Managing Volumes

This chapter contains the following sections:

- Volumes, page 1
- Creating Volumes, page 3
- Adding Mirrored Copy, page 4
- Deleting Volumes, page 5
- Editing Volumes, page 5
- Expanding Volumes, page 6
- Migrating Volumes, page 6
- Renaming Volumes, page 7
- Shrinking Volumes, page 7
- Mapping to Host, page 8
- Unmapping All Hosts, page 8
- Unmapping A Single Host, page 9
- View Details of Volume Mirrored Copies, page 9

Volumes

One or more volumes are allocated physical storage space from each pool.

1. File Volume—A logical disk that the system presents it through the file systems. In comparison to the block volumes, it is a much simpler form of storage for users to access and share. A file volume is available using common file-level protocols, such as Server Message Block (SMB), Common Internet File System (CIFS), and Network File System (NFS), using network-attached storage (NAS) devices.
2. Block Volume—A logical disk that the system presents the physical storage space allocated from a storage pool to the attached hosts.

File Volumes

A file is the physical storage assigned to a file system pool. The file volume, in turn, is a logical disk that the system presents to the file systems.

- File System Pools—A file system pool consists of volumes of the same disk type. The file system pools are a type of storage pools that consists of a collection of disks that jointly contain all the data across a specified set of file systems.
- File Systems—A file system consists of one or more file system pools. The storage pools must be defined before creating the file system. You can create, edit, mount, unmount, set as destination, or remove a file system. You can select either one of the two preset policies for either a single file system pool or a migration, or create a custom policy.
- File Sets—A file set is a subset of a file system that provides granularity of functions such as snapshots or quotas within the file system.
- File Shares—A shared disk space that can be made available through the protocols specified during its creation. Hypertext Transfer Protocol (HTTP), Secure Copy Protocol (SCP), File Transfer Protocol (FTP), Common Internet File System (CIFS), and Network File System (NFS) shares can all be created, provided that the corresponding protocol is enabled for the system.
- Quotas—A quota is used to control the allocation of files and data blocks in a file system.
- Snapshots— A snapshot of an entire file system or of an independent file set can be created to preserve the contents of the file system or the independent file set at a single point in time.

Block Volumes

A block volume is a logical disk that the system presents to a host connected over a fibre channel or Ethernet network. Each volume copy is created from a set of extents in a storage pool. Each volume can have a maximum of two copies. Host applications access volumes, not MDisks or drives. To keep a volume accessible even when an MDisk on which it depends has become unavailable, a mirrored copy can be added to a selected volume. Volumes are presented to hosts by host mapping. Host mapping controls which hosts have access to specific volumes in the storage system.
You can create the following volume types:

- Generic—Creates volumes that use a set amount of capacity from the selected storage pool.
- Mirror—Creates volumes with two physical copies. Each copy can belong to a different storage pool that provide data protection from storage failures.
- ThinMirror—Creates volumes with two physical copies that provide data protection from storage failures while using only the capacity that is written by the host application.
- ThinProvision—Creates large-capacity volumes that use only the capacity that is written by the host application.
- Compressed—Creates volumes where data can be compressed when it is stored on a disk.
- CompressedMirror—Creates volumes where data can be compressed and stored with two physical copies that provide data protection from storage failures.

Creating Volumes

Step 1 Choose **Physical** > **Storage**.

Step 2 In the left pane, navigate to the pod in which the storage account is added.

Step 3 Choose the storage account type.

Step 4 Click **Volumes**.

Step 5 Click **Create**.

Step 6 On the **Create Volume** screen, complete the following fields:

Name	Description
Volume Name field	The volume name. If you do not specify a name, the system assigns a name automatically.
Volume Type drop-down list	Choose the type of volume that you want to create.
Capacity field	Enter the volume capacity in terms of bytes, KB, MB, GB, or TB.
Capacity Unit drop-down list	Choose the unit in bytes, KB, MB, GB, or TB for the volume capacity.
Pool drop-down list	Choose the storage pool.
Secondary Pool drop-down list	Choose the secondary pool.
Mirror Sync Rate field	Enter the rate (%) at which copies (mirroring) can be synchronized. A value of zero prevents synchronization.
Preferrred Node drop-down list	Choose the host. **Note** Hosts try to access the volumes through the preferred node. Each volume has a preferred node that balances the load between nodes. By default, the system automatically balances the load between nodes.
Real Capacity Unit drop-down list	Choose the real capacity that is allocated to the volume in terms of % of Virtual Capacity or GB.
Automatically Expand check box	Check this check box to automatically increase the real capacity as data is written to the volume.

Name	Description
Warning Threshold check box	Check this check box to manually increase the real capacity when the warning threshold exceeds in terms of % of Virtual Capacity. **Note** When the used capacity exceeds the warning threshold, an event is raised, indicating that the additional real capacity is required. You can manually increase the real capacity that is previously allocated to the volume.
Warning Threshold (% of Virtual Capacity) field	Displays the warning threshold set beyond which you have to manually increase the real capacity.
Thin Provisioned Grain Size drop-down list	Choose the thin-provisioned grain size. It is the size of a single chunk of data on the volume. **Note** Smaller grain sizes save data while larger grain sizes produce better performance.

Step 7 Click **Submit**.

Adding Mirrored Copy

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume that you want to create a copy of the volume in another storage pool.
Step 6 Click **Add Mirrored Copy**.
Step 7 On the **Add Mirrored Copy** screen, complete the following fields:

Name	Description
Volume Name	The volume name (Display only).
Current Pool	The current pool (Display only).
Volume Type drop-down list	Choose **Generic** or **Thin-provisioned** or **Compressed** type.
Select Pool drop-down list	Choose the storage pool in which you want to create the copy of the volume.

Step 8 Click **Submit**.

Deleting Volumes

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume that you want to delete.
Step 6 Click **Delete**.
Step 7 On the **Delete Volume** screen, check the **Force Delete** check box.
Step 8 Click **Submit**.

Editing Volumes

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume that you want to edit.
Step 6 Click **Edit**.
Step 7 On the **Edit Volume** screen, complete the following fields:

Name	Description
Volume Name field	The volume name.
Capacity	The volume capacity (Display only).
I/O Group	Display only. The I/O groups through which the hosts can access the volume.
Cache Mode check box	Check this check box to enable the cache for faster I/O operations.

Name	Description
Sync Rate field	Enter the rate (%) at which copies (mirroring) can be synchronized. A value of zero prevents synchronization.

Step 8 Click **Submit**.

Expanding Volumes

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume for which you want to increase the available capacity.
Step 6 Click **Expand**.
Step 7 On the **Expand Volume** screen, enter the capacity in the **Expand By** field.
Step 8 Choose the capacity unit from the **Unit** drop-down list.
Step 9 Click **Submit**.

Migrating Volumes

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume from which you want to migrate data from the current storage pool to the new storage pool.
Step 6 Click **Migrate**.
Step 7 On the **Migrate Volume** screen, click **Select**.
Step 8 Check the check box to choose the new storage pool to which you want to migrate data.
Step 9 Click **Select**.
Step 10 Click **Submit**.

Renaming Volumes

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume that you want to rename.
Step 6 Click **Rename**.
Step 7 On the **Rename Volume** screen, enter a new name for the volume.
Step 8 Click **Submit**.

Shrinking Volumes

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume for which you want to decrease the available capacity.
Step 6 Click **Shrink**.
Step 7 On the **Shrink Volume** screen, enter the capacity in the **Shrink By** field.
Step 8 Choose the capacity unit from the **Unit** drop-down list.
Step 9 Click **Submit**.

Mapping to Host

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume that you want to map to a host.
Step 6 Click **Map to Host**.
Step 7 On the **Map Volume to Host** screen, click **Select**.
Step 8 Check the check box to choose the host to which you want to map the volume.
Step 9 Click **Select**.
Step 10 Click **Submit**.

Unmapping All Hosts

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume that you want to unmap from the host to which the volume is mapped.
Step 6 Click **Unmap All Hosts**.
Step 7 On the **Unmap Volume from All Hosts** screen, click **Submit**.

Unmapping A Single Host

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume that you want to unmap from a single host to which the volume is mapped.
Step 6 Click **Unmap Single Host**.
Step 7 On the **Unmap Single Host** screen, click **Select**.
Step 8 Choose the host from which you want to unmap the volume.
Step 9 Click **Select**.
Step 10 Click **Submit**.

View Details of Volume Mirrored Copies

Use the **Volume** tab and view the details of mirrored copies of volumes.

You can perform the following actions:

- **Make Primary Volume**
- **Split into New Volume**
- **Duplicate**
- **Delete Mirrored Copy**

Viewing Volume Mirrored Copies

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume mirrored copy.
Step 6 Click the down-arrow, and then click **View Details**.
Step 7 Click **Volume Mirrored Copies** to perform actions on the volume mirrored copies.

Making Primary Volume

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume copy that you want to make it as the primary volume.
Step 6 Click **Make Primary Volume**.
Step 7 Click **Select**.
Step 8 Check the check box to choose the volume copy that can be made as the primary volume.
Step 9 Click **Select**.
Step 10 Click **Submit**.

Splitting Volumes into New Volumes

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume copy that you want to split into a new volume.
Step 6 Click **Split into New Volume**.
Step 7 On the **Splitting Volume into New Volume** screen, enter the new volume name.
Step 8 Click **Submit**.

Duplicating Volumes

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Choose the volume that you want to create a copy of the volume.
Step 6 Click **Duplicate**.
Step 7 On the **Duplicate Volume** screen, enter the new volume name.
Step 8 Click **Submit**.

Deleting Mirrored Copy

Step 1 Choose **Physical** > **Storage**.
Step 2 In the left pane, navigate to the pod in which the storage account is added.
Step 3 Choose the storage account type.
Step 4 Click **Volumes**.
Step 5 Click the down-arrow, and then click **View Details**.
Step 6 On the **Volume Mirrored Copies** screen, choose the volume mirrored copy that you want to delete.
Step 7 Click **Delete Mirrorored Copy**.
Step 8 On the **Delete Mirrored Copy** screen, check the **Force Delete** check box to delete the volume mirrored copy.
Step 9 Click **Submit.**