Storage limits for Cloud Volumes ONTAP 9.8 in Azure

Cloud Volumes ONTAP

Ben Cammett
July 07, 2021

Table of Contents

Storage limits for Cloud Volumes ONTAP 9.8 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)
Freemium	500 GB
PAYGO Explore	2 TB (data tiering is not supported with Explore)
PAYGO Standard	10 TB
PAYGO Premium	368 TB
Node-based license	368 TB per license
Capacity-based license	2 PB

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

- 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 purchase multiple node-based 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
E64is_v3	29	368 TB	368 TB
E80ids_v4	29	368 TB	368 TB

Single node with node-based licensing

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 1.95 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

VM size	Max data disks per node	Max system capacity with one license		Max system capacity with multiple licenses	
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
E64is_v3	29	368 TB	368 TB	928 TB	368 TB x each license
E80ids_v4	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

Single node with capacity-based licensing

VM size	Max data disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
DS3_v2	13	416 TB	2 PB
DS4_v2	29	928 TB	2 PB
DS5_v2	61	1.95 TB	2 PB
DS13_v2	29	928 TB	2 PB
DS14_v2	61	1.95 TB	2 PB
DS15_v2	61	1.95 TB	2 PB
E32s_v3	29	928 TB	2 PB
E48s_v3	29	928 TB	2 PB
E80ids_v4	29	928 TB	2 PB
L8s_v2	13	416 TB	2 PB

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
E48s_v3	29	368 TB	368 TB

VM size	Max data disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
E80ids_v4	29	368 TB	368 TB

HA pairs with node-based licensing

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 976 TB 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
E48s_v3	29	368 TB	368 TB	464 TB	368 TB x each license
E80ids_v4	29	368 TB	368 TB	464 TB	368 TB x each license

HA pairs with capacity-based licensing

VM size	Max data disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
DS5_v2	61	976 TB	2 PB
DS14_v2	61	976 TB	2 PB
DS15_v2	61	976 TB	2 PB
E48s_v3	29	464 TB	2 PB
E80ids_v4	29	464 TB	2 PB

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 [1]	384 TB of raw capacity for single node [2] 352 TB of raw capacity for single node with PAYGO 96 TB of raw capacity for HA pairs
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. If using node-based licensing, two BYOL licenses are required to reach 384 TB.
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).
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