Figure 30. vVol datastore

6. To view protocol endpoints information, click **Configure** ⟶ **Protocol Endpoints** from within the dsvvol datastore.

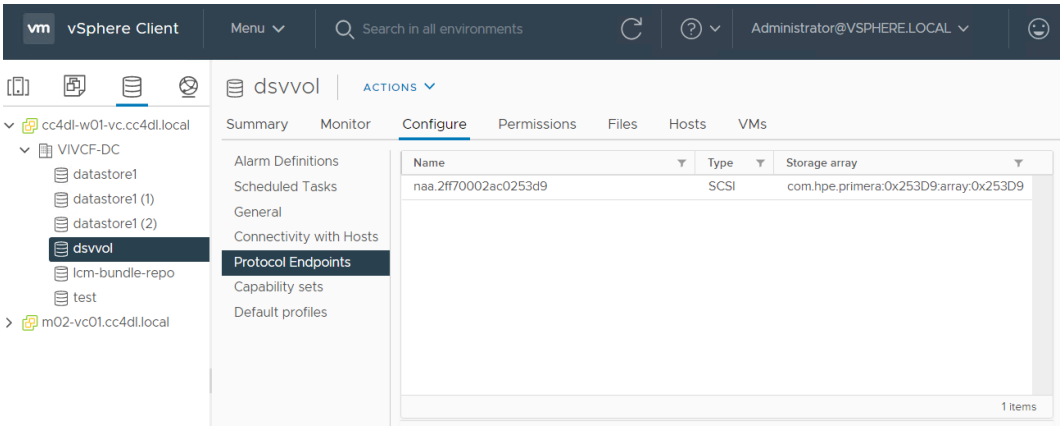

Figure 31. Datastore protocol endpoints view

When these tasks are finished, deployment is complete for VCF VI Workload Domain Principal storage using HPE Storage with vVols over FC.

Summary

Hewlett Packard Enterprise and VMware can deliver a software-defined solution running on modular infrastructure across compute, storage, network, container, security, and cloud management with VMware Cloud Foundation.

This paper reviewed the steps required to deploy a VCF VI workload domain using HPE Storage and vVols as principal storage. It also explained how valuable the solution is and showed how simple it is to set up.

Hewlett Packard Enterprise recommends using vVols when you want to eliminate large VMFS datastore provisioning in the VCF environment. With vVols, you can provision storage on a VM basis by using SPBM, which can be aligned with the application demands of VMs. Determining your storage capabilities through storage policies at the VM level rather than for the entire datastore makes storage management much easier.

Resources

HPE Alletra Storage Arrays
buy.hpe.com/us/en/storage/storage-cloud/storage-saas/data-services/hpe-greenlake-for-block-storage/p/1014658010

HPE Primera 600 Storage
buy.hpe.com/us/en/storage/disk-storage-systems/primera-storage/primera-storage/hpe-primera-600storage/p/1011657880

HPE Servers
hpe.com/servers

HPE VMware Alliance
hpe.com/us/ens/alliance/vmware

HPE Reference Architecture for VMware Cloud Foundation 5.0 on HPE ProLiant DL Servers
hpe.com/psnow/doc/a50009973enw

HPE Firmware and Software Compatibility Matrix for VMware Cloud Foundation 5.1 on HPE ProLiant Gen10 Plus and Gen11 servers
hpe.com/psnow/doc/not sua50009938enw

HPE Synergy Gen10 Firmware and Software Compatibility Matrix for VMware Cloud Foundation 5.1
hpe.com/psnow/doc/a50009912enw

Supported Storage Types for VMware Cloud Foundation
docs.vmware.com/en/VMware-Cloud-Foundation/5.1/vcf-design/GUID-2156EC66-BBBB-4197-91AD-660315385D2E.html

VMware Compatibility Guide
vmware.com/resources/compatibility/search.php

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