



# **Storage VM administration**

## **Cloud Volumes ONTAP**

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# Storage VM administration

## Manage storage VMs in BlueXP

A storage VM is a virtual machine running within ONTAP that provides storage and data services to your clients. You might know this as an *SVM* or a *vserver*. Cloud Volumes ONTAP is configured with one storage VM by default, but some configurations support additional storage VMs.

### Supported number of storage VMs

Multiple storage VMs are supported with certain configurations. Go to the [Cloud Volumes ONTAP Release Notes](#) to verify the supported number of storage VMs for your version of Cloud Volumes ONTAP.

### Work with multiple storage VMs

BlueXP supports any additional storage VMs that you create from System Manager or the CLI.

For example, the following image shows how you can choose a storage VM when you create a volume.

The image shows a configuration interface titled "Details & Protection". It contains the following elements:

- Storage VM Name:** A dropdown menu with "svm\_name1" selected and a downward arrow.
- Volume Name:** An empty text input field.
- Size (GiB):** A text input field containing "Volume size".
- Snapshot Policy:** A dropdown menu with "default" selected and a downward arrow.
- Default Policy:** A link with an information icon (i) and the text "Default Policy".

And the following image shows how you can choose a storage VM when replicating a volume to another system.

Destination Volume Name

volume\_copy

Destination Storage VM Name

svm\_name1

Destination Aggregate

Automatically select the best aggregate

## Modify the name of the default storage VM

BlueXP automatically names the single storage VM that it creates for Cloud Volumes ONTAP. From System Manager, CLI, or API, you can modify the name of the storage VM if you have strict naming standards. For example, you might want the name to match how you name the storage VMs for your ONTAP clusters.

## Create data-serving storage VMs for Cloud Volumes ONTAP in Azure

A storage VM is a virtual machine running within ONTAP that provides storage and data services to your clients. You might know this as an *SVM* or a *vserver*. Cloud Volumes ONTAP is configured with one storage VM by default, but additional storage VMs are supported when running Cloud Volumes ONTAP in Azure.

To create additional data-serving storage VMs, you need to allocate IP addresses in Azure and then run ONTAP commands to create the storage VM and data LIFs.

## Supported number of storage VMs

Multiple storage VMs are supported with specific Cloud Volumes ONTAP configurations starting with the 9.9.0 release. Go to the [Cloud Volumes ONTAP Release Notes](#) to verify the supported number of storage VMs for your version of Cloud Volumes ONTAP.

All other Cloud Volumes ONTAP configurations support one data-serving storage VM and one destination storage VM used for disaster recovery. You can activate the destination storage VM for data access if there's an outage on the source storage VM.

## Allocate IP addresses in Azure

You need to allocate IP addresses in Azure before you create a storage VM and allocate LIFs.

## Single node system

IP addresses must be assigned to nic0 in Azure before you create a storage VM and allocate LIFs.

You'll need to create an IP address for data LIF access and another optional IP address for a storage VM (SVM) management LIF. This management LIF provides a connection to management tools like SnapCenter.

### Steps

1. Log in to the Azure portal and open the **Virtual machine** service.
2. Click the name of the Cloud Volumes ONTAP VM.
3. Click **Networking**.
4. Click the name of the network interface for nic0.
5. Under **Settings**, click **IP configurations**.
6. Click **Add**.
7. Enter a name for the IP configuration, select **Dynamic**, and then click **OK**.
8. Click the name of the IP configuration that you just created, change the **Assignment** to **Static**, and click **Save**.

It's best to use a static IP address because a static IP ensures that the IP address won't change, which can help to prevent unnecessary outages to your application.

If you want to create an SVM management LIF, repeat these steps to create an additional IP address.

### After you finish

Copy the private IP addresses that you just created. You'll need to specify those IP addresses when you create LIFs for the new storage VM.

### HA pair

How you allocate IP addresses for an HA pair depends on the storage protocol that you're using.

## iSCSI

iSCSI IP addresses must be assigned to nic0 in Azure before you create a storage VM and allocate LIFs. IPs for iSCSI are assigned to nic0 and not the load balancer because iSCSI uses ALUA for failover.

You'll need to create the following IP addresses:

- One IP address for iSCSI data LIF access from node 1
- One IP address for iSCSI data LIF access from node 2
- An optional IP address for a storage VM (SVM) management LIF

This management LIF provides a connection to management tools like SnapCenter.

### Steps

1. Log in to the Azure portal and open the **Virtual machine** service.
2. Click the name of the Cloud Volumes ONTAP VM for node 1.
3. Click **Networking**.
4. Click the name of the network interface for nic0.
5. Under **Settings**, click **IP configurations**.
6. Click **Add**.
7. Enter a name for the IP configuration, select **Dynamic**, and then click **OK**.
8. Click the name of the IP configuration that you just created, change the **Assignment** to **Static**, and click **Save**.

It's best to use a static IP address because a static IP ensures that the IP address won't change, which can help to prevent unnecessary outages to your application.

9. Repeat these steps on node 2.
10. If you want to create an SVM management LIF, repeat these steps on node 1.

## NFS

IP addresses that you use for NFS are allocated in the load balancer so that the IP addresses can migrate to the other node in case failover events occur.

You'll need to create the following IP addresses:

- One IP address for NAS data LIF access from node 1
- One IP address for NAS data LIF access from node 2
- An optional IP address for a storage VM (SVM) management LIF

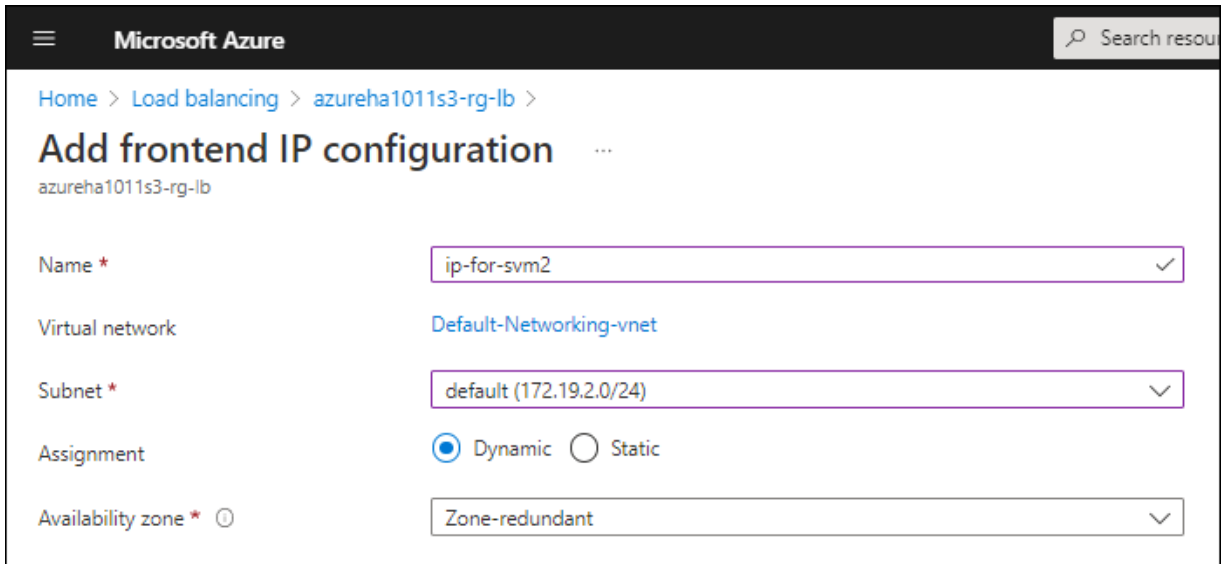
The iSCSI LIFs are required for DNS communication. An iSCSI LIF is used for this purpose because it doesn't migrate on failover.

This management LIF provides a connection to management tools like SnapCenter.

### Steps

1. In the Azure portal, open the **Load balancers** service.

2. Click the name of the load balancer for the HA pair.
3. Create one frontend IP configuration for data LIF access from node 1, another for data LIF access from node 2, and another optional frontend IP for a storage VM (SVM) management LIF.
  - a. Under **Settings**, click **Frontend IP configuration**.
  - b. Click **Add**.
  - c. Enter a name for the frontend IP, select the subnet for the Cloud Volumes ONTAP HA pair, leave **Dynamic** selected, and in regions with Availability Zones, leave **Zone-redundant** selected to ensure that the IP address remains available if a zone fails.



The screenshot shows the Microsoft Azure portal interface for adding a frontend IP configuration to a load balancer. The breadcrumb navigation is 'Home > Load balancing > azureha1011s3-rg-lb >'. The main heading is 'Add frontend IP configuration'. Below the heading, the resource name 'azureha1011s3-rg-lb' is displayed. The configuration form includes the following fields:

- Name \***: A text input field containing 'ip-for-svm2' with a checkmark icon on the right.
- Virtual network**: A dropdown menu showing 'Default-Networking-vnet'.
- Subnet \***: A dropdown menu showing 'default (172.19.2.0/24)' with a downward arrow icon.
- Assignment**: Two radio buttons, 'Dynamic' (which is selected) and 'Static'.
- Availability zone \***: A dropdown menu showing 'Zone-redundant' with a downward arrow icon.

- d. Click the name of the frontend IP configuration that you just created, change the **Assignment** to **Static**, and click **Save**.

It's best to use a static IP address because a static IP ensures that the IP address won't change, which can help to prevent unnecessary outages to your application.

4. Add a health probe for each frontend IP that you just created.
  - a. Under the load balancer's **Settings**, click **Health probes**.
  - b. Click **Add**.
  - c. Enter a name for the health probe and enter a port number that's between 63005 and 65000. Keep the default values for the other fields.

It's important that the port number is between 63005 and 65000. For example, if you are creating three health probes, you could enter probes that use the port numbers 63005, 63006, and 63007.

Microsoft Azure

Search resources, services, and

[Home](#) > [Load balancers](#) > [azureha1011s3-rg-lb](#) >

## Add health probe

azureha1011s3-rg-lb

|                         |                    |                      |
|-------------------------|--------------------|----------------------|
| Name *                  | svm2-health-probe1 | ✓                    |
| Protocol *              | TCP                | ▼                    |
| Port * ⓘ                | 63005              | ✓                    |
| Interval * ⓘ            | 5                  | seconds              |
| Unhealthy threshold * ⓘ | 2                  | consecutive failures |
| Used by ⓘ               | Not used           |                      |

5. Create new load balancing rules for each frontend IP.
  - a. Under the load balancer's **Settings**, click **Load balancing rules**.
  - b. Click **Add** and enter the required information:
    - **Name**: Enter a name for the rule.
    - **IP Version**: Select **IPv4**.
    - **Frontend IP address**: Select one of the frontend IP addresses that you just created.
    - **HA Ports**: Enable this option.
    - **Backend pool**: Keep the default Backend pool that was already selected.
    - **Health probe**: Select the health probe that you created for the selected frontend IP.
    - **Session persistence**: Select **None**.
    - **Floating IP**: Select **Enabled**.



## Add load balancing rule

chandanaTcpRst3-rg-lb

**i** A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. Only backend instances that the health probe considers healthy receive new traffic.

Name \*

jimmy\_new\_rule ✓

IP Version \*

☒ IPv4 ☐ IPv6

Frontend IP address \* ⓘ

10.1.0.156 (dataAFIP) ▼

☒ HA Ports ⓘ

Backend pool ⓘ

backendPool (2 virtual machines) ▼

Health probe ⓘ

dataProbe (TCP:63002) ▼

Session persistence ⓘ

None ▼

Floating IP ⓘ

☐ Disabled ☒ Enabled

6. Ensure that the network security group rules for Cloud Volumes ONTAP allows the load balancer to send TCP probes for the health probes that were created in step 4 above. Note that this is allowed by default.

### SMB

IP addresses that you use for SMB data are allocated in the load balancer so that the IP addresses can migrate to the other node in case failover events occur.

You'll need to create the following IP addresses in the load balancer:

- One IP address for NAS data LIF access from node 1
- One IP address for NAS data LIF access from node 2
- One IP address for an iSCSI LIF on node 1 in each VM's respective NIC0
- One IP address for an iSCSI LIF on node 2

The iSCSI LIFs are required for DNS and SMB communication. An iSCSI LIF is used for this purpose because it doesn't migrate on failover.

- An optional IP address for a storage VM (SVM) management LIF

This management LIF provides a connection to management tools like SnapCenter.

## Steps

1. In the Azure portal, open the **Load balancers** service.
2. Click the name of the load balancer for the HA pair.
3. Create the required number of frontend IP configurations for the data and SVM LIFs only:



A frontend IP should only be created under the NIC0 for each corresponding SVM. For more information on how to add the IP address to the SVM NIC0, see "Step 7 [hyperlink]"

- a. Under **Settings**, click **Frontend IP configuration**.
- b. Click **Add**.
- c. Enter a name for the frontend IP, select the subnet for the Cloud Volumes ONTAP HA pair, leave **Dynamic** selected, and in regions with Availability Zones, leave **Zone-redundant** selected to ensure that the IP address remains available if a zone fails.

The screenshot shows the 'Add frontend IP configuration' page in the Microsoft Azure portal. The breadcrumb navigation is 'Home > Load balancing > azureha1011s3-rg-lb >'. The title is 'Add frontend IP configuration' with a three-dot menu icon. Below the title is the resource name 'azureha1011s3-rg-lb'. The form contains the following fields:

- Name \***: A text input field containing 'ip-for-svm2' with a checkmark icon on the right.
- Virtual network**: A text input field containing 'Default-Networking-vnet'.
- Subnet \***: A dropdown menu showing 'default (172.19.2.0/24)' with a downward arrow.
- Assignment**: Two radio buttons, 'Dynamic' (selected) and 'Static'.
- Availability zone \***: A dropdown menu showing 'Zone-redundant' with a downward arrow and an information icon.

- d. Click the name of the frontend IP configuration that you just created, change the **Assignment** to **Static**, and click **Save**.

It's best to use a static IP address because a static IP ensures that the IP address won't change, which can help to prevent unnecessary outages to your application.

4. Add a health probe for each frontend IP that you just created.
  - a. Under the load balancer's **Settings**, click **Health probes**.
  - b. Click **Add**.
  - c. Enter a name for the health probe and enter a port number that's between 63005 and 65000. Keep the default values for the other fields.

It's important that the port number is between 63005 and 65000. For example, if you are creating three health probes, you could enter probes that use the port numbers 63005, 63006, and 63007.

Microsoft Azure

Search resources, services, and

[Home](#) > [Load balancers](#) > [azureha1011s3-rg-lb](#) >

## Add health probe

azureha1011s3-rg-lb

|                         |                    |                      |
|-------------------------|--------------------|----------------------|
| Name *                  | svm2-health-probe1 | ✓                    |
| Protocol *              | TCP                | ▼                    |
| Port * ⓘ                | 63005              | ✓                    |
| Interval * ⓘ            | 5                  | seconds              |
| Unhealthy threshold * ⓘ | 2                  | consecutive failures |
| Used by ⓘ               | Not used           |                      |

5. Create new load balancing rules for each frontend IP.
  - a. Under the load balancer's **Settings**, click **Load balancing rules**.
  - b. Click **Add** and enter the required information:
    - **Name**: Enter a name for the rule.
    - **IP Version**: Select **IPv4**.
    - **Frontend IP address**: Select one of the frontend IP addresses that you just created.
    - **HA Ports**: Enable this option.
    - **Backend pool**: Keep the default Backend pool that was already selected.
    - **Health probe**: Select the health probe that you created for the selected frontend IP.
    - **Session persistence**: Select **None**.
    - **Floating IP**: Select **Enabled**.

## Add load balancing rule

chandanaTcpRst3-rg-lb

**i** A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. Only backend instances that the health probe considers healthy receive new traffic.

Name \*

jimmy\_new\_rule

IP Version \*



IPv4



IPv6

Frontend IP address \* ⓘ

10.1.0.156 (dataAFIP)



HA Ports ⓘ

Backend pool ⓘ

backendPool (2 virtual machines)

Health probe ⓘ

dataAProbe (TCP:63002)

Session persistence ⓘ

None

Floating IP ⓘ

Disabled

Enabled

6. Ensure that the network security group rules for Cloud Volumes ONTAP allows the load balancer to send TCP probes for the health probes that were created in step 4 above. Note that this is allowed by default.
7. For iSCSI LIFs, add the IP address for NIC0.
  - a. Click the name of the Cloud Volumes ONTAP VM.
  - b. Click **Networking**.
  - c. Click the name of the network interface for nic0.
  - d. Under Settings, click **IP configurations**.
  - e. Click **Add**.

connector1-614 | IP configurations

Network interface

Search

+ Add Save Discard Refresh

Overview

Activity log

Access control (IAM)

Tags

Settings

IP configurations

DNS servers

Network security group

Properties

Locks

Monitoring

Insights

Alerts

Metrics

IP forwarding settings

IP forwarding: Disabled Enabled

Virtual network: Vnet2

IP configurations

Subnet \*: Subnet2

Search IP configurations

| Name      | IP Version | Type    | Private IP address     | Public IP address                  |
|-----------|------------|---------|------------------------|------------------------------------|
| ipconfig1 | IPv4       | Primary | 192.168.1.10 (Dynamic) | 203.105.128.10 (connector1... ***) |

f. Enter a name for the IP configuration, select Dynamic, and then click **OK**.

connector1-614 | IP configurations

Network interface

Search

+ Add Save Discard Refresh

Overview

Activity log

Access control (IAM)

Tags

Settings

IP configurations

DNS servers

Network security group

Properties

Locks

Monitoring

Insights

Alerts

Metrics

IP forwarding settings

IP forwarding: Disabled Enabled

Virtual network: Vnet2

IP configurations

Subnet \*: Subnet2

Search IP configurations

| Name      | IP Version | Type    | Private IP   |
|-----------|------------|---------|--------------|
| ipconfig1 | IPv4       | Primary | 192.168.1.10 |

**Add IP configuration**

connector1-614

Name \*

IP version: ☒ IPv4 ☐ IPv6

Type: ☒ Primary ☐ Secondary

Primary IP configuration already exists

Private IP address settings

Allocation: ☒ Dynamic ☐ Static

Public IP address: ☒ Disassociate ☐ Associate

OK

g. Click the name of the IP configuration that you just created, change the Assignment to Static, and click **Save**.



It's best to use a static IP address because a static IP ensures that the IP address won't change, which can help to prevent unnecessary outages to your application.

## After you finish

Copy the private IP addresses that you just created. You'll need to specify those IP addresses when you create LIFs for the new storage VM.

## Create a storage VM and LIFs

After you allocate IP addresses in Azure, you can create a new storage VM on a single node system or on an

HA pair.

### **Single node system**

How you create a storage VM and LIFs on a single node system depends on the storage protocol that you're using.

## iSCSI

Follow these steps to create a new storage VM, along with the required LIFs.

### Steps

1. Create the storage VM and a route to the storage VM.

```
vserver create -vserver <svm-name> -subtype default -rootvolume  
<root-volume-name> -rootvolume-security-style unix
```

```
network route create -destination 0.0.0.0/0 -vserver <svm-name>  
-gateway <ip-of-gateway-server>
```

2. Create a data LIF:

```
network interface create -vserver <svm-name> -home-port e0a -address  
<iscsi-ip-address> -netmask-length <# of mask bits> -lif <lif-name>  
-home-node <name-of-node1> -data-protocol iscsi
```

3. Optional: Create a storage VM management LIF.

```
network interface create -vserver <svm-name> -lif <lif-name> -role  
data -data-protocol none -address <svm-mgmt-ip-address> -netmask  
-length <length> -home-node <name-of-node1> -status-admin up  
-failover-policy system-defined -firewall-policy mgmt -home-port e0a  
-auto-revert false -failover-group Default
```

4. Assign one or more aggregates to the storage VM.

```
vserver add-aggregates -vserver svm_2 -aggregates aggr1,aggr2
```

This step is required because the new storage VM needs access to at least one aggregate before you can create volumes on the storage VM.

## NFS

Follow these steps to create a new storage VM, along with the required LIFs.

### Steps

1. Create the storage VM and a route to the storage VM.

```
vserver create -vserver <svm-name> -subtype default -rootvolume  
<root-volume-name> -rootvolume-security-style unix
```

```
network route create -destination 0.0.0.0/0 -vserver <svm-name>  
-gateway <ip-of-gateway-server>
```

## 2. Create a data LIF:

```
network interface create -vserver <svm-name> -lif <lif-name> -role  
data -data-protocol cifs,nfs -address <nas-ip-address> -netmask  
-length <length> -home-node <name-of-node1> -status-admin up  
-failover-policy disabled -firewall-policy data -home-port e0a -auto  
-revert true -failover-group Default
```

## 3. Optional: Create a storage VM management LIF.

```
network interface create -vserver <svm-name> -lif <lif-name> -role  
data -data-protocol none -address <svm-mgmt-ip-address> -netmask  
-length <length> -home-node <name-of-node1> -status-admin up  
-failover-policy system-defined -firewall-policy mgmt -home-port e0a  
-auto-revert false -failover-group Default
```

## 4. Assign one or more aggregates to the storage VM.

```
vserver add-aggregates -vserver svm_2 -aggregates aggr1,aggr2
```

This step is required because the new storage VM needs access to at least one aggregate before you can create volumes on the storage VM.

## SMB

Follow these steps to create a new storage VM, along with the required LIFs.

### Steps

#### 1. Create the storage VM and a route to the storage VM.

```
vserver create -vserver <svm-name> -subtype default -rootvolume  
<root-volume-name> -rootvolume-security-style unix
```



```
network route create -destination 0.0.0.0/0 -vserver <svm-name>
-gateway <ip-of-gateway-server>
```

## 2. Create a data LIF:

```
network interface create -vserver <svm-name> -lif <lif-name> -role
data -data-protocol cifs,nfs -address <nas-ip-address> -netmask
-length <length> -home-node <name-of-node1> -status-admin up
-failover-policy disabled -firewall-policy data -home-port e0a -auto
-revert true -failover-group Default
```

## 3. Optional: Create a storage VM management LIF.

```
network interface create -vserver <svm-name> -lif <lif-name> -role
data -data-protocol none -address <svm-mgmt-ip-address> -netmask
-length <length> -home-node <name-of-node1> -status-admin up
-failover-policy system-defined -firewall-policy mgmt -home-port e0a
-auto-revert false -failover-group Default
```

## 4. Assign one or more aggregates to the storage VM.

```
vserver add-aggregates -vserver svm_2 -aggregates aggr1,aggr2
```

This step is required because the new storage VM needs access to at least one aggregate before you can create volumes on the storage VM.

## HA pair

How you create a storage VM and LIFs on an HA pair depends on the storage protocol that you're using.

## iSCSI

Follow these steps to create a new storage VM, along with the required LIFs.

### Steps

1. Create the storage VM and a route to the storage VM.

```
vserver create -vserver <svm-name> -subtype default -rootvolume  
<root-volume-name> -rootvolume-security-style unix
```

```
network route create -destination 0.0.0.0/0 -vserver <svm-name>  
-gateway <ip-of-gateway-server>
```

2. Create data LIFs:

- a. Use the following command to create an iSCSI LIF on node 1.

```
network interface create -vserver <svm-name> -home-port e0a  
-address <iscsi-ip-address> -netmask-length <# of mask bits> -lif  
<lif-name> -home-node <name-of-node1> -data-protocol iscsi
```

- b. Use the following command to create an iSCSI LIF on node 2.

```
network interface create -vserver <svm-name> -home-port e0a  
-address <iscsi-ip-address> -netmask-length <# of mask bits> -lif  
<lif-name> -home-node <name-of-node2> -data-protocol iscsi
```

3. Optional: Create a storage VM management LIF on node 1.

```
network interface create -vserver <svm-name> -lif <lif-name> -role  
data -data-protocol none -address <svm-mgmt-ip-address> -netmask  
-length <length> -home-node <name-of-node1> -status-admin up  
-failover-policy system-defined -firewall-policy mgmt -home-port e0a  
-auto-revert false -failover-group Default
```

This management LIF provides a connection to management tools like SnapCenter.

4. Assign one or more aggregates to the storage VM.

```
vserver add-aggregates -vserver svm_2 -aggregates aggr1,aggr2
```

This step is required because the new storage VM needs access to at least one aggregate before you

can create volumes on the storage VM.

5. If you're running Cloud Volumes ONTAP 9.11.1 or later, modify the network service policies for the storage VM.
  - a. Enter the following command to access advanced mode.

```
::> set adv -con off
```

Modifying the services is required because it ensures that Cloud Volumes ONTAP can use the iSCSI LIF for outbound management connections.

```
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service data-fpolicy-client
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service management-ad-client
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service management-dns-client
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service management-ldap-client
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service management-nis-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service data-fpolicy-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service management-ad-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service management-dns-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service management-ldap-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service management-nis-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service data-fpolicy-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service management-ad-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service management-dns-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service management-ldap-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service management-nis-client
```

## NFS

Follow these steps to create a new storage VM, along with the required LIFs.

## Steps

1. Create the storage VM and a route to the storage VM.

```
vserver create -vserver <svm-name> -subtype default -rootvolume  
<root-volume-name> -rootvolume-security-style unix
```

```
network route create -destination 0.0.0.0/0 -vserver <svm-name>  
-gateway <ip-of-gateway-server>
```

2. Create data LIFs:

- a. Use the following command to create a NAS LIF on node 1.

```
network interface create -vserver <svm-name> -lif <lif-name>  
-role data -data-protocol cifs,nfs -address <nfs-cifs-ip-address>  
-netmask-length <length> -home-node <name-of-node1> -status-admin  
up -failover-policy system-defined -firewall-policy data -home  
-port e0a -auto-revert true -failover-group Default -probe-port  
<port-number-for-azure-health-probe1>
```

- b. Use the following command to create a NAS LIF on node 2.

```
network interface create -vserver <svm-name> -lif <lif-name>  
-role data -data-protocol cifs,nfs -address <nfs-cifs-ip-address>  
-netmask-length <length> -home-node <name-of-node2> -status-admin  
up -failover-policy system-defined -firewall-policy data -home  
-port e0a -auto-revert true -failover-group Default -probe-port  
<port-number-for-azure-health-probe2>
```

3. Create iSCSI LIFs to provide DNS communication:

- a. Use the following command to create an iSCSI LIF on node 1.

```
network interface create -vserver <svm-name> -home-port e0a  
-address <iscsi-ip-address> -netmask-length <# of mask bits> -lif  
<lif-name> -home-node <name-of-node1> -data-protocol iscsi
```

- b. Use the following command to create an iSCSI LIF on node 2.

```
network interface create -vserver <svm-name> -home-port e0a  
-address <iscsi-ip-address> -netmask-length <# of mask bits> -lif  
<lif-name> -home-node <name-of-node2> -data-protocol iscsi
```

4. Optional: Create a storage VM management LIF on node 1.

```
network interface create -vserver <svm-name> -lif <lif-name> -role
data -data-protocol none -address <svm-mgmt-ip-address> -netmask
-length <length> -home-node <name-of-node1> -status-admin up
-failover-policy system-defined -firewall-policy mgmt -home-port e0a
-auto-revert false -failover-group Default -probe-port <port-number-
for-azure-health-probe3>
```

This management LIF provides a connection to management tools like SnapCenter.

5. Optional: Create a storage VM management LIF on node 1.

```
network interface create -vserver <svm-name> -lif <lif-name> -role
data -data-protocol none -address <svm-mgmt-ip-address> -netmask
-length <length> -home-node <name-of-node1> -status-admin up
-failover-policy system-defined -firewall-policy mgmt -home-port e0a
-auto-revert false -failover-group Default -probe-port <port-number-
for-azure-health-probe3>
```

This management LIF provides a connection to management tools like SnapCenter.

6. Assign one or more aggregates to the storage VM.

```
vserver add-aggregates -vserver svm_2 -aggregates aggr1,aggr2
```

This step is required because the new storage VM needs access to at least one aggregate before you can create volumes on the storage VM.

7. If you're running Cloud Volumes ONTAP 9.11.1 or later, modify the network service policies for the storage VM.

- a. Enter the following command to access advanced mode.

```
::> set adv -con off
```

Modifying the services is required because it ensures that Cloud Volumes ONTAP can use the iSCSI LIF for outbound management connections.

```

network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service data-fpolicy-client
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service management-ad-client
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service management-dns-client
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service management-ldap-client
network interface service-policy remove-service -vserver <svm-name> -policy default-data-files -service management-nis-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service data-fpolicy-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service management-ad-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service management-dns-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service management-ldap-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-blocks -service management-nis-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service data-fpolicy-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service management-ad-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service management-dns-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service management-ldap-client
network interface service-policy add-service -vserver <svm-name> -policy default-data-iscsi -service management-nis-client

```

## SMB

Follow these steps to create a new storage VM, along with the required LIFs.

### Steps

1. Create the storage VM and a route to the storage VM.

```

vserver create -vserver <svm-name> -subtype default -rootvolume <root-volume-name> -rootvolume-security-style unix

```

```

network route create -destination 0.0.0.0/0 -vserver <svm-name> -gateway <ip-of-gateway-server>

```

## 2. Create NAS data LIFs:

- a. Use the following command to create a NAS LIF on node 1.

```
network interface create -vserver <svm-name> -lif <lif-name>
-role data -data-protocol cifs,nfs -address <nfs-cifs-ip-address>
-netmask-length <length> -home-node <name-of-node1> -status-admin
up -failover-policy system-defined -firewall-policy data -home
-port e0a -auto-revert true -failover-group Default -probe-port
<port-number-for-azure-health-probe1>
```

- b. Use the following command to create a NAS LIF on node 2.

```
network interface create -vserver <svm-name> -lif <lif-name>
-role data -data-protocol cifs,nfs -address <nfs-cifs-ip-address>
-netmask-length <length> -home-node <name-of-node2> -status-admin
up -failover-policy system-defined -firewall-policy data -home
-port e0a -auto-revert true -failover-group Default -probe-port
<port-number-for-azure-health-probe2>
```

## 3. Create iSCSI LIFs to provide DNS communication:

- a. Use the following command to create an iSCSI LIF on node 1.

```
network interface create -vserver <svm-name> -home-port e0a
-address <iscsi-ip-address> -netmask-length <# of mask bits> -lif
<lif-name> -home-node <name-of-node1> -data-protocol iscsi
```

- b. Use the following command to create an iSCSI LIF on node 2.

```
network interface create -vserver <svm-name> -home-port e0a
-address <iscsi-ip-address> -netmask-length <# of mask bits> -lif
<lif-name> -home-node <name-of-node2> -data-protocol iscsi
```

## 4. Optional: Create a storage VM management LIF on node 1.

```
network interface create -vserver <svm-name> -lif <lif-name> -role
data -data-protocol none -address <svm-mgmt-ip-address> -netmask
-length <length> -home-node <name-of-node1> -status-admin up
-failover-policy system-defined -firewall-policy mgmt -home-port e0a
-auto-revert false -failover-group Default -probe-port <port-number-
for-azure-health-probe3>
```

This management LIF provides a connection to management tools like SnapCenter.

5. Assign one or more aggregates to the storage VM.

```
vserver add-aggregates -vserver svm_2 -aggregates aggr1,aggr2
```

This step is required because the new storage VM needs access to at least one aggregate before you can create volumes on the storage VM.

6. If you're running Cloud Volumes ONTAP 9.11.1 or later, modify the network service policies for the storage VM.
  - a. Enter the following command to access advanced mode.

```
::> set adv -con off
```

Modifying the services is required because it ensures that Cloud Volumes ONTAP can use the iSCSI LIF for outbound management connections.



```

network interface service-policy remove-service -vserver <svm-
name> -policy default-data-files -service data-fpolicy-client
network interface service-policy remove-service -vserver <svm-
name> -policy default-data-files -service management-ad-client
network interface service-policy remove-service -vserver <svm-
name> -policy default-data-files -service management-dns-client
network interface service-policy remove-service -vserver <svm-
name> -policy default-data-files -service management-ldap-client
network interface service-policy remove-service -vserver <svm-
name> -policy default-data-files -service management-nis-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-blocks -service data-fpolicy-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-blocks -service management-ad-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-blocks -service management-dns-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-blocks -service management-ldap-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-blocks -service management-nis-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-iscsi -service data-fpolicy-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-iscsi -service management-ad-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-iscsi -service management-dns-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-iscsi -service management-ldap-client
network interface service-policy add-service -vserver <svm-name>
-policy default-data-iscsi -service management-nis-client

```

### What's next?

After you create a storage VM on an HA pair, it's best to wait 12 hours before you provision storage on that SVM. Starting with the Cloud Volumes ONTAP 9.10.1 release, BlueXP scans the settings for an HA pair's load balancer at a 12-hour interval. If there are new SVMs, BlueXP will enable a setting that provides shorter unplanned failover.

## Set up SVM disaster recovery

BlueXP doesn't provide any setup or orchestration support for storage VM (SVM) disaster recovery. You must use System Manager or the CLI.

If you set up SnapMirror SVM replication between two Cloud Volumes ONTAP systems, the replication must be between two HA pair systems or two single node systems. You can't set up SnapMirror SVM replication between an HA pair and a single node system.

Refer to the following documents for CLI instructions.

- [SVM Disaster Recovery Preparation Express Guide](#)
- [SVM Disaster Recovery Express Guide](#)

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