



Guest Connected storage for AVS

NetApp Solutions

NetApp
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NetApp Guest Connected Storage Options for Azure

Azure supports guest connected NetApp storage with the native Azure NetApp Files (ANF) service or with Cloud Volumes ONTAP (CVO).

Azure NetApp Files (ANF)

Azure netApp Files brings enterprise-grade data management and storage to Azure so you can manage your workloads and applications with ease. Migrate your workloads to the cloud and run them without sacrificing performance.

Azure netApp Files removes obstacles, so you can move all of your file-based applications to the cloud. For the first time, you do not have to re-architect your applications, and you get persistent storage for your applications without complexity.

Because the service is delivered through the Microsoft Azure Portal, users experience a fully managed service as part of their Microsoft enterprise Agreement. World-class support, managed by Microsoft, gives you complete peace of mind. This single solution enables you to quickly and easily add multiprotocol workloads. you can build and deploy both Windows and Linux file-based applications, even for legacy environments.

Azure NetApp Files (ANF) as guest connected storage

Configure Azure NetApp Files with Azure VMware Solution (AVS)

Azure NetApp Files shares can be mounted from VMs that are created in the Azure VMware Solution SDDC environment. The volumes can also be mounted on the Linux client and mapped on the Windows client because Azure NetApp Files supports SMB and NFS protocols. Azure NetApp Files volumes can be set up in five simple steps.

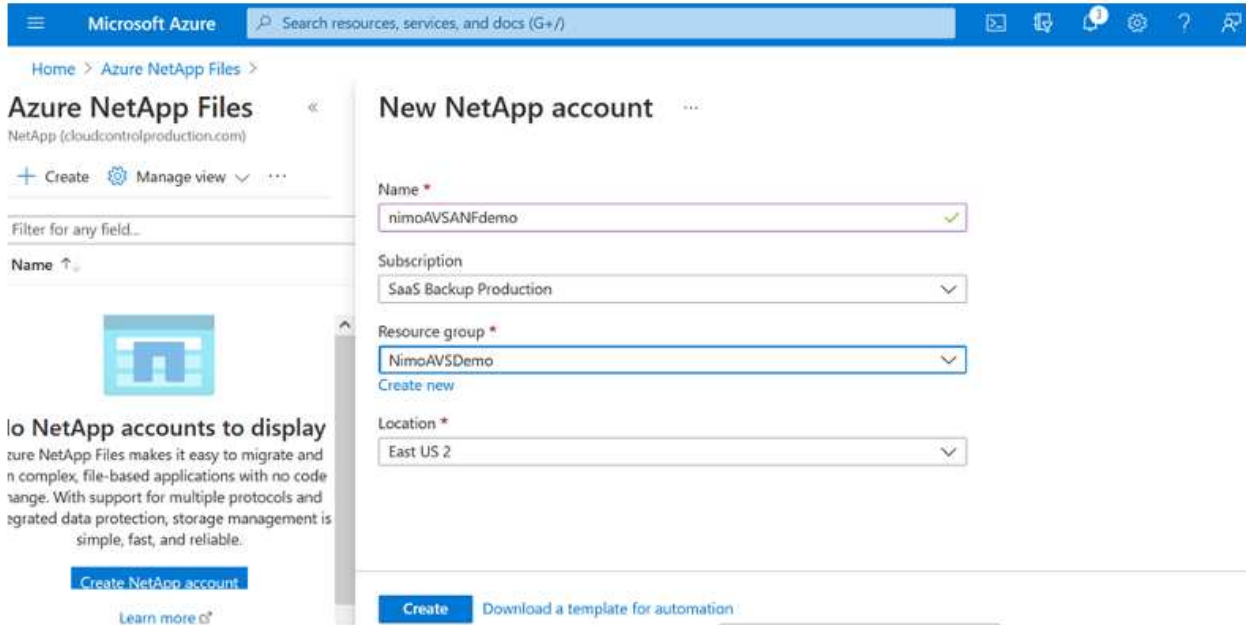
Azure NetApp Files and Azure VMware Solution must be in the same Azure region.

Create and mount Azure NetApp Files volumes

To create and mount Azure NetApp Files volumes, complete the following steps:

1. Log in to the Azure Portal and access Azure NetApp Files. Verify access to the Azure NetApp Files service and register the Azure NetApp Files Resource Provider by using the `az provider register --namespace Microsoft.NetApp --wait` command. After registration is complete, create a NetApp account.

For detailed steps, see [Azure NetApp Files shares](#). This page will guide you through the step-by-step process.



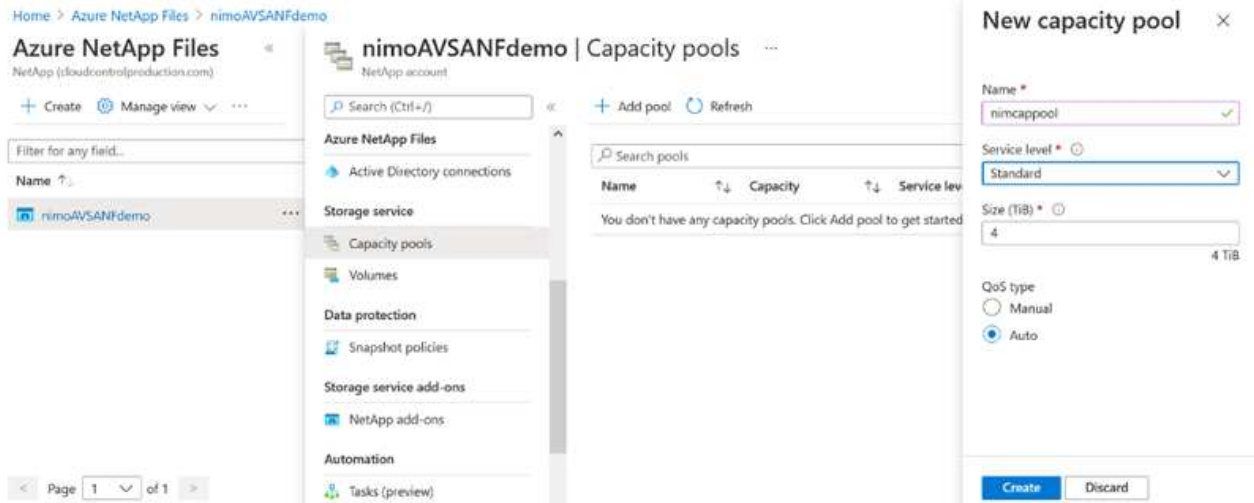
The screenshot shows the 'New NetApp account' page in the Azure Portal. The left sidebar displays the 'Azure NetApp Files' section with a 'Create' button and a 'Manage view' dropdown. The main content area is titled 'New NetApp account' and contains a form with the following fields:

- Name ***: nimoAVSANFdemo (with a green checkmark)
- Subscription**: SaaS Backup Production (dropdown menu)
- Resource group ***: NimoAVSDemo (dropdown menu) with a 'Create new' link below it.
- Location ***: East US 2 (dropdown menu)

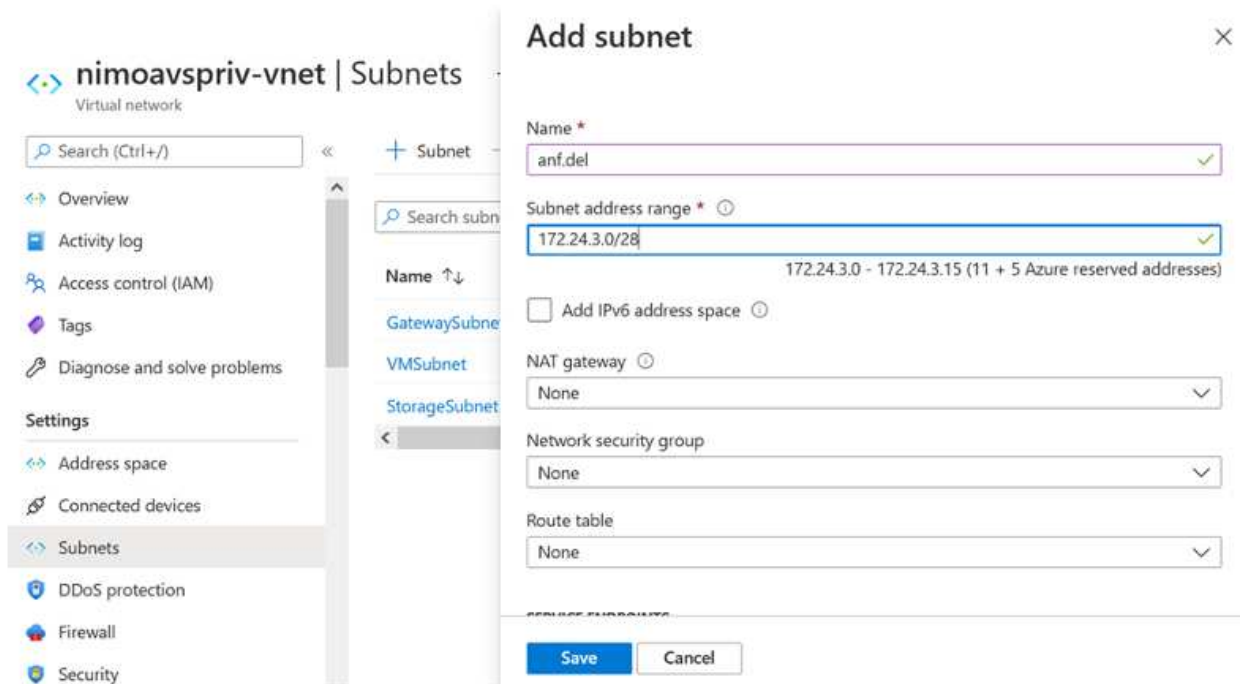
At the bottom of the form, there is a blue 'Create' button and a link to 'Download a template for automation'.

2. After the NetApp account is created, set up the capacity pools with the required service level and size.

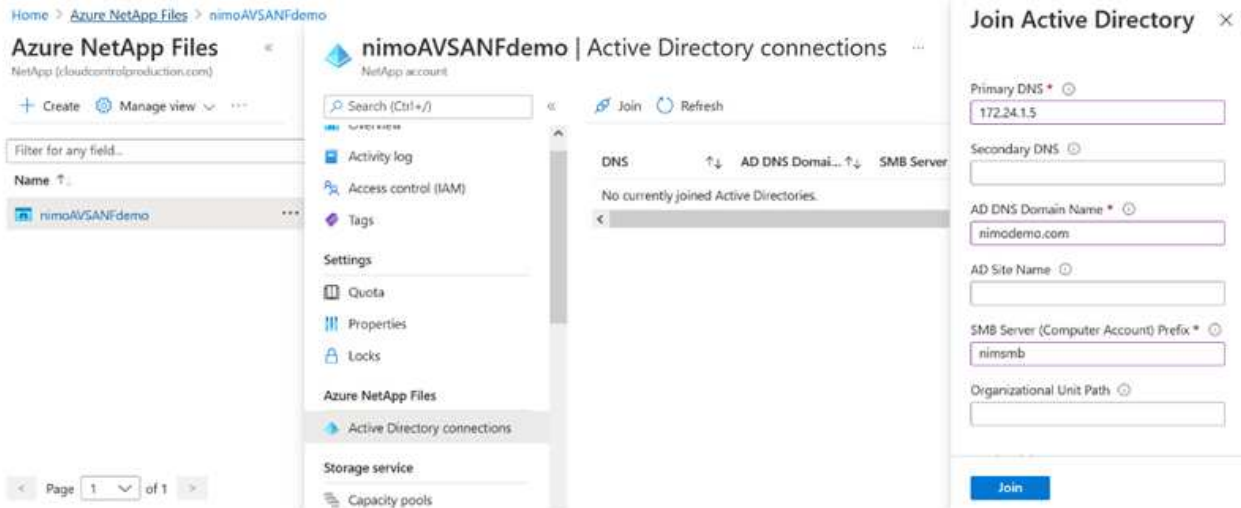
For more information, see [Set up a capacity pool](#).



3. Configure the delegated subnet for Azure NetApp Files and specify this subnet while creating the volumes. For detailed steps to create delegated subnet, see [Delegate a subnet to Azure NetApp Files](#).

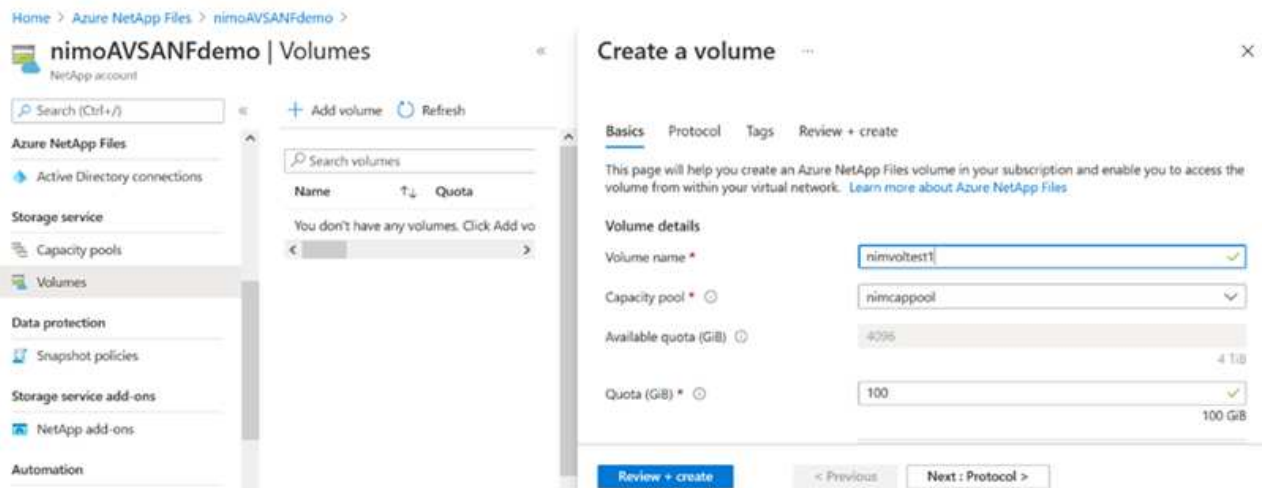


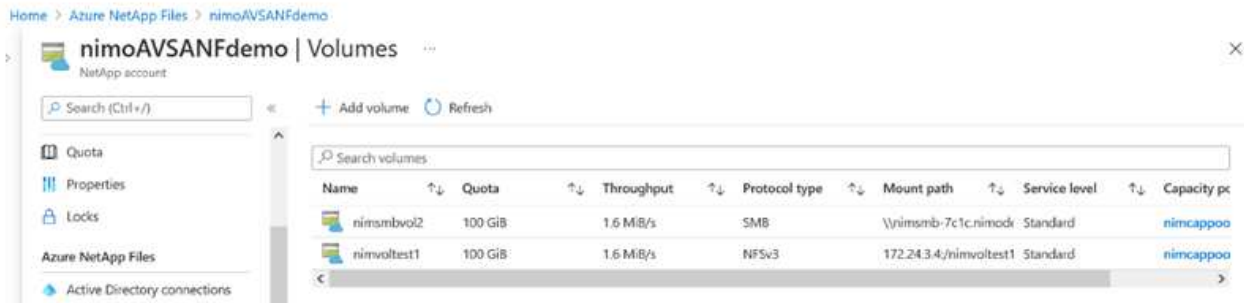
4. Add an SMB volume by using the Volumes blade under the Capacity Pools blade. Make sure the Active Directory connector is configured prior to creating the SMB volume.



5. Click Review + Create to create the SMB volume.

If the application is SQL Server, then enable the SMB continuous availability.

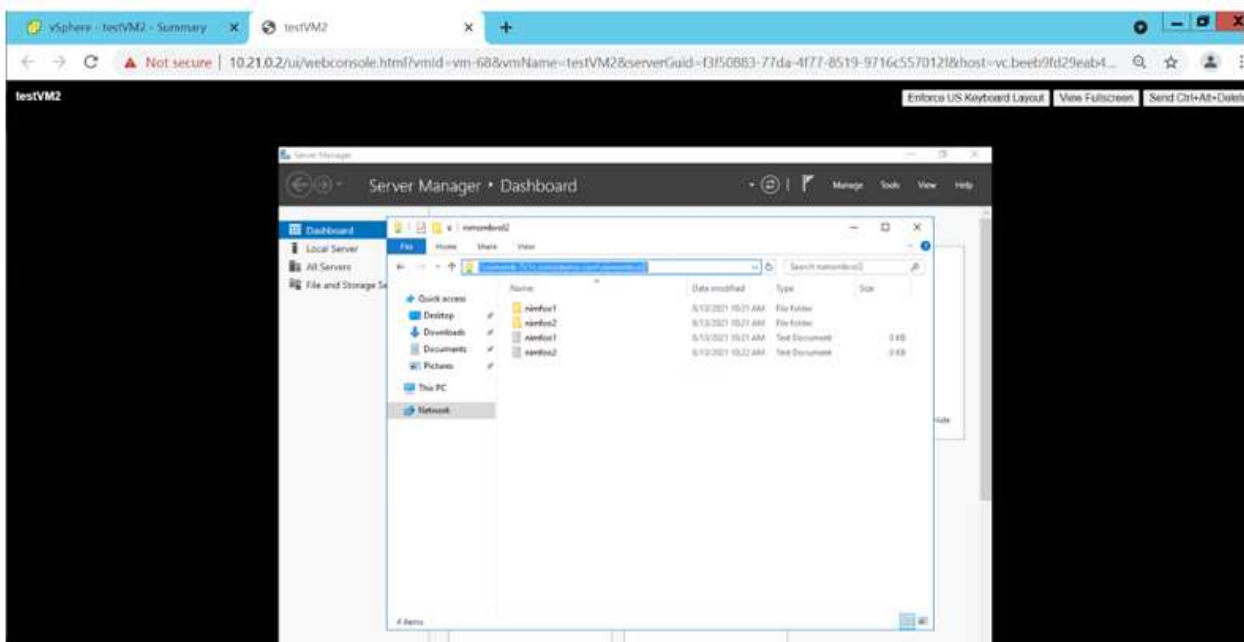


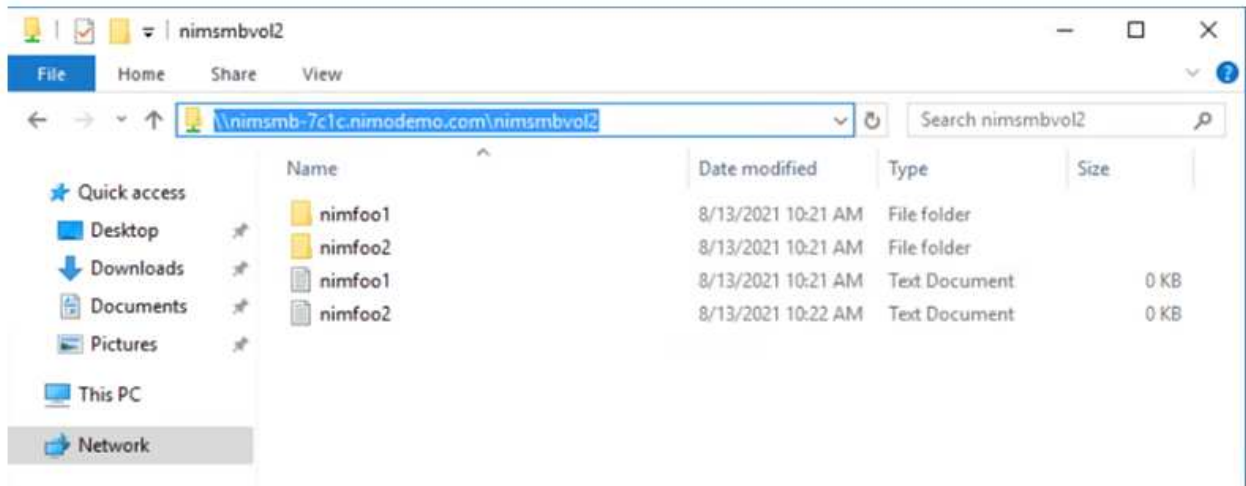


To learn more about Azure NetApp Files volume performance by size or quota, see [Performance considerations for Azure NetApp Files](#).

6. After the connectivity is in place, the volume can be mounted and used for application data.

To accomplish this, from the Azure portal, click the Volumes blade, and then select the volume to mount and access the mount instructions. Copy the path and use the Map Network Drive option to mount the volume on the VM running on Azure VMware Solution SDDC.





7. To mount NFS volumes on Linux VMs running on Azure VMware Solution SDDC, use this same process. Use volume reshaping or dynamic service level capability to meet the workload demands.

```
nimoadmin@nimoadmin-virtual-machine:~$ sudo mount -t nfs -o rw,hard,tcp 172.24.3.4:/n1nodemonfsv1 /home/nimoadmin/n1nodemo11
nimoadmin@nimoadmin-virtual-machine:~$ df
Filesystem            1K-blocks    Used Available Use% Mounted on
udev                  8168112         0   8168112   0% /dev
tmpfs                 1639548      1488   1638060   1% /run
/dev/sda5             50824704 7902752  40310496  17% /
tmpfs                 8197728         0   8197728   0% /dev/shm
tmpfs                  5120         0     5120   0% /run/lock
tmpfs                 8197728         0   8197728   0% /sys/fs/cgroup
/dev/loop0             56832      56832         0 100% /snap/core18/2128
/dev/loop2             66688      66688         0 100% /snap/gtk-common-themes/1515
/dev/loop1            224256     224256         0 100% /snap/gnome-3-34-1804/72
/dev/loop3             52224      52224         0 100% /snap/snap-store/547
/dev/loop4             33152      33152         0 100% /snap/snapd/12704
/dev/sda1              523248         4    523244   1% /boot/efi
tmpfs                 1639544         52   1639492   1% /run/user/1000
/dev/sr0               54738      54738         0 100% /media/nimoadmin/VMware Tools
172.24.3.4:/n1nodemonfsv1 104857600         0 104857600   0% /home/nimoadmin/n1nodemo11
nimoadmin@nimoadmin-virtual-machine:~$
```

For more information, see [Dynamically change the service level of a volume](#).

Cloud Volumes ONTAP (CVO)

Cloud volumes ONTAP, or CVO, is the industry-leading cloud data management solution built on NetApp's ONTAP storage software, available natively on Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform (GCP).

It is a software-defined version of ONTAP that consumes cloud-native storage, allowing you to have the same storage software in the cloud and on-premises, reducing the need to retrain your IT staff in all-new methods to

manage your data.

CVO gives customers the ability to seamlessly move data from the edge, to the data center, to the cloud and back, bringing your hybrid cloud together — all managed with a single-pane management console, NetApp Cloud Manager.

By design, CVO delivers extreme performance and advanced data management capabilities to satisfy even your most demanding applications in the cloud

Cloud Volumes ONTAP (CVO) as guest connected storage

Deploy new Cloud Volumes ONTAP in Azure

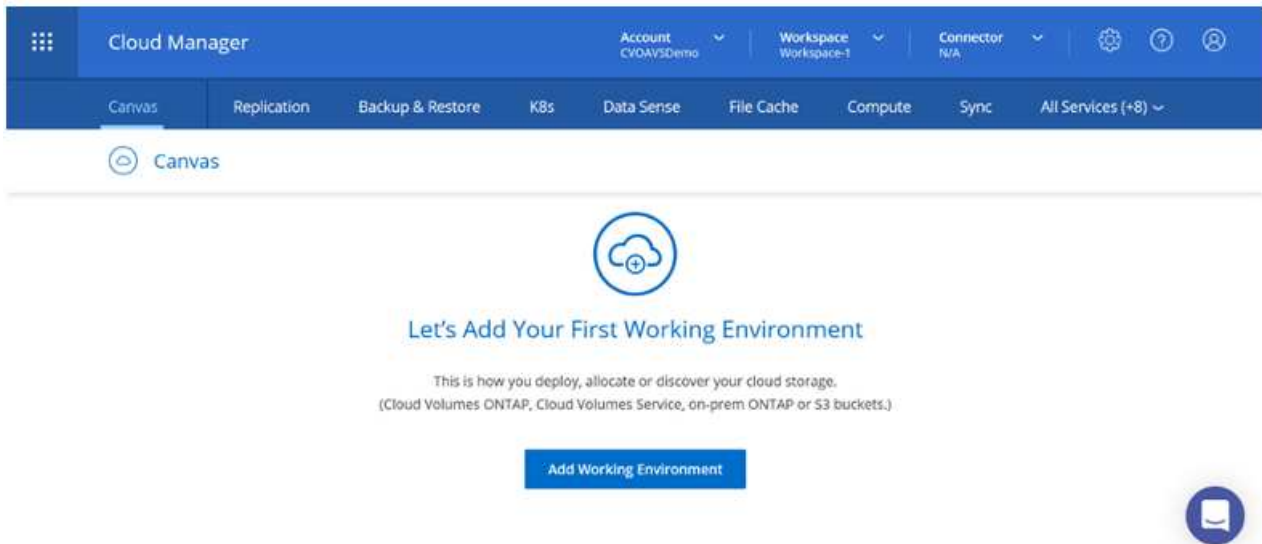
Cloud Volumes ONTAP shares and LUNs can be mounted from VMs that are created in the Azure VMware Solution SDDC environment. The volumes can also be mounted on the Linux client and on Windows client because Cloud Volumes ONTAP supports iSCSI, SMB, and NFS protocols. Cloud Volumes ONTAP volumes can be set up in a few simple steps.

To replicate volumes from an on-premises environment to the cloud for disaster recovery or migration purposes, establish network connectivity to Azure, either using a site-to-site VPN or ExpressRoute. Replicating data from on-premises to Cloud Volumes ONTAP is outside the scope of this document. To replicate data between on-premises and Cloud Volumes ONTAP systems, see [Setting up data replication between systems](#).

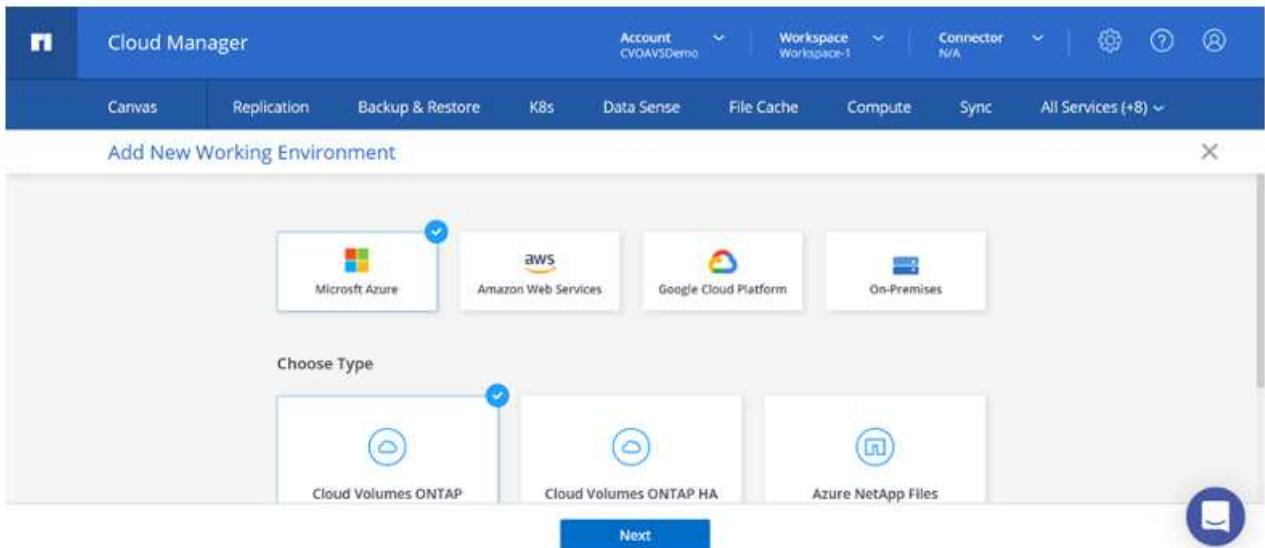


Use [Cloud Volumes ONTAP sizer](#) to accurately size the Cloud Volumes ONTAP instances. Also monitor on-premises performance to use as inputs in the Cloud Volumes ONTAP sizer.

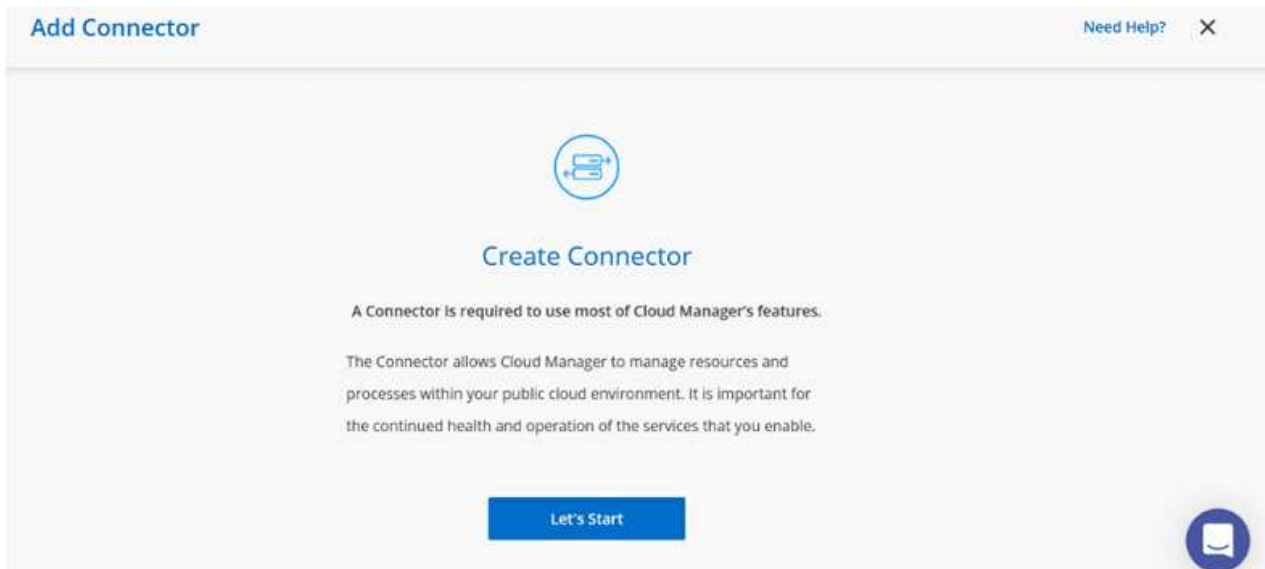
1. Log in to NetApp Cloud Central—the Fabric View screen is displayed. Locate the Cloud Volumes ONTAP tab and select Go to Cloud Manager. After you are logged in, the Canvas screen is displayed.



2. On the Cloud Manager home page, click Add a Working Environment and then select Microsoft Azure as the cloud and the type of the system configuration.



3. When creating the first Cloud Volumes ONTAP working environment, Cloud Manager prompts you to deploy a Connector.



4. After the connector is created, update the Details and Credentials fields.

Managed Service Ide...	SaaS Backup Prod...	CMCVOSub	Edit Credentials
Credential Name	Azure Subscription	Marketplace Subscription	

Details

Working Environment Name (Cluster Name)

nimavsCVO

Credentials

User Name

admin

Password

Continue







5. Provide the details of the environment to be created including the environment name and admin credentials. Add resource group tags for the Azure environment as an optional parameter. After you are done, click Continue.

Details	Credentials
Working Environment Name (Cluster Name)	User Name
nimavsCVO	admin
+ Add Resource Group Tags Optional Field	Password

	Confirm Password

Continue

6. Select the add-on services for Cloud Volumes ONTAP deployment, including BlueXP Classification, BlueXP backup and recovery, and Cloud Insights. Select the services and then click Continue.

 Data Sense & Compliance	<input checked="" type="checkbox"/> 
 Backup to Cloud	<input checked="" type="checkbox"/> 
 Monitoring	<input checked="" type="checkbox"/> 

Continue

7. Configure the Azure location and connectivity. Select the Azure Region, resource group, VNet, and subnet to be used.

Azure Region East US 2	Resource Group <input checked="" type="radio"/> Create a new group <input type="radio"/> Use an existing group
Availability Zone (Optional) Select an Availability Zone	Resource Group Name nimassCVO-rg
VNet nimovspriv-vnet NimioAVSDemo	Security Group <input checked="" type="radio"/> Generated security group <input type="radio"/> Use existing security group
Subnet 172.24.2.0/24	<input checked="" type="checkbox"/> I have verified network connectivity between the Cloud Manager server and the selected VNet.

[Continue](#)

8. Select the license option: Pay-As-You-Go or BYOL for using existing license. In this example, Pay-As-You-Go option is used.





Create a New Working Environment Cloud Volumes ONTAP Charging Methods & NSS Account

Cloud Volumes ONTAP Charging Methods Learn more about our charging methods	NetApp Support Site Account (Optional) Learn more about NetApp Support Site (NSS) accounts
<input checked="" type="radio"/> Pay-As-You-Go by the hour	To register this Cloud Volumes ONTAP to support, you should add NetApp Support Site Account.
<input type="radio"/> Bring your own license	Don't have a NetApp Support Site account? Select go to finish deploying this system. After it's created, use the Support Registration option to create an NSS account.

[Continue](#)

9. Select between several preconfigured packages available for the various types of workloads.

Select a preconfigured Cloud Volumes ONTAP system that best matches your needs, or create your own configuration. Preconfigured settings can be modified at a later time. [Change Configuration](#)

 POC and small workloads Up to 500GB of storage	 Database and application data production workloads	 Cost effective DR Up to 500GB of storage	 Highest performance production workloads
---	--	---	--

[Continue](#)

10. Accept the two agreements regarding activating support and allocation of Azure resources. To create the Cloud Volumes ONTAP instance, click Go.

nimavsCVO

Azure | East US 2

- ☒ I understand that in order to activate support, I must first register Cloud Volumes ONTAP with NetApp. [More information >](#)
- ☒ I understand that Cloud Manager will allocate the appropriate Azure resources to comply with my above requirements. [More information >](#)

Overview

Networking

Storage

Go

11. After Cloud Volumes ONTAP is provisioned, it is listed in the working environments on the Canvas page.

Canvas | Replication | Backup & Restore | K8s | Data Sense | File Cache | Compute | Sync | All Services (+8) v

Canvas Go to Tabular View

Add Working Environment

SINGLE

nimavsCVO
Cloud Volumes ONTAP

Freemium

nimavsCVO

On

DETAILS

Cloud Volumes ONTAP | Azure | Single

SERVICES

Replication

Enter Working Environment

Additional configurations for SMB volumes

1. After the working environment is ready, make sure the CIFS server is configured with the appropriate DNS and Active Directory configuration parameters. This step is required before you can create the SMB volume.

The screenshot shows the 'nimavsCVO' web interface. At the top, there's a navigation bar with 'Volumes' and 'Replications' tabs. Below this, a 'Create a CIFS server' button is visible. The configuration form includes fields for 'DNS Primary IP Address' (172.24.1.5), 'Active Directory Domain to join' (nimodemo.com), 'DNS Secondary IP Address (Optional)' (Example: 127.0.0.1), and 'Credentials authorized to join the domain' (nimoadmin). A password field is also present, masked with dots. The interface also features a '+ Advanced' link and various system icons like power, refresh, and settings.


2. Creating the SMB volume is an easy process. Select the CVO instance to create the volume and click the Create Volume option. Choose the appropriate size and cloud manager chooses the containing aggregate or use advanced allocation mechanism to place on a specific aggregate. For this demo, SMB is selected as the protocol.

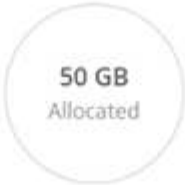
The screenshot displays the 'Volume Details, Protection & Protocol' configuration page. It is divided into two main sections: 'Details & Protection' and 'Protocol'. In the 'Details & Protection' section, there are fields for 'Volume Name' (nimavssmbvol1), 'Size (GB)' (50), and 'Snapshot Policy' (default). The 'Protocol' section shows three tabs: 'NFS', 'CIFS' (selected), and 'iSCSI'. Under the 'CIFS' tab, there are fields for 'Share name' (nimavssmbvol1_share), 'Permissions' (Full Control), and 'Users / Groups' (Everyone). A 'Continue' button is located at the bottom of the form.

3. After the volume is provisioned, it will be available under the Volumes pane. Because a CIFS share is provisioned, give your users or groups permission to the files and folders and verify that those users can access the share and create a file. This step is not required if the volume is replicated from an on-premises environment because the file and folder permissions are all retained as part of SnapMirror replication.

Volumes

1 Volume | 50 GB Allocated | 1.74 MB Total Used (1.74 MB in Disk, 0 KB in Blob)


nimavssmbvol1
ONLINE

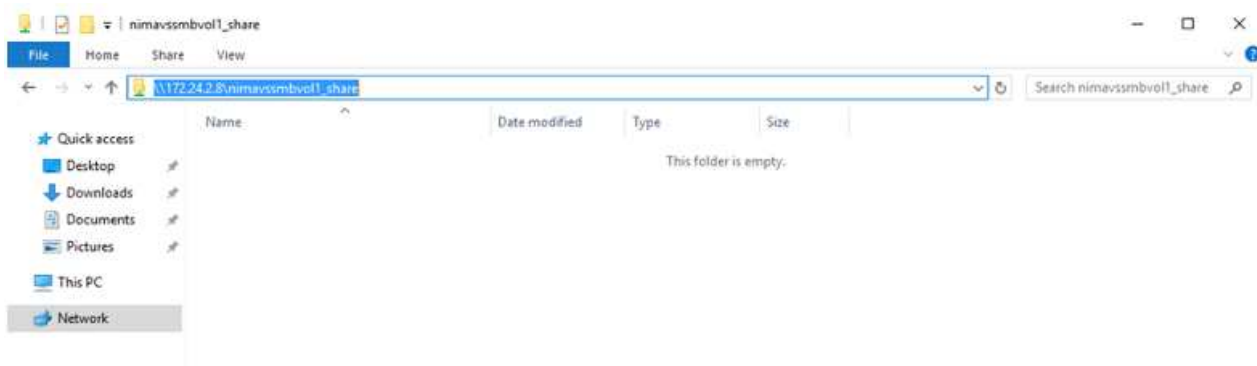
INFO		CAPACITY	
Disk Type	PREMIUM_LRS		1.74 MB Disk Used
Tiering Policy	Auto		0 GB Blob Used
Backup	OFF		

- After the volume is created, use the mount command to connect to the share from the VM running on the Azure VMware Solution SDDC hosts.
- Copy the following path and use the Map Network Drive option to mount the volume on the VM running on Azure VMware Solution SDDC.

Mount Volume nimavssmbvol1

Go to your machine and enter this command

```
\\172.24.2.8\nimavssmbvol1_share
```



Connect the LUN to a host

To connect the LUN to a host, complete the following steps:

1. On the Canvas page, double-click the Cloud Volumes ONTAP working environment to create and manage volumes.
2. Click Add Volume > New Volume and select iSCSI and click Create Initiator Group. Click Continue.

The screenshot shows two side-by-side configuration panels. The left panel, titled 'Details & Protection', contains a 'Volume Name' field with the value 'nimavsscsi1', a 'Size (GB)' field with the value '500', and a 'Snapshot Policy' dropdown menu set to 'default'. Below the dropdown is a link that says 'Default Policy'. The right panel, titled 'Protocol', has three tabs: 'NFS', 'CIFS', and 'iSCSI', with 'iSCSI' being the active tab. Below the tabs is a link that says 'What about LUNs?'. Underneath is an 'Initiator Group' section with two radio buttons: 'Map Existing Initiator Groups' (unselected) and 'Create Initiator Group' (selected). Below the radio buttons is a text field for the 'Initiator Group' name, which contains the value 'avsvmIG'. At the bottom center of the two panels is a blue button labeled 'Continue'.

3. After the volume is provisioned, select the volume, and then click Target IQN. To copy the iSCSI Qualified Name (IQN), click Copy. Set up an iSCSI connection from the host to the LUN.

To accomplish the same for the host residing on Azure VMware Solution SDDC:

- a. RDP to the VM hosted on Azure VMware Solution SDDC.
- b. Open the iSCSI Initiator Properties dialog box: Server Manager > Dashboard > Tools > iSCSI Initiator.
- c. From the Discovery tab, click Discover Portal or Add Portal and then enter the IP address of the iSCSI target port.
- d. From the Targets tab, select the target discovered and then click Log on or Connect.
- e. Select Enable multipath, and then select Automatically Restore This Connection When the Computer Starts or Add This Connection to the List of Favorite Targets. Click Advanced.

Note: The Windows host must have an iSCSI connection to each node in the cluster. The native DSM selects the best paths to use.



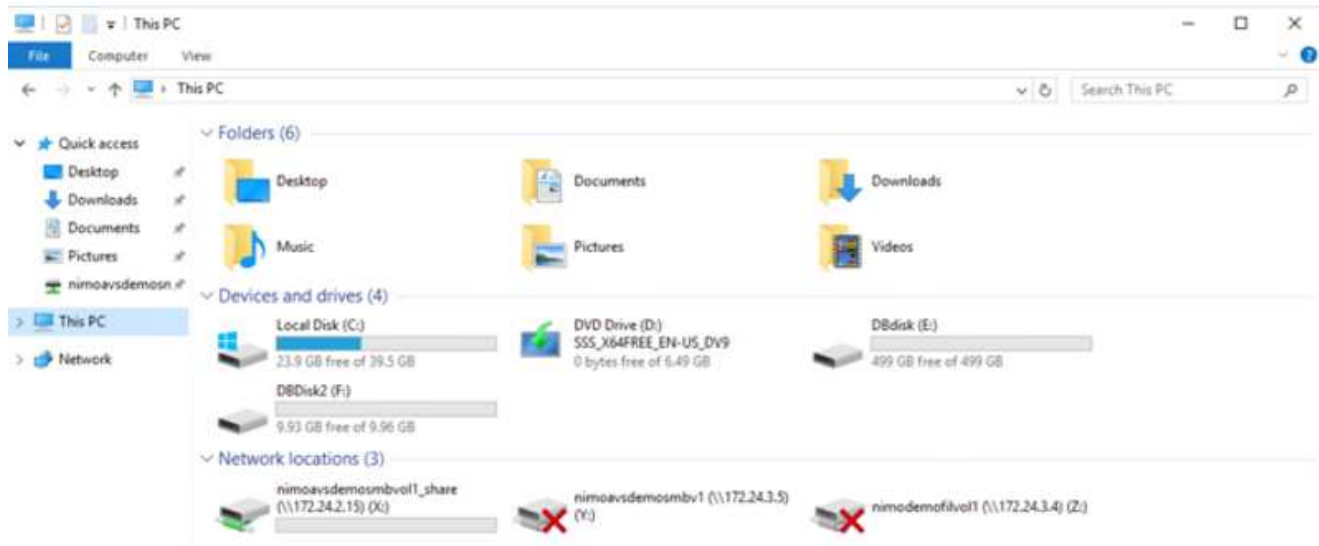
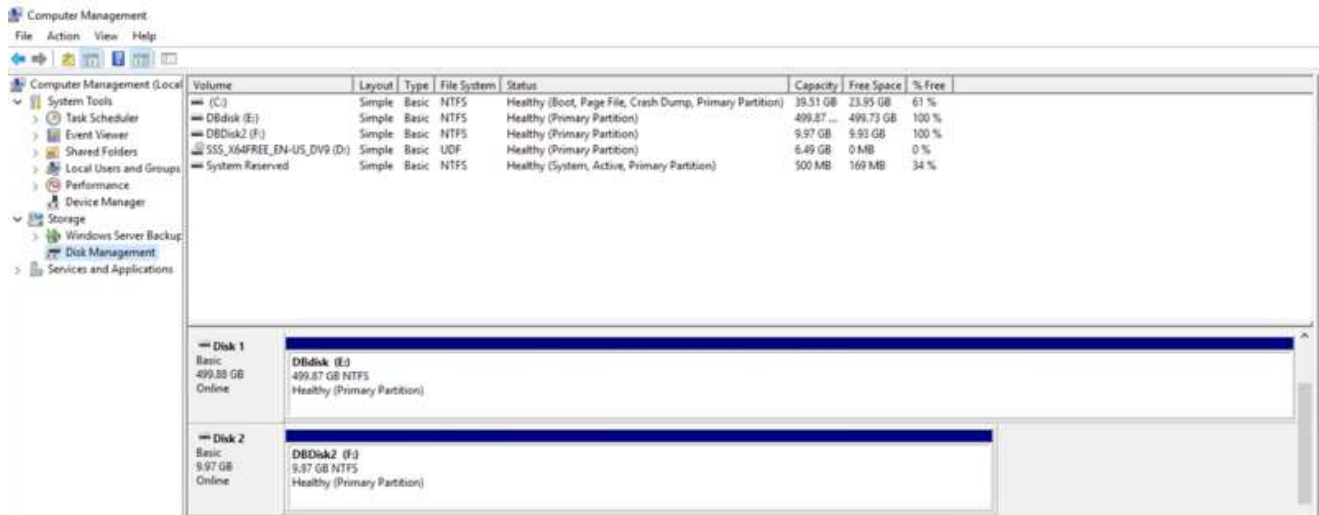
LUNs on storage virtual machine (SVM) appear as disks to the Windows host. Any new disks that are added are not automatically discovered by the host. Trigger a manual rescan to discover the disks by completing the following steps:

1. Open the Windows Computer Management utility: Start > Administrative Tools > Computer Management.
2. Expand the Storage node in the navigation tree.
3. Click Disk Management.
4. Click Action > Rescan Disks.



When a new LUN is first accessed by the Windows host, it has no partition or file system. Initialize the LUN; and optionally, format the LUN with a file system by completing the following steps:

1. Start Windows Disk Management.
2. Right-click the LUN, and then select the required disk or partition type.
3. Follow the instructions in the wizard. In this example, drive E: is mounted



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