Volume-based SnapRestore

Snapdrive for Unix

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Volume-based SnapRestore

SnapDrive 4.0 for UNIX and later provides Snapshot restore capability at a volume level. This explains the various storage operations you can carry out using volume-based Snapshot restore.

What volume-based SnapRestore is

Volume-based SnapRestore (VBSR) restores the volume with all its storage objects. The volume-based restore is faster than each storage object restored individually. VBSR also works with FlexClone volumes and vFiler configurations. VBSR for vFiler is available for Data ONTAP 7.3 and later.

SnapDrive 3.0 for UNIX and earlier can restore LUNs for a host-side entity like file system, disk groups, and host volumes, or normal files created over NFS from an application consistent snapshot. SnapDrive for UNIX uses Single File Snap Restore SFSR implemented in Data ONTAP. SFSR works as following:

- For normal files while the SFSR is proceeding, any operation which tries to change the file is suspended until SFSR is complete.
- For LUNs, when SFSR is proceeding the LUN is available and I/Os (both reads and writes) are allowed. SFSR for normal files as well as LUNs may take a long time depending on the size of the LUN or the file being restored.

Therefore, for some environments SFSR is an obstruction.

SnapDrive 4.0 for UNIX and later enables you to take volume-based Snapshot copies. VBSR is much faster and requires less CPU and storage resources. It restores all the data on the active file system. This functionality can be used if a user wants to restore all LUNs or normal files on a volume from the same Snapshot copy.

Volume-based Snapshot copy should be used with caution because all Snapshot copies taken after volume Snapshot copy that is used for the restore operation are deleted. All the new files and new LUNs created on this volume must be deleted.

Considerations for using volume-based SnapRestore

You can use volume-based SnapRestore (VBSR) with keeping few points in mind. Keeping these points in mind helps you to use the VBSR feature safely.

You must keep the following points in mind:

- VBSR reverts the entire volume to the state of the time when the Snapshot copy is created, which is used for VBSR. VBSR includes the following:
  - All the files and LUNs for the specified host filespec during `snap create` operation.
  - All the files and LUNs that are part of the application consistent Snapshot copy during `snap create` operation.
- VBSR removes all the newer files and LUNs created on the current volume after the Snapshot copy used for restore.

- VBSR removes all the newer Snapshot copies that are taken after the Snapshot copy which is being used for restore.
- It is recommended that you run `-vbsr preview` command before using `-vbsr execute` command.

Mandatory checks for volume-based SnapRestore

Before volume based SnapRestore is carried out, SnapDrive for UNIX does some mandatory checks with the system. These checks are required so that volume based SnapRestore is used safely. The mandatory checks cannot be over-ridden by the user.

The following are the mandatory checks which SnapDrive for UNIX makes before implementing volume-based SnapRestore:

- Volume-based SnapRestore works only with Snapshots which are created using SnapDrive for UNIX.
- The volume in volume-based SnapRestore should not be a storage system's root volume.
- SnapDrive for UNIX checks for volume clones. It does not allow the volume restore operation if there are any volume clones from new Snapshot copies. This is a limitation imposed by Data ONTAP.
- The volume in volume-based SnapRestore should not have any mapped LUNs apart from the LUNs specified (raw LUN or LUNs present in file system, disk group or host volume) for restore.
- SnapDrive for UNIX checks whether the volume exists in a SnapMirror relationship.
- SnapDrive for UNIX checks whether the volume exists in a SnapVault relationship.

The SnapMirror and SnapVault checks can be overridden if SnapDrive for UNIX is using Operations Manager for RBAC and user has SD.SnapShot.DisruptBaseline capability on volume. For more information about the specific RBAC capability for user to override these checks, you can see Role Based Access Control in SnapDrive for UNIX.

Related information

Role-based access control in SnapDrive for UNIX

Checks that can be overridden by the user

Before volume-based SnapRestore is carried out, SnapDrive for UNIX performs some checks that a user can override using `-force` option. These checks are required so that volume-based SnapRestore is used safely.

It is recommended that you follow the various checks that the system performs, but you can override these checks by using the `-force` option.

You can override the following SnapDrive for UNIX for volume-based SnapRestore checks:

- SnapDrive for UNIX checks for LUNs in the Snapshot copy which are not crash consistent. If it finds an application inconsistent LUN in the Snapshot copy, it warns you about it.
- SnapDrive for UNIX checks whether there are additional LUNs in the active volume which were created after the Snapshot copy was taken. If SnapDrive for UNIX finds additional LUNs, it warns you that those additional LUNs in the active volume is lost.
- SnapDrive for UNIX checks for new Snapshot copies. These new Snapshot copies do not get restored and

are lost.

- SnapDrive for UNIX checks for normal file (files that are visible from the local host) in a volume.
- SnapDrive for UNIX checks for NFS exports.
- SnapDrive for UNIX checks for CIFS shares.

If Snapshot copies were created using SnapDrive 3.0 for UNIX or earlier, volume-based SnapRestore preview is not able to perform the first two checks in the earlier mentioned list. If you have provided `-force` option, then during volume-based SnapRestore execute, a prompt message is displayed to over-ride these checks and proceed.

Volume-based SnapRestore command

This section describes the commands and the options to use volume based SnapRestore.

`-vbsr` option is added in snap restore CLI to select volume based SnapRestore. Use the following command syntax to perform restore using volume based SnapRestore:

```
snapdrive snap restore {-lun | -dg | -vg | -hostvol |
-lvol | -fs |-file} file_spec [file_spec ...] [{-lun | -dg |
-vg | -hostvol | -lvol | -fs -file} file_spec [file_spec ...]
...] -snapname snap_name [-force [-noprompt]][{-reserve |
-noreserve}]
[-vbsr [execute | preview]]
```

If no argument is supplied with the `-vbsr`, the default output is that of the `preview` option. A `-verbose` option is used which enables detailed output of all the mandatory checks that can be over-ridden by the user. The default output when `-verbose` option is not provided displays the results of the checks that is failed.

If you do not want any confirmation message to prompt, while executing volume based SnapRestore, you can use `-noprompt` and `-force` option with `snap restore -vbsr execute` command. The following table describes SnapDrive for UNIX behavior depending on the options provided by you.

S.N.	-vbsr execute	-force	-noprompt	Result
1.	No	NA	NA	Preview mode is the default mode. All the checks are done and report for each check is generated.
2.	Yes	No	No	All checks are done. If any mandatory checks that a user can override fails, SnapDrive for UNIX displays an error message.

S.N.	-vbsr execute	-force	-noprompt	Result
3.	Yes	Yes	No	All the checks are done. If any mandatory checks fail, SnapDrive for UNIX displays an error message. If any check that a user can override fails, SnapDrive for UNIX prompts you.
4.	Yes	Yes	Yes	All the checks are done. If any mandatory checks fail, SnapDrive for UNIX displays an error message. If any check that a user can override fails, SnapDrive for UNIX does not prompt you.

Information about LUNs mapped to local or remote hosts

The only mapping information available from the volume to SnapDrive for UNIX during volume based SnapRestore is the initiator group information for a LUN. If the initiator groups used by you are always created by SnapDrive for UNIX, then the fully qualified domain name of the host is part of the initiator group name.

If SnapDrive for UNIX administrator specifies the `-igroup` CLI option or if you use manually created initiator groups, then the `igroup` name need not necessarily have the host name. For all the earlier reasons, SnapDrive for UNIX cannot reliably detect local or remote bindings for a LUN. Therefore, SnapDrive for UNIX displays the full LUN initiator group and initiator information as part of the volume based SnapRestore.

Host filespec information for a particular volume

SnapDrive for UNIX as part of volume restore preview report displays the LUN mapping information. This displayed information is relevant for the checks and the normal files are reverted. Finding out all the host filespecs based on LUNs on a particular volume is a time consuming process and slows down the volume restore process.

If you want to know that the host filespec information for the local host mapped to a particular storage system volume, you can use `snapdrive storage show -filervol <full-volume-name>`. An example of this is shown in the following.

```
#snapdrive storage show -filervol bart:/vol/volusecase2

Connected LUNs and devices:

 device filename        adapter path    size    proto   state   clone
lun path           backing snapshot
----------------        ------- ----    ----    -----   -----   -----
--------                        -----------------
/dev/sdg                  -     P       100m    iscsi   online   No
bart:/vol/volusecase2/lun5          -

Host devices and file systems:

dg: vbsrfs_1_SdDg               dgtype lvm
hostvol: /dev/mapper/vbsrfs_1_SdDg-vbsrfs_1_SdHv        state: AVAIL
fs: /dev/mapper/vbsrfs_1_SdDg-vbsrfs_1_SdHv     mount point: /mnt/vbsrfs_1
(persistent) fstype jfs2

 device filename     adapter path    size    proto   state   clone   lun
path           backing snapshot
----------------        ------- ----    ----    -----   -----   -----
--------                        -----------------
/dev/sdbe                 -     P       100m    iscsi   online   No
bart:/vol/volusecase1/lun9_0        -
/dev/sdbf                 -     P       100m    iscsi   online   No
bart:/vol/volusecase2/lun4_0        -

raw device: /dev/sdbr1  mount point: /mnt/fs11 (persistent) fstype jfs2

 device filename     adapter path    size    proto   state   clone   lun
path           backing snapshot
----------------        ------- ----    ----    -----   -----   -----
--------                        -----------------
/dev/sdbr                 -     P       200m    iscsi   online   No
bart:/vol/volusecase2/fs11_SdLun    -

NFS device: bart:/vol/volusecase1        mount point: /mnt/volusecase1
(non-persistent)

LUNs not connected to this host:

 lun path                                          size   state
 ----------------------------              ------ ------
 bart:/vol/volusecase2/lunotherhost 20m   online
```

Volume-based SnapRestore for space reservation

For space reservation with volume based snap reserve you need to set *space-reservations-volume-enabled* option in the `snapdrive.conf` file.

The *space-reservations-volume-enabled* option is used to set space guarantee policy on volume and can take the following three values.

- **Snapshot**: This is the default value. Space guarantee on the volume does not change.
- **volume**: Space guarantee on the volume is at the volume level.
- **none**: Space guarantee is set as none.

Following table describes the behavior of volume-based snap reserve for space reservation.

No space reserve CLI option used; `-vbsr execute` **is specified**	**space-reservations-volume-enabled=**	**Result**
none	snapshot	Space guarantee on the volume does not change.
none	none	Attempt to set space guarantee as “none” for the volumes.
`-reserve`	configuration value is over-ridden	Attempt to set space guarantee for volumes as "volume"
`-noreserve`	configuration value is over-ridden	Attempt to set space guarantee for volumes as "none"
none	volume	Attempt to set space guarantee for volumes as "volume"

`-vbsr preview` does not check for any of the space reservation options.

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