7-Mode Transition Tool
Copy-Free Transition Cabling Guide

Copy-Free Transition (CFT) Cabling Guide for the 7-Mode Transition Tool

Starting in clustered Data ONTAP 8.3.2, the 7-Mode Transition Tool (7MTT) delivers a new data migration method without copying data. This functionality is available exclusively to NetApp customers using the 7MTT version 2.2. This quick reference guide has been produced to provide cable planning guidance and references to migrate your Data ONTAP 7-Mode disk shelves to clustered Data ONTAP using Copy-Free Transition.
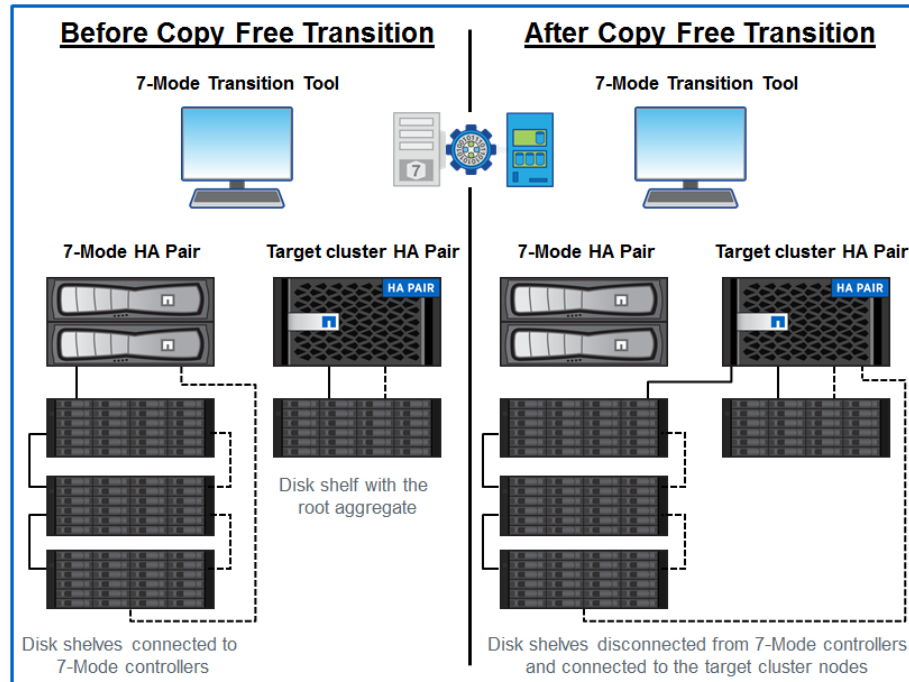
Copy-Free Transition

Benefits

- Significantly reduces transition duration, cost and migration complexity
- Simplifies data migration management
- Supports NFS, CIFS, and SAN
- Supports parallel migration of Volume SnapMirror
- Preserves common Snapshot copies
- Includes capability to rollback to Data ONTAP 7-Mode prior to commit
- Does not require data copy mechanism
- Leverages 7MTT to automate migration from Data ONTAP 7-Mode to clustered Data ONTAP
- Data can be served from non-destination clustered Data ONTAP nodes during CFT migration

Target Environment

- Preparing for Tech Refresh
- Moving from Data ONTAP 7-Mode to clustered Data ONTAP
- Data ONTAP 7-Mode source systems are mid- or high-end FAS controllers

Before Copy Free Transition / **After Copy Free Transition**

Disk shelves connected to 7-Mode controllers

Disk shelves disconnected from 7-Mode controllers and connected to the target cluster nodes

Qualifications

- Transitioning from:
  - FAS3070, FAS31XX, FAS32XX, FAS6040, FAS6080, FAS62XX
  - 7-Mode Data ONTAP 8.1.4P4-9
- Transitioning to:
  - FAS8000 series controllers
  - Clustered Data ONTAP 8.3.2+

- Destination clustered Data ONTAP systems must have two available nodes (HA pair) in the cluster
- Destination HA pair cannot contain any data
- Refer to the IMT for the latest supported configurations

Copy-Free Transition Overview

- Plan the Data ONTAP 7-Mode to clustered Data ONTAP transition
- Install and configure new clustered Data ONTAP systems
- Prepare for the transition
- Review the cabling planning guidance and complete the cabling worksheet
- Provision the SVM on the destination clustered Data ONTAP controller
- Export and halt the Data ONTAP 7-Mode controller
- Power-down and disconnect the disk shelves from the Data ONTAP 7-Mode controller
- Cable the disk shelves to the clustered Data ONTAP controller
- Power-on the disk shelves and wait 70 seconds
- Verify that clustered Data ONTAP controllers recognize the 7-Mode shelf ID's and location
- Transition the aggregates and volumes on the migrated disk shelves to clustered Data ONTAP
- Test the migrated data and configurations
- Commit the aggregates and data to clustered Data ONTAP
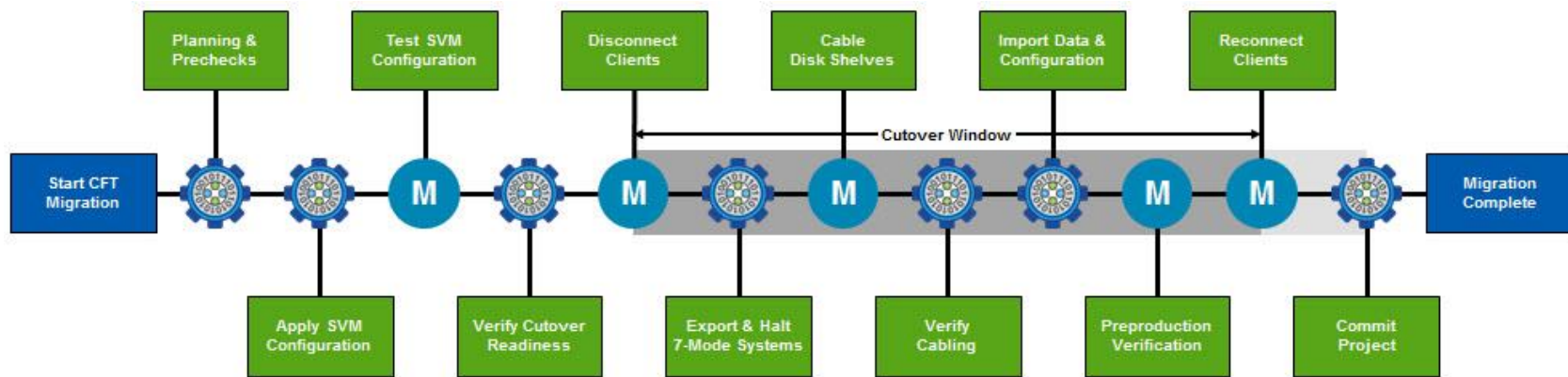
Copy-Free Transition Cabling Worksheet

Complete this worksheet during the planning phase of your transition. Additional guidance and an example worksheet are below.

7-Mode Cabling (source)

Controller A (hostname): _____

Location: _____ **Floor:** _____ **Rack:** _____

Module A Ports	Module B Ports	Shelf Type / Asset Tag	Shelf IDs

Controller B (hostname): _____

Location: _____ **Floor:** _____ **Rack:** _____

Module A Ports	Module B Ports	Shelf Type / Asset Tag	Shelf IDs

Clustered Data ONTAP Cabling (destination)

Controller A (hostname): _____

Location: _____ **Floor:** _____ **Rack:** _____

Module A Ports	Module B Ports	Shelf Type / Asset Tag	Shelf IDs

Controller B (hostname): _____

Location: _____ **Floor:** _____ **Rack:** _____

Module A Ports	Module B Ports	Shelf Type / Asset Tag	Shelf IDs

Notes: _____

Process Flow Diagram

Top row (green boxes): Planning & Prechecks | Test SVM Configuration | Disconnect Clients | Cable Disk Shelves | Import Data & Configuration | Reconnect Clients

Middle row: Start CFT Migration — [gear] — [gear] — M — [gear] — M — [gear] — M — [gear] — [gear] — M — M — [gear] — Migration Complete

Cutover Window spans from Disconnect Clients through Reconnect Clients

Bottom row (green boxes): Apply SVM Configuration | Verify Cutover Readiness | Export & Halt 7-Mode Systems | Verify Cabling | Preproduction Verification | Commit Project

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Copy-Free Transition Cabling Guide

- Run Config Advisor on Data ONTAP 7-Mode and clustered Data ONTAP controllers
  - Expedites gathering port, disk shelf, and disk shelf ID details
- Run `sysconfig -a` on source 7-Mode controllers to identify key configurations
  - Which expansion cards are installed and may be moved to the destination clustered Data ONTAP controllers
  - Identify how the source stacks are cabled
  - Understand how ACP is managed
- Write down the used ports on the Data ONTAP 7-Mode controllers
- Write down the used ports on the clustered Data ONTAP controllers
- Review the available (open) ports on the clustered Data ONTAP controllers
- Review the expansion card slots on the clustered Data ONTAP controllers
- Plan the expansion card configuration on the clustered Data ONTAP controllers following Best Practices
- Plan and document the destination ports to use for the disk shelf cabling on the clustered Data ONTAP controllers
  - Use the Copy-Free Transition Worksheet, or similar table to document the source and destination ports
  - Review the CFT Cabling Considerations below
- Physically verify the port connections on the Data ONTAP 7-Mode and clustered Data ONTAP systems
  - Identify any issues with cabling based on the new disk shelf stack location. E.g. you may need LC-LC to execute CFT
  - Account for longer cable lengths due to ladder racking and/or data center requirements. E.g. you may need longer cables
  - This is a good time to label each disk shelf stack and cable on the Data ONTAP 7-Mode controller
- Verify the disk firmware, shelf firmware, disk qualification packages, and ACP firmware versions are installed and current
- During the outage window, complete the Copy-Free Transition
  - Disk shelf stack must be powered-down before disconnecting cables from Data ONTAP 7-Mode controllers
  - Disconnect the disk shelf stack cables from the Data ONTAP 7-Mode controllers
  - Connect the 7-Mode disk shelf stack cables to the clustered Data ONTAP controllers
  - Power-on the 7-Mode disk shelf stack and wait 70 seconds
- Verify the following before selecting 'Verify Cabling'
  - Ensure that clustered Data ONTAP controllers recognize the 7-Mode disk shelf stack ID's and location

CFT Cabling Considerations

- Ensure all SAS ports follow the (circle/square) rules and path requirements
- Selection of destination ports may depend on multiple factors, including
  - Separate or existing disk shelf stack
  - Port availability
  - SAS or FC connections
  - Limited ports on FAS8020 & FAS8040 systems
- Verify there are no duplicate Shelf IDs
- Use the CLI command `blink_on <disk_name>` to identify disk shelves
- Verify you have the correct cables
- Verify your cables lengths can reach the clustered Data ONTAP system

CFT Migration Considerations

- Plan your outage window (6-8 hours)
  - Outage window includes reconnecting clients and testing
- Cannot consolidate Data ONTAP 7-Mode systems to fewer clustered Data ONTAP systems
- Expansion cards may only be moved from the source Data ONTAP 7-Mode system if they are also supported on the destination clustered Data ONTAP platform and release version

Copy-Free Transition Cabling Worksheet Example

The worksheet below is an example for planning the new port connections for copy-free transition to clustered Data ONTAP.

Note: The disk shelves for the root aggregates on clustered Data ONTAP have shelf ID 10 and 11. Therefore, the source disk shelf IDs 10-13 must be changed (e.g. 20-23).

Module A/B Ports – Specify the port connections for module A and B
Shelf – Specify the disk shelf type
Shelf IDs – Specify the disk shelf IDs

7-Mode Cabling (source)

Controller A (hostname): ___Neptune_____.

Location: _____ Floor: _____ Rack: _____

Module A Ports	Module B Ports	Shelf Type / Asset Tag	Shelf IDs
1a	12d	DS4243 / 150254-7	10-13
1b	11b	DS4243 / 151205-7	30-32
1c (offline)	n/a	n/a	n/a
1d	11d	DS4243 / 143921-2	14-15
11a (offline)	n/a	n/a	n/a
11c	12c	DS4243 / 105390-4	20-25
12a (offline)	n/a	n/a	n/a

Controller B (hostname): ___Saturn_____.

Location: _____ Floor: _____ Rack: _____

Module A Ports	Module B Ports	Shelf Type / Asset Tag	Shelf IDs
1a	12d	DS4243 / 174263-6	10-13
1b	11b	DS4243 / 174274-9	30-35
1c (offline)	n/a	-	n/a
1d	11d	DS4243 / 174285-6	14-15
11a (offline)	n/a	-	n/a
11c	12c	DS4243 / 174296-301	20-25
12a (offline)	n/a	DS4243 / 174243	n/a

Clustered Data ONTAP Cabling (destination)

Controller A (hostname): ___Andromeda_____.

Location: _____ Floor: _____ Rack: _____

Module A Ports	Module B Ports	Shelf Type / Asset Tag	Shelf IDs
0a	4d	DS4243 / 150254-7	20-23
4a	1d	DS4243 / 151205-7	30-32
-	-	n/a	-
1a	0d	DS4243 / 143921-2	40-41
-	-	n/a	-
1b	4c	DS4243 / 105390-4	50-55
-	-	n/a	-

Controller B (hostname): ___Centaurus_____.

Location: _____ Floor: _____ Rack: _____

Module A Ports	Module B Ports	Shelf Type / Asset Tag	Shelf IDs
0a	4d	DS4243 / 174263-6	60-63
4a	1d	DS4243 / 174274-9	70-75
-	-	-	-
1a	0d	DS4243 / 174285-6	80-81
-	-	-	-
1b	4c	DS4243 / 174296-301	90-95
-	-	DS4243 / 174243	-

Notes: _____

Useful Data ONTAP 7-Mode Commands

The following Data ONTAP commands can assist with identifying the port connectivity to the 7-Mode controllers. During the transition planning phase the port connectivity should be physically verified in the data center.

```
hal-7mode::> sysconfig -a
```

```
hal-7mode::> sasadmin channels
```

```
hal-7mode::> sasadmin shelf
```

Useful clustered Data ONTAP Commands

The following Data ONTAP commands can assist with identifying the port connectivity to the clustered Data ONTAP controllers. During the transition planning phase the port connectivity should be physically verified in the data center.

```
skynet::> system node run –node skynet-01 sysconfig -a
```

```
skynet::> system node hardware unified-connect show -node skynet-01
                        Current  Current    Pending Pending    Admin
Node           Adapter  Mode     Type       Mode    Type       Status
------------   -------  -------  ---------  ------- ---------  -----------
skynet-01      0c       fc       initiator  -       -          offline
skynet-01      0d       fc       initiator  -       -          offline
skynet-01      6a       fc       initiator  -       -          offline
skynet-01      6b       fc       initiator  -       -          offline
4 entries were displayed.
```

```
skynet::> system node run -node skynet-01 sasadmin channels
500a09800099c348 0a                SAS-port (GIHAID: 10)
500a09800099c34c 0b                SAS-port (GIHAID: 11)
500a09800126a4b8 4a                SAS-port (GIHAID:  6)
500a09800126a4bc 4b                SAS-port (GIHAID:  7)
```

```
skynet::> system node run -node skynet-01 sasadmin shelf

Expanders on channel 0a:
      +------------------+
  10 |  0 |  1 |  2 |  3 |
     |  4 |  5 |  6 |  7 |
     |  8 |  9 | 10 | 11 |
     | 12 | 13 | 14 | 15 |
     | 16 | 17 | DD | DD |
      +------------------+
```

Where to Go for More Information

- 7-Mode Transition Tool Guides
- Transition Fundamentals Web Portal
- TR-4052: Successfully Transitioning to Clustered Data ONTAP
- TR-3437: Storage Subsystems Resiliency Guide
- Clustered Data ONTAP 8.3 Physical Storage Management Guide
- NetAppU Training
  - NetApp Transition Fundamentals
  - Planning and Implementing Transition Using the 7-Mode Transition Tool
- NetApp Service Offerings
  - Clustered Data ONTAP Migration Service
- NetApp Cabling guides
  - Universal SAS and ACP Cabling Guide
  - DS4243, DS2246, DS4486, and DS4246 Disk Shelf Installation and Service Guide
  - DS4243 and DS4246 Disk Shelf Installation and Setup
- Disk Qualification Package Instructions
- Config Advisor
- Hardware Universe
- Interoperability Matrix (IMT)

Copy-Free Transition Limitations

- Source NetApp platforms supported: FAS3070, FAS31XX, FAS32XX, FAS6040, FAS6080, FAS62XX
- Source Data ONTAP 7-Mode versions supported: 8.1.4P4-9
- Destination NetApp platforms supported: FAS80XX series controllers
- Destination Clustered Data ONTAP versions supported: 8.3.2
- Does not support staggered transition of volume SnapMirror source and destination relationships
  - Parallel SnapMirror transition requires the primary and secondary 7-Mode HA pairs to transition in the same maintenance window (no TDP support)
  - Does not support data reorganization of volumes, LUNs, or qtrees during CFT
    - 1-to-1 mapping from Data ONTAP 7-Mode controller (or vFiler) to clustered Data ONTAP SVM
    - After completing CFT you can perform data reorganization
- Does not support MetroCluster, 32-bit data, TradVols, SnapLock, IPv6, Qtree SnapMirror
- Does not preserve SnapVault relationships
  - Requires re-baseline
- All disk shelves on the Data ONTAP 7-Mode system must move to clustered Data ONTAP
- Consolidation of disk shelf stacks is not supported
- Only disk shelves supported in clustered Data ONTAP 8.3.2 may be migrated:
  - DS14-Mk4-FC, DS14-Mk2-AT, DS4243, DS2246, DS4246, DS4486
  - Check the Interoperability Matrix (IMT) for more details

Solution Overview

7-Mode Transition Tool

- NetApp 7-Mode Transition Tool Datasheet
  http://www.netapp.com/us/media/ds-3584.pdf
- 7MTT 2.2 software installation package
  https://mysupport.netapp.com/NOW/cgi-bin/software/
- 7MTT Data and Configuration Guide for Transitioning to clustered Data ONTAP
  https://library.netapp.com/ecm/ecm_download_file/ECMP12443515
- 7MTT SAN Host Transition Remediation Supplemental Guide
  https://library.netapp.com/ecm/ecm_download_file/ECMP12443516
- 7MTT Release Notes
  https://library.netapp.com/ecm/ecm_download_file/ECMP12443519