Data protection administration

Amazon FSx for NetApp ONTAP

NetApp
February 11, 2026

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Data protection administration

Snapshots

Manage snapshot policies

Manage snapshot policies for FSx for ONTAP volumes in Workload Factory. A snapshot policy defines how the system creates snapshots for a volume.

About this task

Snapshot management operations like assigning, changing, and deleting snapshot policies for volumes in an FSx for ONTAP file system are managed at the storage VM level. Snapshot policies can be shared with a single storage VM or with all storage VMs.

Some management tasks require you to associate a link with the FSx for ONTAP file system. Learn about Workload Factory links.

By default, every volume is associated with the file system's `default` snapshot policy. We recommend using this policy for most workloads.

Change a snapshot policy

You can change the snapshot policy name, schedule, and number of copies to retain, and enable or disable immutable snapshots. It isn't possible to enable or disable policy sharing across storage VMs. This option is available only during snapshot policy creation.

Before you begin

To display existing snapshot policies, you must associate a link. Learn how to associate an existing link or to create and associate a new link. After the link associates, return to this operation.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. In the **FSx for ONTAP** tab, select the actions menu of the file system and then select **Manage**.
4. In the file system overview, select the **Storage VMs** tab.
5. From the **Storage VMs** tab, select the actions menu for the storage VM containing the volume to protect with scheduled snapshots, then **Advanced actions**, and then **Manage snapshot policies**.
6. On the Snapshot policy management page, select the actions menu for the snapshot policy to change and then select **Edit**.
7. In the Edit snapshot policy dialog, make the necessary changes to the snapshot policy.
8. Select **Apply**.

Result

The snapshot policy is updated.

Enable immutable snapshots

Lock snapshots to prevent them from being deleted during the retention period.

Before you begin

You must associate a link to enable immutable snapshots. Learn how to associate an existing link or to create and associate a new link. After the link associates, return to this operation.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. In the **FSx for ONTAP** tab, select the actions menu of the file system that contains the volume to lock snapshots for and then select **Manage**.
4. In the file system overview, select the **Volumes** tab.
5. From the **Volumes** tab, select the actionsenu for the volume to protect.
6. Select **Data protection actions**, **Snapshots**, then **Make a snapshot immutable**.
7. In the Make a snapshot immutable dialog, do the following:
   a. **Snapshot name**: Select the snapshot to lock.
   b. Set the **Retention period** in number of hours, days, months, or years.
   c. Accept the statement.
8. Select **Apply**.

Result

The volume snapshot is now locked.

Assign a snapshot policy to a volume

You can assign a snapshot policy to a single volume to create scheduled snapshots for the volume.

Before you begin

You must associate a link to assign a snapshot policy. Learn how to associate an existing link or to create and associate a new link. After the link associates, return to this operation.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. In the **FSx for ONTAP** tab, select the actions menu of the file system that contains the volume to assign a snapshot policy to and then select **Manage**.
4. In the file system overview, select the **Storage VMs** tab.
5. From the **Storage VMs** tab, select the actions menu for the storage VM containing the volume to protect with scheduled snapshots, then **Advanced actions**, and then **Manage snapshot policies**.
6. On the Snapshot policy management page, select the actions menu of the snapshot policy and then select **Assign policy to volume**.
7. In the Assign snapshot policy dialog, select a snapshot policy to assign to the volume and review the policy schedule.

   If the policy contains immutable snapshots, and you want use it, accept the statement.

8. Select **Assign**.

Result

The snapshot policy is assigned to the volume.

Remove a snapshot policy from a volume

Remove a snapshot policy from a volume because you no longer want snapshots of the volume or because you want to delete a snapshot policy that is assigned to multiple volumes. To delete a snapshot policy that is assigned to more than one volume, you must manually remove it from all volumes.

Before you begin

You must associate a link to remove a snapshot policy. Learn how to associate an existing link or to create and associate a new link. After the link associates, return to this operation.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. In the **FSx for ONTAP** tab, select the actions menu of the file system that contains the volume to assign a snapshot policy to and then select **Manage**.
4. In the file system overview, select the **Storage VMs** tab.
5. From the **Storage VMs** tab, select the actions menu for the storage VM containing the volume to protect with scheduled snapshots, then **Advanced actions**, and then **Manage snapshot policies**.
6. On the Snapshot policy management page, select the actions menu of the snapshot policy and then select **Assign policy to volume**.
7. In the Assign snapshot policy dialog, select **None** to remove the snapshot policy.
8. Select **Assign**.

Result

The snapshot policy is removed from the volume.

Delete a snapshot policy

Delete a snapshot policy when you no longer need it.

When a snapshot policy is assigned to more than one volume, you must manually remove it from all volumes to delete the snapshot policy. Alternatively, you can assign a different snapshot policy to the volumes.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system with the volume and then select **Manage**.
5. In the file system overview, select the **Storage VMs** tab.
6. From the **Storage VMs** tab, select the actions menu of the storage VM with the snapshot policy to delete, then **Advanced actions**, and then **Manage snapshot policies**.
7. On the Snapshot policy management page, select the actions menu for the snapshot policy to delete and then select **Delete**.
8. In the Delete dialog, select **Delete** to delete the policy.

Enable and edit snapshots for long-term retention

In NetApp Workload Factory, you can enable snapshots for long-term retention, which lets you replicate specific snapshots for long-term disaster recovery.

Long-term retention enables business services to continue operating even in the event of a complete site failure, supporting transparent failover of applications using a secondary copy.

The same steps apply for enabling and editing snapshots for long-term retention.

When an on-premises ONTAP cluster is the target for the replication relationship, changing snapshots for long-term retention isn't supported.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actionsenu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.
6. In the Replication relationships tab, select the actions menu of the replication relationship schedule to change.
7. Select **Edit long-term retention**.
8. In the Edit long-term retention dialog, enable or disable snapshots for long-term retention.
9. If you select to disable snapshots for long-term retention, select **Apply** to complete this operation.
10. If you select to enable snapshots for long-term retention, choose between selecting an existing policy or creating a new policy.
    a. To use an existing policy, select it from the dropdown menu.
    b. To create a new policy, provide the following:
        i. **Policy name**: Enter a policy name.
        ii. **Snapshot policies**: Select one or more snapshot policies.
        iii. **Copies to retain**: Enter the number of snapshot copies to retain on the target file system.
11. Select **Apply**.

Manage snapshots of an FSx for ONTAP volume

Edit snapshot settings, enable directory access, and delete snapshots to manage your snapshots and data protection in Workload Factory.

Edit a snapshot

Edit the name, label, and retention period of a snapshot. If the snapshot isn't already immutable, you can make the snapshot immutable.

Steps

1. Log in using one of the console experiences.

2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system with the volume and then select **Manage**.
5. In the file system overview, select the **Volumes** tab.
6. From the **Volumes** tab, select the actions menu for the volume with the snapshot to edit.
7. Select **Data protection actions** and then **Manage snapshots**.
8. From the Manage snapshots page, select the actions menu for the snapshot to edit, and then select **Edit**.
9. In the Edit a snapshot dialog, you may edit the following:
    a. Change the name.
    b. Change the label.
    c. Change the retention period.
    d. Optional: **Make this snapshot immutable** to prevent the snapshot from being deleted during the retention period.

        If the snapshot is already immutable, you can't edit this setting.

        Accept the statement regarding immutable snapshots.
10. Select **Apply**.

Access a snapshot

Enable snapshot directory access to give users the ability access snapshots autonomously.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system with the volume and then select **Manage**.
5. In the file system overview, select the **Volumes** tab.
6. From the **Volumes** tab, select the actions menu for the volume with the snapshot to access.
7. Select **Data protection actions** and then **Manage snapshots**.
8. From the Manage snapshots page, select the actions menu for the snapshot to access, and then select **Access**.
9. In the Access snapshot dialog, select to **Enable snapshot directory access** to access this volume snapshot and all snapshots of the volume.
    - For NFS volumes: Select **NFS access path** to view the NFS path for the snapshot.
    - For SMB/CIFS volumes: Select **SMB access path** to view the SMB path for the snapshot.
10. Copy the access path.
11. Select **Apply**.

Restore data from a snapshot

You have the option to restore data from a snapshot to an existing volume or to a new volume.

Restore a volume from a snapshot

Delete a snapshot

Delete a snapshot to free up space.

Immutable snapshots cannot be deleted until the retention period ends.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system with the volume and then select **Manage**.
5. In the file system overview, select the **Volumes** tab.
6. From the **Volumes** tab, select the actions menu for the volume with the snapshot to delete.
7. Select **Data protection actions** and then **Manage snapshots**.
8. From the Manage snapshots page, select the actions menu for the snapshot to delete, and then select **Delete**.
9. In the Delete snapshot dialog, type "delete".
10. Select **Delete** to confirm deletion.

Related information

- Create a snapshot
- Create a snapshot policy
- Restore a volume from a snapshot

Backups

Manage the backup schedule for an FSx for ONTAP file system

Manage the backup schedule for an FSx for ONTAP file system in NetApp Workload Factory.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system to update the backup schedule for and then select **Manage**.
5. Under Information, select the pencil icon next to **FSx for ONTAP backup**. The pencil icon appears next to the dropdown arrow when the mouse hovers over the **FSx for ONTAP backup** row.

6. In the **FSx for ONTAP backup** dialog, provide the following:
    a. **Daily automatic backups**: Enable or disable the feature. If you disable the feature, select **Apply**. If you enable the feature, complete the following steps.
    b. **Automatic backup retention period**: Enter the number of days to retain automatic backups.
    c. **Daily automatic backup window**: Select either **No preference** (a daily backup start time is Selected for you) or **Select start time for daily backups** and specify a start time.
    d. **Weekly maintenance window**: Select either **No preference** (a weekly maintenance window start time is selected for you) or **Select start time for 30-minute weekly maintenance window** and specify a start time.
7. Select **Apply**.

Replication

Replicate data protection volumes in NetApp Workload Factory

Replicate data protection volumes, or cascade the replication of volume data, to extend data protection to tertiary systems or migrate your data.

About this task

NetApp Workload Factory supports replicating data protection volumes, also called *cascade deployments*. A *cascade deployment* consists of a chain of relationships in which a source volume is mirrored to a secondary volume (first hop), and the secondary volume is mirrored to a tertiary volume (second hop). If the secondary volume becomes unavailable, you can synchronize the relationship between the primary and tertiary volumes without performing a new baseline transfer.

This feature is supported for FSx for ONTAP file systems with ONTAP version 9.6 and higher. Refer to ONTAP documentation for compatible ONTAP versions.

Learn more about how cascade deployments work.

Before you begin

Consider the following before you begin:

- Be aware that volumes that are part of a cascade configuration can take longer to resynchronize.
- If the source volume of the relationship is a data protection volume and is a target of another relationship, reversing the replication relationship isn't supported.
- One replica of a data protection volume (or a second hop) is supported. It isn't considered best practice to create a second replica of a data protection volume (or a third hop).

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system that contains the volume(s) to replicate and then select **Manage**.
5. From the file system overview, select the **Volumes** tab.
6. In the Volumes table, select one or more data protection volumes (DP/replicated volumes), and then select

Replicate data.

7. On the Replicate data page, under Replication target, provide the following:
   a. **FSx for ONTAP file system**: Select credentials, region, and FSx for ONTAP file system name for the target FSx for ONTAP file system.
   b. **Storage VM name**: Select the storage VM from the dropdown menu.
   c. **Volume name**: The target volume name is generated automatically with the following format `{OriginalVolumeName}_copy`. You can use the auto-generated volume name or enter another volume name.
   d. **Use case**: Select one of the following use cases for the replication. Depending on the selected use case, Workload Factory fills in the form with recommended values in accordance with best practices. You can accept the recommended values or make changes as you complete the form.
      - Migration: transfers your data to the target FSx for ONTAP file system
      - Hot disaster recovery: ensures high availability and rapid disaster recovery for critical workloads
      - Cold or archive disaster recovery:
        - Cold disaster recovery: uses longer recovery time objectives (RTO) and recovery point objects (RPO) to lower costs
        - Archive: replicates data for long-term storage and compliance
      - Other
   e. **Tiering policy**: Select the tiering policy for the data stored in the target volume. The tiering policy defaults to the recommended tiering policy for the use case you selected.

      Balanced (Auto) is the default tiering policy when creating a volume using the Workload Factory console. For more information about volume tiering policies, refer to Volume storage capacity in AWS FSx for NetApp ONTAP documentation. Note that Workload factory uses use-case based names in the Workload Factory console for tiering policies and includes FSx for ONTAP tiering policy names in parentheses.

      If you selected the migration use case, Workload Factory automatically selects to copy the tiering policy of source volume to the target volume. You can deselect to copy the tiering policy and select a tiering policy which applies to the volume selected for replication.

   f. **Max transfer rate**: Select **Limited** and enter the max transfer limit in MB/s. Alternatively, select **Unlimited**.

      Without a limit, network and application performance may decline. Alternatively, we recommend an unlimited transfer rate for FSx for ONTAP file systems for critical workloads, for example, those that are used primarily for disaster recovery.

8. Under Replication settings, provide the following:
   a. **Replication interval**: Select the frequency that snapshots are transferred from the source volume to the target volume.
   b. **Long-term retention**: Optionally, enable snapshots for long-term retention. Long-term retention enables business services to continue operating even through a complete site failure, supporting applications to fail over transparently using a secondary copy.

      Replications without long-term retention use the *MirrorAllSnapshots* policy. Enabling long-term retention assigns the *MirrorAndVault* policy to the replication.

If you enable long-term retention, then select an existing policy or create a new policy to define the snapshots to replicate and the number to retain.

> Matching source and target labels are required for long-term retention. If desired, Workload factory can create missing labels for you.

- **Choose an existing policy**: select an existing policy from the dropdown menu.
- **Create a new policy**: provide the following:
  - **Policy name**: Enter a policy name.
  - Optional: Enable immutable snapshots.
    - Select **Enable immutable snapshots** to prevent snapshots taken in this policy from being deleted during the retention period.
    - Set the **Retention period** in number of hours, days, months, or years.
  - **Snapshot policies**: In the table, select the snapshot policy frequency and the number of copies to retain. You can select more than one snapshot policy.

9. Select **Create**.

Result

The replicated volume or volumes replicate and appear in the **Replication relationships** tab in the target FSx for ONTAP file system.

Reverse a replication relationship in NetApp Workload Factory

Reverse a replication relationship in NetApp Workload Factory so that the target volume becomes the source volume.

Reverse operations are supported for the following:

- Two FSx for ONTAP file systems
- One FSx for ONTAP file system and one on-premises ONTAP cluster

After you stop replication and make changes to the target volume, you can replicate those changes back to the source volume. This process is common in a disaster recovery scenario in which you operate on the target volume for a while and want to switch roles of the volumes.

About this task

When you reverse and resume a replication, it switches the source and target roles of your volumes; the target volume becomes the new source volume, and the source volume becomes the new target volume. The reverse operation also overwrites the contents of the new target volume with the contents of the new source volume. If you reverse a replication twice, the original replication direction re-establishes.

> Any data written to the original source volume between the last data replication and the time that the source volume is disabled is not preserved.

Before you begin

Make sure that you know the current and future roles of your source and target volumes because changes on the new target volume are overwritten with the new source volume. If used incorrectly, you can experience unintended data loss.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.
6. In the Replication relationships tab, select the actions menu of the replication relationship to reverse.
7. Select **Reverse relationship**.
8. In the Reverse relationship dialog, select **Reverse**.

Change the replication schedule of a source volume

Change the replication schedule of the source volume in a replication relationship in NetApp Workload Factory.

Choose how frequently snapshots from the source volume are transferred to the replicated volume to match your required point objectives (RPOs).

When an on-premises ONTAP cluster is the target for the replication relationship, changing the replication schedule isn't supported.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.
6. In the Replication relationships tab, select the actionsenu of the replication relationship schedule to change.
7. Select **Edit replication interval**.
8. In the Edit replication interval dialog, select the frequency of snapshot transfer from the source volume. You may select between the following frequencies:
    - Every 5 minutes
    - Hourly
    - Every 8 hours
    - Daily
    - Weekly
9. Select **Apply**.

Limit the max transfer rate of a replication relationship

Limit the max transfer rate of a replication relationship in NetApp Workload Factory. An unlimited transfer rate might negatively impact the performance of other applications and

your network.

About this task

Limiting the max transfer rate is optional but recommended. Without a limit, network and application performance might decline.

Alternatively, we recommend an unlimited transfer rate for FSx for ONTAP file systems for critical workloads, for example, those that are used primarily for disaster recovery.

Before you begin

Consider how much bandwidth to allocate for replication.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actionsenu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.
6. In the Replication relationships tab, select the actionsenu of the replication relationship to limit the max transfer rate for.
7. Select **Edit max transfer rate**.
8. In the Edit max transfer rate dialog, select **Limited** and enter the max transfer limit in MB/s.

   Alternatively, select **Unlimited**.

9. Select **Apply**.

Update snapshot data in a replication relationship

A replication relationship has a set replication schedule, but you can manually update snapshot data transferred between source and target volumes in NetApp Workload Factory at any time.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.
6. In the Replication relationships tab, select the actions menu of the replication relationship to update.
7. Select **Update now**.
8. In the Update dialog, select **Update now**.

Pause and resume a replication relationship in NetApp Workload Factory

Pause a replication relationship to stop scheduled replication updates from the source

volume to the target volume. The target volume transitions from read-only to read/write. Both volumes continue to share the latest replication snapshot as a new baseline for later resynchronization.

About this task

When paused, the replication relationship between source and target volume continues to exist. Data transfers pause and the volumes become independent. To re-enable the transfer of changes from source volume to destination volume, resume the replication.

When you resume a replication, all the changes to the target volume are undone and NetApp Workload Factory re-enables the replication. The target volume transitions from read/write to read-only, and receives updates from the source volume at the scheduled replication interval again. When you resume a replication relationship, the target volume reverts back to the latest initial replication snapshot, at which point, the volume replication process starts over.

Before you begin

If you pause when a transfer is in progress, the transfer is not affected, and the relationship becomes "Quiescing" until the transfer completes. If the current transfer aborts, it is now a future transfer and will not restart.

Pause a replication relationship

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.
6. In the Replication relationships tab, select the actions menu of the replication relationship to pause.
7. Select **Pause (Quiesce)**.
8. In the **Quiesce relationship** dialog, select **Quiesce**.

Result

The relationship pauses and its status shows as "Paused".

Resume a paused replication relationship

When you resume a replication relationship, any changes to the destination volume while the replication was stopped are deleted.

Any data written to the original source volume between the last data replication and the time that the source volume is disabled is not preserved.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.

4. From **FSx for ONTAP**, select the actions menu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.
6. In the Replication relationships tab, select the actions menu of the replication relationship to resume.
7. Select **Resume**.
8. In the Resume relationship dialog, select **Resume**.

Result

The relationship resumes and its status shows as "Replicated".

Stop a replication relationship in NetApp Workload Factory

Stop a replication relationship in NetApp Workload Factory. When you stop a replication relationship, scheduled replication updates from the source volume to the target volume pause. The target volume transitions from read-only to read/write.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.
6. In the Replication relationships tab, select the actions menu of the replication relationship to stop.
7. Select **Break**.
8. In the Break replication dialog, select **Break**.

Result

The replication status of the volume changes to **Broken**. The target volume becomes writable.

Delete a replication relationship in NetApp Workload Factory

Delete a replication relationship in NetApp Workload Factory. When you delete a replication relationship, it removes the replication relationship between the source and target volume. After the replication relationship deletes, both volumes continue to exist independently with the current data they contain.

When you delete a replication relationship, FSx for ONTAP also deletes the common replication snapshots of the source and target volume.

Steps

1. Log in using one of the console experiences.
2. Select the menu and then select **Storage**.
3. From the Storage menu, select **FSx for ONTAP**.
4. From **FSx for ONTAP**, select the actions menu of the file system to update and then select **Manage**.
5. From the file system overview, select the **Replication relationships** tab.

6. In the Replication relationships tab, select the actions menu of the replication relationship to delete.
7. Select **Delete**.
8. In the Delete relationship dialog, select **Delete**.

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