



Configure ONTAP tools

ONTAP tools for VMware vSphere 10.1

NetApp
June 21, 2024

Table of Contents

- Configure ONTAP tools 1
 - ONTAP tools Manager user interface 1
 - Add and manage vCenter Server instances 1
 - Register the VASA Provider with a vCenter Server instance 2
 - Verify registered VASA provider 3
 - Install the NFS VAAI plug-in 3
 - Update host data 4
 - Configure ESXi host settings 4
 - Discover storage systems and hosts 6
 - Add storage backend 7
 - Associate storage backend with a vCenter Server instance 8
 - Configure network access 9
 - Configure ONTAP user roles and privileges 9
- NetApp ONTAP tools for VMware vSphere plug-in Dashboard overview 12
- Create datastore 15

Configure ONTAP tools

ONTAP tools Manager user interface

ONTAP tools for VMware vSphere is a multi-tenant system, which manages multiple vCenter Server instances. ONTAP tools Manager provides more control to ONTAP tools for VMware vSphere administrator over the managed vCenter Server instances and onboarded storage backends.

ONTAP tools Manager helps in:

- vCenter Server instance management - Add and manage vCenter Server instances to ONTAP tools.
- Storage backend management - Add and manage ONTAP storage clusters to ONTAP tools for VMware vSphere and map them to onboarded vCenter Server instances globally.
- Log bundle downloads - Collect log files for ONTAP tools for VMware vSphere.
- Certificate management - Change the self-signed certificate to a custom CA certificate and renew or refresh all certificates.
- Password management - Reset OVA application password for the user.

To access ONTAP tools Manager, launch <https://loadBalanceIP:8443/virtualization/ui/> from the browser and login with the ONTAP tools for VMware vSphere administrator credentials you provided during deployment.

Add and manage vCenter Server instances

vCenter Server provides the central management platform that allows you to control hosts, virtual machines (VMs), and storage backends.

Add a vCenter Server instance

About this task

You can add and manage multiple vCenter Server instances with one instance of ONTAP tools for VMware vSphere.

Steps

1. Launch ONTAP tools Manager from a web browser:
<https://loadBalanceIP:8443/virtualization/ui/>
2. Log in with the ONTAP tools for VMware vSphere administrator credentials you provided during deployment.
3. Select **vCenters** from the sidebar.
4. Select **Add** to onboard vCenter Server instances and provide your vCenter IP address/hostname, username, password, and port details.

When you add a vCenter Server instance to ONTAP tools, the following actions are performed automatically:

- The vCenter Client Plug-in is registered
- Custom privileges for the plug-ins and APIs are pushed to the vCenter Server instance
- Custom roles are created to manage the users.

Register ONTAP tools for VMware vSphere plug-in with vCenter Server instance

When you add a vCenter Server instance, ONTAP tools for VMware vSphere plug-in is registered automatically to vCenter Server as a remote plug-in. The plug-in is visible on the vSphere user interface shortcuts.

The plug-in is registered with a key *com.netapp.otv* to the vCenter Server instance and can be seen in the ExtensionManager of the vCenter Server instance.

Unregister ONTAP tools for VMware vSphere plug-in

You can unregister the ONTAP tools for VMware vSphere Plug-in from a vCenter Server instance using the following steps.

Steps

1. Launch ONTAP tools Manager from a web browser:
`https://loadBalanceIP:8443/virtualization/ui/`
2. Log in with the ONTAP tools for VMware vSphere administrator credentials you provided during deployment.
3. Select vCenters from the sidebar.
4. Click on the vertical ellipses against the vCenter you want to remove and select the **Remove** option.



You cannot remove a vCenter Server instance if there is a storage mapping attached to it. You need to remove the mapping before removing the vCenter Server instance.

When you remove vCenter Server instances in ONTAP tools, the following actions are performed automatically:

- Plug-in is unregistered.
- Plug-in privileges and plug-in roles are removed.

Register the VASA Provider with a vCenter Server instance

You can register and unregister the VASA provider with a vCenter Server instance using ONTAP tools for VMware vSphere remote plugin interface. VASA Provider Settings section shows the VASA Provider registration state for the selected vCenter Server.

Steps

1. Log in to the vSphere client using `https://vcenterip/ui`
2. In the shortcuts page, click on **NetApp ONTAP tools** under the plug-ins section.
3. Select **Settings > VASA provider settings**. VASA provider registration state shows as not registered.
4. Click on **REGISTER** button to register the VASA Provider.

5. Enter a name for the VASA provider and provide ONTAP tools for VMware vSphere application user credentials and click **REGISTER**.
6. On successful registration and page refresh, UI shows the state, name, and version of the registered VASA provider. The unregister action is activated.
7. If you want to unregister the VASA provider, perform the following steps:
 - a. To unregister the VASA provider select **Unregister** option at the bottom of the screen.
 - b. In the **Unregister VASA provider** page, you can see the name of the VASA provider. In this page provide the application user credentials and click **Unregister**.

Verify registered VASA provider

Verify that the onboarded VASA provider is listed under VASA Provider from vCenter client UI and from remote plug-in UI.

Steps

1. To verify VASA Provider from vCenter client UI follow these steps:
 - a. Navigate to vCenter Server.
 - b. Log in with the administrator credentials.
 - c. Select **Storage Providers**.
 - d. Select **Configure**.
 - e. Under Storage Provider/storage backends verify that the onboarded VASA provider is listed correctly.
2. To verify VASA Provider from the remote plug-in UI follow these steps:
 - a. Log in to the vSphere client using `https://vcenterip/ui`
 - b. In the shortcuts page, click on **NetApp ONTAP tools** under the plug-ins section.
 - c. You can see the registered VASA Provider in the overview page and in the **Settings > VASA provider settings** page.

Install the NFS VAAI plug-in

You can install the NetApp NFS Plug-in for VMware vStorage APIs for Array Integration (VAAI) using ONTAP tools for VMware vSphere.

What you will need

- You should have downloaded the installation package for the NFS Plug-in for VAAI (.vib) from the NetApp Support Site. [NetApp NFS Plug-in for VMware VAAI](#)
- You should have installed ESXi host 7.0U3 latest patch as minimum version and ONTAP 9.12.1Px (latest P release) 9.13.1Px, 9.14.1Px, or later.
- You should have powered on the ESXi host and mounted an NFS datastore.
- You should have set the values of the `DataMover.HardwareAcceleratedMove`, `DataMover.HardwareAcceleratedInit`, and `VMFS3.HardwareAcceleratedLocking` host settings to "1".

These values are set automatically on the ESXi host when the Recommended Settings dialog box is

updated.

- You should have enabled the vstorage option on the storage virtual machine (SVM) by using the `vserver nfs modify -vserver vserver_name -vstorage enabled` command.
- You should have ESXi 7.0U3 or later if you are using NetApp NFS VAAI plug-in 2.0.
- You should have the vSphere 7.0U3 latest patch releases as vSphere 6.5 has been deprecated.
- vSphere 8.x is supported with the NetApp NFS VAAI plug-in 2.0.1(build 16).

Steps

1. Click **Settings** from the ONTAP tools for VMware vSphere home page.
2. Click **NFS VAAI Tools** tab.
3. When the VAAI plug-in is uploaded to vCenter Server, select **Change** in the **Existing version** section. If a VAAI plug-in is not uploaded to the vCenter Server, select **Upload** button.
4. Browse and select the `.vib` file, and then click **Upload** to upload the file to ONTAP tools.
5. Click **Install on ESXi host**, select the ESXi host on which you want to install the NFS VAAI plug-in, and then click **Install**.

Only the ESXi hosts that are eligible for the plug-in installation are displayed. You should follow the on-screen instructions to complete the installation. You can monitor the installation progress in the Recent Tasks section of vSphere Web Client.

6. You should manually reboot the ESXi host after the installation finishes.

When the VMware admin reboots the ESXi host, ONTAP tools for VMware vSphere automatically detect the NFS VAAI plug-in. You do not have to perform additional steps to enable the plug-in.

Update host data

You can run an on-demand discovery on the ESXi host to get the latest updates on the storage data.

Steps

1. From the VMware vSphere Web Client home page, click **Hosts and Clusters**.
2. Right-click a host, and then select **NetApp ONTAP tools > Update host data**.
3. In the **Update Host Data** pop-up window, select **Yes** to restart the discovery of all connected storage systems.

Configure ESXi host settings

Configure ESXi server multipath and timeout settings

ONTAP tools for VMware vSphere checks and sets the ESXi host multipath settings and HBA timeout settings that work best with NetApp storage systems.

About this task

This process might take a long time, depending on your configuration and system load. The task progress is displayed in the Recent Tasks panel. As the tasks are completed, the host status Alert icon is replaced by the Normal icon or the Pending Reboot icon.

Steps

1. From the VMware vSphere Web Client home page, click **Hosts and Clusters**.
2. Right-click a host, and then select **NetApp ONTAP tools > Update host data**.
3. In the shortcuts page, click on **NetApp ONTAP tools** under the plug-ins section.
4. Go to ESXi Host compliance card in the Overview (Dashboard) of the ONTAP tools for VMware vSphere plug-in.
5. Select **Apply Recommended Settings** link.
6. In the **Apply recommended host settings** window, select the hosts that you want to comply with NetApp recommended host settings and click **Next**



You can expand the ESXi host to see the current values

7. In the settings page, select the recommended values as required.
8. In the summary pane, check the values and click **Finish** You can track the progress in the Recent task panel.

Set ESXi host values

You can set timeouts and other values on the ESXi hosts using ONTAP tools for VMware vSphere to ensure best performance and successful failover. The values that ONTAP tools for VMware vSphere sets are based on internal NetApp testing.

You can set the following values on an ESXi host:

HBA/CNA Adapter Settings

Sets the recommended HBA timeout settings for NetApp storage systems.

- **Disk.QFullSampleSize**

Set this value to 32 for all configurations. Setting this value helps to prevent I/O errors.

- **Disk.QFullThreshold**

Set this value to 8 for all configurations. Setting this value helps prevent I/O errors.

- **Emulex FC HBA timeouts**

Use the default value.

- **QLogic FC HBA timeouts**

Use the default value.

MPIO Settings

Configures preferred paths for NetApp storage systems. The MPIO settings determine which of the available paths are optimized (as opposed to non-optimized paths that traverse the interconnect cable) and they set the preferred path to one of those paths.

In high-performance environments or when testing performance with a single LUN datastore, consider changing the load balance setting of the round-robin (VMW_PSP_RR) path selection policy (PSP) from the default IOPS setting of 1000 to a value of 1.

NFS settings

- **Net.TcpipHeapSize**

Set this value to 32.

- **Net.TcpipHeapMax**

Set this value to 1024MB.

- **NFS.MaxVolumes**

Set this value to 256.

- **NFS41.MaxVolumes**

Set this value to 256.

- **NFS.MaxQueueDepth**

Set this value to 128 or higher to avoid queuing bottlenecks.

- **NFS.HeartbeatMaxFailures**

Set this value to 10 for all NFS configurations.

- **NFS.HeartbeatFrequency**

Set this value to 12 for all NFS configurations.

- **NFS.HeartbeatTimeout**

Set this value to 5 for all NFS configurations.

Discover storage systems and hosts

When you first run ONTAP tools for VMware vSphere in a vSphere Client, ONTAP tools discovers the ESXi hosts, their LUNs and NFS exports, and the NetApp storage systems that own those LUNs and exports.

What you will need

- All the ESXi hosts should be powered on and connected.

- All the storage virtual machines (SVMs) to be discovered should be running, and each cluster node should have at least one data LIF configured for the storage protocol in use (NFS or iSCSI).

About this task

You can discover new storage systems or update information about existing storage systems to obtain the latest capacity and configuration information at any time. You can also modify the credentials that ONTAP tools for VMware vSphere uses to log in to the storage systems.

While discovering the storage systems, ONTAP tools for VMware vSphere collects information from the ESXi hosts that are managed by the vCenter Server instance.

Steps

1. From the vSphere Client home page, select **Hosts and Clusters**.
2. Right-click the required datacenter, and then select **NetApp ONTAP tools > Update Host Data**.

ONTAP tools for VMware vSphere displays a **Confirm** dialog box with the following message:

"This action will restart the discovery of all connected storage systems and might take a few minutes. Do you want to continue?"

3. Click **Yes**.
4. Select the discovered storage controllers that have the status `Authentication Failure`, and then click **Actions > Modify**.
5. Fill in the required information in the **Modify Storage System** dialog box.
6. Repeat steps 4 and 5 for all storage controllers with `Authentication Failure` status.

After the discovery process is complete, perform the following actions:

- Use ONTAP tools for VMware vSphere to configure ESXi host settings for hosts that display the Alert icon in the Adapter Settings column, the MPIO Settings column, or the NFS Settings column.
- Provide the storage system credentials.

Add storage backend

Storage backends are systems that the ESXi hosts use for data storage.

About this task

This task helps you to onboard an ONTAP cluster. When you add storage backend using ONTAP tools Manager, the storage backend is added to the global cluster. Associate the global cluster with a vCenter Server instance to enable SVM user for vVols datastore provisioning.



When you add storage backend using the vSphere client UI, vVols datastore does not support adding of SVM user directly.

Add storage backend using ONTAP tools Manager



A storage backend is global when added from ONTAP tools Manager or the ONTAP tools APIs. A storage backend is local when added from the vCenter Server APIs. For example, in a multi-tenant setup, you can add a storage backend (cluster) globally and SVM locally to use SVM user credentials.

Steps

1. Launch ONTAP tools Manager from a web browser:
`https://loadBalanceIP:8443/virtualization/ui/`
2. Log in with the ONTAP tools for VMware vSphere administrator credentials you provided during deployment.
3. Select **Storage Backends** from the sidebar.
4. Select **Add**.
5. Provide the Server IP address or FQDN, Username, and Password details and select **Add**.



IPV4 and IPV6 management LIFs are supported. SVM user based credentials with management LIFs are also supported.

Add storage backend using vSphere client UI:

1. Log in to the vSphere client using `https://vcenterip/ui`
2. In the shortcuts page, click on **NetApp ONTAP tools** under the plug-ins section.
3. In the left pane of ONTAP tools, navigate to **Storage Backends** and select **Add**.
4. In the **Add Storage Backend** window, provide the Server IP address, Username, Password, and Port details and click **Add**



You can add cluster-based credentials and IPV4 and IPV6 management LIFs or provide SVM-based credentials with management LIF of SVM to add SVM user directly.

The list gets refreshed, and you can see the newly added storage backend in the list.

Associate storage backend with a vCenter Server instance

The vCenter Server listing page shows the associated number of storage backends. Each vCenter Server instance has the option to associate a storage backend.

About this task

This task helps you to create mapping between storage backend and the onboarded vCenter Server instance globally.

Steps

1. Launch ONTAP tools Manager from a web browser:
`https://loadBalanceIP:8443/virtualization/ui/`
2. Log in with the ONTAP tools for VMware vSphere administrator credentials you provided during deployment.

3. Select vCenter from the sidebar.
4. Click on the vertical ellipses against the vCenter that you want to associate with storage backends.
5. Select storage backend from the dropdown in the pop up.
6. Select **Associate Storage Backend** option to associate vCenter Server instance with the required storage backend.

Configure network access

When you have multiple ESXi hosts IP addresses, all the discovered IP addresses from the host are added to an export policy by default. If you do not want to add all IP addresses to export policy, provide a setting for allowing specific IP addresses in a comma separated list or range or CIDR, or combination of all three for each vCenter.

You can choose to allow a few specific ESXi host addresses for datastore mount operation. If the setting is not provided, export policy adds all IP addresses discovered in the pre-mount step. If the setting is provided, ONTAP tools for VMware vSphere add only the ones which fall within the listed IP addresses or range. If none of the IP addresses of a host belong to the listed IP addresses, the mount on that host fails.

Steps

1. Log in to the vSphere client using `https://vcenterip/ui`
2. In the shortcuts page, click on **NetApp ONTAP tools** under the plug-ins section.
3. In the left pane of ONTAP tools, navigate to **Settings > Manage Network Access > Edit**.

Use comma (,) to separate the IP addresses. You can specify a specific IP address, or a range of IP addresses or IPv6 addresses.

4. Click **SAVE**.

Configure ONTAP user roles and privileges

You can configure new user roles and privileges for managing storage backends using the JSON file provided with ONTAP tools for VMware vSphere and ONTAP System Manager.

What you'll need

- You should have downloaded the ONTAP privileges file from ONTAP tools for VMware vSphere using `https://<loadbalancerIP>:8443/virtualization/user-privileges/users_roles.zip`.
- You should have downloaded the ONTAP Privileges file from ONTAP tools using `https://<loadbalancerIP>:8443/virtualization/user-privileges/users_roles.zip`.



You can create users at cluster or directly at storage virtual machines (SVMs) level. You can also create users without using the `user_roles.json` file and if done so, you need to have a minimum set of privileges at SVM level.

- You should have logged in with administrator privileges for the storage backend.



You can create users at cluster level or at SVM level. You can also create users without using the `user_roles.json` file and if done so, you need to have a minimum set of privileges at SVM level.

Steps

1. Extract the downloaded `https://<loadbalancerIP>:8443/virtualization/user-privileges/users_roles.zip` file.
2. Access ONTAP System Manager using the cluster management IP address of the cluster.
3. Log in as the cluster or SVM user.
4. Select **Cluster > Settings > Users and Roles** pane.
5. Select **Add** under Users.
6. In the **Add User** dialog box, select **Virtualization products**.
7. **Browse** to select and upload the ONTAP Privileges JSON file.

The Product field is auto populated.

8. Select the required capability from the product capability drop-down menu.

The **Role** field is auto populated based on the product capability selected.

9. Enter the required username and password.
10. Select the privileges (Discovery, Create Storage, Modify Storage, Destroy Storage, NAS/SAN Role) required for the user, and then click **Add**.

The new role and user are added, and you can see the detailed privileges under the role that you have configured.



The uninstall operation does not remove ONTAP tool roles but removes the localized names for the ONTAP tool specific privileges and appends the prefix `xxx missing privilege` to them. When you reinstall ONTAP tools for VMware vSphere or upgrade to a newer version, all the standard ONTAP tools for VMware vSphere roles and ONTAP tools-specific privileges are restored.

SVM aggregate mapping requirements

To use SVM user credentials for provisioning datastores, internally ONTAP tools for VMware vSphere creates volumes on the aggregate specified in the datastores POST API. The ONTAP does not allow the creation of volumes on unmapped aggregates on an SVM using SVM user credentials. To resolve this, you need to map the SVMs with the aggregates using the ONTAP REST API or CLI as described here.

REST API:

```
PATCH "/api/svm/svms/f16f0935-5281-11e8-b94d-005056b46485"
'{"aggregates":{"name":["aggr1","aggr2","aggr3"]}}'
```

ONTAP CLI:

```

still15_vsim_ucs630f_aggr1 vserver show-aggregates
AvailableVserver          Aggregate          State          Size Type          SnapLock
Type-----
-----svm_test          still15_vsim_ucs630f_aggr1
online          10.11GB vmdisk  non-snaplock

```

Create ONTAP user and role manually

Follow the instructions in this section to create the user and roles manually without using the JSON file.

1. Access ONTAP System Manager using the cluster management IP address of the cluster.
2. Log in as the cluster or SVM user.
3. Select **Cluster > Settings > Users and Roles** pane.
4. Create Roles:
 - a. Select **Add** under **Roles** table.
 - b. Enter the **Role name** and **Role Attributes** details.

Add the **REST API Path** and the respective access from the drop down.

- c. Add all the needed APIs and save the changes.
5. Create Users:
 - a. Select **Add** under **Users** table.
 - b. In the **Add User** dialog box, select **System Manager**.
 - c. Enter the **Username**.
 - d. Select **Role** from the options created in the **Create Roles** step above.
 - e. Enter the applications to give access to and the authentication method. ONTAPI and HTTP are the required applications, and the authentication type is **Password**.
 - f. Set the **Password for the User** and **Save** the user.

List of minimum privileges required for non-admin global scoped cluster user

The minimum privileges required for non-admin global scoped cluster user created without using the users JSON file is listed in this section. If cluster is added in local scope, it is recommended to use the JSON file to create the users, as ONTAP tools for VMware vSphere requires more than just the Read privileges for provisioning on ONTAP.

Using APIs:

API	Access level	Used for
/api/cluster	Read-Only	Cluster Configuration Discovery
/api/cluster/licensing/licenses	Read-Only	License Check for Protocol specific licenses
/api/cluster/nodes	Read-Only	Platform type discovery

/api/storage/aggregates	Read-Only	Aggregate space check during Datastore/Volume provisioning
/api/storage/cluster	Read-Only	To get the Cluster level Space and Efficiency Data
/api/storage/disks	Read-Only	To get the Disks associated in an Aggregate
/api/storage/qos/policies	Read/Create/Modify	QoS and VM Policy management
/api/svm/svms	Read-Only	To get SVM configuration in the case the Cluster is added locally.
/api/network/ip/interfaces	Read-Only	Add Storage Backend - To identify the management LIF scope is Cluster/SVM
/api	Read-Only	Cluster users should have this privilege to get the correct storage backend status. Otherwise, ONTAP tools Manager shows "unknown" storage backend status.

NetApp ONTAP tools for VMware vSphere plug-in Dashboard overview

When you select NetApp ONTAP tools for VMware vSphere plug-in icon in the shortcuts section on the vCenter client, the user interface navigates to overview page. This page acts like the dashboard providing you the summary of the ONTAP tools for VMware vSphere plug-in.

In the case of Enhanced Linked Mode setup (ELM), the vCenter Server select dropdown appears and you can select a desired vCenter Server to see the data relevant to it. This dropdown is available for all the other listing views of the plugin. vCenter Server selection made in one page persists across the tabs of the plug-in.

vmw vSphere Client Menu Search in all environments

NetApp ONTAP Tools INSTANCE 10.224.132.8444

vCenter server: 172.21.104.101

Overview

- Overview
- Storage backends
- Settings
- Support
- Reports

6 Storage backends

Unhealthy

VASA provider **Online**

[other vasa provider states](#)

Storage backends - capacity

197.3 GB USED AND RESERVED 481.69 GB PHYSICAL AVAILABLE

[VIEW ALL STORAGE BACKENDS \(6\)](#)

Virtual machines

Name	vCenter VM latency	vCenter VM committed capacity	Max datastore latency	Total datastore IOPS	Avg datastore throughput
AE-WEB-APSG-P01	176 ms	33 GB	176 ms	33 k	62 MB/s
AE-WEB-AUD-P01	168 ms	10 GB	168 ms	10 k	96 MB/s
ib-sne-vnx-p01	162 ms	6 GB	162 ms	6 k	180 MB/s
AE-VESTA3	151 ms	11 GB	151 ms	11 k	354 MB/s
AE-VMware1-Network-AAEF0038	75 ms	19 GB	75 ms	19 k	106 MB/s
AE-WEB-APSG-P03	73 ms	40 GB	73 ms	40 k	62 MB/s
AE-WEB-AUD-P07	68 ms	8 GB	68 ms	8 k	96 MB/s
ib-sne-vnx-p04	66 ms	16 GB	66 ms	16 k	180 MB/s
AE-VESTA9	65 ms	24 GB	65 ms	24 k	354 MB/s
AE-VMware1-Network-AAEF0038	63 ms	12 GB	63 ms	12 k	106 MB/s

[VIEW ALL VIRTUAL MACHINES \(318\)](#)

Datstores

Datastore type: All

Name	Space utilized (Top 10↓)	IOPS	Latency	Throughput	Storage VM	Type
datastore01	98%	33 k	176 ms	200	storage_vm_01	NFS
datastore02_long_name	83%	10 k	168 ms	300	svm_02	NFS
datastore03	72%	6 k	162 ms	200	storage_vm_03_long_name	VVols
datastore04	68%	11 k	151 ms	300	storage_vm_04	VMFS
datastore05_long_name	61%	19 k	75 ms	500	storage_vm_05	NFS
datastore06	55%	40 k	73 ms	200	storage_vm_06_long_name	VVols
datastore07	45%	8 k	68 ms	200	storage_vm_07	VMFS
datastore08	36%	16 k	66 ms	500	storage_vm_08	NFS
datastore09	27%	24 k	65 ms	300	storage_vm_09	VMFS
datastore10_very_long_name	12%	12 k	63 ms	500	storage_vm_10_long_name	NFS

[VIEW ALL DATASTORES \(54\)](#)

ESXi host compliance

NFS: **Issues (15)** **Unknown (7)** **Compliant (27)**

MPIO: **Issues (15)** **Unknown (7)** **Compliant (27)**

[APPLY RECOMMENDED SETTINGS](#) [VIEW ALL HOSTS \(49\)](#)

The dashboard has several cards showing different elements of the system. The following table shows the

different cards and what they represent.

Card name	Description
Status	<p>The Status card shows the number of storage backends added and the overall health status of storage backends and VASA Provider status of a vCenter.</p> <p>Storage backends status shows as "Healthy" when all the storage backends status is normal. Storage backends status shows as "Unhealthy" if any one of the storage backends have an issue (Unknown/Unreachable/Degraded status).</p> <p>When you click on the "Unhealthy" status, a tool tip opens with the status of the storage backends. The cluster names are hyperlinked, you can click on the link to open the storage backend summary page for more details.</p> <p>Other VASA Provider (VP) states link shows the current state of the VP that is registered in the vCenter Server.</p>
Storage Backends - Capacity	<p>This card shows the aggregated used and available capacity of all storage backends for the selected vCenter Server instance.</p>
Virtual machines	<p>This card shows the top 10 VMs sorted by performance metric. You can click on the header to get the top 10 VMs for the selected metric sorted by either ascending or descending order. The sorting and filtering changes made on the card persists until you change or clear the browser cache.</p>
Datastores	<p>This card shows the Top 10 datastores sorted by a performance metric. You can click on the header to get the top 10 datastores for the selected metric sorted by either ascending or descending order. The sorting and filtering changes made on the card persists until you change or clear the browser cache. There is a Datastore type drop-down to select the type of the datastores - NFS, VMFS, or vVols.</p>
ESXi Host compliance card	<p>This card shows overall compliance status of all ESXi Hosts (for the selected vCenter) settings with respect to the recommended NetApp host settings by settings group/category. You can click on Apply Recommended Settings link to apply the recommended settings. You can click on issues/unknown to see the list of hosts.</p>

Create datastore

Depending on the destination chosen for action, the datastore is created and mounted on all the hosts of the destination and the action is enabled only if the current user has privilege to execute.

The create Datastore action wizard supports creation of NFS, VMFS, and vVols datastore. The user interface is self-explanatory, use these steps as guidelines.

Create vVols datastore

You can create vVols datastore with new volumes or with existing volumes. You cannot create vVols datastore with the combination of existing volumes and new volumes.



Check to ensure root aggregates are not mapped to SVM.

Steps

1. Log in to the vSphere client using `https://vcenterip/ui`
2. Right-click a host system or a host cluster or a datacenter, and then select **NetApp ONTAP tools > Create Datastore**
3. In the **Type** pane, select vVols in **Datastore Type**.



You get vVols option only if the VASA provider is registered with the selected vCenter.

4. In the **Name and Protocol** pane, provide **Datastore name** and **Protocol** information.
5. In the **Storage** pane, select **Platform** and **storage VM**. In the **Advanced options** section, depending on your choice, select custom export policy (for NFS protocol) or custom initiator group name (for iSCSI protocol).
 - Platform and asymmetric options help you to filter out the SVMs dropdown options. You should select the SVM to create or use the volume(s) for datastore creation.
 - **Asymmetric** toggle button is visible only if iSCSI was selected in the previous step and performance or capacity is selected in the platform drop-down.
 - Asymmetric is true for AFF platform and false for ASA platform.
6. In the **Storage attributes** pane, you can either create new volumes or use the existing volumes. When creating new volume, you can enable QoS on the datastore.
7. Review your selection in the **Summary** pane and click **Finish**. Datastore is created and mounted on all the hosts.

Create NFS datastore

VMware Network File System (NFS) datastore is a type of storage that uses the NFS protocol to connect ESXi hosts to a shared storage device over a network. NFS datastores are commonly used in VMware vSphere environments and offer several advantages, such as simplicity and flexibility.

Steps

1. Log in to the vSphere client using `https://vcenterip/ui`
2. Right-click a Host System or a Host Cluster or a Datacenter, and then select **NetApp ONTAP tools >**

Create Datastore

3. In the **Type** pane, select NFS in **Datastore Type**.
4. In the **Name and Protocol** pane, enter datastore name, size, and protocol information. In the advanced options, select **Datastore cluster** and Kerberos Authentication.



Kerberos Authentication is available only when NFS 4.1 protocol is selected.

5. In the **Storage** pane, select **Platform** and **Storage VM**. You can select **custom Export Policy** in the **Advanced Option** section.
 - **Asymmetric** toggle button is visible only if performance or capacity is selected in the platform dropdown.
 - **Any** option in the platform dropdown enables you to see all the SVMs that are part of the vCenter irrespective of the platform or asymmetric flag.
6. In the **Storage Attributes** pane, select the aggregate for creation of volume. In the advanced options choose **Space Reserve** and **Enable QoS** as required.
7. Review the selections in the **Summary** pane and click **Finish**.

Datastore is created and mounted on all the hosts.

Create VMFS datastore

Virtual Machine File System (VMFS) is a clustered file system specifically designed for storing virtual machine files in VMware vSphere environments. It allows multiple ESXi hosts to access the same virtual machine files concurrently, enabling features like vMotion and High Availability.

Before you begin

Check the following items before proceeding:

- Check if all target hosts are healthy and check if the host supports protocol.
- Create a new volume (min size 2GB)
- Set Volume options with QOS
- Create LUN of type VMware
- Get initiators for all target hosts
- Create/reuse igroup based on matching initiators
- Map LUN to igroup
- Add iSCSI targets to ESXi hosts
- Rescan Host Bus Adapters (HBAs) on all hosts
- Mount volume as VMFS6 datastore (for 6.5+ hosts)
- Rescan VMFS storage on ESXi hosts
- Move datastore to datastore-cluster
- Rebalance iSCSI paths

Steps

1. Log in to the vSphere client using `https://vcenterip/ui`

2. Right-click a Host System or a Host Cluster or a Datastore, and then select **NetApp ONTAP tools > Create Datastore**
3. In the **Type** pane, select VMFS in **Datastore Type**.
4. In the **Name and Protocol** pane, enter the datastore name, size, and protocol information. In the **Advanced options** section of the pane, select the Datastore cluster you want to add this datastore to.
5. Select Platform and storage VM in the Storage pane. Select Asymmetric toggle button. Provide the **Custom initiator group name** in the **Advanced options** section of the pane (optional). You can either choose an existing igroup for the datastore or create new igroup with a custom name.

If you choose **Any** option in the platform dropdown you can see all the SVMs that are part of the vCenter irrespective of the platform or asymmetric flag.

6. From the storage attributes pane, select **Aggregate** from the drop-down. Select **Space Reserve**, **Use existing volume**, and **Enable QoS** options as required from the **Advanced options** section and provide the details as required.
7. Review the datastore details in the **Summary** pane and click **Finish**. Datastore is created and mounted on all the hosts.

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