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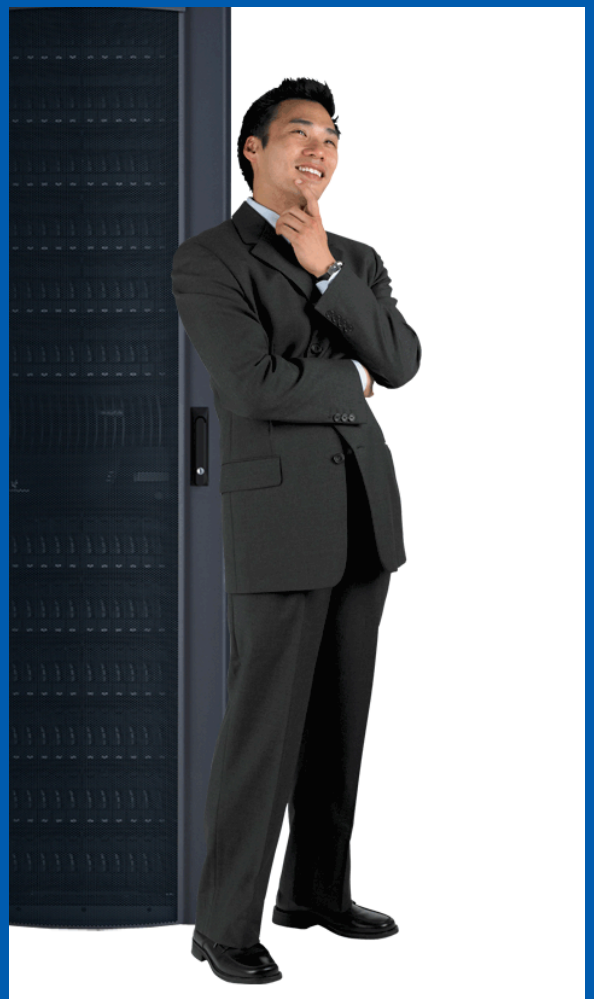
Secondary SnapVault Backup Aggregates

Moving volumes around in a highly thin provisioned environment.



Backup Environment

- The backup environment at TRM is very successful at the de-duplication of data.
- Estimate of 10% to 18% de-duplication.
- Rules for this being successful that must be followed

Rules for Backups

- 14 Terabyte maximum container size.
- Volumes are limited to datacenters based upon their origin (specifics for this rule are in flux!)
- Aggregates below 50% utilization are candidates for having volumes moved into them.
- Aggregates above 90% utilization need to have one or more volumes moved out of them.
- Migrations need to be non-disruptive of backups.
- Relationship between primary and secondary volumes must be maintained.

How is this Accomplished?

- Identification Phase
- Initialization Phase
- Monitoring Phase
- Finalization Phase

Limitations of this Presentation

- This is an overview of the process, not a cookbook.
- Due to time and space limitations, this is not a comprehensive explanation of the process, just an overview.
- Details on what to look for and how to make various decisions are not included.
- Detailed descriptions of why commands are used are not included.
- Other options to accomplish this task are not examined or covered.
- Actual tasks as performed on a day to day basis may vary. This only covers the general principles.
- Known roadblocks are not covered.
- Troubleshooting and problem resolution of known roadblocks is not covered.
- Details on creating or growing aggregates is not covered.

Identification Phase Objectives

- Identify aggregates that are filling.
- Identify candidate volumes to move.
- Identify candidate destination aggregates.

Identification Phase Actions

- Check the storage usage of aggregates on all backup storage controllers.
- Use DFM to identify volumes in very full aggregates that are big enough to make a difference (greater than 400Gb) and not larger than the free space in your destination aggregates.
- Pick aggregates with free space from the df command run before.

Identification Phase Details

- a. Check aggregate usage

```
df -Ah
```

- Identify candidate volumes using DFM

```
dfm report view -s Used volumes-capacity BKP_SERVER
```

- c. Pick destination aggregates

Notes on the examples that follow

- Source storage controller:

`eg-nasbkp-h01`

- Source vFiler:

`corph1`

- Source volume:

`sv_14_ct_pubrecwgs1p_s01ora1_snap`

- Destination storage controller:

`eg-nasbkp-e02`

- Destination vFiler:

`corpe2`

- Destination volume:

`sv_14_ct_pubrecwgs1p_s01ora1_snap_new`

- Many of the examples have extremely long command lines lines. The font size has been dropped in most cases; however, frequently line breaks have been added due to space limitations!

Initialization Phase Objectives

- Start moving data in a volume from a full aggregate to a new location with more free space.

Initialization Phase Actions

- Create the new destination volume in the new destination aggregate. Size must be at least as large as the existing volume, not just the space currently in use.
- Enable auto grow on the new volume.
- Assign the new volume a snap schedule.
- Get rid of the snap reserve on the new volume.
- Add the volume to the correct vFiler.
- Restrict the volume.
- Initialize a snapmirror relationship between the old volume and the new volume.

Initialization Phase Detailed Example

- Create the new destination volume.

```
rsh eg-nasbkp-e02-mgmt vol create sv_14_ct_pubrecwgs1p_s01ora1_snap_new -s none aggr44 13000g
```

- Enable auto grow on the new volume.

```
rsh eg-nasbkp-e02-mgmt vol autosize sv_14_ct_pubrecwgs1p_s01ora1_snap_new -m 14t -i 50g on
```

- Assign the new volume a snap schedule.

```
rsh eg-nasbkp-e02-mgmt snap sched sv_14_ct_pubrecwgs1p_s01ora1_snap_new 0 0 0
```

- Get rid of the snap reserve on the new volume.

```
rsh eg-nasbkp-e02-mgmt snap reserve sv_14_ct_pubrecwgs1p_s01ora1_snap_new 0
```

- Add the volume to the correct vFiler.

```
rsh eg-nasbkp-e02-mgmt vfiler add corpe2 /vol/sv_14_ct_pubrecwgs1p_s01ora1_snap_new
```

- Restrict the volume.

```
rsh eg-nasbkp-e02-mgmt vol restrict sv_14_ct_pubrecwgs1p_s01ora1_snap_new
```

- Initialize a snapmirror relationship between the old volume and the new volume.

```
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapmirror initialize -S
   corph1:sv_14_ct_pubrecwgs1p_s01ora1_snap
   corpe2:sv_14_ct_pubrecwgs1p_s01ora1_snap_new
```

Monitoring Phase Objectives

- Keep track of volumes currently being transferred and take action to finalize the move only after the initial SnapMirror has transferred.

Monitoring Phase Actions and Detailed Example

- Check on the status of the SnapMirror relationship.

```
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapmirror status
   corpe2:sv_14_ct_pubrecwgs1p_s01ora1_snap_new
```

Finalization Phase Objectives

- Transfer the SnapVault relationship to the new secondary volume.
- Delete the old secondary volume.
- Cleanup the Snapshots on the new secondary volume.

Finalization Phase Actions

- Update SnapMirror relationship to minimize lag.
- Break SnapMirror relationship between old destination volume and new destination volume.
- Activate new SnapVault destination.
- Rotate volume names so that old volume now has _old tag and the _new tag is removed from the new destination volume name..
- Delete old SnapVault destination volume.
- Clear invalid snapshots from new destination volume.

Finalization Phase Detailed Example

- Update SnapMirror

```
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapmirror update -S
    corph1:sv_14_ct_pubrecwgs1p_s01ora1_snap corpe2:sv_14_ct_pubrecwgs1p_s01ora1_snap_new
```

- Break SnapMirror relationship

```
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapmirror status
    corpe2:sv_14_ct_pubrecwgs1p_s01ora1_snap_new
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapmirror quiesce
    corpe2:sv_14_ct_pubrecwgs1p_s01ora1_snap_new
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapmirror break
    corpe2:sv_14_ct_pubrecwgs1p_s01ora1_snap_new
rsh eg-nasbkp-e02-mgmt vol options sv_14_ct_pubrecwgs1p_s01ora1_snap_new fs_size_fixed off
rsh eg-nasbkp-e02-mgmt sis on /vol/sv_14_ct_pubrecwgs1p_s01ora1_snap_new
```

- Rotate volume names

```
rsh eg-nasbkp-h01-mgmt vol rename sv_14_ct_pubrecwgs1p_s01ora1_snap
    sv_14_ct_pubrecwgs1p_s01ora1_snap_old
rsh eg-nasbkp-e02-mgmt vol rename sv_14_ct_pubrecwgs1p_s01ora1_snap_new
    sv_14_ct_pubrecwgs1p_s01ora1_snap
```

Finalization Phase Detailed Example (Continued)

- Activate new destination
  - Run this command.

```
rsh eg-nasbkp-h01-mgmt vfiler run corph1 snapvault snap sched sv_14_ct_pubrecwgs1p_s01ora1_snap
```

  - Insert the correct bits into the lines below

```
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapvault snap sched -x -o OPTIONS
    sv_14_ct_pubrecwgs1p_s01ora1_snap SNAPSHOT_NAME SCHEDULE
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapvault snap sched sv_14_ct_pubrecwgs1p_s01ora1_snap
rsh eg-nasbkp-h01-mgmt vfiler run corph1 snapvault snap unsched -f
    sv_14_ct_pubrecwgs1p_s01ora1_snap
```

  - Run this command.

```
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapvault status | egrep
    sv_14_ct_pubrecwgs1p_s01ora1_snap
```

  - Insert the correct bits into the lines below

```
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapvault start -S SOURCE NEW_DEST
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapvault update -S SOURCE NEW_DEST
rsh eg-nasbkp-e02-mgmt vfiler run corpe2 snapvault status NEW_DEST
```

Finalization Phase Detailed Example (Continued)

- Delete old volume

```
rsh eg-nasbkp-h01-mgmt sis stop /vol/sv_14_ct_pubrecwgs1p_s01ora1_snap_old
rsh eg-nasbkp-h01-mgmt vol offline sv_14_ct_pubrecwgs1p_s01ora1_snap_old
rsh eg-nasbkp-h01-mgmt vol destroy sv_14_ct_pubrecwgs1p_s01ora1_snap_old -f
```

- Clear old snapshots
  - Run the following Command

```
rsh eg-nasbkp-e02-mgmt snap list -n sv_14_ct_pubrecwgs1p_s01ora1_snap
```

  - Insert the correct bits into the line below. You will need to use the line multiple times with slightly different values.

```
rsh eg-nasbkp-e02-mgmt "snap delete sv_14_ct_pubrecwgs1p_s01ora1_snap SNAPSHOT"
```

Final Notes

- This set of examples was chosen to give the best overview of the entire process of moving a SnapVault secondary volume from one aggregate to a different aggregate.
- This presentation should not be taken as a cookbook. An understanding of what each command is doing, along with what the correct output of the commands needs to be in the possession of the user.
- This presentation does not cover how to deal with the common errors that occur.

What's Next?

- Automation of this process.
  - Script to help with Identification Phase.
  - Script to help with Initialization Phase and set up the Monitoring Phase
  - Script to help with Finalization Phase

Questions?