Configure and use SnapVault backups in a SAN environment

ONTAP 9

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Learn about ONTAP SnapVault backups in a SAN environment

SnapVault configuration and use in a SAN environment is very similar to configuration and use in a NAS environment, but restoring LUNs in a SAN environment requires some special procedures.

SnapVault backups contain a set of read-only copies of a source volume. In a SAN environment you always back up entire volumes to the SnapVault secondary volume, not individual LUNs.

The procedure for creating and initializing the SnapVault relationship between a primary volume containing LUNs and a secondary volume acting as a SnapVault backup is identical to the procedure used with FlexVol volumes used for file protocols. This procedure is described in detail in Data Protection.

It is important to ensure that LUNs being backed up are in a consistent state before the snapshots are created and copied to the SnapVault secondary volume. Automating the snapshot creation with SnapCenter ensures that backed up LUNs are complete and usable by the original application.

There are three basic choices for restoring LUNs from a SnapVault secondary volume:

- You can map a LUN directly from the SnapVault secondary volume and connect a host to the LUN to access the contents of the LUN.

  The LUN is read-only and you can map only from the most recent snapshot in the SnapVault backup. Persistent reservations and other LUN metadata are lost. If desired, you can use a copy program on the host to copy the LUN contents back to the original LUN if it is still accessible.

  The LUN has a different serial number from the source LUN.

- You can clone any snapshot in the SnapVault secondary volume to a new read-write volume.

  You can then map any of the LUNs in the volume and connect a host to the LUN to access the contents of the LUN. If desired, you can use a copy program on the host to copy the LUN contents back to the original LUN if it is still accessible.

- You can restore the entire volume containing the LUN from any snapshot in the SnapVault secondary volume.

  Restoring the entire volume replaces all of the LUNs, and any files, in the volume. Any new LUNs created since the snapshot was created are lost.

  The LUNs retain their mapping, serial numbers, UUIDs, and persistent reservations.

Access a read-only LUN copy from an ONTAP SnapVault backup

You can access a read-only copy of a LUN from the latest snapshot in a SnapVault

backup. The LUN ID, path, and serial number are different from the source LUN and must first be mapped. Persistent reservations, LUN mappings, and igroups are not replicated to the SnapVault secondary volume.

Before you begin

- The SnapVault relationship must be initialized and the latest snapshot in the SnapVault secondary volume must contain the desired LUN.
- The storage virtual machine (SVM) containing the SnapVault backup must have one or more LIFs with the desired SAN protocol accessible from the host used to access the LUN copy.
- If you plan to access LUN copies directly from the SnapVault secondary volume, you must create your igroups on the SnapVault SVM in advance.

  You can access a LUN directly from the SnapVault secondary volume without having to first restore or clone the volume containing the LUN.

About this task

If a new snapshot is added to the SnapVault secondary volume while you have a LUN mapped from a previous snapshot, the contents of the mapped LUN changes. The LUN is still mapped with the same identifiers, but the data is taken from the new snapshot. If the LUN size changes, some hosts automatically detect the size change; Windows hosts require a disk rescan to pick up any size change.

Steps

1. List the available LUNs in the SnapVault secondary volume.

   ```
   lun show
   ```

   In this example, you can see both the original LUNs in the primary volume srcvolA and the copies in the SnapVault secondary volume dstvolB:

   ```
   cluster::> lun show

   Vserver   Path                State   Mapped   Type          Size
   --------  ------------------  ------  -------  --------      -------
   vserverA  /vol/srcvolA/lun_A  online  mapped   windows  300.0GB
   vserverA  /vol/srcvolA/lun_B  online  mapped   windows  300.0GB
   vserverA  /vol/srcvolA/lun_C  online  mapped   windows  300.0GB
   vserverB  /vol/dstvolB/lun_A  online  unmapped windows  300.0GB
   vserverB  /vol/dstvolB/lun_B  online  unmapped windows  300.0GB
   vserverB  /vol/dstvolB/lun_C  online  unmapped windows  300.0GB

   6 entries were displayed.
   ```

   Learn more about `lun show` in the ONTAP command reference.

2. If the igroup for the desired host does not already exist on the SVM containing the SnapVault secondary volume, create an igroup.

```
igroup create -vserver <SVM_name> -igroup <igroup_name> -protocol
<protocol> -ostype <ostype> -initiator <initiator_name>
```

This command creates an igroup for a Windows host that uses the iSCSI protocol:

```
cluster::> igroup create -vserver vserverB -igroup temp_igroup
  -protocol iscsi -ostype windows
  -initiator iqn.1991-05.com.microsoft:hostA
```

3. Map the desired LUN copy to the igroup.

```
lun mapping create -vserver <SVM_name> -path <LUN_path> -igroup
<igroup_name>
```

```
cluster::> lun mapping create -vserver vserverB -path /vol/dstvolB/lun_A
  -igroup temp_igroup
```

Learn more about `lun mapping create` in the ONTAP command reference.

4. Connect the host to the LUN and access the contents of the LUN as desired.

Restore a single LUN from an ONTAP SnapVault backup

You can restore a single LUN to a new location or to the original location. You can restore from any snapshot in the SnapVault secondary volume. To restore the LUN to the original location, you first restore it to a new location and then copy it.

Before you begin

- The SnapVault relationship must be initialized and the SnapVault secondary volume must contain an appropriate snapshot to restore.
- The storage virtual machine (SVM) containing the SnapVault secondary volume must have one or more LIFs with the desired SAN protocol that are accessible from the host used to access the LUN copy.
- The igroups must already exist on the SnapVault SVM.

About this task

The process includes creating a read-write volume clone from a snapshot in the SnapVault secondary volume. You can use the LUN directly from the clone, or you can optionally copy the LUN contents back to the original LUN location.

The LUN in the clone has a different path and serial number from the original LUN. Persistent reservations are not retained.

Steps

1. Verify the secondary volume that contains the SnapVault backup.

```
snapmirror show
```

```
cluster::> snapmirror show

Source          Dest     Mirror  Relation  Total             Last
Path     Type   Path     State   Status    Progress  Healthy Updated
-------- ---- --------- ------- --------- --------- ------- -------
vserverA:srcvolA
         XDP  vserverB:dstvolB
                        Snapmirrored
                                Idle       -         true    -
```

2. Identify the snapshot that you want to restore the LUN from.

```
volume snapshot show
```

```
cluster::> volume snapshot show

Vserver  Volume  Snapshot                State Size   Total% Used%
-------- ------- ---------------------- ----- ------ ------ -----
vserverB
         dstvolB
                 snap2.2013-02-10_0010  valid  124KB     0%    0%
                 snap1.2013-02-10_0015 valid  112KB     0%    0%
                 snap2.2013-02-11_0010  valid  164KB     0%    0%
```

3. Create a read-write clone from the desired snapshot

```
volume clone create -vserver <SVM_name> -flexclone <flexclone_name>
-type <type> -parent-volume <parent_volume_name> -parent-snapshot
<snapshot_name>
```

The volume clone is created in the same aggregate as the SnapVault backup. There must be enough space in the aggregate to store the clone.

```
cluster::> volume clone create -vserver vserverB
  -flexclone dstvolB_clone -type RW -parent-volume dstvolB
  -parent-snapshot daily.2013-02-10_0010
[Job 108] Job succeeded: Successful
```

4. List the LUNs in the volume clone.

```
lun show -vserver <SVM_name> -volume <flexclone_volume_name>
```

```
cluster::> lun show -vserver vserverB -volume dstvolB_clone

Vserver   Path                      State   Mapped   Type
--------- ------------------------  ------- -------- --------
vserverB  /vol/dstvolB_clone/lun_A  online  unmapped windows
vserverB  /vol/dstvolB_clone/lun_B  online  unmapped windows
vserverB  /vol/dstvolB_clone/lun_C  online  unmapped windows

3 entries were displayed.
```

Learn more about `lun show` in the ONTAP command reference.

5. If the igroup for the desired host does not already exist on the SVM containing the SnapVault backup, create an igroup.

```
igroup create -vserver <SVM_name> -igroup <igroup_name> -protocol
<protocol> -ostype <os_type> -initiator <initiator_name>
```

This example creates an igroup for a Windows host that uses the iSCSI protocol:

```
cluster::> igroup create -vserver vserverB -igroup temp_igroup
  -protocol iscsi -ostype windows
  -initiator iqn.1991-05.com.microsoft:hostA
```

6. Map the desired LUN copy to the igroup.

```
lun mapping create -vserver <SVM_name> -path <lun_path> -igroup
<igroup_name>
```

```
cluster::> lun mapping create -vserver vserverB
  -path /vol/dstvolB_clone/lun_C -igroup temp_igroup
```

Learn more about `lun mapping create` in the ONTAP command reference.

7. Connect the host to the LUN and access the contents of the LUN, as desired.

   The LUN is read-write and can be used in place of the original LUN. Because the LUN serial number is different, the host interprets it as a different LUN from the original.

8. Use a copy program on the host to copy the LUN contents back to the original LUN.

Related information

- snapmirror show

Restore all LUNs in a volume from an ONTAP SnapVault backup

If one or more LUNs in a volume need to be restored from a SnapVault backup, you can restore the entire volume. Restoring the volume affects all LUNs in the volume.

Before you begin

The SnapVault relationship must be initialized and the SnapVault secondary volume must contain an appropriate snapshot to restore.

About this task

Restoring an entire volume returns the volume to the state it was in when the snapshot was made. If a LUN was added to the volume after the snapshot, that LUN is removed during the restore process.

After restoring the volume, the LUNs remain mapped to the igroups they were mapped to just before the restore. The LUN mapping might be different from the mapping at the time of the snapshot. Persistent reservations on the LUNs from host clusters are retained.

Steps

1. Stop I/O to all LUNs in the volume.
2. Verify the secondary volume that contains the SnapVault secondary volume.

```
snapmirror show
```

```
cluster::> snapmirror show

Source          Dest     Mirror  Relation  Total             Last
Path     Type   Path     State   Status    Progress  Healthy Updated
-------- ---- --------- ------- --------- --------- ------- -------
vserverA:srcvolA
         XDP  vserverB:dstvolB
                        Snapmirrored
                                Idle       -         true    -
```

3. Identify the snapshot that you want to restore from.

```
volume snapshot show
```

```
cluster::> volume snapshot show

Vserver  Volume  Snapshot                State Size   Total% Used%
-------- ------- ---------------------- ----- ------ ------ -----
vserverB
         dstvolB
                 snap2.2013-02-10_0010  valid  124KB     0%    0%
                 snap1.2013-02-10_0015 valid  112KB     0%    0%
                 snap2.2013-02-11_0010  valid  164KB     0%    0%
```

4. Specify the snapshot to use.

```
snapmirror restore -destination-path <destination_path> -source-path
<source_path> -source-snapshot <snapshot_name>
```

The destination you specify for the restore is the original volume you are restoring to.

```
cluster::> snapmirror restore -destination-path vserverA:srcvolA
  -source-path vserverB:dstvolB -source-snapshot daily.2013-02-10_0010

Warning: All data newer than Snapshot copy hourly.2013-02-11_1205 on
volume vserverA:src_volA will be deleted.
Do you want to continue? {y|n}: y
[Job 98] Job is queued: snapmirror restore from source
"vserverB:dstvolB" for the snapshot daily.2013-02-10_0010.
```

5. If you are sharing LUNs across a host cluster, restore the persistent reservations on the LUNs from the

affected hosts.

Restoring a volume from a SnapVault backup

In the following example, the LUN named lun_D was added to the volume after the snapshot was created. After restoring the entire volume from the snapshot, lun_D no longer appears.

In the `lun show` command output, you can see the LUNs in the primary volume srcvolA and the read-only copies of those LUNs in the SnapVault secondary volume dstvolB. There is no copy of lun_D in the SnapVault backup.

```
cluster::> lun show
Vserver   Path                 State   Mapped   Type          Size
--------- -----------------  ------- -------- --------      -------
vserverA  /vol/srcvolA/lun_A  online  mapped   windows  300.0GB
vserverA  /vol/srcvolA/lun_B  online  mapped   windows  300.0GB
vserverA  /vol/srcvolA/lun_C  online  mapped   windows  300.0GB
vserverA  /vol/srcvolA/lun_D  online  mapped   windows  250.0GB
vserverB  /vol/dstvolB/lun_A  online  unmapped windows  300.0GB
vserverB  /vol/dstvolB/lun_B  online  unmapped windows  300.0GB
vserverB  /vol/dstvolB/lun_C  online  unmapped windows  300.0GB

7 entries were displayed.

cluster::>snapmirror restore -destination-path vserverA:srcvolA
  -source-path vserverB:dstvolB
  -source-snapshot daily.2013-02-10_0010

Warning: All data newer than snapshot hourly.2013-02-11_1205
on volume vserverA:src_volA will be deleted.
Do you want to continue? {y|n}: y
[Job 98] Job is queued: snapmirror restore from source
"vserverB:dstvolB" for the snapshot daily.2013-02-10_0010.

cluster::> lun show
Vserver   Path                 State   Mapped   Type          Size
--------- -----------------  ------- -------- --------      -------
vserverA  /vol/srcvolA/lun_A  online  mapped   windows  300.0GB
vserverA  /vol/srcvolA/lun_B  online  mapped   windows  300.0GB
vserverA  /vol/srcvolA/lun_C  online  mapped   windows  300.0GB
vserverB  /vol/dstvolB/lun_A  online  unmapped windows  300.0GB
vserverB  /vol/dstvolB/lun_B  online  unmapped windows  300.0GB
vserverB  /vol/dstvolB/lun_C  online  unmapped windows  300.0GB

6 entries were displayed.
```

After the volume is restored from the SnapVault secondary volume, the source volume no longer contains

lun_D. You do not need to remap the LUNs in the source volume after the restore because they are still mapped.

Related information

- snapmirror restore
- snapmirror show

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