Learn about S3 support in ONTAP 9

ONTAP 9

NetApp
February 12, 2026

Table of Contents

Learn about S3 support in ONTAP 9

Learn about ONTAP S3 configuration

Beginning with ONTAP 9.8, you can enable an ONTAP Simple Storage Service (S3) object storage server in an ONTAP cluster, using familiar manageability tools such as ONTAP System Manager to rapidly provision high-performance object storage for development and operations in ONTAP and taking advantage of ONTAP's storage efficiencies and security.

Beginning in July 2024, content from technical reports previously published as PDFs has been integrated with ONTAP product documentation. The ONTAP S3 documentation now includes content from *TR-4814: S3 in ONTAP best practices*.

S3 configuration with System Manager and the ONTAP CLI

You can configure and manage ONTAP S3 with System Manager and the ONTAP CLI. When you enable S3 and create buckets using System Manager, ONTAP selects best-practice defaults for simplified configuration. If you need to specify configuration parameters, you might want to use the ONTAP CLI. If you configure the S3 server and buckets from the CLI, you can still manage them with System Manager if desired, or vice-versa.

When you create an S3 bucket using System Manager, ONTAP configures a default performance service level that is the highest available on your system. For example, on an AFF system, the default setting would be **Extreme**. Performance service levels are predefined adaptive Quality of Service (QoS) policy groups. Instead of one of the default service levels, you can specify a custom QoS policy group or no policy group.

Predefined adaptive QoS policy groups are:

- **Extreme**: Used for applications that expect the lowest latency and highest performance.
- **Performance**: Used for applications with modest performance needs and latency.
- **Value**: Used for applications for which throughput and capacity are more important than latency.
- **Custom**: Specify a custom QoS policy or no QoS policy.

If you select **Use for tiering**, no performance service levels are selected, and the system tries to select low-cost media with optimal performance for the tiered data.

See also: Use adaptive QoS policy groups.

ONTAP tries to provision this bucket on local tiers that have the most appropriate disks, satisfying the chosen service level. However, if you need to specify which disks to include in the bucket, consider configuring S3 object storage from the CLI by specifying the local tiers (aggregate). If you configure the S3 server from the CLI, you can still manage it with System Manager if desired.

If you want the ability to specify which aggregates are used for buckets, you can only do so using the CLI.

Configuring S3 buckets on Cloud Volumes ONTAP

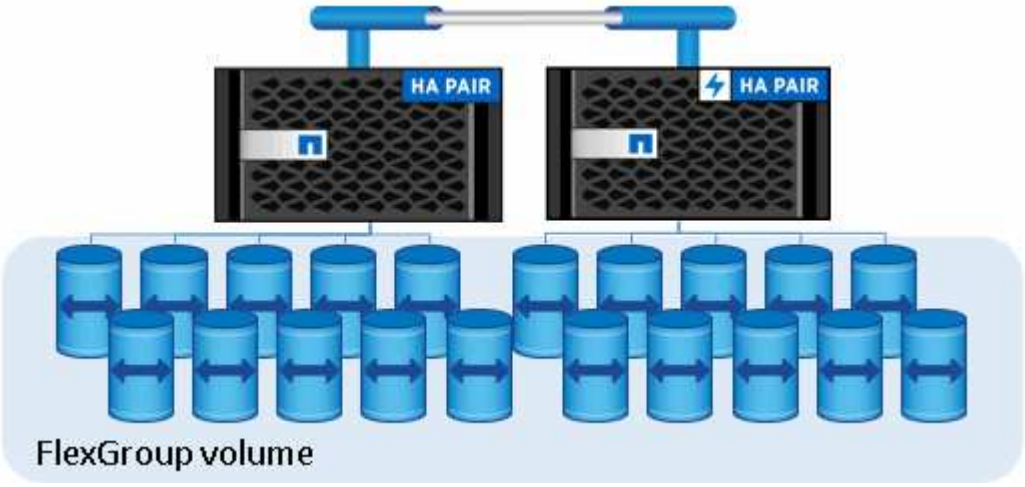
If you want to serve buckets from Cloud Volumes ONTAP, it is strongly recommended that you manually select the underlying aggregates to ensure that they are using one node only. Using aggregates from both nodes can impact performance, because the nodes will be in geographically separated availability zones and hence

susceptible to latency issues. Therefore, in Cloud Volumes ONTAP environments, you should configure S3 buckets from the CLI.

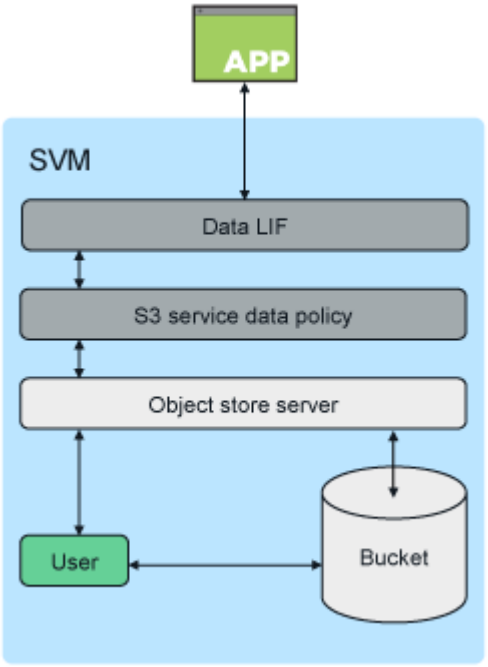
Otherwise, S3 servers on Cloud Volumes ONTAP are configured and maintained the same in Cloud Volumes ONTAP as in on-premises environments.

ONTAP S3 architecture using FlexGroup volumes

In ONTAP, the underlying architecture for a bucket is a FlexGroup volume, which is a single namespace that is made up of multiple constituent member volumes but is managed as a single volume.



Access to the bucket is provided through authorized users and client applications.



When a bucket is used exclusively for S3 applications, including use as a FabricPool endpoint, the underlying FlexGroup volume will only support the S3 protocol.

Beginning with ONTAP 9.12.1, the S3 protocol can also be enabled in multiprotocol NAS volumes that have been preconfigured to use NAS protocols. When the S3 protocol is enabled in multiprotocol NAS volumes, client applications can read and write data using NFS, SMB, and S3.

Bucket limits

Minimum capacity

Minimum bucket capacity is determined by the ONTAP platform.

- 95GB for on-prem platforms.
- 1.6GB for Lab on Demand.
- 200MB for ONTAP Select.

Maximum size

Maximum bucket capacity is limited to the maximum FlexGroup size of 60PB.

Maximum number of buckets

The maximum number of buckets is 1000 per FlexGroup volume, or 12,000 buckets per cluster (using 12 FlexGroup volumes).

Automatic FlexGroup sizing with ONTAP 9.14.1 and later

Beginning with ONTAP 9.14.1, the default FlexGroup size is based on the size of the buckets it contains. The FlexGroup volume will automatically grow or shrink as buckets are added or removed.

For example, if an initial Bucket_A is provisioned to be 100GB, the FlexGroup will be thin-provisioned to be 100GB. If two additional buckets are created, Bucket_B at 300GB and Bucket_C at 500GB, the FlexGroup volume will grow to 900GB.

(Bucket_A at 100GB + Bucket_B at 300GB + Bucket_C at 500GB = 900GB.)

If Bucket_A is deleted, the underlying FlexGroup volume will shrink to 800GB.

Fixed default FlexGroup sizes in ONTAP 9.13.1 and earlier

To provide capacity for bucket expansion, the total used capacity of all buckets on the FlexGroup volume should be less than 33% of the maximum FlexGroup volume capacity based on available storage aggregates on the cluster. If this cannot be met, the new bucket being created will be provisioned on a new, automatically created, FlexGroup volume.

Prior to ONTAP 9.14.1, the FlexGroup size is fixed to a default size based on its environment:

- 1.6PB in ONTAP
- 100TB in ONTAP Select

If a cluster does not have enough capacity to provision a FlexGroup volume at the default size, ONTAP reduces the default size by half until it can be provisioned in the existing environment.

For example, in a 300TB environment, a FlexGroup volume is automatically provisioned at 200TB (1.6PB, 800TB, and 400TB FlexGroup volumes being too large for the environment).

ONTAP S3 primary use cases

These are the primary use cases for client access to ONTAP S3 services:

- Using FabricPool to tier inactive data to a bucket in ONTAP, allowing for ONTAP to ONTAP tiering. Tiering to a bucket within the local cluster—or tiering to a bucket on a remote cluster—are both supported. Tiering to ONTAP S3 lets you use less expensive ONTAP systems for inactive data and save money on new flash capacity without the need for additional FabricPool licenses or new technologies to manage.
- Beginning with ONTAP 9.12.1, the S3 protocol can also be enabled in multiprotocol NAS volumes that have been preconfigured to use NAS protocols. When the S3 protocol is enabled in multiprotocol NAS volumes, client applications can read and write data using S3, NFS, and SMB, which opens up a variety of additional use cases. One of the most common use cases is NAS clients writing data to a volume and S3 clients reading the same data and performing specialized tasks such as analytics, business intelligence, machine learning, and optical character recognition.

ONTAP S3 is appropriate if you want to enable S3 capabilities on existing ONTAP clusters without additional hardware and management. NetApp StorageGRID is NetApp's flagship solution for object storage. StorageGRID is recommended for native S3 applications that need to take advantage of the full range of S3 actions, advanced ILM capabilities, or capacities not achievable in ONTAP-based systems. For more information, see the StorageGRID documentation.

Related information

FlexGroup volumes management

Copyright information

Trademark information