

Enterprise Network Storage

**NetApp Tech Refresh Process**

**Synopsis:** This document details the process to be used during migrations from NetApp source arrays to NetApp target arrays.

**Segment:** DCO – Storage

**Authors:** Ian Daniel & Santhana Ramasamy

**Contributors:**

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# Introduction

## Purpose and Scope

The scope of this document is to provide a detailed migration process to be used when performing refresh activities on NetApp controllers where both the source and destination are NetApp.

## Audience

This document is a reference guide for deployment and operations at Thomson Reuters. It is intended for storage administrators who are supporting NetApp technology in the Thomson Reuters environment.

## References

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## Change History

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| **Ver** | | **Date** | **Author(s)** | **Key Changes** |
| 0.1 | 29th January 2013 | | Ian Daniel | Initial Creation of document |
| 0.2 | 30th January 2013 | | Ian Daniel | Updated table in appendix. |
| 0.3 | 22nd February2013 | | Santhana Ramasamy | Added unix text file details |

## Distribution List

|  |  |
| --- | --- |
| **Name** | **Role** |
| Sridhar Chevendra | Storage Team Lead |
| Design and Engineering | Reviewer |
|  |  |

## Glossary

|  |  |
| --- | --- |
| **Term** | **Definition** |
|  |  |

# 

# Work To Be Carried Out Before Migration

## Data Collection

The following table details the required data to be collected prior to migration planning. The main items are at the top and the associated items for that object are below it.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Source** | | | **Destination** | | |
| Source Filer Name | Vfiler Name | Volume Name | Destination Filer Name | Vfiler Name | Volume Name |
| ONTAP Version | Thin Provisioned? | ONTAP Version | Thin Provisioned? |
| Licenses | Snap Reserve | Licenses | Snap Reserve |
| VLAN | | Snap Schedule | VLAN | | Snap Schedule |
| IP Space | | Qtrees | IP Space | | Qtrees |
| IP Address | | CIFS Shares | IP Address | | CIFS Shares |
| MTU | | NFS Exports | MTU | | NFS Exports |
| Interface Type/Speed | | ISCSI LUNS | Interface Type/Speed | | ISCSI LUNS |
| SnapMirror in Use? | | SnapMirrored? | SnapMirror in Use? | | SnapMirrored? |
| SnapMirror Capable? | | SnapMirror Destination | SnapMirror Capable? | | SnapMirror Destination |
| Igroup details | | Aggregate Name | Igroup details | | Aggregate Name |
|  | | Disk Type |  | | Disk Type |
| Hosts Affected By Migration | | | | | |

Table 1 - Pre-Migration Data Collection

## Customer Communications and Downtime

A Project Manager will handle this task. The project manager will also be responsible for collating the detail above in order to ensure they have all relevant details to hand when speaking to the customer.

# Migration Methods

We have five migration methods that are commonly used across the NetApp estate. These are:

* SnapMirror
* Offline Vfiler DataMotion
* Online Vfiler DataMotion
* Storage Vmotion
* File Copy

The first three methods are array based; the last two rely on server-based processes to move the data.

The NetApp methods are summarised below in terms of basic requirements:

## SnapMirror

* Requires source and destination to be the same ONTAP version or destination may be higher.
* Can be scheduled to run at regular intervals.
* Transfers are block level changes only once initialized.
* Downtime required for cutover.

## Offline Vfiler DataMotion

* Utilises SnapMirror
* Provides a convenient way to move an entire vfiler configuration including volumes and config data to a new NetApp controller.
* ONTAP versions may be different as with SnapMirror.
* Downtime required for cutover.

## Online Vfiler DataMotion

* Utilises SnapMirror
* Provides a convenient way to move an entire vfiler configuration including volumes and config data to a new NetApp controller with no downtime (NFS/ISCSI).
* ONTAP versions may not be different.
* Requires ONTAP 8.1.x
* Downtime required for cutover if using CIFS.

The server based methods are summarised below in terms of basic requirements:

## Storage VMotion

* Requires source and destination to be available on the ESX Cluster
* Requires no downtime.
* Can be resource intensive and time consuming.

## File Copy

* Requires source and destination available to the server.
* Requires downtime on the share for the duration of the copy.
* Will require careful consideration with regard to user permissions and copy methods.

# Migration Process

This assumes that all pre-work is done. The method to be used is valid and supported by both source and destination.

## SnapMirror

**Project Manager**

* Customers confirm outage window.
* Change raised and approved

**Pre-Work**

* Create destination vfiler and volumes.
* Ensure clients can connect to new destination.
* Ensure SnapMirror between source and destination is configured and working.
* Configure Schedule
* Initialize SnapMirror of all volumes to migrate to destination vfiler.

**Migration Day**

* Stop all traffic on volumes
* Remove access to volumes from clients
* Update, Quiesce and Break Snapmirrors
* Ensure volumes are read/write and exported via NFS/CIFS if required.
* Ensure ISCSI LUNs are read/write and mapped to correct IDs via igroup if required.
* Re-point clients to new destination.

**Testing**

* Mount shares/LUNs on one client and test access.

**Completion**

* If access is ok and customer is happy bring up remaining clients and mount shares/LUNs.

**Back Out**

* If there are issues that are time consuming to resolve back out and attach clients back onto original storage
* Reschedule migration and resolve issues.

## Offline Vfiler DataMotion

**Project Manager**

* Customers confirm outage window.
* Change raised and approved
* Ensure all network configurations on both sites match (vlan/subnet/routing/firewalls) and move of vfiler IP address is supported.

**Pre-Work**

* Ensure SnapMirror between source and destination is working.

**Migration Day**

* Stop all traffic on volumes
* Remove access to volumes from clients
* Initiate vfiler DM
* Ensure volumes are read/write and exported via NFS/CIFS if required.
* Ensure ISCSI LUNs are read/write and mapped to correct IDs via igroup if required.

**Testing**

* Ensure clients have access and if using CIFS can re-map shares then test access.

**Completion**

* If access is ok and customer is happy migration is completed.

**Back Out**

* If there are issues that are time consuming to resolve back out and attach clients back onto original storage
* Reschedule migration and resolve issues.

## Online Vfiler DataMotion

**Project Manager**

* Customers confirm outage window if CIFS in use.
* Change raised and approved
* Ensure all network configurations on both sites match (vlan/subnet/routing/firewalls) and move of vfiler IP address is supported.

**Pre-Work**

* Ensure source and destination are capable of online vfiler DataMotion
* Ensure SnapMirror between source and destination is working.

**Migration Day**

* Stop all traffic on CIFS volumes
* Remove access to CIFS volumes from clients
* Initiate vfiler DM
* Ensure volumes are read/write and exported via NFS/CIFS if required.
* Ensure ISCSI LUNs are read/write and mapped to correct IDs via igroup if required.

**Testing**

* Ensure clients have access and if using CIFS can re-map shares then test access.

**Completion**

* If access is ok and customer is happy migration is completed.

**Back Out**

* If there are issues that are time consuming to resolve back out and attach clients back onto original storage
* Reschedule migration and resolve issues.

## SVMotion

**Project Manager**

* Customers confirm outage window.
* Change raised and approved

**Pre-Work**

* Create destination vfiler and volumes.
* Ensure clients can connect to new destination.

**Migration Day**

* Platforms team migrate VMs to new DataStore(s).

**Testing**

* Platforms team tests VMs are operational.
* Customer confirms all applications are functioning.

**Completion**

* If access is ok and customer is happy migration is completed.

**Back Out**

* If there are issues that are time consuming to resolve back out and either move VMs back or leave successfully migrated VMs on new DataStore
* Reschedule remaining migrations and resolve issues.

## File Copy

**Project Manager**

* Customers confirm outage window.
* Change raised and approved

**Pre-Work**

* Create destination vfiler and volumes.
* Ensure clients can connect to new destination and map volumes to client.

**Migration Day**

* Initiate file copies

**Testing**

* Customer confirms all files are copied and accessible.

**Completion**

* If access is ok and customer is happy migration is completed.

**Back Out**

* If there are issues customer switches back to source volume.
* Reschedule migration and resolve issues.

**4.6** **UNIX txt input files (Specific to Ex-P)**

* Used by UNIX team to create pre and post migration un-mount/mount scripts
  + Comma delineated TXT file
    - Field 1) Group or Team Name
    - Field 2) Source Filer Name
    - Field 3) Source Volume/qtree Name
    - Field 4) Destination vFiler Name
    - Field 5) Destination Volume/qtree Name
  + Remove any duplicate line items before submission

# Appendix A - Migration Checklists

|  |  |  |
| --- | --- | --- |
| **Migration Checklist** | | |
| **Engineer name:** | | |
| **CR Number:** | | |
| **Global** | **Pre-Migration** | **Completed (Y/N)** |
|  | CR approved? |  |
|  | Outage Window Confirmed (If required) |  |
|  | Network configuration at destination confirmed? |  |
|  | Instance Name/Volume/Qtree/Vfiler name confirmed |  |
|  | Listed the Hosts Affected for migration?  (use exports entry and NFS exports URL) |  |
|  | Provided exportfs(hosts ) details to PM ? |  |
|  | Check CIFS shares on source filer / Collect  share details + access details |  |
| **Specific** | **SnapMirror Migration** | **Completed (Y/N)** |
|  | Create new volume/qtree/Vfiler on target filer and verify the same |  |
|  | snapmirror initialized? (Data,flat Volume or Qtree level ) |  |
|  | snapmirror regular schedule is added to snapmirror.conf ? |  |
|  | new fstab\_CRno\_date\_yourID\_post created? (unix) |  |
|  | old fstab saved as fstab\_CRno\_date\_yourID\_pre ? (unix) |  |
|  | mount options verified? Mount points like Oradmin shouldn’t have noactimeo=0 (unix) |  |
|  | Add exports and quotas entries on the target filer for the volumes (if needed) |  |
|  | Are all the volume/qtree SnapMirrors in sync ? |  |
|  | a) snapmirror status |  |
|  | b) **FOR CIFS shares-->** Once the volume/qtree is in sync,setup the permission for the target share(everyone) |  |
|  | Setup a call with all the teams involved to join the call (Project manager) |  |
|  | Apps/DB shutdown? |  |
|  | All filesystems to be migrated unmounted from all the client machines? (UNIX) |  |
|  | unexport the source volumes and qtrees ? |  |
|  | Terminate CIFS sessions if any exist. |  |
|  | snapmirror update |  |
|  | snapmirror quiesce |  |
|  | snapmirror break |  |
|  | vol options set as required? |  |
|  | netgroup and exports file verified and exported ? |  |
|  | ssh <filername> exportfs <volumename> |  |
|  | fstab\_CRno\_date\_yourID\_post copied to /etc/fstab? |  |
|  | Verify whether the new filesystem is updated in fstab ? (Unix) |  |
|  | all migrated filesystems mounted? |  |
|  | all mount options are correct, Especially RAC ? |  |
|  | (noactimeo=0 or noac options oradata/arch and oradata\_oracm) |  |
|  | Mount points like Oradmin shouldn’t have noactimeo=0 (unix team ) |  |
|  | Created CIFS shares with same permission as before? |  |
|  | With the right ownership and permission? |  |
|  | RAC, subdir created? |  |
|  | Database brought up? |  |
|  | Application brought up? |  |
|  | Post Migration Healthcheck performed? |  |
| **Specific** | **Offline Vfiler DM Migration** | **Completed (Y/N)** |
|  | Setup a call with all the teams involved to join the call (Project manager) |  |
|  | Apps/DB shutdown? |  |
|  | All filesystems to be migrated unmounted from all the client machines? (UNIX) |  |
|  | Terminate CIFS sessions if any exist. |  |
|  | Initiate offline vfiler DM |  |
|  | all migrated filesystems mounted? |  |
|  | CIFS shares mounted? |  |
|  | Database brought up? |  |
|  | Application brought up? |  |
|  | Post Migration Healthcheck performed? |  |
| **Specific** | **Online Vfiler DM Migration** | **Completed (Y/N)** |
|  | Setup a call with all the teams involved to join the call (Project manager) |  |
|  | Apps/DB shutdown if using CIFS? |  |
|  | Terminate CIFS sessions if any exist. |  |
|  | Initiate online vfiler DM |  |
|  | all migrated filesystems mounted? |  |
|  | CIFS shares mounted? |  |
|  | Database brought up if using CIFS? |  |
|  | Application brought up if using CIFS? |  |
|  | Post Migration Healthcheck performed? |  |
| **Specific** | **SVMotion Migration** | **Completed (Y/N)** |
|  | Setup a call with all the teams involved to join the call (Project manager) |  |
|  | New datastores mounted on ESX servers and accessible? |  |
|  | Initiate SVMotion of VMs to new datastore |  |
|  | all migrated VMs online? |  |
|  | Post Migration Healthcheck performed? |  |
| **Specific** | **File Copy Migration** | **Completed (Y/N)** |
|  | Setup a call with all the teams involved to join the call (Project manager) |  |
|  | New shares mounted on servers and accessible? |  |
|  | Initiate file copies to new areas. |  |
|  | all files copied and accessible? |  |
|  | Post Migration Healthcheck performed? |  |
| **Global** | **Cleanup** | **Completed (Y/N)** |
|  | Entry is snapmirror.conf commented out? |  |
|  | Cleanup Snapmirror Snapshots in Source & Target Volumes, Arch Qtree? |  |
|  | Old Volname/qtrees Renamed using standard procedure? |  |
|  | Rename the old volume as <volumename\_CR\_expirydate> (we can keep the volume for a week or two ) |  |
| **Global** | **Completion** | **Completed (Y/N)** |
|  | CR updated? |  |
|  | **This checklist completed? (upload to SharePoint as a record of migration)** |  |