



Managing File Storage

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File System Pools

A file system pool consists of volumes of the same disk type. 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. Policies are used to define file placement and migration to different file system pools.

File Systems

You can create, mount, unmount, set as destination, or remove a file system. A file system consists of one or more file system pools.

You can select one of the following presets to create a file system:

- **Single pool**—Creates a file system with a single pool.
- **Compressed**—Creates a file system with a compressed data pool and a placement policy that places incompressible files to the system pool.
- **Migration-ILM**—Creates a file system that migrates data between a main pool called System and a secondary pool.
- **Custom**—Creates a file system with customized settings.

Creating Single Pool File Systems

- Step 1** On the menu bar, 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 the **File Systems** tab.
- Step 5** Click **Single Pool**.
- Step 6** In the **Single Pool** dialog box, complete the following fields:

Name	Description
File System Name field	Enter a unique name for the file system.
Owner	Enter the name of the owner or the UID of the owner of the path. It can be a user name or a combination of domain and user name (for example, admin or domain\admin).
File System Pool Name	Choose the file system pool.
Storage Pool table	Choose the storage pool. <ol style="list-style-type: none"> 1 Click Select and choose the storage pool. 2 Click Select .
File System Size	Enter the size of the file system.
File System Size Units	Display only. The size of the file system in terms of GB.

- Step 7** Click **Submit**.

Creating Compressed File Systems

- Step 1** On the menu bar, 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 the **File Systems** tab.
- Step 5** Click **Compressed**.
- Step 6** In the **Create Compressed File System** dialog box, complete the following fields:

Name	Description
File System Name field	Enter a unique name for the compressed file system.
Owner	Displays the name of the owner or the UID of the owner of the path. It can be a user name or a combination of domain and user name (for example, admin or domain\admin). The owner can also be the root.
Owning Group	Displays the name or GID of the group that is associated with the path. The owner group can also be the root.
File System Pool Settings	
System (non compressed) table	Choose the storage pool. 1 Click Select and choose the storage pool. 2 Click Select .
Size (GB) field	Enter the size of the file system.
System (metadata) table Note To enable metadata replication, select a pool from System (metadata)	Choose the storage pool. 1 Click Select and choose the storage pool. 2 Click Select .
Size (GB) field	Enter the size of the file system.
System (compressed) table	Choose the storage pool. 1 Click Select and choose the storage pool. 2 Click Select .
Size (GB) field	Enter the size of the file system.

Step 7 Click **Submit**.

Creating Migration-ILM File Systems

- Step 1** On the menu bar, 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 the **File Systems** tab.
- Step 5** Click **Migration-ILM**.
- Step 6** In the **Create Migration-ILM File System** dialog box, complete the following fields:

Name	Description
File System Name field	Enter a unique name for the Migration-ILM file system.
Owner	root
Owning Group	root
File System Pool Settings	
System table	Choose the storage pool. <ol style="list-style-type: none"> 1 Click Select and choose the storage pool. 2 Click Select .
Size (GB) field	Enter the size of the file system.
System (metadata) table Note To enable metadata replication, select a pool from System (metadata)	Choose the storage pool. <ol style="list-style-type: none"> 1 Click Select and choose the storage pool. 2 Click Select .
Size (GB) field	Enter the size of the file system.
Name field	Enter a unique name.
Compressed check box	Check this check box to create a compressed file system.
Storage Pool	Choose the storage pool. <ol style="list-style-type: none"> 1 Click Select and choose the storage pool. 2 Click Select .
Size (GB) field	Enter the size of the file system.

Name	Description
Migration start threshold (%) field	Starts migrating data automatically when the used capacity exceeds the specified value.
Migration stop threshold (%) field	Stops migrating data automatically when the used capacity decreases below the specified value.
Enable Migration Schedule	<p>Check this check box that enables to schedule migration.</p> <ul style="list-style-type: none"> • Type—Allows to choose the frequency to schedule migration. • Time of Day—Allows to choose the time (00:00) of the day for all types of migration. • Day of the Week—Allows to choose the time (00:00) of the day and one of the days by their names in the week, if Once a Week is the Type selected. • Days of the Week—Allows to choose the time (00:00) of the day and multiple days by their names in the week, if Multiple Days a Week is the Type selected. • Day of Month—Allows to choose the time (00:00) of the day and one of the days in the month, if Once a Month is the Type selected. • Days of Month—Allows to choose the time (00:00) of the day and multiple days by their names, if Multiple Days in a Month is the Type selected.

Step 7 Click **Submit**.

Mounting File Systems

- Step 1** On the menu bar, 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 the **File Systems** tab.
 - Step 5** Choose the file system that you want to mount.
 - Step 6** Click **Mount**.
 - Step 7** In the **Mount File System** dialog box, click **Submit**.
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Unmounting File Systems

- Step 1** On the menu bar, 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 the **File Systems** tab.
 - Step 5** Choose the file system that you want to unmount.
 - Step 6** Click **Unmount**.
 - Step 7** In the **Unmount File System** dialog box, click **Submit**.
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Deleting File Systems

- Step 1** On the menu bar, 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 the **File Systems** tab.
 - Step 5** Choose the file system that you want to delete.
 - Step 6** Click **Delete**.
 - Step 7** In the **Confirm File System Deletion** dialog box, enter Yes in the text box.
 - Step 8** Click **Submit**.
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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 sets provide the ability to partition a file system to allow administrative operations at a finer granularity than the entire file system. There are two types of file sets: dependent and independent.

You can create a preset file set, either a basic or custom type.

- **Basic**—If you are creating a basic file set, specify a path and name, and select if it is a dependent or independent file set type.
- **Custom**—If you are creating a custom file set, specify a path and name, and select the file set type (independent or dependent). Depending on the file set type, you can specify quota or snapshot settings.

Creating File Sets

Step 1 On the menu bar, 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 the **File Sets** tab.

Step 5 Click **Create**.

Step 6 In the **Create File Set** dialog box, complete the following fields:

Name	Description
File Set Type drop-down list	Choose the preset file set type.
Junction Path drop-down list	Choose the path of junction. The junction path must be on one of the file systems.
Subdirectory field	Enter the name of the subdirectory to which the file set belongs.
Name field	Enter the name of the new file set.
Owner field	Enter the owner of path or the UID of the owner of the path. It can be a user name or a combination of domain and user name (for example, admin or domain\admin).
Group field	Enter the group or the GID of the group that is associated with the path.
Comments field	Enter comments, if any.
Type drop-down list	Choose the file set type.

Name	Description
Maximum number of inodes field	Specify the maximum number of inodes that the file set can use. This value depends on the available inodes in the file system. Note The maximum number of inodes that need to be available to create a file set is 1024.
Allocated number of inodes field	Specify the number of inodes that are allocated when the file set is created.
Set Quota check box	Check this check box to set a quota on the new file set.
Soft Limit field and Sized drop-down list	Enter the soft limit for the quota.
Hard Limit field and Sized drop-down list	Enter the hard limit for the quota.
Snapshot drop-down list	Choose the snapshot rule.

Step 7 Click **Submit**.

Editing File Sets

- Step 1** On the menu bar, 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 the **File Sets** tab.
 - Step 5** Choose the file set that you want to edit.
 - Step 6** Click **Edit**.
 - Step 7** In the **Edit File Set** dialog box, enter details in the editable fields, and then click **Submit**.
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Deleting File Sets

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- Step 1** On the menu bar, 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 the **File Sets** tab.
 - Step 5** Choose the file set that you want to delete.
 - Step 6** Click **Delete**.
 - Step 7** In the **Confirm File Set Deletion** dialog box, type Yes in the text box.
 - Step 8** Click **Submit**.
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File Shares

A share is a shared disk space available through the protocols specified during its creation. You can create Hypertext Transfer Protocol (HTTP), Secure Copy Protocol (SCP), File Transfer Protocol (FTP), Common Internet File System (CIFS), and Network File System (NFS) shares, provided that the corresponding protocol is enabled for the system.

Creating File Shares

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- Step 1** On the menu bar, 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 the **File Shares** tab.
 - Step 5** Click **Create**.
 - Step 6** In the **Create File Share** dialog box, complete the following fields:

Name	Description
Share Type drop-down list	Choose the file share type.
Path drop-down list	Choose the file share path.
Share Name field	the name of the new file share.
Owner field	Enter the owner of path or the UID of the owner of the path. It can be a user name or a combination of domain and user name (for example, admin or domain\admin).

Name	Description
Group field	Enter the group or the GID of the group that is associated with the path.
Create a New Independent File Set check box	Check this check box to create a new independent file set that allows for snapshots, user and group quotas
Supported Protocols check boxes	<p>Check one or more check boxes to enable the protocols for the file share:</p> <ol style="list-style-type: none"> 1 HTTP 2 FTP 3 SCP 4 Enable CIFS. See CIFS Settings below. 5 Enable NFS. See NFS Settings below.
CIFS Settings	
Read Only Access check box	Check the check box to enable read-only access. If selected, none of the users and user groups is allowed to modify the existing files or create new files on this share.
Browsable by the File System Browser check box	Check the check box to display the file share in a browser that supports file systems, for example, Windows Explorer.
Hide Objects check box	Check the check box to hide files and directories for users who have no read permissions.
Comments field	Enter comments, if any.
Display Access Control Lists with CIFS check box	Check the check box to enable that displays CIFS access control lists through the CIFS protocol.
Cache Policy drop-down list	Choose the caching policy for the client-side offline caching.

Name	Description
<p>Share Permissions</p>	<p>To specify the access restriction to the file shares, do the following:</p> <ol style="list-style-type: none"> 1 Click the + icon. 2 In the Add Entry to Share Permissions dialog box, enter the name of the user or group, or the security identifier (SID) for access to the file share. 3 Choose either to allow or deny access to the file share. 4 Choose the value for the selected type of access. 5 Click Submit.
<p>NFS Settings</p>	
<p>Add NFS Clients</p>	<p>To add NFS clients, do the following:</p> <ol style="list-style-type: none"> 1 Click the + icon. 2 In the Add Entry to NFS Clients dialog box, enter the client host name or IP address. 3 Check the Read Only Access check box that enables only read-only access. 4 Check the Root Squash check box that enables mapping either the root UID or all client UIDs to the anonymous UID. 5 Check the Secure check box to specify the type of security to use when authenticating NFS clients. The default value is System. If the default value is selected, the UNIX UIDs and GIDs are used to authenticate users. 6 Check the All Squash check box. 7 Enter the anonymous UID for the root user in the Anonymous UID field. The default value is -2. 8 Enter the anonymous GID for the root user in the Anonymous GID field. The default value is -2. 9 Click Submit.

Step 7 Click **Submit**.

Deleting File Shares

- Step 1** On the menu bar, 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 the **File Shares** tab.
 - Step 5** Choose the file share that you want to delete.
 - Step 6** Click **Delete**.
 - Step 7** In the **Delete File Share** dialog box, click **Submit**.
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Activating and Deactivating File Shares

- Step 1** On the menu bar, 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 the **File Shares** tab.
 - Step 5** Choose the file share that you want to activate or deactivate.
 - Step 6** Click **Activate/Deactivate**.
 - Step 7** Click **Submit**.
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Quotas

You can define the quota for users, user groups, and file sets in the system. When you set a quota, you need to specify the soft and hard limits.

Creating Quotas

- Step 1** On the menu bar, 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 the **Quotas** tab.
- Step 5** Choose the file system in which you want to create a quota.
- Step 6** Click **Create**.
- Step 7** In the **Create Quota** dialog box, complete the following fields:

Name	Description
Type drop-down list	Choose the level (file sets, user groups, and users) at which you want to set the quota.
Path drop-down list	Choose the file system path (including the sub directory) to set the quota.
Soft Limit field	Enter the soft limit for the quota.
Soft Limit Unit drop-down list	Choose the soft limit unit.
Hard Limit field	Enter the hard limit for the quota.
Hard Limit Unit drop-down limit	Choose the hard limit unit.
Quota Scope	Choose the file system path to set the quota.
Specify Group IDs and quota sizes	<p>In the Specify Group IDs and Quota Sizes table:</p> <ol style="list-style-type: none"> 1 Click the + icon. 2 In the Add Entry to Specify Group IDs and Quota Sizes dialog box, enter the group ID. 3 Enter the soft limit. 4 Choose the soft limit unit. 5 Enter the hard limit. 6 Choose the hard limit unit. 7 Click Submit.

Name	Description
Specify User IDs and quota sizes	In the Specify User IDs and Quota Sizes table: <ol style="list-style-type: none"> 1 Click the + icon. 2 In the Add Entry to Specify User IDs and Quota Sizes dialog box, enter the user ID. 3 Enter the soft limit. 4 Choose the soft limit unit. 5 Enter the hard limit. 6 Choose the hard limit unit. 7 Click Submit.

Step 8 Click **Submit**.

Editing Quotas

- Step 1** On the menu bar, 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 the **Quotas** tab.
- Step 5** Choose the type of quota that you want to edit.
- Step 6** Click **Edit**.
- Step 7** In the **Edit Quota** dialog box, edit the quota sizes that you have already specified for soft limit and hard limit.
- Step 8** Click **Submit**.
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Deleting Quotas

- Step 1** On the menu bar, 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 the **Quotas** tab.
 - Step 5** Choose the type of quota that you want to delete.
 - Step 6** Click **Delete**.
 - Step 7** In the **Delete Quota** dialog box, click **Submit**.
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Snapshots

You can create a snapshot of an entire file system or of an independent file set to preserve the contents of the file system or the independent file set quota at a single point in time. Snapshots can still be created or deleted manually at any time. The storage space is required only to retain a copy of all of the data blocks that have been changed or deleted after the time of the snapshot, and is charged against the file system or the independent file set quota.

You cannot create a snapshot of a dependent file set.

Snapshot Rules

You can configure (create, change, or delete) the snapshot scheduling rules to schedule the creation and deletion of snapshots. You can specify the frequency to automatically take snapshots and retain these snapshots in the system. You can take snapshots hourly, daily, weekly, or monthly. The frequency in which the snapshots are taken can also be defined for specific days of the week, specific weeks of the month, or specific months. A snapshot rule can be associated with one or more file sets, and a file set can have one or more rules defined for it.

Creating Snapshot Rules

- Step 1** On the menu bar, 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 the **Snapshot Rules** tab.
- Step 5** Click **Create**.
- Step 6** In the **Create Snapshot Rule** dialog box, complete the following fields:

Name	Description
Name field	Enter the snapshot rule name.
Frequency drop-down list	Choose the frequency to automatically create and retain snapshots.
Frequency Options	Specify the options according to the selection of the frequency.
Retention—For each past time period, enter the minimum number of snapshots to be kept for this snapshot rule.	
Hours field	Specify the hour.
Days field	Specify the day.
Weeks field	Specify the week.
Months field	Specify the month.
Prefix field	Specifies the prefix for the snapshots to be taken with this rule. The prefix is added to the date and time to identify the rule that created the snapshot. If the prefix is not specified, only the date and time is used. A prefix should be between 1 and 12 characters long and cannot contain any white space.

Step 7 Click **Submit**.

Creating Snapshots

- Step 1** On the menu bar, 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 the **Snapshots** tab.
- Step 5** Click **Create**.
- Step 6** In the **Create Snapshot** dialog box, complete the following fields:

Name	Description
Snapshot Type drop-down field	Choose the snapshot type either to create manually or schedule the creation of snapshots.
Path field	Specify the file path.
Snapshot name	Enter the snapshot name. Use the format @GMT-dddd.MM.dd-HH.mm.ss if Windows Volume Shadow Copy Service is used to restore files. (For example, @GMT-2015.01.23-09.46.12)
Snapshot Schedules	Choose one or more snapshot schedules.

Step 7 Click **Submit**.

Deleting Snapshots

Step 1 On the menu bar, 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 the **Snapshots** tab.

Step 5 Click **Delete**.

Step 6 In the Snapshot Deletion dialog box, click **Delete**.

If the snapshots are used with NDMP (Network Data Management Protocol) backups, ensure that you deactivate and reactivate the NDMP configuration after you delete the snapshots.

Step 7 Click **Submit**.

Configuring Snapshot Notifications

Use this procedure to specify the snapshots events that you want them to be notified.

- Step 1** On the menu bar, 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 the **Snapshots** tab.
- Step 5** Click **Configure** .
- Step 6** In the **Configure Snapshot** dialog box, complete the following fields:

Name	Description
Concurrent Rules check box	Check this check box to notify when another rule is in progress while a new rule is attempting to start.
Rule-created snapshot creation fails check box	Check this check box to notify when the creation of a snapshot that is invoked by a rule fails.
A snapshot deletion fails check box	Check this check box to notify when the deletion of a snapshot that is invoked by a rule fails.
The number of pending operations exceeds check box	Check this check box to notify when the number of pending operations for a rule exceed a specified value.
The total number of pending rule operations exceeds check box	Check this check box to notify when the total number of pending operations for a rule exceed a specified value.
A snapshot operation exceeds time limit (minutes)	Check this check box to notify when the duration of a snapshot exceeds the specified time limit.

- Step 7** Click **Submit**.