



## FlashCopy Mappings

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## FlashCopy Mappings

A FlashCopy mapping defines the relationship between a source volume and a target volume that can be created between any two volumes in a system. The source and target volumes must be of equal size and the volumes need not be in the same I/O group or pool.

The FlashCopy function creates an instant copy of a volume. To create an instant copy of a volume, you must first create a mapping between the source volume (the disk that is copied) and the target volume (the disk that receives the copy).

When a FlashCopy operation starts, no data is actually copied at the time, but a checkpoint is made of the source volume. The checkpoint creates a bitmap that indicates that no part of the source volume is copied. Each bit in the bitmap represents one region (a grain) of the source volume. If new data is written to the source or target volume, the existing data on the source is copied to the target volume before the new data is written to the source or target volume.

After a FlashCopy operation starts, the read operations to the source volume continue to occur. The bitmap is updated to mark that the grain of the source volume is copied so that the write operations to the same grain do not re-copy the data later. During a read operation to the target volume, the bitmap is used to determine if the grain is copied. If the grain is already copied, the data is read from the target volume. If the grain is not copied, the data is read from the source volume.

# FlashCopy Mapping States

At any point in time, a FlashCopy mapping is in one of the following states:

- 1 **Idle or Copied**—In this state, the source and target volumes act as independent volumes even if a mapping exists between the two. If the mapping is incremental, and the background copy is complete, the mapping records only the differences between the source and target volumes. If the connection to both nodes in the I/O group that the mapping is assigned to is lost, the source and target volumes will be offline. Read and write caching is enabled for both the source and the target volumes.
- 2 **Copying**—In this state, the copy is in progress. Read and write caching is enabled on the source and the target volumes.
- 3 **Stopped**— In this state, the mapping is stopped because you issued a stop command or an I/O error occurred. The target volume is offline and its data is lost. To access the target volume, you must restart or delete the mapping. The source volume is accessible and the read and write cache is enabled. If the mapping is incremental, the mapping records the write operations to the source volume. If the connection to both nodes in the I/O group that the mapping is assigned to is lost, the source and target volumes go offline.

## Creating FlashCopy Mappings

- 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 **FlashCopy Mappings** tab.
- Step 5** Click **Create**.
- Step 6** In the **Create FlashCopy Mapping** dialog box, complete the following fields:

Name	Description
Name field	Enter the name for the FlashCopy Mapping.
Master Volume drop-down list	Choose the master volume.
Auxili Auxiliary Volume drop-down list	Choose the auxiliary volume that has the same size as the master volume that was previously selected.
Select a Preset check box	Check this check box to create a FlashCopy mapping for the FlashCopy types. <b>Note</b> If you do not check the <b>Select a Preset</b> check box, you can proceed with the Advanced Setting.

Name	Description
Type drop-down list	Choose one of the following FlashCopy types: <ul style="list-style-type: none"> <li>• Snap shot</li> <li>• Clone</li> <li>• Backup</li> </ul>
<b>Advanced Setting</b>	
Background Copy Rate field	Specify the copy rate to determine the priority that is given to the copy process. <b>Note</b> A faster rate increases the priority of the copy process, which might affect the performance of other operations.
Incremental check box	Check this check box to copy the data that is modified since the initial FlashCopy mapping.
Delete mapping after completion check box	Check this check box to automatically delete the mapping when the mapping reaches the idle_or_copied state and the progress is 100%.
Clearing Rate field	Specify the clean rate to minimize the amount of time if a mapping is in the stopping state. <b>Note</b> If the mapping has not completed, the target volume is offline while the mapping is stopping.

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

## FlashCopy Advanced Settings

### Incremental FlashCopy Mappings

In an incremental FlashCopy mapping, the initial mapping copies all of the data from the source volume to the target volume. Subsequent FlashCopy mappings copy only the data that is modified since the initial FlashCopy mapping.



**Note**

You can define a FlashCopy mapping as incremental only when you create the FlashCopy mapping.

### Background Copy Rate

You can specify a copy rate when you create a FlashCopy mapping. When the mapping is in the copying state, the copy rate determines the priority that is given to the background copy process. If you want a copy of the whole source volume so that a mapping can be deleted and still be accessed from the target volume, you must copy all the data that is on the source volume to the target volume.

When a mapping is started and the copy rate is greater than zero, the unchanged data is copied to the target volume, and the bitmap is updated to show that the copy has occurred. After a certain period of time, the length of which depends on the priority that is determined by the copy rate and the size of the volume, the whole volume (source) is copied to the target. The mapping returns to the `idle_or_copied` state and you can now restart the mapping at any time to create a new copy at the target.

While the mapping is in the copying state, you can set the copy rate to zero and the clean rate to a value other than zero to minimize the amount of time a mapping is in the stopping state. If the copy rate is zero, only the data that changes on the source is copied to the target. The target never contains a copy of the whole source unless every extent is overwritten at the source. You can use this copy rate when you require a temporary copy of the source.

### Clean Rate

You can specify a clean rate when you create a FlashCopy mapping. The clean rate is used to control the rate where the data is copied from the target volume of the mapping to the target volume of a mapping that is either the latest copy of the target volume, or is the next oldest copy of the source volume.

You can use the clean rate in the following scenarios:

- The mapping is in the stopping state.
- The mapping is in the copying state and has a copy rate of zero.
- The mapping is in the copying state and the background copy has completed.

You can use the clean rate to minimize the amount of time that a mapping is in the stopping state. If the mapping has not completed, the target volume is offline while the mapping is in the stopping state. The target volume remains offline until the mapping is restarted. You can stop the mapping at any time after it has been started. If the target volume already contains a complete copy of the source volume, this action makes the target inconsistent and the target volume goes offline. The target volume remains offline until the mapping is restarted.

# Moving FlashCopy Mapping to FlashCopy Consistency Group

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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 **FlashCopy Mappings** tab.
  - Step 5** Choose the FlashCopy mapping, if the mapping is in one of the following states: stopped, idle, or copied.
  - Step 6** Click **Move To Group**.
  - Step 7** In the **Move FlashCopy Mapping to Consistency Group** dialog box, click **Select**.
  - Step 8** Check the check box to which FlashCopy Consistency Group you want to move the FlashCopy mapping.
  - Step 9** Click **Submit**.
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# Starting FlashCopy Mapping

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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 **FlashCopy Mappings** tab.
  - Step 5** Choose the FlashCopy mapping, if the mapping is in one of the following states: stopped, idle, or copied.
  - Step 6** Click **Start**.
  - Step 7** In the **Start FlashCopy Mapping** dialog box, click **Submit**.
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## Stopping FlashCopy Mapping

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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 **FlashCopy Mappings** tab.
  - Step 5** Choose the FlashCopy mapping, if the mapping is in the copying state.
  - Step 6** Click **Stop**.
  - Step 7** In the **Stop FlashCopy Mapping** dialog box, click **Submit**.
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## Deleting FlashCopy Mapping

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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 **FlashCopy Mappings** tab.
  - Step 5** Choose the FlashCopy mapping that you want to delete.
  - Step 6** Click **Delete**.  
You can delete the FlashCopy mapping even when the data on the target volume is inconsistent or if the target volume has other dependencies.
  - Step 7** Check the **Force Delete** check box, if required.
  - Step 8** In the **Delete FlashCopy Mapping** dialog box, click **Submit**.
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