Abstract

NetApp® ONTAP® 9.7 software supports the Amazon Simple Storage Service (Amazon S3) as a public preview. This public preview is an advance release of the upcoming ONTAP feature support. It provides limited functionality and stable code but it is not recommended for production workloads or critical data.
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1 Overview

NetApp ONTAP 9.7 software supports the Amazon Simple Storage Service (S3) as a public preview. The public preview is an advance release of the upcoming ONTAP feature support. It provides limited functionality and stable code but is not recommended for production workloads or critical data.

Feedback is essential and will guide the prioritization of the requirements necessary for production workloads. The ONTAP team closely monitors S3 usage by using AutoSupport data tools.

Although not intended for production workloads, NetApp Support is ready to assist with ONTAP S3 configuration troubleshooting questions.

2 Primary Use Cases

With the rapid growth of object data, particularly with Internet of Things (IoT) devices, autonomous vehicles, and emerging 5G technology, an increasing number of customers need ONTAP to support the S3 API.

NetApp StorageGRID® software is, and will remain, the NetApp flagship solution for object storage. ONTAP complements StorageGRID by providing an ingest and preprocessing point on the Edge, expanding the NetApp Data Fabric for object data, increasing the value of the NetApp product portfolio.

In the near future, NetApp expects to see seamless integration between ONTAP and StorageGRID by using NetApp Cloud Sync.

3 Requirements

The requirements listed in this section apply to the ONTAP 9.7 S3 public preview—they are not representative of the requirements for when S3 is officially supported in ONTAP.

3.1 Platforms

- **NetApp AFF storage system.** S3 is supported on all AFF platforms using ONTAP 9.7.
- **FAS storage system.** S3 is supported on all FAS platforms using ONTAP 9.7.
- **NetApp ONTAP Select.** S3 is supported on all platforms using ONTAP Select 9.7.
- **Cloud Volumes ONTAP.** S3 is not supported on Cloud Volumes ONTAP.

3.2 Data LIFs

Storage virtual machines (SVMs) hosting object store servers require data LIFs to communicate with applications using S3.
3.3 S3 License

As with other protocols such as FC, iSCSI, NFS, NVMe_oF, and SMB, S3 requires a license to be installed before it can be used in ONTAP. You can obtain a free evaluation license on the NetApp Evaluation Central site.

**Note:** This site requires NetApp login credentials. If you don’t have access, you can obtain a free evaluation license by opening the NetApp Support site and completing the feedback request for your system. If you do not have access to the site, please reach out to your NetApp representative.

**Installation**

To install the S3 license, run the following command in the ONTAP CLI:

```
system license add <license_code>
```

4 Configuration

After you meet the basic requirements for using S3 in ONTAP, complete these tasks to configure ONTAP:

1. Create the S3 service data policy and the S3 server LIF.
2. Modify a LIF so it can use the S3 service data policy.
3. Create the object store server.
4. Create the bucket.
5. Create a user.

4.1 Create S3 Service Data Policy and S3 Server LIF

An S3 service data policy is required to enable S3 data traffic on LIFs.

**ONTAP CLI**

To create an S3 service data policy by using the ONTAP CLI, run the following command:

```
network interface service-policy create
    -vserv <name>
    -policy <name>
    -services data-core, data-s3-server
```

4.2 Modify a LIF to Use the S3 Service Data Policy

**ONTAP CLI**

To assign the S3 service data policy to a LIF using the ONTAP CLI, run the following command:

```
network interface modify
    -vserv <name>
    -lif <name>
    -service-policy <name>
```

4.3 Create the Object Store Server

The ONTAP object store server manages data as objects, as opposed to other storage architectures such as file or block storage.

Although object storage is generally less performative than file or block storage, it is significantly more scalable.
ONTAP CLI

To create an object store server using the ONTAP CLI, run the following command:

```
  vserver object-store-server create
    -vserver <name>
    -object-store-server <name>
```

**Note:** Only port 80 can be used in the ONTAP 9.7 S3 public preview. The ability to select specific ports, including secure ports, will be available in future releases.

4.4 Create the Bucket

Objects are kept inside a single flat container (a bucket)—they are not nested as files inside a directory inside other directories.

In ONTAP, the underlying architecture for a bucket is a NetApp ONTAP FlexGroup volume—a single namespace that is made up of multiple constituent member volumes but is managed as a single volume, as shown in Figure 1. Individual objects in a bucket are allocated to individual member volumes and are not striped across volumes or nodes.

![FlexGroup volume](image)

When used by buckets, FlexGroup volumes use elastic sizing.

Buckets are only limited by the physical maximums of the underlying hardware and have been tested to 20PB and 400 billion files. Architectural maximums could be higher.

ONTAP CLI

To create a bucket using the ONTAP CLI, run the following command:

```
vserver object-store-server bucket create
  -vserver <name>
  -bucket <name>
  -size <size>
```
4.5 Create a User

User authorization is required on all ONTAP object stores in order to restrict connectivity to authorized clients.

ONTAP CLI

To create a user by using the ONTAP CLI, run the following command:

```
svserver object-store-server user create
  -vserver <name>
  -user <name>
```

To view the user’s access and secret key by using the ONTAP CLI, run the following command:

**Note:** Advanced privilege level is required.

```
object-store-server user show
```

Figure 2 illustrates access to the bucket through authorized users.

**Figure 2) Access to the bucket through authorized users.**

Root User

When an object store server is created, a root user with UID 0 is created.

No access key or secret key is generated for this root user. The ONTAP administrator must run the `object-store-server users regenerate-keys` command to set the access key and secret key for this user.

As a NetApp best practice, do not use this root user. Any client application that uses the access key or secret key of the root user has full access to all buckets and objects in the object store.
## 5 Interoperability

The exceptions to normal interoperability that are listed in Table 1 are unique to ONTAP object stores.

**Table 1) NetApp interoperability.**

<table>
<thead>
<tr>
<th>Focus</th>
<th>Supported</th>
<th>Not Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data protection</td>
<td>• Cloud Sync</td>
<td>• Erasure coding</td>
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<tr>
<td></td>
<td>• System scheduled NetApp snapshot copies</td>
<td>• MetroCluster</td>
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<td></td>
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<td>• NDMP</td>
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<td></td>
<td>• NetApp SnapLock® technology</td>
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<td>• NetApp SnapMirror® technology</td>
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<td></td>
<td></td>
<td>• NetApp SyncMirror® technology</td>
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<td>• Object versioning</td>
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<td>• SMTape</td>
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<td>• SVM-DR</td>
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<td></td>
<td>• User-created snapshots</td>
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<td>• WORM</td>
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<tr>
<td>Encryption</td>
<td>• NetApp Volume Encryption (NVE)</td>
<td>• TLS</td>
</tr>
<tr>
<td></td>
<td>• NetApp Storage Encryption (NSE)</td>
<td>• SLAG</td>
</tr>
<tr>
<td>Storage efficiency</td>
<td>• Inline deduplication</td>
<td>Aggregate-level efficiencies</td>
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<tr>
<td></td>
<td>• Inline compression</td>
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<td>• Compaction</td>
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<tr>
<td>Storage virtualization</td>
<td>–</td>
<td>NetApp FlexArray® technology</td>
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<tr>
<td>Quality of service (QoS)</td>
<td>QoS maximums (ceiling)</td>
<td>–</td>
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<td>QoS minimums (floors)</td>
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<td>Additional features</td>
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<td>NetApp FPolicy software</td>
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<td>Qtrees</td>
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<td>Quotas</td>
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</tbody>
</table>
6 Public Preview Testing

It is not necessary to test all the scenarios listed here, but NetApp recommends that you test the following as appropriate for the S3 use cases that you are interested in:

- PUT an object with different keys and sizes.
- GET an object with different keys.
- DELETE an object.
- GET and PUT in parallel with different objects.
- GET and PUT on the same object.
- DELETE an object while a PUT operation is in progress.
- DELETE an object while a GET operation is in progress.
- GET with multiple byte range values on objects of different sizes.

Supported REST APIs:

- DELETE Object
- GET Object
- HEAD Bucket
- LIST Objects
- PUT Object

Feedback is essential and will guide the prioritization of the requirements necessary for production workloads. The ONTAP team closely monitors S3 usage by using AutoSupport data tools.

Where to Find Additional Information

To learn more about the information that is described in this document, review the following documents and/or websites:

- ONTAP 9 Documentation Center
  https://docs.netapp.com/ontap-9/index.jsp
- ONTAP and ONTAP System Manager Documentation Resources
- NetApp Product Documentation

Version History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Document Version History</th>
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<tbody>
<tr>
<td>1.1</td>
<td>March 2020</td>
<td>Updated data LIF service policy instructions.</td>
</tr>
<tr>
<td>1.0</td>
<td>January 2020</td>
<td>Initial release.</td>
</tr>
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</table>

Contact Us

Let us know how we can improve this technical report.

Contact us at doccomments@netapp.com.

Include TR-4814: S3 Public Preview in the subject line.
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