9.7 Release Notes

Cloud Volumes ONTAP

NetApp
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9.7 Release Notes

What's new in Cloud Volumes ONTAP 9.7

Cloud Volumes ONTAP 9.7 includes several new features and enhancements.

Additional features and enhancements are also introduced in the latest versions of Cloud Manager. See the Cloud Manager Release Notes for details.

9.7 P6 (15 Aug 2020)

The 9.7 P6 patch release for Cloud Volumes ONTAP is now available through Cloud Manager 3.8 and later. Cloud Manager will prompt you to upgrade your existing systems to this patch release. View the list of bugs fixed in the P6 patch (NetApp Support Site login required).

Multiple BYOL licenses for additional capacity (3 Aug 2020)

You can now purchase multiple licenses for a Cloud Volumes ONTAP BYOL system to allocate more than 368 TB of capacity. For example, you might purchase two licenses to allocate up to 736 TB of capacity to Cloud Volumes ONTAP. Or you could purchase four licenses to get up to 1.4 PB.

The number of licenses that you can purchase for a single node system or HA pair is unlimited.

Be aware that disk limits can prevent you from reaching the capacity limit by using disks alone. You can go beyond the disk limit by tiering inactive data to object storage. For information about disk limits, refer to the storage limits in these release notes.

Learn how to add additional system licenses to Cloud Volumes ONTAP.

9.7 P5 in AWS (27 July 2020)

Cloud Volumes ONTAP 9.7 P5 is now available in AWS. This patch release includes bug fixes and support for new EC2 instance types.

View the list of bugs fixed in the P5 patch (NetApp Support Site login required).

Support for new EC2 instance types

Cloud Volumes ONTAP now supports the following EC2 instance types with the Premium and BYOL licenses:

- c5n.9xlarge
- c5n.18xlarge

9.7 P5 in Azure (20 July 2020)

Cloud Volumes ONTAP 9.7 P5 is now available in Microsoft Azure. This patch release includes bug fixes and support for new VM types.

View the list of bugs fixed in the P5 patch (NetApp Support Site login required).

Support for new VM types with Ultra SSD VNVRAM

Cloud Volumes ONTAP now supports the following VM types with single node systems that have a Premium or BYOL license:

- Standard_E32s_v3
- Standard_E48s_v3

The E32s_v3 VM type uses an Ultra SSD for VNVRAM, which provides better write performance.

Support for these VM types is currently available in the following regions: US Gov Virginia, South Central US, and West US.

Support for multiple storage VMs in AWS (16 July 2020)

Cloud Volumes ONTAP 9.7 now supports multiple storage VMs (SVMs) in AWS.

Multiple storage VMs are supported with the C5, M5, and R5 instance types when you bring your own license (BYOL). The following number of storage VMs are supported:

- 12 storage VMs with single node systems
- 8 storage VMs with HA pairs

An add-on license is required for each additional *data-serving* storage VM beyond the first storage VM that is configured with Cloud Volumes ONTAP by default. Contact your account team to obtain an SVM add-on license.

Storage VMs that you configure for disaster recovery (DR) don't require an add-on license (they are free of charge), but they do count against the storage VM limit.

For example, if you have 8 data-serving storage VMs on an HA pair, then you've reached the limit and can't create any additional storage VMs. The same is true for another HA pair that has 8 storage VMs configured for disaster recovery—you've reached the limit and can't create any additional storage VMs.

Creating additional storage VMs must be done through System Manager or the CLI.

Germany Sovereign regions in Azure are no longer supported (26 June 2020)

Cloud Volumes ONTAP is no longer supported in the following Azure regions:

- Germany Central (Sovereign)
- Germany Northeast (Sovereign)

NetApp continues to support Cloud Volumes ONTAP in the public Germany regions:

- Germany North (Public)
- Germany West Central (Public)

See the full list of supported Azure regions.

9.7 P4 (2 June 2020)

The 9.7 P4 patch release for Cloud Volumes ONTAP is now available through Cloud Manager 3.8 and later.

Cloud Manager will prompt you to upgrade your existing systems to this patch release. View the list of bugs fixed in the P4 patch (NetApp Support Site login required).

9.7 P3 (2 May 2020)

The 9.7 P3 patch release for Cloud Volumes ONTAP is now available through Cloud Manager 3.8 and later. Cloud Manager will prompt you to upgrade your existing systems to this patch release. View the list of bugs fixed in the P3 patch (NetApp Support Site login required).

9.7 P2 (8 Apr 2020)

The 9.7 P2 patch release for Cloud Volumes ONTAP is now available through Cloud Manager 3.8 and later. Cloud Manager will prompt you to upgrade your existing systems to this patch release. View the list of bugs fixed in the P2 patch (NetApp Support Site login required).

Increased disk capacity in GCP (13 Mar 2020)

You can now attach up to 256 TB of persistent disks to Cloud Volumes ONTAP when using the Premium or BYOL licenses in Google Cloud. This is up from 64 TB.

Just like before, you can reach the 368 TB maximum system capacity for Premium and BYOL by combining persistent disks with data tiering to object storage.

The maximum number of data disks per system has also increased to 124 disks.

- Learn more about supported configurations for Cloud Volumes ONTAP in GCP
- Review storage limits in GCP

9.7 P1 (6 Mar 2020)

The 9.7 P1 patch release for Cloud Volumes ONTAP is now available through Cloud Manager 3.8 and later. Cloud Manager will prompt you to upgrade your existing systems to this patch release. View the list of bugs fixed in the P1 patch (NetApp Support Site login required).

AWS updates (16 Feb 2020)

We've introduced support for new EC2 instances and a change in the number of supported data disks.

Support for new instances

Several new EC2 instance types are now supported with Cloud Volumes ONTAP 9.7 when using a Premium or BYOL license:

- c5.9xlarge
- c5d.18xlarge [1]
- m5d.8xlarge [1]
- m5d.12xlarge [1]
- m5.16xlarge
- r5.8xlarge
- r5.12xlarge [2]

[1] These instance types include local NVMe storage, which Cloud Volumes ONTAP uses as *Flash Cache*. Learn more.

[2] 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.

Learn more about these EC2 instance types.

Learn more about supported 9.7 configurations in AWS.

Supported data disks

One less data disk is now supported for c5, m5, and r5 instances. For single node systems, 22 data disks are supported. For HA pairs, 19 data disks are supported per node.

Learn more about storage limits in AWS.

Support for DS15_v2 in Azure (12 Feb 2020)

Cloud Volumes ONTAP is now supported with the DS15_v2 virtual machine type in Azure, on both single node systems and HA pairs.

Learn more about the DSv2 series.

Learn more about supported 9.7 configurations in Azure.

9.7 GA (10 Feb 2020)

The General Availability (GA) release of Cloud Volumes ONTAP 9.7 is now available in AWS and GCP. The GA release includes bug fixes. Cloud Manager will prompt you to upgrade your existing systems to this release.

9.7 D1 for Azure (29 Jan 2020)

Cloud Volumes ONTAP 9.7 D1 is now available in Microsoft Azure.

We discovered an issue with Cloud Volumes ONTAP 9.7 and earlier, where Cloud Volumes ONTAP may not start up successfully in situations where the Azure virtual machine is restarted.

This issue is fixed in 9.7 D1 (and later). We highly recommend upgrading to the latest Cloud Volumes ONTAP version as soon as possible.

If you have any questions, please contact us using the in-product chat or at https://www.netapp.com/us/contact-us/support.aspx.

9.7 RC1 (16 Dec 2019)

Cloud Volumes ONTAP 9.7 RC1 is now available in AWS, Azure, and Google Cloud Platform. In addition to the features introduced with ONTAP 9.7, this release of Cloud Volumes ONTAP includes the following:

- Flash Cache support in Azure
- Fix for Azure NIC detach events

Flash Cache support in Azure

Cloud Volumes ONTAP now supports the Standard_L8s_v2 VM type with single node, BYOL systems in Azure. 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's effective for random read-intensive workloads, including databases, email, and file services.

Deploy new systems using this VM type or modify existing systems to use this VM type and you'll automatically take advantage of Flash Cache.

Learn more about enabling Flash Cache on Cloud Volumes ONTAP, including a limitation with data compression.

Fix for Azure NIC detach events

This release addresses an issue with Cloud Volumes ONTAP node reboots from Azure NIC detach events. Cloud Volumes ONTAP will handle these events more gracefully and not disrupt service. Cloud Volumes ONTAP HA pairs will still perform a takeover/give back sequence from Azure freeze maintenance events, but there's no subsequent reboot from a NIC detach that might occur during this time.

Upgrade notes

- Upgrades of Cloud Volumes ONTAP must be completed from Cloud Manager. You should not upgrade Cloud Volumes ONTAP by using System Manager or the CLI. Doing so can impact system stability.
- You can upgrade to Cloud Volumes ONTAP 9.7 from the 9.6 release. Cloud Manager will prompt you to upgrade your existing Cloud Volumes ONTAP 9.6 systems to the 9.7 release.

  Learn how to upgrade when Cloud Manager notifies you.

- The upgrade of a single node system takes the system offline for up to 25 minutes, during which I/O is interrupted.
- Upgrading an HA pair is nondisruptive and I/O is uninterrupted. During this nondisruptive upgrade process, each node is upgraded in tandem to continue serving I/O to clients.

Supported configurations

Supported configurations for Cloud Volumes ONTAP 9.7 in AWS

Cloud Volumes ONTAP is available in AWS as a single node system or an HA pair. Two pricing options are available: pay as you go and Bring Your Own License (BYOL).

Pay-as-you-go overview

- Offers Cloud Volumes ONTAP in three different licensing options: Explore, Standard, and Premium.
- A 30-day free trial is available for the first Cloud Volumes ONTAP system that you deploy in AWS.
  - There are no hourly software charges, but AWS infrastructure charges still apply (compute, storage, and networking).
  - When the free trial ends, you'll be charged hourly according to the selected license, as long as you subscribed. If you haven't subscribed, the system shuts down.

- Conversions from PAYGO to BYOL aren’t currently supported.
- Basic technical support is offered, but you must register and activate the NetApp serial number associated with your system.

  Register pay-as-you-go systems in Cloud Manager

BYOL overview

- Single node or HA license with term-based subscription options like 12 months, 24 months, and more.
- Support is included for the length of the subscription term.
- You can purchase multiple licenses for a Cloud Volumes ONTAP BYOL system to allocate more than 368 TB of capacity.

  For example, you might purchase two licenses to allocate up to 736 TB of capacity to Cloud Volumes ONTAP. Or you could purchase four licenses to get up to 1.4 PB.

Supported configurations by license

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.

	Explore	Standard	Premium	BYOL
Supported EC2 instance types [1]	• m4.xlarge • m5.xlarge	• m4.2xlarge • m5.2xlarge • r4.xlarge • r5.xlarge	• c4.4xlarge • c4.8xlarge • c5.9xlarge • c5.18xlarge • c5d.4xlarge [2] • c5d.9xlarge [2] • c5d.18xlarge [2] • c5n.9xlarge [3] • c5n.18xlarge [3] • m4.4xlarge • m5.4xlarge • m5.16xlarge • m5d.8xlarge [2] • m5d.12xlarge [2] • r4.2xlarge • r5.2xlarge • r5.8xlarge • r5.12xlarge [4] • r5d.2xlarge [2]	• c4.4xlarge • c4.8xlarge • c5.9xlarge • c5.18xlarge • c5d.4xlarge [2] • c5d.9xlarge [2] • c5d.18xlarge [2] • c5n.9xlarge [3] • c5n.18xlarge [3] • m4.xlarge • m4.2xlarge • m4.4xlarge • m5.xlarge • m5.2xlarge • m5.4xlarge • m5.16xlarge • m5d.8xlarge [2] • m5d.12xlarge [2] • r4.xlarge • r4.2xlarge • r5.xlarge • r5.2xlarge • r5.8xlarge • r5.12xlarge [4] • r5d.2xlarge [2]
Supported disk types [5]	General Purpose SSDs (gp3 and gp2), Provisioned IOPS SSDs (io1), and Throughput Optimized HDDs (st1) [6]			
Cold data tiering to S3	Not supported	Supported		
Maximum system capacity (disks + object storage)	2 TB	10 TB	368 TB [7]	368 TB per license [7]

Notes:

1. When you choose an EC2 instance type, you can specify whether it is a shared instance or a dedicated instance.

2. These 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 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. c5n.9xlarge and c5n.18xlarge are supported starting with 9.7 P5.
4. 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.
5. Enhanced write performance is enabled when using SSDs with Cloud Volumes ONTAP Standard, Premium, and BYOL.
6. Tiering data to object storage is not recommended when using Throughput Optimized HDDs (st1).
7. For some HA configurations, disk limits prevent you from reaching the 368 TB capacity limit by using disks alone. In those cases, you can reach the 368 TB capacity limit by tiering inactive data to object storage. For information about disk limits, refer to storage limits.
8. For AWS region support, see Cloud Volumes Global Regions.
9. 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 AWS, an aggregate can contain up to 6 disks that are all the same type and size.

General Purpose SSD (gp3 and gp2)	Provisioned IOPS SSD (io1)	Throughput Optimized HDD (st1)
• 100 GB • 500 GB • 1 TB • 2 TB • 4 TB • 6 TB • 8 TB • 16 TB	• 100 GB • 500 GB • 1 TB • 2 TB • 4 TB • 6 TB • 8 TB • 16 TB	• 500 GB • 1 TB • 2 TB • 4 TB • 6 TB • 8 TB • 16 TB

Supported configurations for Cloud Volumes ONTAP 9.7 in Azure

Cloud Volumes ONTAP is available in Azure as a single node system or an HA pair. Two pricing options are available: pay as you go and Bring Your Own License (BYOL).

Pay-as-you-go overview

- Offers Cloud Volumes ONTAP in three different licensing options: Explore, Standard, and Premium.
- A 30-day free trial is available for the first Cloud Volumes ONTAP system that you deploy in Azure.

There are no hourly software charges, but Azure infrastructure charges still apply (compute, storage, and networking).

- Conversions from PAYGO to BYOL aren't currently supported.
- Basic technical support is offered, but you must register and activate the NetApp serial number associated with your system.

  Register pay-as-you-go systems in Cloud Manager

BYOL overview

- Single node or HA license with term-based subscription options like 12 months, 24 months, and more.
- Support is included for the length of the subscription term.
- You can purchase multiple licenses for a Cloud Volumes ONTAP BYOL system to allocate more than 368 TB of capacity.

  For example, you might purchase two licenses to allocate up to 736 TB of capacity to Cloud Volumes ONTAP. Or you could purchase four licenses to get up to 1.4 PB.

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:

	Explore	Standard	Premium	BYOL
Supported virtual machine types	DS3_v2	• DS4_v2 • DS13_v2	• DS5_v2 • DS14_v2 • DS15_v2 • E32s_v3 [1] • E48s_v3 [1]	• DS3_v2 • DS4_v2 • DS5_v2 • DS13_v2 • DS14_v2 • DS15_v2 • E32s_v3 [1] • E48s_v3 [1] • L8s_v2 [2]
Supported disk types [3]	Standard HDD Managed Disks, Standard SSD Managed Disks, and Premium SSD Managed Disks			

	Explore	Standard	Premium	BYOL
Cold data tiering to Blob storage	Not supported	Supported		
Maximum system capacity (disks + object storage)	2 TB	10 TB	368 TB	368 TB per license

Notes:

1. This VM type uses an Ultra SSD for VNVRAM, which provides better write performance.
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. Enhanced write performance is enabled when using SSDs, but not when using the DS3_v2 virtual machine type.
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.

HA pairs

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

	Explore	Standard	Premium	BYOL
Supported virtual machine types	Not supported	• DS4_v2 • DS13_v2	• DS5_v2 • DS14_v2 • DS15_v2	• DS4_v2 • DS5_v2 • DS13_v2 • DS14_v2 • DS15_v2
Supported disk types	Not supported	Premium page blobs		
Cold data tiering to Blob storage [2]	Not supported	Supported		
Maximum system capacity (disks + object storage)	Not supported	10 TB	368 TB	368 TB per license

Notes:

1. For Azure region support, see Cloud Volumes Global Regions.

2. 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 GB • 1 TB • 2 TB • 4 TB • 8 TB • 16 TB • 32 TB	• 100 GB • 500 GB • 1 TB • 2 TB • 4 TB • 8 TB • 16 TB • 32 TB	• 100 GB • 500 GB • 1 TB • 2 TB • 4 TB • 8 TB • 16 TB • 32 TB

HA pairs

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

- 500 GB
- 1 TB
- 2 TB
- 4 TB
- 8 TB

Supported configurations for Cloud Volumes ONTAP 9.7 in GCP

Cloud Volumes ONTAP is available in Google Cloud Platform as a single node system. Two pricing options are available: pay as you go and Bring Your Own License (BYOL).

Pay-as-you-go overview

- Offers Cloud Volumes ONTAP in three different licensing options: Explore, Standard, and Premium.
- A 30-day free trial is available for the first Cloud Volumes ONTAP system that you deploy in GCP.
  - There are no hourly software charges, but GCP infrastructure charges still apply (compute, storage, and networking).
  - When the free trial ends, you'll be charged hourly according to the selected license, as long as you subscribed. If you haven't subscribed, the system shuts down.
- Conversions from PAYGO to BYOL aren't currently supported.

- Basic technical support is offered, but you must register and activate the NetApp serial number associated with your system.

  Register pay-as-you-go systems in Cloud Manager

BYOL overview

- Single node license with term-based subscription options like 12 months, 24 months, and more.
- Support is included for the length of the subscription term.
- You can purchase multiple licenses for a Cloud Volumes ONTAP BYOL system to allocate more than 368 TB of capacity.

  For example, you might purchase two licenses to allocate up to 736 TB of capacity to Cloud Volumes ONTAP. Or you could purchase four licenses to get up to 1.4 PB.

Supported configurations by license

Cloud Volumes ONTAP is available in Google Cloud Platform as a single node system.

	Explore	Standard	Premium	BYOL
Supported machine types [1]	custom-4-16384	n1-standard-8	n1-standard-32	• custom-4-16384 • n1-standard-8 • n1-standard-32
Supported disk types [2]	Zonal persistent disks (SSD and standard)			
Cold data tiering to object storage	Not supported	Supported		
Maximum system capacity (disks + object storage)	2 TB	10 TB	368 TB [3]	368 TB per license [3]

Notes:

1. The custom machine type has 4 vCPUs and 16 GB of memory. For details about standard machine types, refer to Google Cloud Documentation: Machine Types.
2. Enhanced write performance is enabled when using SSDs.
3. Disk limits prevent you from reaching the 368 TB capacity limit by using disks alone. You can reach the 368 TB capacity limit by tiering inactive data to object storage.

   Learn more about disk limits in GCP.

4. For Google Cloud Platform 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 GCP, 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

Storage limits

Storage limits for Cloud Volumes ONTAP 9.7 in AWS

Cloud Volumes ONTAP has storage configuration limits to provide reliable operations. For best performance, do not configure your system at the maximum values.

Maximum system capacity by license

The maximum system capacity for a Cloud Volumes ONTAP system is determined by its license. The maximum system capacity includes disk-based storage plus object storage used for data tiering. NetApp doesn't support exceeding this limit.

For some HA configurations, disk limits prevent you from reaching the 368 TB capacity limit by using disks alone. In those cases, you can reach the 368 TB capacity limit by tiering inactive data to object storage. Refer to capacity and disk limits below for more details.

License	Maximum system capacity (disks + object storage)
Explore	2 TB (data tiering is not supported with Explore)
Standard	10 TB
Premium	368 TB
BYOL	368 TB per license

For HA, is the license capacity limit per node or for the entire HA pair?

The capacity limit is for the entire HA pair. It is not per node. For example, if you use the Premium license, you can have up to 368 TB of capacity between both nodes.

For an HA system in AWS, does mirrored data count against the capacity limit?

No, it doesn't. Data in an AWS HA pair is synchronously mirrored between the nodes so that the data is available in the event of failure. For example, if you purchase an 8 TB disk on node A, Cloud Manager also allocates an 8 TB disk on node B that is used for mirrored data. While 16 TB of capacity was provisioned, only

8 TB counts against the license limit.

Disk and tiering limits by EC2 instance

Cloud Volumes ONTAP uses EBS volumes as disks, with a maximum disk size of 16 TB. The sections below show disk and tiering limits by EC2 instance type because many EC2 instance types have different disk limits. Disk limits are also different between single node systems and HA pairs.

The disk limits below are specific to disks that contain user data. The limits do not include the boot disk and root disk.

Disk limits are shown by instance for Premium and BYOL licenses only because disk limits can't be reached with Explore or Standard licenses.

You can now purchase multiple licenses for a Cloud Volumes ONTAP BYOL system to allocate more than 368 TB of capacity. The number of licenses that you can purchase for a single node system or HA pair is unlimited. Be aware that disk limits can prevent you from reaching the capacity limit by using disks alone. You can go beyond the disk limit by tiering inactive data to object storage. Learn how to add additional system licenses to Cloud Volumes ONTAP.

Single node with a Premium license

Instance type	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
c4.4xlarge	34	368 TB	368 TB
c4.8xlarge	34	368 TB	368 TB
c5.9xlarge	22	352 TB	368 TB
c5.18xlarge	22	352 TB	368 TB
c5d.4xlarge	22	352 TB	368 TB
c5d.9xlarge	22	352 TB	368 TB
c5d.18xlarge	22	352 TB	368 TB
c5n.9xlarge	22	352 TB	368 TB
c5n.18xlarge	22	352 TB	368 TB
m4.4xlarge	34	368 TB	368 TB
m5.4xlarge	22	352 TB	368 TB
m5.16xlarge	22	352 TB	368 TB

Instance type	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
m5d.8xlarge	22	352 TB	368 TB
m5d.12xlarge	22	352 TB	368 TB
r4.2xlarge	34	368 TB	368 TB
r5.2xlarge	22	352 TB	368 TB
r5.8xlarge	22	352 TB	368 TB
r5.12xlarge	22	352 TB	368 TB
r5d.2xlarge	22	352 TB	368 TB

Single node with one or more BYOL licenses

Instance type	Max disks per node	Max system capacity with one license		Max system capacity with multiple licenses	
		Disks alone	Disks + data tiering	Disks alone	Disks + data tiering
c4.4xlarge	34	368 TB	368 TB	544 TB	368 TB x each license
c4.8xlarge	34	368 TB	368 TB	544 TB	368 TB x each license
c5.9xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
c5.18xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
c5d.4xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
c5d.9xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
c5d.18xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
c5n.9xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
c5n.18xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
m4.xlarge	34	368 TB	368 TB	544 TB	368 TB x each license
m4.2xlarge	34	368 TB	368 TB	544 TB	368 TB x each license

Instance type	Max disks per node	Max system capacity with one license		Max system capacity with multiple licenses	
m4.4xlarge	34	368 TB	368 TB	544 TB	368 TB x each license
m5.xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
m5.2xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
m5.4xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
m5.16xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
m5d.8xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
m5d.12xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
r4.xlarge	34	368 TB	368 TB	544 TB	368 TB x each license
r4.2xlarge	34	368 TB	368 TB	544 TB	368 TB x each license
r5.xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
r5.2xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
r5.8xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
r5.12xlarge	22	352 TB	368 TB	352 TB	368 TB x each license
r5d.2xlarge	22	352 TB	368 TB	352 TB	368 TB x each license

HA pairs with a Premium license

Instance type	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
c4.4xlarge	31	368 TB	368 TB
c4.8xlarge	31	368 TB	368 TB
c5.9xlarge	19	304 TB	368 TB
c5.18xlarge	19	304 TB	368 TB

Instance type	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
c5d.4xlarge	19	304 TB	368 TB
c5d.9xlarge	19	304 TB	368 TB
c5d.18xlarge	19	304 TB	368 TB
c5n.9xlarge	19	304 TB	368 TB
c5n.18xlarge	19	304 TB	368 TB
m4.4xlarge	31	368 TB	368 TB
m5.4xlarge	19	304 TB	368 TB
m5.16xlarge	19	304 TB	368 TB
m5d.8xlarge	19	304 TB	368 TB
m5d.12xlarge	19	304 TB	368 TB
r4.2xlarge	31	368 TB	368 TB
r5.2xlarge	19	304 TB	368 TB
r5.8xlarge	19	304 TB	368 TB
r5.12xlarge	19	304 TB	368 TB
r5d.2xlarge	19	304 TB	368 TB

HA pairs with one or more BYOL licenses

Instance type	Max disks per node	Max system capacity with one license		Max system capacity with multiple licenses	
		Disks alone	Disks + data tiering	Disks alone	Disks + data tiering
c4.4xlarge	31	368 TB	368 TB	496 TB	368 TB x each license
c4.8xlarge	31	368 TB	368 TB	496 TB	368 TB x each license
c5.9xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
c5.18xlarge	19	304 TB	368 TB	304 TB	368 TB x each license

Instance type	Max disks per node	Max system capacity with one license		Max system capacity with multiple licenses	
c5d.4xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
c5d.9xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
c5d.18xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
c5n.9xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
c5n.18xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
m4.xlarge	31	368 TB	368 TB	496 TB	368 TB x each license
m4.2xlarge	31	368 TB	368 TB	496 TB	368 TB x each license
m4.4xlarge	31	368 TB	368 TB	496 TB	368 TB x each license
m5.xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
m5.2xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
m5.4xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
m5.16xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
m5d.8xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
m5d.12xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
r4.xlarge	31	368 TB	368 TB	496 TB	368 TB x each license
r4.2xlarge	31	368 TB	368 TB	496 TB	368 TB x each license
r5.xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
r5.2xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
r5.8xlarge	19	304 TB	368 TB	304 TB	368 TB x each license
r5.12xlarge	19	304 TB	368 TB	304 TB	368 TB x each license

Instance type	Max disks per node	Max system capacity with one license		Max system capacity with multiple licenses	
r5d.2xlarge	19	304 TB	368 TB	304 TB	368 TB x each license

Aggregate limits

Cloud Volumes ONTAP uses AWS volumes as disks and groups them into *aggregates*. Aggregates provide storage to volumes.

Parameter	Limit
Maximum number of aggregates	Single node: Same as the disk limit HA pairs: 18 in a node [1]
Maximum aggregate size	96 TB of raw capacity [2]
Disks per aggregate	1-6 [3]
Maximum number of RAID groups per aggregate	1

Notes:

1. It is not possible to create 19 aggregates on both nodes in an HA pair because doing so would exceed the data disk limit.
2. The aggregate capacity limit is based on the disks that comprise the aggregate. The limit does not include object storage used for data tiering.
3. All disks in an aggregate must be the same size.

Logical storage limits

Logical storage	Parameter	Limit
Storage VMs (SVMs)	Maximum number for Cloud Volumes ONTAP (HA pair or single node)	**C5, M5, and R5 instances with BYOL** The following number of storage VMs are supported with C5, M5, and R5 instance types when you bring your own license (BYOL): • 12 storage VMs with single node systems • 8 storage VMs with HA pairs A storage VM spans the entire Cloud Volumes ONTAP system (HA pair or single node) An add-on license is required for each additional *data-serving* SVM beyond the first storage VM that comes with Cloud Volumes ONTAP by default. Contact your account team to obtain an SVM add-on license. Storage VMs that you configure for disaster recovery (DR) don't require an add-on license (they are free of charge), but they do count against the storage VM limit. [1,2] **All other configurations** One data-serving storage VM and one destination storage VM used for disaster recovery are supported. [2] A storage VM spans the entire Cloud Volumes ONTAP system (HA pair or single node).
Files	Maximum size	16 TB
	Maximum per volume	Volume size dependent, up to 2 billion
FlexClone volumes	Hierarchical clone depth [3]	499
FlexVol volumes	Maximum per node	500
	Minimum size	20 MB
	Maximum size	Dependent on the size of the aggregate
Qtrees	Maximum per FlexVol volume	4,995
Snapshot copies	Maximum per FlexVol volume	1,023

Notes:

1. For example, if you have 8 data-serving storage VMs on an HA pair, then you've reached the limit and can't create any additional storage VMs. The same is true for another HA pair that has 8 storage VMs configured for disaster recovery—you've reached the limit and can't create any additional storage VMs.
2. You can activate a destination storage VM for data access if there's an outage on the source storage VM. Cloud Manager doesn't provide any setup or orchestration support for storage VM disaster recovery. You

must use System Manager or the CLI.

- SVM Disaster Recovery Preparation Express Guide
- SVM Disaster Recovery Express Guide

3. Hierarchical clone depth is the maximum depth of a nested hierarchy of FlexClone volumes that can be created from a single FlexVol volume.

iSCSI storage limits

iSCSI storage	Parameter	Limit
LUNs	Maximum per node	1,024
	Maximum number of LUN maps	1,024
	Maximum size	16 TB
	Maximum per volume	512
igroups	Maximum per node	256
Initiators	Maximum per node	512
	Maximum per igroup	128
iSCSI sessions	Maximum per node	1,024
LIFs	Maximum per port	32
	Maximum per portset	32
Portsets	Maximum per node	256

Storage limits for Cloud Volumes ONTAP 9.7 in Azure

Cloud Volumes ONTAP has storage configuration limits to provide reliable operations. For best performance, do not configure your system at the maximum values.

Maximum system capacity by license

The maximum system capacity for a Cloud Volumes ONTAP system is determined by its license. The maximum system capacity includes disk-based storage plus object storage used for data tiering. NetApp doesn't support exceeding this limit.

License	Maximum system capacity (disks + object storage)
Explore	2 TB (data tiering is not supported with Explore)
Standard	10 TB
Premium	368 TB
BYOL	368 TB per license

For HA, is the license capacity limit per node or for the entire HA pair?

The capacity limit is for the entire HA pair. It is not per node. For example, if you use the Premium license, you can have up to 368 TB of capacity between both nodes.

Disk and tiering limits by VM size

The disk limits below are specific to disks that contain user data. The limits do not include the root disk, core disk, and VNVRAM.

> The number of data disks listed in the tables below are as 9.7 P5. In previous 9.7 releases, two additional data disks were supported. Starting in 9.7 P5, Cloud Volumes ONTAP uses an additional disk for core data and another for VNVRAM. This change reduced the number of disks available for data.

The tables below show the maximum system capacity by VM size with disks alone, and with disks and cold data tiering to object storage.

Disk limits are shown by VM size for Premium and BYOL licenses only because disk limits can't be reached with Explore or Standard licenses due to system capacity limits.

- Single node systems can use Standard HDD Managed Disks, Standard SSD Managed Disks, and Premium SSD Managed Disks, with up to 32 TB per disk. The number of supported disks varies by VM size.
- HA systems use Premium page blobs as disks, with up to 8 TB per page blob. The number of supported disks varies by VM size.

> You can now purchase multiple licenses for a Cloud Volumes ONTAP BYOL system to allocate more than 368 TB of capacity. The number of licenses that you can purchase for a single node system or HA pair is unlimited. Be aware that disk limits can prevent you from reaching the capacity limit by using disks alone. You can go beyond the disk limit by tiering inactive data to object storage. Learn how to add additional system licenses to Cloud Volumes ONTAP.

Single node with a Premium license

VM size	Max data disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
DS5_v2	61	368 TB	368 TB
DS14_v2	61	368 TB	368 TB
DS15_v2	61	368 TB	368 TB
E32s_v3	29	368 TB	368 TB
E48s_v3	29	368 TB	368 TB
L8s_v2	13	368 TB	368 TB

Single node with one or more BYOL licenses

For some VM types, you'll need several BYOL licenses to reach the max system capacity listed below. For example, you'd need 6 BYOL licenses to reach 2 PB with DS5_v2.

VM size	Max data disks per node	Max system capacity with one license		Max system capacity with multiple licenses	
		Disks alone	Disks + data tiering	Disks alone	Disks + data tiering
DS3_v2	13	368 TB	368 TB	416 TB	368 TB x each license
DS4_v2	29	368 TB	368 TB	928 TB	368 TB x each license
DS5_v2	61	368 TB	368 TB	1.95 PB	368 TB x each license
DS13_v2	29	368 TB	368 TB	928 TB	368 TB x each license
DS14_v2	61	368 TB	368 TB	1.95 PB	368 TB x each license
DS15_v2	61	368 TB	368 TB	1.95 PB	368 TB x each license
E32s_v3	29	368 TB	368 TB	928 TB	368 TB x each license
E48s_v3	29	368 TB	368 TB	928 TB	368 TB x each license
L8s_v2	13	368 TB	368 TB	416 TB	368 TB x each license

HA pairs with a Premium license

VM size	Max data disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
DS5_v2	61	368 TB	368 TB
DS14_v2	61	368 TB	368 TB
DS15_v2	61	368 TB	368 TB

HA pairs with one or more BYOL licenses

For some VM types, you'll need several BYOL licenses to reach the max system capacity listed below. For example, you'd need 3 BYOL licenses to reach 1 PB with DS5_v2.

VM size	Max data disks per node	Max system capacity with one license		Max system capacity with multiple licenses	
		Disks alone	Disks + data tiering	Disks alone	Disks + data tiering
DS4_v2	29	368 TB	368 TB	464 TB	368 TB x each license
DS5_v2	61	368 TB	368 TB	976 TB	368 TB x each license
DS13_v2	29	368 TB	368 TB	464 TB	368 TB x each license
DS14_v2	61	368 TB	368 TB	976 TB	368 TB x each license
DS15_v2	61	368 TB	368 TB	976 TB	368 TB x each license

Aggregate limits

Cloud Volumes ONTAP uses Azure storage as disks and groups them into *aggregates*. Aggregates provide storage to volumes.

Parameter	Limit
Maximum number of aggregates	Same as the disk limit
Maximum aggregate size	352 TB of raw capacity for single node [1, 2] 96 TB of raw capacity for HA pairs [1]
Disks per aggregate	1-12 [3]
Maximum number of RAID groups per aggregate	1

Notes:

1. The aggregate capacity limit is based on the disks that comprise the aggregate. The limit does not include object storage used for data tiering.
2. The 352 TB limit is supported starting with 9.6 P3. Releases prior to 9.6 P3 support up to 200 TB of raw capacity in an aggregate on a single node system.
3. All disks in an aggregate must be the same size.

Logical storage limits

Logical storage	Parameter	Limit
Storage virtual machines (SVMs)	Maximum number for Cloud Volumes ONTAP (HA pair or single node)	One data-serving SVM and one destination SVM used for disaster recovery. You can activate the destination SVM for data access if there's an outage on the source SVM. [1] The one data-serving SVM spans the entire Cloud Volumes ONTAP system (HA pair or single node).

Logical storage	Parameter	Limit
Files	Maximum size	16 TB
	Maximum per volume	Volume size dependent, up to 2 billion
FlexClone volumes	Hierarchical clone depth [2]	499
FlexVol volumes	Maximum per node	500
	Minimum size	20 MB
	Maximum size	Azure HA: Dependent on the size of the aggregate [3] Azure single node: 100 TB
Qtrees	Maximum per FlexVol volume	4,995
Snapshot copies	Maximum per FlexVol volume	1,023

Notes:

1. Cloud Manager does not provide any setup or orchestration support for SVM disaster recovery. It also does not support storage-related tasks on an additional SVM. You must use System Manager or the CLI for SVM disaster recovery.
   - SVM Disaster Recovery Preparation Express Guide
   - SVM Disaster Recovery Express Guide
2. Hierarchical clone depth is the maximum depth of a nested hierarchy of FlexClone volumes that can be created from a single FlexVol volume.
3. Less than 100 TB is supported for this configuration because aggregates on HA pairs are limited to 96 TB of *raw* capacity.

iSCSI storage limits

iSCSI storage	Parameter	Limit
LUNs	Maximum per node	1,024
	Maximum number of LUN maps	1,024
	Maximum size	16 TB
	Maximum per volume	512
igroups	Maximum per node	256
Initiators	Maximum per node	512
	Maximum per igroup	128
iSCSI sessions	Maximum per node	1,024
LIFs	Maximum per port	32
	Maximum per portset	32
Portsets	Maximum per node	256

Storage limits for Cloud Volumes ONTAP 9.7 in GCP

Cloud Volumes ONTAP has storage configuration limits to provide reliable operations. For best performance, do not configure your system at the maximum values.

Maximum system capacity by license

The maximum system capacity for a Cloud Volumes ONTAP system is determined by its license. The maximum system capacity includes disk-based storage plus object storage used for data tiering. NetApp doesn't support exceeding this limit.

For the Premium and BYOL licenses, disk limits prevent you from reaching the 368 TB capacity limit by using disks alone. You can reach the 368 TB capacity limit by tiering inactive data to object storage. Refer to the disk limits below for more details.

License	Maximum system capacity (disks + object storage)
Explore	2 TB (data tiering is not supported with Explore)
Standard	10 TB
Premium	368 TB
BYOL	368 TB per license

Disk and tiering limits

The table below shows the maximum system capacity with disks alone, and with disks and cold data tiering to object storage. The disk limits are specific to disks that contain user data. The limits do not include the boot disk and root disk.

Parameter	Limit
Maximum disks per system	124
Maximum disk size	16 TB
Maximum system capacity with disks alone	256 TB
Maximum system capacity with disks and cold data tiering to a Google Cloud Storage bucket	• Premium: 368 TB • BYOL: 368 TB per license

Aggregate limits

Cloud Volumes ONTAP groups Google Cloud Platform disks into *aggregates*. Aggregates provide storage to volumes.

Parameter	Limit
Maximum number of data aggregates	99 [1]

Parameter	Limit
Maximum aggregate size	96 TB of raw capacity [2]
Disks per aggregate	1-6 [3]
Maximum number of RAID groups per aggregate	1

Notes:

1. The maximum number of data aggregates doesn't include the root aggregate.
2. The aggregate capacity limit is based on the disks that comprise the aggregate. The limit does not include object storage used for data tiering.
3. All disks in an aggregate must be the same size.

Logical storage limits

Logical storage	Parameter	Limit
Storage virtual machines (SVMs)	Maximum number for Cloud Volumes ONTAP	One data-serving SVM and one destination SVM used for disaster recovery. You can activate the destination SVM for data access if there's an outage on the source SVM. [1] The one data-serving SVM spans the entire Cloud Volumes ONTAP system.
Files	Maximum size	16 TB
	Maximum per volume	Volume size dependent, up to 2 billion
FlexClone volumes	Hierarchical clone depth [2]	499
FlexVol volumes	Maximum per node	500
	Minimum size	20 MB
	Maximum size	Dependent on the size of the aggregate
Qtrees	Maximum per FlexVol volume	4,995
Snapshot copies	Maximum per FlexVol volume	1,023

Notes:

1. Cloud Manager does not provide any setup or orchestration support for SVM disaster recovery. It also does not support storage-related tasks on an additional SVM. You must use System Manager or the CLI for SVM disaster recovery.
   - SVM Disaster Recovery Preparation Express Guide
   - SVM Disaster Recovery Express Guide
2. Hierarchical clone depth is the maximum depth of a nested hierarchy of FlexClone volumes that can be created from a single FlexVol volume.

iSCSI storage limits

iSCSI storage	Parameter	Limit
LUNs	Maximum per node	1,024
	Maximum number of LUN maps	1,024
	Maximum size	16 TB
	Maximum per volume	512
igroups	Maximum per node	256
Initiators	Maximum per node	512
	Maximum per igroup	128
iSCSI sessions	Maximum per node	1,024
LIFs	Maximum per port	1
	Maximum per portset	32
Portsets	Maximum per node	256

Known issues for Cloud Volumes ONTAP 9.7

Known issues identify problems that might prevent you from using this release of the product successfully.

You can find known issues for ONTAP software in the ONTAP Release Notes.

Node halt can fail on HA pairs with multiple SVMs

If you plan to halt or reboot a Cloud Volumes ONTAP node in an HA pair that has multiple storage VMs (SVMs), we recommend that you pre-migrate all logical interfaces (LIFs) to the partner node before shutting down the node.

The following example migrates all data LIFs from the current (local) node:

```
node1::> network interface migrate-all -node local
```

This action expediates the network transition to the partner node and avoids occasional known problems with stopping the node.

If the node can't be stopped because it takes too much time to migrate the LIFs, a retry of the reboot or halt command should make it stop.

Known limitations

Limitations for Cloud Volumes ONTAP 9.7 in all cloud providers

Known limitations identify platforms, devices, or functions that are not supported by this release of the product, or that do not interoperate correctly with it. Review these limitations carefully.

The following limitations apply to Cloud Volumes ONTAP in all cloud providers: AWS, Azure, and GCP.

Cloud Volumes ONTAP supports Reserved and On-demand VM instances

Cloud Volumes ONTAP can run on either a Reserved or On-demand VM instance from your cloud provider. Other types of VM instances aren't supported.

Automatic application resource management solutions shouldn't be used

Automatic application resource management solutions should not manage Cloud Volumes ONTAP systems. Doing so can result in a change to an unsupported configuration. For example, the solution might change Cloud Volumes ONTAP to an unsupported VM instance type.

Software updates must be completed by Cloud Manager

Upgrades of Cloud Volumes ONTAP must be completed from Cloud Manager. You should not upgrade Cloud Volumes ONTAP by using System Manager or the CLI. Doing so can impact system stability.

Cloud Volumes ONTAP deployment must not be modified from your cloud provider's console

Changes to a Cloud Volumes ONTAP configuration from your cloud provider's console results in an unsupported configuration. Any changes to the Cloud Volumes ONTAP resources that Cloud Manager creates and manages can impact system stability and Cloud Manager's ability to manage the system.

Disks and aggregates must be managed from Cloud Manager

All disks and aggregates must be created and deleted directly from Cloud Manager. 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.

SnapManager licensing limitation

SnapManager per-server licenses are supported with Cloud Volumes ONTAP. Per-storage system (SnapManager suite) licenses are not supported.

Unsupported ONTAP features

The following features are not supported with Cloud Volumes ONTAP:

- Aggregate-level inline deduplication
- Aggregate-level background deduplication
- Disk maintenance center
- Disk sanitization
- FabricPool mirroring
- Fibre Channel (FC)
- Flash Pools
- Infinite Volumes
- Interface groups
- Intranode LIF failover

- MetroCluster
- RAID4, RAID-DP, RAID-TEC (RAID0 is supported)
- Service Processor
- SnapLock Compliance mode (Enterprise mode is supported)
- SnapMirror Synchronous
- VLANs

Known limitations for Cloud Volumes ONTAP 9.7 in AWS

The following known limitations are specific to Cloud Volumes ONTAP in Amazon Web Services. Be sure to also review Limitations for Cloud Volumes ONTAP 9.7 in all cloud providers.

HA pairs not supported with AWS Outposts

Single node systems are supported with AWS Outposts but HA pairs aren't supported at this time.

Flash Cache limitations

C5D and R5D instance types include local NVMe storage, which Cloud Volumes ONTAP uses as *Flash Cache*. Note the following limitations:

- Compression must be disabled on all volumes to take advantage of the Flash Cache performance improvements.

  You can choose no storage efficiency when creating a volume from Cloud Manager, or you can create a volume and then disable data compression by using the CLI.

- Cache rewarming after a reboot is not supported with Cloud Volumes ONTAP.

False alarms reported by Amazon CloudWatch

Cloud Volumes ONTAP does not release CPUs when idle, so Amazon CloudWatch can report a high CPU warning for the EC2 instance because it sees 100% usage. You can ignore this alarm. The ONTAP statistics command displays the true usage of the CPUs.

Cloud Volumes ONTAP HA pairs do not support immediate storage giveback

After a node reboots, the partner must sync data before it can return the storage. The time that it takes to resync data depends on the amount of data written by clients while the node was down and the data write speed during the time of giveback.

Learn how storage works in a Cloud Volumes ONTAP HA pair running in AWS.

Limitations in the AWS C2S environment

See the Quick Start Guide for the AWS Commercial Cloud Services Environment.

Known limitations for Cloud Volumes ONTAP 9.7 in Azure

The following known limitations are specific to Cloud Volumes ONTAP in Microsoft Azure.

Be sure to also review Limitations for Cloud Volumes ONTAP 9.7 in all cloud providers.

Flash Cache limitations

The Standard_L8s_v2 VM type includes local NVMe storage, which Cloud Volumes ONTAP uses as *Flash Cache*. Note the following limitations for Flash Cache:

- Compression must be disabled on all volumes to take advantage of the Flash Cache performance improvements.

  You can choose no storage efficiency when creating a volume from Cloud Manager, or you can create a volume and then disable data compression by using the CLI.

- Cache rewarming after a reboot is not supported with Cloud Volumes ONTAP.

HA limitations

The following limitations affect Cloud Volumes ONTAP HA pairs in Microsoft Azure:

- NFSv4 isn't supported. NFSv3 is supported.
- HA pairs aren't supported in some regions.

  See the list of supported Azure regions.

Pay-as-you-go not available for CSP partners

If you are a Microsoft Cloud Solution Provider (CSP) partner, you cannot deploy Cloud Volumes ONTAP Explore, Standard, or Premium because pay-as-you-go subscriptions are not available for CSP partners. You must purchase a license and deploy Cloud Volumes ONTAP BYOL.

Known limitations for Cloud Volumes ONTAP 9.7 in GCP

There are no known limitations specific to Cloud Volumes ONTAP in Google Cloud Platform. See the Limitations for Cloud Volumes ONTAP 9.7 in all cloud providers.