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

Cloud Manager

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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 Cloud Volumes ONTAP BYOL in Azure with an add-on license 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

Follow the steps below for your configuration: either a single node system, an HA pair using iSCSI, or an HA pair using NFS/SMB.

Single node

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

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 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 an IP address for data LIF access from node 1, another IP address for data LIF access from node 2, 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 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**.
9. Repeat these steps on node 2.
10. If you want to create an SVM management LIF, repeat these steps on node 1.

After you finish

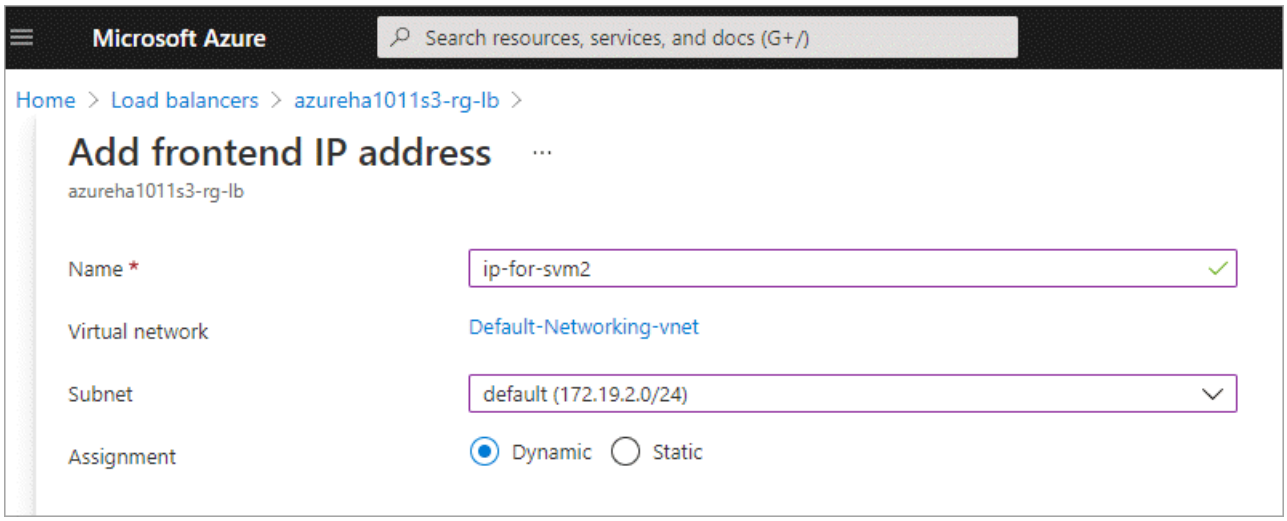
Copy the private IP addresses that you just created. You'll need to specify those IP addresses when you create LIFs for the new storage VM.

HA pair using NFS/SMB

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

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 (HA pairs only), 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, and leave **Dynamic** selected.



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

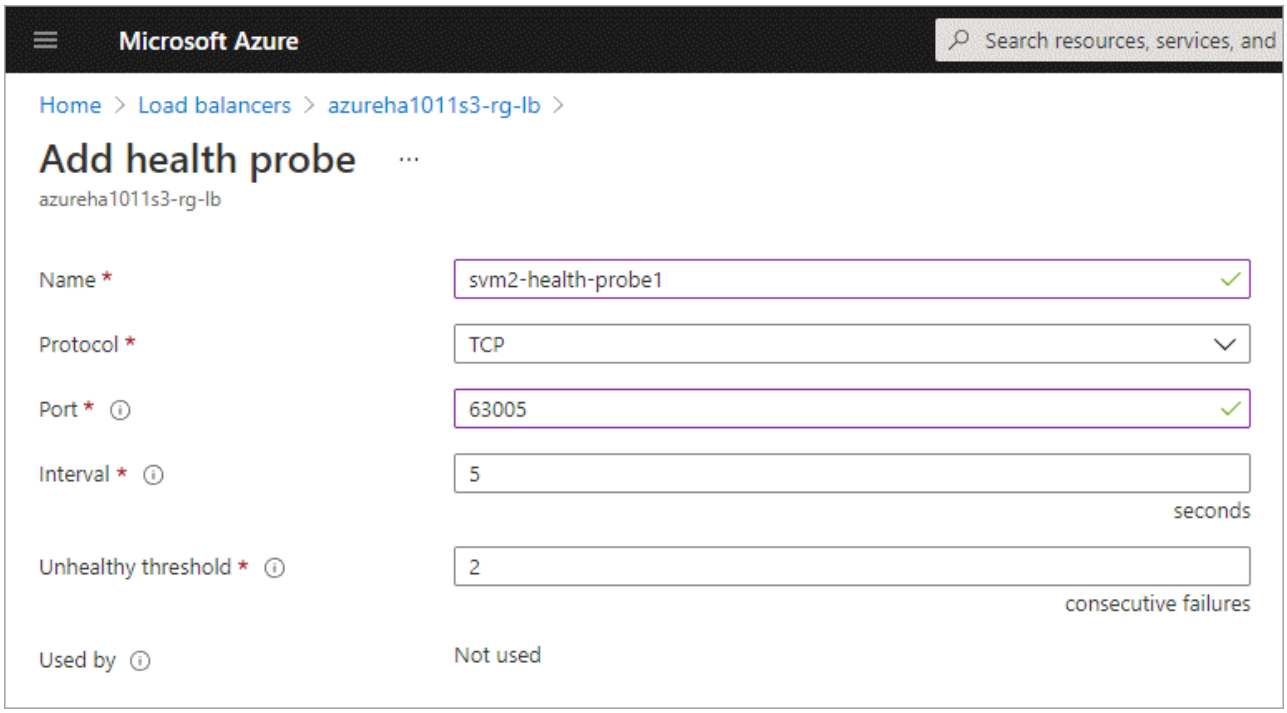
4. Add a health probe for each frontend IP that you just created.

   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.

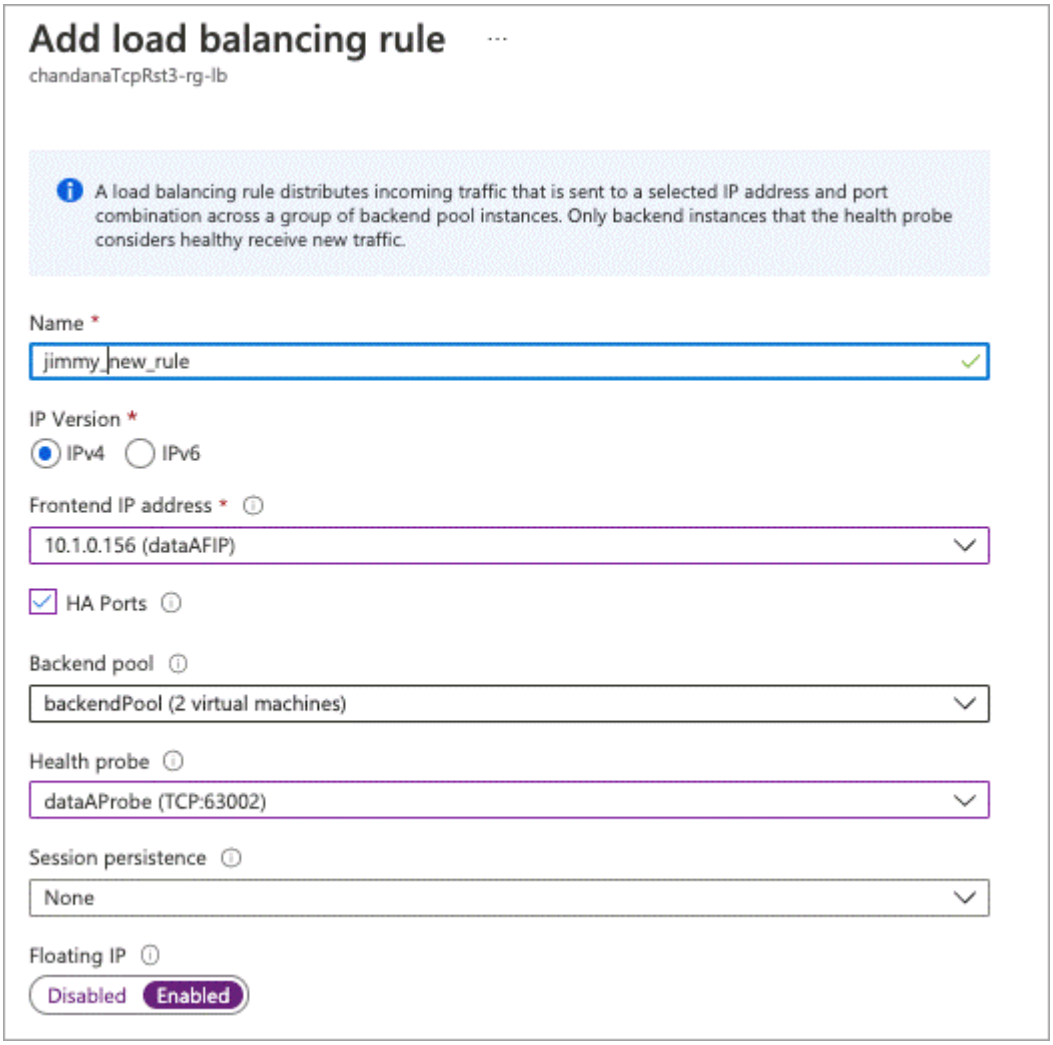


5. Create new load balancing rules for each frontend IP.

   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**.



After you finish

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.

Create a storage VM and LIFs

These steps create a new storage VM on a single node system or on an HA pair. One IP address is required for data LIF access from node 1, another IP address for data LIF access from node 2 (HA pairs only), and another optional IP address for a storage VM (SVM) management LIF. This management LIF provides a connection to management tools like SnapCenter.

Use the commands below that match the data access protocol for the storage VM, which is either NAS or iSCSI.

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--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>
```

   If this is a single node system, then you should change the value of the -failover-policy parameter to *disabled*.

   b. Use the following command to create a NAS LIF on node 2 (for HA pairs only).

```
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>
```

   c. 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> -lif <lif-name> -home-node <name-of-node1> -data
-protocol iscsi
```

   d. Use the following command to create an iSCSI LIF on node 2 (for HA pairs only).

```
network interface create -vserver <svm-name> -home-port e0a -address
<iscsi-ip-address> -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 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>
```