



Learn about S3 support in ONTAP 9

ONTAP 9

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S3 configuration overview

Beginning with ONTAP 9.8, you can enable an ONTAP Simple Storage Service (S3) object storage server in an ONTAP cluster.

ONTAP supports two on-premises use case scenarios for serving S3 object storage:

- FabricPool tier to a bucket on local cluster (tier to a local bucket) or remote cluster (cloud tier).
- S3 client app access to a bucket on the local cluster or a remote cluster.

Beginning with ONTAP 9.14.1, you can enable an S3 object storage server on an SVM in a mirrored or unmirrored aggregate in MetroCluster IP and FC configurations.

Beginning with ONTAP 9.12.1, you can enable an S3 object storage server on an SVM in an unmirrored aggregate in a MetroCluster IP configuration. For more information on the limitations of unmirrored aggregates in MetroCluster IP configurations, see [Considerations for unmirrored aggregates](#).

You should use these procedures if you want to configure S3 object storage in the following way:

- You want to provide S3 object storage from an existing cluster running ONTAP.

ONTAP S3 is appropriate if you want S3 capabilities on existing clusters without additional hardware and management. However, NetApp StorageGRID software continues to be the NetApp flagship solution for object storage. For more information, see the [StorageGRID documentation](#).

- You have cluster administrator privileges, not SVM administrator privileges.

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.

Architecture

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



Buckets are only limited by the physical maximums of the underlying hardware, architectural maximums could be higher. Buckets can take advantage of FlexGroup elastic sizing to automatically grow a constituent of a FlexGroup volume if it is running out of space. There is a limit of 1000 buckets per FlexGroup volume, or 1/3 of the FlexGroup volume's capacity (to account for data growth in buckets).



No NAS or SAN protocol access is permitted to the FlexGroup volume that contain S3 buckets.

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



Use cases

There are three primary use cases for client access to ONTAP S3 services:

- For ONTAP systems using ONTAP S3 as a remote FabricPool capacity (cloud) tier

The S3 server and bucket containing the capacity tier (for *cold* data) is on a different cluster than the performance tier (for *hot* data).

- For ONTAP systems using ONTAP S3 as a local FabricPool tier

The S3 server and bucket containing the capacity tier is on the same cluster, but on a different HA pair, as the performance tier.

- For external S3 client apps

ONTAP S3 serves S3 client apps run on non-NetApp systems.

It is a best practice to provide access to ONTAP S3 buckets using HTTPS. When HTTPS is enabled, security certificates are required for proper integration with SSL/TLS. Client users' access and secret keys are then required to authenticate the user with ONTAP S3 as well as authorizing the users' access permissions for operations within ONTAP S3. The client application should also have access to the root CA certificate (the ONTAP S3 server's signed certificate) to be able to authenticate the server and create a secure connection between client and server.

Users are created within the S3-enabled SVM, and their access permissions can be controlled at the bucket or SVM level; that is, they can be granted access to one or more buckets within the SVM.

HTTPS is enabled by default on ONTAP S3 servers. It is possible to disable HTTPS and enable HTTP for client access, in which case authentication using CA certificates is not required. However, when HTTP is enabled and HTTPS is disabled, all communication with the ONTAP S3 server are sent over the network in clear text.

For additional information, see [Technical Report: S3 in ONTAP Best Practices](#)

Related information

[FlexGroup volumes management](#)

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