SAN Volume Controller Flash Copy

Introduction

FlashCopy is a "point in time" backup of one drive to another. FlashCopy makes a copy of a Source Virtual Disk to a Target Virtual Disk. After the copy operation occurs, the Target Virtual Disk has the contents of the Source Virtual Disk as it existed at a single point in time (PIT), known as a T(0) copy. Point in time copy techniques are used to resolve the difficulty of making a consistent copy of a data set which is being constantly updated. Even though the copy operation does, in fact, take a finite time, the resulting data on the target disk appears as if the copy was made instantaneously. Both the source and target virtual disks are available for read and write operations even though not all the data has been copied across from the source to the target disk.

FlashCopy Applications

There are a large variety of business applications for FlashCopy. One of these is making consistent backups of changing data. In that application, a FlashCopy is created to capture a 'point in time' back-up and the resulting image can then be backed up to tertiary storage such as tape. Another feature of using FlashCopy for back-ups is that it allows you to run another application while creating the back-up. The application only has to be closed for the time the FlashCopy task is started, and can be restarted almost immediately. After a back-up is completed, FlashCopy targets can be kept online for an extended period of time. This can save time by allowing the copying of files that need to be restored from the FlashCopy target rather than having to restore from tape.

FlashCopy can be used to move and migrate data, especially when moving data from one server to another. FlashCopy is also helpful for testing new applications and new operating system releases against a FlashCopy of the production data. The risk of data corruption is eliminated, and the application does not need to be taken off-line for an extended period of time in order to perform the copy of the data.

In the SVC, FlashCopy occurs between a Source Virtual Disk and a Target Virtual Disk. The Source Virtual Disk and Target Virtual Disk MUST be the same size. The minimum granularity that SVC supports for FlashCopy is an entire Virtual Disk. The Source and Target Virtual Disks must both be managed by the same SVC Cluster, but may be in different I/O groups within that Cluster. The act of creating a relationship between a source virtual disk and a target virtual disk is called a mapping. SVC FlashCopy associates a Source Virtual Disk and a Target Virtual Disk together in a FlashCopy Mapping. Each Virtual Disk may be a member of only one FlashCopy Mapping and a FlashCopy Mapping always has exactly one Source and one Target Virtual Disk. Thus, it is not possible for a Virtual Disk to simultaneously be the source for one FlashCopy Mapping and the target for another. Virtual Disks which are members of a FlashCopy Mapping cannot have their size increased or decreased while they are members of the FlashCopy Mapping.

Consistency Groups are created to eliminate difficulties while copying. They do this by making sure the attributes for all the disks in the group are the same. Consistency Groups also address the issue that the 'using' application may have related data which spans multiple Virtual Disks. FlashCopy Mappings must be part of a Consistency Group. A FlashCopy must be performed in a way that preserves data integrity across multiple virtual disks. One requirement for preserving the integrity of data being written is to ensure that "dependent writes" are executed in the application's intended sequence.

In this lab you learn how to use the FlashCopy feature. You will:
- Create a FlashCopy Consistency Group
- Shrink the size of your target virtual disk to match the source virtual disk
- Create a FlashCopy Mapping
- Prepare the FlashCopy
- Perform the FlashCopy.

Instructions

Consistency groups are created to eliminate difficulties while copying. They do this by making sure the attributes for all the disks in the group are the same. Thus the first task is to create a FlashCopy Consistency Group.

1. Click 'Manage Copy Services' from on the left of the browser window.
2. Click 'FlashCopy Consistency Groups' from the Manage Copy Services submenu.

Since you are going to create a FlashCopy consistency group, there is no need to use the filter.

3. Click the 'Bypass Filter' button.

Since you want to **Create a consistency group**, simply click the **Go** button.

4. Click the 'Go' button.

The next step is to name the consistency group.

5. In the FCCGroup Name field, type 'svc2FCCgrp'.
6. Click the 'OK' button.

You can see the FlashCopy consistency group you created now listed. Once the FlashCopy consistency group is created, the next step is to make sure the target and source disks are the same size.

7. Click the white X in the blue box in the top right corner of the FlashCopy Consistency Groups (FCCGroups) window.

Access the list of virtual disks to verify that the size of the target and source disks to be used in the FlashCopy are the same.

8. Click 'Work with Virtual Disks' from the menu on the left of the browser window.
9. Click the 'Virtual Disks' link from the Work with Virtual Disks submenu.

Since you want to see all the virtual disks, bypass the filter.

10. Click the 'Bypass Filter' button.

As you can see, your source disk (svc2Vdisk1) is 20 GB and your target disk (svc2FCCtgtVdisk) is 21GB. Since the source disk and target disk must be the same size when performing a FlashCopy, the next step is to shrink the size of the target virtual disk to match the source virtual disk.

11. Select the radio button to the left of svc2FCCtgtVdisk.
12. Use the drop down menu to select 'Shrink a VDisk'.
13. Click the 'Go' button.

Enter the capacity by which you want to reduce the target virtual disk.

14. In the Reduce Capacity By field, type '1'.
15. From the drop down, select 'GB'.
16. Click the 'OK' button.

You can see the capacity of the target VDisk svc2FCCtgtVdisk is 20480MB (or 20GB) and is now the same size of the source VDisk svc2Vdisk1..

17. Click the white X in the blue box in the top right corner of the Virtual Disks window.

Now that the target and source disks are the same size, the next step is to create the FlashCopy Mapping.

18. Click the 'FlashCopy Mappings' link from the Manage Copy Service submenu.

Since you are going to create a FlashCopy Mapping, there is no need to use the filter.

19. Click the 'Bypass Filter' button.

Click Go to create the mapping.

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20. Click the 'Go' button.

Name the FlashCopy Mapping and select your source disk, target disks and consistency group.

21. In the FlashCopy Mapping Name field, type 'svc2FCCmapping'.
22. Choose 'svc2Vdisk1' from the Source VDisk Name drop down menu.
23. The correct target disk 'svc2FCCtgtVdisk' is already selected.
24. Choose 'svc2FCCgrp' from the Consistency Group Name drop down menu.
25. Click the 'OK' button.

You can see the mapping you created, showing the target disk, source disk and the FlashCopy Consistency Group (FC Group Name). Now that both the Flashcopy Consistency Group and FlashCopy Mapping are created, it is possible to start the FlashCopy operation. First the source and target must be prepared. The FlashCopy **prepare a mapping** command will flush the cache on the target (and it will remain in write-thru mode) and discard any data in cache destined for the target. By specifying the consistency group name, all disks in the group will be prepared for FlashCopy.

26. Select 'Prepare a mapping' from the drop down menu.
27. Click the 'Go' button.

Confirm that you want to prepare the mapping for starting.

28. Click the 'OK' button.

You can see the mapping is now prepared. The next step is to start the FlashCopy.

29. Click the 'FlashCopy Consistency Groups' link from the Manage Copy Services submenu.

Since you want to see all the FlashCopy consistency groups, bypass the filter.

30. Click the 'Bypass Filter' button.

Select and start the consistency group **svc2FCCgrp**.

31. Click the radio button to the left of svc2FCCgrp.
32. Select 'Start a consistency group' from the drop down menu.
33. Click the 'Go' button.

Confirm that the cache will be flushed on the source disks to start the FlashCopy.

34. Click the 'OK' button.

You can see the status is now **Copying**. The status column will say **Copying** until the background copy is complete. There is no dynamic refresh on this screen. You can check the progress of the FlashCopy by pulling up the FlashCopy Mappings during the FlashCopy.

35. Click the white X in the blue box in the top right corner of the FlashCopy Consistency Groups (FCCGroups) window.

A 20GB FlashCopy will usually take 2-3 hours. Use the **FlashCopy Mappings** link to check the progress of your FlashCopy.

36. Click the 'FlashCopy Mappings' link from the Manage Copy Service submenu.

Since you want to see all FlashCopy Mappings, there is no need to use the filter.

37. Click the 'Bypass Filter' button.

Please change the side note on page 27 to say: You can see the status is now Copying. The status column will say **Copying** until the background copy is complete. Please note that during the FlashCopy process, the target VDisk is available to be used. There is no dynamic refresh on this screen. You can check the progress of the FlashCopy by pulling up the FlashCopy Mappings during the FlashCopy.

38. Click the white X in the blue box in the top right corner of the FlashCopy Consistency Groups (FCCGroups) window.

Check back after a few hours to see if the FlashCopy is complete.

39. Click the 'FlashCopy Mappings' link from the Manage Copy Service submenu.

Since you want to see all FlashCopy Mappings, bypass the filter.

40. Click the 'Bypass Filter' button.

The FlashCopy is complete. You can see the status of the mapping **svc2FCCmapping** is now Idle Copied and the progress is 100%.

Congratulations! You have completed this lab.