Aggregate administration

Cloud Volumes ONTAP

NetApp
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Aggregate administration

Create an aggregate for Cloud Volumes ONTAP systems

You can create aggregates yourself or let the NetApp Console do it for you when it creates volumes. The benefit of creating aggregates yourself is that you can choose the underlying disk size, which enables you to size your aggregate for the capacity or the performance that you need.

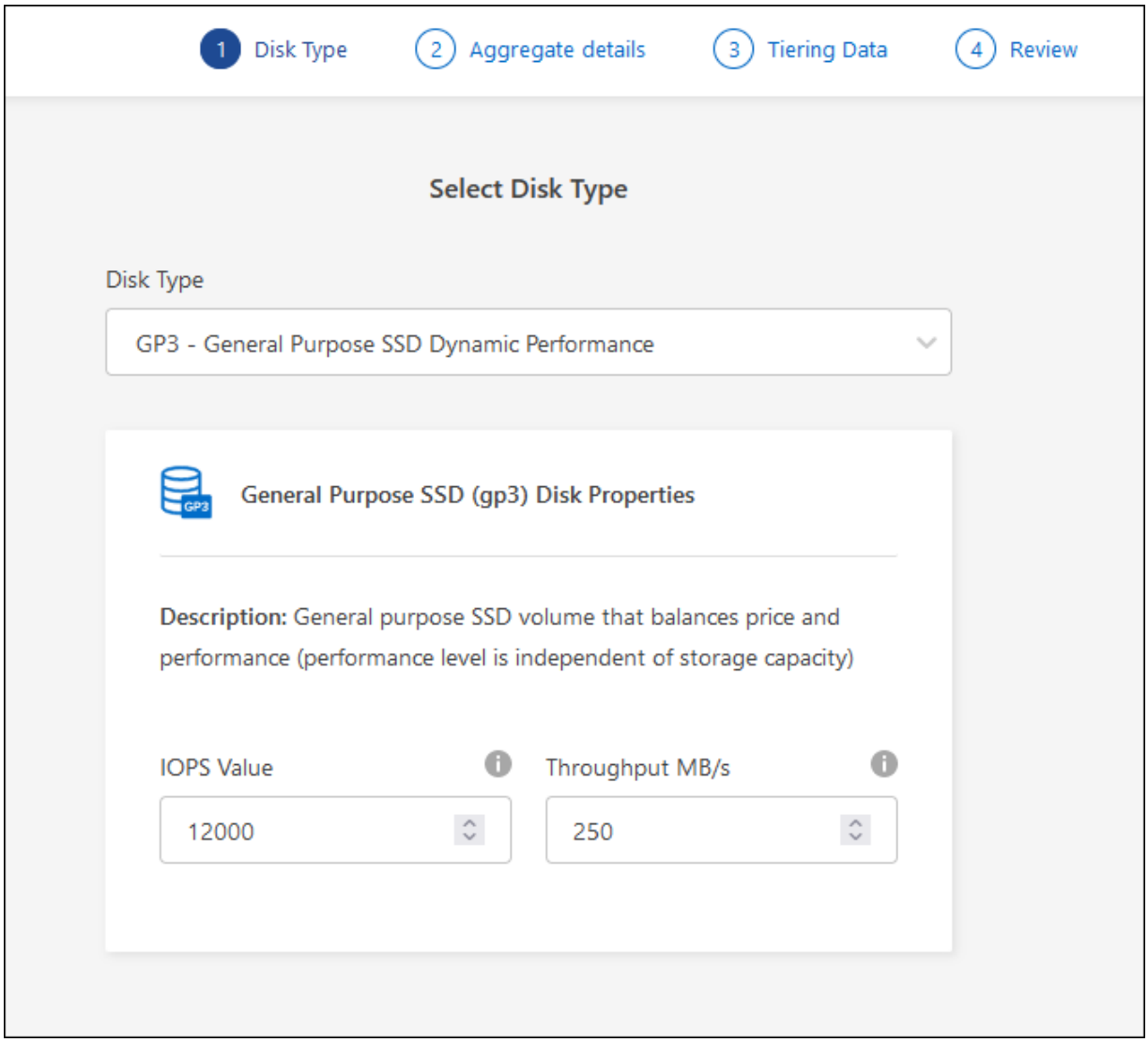
> All disks and aggregates must be created and deleted directly from the Console. You should not perform these actions from another management tool. Doing so can impact system stability, hamper the ability to add disks in the future, and potentially generate redundant cloud provider fees.

Steps

1. From the left navigation menu, select **Storage > Management**.
2. On the **Systems** page, double-click the name of the Cloud Volumes ONTAP system on which you want to manage aggregates.
3. On the Aggregates tab, click **Add Aggregate** and then specify details for the aggregate.

AWS

- If you're prompted to choose a disk type and disk size, refer to Plan your Cloud Volumes ONTAP configuration in AWS.
- If you're prompted to enter the aggregate's capacity size, then you're creating an aggregate on a configuration that supports the Amazon EBS Elastic Volumes feature. The following screenshot shows an example of a new aggregate comprised of gp3 disks.



Learn more about support for Elastic Volumes.

Azure

For help with disk type and disk size, refer to Plan your Cloud Volumes ONTAP configuration in Azure.

Google Cloud

For help with disk type and disk size, refer to Plan your Cloud Volumes ONTAP configuration in Google Cloud.

4. Click **Add**, and then click **Approve and Purchase**.

Manage aggregates for Cloud Volumes ONTAP clusters

Manage aggregates yourself by adding disks, viewing information about the aggregates, and by deleting them.

All disks and aggregates must be created and deleted directly from the NetApp Console. You should not perform these actions from another management tool. Doing so can impact system stability, hamper the ability to add disks in the future, and potentially generate redundant cloud provider fees.

Before you begin

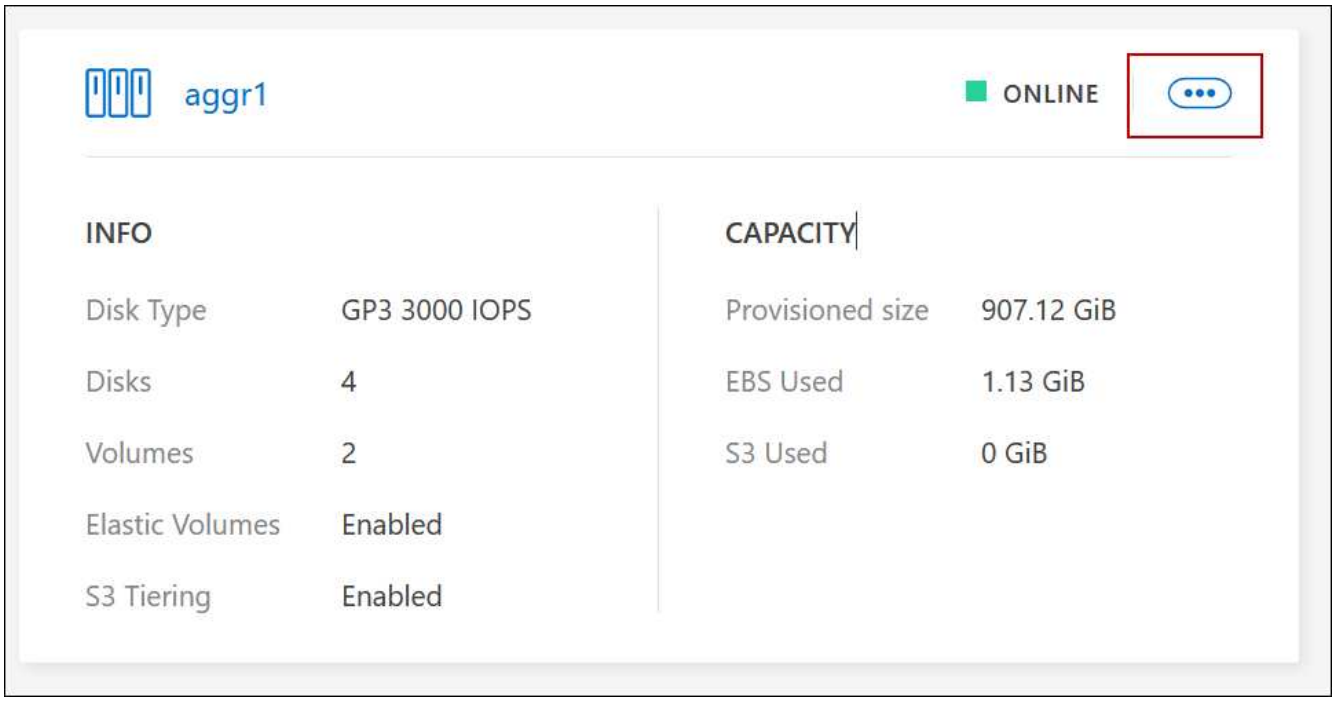
If you want to delete an aggregate, you must have first deleted the volumes in the aggregate.

About this task

If an aggregate is running out of space, you can move volumes to another aggregate by using ONTAP System Manager.

Steps

1. From the left navigation menu, select **Storage > Management**.
2. On the **Systems** page, double-click the Cloud Volumes ONTAP system on which you want to manage aggregates.
3. From the system details, click the **Aggregates** tab.
4. For the required aggregate, click the ••• icon for the management actions.



5. Manage your aggregates from the available options in the ••• menu.

For adding disks to an aggregate, all disks in the aggregate must be of the same size.

For AWS, you can increase the capacity of an aggregate that supports Amazon EBS Elastic Volumes.

a. Under the ••• menu, click **Increase capacity**.

b. Enter the additional capacity that you'd like to add and then click **Increase**.

Note that you must increase the capacity of the aggregate by a minimum of 256 GiB or 10% of the aggregate's size. For example, if you have a 1.77 TiB aggregate, 10% is 181 GiB. That's lower than 256 GiB, so the size of the aggregate must in increased by the 256 GiB minimum.

Manage the Cloud Volumes ONTAP aggregate capacity on a Console agent

Each Console agent has settings that determines how it manages aggregate capacity for Cloud Volumes ONTAP.

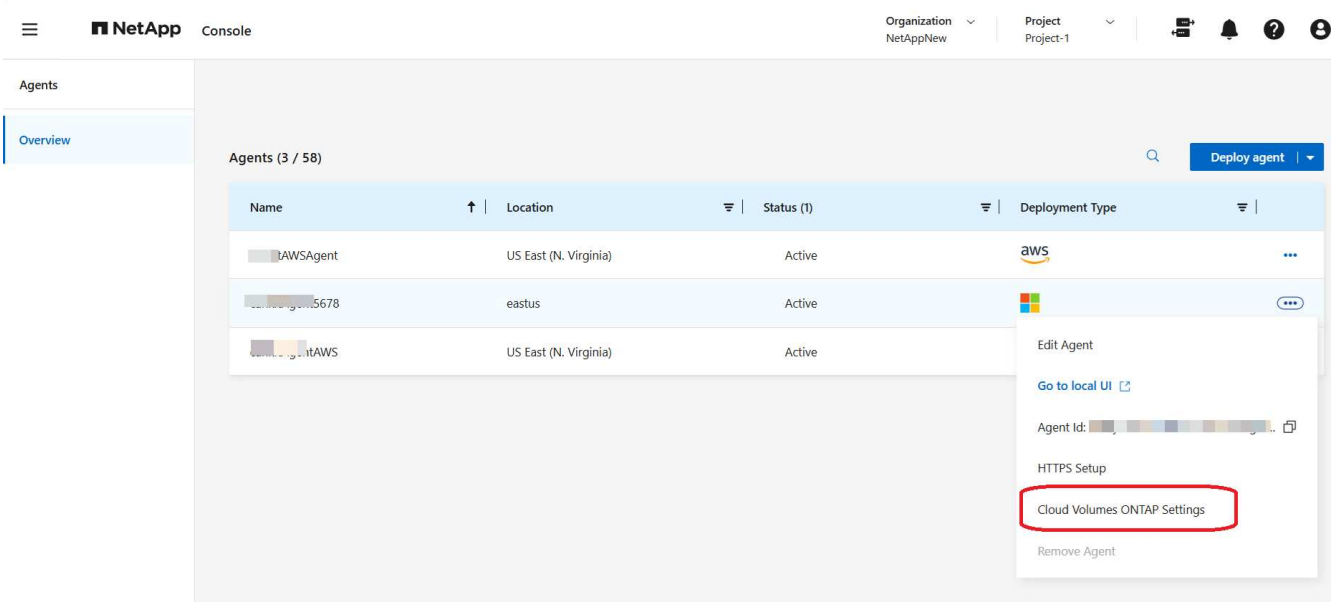
These settings affect all Cloud Volumes ONTAP systems managed by a Console agent. If you have another Console agent, it can be configured differently.

Required permissions

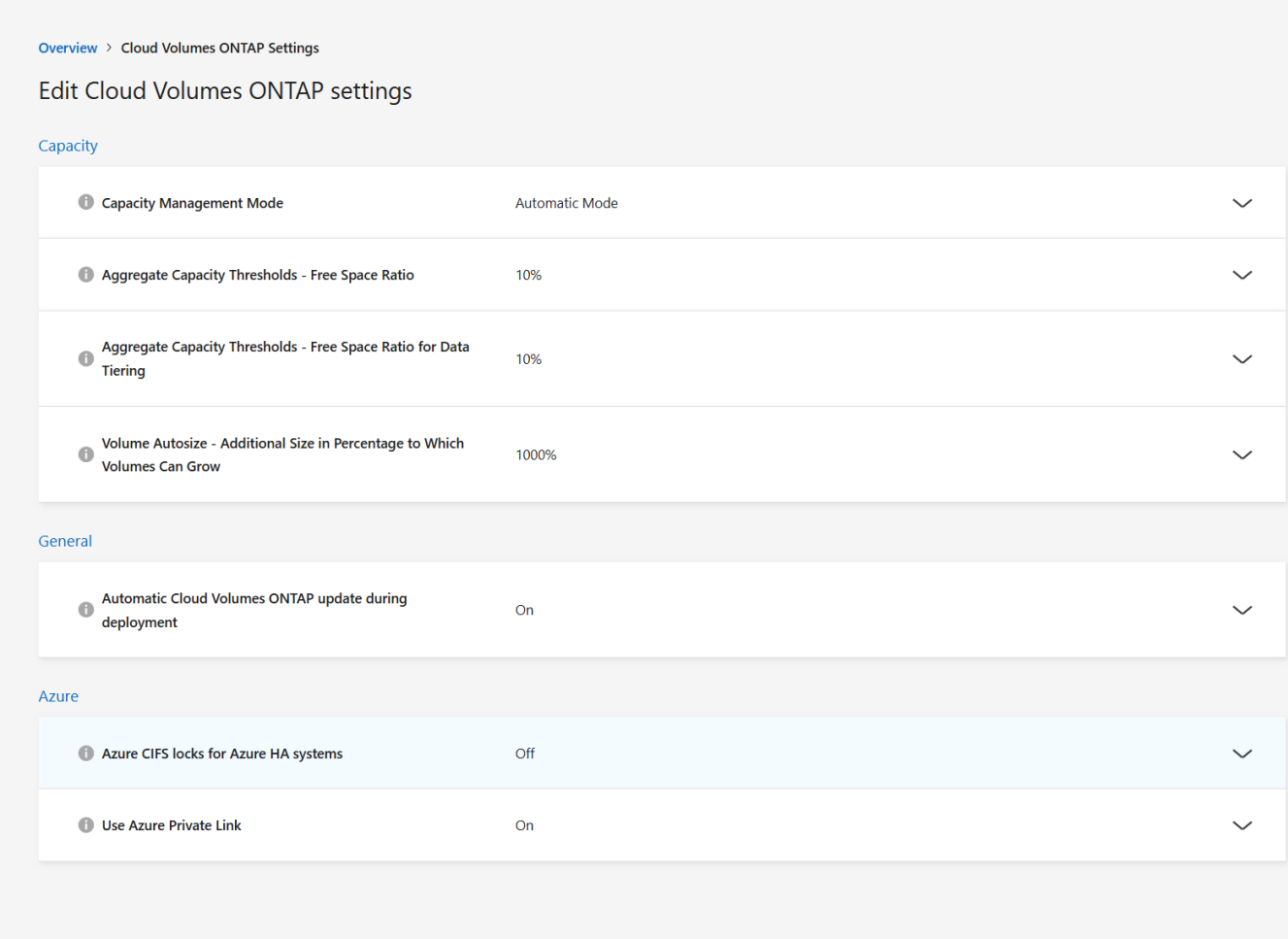
You need the organization or account admin privileges of the NetApp Console to modify Cloud Volumes ONTAP Settings.

Steps

1. From the left navigation pane, go to **Administration > Agents**.
2. Click the ••• icon for the Console agent that manages your Cloud Volumes ONTAP system.
3. Select **Cloud Volumes ONTAP Settings**.



4. Under **Capacity**, modify any of the following settings:



Capacity Management Mode

Choose whether the Console should notify you of storage capacity decisions or whether it should automatically manage capacity requirements for you.

Learn how Capacity Management Mode works.

Aggregate Capacity Threshold - Free Space Ratio

This ratio is a key parameter in capacity management decisions, and understanding its impact is essential regardless of whether you are in an automatic or manual mode of capacity management. It is recommended to set this threshold with consideration of your specific storage needs and anticipated growth to maintain a balance between resource utilization and cost.

In the manual mode, if the free space ratio on an aggregate drops below the specified threshold, it triggers a notification, alerting you that you should take actions to address the low free space ratio. It is important to monitor these notifications and manually manage the aggregate capacity to avoid service disruption and ensure optimal performance.

The free space ratio is calculated as follows:
(aggregate capacity - total used capacity on the aggregate) / aggregate capacity

Refer to Automatic capacity management to learn now capacity is automatically managed in Cloud Volumes ONTAP.

Aggregate Capacity Thresholds - Free Space Ratio for Data Tiering

Defines how much free space is required on the performance tier (disks) when tiering data to a capacity tier (object storage).

The ratio is important for disaster recovery scenarios. As data is read from the capacity tier, Cloud Volumes ONTAP moves data to the performance tier to provide better performance. If there isn't sufficient space, then Cloud Volumes ONTAP can't move the data.

5. Click **Save**.

Manage disk performance in Azure

Manage Premium SSD v2 disk performance for Cloud Volumes ONTAP in Azure

You can optimize Cloud Volumes ONTAP performance in Azure by configuring the IOPS and throughput parameters for Premium SSD v2 disks. This functionality is available only when Cloud Volumes ONTAP is already deployed with Azure Premium SSD v2 disk type, not during the initial deployment. By enhancing performance, you can leverage the full flexibility and high-performance capabilities of Azure Premium SSD v2 disks.

Premium SSD v2 disks support workloads that need fast, reliable performance with low latency, high IOPS, and high throughput. By adjusting the IOPS and throughput settings, you can tailor the performance of the aggregates in your deployment. For more information about Premium SSD v2 disks, refer to Deploy a Premium SSD v2 disk.

Use the APIs to automate the process for modifying Premium SSD v2 disk settings. For information about running Cloud Volumes ONTAP API calls, refer to Your first API call.

About this task

- This feature applies to Cloud Volumes ONTAP deployments in Azure single availability zones.
- Changing the disk settings uniformly modifies the performance of the RAID group or aggregate. The performance of all the disks in the aggregate is adjusted to the same level to ensure consistent performance across the aggregate.
- The changes affect a single aggregate and not other aggregates in a group.
- Premium SSD v2 disks that are provisioned automatically during Cloud Volumes ONTAP deployment or capacity optimization in the NetApp Console, or added through the APIs are all eligible for modification.
- Disk resizing (changing disk capacity) is not supported.

Before you begin

Note these points before configuring the IOPS and throughput parameters for Premium SSD v2 disks:

- Ensure that you have selected Premium SSD v2 data disks only. Premium SSD v1 disks or root and boot disks are not eligible for this change.
- Use the pre-configured baseline settings established by Cloud Volumes ONTAP during deployment as the minimum IOPS and throughput values for the respective disk size. These baseline settings align with the Premium SSD v1 performance characteristics.
- Set IOPS and throughput values at or above the minimum baseline for your disk size. For example, for a 1TB disk size, set the minimum IOPS value to 5,000 and the minimum throughput value to 200 MBps. You can configure values higher than these minimums but not lower.

- Configure values within the supported Premium SSD v2 ranges: IOPS between 3000 and 80000 and throughput between 125 and 1200 MBps.
- Ensure that your Premium SSD v2 disk size is within the supported range of 500GB to 32TB for Cloud Volumes ONTAP in Azure. Note that these size limits differ from the minimum and maximum values offered by Azure for Premium SSD v2 disks.

Steps

- Use the following API call to alter the attribute values for IOPS and throughput:

  You can invoke this API a maximum of four times within a 24-hour period.

  `PUT /azure/vsa/aggregates/{workingEnvironmentId}/{aggregateName}`

  Include the following parameters in the request body:

```
{
  "aggregateName": "aggr_name",
  "iops": "modified_iops_value",
  "throughput": "modified_throughput_value",
  "workingEnvironmentId": "we_id"
}
```

After you finish

After the API returns a response indicating the operation is successful, verify the modified parameters by checking the disk details in the Azure portal for your Cloud Volumes ONTAP system.

Related information

- Prepare to use the API
- Cloud Volumes ONTAP workflows
- Get required identifiers
- Use REST APIs for Cloud Volumes ONTAP
- Use Premium SSD v2 with VMs in availability set

Change performance tier of Premium SSD disks in Cloud Volumes ONTAP in Azure

You can upgrade the performance tier of Premium SSD managed disks in Cloud Volumes ONTAP in Azure by using the Azure portal. This is a manual process that involves changing the disk tier of each Premium SSD disk to a higher performance tier. Changing the performance tier of your NVRAM disk can help alleviate performance bottlenecks and enhance the efficiency of your Cloud Volumes ONTAP system by providing higher IOPS and throughput capabilities.

Ensure that you work with NetApp support to determine that the bottleneck that you experience in your environment is due to the NVRAM disk, and upgrading the tier resolves the issue.

About this task

- By default, Cloud Volumes ONTAP in Azure deploys Premium SSD disks for NVRAM in P20 tier. The P20 tier provides a balanced performance suitable for most workloads. However, if your workload demands higher performance, you can upgrade the NVRAM disk to a higher tier such as P30.

  Currently, you can upgrade an NVRAM disk from P20 to P30 tier, only through the Azure portal.

- You do not change the size of the disk. It continues to remain 512 GB. This procedure only changes the disk's performance tier.

Before you begin

- Assess the need for this change carefully, because upgrading the NVRAM disk to a higher performance tier incurs additional costs.
- Your Cloud Volumes ONTAP version must be 9.11.1 or later. For lower versions, you can upgrade to 9.11.1 or later, or raise a Feature Policy Variation Request (FPVR) with NetApp support.

Steps

This scenario assumes that there are two nodes `node01` and `node02` in the Cloud Volumes ONTAP high-availability (HA) deployment. Use the Azure portal to upgrade the tier.

1. Run this command to make `node1` the active node. Manually fail over `node02`.

   ```
   storage failover takeover -ofnode <Node02>
   ```

2. Sign in to the Azure portal.
3. When the takeover is complete, go to the VM instance for `node02`, and click the **Stop** button to switch it off.
4. Navigate to the resource group for `node02` and from the list of disks, select the NVRAM disk to change the tier.
5. Select **Size + Performance**.
6. In the **Performance tier** dropdown, select `P30 - 5000 IOPS, 200MB/s`.
7. Select **Resize**.
8. Switch on the `node02` instance.
9. Check the Azure serial console until you can see the message: `waiting for giveback`.
10. Run this command to give back `node02`:

    ```
    storage failover giveback -ofnode <Node02>
    ```

11. Repeat these steps on `node01` to make `node02` take over `node01`, so that you can upgrade the NVRAM disk tier for `node01`.

After you finish

When you have switched on both the nodes, verify the modified parameters by checking the disk details in the Azure portal for your Cloud Volumes ONTAP system.

Related information

- Azure documentation: Change your performance tier without downtime

- Knowledge base for the support team: How to upgrade performance tier of NVRAM disk in Azure CVO
- Upgrade Cloud Volumes ONTAP software versions

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