Supported configurations

Cloud Volumes ONTAP 9.11.1 release notes

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Table of Contents

Supported configurations 1
Supported configurations in AWS 1
Supported configurations in Azure 4
Supported configurations in Google Cloud 7

Supported configurations

Supported configurations in AWS

Several Cloud Volumes ONTAP configurations are supported in AWS.

Supported number of nodes

Cloud Volumes ONTAP is available in AWS as a single node system and as a high-availability (HA) pair of nodes for fault tolerance and nondisruptive operations.

Upgrading a single node system to an HA pair is not supported. If you want to switch between a single node system and an HA pair, then you need to deploy a new system and replicate data from the existing system to the new system.

Supported storage

Cloud Volumes ONTAP supports several types of EBS disks, and S3 object storage for data tiering. The maximum storage capacity is determined by the license that you choose.

Storage support by license

Each license supports a different maximum system capacity. The maximum system capacity includes disk-based storage plus object storage used for data tiering. NetApp doesn't support exceeding this limit.

	Freemium	PAYGO Explore	PAYGO Standard	PAYGO Premium	Node-based BYOL	Capacity-based license
Maximum system capacity (disks + object storage) [1]	500 GiB	2 TiB	10 TiB	368 TiB [2]	368 TiB per license [2]	2 PiB [2]
Supported disk types	• General Purpose SSD (gp3 and gp2) [3] • Provisioned IOPS SSD (io1) [3] • Throughput Optimized HDD (st1) [4]					
Cold data tiering to S3	Supported	Not supported	Supported			

1. For an HA pair, the capacity limit is for the entire HA pair. It's not per node. For example, if you use the Premium license, you can have up to 368 TiB of capacity between both nodes.
2. For some configurations, disk limits prevent you from reaching the capacity limit by using disks alone. In those cases, you can reach the capacity limit by tiering inactive data to object storage. For information about disk limits, refer to storage limits.
3. Enhanced write performance is enabled when using SSDs with all Cloud Volumes ONTAP configurations, except for PAYGO Explore.

4. Tiering data to object storage is not recommended when using Throughput Optimized HDDs (st1).

Supported disk sizes

In AWS, an aggregate can contain up to 6 disks that are all the same size. But if you have a configuration that supports the Amazon EBS Elastic Volumes feature, then an aggregate can contain up to 8 disks. Learn more about support for Elastic Volumes

General Purpose SSDs (gp3 and gp2)	Provisioned IOPS SSDs (io1)	Throughput Optimized HDDs (st1)
• 100 GiB • 500 GiB • 1 TiB • 2 TiB • 4 TiB • 6 TiB • 8 TiB • 16 TiB	• 100 GiB • 500 GiB • 1 TiB • 2 TiB • 4 TiB • 6 TiB • 8 TiB • 16 TiB	• 500 GiB • 1 TiB • 2 TiB • 4 TiB • 6 TiB • 8 TiB • 16 TiB

Supported EC2 compute

Each Cloud Volumes ONTAP license supports different EC2 instance types. For your convenience, the table below shows the vCPU, RAM, and bandwidth for each supported instance type. You should refer to AWS for the latest and complete details about EC2 instance types.

The bandwidths shown in the table below match the documented AWS limits for each instance type. These limits don't completely align with what Cloud Volumes ONTAP can provide. For the expected performance, refer to NetApp Technical Report 4383: Performance Characterization of Cloud Volumes ONTAP in Amazon Web Services with Application Workloads.

License	Supported instance	vCPU	RAM	Flash Cache [1]	Network bandwidth (Gbps)	EBS bandwidth (Mbps)	High write speed [2]
Explore or any other license	m5.xlarge	4	16	Not supported	Up to 10	Up to 4,750	Supported (single node only)
Standard or any other license	r5.xlarge	4	32	Not supported	Up to 10	Up to 4,750	Supported (single node only)
	m5a.2xlarge	8	32	Not supported	Up to 10	Up to 2,880	Supported
	m5.2xlarge	8	32	Not supported	Up to 10	Up to 4,750	Supported

License	Supported instance	vCPU	RAM	Flash Cache [1]	Network bandwidth (Gbps)	EBS bandwidth (Mbps)	High write speed [2]
Premium or any other license	m5n.2xlarge	8	32	Not supported	Up to 25	Up to 4,750	Supported
	r5.2xlarge	8	64	Not supported	Up to 10	Up to 4,750	Supported
	r5d.2xlarge	8	64	Supported	Up to 10	Up to 4,750	Supported
	c5d.4xlarge	16	32	Supported	Up to 10	4,570	Supported
	m5.4xlarge	16	64	Not supported	Up to 10	4,750	Supported
	m5dn.4xlarge	16	64	Supported	Up to 25	4,750	Supported
	m5d.8xlarge	32	128	Supported	10	6,800	Supported
	r5.8xlarge	32	256	Not supported	10	6,800	Supported
	c5.9xlarge	36	72	Not supported	10	9,500	Supported
	c5d.9xlarge	36	72	Supported	10	9,500	Supported
	c5n.9xlarge	36	96	Not supported	50	9,500	Supported
	c5a.12xlarge	48 [4]	96	Not supported	12	4,750	Supported
	c5.18xlarge	48 [4]	144	Not supported	25	19,000	Supported
	c5d.18xlarge	48 [4]	144	Supported	25	19,000	Supported
	m5d.12xlarge	48	192	Supported	12	9,500	Supported
	m5dn.12xlarge	48	192	Supported	50	9,500	Supported
	c5n.18xlarge	48 [4]	192	Not supported	100	19,000	Supported
	m5a.16xlarge	48 [4]	256	Not supported	12	9,500	Supported
	m5.16xlarge	48 [4]	256	Not supported	20	13,600	Supported
	r5.12xlarge [3]	48	384	Not supported	10	9,500	Supported
	m5dn.24xlarge	48 [4]	384	Supported	100	19,000	Supported

1. Some instance types include local NVMe storage, which Cloud Volumes ONTAP uses as *Flash Cache*. Flash Cache speeds access to data through real-time intelligent caching of recently read user data and NetApp metadata. It's effective for random read-intensive workloads, including databases, email, and file services. Compression must be disabled on all volumes to take advantage of the Flash Cache performance improvements. Learn more about Flash Cache.
2. Cloud Volumes ONTAP supports high write speed with most instance types when using an HA pair. High write speed is supported with all instance types when using a single node system. Learn more about choosing a write speed.
3. The r5.12xlarge instance type has a known limitation with supportability. If a node unexpectedly reboots due to a panic, the system might not collect core files used to troubleshoot and root cause the problem. The customer accepts the risks and limited support terms and bears all support responsibility if this condition occurs. This limitation affects newly deployed HA pairs and HA pairs upgraded from 9.8. The limitation does not affect newly deployed single node systems.
4. While these EC2 instance types support more than 48 vCPUs, Cloud Volumes ONTAP supports up to 48 vCPUs.
5. When you choose an EC2 instance type, you can specify whether it is a shared instance or a dedicated instance.
6. Cloud Volumes ONTAP can run on either a Reserved or On-demand EC2 instance. Solutions that use other instance types aren't supported.

Supported regions

For AWS region support, see Cloud Volumes Global Regions.

Supported configurations in Azure

Several Cloud Volumes ONTAP configurations are supported in Azure.

Supported configurations by license

Cloud Volumes ONTAP is available in Azure as a single node system and as a high-availability (HA) pair of nodes for fault tolerance and nondisruptive operations.

Upgrading a single node system to an HA pair is not supported. If you want to switch between a single node system and an HA pair, then you need to deploy a new system and replicate data from the existing system to the new system.

Single node systems

You can choose from the following configurations when deploying Cloud Volumes ONTAP as a single-node system in Azure:

	Freemium	PAYGO Explore	PAYGO Standard	PAYGO Premium	Node-based BYOL	Capacity-based license
Maximum system capacity (disks + object storage)	500 GiB	2 TiB [1]	10 TiB	368 TiB	368 TiB per license	2 PiB
Supported virtual machine types	• DS4_v2 • DS5_v2 • DS13_v2 • DS14_v2 • DS15_v2 • L8s_v2 [2] • E4s_v3 • E8s_v3 • E32s_v3 [3] • E48s_v3 [3] • E64is_v3 [3] • E4ds_v4 [3] • E8ds_v4 [3] • E32ds_v4 [3] • E48ds_v4 [3] • E80ids_v4 [3]	• E4s_v3 • E4ds_v4 [3]	• DS4_v2 • DS13_v2 • E8s_v3 • E8ds_v4 [3]	• DS5_v2 • DS14_v2 • DS15_v2 • E32s_v3 [3] • E48s_v3 [3] • E64is_v3 [3] • E32ds_v4 [3] • E48ds_v4 [3] • E80ids_v4 [3]	• DS4_v2 • DS5_v2 • DS13_v2 • DS14_v2 • DS15_v2 • L8s_v2 [2] • E4s_v3 • E8s_v3 • E32s_v3 [3] • E48s_v3 [3] • E64is_v3 [3] • E4ds_v4 [3] • E8ds_v4 [3] • E32ds_v4 [3] • E48ds_v4 [3] • E80ids_v4 [3]	• DS4_v2 • DS5_v2 • DS13_v2 • DS14_v2 • DS15_v2 • L8s_v2 [2] • E4s_v3 • E8s_v3 • E32s_v3 [3] • E48s_v3 [3] • E64is_v3 [3] • E4ds_v4 [3] • E8ds_v4 [3] • E32ds_v4 [3] • E48ds_v4 [3] • E80ids_v4 [3]
Supported disk types [4]	Standard HDD Managed Disks, Standard SSD Managed Disks, and Premium SSD Managed Disks					

Notes:

1. Data tiering to Azure Blob storage isn't supported with PAYGO Explore.
2. This VM type includes local NVMe storage, which Cloud Volumes ONTAP uses as *Flash Cache*. Flash Cache speeds access to data through real-time intelligent caching of recently read user data and NetApp metadata. It is effective for random read-intensive workloads, including databases, email, and file services. Compression must be disabled on all volumes to take advantage of the Flash Cache performance improvements. Learn more.
3. These VM types use an Ultra SSD for VNVRAM, which provides better write performance.

   If you choose any of these VM types when you deploy a new Cloud Volumes ONTAP system, you can't change to another VM type that *doesn't* use an Ultra SSD for VNVRAM. For example, you can't change from E8ds_v4 to E8s_v3, but you can change from E8ds_v4 to E32ds_v4 because both of those VM types

use Ultra SSDs.

Conversely, if you deployed Cloud Volumes ONTAP using any other VM type, you won't be able to change to a VM type that uses an Ultra SSD for VNVRAM. For example, you can't change from E8s_v3 to E8ds_v4.

4. High write speed is supported with all instance types when using a single node system. You can enable high write speed from Cloud Manager during deployment or any time after. Learn more about choosing a write speed.
5. Enhanced write performance is enabled when using SSDs.
6. For Azure region support, see Cloud Volumes Global Regions.
7. Cloud Volumes ONTAP can run on either a Reserved or On-demand VM instance from your cloud provider. Solutions that use other VM instance types aren't supported.

HA pairs

You can choose from the following configurations when deploying Cloud Volumes ONTAP as an HA pair in Azure.

	Freemium	PAYGO Standard	PAYGO Premium	Node-based BYOL	Capacity-based license
Maximum system capacity (disks + object storage)	500 GiB	10 TiB	368 TiB	368 TiB per license	2 PiB
Supported virtual machine types	• DS4_v2 • DS5_v2 [1] • DS13_v2 • DS14_v2 [1] • DS15_v2 [1] • E8s_v3 • E48s_v3 [1] • E8ds_v4 [1] • E32ds_v4 [1] • E48ds_v4 [1] • E80ids_v4 [1,2]	• DS4_v2 • DS13_v2 • E8ds_v4 [1]	• DS5_v2 [1] • DS14_v2 [1] • DS15_v2 [1] • E8s_v3 • E48s_v3 [1] • E32ds_v4 [1] • E48ds_v4 [1] • E80ids_v4 [1,2]	• DS4_v2 • DS5_v2 [1] • DS13_v2 • DS14_v2 [1] • DS15_v2 [1] • E8s_v3 • E48s_v3 [1] • E8ds_v4 [1] • E32ds_v4 [1] • E48ds_v4 [1] • E80ids_v4 [1,2]	• DS4_v2 • DS5_v2 [1] • DS13_v2 • DS14_v2 [1] • DS15_v2 [1] • E8s_v3 • E48s_v3 [1] • E8ds_v4 [1] • E32ds_v4 [1] • E48ds_v4 [1] • E80ids_v4 [1,2]
Supported disk types	Premium page blobs				

Notes:

1. Cloud Volumes ONTAP supports high write speed with these VM types when using an HA pair. You can enable high write speed from Cloud Manager during deployment or any time after. Learn more about choosing a write speed.

2. This VM is recommended only when Azure maintenance control is needed. It's not recommended for any other use case due to the higher pricing.
3. PAYGO Explore isn't supported with HA pairs in Azure.
4. For Azure region support, see Cloud Volumes Global Regions.
5. Cloud Volumes ONTAP can run on either a Reserved or On-demand VM instance from your cloud provider. Solutions that use other VM instance types aren't supported.

Supported disk sizes

In Azure, an aggregate can contain up to 12 disks that are all the same type and size.

Single node systems

Single node systems use Azure Managed Disks. The following disk sizes are supported:

Premium SSD	Standard SSD	Standard HDD
• 500 GiB • 1 TiB • 2 TiB • 4 TiB • 8 TiB • 16 TiB • 32 TiB	• 100 GiB • 500 GiB • 1 TiB • 2 TiB • 4 TiB • 8 TiB • 16 TiB • 32 TiB	• 100 GiB • 500 GiB • 1 TiB • 2 TiB • 4 TiB • 8 TiB • 16 TiB • 32 TiB

HA pairs

HA pairs use Premium page blobs. The following disk sizes are supported:

- 500 GiB
- 1 TiB
- 2 TiB
- 4 TiB
- 8 TiB

Supported configurations in Google Cloud

Several Cloud Volumes ONTAP configurations are supported in Google Cloud.

Supported configurations by license

Cloud Volumes ONTAP is available in Google Cloud Platform as a single node system and as a high-availability (HA) pair of nodes for fault tolerance and nondisruptive operations.

Upgrading a single node system to an HA pair isn't supported. If you want to switch between a single node

system and an HA pair, then you need to deploy a new system and replicate data from the existing system to the new system.

	Freemium	PAYGO Explore	PAYGO Standard	PAYGO Premium	Node-based BYOL	Capacity-based license
Maximum system capacity (disks + object storage) [1]	500 GB	2 TB [2]	10 TB	368 TB	368 TB per license	2 PiB
Supported machine types [3]	• n1-standard-8 • n1-standard-32 • n2-standard-4 • n2-standard-8 • n2-standard-16 • n2-standard-32	• n2-standard-4	• n1-standard-8 • n2-standard-8	• n1-standard-32 • n2-standard-16 • n2-standard-32	• n1-standard-8 • n1-standard-32 • n2-standard-4 • n2-standard-8 • n2-standard-16 • n2-standard-32	• n1-standard-8 • n1-standard-32 • n2-standard-4 • n2-standard-8 • n2-standard-16 • n2-standard-32
Supported disk types [4]	Zonal persistent disks (SSD, balanced, and standard)					

Notes:

1. Disk limits can prevent you from reaching the maximum system capacity limit by using disks alone. You can reach the capacity limit by tiering inactive data to object storage.

   Learn more about disk limits in Google Cloud.

2. Data tiering to Google Cloud Storage isn't supported with PAYGO Explore.
3. The custom-4-16384 machine type is no longer supported with new Cloud Volumes ONTAP systems.

   If you have an existing system running on this machine type, you can keep using it, but we recommend switching to the n2-standard-4 machine type.

4. Enhanced write performance is enabled when using SSDs.
5. The Cloud Manager interface shows an additional supported machine type for Standard and BYOL: n1-highmem-4. However, this machine type isn't meant for production environments. We've made it available

for a specific lab environment only.

6. For Google Cloud Platform region support, see Cloud Volumes Global Regions.
7. Cloud Volumes ONTAP can run on either a Reserved or On-demand VM instance from your cloud provider. Solutions that use other VM instance types aren't supported.

Supported disk sizes

In Google Cloud, an aggregate can contain up to 6 disks that are all the same type and size. The following disk sizes are supported:

- 100 GB
- 500 GB
- 1 TB
- 2 TB
- 4 TB
- 8 TB
- 16 TB
- 64 TB

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