Work with block storage

NetApp Keystone

NetApp
March 11, 2021

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Overview

In block storage systems, the data storage is broken up into individual pieces each with a unique identifier. NetApp Service Engine refers to the block data storage as a block store, and the individual pieces as disks.

Block stores belong to a subtenant and are specified within a zone (one block store per zone per subtenant). A block store has networking attributes (for example, IP address and VLAN ID) which are used to access disks through the iSCSI or FC protocol. Disaster recovery DP can be enabled on a block store. For more information, see Disaster recovery.

Block stores must be initialized before they can be used. Where block storage is available and it has not been initialized, it can be initialized prior to creating the first disk on the block store as part of the Create Disk process.

Disks are created on block stores. Disks have many configurable attributes included capacity and associated service level. DP options such as Snapshots and Disaster recovery can be enabled for a disk.

Access to disks is controlled through host groups. Host groups consist of initiator node names; by mapping one or more host groups to a disk, you can define which initiators have access to the disk.

Host groups:

- Are protocol specific. They can be either:
  - FC protocol host groups: these consist of initiators that are FC World Wide Port Names (WWPNs). For example, `20:56:00:a0:98:5c:0d:da`).
  - iSCSI protocol host groups: these consist of initiators that are iSCSI qualified names (IQNs). For example, `iqn.1998-01.com.vmware:esx2`.
- Consist of alias/initiator pairs. An alias allows a simple way to identify the initiator. For example, `esxserver1`.
- Can be created without any initiators. Empty host groups can be mapped to disks as placeholders but must be fully defined to allow access to the disk. Using host groups allows for:
- Mapping multiple disks to the same set of initiators
- Updating the set of initiators across multiple disks.

This section contains information on:

- Working with host groups:
  - View host groups
  - Create a host group
  - Modify host group initiators
  - Delete a host group
- Working with disks:
  - View disks
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- Modify a disk
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Work with host groups

Host groups are defined to determine access to disks. Based on the initiator nodes assigned to a host groups, the access of that host group is determined.

View host groups

To view the Host Group list, select **BLOCK STORAGE > Host Groups** from the menu.

The list displays the defined host groups.

From this page you can create a new host group, modify a host group, and delete a host group.

Create a host group

There are two ways to create a host group:

- From the Host Groups page, described below.
- As part of creating a new disk. Use this method when you need to create a host group on a block store that has not yet been initialized. For more information see Create a new disk.

  It is possible to create an empty host group and map it to a disk as a placeholder. You must update the empty host group to add initiators before you will be able to access the storage.

Before you begin

You need the following to create the host group:

- The subtenant, region and zone in which to create the host group.

If the block store for a subtenant/zone combination has not been previously initialized, you will not be able to create a host group using this method. An alternative is to follow the Create a new disk process, which allows you to initialize the block store and create a host group as part of the process.

- A name for the host group
- The host group protocol: iSCSI or FCP
- The list of initiators to add to the group: WWPNs for FC hosts nodes or IQNs for iSCSI host node names.
- An alias for each initiator; an alias is a simple name to identify the initiator server, or an individual port/interface on the server. For example, Server 4.

Steps

1. View the host groups list.

2. Click **Create Host Group**.
3. On the Create Host Group page:
    a. Select the protocol: iSCSI or FCP.
    b. Select the subtenant, region, and zone and for the host group.
4. Specify a name for the host group.
5. Select the OS Type: the disk operating system.
6. Add the Initiators for the group. For each initiator, specify the alias and the initiator.
7. If required, add tags (key-value pairs) to the host group in the Tags section.
8. Click **Create**. This creates the host group.

After you finish

After the host group is created, it is available for mapping to disks.

Modify host Groups

You can modify a host group to add, remove or amend initiators.

Modifying a host group will modify access for each disk mapped to the host group.

You cannot modify the alias of an initiator. To change the alias, delete the initiator from the group and then re-create it.

Steps

1. View the Host Groups list.
2. Locate the host group in the list and click the Edit icon for that host group.

    To modify an existing initiator, locate the initiator in the list, edit the initiator value and click **Update**.

    To add an initiator:

    a. click **Add Initiator**.
    b. Specify the Alias and Initiator.
    c. Click **Create**.

    To remove an initiator from the host group, locate the initiator in the list and click the Delete icon.
3. Click **Done**.

Delete a host groups

You can delete a host group if there are no disks mapped to the host group.

Steps

1. View the Host Groups list.
2. Locate the host group in the list and click the Delete icon for that host group.

3. At the Confirm Delete dialog, enter the host group name to confirm that you want to delete the host group.
4. Click **Confirm**.

View disks

The Disks list displays the disks belonging to the selected tenant. To view the list, select **BLOCK STORAGE > Disks** from the menu.

The disks that are already a part of your existing environment and belong to the storage VMs configured in your NetApp Service Engine, can also be viewed on this screen and be managed as a part of your NetApp Keystone Flex Subscription (Flex Subscription) services. The disks provisioned outside of the NetApp Service Engine are periodically imported and listed on this page with appropriate status codes.

If the imported disks are in acceptable standards of NetApp Service Engine, that is, if all the parameters that are required for making the disks operational are available, they are imported with the status as `Operational` and can be directly managed through NetApp Service Engine. However, some disks might not be in the same standard as the existing disks on NetApp Service Engine. After import, these disks are categorized with `Imported` or `Non-Standard` status. For understanding the disk statuses and the steps to be taken to make them operational, see Object states

In the Disks list, view simple information. For more information about how to use the features of a list, see List view.

- Disk name
- Path to the disk
- Disk size
- Protocol
- Subtenant to which the disk belongs
- Zone in which disk exists
- Operational state

Create a disk

This section describes how to create a new disk by directly specifying the disk details. For instructions on how to create a disk based on a snapshot of an existing disk, see Create a disk from a snapshot.

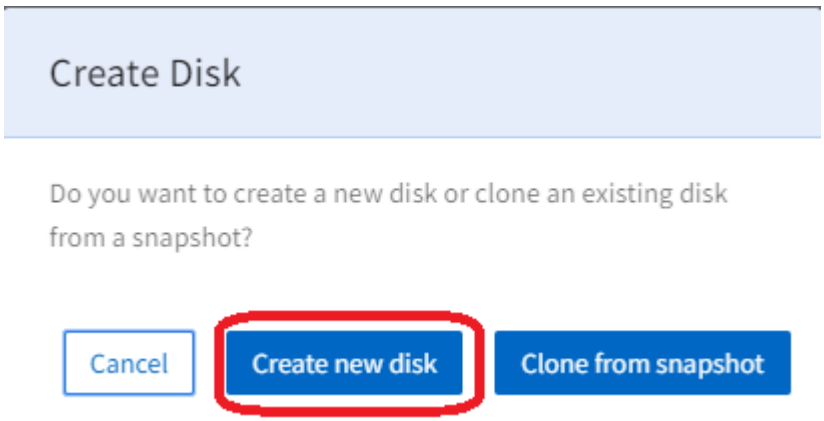
Before you begin

- If block storage is available but not initialized, you will be asked to initialize it before you can create the disk. To initialize the block store, you need:
  - The VLAN ID and subnet for the block store. If you are not familiar with your network environment, please check with you IT department for the relevant values.
  - The protocol to be used. By default, block stores have the iSCSI service enabled. You can optionally enable the FCP service if the infrastructure allows it.
  - The disaster recovery region, zone, and schedule if you want to enable asynchronous disaster recovery DP for the disk. For more information, see Disaster recovery.

- Identify or define the host groups to be mapped to the disk. You can also create a host group as part of the disk creation.
- To enable asynchronous disaster recovery DP options for the disk, you must create the disk on a block store that is asynchronous disaster recovery enabled. For more information, see Disaster recovery.
- To enable synchronous disaster recovery for a disk, create the disk in a zone that is MetroCluster-enabled.
- You can define a backup policy to capture backups of the disk on a scheduled basis. For more information, see Backups.

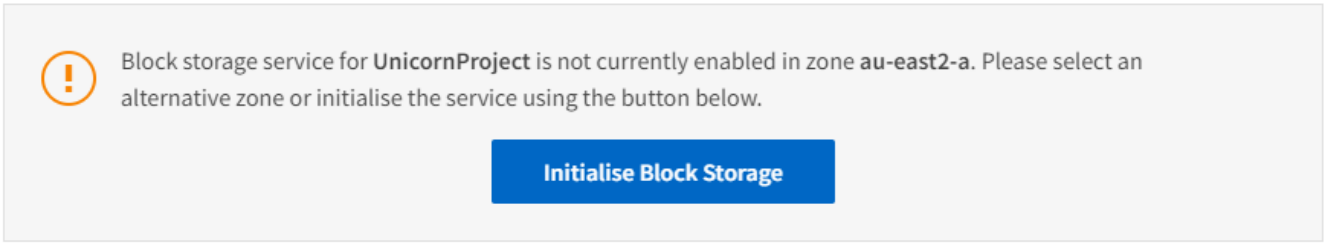
Steps

1. View the Disks list.
2. Click **Create Disk**.
3. In the Create Disk dialog box, select Create New Disk.



The Create Disk page is displayed.

4. Select the protocol for accessing the disk: iSCSI or FCP.
5. Select the subtenant, region, and zone, and subtenant for the new disk. The block store details for the selected region, zone, and subtenant display.
6. If block storage is not enabled in the selected zone for the selected subtenant, a message displays to initialize it.



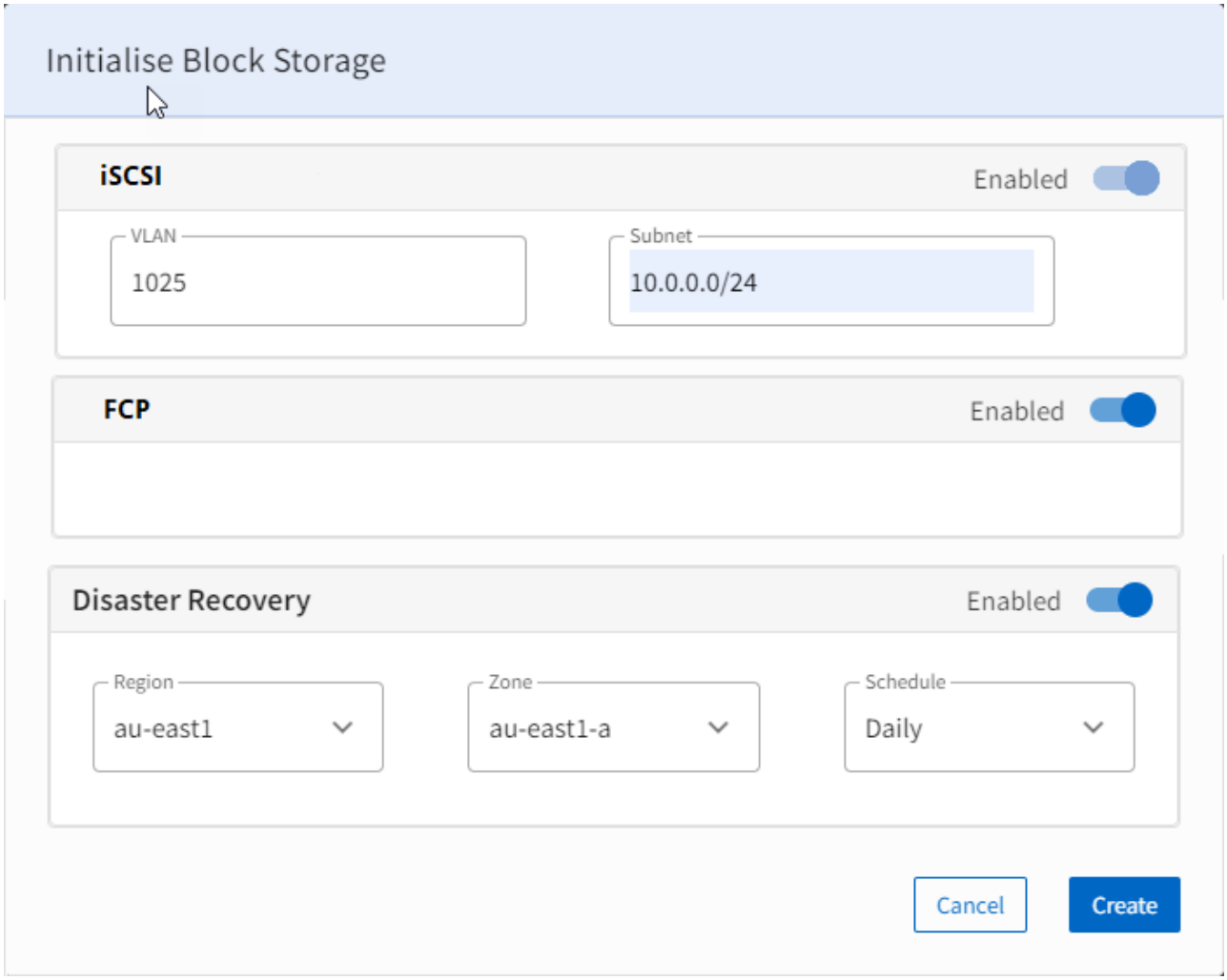
7. Click **Initialize Block Storage**.
8. In the Initialize Block Storage dialog box:
   a. In the iSCSI panel, specify the VLAN and Subnet.

      The iSCSI service is enabled for all disks by default.

   b. If required, enable the FCP protocol (only available if the underlying infrastructure supports it).

c. If required, enable the Asynchronous Disaster Recovery options (enable and select Region, Zone, and Schedule).

d. If the zone selected is MCC-enabled, the Synchronous Disaster Recovery toggle is enabled and cannot be disabled. Disks created in this block store synchronously replicate to the zone displayed in the Synchronous Disaster Recovery panel.



e. Click **Create** to initialize the block store. Wait until the block store initializes. The display returns to Create Disk page.

9. Complete the following fields:

Field	Description
Name	Enter the disk name.
Disk Path	Enter the path for the disk.
OS Type	Select an operating system for the disk.
Host Groups	This list displays existing host groups that match the protocol, OS type, subtenant and zone selected for the disk. Select one or more host groups. To define a new host group, see the next step.

10. If required, create a new host group:
    a. Click **Create Host Group**. The Create Host Group dialog is displayed.
    b. Specify the Name of the host group.
    c. Add the Initiators for the group. For each initiator, specify the alias and the initiator.
    d. If required, add tags (key-value pairs) to the host group in the Tags section.
    e. Click **Create**. The system creates the host group and displays a message when it is successfully created.
    f. To map the newly created host group to the disk, go to the Host Groups field and select it.
11. Select a performance service level.

    Select an option to view the performance details for that level (as peak/expected IOPS/throughput). Select the service level that best matches your needs.

12. Specify the capacity of the disk.
13. If snapshots are required for this disk:
    a. Toggle to enable the Snapshot Policy to view the Snapshot Policy fields.
    b. Specify when to create the snapshots:
        - **Hourly.** Specify which minute (of the hour) to take snapshot (check) and the number of hourly snapshots to retain.
        - **Daily.** Specify when (hour and minute) to take the snapshot (check) and the number of hourly snapshots to retain.
        - **Weekly.** Specify when (day of the week, hour and minute) to take snapshot (check) and the number of weekly snapshots to retain.
        - **Monthly.** Specify when (day of the month, hour, and minute) to take snapshot and the number of monthly snapshots to retain.
14. If asynchronous disaster recovery is enabled on the underlying block store, asynchronous disaster recovery replication is automatically enabled for the new disk. If you wish to exclude the disk from asynchronous disaster recovery replications, toggle the Asynchronous Disaster Recovery toggle so that asynchronous disaster recovery is disabled.
15. If the disk is being created in a zone that is MetroCluster-enabled, the Synchronous Disaster Recovery button is enabled and cannot be disabled. The disk will be replicated to the zone displayed in the Synchronous Disaster Recovery panel.
16. To enable backups for this disk:
    a. Toggle to enable the Backup Policy to view the Backup Policy fields.
    b. Specify the backup zone.
    c. Specify how many of each type of backup to keep: daily, weekly, and/or monthly.
17. If you want to add tags (key-value pairs) to the disk, specify them in the Tags section.
18. Click **Create**. This creates a job to create the disk.

After you finish

Create disk is run as an asynchronous job. You can:

- Check the status of the job in the jobs list.

- After the job is finished, check the status of the disk in the Disks list.

Create a disk from a Snapshot

You can create a new disk from an existing Snapshot. The new disk, cloned from the Snapshot, has the same properties as the disk from which the Snapshot is created.

Steps

1. Select **BLOCK STORAGE** from the left navigation pane and select **Disks**.
2. Click **Create Disk** and select **Clone from snapshot**.
   The **Select Disk** screen is displayed with all the disks for the tenant. You can filter disks by region, zone, and subtenant. You can select any disk that is in operational state.
3. Select the checkbox next to the disk that you want and click **Next**.
   The **Select Snapshot** screen is displayed with all the Snapshots for the disk.

   For the selected disk, if you have some Snapshots created in your SnapCenter environment outside of NetApp Service Engine, you can find these Snapshots imported and listed for your selection. You can select these imported Snapshots and clone the new disks from them.

   You can search for a particular Snapshot or select the schedule type to filter the Snapshots.
4. Select the checkbox next to the Snapshot that you want to clone from and click **Next**.
   The new disk inherits the properties of the selected Snapshot.
5. Add **Name** and **Disk Path**. Update the other settings, such as assigning a **Service Level**, and click **Create**.

After you finish

Create Disk is run as an asynchronous job. You can:

- Check the status of the job in the jobs list. For information about tracking jobs, see here.
- After the job is finished, check the status of the disk in the **Disks** list.

Modify a disk

You can change the disk name, the host group mapping, performance service level, capacity, and snapshot policy. Using this method, you can move your disks to different service levels if available.

Before you begin

The disk must be in an operational state. For understanding volume statuses and the steps to be taken to make them operational, see View disks and Object states

Steps

1. View the Disks list.
2. Locate the disk in the list and click the Edit icon for that disk. (For details about working with items in lists, see List view actions).

3. Make any changes as required; refer to Create a new disk for field descriptions.
4. Click **Done**. This creates a job to modify the disk.

After you finish

Modify disk is run as an asynchronous job. You can:

- Check the status of the job in the jobs list. For information about tracking jobs, see here.
- After the job is finished, check the status of the disk in the Disks list.

Delete a disk

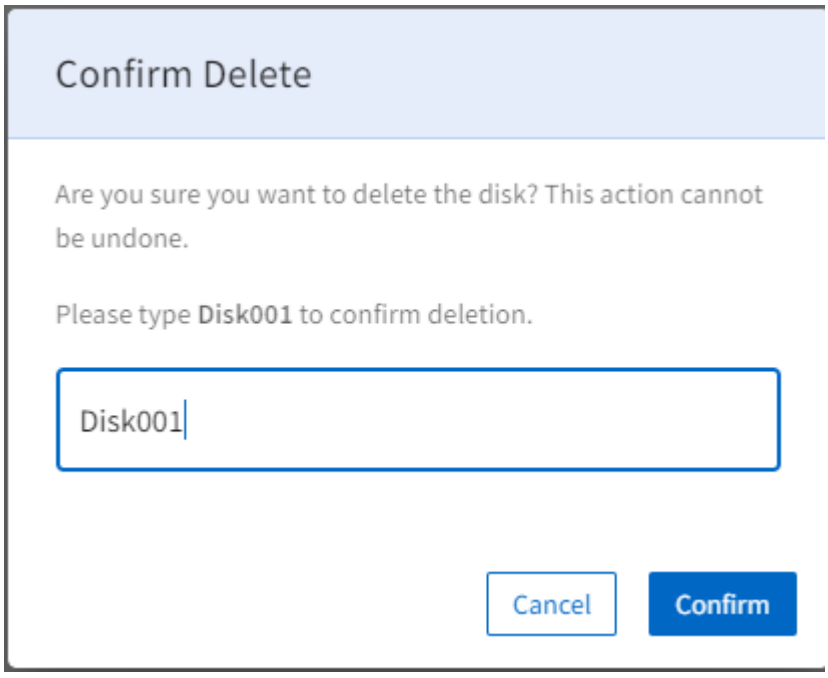
This section describes how to delete a disk.

Attention:

- You cannot undo deletion of a disk.
- Deleting a primary disk will delete all associated backups

Steps

1. View the Disks list.
2. Locate the disk in the list and click the Delete icon for that disk. (For details about working with items in lists, see List view actions.
3. In the Confirm Delete dialog box, enter the disk name to confirm that you want to delete the disk.



4. Click **Confirm**. This creates a job to delete the disk.

After you finish

Delete disk is run as an asynchronous job. You can:

- Check the status of the job in the jobs list. For information about tracking jobs, see here.
- After the job is finished, verify that the disk has been removed from the Disks list.

Create an adhoc snapshot of a disk

This section describes how to create an adhoc snapshot of a disk.

Steps

1. View the Disks list.
2. Locate the disk in the list and click the Snapshot icon for that disk. (For details about working with items in lists, see List view actions).
3. In the Create Snapshot dialog box, enter a name for your snapshot and click **Create**.

After you finish

The snapshot might take a few minutes to become available.