



# Managing MDisks

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## MDisks

An MDisk (managed disk) is a logical unit of the physical storage that consists of multiple physical disks. It provides usable blocks of physical storage to the system even if it does not have a one-to-one correspondence with a physical disk. Each MDisk is divided into several extents, which are numbered, from 0, sequentially from the start to the end of the MDisk. The extent size is a property of storage pools. The size of the extents that the MDisk is divided into depends on the attribute of the storage pool to which it has been added.

MDisks are either RAID arrays from an internal storage or volumes from an external storage system that are presented as a single logical disk to the storage area network (SAN). MDisks, either RAID arrays from an internal storage or volumes that are discovered from an external storage can be added to storage pools. MDisks are not visible to host systems.

Cisco UCS Director allows you to perform the following tasks on the selected MDisk:

- **Refresh**—Refreshes the list of MDisks for the selected IBM Storwize, IBM Storage Array, or IBM SVCs account.

- **Favorite**—Adds the MDisks report to the favorite list for the selected IBM Storwize, IBM Storage Array, or IBM SVCs account.
- **Create**—Creates a RAID array MDisk from an internal storage.
- **Rename**—Renames MDisks.
- **Unassign MDisk from Pool**—Removes an MDisk from a storage pool it is currently assigned to, even if it contains data on it. The system migrates the data to other MDisks in the storage pool.
- **Set Spare Goal**—Sets an optimal number of spares that are required to protect the array from drive failures.
- **Swap Drive**—Allows to swap internal drives into an MDisk or out of an MDisk.
- **Delete Array MDisk**—Deletes the RAID array MDisk, even if it contains data on it. The system migrates the data to other MDisks in the storage pool.
- **Select Tier**—Allows the MDisk to modify the existing enterprise-class, nearline-class, or flash drive technology.
- **Assign MDisk to Pool**—Assigns an MDisk to a storage pool.
- **Detect MDisks**—Identifies MDisks both from an internal and an external IBM Storwize, IBM Storage Array, or IBM SAN Volume Controller storage systems.

## Encryption Enabled Array MDisks

The IBM Storwize V7000 Gen2 system provides optional encryption of data at rest, which protects exposure of sensitive user data and user metadata that is stored on storage devices. For example, encryption protects exposure of sensitive data that is stored on discarded, lost, or stolen storage devices. Encryption of system data and system metadata is not required, and so system data and metadata are not encrypted.

You can activate the encryption license and enable encryption on the system to create encrypted array MDisks.

## Creating an Array MDisk

An internal drive that is designated as a candidate can be used to create an array or a spare. You can create an encrypted array MDisk if encryption is enabled on your system.

- 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 in which you want to create MDisks.
- Step 4** Click the **MDisks** tab.
- Step 5** Click **Create**.
- Step 6** In the **Create Array MDisk** dialog box, complete the following fields:

Name	Description
MDisk Name field	A unique name that you want to assign to the MDisk.

Name	Description
<b>Drive(s)</b> table	Drives that are marked as candidates are available for you to create an array. <ol style="list-style-type: none"> <li>1 Click <b>Select</b> and choose one or more internal drives.</li> <li>2 Click <b>Select</b>.</li> </ol>
<b>RAID Level</b> drop-down list	Choose the RAID level configuration. This field is not displayed when you select the account type as IBM Flash System V9000.
<b>Storage Pool</b> table	Choose the storage pool. <ol style="list-style-type: none"> <li>1 Click <b>Select</b> and choose a storage pool.</li> <li>2 Click <b>Select</b>.</li> </ol> This field is not displayed when you select the account type as IBM Flash System V9000.
<b>Enable encryption</b> check box	Check the check box to enable encryption.

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

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## Renaming an MDisk

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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 **MDisks** tab.
  - Step 5** Choose an MDisk that you want to rename.
  - Step 6** Click **Rename**.
  - Step 7** In the **Rename MDisk** dialog box, enter a new name for the MDisk.
  - Step 8** Click **Submit**.
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## Deleting an Array MDisk

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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 **MDisks** tab.
  - Step 5** Choose an MDisk that you want to delete.
  - Step 6** In the **Delete Array MDisk** dialog box, check the **Delete RAID array MDisk even if it has data on it. System migrates data to other MDisks in the pool** check box.
  - Step 7** Click **Submit**.
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## Assigning an MDisk to a Storage Pool

The mode of an MDisk can be either an array of drives that are located on the internal storage or unmanaged while the MDisk is not used by the storage pool. It can also be an image that is assigned to a volume with a direct mapping of data between the MDisk and the volume.

You can assign only unmanaged MDisks to a storage pool.

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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 **MDisks** tab.
  - Step 5** Choose an unmanaged MDisk that you want to assign to a storage pool.
  - Step 6** Click **Assign MDisk to Pool**.
  - Step 7** In the **Assign MDisk to Pool** dialog box, click **Select**.
  - Step 8** Check the check box to choose a storage pool to which you want to assign the MDisk.
  - Step 9** Click **Select**.
  - Step 10** Click **Submit**.
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# Unassigning an MDisk from the Storage Pool

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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 **MDisks** tab.
- Step 5** Choose an MDisk that you want to unassign from the storage pool.
- Step 6** Click **Unassign MDisk from Pool**.
- Step 7** In the **Unassign MDisk from Pool** dialog box, check the **Unassign MDisk from storage pool even if it has data on it. System migrates data to other MDisks in the pool** check box.
- Step 8** Click **Submit**.
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## MDisk Tier

The IBM Storwize and IBM SAN Volume Controllers automatically and nondisruptively move frequently accessed data on MDisks that use enterprise-class or nearline-class drives to MDisks that use flash drives, thus placing such data in a faster tier of storage. The flash MDisks provide greater performance than enterprise-class or nearline-class MDisks.

IBM Storwize and IBM SAN Volume Controllers support the following tiers:

- **Enterprise**—The enterprise tier exists when enterprise-class MDisks are in the storage pool, such as those drives built from Serial Attached SCSI (SAS) drives.
- **Nearline**—The nearline tier exists when nearline-class MDisks are used in the storage pool, such as those drives built from nearline SAS drives.
- **Flash**—The flash tier exists when flash MDisks are in the storage pool.

## Setting Tier

The tier indicates whether an MDisk uses an enterprise-class, nearline-class, or flash drives.

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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 **MDisks** tab.
  - Step 5** Choose an MDisk.
  - Step 6** Click **Select Tier**.
  - Step 7** In the **Select MDisk Tier** dialog box, choose the desired tier from the drop-down list.
  - Step 8** Click **Submit**.
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## Swapping Internal Drives

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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 **MDisks** tab.
  - Step 5** Choose an array MDisk in which you want to swap in and swap out an internal drive.
  - Step 6** Click **Swap Drive**.
  - Step 7** In the **Swap Drive** dialog box, click **Select** to choose an internal drive to swap out of an MDisk or swap into an MDisk.
  - Step 8** Check the check box that corresponds to an internal drive ID to swap out or swap into an internal drive.
  - Step 9** Click **Submit**.
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## Setting Spare Drives

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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 **MDisks** tab.
  - Step 5** Choose an MDisk.
  - Step 6** Click **Set Spare Goal**.
  - Step 7** In the **Set Spare Goal** dialog box, enter the number of spares you want to set.
  - Step 8** Click **Submit**.
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