Storage limits for Cloud Volumes ONTAP 9.7 in AWS

Cloud Volumes ONTAP

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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 capacity limit by using disks alone. In those cases, you can reach the 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)
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.

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.

You can now 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

Instance family	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
c5, m5, and r5 instances	22	352 TB	368 TB
c4, m4, and r4 instances	34	368 TB	368 TB

Single node with node-based licensing

Instance family	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
c5, m5, and r5 instances	22	352 TB	368 TB	352 TB	368 TB x each license
c4, m4, and r4 instances	34	368 TB	368 TB	544 TB	368 TB x each license

Single node with capacity-based licensing

Instance family	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
c5, m5, and r5 instances	22	352 TB	2 PB
c4, m4, and r4 instances	34	544 TB	2 PB

HA pairs with a Premium license

Instance family	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
c5, m5, and r5 instances	19	304 TB	368 TB

Instance family	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
c4, m4, and r4 instances	31	368 TB	368 TB

HA pairs with node-based licensing

Instance family	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
c5, m5, and r5 instances	19	304 TB	368 TB	304 TB	368 TB x each license
c4, m4, and r4 instances	31	368 TB	368 TB	496 TB	368 TB x each license

HA pairs with capacity-based licensing

Instance family	Max disks per node	Max system capacity with disks alone	Max system capacity with disks and data tiering
c5, m5, and r5 instances	19	304 TB	2 PB
c4, m4, and r4 instances	31	496 TB	2 PB

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