Manage data

AFX

NetApp
January 21, 2026

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Manage data

Prepare to manage your AFX storage system data

Before managing your AFX data, you should be familiar with the basic concepts and capabilities.

Because many of the concepts and administration procedures available on AFF and FAS systems are the same with AFX storage systems, reviewing the Unified ONTAP documentation can be helpful. Refer to the links in Related information for more information.

Terminology and options

There are several terms related to AFX storage you should be familiar with.

FlexVolume

A FlexVol is a type of logical container used in AFX storage systems. FlexVol volumes can be expanded, contracted, moved, and efficiently copied. They can also be partitioned into more manageable units using qtrees and resource usage can be limited using quotas.

FlexGroup

A FlexGroup volume is a scale-out NAS container that provides both high performance and automatic load distribution. Each consists of multiple volumes that share traffic transparently. FlexGroup volumes offer several benefits, including improved scalability and performance as well as simplified management.

FlexCache

FlexCache is an ONTAP caching technology that creates sparse, writable replicas of volumes on the same or different ONTAP clusters. It is designed to improve data access performance by bringing data closer to users, which can result in faster throughput with a smaller footprint. FlexCache is particularly useful for read-intensive workflows and helps to offload traffic from heavily accessed volumes.

S3 bucket

An S3 bucket is a storage container that holds objects or data in the cloud. With ONTAP, an S3 NAS bucket is a mapping between an S3 bucket name and a NAS path, allowing S3 access to any part of an SVM namespace with existing volumes and directory structure.

Data container

In the context of an AFX system, a data container is a generic term and can be either a volume or S3 bucket.

Qtree

A qtree is a logical subdivision within a volume that you can create to manage and organize data. It allows you to specify its properties and security style (NTFS or UNIX) and can inherit export policies from its parent volume or have its own. Qtrees can contain files and directories, and are often used to manage permissions and quotas more granularly within a volume.

Quota

A quota in ONTAP is a limit set on the amount of storage space or number of files that can be used by a user, group, or qtree. Quotas are used to manage and control resource usage within a storage system, ensuring that no single user or application can consume an excessive amount of resources.

NFS session trunking

NFS trunking is a technology that enables NFS v4.1 clients to open multiple connections to different LIFs on the NFS server. This increases the data transfer speed and provides resilience through multiple paths when exporting volumes to trunking-capable clients. The LIFs must be on the same node to participate in the trunk.

To enable trunking, you need to have an SVM configured for NFS and NFSv4.1 should be enabled. It also requires remounting all the NFSv4.x clients after a configuration change which can be disruptive. Support and configuration procedures for NFS trunking are the same for all ONTAP systems. Learn more about NFS trunking

File system analytics

File System Analytics (FSA) is an ONTAP feature that provides real-time visibility into file usage and storage capacity trends within FlexGroup or FlexVol volumes. It eliminates the need for external tools by offering insights into storage utilization and optimization opportunities. FSA provides detailed views at various levels of a volume's file system hierarchy, including the SVM, volume, directory, and file levels.

Data migration options

There are several data migration options. The focus is on migrating external data into an AFX cluster.

Migrating data from AFF or FAS systems

A fully integrated migration path from AFF or FAS systems (which run the Unified ONTAP personality) to AFX is available using the following technologies:

- SnapMirror
- SVM Migrate
- SVM DR

In addition, FlexCache volumes can be attached between AFX and AFF or FAS systems in either direction.

Migrating data from a non-ONTAP source

Data migration from non-ONTAP systems can be performed using file-level copy operations. Fast copy utilities such as XCP or Copy and Sync can be used as well as standard utilities such as RoboCopy (for SMB) and rsync (for NFS) as well as third-party tools such as DataDobi.

Migration limitations

You can replicate data from AFF or FAS systems to AFX if the source data volume does not contain LUNs or NVMe namespaces. When replicating from AFX to AFF or FAS systems, the minimum supported ONTAP version for the AFF or FAS system is 9.16.1. This is the first ONTAP release that supports Advanced Capacity Balancing.

Display an overview of your storage

To get started managing your AFX data, you should display an overview of the storage.

About this task

You can access all the volumes and buckets defined for the AFX cluster. Each of these is considered to be a data container.

Steps

1. In System Manager, select **Storage** and then **Overview**
2. Next to **Volumes**, select → to display a list of volumes.
3. Next to **Buckets**, select → to display a list of buckets.
4. Update or create a data container as needed.

Related information

- Learn about ONTAP File System Analytics
- Additional AFX SVM administration
- Prepare to administer your AFX system
- Migrate an AFX system SVM
- NetApp Interoperability Matrix Tool

Create and configure a volume on an AFX storage system

You can create a volume and attach it to an SVM. Each volume can be exposed to clients using one of the access protocols supported by AFX.

About this task

When creating a volume, you need to provide a minimum amount of configuration details. Additional details can be provided during creation or afterwards by editing the volume. You need to select the SVM for the volume if you've created additional SVMs.

Steps

1. In System Manager, select **Storage** and then **Volumes**.
2. Select + Add and provide the basic configuration including name, capacity, and optimization.
3. Optionally select **More options** for additional configuration related to data protection, SnapLock, and NFS access.
4. Select **Save** to add the volume.

Manage the AFX storage system volumes

There are several administrative tasks you can perform as part of administering the volumes defined at your AFX cluster.

Create a qtree

A qtree is a logical subdivision within a volume that you can create to organize and administer data.

Steps

1. In System Manager, select **Storage** and then **Qtrees**.
2. Select + Add and provide the basic configuration including name, volume, and security style; optionally configure a quota.
3. Select **Save** to add the qtree.

Create a quota

A quota is a limit set on the amount of storage space or number of files that can be used by a user, group, or qtree. Quotas are used to manage and control resource usage within an AFX system.

Steps

1. In System Manager, select **Storage** and then **Quotas**.
2. Select the **Usage** tab to display a list of the active quotas across all volumes.
3. Select the **Volumes** tab to display a list of the volumes defined in the AFX cluster; select a specific volume to display additional information.
4. To define a quota, select the **Rules** tab.
5. Provide the configuration details, including the quota target, type and limits.
6. Select **Save** to add the quota.

Create and configure an S3 bucket on an AFX storage system

You can create a bucket and attach it to an SVM. Each bucket can be exposed to clients using the S3 access protocol supported by AFX.

About this task

When creating a bucket, you need to provide a minimum amount of configuration details. Additional details can be provided during creation or afterwards by editing the bucket. You need to select the SVM for the bucket if you've created additional SVMs.

Before you begin

You need to configure the S3 service for the SVM for clients to be able to access the bucket.

Steps

1. In System Manager, select **Storage** and then **Buckets**.
2. Select + Add and provide the basic configuration including name and capacity.
3. Optionally select **More options** for additional configuration related to data protection, locking, and permissions.
4. Select **Save** to add the bucket.

Manage the AFX storage system buckets

There are several administrative tasks you can perform as part of managing AFX S3 buckets and client access. S3 configuration and support in AFX is the same as provided with Unified ONTAP. Refer to the Unified ONTAP documentation for details.

Related information

Learn about ONTAP S3 configuration

Monitor and troubleshoot an AFX storage system

The AFX system includes several options to monitor the storage each cluster manages.

Display NAS clients

You can display a list of the NFS and SMB/CIFS clients currently connected to the AFX cluster.

Steps

1. In System Manager, select **Clients** in the navigation pane.
2. Select the tab **NFS** or **SMB/CIFS** as desired.
3. Customize the display as well as search and download the client information as needed.

Related information

- Prepare to manage your AFX data

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