7-Mode Transition Documentation

ONTAP 7-Mode Transition

NetApp
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7-Mode Transition Documentation

7-Mode Transition Tool Release Notes

The 7-Mode Transition Release Notes describe new features, upgrade notes, fixed issues, known limitations, and known issues.

You are required to sign on to the NetApp Support Site to access the Release Notes.

Command Map for 7-Mode Administrators

This guide maps 7-Mode commands to their equivalents in ONTAP.

How 7-Mode commands map to ONTAP commands

You can use the tables provided to find the ONTAP equivalents of 7-Mode commands, with the exception of the options command.

The following tables list the ONTAP equivalents of the 7-Mode options command. Information about understanding these tables is also provided.

Understanding the 7-Mode to clustered Data ONTAP command map

A-E

A

7-Mode command	ONTAP command
`acpadmin configure`	**`system node run -node {`*`nodename`*`|local} acpadmin configure`**
`acpadmin list_all`	**`system node run -node {`*`nodename`*`|local} acpadmin list_all`**
`acpadmin stats`	**`system node run -node {`*`nodename`*`|local} acpadmin stats`**

`aggr add`	**`aggr add`**
	`aggr add-disks`
	`storage aggregate add-disks`

`aggr create`	**`aggr create`** `storage aggregate create`
`aggr destroy`	**`aggr delete`** `storage aggregate delete`
`aggr media_scrub`	**`system node run -node {`*`nodename`*`|local} aggr media_scrub`**

7-Mode command	ONTAP command
aggr offline	**aggr offline** storage aggregate offline
aggr online	**aggr online** storage aggregate online
aggr options	**aggr modify** storage aggregate {show | modify}
aggr rename	**aggr rename** storage aggregate rename
aggr restrict	**aggr restrict** storage aggregate restrict
aggr scrub	**aggr scrub** storage aggregate scrub
aggr show_space	**aggr show-space** storage aggregate show-space
aggr status	aggr show storage aggregate show
aggr verify	**system node run -node {*nodename*|local} aggr verify**
autosupport destinations	**autosupport destinations** system node autosupport destinations
autosupport history	**autosupport history** system node autosupport history

7-Mode command	ONTAP command
`autosupport manifest`	**`autosupport manifest`** `system node autosupport manifest`
`autosupport trigger`	**`autosupport trigger`** `system node autosupport trigger`

B

7-Mode command	ONTAP command
`backup status`	**`system node run -node {`*`nodename`*` -command backup status`**
`backup terminate`	Not supported
`bmc`	Not supported
`bmc reboot`	Not supported
`bmc status`	Not supported
`bmc test`	Not supported

C

7-Mode command	ONTAP command
`cdpd show-neighbors`	**`system node run -node {`*`nodename`*`|local} -command network device-discovery show`**
`cdpd show-stats`	**`system node run -node {`*`nodename`*`|local} -command cdpd show-stats`**
`cdpd zero stats`	**`system node run -node {`*`nodename`*`|local} -command cdpd zero-stats`**
`cf disable`	`cf disable`
`cf enable`	`cf enable`

7-Mode command	ONTAP command
`cf forcegiveback`	Not supported
`cf forcetakeover`	`cf forcetakeover`
`cf giveback`	**`cf giveback`** `storage failover giveback`
`cf hw_assist`	**`cf hwassist status`** `storage failover hwassist show`
`cf monitor all`	**`cf monitor all`** `storage failover show -instance`
`cf partner`	**`cf partner`** `storage failover show -fields partner-name`
`cf rsrctbl`	**`cf rsrctbl`** `storage failover progress -table show`
`f status`	**`cf status`** `storage failover show`
`cf takeover`	**`cf takeover`** `storage failover takeover`
`charmap`	`vserver cifs character-mapping`
`cifs access`	**`cifs access`** `vserver cifs access`
`cifs branchcache`	**`cifs branchcache`** `vserver cifs branchcache`

7-Mode command	ONTAP command
`cifs changefilerpwd`	**`cifs changefilerpwd`** `vserver cifs changefilerpwd`
`cifs domaininfo`	vserver cifs {show instance|domain discovered-servers show -instance}
`cifs gpresult`	`vserver cifs group-policy show-applied`
`cifs gpupdate`	`vserver cifs group-policy update`
`cifs homedir`	`vserver cifs home-directory`
cifs nbalias	vserver cifs { add-netbios-aliases | remove-netbios-aliases | show -display-netbios-aliases }
cifs prefdc	vserver cifs domain preferred-dc
cifs restart	vserver cifs start
cifs sessions	vserver cifs sessions show
cifs setup	vserver cifs create
cifs shares	**cifs shares** vserver cifs share
cifs stat	statistics show -object cifs
cifs terminate	vserver cifs stop
cifs testdc	vserver cifs domain discovered-servers
cifs resetdc	**cifs resetdc** vserver cifs domain discovered-servers reset-servers
clone clear	Not supported
clone start	volume file clone create
clone stop	Not supported
clone status	volume file clone show

7-Mode command	ONTAP command
config clone	Not supported
config diff	Not supported
config dump	Not supported
config restore	Not supported
coredump	system node coredump

D

7-Mode command	ONTAP command
date	**date** { system | cluster } date { show | modify }
dcb priority	system node run -node *nodename* -command dcb priority
dcb priority show	system node run -node *nodename* -command dcb priority show
dcb show	system node run -node *nodename* -command dcb show
df	**df**
df [aggr name]	df -aggregate *aggregate-name*
df [path name]	df -filesys-name *path- name*
df -A	**df -A**
df -g	**df -g** df -gigabyte
df -h	**df -h** df -autosize
df -i	**df -i**
df -k	**df -k** df -kilobyte
df -L	**df -L** df -flexcache
df -m	**df -m** df -megabyte

7-Mode command	ONTAP command
df -r	**df -r**
df -s	**df -s**
df -S	**df -S**
df -t	**df -t** df -terabyte
df -V	**df -V** df -volumes
df -x	**df -x** df -skip-snapshot-lines
disk assign	**disk assign** storage disk assign
disk encrypt	system node run -node run*nodename* -command disk encrypt
disk fail	**disk fail** storage disk fail
disk maint	**disk maint {start | abort | status | list }** system node run -node {*nodename*|local} -command disk maint {start | abort | status | list }
disk remove	**disk remove** storage disk remove
disk replace	**disk replace** storage disk replace
disk sanitize	system node run -node *nodename* -command disk sanitize
disk scrub	storage aggregate scrub
disk show	storage disk show
disk simpull	system node run -node *nodename* -command disk simpull
disk simpush	system node run -node *nodename* -command disk simpush
disk zero spares	storage disk zerospares
disk_fw_update	system node image modify

7-Mode command	ONTAP command
dns info	dns show
download	system node image update
du [path name]	du -vserver *vservername* -path *pathname*volume file show-disk-usage -vserver *vserver_name* -path *pathname*
du -h	du -vserver *vservername* -path *pathname* -hvolume file show-disk-usage -vserver *vserver_name* -path *pathname* -h
du -k	du -vserver *vservername* -path *pathname* -kvolume file show-disk-usage -vserver *vserver_name* -path *pathname* -k
du -m	du -vserver *vservername* -path *pathname* -mvolume file show-disk-usage -vserver *vserver_name* -path *pathname* -m
du -r	du -vserver *vservername* -path *pathname* -rvolume file show-disk-usage -vserver *vserver_name* -path *pathname* -r
du -u	du -vserver *vservername* -path *pathname* -uvolume file show-disk-usage -vserver *vserver_name* -path *pathname* -u
dump	Not supportedYou must initiate the backup by using NDMP as described in tape backup documentation. For dump-to-null functionality, you must set the NDMP environment variable DUMP_TO_NULL. Data protection using tape backup

E

7-Mode command	ONTAP command
echo	**echo**
ems event status	**ems event status** event status show
ems log dump	event log show -time >*time-interval*
ems log dump value	event log show

7-Mode command	ONTAP command
environment chassis	system node run -node {*nodename*|local} -command environment chassis
environment status	system node run -node*nodename* -command environment status
environment shelf	Not supported You must use the “storage shelf” command set.
environment shelf_log	**environment shelf_log** system node run -node {*nodename*|local} -command environment shelf_log
environment shelf_stats	system node run -node {*nodename*|local} -command environment shelf_stats
environment shelf_power_status	Not supported You must use the “storage shelf” command set.
environment chassis	system node run -node {*nodename*|local} -command environment chassis
environment chassis list-sensors	system node run -node {*nodename*|local} environment sensors show
exportfs	vserver export policy [rule]
exportfs -f	vserver export-policy cache flush
exportfs -o	vserver export-policy rule
exportfs -p	vserver export policy rule
exportfs -q	vserver export policy [rule]

F-J

F

7-Mode command	ONTAP command
fcadmin config	system node run -node {*nodename*|local} -command fcadmin config

7-Mode command	ONTAP command
fcadmin link_stats	system node run -node {*nodename*|local} -command fcadmin link_stats
fcadmin fcal_stats	system node run -node {*nodename*|local} -command fcadmin fcal_stats
fcadmin device_map	system node run -node {*nodename*|local} -command fcadmin device_map
fcnic	Not supported
fcp config	network fcp adapter modify
fcp nameserver	**fcp nameserver show** vserver fcp nameserver show
fcp nodename	vserver fcp nodename
fcp ping	**fcp ping-igroup show OR fcp ping-initiator show** vserver fcp ping-igroup show OR vserver fcp ping-initiator show
fcp portname	**fcp portname show** vserver fcp portname show
fcp show	vserver fcp show
fcp start	**fcp start** vserver fcp start
fcp stats	**fcp stats** fcp adapter stats
fcp status	vserver fcp status
fcp stop	**fcp stop** vserver fcp stop
fcp topology	network fcp topology show OR vserver fcp topology show
fcp wwpn-alias	**fcp wwpn-alias** vserver fcp wwpn-alias
fcp zone	**fcp zone show** network fcp zone show
fcp dump	**fcp adapter dump** network fcp adapter dump

7-Mode command	ONTAP command
fcp reset	**fcp adapter reset** network fcp adapter reset
fcstat link_stats	system node run -node {*nodename*|local} -command fcstat link_stats
fcstat fcal_stats	system node run -node {*nodename*|local} -command fcstat fcal_stats
fcstat device_map	system node run -node {*nodename*|local} -command fcstat device_map
file reservation	volume file reservation
filestats	Not supported
flexcache	volume flexcache
fpolicy	**fpolicy** vserver fpolicy
fsecurity show	vserver security file-directory show
fsecurity apply	vserver security file-directory apply
fsecurity status	vserver security file-directory job-show
fsecurity cancel	vserver security file-directory job-stop
fsecurity remove-guard	vserver security file-directory remove-slag
ftp	Not supported

H

7-Mode command	ONTAP command
halt	system node halt -node *nodename*
halt -f	system node halt inhibit -takeover true
halt -d	system node halt -dump true

7-Mode command	ONTAP command
help	? You must type the question mark (?) symbol to execute this command in ONTAP.
hostname	**hostname** system hostname
httpstat	Not supportedYou must use the statistics command.

I

7-Mode command	ONTAP command
if_addr_filter_info	system node run -note *nodename* -command if_addr_filter_info
ifconfig	network interfacenetwork {interface | port}
ifconfig -a	network interface show network {interface | port} show
ifconfig alias	network interface create
ifconfig down	network interface modify -status-admin down
ifconfig flowcontrol	network port modify -flowcontrol-admin
ifconfig mediatype	network port modify {-duplex-admin | -speed-admin}
ifconfig mtusize	network port modify -mtu
ifconfig netmask	network interface modify -netmask
ifconfig up	network interface modify -status-admin up
ifgrp create	network port ifgrp create
ifgrp add	network port ifgrp add -port
ifgrp delete	network port ifgrp remove-port
ifgrp destroy	network port ifgrp delete

7-Mode command	ONTAP command
ifgrp favor	For ONTAP 9 releases, create a failover group for the two ports using the network interface failover-groups create command. Then use the network interface modify command to set the favored home port with the -home-port option and set the -autorevert option to true. ⓘ Remove the ports from the ifgrp before adding them to the failover group. It is a best practice to use ports from different NICs. This practice also prevents EMS warnings regarding insufficient redundancy.
ifgrp nofavor	For ONTAP 9 releases, use the same procedure for failover groups.
ifgrp status	system node run -node {*nodename*|local} -command ifgrp status
ifgrp stat	system node run -node {*nodename*|local} -command ifstat *ifgrp-port*
ifgrp show	network port ifgrp show
ifinfo	system node run -node {*nodename*|local} -command ifinfo
ifstat	system node run -node {*nodename*|local} -command ifstat
igroup add	**igroup add** lun igroup add
igroup alua	lun igroup modify -alua
igroup bind	**igroup bind** lun igroup bind
igroup destroy	**igroup delete** lun igroup delete
igroup create	**igroup create** lun igroup create
igroup remove	**igroup remove** lun igroup remove
igroup rename	**igroup rename** lun igroup rename

7-Mode command	ONTAP command
igroup set	igrouplun igroup set
igroup show	**igroup show** lun igroup show
igroup set ostype	igroup modify -ostype
igroup unbind	**igroup unbind** lun igroup unbind
ipsec	Not supported
iscsi alias	iscsi createvserver iscsi create OR iscsi modify vserver iscsi modify
iscsi connection	**iscsi connection** vserver iscsi connection
iscsi initiator	**iscsi initiator** vserver iscsi initiator
iscsi interface	**iscsi interface** vserver iscsi interface
iscsi isns	**iscsi isns** vserver iscsi isns
iscsi portal	**iscsi portal** vserver iscsi portal
iscsi security	**iscsi security** vserver iscsi security
iscsi session	**iscsi session** vserver iscsi session
iscsi show	**iscsi show** vserver iscsi show
iscsi start	**iscsi start** vserver iscsi start
iscsi stats	statistics {start|stop|show} -object *object* ⓘ Available at the advanced privilege level.
iscsi stop	**iscsi stop** vserver iscsi stop

K-O

K

7-Mode command	ONTAP command
key_manager	system node run -node {*nodename*|local} -command key_manager
keymgr	system node run -node {*nodename*|local} -command keymgr For management interface keys, you must use the “security certificates” commands.

L

7-Mode command	ONTAP command

`license`	`license show`
	
	`system license show`

`license add`	`license add` `system license add -license-code` ***`V2_license_code`***
`license delete`	`license delete` `system license delete -package` ***`package_name`***
`lock break`	`vserver locks break` Available at the advanced privilege level.
`lock break -h host`	`vserver locks break -client-address` ***`client-address`***
`lock break -net network`	`vserver locks break -client-address -type` ***`ip address type`***
`lock break -o owner`	`vserver locks break -owner-id` ***`owner-id`***
`lock break -p protocol`	`vserver locks break -protocol` ***`protocol`***
`lock status`	`vserver locks show`
`lock status -h host`	`vserver locks show -client-address` ***`client-address`***

7-Mode command	ONTAP command
`lock status -o owner`	`vserver locks show -owner-id` *`owner id`*
`lock status -p protocol`	`vserver locks show -protocol` *`protocol`*

`logger`	`logger`
	
	`system node run -node {nodename|local} -command logger`

`logout`	`exit`
`lun clone`	`volume file clone create`
`lun comment`	`lun comment`
`lun config_check`	Not supported
`lun create`	`lun create -vserver` *`vserver_name`**
`lun destroy`	`lun delete`
`lun map`	`lun map -vserver` *`vserver_name`*
`lun maxsize`	`lun maxsize`
`lun move`	`lun move`
`lun offline`	`lun modify -state offline`
`lun online`	`lun modify -state online`
`lun resize`	`lun resize`
`lun set`	`lun set`
`lun setup`	`lun create`
`lun share`	Not supported
`lun show`	`lun show`

7-Mode command	ONTAP command
`lun snap`	Not supported
`lun stats`	**`statistics show -object lun`** Available at the advanced privilege level.
`lun unmap`	**`lun unmap`**

M

7-Mode command	ONTAP command
man	**man**
maxfiles	vol modify -max-*number-of-files* OR vol -fields files
mt	Not supported You must use the storage tape command set.

N

7-Mode command	ONTAP command
nbtstat	vserver cifs nbtstat
ndmpd	{system | server} services ndmp
ndmpcopy	system node run -node {*nodename*|local} ndmpcopy
ndmpd on	**ndmpd on** system services ndmpd on
ndmpd off	**ndmpd off** system services ndmpd off
ndmpd status	{system | vserver} services ndmp status
ndmpd probe	{system | vserver} services ndmp probe
ndmpd kill	{system | vserver} services ndmp kill
ndmpd killall	{system | vserver} services ndmp kill-all

7-Mode command	ONTAP command
ndmpd password	{system | vserver} services ndmp password
ndmpd version	{system | vserver} services ndmp version
ndp	system node run -node {*nodename*|local} keymgr
netdiag	Not supportedYou must use the network interface or netstat commands.
netsat	system node run node *nodename* command netstat
network interface failover	network interface show -failover
network port vlan modify	Not supported
nfs off	**nfs off** vserver nfs off
nfs on	**nfs on** vserver nfs on
nfs setup	vserver nfs create OR vserver setup
nfs stat	statistics {start | stop | show} -object nfs*
nfs status	vserver nfs status
nfs vstorage	vserver nfs modify -vstorage
nfsstat	statistics show -object nfs*

O

7-Mode command	ONTAP command
orouted	Not supported

P-T

P

7-Mode command	ONTAP command
partner	Not supported

7-Mode command	ONTAP command
passwd	security login password
perf report -t	statistics {start | stop | show} -object perf
ping {host}	network ping {-node *nodename* | -lif *lif-name*} -destination
ping {count}	network ping {-node *nodename* | -lif *lif-name*} -count
ping -l interface	network ping -lif *lif-name*
ping -v	network ping -node {*nodename* | -lif *lif-name*} -verbose
ping -s	network ping -node {*nodename* | -lif *lif-name*} -show -detail
ping -R	network ping -node {*nodename* | -lif *lif-name*} -record -route
pktt delete	system node run -node {*nodename*|local} pktt delete
pktt dump	system node run -node {*nodename*|local} pktt dump
pktt list	system node run -node {*nodename*|local} pktt list
pktt pause	system node run -node {*nodename*|local} pktt pause
pktt start	system node run -node {*nodename*|local} pktt start
pktt status	system node run -node {*nodename*|local} pktt status
pktt stop	system node run -node {*nodename*|local} pktt stop
portset add	**portset add** lun portset add
portset create	**portset create** lun portset create
portset delete	**portset delete** lun portset delete
portset remove	**portset remove** lun portset remove
portset show	**portset show** lun portset show

7-Mode command	ONTAP command
priority hybrid-cache default	Not supported
priority hybrid-cache set	volume modify -volume *volume_name* -vserver *vserver_name* -caching-policy *policy_name*
priority hybrid-cache show	volume show -volume *volume_name* -vserver *vserver_name* -fields caching -policy
priv set	set -privilege

Q

7-Mode command	ONTAP command
qtree create	**qtree create** volume qtree create
qtree oplocks	**qtree oplocks** volume qtree oplocks
qtree security	**qtree security** volume qtree security
qtree status	qtree show volume qtree show
qtree stats	qtree statisticsvolume qtree statistics
quota allow	quota modify -state volume quota modify -state on
quota disallow	quota modify -statevolume quota modify -state off
quota off	**quota off** volume quota off
quota on	**quota on** volume quota on
quota report	**quota report** volume quota report
quota resize	**quota resize** volume quota resize
quota status	quota show volume quota show
quota logmsg	volume quota show -fields logging, logging -interval

R

7-Mode command	ONTAP command
radius	Not supported
rdate	Not supported
rdfile	Not supported
reallocate off	**reallocate off**
reallocate measure	**reallocate measure**
reallocate on	**reallocate on**
reallocate quiesce	**reallocate quiesce**
reallocate restart	**reallocate restart**
reallocate schedule	**reallocate schedule**
reallocate start	**reallocate start**
reallocate status	reallocate show
reallocate stop	**reallocate stop**
reboot	**reboot** system node reboot -node *nodename*
reboot -d	**reboot -d** system node reboot -dump true -node *nodename*
reboot -f	**reboot -f** reboot -inhibit-takeover true -node *nodename*
restore	Not supported You must initiate the restore by using NDMP as described in tape backup documentation. Data protection using tape backup

7-Mode command	ONTAP command
restore_backup	system node restore-backup Available at the advanced privilege level.
revert_to	system node revert-to node *nodename* -version
rlm	Not supported
route add	**route add** network route create
route delete	**route delete** network route delete
route -s	**route show** network route show The network routing-groups command family is deprecated in ONTAP 9 and no longer supported beginning with 9.4.

S

7-Mode command	ONTAP command
`sasadmin adapter_state`	`system node run -node {nodename|local} -command sasadmin adapter_state`
`sasadmin channels`	`system node run -node {nodename|local} -command sasadmin channels`
`sasadmin dev_stats`	`system node run -node {nodename|local} -command sasadmin dev_stats`
`sasadmin expander`	`system node run -node {nodename|local} -command sasadmin expander`
`sasadmin expander_map`	`system node run -node {nodename|local} -command sasadmin expander_map`

7-Mode command	ONTAP command
sasadmin expander_phy_state	system node run -node {nodename|local} -command sasadmin expander_phy_state
sasadmin shelf	storage shelf
sasadmin shelf_short	storage shelf
sasstat dev_stats	system node run -node {nodename|local} -command sasstat dev_stats
sasstat adapter_state	system node run -node {nodename|local} -command sasstat adapter_state
sasstat expander	system shelf show -port
sasstat expander_map	storage shelf show -module
sasstat expander_phy_state	system node run -node {nodename|local} sasstat expander_phy_state
sasstat shelf	storage shelf
savecore	system node coredump save-all
savecore -i	system node coredump config show -i
savecore -l	system node coredump show
savecore -s	system node coredump status
*savecore -*w	Not supported
savecore -k	system node coredump delete-all -type unsaved-kernel
sectrace add	vserver security trace create
sectrace delete	vserver security trace delete
sectrace show	vserver security trace filter show

7-Mode command	ONTAP command
`sectrace print-status`	`vserver security trace trace-result show`
`secureadmin addcert`	`security certificate install`
`secureadmin disable ssh`	`security login modify`
`secureadmin disable ssl`	`security ssl modify`
`secureadmin enable ssl`	`security ssl modify`
`secureadmin setup`	`security`
`secureadmin setup ssh`	`security ssh {add|modify}`
`secureadmin setup ssl`	`security ssl {add|modify}`
`secureadmin enable ssh`	`security login modify`
`secureadmin status ssh`	`security login show`
`secureadmin status ssl`	`security ssl show`
`setup`	Not supported
`shelfchk`	`security ssh {add|modify}`
`showfh`	`security ssl {add|modify}`
`sis config`	`security login modify`
`sis off`	`security login show`
`sis on`	`security ssl show`
`sis revert_to`	Not supported

`sis start`	`showfh`
	
	`volume file show-filehandle`

7-Mode command	ONTAP command

`sis stop`	`sis off`
	
	`volume efficiency off`

`smtape`	`sis on`
	
	`volume efficiency on`

`snap autodelete`	`sis policy`

`snap create`	`sis revert_to`
	
	`volume efficiency revert-to`
	
	Available at the advanced privilege level.

`snap delete`	`snap delete`
	
	`volume snapshot delete`

`snap delta`	Not supported

`snap list`	`snap show`
	
	`volume snapshot show`

`snap reclaimable`	`volume snapshot compute -reclaimable` Available at the advanced privilege level.

`snap rename`	`snap rename`
	
	`volume snapshot rename`

`snap reserve`	volume {modify|show} --fields percent-snapshot-space --volume *volume-name* storage aggregate {modify|show} --fields percent-snapshot-space --aggregate *aggregate-name*

7-Mode command	ONTAP command

`snap restore`	`snap restore`
	`volume snapshot restore`
	Available at the advanced privilege level.

`snap sched`	`volume snapshot policy`
`snap reclaimable`	`volume snapshot compute-reclaimable` Available at the advanced privilege level.
`snapmirror abort`	`snapmirror abort`
`snapmirror break`	`snapmirror break`
`snapmirror destinations`	`snapmirror list-destinations`
`snapmirror initialize`	`snapmirror initialize`
`snapmirror migrate`	Not supported
`snapmirror off`	Not supported
`snapmirror on`	Not supported
`snapmirror quiesce`	`snapmirror quiesce`
`snapmirror release`	`snapmirror release`
`snapmirror resume`	`snapmirror resume`
`snapmirror resync`	`snapmirror resync`
`snapmirror status`	`snapmirror show`
`snapmirror throttle`	Not supported
`snapmirror update`	`snapmirror update`

7-Mode command	ONTAP command
`snmp authtrap`	`snmp authtrap`
`snmp community`	`snmp community`
`snmp contact`	`snmp contact`
`snmp init`	`snmp init`
`snmp location`	`snmp location`
`snmp traphost`	`snmp traphost`
`snmp traps`	`event route show -snmp-support true`
`software delete`	`system node image package delete`
`software get`	`system node image get`
`software install`	`system node image update`
`software list`	`system node image package show`
`software update`	`system node image update`
`source`	Not supported
`sp reboot`	`system service-processor reboot-sp`
`sp setup`	`system service-processor network modify`
`sp status`	`system service-processor show`
`sp status -d`	`system node autosupport invoke-splog`
`sp status -v`	`system node autosupport invoke-splog`
`sp update`	`system service-processor image update`
`sp update-status`	`system service-processor image update-progress`

7-Mode command	ONTAP command
`statit`	`statistics {start|stop|show} -preset statit`
`stats`	`statistics {start|stop|show} -object object` Available at the advanced privilege level.
`storage aggregate copy`	Not supported
`storage aggregate media_scrub`	`system node run -node nodename -command aggr media_scrub`
`storage aggregate snapshot`	Not supported
`storage aggregate split`	Not supported
`storage aggregate undestroy`	Not supported
`storage alias`	`storage tape alias set`
`storage array`	`storage array`
`storage array modify`	`storage array modify`
`storage array remove`	`storage array remove`
`storage array remove-port`	`storage array port remove`
`storage array show`	`storage array show`
`storage array show-config`	`storage array config show`
`storage array show luns`	Not supported
`storage array show-ports`	`storage array port show`
`storage disable adapter`	`system node run -node {nodename|local} -command storage disable adapter`

7-Mode command	ONTAP command
`storage download acp`	`Storage shelf acp firmware update`
`storage download shelf`	`storage firmware download` Available at the advanced privilege level.
`storage enable adapter`	`system node run -node {nodename|local} -command storage enable adapter`
`storage load balance`	`storage load balance`
`storage load show`	`storage load show`
`storage show acp`	`system node run -node {nodename|local} -command storage show acp`
`storage show adapter`	`system node run -node {nodename|local} -command storage show adapter`
`storage show bridge`	`storage bridge show`

`storage show disk`	`storage show disk`
	
	`storage disk show`

`storage show expander`	`storage shelf`
`storage show fabric`	`system node run -node {nodename|local} -command storage show fabric`
`storage show fault`	`system node run -node` ***`nodename`*** `-command storage show fault`
`storage show hub`	`system node run -node {nodename|local} -command storage show hub`
`storage show initiators`	`system node run -node {nodename|local} -command storage show initiators`
`storage show mc`	`storage tape show-media-changer`

7-Mode command	ONTAP command
`storage show port`	`storage switch`
`storage show shelf`	`storage shelf`
`storage show switch`	`storage switch show`
`storage show tape`	`storage tape show-tape-drive`
`storage stats tape`	`statistics show -object tape`
`storage stats tape zero`	`statistics {start|stop|show} -object tape`
`storage unalias`	`storage tape alias clear`
`sysconfig`	Not supported
`sysconfig -a`	`system node run -node {nodename|local} -command sysconfig -a`
`sysconfig -A`	`system node run -node {nodename|local} -command sysconfig -A`
`sysconfig -ac`	`system controller config show-errors -verbose`
`sysconfig -c`	`system controllers config-errors show`
`sysconfig -d`	`system node run -node {nodename|local} -command sysconfig -d`
`sysconfig -D`	`system controller config pci show-add-on devices`
`sysconfig -h`	`system node run -node {nodename|local} -command sysconfig -h`
`sysconfig -m`	`storage tape show-media-changer`
`syconfig -M`	`system node run -node {nodename|local} -command sysconfig -M`

7-Mode command	ONTAP command
`sysconfig -p`	Not supported You must use the following commands as alternatives: • Hypervisor information: system node virtual-machine hypervisor show • System disks backing stores: system node virtual-machine instance show-system-disks • Virtual disks backing information: storage disk show -virtual-machine-disk-info
`sysconfig -P`	**`system controller config pci show-hierarchy`**
`sysconfig -r`	Not supported To view disk information, you must use the following commands: • File system disks: storage aggregate showstatus • Spare disks: storage aggregate show-sparedisks • Broken disks: storage disk show -broken • Disks in the maintenance center: storage disk show -maintenance
`sysconfig -t`	**`storage tape show`**
`sysconfig -v`	**`system node run -node`** ***`nodename`*** **`-command sysconfig -v`**
`sysconfig -V`	**`system node run -node {nodename|local} -command sysconfig -V`**
`sysstat`	**`statistics {start|stop|show} -preset systat`** ⓘ Available at the advanced privilege level.
`system health alert`	**`system health alert`**
`system health autosupport`	**`system health autosupport`**

7-Mode command	ONTAP command
system health config	**system health config**
system health node-connectivity	**system health node-connectivity**
system health policy	**system health policy**
system health status	**system health status**
system health subsystem show	**system health subsystem show**

T

7-Mode command	ONTAP command
timezone	**timezone**
traceroute -m	**traceroute -m** network traceroute { -node *nodename* | -lif *lif-name* } -maxttl *integer*
traceroute -n	**traceroute -n** network traceroute -node {*nodename*| -lif *lif-name*} -numeric true
traceroute -p	**traceroute -p** network traceroute { -node *nodename* | -lif *lif-name* } --port *integer*
traceroute -q	**traceroute -q** network traceroute { -node *nodename* | -lif *lif-name* } -nqueries *integer*
traceroute -s	Not supported
traceroute -v	**traceroute -v** network traceroute { -node *nodename* | -lif *lif-name* } -verbose [true]

7-Mode command	ONTAP command
traceroute -w	**traceroute -w** network traceroute { -node *nodename* | -lif *lif-name* } -waittime *integer*

U-Z

U

7-Mode command	ONTAP command
ucadmin	system node hardware unified-connect
ups	Not supported
uptime	system node show -fields uptime
useradmin domainuser add	security login create
useradmin domainuser delete	security login delete
useradmin domainuser list	security login show
useradmin domainuser load	Not supported Use "vserver cifs users-and-groups" command set.
useradmin group add	security login role create
useradmin group delete	security login role delete
useradmin group list	security login role show
useradmin group modify	security login role modify
useradmin role add	security login role create
useradmin role delete	security login role delete
useradmin role list	security login role show
useradmin role modify	security login role modify
useradmin user add	security login create

7-Mode command	ONTAP command
useradmin user delete	security login delete
useradmin user list	security login show
useradmin user modify	security login modify

V

7-Mode command	ONTAP command
version -b	**version -b** OR system image show
version -v	**version -v** OR system image show
vfiler	Not supported
vfiler run	vserver
vfiler start	vserver start
vfiler stop	vserver stop
vfiler status	vserver show
vfiler disallow	vserver modify -disallowed-protocols
vlan add	network port vlan create
vlan create	network port vlan create
vlan delete	network port vlan delete
vlan modify	Not supported
vlan stat	system node run -node *nodename* -command vlan stat
vmservices	system node run -node {*nodename*|local} vmservices
volume add	Not supported

7-Mode command	ONTAP command
volume autosize	**volume autosize**
volume clone	**volume clone**
volume clone split	**volume clone split**
volume container	volume show -fields aggregate
volume copy	Not supportedYou must use one of the following methods as described in logical storage documentation: • Create a FlexClone volume of the original volume, then move the volume to another aggregate by using the volume move command. • Replicate the original volume using SnapMirror, then break the SnapMirror relationship to make a read-write volume copy. Logical Storage Management Guide
volume create	**volume create**
vol destroy	volume destroy
volume file fingerprint	Not supported
volume media_scrub	Not supported
volume migrate	Not supported
vol mirror	Not supported
volume move	**volume move**
volume offline	**volume offline**
volume online	**volume online**
volume options	volume {show | modify}
volume quota allow	Not supported
volume quota disallow	Not supported

7-Mode command	ONTAP command
volume rename	**volume rename**
volume restrict	**volume restrict**
volume scrub	Not supported
volume size	**volume size**
volume snapshot delta	Not supported
volume snapshot reserve	Not supported Alternative commands include the following: • For volumes, use: the "volume show -fields percent-snapshot-space" and "volume modify -volume *volumename* -percent-snapshot-space *percent*" commands. • For aggregates, use the "storage aggregate show -fields percent-snapshot-space" and "storage aggregate modify -aggregate *aggregate name* -percent-snapshot-space *percent*" commands.
volume split	Not supported
volume status	volume show
volume verify	Not supported
volume wafliron	Not supported
vscan	vserver vscan
vserver cifs adupdate	Not supported
vserver cifs broadcast	Not supported
vserver cifs comment	Not supported
vserver cifs top	Not supported
vserver iscsi ip_tpgroup add	Not supported
vserver iscsi ip_tpgroup create	Not supported

7-Mode command	ONTAP command
vserver iscsi ip_tpgroup destroy	Not supported
vserver iscsi ip_tpgroup remove	Not supported
vserver iscsi ip_tpgroup show	Not supported
vserver iscsi tpgroup alua set	Not supported
vserver iscsi tpgroup alua show	Not supported
vserver services name-service dns flush	Not supported

W

7-Mode command	ONTAP command
wrfile	Not supported

Y

7-Mode command	ONTAP command
ypcat	Not supported
ypgroup	Not supported
ypmatch	Not supported
ypwhich	Not supported

How 7-Mode options map to ONTAP commands

In Data ONTAP operating in 7-Mode, you execute the `options` command to set configurable storage system software options. In ONTAP, you use command parameters to set these options. You can use the provided tables to view how 7-Mode commands map to ONTAP commands.

In the “7-Mode command” column, the base options command is not shown, for the sake of clarity. Where you see `acp.domain`, the actual long form of the command is options `acp.domain`.

The “Understanding the 7-Mode to clustered Data ONTAP command mapping” section contains information about how the tables in this chapter are organized.

Understanding the 7-Mode to clustered Data ONTAP command mapping

A-E

A

7-Mode option	Clustered Data ONTAP command
`acp.domain`	**`system node run -node {nodename|local} options acp.domain`**
`acp.enabled`	**`system node run -node {nodename|local} options acp.enabled`**
`acp.netmask`	**`system node run -node {nodename|local} options acp.netmask`**
`acp.port`	**`system node run -node {nodename|local} options acp.port`**
`auditlog.enable`	`security audit`
`auditlog.max_file_size`	Not supported
`auditlog.readonly_api.enable`	`security audit`
`autologout.console.enable`	**`system timeout modify -timeout`**
`autologout.console.timeout`	**`system timeout modify -timeout`**
`autologout.telnet.enable`	Not supported
`autologout.telnet.timeout`	Not supported
`autosupport.cifs.verbose`	Not supported
`autosupport.content`	**`system node autosupport modify -node`** ***`nodename`*** **`-remove -private -data {true|false}`**
`autosupport.doit`	**`system node autosupport invoke -node`** ***`nodename`*** **`-type {all|test}`**
`autosupport.enable`	**`system node autosupport modify -node`** ***`nodename`*** **`-state {enable|disable}`**

7-Mode option	Clustered Data ONTAP command
`autosupport.from`	**`system node autosupport modify -node`** ***`nodename`*** **`-from`**
`autosupport.local_collection`	**`system node autosupport modify -node`** ***`nodename`*** **`-local-collection {true|false}`**
`autosupport.mailhost`	**`system node autosupport modify -node`** ***`nodename`*** **`-mail-hosts`**
`autosupport.max_http_size`	**`system node autosupport modify -node`** ***`nodename`*** **`-max-http-size`**
`autosupport.max_smtp_size`	**`system node autosupport modify -node`** ***`nodename`*** **`-max-smtp-size`**
`autosupport.minimal.subject.id`	**`system node autosupport modify -node`** ***`nodename`*** **`-hostname-subj`**
`autosupport.nht_data.enable` (not in smf)	**`autosupport modify -nht`** **`system node autosupport modify -nht`**
`autosupport.noteto`	**`system node autosupport modify -node`** ***`nodename`*** **`-noteto`**
`autosupport.partner.to`	**`system node autosupport modify -node`** ***`nodename`*** **`-partner-address`**
`autosupport.performance_data.doit`	**`system node autosupport invoke -node`** ***`nodename`*** **`-type performance`**
`autosupport.performance_data.enable`	**`system node autosupport modify -node`** ***`nodename`*** **`-perf {true|false}`**
`autosupport.periodic.tx_window`	**`system node autosupport modify -node`** ***`nodename`*** **`-periodic-tx-window`**
`autosupport.retry.count`	**`system node autosupport modify -node`** ***`nodename`*** **`-retry-count`**
`autosupport.retry.interval`	**`system node autosupport modify -node`** ***`nodename`*** **`-retry-interval`**

7-Mode option	Clustered Data ONTAP command
autosupport.support.enable	**system node autosupport modify -node *nodename* -support {enable|disable}**
autosupport.support.proxy	**system node autosupport modify -node *nodename* -proxy-url**
autosupport.support.reminder	**system node autosupport show -node *nodename* -fields reminder**
autosupport.support.transport	**system node autosupport modify -node *nodename* -transport {http|https|smtp}**
autosupport.to	**system node autosupport modify -node *nodename* -to**
autosupport.validate_digital_certificate	**system node autosupport modify -node nodename -validate-digital-certificate {true|false}**

B

7-Mode option	Clustered Data ONTAP command
backup.log.enable	Not supported

C

7-Mode option	Clustered Data ONTAP command
cdpd.enable	**system node run -node {nodename|local} options cdpd.enable**
cdpd.holdtime	**system node run -node {nodename|local} options cdpd.holdtime**
cdpd.interval	**system node run -node {nodename|local} options cdpd.interval**
cf.giveback.auto.after.panic.takeover	**storage failover modify -auto-giveback -after-panic**
cf.giveback.auto.cancel.on_network_failure	Not supported

7-Mode option	Clustered Data ONTAP command
`cf.giveback.auto.delay.seconds`	**`storage failover modify -delay-seconds`**
`cf.giveback.auto.enable`	**`storage failover modify -auto-giveback`**
`cf.hw_assist.enable`	**`storage failover modify -hwassist`**
`cf.hw_assist.partner.address`	**`storage failover modify -hwassist -partner-ip`**
`cf.hw_assist.partner.port`	**`storage failover modify -hwassist -partner-port`**
`cf.mode`	**`storage failover modify -mode`**
`cf.remote_syncmirror.enable`	Not supported
`cf.sfoaggr_maxtime`	**`storage failover modify -aggregate -migration-timeout`** ⓘ Available at the advanced privilege level.
`cf.takeover.change_fsid`	Not supported
`cf.takeover.detection.seconds`	**`storage failover modify -detection-time`**
`cf.takeover.on_disk_shelf_miscompare`	Not supported
`cf.takeover.on_failure`	**`storage failover modify -onfailure`** ⓘ Available at the advanced privilege level.
`cf.takeover.on_network_interface_failure`	Not supported
`cf.takeover.on_network_interface_failure.policy all_nics`	Not supported
`cf.takeover.on_panic`	**`storage failover modify -onpanic`**
`cf.takeover.on_reboot`	**`storage failover modify -onreboot`**

7-Mode option	Clustered Data ONTAP command
`cf.takeover.on_short_uptime`	**`storage failover modify -onshort-uptime`** Available at the advanced privilege level.
`cifs.LMCompatibilityLevel`	**`vserver cifs security modify -lm -compatibility-level`**
`cifs.audit.autosave.file.extension`	Not supported
`cifs.audit.autosave.file.limit`	**`vserver audit modify -rotate-limit`**
`cifs.audit.autosave.onsize.enable`	Not supported
`cifs.audit.autosave.onsize.threshold`	Not supported
`cifs.audit.autosave.ontime.enable`	Not supported
`cifs.audit.autosave.ontime.interval`	Not supported
`cifs.audit.enable`	**`vserver audit`**
`cifs.audit.file_access_events.enable`	**`vserver audit modify -events`**
`cifs.audit.nfs.filter.filename`	Not supported
`cifs.audit.logon_events.enable`	**`vserver audit modify -events cifs-logon-logoff`**
`cifs.audit.logsize`	Not supported
`cifs.audit.nfs.enable`	**`vserver audit modify -events file-ops`**
`cifs.audit.nfs.filter.filename`	Not supported
`cifs.audit.saveas`	**`vserver audit modify -destination`**
`cifs.bypass_traverse_checking`	**`vserver cifs users-and-groups privilege`**
`cifs.comment`	**`vserver cifs create -comment`**

7-Mode option	Clustered Data ONTAP command
`cifs.enable_share_browsing`	`vserver cifs share`
`cifs.gpo.enable`	**`vserver cifs group-policy`**
`cifs.gpo.trace.enable`	Not supported
`cifs.grant_implicit_exe_perms`	**`vserver cifs options modify -read-grant -exec`**
`cifs.guest_account`	Not supported
`cifs.home_dir_namestyle`	**`vserver cifs share create`**
`cifs.home_dirs_public`	**`vserver cifs home-directory modify -is -home-dirs-access-for-public-enabled {true|false}`** Available at the advanced privilege level.
`cifs.home_dirs_public_for_admin`	**`vserver cifs home-directory modify -is -home-dirs-access-for-public -enabled{true|false}`** Available at the advanced privilege level.
`cifs.idle_timeout`	**`vserver cifs options modify -client -session-timeout`**
`cifs.ipv6.enable`	Not supported
`cifs.max_mpx`	**`vserver cifs options modify -max-mpx`**
`cifs.ms_snapshot_mode`	Not supported
`cifs.mapped_null_user_extra_group`	*`vserver cifs options modify -win-name -for-null-user`*
`cifs.netbios_over_tcp.enable`	Not supported

7-Mode option	Clustered Data ONTAP command
`cifs.nfs_root_ignore_acl`	**`vserver nfs modify -ignore-nt-acl-for -root`** Available at the advanced privilege level.
`cifs.ntfs_ignore_unix_security_ops`	**`vserver nfs modify -ntfs-unix-security -ops`** Available at the advanced privilege level.
`cifs.oplocks.enable`	`vserver cifs share properties add -share-properties`
`cifs.oplocks.opendelta*`	Not supported
`cifs.perm_check_ro_del_ok`	**`vserver cifs options modify -is-read -only-delete-enabled`**
`cifs.perm_check_use_gid`	Not supported
`cifs.restrict_anonymous`	**`vserver cifs options modify -restrict -anonymous`**
`cifs.save_case`	Not supported
`cifs.scopeid`	Not supported
`cifs.search_domains`	**`vserver cifs domain name-mapping-search`**
`cifs.show_dotfiles`	`is-hide-dotfiles-enabled`
`cifs.show_snapshot`	**`vserver cifs share properties add -share-properties`**
`cifs.shutdown_msg_level`	Not supported
`cifs.signing.enable`	**`vserver cifs security modify -is -signing-required`**
`cifs.smb2.client.enable`	Not supported

7-Mode option	Clustered Data ONTAP command
`cifs.smb2.durable_handle.enable`	Not supported
`cifs.smb2.durable_handle.timeout`	Not supported
`cifs.smb2.enable`	**`vserver cifs options modify -smb2 -enabled`**
`cifs.smb2.signing.required`	**`vserver cifs security modify -is -signing-required`**
`cifs.smb2_1.branch_cache.enable`	**`vserver cifs share properties`**
`cifs.smb2_1.branch_cache.hash_time_out`	Not supported
`cifs.snapshot_file_folding.enable`	Not supported
`cifs.symlinks.cycleguard`	Not supported
`cifs.symlinks.enable`	**`vserver cifs share modify -symlink -properties`**
`cifs.universal_nested_groups.enable`	Not supported
`cifs.W2K_password_change`	**`vserver cifs domain password change`**
`cifs.W2K_password_change_interval`	**`vserver cifs domain password change schedule`**
`cifs.W2K_password_change_within`	**`vserver cifs domain password change schedule`**
`cifs.widelink.ttl`	Not supported
`console.encoding`	Not supported
`coredump.dump.attempts`	**`system node coredump config modify -coredump-attempts`**
`coredump.metadata_only`	**`system node coredump config modify -sparsecore-enabled true`**

D

7-Mode option	Clustered Data ONTAP command
`disk.asup_on_mp_loss`	**`system node autosupport trigger modify dsk.redun.fault`**
`disk.auto_assign`	**`storage disk option modify -autoassign`**
`disk.auto_assign_shelf`	**`storage disk option modify -autoassign -shelf`**
`disk.maint_center.allowed_entries`	Not supported
`disk.maint_center.enable`	**`system node run -node {nodename|local} options disk.maint_center.enable`**
`disk.maint_center.max_disks`	**`system node run -node {nodename|local} options disk.maint_center.max_disks`**
`disk.maint_center.rec_allowed_entries`	**`system node run -node {nodename|local} options disk.maint_center.rec_allowed_entries`**
`disk.maint_center.spares_check`	**`system node run -node {nodename|local} options disk.maint_center.spares_check`**
`disk.powercycle.enable`	**`system node run -node {nodename|local} options disk.powercycle.enable`**
`disk.recovery_needed.count`	Not supported
`disk.target_port.cmd_queue_depth`	**`storage array modify -name`** ***`array_name`*** **`-max-queue-depth`**
`dns.cache.enable`	Not supported
`dns.domainname`	**`vserver services name-service dns modify -domains`**
`dns.enable`	**`vserver services name-service dns modify -state`**
`dns.update.enable`	Not supported
`dns.update.ttl`	Not supported

E

7-Mode option	Clustered Data ONTAP command
ems.autosuppress.enable	**event config modify -suppression {*on*|*off*}** Available at the advanced privilege level.

F-K

F

7-Mode option	Clustered Data ONTAP command
fcp.enable	**fcp start**
flexcache.access	Not supported
flexcache.deleg.high_water	Not supported
flexcache.deleg.low_water	Not supported
flexcache.enable	Not supported
flexcache.per_client_stats	Not supported
flexscale.enable	**system node run -node *node_name*|local} options flexscale.enable**
flexscale.lopri_blocks	**system node run -node *node_name*|local} options flexscale.lopri_blocks**
flexscale.normal_data_blocks	**system node run -node *node_name*|local} options flexscale.normal_data_blocks**
flexscale.pcs_high_res	**system node run -node *node_name*|local} options flexscale.pcs_high_res**
flexscale.pcs_size	**system node run -node *node_name*|local} options flexscale.pcs_size**
flexscale.rewarm	**system node run -node *node_name*|local} options flexscale.rewarm**

7-Mode option	Clustered Data ONTAP command
`fpolicy.enable`	**`vserver fpolicy enable`**
`fpolicy.i2p_ems_interval`	Not supported
`fpolicy.multiple_pipes`	Not supported
`ftpd.3way.enable`	Not supported
`ftpd.anonymous.enable`	Not supported
`ftpd.anonymous.home_dir`	Not supported
`ftpd.anonymous.name`	Not supported
`ftpd.auth_style`	Not supported
`ftpd.bypass_traverse_checking`	Not supported
`ftpd.dir.override`	Not supported
`ftpd.dir.restriction`	Not supported
`ftpd.enable`	Not supported
`ftpd.explicit.allow_secure_data_conn`	Not supported
`ftpd.explicit.enable`	Not supported
`ftpd.idle_timeout`	Not supported
`ftpd.implicit.enable`	Not supported
`ftpd.ipv6.enable`	Not supported
`ftpd.locking`	Not supported
`ftpd.log.enable`	Not supported
`ftpd.log.filesize`	Not supported

7-Mode option	Clustered Data ONTAP command
`ftpd.log.nfiles`	Not supported
`ftpd.max_connections`	Not supported
`ftpd.max_connections_threshold`	Not supported
`ftpd.tcp_window_size`	Not supported

H

7-Mode option	Clustered Data ONTAP command
`httpd.access`	`Not supported`
`httpd.admin.access`	Not supported
`httpd.admin.enable`	**`vserver services web modify -enabled{true|false}`**
`httpd.admin.hostsequiv.enable`	Not supported
`httpd.admin.max_connections`	Not supported
`httpd.admin.ssl.enable`	**`security ssl`**
`httpd.admin.top-page.authentication`	Not supported
`httpd.bypass_traverse_checking`	Not supported
`httpd.enable`	Not supported
`httpd.ipv6.enable`	Not supported
`httpd.log.format`	Not supported
`httpd.method.trace.enable`	Not supported
`httpd.rootdir`	Not supported
`httpd.timeout`	Not supported

7-Mode option	Clustered Data ONTAP command
`httpd.timewait.enable`	Not supported

I

7-Mode option	Clustered Data ONTAP command
`ifgrp.failover.link_degraded`	Not supported
`interface.blocked.cifs`	**`network interface create -data-protocol`**
`interface.blocked.iscsi`	**`network interface create -data-protocol`**
`interface.blocked.mgmt_data_traffic`	**`network interface create -role`**
`interface.blocked.ndmp`	**`system services firewall policy modify -policy`** ***`policy_name`*** **`-service ndmp`**
`interface.blocked.nfs`	**`network interface create -data-protocol`**
`interface.blocked.snapmirror`	**`network interface create -role`**
`ip.fastpath.enable`	**`system node run -node`** ***`node_name`*** **`|local} options ip.fastpath.enable`** Beginning with ONTAP 9.2, fastpath is no longer supported.
`ip.ipsec.enable`	Not supported
`ip.match_any_ifaddr`	Not supported
`ip.path_mtu_discovery.enable`	**`system node run -node`*****`node_name`*** **`|local} options ip.path_mtu_discovery.enable`**
`ip.ping_throttle.alarm_interval`	**`system node run -node`*****`node_name`*** **`|local} options ip.ping_throttle.alarm_`*****`node_name`*****`interval`**
`ip.ping_throttle.drop_level`	**`system node run -node|local} options ip.ping_throttle.drop.level`**

7-Mode option	Clustered Data ONTAP command
`ip.tcp.abc.enable`	**`system node run -node`*`node_name`*`|local} options ip.tcp.abc.enable`**
`ip.tcp.abc.l_limit`	**`system node run -node`*`node_name`*`|local} options ip.tcp.abc.l_limit`**
`ip.tcp.batching.enable`	**`system node run -node`*`node_name`*`|local} options ip.tcp.batching.enable`**
`ip.tcp.newreno.enable`	Not supported
`ip.tcp.rfc3390.enable`	**`system node run -node`*`node_name`*`|local} options ip.tcp.rfc3390.enable`**
`ip.tcp.sack.enable`	**`system node run -node`*`node_name`*`|local} options ip.tcp.sack.enable`**
`ip.v6.enable`	**`network options ipv6 modify`**
`ip.v6.ra_enable`	Not supported
`iscsi.auth.radius.enable`	Not supported
`iscsi.enable`	**`iscsi start`**
`iscsi.max_connections_per_session`	**`iscsi modify -max -conn-per-session`**
`iscsi.max_error_recovery_level`	**`iscsi modify -max-error-recovery-level`**

K

7-Mode option	Clustered Data ONTAP command
`kerberos.file_keytab.principal`	Not supported
`kerberos.file_keytab.realmipal`	Not supported

O-Q

L

7-Mode option	Clustered Data ONTAP command
`ldap.ADdomain`	**`vserver services name-service ldap client modify -ad-domain`**
`ldap.base`	**`vserver services name-service ldap client modify -base-dn`**
`ldap.base.group`	**`ldap client modify -group-dn ldap DN-group-scope`** Available at the advanced privilege level.
`ldap.base.netgroup`	**`ldap client modify -netgroup-dn ldap DN-netgroup-scope`** Available at the advanced privilege level.
`ldap.base.passwd`	**`vserver services ldap client modify -user-dn`** Available at the advanced privilege level.
`ldap.enable`	**`vserver services name-service ldap modify`**
`ldap.minimum_bind_level`	**`vserver services name-service ldap client modify -min-bind-level`**
`ldap.name`	**`vserver services name-service ldap client modify -bind-dn`**
`ldap.nssmap.attribute.gecos`	**`ldap client schema modify -gecos -attribute`** Available at the advanced privilege level.

7-Mode option	Clustered Data ONTAP command
`ldap.nssmap.attribute.gidNumber`	**`ldap client schema modify -gid-number -attribute`** Available at the advanced privilege level.
`ldap.nssmap.attribute.groupname`	**`ldap client schema modify -cn-group -attribute`** Available at the advanced privilege level.
`ldap.nssmap.attribute.homeDirectory`	**`ldap client schema modify -home -directory-attribute`** Available at the advanced privilege level.
`ldap.nssmap.attribute.loginShell`	**`ldap client schema modify -login-shell -attribute`** Available at the advanced privilege level.
`ldap.nssmap.attribute.memberNisNetgroup`	**`ldap client schema modify -member-nis -netgroup-attribute`** Available at the advanced privilege level.
`ldap.nssmap.attribute.memberUid`	**`ldap client schema modify -member-uid -attribute`** Available at the advanced privilege level.
`ldap.nssmap.attribute.netgroupname`	**`ldap client schema modify -cn-netgroup -attribute`** Available at the advanced privilege level.

7-Mode option	Clustered Data ONTAP command
`ldap.nssmap.attribute.nisNetgroupTriple`	ldap client schema modify -nis-netgroup-triple -attribute Available at the advanced privilege level.
`ldap.nssmap.attribute.uid`	**`ldap client schema modify -uid -attribute`** Available at the advanced privilege level.
`ldap.nssmap.attribute.uidNumber`	**`ldap client schema modify -uid-number -attribute`** Available at the advanced privilege level.
`ldap.nssmap.attribute.userPassword`	**`ldap client schema modify -user -password-attribute`** Available at the advanced privilege level.
`ldap.nssmap.objectClass.nisNetgroup`	**`ldap client schema modify -nis-netgroup -object-class`** Available at the advanced privilege level.
`ldap.nssmap.objectClass.posixAccount`	**`ldap client schema modify -posix -account-object-class`** Available at the advanced privilege level.
`ldap.nssmap.objectClass.posixGroup`	**`ldap client schema modify -posix-group -object-class`** Available at the advanced privilege level.

7-Mode option	Clustered Data ONTAP command
`ldap.passwd`	**`vserver services name-service ldap client modify-bind-password`**
`ldap.port`	**`vserver services name-service ldap client modify -port`**
`ldap.servers`	**`vserver services name-service ldap client modify -servers`**
`ldap.servers.preferred`	**`vserver services name-service ldap client modify -preferred-ad-servers`**
`ldap.ssl.enable`	Not supported
`ldap.timeout`	**`vserver services name-service ldap client modify -query-timeout`**
`ldap.usermap.attribute.windowsaccount`	**`ldap client schema modify -windows -account-attribute`** Available at the advanced privilege level.
`ldap.usermap.base`	**`ldap client modify -user-dnldap DN-user-scope`** Available at the advanced privilege level.
`ldap.usermap.enable`	Not supported
`licensed_feature.fcp.enable`	Not supported
`licensed_feature.flex_clone.enable`	Not supported
`licensed_feature.flexcache_nfs.enable`	Not supported
`licensed_feature.iscsi.enable`	Not supported
`licensed_feature.multistore.enable`	Not supported

7-Mode option	Clustered Data ONTAP command
licensed_feature.nearstore_option.enable	Not supported
licensed_feature.vld.enable	Not supported
locking.grace_lease_seconds	**vserver nfs modify -v4-grace-seconds**
lun.clone_restore	Not supported
lun.partner_unreachable.linux.asc	Not supported
lun.partner_unreachable.linux.ascq	Not supported
lun.partner_unreachable.linux.behavior	Not supported
lun.partner_unreachable.linux.hold_time	Not supported
lun.partner_unreachable.linux.scsi_status	Not supported
lun.partner_unreachable.linux.skey	Not supported
lun.partner_unreachable.vmware.behavior	Not supported
lun.partner_unreachable.vmware.hold_time	Not supported

N

7-Mode option	Clustered Data ONTAP command
ndmpd.abort_on_disk_error	**options ndmpd.abort_on_disk_error** Available at the advanced privilege level.
ndmpd.access	**system services firewall policy modify -policy * -service ndmp -allow-list**
ndmpd.authtype	**system services ndmpd modify -clear -text**

7-Mode option	Clustered Data ONTAP command
`ndmpd.connectlog.enabled`	Not supported
`ndmpd.data_port_range`	`Not supported`
`ndmpd.enable`	Not supported
`ndmpd.ignore_ctime.enabled`	Not supported
`ndmpd.maxversion`	Not supported
`ndmpd.offset_map.enable`	Not supported
`ndmpd.password_length`	Not supported
`ndmpd.preferred_interface`	Not supported
`ndmpd.tcpnodelay.enable`	Not supported
`ndmpd.tcpwinsize`	Not supported
`nfs.assist.queue.limit`	Not supported
`nfs.authsys.extended_groups_ns.enable`	*`vserver nfs modify -auth-sys-extended -groups`* ⓘ Available at the advanced privilege level.
`nfs.export.allow_provisional_access`	Not supported
`nfs.export.auto-update`	Not supported
`nfs.export.exportfs_comment_on_delete`	Not supported
`nfs.export.harvest.timeout`	Not supported
`nfs.export.neg.timeout`	Not supported
`nfs.kerberos.enable`	**`vserver nfs kerberos realm create`**
`nfs.kerberos.file_keytab.enable`	Not supported

7-Mode option	Clustered Data ONTAP command
`nfs.kerberos.file_keytab.principal`	**`vserver nfs kerberos realm create`**
`nfs.kerberos.file_keytab.realm`	**`vserver nfs kerberos realm create`**
`nfs.max_num_aux_groups`	**`vserver nfs \{ show | modify \} -extended-groups-limit`**
`nfs.mount_rootonly`	**`vserver nfs modify -mount-rootonly`**
`nfs.netgroup.strict`	Not supported
`nfs.nfs_rootonly`	**`vserver nfs modify -nfs-rootonly`**
`nfs.per_client_stats.enable`	**`statistics settings modify -client stats`** Available at the advanced privilege level.
`nfs.require_valid_mapped_uid`	**`vserver name-mapping create`**
`nfs.response.trace`	**`vserver nfs modify -trace-enabled`** Available at the advanced privilege level.
`nfs.response.trigger`	**`vserver nfs modify -trigger`** Available at the advanced privilege level.
`nfs.rpcsec.ctx.high`	**`nfs modify -rpcsec-ctx-high`** Available at the advanced privilege level.
`nfs.rpcsec.ctx.idle`	**`nfs modify -rpcsec-ctx-idle`** Available at the advanced privilege level.
`nfs.tcp.enable`	**`vserver nfs modify -tcp`**

7-Mode option	Clustered Data ONTAP command
`nfs.thin_prov.ejuke`	**`vserver nfs modify -enable-ejukebox`** Available at the advanced privilege level.
`nfs.udp.enable`	**`vserver nfs modify -udp`**
`nfs.udp.xfersize`	**`vserver nfs modify -udp-max-xfer-size`** Available at the advanced privilege level.
`nfs.v2.df_2gb_lim`	`Not supported
`nfs.v2.enable`	`Not supported
`nfs.v3.enable`	**`vserver nfs modify -v3`**
`nfs.v4.acl.enable`	`*vserver nfs modify -v4.0-ac*l`
`nfs.v4.enable`	**`vserver nfs modify -v4.0`**
`nfs.v4.id.allow_numerics`	**`vserver nfs modify -v4-numeric-ids`**
`nfs.v4.id.domain`	**`vserver nfs modify -v4-id-domain`**
`nfs.v4.read_delegation`	**`vserver nfs modify -v4.0-read -delegation`**
`nfs.v4.write_delegation`	**`vserver nfs modify -v4.0-write -delegation`**
`nfs.vstorage.enable`	**`vserver nfs modify -vstorage`**
`nfs.webnfs.enable`	Not supported
`nfs.webnfs.rootdir`	Not supported
`nfs.webnfs.rootdir.set`	Not supported

7-Mode option	Clustered Data ONTAP command
`nis.domainname`	**`vserver services name-service nis-domain modify -domain`**
`nis.enable`	**`vserver services name-service nis-domain modify -active`**
`nis.group_update.enable`	Not supported
`nis.group_update_schedule`	Not supported
`nis.netgroup.domain_search.enable`	Not supported
`nis.servers`	**`vserver services name-service nis-domain modify -servers`**
`nis.slave.enable`	Not supported
`nlm.cleanup.timeout`	Not supported

P

7-Mode option	Clustered Data ONTAP command
`pcnfsd.enable`	Not supported
`pcnfsd.umask`	Not supported

Q

7-Mode option	Clustered Data ONTAP command
`qos.classify.count_all_matches`	Not supported

R

> All RAID options have 7-Mode-compatible nodeshell shortcuts of the form `options` *`option_name`*.

7-Mode option	Clustered Data ONTAP command
`raid`	**`storage raid-options \{ modify | show\}`**

7-Mode option	Clustered Data ONTAP command
raid.background_disk_fw_update.enable	**storage disk option modify -bkg -firmware-update**
raid.disk.copy.auto.enable	**storage raid-options modify -raid.disk.copy.auto.enable**
raid.disk.timeout.enable	**system node run -node {*node_name*|local} options raid.disk.timeout.enable**
raid.disktype.enable	Not supported
raid.disktype.enable	**raid-options modify raid.lost_write.enable** Available at the advanced privilege level.
raid.lost_write.enable	**storage raid-options \{ modify | show \} -name raid.media_scrub.enable**
raid.media_scrub.rate	**storage raid-options \{ modify | show \}-name raid.media_scrub.rate**
raid.min_spare_count	**storage raid-options \{ modify | show \}-name raid.min_spare_count**
raid.mix.hdd.disktype.capacity	**storage raid-options \{ modify | show \}-name raid.mix.hdd.disktype.capacity**
raid.mix.hdd.disktype.performance	**storage raid-options \{ modify | show \}-name raid.mix.hdd.disktype.performance**
raid.mix.hdd.rpm.capacity	**storage raid-options \{ modify | show \} -name raid.mix.hdd.rpm.capacity**
raid.mix.hdd.rpm.performance	**storage raid-options \{ modify | show \} -name raid.mix.hdd.rpm.performance**
raid.mirror_read_plex_pref	**storage raid-options \{ modify | show \}-name raid.mirror_read_plex_pref**

<table>
<tr><th>7-Mode option</th><th>Clustered Data ONTAP command</th></tr>
<tr><td>raid.reconstruct.perf_impact</td><td>storage raid-options \{ modify | show \}-name raid.reconstruct.perf_impact</td></tr>
<tr><td>raid.resync.perf_impact</td><td>storage raid-options \{ modify | show \}-name raid.resync.perf_impact</td></tr>
<tr><td>raid.rpm.ata.enable</td><td>Not supported</td></tr>
<tr><td>raid.rpm.fcal.enable</td><td>Not supported</td></tr>
<tr><td>raid.scrub.duration</td><td>storage raid-options \{ modify | show \}-name raid.scrub.duration</td></tr>
<tr><td>raid.scrub.perf_impact</td><td>storage raid-options \{ modify | show \}-name raid.scrub.perf_impact</td></tr>
<tr><td>raid.scrub.schedule</td><td>storage raid-options \{ modify | show \}-name raid.scrub.schedule</td></tr>
<tr><td>raid.timeout</td><td>storage raid-options \{ modify | show \}-name raid.timeout</td></tr>
<tr><td>raid.verify.perf_impact</td><td>storage raid-options\{ modify | show \}-name raid.verify.perf_impact</td></tr>
<tr><td>replication.logical.reserved_transfers</td><td>snapmirror set-options -xdp-source-xfer -reserve-pct</td></tr>
<tr><td>replication.throttle.enable</td><td>snapmirror modify -throttle</td></tr>
<tr><td>replication.volume.reserved_transfers</td><td>snapmirror set-options -dp-source-xfer -reserve-pct</td></tr>
<tr><td>replication.volume.use_auto_resync</td><td>Not supported</td></tr>
<tr><td>rpc.mountd.tcp.port</td><td>vserver nfs modify -mountd-port

Available at the advanced privilege level.</td></tr>
</table>

7-Mode option	Clustered Data ONTAP command
`rpc.mountd.udp.port`	**`vserver nfs modify -mountd-port`** Available at the advanced privilege level.
`rpc.nlm.tcp.port`	**`vserver nfs modify -nlm-port`** Available at the advanced privilege level.
`rpc.nlm.udp.port`	**`vserver nfs modify -nlm-port`** Available at the advanced privilege level.
`rpc.nsm.tcp.port`	**`vserver nfs modify -nsm-port`** Available at the advanced privilege level.
`rpc.nsm.udp.port`	**`vserver nfs modify -nsm-port`** Available at the advanced privilege level.
`rpc.pcnfsd.tcp.port`	Not supported
`rpc.pcnfsd.udp.port`	Not supported
`rpc.rquotad.udp.port`	**`vserver nfs modify -rquotad-port`** Available at the advanced privilege level.
`rquotad.enable`	**`vserver nfs modify -rquota`**
`rsh.access`	**`system services firewall policy create -policy mgmt -service rsh -allow-list`**
`rsh.enable`	**`system services firewall policy create -policy mgmt -service rsh -allow-list`**

S-Z

S

7-Mode option	Clustered Data ONTAP command
`security.admin.authentication`	**`security login modify`**
`security.admin.nsswitchgroup`	**`vserver modify`**
`security.passwd.firstlogin.enable`	**`security login role config modify`**
`security.passwd.lockout.numtries`	**`security login role config modify`**
`security.passwd.rootaccess.enable`	Not supported
`security.passwd.rules.enable`	**`security login role config modify`**
`security.passwd.rules.everyone`	**`security login role config modify`**
`security.passwd.rules.history`	**`security login role config modify`**
`security.passwd.rules.maximum`	**`security login role config modify`**
`security.passwd.rules.minimum`	**`security login role config modify`**
`security.passwd.rules.minimum.alphabetic`	Not supported
`security.passwd.rules.minimum.digit`	**`security login role config modify`**
`security.passwd.rules.minimum.symbol`	Not supported
`sftp.auth_style`	Not supported
`sftp.dir_override`	Not supported
`sftp.dir_restriction`	Not supported
`sftp.enable`	Not supported
`sftp.idle_timeout`	Not supported

7-Mode option	Clustered Data ONTAP command
`sftp.locking`	Not supported
`sftp.log_enable`	Not supported
`sftp.log_filesize`	Not supported
`sftp.log_nfiles`	Not supported
`sftp.max_connections`	Not supported
`sftp.max_connections_threshold`	Not supported
`sftp.override_client_permissions`	Not supported
`sis.max_vfiler_active_ops`	Not supported
`snaplock.autocommit_period`	Not supported
`snaplock.compliance.write_verify`	Not supported
`snaplock.log.default_retention`	Not supported
`snaplock.log.maximum_size`	Not supported
`snapmirror.access`	**`snapmirror create`**
`snapmirror.checkip.enable`	Not supported
`snapmirror.cmode.suspend`	**`snapmirror quiesce`**
`snapmirror.delayed_acks.enable`	Not supported
`snapmirror.vsm.volread.smtape_enable`	Not supported
`snapvalidator.version`	Not supported
`snapvault.access`	**`vserver peer`**
`snapvault.enable`	Not supported

7-Mode option	Clustered Data ONTAP command
`snapvault.lockvault_log_volume`	Not supported
`snapvault.preservesnap`	`snapmirror policy`
`snapvault.snapshot_for_dr_backup`	Not supported
`snmp.access`	**`system services firewall policy modify -policy` *`policy_name`*`-service snmp -allow -list`**
`snmp.enable`	Not supported
`ssh.access`	**`system services firewall policy modify -policy` *`_policy_name`*`-service ssh -allow -list`**
`ssh.enable`	**`system services firewall policy modify -policy` *`policy_name`*`-service ssh -allow -list`**
`ssh.idle.timeout`	Not supported
`ssh.passwd_auth.enable`	**`security login \{ show | create | delete \}-user-or-group-name` *`user_name`* `-application ssh -authmethod publickey -role` *`role_name`* `-vserver` *`vserver_name`***
`ssh.pubkey_auth.enable`	**`security login modify -authmethod publickey`**
`ssh1.enable`	Not supported
`ssh2.enable`	Not supported
ssl.enable	**`security ssl modify -server -enabled`**
`ssl.v2.enable`	**`system services web modify -sslv2 -enabled`**
`ssl.v3.enable`	**`system services web modify -sslv3 -enabled`**

7-Mode option	Clustered Data ONTAP command
`stats.archive.frequency_config`	Not supported

T

7-Mode option	Clustered Data ONTAP command
`tape.reservations`	**`options tape.reservations`**
`telnet.access`	**`system services firewall policy create -policy mgmt -service telnet -allow -list`**
`telnet.distinct.enable`	Not supported
`telnet.enable`	**`system services firewall policy create -policy mgmt -service telnet -allow -list`**
`tftpd.enable`	Not supported
`tftpd.logging`	Not supported
`tftpd.max_connections`	Not supported
`tftpd.rootdir`	Not supported
`timed.enable`	**`system services ntp config modify -enabled`**
`timed.log`	Not supported
`timed.max_skew`	Not supported
`timed.min_skew`	Not supported
`timed.proto`	Not supported
`timed.sched`	Not supported
`timed.servers`	*`cluster time-service ntp server`*

7-Mode option	Clustered Data ONTAP command
`timed.window`	Not supported
`trusted.hosts`	Not supported

V

7-Mode option	Clustered Data ONTAP command
`vol.move.cutover.cpu.busy.limit`	Not supported
`vol.move.cutover.disk.busy.limit`	Not supported
`vsm.smtape.concurrent.cascade.support`	Not supported

W

7-Mode option	Clustered Data ONTAP command
`wafl.default_nt_user`	**`vserver nfs modify -default-win-user`**
`wafl.default_unix_user`	**`vserver cifs options modify -default -unix-user`**
`wafl.inconsistent.asup_frequency.blks`	**`system node run -node{`*`node_name`*`|local} options wafl.inconsistent.asup_frequency.blks`**
`wafl.inconsistent.asup_frequency.time`	**`system node run -node{`*`node_name`*`|local} options wafl.inconsistent.asup_frequency.time`**
`wafl.inconsistent.ems_suppress`	**`system node run -node{`*`node_name`*`|local} options wafl.inconsistent.ems_suppress`**
`wafl.maxdirsize`	**`vol create -maxdir-size`** ⓘ Available at the advanced privilege level.
`wafl.nt_admin_priv_map_to_root`	**`vserver name-mapping create`**

7-Mode option	Clustered Data ONTAP command
`wafl.root_only_chown`	**`vserver nfs modify -chown-mode`** Available at the advanced privilege level.
`wafl.wcc_minutes_valid`	Not supported
`webdav.enable`	Not supported

How 7-Mode configuration files map to clustered Data ONTAP commands

In Data ONTAP operating in 7-Mode, you typically use flat files to configure the storage system. In clustered Data ONTAP, you use configuration commands. You need to know how 7-Mode configuration files map to clustered Data ONTAP configuration commands.

7-Mode configuration file	Clustered Data ONTAP configuration command
`/etc/cifs_homedir.cfg`	`vserver cifs home-directory search-path`
`/etc/exports`	`vserver export-policy`
`/etc/hosts`	`vserver services dns hosts`
`/etc/hosts.equiv`	Not applicable. The `security login` commands create user access profiles.
`/etc/messages`	`event log show`
`/etc/motd`	`security login motd modify`
`/etc/nsswitch.conf`	`vserver modify`
`/etc/rc`	In clustered Data ONTAP, the retention of node configuration information processed at boot is transferred to other internal files that retain the configuration information. In Data ONTAP operating in 7-Mode, features configured in memory are also retained in the `/etc/rc` file to be replayed at boot and reconfigured.

7-Mode configuration file	Clustered Data ONTAP configuration command
`/etc/quotas`	`volume quota`
`/etc/resolv.conf`	`vserver services dns modify`
`/etc/snapmirror.allow`	Intercluster relationships exist between two clusters. Intracluster relationships exist between two nodes on the same cluster. Authentication of the remote cluster occurs during the creation of the cluster peering relationship. Intracluster `snapmirror create` commands can be performed only by the cluster administrator to enforce per storage virtual machine (SVM) security.
`/etc/snapmirror.conf`	`snapmirror create`
`/etc/symlink.translations`	`vserver cifs symlink`
`/etc/usermap.cfg`	`vserver name-mapping create`

How to interpret the clustered Data ONTAP commands, options, and configuration files maps for 7-Mode administrators

If you are moving from Data ONTAP running in 7-Mode to clustered Data ONTAP, you might find it handy to refer to the command maps, which show the clustered Data ONTAP equivalents of 7-Mode commands, options, and configuration files.

What mapping information is included

The Command Map for 7-Mode Administrators includes the following mappings of 7-Mode commands, options, and configuration files to their clustered Data ONTAP equivalents:

- How 7-Mode commands map to clustered Data ONTAP commands
- How 7-Mode options map to clustered Data ONTAP commands
- How 7-Mode configuration files map to clustered Data ONTAP commands

How to interpret 7-Mode-compatible shortcut commands

Although the Data ONTAP command-line interface (CLI) is significantly reorganized for cluster operations, many of the commands have 7-Mode-compatible shortcut versions that require no change to scripts or other automated tasks. These shortcut versions are listed first and in **bold** in the tables here. Shortcut versions that are not 7-Mode-compatible are listed next, followed by the full, long-form version of the commands:

7-Mode command	Clustered Data ONTAP command

`aggr add`	**`aggr add`**
	`aggr add-disks`
	`storage aggregate add-disks`

If no **bold** shortcut is listed, a 7-Mode-compatible version is not available. Not all forms of the commands are shown in the table. The CLI is extremely flexible, allowing multiple abbreviated forms.

Understanding the different clustered Data ONTAP shells for CLI commands

A cluster has three different shells for CLI commands:

- The *clustershell* is the native shell, started automatically when you log in to the cluster.

  It provides all the commands you need to configure and manage the cluster.

- The *nodeshell* is a special shell that enables you to run a subset of 7-Mode commands.

  These commands take effect only at the node level. You can switch from the clustershell to a nodeshell session to run nodeshell commands interactively, or you can run a single nodeshell command from the clustershell. You can recognize a command as a nodeshell command if it has the (long) form `system node run -node {nodename|local} commandname`.

- The *systemshell* is a low-level shell used only for diagnostic and troubleshooting purposes.

  It is not intended for general administrative purposes. Access the systemshell only with guidance from technical support.

Switching to nodeshell

When you see a 7-Mode-compatible shortcut version of a nodeshell command, it is assumed that you are running the command from the nodeshell. To switch to the nodeshell, enter the following:

`system node run -node {nodename|local}`

Other forms of the `nodeshell` command must be run from the clustershell.

Where to go for more information

If you want to…	For more information…
Use clustershell commands	ONTAP 9 commands
Use nodeshell commands	Data ONTAP 8. 2 Commands: Manual Page Reference for 7-Mode, Volume 1

If you want to…	For more information…
Execute CLI commands, navigate CLI command directories, set values in the CLI, and use queries, patterns, and wildcards	System administration

Installation and Setup Guide

This guide describes how to install and set up the 7-Mode Transition Tool for copy-free transition or copy-based transition.

Transition to clustered ONTAP by using the 7-Mode Transition Tool

The 7-Mode Transition Tool enables you to collect inventory of 7-Mode controllers, hosts, switches, and applications, and assess their readiness for transition to clustered ONTAP. After assessment, you can migrate your data and configurations from 7-Mode to clustered ONTAP either by using the copy-based transition method or copy-free transition method. The 7-Mode Transition Tool can be downloaded from the NetApp Support Site and installed on a Linux or Windows system.

Be sure to consult the current 7-Mode Transition Tool *Release Notes* for the latest information about supported target releases and known issues.

7-Mode Transition Tool Release Notes

ONTAP target releases supported by the 7-Mode Transition Tool

Release support for ONTAP transition target clusters depends on the transition method you want to use, copy-based or copy-free, and on the version of the 7-Mode Transition Tool.

Be sure to consult the current 7-Mode Transition Tool Release Notes for the latest information about supported target releases and known issues.

Copy-based transitions are supported to these ONTAP target releases.

If your transition target is running …	You must use this 7-Mode Transition Tool version …
ONTAP 9.10.1, ONTAP 9.11.1 or earlier supported release	3.5.0
ONTAP 9.9.1 or earlier supported release	3.4.0
ONTAP 9.8 or earlier supported release	3.3.3
ONTAP 9.7P2 or later 9.7 P release Earlier 9.7 releases are not supported.	3.3.2

If your transition target is running …	You must use this 7-Mode Transition Tool version …
ONTAP 9.6P7 or later 9.6 P release Earlier 9.6 releases are not supported.	3.3.2
ONTAP 9.5 or earlier ONTAP 9 release	3.3.2 or 3.3.1
Clustered Data ONTAP 8.1.4P4 and later 8.x releases.	3.3.2 or 3.3.1

Copy-free transitions are supported to these ONTAP target releases using 7-Mode Transition Tool 3.3.1.

- ONTAP 9.4 and earlier ONTAP 9 releases.
- Clustered Data ONTAP 8.3.2 and later 8.x releases.

> You cannot use the 7-Mode Transition Tool to transition to ONTAP 9.5 or later using the copy-free method. To do so, you must first transition to ONTAP 9.4 using 7-Mode Transition Tool 3.3.1 and then upgrade your cluster to ONTAP 9.5 or later. 7-Mode Transition Tool 3.3.2 does not support copy-free transitions.

Comparison of copy-free transition and copy-based transition

You can use the 7-Mode Transition Tool to migrate your data and configurations from 7-Mode to ONTAP by using either copy-based transition or copy-free transition. It is important to understand the differences between the two methods before transition.

Parameter	Copy-free transition	Copy-based transition
Unit of transition	HA pair	Group of volumes
Hardware requirement	Disk shelves are reused	New disks shelves and disks to host the transitioned volumes
Platform requirement	Supported only on mid-level and high-level platforms NetApp Interoperability Matrix Tool	Supported on all platforms
Transition duration	Overall, shorter transition duration (no data copy required)	Longer duration (initial baseline and update transfer time varies based on workload, network bandwidth, and data capacity being migrated)

Parameter	Copy-free transition	Copy-based transition
Disruption to data access	In the range of hours In most cases, the storage cutover time can be 3 through 8 hours. Cutover time includes the time taken by the tool to perform two automated operations—the export and halt operation and the import operation—as well as the time taken for manually cabling the disk shelves to the new controllers. The export and halt operation and the import operation together can take up to 2 hours. Cabling of the disk shelves can take from 1 hour through 6 hours. This cutover time guidance does not include the time taken for the required preproduction testing and assumes an error-free transition without unexpected failures such as a disk failure.	In the range of minutes

Interfaces and transition capabilities available on Windows and Linux

You can install the 7-Mode Transition Tool on Windows or Linux. You must be aware of the features and the user interfaces that are supported before installing the 7-Mode Transition Tool.

Migration method	Feature	Supported on Windows	Supported on Linux
Copy-free transition	Graphical user interface (GUI)	Yes	No
	Command-line interface (CLI)	No You cannot use the CLI for creating and managing projects; however, you have to run certain commands, such as commands for ignoring blocking errors, during the transition from the Windows CLI.	No
	Collect and assess	Yes	No
Copy-based transition	GUI	Yes	No
	CLI	Yes	Yes
	Collect and assess	Yes	No

Installing or uninstalling the 7-Mode Transition Tool on a Windows system

You can download and install the 7-Mode Transition Tool on a Windows system by using the standard wizard-based installer. However, if you have a previously installed version of the 7-Mode Transition Tool, you need to be aware of certain prerequisites before doing so.

- If you have a 7-Mode Transition Tool version earlier than 3.0 installed in your system, then you need to uninstall that before installing the latest version.

  You must create a backup of the log files if you choose to retain the log files during uninstallation. The 7-Mode Transition Tool installer installs the tool to the same folder and overwrites the log files the next time you run it.

- If you have 7-Mode Transition Tool 3.0 or later installed in your system, then the following conditions must be met before installing the latest version of the 7-Mode Transition Tool:
  - All existing copy-based transition projects must either be completed or aborted.
  - All existing copy-free transition projects must either be completed or rollback complete.

System requirements for installing the 7-Mode Transition Tool on Windows systems

You must ensure that the Windows host meets the required configuration to install and run the 7-Mode Transition Tool.

Be sure to consult the current 7-Mode Transition Tool Release Notes for the latest information about supported hosts and known issues.

Hardware requirements

- Dual-core x64 processor, 1.0 GHz or more
- 8 GB RAM
- 40 GB free disk space

Software requirements

- Your 64-bit Windows system must be running one of the following operating system versions:
  - Windows 7 Enterprise
  - Windows 7 Enterprise SP1
  - Windows Server 2008 Standard
  - Windows Server 2008 R2 Standard
  - Windows Server 2008 R2 Enterprise with SP1
  - Windows Server 2012 Standard
  - Windows Server 2012 R2 Standard
  - Windows 8.1 Enterprise
  - Windows Server 2012 R2 Datacenter edition
  - For 7-Mode Transition Tool version 3.3.2P1, you can also use one of the following operating system versions:
    - Windows 10 Enterprise
    - Windows Server 2016 Standard
    - Windows Server 2016 Datacenter
    - Windows Server 2019 Standard
    - Windows Server 2019 Datacenter
  - For 7-Mode Transition Tool version 3.3.3, you can also use one of the following operating system versions:
    - Windows 10 Professional

    You can use a Windows virtual machine that meets the required software requirements and hardware requirements to install the 7-Mode Transition Tool.

- 64-bit Oracle Java Runtime Environment (JRE) 1.8 update 331

> If the Windows host does not have JRE or has 32-bit JRE installed, the 7-Mode Transition Tool installer automatically installs 64-bit JRE 1.8 update 331. If an earlier version of 64-bit JRE is installed, the installer automatically updates JRE to JRE 1.8 update 331.

When JRE is updated automatically, the other applications that require earlier versions of JRE might be affected.

> With JRE versions 1.8 update 46 or later (including JRE 1.8 update 331), for the 7-Mode Transition Tool to communicate with Data ONTAP operating in 7-Mode systems and ONTAP systems, the SSL key length on the Data ONTAP operating in 7-Mode systems and ONTAP systems must be at least 1024.

7MTT: How to resolve TLS or SSL communication issue

Server configuration requirements

To access the web interface, the Windows system on which the tool is installed must be configured as follows:

- Port 8443 of the 7-Mode Transition Tool server must be available.

  If port 8443 is not available, or if you want to use a different port, you must change the port specified by the `tool.https.port` parameter in the `$INSTALL_DIR\etc\conf\transition-tool.conf` file.

  The best practice is to use HTTPS for accessing the web interface. However, if you want to use HTTP for accessing the web interface, port 8088 must be available. For an alternative to port 8088, you must change the port specified by the `tool.http.port` parameter in the `transition-tool.conf` file.

  > You must restart the 7-Mode Transition Tool service after changing the port in the configuration file.

- The firewall should be either turned off or configured to allow traffic on the port that is used to access the tool.

To transition netgroups and CIFS local users and groups, the following requirements must be met:

- Port 8088 of the 7-Mode Transition Tool must be available.

  For an alternative to port 8088, you must change the port specified by the `tool.http.port` parameter in the `transition-tool.conf` file, and then restart the 7-Mode Transition Tool service.

- Each node in the cluster must have at least one data LIF configured for the target SVM.
- All of the SVM data LIFs must be able to communicate with the 7-Mode Transition Tool port 8088 or the port specified by the `tool.http.port` parameter in the `transition-tool.conf` file.

  > You must ensure that firewalls do not block this traffic.

Client (web interface) requirements

The system that accesses the web interface must have the following:

- One of the following web browsers:

    - Microsoft Internet Explorer 9, 10, or 11
    - Google Chrome 27 or later
    - Mozilla Firefox 20 or later
      All of the browsers must be TLS-enabled.

    If you are using Microsoft Internet Explorer as your web browser, you must disable SSLv2.

- A screen resolution of 1280 × 1024 or higher

Every time you install a new version of the tool, you must clear the browser cache by pressing Ctrl+F5 on the system.

Related information

NetApp Interoperability

Installing the 7-Mode Transition Tool on a Windows system

You can install the 7-Mode Transition Tool on a Windows system by using the wizard-based installer.

- You must have reviewed the system requirements for the 7-Mode Transition Tool.

  System requirements for the 7-Mode Transition Tool on Windows

- You must have the necessary administrator privileges to install and launch the application.
- You must have cleared the browser cache by pressing Ctrl+F5.

  You must clear the cache every time you install a new version of the tool.

Steps

1. Download the software from the NetApp Support Site.

   NetApp Downloads: Software

2. Run the `NetApp_7ModeTransitionTool_Setup.exe` file.
3. In the 7-Mode Transition Tool Setup welcome screen, click **Next**.
4. Follow the on-screen prompts to continue with the installation.
5. Select **Launch the tool** to open the 7-Mode Transition Tool immediately after the installation.
6. Click **Finish** to complete the installation.

Enabling login for users not part of the Administrator group

By default, users must be members of the Administrator group on the Windows system on which the 7-Mode Transition Tool is installed. At any time, you can enable login for users who are not members of the Administrators group and who cannot install the tool but are authenticated to use the Windows system on which the tool is installed.

Steps

1. Log in to the Windows host using admin privileges.
2. Modify the configuration file of the tool to enable users who are not part of the Administrator group to log in to the tool:
   a. Open the `\etc\conf\transition-tool.conf` file from the installation directory.
   b. Set the value of the `tool.login.non.admin.enabled` parameter in the `transition-tool.conf` file to true.
   c. Save the file.
3. Restart the transition service.
   a. Click **Start** > **Control Panel** > **System and Services** > **Administrative Tools** > **Services**.
   b. Right-click the **NetApp 7-Mode Transition Tool** service and click **Stop**.
   c. Right-click the **NetApp 7-Mode Transition Tool** service again and click **Start**.

Related information

Modifying the configuration options of the 7-Mode Transition Tool

Logging in to the 7-Mode Transition Tool

You can log in to the 7-Mode Transition Tool (web interface) by using your credentials of the Windows system on which the tool is installed. The procedure to log in varies depending on the type of user credentials you have.

Guest users are not allowed to log in to the tool.

Steps

1. Navigate to the login page:

If you are a…	Then…
User who is a member of the Administrator group and if you are accessing the tool (web interface) from the server on which it was installed	Double-click the 7-Mode Transition Tool icon on your desktop.
User who is a member of the Administrator group and if you have not installed the tool	Use a supported browser to navigate to one of the following URLs: • `https://`*`IP_address:port`*`/transition` • `http://`*`IP_address:port`*`/transition` *`IP_address`* is the IP address of the server and *`port`* can be 8443 (default), the value specified for *`tool.https.port`*, or 8088, the value specified for the *`tool.http.port`* parameter in the *`transition-tool.conf`* file.

If you are a…	Then…
User who is a member of the Administrator group and if you are accessing the tool (web interface) from another computer	Use a supported browser to navigate to one of the following URLs: • `https://IP_address:port/transition` • `http://IP_address:port/transition` *IP_address* is the IP address of the server and port can be 8443 (default), the value specified for *tool.https.port*, or 8088, the value specified for the *tool.http.port* parameter in the *transition-tool.conf* file.
User who is not a member of the Administrator group and if you are accessing the tool (web interface) either from the server on which it was installed or from another computer	Use a supported browser to navigate to one of the following URLs: • `https://IP_address:port/transition` • `http://IP_address:port/transition` *IP_address* is the IP address of the server and port can be 8443 (default), the value specified for the *tool.https.port*, or 8088, the value specified for the *tool.http.port* parameter in the *transition-tool.conf* file.

2. If the browser displays a message about the self-signed SSL certificate, then accept the self-signed certificate to continue.
3. Log in to the web interface by using the credentials of the Windows system in which the tool is installed.

Uninstalling the 7-Mode Transition Tool on a Windows system

You can uninstall the 7-Mode Transition Tool by using the Windows Uninstall program utility.

- You must have completed all in-progress transitions.

> Installing a newer version or reinstalling the same version of the tool does not allow you to access the transition operations started by the uninstalled instance.

- If the 7-Mode Transition Tool is running, it must be closed.

Java Runtime Environment (JRE) is not removed as part of the uninstallation.

Steps

1. Click **Start** > **Control Panel** > **Uninstall a program**.
2. Select the 7-Mode Transition Tool from the list of programs and click **Uninstall**.
3. Complete the steps in the wizard to uninstall the 7-Mode Transition Tool.

   You can choose to save the project details and logs for troubleshooting purposes.

You must create a backup of the log files if you choose to retain the log files during uninstallation. The 7-Mode Transition Tool installer installs the tool to the same folder and overwrites the log files the next time you run it.

Installing or uninstalling the 7-Mode Transition Tool on Linux (Copy-based transition only)

You can download and install the 7-Mode Transition Tool on a Linux system by using the command-line interface. When required, you can uninstall the 7-Mode Transition Tool.

You can perform only copy-based transition on a Linux system. Copy-free transition is not supported on Linux.

> The 7-Mode Transition Tool web interface is not supported on Linux. You must use the CLI to perform copy-based transition tasks on a Linux system.

System requirements for installing 7-Mode Transition Tool on Linux

You must ensure that the Linux host has the required configuration to install and run the 7-Mode Transition Tool.

Be sure to consult the current 7-Mode Transition Tool Release Notes for the latest information about supported hosts and known issues.

Hardware requirements

- Dual-core x64 processor, 1.0 GHz or more
- 8 GB RAM
- 40 GB free disk space

Software requirements

- Your Linux system must be running one of the following:
  - Red Hat Enterprise Linux 5.6
  - Red Hat Enterprise Linux 6.0
  - Red Hat Enterprise Linux 7.0 (7-Mode Transition Tool version 3.3.2 and later)
  - CentOS release 6.4

  > You can use a Linux virtual machine that meets the required software and hardware requirements to install the 7-Mode Transition Tool.

- 64-bit Oracle JRE 1.8 update 331
- 7-zip utility (`rpmforge-release-0.3.6-1.el5.rf.x86_64.rpm`)

> JRE 1.8 and the 7-zip utility must be installed on the Linux system before configuring the 7-Mode Transition Tool.

Installing 7-Mode Transition Tool on Linux

You can install the 7-Mode Transition Tool on your Linux system by using the command-line interface.

- You must have reviewed the system requirements for 7-Mode transition tool.

  System requirements for installing 7-Mode Transition Tool on Linux

- You must have root user privileges to install and launch the application.

Steps

1. Download the `tar.gz` file from the NetApp Support Site.

   NetApp Downloads: Software

2. Extract the `tar.gz` file to a directory in the Linux system:

   `tar -xzvf NetApp_7ModeTransitionTool_Setup.tar.gz -C` ***`directory_path`***

3. Change the directory to the installation directory:

   `cd` ***`directory_path/NetApp_7ModeTransitionTool`***

4. Configure the 7-Mode Transition Tool server:

   `./configure`

   This starts the 7-Mode Transition Tool service on the Linux system.

5. Verify that the 7-Mode Transition Tool service is running on the Linux system:

   `service transition-service status`

Example

```
bash-4.2# tar -xzvf NetApp_7ModeTransitionTool_Setup.tar.gz -C
/root/Downloads/extracted_folder
bash-4.2# cd /root/Downloads/extracted_folder/NetApp_7ModeTransitionTool
bash-4.2# ./configure
bash-4.2# service transition-service status
The transition-service (NetApp 7-Mode Transition Tool server) is running.
PID=38384.
```

Uninstalling 7-Mode Transition Tool on Linux

You can uninstall the 7-Mode Transition Tool on Linux by using the command-line interface.

- You must have completed all in-progress transitions.

> Installing a newer version or reinstalling the same version of the tool does not allow you to access the transition operations started by the uninstalled instance.

- If the 7-Mode Transition Tool is running, it must be stopped.

JRE is not removed as part of the uninstallation.

Steps

1. Uninstall 7-Mode Transition Tool by running the following command from the location where you extracted the 7-Mode Transition Tool:

   `./unconfigure`

2. Remove the 7-Mode Transition Tool directory:

   a. **`cd ..`**

   b. **`rm -rf NetApp_7ModeTransitionTool`**

Example

```
bash-4.2# cd /root/Downloads/extracted_folder/NetApp_7ModeTransitionTool
bash-4.2# ./unconfigure
bash-4.2# cd ..
bash-4.2# rm -rf NetApp_7ModeTransitionTool
```

Modifying the configuration options of the 7-Mode Transition Tool

You can edit the `$INSTALL_DIR\etc...` file to modify any configuration option that is used by the 7-Mode Transition Tool. This file contains information about all of the configurable options that are necessary for the tool to operate.

The file contains various options; for example, you can specify the port on which the tool service starts, and the port that the tool uses to communicate with the 7-Mode system or cluster.

Steps

1. From the system in which the 7-Mode Transition Tool is installed, open the `$INSTALL_DIR\etc\conf\transition-tool.conf` file from the installation directory, and then modify it.

   Port 8443 or 8088 must be available for the 7-Mode Transition Tool to communicate with the 7-Mode system and cluster. If port 8443 or 8088 is not available or if you want to use a different port, you must change the port specified by the `tool.https.port` option in the `transition-tool.conf` file. If port 8088 is not available or if you want to use a different port, you must change the port specified by the `tool.http.port` option in the `transition-tool.conf` file.

2. Restart the 7-Mode Transition Tool service for the new values to take effect:

If your system type is…	Do the following…
Windows	a. Click **Start** > **Control Panel** > **System and Security** > **Administrative Tools** > **Services**. b. Right-click the **NetApp 7-Mode Transition Tool** service, and then click **Stop**. c. Right-click the **NetApp 7-Mode Transition Tool** service again, and then click **Start**.
Linux	Run the following command: **`service transition-service restart`**

3. After the 7-Mode Transition Tool service is restarted, add the 7-Mode system and cluster credentials again.

Troubleshooting issues

You need to be aware of some of the common issues with the 7-Mode Transition Tool and the steps to resolve them.

Tool installation fails with an incompatible OS error

Installation of the 7-Mode Transition Tool fails with the error message `7-Mode Transition Tool is not compatible with this version of Windows.`

- **Workaround**
    a. Right-click the `NetApp_7ModeTransitionTool_Setup.exe` file, and then select **Properties**.
    b. In the Compatibility tab, click **Change settings for all users**.
    c. Verify that the **Run this program in compatibility mode for:** check box is not selected, and then click **Apply**.

Installation or uninstallation of the 7-Mode Transition Tool is blocked

When you use the 7-Mode Transition Tool installer or the uninstaller to perform any operation (such as install, repair, reinstall, upgrade, uninstall), the following error message is displayed: `Another instance of NetApp 7-Mode Transition Tool Setup or Uninstall is running. Only one instance can run at a time.`

Workaround

Before you begin, ensure that there are no open instances or dialog boxes of the 7-Mode Transition Tool. Otherwise, you might have to perform the steps again.

1. Open **Registry** by clicking **Start**.
2. In **Search programs and files**, enter **`RegEdit`**.

3. When Registry Editor is open, locate the HKEY_LOCAL_MACHINE registry hive.
4. Expand the HKEY_LOCAL_MACHINE hive by clicking the expand icon to the left of the folder icon.
5. Continue to expand the registry keys and subkeys until you locate `HKEY_LOCAL_MACHINE\ SOFTWARE \NetApp \7-Mode Transition Tool`.
6. Click **7-Mode Transition Tool**.
7. Right-click INSTALLATION_STATUS, and select **Modify**.
8. Change the value from INSTALLER_RUNNING to INSTALLED, and click **OK**.

You should now be able to perform any operation using the 7-Mode Transition Tool installer or the uninstaller.

Reinstalling or upgrading the 7-Mode Transition Tool fails on Windows system

This section provides information about the error when you reinstall or upgrade the 7-Mode Transition Tool on Windows system. It also provides the reason for the error and the steps to resolve the error.

- **Message**

  ```
  Another instance of NetApp 7-Mode Transition Tool setup or uninstall is
  running. Only one instance can run at a time.
  ```

- **Cause**

  Some of the files in the 7-Mode Transition Tool installation folder are open.

- **Corrective action**
  a. Close all of the 7-Mode Transition Tool installation files.
  b. Open the registry entry for 7-Mode Transition Tool:
     i. Check the **INSTALLATION_STATUS** field.
     ii. If the value is **`INSTALLER_IS_RUNNING`**, change it to **`INSTALLED`**.
  c. Retry reinstalling or upgrading the tool.

Windows Program Compatibility Assistant notification displayed while installing the tool

Sometimes while installing the tool, you receive the Windows Program Compatibility Assistant notification that the program might not have installed correctly. This notification does not necessarily indicate that the program did not install correctly.

You can ignore this notification by clicking **This program installed correctly**.

Copy-Based Transition Guide

This guide describes how to assess 7-Mode controllers, hosts, and applications for transition and perform a copy-based migration of data and configuration from 7-Mode systems to ONTAP by using the 7-Mode Transition Tool.

Transition overview

Transitioning to clustered ONTAP involves identifying your current environment, defining the transition scope, designing the optimal configuration of the destination systems, planning how to migrate data and configurations, and making necessary environmental updates.

Be sure to consult the current 7-Mode Transition Tool *Release Notes* for the latest information about supported target releases and known issues.

7-Mode Transition Tool Release Notes

You must first collect information about the current environment, including both the current storage environment as well as the hosts and applications. After collecting the storage inventory, you can assess the current features and functionality that are used and identify any differences in the ONTAP version selected. You can use 7-Mode Transition Tool to perform these tasks.

You can then define your migration project. This involves identifying what volumes and workloads you want to migrate together, then you can design your cluster, and plan your transition. You can begin planning your migration by first selecting the optimal migration method. When designing your cluster, you can use the information gathered about your storage environment to map existing configuration items to their equivalent items in ONTAP. For example, a 7-Mode volume should be mapped to an SVM and a volume in ONTAP and an IP address that will be transitioned should be mapped to LIFs. You should also determine if any environmental changes have to be made on the ONTAP system.

Implementation includes deploying and configuring the cluster, migrating data, applying configuration changes, disconnecting clients and reconnecting to the destination ONTAP system, verifying access, as well as performing any necessary environmental changes.

Related information

NetApp Documentation: ONTAP 9

Copy-based transition by using the 7-Mode Transition Tool

The 7-Mode Transition Tool enables you to perform copy-based transition by collecting information and assessing 7-Mode controllers, hosts, switches, and applications for transition. You can then migrate your data and configurations from 7-Mode to ONTAP.

The 7-Mode Transition Tool runs on a Windows or Linux system. The 7-Mode Transition Tool provides both a web interface and a command-line interface for managing your transition operations.

Collecting and assessing ONTAP systems, hosts, switches, and applications

You can perform the following collect and assess tasks by using the 7-Mode Transition Tool:

- Collect inventory information from ONTAP systems (7-Mode controllers and nodes in the cluster), hosts, switches, and host applications.
- Generate the FC Zone plan to configure the zones for grouping the initiator hosts and targets.
- Assess the features and functionalities of the 7-Mode systems, and identify how these features and functionalities work in the ONTAP version selected for transition.

Moving data and configurations from 7-Mode to ONTAP

Copy-based transition uses SnapMirror technology to copy 7-Mode volumes and configurations from Data ONTAP 7G and 7-Mode to ONTAP.

You can perform the following tasks by using the 7-Mode Transition Tool for copy-based migration:

- Migrate a group of 7-Mode stand-alone volumes or a group of 7-Mode volumes in volume SnapMirror relationships from systems running different 7-Mode versions to any version from ONTAP 8.2.x and later supported releases.
- Run prechecks on volumes included in a transition project to verify their compatibility for transition and view possible corrective actions.
- Apply 7-Mode configurations to ONTAP before disconnecting client access, reducing the downtime.

  Copy-based transition supports the transition of NAS and SAN configurations.

  > SAN transition is supported only to ONTAP 8.3 and later supported releases.

Related information

Requirements for copy-based transition

Transition terminology

Understanding the transition terminology related to the 7-Mode Transition Tool helps you to understand the transition process.

- **Collect and assess**

  Before transitioning data and configurations to ONTAP, you must collect information about the storage environment that includes storage systems, hosts, and applications. You must then assess the features and functionalities of these systems, and identify how these features and functionalities work in the ONTAP version selected for transition.

- **Migrate**

  Refers to transitioning data and configurations from the 7-Mode volumes to ONTAP. Migration should be performed after assessing the 7-Mode controllers.

- **Project**

  In the 7-Mode Transition Tool, a project enables you to configure and manage the transition of a group of volumes.

  Transition projects are of three types: stand-alone, primary, and secondary.

- **Stand-alone project**

  Volumes in this project are either not in any SnapMirror relationship with volumes in other storage systems, or you want to transition these volumes without retaining their SnapMirror relationships.

- **Primary project**

  Volumes in this project are the source volumes of a SnapMirror relationship.

- **Secondary project**

  Volumes in this project are the destination volumes of a SnapMirror relationship.

- **Project group**

  In the 7-Mode Transition Tool, a project group is a logical container that you can use to hold related migration projects. There is always one default group with Default_Group name that exists in the system.

- **Transition peer relationship**

  Transition peer relationship is an authorization mechanism that enables SnapMirror to establish relationships between a 7-Mode storage system and an SVM in the cluster for copying data from the 7-Mode volumes to the ONTAP volumes for transition. A transition peer relationship can be created only by a cluster administrator and is initiated from the cluster.

- **Transition data protection relationship**

  Transition data protection (TDP) relationships are volume SnapMirror relationships that are established between a 7-Mode system and an ONTAP system.

  Transition data protection is supported only for transition. You should not keep this relationship for long periods of time because it is not possible to resynchronize data from an ONTAP volume back to a 7-Mode volume.

Limits for transition

When you transition volumes using the 7-Mode Transition Tool, you should consider certain limits for assessment, such as the number of controllers and hosts that can be assessed simultaneously. For migration, you should review the number of volumes in a project and number of projects that can be run simultaneously.

The following table lists the number of controllers and hosts that can be assessed simultaneously:

Parameter	Maximum limit
Number of controllers	50
Number of hosts	20
Number of ESXi hosts	10

The maximum number of 7-Mode controllers in a single assessment depends on the number of objects, such as number of volumes, qtrees, quota, and exports.

The following table lists the number of volumes in a project and the number of projects that can be run simultaneously during migration:

Parameter	Maximum limit
Number of volumes in a project	160
Recommended limit for the total number of volumes across all active projects in the web interface at any given time	240
Maximum number of active project at any given time	50 If you have 50 active projects, you can replicate data from 50 7-Mode storage systems and their associated SnapMirror destinations.
Number of data copy schedules per project	7

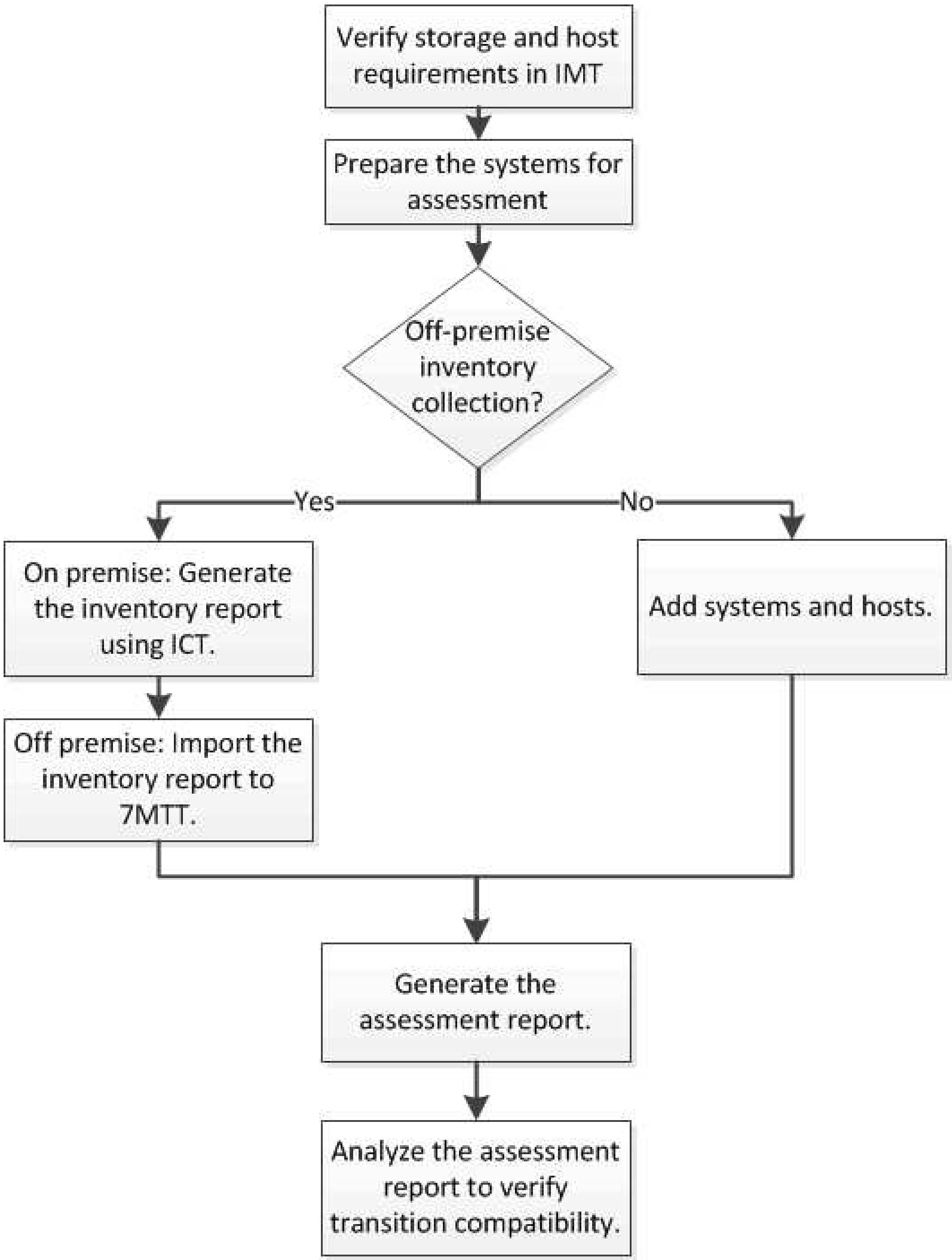
Collecting and assessing the inventory information

You can collect inventory information from controllers, hosts, and FC switches. You can then assess features and functionalities of these systems, and identify how these features and functionalities work in the ONTAP version that is selected for transition.

You can collect inventory information in two ways:

- If your environment security allows it, you can install the 7-Mode Transition Tool, and then use it to collect the inventory information.
- You can import the inventory XML report generated by the Inventory Collect Tool, and then perform the assessment.

In both cases, you must use Inventory Collect Tool 3.3 to collect the inventory.



Storage, host, and FC switches version requirements for transition assessment

You must be aware of the versions of Data ONTAP operating in 7-Mode, hosts, and FC switches that are supported for transition assessment.

For the list of 7-Mode versions, hosts, and FC switches that are supported for assessment by the 7-Mode Transition Tool, see the NetApp Interoperability Matrix Tool.

NetApp Interoperability Matrix Tool

Preparing the 7-Mode systems and hosts for transition assessment

You must ensure that the 7-Mode systems and hosts meet certain network and protocol requirements for successfully generating an assessment report.

Steps

1. Enable HTTPS on the 7-Mode system:

   `options httpd.admin.ssl.enable on`

2. Enable TLS on the 7-Mode system:

   `options tls.enable on`

   > The best practice is to enable TLS because of the security vulnerabilities in SSLv3.

3. Enable SSL and disable SSLv2 and SSLv3 on the 7-Mode system:

   a. Set up and start SSL:

      `secureadmin setup ssl`

   b. Enable SSL:

      `options ssl.enable on`

   c. Disable SSLv2 and SSLv3:

      `options ssl.v2.enable off`

      `options ssl.v3.enable off`

      > The best practice is to disable SSLv2 and SSLv3 to avoid security vulnerabilities.

4. Enable SSH on the 7-Mode system:

   a. Set up SSH on the 7-Mode system:

      `secureadmin setup -f ssh`

      The `-f` option forces the setup to run even if the SSH server is already configured.

   b. Enable SSH:

      `secureadmin enable ssh2`

   c. Enable password authentication on the SSH server:

      `options ssh.passwd_auth.enable`

   d. Enable SSH access to the host:
      +
      `options ssh.access`

5. Prepare your Windows host systems:
   - Enable WMI access.

     For more information about enabling WMI access, see the host documentation.
   - If you have Windows Server 2003, verify that you have installed the Microsoft Fibre Channel Information Tool (fcinfo) package and run the tool once on your Windows host system.

     This tool enables you to collect the HBA configuration information of the host.
   - If the system on which the 7-Mode Transition Tool is run does not belong to a domain, verify the following:
     - The host system belongs to a domain.
     - If the host has a local user, and the user name for that user is in the following format:

       `SystemName\Username`
6. Enable SSH on the Linux or ESXi host.

   For more information about enabling SSH, see the host documentation.
7. Verify that you have installed the latest NetApp Host Utilities software for each host.

   For information about downloading and installing the NetApp Host Utilities software, see the NetApp Support Site.
8. Verify that all the hosts and storage systems can be reached by the Windows system from which the 7-Mode Transition Tool is run.

Assessing controllers and hosts

You can collect and assess information about the controllers and hosts by using either the 7-Mode Transition Tool or the Inventory Collect Tool, depending on the security regulations in your environment.

- The 7-Mode Transition Tool collects inventory information about controller and hosts by adding the systems or by using the inventory report generated by the Inventory Collect Tool.

  The 7-Mode Transition Tool then assesses inventory information and creates the transition assessment report.
- You must be aware of the following considerations when performing transition assessment:
  - You should not perform both assessment and migration operations simultaneously on a controller.
  - You should avoid performing assessment operations on active storage controllers during peak hours.

Generating an assessment report by adding systems to the 7-Mode Transition Tool

You can collect inventory information for controllers, hosts, and FC switches by adding the systems to the 7-Mode Transition Tool. You can then create an assessment report to assess the features and functionalities of those systems, and to identify how they work in the ONTAP version selected for transition.

- The user name for the storage system and hosts must have sufficient privileges to execute the commands listed in the readme file.

  The readme file is located at *7-Mode_Transition_Tool_installed_location\bin\ict*.
- You must have prepared the 7-Mode systems, hosts, and FC switches for transition assessment.
- For assessing Windows systems, you must have a domain user account.
- If you are adding multiple systems for assessment, you must create a text file that is encoded in the ASCII or UTF-8 format and must contain the system details in the form of one system per line.

  Each system details must be in the following format:

  ```
  (ontap|windows|vmware|linux|cisco|brocade)://[(user|domain_user)[:passwo
  rd]@](host_name|ip)
  ```
- The controller or host must be accessible by the system on which the 7-Mode Transition Tool is installed and run.
- All features must be configured or their license enabled so that the workbook can contain inventory information about these features.
- The user name for the storage system must have sufficient administrative privileges to collect inventory information.
- All host names and storage system configurations, such as CIFS share names, user names, and group names, must be in the UTF-8 format.

If the 7-Mode Transition Tool service or the system on which this tool is installed is restarted, then the system details added to the tool are lost and the system must be added to the tool again.

Steps

1. If you want to use the latest Interoperability Matrix (IMT) data for transition assessment:
   a. Download the IMT data from the Interoperability Matrix, and then save it:
      i. From the Reports menu, click **Complete Daily Exports**.
      ii. In the Complete Daily Exports dialog box, enter FAS in the search field.
      iii. Download the ONTAP SAN Host excel file, and then save it.
      NetApp Interoperability Matrix Tool
   b. From the CLI, import the IMT data by using the `transition imt import` command.
   c. Verify that the import is successful by using the `transition imt show` command.

      Troubleshooting: If the IMT data import operation fails, you can revert to the previous data by using the `transition imt restore` command.
2. Log in to the 7-Mode Transition Tool, and then click **Get Started** in the Collect and Assess section.
3. Click **Add Systems**.
4. In the Add System window, perform one of the following actions:
   - Add a single system:
     i. Enter the fully qualified domain name (FQDN) or IP address of the system.

ii. Enter the user name and password for the specified system.

iii. Select the system type:

   - Data ONTAP storage systems
   - Hosts: Microsoft Windows, Red Hat Linux Enterprise, and VMware ESXi
   - FC switches: Cisco and Brocade

- Add multiple systems by clicking **Browse**, and then selecting the text file that contains the credentials for multiple systems.

5. Click **Add**.

   If the assessment status of a system is Ready, then you can perform transition assessment for that system.

6. Generate the transition assessment report:

   a. Select the systems for transition assessment.
   b. Click **Create Transition Assessment Report**.
   c. In the Create Transition Assessment Report dialog box, select the Data ONTAP version of the target cluster.
   d. Specify a prefix for the file name of the reports.
   e. Click **Generate Report**.

   The assessment workbook (report name appended with “AssessmentWorkbook”) and assessment executive summary (report name appended with “AssessmentExecutiveSummary”) reports are generated in XML format.

   +
   You can access the assessment workbook, assessment summary, and inventory XML files that are used to generate the assessment report from the …`etc/webapp/transition-gui/tmc` folder.

7. View the assessment workbook in Microsoft Excel and assessment executive summary in Microsoft Word by using Microsoft Office 2007 or later versions.

   In the assessment workbook, see the Transition Feasibility (CBT), Config Precheck Summary, Config Precheck Details, and CBT Precheck Summary tabs for copy-based transition assessment details.

   In the assessment executive summary, see the Copy-Based Transition Feasibility section for controller-level assessment details.

   You might have to enable macros in Excel to view the assessment workbook.

   In the data collection summary of the assessment workbook, if the access status of a system is `FAILED`, then the inventory information for that system is invalid. In the assessment executive summary, the value of some of the fields of this system is displayed as `Not Assessed`.

Related information

Downloading transition log files

Generating an assessment report by importing the inventory report XML

You can import the inventory XML report generated by the Inventory Collect Tool to assess the features and functionalities of hosts and controllers. You can then identify how these host and controllers work in the ONTAP version selected for transition by creating an assessment report.

- You must have run the Inventory Collect Tool and generated the inventory report XML file.

> To assess hosts and controllers for copy-based transition, you must use Inventory Collect Tool 3.3 to collect inventory.

- You must have prepared the 7-Mode systems and hosts for transition assessment.

The systems that you want to assess need not be reachable while importing the inventory report and performing transition assessment.

Steps

1. Log in to the 7-Mode Transition Tool, and then click **Collect and Assess** in the home page.
2. Click **Import Inventory Report XML**.
3. Click **Browse**, and then select the XML report generated by the Inventory Collect Tool.
4. Click **Import**.

   The assessment status of the system shows `Imported;Ready`.

5. Select the system for which you want to perform transition assessment.
6. Click **Create Transition Assessment Report**.
7. In the Create Transition Assessment Report dialog box, select the Data ONTAP version of the target cluster.
8. Specify a prefix for the file name of the reports.
9. Click **Generate Report**.

   The AssessmentWorkbook and AssessmentExecutiveSummary reports are generated in XML format.

10. View the AssessmentWorkbook report in Microsoft Excel and the AssessmentExecutiveSummary report in Microsoft Word by using Microsoft Office 2007 or later versions.

    To view the AssessmentWorkbook report in Microsoft Excel, you might have to enable macros in Excel.

Related information

Downloading transition log files

Generating an FC zone plan

For FC switches, you must generate an FC zone plan as part of the transition assessment report to configure the zones for grouping the initiator hosts and targets after the migration.

- The 7-Mode system, hosts, and the cluster must be connected to the same switch.

  Supported configurations for generating an FC zone plan

- You must have created the required target SVMs and FC LIFs on the cluster.
- The FC LIFs that are created on the target SVMs will have WWPN, which are different from 7-Mode WWPNs. Therefore, perform FC zoning while you transition SAN for FCP.

Steps

1. In the Collect and Assess section, click **Add Systems**.
2. In the Add System window, perform one of the following actions:
   - Add a single system:
     i. Enter the FQDN or IP address of the system.
     ii. Enter the user name and password for the specified system.
     iii. Select the system type:
        - Data ONTAP storage systems
        - Hosts: Microsoft Windows, Red Hat Linux Enterprise, and VMware ESXi
        - FC switches: Cisco and Brocade
   - Add multiple systems by clicking **Browse**, and then selecting the text file that contains the credentials for multiple systems.
3. Click **Add**.

   If the assessment status of a system is Ready, then you can perform transition assessment for that system.

4. Generate the transition assessment report with the FC zone plan:
   a. Select the systems, including the required FC switches, for transition assessment.
   b. Click **Create Transition Assessment Report**.
   c. In the pair systems and start FC zone planner dialog box, select the 7-Mode systems (single controller or HA pair), the switch connected to the cluster, and an SVM in the cluster.
   d. Click **FC Zoning for paired systems**.
   e. In the Create Transition Assessment Report dialog box, select the Data ONTAP version of the target cluster.
   f. Specify a prefix for the file name of the reports.
   g. Click **Generate Report**.

The FC zone plan is generated as a `.zip` file. The plan contains zones created per the igroup configurations on the 7-Mode systems. Each zone contains a single initiator WWPN and multiple SVM target WWPNs.

You must use the FC zone plan for configuring the zones to group the initiator hosts and targets for providing data access from the cluster.

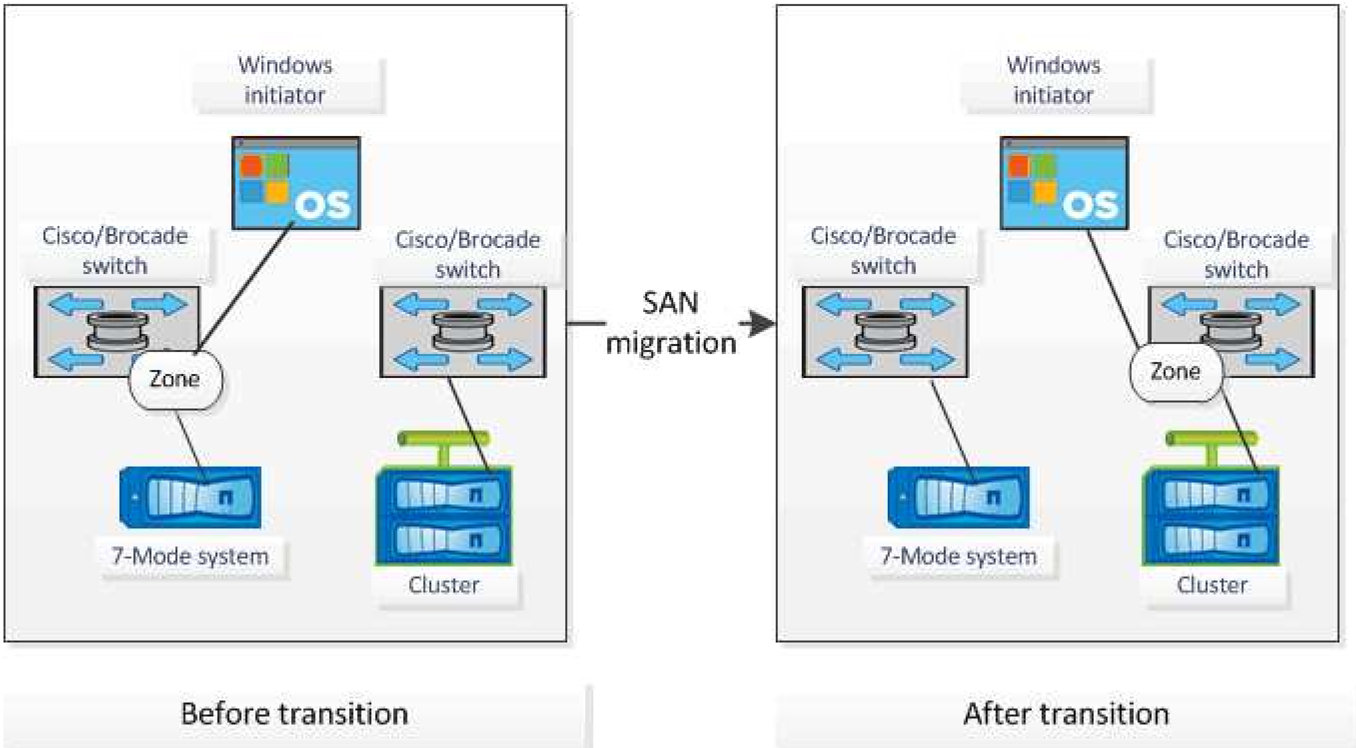
Supported configurations for generating an FC zone plan

You must be aware of the supported configurations of 7-Mode systems, hosts, FC switches, and the cluster to generate the FC zone plan. You should use the plan to configure zones for the cluster after migration.

The 7-Mode systems (single controller or an HA pair), hosts, and cluster can be connected either to the switches in the same fabric or different fabrics, depending on the data center requirements.

The following figure illustrates a configuration in which the 7-Mode systems, hosts, and cluster are connected to the switches in the same fabric:

The following figure illustrates a configuration in which the 7-Mode systems and cluster are connected to switches in different fabrics:



How you can use the assessment executive summary for transition assessment

The transition executive summary provides a summary of the 7-Mode controllers, hosts, and FC switches in your environment. It provides an assessment report of the current features and functionality that are used and recommends the transition methodology for each volume within your storage environment. You can use the summary to plan your transition.

The executive summary has the following main sections:

Target cluster

This section lists the ONTAP version of the target cluster that you selected during assessment.

Data collection summary

You can view the list of 7-Mode controllers, hosts, and switches for which you have collected information. You can view the ONTAP version and model details of the 7-Mode controller. You can also view the OS type, version, and model of the hosts.

Transition feasibility and recommended transition methodology

This section provides a summary of the prechecks that are run on each controller and the feasibility of transition at the controller and volume level. The volumes that belong to vFiler units that are in the `stopped` or `inconsistent` state or the volumes that are offline or restricted are not included for assessment. The report displays the count of errors and warnings reported in the precheck against each controller. You should review these errors and warnings and resolve any issues before transitioning. Details of these prechecks are available in the Config Precheck Summary tab of the assessment workbook.

Based on the volume and controller configurations and the precheck summary, the executive summary provides a recommendation about the best transition methodology for each assessed volume. For example, you cannot transition 7-Mode traditional volumes or FlexCache volumes because these features are not supported in ONTAP.

For most of the configurations, the 7-Mode Transition Tool is the recommended tool for transition. However, there are some workloads that cannot be transitioned by using the 7-Mode Transition Tool, and for those you should use an application-based or host-based migration method.

NetApp Technical Report 4052: Successfully Transitioning to Clustered Data ONTAP (Data ONTAP 8.2.x and 8.3)

Storage inventory

This section provides the following information:

- Storage objects: Provides information about the number of storage objects, such as volumes, qtrees, LUNs, vFiler units, SnapMirror relationships, shares, and exports, in each controller.
- Storage utilization: Provides information about the used space, available space, and space utilized by the 7-Mode controllers.
- Licenses: Provides the list of feature licenses enabled on each controller.
- Protocol configuration: Provides details about the protocols configured on the controllers, such as CIFS, NFS, and SAN protocols, and the versions.
- SnapMirror interconnectivity: Provides information about the controllers or volumes that are either the source or destination of a SnapMirror relationship.

  You can use this information to identify controllers that are in SnapMirror relationships with the controllers listed in the report, but are not included for assessment.
- SnapVault interconnectivity: Provides information about the controllers, volumes, or qtrees that are either the source or destination of a SnapVault relationship with the specified controller, volumes, or qtrees in the controller.

SVM consolidation considerations

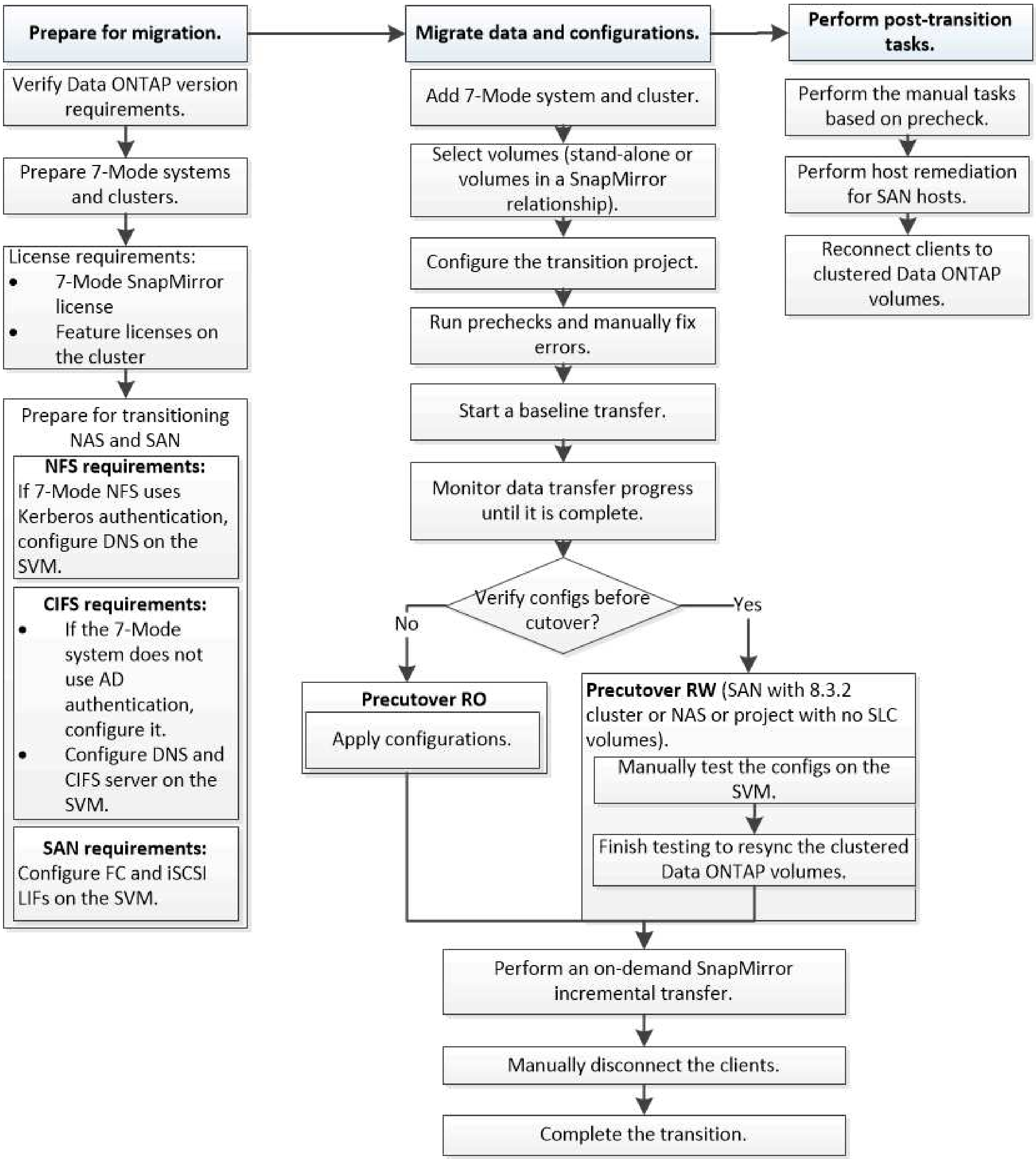
If you are considering consolidating volumes from different vFiler units or 7-Mode controllers to a single SVM, you can use the information provided in this section to identify whether 7-Mode systems are bound to different Active Directory domains, have different NIS configurations, have the same volume names or CIFS share names, and how many local users and groups there are in each controller. These considerations are important in identifying issues when consolidating different vFiler units or 7-Mode controllers and planning the transition to a single SVM.

Data collection errors

This section provides details about controller and host information that could not be collected by the 7-Mode Transition Tool and the reason for the failure. Details of the data collection errors are available in the Data Collection Errors tab of the assessment workbook. You can resolve these errors and assess the systems again.

Copy-based transition workflow

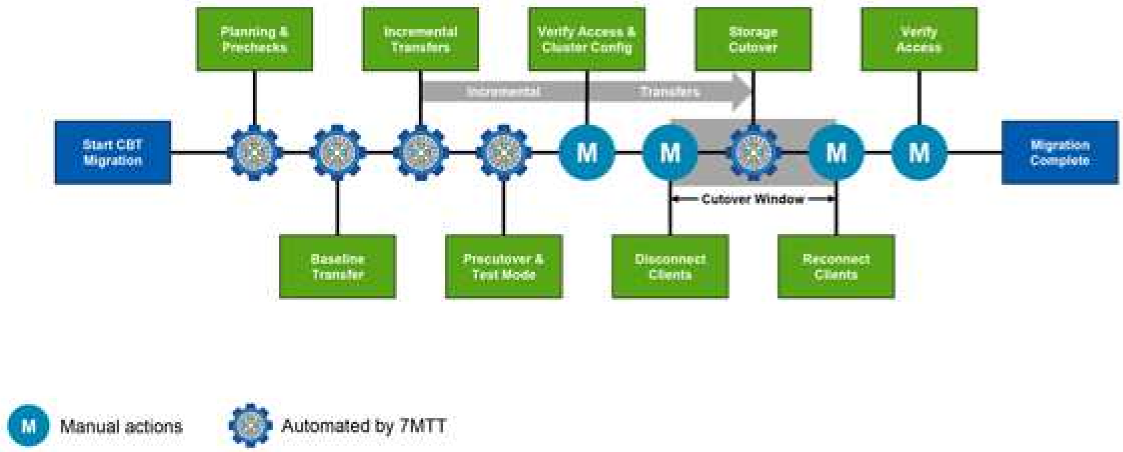
The copy-based transition workflow involves preparing for migration, migrating data and configurations, and performing post-transition configurations.



Data and configuration migration process

The data and configuration migration process using the 7-Mode Transition Tool consists of the following phases: preparation, baseline data copy, apply configuration (precutover), and storage cutover. If you have SnapLock volumes for Chain of Custody verification, Chain of Custody verification is additional phase after the cutover.

The following image shows the different phases in the migration process:



Preparation

In this phase, prechecks are run to verify feature functionality. The process checks the 7-Mode storage systems to verify that the volumes and configuration are ready to be migrated to ONTAP. It checks that the cluster is configured properly and can support the transition. Any errors must be resolved before continuing with the transition. Although the tool allows you to continue without resolving warnings, you must understand the impact of the warnings before proceeding with the transition. You can run the prechecks multiple times to verify that all of the errors have been resolved.

Although the precheck step and assessment steps performed during the assessment appear to be similar, there are differences. The precheck step is a more detailed test that is focused on the specific storage systems that have been identified as the migration source (7-Mode) and destination (ONTAP) systems. The assessment step only evaluates the migration source systems, checking feature and functionality differences with ONTAP.

Baseline data copy

New volumes are created on the SVM, a SnapMirror relationship is established between the 7-Mode and ONTAP volumes, and a baseline transfer is performed. After the baseline is complete, incremental transfers are automatically run according to a user-defined data copy schedule. Clients and servers accessing the source storage remain online while this step is completed.

Copying data requires CPU, memory, and storage access, which results in additional resources being used on the source storage system. It is a best practice to schedule data copy activity to occur during off-peak times (preferably, CPU usage should be around 50%).

Apply configuration (precutover)

This phase includes SnapMirror incremental transfers; configuration information is applied to the ONTAP system, SVM, and volumes. Optionally, you can also test the ONTAP volumes that are being transitioned before storage cutover.

Although a majority of the configuration is applied, some actions are deferred to storage cutover: for example, applying quotas.

The 7-Mode IP addresses selected for the transition are created in the administrative down state. The new IP addresses selected for the transition are created in the administrative up state. These new IP addresses can be used to verify data access during precutover testing.

It is a best practice to run the apply configuration (precutover) phase a few days or weeks before the planned cutover window. This activity helps to verify that all of the configurations are applied properly and whether any changes are required.

> Although incremental updates are not required, it is a best practice to perform an incremental transfer as close to the storage cutover as possible to minimize the time that clients are disconnected.

Storage cutover

At a high level during storage cutover, clients are disconnected, a final data transfer is performed, the SnapMirror relationship is broken, and clients are manually reconnected.

Disconnecting clients or servers from the source storage volume prevents additional writes from being performed while the final copy is being executed. Before disconnecting clients, it is a best practice to perform an incremental update to minimize the downtime.

Storage access must be disconnected only for the volumes that are being migrated. Access to storage can be discontinued from the storage side or the client side. The best practice is to discontinue connectivity from the storage side. For example, if a CIFS client is accessing a volume named “user01” on a 7-Mode storage system, you can use the `cifs terminate -v user01` command to disable access to all of the CIFS shares on the volume (discontinuing client access from the storage side). The IP addresses, mount points, or even share names might change as a result of the migration, and therefore client access might be discontinued from the client side as well. As long as clients cannot write any new data to the storage container that is being migrated, you can use either or both of these methods for discontinuing access.

After clients are disconnected, the 7-Mode Transition Tool executes a final copy so that both the source and destination datasets are at parity. The 7-Mode Transition Tool configures the data LIFs on the SVM. Some configuration changes that were not transitioned during precutover, such as applying SAN configurations and quotas, are also applied to the SVM at this time.

After storage cutover is complete, you can manually reconnect the clients and validate data access. Validating data access involves verifying that clients are accessing the ONTAP system properly and that all permissions are working as expected.

Chain of Custody verification for SnapLock volumes

You can trigger the Chain of Custody operation for the SnapLock volumes in the project after the transition is complete. This operation is not mandatory and is required only if Chain of Custody verification is essential for the transition of SnapLock volumes. You can perform this operation for all SnapLock volumes in the project or for a subset of SnapLock volumes in the project. The Chain of Custody verification is supported for both compliance and enterprise SnapLock volumes. The Chain of Custody verification is supported only for read-write SnapLock volumes, and is not supported for read-only SnapLock volumes.

> The Chain of Custody verification is not supported for SnapLock volume that have file names with non-ASCII characters.

The verification workflow is supported only in the 7-Mode Transition Tool GUI and is not supported in the CLI workflow.

The Chain of Custody verification operation performs the following:

- Enumerates all of the WORM files from 7-Mode volumes
- Calculates the fingerprint for each WORM file enumerated previously on both 7-Mode volumes and transitioned ONTAP volumes
- Generates a report with details about the number of files with matched and unmatched fingerprints, and the reason for the mismatch

Fingerprint data for all WORM files is stored in an ONTAP volume provided during the planning phase.

> Based on the number of files on the 7-Mode volumes, the Chain of Custody verification process can take a significant amount of time (days or weeks).

How you transition a stand-alone volume

Transitioning a stand-alone volume includes different phases: preparation, data copy, apply configuration (precutover), and storage cutover. After completing transition, you must perform some post-transition steps before resuming client access. Understanding what occurs during each phase helps you manage your transition efficiently.

Phase	Steps
Preparation	1. Gathering information 2. Performing the precheck 3. Creating data copy schedules
Data copy	1. Creating the ONTAP volumes as read-only 2. Creating a transition peer relationship 3. Establishing a SnapMirror relationship 4. Performing a baseline transfer 5. Performing scheduled incremental updates

Phase	Steps
Precutover	1. Breaking the SnapMirror relationship 2. Applying configurations to the SVM 3. Configuring data LIFs on the SVM 4. Testing data and configurations (manual and only for precutover RW) 5. Resynchronizing ONTAP volumes with corresponding 7-Mode volumes
Storage cutover	1. Disconnecting client access (manual) 2. Performing a final SnapMirror update 3. Breaking the SnapMirror relationship 4. Removing 7-Mode IP addresses and setting the data LIFs to the up state on the SVM 5. Taking the source volume offline After cutover, performing post-transition steps and enabling client access (manual)
Chain of Custody verification for SnapLock volumes	1. Enumerating all of the WORM files from 7-Mode volumes 2. Calculating the fingerprint for each WORM file on the 7-Mode volumes (enumerated in the previous step) and calculating the fingerprint for the corresponding WORM file on the transitioned ONTAP volumes 3. Generating a report with details about the number of files with matched and unmatched fingerprints, and the reason for the mismatch

Preparation phase

In this phase, information about the 7-Mode system and the cluster, volumes, and IP addresses is collected. The 7-Mode Transition Tool performs the following tasks in this phase:

1. Collects and adds 7-Mode storage system and volume information.
2. Runs the transition precheck.
3. Collects and adds cluster, SVM, and aggregate information.
4. Collects IP addresses that must be configured on the SVM:
   - Selects the IP addresses that exist on the 7-Mode system.
   - Specifies new IP addresses that must be configured on the SVM.
     NOTE: Transitioning of iSCSI and FC LIFs (SAN) is not supported by the tool. You must manually configure SAN LIFs on the SVM before transition.
5. Creates data copy schedules for baseline copy and incremental updates.

6. If the project contains SnapLock volumes, collects information about the read-write SnapLock volumes for which Chain of Custody verification is required and the details of the ONTAP volume that stores the fingerprint data that is generated during the Chain of Custody verification operation.

   > The Chain of Custody verification operation is supported only for volumes with file names that have only ASCII characters.

7. Plans configuration transition by selecting the 7-Mode configurations that must be transitioned to the target SVM and target volumes.

You should not modify the objects (volumes, IP addresses, system information, and so on) on the controller after fixing the errors and warnings that are reported during the precheck.

Data copy phase

In this phase, data from the 7-Mode volumes is copied to the ONTAP volumes. The 7-Mode Transition Tool performs the following tasks in this phase:

1. Creates the ONTAP volumes with read-only access.
2. Set up a transition peer relationship between the 7-Mode system and the SVM.
3. Establishes a transition SnapMirror relationship (relationship of type TDP) between the 7-Mode volumes and ONTAP volumes.
4. Completes the baseline data copy transfer based on schedule inputs.
5. Performs scheduled incremental updates to the ONTAP volumes.

Apply configuration (precutover) phase

It is a best practice to run precutover operation a few days or weeks before the planned cutover window. This activity is to verify whether all the configurations are applied properly and whether any changes are required.

In this phase, configurations from the 7-Mode volumes are copied to ONTAP volumes.

There are two modes for the apply configuration (precutover) phase: **precutover read-only** and **precutover read/write**.

The precutover read/write mode is not supported when the project contains:

- SAN volumes and the target cluster is running Data ONTAP 8.3.1 or earlier

  In this situation, the following configurations are not applied in the apply configuration (precutover) phase. Instead, they are applied during the cutover phase.

  - SAN configurations
  - Snapshot Schedule configurations
- SnapLock Compliance volumes

  If the project contains SnapLock Compliance volumes, then the Snapshot Schedule configurations are not applied in the apply configuration (precutover) phase. Instead, these configurations are applied during the cutover phase.

  Considerations for transitioning of SnapLock Compliance volumes

If the target cluster is running Data ONTAP 8.3.1 or earlier, and you want to run the apply configuration (precutover) operation in read/write mode for NAS volumes, then you must create separate projects for the NAS volumes and SAN volumes. This action is required because the precutover read/write mode is not supported if you have SAN volumes in your project.

If the project contains SnapLock Compliance volumes, and you want to run the apply configuration (precutover) operation in read/write mode for non-SnapLock Compliance volumes, then you must create separate projects for SnapLock Compliance volumes and non-SnapLock Compliance volumes. This action is required because the precutover read/write mode is not supported if you have SnapLock Compliance volumes in your project.

The tool performs the following steps in the **precutover read-only mode**:

1. Performs an incremental update from 7-Mode volumes to ONTAP volumes.
2. Breaks the SnapMirror relationship between 7-Mode volumes and ONTAP volumes.

   > For SnapLock Compliance volumes, the SnapMirror relationship between the 7-Mode volume and ONTAP volumes is not broken. The SnapMirror relationship is not broken because the SnapMirror resynchronization operation between 7-Mode and ONTAP volumes is not supported for SnapLock Compliance volumes.

3. Collects configurations from 7-Mode volumes, and applies the configurations to the ONTAP volumes and the SVM.
4. Configures the data LIFs on the SVM:
   - Existing 7-Mode IP addresses are created on the SVM in the administrative down state.
   - New IP addresses are created on the SVM in the administrative up state.
5. Resynchronizes the SnapMirror relationship between 7-Mode volumes and ONTAP volumes

The tool performs the following steps in the **precutover read/write mode**:

1. Performs an incremental update from 7-Mode volumes to ONTAP volumes.
2. Breaks the SnapMirror relationship between 7-Mode volumes and ONTAP volumes.
3. Collects configurations from 7-Mode volumes, and applying the configurations to the ONTAP volumes and the SVM.
4. Configures the data LIFs on the SVM:
   - Existing 7-Mode IP addresses are created on the SVM in the administrative down state.
   - New IP addresses are created on the SVM in the administrative up state.
5. Makes the ONTAP volumes available for read/write access.

   After you apply the configuration, the ONTAP volumes are available for read/write access so that read/write data access can be tested on these volumes during apply configuration (precutover) testing. You can manually verify the configurations and data access in ONTAP.

6. Resynchronizes the ONTAP volumes when "finish testing" operation is triggered manually.

Storage cutover phase

The 7-Mode Transition Tool performs the following tasks in this phase:

1. Optional: Performs an on-demand SnapMirror update to reduce the downtime after cutover.
2. Manual: Disconnect client access from the 7-Mode system.
3. Performs a final SnapMirror update from 7-Mode volumes to ONTAP volumes.
4. Breaks and deletes the SnapMirror relationship between the 7-Mode volumes to ONTAP volumes, making the ONTAP volumes read/write.

   If the selected volume is a SnapLock Compliance volume and the volume is the destination of a SnapMirror relationship, then the SnapMirror relationship between the 7-Mode volume and the ONTAP volume is deleted without a SnapMirror break operation. This action is performed to ensure that secondary ONTAP SnapLock Compliance volumes remain in read-only mode. The secondary ONTAP SnapLock Compliance volumes must be in read-only mode for the resynchronization operation to be successful between the primary and secondary SnapLock Compliance volumes.

5. Applies Snapshot schedules configuration if:
   - The target cluster is running clustered Data ONTAP 8.3.0 or 8.3.1 and project contains SAN volumes.
   - The project contains SnapLock compliance volumes.
6. Applies SAN configurations, if the target cluster is running Data ONTAP 8.3.1 or earlier.
7. Applies quota configurations, if any.
8. Removes the existing 7-Mode IP addresses selected for transition from the 7-Mode system and brings the data LIFs on the SVM to the administrative up state.

   > SAN LIFs are not transitioned by the 7-Mode Transition Tool.

9. Optional: Takes the 7-Mode volumes offline.

Chain of Custody verification process for SnapLock volumes

You must perform the Chain of Custody verification operation. The tool performs the following operations when a Chain of Custody verification is initiated:

1. Enumerates all of the WORM files from 7-Mode volumes.
2. Calculates the fingerprint for each WORM file on the 7-Mode volumes (enumerated in the previous step) and calculates the fingerprint for the corresponding WORM file on the transitioned ONTAP volumes.
3. Generates a report with details about the number of files with matched and unmatched fingerprints, and the reason for the mismatch.

> - The Chain of Custody verification operation is supported only for read-write SnapLock volumes that have file names with only ASCII characters.
> - This operation can take a significant amount of time based on the number of files on the 7-Mode SnapLock volumes.

Post-transition steps

After the storage cutover phase finishes successfully and the transition is completed, you must perform some post-transition manual tasks:

1. Perform the required steps to configure features that were not transitioned or were partially transitioned, as listed in the precheck report.

For example, IPv6 and FPolicy must be configured manually after transition.

2. For SAN transition, reconfigure the hosts.

   SAN host transition and remediation

3. Ensure that the SVM is ready to serve data to the clients by verifying the following:
   - The volumes on the SVM are online and read/write.
   - The IP addresses are up and reachable on the SVM.
4. Redirect client access to the ONTAP volumes.

Related information

Migrating data and configuration from 7-Mode volumes

How you transition volumes in a SnapMirror relationship

If you want to transition 7-Mode volumes that are in a SnapMirror relationship, the secondary volumes must be transitioned first. Then, a volume SnapMirror relationship is established between the 7-Mode primary volumes and ONTAP secondary volumes.

After transitioning the primary volumes, the 7-Mode Transition Tool establishes a volume SnapMirror relationship between ONTAP primary and secondary volumes.

> The 7-Mode Transition Tool does not automatically transition SnapLock Compliance volumes that are in a SnapMirror relationship. All SnapLock Compliance volumes that are in a SnapMirror relationship must be transitioned as stand-alone volumes. After the primary and secondary SnapLock Compliance volumes are transitioned to ONTAP, you must manually perform the SnapMirror resynchronization operation between these volumes.

You can perform precheck, baseline copy, incremental transfers, and apply configuration (precutover) on the secondary and primary projects simultaneously; however, the storage cutover for the secondary project must be performed first.

Preparation phase

In this phase, the 7-Mode system, cluster, volumes, and IP addresses are selected. The 7-Mode Transition Tool performs the following tasks in this phase:

1. Adds 7-Mode storage system and volume information
2. Gathers information about 7-Mode source volumes and SnapMirror relationships:
   - For transitioning a secondary volume, collecting information about the 7-Mode primary system
   - For transitioning a primary volume, collecting information about the 7-Mode secondary system
3. Runs the transition precheck
4. Adds cluster, SVM, and aggregate information
5. Collects IP addresses that must be configured on the SVM:
   - Selecting IP addresses that exist on the 7-Mode system
   - Specifying new IP addresses that must be configured on the SVM

> Transitioning iSCSI and FC LIFs (SAN) is not supported by the tool. You must manually configure the SAN LIFs on the SVM before transition.

6. Creates the data copy schedules for baseline and incremental transfers.
7. If the project contains SnapLock volumes, collects information about the read-write SnapLock volumes for which Chain of Custody verification is required and details about the ONTAP volume that stores the fingerprint data generated during the Chain of Custody verification operation.

   > The SnapLock Chain of Custody verification is supported only for read/write 7-Mode SnapLock volumes. It is not supported for read-only volumes. The SnapLock Chain of Custody verification is not supported for SnapLock volumes containing files that have names with non-ASCII characters.

8. Plans the configuration transition by selecting the 7-Mode configurations that must be transitioned to target SVM and target volumes.

You must not modify the objects (volumes, IP addresses, system information, and so on) on the controller after fixing errors and warnings that are reported by the precheck.

Data copy phase

In this phase, data from the 7-Mode volumes is copied to the ONTAP volumes. The 7-Mode Transition Tool performs the following tasks in this phase:

1. Creates the ONTAP volumes with read-only access
2. Set up a transition peer relationship between the 7-Mode system and the SVM
3. Establishes a SnapMirror relationship between the 7-Mode volumes and ONTAP volumes
4. Completes the baseline data transfer based on schedule inputs
5. Performs scheduled SnapMirror data copy updates to the ONTAP volumes

Apply configuration (precutover) phase

It is a best practice to run **Apply configuration** a few days or weeks before the planned cutover window. This precheck enables you to have enough time to verify that all of the configurations are applied properly and whether any changes are required.

In this phase, configurations from the 7-Mode volumes are copied to the ONTAP volumes.

There are two modes for the apply configuration (precutover) phase: precutover read-only and precutover read/write.

The precutover read/write mode is not supported when the project contains the following:

- SAN volumes and the target cluster is running Data ONTAP 8.3.1 or earlier

  In this situation, the following configurations are not applied in the apply configuration (precutover) phase, instead they are applied during the cutover phase:

  - SAN configurations
  - Snapshot schedule configurations

- SnapLock Compliance volumes

  If the project contains SnapLock Compliance volumes, then the Snapshot schedule configurations are not applied in the apply configuration (precutover) phase. Instead, these configurations are applied during the cutover phase.

  Considerations for transitioning of SnapLock Compliance volumes.

If the target cluster is running Data ONTAP 8.3.1 or earlier and you want to run the apply configuration (precutover) operation in read/write mode for NAS volumes, then you must create separate projects for the NAS and SAN volumes. This action is required because the apply configuration (precutover) read/write mode is not supported if you have SAN volumes in your project.

If the project contains SnapLock Compliance volumes and you want to run the apply configuration (precutover) operation in read/write mode for non-SnapLock Compliance volumes, then you must create separate projects for SnapLock Compliance volumes and non-SnapLock Compliance volumes. This action is required because the apply configuration (precutover) read/write mode is not supported if you have SnapLock Compliance volumes in your project.

The following steps are performed by the tool in the **precutover read-only mode**:

1. Performs an incremental update from 7-Mode volumes to ONTAP volumes
2. Breaks the SnapMirror relationship between 7-Mode volumes and ONTAP volumes

   > For SnapLock Compliance volumes, the SnapMirror relationship between the 7-Mode volume and ONTAP volumes is not broken. This is because the SnapMirror resynchronization operation between 7-Mode and ONTAP volumes is not supported for SnapLock Compliance volumes.

3. Collects configurations from 7-Mode volumes and applying the configurations to the ONTAP volumes and SVM
4. Configures the data LIFs on the SVM:
   - Existing 7-Mode IP addresses are created on the SVM in the administrative down state.
   - New IP addresses are created on the SVM in the administrative up state.
5. Resynchronizes the SnapMirror relationship between 7-Mode volumes and ONTAP volumes

The following steps are performed in the **precutover read/write mode**:

1. Performs an incremental update from 7-Mode volumes to ONTAP volumes
2. Breaks the SnapMirror relationship between 7-Mode volumes and ONTAP volumes
3. Collects configurations from 7-Mode volumes and applying the configurations to the ONTAP volumes and SVM
4. Configures the data LIFs on the SVM:
   - Existing 7-Mode IP addresses are created on the SVM in the administrative down state.
   - New IP addresses are created on the SVM in the administrative up state.
5. Tests the read/write data access on the ONTAP volumes during apply configuration (precutover) testing

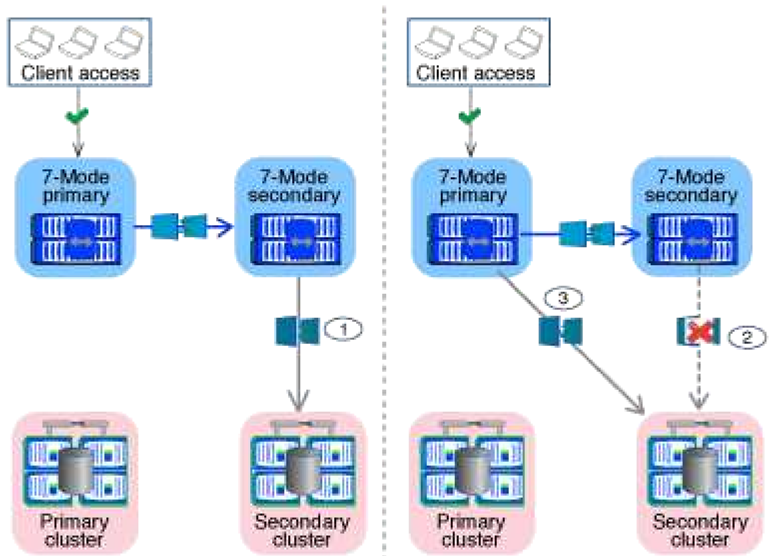
   These ONTAP volumes will be available for read/write access after you apply the configuration. After you apply the configuration, the ONTAP volumes are available for read/write access so that read/write data access can be tested on these volumes during apply configuration (precutover) testing.

6. Manual: Verifying the configurations and data access in ONTAP
7. Manual: Finish testing

   The ONTAP volumes are resynchronized.

Storage cutover (secondary volumes) phase

The following illustration depicts the transition of a secondary volume:



Phase	Steps
Storage cutover (secondary volumes)	1. Transitioning the secondary volumes 2. Breaking and deleting SnapMirror relationship between the secondary volumes 3. Establishing a DR relationship between the 7-Mode primary and ONTAP secondary volumes

The 7-Mode Transition Tool performs the following tasks in this phase:

1. Optional: Performs an on-demand SnapMirror update on the ONTAP secondary volumes
2. Manual: Disconnecting client access, if required
3. Performs a final SnapMirror update from the 7-Mode secondary volume to the ONTAP secondary volume
4. Breaks and deletes the SnapMirror relationship between the 7-Mode secondary volume and the ONTAP secondary volume, and making the destination volumes read/write
5. Applies the Snapshot schedules configuration, if the target cluster is running Data ONTAP 8.3.0 or 8.3.1 and the project contains SAN volumes
6. Applies SAN configurations, if the target cluster is running Data ONTAP 8.3.1 or earlier

All of the required igroups are created during this operation. For the secondary volumes, mapping LUNs to igroups is not supported during the cutover operation. You must manually map the secondary LUNs after completing the storage cutover operation of the primary volumes. However, for stand-alone volumes included in the secondary project, LUNs are mapped to the igroups during this operation.

7. Applies quota configurations, if any
8. Establishes a SnapMirror relationship between the volumes on the 7-Mode primary system and the ONTAP secondary volumes

   The SnapMirror schedule that is used to update the SnapMirror relationships between the 7-Mode primary volumes and 7-Mode secondary volumes is applied to the SnapMirror relationships between the 7-Mode primary volumes and ONTAP secondary volumes.

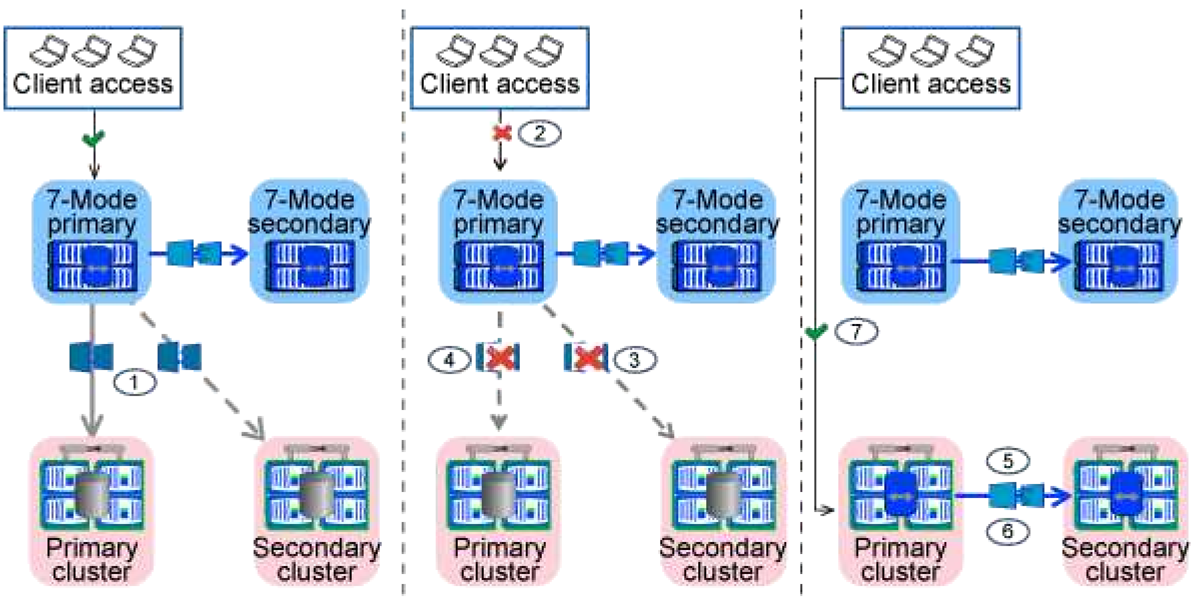
9. Removes the existing 7-Mode IP addresses selected for transition from the 7-Mode system and bringing the data LIFs on the SVM to the administrative up state

   SAN LIFs are not transitioned by the 7-Mode Transition Tool.

10. Optional: Taking the 7-Mode volumes offline

Storage cutover (primary volumes) phase

The following illustration depicts the transition of a primary volume:



Phase	Steps
Storage cutover (primary volumes)	1. Transitioning the primary volumes 2. Disconnecting clients from the 7-Mode system (storage cutover) 3. Breaking and deleting the DR relationship between the 7-Mode primary and ONTAP secondary volumes 4. Breaking and deleting SnapMirror relationship between the primary volumes 5. Setting up an SVM peer relationship between the ONTAP primary and secondary volumes 6. Resynchronizing the SnapMirror relationship between ONTAP volumes 7. Enabling client access to ONTAP volumes

The 7-Mode Transition Tool performs the following tasks in this phase:

1. Optional: Performs an on-demand SnapMirror update on the ONTAP secondary volumes
2. Manual: Disconnecting client access from the 7-Mode system
3. Performs a final incremental update from the 7-Mode primary volume and the ONTAP primary volume
4. Breaks and deletes the SnapMirror relationship between the 7-Mode primary volume and the ONTAP primary volume, and making the destination volumes read/write
5. Applies the Snapshot schedules configuration if the target cluster is running Data ONTAP 8.3.0 or 8.3.1 and the project contains SAN volumes
6. Applies SAN configurations, if the target cluster is running Data ONTAP 8.3.1 or earlier
7. Applies quota configurations, if any
8. Breaks and deletes the SnapMirror relationship between the 7-Mode primary volume and the ONTAP secondary volume
9. Setting up cluster peer and SVM peer relationships between the primary and secondary clusters
10. Setting up a SnapMirror relationship between the primary and secondary ONTAP volumes
11. Resynchronizes the SnapMirror relationship between the ONTAP volumes
12. Removes the existing 7-Mode IP addresses selected for transition from the 7-Mode system and bringing the data LIFs on the primary SVM to the administrative up state

    SAN LIFs are not transitioned by the 7-Mode Transition Tool.

13. Optional: Taking the 7-Mode volumes offline

Chain of Custody verification process for SnapLock volumes

Perform the Chain of Custody verification operation.

1. Enumerates all of the WORM files from 7-Mode volumes

2. Calculates the fingerprint for each WORM file on the 7-Mode volumes (enumerated in the previous step) and calculates the fingerprint for the corresponding WORM file on the transitioned ONTAP volumes.
3. Generates a report with details about the number of files with matched and unmatched fingerprints, and the reason for the mismatch

> - The Chain of Custody verification operation is supported only for read-write SnapLock volumes that have file names with only ASCII characters.
> - This operation can take significant amount of time based on the number of files on the 7-Mode SnapLock volumes.

Post-transition steps

After the cutover phase is successfully and the transition is completed, you must perform the following post-transition tasks:

1. Perform any manual steps to transition features that were available on the 7-Mode system, but were not transitioned automatically to the SVM by the tool.
2. If the target cluster is running Data ONTAP 8.3.1 or earlier, you must map the secondary LUNs manually.
3. For SAN transitions, manually reconfigure the hosts.

   SAN host transition and remediation

4. Ensure that the SVM is ready to serve data to the clients by verifying the following:
   - The volumes on the SVM are online and read/write.
   - The transitioned IP addresses are up and reachable on the SVM.
5. Redirect client access to the ONTAP volumes.

Related information

Migrating data and configuration from 7-Mode volumes

Preparing for copy-based transition

Before initiating a data copy operation from 7-Mode to ONTAP, you must understand the requirements and restrictions for migration, and complete certain tasks on the 7-Mode system and the cluster.

You must ensure that the following requirements are met before transition:

- The 7-Mode and ONTAP systems must be reachable from the host on which the tool is installed.
- The 7-Mode systems must be running the supported Data ONTAP versions.
- SnapMirror must be licensed on the 7-Mode system.
- Required feature licenses, if they exist on the 7-Mode system, must be installed on the cluster.
- The NTP server must be configured and the time must be synchronized across the 7-Mode system and cluster.
- All preparatory tasks on the 7-Mode system must be completed.
- All preparatory tasks on the cluster must be completed.

Related information

Transition preparation checklist

7MTT v2.0/Transitioned Data ONTAP features

NetApp Interoperability Matrix Tool

Requirements for copy-based transition

You must be aware of the ONTAP release requirements, licensing requirements, and 7-Mode Transition Tool requirements for copy-based transition.

- **Data ONTAP 7-Mode source systems**

  For a list of the 7-Mode releases supported for migration by the 7-Mode Transition Tool, see the NetApp Interoperability Matrix Tool.

- **ONTAP target systems**

  Copy-based transitions are supported to these ONTAP target releases.

If your transition target is running …	You must use this 7-Mode Transition Tool version …
ONTAP 9.10.1, ONTAP 9.11.1 or earlier supported release	3.5.0
ONTAP 9.9.1 or earlier supported release	3.4.0
ONTAP 9.8 or earlier supported release	3.3.3
ONTAP 9.7P2 or later 9.7 P release Earlier 9.7 releases are not supported.	3.3.2
ONTAP 9.6P7 or later 9.6 P release Earlier 9.6 releases are not supported.	3.3.2
ONTAP 9.5 or earlier ONTAP 9 release	3.3.2 or 3.3.1
Clustered Data ONTAP 8.1.4P4 or later 8.x release	3.3.2 or 3.3.1

- **Licensing requirements**

  SnapMirror must be licensed on the 7-Mode storage system. If the 7-Mode system does not have a SnapMirror license, you can obtain a temporary SnapMirror license for transition from your sales representative.

SnapLock must be licensed on the destination cluster if Chain of Custody verification must be performed.

- **7-Mode Transition Tool service**

  For the data copy schedules to take effect, the 7-Mode Transition Tool service must be always up and running on the Windows or Linux system on which the tool is installed. However, it does not require the web interface to be active or open for the schedules to take effect. You can close the web interface and re-log in whenever required.

- **Storage, host, and FC switch version requirements for transition assessment**

  For the list of 7-Mode versions, hosts, and FC switches that are supported for assessment by the 7-Mode Transition Tool, see the NetApp Interoperability Matrix Tool.

Port requirements for communicating with the 7-Mode Transition Tool

The 7-Mode Transition Tool communicates with the 7-Mode system and the cluster over certain ports. You must ensure that these ports on the 7-Mode system and the cluster are open to allow communication with the 7-Mode Transition Tool.

Ports that must be open on the 7-Mode systems

The 7-Mode Transition Tool communicates with the 7-Mode systems by using HTTPS on port 443.

The following ports are required by the cluster to communicate with the 7-Mode systems for SnapMirror replication:

- 10565/TCP
- 10566/TCP
- 10567/TCP
- 10568/TCP
- 10569/TCP
- 10670/TCP

Ports that must be open on the cluster

The 7-Mode Transition Tool communicates with the cluster by using HTTPS on port 443.

The following ports are required by the 7-Mode systems to communicate with the cluster for SnapMirror replication:

- 10565/TCP
- 10566/TCP
- 10567/TCP
- 10568/TCP
- 10569/TCP
- 10670/TCP

- 11105/TCP

Additionally, the 7-Mode Transition Tool performs a ping operation from the intercluster LIFs to the data copy IP address of the 7-Mode system to verify reachability.

Ports that must be open on the 7-Mode Transition Tool

Port 8444 of the 7-Mode Transition Tool must be open for the web interface.

To transition netgroups and CIFS local users and groups, the following requirements must be met:

- Port 8088 of the 7-Mode Transition Tool must be available.

  For an alternative to port 8088, you must change the port specified by the `tool.http.port` parameter in the `transition-tool.conf` file of the 7-Mode Transition Tool installation directory.

  > You must restart the 7-Mode Transition Tool service after changing the port in the configuration file.

- Each node in the cluster must have at least one data LIF configured for the target SVM.
- All SVM data LIFs must be able to communicate with the 7-Mode Transition Tool port 8088 or the port specified by the `tool.http.port` parameter in the `transition-tool.conf` file.

  > You must verify that firewalls do not block this traffic.

Restrictions for transition

You must be aware of certain restrictions for transitioning some 7-Mode volumes and configurations.

- No volume within the same project can cut over until all volumes in the same project have completed their baseline transfers.
- If you want to transition 7-Mode primary and secondary volumes when both the 7-Mode source and destination are running Data ONTAP 7.3.x or 8.0.x, you must start transitioning the 7-Mode secondary volume only when there are no data updates from the 7-Mode primary to the 7-Mode secondary volume.

  You must verify that the data update schedules for the 7-Mode primary volume to the 7-Mode secondary volume do not conflict with the schedules for the 7-Mode secondary volume to the ONTAP secondary volume.

- You must not initiate a transition while the aggregates on either the 7-Mode system or cluster are upgrading from 32-bit to 64-bit format; otherwise the transition fails.
- The 7-Mode Transition tool does not transition a volume with a qtree that is the destination of a qtree SnapMirror relationship.

  The qtree SnapMirror relationship must be broken before the volume can be transitioned.

- You cannot transition a fanout SnapMirror relationship (a primary volume that is in SnapMirror relationships with more than one secondary volume in different controllers) by using the 7-Mode Transition Tool web interface.

To transition the SnapMirror relationships in a fanout configuration, you must use the 7-Mode Transition Tool CLI. You should create separate projects for each secondary volume, complete the transition of the secondary projects, and then create and complete the transition of the primary volume.

- You cannot transition volumes from different vFiler units or from different 7-Mode controllers to the same SVM at the same time.

  You must complete the transition of volumes from a given vFiler unit or 7-Mode controller before you can start the transition of volumes from another vFiler unit or 7-Mode controller.

- The 7-Mode Transition tool does not transition a vFiler unit as a single entity.

  However, you can transition all of the volumes in a vFiler unit by selecting them as a part of one or more projects.

- The 7-Mode Transition tool does not transition the root volume of a vFiler unit if the root volume is based on a qtree that belongs to the default vFiler unit.
- The 7-Mode Transition tool does not transition a volume with a qtree if the volume and qtree are owned by different vFiler units.

  Transitioning such a volume causes the qtree to become inaccessible.

The precheck operation displays information about some of these restrictions.

Preparing the 7-Mode system for transition

Before starting a transition, you must complete certain tasks on the 7-Mode system, such as adding the SnapMirror license, enabling the 7-Mode system to communicate with the target cluster, and enabling TLS.

All the 7-Mode volumes that you want to transition must be online.

Steps

1. Add and enable the SnapMirror license on the 7-Mode system:
   a. Add the SnapMirror license on the 7-Mode system:

      `license add` ***`license_code`***

      `license_code` is the license code you purchased.

   b. Enable the SnapMirror functionality:
      +
      `options snapmirror.enable on`
2. Configure the 7-Mode system and the target cluster to communicate with each other by choosing one of the following options:
   - Set the `snapmirror.access` option to all.
   - Set the value of the `snapmirror.access` option to the IP addresses of all the intercluster LIFs on the cluster.
   - If the `snapmirror.access` option is `legacy` and the `snapmirror.checkip.enable` option is `off`, add the SVM name to the `/etc/snapmirror.allow` file.

◦ If the `snapmirror.access` option is `legacy` and the `snapmirror.checkip.enable` option is `on`, add the IP addresses of the intercluster LIFs to the `/etc/snapmirror.allow` file.

3. If HTTPS is not enabled on the storage system, enable HTTPS:

   `options httpd.admin.ssl.enable on`

   HTTPS is enabled by default.

4. Enable TLS on the 7-Mode storage systems for enabling the 7-Mode Transition Tool to communicate with the 7-Mode systems:

   a. If SSL is not already enabled on the storage system, set up and start SSL:

      `secureadmin setup ssl`

      SSL is set up for the storage systems by default. If SSL has been previously set up for the storage system, you are asked whether you want to continue. You can exit the SSL setup if you do not want to make any changes.

   b. Enable SSL:

      `options ssl.enable on`

      This option must be enabled for allowing communication over TLS.

   c. Enable TLS:

      `options tls.enable on`

   d. Disable SSLv2 and SSLv3 on the 7-Mode system:

      `options ssl.v2.enable off`

      `options ssl.v3.enable off`

   The 7-Mode Transition Tool uses TLS or SSL protocols for communicating with the 7-Mode storage systems. The tool communicates with the storage system using the TLS protocol if TLS is enabled on the storage system. If TLS is disabled and SSLv3 is enabled on a storage system, the tool uses SSLv3 to communicate with the storage system.

   +
   IMPORTANT: The best practice is to enable TLS and disable SSLv2 and SSLv3 in order to avoid security vulnerabilities.

5. Depending on the Data ONTAP version of your 7-Mode system, perform the following steps:

   a. Allow SnapMirror traffic on all the interfaces:

      `options interface.blocked.snapmirror ""`

   b. If you are running Data ONTAP version 7.3.7, 8.0.3, or 8.1 and you are using the IP address of the e0M interface as the management IP address to interact with 7-Mode Transition Tool, allow data traffic on the e0M interface:

```
options interface.blocked.mgmt_data_traffic off
```

6. If you have set the I2P, read allocations, or NVFAIL options on the volume, perform the following steps:
   a. Verify that other operations are not impacted if these options are disabled.
   b. Disable the options:

   ```
   vol options vol_name no_i2p off
   ```

   ```
   vol options vol_name read_realloc off
   ```

   ```
   vol options vol_name nvfail off
   ```

Preparing the network for transition

You must prepare the data network of the cluster for transition by creating logical ports (VLANs and interface groups).

The NTP server must be configured and the time must be synchronized across the 7-Mode systems and cluster.

Steps

1. Create VLANs or interface groups on the target cluster nodes, if required:

   ```
   network port vlan create
   ```

   or

   ```
   network port ifgrp create
   ```

   To provide network connectivity after transition, you should transition the 7-Mode IP addresses to a similar network topology in ONTAP. For example, if the 7-Mode IP addresses are configured on physical ports, the IP addresses should be transitioned to appropriate physical ports in ONTAP. Similarly, IP addresses configured on VLAN ports or interface groups should be transitioned to appropriate VLAN ports or interface groups in ONTAP.

2. If you want SVMs in the non-default IPspace, create the required IPspaces:

   ```
   network ipspace create
   ```

   The 7-Mode IP addresses or the new LIFs that are selected for transition are created in the IPspace of the mapped SVM.

   IPv6 addresses cannot be transitioned and must be configured manually post-transition.

Related information

Network and LIF management

Considerations for transitioning 7-Mode IP addresses

You must be aware of certain considerations when transitioning 7-Mode IP addresses to storage virtual machines (SVMs) in ONTAP.

- You can transition existing 7-Mode IP addresses or specify new IP addresses to be configured on the SVM by using the 7-Mode Transition Tool.
  - Existing 7-Mode IP addresses are created on the SVM in the administrative `down` state in the apply configuration (precutover) phase.
  - New IP addresses are created on the SVM in the administrative `up` state in the apply configuration (precutover) phase.
- IPv6 addresses cannot be transitioned and must be manually configured after the transition.
- iSCSI and FC LIFs are not transitioned and must be manually configured after the transition.

Preparing the cluster for transition

Before transition, you must ensure that the cluster meets requirements such as allowing HTTPS, setting up intercluster LIFs, and verifying the network connectivity for transition.

- The cluster and the SVM must already be set up.

  Software setup

  The target SVM must not be in an SVM disaster recovery relationship.
- The cluster must be healthy and none of the nodes must be in takeover mode.
- The target aggregates that will contain the transitioned volumes must have an SFO policy.
- The aggregates must be on nodes that have not reached the maximum volume limit.
- If you want to transition volumes from a 32-bit aggregate of a 7-Mode system to a 64-bit aggregate of a Data ONTAP 8.2.x cluster, you must have provided an additional 5 percent space in the destination aggregate.

  The additional space is required to upgrade the transitioned volume to 64-bit format.

  Disk and aggregate management
- For establishing an SVM peer relationship when transitioning a volume SnapMirror relationship, the following conditions must be met:
  - The secondary cluster should not have an SVM with the same name as that of the primary SVM.
  - The primary cluster should not have an SVM with the same name as that of the secondary SVM.
  - The name of the source 7-Mode system should not conflict with any of the local SVMs or SVMs that are already peered.

You should not upgrade the cluster to a different ONTAP version during transition.

> You can upgrade the cluster to a patch release of the same ONTAP version, if required.

Steps

1. From an administration host, verify that the cluster is reachable by using the cluster-management LIF:

   `ssh username@cluster_mgmt_IP`

2. Enable SSLv3 or FIPS on the cluster:

If you want to enable…	Enter…
SSLv3	**`system services web modify -sslv3 -enabled true`**
FIPS 140-2 compliance	**`system services web modify -ssl-fips -enabled true`**

When FIPS 140-2 compliance is enabled, SSLv3 is disabled. ONTAP prevents you from enabling SSLv3 when FIPS 140-2 compliance is enabled. If you enable FIPS 140-2 and then subsequently disable it, SSLv3 remains disabled.

> The best practice is to enable FIPS because of the security vulnerabilities in SSLv3.

3. Verify that HTTPS is allowed on the cluster management LIF:

a. View the firewall policy for the cluster management LIF:

`network interface show -vserver` ***`svm_name`*** **`-lif`** ***`cluster_mgmt_lif`*** **`-fields firewall-policy`**

```
cluster1::> network interface show -vserver cluster1 -lif
cluster_mgmt -fields firewall-policy
vserver lif          firewall-policy
------- ------------ ---------------
cluster1  cluster_mgmt mgmt
```

b. Verify that the firewall policy associated with the cluster management LIF allows HTTPS access:

`system services firewall policy show -policy mgmt`

```
cluster1::> system services firewall policy show -policy mgmt
Policy           Service    Action IP-List
---------------- ---------- ------ --------------------
mgmt
                 dns        allow  0.0.0.0/0, ::/0
                 http       allow  0.0.0.0/0, ::/0
                 https      allow  0.0.0.0/0, ::/0
                 ndmp       allow  0.0.0.0/0, ::/0
                 ntp        allow  0.0.0.0/0, ::/0
                 rsh        deny   0.0.0.0/0, ::/0
                 snmp       allow  0.0.0.0/0, ::/0
                 ssh        allow  0.0.0.0/0, ::/0
                 telnet     deny   0.0.0.0/0, ::/0
9 entries were displayed.
```

System administration

4. Create an intercluster LIF on each node of the cluster for communication between the cluster and 7-Mode system:

   a. **network interface create -vserver *svm_name* -lif *intercluster_lif* -role intercluster -home-node *home_node* -home-port *home_port* -address *ip_address* -netmask *netmask***

   ```
   cluster1::> network interface create -vserver cluster1-01 -lif
   intercluster_lif -role intercluster -home-node cluster1-01 -home-port
   e0c -address 192.0.2.130 -netmask 255.255.255.0
   ```

   b. Create a static route.

If you are transitioning to…	Run this command…
ONTAP 9.5 or earlier or clustered Data ONTAP 8.3.x	network route create `cluster1::> network route create -vserver vs0 -destination 0.0.0.0/0 -gateway 10.61.208.1`

If you are transitioning to…	Run this command…
Clustered Data ONTAP 8.2.x	network routing-groups route create `cluster1::> network routing-groups route create -vserver cluster1-01 -routing-group i192.0.0.0/18 -destination 0.0.0.0/0 - gateway 192.0.2.129`

c. Verify that you can use the intercluster LIF to ping the 7-Mode system:

network ping -lif *intercluster_lif* -vserver *svm_name* -destination *remote_inetaddress*

```
cluster1::> network ping -lif intercluster_lif -vserver cluster1
-destination system7mode
system7mode is alive
```

For multipathing, you must have two intercluster LIFs on each node.

Network and LIF management

Preparing 7-Mode aggregates and volumes for transition

Before transition, you must ensure that the 7-Mode aggregates and volumes are eligible for transition and perform some manual steps before transition. For example, some volume types cannot be transitioned and any 32-bit data must be removed from the 7-Mode systems before transition.

Restrictions for transitioning 7-Mode volumes

You must be aware of certain restrictions for transitioning 7-Mode volumes. Some of the restrictions are due to features that are not supported in ONTAP. For some restrictions, you can perform a corrective action that enables you to continue with the transition.

Volume types

The following types of volumes are not supported for transition:

- Traditional volumes

  You can use host-based transition methods to transition traditional volumes.

  NetApp Technical Report 4052: Successfully Transitioning to Clustered Data ONTAP (Data ONTAP 8.2.x and 8.3)

- FlexCache volumes

Volume states

Transition is blocked if any of the 7-Mode volumes selected for the transition are in one of the following states:

- Offline
- Restricted
- Inconsistent (`wafl inconsistent`)

Volume with qtrees that belong to a different vFiler unit

You cannot transition volumes with qtrees, where the qtrees are owned by a different vFiler unit than that of the volume. Before transition, you must ensure that each volume and all of its qtrees belong to the same vFiler unit by performing one of the following actions:

- Move the qtrees to the vFiler unit that owns the volume.
- Delete the qtrees.

Inode to parent pathname translation setting

The inode to parent pathname translations must be enabled on each volume. You can enable the parent to pathname translations by turning off the `no_i2p` option:

`vol options` ***`vol_name`*** **`no_i2p off`**

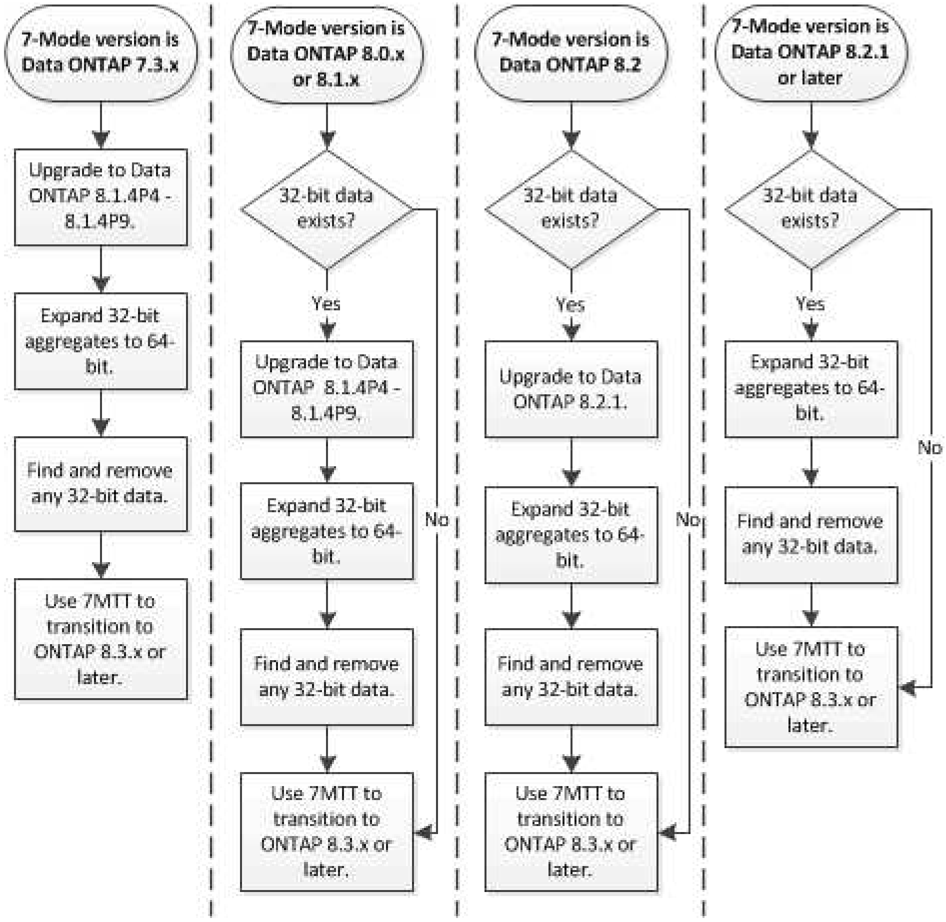
You do not have to wait for the i2p scan to finish, and you can continue with the transition preparation.

Preparing for transitioning to ONTAP 8.3 and later supported releases

32-bit aggregates, volumes, and Snapshot copies are not supported in ONTAP 8.3 and later. Therefore, you must expand the 32-bit aggregates to 64-bit, and then find and remove any 32-bit volumes and Snapshot copies from the 7-Mode system before transition. Because all 7-Mode versions do not support the capability of expanding 32-bit aggregates and removing 32-bit volumes and Snapshot copies, you might have to upgrade your 7-Mode system before transition.

> Clustered Data ONTAP 8.2.x supports 32-bit aggregates, volumes and Snapshot copies. Therefore, you can transition 32-bit data from 7-Mode system to a target cluster running Data ONTAP 8.2.x. However, after the transition, if the target cluster must be upgraded to ONTAP 8.3 or later version , then you must upgrade all the existing 32-bit data on the target cluster to 64-bit format before upgrading the ONTAP version of the target cluster..

You should use the following workflow to decide whether an upgrade is required before transition.



Related information

[NetApp Technical Report 3978: In-Place Expansion of 32-Bit Aggregates to 64-Bit Overview and Best Practices]

Expanding an aggregate to the 64-bit format

If your system contains 32-bit aggregates, you must expand them to the 64-bit format on your 7-Mode system *before* transitioning to Data ONTAP 8.3 or later versions, because those versions of Data ONTAP do not support the 32-bit format.

- If the aggregate contains destination volumes for a SnapMirror relationship with a 32-bit source volume, the aggregate containing the source volume must be expanded before expanding the aggregate containing the destination volume.

For volumes in a SnapMirror relationship, the destination volume inherits the format of the source volume while the mirror is intact. If the aggregate you are expanding contains a destination volume whose source is a 32-bit volume and you break the mirror before expanding the aggregate, the destination volume is expanded to the 64-bit format. However, if you reestablish the mirror and the source volume is still 32-bit, the destination volume returns to the 32-bit format. For this reason, you must expand the aggregate containing the source volume before reestablishing the SnapMirror relationship if you want to expand all 32-bit volumes in the aggregate to the 64-bit format.

Steps

1. Enter advanced privilege mode:

```
priv set advanced
```

2. Initiate the expansion:

   `aggr 64bit-upgrade start` ***`aggr_name`***

3. Perform the appropriate action:

If the command…	Then…
Initiates successfully	Proceed to the next step.
Indicates that one or more volumes could not be expanded because they did not have enough space	Retry the command, adding the `grow-all` option.
Indicates that the expansion could not be completed for some other reason	Perform the appropriate action, based on the issue outlined in the error message.

4. Display the status of the expansion:

   `aggr 64bit-upgrade status` ***`aggr_name`***

   The current status of the expansion is displayed. When the message indicates that there is no upgrade in progress, the expansion is complete.

5. Confirm that all volumes in the aggregate are 64-bit format:

   `aggr 64bit-upgrade status` ***`aggr_name`*** **`-all`**

6. Return to administrative privilege mode:

   ```
   priv set admin
   ```

The aggregate is expanded to the 64-bit format. However, even if all volumes are expanded, some 32-bit Snapshot copies might remain. The presence of 32-bit Snapshot copies in the source volumes prevents an upgrade or transition to Data ONTAP 8.3 or later.

Finding and removing 32-bit volumes and Snapshot copies

Even if you have expanded all of your aggregates to the 64-bit format, some 32-bit or mixed-format FlexVol volumes or Snapshot copies can remain. These volumes and Snapshot copies must be removed before your data can be accessed by a cluster running Data ONTAP 8.3 or later.

- You must have expanded all 32-bit aggregates on the system to the 64-bit format.

You must repeat the steps in this task for each aggregate that contains 32-bit volumes and Snapshot copies.

Steps

1. Enter advanced mode:

priv set advanced

2. Display the format of all volumes in the aggregate:

   aggr 64bit-upgrade status *aggr_name* -all

   Each volume in the aggregate is displayed with its format.

3. For each 32-bit or mixed-format volume, determine the reason that the volume has not been expanded to the 64-bit format, and then take the appropriate action.

   If you cannot determine the reason that the volume was not expanded, retry the aggregate expansion.

If the volume…	Then…
Is the destination of a SnapMirror relationship	Expand the aggregate containing the source volume to the 64-bit format.
Is a read-only volume (but not a SnapMirror destination)	Make the volume writable and retry the expansion, or destroy the volume.
Did not expand because of insufficient free space in the volume or aggregate	Increase the free space in the volume or aggregate and retry the expansion.

   All 32-bit and mixed-format volumes in the aggregate are now 64-bit. You can confirm this by repeating the previous step.

4. Display the format of all Snapshot copies on the system:

   snap list -fs-block-format

5. Remove the 32-bit Snapshot copies by using the `snap delete` command.

   > ⓘ This action deletes the data in the Snapshot copies. You must be certain that you do not need to retain the Snapshot copies before you delete them. Alternatively, you can wait for the 32-bit Snapshot copies to be aged out. The amount of time this takes depends on your Snapshot copy schedule.

   If a Snapshot copy is the base Snapshot copy for a FlexClone volume, you must split the FlexClone volume from its parent before you can remove the Snapshot copy.

   All 32-bit Snapshot copies are removed. You can confirm this by repeating the previous step.

6. Return to the administrative privilege level:

   priv set admin

Considerations for deduplication and compression

When using compression, the source and the destination volumes must belong to a 64-bit aggregate. All compression and deduplication savings on the source volume are retained over the network during transition. After transition, the destination volume inherits all of the compression and deduplication attributes and storage savings from the source volume.

Transitioning deduplicated and compressed data helps in reducing the network bandwidth during transition because of the following reasons:

- Shared blocks are transferred only once.
- Compression is maintained throughout the transfer.
- Compressed and deduplicated data involves smaller transfer sizes as a result of compression and deduplication space savings; therefore, the transfers are completed more quickly.

You should not start compression or deduplication of existing data on the source volume during transition. If deduplication or compression is in progress, you should start the transition only after the deduplication or compression operation is complete. Therefore, undeduplicated or uncompressed data and additional temporary metadata files are not sent over the network to the destination volume.

For deduplication and compression to take effect on any new data written on the ONTAP volume, you must enable deduplication and compression schedules after the transition.

Beginning with Data ONTAP 8.1, deduplication maintains a partially ordered fingerprint database in the volume along with the aggregate copy. As a result, the destination system will have the space savings from the source volume as well as a copy of the ordered fingerprint database. After migration, when volume efficiency is run on the new volume for the first time, the aggregate fingerprint database is automatically constructed from the copy in the destination volume. This can result in a one-time increase in the time it takes for volume efficiency operations to complete.

If your source volume is running a Data ONTAP operating in 7-Mode prior to 8.1, you must run the `volume efficiency start` command with the `-scan-old-data option` parameter to optimize space savings. After the migration is complete, you should verify whether the deduplication schedule meets your requirements on your cluster and consider switching to a volume efficiency policy.

Considerations for FlexClone volumes

When transitioning FlexClone volumes to the SVM, the clones are split from the parent volumes and are transitioned as FlexVol volumes to the destination cluster. As a result, the clone hierarchy and storage efficiency are lost in the transition process.

If the target cluster is running Data ONTAP 8.3 or earlier, FlexClone volumes cannot be created from Snapshot copies that are transitioned from 7-Mode. You can create FlexClone volumes only from new Snapshot copies that are created after the volume is transitioned to ONTAP. Beginning with clustered Data ONTAP 8.3.1, you can create FlexClone volumes from Snapshot copies that are transitioned from 7-Mode.

Considerations for quotas

You must be aware of how quotas are transitioned when “apply configuration” (precutover) is run in read-only and read-write mode.

Quotas are applied in the following ways during the precutover phase:

- Read-only mode

Quotas are not applied in the precutover read-only mode on the ONTAP system; they are applied only during the storage cutover phase.

- Read-write mode

  Quotas are applied in the precutover read-write mode on the ONTAP system, so that you can test them in ONTAP. However, the quotas are removed during resynchronization (after testing is completed) of the ONTAP volumes. The quotas are applied again during the storage cutover phase.

Support for transitioning SnapLock volumes

The 7-Mode Transition Tool supports the transition of SnapLock volumes to target clusters running any ONTAP 9.0 release except 9.6.

The SnapLock Enterprise and SnapLock Compliance volumes are supported for transition to target clusters that are running any ONTAP release except 9.6. However, SnapLock Compliance volume transition is not supported to the target clusters that are in MetroCluster configurations.

Considerations for transitioning of SnapLock Enterprise volumes

The 7-Mode Transition Tool supports the transition of stand-alone SnapLock Enterprise volumes and SnapLock Enterprise volumes that are in a SnapMirror relationship.

The workflow for transitioning SnapLock Enterprise volumes is the same as for FlexVol volumes.

SnapMirror relationships are preserved during the transition.

> The 7-Mode Transition Tool only supports like-to-like transition for SnapMirror relationships of SnapLock Enterprise volumes. That is, both the source and destination volumes must be SnapLock Enterprise volumes.

Considerations for transitioning of SnapLock Compliance volumes

The 7-Mode Transition Tool supports the transition of standalone SnapLock Compliance volumes and SnapLock Compliance volumes that are in a SnapMirror relationship.

The workflow for transitioning standalone SnapLock Compliance volumes is the same as for transitioning FlexVol volumes.

The transition of SnapMirror relationships for SnapLock Compliance volumes is not automated by the 7-Mode Transition Tool. You must transition the primary and secondary SnapLock Compliance volumes as stand-alone volumes, and then manually resynchronize the relationships.

You can include the SnapLock Compliance volumes (both stand-alone and the volumes that are in SnapMirror relationships) as a standalone volume in stand-alone, primary, and secondary projects.

The precutover read/write mode is not supported for projects with SnapLock Compliance volumes. It is a best practice to create separate projects for SnapLock Compliance volumes and non-SnapLock Compliance volumes because the precutover read/write mode is not supported if SnapLock Compliance volumes are included in the project.

During the cutover operation, if the selected volume is a SnapLock Compliance volume and it is the destination of a SnapMirror relationship, then the SnapMirror relationship between the 7-Mode volume and the ONTAP volume is deleted without SnapMirror break operation. This action enables the secondary ONTAP SnapLock Compliance volumes to remain in read-only mode. The secondary ONTAP SnapLock Compliance volumes must be in read-only mode for the resynchronization operation to be successful between the primary and secondary SnapLock Compliance volumes.

See How to transition the 7-Mode SnapLock Compliance volumes with SnapMirror relationship to clustered Data ONTAP

Considerations for transitioning of SnapLock Audit volumes

The 7-Mode Transition Tool supports the transition of SnapLock Audit volumes. The workflow to transition SnapLock Audit volumes is the same as the transition of SnapLock Compliance volumes.

After you transition audit volumes to the ONTAP, you must manually designate the transitioned audit volume as SnapLock Audit volume for the target SVM.

In ONTAP, the audit volumes are configured at an SVM level. In Data ONTAP operating in 7-Mode, an audit volume serves as a consolidated repository for all of the volumes in the controller across the vFiler units.

SnapLock Audit volumes are a type of SnapLock Compliance volume. The transition of SnapLock Audit volumes is not supported if the target cluster is in a MetroCluster configuration.

See How to configure audit volume in clustered Data ONTAP for the transitioned SnapLock volumes

Considerations for transitioning of 7-Mode SnapLock options

The 7-Mode Transition Tool supports the transition of a few 7-Mode options that are related to SnapLock volumes.

Data ONTAP operating in 7-Mode has the following options that are related to SnapLock volumes:

- `snaplock.autocommit_period`

  This option is at a volume level in ONTAP, and is transitioned to ONTAP during the transition.

- `snaplock.compliance.write_verify`

  This option is not applicable in ONTAP.

- `snaplock.log.default_retention`
- `snaplock.log.maximum_size`

Although the `snaplock.log.default_retention` and `snaplock.log.maximum_size` options are supported in ONTAP, the settings configured in these options are not transitioned by the 7-Mode Transition Tool. You must manually set these options for audit volumes after the transition is completed.

Considerations for using Chain of Custody verification for 7-Mode SnapLock volumes

You should be aware of the considerations for using Chain of Custody verification for 7-Mode SnapLock volumes.

- The SnapLock Chain of Custody verification must be performed only if it is a requirement for the transition of SnapLock volumes.

  You can perform the Chain of Custody verification for all or a subset of SnapLock volumes in the project.

- The SnapLock Chain of Custody verification can take a significant amount of time based on the number of files on the 7-Mode SnapLock volumes.
- The Chain of Custody verification is supported only for read/write 7-Mode SnapLock volumes

  The Chain of Custody verification is not supported for read-only volumes.

- The Chain of Custody verification is not supported for SnapLock volumes containing files that have names with non-ASCII characters.

Preparing to transition name services

Name service configurations that include DNS, LDAP, NIS, hosts, name services switch, UNIX users and groups, and netgroups configurations are transitioned by the 7-Mode Transition Tool. You must be aware of some considerations before transitioning name services configurations.

Name services transition: supported and unsupported configurations, and required manual steps

You must be aware of the name services configurations that are transitioned by the 7-Mode Transition Tool. Some name services configurations are not transitioned to ONTAP because either these are not supported in ONTAP or these must be manually transitioned.

You should verify all the precheck error and warning messages to evaluate the impact of such configurations on transition.

Configurations that are transitioned

At a high level, the following name services configurations are transitioned by the 7-Mode Transition Tool:

- DNS configuration (`/etc/resolv.conf`)
- LDAP configuration
- NIS configuration
- Name service switch configuration (`/etc/nsswitch.conf` and `/etc/resolv.conf`)
- Hosts configuration (`/etc/hosts`)
- UNIX users and groups (`/etc/passwd` and `/etc/group`)
- Netgroups configuration (`/etc/netgroup`)

See the precheck results for details about these name services configurations.

Unsupported configurations in ONTAP

- NIS slave

- NIS broadcast
- NIS groups caching
- Dynamic DNS
- DNS cache
- Shadow database
- Host database sources other than file or DNS

  ONTAP supports only file and DNS for host lookup; other database sources are not supported. Host lookup order in the `/etc/nsswitch.conf` is ignored during transition.

Configurations that must be manually configured

You must manually configure the following LDAP options on the SVMs:

- `ldap.usermap.attribute.unixaccount`
- `ldap.password`
- `ldap.usermap.base`
- `ldap.ssl.enable`

Related information

NFS management

Network and LIF management

Considerations for transitioning DNS, NIS, and LDAP configurations

You should be aware of how the DNS, NIS, and LDAP configurations in Data ONTAP operating in 7-Mode are transitioned and applied in ONTAP.

Considerations for DNS transition

For DNS configurations, a maximum of six domain names and three name servers per SVM are supported in ONTAP. If the unique number of domain names or name servers across 7-Mode systems and the target SVM exceed the supported limit, the 7-Mode Transition Tool reports a blocking error. To continue with the transition, you should ignore the transition of the DNS configuration from the tool.

> If you ignore the transition of the DNS configuration, you must manually configure DNS on the target SVM.

Considerations for NIS transition

- The length of the NIS domain name on the 7-Mode system must not exceed 64 characters.
- For transitioning to target cluster versions running ONTAP 9.1 or earlier, the `nis.servers` option on the 7-Mode system must be configured only with IP addresses, and not a fully qualified domain name (FQDN).

  You must configure the `nis.servers` option on the 7-Mode system with IP addresses before transition if you are transitioning to a cluster running ONTAP 9.1 or earlier. Transition is supported if you have the `nis.servers` option on the 7-Mode system configured with an FQDN and you are transitioning to a cluster running any version of ONTAP between 9.2 and 9.5.

Considerations for LDAP transition

- If multiple base values and scope values are set for the ldap.base, `ldap.base.passwd`, `ldap.base.group`, or `ldap.base.netgroup` option, and if you are transitioning to clustered Data ONTAP 8.2 or 8.2.1, only one value for each option is transitioned.

  After transition, there might be lookup issues for these options. You must manually add the base values and scope values after transition.

- If multiple scope values are set for the `ldap.base`, `ldap.base.passwd`, `ldap.base.group`, or `ldap.base.netgroup` option, and if you are transitioning to clustered Data ONTAP 8.2.2, only one value for each option is transitioned.
- If separate base values and scope values are specified for user mapping (`ldap.usermap.base`) and user password (`ldap.base.passwd`) lookups in the 7-Mode system, the base values and scope values for only the user password are transitioned.

  The base values and scope values are used for user mapping and user password lookups in ONTAP, which can cause security issues. You must manually add the base values and scope values for user mapping to the user distinguished name (DN) option in ONTAP after transition, if required.

Considerations for transitioning netgroups and UNIX users and groups

Netgroup configuration is transitioned only if the 7-Mode `/etc/netgroup` file is less than 5 MB in size. UNIX users and groups are transitioned only if the total number of UNIX users and groups on the SVM do not exceed the limits for users and groups in ONTAP.

Considerations for netgroups

If the `/etc/netgroup` file on 7-Mode is greater than 5 MB, the netgroup configuration is not transitioned. You must perform one of the following actions to continue with the transition:

- Exclude the transition of netgroups.
- Move the netgroup configuration to NIS or LDAP servers before transition.

Considerations for UNIX users and groups

If the total number of transitioning UNIX users and groups exceed the limit of UNIX users and groups in ONTAP, the 7-Mode Transition Tool blocks the transition. You must perform one of the following actions to continue with the transition:

- Exclude the transition of UNIX users and groups.
- Move the UNIX users and groups to NIS or LDAP servers before transition.

Related information

NFS management

Preparing for NFS transition

If NFS is licensed and NFS service is running on the systems operating in 7-Mode, you must manually prepare the cluster and target SVM for transitioning NFS configurations. You must also be aware of what configurations are transitioned.

Some NFS configurations operating in 7-Mode are not supported in ONTAP. Some configurations are not transitioned by the 7-Mode Transition Tool and must be manually applied to the SVM.

Prerequisites for transitioning NFS configurations

NFS configurations are transitioned by the 7-Mode Transition Tool only when certain prerequisites are met on the 7-Mode system and the cluster. If any of the conditions are not met, the tool does not transition the configuration.

7-Mode prerequisites

- NFS must be licensed.
- If MultiStore is licensed, NFS must be enabled on the vFiler unit that owns the transitioning volumes.
- For transitioning a Microsoft Active Directory (AD) based Kerberos server to a new SVM, a DNS entry must exist for the AD domain.

> To transition the Kerberos configuration, at least one LIF must be transitioned as part of the project and the LIF must be resolvable to a host name.

- If you want to transition in-memory export rules, you must add them to the `/etc/exports` file before transition.

  The 7-Mode Transition Tool transitions only the persistent export rules that are defined in the `/etc/exports` file.

Cluster prerequisites

- NFS must be licensed.
- For transitioning a Microsoft AD-based Kerberos server to an existing SVM with DNS configured, a DNS entry must exist for the AD domain.
- The clock skew between the Kerberos key distribution center (KDC) and the ONTAP system must be less than or equal to 5 minutes.

Related information

How NFS exports are transitioned

NetApp Documentation: ONTAP 9

NFS transition: supported and unsupported configurations, and required manual steps

Some NFS configurations are not transitioned to ONTAP because they are not supported in ONTAP, there are functionality differences from 7-Mode, or they must be manually transitioned. You should verify all of the precheck errors and warning messages to evaluate the impact of such configurations on transition.

Supported configurations for transition

At a high level, the following NFS configurations are transitioned by the 7-Mode Transition Tool:

- NFS options:
  - `nfs.udp.xfersize`
  - `nfs.v4.id.domain`
  - `nfs.v4.acl.max.aces`
  - `nfs.tcp.xfersize`
  - `nfs.rpcsec.ctx.high`
  - `nfs.rpcsec.ctx.idle`
  - `nfs.response.trigger`
  - `wafl.default_nt_user`
  - `nfs.mount_rootonly`
  - `nfs.tcp.enable`
  - `nfs.udp.enable`
  - `nfs.response.trace`
  - `nfs.v4.read_delegation`
  - `nfs.v4.write_delegation`
  - `nfs.v4.acl.enable`
  - `nfs.vstorage.enable`
  - `nfs.v3.enable`
  - `nfs.v4.enable`
- NFS export rule:

  If the export rule is configured with the `-actual` option, the exported path (alias path) is ignored and the export rule is configured with the actual path.

- Export rules with Kerberos security krb5p
- Kerberos configuration

See the precheck results for details about these NFS configurations.

Unsupported configurations in ONTAP

The following NFS configurations are not supported in ONTAP:

- Subvolume NFS exports other than qtree-level NFS exports
- WebNFS

- PC-NFS
- NFSv2
- Fencing of NFS clients from one or more file system paths
- Some NFS options

  See the precheck warning messages for a complete list of unsupported options.

Configurations that must be manually transitioned

There are some NFS configurations that are supported in ONTAP, but are not transitioned by the 7-Mode Transition Tool.

The following NFS configurations generate a warning message in the precheck operation, and you must manually apply the configurations on the SVM:

- NFS audit configuration
- NFS options:
  - `rpc.nsm.tcp.port`
  - `rpc.nsm.udp.port`
  - `rpc.mountd.tcp.port`
  - `rpc.mountd.udp.port`
  - `nfs.export.neg.timeout`
  - `nfs.export.pos.timeout`
  - `nfs.export.harvest.timeout`
    Use the `vserver nfs modify` command to modify the configuration of an NFS-enabled storage virtual machine (SVM).
- Export rules with Kerberos security krb5p

Configurations that are functionally different in ONTAP

The following NFS configurations are functionally different in ONTAP:

- NFS export rules
- NFS export access cache
- NFS diagnostic commands
- Support for the `showmount` command
- NFS Kerberos encryption
- NLM version support

Related information

NFS management

How NFS exports are transitioned

You must be aware of how NFS exports are configured on the SVM after transition. You might have to perform some manual steps if the 7-Mode export configurations are not supported in ONTAP.

You must be aware of the following considerations about NFS exports transition:

- If the SVM root volume is not exported to allow read-only access to all NFS clients, the 7-Mode Transition Tool creates a new export policy that allows read-only access for all the NFS clients and exports the root volume of the SVM with the new export policy.

  To ensure that all the transitioned volumes or qtrees are mountable, the root volume of the SVM must be allowed read-only access for all the NFS clients.

- When 7-Mode volumes with export configurations that are not supported in ONTAP are transitioned, these volumes are exported to allow read-only permissions to all NFS clients on the SVM.

  Export policies for these volumes must be configured manually after transition to provide the required access permissions.

- When 7-Mode qtrees with export configurations that are not supported in ONTAP are transitioned, they inherit the export policy of the parent volume.

  Export policies for these qtrees must be configured manually after transition to provide the required access permissions.

- In ONTAP, for an NFS client to mount a qtree, the NFS client must have read-only permissions at all the parent junction paths up to the SVM's root volume junction path (that is, /).

  For NFS clients to mount qtrees, the qtrees must belong to a volume that has read-only permission. Without the read-only permissions at the volume level, the NFS clients cannot mount the qtree.

- If the same host is specified in the combination of read-only, read-write, and root access permission lists, you must evaluate the transitioned export rules after transition to determine appropriate access privilege for the hosts.

NetApp Technical Report 4067: NFS Best Practice and Implementation Guide

Example: Modifying the export policy of a volume to allow access to a qtree

Consider the following export rule configured in the 7-Mode storage system (192.168.26.18) that allows read/write access to the volume volstd10 and qtree qtree1 for the NFS client 192.168.10.10:

```
/vol/volstd10/qtree1 -sec=sys,rw=192.168.10.10,nosuid
/vol/volstd10 -sec=sys,rw=192.168.11.11,nosuid
```

After transition, the export policy of the volume volsdt10 in ONTAP is as shown below:

```
cluster-01::> export-policy rule show -vserver std_22 -policyname std_2226
-instance
 (vserver export-policy rule show)

                                                  Vserver: std_22
                                              Policy Name: std_2226
                                               Rule Index: 1
                                          Access Protocol: any
Client Match Hostname, IP Address, Netgroup, or Domain: 192.168.11.11
                                           RO Access Rule: sys
                                           RW Access Rule: sys
           User ID To Which Anonymous Users Are Mapped:65534
                                Superuser Security Types: none
                            Honor SetUID Bits in SETATTR: false
                               Allow Creation of Devices: true
cluster-01::>
```

After transition, the export policy of the qtree qtree1 in ONTAP is as shown below:

```
 cluster-01::> export-policy rule show -vserver std_22 -policyname
std_2225 -instance
  (vserver export-policy rule show)

                                    Vserver: std_22
                                Policy Name: std_2225
                                 Rule Index: 1
                            Access Protocol: any
Client Match Hostname, IP Address, Netgroup, or Domain: 192.168.10.10
                             RO Access Rule: sys
                             RW Access Rule: sys
User ID To Which Anonymous Users Are Mapped: 65534
                   Superuser Security Types: none
               Honor SetUID Bits in SETATTR: false
                  Allow Creation of Devices: true
cluster-01::>
```

For the NFS client 192.168.10.10 to access the qtree, the NFS client 192.168.10.10 must have read-only access to the qtree’s parent volume.

The following output shows that the NFS client is denied access while mounting the qtree:

```
 [root@192.168.10.10 ]# mount 192.168.35.223:/vol/volstd10/qtree1
transition_volume_qtreemount:192.168.35.223:/vol/volstd10/qtree1 failed,
reason
given by server: Permission denied [root@192.168.10.10 ]#
```

You must manually modify the export policy of the volume to provide read-only access to the NFS client 192.168.10.10.

```
cluster-01::> export-policy rule create -vserver std_22 -policyname
std_2226 -clientmatch
192.168.10.10 -rorule sys -rwrule never -allow-suid false -allow-dev true
-superuser none -protocol nfs
  (vserver export-policy rule create)

cluster-01::> export-policy rule show -vserver std_22 -policyname std_2226
-instance
  (vserver export-policy rule show)

                                    Vserver: std_22
                                Policy Name: std_2226
                                 Rule Index: 1
                            Access Protocol: any
Client Match Hostname, IP Address, Netgroup, or Domain: 192.168.11.11
                             RO Access Rule: sys
                             RW Access Rule: sys
User ID To Which Anonymous Users Are Mapped: 65534
                   Superuser Security Types: none
               Honor SetUID Bits in SETATTR: false
                  Allow Creation of Devices: true

**                                  Vserver: std_22
                                Policy Name: std_2226
                                 Rule Index: 2
                            Access Protocol: nfs
Client Match Hostname, IP Address, Netgroup, or Domain: 192.168.10.10
                             RO Access Rule: sys
                             RW Access Rule: never
User ID To Which Anonymous Users Are Mapped: 65534
                   Superuser Security Types: none
               Honor SetUID Bits in SETATTR: false
                  Allow Creation of Devices: true**

cluster-01::>
```

Example: How qtree export rules differ in 7-Mode and ONTAP

In the 7-Mode storage system, when an NFS client accesses a qtree through the mount point of its parent volume, the qtree export rules are ignored and the export rules of its parent volume are in effect. However, in ONTAP, qtree export rules are always enforced whether NFS client mounts to the qtree directly or it accesses the qtree through the mount point of its parent volume. This example is specifically applicable for NFSv4.

The following is an example of an export rule on the 7-Mode storage system (192.168.26.18):

```
/vol/volstd10/qtree1 -sec=sys,ro=192.168.10.10,nosuid
/vol/volstd10   -sec=sys,rw=192.168.10.10,nosuid
```

On the 7-Mode storage system, the NFS client 192.168.10.10 has only read-only access to the qtree. However, when the client accesses the qtree through the mount point of its parent volume, the client can write to the qtree because the client has read/write access to the volume.

```
[root@192.168.10.10]# mount 192.168.26.18:/vol/volstd10 transition_volume
[root@192.168.10.10]# cd transition_volume/qtree1
[root@192.168.10.10]# ls transition_volume/qtree1
[root@192.168.10.10]# mkdir new_folder
[root@192.168.10.10]# ls
new_folder
[root@192.168.10.10]#
```

In ONTAP, the NFS client 192.168.10.10 has only read-only access to the qtree qtree1 when the client accesses the qtree directly or through the mount point of the qtree’s parent volume.

After transition, you must evaluate the impact of enforcing the NFS export policies, and if necessary modify the processes to the new way of enforcing NFS export policies in ONTAP.

Related information

NFS management

Preparing for SMB/CIFS transition

If SMB/CIFS is licensed and SMB/CIFS service is running on the 7-Mode systems, you must manually perform some tasks, such as adding the SMB/CIFS license and creating a SMB/CIFS server, on the target cluster and SVM for transitioning SMB/CIFS configurations.

You must also be aware of what configurations are transitioned. Some SMB/CIFS configurations operating in 7-Mode are not supported in ONTAP. Some configurations are not transitioned by the 7-Mode Transition Tool and must be manually applied to the SVM.

Prerequisites for transitioning CIFS configurations

CIFS configurations are transitioned by the 7-Mode Transition Tool only when certain prerequisites are met on the 7-Mode system and cluster. If any of the conditions are not met, the tool does not transition the configuration.

7-Mode prerequisites

- The CIFS license must be added.
- If the MultiStore license is enabled, CIFS must be added to the list of allowed protocols for the vFiler unit that owns the transitioning volumes.
- CIFS must be set up and running during transition.
- The authentication type for CIFS must be Active Directory (AD) or Workgroup.

Cluster prerequisites

- The CIFS license must be added.
- CIFS must be added to the list of allowed protocols for the SVM.
- DNS must be configured for the SVM.
- The following CIFS authentication methods are supported in different ONTAP versions:
    - Clustered Data ONTAP 8.2.x and 8.3.x support AD authentication.
    - ONTAP 9.0 or later supports AD authentication and Workgroup authentication.
- Use the following table to decide which authentication must be used on the target SVM:

7-Mode authentication method	Clustered Data ONTAP 8.2.x and 8.3.x authentication method	ONTAP 9.5 or earlier authentication method
AD	AD	AD
Workgroup	AD	Workgroup or AD

- You can transition CIFS configuration from 7-Mode to ONTAP if the AD domains does not match between 7-Mode CIFS server and target SVM CIFS server. The tool triggers an ignorable blocking error when an AD domain name mismatch is detected. To proceed with the transition, acknowledge the blocking error.
- The CIFS server must be manually configured before the apply configuration phase (precutover).

  You can create the CIFS server on the SVM in the following two ways:

If you want to…	Do the following…
Transfer or preserve the CIFS server identity to the target SVM	• You must plan to transition all of the volumes in the source 7-Mode system or vFiler unit in a single project. This plan is required because the 7-Mode system loses the original CIFS server identity after the transition and cannot serve clients. The maximum number of volumes that can be transitioned in one project is 160; therefore, to preserve the CIFS server identity, the 7-Mode system can have a maximum of 160 volumes and all these volumes must be transitioned in a single project. You have the following two options to create the CIFS server: a. Applicable for all versions of ONTAP: ▪ Before the “apply configuration” phase (precutover), you must reconfigure the CIFS server on the 7-Mode system by using a temporary CIFS identity. This reconfiguration allows the original CIFS server identity to be configured on the SVM. You must verify that the CIFS server is running on the 7-Mode system during the “apply configuration” phase (precutover) operation with the new temporary identity. This action is required to read CIFS configurations from 7-Mode during precutover. ▪ You must configure the CIFS server on the target SVM with the original 7-Mode CIFS identity. ▪ After these conditions are met, you can perform the precutover operation. You must then plan to perform the storage cutover immediately after precutover for enabling client access to ONTAP volumes. b. Applicable for ONTAP releases 9.0 through 9.5: ▪ Use the `vserver cifs modify` command to change the CIFS server name (CIFS Server NetBIOS Name). Using this feature, you should create a CIFS server on the target SVM with a temporary identity, and then perform the apply configuration (precutover) operation.

If you want to…	Do the following…
Use a new identity	• Before the “apply configuration” phase (precutover), you must configure the CIFS server on the target SVM with a new CIFS identity. • You must verify that the CIFS server is up and running on the 7-Mode system during the “apply configuration” phase (precutover) operation. This action is required to read CIFS configurations from 7-Mode systems during the “apply configuration” phase (precutover). After these conditions are met, you can perform the precutover operation. You can then test the SVM configurations and plan to perform the storage cutover operation.

Related information

Considerations for transitioning CIFS local users and groups

Supported and unsupported CIFS configurations for transition to ONTAP

Some CIFS configurations are not transitioned to ONTAP because either they are not supported in ONTAP or they must be manually transitioned. You should verify all precheck error and warning messages to evaluate the impact of such configurations on transition.

Configurations that are supported for transition

At a high level, the 7-Mode Transition Tool transitions the following CIFS configurations:

- CIFS preferred DC configuration
- User mapping configuration:
  - `/etc/usermap.cfg`
  - *`wafl.nt_admin_priv_map_to_root`*
- CIFS local users and groups
- Symlink and widelink configuration (`/etc/symlink.translations`)
- CIFS audit configuration
- CIFS shares
- CIFS share ACLs
- CIFS home directory configuration
- CIFS options:
  - `cifs.gpo.enable`

- `cifs.smb2.enable`
- `cifs.smb2.signing.required`
- `cifs.wins_servers`
- `cifs.grant_implicit_exe_perms`
- `cifs.restrict_anonymous`

- SMB2 connections to external servers, such as a domain controller. The following command implements this support:
  - **`cifs security modify -vserver SVM1 -smb2-enabled-for-dc-connections`**
- FPolicy native file blocking configuration

See the precheck results for details about these CIFS configurations.

Configurations that are not supported in ONTAP

The following 7-Mode configurations are not supported in ONTAP. Therefore, these configurations cannot be transitioned.

- NT4, and password authentication types
- Separate options for SMB1 and SMB2 signing
- CIFS statistics on a per-client basis
-
  - Authentication for clients earlier than Windows NT
- Auditing of account management events for local users and groups
- Usermap entries with IP addresses, host names, network names, or network names with subnet specified in dotted notation
- CIFS shares with access restriction for machine accounts

  Machine accounts can access all shares after transition.

Configurations that must be manually transitioned

Some CIFS configurations are supported in ONTAP, but are not transitioned by the 7-Mode Transition Tool.

The following CIFS configurations generate a warning message in the precheck. You must manually apply these configurations on the SVM:

- Antivirus settings
- FPolicy configurations

  7-Mode FPolicy and antivirus servers do not work with ONTAP. You must contact the server vendors for upgrading these servers. However, you must not decommission the 7-Mode FPolicy and antivirus servers until you commit the transition. These are required in case you decide to roll back the transition.

- BranchCache configurations
- Character mapping configuration (charmap)
- Forcegroup attribute of CIFS shares to create files with a specified UNIX group as owning group

- Maxusers attribute of CIFS shares to specify the maximum number of simultaneous connections allowed to a 7-Mode CIFS share
- Storage-Level Access Guard (SLAG) configurations
- Share-level ACLs with UNIX-style permission
- Share ACLs for UNIX users and groups
- LAN Manager authentication level
- NetBIOS aliases
- CIFS search domains
- Some CIFS options

  See the precheck results for details about these options.

Considerations for transitioning CIFS local users and groups

You must be aware of the considerations for running the transition operations when migrating CIFS local users and groups.

- If the destination cluster is running clustered Data ONTAP 8.2, transition should not be attempted for 7-Mode volumes that are serving CIFS data and are being accessed by local users and groups.

  The 7-Mode Transition Tool does not support the transition of local users and groups to clustered Data ONTAP 8.2.

- Transition of CIFS data-serving volumes from a 7-Mode controller or a vFiler unit that has local users and groups to an SVM that has non-BUILTIN CIFS local users and groups is not supported.

  The SVM must have only BUILTIN CIFS local users and groups for transition.

  While transitioning local users and groups from a specific 7-Mode controller or a vFiler unit to a specific SVM, local users and groups from the first transition project are transitioned. In the subsequent transition of projects with the same 7-Mode controller or vFiler unit to the same SVM, the transition of local users and groups is ignored, although transition succeeds. The local user's name on the 7-Mode system must not be the same as the CIFS server name on the SVM.

- You must be aware of the limits on the number of local users and groups supported in clustered Data ONTAP 8.2.1 and later.
- A local user account with an empty password or local user accounts with passwords containing more than 14 characters on the 7-Mode system are transitioned to ONTAP software with the password **`cifsUser@1`**.

  After the transition is complete, you can access these users from the Windows system by using the password **`cifsUser@1`**. You must then manually change the password for such CIFS local users on the SVM by using the following command:

  `cifs users-and-groups local-user set-password -vserver` ***`svm_name`*** **`-user-name`** ***`user_name`***.

- If the 7-Mode Transition Tool IP address is not reachable from the target ONTAP software, the 7-Mode Transition Tool blocks the transition of CIFS local users and groups to the ONTAP software during the precheck phase. If you see this error during the precheck phase, use the

network ping -node local -destination *ip_address*

command to make sure the 7-Mode Transition Tool IP address is reachable from the target ONTAP software. You can edit the `\etc\conf\transition-tool.conf` file that is installed with the 7-Mode Transition Tool to modify any configuration option that is used by the tool, such as the 7-Mode Transition Tool IP address.

- The SVM to which the local users and groups are transitioned must have a data LIF.
- If a local group has multiple member system identifiers (SIDs) mapped to a single domain user or group on the 7-Mode system, the 7-Mode Transition Tool blocks the transition of local users and groups to ONTAP during the precheck phase.

  If you see this error during the precheck phase, you must manually remove the additional SIDs that are mapped to a single domain user or group on the 7-Mode system. You must then rerun the precheck operation with only a single SID mapped to the domain user or group.

  Troubleshooting Workflow: CIFS: Device attached to the system is not functioning

Related information

SMB/CIFS management

Preparing for MetroCluster configuration transition

Before transitioning to a MetroCluster configuration, you must understand the requirements and considerations for transitioning 7-Mode volumes to a MetroCluster configuration in ONTAP.

Prerequisites

- The MetroCluster configuration in ONTAP must already be set up.
- The SVM type must be `sync-source`.
- The 7-Mode controllers must not be in a taken over state or waiting for a giveback.
- The nodes in the MetroCluster configuration in ONTAP must not be switched over or waiting for a switchback.

Considerations

- Transitioning SnapLock Compliance volumes is not supported if the target cluster is in a MetroCluster configuration.
- You can transition volumes from a 7-Mode controller, HA configuration, or MetroCluster configuration to a MetroCluster configuration in ONTAP as stand-alone volumes.
- If a 7-Mode MetroCluster configuration has volumes that are in volume SnapMirror relationships with volumes in another 7-Mode controller, you can transition the SnapMirror relationships as primary and secondary relationships.

  You should install the 7-Mode Transition Tool on each MetroCluster site and transition the volumes from each site.

- Different subnets configured for a 7-Mode fabric MetroCluster configuration cannot be configured on the MetroCluster configuration in ONTAP.

- The preferred port configured in a 7-Mode fabric MetroCluster configuration cannot be configured for the MetroCluster configurations in ONTAP.
- If your 7-Mode fabric MetroCluster configuration is using Brocade 6510 switches, you can share the existing switch fabrics with the new MetroCluster configuration in ONTAP.

  It is best to share the switch fabrics only for the duration of the transition.

  Fabric-attached MetroCluster installation and configuration, ONTAP 9.8 or earlier

  Fabric-attached MetroCluster installation and configuration, ONTAP 9.9.1
- The cron job schedules created during transition are not replicated to the remote site, and therefore the negotiated switchover fails after transition.

  You must manually create the cron job schedules on the remote site after the transition.

Related information

Configuring cron job schedules on the remote site after transitioning a MetroCluster configuration

Impact of takeover and giveback on transition

Transitioning a MetroCluster configuration that failed due to switchover or switchback

Preparing for SAN transition

Before transitioning a SAN environment, you must understand what configurations are supported for SAN transition, create SAN LIFs on the SVM, and prepare the SAN hosts for transition.

Preparing SAN hosts for transition

Before transitioning a SAN environment, you must perform some manual steps to prepare the SAN hosts for transition.

You must have generated the inventory workbook for the SAN hosts by using the Inventory Collect Tool.

Host and storage transition information collection

Steps

1. Verify that the host is supported for transition.

   NetApp Interoperability Matrix Tool
2. Perform the pretransition steps on the host.

   SAN host transition and remediation

Configuring zones by using the FC zone plan

Before transitioning a SAN FC environment, you must configure zones by using the FC zone planner to group the initiator hosts and targets.

- The cluster and initiator hosts must be connected to the switch.
- The FC zone script file must be accessible.

Steps

1. If there are any changes to the igroup configurations on the 7-Mode systems, modify and regenerate the FC zone plan.

   Generating an assessment report by adding systems to the 7-Mode Transition Tool

2. Log in to the CLI of the switch.
3. Copy and execute the required zone commands one at a time.

   The following example runs the zone commands on the switch:

   ```
   switch1:admin>config terminal
   # Enable NPIV feature
   feature npiv
   zone name auto_transition_igroup_d31_194bf3 vsan 10
   member pwwn 21:00:00:c0:dd:19:4b:f3
   member pwwn 20:07:00:a0:98:32:99:07
   member pwwn 20:09:00:a0:98:32:99:07
   .......
   .......
   .......
   copy running-config startup-config
   ```

4. Verify the data access from the cluster by using the test initiator hosts.
5. After the verification is complete, perform the following steps:
   a. Disconnect the test initiator hosts.
   b. Remove the zone configuration.

Creating SAN LIFs before transition

Because FC and iSCSI LIFs are not transitioned by the 7-Mode Transition Tool, you must create these LIFs on the SVMs before transition. You must configure SAN LIFs on both the nodes that own the LUN and the node's HA partner.

The required SAN (FC or iSCSI) license must be added to the cluster.

For redundancy, you must create SAN LIFs on both the node hosting the LUNs and its HA partner.

Steps

1. Create an FC or iSCSI LIF on the target node to which the LUNs are transitioned, depending on the protocol used:

   `network interface create`

   If you want to reuse the 7-Mode IP address for iSCSI LIFs, you must create the LIFs in administrative down state. You can bring these LIFs to the administrative up state after the cutover operation.

2. Create a LIF on the HA partner of the node.
3. Verify that you have set up your LIFs correctly:

```
network interface show
```

Related information

SAN administration

SAN transition: supported and unsupported configurations, and required manual steps

You must be aware of the SAN configurations that are transitioned by the 7-Mode Transition Tool. You should also be aware of the 7-Mode SAN features that are not supported in ONTAP, so that you can take any necessary actions before the transition.

You should verify all of the precheck error and warning messages to evaluate the impact of such configurations on transition.

Configurations that are transitioned

The following SAN configurations are transitioned by the 7-Mode Transition Tool:

- FC and iSCSI services
- igroups and LUN maps

> - 7-Mode igroups that are not mapped to any LUNs are not transitioned to the target SVMs.
> - For clustered Data ONTAP 8.3.0 and 8.3.1, the transition of igroups and LUN mapping configurations is not supported during the precutover operation.
>
>   Instead, the required igroups are created during the cutover operation. For primary and stand-alone volumes, LUNs are mapped to igroups during the cutover operation. However, for secondary volumes, the mapping of LUNs to igroups is not supported during the cutover operation. You must manually map the secondary LUNs after completing the transition of primary volumes.
> - For ONTAP 8.3.2 and later supported releases, igroups and LUN mapping configurations are applied during the precutover operation.

Unsupported configurations in ONTAP

The unsupported configurations in ONTAP are as follows:

- 7-Mode Snapshot copy-backed LUN clones

  Snapshot copy-backed LUN clones present in the Snapshot copies are not supported for any restore operation. These LUNs are not accessible in ONTAP. You must split or delete the 7-Mode Snapshot copy-backed LUN clones before transition.

- LUNs with an `ostype` parameter value of `vld`, `image`, or any user-defined string

  You must either change the value of the `ostype` parameter for such LUNs or delete the LUNs before transition.

- LUN clone split

  You must either wait for the active LUN clone split operations to finish or abort the LUN clone split and delete the LUN before transition.

The following 7-Mode features enable you to continue with the transition process, but are not supported in ONTAP:

- The `lun share` command

  Sharing a LUN over NAS protocols

- SnapValidator

Configurations that must be manually transitioned

The following configurations must be transitioned manually:

- SAN LIFs

  You must manually create the LIFs before transition.

- Portsets

  You must manually configure igroups that are bound to a portset after transition.

- iSCSI access list information
- iSNS configuration
- iSCSI CHAP and RADIUS configurations

Related information

NFS management

Network and LIF management

Space considerations when transitioning SAN volumes

You must ensure that sufficient space is available in the volumes during transition. In addition to the space required for storing data and Snapshot copies, the transition process also requires 1 MB of space per LUN for updating certain filesystem metadata.

Before cutover, you can use the `df -h` command on the 7-Mode volume to verify whether free space of 1 MB per LUN is available in the volume. The volume should also have free space equivalent to the amount of data that is expected to be written to the volume before final cutover. If the volume does not have sufficient free space available, the required amount of space must be added to the 7-Mode volume.

If the transition of LUNs fails due to lack of space on the destination volume, the following EMS message is generated: `LUN.vol.proc.fail.no.space: Processing for LUNs in volume vol1 failed due to lack of space.`

In this case, you must set the `filesys-size-fixed` attribute to `false` on the destination volume, and then add 1 MB per LUN of free space to the volume.

If there are volumes containing space-reserved LUNs, growing the volume by 1MB per LUN might not provide sufficient space. In such cases, the amount of additional space that has to be added is the size of the Snapshot reserve for the volume. After space is added to the destination volume, you can use the `lun transition start` command to transition the LUNs.

Related information

NetApp Documentation: ONTAP 9

Preparing data protection features for transition

You must perform some manual steps for transitioning 7-Mode SnapMirror relationships. You must also be aware of the data protection relationships that are supported and unsupported for transition.

Data protection transition: supported and unsupported configurations

You can transition a volume that is part of a SnapMirror relationship. However, some data protection and disaster recovery configurations are not supported for transition and therefore you have to perform some manual steps for transitioning these configurations.

Supported configurations

You can transition volume SnapMirror relationships by using the 7-Mode Transition Tool. You can also transition 7-Mode volumes from a MetroCluster Configuration to a MetroCluster Configuration in ONTAP 8.3 and later supported releases.

Unsupported configurations

- SnapVault relationships

  Volumes that are the source of a SnapVault relationship can be migrated; however, the SnapVault relationship is not transitioned. A volume that is the destination of a SnapVault relationship can be migrated only after the SnapVault backups are stopped.

  NetApp Technical Report 4052: Successfully Transitioning to Clustered Data ONTAP (Data ONTAP 8.2.x and 8.3)

- Qtree SnapMirror relationships

  Volumes with qtrees that are the source of a qtree SnapMirror relationship can be transitioned, but the qtree SnapMirror relationship is not transitioned. A volume with a qtree that is the destination of a qtree SnapMirror relationship can be migrated only after the qtree SnapMirror relationship is broken.

- Disaster recovery vFiler unit

  Volumes that are the source of a disaster recovery vFiler unit can be migrated; however, the disaster recovery vFiler unit is not transitioned. A volume that is the destination of a disaster recovery vFiler unit can be migrated only after the disaster recovery relationship is deleted.

- NDMP configuration

  After the transition is complete, you must manually set up backup policies for the transitioned volumes in ONTAP.

  Data protection using tape backup

- Synchronous SnapMirror relationships

  This feature is not supported in ONTAP; however, the volumes that are part of the relationship can be transitioned.

Considerations for using SnapMirror for transition

You can create data copy schedules and customize the SnapMirror data transfers for transition operations without affecting the existing 7-Mode to 7-Mode SnapMirror or SnapVault operations.

Maximum number of concurrent SnapMirror transfers

During transition, the maximum number of concurrent SnapMirror transfers supported on the 7-Mode and ONTAP systems depend on the number of volume SnapMirror replication operations allowed for a specific storage system model.

For information about the maximum number of concurrent volume SnapMirror transfers for your system model, see the Data ONTAP Data Protection Online Backup and Recovery Guide for 7-Mode.

Data copy schedules

- The number of concurrent SnapMirror transfers that the tool uses for running the SnapMirror operations (baseline, update, or resynchronization) is based on the schedules you configure while creating the project.
- If different projects are transitioning volumes from the same 7-Mode controller, you must ensure that the data copy schedules do not overlap across different projects.
- You can ensure that your existing backup and disaster recovery (DR) operations are not impacted by the 7-Mode Transition Tool transition operations in the following ways:
  - You should create SnapMirror data copy schedules for a project such that it does not overlap with the existing 7-Mode SnapMirror or SnapVault schedules.
  - You should configure the number of concurrent SnapMirror transfers to run in such a way that the existing 7-Mode SnapMirror or SnapVault schedules do not fail.

    You can also release some transfers by editing the active schedule and modifying the maximum number of concurrent volume SnapMirror transfers to zero.

- You must ensure that the number of concurrent SnapMirror transfers and the throttle configured for the operations (precutover, cutover, and on-demand update) are available on the 7-Mode storage system for the entire duration of the operation.

  The cutover operation fails if the final incremental update operation fails even for one of the volumes in the project.

- For secondary projects, after cutover, the incremental SnapMirror updates for the SnapMirror relationship between the 7-Mode primary volumes and the ONTAP secondary volume is based on the 7-Mode to 7-Mode SnapMirror relationship schedule.

  You must ensure that there are sufficient concurrent SnapMirror transfers available on the 7-Mode primary controller for these updates to occur.

Using multiple paths for transition

You can specify two paths for transition by using a data copy IP address and a multipath IP address. However, both paths can be used only for load-balancing, not for failover.

Related information

Considerations for creating a data copy schedule

Creating a data copy schedule for SnapMirror transfers

Guidelines for deciding when to perform cutover

Because transition cutover is disruptive to clients, you must plan the activity to minimize the downtime. You must schedule the cutover during a low-activity window. You should update the ONTAP volumes and wait for the transfers to complete before disconnecting clients and initiating storage cutover for reducing the downtime.

You must keep monitoring the SnapMirror status for each volume. If the last transfer duration of the previous few updates for the volume is within an acceptable limit, most of the data changes in the volume should have been copied and the time for final data update during cutover should be within the acceptable limit.

You can derive the approximate downtime depending on the number of volumes that are transitioned.

To minimize the cutover time, the network latency between the 7-Mode Transition Tool and storage systems should be minimum. For transitioning a volume SnapMirror relationship, the network latency between the tool and the primary systems should be minimum.

Related information

Performing on-demand SnapMirror updates

Impact of takeover and giveback on transition

Transition operations, such as transition prepare, start, pause, resume, or complete, fail during a controller takeover or giveback.

If a transition operation fails due to a takeover, you must wait for the giveback to finish, and then run the transition operation again.

If a controller takeover occurs during a baseline transfer, the transfer fails. To resume the baseline transfer from the point where it was aborted, you must wait for the giveback to finish.

Data copy resumes based on the configured schedule.

Migrating data and configuration from 7-Mode volumes

To migrate volumes or a volume SnapMirror relationship by using the 7-Mode Transition Tool, you must first configure projects, start a baseline copy, and complete the projects.

- The 7-Mode controllers and clusters that you want to include in the transition must be reachable from the Windows host where the tool is installed.
- You must have all administrator-level privileges for the controllers and clusters that you want to include in the transition project.
- The 7-Mode Transition Tool service must be running on the machine on which it is installed.

  The service is set to automatic by default, and should start when you restart the machine.

- You should not perform assessment and migration operations on a controller simultaneously.
- You should not modify the objects (volumes, IP addresses, system information, and so on) on the 7-Mode controllers and clusters after fixing errors and warnings that are reported by precheck.
- You should avoid using multiple web interface sessions that are writing to the same SVM simultaneously to prevent undesired results.
- You should avoid modifying the controller and cluster passwords during the transition process.
- You should avoid using the **Back**and **Forward** browser buttons, as the tool does not support web browser navigation and might cause undesired results.
- You should avoid browser refresh while transition is in progress, because it might cause undesired results.

The following image illustrates the migration process:

Related information

How you transition a stand-alone volume

How you transition volumes in a SnapMirror relationship

Transition preparation checklist

Before you start transition, you should verify that you have met all of the prerequisites for transition.

ONTAP version requirements

Item	Yes
Supported 7-Mode version NetApp Interoperability Matrix Tool	

<table>
<tr><th>Item</th><th>Yes</th></tr>
<tr><td>Your cluster must be running one of the following Data ONTAP versions:
Data ONTAP 8.2.x
Data ONTAP 8.3.x</td><td></td></tr>
<tr><td>You must transition to one of the following ONTAP releases:
Using 7-Mode Transition Tool 3.3.3:
ONTAP 9.8 or earlier supported releases
Using 7-Mode Transition Tool 3.3.2:
ONTAP 9.7P2 or later 9.7 P release (earlier 9.7 releases are not supported)
ONTAP 9.6P7 or later 9.6 P release (earlier 9.6 releases are not supported)
ONTAP 9.5 or earlier ONTAP 9 release
Clustered Data ONTAP 8.1.4P4 or later 8.x release
Using 7-Mode Transition Tool 3.3.1:
ONTAP 9.5 or earlier ONTAP 9 release
Clustered Data ONTAP 8.1.4P4 or later 8.x release</td><td></td></tr>
</table>

Licensing requirements

Item	Yes
SnapMirror license is enabled on the 7-Mode system	
SnapMirror licenses are enabled on the primary and secondary clusters for transitioning a volume SnapMirror relationship	
CIFS license is enabled on the cluster, if it is enabled on the 7-Mode system	
NFS license is enabled on the cluster, if it is enabled on the 7-Mode system	
iSCSI license is enabled on the cluster, if it is enabled on the 7-Mode system	

Item	Yes
FC license is enabled on the cluster, if it is enabled on the 7-Mode system	
Other feature licenses, if available on the 7-Mode system, are added to the cluster	

SnapMirror requirements on the 7-Mode system

Item	Yes
SnapMirror license	
`options snapmirror.enable on`	
`options interface.snapmirror.blocked ""`	
Verify if one of the following is true: • The `snapmirror.access` option is set to all • The `snapmirror.access` option is set to the IP addresses of all the intercluster LIFs on the cluster • If the `snapmirror.access` option is set to `legacy` and the `snapmirror.checkip.enable` option is `off`, the SVM name is added to the `/etc/snapmirror.allow` file • If the `snapmirror.access` option is set to legacy and the `snapmirror.checkip.enable` option is `on`, the IP addresses of the intercluster LIFs are added to the `/etc/snapmirror.allow` file	

Volume settings on the 7-Mode system

Item	Yes
Volume is online	
Volume is not restricted	

Item	Yes
The following volume options are disabled: • `no_i2p` • `read_realloc` • `nvfail`	

Managing access to the cluster

Item	Yes
SSL is enabled `system services web show`	
HTTPS is allowed on the cluster-management LIF `system services firewall policy show`	

Managing access to the 7-Mode system

Item	Yes
HTTPS is enabled `options httpd.admin.ssl.enable on`	

SSL is enabled
`secureadmin setup ssl`
`options ssl.enable on`	

SSLv2 and SSLv3 are disabled
`options ssl.v2.enable off`
`options ssl.v3.enable off`	

Networking requirements

Item	Yes
Cluster is reachable using the cluster-management LIF	

Item	Yes
One or more intercluster LIFs are set up on each node of the cluster For multipathing, two intercluster LIFs are required on each node	
Static routes are created for the intercluster LIFs	
7-Mode system and cluster are reachable from the Windows system on which 7-Mode Transition Tool is installed	
NTP server is configured and the 7-Mode system time is synchronized with the cluster time	

Port requirements

Item	Yes
7-Mode system • 10565/TCP • 10566/TCP • 10567/TCP • 10568/TCP • 10569/TCP • 10670/TCP • 80/TCP • 443/TCP	
Cluster • 10565/TCP • 10566/TCP • 10567/TCP • 10568/TCP • 10569/TCP • 10670/TCP • 11105/TCP • 80/TCP • 443/TCP	

NFS requirements

Item	Yes
NFS license is added to the cluster	
DNS entry must be configured for AD domain on the SVM	
NFS is added to the list of allowed protocols for the SVM	
Clock skews between KDC and the cluster is less than or equal to 5 minutes	

CIFS requirements

Item	Yes
CIFS license is added to the cluster	
If MultiStore license is enabled, CIFS must be added to the list of allowed protocols for the vFiler unit that owns the transitioning volumes	
CIFS is set up and running on the 7-Mode system	
Authentication type in 7-Mode for CIFS is Active Directory (AD) or Workgroup	
CIFS is added to the list of allowed protocols for the SVM	
DNS is configured for the SVM	
CIFS server is configured for the SVM	
CIFS is running on the SVM	

Related information

Preparing for copy-based transition

Adding controllers and clusters

Before you start the transition, you must add the 7-Mode controllers and clusters that are required for the transition. The 7-Mode controllers that are included for assessment are automatically added for migration.

- The 7-Mode controller and cluster information that you provide is not persistent.

  If the 7-Mode Transition Tool service is restarted, the tool prompts you for information about controllers and clusters that are part of active projects. You must provide the same host name that you provided for your system when you created the project.

- If a 7-Mode controller is part of an HA pair, the tool does not request for credentials of the HA partner of the 7-Mode controller (unless the HA partner is part of another active project.)

  1. From the top pane, click **Storage Systems**.
  2. In the **Hostname** field, enter the FQDN or IP address of the 7-Mode controller or the ONTAP system.

     For a cluster, you can specify the IP address or FQDN of the cluster-management interface. For a 7-Mode controller, you must specify the IP address of the default vFiler unit, because the IP addresses of individual vFiler units are not accepted.

Steps

1. Enter the administrator credentials for the specified host, and then click **Add**.

   The 7-Mode controllers are added to the “7-Mode Controllers” table and clusters are added to the “Clustered Data ONTAP Systems” table.

2. Repeat Steps 2 and 3 to add all of the controllers and clusters that you require for the transition.
3. If the Status column indicates that the credentials of the system are missing or the credentials have changed from what was initially entered in the tool, click the  icon, and then enter the credentials again.

Creating a transition project

Creating a transition project includes selecting and mapping 7-Mode volumes to the storage virtual machine (SVM), mapping interfaces, and creating data copy schedules for SnapMirror relationships.

You must have created the required SVM on the cluster.

All of the volumes within a project are migrated to the same SVM. If you want to migrate the volumes to different SVMs, you must create multiple projects.

If the target cluster is running Data ONTAP 8.3.1 or earlier and you want to run the precutover operation in read/write mode for NAS volumes, then you must create separate projects for the NAS volumes and SAN volumes. This action is required because the precutover read/write mode is not supported if you have SAN volumes in your project.

If the project contains SnapLock Compliance volumes and you want to run the precutover operation in read/write mode for non-SnapLock Compliance volumes, then you must create separate projects for SnapLock Compliance volumes and non-SnapLock Compliance volumes. This action is required because the precutover read/write mode is not supported if you have SnapLock Compliance volumes in your project.

Steps

1. Select the **Copy-Based Transition** migration method from the homepage, and then click **Start Planning**.

   If the controller and cluster that are required by the new project have not been added, you can enter the details in the Enter Device Credentials pane.

2. Verify that all of the required Data ONTAP operating in 7-Mode systems and ONTAP systems are added to the tool, and then click **Next**.

   The Select Source Volume page appears.

3. Select the 7-Mode volumes that you want to transition.

   a. From the 7-Mode Controller pane, select the 7-Mode controller or the vFiler unit from which you want to add volumes.

   b. Add the volumes that you want to include in the project group:

If you want to transition…	Then…
Stand-alone volumes	Select **Transition as stand-alone** for the volumes that you want to transition. A stand-alone project is created if you select the first volume from this column.
Volume SnapMirror relationship	i. Select **Transition with SnapMirror Relationship** for all of the primary volumes. Two projects are created: a primary project for the primary volumes and a secondary project. ii. **Optional:** If the secondary controller is not included in the project, enter the details for the controller in the Need additional storage system credentials dialog box.

   If you have at least one LUN in your volume, the volume type is shown as SAN.

   The hyperlink that is provided on the volume name opens a dialog box that lists the qtrees and LUNs in the volume and their attributes.

   It is a best practice to have all of the volumes within a single project to be of the same definition (stand-alone, primary, or secondary). For example, a project should contain all stand-alone volumes rather than a mix of stand-alone and SnapMirror relationships.

   c. After you have selected all of the volumes that you want to include in the project, click **Create Project and Continue**, enter the project name and project group details from the dialog box that appears, and then click **Save** to create the project.

4. Select the 7-Mode IP address and multipath IP address to be used for SnapMirror data copy.

   a. Enter the 7-Mode data copy IP address.

      By default, this field is prepopulated with the management IP address of the 7-Mode system. If required, you can change this IP address to any valid IPv4 address with data copy permission.

   b. If you want to use multiple paths for load balancing the data transfers, enter an IP address in the IP Configuration pane, and then click **Next**.

5. From the Select SVM page, select the target cluster and SVM and follow these steps:

a. Select the target cluster by clicking on the cluster name in the Select a Clustered Data ONTAP System drop-down list.

   The SVMs are loaded in the Select SVM pane.

b. Select the target SVM to transition the volumes from the Select SVM pane.

c. Click **Next**.

For transitioning 7-Mode volumes to a MetroCluster configuration in ONTAP, the SVM subtype must be `sync-source`.

+
If you select an SVM that belongs to clustered Data ONTAP 8.2, a dialog box is displayed to confirm whether local users and groups or CIFS shares or files are configured on the 7-Mode storage system. The 7-Mode Transition Tool does not support the transition of local users and groups to clustered Data ONTAP 8.2. If you have local users and groups, you can select an SVM that belongs to ONTAP 8.2.1 and later supported releases.

6. In the SVM audit logs destination path dialog box, enter a path on the destination SVM to enable transition of the audit configuration from the 7-Mode storage system.

   This path is used to save the audit logs in the ONTAP system.

7. From the Map Volumes page, select the target volumes for transition to map each source volume to the required aggregate.

   a. From the Map Origin Volumes to Aggregates on Target Cluster pane, select the aggregates to which the 7-Mode volumes must be copied.

   b. To change the name of the target volume on the cluster, enter a different name in the **Target Volume** field.

   c. Click **Next**.

   If all of the volumes and qtrees that are included in the project are configured to serve only NFS requests, then you do not have to provide the audit path because the audit configuration is not transitioned (even if you provide the audit path, this input is ignored) .

8. From the Network Configuration pane, provide information about the LIFs that must be created on the SVM.

   FC and iSCSI LIFs cannot be transitioned. You must manually create them on the SVM.

If you want to…	Then…
Transition an existing 7-Mode IP address	a. Click **Select 7-Mode LIF**. b. Select the required 7-Mode IP addresses, and provide target node and target port details. c. Click **Save**.

If you want to…	Then…
Create a new LIF	a. Click **Add New LIF**. b. In the dialog box that appears, enter the details for the new LIF. c. Click **Save**.

To provide network connectivity after a successful transition, you must transition the 7-Mode IP addresses to a similar network topology in ONTAP. For example, if the 7-Mode IP addresses are configured on physical ports, the IP addresses should be transitioned to appropriate physical ports in ONTAP. Similarly, IP addresses configured on VLAN ports or interface groups should be transitioned to appropriate VLAN ports or interface groups in ONTAP.

9. After you add all the required IP addresses, click **Next**.
10. In the Configure Schedule page, configure the data copy schedules for baseline and incremental transfers, the number of concurrent volume SnapMirror transfers, and the throttle limit for the SnapMirror transfers for transition.

    You can provide data copy schedules and a throttle limit to effectively manage your DR and transition data copy operations. You can create multiple schedules, with a maximum of seven schedules for each project. For example, you can create customized schedules for weekdays and weekends.

    > The schedules are effective based on the source 7-Mode controller time zone.

    a. In the Configure Schedule pane, click **Create Schedule**.
    b. In the Create Data Copy Schedule dialog box, enter a name for the new schedule.
    c. In the Recurring Days pane, select **Daily** or **Select Days** to specify the days on which the data copy operations should run.
    d. In the Time Interval pane, specify the **Start Time** and **Duration** for the data transfers.
    e. In the Time Interval pane, either specify the **Update Frequency** for the incremental transfers or select **Continuous Update**.

       If you enable continuous updates, the updates start with a minimum delay of 5 minutes, depending on the availability of concurrent SnapMirror transfers.

    f. In the Parameters for Transition Data Copy Operations (based on Volume SnapMirror) pane, specify the maximum number of concurrent volume SnapMirror transfers (as a percentage of available SnapMirror transfers at run time and as a number) and the throttle limit (maximum bandwidth for all of the volumes in the project).

       > The default values that are provided in the fields are the recommended values. When changing the default values, you must analyze the 7-Mode SnapMirror schedules and ensure that the values that you provide do not affect these schedules.

    g. Click **Create**.

       The new schedule is added to the Transition Schedule pane.

    h. After you add all of the required data copy schedules, click **Next**.

11. If you have SnapLock volumes to transition, plan the volumes that require Chain of Custody verification after transition.

    a. Select the source SnapLock volumes that require Chain of Custody verification.

       The Chain of Custody verification process is supported only for read/write 7-Mode SnapLock volumes and is not supported for read-only volumes. Only SnapLock volumes that have file names with ASCII characters are supported for Chain of Custody verification.

    b. Provide details about the ONTAP volume that will be used to store the fingerprint data generated during the Chain of Custody verification operation.

       The ONTAP volume must already exist on the specified SVM.

    c. Click **Next**.

Related information

Considerations for creating a data copy schedule

Creating a data copy schedule for SnapMirror transfers

Managing SnapMirror transfers and schedule

Customizing the transition of 7-Mode configurations by using the CLI

Managing logical interfaces

Removing volumes from a project

Customizing the transition of 7-Mode configurations

When planning the transition of configurations from 7-Mode to ONTAP, you can customize the configuration transition in two ways. You can ignore or skip the transition of one or more configurations. You can consolidate the 7-Mode NFS export rules, and then reuse an existing NFS export policy and Snapshot policy on the target SVM.

You must perform this task before you apply the configuration (precutover) phase. This is because after this phase, the Plan Configuration pane is disabled for any modification. You use the command-line interface (CLI) of the 7-Mode Transition Tool for excluding the configurations that are applied during the cutover phase.

The 7-Mode Transition Tool does not perform prechecks for the configuration that is excluded.

By default, all 7-Mode configurations are selected for transition.

It is a best practice to run the prechecks with all configurations first, and then exclude one or more configurations in the subsequent run of the prechecks. This helps you to understand which configurations are excluded from transition and which prechecks are skipped subsequently.

Steps

1. From the Plan Configuration page, select the following options from the **SVM Configuration** pane:
    - For excluding the transition of configurations, clear the check box for those configurations.
    - For consolidating similar 7-Mode NFS export rules to a single export policy in ONTAP, which can then be applied to the transitioned volume or qtree, select the **Consolidate NFS Export Policies on 7-**

Mode check box.

- For reusing an existing NFS export policy on the SVM that matches the export policy that will be created by the tool, which can then be applied to the transitioned volumes or qtrees, select the **Reuse Export Policies of SVM** check box.
- For consolidating similar 7-Mode Snapshot schedules to a single Snapshot policy in ONTAP, which can then be applied to the transitioned volume, select the **Consolidate 7-Mode Snapshot Policies** check box.
- For reusing an existing Snapshot policy on the SVM that matches the Snapshot policy that will be created by the tool, which can then be applied to the transitioned volumes, select the **Reuse Snapshot Policies of SVM** check box.

2. Click **Save and go to Dashboard**.

Related information

Supported and unsupported CIFS configurations for transition to ONTAP

NFS transition: supported and unsupported configurations, and required manual steps

Name services transition: supported and unsupported configurations, and required manual steps

SAN transition: supported and unsupported configurations, and required manual steps

Examples of consolidating NFS export rules and Snapshot schedules for transition

Configurations that can be excluded from transition

Running prechecks

You can run prechecks to identify any issues before you start a transition. Prechecks verify that the 7-Mode sources, ONTAP targets, and configurations are valid for your transition. You can run prechecks any number of times.

The prechecks run more than 200 different checks. For example, the tool checks for items such as if volumes are online and network access exists between the systems.

Steps

1. From Dashboard, select the project for which you want to run the prechecks.
2. Click **Run Prechecks**.

   After the prechecks are complete, the result summary is displayed in the dialog box.

   > ⓘ The prechecks usually take only a few minutes to run, but the duration of the precheck phase depends on the number and type of errors or warnings that you resolve.

3. Choose an option under **Apply Type Filter** to filter the results:
   - To view all messages related to security, select **Error**, **Warning**, **Informational**, and **Security Only**.
   - To view all error messages related to security, select **Error** and **Security Only**.
   - To view all warning messages related to security, select **Warning**and **Security Only**.
   - To view all informational messages related to security, select **Informational** and **Security Only**.

4. To save the raw results in comma-separated values (CSV) format and export the results, click **Save As CSV**.

   You can view the transition operations that have been performed during the transition along with the operation type, status, start time, end time, and results in the Operation History tab on the Dashboard pane.

You must resolve all the errors detected by the prechecks before you start data copy. It is also a best practice to resolve all warnings prior to proceeding with the migration process. Resolution can be resolving the source issue of the warning message, implementing a workaround, or accepting the result of the issue.

Severity levels for precheck messages

You can verify whether the 7-Mode volumes can be transitioned by running the transition precheck operation. Transition precheck reports all the transition issues. Transition issues are assigned different severity levels, depending on the impact of the issue on the transition process.

The issues detected by the prechecks are classified into the following categories:

- **Error**

  Configurations that cannot be transitioned.

  You cannot continue the transition if there is even one error. The following are a few example configurations on the 7-Mode system that cause an error:

  - Traditional volumes
  - SnapLock volumes
  - Offline volumes
- **Warning**

  Configurations that can cause minor problems after transition.

  Features that are supported in ONTAP, but are not transitioned by the 7-Mode Transition Tool, also generate a warning message. You can continue the transition with these warnings. However, after the transition you might lose some of these configurations or might have to complete some manual tasks for enabling these configurations in ONTAP.

  The following are a few example configurations on the 7-Mode system that generate a warning:

  - IPv6
  - NFSv2
  - NDMP configurations
  - Interface groups and VLANs
  - Routing Information Protocol (RIP)
- **Information**

  Configurations that have been successfully transitioned.

Starting baseline data copy

After you create a project and complete the precheck operation, you must initiate data copy from the 7-Mode volumes to ONTAP. You can start baseline data copy operation for individual projects. You should stop unnecessary system processes and network activity during the data copy.

You must have created at least one data copy schedule.

You can estimate the time to complete baseline transfers and evaluate the performance achieved by volume SnapMirror transfers in your environment by performing a test migration. The following are some of the factors that can affect performance:

- Transition data copy schedule options selected

  This schedule controls both the maximum number of SnapMirror concurrent transfers and the maximum bandwidth to be used for the transfers.

- Maximum number of concurrent volume SnapMirror transfers supported by the 7-Mode source controllers
- Network bandwidth between the 7-Mode source and ONTAP destination controllers

  Network traffic that is unrelated to the migration activity must be minimized so that the throughput is maximized and response time is minimized between the source and destination systems.

- Performance capabilities of both the source and destination controllers

  The source and destination systems should have optimum CPU utilization and memory available.

- Number of 7-Mode volume SnapMirror transfers occurring during the data copy

Steps

1. From Dashboard, select the project for which you want to start the baseline data copy.
2. Click **Start Baseline**.

   The precheck is run once again in the background, and if no errors are detected, the baseline transfer is started based on the data copy schedule. The Operation Progress dialog box displays the information about the status of the precheck operations run during the baseline data copy.

3. Click the **Volumes** tab to view the status and progress of the baseline transfer.

   To view the detailed SnapMirror details of each volume, you can click **View Transition Details**. The number of concurrent SnapMirror transfers is based on the input provided in the schedule that is currently active. You can track the active schedule from the Data Copy Schedule tab on Dashboard.

   After the baseline data copy operation is completed, the incremental SnapMirror updates start based on the schedule provided while creating the project.

Related information

Creating a data copy schedule for SnapMirror transfers

Applying 7-Mode configurations

After the baseline data copy is completed, you can copy and apply all configurations from the 7-Mode system (including protocols and services configuration) to the ONTAP volumes. If the target cluster is running any version from ONTAP 8.3.2 and later supported releases, SAN configuration is transitioned in this phase.

If you are transitioning SAN volumes, you must have created at least one data LIF of the appropriate protocol (iSCSI or FC) for every node in the cluster.

- The configurations are applied in the apply configuration (precutover) phase, which has two modes: precutover read-only mode and precutover read/write mode.

The precutover read/write mode is not supported when the project contains:

- SAN volumes and the target cluster is running Data ONTAP 8.3.1 or earlier. In this situation, the following configurations are not applied in the precutover phase, instead they are applied during the cutover phase:
  - SAN configurations
  - Snapshot Schedule configurations
- SnapLock Compliance volumes.

  If the project contains SnapLock Compliance volumes, then the Snapshot Schedule configurations are not applied in the precutover phase, instead these configurations are applied during the cutover phase.

  See Considerations for transitioning of SnapLock Compliance volumes.

Steps

1. From the Dashboard, select the project.
2. Apply the configurations:

If you want to apply all configurations in…	Then…
Read-only mode	Click **Apply Configuration**.
Read/write mode	a. Select the **Test Mode** check box. b. Click **Apply Configuration**. The ONTAP volumes are made read/write and you can test the configurations and data access operations. c. Select **Apply configuration in test mode** in the Apply Configuration (Precutover) dialog box.

3. Select the **Customize the number of concurrent SnapMirror transfers and Throttle limit for this operation** check box to specify the number of SnapMirror data copy operations and throttle limit:
   a. Enter the maximum number of concurrent SnapMirror transfers to run during transition.
   b. Enter the percentage of available streams that can be used for SnapMirror transfers.

By default, the tool uses 50% of the available volume SnapMirror transfers.

c. Either enter a throttle limit or select **Maximum** to use the maximum bandwidth.

By default, the tool uses maximum throttle for configuration transition.

4. Select the **Transition Kerberos Configuration** check box to provide UNIX-based or Microsoft AD based Kerberos server configuration details for transition.

> This option is enabled only when Kerberos is configured on the source 7-Mode storage system.

a. Enter the Kerberos server details such as the host name, IP address, user name, and password.

> To transition the Kerberos configuration, at least one LIF has to be transitioned as part of the project and the LIF must be resolvable to a host name.

5. Click **Continue**.

   The Operation Progress dialog box is displayed, and the copy configuration operation is started.

6. If the configuration transition is performed in read/write mode, click **Finish Testing** after the testing and verification of the configurations is complete.

   This mode should be used only for testing purposes. All data written to the cluster on the volumes being migrated during test mode is lost.

   The tool reestablishes the SnapMirror relationship and resynchronizes (based on the active schedule for that project at that time) the ONTAP volumes. Any data written to the 7-Mode is resynchronized with the ONTAP volumes.

> For a successful resynchronization, a common Snapshot copy must exist between the 7-Mode and clustered Data ONTAP volumes. You should not manually delete the common Snapshot copy; otherwise, resynchronization fails.

The 7-Mode IP addresses remain operational. The LIFs are configured on the storage virtual machine (SVM) in the following ways:

- Existing 7-Mode IP addresses are created in the administrative down state.

  During the storage cutover, these IP addresses are removed from the 7-Mode system and the corresponding storage virtual machine (SVM) LIFs are brought to the administrative up state. If you select the precutover read/write mode, you must use a different LIF to gain access to the volumes being migrated to the cluster.

- New IP addresses are created in the administrative up state.

  If you select the precutover read/write mode, these LIFs can be used for testing access to the volumes being migrated in the cluster.

Related information

Managing logical interfaces

[Considerations for quotas](#)

[7MTT v2.0/Transitioned Data ONTAP features](#)

Configuring zones by using the FC zone plan

Before transitioning a SAN FC environment, you must configure zones by using the FC zone planner to group the initiator hosts and targets.

- The cluster and initiator hosts must be connected to the switch.
- The FC zone script file must be accessible.

Steps

1. If there are any changes to the igroup configurations on the 7-Mode systems, modify and regenerate the FC zone plan.

   Generating an assessment report by adding systems to the 7-Mode Transition Tool

2. Log in to the CLI of the switch.
3. Copy and execute the required zone commands one at a time.

   The following example runs the zone commands on the switch:

   ```
   switch1:admin>config terminal
   # Enable NPIV feature
   feature npiv
   zone name auto_transition_igroup_d31_194bf3 vsan 10
   member pwwn 21:00:00:c0:dd:19:4b:f3
   member pwwn 20:07:00:a0:98:32:99:07
   member pwwn 20:09:00:a0:98:32:99:07
   .......
   .......
   .......
   copy running-config startup-config
   ```

4. Verify the data access from the cluster by using the test initiator hosts.
5. After the verification is complete, perform the following steps:
   a. Disconnect the test initiator hosts.
   b. Remove the zone configuration.

Performing on-demand SnapMirror updates

You can perform SnapMirror incremental updates for all the volumes before the cutover operation to reduce the cutover time.

- You cannot perform on-demand SnapMirror updates when incremental data transfers are scheduled after baseline data copy and after precutover operation.

- This is an optional task.
  1. Click **Update Now** to perform a manual SnapMirror update.

     The Transition Update dialog box is displayed, where you can choose to customize the number of SnapMirror transfers and throttle limit for this operation.

  2. Select the **Customize the number of concurrent SnapMirror transfers and Throttle limit for this operation** check box to specify the number of SnapMirror data copy operations and throttle limit.
     a. Enter the maximum number of concurrent SnapMirror transfers to run during transition.
     b. Enter the percentage of available streams that the tool can use for SnapMirror transfers.

        By default, the tool uses 50% of the available volume SnapMirror transfers.

     c. Enter the throttle limit to use the maximum bandwidth.

        By default, the tool uses maximum throttle for configuration transition.

  3. Click **Continue**.

Related information

Starting baseline data copy

Creating a data copy schedule for SnapMirror transfers

Completing a transition project

You can complete a transition by completing the individual projects. Because this operation is disruptive, you should evaluate when to run it. When transitioning volumes in a SnapMirror relationship, the secondary project must be completed before completing the transition of the primary project.

The storage cutover is completed in a few minutes. The time required for the clients to remount the data varies. The timing of the storage cutover or outage window depends on the following factors:

- Final update

  The final update of the data depends on the amount of change in the source data since the last update. Incremental transfers minimize the amount of data that has to be transferred during cutover.

- Reconnecting clients

  If updates are required for each client to connect to the cluster, the number of clients that have to be updated determines the cutover time.

Outages apply only to the volumes that are being migrated. You do not need to shut down the entire source 7-Mode storage system. Volumes on the source system that are not being migrated can remain online and accessible.

1. From the Migration Dashboard, select the project that you want to complete.
2. Disconnect client access manually.

3. Click **Complete Transition**.

    a. If you want to keep the 7-Mode source volumes online after the transition, clear the **Take source volumes offline after transition** checkbox.

       By default, this option is selected, and the source volumes are taken offline.

    b. If you have selected SnapLock volumes for Chain of Custody verification, select the **I understand that I must not take 7-Mode SnapLock volumes offline during Chain of Custody verification** checkbox to keep the SnapLock volumes online after transition.

    c. If you have selected the transition of a SnapMirror relationship between clusters that are running ONTAP 9.3 or later supported releases, select the **I understand that I must manually convert SnapMirror relationship type from data_protection to extended_data_protection** checkbox.

    d. Select the **Customize the number of concurrent SnapMirror transfers and Throttle limit for this operation** checkbox to specify the number of SnapMirror data copy operations and the throttle limit.

    e. Click **Continue**.

    The results of the cutover operation are displayed.

The 7-Mode IP addresses selected for the transition are unconfigured from the 7-Mode storage system, and the associated LIFs created before the cutover are brought to the administrative up state. The 7-Mode volumes are offline.

From the cluster, run the vserver check lif-multitenancy run command to verify that the name servers are reachable by using the transitioned LIFs.

> If you have created a new LIF, the users and applications of the transitioned volumes must be remapped to the drives by using the new IP addresses and ports after all of the projects have been completed.

If you have completed the transition of a SnapMirror relationship between clusters that are running ONTAP 9.3 or later supported releases, you must convert the SnapMirror relationship from type DP to type XDP.

Data protection

Related information

Guidelines for deciding when to perform cutover

Completing the Chain of Custody verification

If one or more SnapLock volumes are selected for Chain of Custody verification, then you must perform the Chain of Custody operation to generate a Chain of Custody report.

You must have completed the transition of the project.

SnapLock Chain of Custody operation is supported for volumes with files that have file names with only ASCII characters.

1. From the Migration Dashboard, click **Start Chain of Custody**.

   If you want to keep the 7-Mode SnapLock volumes online after the Chain of Custody verification, you should clear the **Take 7-Mode SnapLock volumes selected for Chain of Custody verification offline**

after Chain of Custody verification operation is completed check box.

2. Click **Continue**.

   The Chain of Custody verification operation is initiated. This operation can take a significant amount of time based on the number of files on the SnapLock volumes. You can click **Run in Background** to perform the operation in the background.

   You can track the progress of the Chain of Custody verification operation by clicking the SnapLock Chain of Custody tab in the Migration Dashboard window. This tab displays per volume progress of the Chain of Custody operation.

3. After the Chain of Custody operation is complete, click **Download Report** in the SnapLock Chain of Custody tab to download the Chain of Custody verification report.

   The Chain of Custody verification report contains details about whether the SnapLock Chain of Custody verification succeeded. The report shows the total file count and the number of non-WORM files in each of the 7-Mode SnapLock volumes that are selected for the Chain of Custody operation. You can also verify the number of files for which the fingerprints matched and unmatched. The report also shows the number of WORM files for which the Chain of Custody verification failed and reason for the failure.

Transitioning volumes by using the 7-Mode Transition Tool CLI

The 7-Mode Transition Tool provides commands that enable you to transition 7-Mode volumes. If you have the 7-Mode Transition Tool installed on a Linux system, you must use the CLI to perform the transition.

The tool collects the 7-Mode storage system’s volume and IP address information, verifies the 7-Mode configuration, and interacts with the cluster to apply the configuration on the SVM.

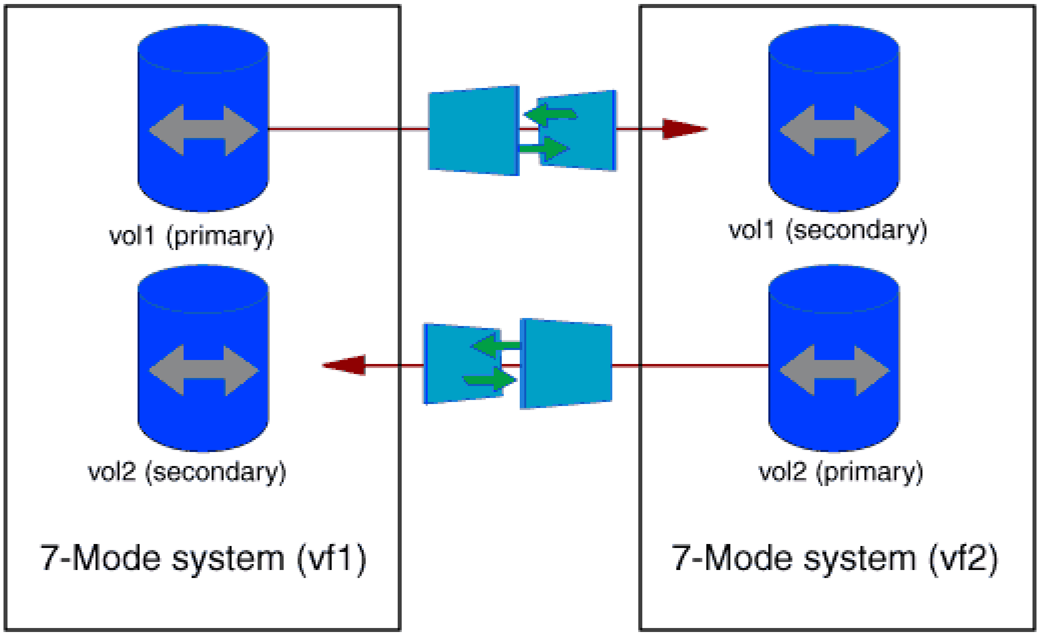
Scenarios for selecting volumes in a project

Planning a project composition and deciding which 7-Mode volumes to transition in a single transition operation can help in reducing the downtime for applications. Understanding some sample scenarios can help you while creating projects in your environment.

Bidirectional SnapMirror relationship

To transition a bidirectional SnapMirror relationship, you must create different transition projects for each volume.

For example, as shown in the illustration below, consider a volume SnapMirror relationship that exists between vf1:vol1 (primary) on system1 and vf2:vol1 (secondary) on system2. Similarly, another volume SnapMirror relationship exists between vf2:vol2 (primary) on system2 and vf1:vol2 (secondary) on system1.



You cannot combine the volumes vf1:vol1 and vf1:vol2 in one transition project. Similarly, you cannot combine the volumes vf2:vol1 and vf2:vol2 in one transition project. You must create separate transition projects for each volume to transition the volume SnapMirror relationship.

Volumes with CIFS configuration

You must group volumes that have CIFS configuration in one project so that all the CIFS-related configuration is transitioned completely to the SVM.

For example, if 10 volumes in a 7-Mode system or a vFiler unit have associated CIFS shares, home-directory search path, and audit configuration, these 10 volumes must be transitioned in one project . This ensures that all the volumes and CIFS configuration are completely applied on the SVM after transition.

SnapMirror relationship between a primary volume and multiple secondary volumes

If a SnapMirror relationship exists between a primary volume and multiple secondary volumes and if all the secondary volumes are on the same 7-Mode controller, you can create a secondary project to group all the secondary volumes and complete the transition of all secondary volumes in that project. You can then create a primary project to transition the primary volume and complete the SnapMirror transition.

Transitioning volumes by using the 7-Mode Transition Tool CLI

The 7-Mode Transition Tool provides commands that enable you to transition 7-Mode volumes. If you have the 7-Mode Transition Tool installed on a Linux system, you must use the CLI to perform the transition.

The tool collects the 7-Mode storage system’s volume and IP address information, verifies the 7-Mode configuration, and interacts with the cluster to apply the configuration on the SVM.

Creating a transition project

You can create a transition project that identifies the 7-Mode objects to be transitioned and how they map to the ONTAP objects. While creating the project, the 7-Mode Transition Tool collects and saves the information about the transition objects. You can use this project information to perform the transition in stages.

You must have gathered the following information:

- Project type: Possible values are stand-alone, primary, or secondary
- FQDN or IP address of the 7-Mode storage system or the default vFiler unit, if MultiStore is licensed
- Administrative user name and password of the 7-Mode storage system
- List of 7-Mode volumes
- FQDN of the cluster or IP address of the cluster-management LIF
- SVM name

Steps

1. From the **Start** menu, click **All Programs** > **NetApp 7-Mode Transition Tool** > **NetApp 7-Mode Transition Tool (CLI) 3.0** to open the 7-Mode Transition Tool command prompt.
2. Add the user name and password of the systems that are a part of the transition project:

   `transition credentials add -h` ***`host_name`*** **`-u`** ***`user_name`***

   `host_name` is FQDN or IP address of the 7-Mode system or cluster.

   `user_name` is the administrative user name for the system.

   > You must repeat this step for each storage system that you want to add to the transition projects.

   ```
   7-Mode Transition Tool>transition credentials add -h system1.example.com
   -u root
   Enter password for 'root@system1.example.com':
   ```

3. Create a transition project:

   `transition cbt create -p` ***`project_name`*** **`-t`** ***`project_type`*** **`-n`** ***`7-Mode_system`*** **`-c`** ***`data-copy-ipaddress`*** **`[-f`** ***`vfiler_name`*** **`] [-h`** ***`cluster`*** **`-v`** ***`vserver_name`***

   `project_name` is the name of the transition project.

   `project_type` is the project type. Valid values are standalone, secondary, or primary.

   `7-Mode_system` is the FQDN or IP address of the 7-Mode system.

   `cluster` is the FQDN of the cluster or IP address of the cluster-management LIF.

   > The host names of your 7-Mode system and cluster must be the same as those you had provided while creating the project.

   `data-copy-ipaddress` is the IP address over which data is copied.

vfiler_name is the name of the nondefault vFiler unit.

vserver_name is the name of the SVM.

For a new SVM, you must provide the aggregate name of the root volume of the SVM with the `-g` option.

```
7-Mode Transition Tool>transition cbt create -p sample_project -t
standalone -n system1.example.com -n 10.238.55.33 -h
cluster1.example.com -v vs2
```

The transition project moves to the preparation state.

4. Add the 7-Mode volume and ONTAP volume to the project:

transition cbt volumepair add -p *project_name* -v *7-Mode_volume* -c *vserver_volume* -g *aggr_name* -t

7-Mode_volume is the 7-Mode volume name.

vserver_volume is the ONTAP volume on the SVM.

You can also add an ONTAP volume for which the baseline transfer has been completed. When you add such a volume in the preparation phase, only incremental transfers are performed during the data copy phase.

aggr_name is the aggregate on which the ONTAP volume *vserver_volume* is created during the start operation.

-t is used when a volume which is in SnapMirror relationships must be transitioned as standalone volume.

When a volume is transitioned as standalone volume, SnapMirror relationships are not preserved during the transition.

For SnapLock Compliance volumes that are in SnapMirror relationship, the transition of SnapMirror relationships for SnapLock Compliance volumes is not automated by the 7-Mode Transition Tool. All SnapLock Compliance volumes that are in SnapMirror relationship must be transitioned as standalone volumes (by specifying the flag -t) by including the volumes in standalone, primary, or secondary projects. You must then manually perform the SnapMirror resychronization operation between these volumes after the transition.

See Considerations for transitioning of SnapLock Compliance volumes

```
7-Mode Transition Tool>transition cbt volumepair add -p sample_project
-v vol1 -c vol1 -g aggr1
```

5. Add the IP addresses to be transitioned to the project:

transition cbt lif add -p *project_name* -i *ip-address* [-m *netmask*] [-g *default-gateway*] [-p *home_port*] [-n *home_node*]

To a transition project, you can also add existing IP addresses that are unconfigured or removed from the 7-Mode system during storage cutover, and new IP addresses that are not yet configured on either the 7-Mode or ONTAP.

FC and iSCSI LIFs are not transitioned by the 7-Mode Transition Tool.

```
7-Mode Transition Tool>transition cbt lif add -p sample_project -i
192.0.2.250 -m 255.255.255.128 -g 192.40.0.1 -p e0a -n cluster1-01
```

The new IP addresses are configured on the ONTAP system in the up state during the apply configuration (precutover) operation.

6. Follow these steps to add information to the primary and secondary project:

If you want to add information about the…	Enter…
Primary 7-Mode system to the secondary project	**transition cbt add-primary-seven-mode-system -p *project_name* -h *source-host* -f *management-ipaddress* -d *data-copy-ipaddress* [-m *multipathing-ipaddress*]** For more information, see CBT : How to provide all the required primary 7-Mode details for a given secondary project.
Secondary cluster or SVM to the primary project	**transition cbt add-secondary-cluster-mode-system -p *project_name* -h *c-mode-host-name* -v *vserver-name*** For more information, see the CBT: How to add the required secondary cluster details to the primary project

`project_name` is the name of the transition project.

`source-host` is the primary 7-Mode storage system host name or IP address as seen in the `snapmirror status` command output of the secondary 7-Mode system.

For considerations about providing the 7-Mode primary system details, see the man pages.

`management-ipaddress` is the management IP address of the source host.

`data-copy-ipaddress` is the IP address over which data is copied.

`multipathing-ipaddress` is the additional IP address that is used for data copy.

`c-mode-host-name` is the FQDN or IP address of the cluster to which the secondary volumes in the

project have been transitioned.

vserver-name is the name of the SVM hosting the secondary volumes.

7. Create a data copy schedule:

   transition cbt schedule add -p *project_name* -n *schedule_name* -d *days-range* -b *start-time* -e *duration* -u *update-frequency* -t *available-transfers-percentage* -c *max-cap-concurrent-transfers* -x *project-snapmirror-throttle*

   The following command shows how to add a schedule that uses 100% of available concurrent SnapMirror transfers. However, it does not exceed the 25 concurrent SnapMirror transfers at any point of time.

   transition schedule add -p sample_project -n dr_active -d 1-5 -b 23:30 -e 03:00 -c 25 -x 200 -u 00:30

8. View the detailed information about the transition project created:

   transition cbt show -p *project-name*

Customizing the transition of 7-Mode configurations by using the CLI

By default, all 7-Mode configurations are transitioned to ONTAP. You can choose to exclude some or all the volume, NFS, CIFS, SAN, and name services configurations from transition by using the 7-Mode Transition Tool CLI. You can also choose to consolidate the 7-Mode NFS export rules and Snapshot schedules, and reuse an existing NFS export policy and Snapshot policy on the target SVM.

You must perform this task before the configuration is applied, after which any modification will be ignored.

The 7-Mode Transition Tool does not perform prechecks for the configuration that is excluded.

By default, all 7-Mode configurations are selected for transition.

It is a best practice to run the prechecks with all configurations first, and then exclude one or more configurations in the subsequent run of the prechecks. This helps you to understand which configurations are excluded from transition and which prechecks are skipped subsequently.

Steps

- Exclude and verify the configurations:

  a. Exclude the configurations:

     transition cbt property-set -p *project_name* -n *config_property_name* -v true

     config_property_name is the configuration that you want to exclude.

     Configurations that can be excluded from transition

  b. Verify the value of the property that is set for excluding the configuration:

     transition cbt property-get -p *project_name* -n *config_property_name*

- Consolidate NFS export rules for transition:
  - Consolidate similar 7-Mode NFS export rules to a single export policy in clustered Data ONTAP, which can then be applied to the transitioned volume or qtree:

    transition cbt property-set -p *project_name* -n *nfs-consolidate-similiar-7mode-exports* -v true

    If the `nfs-consolidate-similiar-7mode-exports` property is set to `false`, the 7-Mode Transition Tool creates a new NFS export policy in ONTAP for each 7-Mode NFS export rule.

  - Reuse an existing NFS export policy on the SVM that matches the export policy that will be created by the tool, which can be applied to the transitioned volumes or qtrees:

    transition cbt property-set -p *project_name* -n *nfs-reuse-matching-svm-export-policies* -v true
- Consolidate Snapshot schedules for transition:
  - Consolidate similar 7-Mode Snapshot schedules to a single Snapshot policy in ONTAP, which can then be applied to the transitioned volume:

    transition cbt property-set -p *project_name* -n *consolidate-similar-7mode-snapshot-policies* -v true

    If the `consolidate-similar-7mode-snapshot-policies` property is set to false, the 7-Mode Transition Tool creates a new Snapshot policy in ONTAP for each Snapshot schedule.

  - Reuse an existing Snapshot policy on the SVM that matches the Snapshot policy that will be created by the tool, which can be applied to the transitioned volumes:

    transition cbt property-set -p *project_name* -n *reuse-matching-svm-snapshot-policies* -v true

Configurations that can be excluded from transition

You can customize the configuration transition by excluding some volume-level or SVM-level configurations for NFS, CIFS, SAN, and name services configurations from transition by specifying the property name with the `transition cbt property-set` command of the 7-Mode Transition Tool CLI.

NFS

7-Mode configuration to exclude	Property name
Export policies	`ignore-nfs-exports-transition`
NFS options	`ignore-nfs-options-transition`
All NFS configurations	`ignore-all-nfs-configurations-transition`

CIFS

7-Mode configuration to exclude	Property name
Local users and groups	`ignore-local-users-groups-transition`
Home directory paths	`ignore-cifs-home-directory-paths-transition`
Symbolic links	`ignore-cifs-symlinks-transition`
Widelinks	`ignore-cifs-widelinks-transition`
Shares and Share ACLs	`ignore-cifs-shares-and-acls-transition`
CIFS options	`ignore-cifs-options-transition`
Name mapping	`ignore-cifs-name-mapping-transition`
Audit configuration	`ignore-cifs-audit-transition`
Preferred domain controller list	`ignore-cifs-preferred-domain-controllers-list-transition`
All CIFS configurations	`ignore-all-cifs-configurations-transition`

Name services

7-Mode configuration to exclude	Property name
Netgroups	`ignore-netgroups-transition`
UNIX users and groups	`ignore-unix-users-groups-transition`
NIS	`ignore-nis-transition`
DNS	`ignore-dns-transition`
LDAP	`ignore-ldap-transition`
`/etc/nsswitch.conf` file	`ignore-nsswitch-transition`
LDAP-based user mapping	`ignore-nmswitch-transition`

7-Mode configuration to exclude	Property name
`/etc/hosts` files	`ignore-etc-hosts-transition`
All name services configurations	`ignore-all-nameservices-configurations-transition`

SAN

7-Mode configuration to exclude	Property name
igroup and LUN mapping	`ignore-igroup-and-lunmapping-transition`
All configurations	`ignore-all-san-configurations-transition`

Snapshot schedules

7-Mode configuration to exclude	Property name
Snapshot schedules	ignore-snapshot-schedule-transition If this option is set to true, the 'default' Snapshot policy is applied to the transitioned volumes.

Related information

Supported and unsupported CIFS configurations for transition to ONTAP

NFS transition: supported and unsupported configurations, and required manual steps

Name services transition: supported and unsupported configurations, and required manual steps

SAN transition: supported and unsupported configurations, and required manual steps

Examples of consolidating NFS export rules and Snapshot schedules for transition

You might want to review examples of how similar 7-Mode export rules and 7-Mode Snapshot schedules are consolidated to a single NFS export policy and a single Snapshot policy in ONTAP. You might also want to understand how the consolidated policies are assigned to the transitioned volumes or qtrees with or without reusing a matching existing policy on the target SVM.

Example of consolidating NFS export rules for transition

NFS export rules in 7-Mode and ONTAP before transition

7-Mode export rules

```
/vol/vol1       -sec=sys,rw,nosuid
/vol/vol2       -sec=sys,rw,nosuid
/vol/vol3       -sec=sys,rw,nosuid
```

Export policies existing in ONTAP

```
cluster-2::> vserver export-policy show -vserver vs1
Vserver          Policy Name
---------------  -------------------
vs1              default
vs1              export_policy_1
```

The existing export policy export_policy_1 has the following export rule:

```
cluster-2::> vserver export-policy rule show -vserver vs1 -policyname
export_policy_1
             Policy          Rule    Access   Client                RO
Vserver      Name            Index   Protocol Match                 Rule
------------ --------------- ------  -------- ---------------------
---------
vs1          export_policy_1 1       nfs      0.0.0.0/0             sys
```

Export policies in ONTAP after transition with consolidation (no reuse)

Volumes vol1, vol2, and vol3 have similar export rules in 7-Mode; therefore, a new consolidated export policy, transition_export_policy_1, is assigned to these volumes after transition:

```
cluster-2::> vserver export-policy show -vserver vs1
Vserver          Policy Name
---------------  -------------------
vs1              default
vs1              export_policy_1
vs1              transition_export_policy_1
3 entries were displayed.
```

```
cluster-2::> vserver export-policy rule show -vserver vs1 -policyname
transition_export_policy_1
             Policy          Rule    Access   Client                RO
Vserver      Name            Index   Protocol Match                 Rule
------------ --------------- ------  -------- ---------------------
---------
vs1          transition_export_policy_1
                             1       nfs      0.0.0.0/0             sys
```

```
cluster-2::> volume show -vserver vs1 -volume vol1,vol2,vol3 -fields
policy
vserver volume policy
------- ------ --------------------------
vs1     vol1   transition_export_policy_1
vs1     vol2   transition_export_policy_1
vs1     vol3   transition_export_policy_1
3 entries were displayed.
```

Export policies in ONTAP after transition with consolidation and reuse

Volumes vol1, vol2, and vol3 have similar export rules in 7-Mode; therefore, a consolidated export policy is assigned to these volumes after transition. The export policy, export_policy_1, which matches the 7-Mode export rules, already exists on the SVM. Therefore, the policy is applied to these volumes:

```
cluster-2::> vserver export-policy show -vserver vs1
Vserver          Policy Name
---------------  -------------------
vs1              default
vs1              export_policy_1
2 entries were displayed.
```

```
cluster-2::> vserver export-policy rule show -vserver vs1 -policyname
export_policy_1
             Policy          Rule    Access   Client                RO
Vserver      Name            Index   Protocol Match                 Rule
------------ --------------- ------  -------- ---------------------
---------
vs1          export_policy_1 1       nfs      0.0.0.0/0             sys
```

```
cluster-2::> volume show -vserver vs1 -volume vol1,vol2,vol3 -fields
policy
vserver volume policy
------- ------ --------------------------
vs1     vol1   export_policy_1
vs1     vol2   export_policy_1
vs1     vol3   export_policy_1
3 entries were displayed.
```

Example of consolidating Snapshot policies for transition

Snapshot schedules in 7-Mode and ONTAP before transition

7-Mode schedule

7-Mode volume	7-Mode Snapshot schedule
vol1	0 2 4@8,12,16,20 (weekly Snapshot copies: 0, daily Snapshot copies: 2, hourly Snapshot copies: 6 at 2, 4, 8, 12, 16, 20 hours)
vol2	0 2 4@8,12,16,20
vol3	0 2 4@8,12,16,20
vol4	1 2 3@8,12,16 (weekly Snapshot copies: 1, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)
vol5	2 2 3@8,12,16 (weekly Snapshot copies: 2, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)

Snapshot policies existing in ONTAP

Snapshot policy name	Policy details
ScheduleWeekly	Weekly, count: 1
ScheduleDailyHourly4	**Schedule details** • Schedule1: daily, count1: 2 • Schedule2: hourly, count2: 4 every 8, 12, 16, 20 hours
ScheduleHourly1	Hourly at 8, 12, 16, 20 hours, count: 4

Snapshot policy in ONTAP after transition with consolidation (no reuse)

7-Mode volume	7-Mode Snapshot schedule	Snapshot policy in ONTAP
vol1	0 2 4@8,12,16,20 (weekly Snapshot copies: 0, daily Snapshot copies: 2, hourly Snapshot copies: 4 at 8, 12, 16, 20 hours)	**Consolidated policy for vol1, vol2, and vol3** • Name: transition_snapshot_policy_0 • Schedule details ◦ Schedule1: daily, count1: 2 ◦ Schedule2: hourly, count2: 4 every 8, 12, 16, 20 hours
vol2	0 2 4@8,12,16,20	vol3
0 2 4@8,12,16,20	vol4	1 2 3@8,12,16 (weekly Snapshot copies: 1, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)
• Name: transition_snapshot_policy_1 • Schedule details ◦ Schedule1: weekly, count1: 1 ◦ Schedule2: daily, count2: 2 ◦ Schedule3: hourly, count3: 3 every 8,12,16 hours	vol5	2 2 3@8,12,16 (weekly Snapshot copies: 2, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)

Snapshot policy in ONTAP after transition with consolidation and reuse

7-Mode volume	7-Mode Snapshot schedule	Snapshot policy in ONTAP
vol1	0 2 4@8,12,16,20 (weekly Snapshot copies: 0, daily Snapshot copies: 2, hourly Snapshot copies: 4 at 2, 4, 8, 12, 16, 20 hours)	Consolidated policy for vol1, vol2, and vol3 for which the existing ONTAP policy is reused Name: ScheduleDailyHourly4
vol2	0 2 4@8,12,16,20	vol3
0 2 4@8,12,16,20	vol4	1 2 3@8,12,16 (weekly Snapshot copies: 1, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)

7-Mode volume	7-Mode Snapshot schedule	Snapshot policy in ONTAP
• Name: transition_snapshot_policy_1 • Schedule details ◦ Schedule1: weekly, count1: 1 ◦ Schedule2: daily, count2: 2 ◦ Schedule3: hourly, count3: 3 every 8,12,16 hours	vol5	2 2 3@8,12,16 (weekly Snapshot copies: 2, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)

Running prechecks

After creating a transition session, you can validate the session to verify whether the 7-Mode environment can be transitioned by using the `transition precheck` command. You can verify the compatibility between the 7-Mode storage system and the SVM for factors such as features and security settings.

The transition session must be in the preparation state.

The `transition cbt precheck` command generates a detailed error message report. Issues identified in the report are assigned different severity levels, depending on the impact of the issue on the transition process. Because some errors can hinder the transition, you must perform corrective actions for errors and warnings. You should also review the impact of messages of other severity levels before proceeding with the transition.

Steps

1. Verify the compatibility for transition:

   `transition cbt precheck -p` ***`project_name`***

```
7-Mode Transition Tool>transition cbt precheck -p project_finance

[1/14 ] Project status checks
[    Errors     ]

Operation summary:
------------------
The 'precheck' operation on the project 'project_finance' has failed.

 1  Errors - Failed!

Do you want to see a detailed report {yes, no} [yes]:

1 Errors:
---------
90202: Checking whether any of the 7-Mode volumes are in 'offline'
state.                              [     Error     ]
  > Following volumes are in 'offline' state.
  > CORRECTIVE-ACTION: Bring offline volumes online by using the
following command: 'vol online
  > <volume_name>'.
  > AFFECTED-OBJECTS: { vol2 }

Next suggested steps:
---------------------
1. Review the 'precheck' operation results, fix all blocking errors and
run the 'precheck' operation again.
2. Use the 'transition job-results -j 6e33e0a7-bb36-49df-91f3-
2e52cbfa3074' command to see the results of this
operation.

Ran precheck for project 'project_finance'.
```

You must resolve all of the errors that might cause problems with the transition before starting the data copy from the 7-Mode volumes.

Starting data copy for a transition project

You can initiate a data copy from 7-Mode volumes to ONTAP volumes for a baseline transfer. The baseline transfer starts when the data copy schedules configured in a project becomes active. After the baseline transfer is complete, the ONTAP volumes are updated periodically based on the data copy schedule.

- You must have run a precheck on the project and resolved all errors.
- You must have configured a dedicated, high-bandwidth, low-latency network between the source and

destination systems for data transfer.

> You can use SnapMirror multipathing to balance the data transfer load between the two paths.

- A data copy schedule must be configured for the session.

If you are transitioning to an existing SVM, the volumes are created during this operation. If you are transitioning to a new SVM, the SVM and its volumes get created during this operation.

SnapMirror relationships are created between 7-Mode and ONTAP volumes.

Steps

1. Start the data copy:

   `transition start -p` ***`project_name`***

   If the start operation fails and data copy is not started, you must resolve the issues and run the `transition start` command again.

```
7-Mode Transition Tool>transition start -p project_finance

[1/17 ] Project status checks                                        [
Ok        ]
[2/17 ] Validating 7-Mode system information                         [
Ok        ]
[3/17 ] Validating 7-Mode volumes information                        [
Ok        ]
[4/17 ] Validating Cluster-Mode system information                   [
Ok        ]
[5/17 ] Validating Cluster-Mode volume information                   [
Ok        ]
[6/17 ] Validating LIF information                                   [
Notifications ]
[7/17 ] WAFL prechecks                                               [
Ok        ]
[8/17 ] UNIX users and groups prechecks                              [
Warnings    ]
[9/17 ] SnapMirror prechecks                                         [
Notifications ]
[10/17] NFS prechecks                                                [
Warnings    ]
[11/17] Networking prechecks                                         [
Notifications ]
[12/17] CIFS prechecks                                               [
Warnings    ]
[13/17] Name services prechecks                                      [
Warnings    ]
```

```
[14/17] SAN prechecks                                              [
Ok       ]
[15/17] Creating Cluster-Mode volumes                              [
Ok       ]
[16/17] Establishing SnapMirror relationships between the 7-Mode and
Cluster-Mode volumes
[      Ok       ]
[17/17] Initializing SnapMirror relationships between the 7-Mode and
Cluster-Mode volumes
[      Ok       ]

Operation summary:
------------------
The 'start' operation is completed with warnings and notifications.

 0  Errors - No action required
22  Warnings - Need your attention!
16  Notifications - Please review
102  Informational messages

Do you want to see a detailed report {yes, no} [yes]:

22 Warnings:
------------
20362: Checking whether 7-Mode UNIX groups' names are in use in the
Vserver 'vs2'.  [    Warning    ]
  > The following 7-Mode UNIX groups' names are already in use in the
Vserver 'vs2'.
  > AFFECTED-OBJECTS: { daemon }

20372: Checking whether 7-Mode UNIX groups' ids are in use in the
Vserver 'vs2'.    [    Warning    ]
  > The following 7-Mode UNIX groups' ids are already in use in the
Vserver 'vs2'.
  > AFFECTED-OBJECTS: { daemon }
```

The project moves to the copy-baseline state. After the baseline transfer is completed, the project moves to the copy-update state.

Applying configurations to ONTAP volumes

After the baseline data copy is completed, you can copy and apply all NAS configurations from the 7-Mode system (including protocols and services configuration) to the ONTAP volumes. If the target cluster is running Data ONTAP 8.3.2 or later, SAN configurations are transitioned in this phase.

- The configurations are applied in the precutover phase, which has two modes: precutover read-only mode and precutover read/write mode.
- The precutover read/write mode is not supported when the project contains the following:
    - SAN volumes and the target cluster is running Data ONTAP 8.3.1 or earlier. In this situation, the following configurations are not applied in the precutover phase, instead they are applied during the cutover phase:
        - SAN configurations
        - Snapshot Schedule configurations
    - SnapLock Compliance volumes.

      If the project contains SnapLock Compliance volumes, then the Snapshot Schedule configurations are not applied in the precutover phase, instead these configurations are applied during the cutover phase.

      See Considerations for transitioning of SnapLock Compliance volumes.
- If the target cluster is running Data ONTAP 8.3.1 or earlier, the read/write mode is not supported during precutover if any volume in the project contains LUNs.
- If the target cluster is running Data ONTAP 8.3.1 or earlier and a project contains both SAN and NAS volumes, only NAS configurations are transitioned in the precutover phase, and these NAS configurations can be tested only in the read-only mode.

  SAN configurations are transitioned only in the storage cutover phase.

  > SAN LIFs are not configured.
- If the target cluster is running Data ONTAP 8.3.1 or earlier and the project contains SAN volumes, then Snapshot schedule configuration is not applied during apply configuration (precutover) phase.

  These configurations are applied during the cutover phase.
- If the target cluster is running Data ONTAP 8.3.1 or earlier and the project contains SAN volumes, then Snapshot schedule configuration is not applied during apply configuration (precutover) phase.

  These configurations are applied during the cutover phase.

Steps

- Run the transition operation in read-only mode:

  transition cbt precutover -p *project_name* -m ro_test -c *max_cap_concurrent_transfers* -b *snapmirror_throttle*
- Run the transition operation in read/write mode:
    a. Apply the configurations to ONTAP:
       +
       transition cbt precutover -p *project_name* -m rw_test -c *max_cap_concurrent_transfers* -b *snapmirror_throttle*
    b. Manually test and verify the configurations in ONTAP.
    c. Start the resynchronization operation:
       +

```
transition cbt resync -p project_name
```

Completing the transition

Because the complete operation is disruptive, you should evaluate when to run it. When transitioning volumes in a SnapMirror relationship, the secondary project must be completed before completing the transition of the primary project.

Steps

1. Perform a data copy from the 7-Mode volumes to the ONTAP volumes:

   ```
   transition cbt update -p project_name -t available-transfers-percentage -c
   snapmirror-throttlemax-cap-concurrent-transfers -x -r interactive
   ```

   This helps in reducing the downtime during storage cutover.

2. Manual: Disconnect client access.
3. Complete the transition process:

   ```
   transition cbt cutover -p project_name -t available-transfers-percentage -c
   max-cap-concurrent-transfers -x snapmirror-throttle -r interactive -o
   [true|false]
   ```

   By default, the 7-Mode volumes are made offline. To keep the 7-Mode volumes online, set the `-o` option to `false`.

   > If the cutover is not successful for some reason—for example, the 7-Mode system or cluster is not reachable—you must resolve the issues and run the `transition cutover` command again.

   For more information about the commands, see the man pages.

   The transition session moves to the cutover state. If the cutover is successful, the session moves to the completed state.

You must perform any post-transition tasks and reconnect the clients to the ONTAP volumes.

Commands for managing transition

You can use the `transition cbt` command to manage functions, such as creating, modifying, deleting, and displaying transition projects.

The following option can be used with all commands:

`-r no`: Disables the interactive nature of the command. By default, this option is enabled.

You can also use the `-v` option, which enables the verbose mode, with the `transition version` and `transition cbt menu` commands.

Commands to manage transition operations

If you want to…	Use this command…
Create a transition project	`transition cbt create`
Add the cluster information to the given project	`transition cbt add-cluster-info`
Modify a transition project	`transition cbt modify`
Complete the transition to an ONTAP storage system	`transition cbt cutover`
Run precheck on the project	`transition cbt precheck`
Apply the configurations to an ONTAP storage system	`transition cbt precutover`
Trigger the SnapMirror resynchronization between the 7-Mode volumes and ONTAP volumes in the project	`transition cbt resync`
Trigger the SnapMirror update operation for the ONTAP volumes	`transition cbt update`
Display the version of 7-Mode Transition Tool	`transition cbt version`
Start baseline data copy from the 7-Mode volumes to ONTAP volumes in a project	`transition cbt start`
Pause data copy from the 7-Mode volumes to ONTAP volumes in a project	`transition cbt pause`
Resume data copy transfers from the 7-Mode volumes to ONTAP volumes of a paused project	`transition cbt resume`
Abort a transition project	`transition cbt abort`
Delete a transition project	`transition cbt delete`
Display the list of transition projects or display information about a project	`transition cbt show`

Commands to manage volume SnapMirror relationships

If you want to…	Use this command…
Add information about a 7-Mode primary system to a secondary project	`transition cbt add-primary-seven-mode-system `` CBT : How to provide all the required primary 7-Mode details for a given secondary project
Add information about an ONTAP secondary system to a primary project	`transition cbt add-secondary-cluster-mode-system` CBT: How to add the required secondary cluster details to the primary project
Remove information about a 7-Mode primary system from a secondary project	`transition cbt remove-primary-seven-mode-system`
Remove information about an ONTAP secondary system from a primary project	`transition cbt remove-secondary-cluster-mode-system`
List the 7-Mode primary systems added to a secondary project	`transition cbt show-primary-seven-mode-systems`
List the ONTAP secondary systems added to a primary project	`transition cbt show-secondary-cluster-mode-systems`

Commands to manage credentials of Data ONTAP systems

If you want to…	Use this command…
Save credentials (user name and password) of a host in the transition server	`transition credentials add`
Retrieve user name of a host	`transition credentials get`
Modify the user name or password of a host	`transition credentials modify`
Delete credentials of a host from the transition server	`transition credentials remove`

Commands to manage the volume pairs in a project

If you want to…	Use this command…
Add the 7-Mode volume and the ONTAP volume (volume pair) to a project	`transition cbt volumepair add`

If you want to…	Use this command…
Modify the ONTAP volume of a project	`transition cbt volumepair modify`
Remove a volume pair from a project	`transition cbt volumepair remove`
List volume pairs in a project	`transition cbt volumepair show`

Commands to manage LIF details

FC and iSCSI LIFs are not transitioned by the 7-Mode Transition Tool.

If you want to…	Use this command…
Add anSVM data LIF to a project	`transition cbt lif add`
Modify anSVM data LIF of a project	`transition cbt lif modify`
Remove LIFs from a project	`transition cbt lif remove`
List all the LIFs added to a project	`transition cbt lif show`

Commands to manage project properties

If you want to…	Use this command…
Set value for a specific project property	`transition cbt property-set`
Clear the value of a specific project property	`transition cbt property-reset`
Get the value of a specific project property	`transition cbt property-get`

Commands to manage transition jobs

If you want to…	Use this command…
List jobs that ran or are running on the given project and operation	`transition jobs`
View the status of a job	`transition job-status`
View the results of a job	`transition job-results`

Commands to manage transition schedules

If you want to…	Use this command…
Add a schedule to manage SnapMirror transfers along with bandwidth	`transition cbt schedule add`
Modify a SnapMirror schedule of the project	`transition cbt schedule modify`
Remove the SnapMirror schedules from the project	`transition cbt schedule remove`
List all the SnapMirror schedules in a project	`transition cbt schedule show`

Command to collect tool logs

If you want to…	Use this command…
Collect the log files of 7-Mode Transition Tool Logs are saved on the server in the `asup` directory of the 7-Mode Transition Tool installation path.	`transition bundle-tool-logs`

For more information about these commands, see the man pages for the 7-Mode Transition Tool CLI.

Related information

Migrating data and configuration from 7-Mode volumes

Performing manual post-transition tasks

After the storage cutover finishes successfully and transition is completed, you must perform some post-transition tasks for configuring features that are not transitioned, before enabling client access to the ONTAP volumes.

Steps

1. Manual: Perform the required steps to configure features that were not transitioned, as listed in the precheck report.

   For example, you must manually configure IPv6 and FPolicy after transition.

2. Delete or consolidate the configurations that are transitioned.

   The 7-Mode Transition Tool creates a new instance for all configurations that are transitioned from 7-Mode. Therefore, there might be several instances of some configurations, such as cron schedules, that might need to be consolidated or deleted manually.

3. SAN transition: Manually reconfigure the hosts.

   SAN host transition and remediation

4. Ensure that the SVM is ready to serve data to the clients by verifying the following:

◦ The volumes on the SVM are online and read/write.
◦ The IP addresses on the SVM are up and reachable from the name servers.

5. Redirect client access to the ONTAP volumes.

Related information

NetApp Documentation: ONTAP 9

Configuring zones by using the FC zone plan

After completing the transition, you must configure the zones by using the FC zone plan to group the initiator hosts and targets for providing data access from the cluster.

- The cluster and initiator hosts must be connected to the switch.
- The FC zone script file must be accessible.

Steps

1. Log in to the CLI of the switch.
2. Copy and execute the required zone commands one at a time.

   The following example runs the zone commands on the switch:

```
switch1:admin>config terminal
# Enable NPIV feature
feature npiv
zone name auto_transition_igroup_d31_194bf3 vsan 10
member pwwn 21:00:00:c0:dd:19:4b:f3
member pwwn 20:07:00:a0:98:32:99:07
member pwwn 20:09:00:a0:98:32:99:07
.......
.......
.......
copy running-config startup-config
```

The initiator hosts can access data from the cluster.

Recovering from a failed LUN transition

If the transition of volumes with LUNs fails, you can use the lun transition 7-mode show command to check which LUNs were not transitioned to ONTAP, and then determine a corrective action.

Steps

1. Change to advanced privilege level:

   `set -privilege advanced`

2. Check which LUNs failed:

   `lun transition 7-mode show`

3. Review the EMS logs and determine the corrective action that you must take.
4. Perform the required steps shown in the EMS message to correct the failure.
5. If any supported LUNs failed the transition, then to complete the transition:

   `lun transition start`

6. View the transition status of the volumes:

   `lun transition show`

   The transition status can be one of following values:

   - `active`: The volume is in an active SnapMirror transition relationship and not yet transitioned.
   - `complete`: All supported LUNs are transitioned for this volume.
   - `failed`: LUN transition failed for the volume.
   - `none`: The volume did not contain LUNs to transition from 7-Mode systems.

```
cluster1::*> lun transition show
Vserver              Volume             Transition Status
-------------------- ------------------ -----------------
vs1                  vol0               none
                     vol1               complete
                     vol2               failed
                     vol3               active
```

Viewing transitioned SAN configurations

The LUN serial numbers and LUN IDs of SAN volumes change after transition. To view the transitioned SAN configurations, you can generate the mapping of the old LUNs to the new transitioned LUNs by using the 7-Mode Transition Tool CLI and export the LUN mapping information to a `.csv` file.

Storage cutover must have completed successfully.

Steps

1. To generate LUN mapping information, run the following command from the CLI:

   `transition cbt export lunmap -p` ***`project_name`*** **`-o`** ***`file_path`***

```
C:\Program Files\NetApp\7-Mode Transition Tool>transition cbt export
lunmap -s SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv
Successfully exported 7 to C LUN mapping for 'SanWorkLoad'
```

The following example shows a sample LUN mapping file:

```
7-Mode Storage System,192.168.43.49,
vfiler,finance,

cDOT Storage System,192.168.32.97,
SVM,finance,

LUN#,Source LUN Path,7-Mode Serial Number,Source Igroups,Source mapping
LUN ID,Destination LUN Path,Serial Number,Destination Igroup,Destination
mapping LUN ID
LUN#1,/vol/vol_SANdataset_sm_0/lun-
inventory,dtY5B4tFAaAF,WinGrp,0,/vol/vol_SANdataset_sm_0/lun-
inventory,7SQ8p$DQ12rX,WinGrp,0
LUN#1,/vol/vol_SANdataset_sm_0/lun-
inventory,dtY5B4tFAaAF,WinGrp2,3,/vol/vol_SANdataset_sm_0/lun-
inventory,7SQ8p$DQ12rX,WinGrp2,3
LUN#1,/vol/vol_SANdataset_sm_0/lun-
inventory,dtY5B4tFAaAF,WinGrp3,4,/vol/vol_SANdataset_sm_0/lun-
inventory,7SQ8p$DQ12rX,WinGrp3,4
LUN#2,/vol/vol_SANdataset_sm_0/lun-
payroll,dtY5B4tFAaAC,LnxGrp1,2,/vol/vol_SANdataset_sm_0/lun-
payroll,7SQ8p$DQ12rT,LnxGrp1,4
LUN#2,/vol/vol_SANdataset_sm_0/lun-
payroll,dtY5B4tFAaAC,LnxGrp2,2,/vol/vol_SANdataset_sm_0/lun-
payroll,7SQ8p$DQ12rT,LnxGrp2,4
```

You must perform the required post-transition tasks on the host before restoring access to the transitioned ONTAP volumes.

SAN host transition and remediation

Limitations with 7-Mode Snapshot copies of LUNs managed by SnapDrive and SnapManager after transition

When transitioning to clustered Data ONTAP 8.3, SnapDrive and SnapManager backup verification and restore operations fail on the transitioned 7-Mode Snapshot copies. When transitioning to clustered Data ONTAP 8.3.1, SnapManager for Microsoft Exchange Server (SME) backup verification and SnapManager for Hyper-V (SMHV) restore operations of files fail on the transitioned 7-Mode Snapshot copies.

Depending on the SnapDrive or SnapManager that is used on the host connected to the 7-Mode system and the Data ONTAP version running on your cluster, 7-Mode Transition Tool displays a warning message for this limitation during precheck.

> All SnapDrive and SnapManager backup verification and restore operations are supported on any newly created Snapshot copies in clustered Data ONTAP.

Workaround for backup and restore operations using SnapDrive and SnapManager in clustered Data ONTAP 8.3

Perform the one of the following actions:

- Retain the 7-Mode systems till the 7-Mode Snapshot copies expire.

  You can use the 7-Mode system to restore a file from a LUN in the 7-Mode Snapshot copy and then migrate it to clustered Data ONTAP, if required.

- Use single file SnapRestore in ONTAP to restore the LUN from a 7-Mode Snapshot copy to the active file system, and then mount the restored LUN for single file restore.

Workaround for backup and restore operations using SME and SMHV in ONTAP 8.3.1 and later supported releases

Perform the one of the following actions:

- Verify that the SnapManager backups created in 7-Mode are valid before you perform a storage cutover to ONTAP.
- Create a clone of the volume in ONTAP from the transitioned 7-Mode Snapshot copies, and then mount the LUN on the cloned volume for backup verification and restore operations.

The best practice is to retain the 7-Mode systems till the 7-Mode Snapshot copies expire.

NetApp Documentation: SnapManager for Microsoft Exchange Server

NetApp Documentation: SnapManager for Hyper-V

NetApp Documentation: SnapManager for SAP

NetApp Documentation: SnapManager for Oracle

NetApp Documentation: SnapDrive for UNIX

NetApp Documentation: SnapDrive for Windows (current releases)

NetApp Documentation: SnapManager for Microsoft SQL Server

NetApp Documentation: SnapManager for Microsoft SharePoint

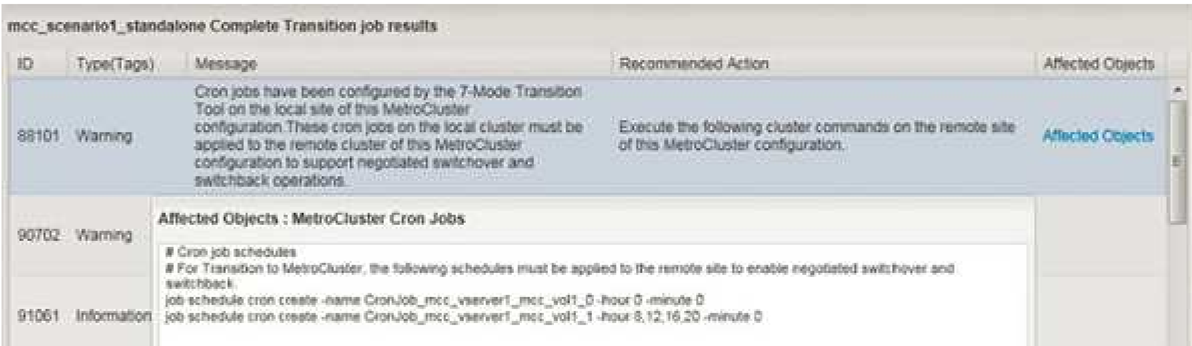
Configuring cron job schedules on the remote site after transitioning a MetroCluster configuration

The cron job schedules created during transition are not replicated to the remote site, and therefore negotiated switchover fails after transition. You must manually create the cron job schedules on the remote site after transition.

Storage cutover for the 7-Mode active site must have been completed successfully.

Steps

1. Record the cron job messages generated at the storage cutover to identify the job schedules that must be replicated to the remote site.



2. From the cluster CLI of the remote site, run the `job schedule cron create` commands recorded in Step 1.

Deleting 7-Mode volume Snapshot copies from transitioned volumes

Because the 7-Mode volume Snapshot copies are not deleted automatically from a transitioned volume, you must delete these Snapshot copies manually after the transition operation is completed.

Because the naming convention for Snapshot copies differs between 7-Mode environments and clustered Data ONTAP, the 7-Mode Snapshot copies cannot be automatically overwritten by the Snapshot copies in the clustered Data ONTAP environment.

To achieve better space utilization, you should delete the unwanted 7-Mode Snapshot copies, including the ones from the 7-Mode to 7-Mode SnapMirror relationships and the 7-Mode to clustered Data ONTAP SnapMirror relationships.

Steps

1. After the storage cutover operation is completed, delete the unwanted 7-Mode Snapshot copies:

   `snap delete -vserver <svm_name> -volume <volume_name> -snapshot <snapshot_name>`

Consolidating cron schedules from transitioned volumes

The 7-Mode Transition Tool generates unique schedules per transitioned volume. Because of this, a large number of cron schedules can be created after the transition, so you need to know how to consolidate them after transition.

Steps

1. Consolidate the cron schedules after transition by using the `job schedule cron` command.

Managing a transition project

You can manage transition projects by using the 7-Mode Transition Tool (web interface). You can edit, pause, resume, abort, delete, and run prechecks on a project.

Editing a project

You can edit a project to add or remove volumes, and to modify the transition configurations.

- You must have created a project.
- You must not have started the project that you want to edit.

You can edit a project to change the volumes that are selected for transition. You can also edit a project to change the SVM mapping, volume mapping, and interface mapping, as well as the data copy schedule. You cannot change the project type or the vFiler unit when editing a project.

Steps

1. From the **Dashboard** window, select the project that you want to edit.
2. Click **Edit Project**, and then select the required step from the drop-down list.
3. Complete the wizard to edit your project.

Managing SnapMirror transfers and schedule

In the data copy phase, the clustered Data ONTAP volumes are updated periodically with the data from the 7-Mode volumes based on a data copy schedule. You can create, edit, and delete the data copy schedule to be used for SnapMirror baseline copy, update, and resynchronization operations.

You can manage the copy operations for all the volumes selected for transition by specifying multiple data copy schedules comprising details such as, start time, duration, update frequency, the number of concurrent SnapMirror transfers to run during that schedule, and throttle limit.

You can provide multiple concurrent transfers count and throttle limit for different time periods, such as weekday, weekend, business hours, non-business hours, DR schedules, and non-DR schedules.

Related information

Creating a transition project

Creating a data copy schedule for SnapMirror transfers

You can create data copy schedules to effectively manage the transition data copy operations for the volumes in a project. You can also specify the number of concurrent SnapMirror transfers to run during that schedule to ensure that any replication operation does not fail due to the concurrent SnapMirror transfers reaching the maximum limit.

- The project must be in the preparation, data copy, or apply configuration (precutover) phase.
- The 7-Mode Transition Tool service must always be running for the schedules to be effective.

> The data copy schedule is used for SnapMirror baseline copy, update, and resynchronization operations.

- You must create at least one data copy schedule for each project.
- You can create a maximum of 7 schedules per project; however, the schedules cannot overlap within a project.

  For example, you can create customized schedules for business hours and non-business hours, DR hours and non-DR hours, and weekdays and weekends.

  > If the projects use the same 7-Mode controller or cluster, ensure that the data copy schedules do not overlap across different projects.

- The configured schedules are applied based on the 7-Mode controller's time zone.
- The number of concurrent SnapMirror transfers to use during the schedule is determined at run time based on the percentage of concurrent SnapMirror streams to use and the maximum limit configured.
- The number of concurrent SnapMirror transfers to use during the schedule should be provided in such a way that the existing 7-Mode DR schedules are not affected because of the tool using the SnapMirror transfers specified with the schedule.
- If the number of concurrent SnapMirror transfers that the tool is using is less than the configured number of concurrent SnapMirror transfers to use during the schedule, tool schedules new transfers to make use of the remaining transfers.
- If the schedule is coming to an end or there is a reduction in number of concurrent SnapMirror transfers on the 7-Mode storage system, the tool aborts the extra transfers to ensure that it uses only the configured number of transfers at any point in time.

  > If a baseline is in progress and Snapshot checkpoint is not yet created, the tool does not abort the transfer but waits for the Snapshot checkpoint to be created before aborting the transfer.

Steps

1. Create schedules from the Data Copy Schedule page of the Dashboard by clicking **Edit Project**, and then selecting **Configure Schedule**.
2. Enter a name for the new schedule.
3. In the Recurring Days pane, select the days when the data copy operation should run.

If you want to run the data copy operations…	Then…
Daily	Select **Daily**. This is the default value.
Only on certain days	a. Select **Select Days**. b. Select the days of the week.

4. In the Time Interval pane, specify the start time, duration, and frequency of the data copy schedule.

   a. Enter the time the data copy operations should start by selecting the hours and minutes from the **Start Time** drop-down list.

Valid values are from 00:00 to 23:30.

b. Enter the time period for which you want the data copy operations to run, select the hours and minutes from the **Duration** drop-down list.

> ⓘ The duration of a schedule should not exceed a week (167 hours and 30 minutes).

For example, if 20:30 is specified, SnapMirror operations run for next 20 hours and 30 minutes from the start time.

c. Select the frequency at which incremental transfers should be done (within the created schedule duration) after the baseline transfer has been completed by doing one of the following:

   - Select the hours and minutes from the **Update Frequency** drop-down list.
   - Select **Continuous Updates**.

     The minimum delay between two consecutive updates will be 5 minutes.

By default, SnapMirror updates run every 30 minutes.

5. In the Parameters for Transition Data Copy Operations pane, enter the SnapMirror parameters.

a. Specify the maximum number of concurrent SnapMirror transfers that should be used for data copy by doing one or all of the following:

   - Specify the percentage of the available volume SnapMirror transfers that should be used for data copy (when schedule is active), by entering the percentage in the **Maximum Number of Concurrent VSM Transfers** field.

     The available volume SnapMirror transfers is calculated at run time.

     > ⓘ The maximum number of concurrent SnapMirror transfers supported on your platform is displayed in this pane.

   - Specify the maximum number of concurrent volume SnapMirror transfers that can run during this schedule in the **Not Exceeding** field.
     If you enter both values, the lowest value is used as the number of concurrent transfers.

The number of concurrent transfers to be used for transition is calculated at run time based on the schedule and the number of configured concurrent transfers.

+
Your platform supports a maximum of 100 concurrent volume SnapMirror transfers, 60 are currently available, and you have specified the following values:

◦ Percentage of the available volume SnapMirror transfers option is 50%.

  The maximum number of concurrent transfers based on the percentage option is 50% of 60 = 30.

◦ Maximum number of concurrent volume SnapMirror transfers option is 25.
  In this scenario, the tool sets the maximum number of concurrent volume SnapMirror transfers to 25, which is the lowest of the two values.

  a. Specify the maximum bandwidth in MB/s (throttle) by doing one of the following:

If you want to…	Then…
Utilize all the available bandwidth	Select **Maximum**. This is the default value.
Specify the throttle value	Enter the value in the **Not Exceeding** field. Maximum allowed input value is 4194303. +

The throttle value is equally distributed among all the active transfers in the project.

> The throttle for each transfer is determined at run time based on the number of available concurrent volume SnapMirror transfers.

If the active schedule is configured with the throttle value of 200 MBps and only 10 concurrent transfers are available, each transfer uses 20 MBps bandwidth.

The schedules become effective only when the project is in data copy or apply configuration (precutover) phase.

Example for planning a data copy schedule

Consider a 7-Mode controller that supports 100 concurrent SnapMirror transfers with 75 DR relationships. The business requirements need SnapMirror operations to run during the following timings:

Days	Time	Currently used SnapMirror transfers
Monday to Friday	9:00 a.m. to 5:00 p.m.	50% of available transfers
Monday to Friday	11:30 p.m. to 2:30 a.m.	75 transfers used for DR
Monday to Friday	2:30 a.m. to 9:00 a.m. and 5:00 p.m. to 11:30 p.m.	25% of available transfers
Saturday to Monday	2:30 a.m. (Saturday) to 9:00 a.m. (Monday)	10% of available transfers

You can create the following data copy schedules to manage your transition data copy operations:

Schedule	Option	Value
peak_hours	Days Range	Monday to Friday
	Start Time	09:30
	Duration	8:00
	Percentage of maximum number of concurrent transfers	50
	Maximum number of concurrent transfers	
	Throttle (MBps)	100
	Update Frequency	0:00
dr_active	Days Range	Monday to Friday
	Start Time	23:30
	Duration	3:00
	Percentage of maximum number of concurrent transfers	
	Maximum number of concurrent transfers	25
	Throttle (MBps)	200
	Update Frequency	0:30

Schedule	Option	Value
non_peak_non_dr1	Days Range	Monday to Friday
	Start Time	17:00
	Duration	6:30
	Percentage of maximum number of concurrent transfers	75
	Maximum number of concurrent transfers	
	Throttle (MBps)	300
	Update Frequency	1:00
non_peak_non_dr2	Days Range	Monday to Friday
	Start Time	02:30
	Duration	6:30
	Percentage of maximum number of concurrent transfers	75
	Maximum number of concurrent transfers	
	Throttle (MBps)	300
	Update Frequency	1:00

Schedule	Option	Value
week_ends	Days Range	Saturday
	Start Time	02:30
	Duration	53:30
	Percentage of maximum number of concurrent transfers	90
	Maximum number of concurrent transfers	
	Throttle (MBps)	500
	Update Frequency	2:00

Considerations for creating a data copy schedule

The 7-Mode Transition Tool runs a scheduler that checks for the active schedule every 5 minutes. You must be aware of the requirements to make a data copy schedule active. You can manage the SnapMirror transfers effectively by following some best practices when configuring the different parameters of a data copy schedule.

Requirements to make a data copy schedule active

- The 7-Mode Transition Tool service must be running.

  If the 7-Mode Transition Tool service is restarted, the SnapMirror operations are not performed until the credentials are added.

- There should be at least one data copy schedule available for SnapMirror data copy operations to run.

  If there is no schedule available for a particular time range, the SnapMirror data copy operations are not performed during that time.

- If the SnapMirror relationships are in the quiesced state, the data copy operations are not performed.
- The system time of the 7-Mode and the cluster must be synchronized for the incremental transfers to happen according to the data copy schedule.

  If the 7-Mode system time is lagging behind the cluster time, the updates are scheduled more frequently than the specified update frequency. If the 7-Mode system time is ahead of the cluster time, the updates are delayed than the specified update frequency.

Best practices during data copy

To improve SnapMirror replication performance, the source and destination systems should have optimum CPU utilization and memory available. Additionally, network traffic that is unrelated to the migration activity should be minimized so that the throughput is maximized and latency is minimized between the source and destination systems.

Priority for data transfers

When scheduling the data copy operations, baseline or resynchronization operations take priority over the incremental transfers.

When aborting the data copy operations for releasing the SnapMirror transfers, incremental transfers are aborted first, and then baseline or resynchronization operations are aborted.

For incremental transfers, priority is given to the volumes that are lagging more behind the source volume based on the time elapsed from the previous update.

Editing or deleting a data copy schedule for SnapMirror transfers

You can edit or delete data copy schedules that are used for SnapMirror baseline copy, update, and resynchronization operations, if you have other DR schedules configured or modified that require the transition data copy schedule to be modified.

The project must be in the preparation, data copy, or apply configuration (precutover) phase.

- After a schedule is edited, it takes up to 5 minutes for it to become effective.
- If the throttle limit is changed in the schedule when there are active transfers, the new throttle limit is not applicable for the currently running SnapMirror transfers.

  After the current transfer is completed for a particular SnapMirror relationship, a new throttle limit is considered for the subsequent operations for that SnapMirror relationship.

- If you want the throttle limit to be effective immediately for the current SnapMirror transfers, you must pause and resume the project.

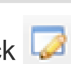
Steps

1. From the Dashboard, select a project, and then click Configure Schedule.

   All the existing schedules for the project are displayed.

   You can also edit or delete schedules from the Configure Schedule option.

2. Edit or delete a schedule:

If you want to…	Then…
Edit an existing schedule	a. Click . The Modify Schedule dialog box is displayed. You can edit the schedule and SnapMirror parameters for the data copy operations. b. Make the required changes, and then click **Save**.

If you want to…	Then…
Delete a schedule	a. Click . The schedule is deleted from the pane. At least one schedule is required for data transfers. Therefore, you should not delete all of the schedules.

Example

The following example illustrates how the throttle limit is applied when there are active SnapMirror transfers in the project.

Schedule	Number of volumes and data copy state	Maximum number of concurrent SnapMirror transfers	Throttle limit	Throttle used by each transfer
Before modifying	Five volumes waiting for baseline	Five	500 MBps	100 MBps
After modifying	• For two volumes, baseline is in progress using 100 MBps throttle • For three volumes, baseline is completed and are waiting for updates	Five	250 MBps	• Two volumes that are in baseline continue to use the 100 MBps throttle • Three volumes for which the baseline is completed use the modified 50 MBps throttle for the updates

When the baseline copy for the two volumes is completed, the new throttle limit of 50 MBps is used for these volume SnapMirror relationships while scheduling the next data copy operations.

Managing logical interfaces

You can add, edit, or remove 7-Mode IP addresses from a project.

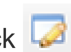
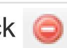
The LIFs are configured on the storage virtual machine (SVM) in the apply configuration (precutover) phase:

- Existing 7-Mode IP addresses are created in the administrative “down” state.
- New IP addresses are created in the administrative “up” state.

FC and iSCSI LIFs are not transitioned by the 7-Mode Transition Tool.

Steps

1. Perform one of the following actions:

If you want to…	Then…
Edit an existing LIF	a. Click  . b. In the Modify LIF dialog box, make the required changes, and then click **Save**.
Remove an existing LIF	a. Click  in the table. You can remove a LIF only when the project is in the preparation, baseline data copy, pause, precutover, or update state. However, you cannot remove a LIF if the cutover operation has failed. b. Click **Select 7-Mode LIF**. c. Select the 7-Mode IP addresses for transition. d. Enter the target node and target port details. e. Click **Save**.
Add a 7-Mode IP address	• Click **Select 7-Mode LIF**. • Select the 7-Mode IP addresses for transition. • Enter the target node and target port details. • Click **Save**.
Add a new LIF	a. Click **Add New LIF** below the table. b. Enter the required values. c. Click **Save**.

Removing volumes from a project

You can remove the failed volumes from a project during the transition process and abort a volume SnapMirror relationship.

If a volume is removed when the data copy is in progress, then the transfer is not aborted and continues until the operation is completed. The volume is not considered for any further data copy operations.

1. From the Dashboard window, select a project, and then click Volumes.

All of the existing volumes for the project are displayed.

2. Click .

   The volume is removed from the project.

The best practice is to delete the ONTAP volumes and release the SnapMirror relationships.

1. From the cluster, delete the ONTAP volumes that are created as part of the transition.

   ONTAP 9 commands

2. From the 7-Mode system, release the SnapMirror relationships to the ONTAP volumes.
3. If you abort a volume SnapMirror relationship, perform the following steps:
   a. Break and delete the SnapMirror relationship between the 7-Mode primary volumes and ONTAP secondary volumes.
   b. From the primary 7-Mode system, release the SnapMirror relationships to the ONTAP secondary volumes.

Clustered Data ONTAP 8.3 Command Map for 7-Mode Administrators

Pausing and resuming a project

You can pause and resume a project for which data copy has started.

When you pause a primary project, only the copy operation from the 7-Mode primary volume to the corresponding clustered Data ONTAP primary volume is paused. The data copy from the 7-Mode primary volume to the ONTAP secondary volume continues to run according to the schedule. This ensures continued data protection for the primary volumes.

1. From Dashboard, select the project that you want to pause.
2. Click **Pause**.

   The data copy operation for all the volumes in the project is stopped.

   If the baseline transfer for a volume is in progress and there is no Snapshot copy checkpoint created for the SnapMirror relationships, the pause operation is ignored for the volume. Wait for the Snapshot copy checkpoint to be created and run the pause operation again.

3. Click **Resume**.

   The copy operation resumes from the point where it was paused.

   > The data copy operation is resumed based on the active schedule available at that time.

Related information

Starting baseline data copy

Aborting a project

You might want to abort a running project, for example, when the performance of the controller or the cluster is impacted. You can abort a running project from the Dashboard.

You must consider the following before aborting projects that transition volumes with SnapMirror relationships:

- If both projects have been started, aborting one project aborts the associated project.

  For example, if you abort a primary project, the secondary project is also aborted.

- If the abort operation fails on the current project, the associated project is not aborted.
- If only one active project is aborted, the start operation on the associated project fails.
- When you abort a primary project, the copy operation from the 7-Mode primary volume to the ONTAP secondary volume is not aborted.

  Only the copy operation from the 7-Mode primary volume to the corresponding ONTAP primary volume is aborted.

> If the 7-Mode project is aborted, the only option is to delete the project. It is not possible to resume or restart the project after it is aborted.

Steps

1. From the Dashboard, select the project that you want to abort.
2. Click **Abort**.
3. From the cluster, delete the ONTAP volumes that were created as part of the transition.
4. From the 7-Mode system, release the SnapMirror relationships to the ONTAP volumes.
5. If you abort a volume SnapMirror relationship, you must do the following:
   a. Break and delete the SnapMirror relationship between the 7-Mode primary volumes and ONTAP secondary volumes.
   b. From the primary 7-Mode system, release the SnapMirror relationships to the ONTAP secondary volumes.

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Data ONTAP 8. 2 Commands: Manual Page Reference for 7-Mode, Volume 1

Deleting a project

If you do not want a project, you can delete it from the Dashboard.

1. From the DashboardProjects Groups pane, click the project group to which the project belongs.
2. From the Group Summary pane, click **Modify**, and then click **Delete**.

   You cannot delete a project if the project has failed during the cutover stage.

Troubleshooting issues

You need to be aware of some of the common issues with the 7-Mode Transition Tool and the steps to resolve them.

Downloading transition log files

The 7-Mode Transition Tool creates log files that provide processing details of the transition assessment and migration operations run on your system.

1. Click **Logs** in the top menu.
2. Click **Collect Project Logs** to collect logs related to all of the projects.
3. To collect logs for a given projects, locate the projects from the project list, and then click **Download**.

   The logs are downloaded as a `.zip` file, and the folder name is the timestamp.

Related information

How to upload a file to NetApp

Log files for the 7-Mode Transition Tool

The 7-Mode Transition Tool creates log files that provide processing details of the transition operations that have occurred on your system. The log files are located in the logs directory of the path where 7-Mode Transition Tool is installed.

You can also use the EMS messages related to SnapMirror logs from the 7-Mode system and the cluster to troubleshoot issues.

The following table lists the log files that are related to a particular transition project:

Log file path	Contains information about…
project_name/transition.log	Debug messages that are specific to a project
project_name/zapi-outbound.log	Output of all the Data ONTAP APIs that are executed by 7-Mode Transition Tool for a particular project

The following table lists the log files that are not related to any particular project:

Log file path	Contains information about…
transition-gui.log	Entries of all the actions performed by using the web interface

Log file path	Contains information about…
`default/audit.log`	• All the parameters, such as HTTP or HTTPS port and log directory path, that are used by the tool every time 7-Mode Transition Tool is run • All the transition commands that are executed with the outputs
`default/default/transition.log`	Debug messages that are not specific to any project
`default/STREAM_MANAGEMENT/stream_management.log`	Debug messages that are logged by the scheduler while managing the schedules and which do not belong to any project
`default/default/zapi-outbound.log`	Output of all the Data ONTAP APIs that are executed by 7-Mode Transition Tool and which do not belong to any project
`default/STREAM_MANAGEMENT/zapi-outbound.log`	Output of all the Data ONTAP APIs that are executed by the 7-Mode Transition Tool scheduler while managing the schedules and which do not belong to any project
`server-console.log`	Log entries of all the packet exchanges done with the 7-Mode Transition Tool server. This file helps in troubleshooting issues related to a server crash.

Continuing with the transition if ignorable errors occur

During the transition, you might encounter some errors that block the transition. You can choose to ignore some of these errors by acknowledging the issues through the 7-Mode Transition Tool CLI. You should rerun the failed operation after ignoring the error to continue with the transition.

When you acknowledge an error, it means that you have understood the impact of these errors and acknowledged them.

You must rerun the transition operation after ignoring the error. In some cases, after you acknowledge the issue, Data ONTAP performs corrective actions on the affected aggregates and volumes when the operation is run the next time.

Steps

1. If the transition operation results in any ignorable errors, run the following command from the 7-Mode Transition Tool CLI:

   `transition cbt ignorableerrors add -p` ***`project_name`*** **`-c`** ***`ignorable_errorcategory`***

   `ignorable_errorcategory` is the type of error that you can ignore.

2. Rerun the transition operation.

   The blocking error changes to a warning and the error is shown as `acknowledged`. You can continue the transition with the warning.

Ignorable errors during transition

You might encounter some ignorable errors during the transition. You must acknowledge these errors before continuing with transition.

When you add any ignorable error category to the copy-based transition project by using the 7-Mode Transition Tool CLI, it means that you have understood the impact of the error. You must rerun the transition operation after ignoring the error. At this time, the blocking error changes to a warning message, and the error is shown as “acknowledged”. You can continue the transition with the warning.

Category	Description
`acknowledge-no-nonascii-filenames-in-source-volumes`	Acknowledging this error means that you have verified that the SnapLock volumes that you have selected for the Chain of Custody verification operation do not contain any files that have file names with non-ASCII characters.
`acknowledge-snaplock-coc-volume-autocommit-period`	After this ignorable error is added to the project, the 7-Mode Transition Tool continues with the transition even if the autocommit period property is set on the ONTAP SnapLock volume that is configured to store the results of the SnapLock Chain of Custody verification.
`nfs-qtrees-exported`	Acknowledging this error means that you have understood the differences in the enforcement of the qtree export rules between Data ONTAP operating in 7-Mode and ONTAP. It also means that you have understood the possible manual steps that are required after the NFS exports rules are applied by the 7-Mode Transition Tool. 7MTT Precheck 10111 - How to transition 7-Mode volumes that have qtree level exports
`ignore-cifs-ad-domain-mismatch`	If you acknowledge this error, the 7-Mode Transition Tool continues with the transition of CIFS configurations even if the CIFS Active Directory (AD) domain of the 7-Mode system is different from the CIFS AD domain of the target SVM. You must ensure that the CIFS AD domains of the 7-Mode system and the target SVM are trusted domains. Otherwise, the transition of CIFS configurations to the target SVM fails. How to transition CIFS configurations when Active Directory Domain of CIFS server on 7-Mode and target SVM are different

Category	Description
`ignore-ping-check-from-ic-lifs-to-7mode`	After this ignorable error is added to the project, the 7-Mode Transition Tool does not run the check to ping the 7-Mode storage system from the target cluster intercluster LIFs. 7MTT Copy-Based Transition - How to handle the scenario where 7-Mode data-copy IP address is not reachable from target cluster intercluster LIFs
`ignore-secondary-snapmirror-source-check`	After this ignorable error is added to the project, the 7-Mode Transition Tool does not check whether all of the required primary 7-Mode details are added to the secondary project. Due to this error, the 7-Mode Transition Tool might not create the SnapMirror relationships between the primary 7-Mode volumes and secondary cluster volumes during the secondary project complete (cutover) operation.
`ignore-configuration-limits-check`	You can use this option to acknowledge the configuration limits (precheck error) and continue with the transition. By acknowledging this error, you understand that the storage cutover time is expected to take more than 3 to 8 hours, which includes time for the export, halt, and import operations (the automated operations), and also for cabling disk shelves to the new controllers. Storage cutover time considerations for Copy-Free Transition
`mount-snaplock-volumes-using-7mode-volume-name`	After this ignorable error is added to the project, the 7-Mode Transition Tool mounts the SnapLock volumes with the mount path `/<7-mode-volume-name>`
`acknowledge-no-snaplock-audit-transition-to-mcc`	After this ignorable error is added to the project, the 7-Mode Transition Tool continues with the transition even if the target cluster is in a MetroCluster configuration.

Transitioning a MetroCluster configuration that failed due to switchover or switchback

Transition operations, such as transition prepare, start, pause, resume, or complete, fail during a MetroCluster switchover or after a MetroCluster switchback. You must then manually reestablish the SnapMirror relationships to resume transition.

Steps

1. Wait for the switchback to complete.
2. From the cluster CLI, use the `snapmirror create` command to reestablish the SnapMirror relationships between the 7-Mode volumes and clustered Data ONTAP volumes that were part of the transition.

3. From the 7-Mode Transition Tool, rerun the transition operation.

   Data copy operations start when the next schedule becomes active.

Cannot select a secondary volume from the Volume selection pane

You cannot select a secondary volume from the Volume selection pane and transition it as a volume SnapMirror relationship if the volume is not online or if the SnapMirror relationship is broken.

Workaround

Use the ONTAP command-line to perform either of the following workarounds:

- Bring the secondary volume online if it is offline.
- Fix the SnapMirror relationship if it is broken.

Cannot select a volume for transition if the tool fails to retrieve the volume information

The Volume selection pane displays the `Failed to retrieve volume information` error message when you try to select a volume. This error usually occurs if the controller is busy.

Workaround

Wait until the controller is not busy, and then select the volume again.

Cannot proceed from the Volume mapping pane if the selected SVM has no aggregate

The tool displays an error message, `SVM does not have aggregate assigned. Please assign some aggregates to the SVM and click on the refresh button`, on the **Volume mapping** pane if the selected SVM has no aggregate other than the root node aggregate.

Workaround

Add an aggregate to the SVM in clustered Data ONTAP.

Compression is not enabled after transition from Data ONTAP 7.3.x

If you transition a 32-bit volume on a system running Data ONTAP 7.3.x to an ONTAP volume that is in a 64-bit aggregate, compression is not enabled on the ONTAP volume after the transition. Compression cannot be enabled until the volume is upgraded from 32-bit to 64-bit.

Workaround

1. Wait for the upgrade to finish.

   You can use the `volume show -fields block-type -volume vol_name` command to verify that the block type of the volume changes to 64-bit.

2. Enable compression by using the `volume efficiency modify` command.

Copy-Free Transition Guide

This guide describes how to transition from a 7-Mode HA pair to an ONTAP cluster using the 7-Mode Transition Tool, without having to copy data from disks; the existing disk shelves are connected to the new cluster.

Transition overview

Transitioning to clustered ONTAP involves identifying your current environment, defining the transition scope, designing the optimal configuration of the destination systems, planning how to migrate data and configurations, and making necessary environmental updates.

Be sure to consult the current 7-Mode Transition Tool *Release Notes* for the latest information about supported target releases and known issues.

7-Mode Transition Tool Release Notes

You must first collect information about the current environment, including both the current storage environment as well as the hosts and applications. After collecting the storage inventory, you can assess the current features and functionality that are used and identify any differences in the ONTAP version selected. You can use 7-Mode Transition Tool to perform these tasks.

You can then define your migration project. This involves identifying what volumes and workloads you want to migrate together, then you can design your cluster, and plan your transition. You can begin planning your migration by first selecting the optimal migration method. When designing your cluster, you can use the information gathered about your storage environment to map existing configuration items to their equivalent items in ONTAP. For example, a 7-Mode volume should be mapped to an SVM and a volume in ONTAP and an IP address that will be transitioned should be mapped to LIFs. You should also determine if any environmental changes have to be made on the ONTAP system.

Implementation includes deploying and configuring the cluster, migrating data, applying configuration changes, disconnecting clients and reconnecting to the destination ONTAP system, verifying access, as well as performing any necessary environmental changes.

Related information

NetApp Documentation: ONTAP 9

Copy-free transition by using 7-Mode Transition Tool

The 7-Mode Transition Tool enables you to collect inventory and to assess 7-Mode controllers, hosts, switches, and applications for transition. After assessment, you can use a copy-free transition to migrate your data and configurations to ONTAP. In copy-free transition, you disconnect all the disk shelves from a 7-Mode HA pair and connect them to an HA pair in the target cluster.

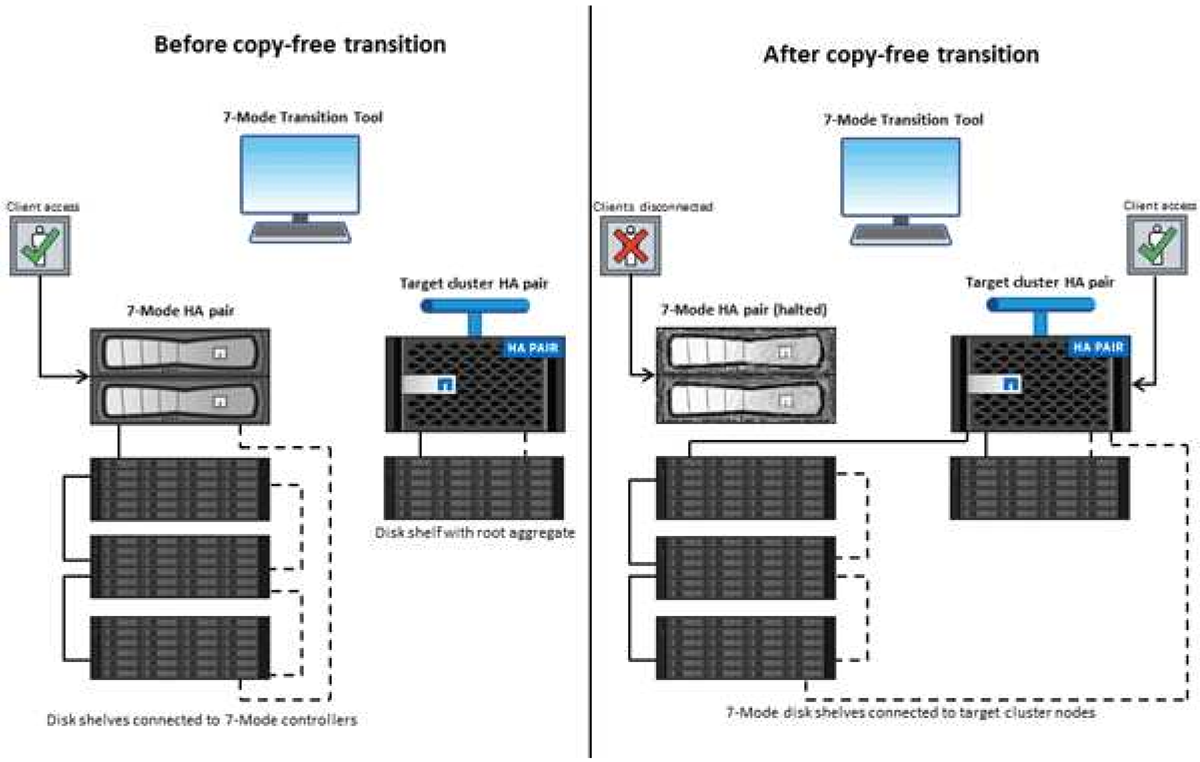
Copy-free transition significantly reduces the migration cost by enabling the reuse of 7-Mode disk shelves. The overall duration for performing the transition is faster because data copy is not required.

The unit of a copy-free transition is an HA pair. You must move all the disk shelves from the 7-Mode HA pair to the target cluster nodes.

The metadata of the 7-Mode aggregates and volumes is converted to the ONTAP format by the 7-Mode Transition Tool. The time taken for this conversion does not depend on the size of the aggregates and volumes. For example, the time taken to convert a 10 GB aggregate to the ONTAP format is the same as the time required to convert a 100 TB aggregate.

Copy-free transition involves a disruption to data access. However, the total time taken to perform the data migration is faster because no data copy is required.

The following illustration shows the before and after scenarios for copy-free transition from a 7-Mode HA pair to a two-node cluster:



The 7-Mode Transition Tool runs on a Windows system and provides web interface for managing transition operations.

Collecting and assessing ONTAP systems, hosts, switches, and applications

You can perform the following collect and assess tasks by using the 7-Mode Transition Tool:

- Collecting inventory information from ONTAP systems (7-Mode controllers and nodes in the cluster), hosts, switches, and host applications.
- Generating the FC Zone plan to configure the zones for SAN FC transition.
- Assessing the features and functionalities of the 7-Mode systems, and identify how these features and functionalities work in the ONTAP version selected for the transition.

Moving data and configurations from 7-Mode to ONTAP

Copy-free transition reuses the 7-Mode disk shelves to copy 7-Mode data from 7-Mode to ONTAP. You can perform the following tasks by using the 7-Mode Transition Tool for copy-free migration:

- Planning your transition to map the 7-Mode controllers or vFiler units to the target SVMs, and design the namespace.
- Running prechecks to verify the compatibility of the 7-Mode systems and target cluster nodes for transition.
- Importing 7-Mode disk shelves in the following ways:
  - From a 7-Mode HA pair to a new HA pair in a new cluster
  - From a 7-Mode HA pair to a new HA pair in an existing cluster that has additional data-serving nodes
  - From a 7-Mode HA pair to an HA pair that has data aggregates in an existing cluster that is serving data
  - From an HA pair that contains volumes in a volume SnapMirror relationship to an HA pair in a new or existing cluster

    You must manually create the cluster peer relationship after transition; however, a rebaseline transfer is not required, and you can retain the SnapMirror relationship after transition.
- Transitioning 7-Mode configurations to SVMs.

  Copy-free transition supports the transition of NAS and SAN configurations.
- Rolling back storage and configurations to 7-Mode if transition to ONTAP fails.

  The tool generates the list of steps that are required to roll back to 7-Mode. You must manually perform these rollback steps on the 7-Mode systems and the cluster.

Transition terminology

Understanding the transition terminology related to the 7-Mode Transition Tool helps you to understand the transition process.

- **Collect and assess**

  Before transitioning data and configurations to ONTAP, you must collect information about the storage environment that includes storage systems, hosts, and applications. You must then assess the features and functionalities of these systems, and identify how these features and functionalities work in the ONTAP version selected for transition.
- **Migrate**

  Refers to transitioning data and configurations from the 7-Mode volumes to ONTAP. Migration should be performed after assessing the 7-Mode controllers.
- **Project**

  In the 7-Mode Transition Tool, a project enables you to configure and manage the transition of a group of volumes.
- **Project group**

  In the 7-Mode Transition Tool, a project group is a logical container that you can use to hold related migration projects. There is always one default group with Default_Group name that exists in the system.

Collecting and assessing the inventory information

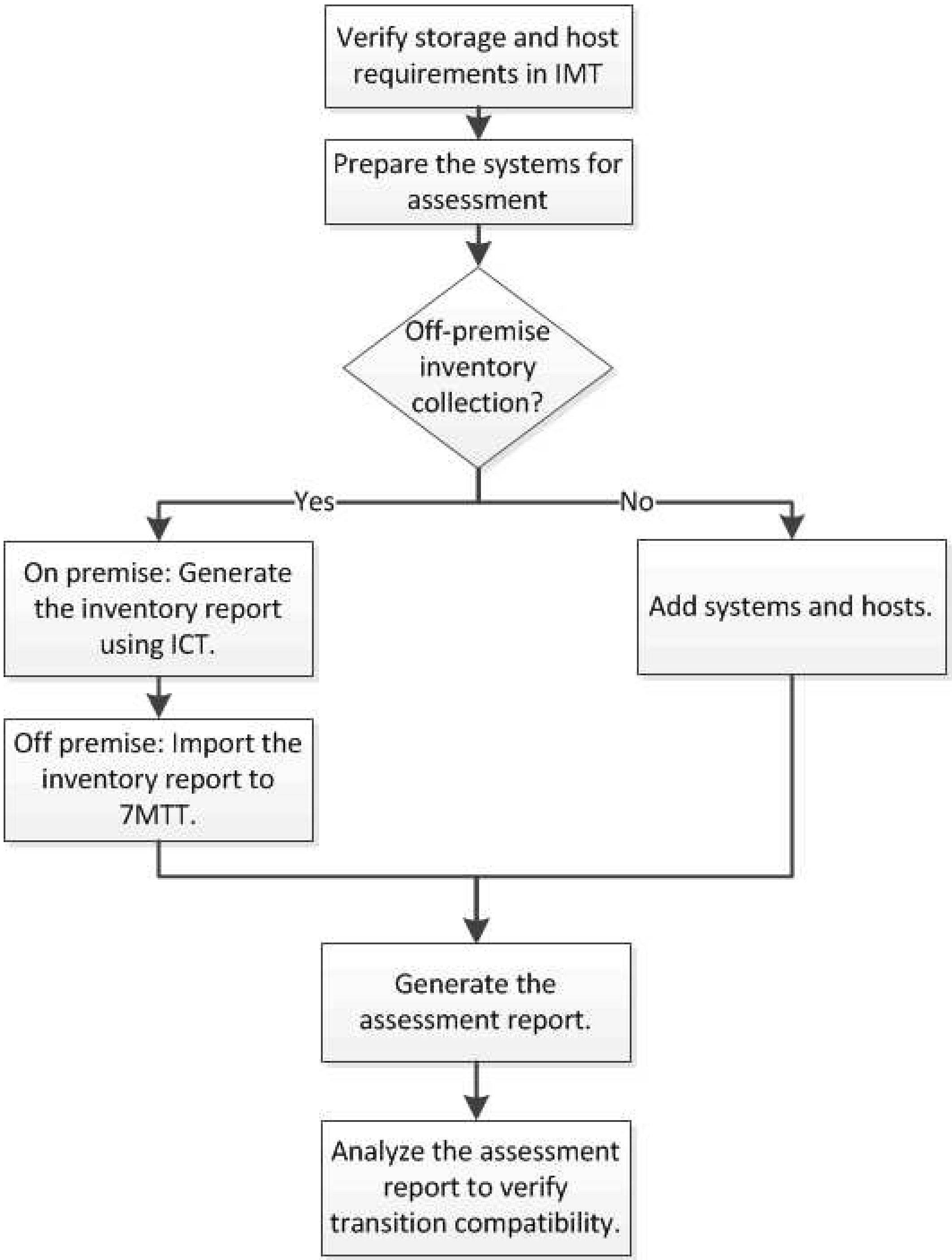
You can collect inventory information from controllers, hosts, and FC switches. You can then assess features and functionalities of these systems, and identify how these features and functionalities work in the ONTAP version that is selected for transition.

You can collect inventory information in two ways:

- If your environment security allows it, you can install the 7-Mode Transition Tool, and then use it to collect the inventory information.
- You can import the inventory XML report generated by the Inventory Collect Tool, and then perform the assessment.

In both cases, you must use the latest version of the Inventory Collect Tool to collect the inventory.

To assess the inventory information for a copy-free transition, you must select both of the nodes of the source 7-Mode HA pair. Although the assessment is done on a per-node basis, if a single node is not qualified for transition, the entire HA pair cannot be transitioned.



Storage, host, and FC switches version requirements for transition assessment

You must be aware of the versions of Data ONTAP operating in 7-Mode, hosts, and FC switches that are supported for transition assessment.

For the list of 7-Mode versions, hosts, and FC switches that are supported for assessment by the 7-Mode Transition Tool, see the NetApp Interoperability Matrix Tool.

[NetApp Interoperability Matrix Tool]

Preparing the 7-Mode systems and hosts for transition assessment

You must ensure that the 7-Mode systems and hosts meet certain network and protocol requirements for successfully generating an assessment report.

Steps

1. Enable HTTPS on the 7-Mode system:

   `options httpd.admin.ssl.enable on`

2. Enable TLS on the 7-Mode system:

   `options tls.enable on`

   > The best practice is to enable TLS because of the security vulnerabilities in SSLv3.

3. Enable SSL and disable SSLv2 and SSLv3 on the 7-Mode system:

   a. Set up and start SSL:

      `secureadmin setup ssl`

   b. Enable SSL:

      `options ssl.enable on`

   c. Disable SSLv2 and SSLv3:

      `options ssl.v2.enable off`

      `options ssl.v3.enable off`

      > The best practice is to disable SSLv2 and SSLv3 to avoid security vulnerabilities.

4. Enable SSH on the 7-Mode system:

   a. Set up SSH on the 7-Mode system:

      `secureadmin setup -f ssh`

      The -f option forces the setup to run even if the SSH server is already configured.

   b. Enable SSH:

      `secureadmin enable ssh2`

   c. Enable password authentication on the SSH server:

      `options ssh.passwd_auth.enable`

   d. Enable SSH access to the host:

      `options ssh.access`

5. Prepare your Windows host systems:
   ◦ Enable WMI access.

     For more information about enabling WMI access, see the host documentation.

   ◦ If you have Windows Server 2003, verify that you have installed the Microsoft Fibre Channel Information Tool (fcinfo) package and run the tool once on your Windows host system.

     This tool enables you to collect the HBA configuration information of the host.

   ◦ If the system on which the 7-Mode Transition Tool is run does not belong to a domain, verify the following:
     ▪ The host system belongs to a domain.
     ▪ If the host has a local user, and the user name for that user is in the following format:

       ```
       SystemName\Username
       ```

6. Enable SSH on the Linux or ESXi host.

   For more information about enabling SSH, see the host documentation.

7. Verify that you have installed the latest NetApp Host Utilities software for each host.

   For information about downloading and installing the NetApp Host Utilities software, see the NetApp Support Site.

8. Verify that all the hosts and storage systems can be reached by the Windows system from which the 7-Mode Transition Tool is run.

Related information

Documentation on the NetApp Support Site: mysupport.netapp.com

Assessing controllers and hosts

You can collect and assess information about the controllers and hosts by using either the 7-Mode Transition Tool or the Inventory Collect Tool, depending on the security regulations in your environment.

- The 7-Mode Transition Tool collects inventory information about controller and hosts by adding the systems or by using the inventory report generated by the Inventory Collect Tool.

  The 7-Mode Transition Tool then assesses inventory information and creates the transition assessment report.

- You must be aware of the following considerations when performing transition assessment:
  ◦ You should not perform both assessment and migration operations simultaneously on a controller.
  ◦ You should avoid performing assessment operations on active storage controllers during peak hours.

Generating an assessment report by adding systems to the 7-Mode Transition Tool

You can collect inventory information for controllers, hosts, and FC switches by adding the systems to the 7-Mode Transition Tool. You can then create an assessment report to assess the features and functionalities of those systems, and to identify how they work in the ONTAP version selected for transition.

- The user name for the storage system and hosts must have sufficient privileges to execute the commands listed in the readme file.

  The readme file is located at `_7-Mode_Transition_Tool_installed_location\bin\ict`.

- You must have prepared the 7-Mode systems, hosts, and FC switches for transition assessment.
- For assessing Windows systems, you must have a domain user account.
- If you are adding multiple systems for assessment, you must create a text file that is encoded in the ASCII or UTF-8 format and must contain the system details in the form of one system per line.

  Each system details must be in the following format:

  `(ontap|windows|vmware|linux|cisco|brocade)://[(`*`user|domain_user`*`)[:`*`password`*`]@](`*`host_name|ip`*`)`

- The controller or host must be accessible by the system on which the 7-Mode Transition Tool is installed and run.
- All features must be configured or their license enabled so that the workbook can contain inventory information about these features.
- The user name for the storage system must have sufficient administrative privileges to collect inventory information.
- All host names and storage system configurations, such as CIFS share names, user names, and group names, must be in the UTF-8 format.

If the 7-Mode Transition Tool service or the system on which this tool is installed is restarted, then the system details added to the tool are lost and the system must be added to the tool again.

Steps

1. If you want to use the latest Interoperability Matrix (IMT) data for transition assessment:
   a. Download the IMT data from the Interoperability Matrix, and then save it:
      i. From the Reports menu, click **Complete Daily Exports**.
      ii. In the Complete Daily Exports dialog box, enter FAS in the search field.
      iii. Download the ONTAP SAN Host excel file, and then save it.
      NetApp Interoperability Matrix Tool
   b. From the CLI, import the IMT data by using the `transition imt import` command.
   c. Verify that the import is successful by using the `transition imt show` command.

      Troubleshooting: If the IMT data import operation fails, you can revert to the previous data by using the `transition imt restore` command.
2. Log in to the 7-Mode Transition Tool, and then click **Collect & Assess** in the home page.

3. Click **Add Systems**.
4. In the Add System window, perform one of the following actions:
   - Add a single system:
     i. Enter the fully qualified domain name (FQDN) or IP address of the system.
     ii. Enter the user name and password for the specified system.
     iii. Select the system type:
        - Data ONTAP storage systems
        - Hosts: Microsoft Windows, Red Hat Linux Enterprise, and VMware ESXi
        - FC switches: Cisco and Brocade
   - Add multiple systems by clicking **Browse**, and then selecting the text file that contains the credentials for multiple systems.
5. Click **Add**.

   If the assessment status of a system is Ready, then you can perform transition assessment for that system.

6. Generate the transition assessment report:

   a. Select the systems for transition assessment.
   b. Click **Create Transition Assessment Report**.
   c. In the Create Transition Assessment Report dialog box, select the Data ONTAP version of the target cluster.
   d. Specify a prefix for the file name of the reports.
   e. Click **Generate Report**.

   The assessment workbook (report name appended with “AssessmentWorkbook”) and assessment executive summary (report name appended with “AssessmentExecutiveSummary”) reports are generated in XML format.

   +
   You can access the assessment workbook, assessment summary, and inventory XML files that are used to generate the assessment report from the …`etc/webapp/transition-gui/tmc` folder.

7. View the assessment workbook in Microsoft Excel and assessment executive summary in Microsoft Word by using Microsoft Office 2007 or later versions.

   In the assessment workbook, see the Transition Feasibility (CFT), Config Precheck Summary, Config Precheck Details, and CFT Precheck Summary tabs for copy-free transition assessment details.

   In the assessment executive summary, see the Copy-Free Transition Feasibility section for controller-level assessment details.

   You might have to enable macros in Excel to view the assessment workbook.

   In the data collection summary of the assessment workbook, if the access status of a system is `FAILED`, then the inventory information for that system is invalid. In the assessment executive summary, the value of some of the fields of this system is displayed as `Not Assessed`.

Generating an assessment report by importing the inventory report XML

You can import the inventory XML report generated by the Inventory Collect Tool to assess the features and functionalities of hosts and controllers. You can then identify how these host and controllers work in the ONTAP version selected for transition by creating an assessment report.

- You must have run the Inventory Collect Tool and generated the inventory report XML file.

> To assess hosts and controllers for copy-free transition, you must use the latest version of the Inventory Collect Tool to collect inventory.

- You must have prepared the 7-Mode systems and hosts for transition assessment.

The systems that you want to assess need not be reachable while importing the inventory report and performing transition assessment.

Steps

1. Log in to the 7-Mode Transition Tool, and then click **Collect and Assess** in the home page.
2. Click **Import Inventory Report XML**.
3. Click **Browse**, and then select the XML report generated by the Inventory Collect Tool.
4. Click **Import**.

   The assessment status of the system shows `Imported;Ready`.

5. Select the system for which you want to perform transition assessment.
6. Click **Create Transition Assessment Report**.
7. In the Create Transition Assessment Report dialog box, select the Data ONTAP version of the target cluster.
8. Specify a prefix for the file name of the reports.
9. Click **Generate Report**.

   The AssessmentWorkbook and AssessmentExecutiveSummary reports are generated in XML format.

10. View the AssessmentWorkbook report in Microsoft Excel and the AssessmentExecutiveSummary report in Microsoft Word by using Microsoft Office 2007 or later versions.

    To view the AssessmentWorkbook report in Microsoft Excel, you might have to enable macros in Excel.

Generating an FC zone plan

For FC switches, you must generate an FC zone plan as part of the transition assessment report to configure the zones for grouping the initiator hosts and targets after the migration.

- The 7-Mode system, hosts, and the cluster must be connected to the same switch.

  Supported configurations for generating an FC zone plan

- You must have created the required target SVMs and FC LIFs on the cluster.
- The FC LIFs that are created on the target SVMs will have WWPN, which are different from 7-Mode WWPNs. Therefore, perform FC zoning while you transition SAN for FCP.

Steps

1. In the Collect and Assess section, click **Add Systems**.
2. In the Add System window, perform one of the following actions:
   - Add a single system:
     i. Enter the FQDN or IP address of the system.
     ii. Enter the user name and password for the specified system.
     iii. Select the system type:
        - Data ONTAP storage systems
        - Hosts: Microsoft Windows, Red Hat Linux Enterprise, and VMware ESXi
        - FC switches: Cisco and Brocade
   - Add multiple systems by clicking **Browse**, and then selecting the text file that contains the credentials for multiple systems.
3. Click **Add**.

   If the assessment status of a system is Ready, then you can perform transition assessment for that system.

4. Generate the transition assessment report with the FC zone plan:
   a. Select the systems, including the required FC switches, for transition assessment.
   b. Click **Create Transition Assessment Report**.
   c. In the pair systems and start FC zone planner dialog box, select the 7-Mode systems (single controller or HA pair), the switch connected to the cluster, and an SVM in the cluster.

      If you plan to consolidate the FC LUNs to a single SVM by rehosting transitioned volumes, select the 7-Mode HA pair and the target SVM.

      > It is a best practice to consolidate the FC LUNs to a single SVM for preserving the 7-Mode single-system image (SSI) configuration.

      If you do not plan to consolidate the FC LUNs, you must generate the FC zone plan for each 7-Mode controller and the corresponding target SVM.

   d. Click **FC Zoning for paired systems**.
   e. In the Create Transition Assessment Report dialog box, select the Data ONTAP version of the target cluster.
   f. Specify a prefix for the file name of the reports.
   g. Click **Generate Report**.

The FC zone plan is generated as a `.zip` file. The plan contains zones created per the igroup configurations on the 7-Mode systems. Each zone contains a single initiator WWPN and multiple SVM target WWPNs.

You must use the FC zone plan for configuring the zones to group the initiator hosts and targets for providing data access from the cluster.

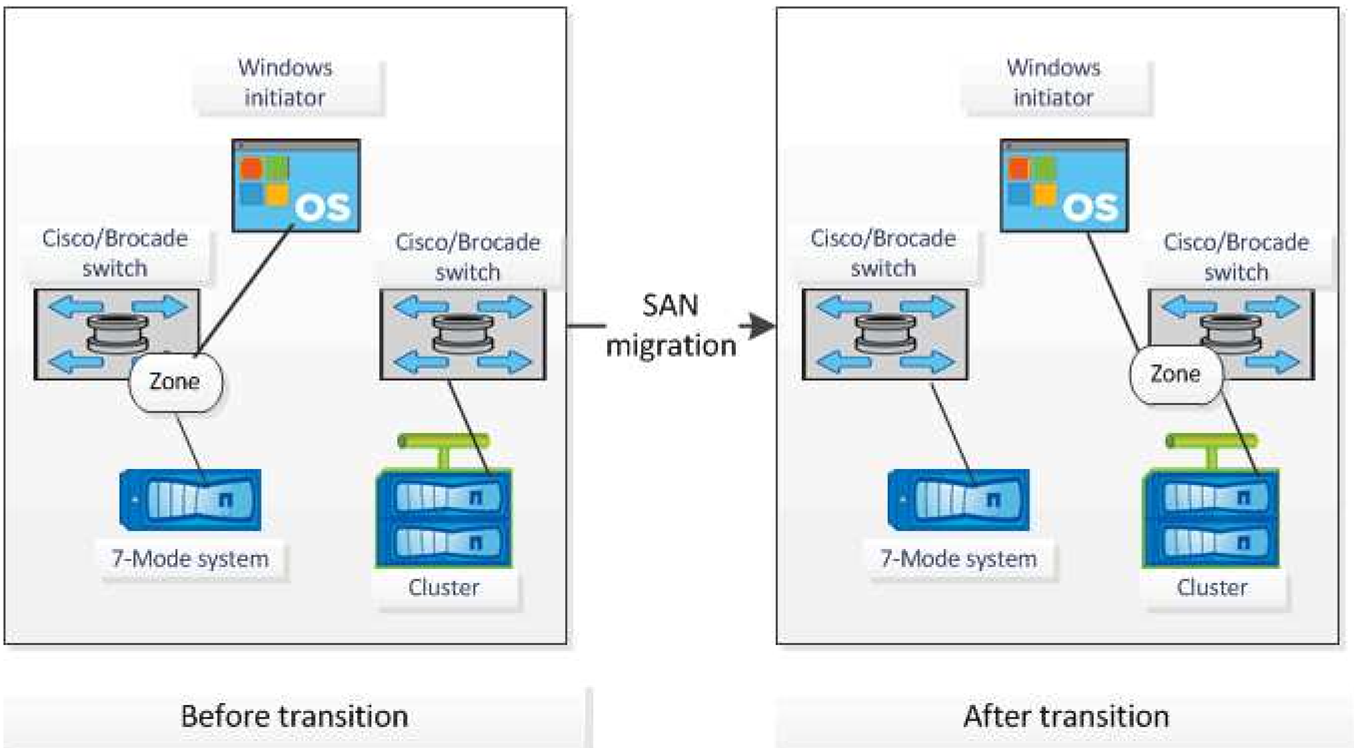
Supported configurations for generating an FC zone plan

You must be aware of the supported configurations of 7-Mode systems, hosts, FC switches, and the cluster to generate the FC zone plan. You should use the plan to configure zones for the cluster after migration.

The 7-Mode systems (single controller or an HA pair), hosts, and cluster can be connected either to the switches in the same fabric or different fabrics, depending on the data center requirements.

The following figure illustrates a configuration in which the 7-Mode systems, hosts, and cluster are connected to the switches in the same fabric:

The following figure illustrates a configuration in which the 7-Mode systems and cluster are connected to switches in different fabrics:



How you can use the assessment executive summary for transition assessment

The transition executive summary provides a summary of the 7-Mode controllers, hosts, and FC switches in your environment. It provides an assessment report of the current features and functionality that are used and recommends the transition methodology for each volume within your storage environment. You can use the summary to plan your transition.

The executive summary has the following main sections:

Target cluster

This section lists the ONTAP version of the target cluster that you selected during assessment.

Data collection summary

You can view the list of 7-Mode controllers, hosts, and switches for which you have collected information. You can view the ONTAP version and model details of the 7-Mode controller. You can also view the OS type, version, and model of the hosts.

Transition feasibility and recommended transition methodology

This section provides a summary of the prechecks that are run on each controller and the feasibility of transition at the controller and volume level. The volumes that belong to vFiler units that are in the `stopped` or `inconsistent` state or the volumes that are offline or restricted are not included for assessment. The report displays the count of errors and warnings reported in the precheck against each controller. You should review these errors and warnings and resolve any issues before transitioning. Details of these prechecks are available in the Config Precheck Summary tab of the assessment workbook.

Copy-free transition feasibility: This section lists the number of controller-level prechecks that resulted in errors and warnings for copy-free transition. If a precheck fails for any one controller in the HA pair, you cannot transition the HA pair by using copy-free transition. You must resolve all errors and warnings before transitioning the HA pair. Details of these prechecks are available in the CFT Precheck Summary tab of the assessment workbook.

Based on the volume and controller configurations and the precheck summary, the executive summary provides a recommendation about the best transition methodology for each assessed volume. For example, you cannot transition 7-Mode traditional volumes or FlexCache volumes because these features are not supported in ONTAP.

For most of the configurations, the 7-Mode Transition Tool is the recommended tool for transition. However, there are some workloads that cannot be transitioned by using the 7-Mode Transition Tool, and for those you should use an application-based or host-based migration method.

NetApp Technical Report 4052: Successfully Transitioning to Clustered Data ONTAP (Data ONTAP 8.2.x and 8.3)

Storage inventory

This section provides the following information:

- Storage objects: Provides information about the number of storage objects, such as volumes, qtrees, LUNs, vFiler units, SnapMirror relationships, shares, and exports, in each controller.
- Storage utilization: Provides information about the used space, available space, and space utilized by the 7-Mode controllers.
- Licenses: Provides the list of feature licenses enabled on each controller.
- Protocol configuration: Provides details about the protocols configured on the controllers, such as CIFS, NFS, and SAN protocols, and the versions.
- SnapMirror interconnectivity: Provides information about the controllers or volumes that are either the source or destination of a SnapMirror relationship.

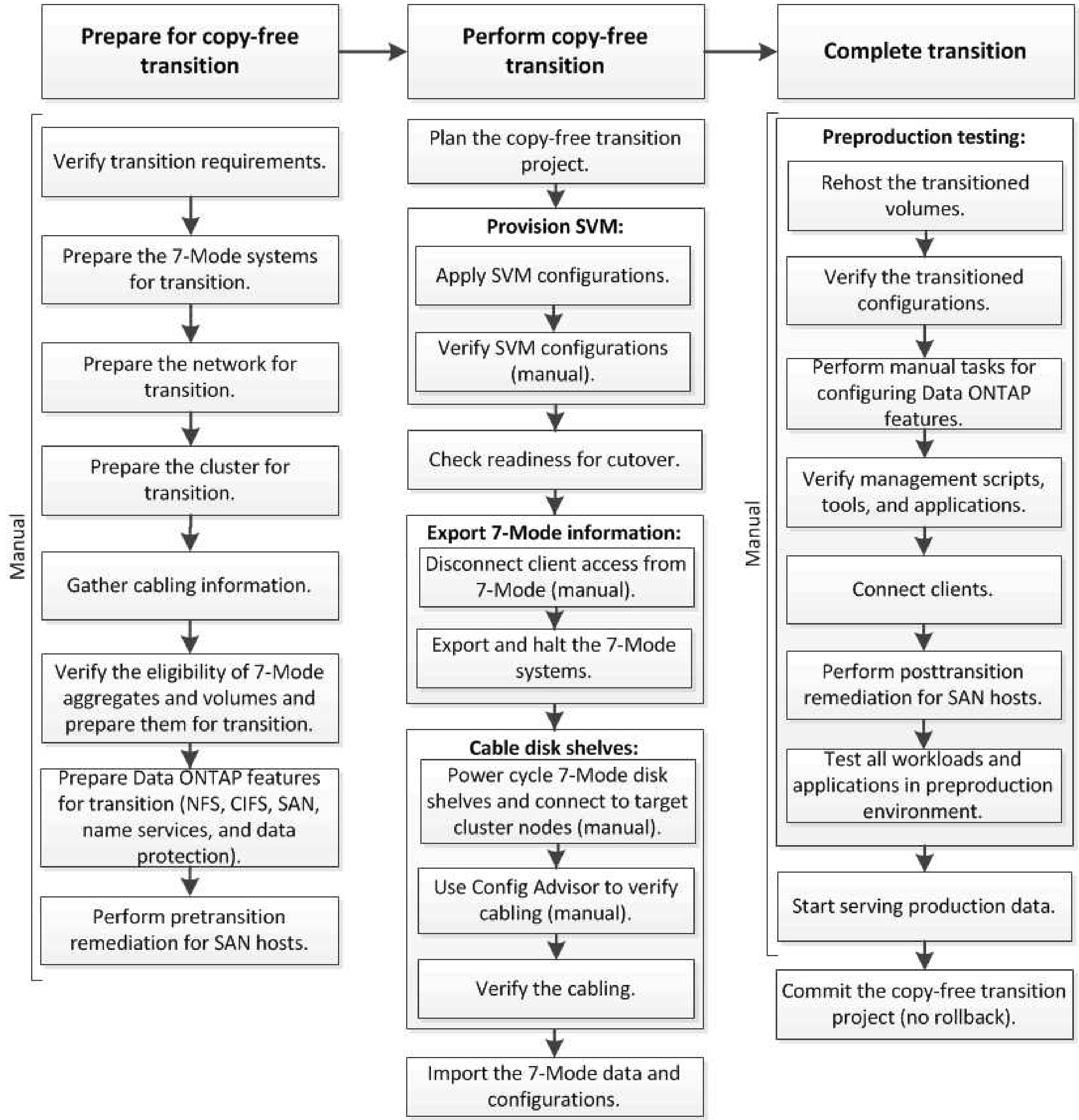
  You can use this information to identify controllers that are in SnapMirror relationships with the controllers listed in the report, but are not included for assessment.
- SnapVault interconnectivity: Provides information about the controllers, volumes, or qtrees that are either the source or destination of a SnapVault relationship with the specified controller, volumes, or qtrees in the controller.

Data collection errors

This section provides details about controller and host information that could not be collected by the 7-Mode Transition Tool and the reason for the failure. Details of the data collection errors are available in the Data Collection Errors tab of the assessment workbook. You can resolve these errors and assess the systems again.

Copy-free transition workflow

The copy-free transition workflow includes preparing for the transition, performing the transition, and completing the transition. Some of these tasks must be done manually on the 7-Mode systems and the cluster.



Manual: Tasks that cannot be done from 7-Mode Transition Tool

Phases of copy-free transition

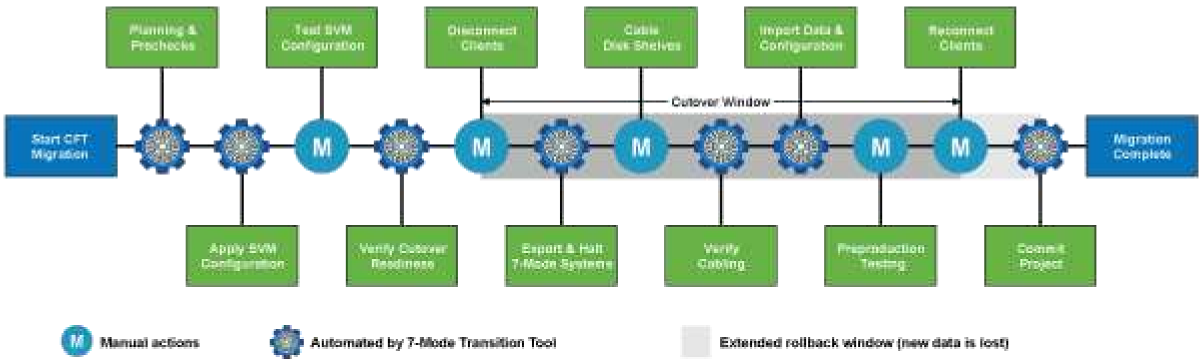
Copy-free transition using the 7-Mode Transition Tool consists of the following phases: planning, SVM provisioning, exporting and halting, cabling, importing, preproduction testing, starting production, and committing. You should understand the phases to manage the transition effectively.

Copy-free transition is a disruptive operation. Therefore, you must plan for the downtime for the applications and workload running on the 7-Mode storage systems.

In most cases, the storage cutover time can be 3 through 8 hours. Cutover time includes the time taken by the tool to perform two automated operations—the export and halt operation and the import operation—as well as the time taken for manually cabling the disk shelves to the new controllers. The export and halt operation and the import operation together can up to 2 hours.

> For scaled configurations, the export and halt operation and the import operation together can take more than 2 hours. 7-Mode Transition Tool detects such conditions and provides a warning.

Cabling of the disk shelves can take from 1 hour through 6 hours. This cutover time guidance does not include the time for the required preproduction testing and assumes an error-free transition without unexpected failures such as disk failure.



Planning the project

You can plan the following details about the source and target of a copy-free transition project:

- 7-Mode HA pair and vFiler unit details
- Target cluster nodes and mapping of source controllers to target nodes
- 7-Mode controller or vFiler unit to SVM mapping
- IP addresses to transition (new LIFs or existing 7-Mode IP addresses) and the IPspaces and broadcast domains on the SVM

> The 7-Mode Transition Tool does not support the transition of FC and iSCSI LIFs. These LIFs must be manually configured on the SVMs before transition.

In this phase, prechecks are run to verify whether the 7-Mode HA pair is ready to be migrated to clustered Data ONTAP. The 7-Mode Transition Tool also verifies that the cluster is configured properly and can support the transition.

You must resolve any errors before continuing with the transition. Although the tool allows you to continue without resolving warnings, it is a best practice to address any warnings before continuing with the transition. You can run the prechecks multiple times to verify that all the errors have been resolved.

SVM provisioning

After planning your transition project, you must perform some manual tasks, such as adding licenses, creating the CIFS server, and creating SAN LIFs, to prepare the cluster and SVMs for transition.

You can then apply the configurations on the SVMs by using the tool. All the 7-Mode controller or vFiler unit level configurations are transitioned to the mapped SVM. Volume and LUN configurations are not transitioned during this phase; they are transitioned in the import phase.

At the end of this phase, you should manually verify the configurations applied to SVMs and make the necessary changes.

Exporting storage configurations and halting 7-Mode systems

This phase starts the cutover window for copy-free transition. Client access must be manually disconnected. However, all the NAS and SAN services must be up and running on the 7-Mode HA pair. This is because the 7-Mode Transition Tool requires all services to be up and running for collecting the volume-level configurations from the 7-Mode systems.

The tool performs the following operations in the export phase:

- Collects all volume and storage configurations
- Creates a Snapshot copy of each transitioning aggregate

  This Snapshot copy is used for rolling back to 7-Mode, if required.

- Boots the 7-Mode controllers in maintenance mode
- Removes disk ownership from the disks attached to the 7-Mode controllers
- Disables disk autoassignment on the target cluster nodes

Cabling the 7-Mode disk shelves

You must perform the tasks in this phase manually. You must ensure that the disk shelf IDs are unique across the 7-Mode controllers and target cluster nodes.

> If there are duplicate shelf IDs, you must change the disk shelf IDs and power cycle the disk shelves.

You must disconnect all the 7-Mode disk shelves and hot-add them to the target cluster nodes. After the disk shelves are connected to the target cluster nodes, you must power cycle the disk shelves.

It is a best practice to manually verify the cabling by using Config Advisor. Config Advisor is a configuration validation and health check tool for NetApp systems. It can be deployed at both secure sites and non-secure sites for data collection and system analysis.

You can then verify the cabling by using the 7-Mode Transition Tool to proceed with the transition. The 7-Mode Transition Tool performs only a subset of the cabling checks that are performed by Config Advisor.

Importing 7-Mode data and configurations

All the storage objects (aggregates, volumes, and LUNs) and the associated configurations are transitioned during this phase.

The tool performs the following operations in the import phase:

- 7-Mode disks are assigned to the mapped target cluster nodes.
- All 7-Mode aggregates, volumes, and LUNs are converted to the clustered Data ONTAP format.
- LIFs are configured on the SVMs in the administrative up state.
- All volume-level and LUN-level configurations are applied.

Preproduction testing

You must manually test all the transitioned aggregates, volumes, and configurations that are applied to the target SVMs during this phase. You must also perform all manual tasks for completing your configuration—for example, configuring hosts and performing host remediation for SAN hosts.

You cannot perform certain operations on the transitioned aggregates or volumes during this phase. There are also certain operations that are not recommended during the testing phase. This is to ensure a successful rollback operation in case you decide to roll back to 7-Mode.

You must also manually test all applications and workloads thoroughly before starting data access in a production environment.

> The aggregates might run out of space because of the aggregate Snapshot copies and the write operations that are performed during the testing. If the free physical space is less than 5% of the total space, the aggregates are taken offline. You must regularly monitor the free physical space available in the transitioned aggregates to avoid space issues.

Starting production

After testing all workloads and applications, you can start client access to the transitioned data in the production environment. This stage of transition—where production is started but the project is not yet committed—is the final stage of transition when you can decide to roll back to 7-Mode. You must not prolong this phase because of the following reasons:

- The probability of running out of space in the transitioned aggregates increases as new data is written to the volumes.
- Any new data written to the volumes during this stage will not be available after rollback.

Committing the project

In this final stage of transition, the aggregate-level Snapshot copies that were created during the export phase are deleted.

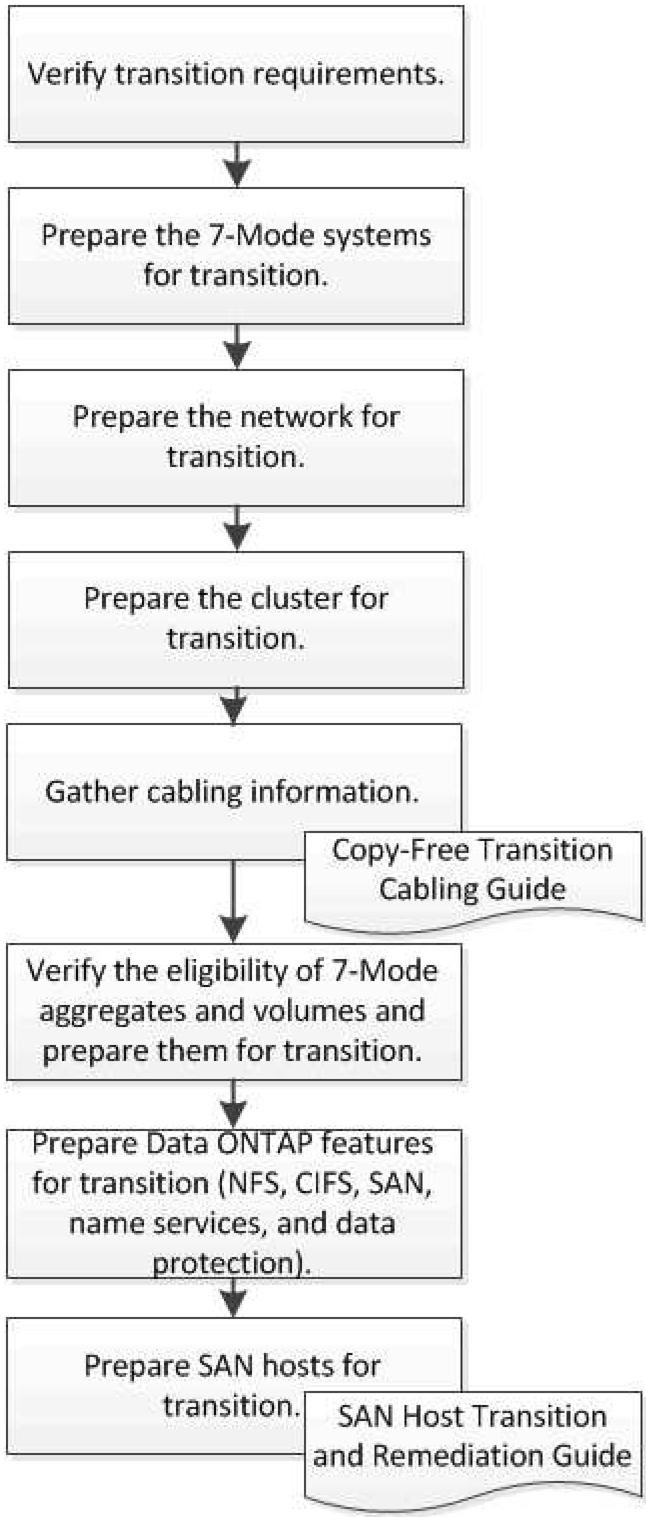
You cannot roll back to 7-Mode after you commit the 7-Mode aggregates and complete the transition.

Related information

NetApp Downloads: Config Advisor

Preparing for copy-free transition

Before starting the copy-free transition, you must identify the 7-Mode HA pair to transition, understand the requirements and restrictions for migration, and prepare the 7-Mode systems and cluster for transition. You must also be aware of the Data ONTAP features that are supported and unsupported for transition.



Related information

NetApp Interoperability Matrix Tool

Requirements for copy-free transition

You should be aware of the requirements for 7-Mode systems, clusters, ONTAP releases, and disk shelves for copy-free transition.

Be sure to consult the current 7-Mode Transition Tool *Release Notes* for the latest information about supported target releases and known issues.

7-Mode Transition Tool Release Notes

- **Platform models**

  Copy-free transition is supported only on mid-end and high-end FAS systems and IBM N series systems. The NetApp Interoperability Matrix Tool has the latest information about the supported platforms for 7-Mode systems and the target cluster nodes.

- **Data ONTAP in 7-Mode source systems**

  For a list of the 7-Mode releases supported for migration by the 7-Mode Transition Tool, see the NetApp Interoperability Matrix Tool

- **ONTAP target systems**

  7-Mode Transition Tool version 3.3.1 supports transition to the following ONTAP releases by using the copy-free method:

  - ONTAP 9.4 and earlier ONTAP 9 releases
  - Clustered Data ONTAP 8.3.2 and later 8.x releases
    Note: You cannot use the 7-Mode Transition Tool to transition to ONTAP 9.5 or later using the copy-free method. To do so, you must first transition to ONTAP 9.4 using 7-Mode Transition Tool 3.3.1 and then upgrade your cluster to ONTAP 9.5 or later. 7-Mode Transition Tool 3.3.2 does not support copy-free transitions.

- **HA configuration**

  The 7-Mode controllers and target cluster nodes must be in an HA configuration. The HA pairs must be healthy, and none of the nodes can be in takeover mode. Stand-alone controllers are not supported for copy-free transition.

- **Disk shelf models**

  The following disk shelf models are supported:

  - DS4486
  - DS4246
  - DS4243

    The disk shelf model DS4243 is not supported with ONTAP 9.2 and ONTAP 9.4. This model is supported with all ONTAP 9.2 patch releases starting with ONTAP 9.2P1 and with ONTAP 9.3. 7-Mode Transition Tool 3.3.1 supports transition with the disk shelf model DS4243 for copy-free transition to ONTAP 9.2P1 through ONTAP 9.3.

  - DS2246
  - DS14mk4 FC (not supported in ONTAP 9.0 and later)
  - DS14mk2 AT (not supported in ONTAP 9.0 and later)

The disk shelf model DS14mk2 FC is not supported.

- **Disk firmware**

  You must download and install the latest disk qualification package, disk firmware, and disk shelf and ACP firmware on the 7-Mode systems and target cluster nodes.

  NetApp Downloads: Disk Qualification Package

  NetApp Downloads: Disk Drive Firmware

  NetApp Downloads: Disk Shelf Firmware

- **Tool to verify cabling**

  After connecting the 7-Mode disk shelves to the target cluster nodes during the transition, you must use Config Advisor to verify the cabling.

  NetApp Downloads: Config Advisor

Tools and documentation required for copy-free transition

The Config Advisor is the required tool for copy-free transition. You should use Config Advisor to verify the cabling of the disk shelves. Additional documentation is also available for SAN host remediation.

Config Advisor

You should use the "Transition" execution profile in Config Advisor to verify the cabling after the 7-Mode disk shelves are connected to the target cluster nodes.

NetApp Downloads: Config Advisor

Documentation

Describes the pre-transition and post-transition steps that have to be performed on SAN hosts when transitioning using copy-free transition.

SAN host transition and remediation

Port requirements for communicating with the 7-Mode Transition Tool

The 7-Mode Transition Tool communicates with the 7-Mode system and the cluster over certain ports. You must ensure that these ports on the 7-Mode system and the cluster are open to allow communication with the 7-Mode Transition Tool.

Ports that must be open on the 7-Mode systems

The 7-Mode Transition Tool communicates with the 7-Mode systems by using HTTPS on port 443.

Ports that must be open on the cluster

The 7-Mode Transition Tool communicates with the cluster by using HTTPS on port 443.

Ports that must be open on the 7-Mode Transition Tool

Port 8444 of the 7-Mode Transition Tool must be open for the web interface.

To transition netgroups and CIFS local users and groups, the following requirements must be met:

- Port 8088 of the 7-Mode Transition Tool must be available.

  For an alternative to port 8088, you must change the port specified by the `tool.http.port` parameter in the `transition-tool.conf` file of the 7-Mode Transition Tool installation directory.

  > You must restart the 7-Mode Transition Tool service after changing the port in the configuration file.

- Each node in the cluster must have at least one data LIF configured for the target SVM.
- All SVM data LIFs must be able to communicate with the 7-Mode Transition Tool port 8088 or the port specified by the `tool.http.port` parameter in the `transition-tool.conf` file.

  > You must verify that firewalls do not block this traffic.

Related information

7-Mode Transition Tool installation and administration

Preparing the 7-Mode HA pair for transition

Before starting a transition, you must complete certain tasks on the 7-Mode system, such as enabling the 7-Mode system to communicate with the target cluster, and enabling HTTPS and TLS.

The HA pair must be healthy and none of the nodes must be in the takeover mode, which can be verified by using the cf status command. You can also use the NetApp AutoSupport tool to detect any errors or at risk conditions.

1. If HTTPS is not enabled on the storage system, enable HTTPS:

   `options httpd.admin.ssl.enable on`

   HTTPS is enabled by default.

2. Enable TLS on the 7-Mode storage systems for enabling the 7-Mode Transition Tool to communicate with the 7-Mode systems:

   a. If SSL is not already enabled on the storage system, set up and start SSL:

      `secureadmin setup ssl`

      SSL is set up for the storage systems by default. If SSL has been previously set up for the storage system, you are asked whether you want to continue. You can exit the SSL setup if you do not want to make any changes.

   b. Enable SSL:

```
options ssl.enable on
```

This option must be enabled for allowing communication over TLS.

c. Enable TLS:

```
options tls.enable on
```

d. Disable SSLv2 and SSLv3 on the 7-Mode system:

```
options ssl.v2.enable off
```

```
options ssl.v3.enable off
```

The 7-Mode Transition Tool uses TLS or SSL protocols for communicating with the 7-Mode storage systems. The tool communicates with the storage system using the TLS protocol if TLS is enabled on the storage system. If TLS is disabled and SSLv3 is enabled on a storage system, the tool uses SSLv3 to communicate with the storage system.

+
IMPORTANT: The best practice is to enable TLS and disable SSLv2 and SSLv3 in order to avoid security vulnerabilities.

Setting up the SP or RLM on the 7-Mode systems for copy-free transition

If the Service Processor (SP) or the Remote LAN Module (RLM) is not already configured on the 7-Mode storage systems or if you have configured the SP or RLM with an IPv6 address, you must configure the SP or RLM with an IPv4 address.

- SSHv2 must be supported on the host on which the 7-Mode Transition Tool is installed.
- You must have access to the SP or RLM “naroot” account or a Data ONTAP user account with the credentials of the “admin” role or a role with “login-sp” capability.

7-Mode Transition Tool accesses the 7-Mode systems when the systems are halted during transition by using a remote management device that can be the SP or RLM, whichever is available on your system based on the platform model. You must configure the SP or RLM with an IPv4 address. IPv6 configuration is not supported for transition.

Steps

- Configure the SP and provide SP access to the host on which 7-Mode Transition Tool is installed.
  a. Configure and enable the SP network with an IPv4 address:

  ```
  sp setup
  ```

```
system1> sp setup
   The Service Processor (SP) provides remote management capabilities
   including console redirection, logging and power control.
   It also extends autosupport by sending
   additional system event alerts. Your autosupport settings are use
   for sending these alerts via email over the SP LAN interface.
Would you like to configure the SP? y
Would you like to enable DHCP on the SP LAN interface? n
Please enter the IP address of the SP []: 192.168.123.98
Please enter the netmask of the SP []: 255.255.255.0
Please enter the IP address for the SP gateway []: 192.168.123.1
Do you want to enable IPv6 on the SP ? n
Verifying mailhost settings for SP use...
```

b. Verify the SP network configuration settings:

`sp status`

```
system1> sp status
        Service Processor      Status: Online
             Firmware Version:   1.2
             Mgmt MAC Address:   00:A0:98:01:7D:5B
             Ethernet Link:      up
             Using DHCP:         no
    IPv4 configuration:
             IP Address:         192.168.123.98
             Netmask:            255.255.255.0
             Gateway:            192.168.123.1
```

c. Provide SP access to the host on which the 7-Mode Transition Tool is installed:

`options sp.ssh.access host=`*`7mtt_host`*

`7mtt_host` is the host name or IP address of the host on which the 7-Mode Transition Tool is installed.

> When you configure the SP, all hosts are granted access by default. You must perform this step if you want to restrict the access to specific hosts.

d. From the host on which the 7-Mode Transition Tool is installed, log in to the SP:

`ssh `*`username@SP_IP_address`*

When prompted, enter the password for the user name.

The SP prompt is displayed, indicating that you have access to the SP CLI.

- Configure the RLM and provide RLM access to the host on which the 7-Mode Transition Tool is installed.

  a. Configure the RLM network with an IPv4 address:

     `rlm setup`

     In the RLM CLI wizard, you must enter the IP address, network mask, and gateway for the RLM.

```
system> rlm setup
      The Remote LAN Module (RLM) provides remote management
capabilities
     including console redirection, logging and power control.
     It also extends autosupport by sending
     additional system event alerts. Your autosupport settings are
used
     for sending these alerts via email over the RLM LAN interface.
Would you like to configure the RLM? y
Would you like to enable DHCP on the RLM LAN interface? n
Please enter the IP address for the RLM []:192.168.123.98
Please enter the netmask for the RLM []:255.255.255.0
Please enter the IP address for the RLM gateway []:192.168.123.1
Do you want to enable IPv6 on the RLM ? n
Verifying mailhost settings for RLM use...
```

  b. Verify that the RLM network configuration is correct:

     `rlm status`

```
system> rlm status
    Remote LAN Module    Status: Online
        Part Number:        110-00030
        Revision:           A0
        Serial Number:      123456
        Firmware Version:   4.0
        Mgmt MAC Address:   00:A0:98:01:7D:5B
        Ethernet Link:      up, 100Mb, full duplex, auto-neg complete
        Using DHCP:         no
    IPv4 configuration:
        IP Address:         192.168.123.98
        Netmask:            255.255.255.0
        Gateway:            192.168.123.1
```

  c. Provide RLM access to the host on which the 7-Mode Transition Tool is installed:

     `+options rlm.ssh.access host=7`*`mtt_host*`*

     7mtt_host is the host name or IP address of the host on which the 7-Mode Transition Tool is installed.

When you configure the RLM, all hosts are granted access by default. You must perform this step if you want to restrict the access to specific hosts.

d. From the host on which the 7-Mode Transition Tool is installed, log in to the RLM:

   ssh *username@RLM_IP_address*

   When you are prompted, you must enter the password for the user name.

   The RLM prompt is displayed, indicating that you have access to the RLM CLI.

Preparing the network for transition

You must prepare the data network of the cluster for transition by creating logical ports (VLANs and interface groups).

The NTP server must be configured and the time must be synchronized across the 7-Mode systems and cluster.

Steps

1. Create VLANs or interface groups on the target cluster nodes, if required:

   network port vlan create

   or

   network port ifgrp create

   To provide network connectivity after transition, you should transition the 7-Mode IP addresses to a similar network topology in ONTAP. For example, if the 7-Mode IP addresses are configured on physical ports, the IP addresses should be transitioned to appropriate physical ports in ONTAP. Similarly, IP addresses configured on VLAN ports or interface groups should be transitioned to appropriate VLAN ports or interface groups in ONTAP.

2. If you want SVMs in the non-default IPspace, create the required IPspaces:

   network ipspace create

   The 7-Mode IP addresses or the new LIFs that are selected for transition are created in the IPspace of the mapped SVM.

   IPv6 addresses cannot be transitioned and must be configured manually post-transition.

Related information

Network and LIF management

Considerations for transitioning 7-Mode IP addresses

You must be aware of certain considerations when transitioning 7-Mode IP addresses to storage virtual machines (SVMs) in ONTAP.

- You can transition existing 7-Mode IP addresses or specify new IP addresses to be configured on the SVM by using the 7-Mode Transition Tool.
  - Existing 7-Mode IP addresses are created on the SVM in the administrative `down` state in the apply configuration (precutover) phase.
  - New IP addresses are created on the SVM in the administrative `up` state in the apply configuration (precutover) phase.
- IPv6 addresses cannot be transitioned and must be manually configured after the transition.
- iSCSI and FC LIFs are not transitioned and must be manually configured after the transition.

Preparing the cluster for transition

Before transition, you must prepare the cluster to communicate with the 7-Mode Transition Tool and prepare the SVMs for transition. You can transition to a target HA pair that has data aggregates.

- The cluster must already be set up and the target cluster nodes must be joined to the cluster.

  Software setup

- The SVMs must be created and assigned to an IPspace.
- You can transition the 7-Mode disk shelves to a target HA pair that has preexisting data aggregates and volumes.

  For a two-node cluster, you must have a data aggregate to host the root volumes of the target SVMs. For a cluster with four or more nodes, the root volumes of the SVMs can be hosted either on the target nodes of the transition or on other nodes in the cluster.

You should not upgrade the cluster to a different ONTAP version during transition.

You can upgrade the cluster to a patch release of the same ONTAP version, if required.

1. From an administration host, verify that the cluster is reachable by using the cluster-management LIF:

   `ssh username@cluster_mgmt_IP`

2. Enable SSLv3 or FIPS on the cluster:

If you want to enable…	Enter…
SSLv3	**`system services web modify -sslv3 -enabled true`**
FIPS 140-2 compliance	**`system services web modify -ssl-fips -enabled true`**

   When FIPS 140-2 compliance is enabled, SSLv3 is disabled. ONTAP prevents you from enabling SSLv3 when FIPS 140-2 compliance is enabled. If you enable FIPS 140-2 and then subsequently disable it, SSLv3 remains disabled.

The best practice is to enable FIPS because of the security vulnerabilities in SSLv3.

3. Verify that HTTPS is allowed on the cluster management LIF:

   a. View the firewall policy for the cluster management LIF:

      network interface show -vserver *svm_name* -lif *cluster_mgmt_lif* -fields firewall-policy

```
cluster1::> network interface show -vserver cluster1 -lif
cluster_mgmt -fields firewall-policy
vserver lif          firewall-policy
------- ------------ ---------------
cluster1  cluster_mgmt mgmt
```

   b. Verify that the firewall policy associated with the cluster management LIF allows HTTPS access:

      system services firewall policy show -policy mgmt

```
cluster1::> system services firewall policy show -policy mgmt
Policy           Service    Action IP-List
---------------- ---------- ------ --------------------
mgmt
                 dns        allow  0.0.0.0/0, ::/0
                 http       allow  0.0.0.0/0, ::/0
                 https      allow  0.0.0.0/0, ::/0
                 ndmp       allow  0.0.0.0/0, ::/0
                 ntp        allow  0.0.0.0/0, ::/0
                 rsh        deny   0.0.0.0/0, ::/0
                 snmp       allow  0.0.0.0/0, ::/0
                 ssh        allow  0.0.0.0/0, ::/0
                 telnet     deny   0.0.0.0/0, ::/0
9 entries were displayed.
```

System administration

Gathering cabling information for transition

Before starting copy-free transition, you must gather information about the adapters, ports, disk shelves, and storage connectivity of your 7-Mode controllers, and then plan how to connect the 7-Mode disk shelves to the target cluster nodes.

You must have printed the copy-free transition cabling worksheet.

Copy-free transition cabling worksheet

1. Use Config Advisor to perform a health check on the 7-Mode storage and cabling and collect cabling data.

   You should use the `7-Mode Install Checks` option from the “Data ONTAP 7 and 8 (7-Mode)” execution profile.

2. Gather the required information about each 7-Mode controller by using the following command:

   sysconfig *slot_number*

   You can use the output of this command to identify which ports are used for disk shelf connectivity.

   ```
   host1> sysconfig 3
           slot 3: SAS Host Adapter 3a
                   24 Disks:              13440.0GB
                   1 shelf with IOM3
           slot 3: SAS Host Adapter 3b
                   24 Disks:              13440.0GB
                   1 shelf with IOM3
           slot 3: SAS Host Adapter 3c
                   24 Disks:              13440.0GB
                   1 shelf with IOM3
           slot 3: SAS Host Adapter 3d
                   24 Disks:              13440.0GB
                   1 shelf with IOM3
   ```

3. From the cluster, run the following nodeshell command on each node:

   system node run -node *node_name* -command sysconfig -a

   You can use the output of this command to obtain information about the available ports and expansion card slots.

4. On the target cluster nodes, plan the ports to be used for connecting the 7-Mode disk shelves:

   a. Review the available (open) ports.

   b. Review the expansion card slots.

   c. Plan the expansion card configuration.

      You can plan to move the expansion cards from the 7-Mode systems if they are also supported on the destination platform and ONTAP version. You can also plan for PAM cards, if required.

      NetApp Hardware Universe

   d. Plan the destination ports to use for the disk shelf cabling.

      The selection of the destination ports depends on some of the following factors:

      - Separate or existing disk shelf stack
      - Port availability

- SAS or FC connections
- Availability of on-board ports or expansion cards

5. Go to the data center to physically record the port connections on the 7-Mode controllers and target cluster nodes in the cabling worksheet:
   a. Record the used ports on the 7-Mode controllers in the cabling worksheet.
   b. Record the used ports on the target cluster nodes in the cabling worksheet.
   c. Record the destination ports to be used for connecting the 7-Mode disk shelves, as planned in Step #STEP_D0CFE719A0384F7FA5D9E73C8EA6C2E7.
   d. Ensure that you have the right cables for connecting the disk shelves.

      You should identify any issues with cabling based on the new disk shelf stack location.
   e. Plan for longer cable lengths due to ladder racking or data center requirements.
   f. Label each disk shelf stack and cable on the 7-Mode controllers.

      The best practice is to label the 7-Mode disk shelf stacks in case you want to roll back the transition and have to reconnect the disk shelves to the 7-Mode controllers.

Related information

SAS Disk Shelves Installation and Service Guide for DS4243, DS2246, DS4486, and DS4246

DiskShelf14mk2 AT Hardware Service Guide

DS14mk2 FC, and DS14mk4 FC Hardware Service Guide

Copy-free transition cabling worksheet

You can use the copy-free transition cabling worksheet to plan your cabling. You must record information about the ports and disk shelves connected to the 7-Mode controllers and target cluster nodes. You should also record the ports to use for connecting the 7-Mode disk shelves to the target cluster nodes.

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

- Module A/B Ports: Port connections for module A/B
- Shelf Type/Asset Tag: Disk shelf type
- Shelf IDs: Disk shelf IDs

Sample cabling worksheet

7-Mode cabling				**Clustered Data ONTAP cabling**			
Controller A (host name): 7hostA				Node A (host name): cluster1-01			
Location: Colorado Floor: Third Rack: 8				Location: Colorado Floor: Fifth Rack: 3			
Module A Ports	Module B Ports	Shelf Type/Asset Tag	Shelf IDs	Module A Ports	Module B Ports	Shelf Type/Asset Tag	Shelf IDs
1a	0a	DS4243/150254-7	10-13	1a	0a	DS4243/174243-2	10-11
1b	0b	DS4243/151205-2	30-37	1b	0b	DS4243/150254-7	20-23
1c (offline)	0c (offline)	n/a	n/a	1c	0c	DS4243/151205-2	30-37
1d	0d	DS4243/143921-4	14-15	1d	0d	DS4243/143921-4	14-15
Controller B (host name): 7hostB				**Node B (host name):cluster1-02**			

7-Mode cabling				Clustered Data ONTAP cabling			
Location: Colorado Floor: Third Rack: 8				**Location: Colorado Floor: Fifth Rack: 3**			
Module A Ports	**Module B Ports**	**Shelf Type/Asset Tag**	**Shelf IDs**	**Module A Ports**	**Module B Ports**	**Shelf Type/Asset Tag**	**Shelf IDs**
1a	0a	DS4243/174263-6	10-13	1a	0a	DS4243/174233-2	10-11
1b (offline)	0b (offline)	n/a	n/a	1b	0b	DS4243/174263-6	20-23
1c	0c	DS4243/174274-9	30-37	1c	0c	DS4243/174274-9	30-37
1d	0d	DS4243/174285-6	14-15	1d	0d	DS4243/174285-6	14-15

Preparing 7-Mode aggregates and volumes for transition

Before transition, you must ensure that the 7-Mode aggregates and volumes are eligible for transition and perform some manual steps before transition. For example, some volume types cannot be transitioned and any 32-bit data must be removed from the 7-Mode systems before transition.

Restrictions for transitioning 7-Mode aggregates and volumes

You must be aware of certain restrictions for transitioning 7-Mode aggregates and volumes. Some of the restrictions are due to features that are not supported in ONTAP. For some restrictions, you can perform a corrective action that enables you to continue with the transition.

Volume types

The following types of volumes are not supported for transition:

- Traditional volumes

  You can use host-based transition methods to transition traditional volumes.

  NetApp Technical Report 4052: Successfully Transitioning to Clustered Data ONTAP (Data ONTAP 8.2.x and 8.3)

- SnapLock volumes

  The transition of SnapLock volumes is supported for all of the latest ONTAP releases.

- FlexCache volumes

Aggregate and volume states

Transition is blocked if any of the 7-Mode aggregates and volumes selected for the transition are in one of the following states:

- Offline
- Restricted
- Inconsistent (`wafl inconsistent`)

FlexClone volumes

The clone hierarchy and storage efficiency are preserved during the copy-free transition. However, you must ensure that the parent FlexVol volume and all of its FlexClone volumes belong to the same vFiler unit. If the FlexClone volumes are in different vFiler units from the parent volume, you must choose one of the following actions:

- Move the FlexClone volumes to the vFiler unit that owns the parent FlexVol volume.
- Split the clones from the parent FlexClone volume, and then transition these volumes as FlexVol volumes.

Volume with qtrees that belong to a different vFiler unit

You cannot transition volumes with qtrees, where the qtrees are owned by a different vFiler unit than that of the volume. Before transition, you must ensure that each volume and all of its qtrees belong to the same vFiler unit by performing one of the following actions:

- Move the qtrees to the vFiler unit that owns the volume.
- Delete the qtrees.

Inode to parent pathname translation setting

The inode to parent pathname translations must be enabled on each volume. You can enable the parent to pathname translations by turning off the no_i2p option:

`vol options` ***`vol_name`*** **`no_i2p off`**

You do not have to wait for the i2p scan to finish, and you can continue with the transition preparation.

Preparing for transitioning 7-Mode systems with 32-bit aggregates

32-bit aggregates, volumes, and Snapshot copies are not supported in ONTAP 8.3 and later. Therefore, you must expand the 32-bit aggregates to 64-bit, and then find and remove any 32-bit volumes and Snapshot copies from the 7-Mode system before transition.

- **32-bit aggregates**
  a. Expanding an aggregate to the 64-bit format
  b. Finding and removing 32-bit volumes and Snapshot copies
- **32-bit volumes or Snapshot copies**

  Even if you have only 64-bit aggregates and volumes, some 32-bit or mixed-format FlexVol volumes or Snapshot copies might remain. You must remove these volumes and Snapshot copies before transition.

[Finding and removing 32-bit volumes and Snapshot copies]

Related information

[NetApp Technical Report 3978: In-Place Expansion of 32-Bit Aggregates to 64-Bit Overview and Best Practices]

Expanding an aggregate to the 64-bit format

If your system contains 32-bit aggregates, you must expand them to the 64-bit format on your 7-Mode system *before* transitioning to Data ONTAP 8.3 or later versions, because those versions of Data ONTAP do not support the 32-bit format.

- If the aggregate contains destination volumes for a SnapMirror relationship with a 32-bit source volume, the aggregate containing the source volume must be expanded before expanding the aggregate containing the destination volume.

For volumes in a SnapMirror relationship, the destination volume inherits the format of the source volume while the mirror is intact. If the aggregate you are expanding contains a destination volume whose source is a 32-bit volume and you break the mirror before expanding the aggregate, the destination volume is expanded to the 64-bit format. However, if you reestablish the mirror and the source volume is still 32-bit, the destination volume returns to the 32-bit format. For this reason, you must expand the aggregate containing the source volume before reestablishing the SnapMirror relationship if you want to expand all 32-bit volumes in the aggregate to the 64-bit format.

Steps

1. Enter advanced privilege mode:

   `priv set advanced`

2. Initiate the expansion:

   `aggr 64bit-upgrade start` ***`aggr_name`***

3. Perform the appropriate action:

If the command…	Then…
Initiates successfully	Proceed to the next step.
Indicates that one or more volumes could not be expanded because they did not have enough space	Retry the command, adding the `grow-all` option.
Indicates that the expansion could not be completed for some other reason	Perform the appropriate action, based on the issue outlined in the error message.

4. Display the status of the expansion:

   `aggr 64bit-upgrade status` ***`aggr_name`***

   The current status of the expansion is displayed. When the message indicates that there is no upgrade in progress, the expansion is complete.

5. Confirm that all volumes in the aggregate are 64-bit format:

   aggr 64bit-upgrade status *aggr_name* -all

6. Return to administrative privilege mode:
   priv set admin

The aggregate is expanded to the 64-bit format. However, even if all volumes are expanded, some 32-bit Snapshot copies might remain. The presence of 32-bit Snapshot copies in the source volumes prevents an upgrade or transition to Data ONTAP 8.3 or later.

Finding and removing 32-bit volumes and Snapshot copies

Even if you have expanded all of your aggregates to the 64-bit format, some 32-bit or mixed-format FlexVol volumes or Snapshot copies can remain. These volumes and Snapshot copies must be removed before your data can be accessed by a cluster running Data ONTAP 8.3 or later.

- You must have expanded all 32-bit aggregates on the system to the 64-bit format.

You must repeat the steps in this task for each aggregate that contains 32-bit volumes and Snapshot copies.

Steps

1. Enter advanced mode:

   priv set advanced

2. Display the format of all volumes in the aggregate:

   aggr 64bit-upgrade status *aggr_name* -all

   Each volume in the aggregate is displayed with its format.

3. For each 32-bit or mixed-format volume, determine the reason that the volume has not been expanded to the 64-bit format, and then take the appropriate action.

   If you cannot determine the reason that the volume was not expanded, retry the aggregate expansion.

If the volume…	Then…
Is the destination of a SnapMirror relationship	Expand the aggregate containing the source volume to the 64-bit format.
Is a read-only volume (but not a SnapMirror destination)	Make the volume writable and retry the expansion, or destroy the volume.
Did not expand because of insufficient free space in the volume or aggregate	Increase the free space in the volume or aggregate and retry the expansion.

   All 32-bit and mixed-format volumes in the aggregate are now 64-bit. You can confirm this by repeating the previous step.

4. Display the format of all Snapshot copies on the system:

   `snap list -fs-block-format`

5. Remove the 32-bit Snapshot copies by using the snap delete command.

   > This action deletes the data in the Snapshot copies. You must be certain that you do not need to retain the Snapshot copies before you delete them. Alternatively, you can wait for the 32-bit Snapshot copies to be aged out. The amount of time this takes depends on your Snapshot copy schedule.

   If a Snapshot copy is the base Snapshot copy for a FlexClone volume, you must split the FlexClone volume from its parent before you can remove the Snapshot copy.

   All 32-bit Snapshot copies are removed. You can confirm this by repeating the previous step.

6. Return to the administrative privilege level:

   `priv set admin`

Aggregate space requirements for transition

Before transition, you must ensure that the 7-Mode aggregates have adequate free space. The 7-Mode Transition Tool performs various space checks on the aggregates based on the physical space, logical space, space occupied by Snapshot copies, and space guarantee settings. You must also be aware of the space considerations with Flash Pool aggregates.

Physical space in the aggregates

Transition is blocked if the free space is less than 5% of the physical space in the 7-Mode aggregates. The best practice is to have at least 20% free space in the 7-Mode aggregates before transition.

The additional space is required in the aggregates for the following reasons:

- Creating the aggregate-level Snapshot copy for each 7-Mode aggregate during the export phase
- Testing the workload on the transitioned aggregates with new data in the preproduction testing phase

If you do not have additional space, you can add disks to the 7-Mode systems before transition. If adding disks is not feasible or if you can ensure that only limited amount of data is written on the transitioned volumes during the preproduction phase, the 7-Mode Transition Tool allows you to acknowledge this error and continue with the transition. However, you must continue to monitor the aggregate space during the transition and ensure that the aggregates do not grow in the preproduction testing phase.

Logical space in the aggregates

If the logical space in the 7-Mode aggregates is more than 97% full, 7-Mode Transition Tool throws a blocking error during precheck. You can ignore this error during the planning phase and continue with the transition; however, you must ensure that the logical space used is less than 97% before the export and halt operation by either reducing the size of the volumes in such aggregates or adding more disks to the aggregates. You cannot ignore this error in the export and halt phase.

Snapshot spill

If the Snapshot copies in the 7-Mode aggregates occupy more space than the allocated space for Snapshot copy reserve, the creation of aggregate-level Snapshot copies in the export and halt operation might fail. 7-Mode Transition Tool throws a blocking error during precheck for this condition. In such conditions, you must delete all the existing aggregate-level Snapshot copies during the planning phase.

If you do not want to delete the existing Snapshot copies, you can ignore this error during the planning phase and continue with the transition; however, you must ensure that the Snapshot copy used capacity percentage is less than 100% before the export and halt operation.

Space guarantee settings

7-Mode Transition Tool throws a blocking error during precheck if the 7-Mode controllers have volumes with the following space guarantee settings:

- Volume-guaranteed volumes with guarantee disabled
- File-guaranteed volumes
- **Volume-guaranteed volumes with guarantee disabled**

  In some cases, the space guarantee is disabled for the volume guaranteed volumes because of lack of space in the aggregates.

  You must create sufficient free space on the 7-Mode aggregates and then enable space guarantee for such 7-Mode volumes by using the following 7-Mode command:

  `vol options` ***`volume_name`*** **`guarantee volume`**

  If you do not want to perform any corrective actions on 7-Mode, you can ignore this error. After the transition, examine the volumes for which guarantee is disabled and enable the guarantee manually by using the following command:

  `volume modify -vserver -volume -space-guarantee volume`

- **File-guaranteed volumes**

  File guarantee is not supported in ONTAP.

  If you have file-guaranteed volumes, you must perform one of the following actions:

  - If the 7-Mode volumes contain space-reserved LUNs or files, change the space guarantee type of the volumes to volume by using the 7-Mode command:

    `vol options` ***`volume_name`*** **`guarantee volume`**

    You must ensure that there is enough free space on the 7-Mode aggregates before running this command.

  - If the 7-Mode volumes do not contain any space-reserved LUNs or files, change the space guarantee of the volumes to none by using the following 7-Mode command:

    `vol options` ***`volume_name`*** **`guarantee none`**
    If you do not want to perform any corrective actions on 7-Mode, you can ignore this error and continue with the transition.

During the transition, if these volumes contain space-reserved LUNs or files, their space guarantee will be automatically converted to `volume`, but the space guarantee will be disabled initially. You must create sufficient free space on the aggregates and then manually enable the guarantee by using the following command:

+
`volume modify -vserver -volume -space-guarantee volume`

+
If the volumes do not contain any space-reserved LUNs or files, their space guarantee will be automatically converted to none during the transition.

Additional consideration for Flash Pool aggregates

Transition is not supported if the free space in the SSDs of Flash Pool aggregates is less than 5% of the total disk space of the SSDs. You must either disable the SSD cache or add more SSDs to continue with the transition.

Related information

Ignorable errors during transition

Disk and aggregate management

Preparing to transition name services

Name service configurations that include DNS, LDAP, NIS, hosts, name services switch, UNIX users and groups, and netgroups configurations are transitioned by the 7-Mode Transition Tool. You must be aware of some considerations before transitioning name services configurations.

Name services transition: supported and unsupported configurations, and required manual steps

You must be aware of the name services configurations that are transitioned by the 7-Mode Transition Tool. Some name services configurations are not transitioned to ONTAP because either these are not supported in ONTAP or these must be manually transitioned.

You should verify all the precheck error and warning messages to evaluate the impact of such configurations on transition.

Configurations that are transitioned

At a high level, the following name services configurations are transitioned by the 7-Mode Transition Tool:

- DNS configuration (`/etc/resolv.conf`)
- LDAP configuration
- NIS configuration
- Name service switch configuration (`/etc/nsswitch.conf` and `/etc/resolv.conf`)
- Hosts configuration (`/etc/hosts`)

- UNIX users and groups (`/etc/passwd` and `/etc/group`)
- Netgroups configuration (`/etc/netgroup`)

See the precheck results for details about these name services configurations.

Unsupported configurations in ONTAP

- NIS slave
- NIS broadcast
- NIS groups caching
- Dynamic DNS
- DNS cache
- Shadow database
- Host database sources other than file or DNS

  ONTAP supports only file and DNS for host lookup; other database sources are not supported. Host lookup order in the `/etc/nsswitch.conf` is ignored during transition.

Configurations that must be manually configured

You must manually configure the following LDAP options on the SVMs:

- `ldap.usermap.attribute.unixaccount`
- `ldap.password`
- `ldap.usermap.base`
- `ldap.ssl.enable`

Related information

Customizing the transition of 7-Mode configurations

NFS management

Network and LIF management

Considerations for transitioning DNS, NIS, and LDAP configurations

You should be aware of how the DNS, NIS, and LDAP configurations in Data ONTAP operating in 7-Mode are transitioned and applied in ONTAP.

Considerations for DNS transition

For DNS configurations, a maximum of six domain names and three name servers per SVM are supported in ONTAP. If the unique number of domain names or name servers across 7-Mode systems and the target SVM exceed the supported limit, the 7-Mode Transition Tool reports a blocking error. To continue with the transition, you should ignore the transition of the DNS configuration from the tool.

> If you ignore the transition of the DNS configuration, you must manually configure DNS on the target SVM.

Considerations for NIS transition

- The length of the NIS domain name on the 7-Mode system must not exceed 64 characters.
- For transitioning to target cluster versions running ONTAP 9.1 or earlier, the `nis.servers` option on the 7-Mode system must be configured only with IP addresses, and not a fully qualified domain name (FQDN).

  You must configure the `nis.servers` option on the 7-Mode system with IP addresses before transition if you are transitioning to a cluster running ONTAP 9.1 or earlier. Transition is supported if you have the `nis.servers` option on the 7-Mode system configured with an FQDN and you are transitioning to a cluster running any version of ONTAP between 9.2 and 9.5.

Considerations for LDAP transition

- If separate base values and scope values are specified for user mapping (`ldap.usermap.base`) and user password (`ldap.base.passwd`) lookups in the 7-Mode system, the base values and scope values for only the user password are transitioned.

  The base values and scope values are used for user mapping and user password lookups in ONTAP, which can cause security issues. You must manually add the base values and scope values for user mapping to the user distinguished name (DN) option in ONTAP after transition, if required.

Considerations for transitioning netgroups and UNIX users and groups

Netgroup configuration is transitioned only if the 7-Mode `/etc/netgroup` file is less than 5 MB in size. UNIX users and groups are transitioned only if the total number of UNIX users and groups on the SVM do not exceed the limits for users and groups in ONTAP.

Considerations for netgroups

If the `/etc/netgroup` file on 7-Mode is greater than 5 MB, the netgroup configuration is not transitioned. You must perform one of the following actions to continue with the transition:

- Exclude the transition of netgroups.

  Customizing the transition of 7-Mode configurations

- Move the netgroup configuration to NIS or LDAP servers before transition.

Considerations for UNIX users and groups

If the total number of transitioning UNIX users and groups exceed the limit of UNIX users and groups in ONTAP, the 7-Mode Transition Tool blocks the transition. You must perform one of the following actions to continue with the transition:

- Exclude the transition of UNIX users and groups.

  Customizing the transition of 7-Mode configurations

- Move the UNIX users and groups to NIS or LDAP servers before transition.

Related information

NFS management

Preparing for NFS transition

If NFS is licensed and NFS service is running on the systems operating in 7-Mode, you must manually prepare the cluster and target SVM for transitioning NFS configurations. You must also be aware of what configurations are transitioned.

Some NFS configurations operating in 7-Mode are not supported in ONTAP. Some configurations are not transitioned by the 7-Mode Transition Tool and must be manually applied to the SVM.

Prerequisites for transitioning NFS configurations

NFS configurations are transitioned by the 7-Mode Transition Tool only when certain prerequisites are met on the 7-Mode system and the cluster. If any of the conditions are not met, the tool does not transition the configuration.

7-Mode prerequisites

- NFS must be licensed.
- If MultiStore is licensed, NFS must be enabled on all of the vFiler units.
- NFS service must be running on the 7-Mode systems during transition.

  Even after client access is disconnected and you prepare to start the export phase, the service must be running on the 7-Mode systems.
- If you want to transition in-memory export rules, you must add them to the `/etc/exports` file before transition.

  The 7-Mode Transition Tool transitions only the persistent export rules that are defined in the `/etc/exports` file.

Cluster prerequisites

- NFS must be licensed.

Related information

NetApp Documentation: ONTAP 9

NFS transition: supported and unsupported configurations, and required manual steps

Some NFS configurations are not transitioned to ONTAP because they are not supported in ONTAP, there are functionality differences from 7-Mode, or they must be manually transitioned. You should verify all of the precheck errors and warning messages to evaluate the impact of such configurations on transition.

Supported configurations for transition

At a high level, the following NFS configurations are transitioned by the 7-Mode Transition Tool:

- NFS options:
  - `nfs.udp.xfersize`
  - `nfs.v4.id.domain`
  - `nfs.v4.acl.max.aces`
  - `nfs.tcp.xfersize`
  - `nfs.rpcsec.ctx.high`
  - `nfs.rpcsec.ctx.idle`
  - `nfs.response.trigger`
  - `wafl.default_nt_user`
  - `nfs.mount_rootonly`
  - `nfs.tcp.enable`
  - `nfs.udp.enable`
  - `nfs.response.trace`
  - `nfs.v4.read_delegation`
  - `nfs.v4.write_delegation`
  - `nfs.v4.acl.enable`
  - `nfs.vstorage.enable`
  - `nfs.v3.enable`
  - `nfs.v4.enable`
- NFS export rule:

  If the export rule is configured with the -actual option, the exported path (alias path) is ignored and the export rule is configured with the actual path.
- Export rules with Kerberos security krb5p

See the precheck results for details about these NFS configurations.

Unsupported configurations in ONTAP

The following NFS configurations are not supported in ONTAP:

- Subvolume NFS exports other than qtree-level NFS exports
- WebNFS
- PC-NFS
- NFSv2
- Fencing of NFS clients from one or more file system paths

- Some NFS options

  See the precheck warning messages for a complete list of unsupported options.

Configurations that must be manually transitioned

There are some NFS configurations that are supported in ONTAP, but are not transitioned by the 7-Mode Transition Tool.

The following NFS configurations generate a warning message in the precheck operation, and you must manually apply the configurations on the SVM:

- NFS audit configuration
- NFS options:
  - `rpc.nsm.tcp.port`
  - `rpc.nsm.udp.port`
  - `rpc.mountd.tcp.port`
  - `rpc.mountd.udp.port`
  - `nfs.export.neg.timeout`
  - `nfs.export.pos.timeout`
  - `nfs.export.harvest.timeout`
    Use the `vserver nfs modify` command to modify the configuration of an NFS-enabled storage virtual machine (SVM).
- Kerberos configuration

Configurations that are functionally different in ONTAP

The following NFS configurations are functionally different in ONTAP:

- NFS export rules
- NFS export access cache
- NFS diagnostic commands
- Support for the `showmount` command
- NFS Kerberos encryption
- NLM version support

Related information

Customizing the transition of 7-Mode configurations

NFS management

How NFS exports are transitioned

You must be aware of how NFS exports are configured on the SVM after transition. You might have to perform some manual steps if the 7-Mode export configurations are not supported in ONTAP.

You must be aware of the following considerations about NFS exports transition:

- If the SVM root volume is not exported to allow read-only access to all NFS clients, the 7-Mode Transition Tool creates a new export policy that allows read-only access for all the NFS clients and exports the root volume of the SVM with the new export policy.

  To ensure that all the transitioned volumes or qtrees are mountable, the root volume of the SVM must be allowed read-only access for all the NFS clients.

- When 7-Mode volumes with export configurations that are not supported in ONTAP are transitioned, these volumes are exported to disallow access to all NFS clients.

  Export policies for these volumes must be configured manually after transition to provide the required access permissions.

- When 7-Mode qtrees with export configurations that are not supported in ONTAP are transitioned, they inherit the export policy of the parent volume.

  Export policies for these qtrees must be configured manually after transition to provide the required access permissions.

- In ONTAP, for an NFS client to mount a qtree, the NFS client must have read-only permissions at all the parent junction paths up to the SVM's root volume junction path (that is, /).

  For NFS clients to mount qtrees, the qtrees must belong to a volume that has read-only permission. Without the read-only permissions at the volume level, the NFS clients cannot mount the qtree.

- If the same host is specified in the combination of read-only, read-write, and root access permission lists, you must evaluate the transitioned export rules after transition to determine appropriate access privilege for the hosts.

NetApp Technical Report 4067: NFS Best Practice and Implementation Guide

Example: Modifying the export policy of a volume to allow access to a qtree

Consider the following export rule configured in the 7-Mode storage system (192.168.26.18) that allows read/write access to the volume volstd10 and qtree qtree1 for the NFS client 192.168.10.10:

```
/vol/volstd10/qtree1 -sec=sys,rw=192.168.10.10,nosuid
/vol/volstd10 -sec=sys,rw=192.168.11.11,nosuid
```

After transition, the export policy of the volume volsdt10 in ONTAP is as shown below:

```
cluster-01::> export-policy rule show -vserver std_22 -policyname std_2226
-instance
 (vserver export-policy rule show)

                                              Vserver: std_22
                                          Policy Name: std_2226
                                           Rule Index: 1
                                      Access Protocol: any
Client Match Hostname, IP Address, Netgroup, or Domain: 192.168.11.11
                                       RO Access Rule: sys
                                       RW Access Rule: sys
           User ID To Which Anonymous Users Are Mapped:65534
                             Superuser Security Types: none
                         Honor SetUID Bits in SETATTR: false
                            Allow Creation of Devices: true
cluster-01::>
```

After transition, the export policy of the qtree qtree1 in ONTAP is as shown below:

```
 cluster-01::> export-policy rule show -vserver std_22 -policyname
std_2225 -instance
  (vserver export-policy rule show)

                                   Vserver: std_22
                               Policy Name: std_2225
                                Rule Index: 1
                           Access Protocol: any
Client Match Hostname, IP Address, Netgroup, or Domain: 192.168.10.10
                            RO Access Rule: sys
                            RW Access Rule: sys
User ID To Which Anonymous Users Are Mapped: 65534
                  Superuser Security Types: none
              Honor SetUID Bits in SETATTR: false
                 Allow Creation of Devices: true
cluster-01::>
```

For the NFS client 192.168.10.10 to access the qtree, the NFS client 192.168.10.10 must have read-only access to the qtree’s parent volume.

The following output shows that the NFS client is denied access while mounting the qtree:

```
 [root@192.168.10.10 ]# mount 192.168.35.223:/vol/volstd10/qtree1
transition_volume_qtreemount:192.168.35.223:/vol/volstd10/qtree1 failed,
reason
given by server: Permission denied [root@192.168.10.10 ]#
```

You must manually modify the export policy of the volume to provide read-only access to the NFS client 192.168.10.10.

```
cluster-01::> export-policy rule create -vserver std_22 -policyname
std_2226 -clientmatch
192.168.10.10 -rorule sys -rwrule never -allow-suid false -allow-dev true
-superuser none -protocol nfs
  (vserver export-policy rule create)

cluster-01::> export-policy rule show -vserver std_22 -policyname std_2226
-instance
  (vserver export-policy rule show)

                                    Vserver: std_22
                                Policy Name: std_2226
                                 Rule Index: 1
                            Access Protocol: any
Client Match Hostname, IP Address, Netgroup, or Domain: 192.168.11.11
                             RO Access Rule: sys
                             RW Access Rule: sys
User ID To Which Anonymous Users Are Mapped: 65534
                   Superuser Security Types: none
               Honor SetUID Bits in SETATTR: false
                  Allow Creation of Devices: true

**                                    Vserver: std_22
                                Policy Name: std_2226
                                 Rule Index: 2
                            Access Protocol: nfs
Client Match Hostname, IP Address, Netgroup, or Domain: 192.168.10.10
                             RO Access Rule: sys
                             RW Access Rule: never
User ID To Which Anonymous Users Are Mapped: 65534
                   Superuser Security Types: none
               Honor SetUID Bits in SETATTR: false
                  Allow Creation of Devices: true**

cluster-01::>
```

Example: How qtree export rules differ in 7-Mode and ONTAP

In the 7-Mode storage system, when an NFS client accesses a qtree through the mount point of its parent volume, the qtree export rules are ignored and the export rules of its parent volume are in effect. However, in ONTAP, qtree export rules are always enforced whether NFS client mounts to the qtree directly or it accesses the qtree through the mount point of its parent volume. This example is specifically applicable for NFSv4.

The following is an example of an export rule on the 7-Mode storage system (192.168.26.18):

```
/vol/volstd10/qtree1 -sec=sys,ro=192.168.10.10,nosuid
/vol/volstd10   -sec=sys,rw=192.168.10.10,nosuid
```

On the 7-Mode storage system, the NFS client 192.168.10.10 has only read-only access to the qtree. However, when the client accesses the qtree through the mount point of its parent volume, the client can write to the qtree because the client has read/write access to the volume.

```
[root@192.168.10.10]# mount 192.168.26.18:/vol/volstd10 transition_volume
[root@192.168.10.10]# cd transition_volume/qtree1
[root@192.168.10.10]# ls transition_volume/qtree1
[root@192.168.10.10]# mkdir new_folder
[root@192.168.10.10]# ls
new_folder
[root@192.168.10.10]#
```

In ONTAP, the NFS client 192.168.10.10 has only read-only access to the qtree qtree1 when the client accesses the qtree directly or through the mount point of the qtree's parent volume.

After transition, you must evaluate the impact of enforcing the NFS export policies, and if necessary modify the processes to the new way of enforcing NFS export policies in ONTAP.

Related information

[NFS management]

Preparing for SMB/CIFS transition

If SMB/CIFS is licensed and SMB/CIFS service is running on the 7-Mode systems, you must manually perform some tasks, such as adding the SMB/CIFS license and creating a SMB/CIFS server, on the target cluster and SVM for transitioning SMB/CIFS configurations.

You must also be aware of what configurations are transitioned. Some SMB/CIFS configurations operating in 7-Mode are not supported in ONTAP. Some configurations are not transitioned by the 7-Mode Transition Tool and must be manually applied to the SVM.

Prerequisites for transitioning CIFS configurations

CIFS configurations are transitioned by the 7-Mode Transition Tool only when certain prerequisites are met on the 7-Mode system and cluster. If any of the conditions are not met, the tool does not transition the configuration.

7-Mode prerequisites

- The CIFS license must be added.
- If the MultiStore license is enabled, CIFS must be added to the list of allowed protocols for the vFiler unit that owns the transitioning volumes.
- CIFS must be set up and running during transition.

  Even after client access is disconnected and you prepare to start the export phase, the CIFS service must be running on the 7-Mode systems.
- The authentication type for CIFS must be Active Directory (AD) or Workgroup.

Cluster prerequisites

- The CIFS license must be added.
- The following CIFS authentication methods are supported in different ONTAP versions:
  - Clustered Data ONTAP 8.2.x and 8.3.x support AD authentication.
  - ONTAP 9.0 or later supports AD authentication and Workgroup authentication.
- The following table identifies which authentication method must be used on the target SVM:

7-Mode authentication method	Clustered Data ONTAP 8.2.x and 8.3.x authentication method	ONTAP 9.5 or earlier authentication method
AD	AD	AD
Workgroup	AD	Workgroup or AD

- You can transition the CIFS configuration from 7-Mode to ONTAP if the AD domains do not match between the 7-Mode CIFS server and the target SVM CIFS server.

  The tool triggers an ignorable blocking error when an AD domain name mismatch is detected. To proceed with the transition, you can acknowledge the blocking error.
- The CIFS server must be manually configured before the apply configuration (precutover) phase.

  You can create the CIFS server on the SVM in the following two ways:

<table>
<tr><th>If you want to…</th><th>Do the following…</th></tr>
<tr><td>Transfer or preserve the CIFS server identity to the target SVM</td><td>

```
You have the following two
options to create the CIFS
server:
```

a. Applicable for all versions of ONTAP:

- Before the SVM provision phase, you must reconfigure the CIFS server on the 7-Mode system system by using a temporary CIFS identity.

This reconfiguration allows the original CIFS server identity to be configured on the SVM. You must verify that the CIFS server is running on the 7-Mode system during the “SVM Provision” and “Export & Halt” phases with the new temporary identity. This action is required to read CIFS configurations from 7-Mode during the SVM Provision and “Export & Halt” phases.
- You must configure the CIFS server on the target SVM with the original 7-Mode CIFS identity.
- After these conditions are met, you can perform the “SVM Provision” operation, and then perform the “Export & Halt” operation to enable client access to ONTAP volumes.

b. Applicable for ONTAP releases 9.0 through 9.5:

- Use the `vserver cifs modify` command to change the CIFS server name (CIFS Server NetBIOS Name).

Using this feature, you should create a CIFS server on the target SVM with a temporary identity, and then perform the “SVM Provision” operation.
- After the “import”' phase, you can run the `vserver cifs modify` command on the target cluster to replace the target SVM CIFS identity with the 7-Mode CIFS identity.

</td></tr>
</table>

If you want to…	Do the following…
Use a new identity	• Before the “SVM Provision” phase, you must configure the CIFS server on the target SVM with a new CIFS identity. • You must verify that the CIFS server is up and running on the 7-Mode system during the “SVM Provision” and “Export & Halt” phases. This action is required to read CIFS configurations from 7-Mode during the “SVM Provision`"and "`Export & Halt”. • After verifying these conditions, you can perform the “SVM Provision” operation. You can then test the SVM configurations, and then plan to perform the storage cutover.

Supported and unsupported CIFS configurations for transition to ONTAP

Some CIFS configurations are not transitioned to ONTAP because either they are not supported in ONTAP or they must be manually transitioned. You should verify all precheck error and warning messages to evaluate the impact of such configurations on transition.

Configurations that are supported for transition

At a high level, the 7-Mode Transition Tool transitions the following CIFS configurations:

- CIFS preferred DC configuration
- User mapping configuration:
  - `/etc/usermap.cfg`
  - *`wafl.nt_admin_priv_map_to_root`*
- CIFS local users and groups
- Symlink and widelink configuration (`/etc/symlink.translations`)
- CIFS audit configuration
- CIFS shares
- CIFS share ACLs
- CIFS home directory configuration
- CIFS options:
  - `cifs.gpo.enable`
  - `cifs.smb2.enable`
  - `cifs.smb2.signing.required`

    ◦ `cifs.wins_servers`
    ◦ `cifs.grant_implicit_exe_perms`
    ◦ `cifs.restrict_anonymous`
- SMB2 connections to external servers, such as a domain controller. The following command implements this support:
    ◦ **`cifs security modify -vserver SVM1 -smb2-enabled-for-dc-connections`**
- FPolicy native file blocking configuration

See the precheck results for details about these CIFS configurations.

Configurations that are not supported in ONTAP

The following 7-Mode configurations are not supported in ONTAP. Therefore, these configurations cannot be transitioned.

- NT4, and password authentication types
- Separate options for SMB1 and SMB2 signing
- CIFS statistics on a per-client basis
-     ◦ Authentication for clients earlier than Windows NT
- Auditing of account management events for local users and groups
- Usermap entries with IP addresses, host names, network names, or network names with subnet specified in dotted notation
- CIFS shares with access restriction for machine accounts

  Machine accounts can access all shares after transition.

Configurations that must be manually transitioned

Some CIFS configurations are supported in ONTAP, but are not transitioned by the 7-Mode Transition Tool.

The following CIFS configurations generate a warning message in the precheck. You must manually apply these configurations on the SVM:

- Antivirus settings
- FPolicy configurations

  7-Mode FPolicy and antivirus servers do not work with ONTAP. You must contact the server vendors for upgrading these servers. However, you must not decommission the 7-Mode FPolicy and antivirus servers until you commit the transition. These are required in case you decide to roll back the transition.

- BranchCache configurations
- Character mapping configuration (charmap)
- Forcegroup attribute of CIFS shares to create files with a specified UNIX group as owning group
- Maxusers attribute of CIFS shares to specify the maximum number of simultaneous connections allowed to a 7-Mode CIFS share
- Storage-Level Access Guard (SLAG) configurations

- Share-level ACLs with UNIX-style permission
- Share ACLs for UNIX users and groups
- LAN Manager authentication level
- NetBIOS aliases
- CIFS search domains
- Some CIFS options

  See the precheck results for details about these options.

Related information

Customizing the transition of 7-Mode configurations

Considerations for transitioning CIFS local users and groups

You must be aware of the considerations for running the transition operations when migrating CIFS local users and groups.

- Transition of CIFS data-serving volumes from a 7-Mode controller or a vFiler unit that has local users and groups to an SVM that has non-BUILTIN CIFS local users and groups is not supported.

  The SVM must have only BUILTIN CIFS local users and groups for transition.

- You must ensure that the number of local users and groups in 7-Mode does not exceed the local users and groups limit for ONTAP.

  You must contact technical support if the number of local users and groups in 7-Mode exceeds the limit defined in ONTAP.

- A local user account with an empty password or local user accounts with passwords containing more than 14 characters on the 7-Mode system are transitioned to ONTAP software with the password **`cifsUser@1`**.

  After the transition is complete, you can access these users from the Windows system by using the password **`cifsUser@1`**. You must then manually change the password for such CIFS local users on the SVM by using the following command:

  `cifs users-and-groups local-user set-password -vserver` ***`svm_name`*** **`-user-name`** ***`user_name`***.

- If the 7-Mode Transition Tool IP address is not reachable from the target ONTAP software, the 7-Mode Transition Tool blocks the transition of CIFS local users and groups to the ONTAP software during the precheck phase. If you see this error during the precheck phase, use the

  `network ping -node local -destination` ***`ip_address`***

  command to make sure the 7-Mode Transition Tool IP address is reachable from the target ONTAP software. You can edit the `\etc\conf\transition-tool.conf` file that is installed with the 7-Mode Transition Tool to modify any configuration option that is used by the tool, such as the 7-Mode Transition Tool IP address.

- The SVM to which the local users and groups are transitioned must have a data LIF.

- If a local group has multiple member system identifiers (SIDs) mapped to a single domain user or group on the 7-Mode system, the 7-Mode Transition Tool blocks the transition of local users and groups to ONTAP during the precheck phase.

  If you see this error during the precheck phase, you must manually remove the additional SIDs that are mapped to a single domain user or group on the 7-Mode system. You must then rerun the precheck operation with only a single SID mapped to the domain user or group.

  Troubleshooting Workflow: CIFS: Device attached to the system is not functioning

Related information

SMB/CIFS management

Preparing for SAN transition

Before transitioning a SAN environment, you must understand what configurations are supported for SAN transition, create SAN LIFs on the SVM, and prepare the SAN hosts for transition.

Creating SAN LIFs before transition

Because FC and iSCSI LIFs are not transitioned by the 7-Mode Transition Tool, you must create these LIFs on the SVMs before transition. You must configure SAN LIFs on both the nodes that own the LUN and the node’s HA partner.

The required SAN (FC or iSCSI) license must be added to the cluster.

For redundancy, you must create SAN LIFs on both the node hosting the LUNs and its HA partner.

Steps

1. Create an FC or iSCSI LIF on the target node to which the LUNs are transitioned, depending on the protocol used:

   `network interface create`

   If you want to reuse the 7-Mode IP address for iSCSI LIFs, you must create the LIFs in administrative down state. You can bring these LIFs to the administrative up state after the cutover operation.

2. Create a LIF on the HA partner of the node.
3. Verify that you have set up your LIFs correctly:

   `network interface show`

Related information

SAN administration

Configuring zones by using the FC zone plan

Before transitioning a SAN FC environment, you must configure zones by using the FC zone planner to group the initiator hosts and targets.

- The FC zone planner must be generated by using the Collect and Access feature of the 7-Mode Transition Tool
- The FC zone script file must be accessible.

1. If there are any changes to the igroup configurations on the 7-Mode systems, modify and regenerate the FC zone plan.

   Generating an assessment report by adding systems to the 7-Mode Transition Tool

2. Log in to the CLI of the switch.
3. Copy and execute the required zone commands one at a time.

   The following example runs the zone commands on the switch:

```
switch1:admin>config terminal
# Enable NPIV feature
feature npiv
zone name auto_transition_igroup_d31_194bf3 vsan 10
member pwwn 21:00:00:c0:dd:19:4b:f3
member pwwn 20:07:00:a0:98:32:99:07
member pwwn 20:09:00:a0:98:32:99:07
.......
.......
.......
copy running-config startup-config
```

4. Verify the data access from the cluster by using the test initiator hosts.
5. After the verification is complete, perform the following steps:
   a. Disconnect the test initiator hosts.
   b. Remove the zone configuration.

Preparing SAN hosts for transition

Before transitioning a SAN environment, you must perform some manual steps to prepare the SAN hosts for transition.

You must have generated the inventory workbook for the SAN hosts by using the Inventory Collect Tool.

Host and storage transition information collection

Steps

1. Verify that the host is supported for transition.

   NetApp Interoperability Matrix Tool

2. Perform the pretransition steps on the host.

[SAN host transition and remediation](#)

SAN transition: supported and unsupported configurations, and required manual steps

You must be aware of the SAN configurations that are transitioned by the 7-Mode Transition Tool. You should also be aware of the 7-Mode SAN features that are not supported in ONTAP, so that you can take any necessary actions before the transition.

You should verify all of the precheck error and warning messages to evaluate the impact of such configurations on transition.

Configurations that are transitioned

The following SAN configurations are transitioned by the 7-Mode Transition Tool:

- FC and iSCSI services
- igroups and LUN maps

> - 7-Mode igroups that are not mapped to any LUNs are not transitioned to the target SVMs.
> - For clustered Data ONTAP 8.3.0 and 8.3.1, the transition of igroups and LUN mapping configurations is not supported during the precutover operation.
>
>   Instead, the required igroups are created during the cutover operation. For primary and stand-alone volumes, LUNs are mapped to igroups during the cutover operation. However, for secondary volumes, the mapping of LUNs to igroups is not supported during the cutover operation. You must manually map the secondary LUNs after completing the transition of primary volumes.
> - For ONTAP 8.3.2 and later supported releases, igroups and LUN mapping configurations are applied during the precutover operation.

Unsupported configurations in ONTAP

The unsupported configurations in ONTAP are as follows:

- 7-Mode Snapshot copy-backed LUN clones

  Snapshot copy-backed LUN clones present in the Snapshot copies are not supported for any restore operation. These LUNs are not accessible in ONTAP. You must split or delete the 7-Mode Snapshot copy-backed LUN clones before transition.
- LUNs with an ostype parameter value of vld, image, or any user-defined string

  You must either change the value of the ostype parameter for such LUNs or delete the LUNs before transition.
- LUN clone split

  You must either wait for the active LUN clone split operations to finish or abort the LUN clone split and delete the LUN before transition.

The following 7-Mode features enable you to continue with the transition process, but are not supported in ONTAP:

- The `lun share` command

  Sharing a LUN over NAS protocols

- SnapValidator

Configurations that must be manually transitioned

The following configurations must be transitioned manually:

- SAN LIFs

  You must manually create the LIFs before transition.

- Portsets

  You must manually configure igroups that are bound to a portset after transition.

- iSCSI access list information
- iSNS configuration
- iSCSI CHAP and RADIUS configurations

Related information

NFS management

Network and LIF management

Space considerations when transitioning SAN volumes

You must ensure that sufficient space is available in the volumes during transition. In addition to the space required for storing data and Snapshot copies, the transition process also requires 1 MB of space per LUN for updating certain filesystem metadata.

You can use the `df -h` command on the 7-Mode volume to verify whether free space of 1 MB per LUN is available in the volume. The volume should also have free space equivalent to the amount of data that is expected to be written to the volume before the hosts are quiesced. If the volume does not have sufficient free space available, the required amount of space must be added to the 7-Mode volume.

If transition fails during the import phase due to lack of space on the volume, the following EMS message is generated: `LUN.vol.proc.fail.no.space: Processing for LUNs in volume vol_name failed due to lack of space.`

If there are volumes containing space-reserved LUNs, growing the volume by 1MB per LUN might not provide sufficient space. In such cases, the amount of space that has to be added is the size of the Snapshot reserve for the volume. After space is added to the volume, you can use the `lun transition start` command to transition the LUNs.

Related information

Recovering from a failed LUN transition

Preparing data protection features for transition

You must perform some manual steps for transitioning 7-Mode SnapMirror relationships. You must also be aware of the data protection relationships that are supported and unsupported for transition.

Preparing the cluster for transitioning volume SnapMirror relationships

For transitioning 7-Mode volume SnapMirror relationships, you must add the SnapMirror license to the source and destination clusters. You must also create a cluster peer relationship between the clusters to which the primary and secondary volumes of the SnapMirror relationships are transitioned and create the SnapMirror schedules.

You must have recorded the SnapMirror schedules defined in the `/etc/snapmirror.conf` file of the 7-Mode secondary system.

Steps

1. Add the SnapMirror license on both the source and destination clusters:

   `system license add` ***`license_code`***

2. From each cluster, create the cluster peer relationship.

   Cluster and SVM peering express configuration

3. Create schedules on the secondary SVMs that match the schedules in the 7-Mode secondary system:

   `job schedule cron create`

Related information

ONTAP 9 commands

Data protection transition: supported and unsupported configurations

You can transition a volume that is part of a SnapMirror relationship. However, some data protection and disaster recovery configurations are not supported for transition and therefore you have to perform some manual steps for transitioning these configurations.

Supported configurations

You can transition volume SnapMirror relationships by using the 7-Mode Transition Tool. You can perform a copy-free transition of primary and secondary HA pairs. You must then manually set up the volume SnapMirror relationships after transition.

Transitioning a SnapMirror relationship

Unsupported configurations

- SnapVault relationships

  Volumes that are the source of a SnapVault relationship can be migrated; however, the SnapVault relationship is not transitioned. A volume that is the destination of a SnapVault relationship can be migrated only after the SnapVault backups are stopped.

  NetApp Technical Report 4052: Successfully Transitioning to Clustered Data ONTAP (Data ONTAP 8.2.x and 8.3)

- Qtree SnapMirror relationships

  Volumes with qtrees that are the source of a qtree SnapMirror relationship can be transitioned, but the qtree SnapMirror relationship is not transitioned. A volume with a qtree that is the destination of a qtree SnapMirror relationship can be migrated only after the qtree SnapMirror relationship is broken.

- Disaster recovery vFiler unit

  Volumes that are the source of a disaster recovery vFiler unit can be migrated; however, the disaster recovery vFiler unit is not transitioned. A volume that is the destination of a disaster recovery vFiler unit can be migrated only after the disaster recovery relationship is deleted.

- NDMP configuration

  After the transition is complete, you must manually set up backup policies for the transitioned volumes in ONTAP.

  Data protection using tape backup

- Synchronous SnapMirror relationships

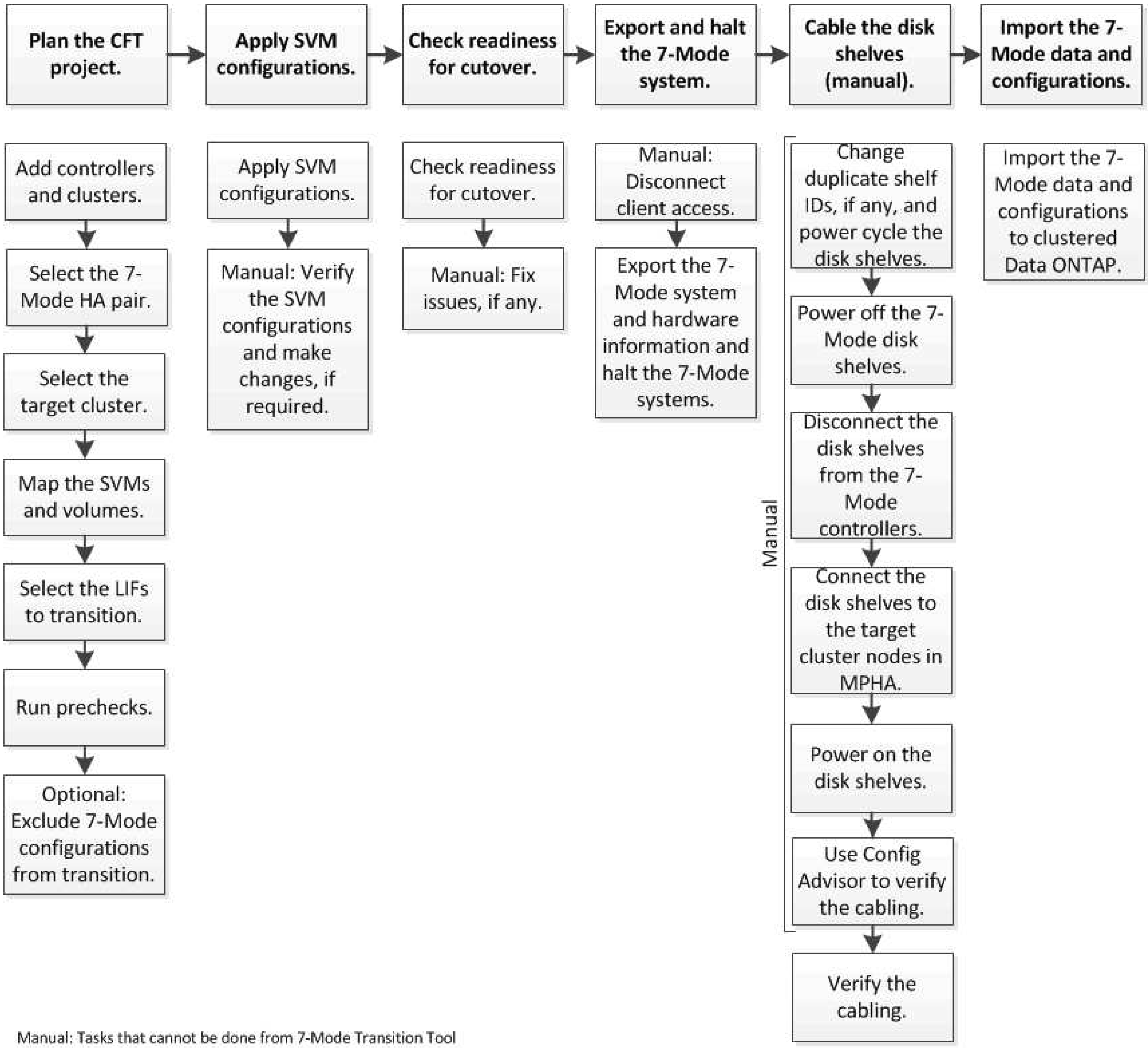
  This feature is not supported in ONTAP; however, the volumes that are part of the relationship can be transitioned.

Related information

Customizing the transition of 7-Mode configurations

Transitioning 7-Mode aggregates using copy-free transition

The copy-free transition workflow involves planning a project, applying 7-Mode configurations to the SVMs, exporting the 7-Mode system information and halting the 7-Mode system, manually cabling the disk shelves to cluster nodes, and importing the 7-Mode data and configurations.



You must have prepared the 7-Mode system and the cluster for copy-free transition.

The storage cutover time can be 4-8 hours or less. The cutover time includes the time taken by the tool to perform two automated operations—the export and halt and import operations-- as well as the time taken for manually cabling the disk shelves to the new controllers.

The export and import operations take about 2 hours or less. Cabling can take 2-6 hours or less.

Planning a copy-free transition project

Planning a copy-free transition project involves selecting the source 7-Mode controllers and target cluster nodes, mapping 7-Mode volumes to a storage virtual machine (SVM), selecting the LIFs to be transitioned, and running prechecks.

You can create multiple projects with the same target cluster HA pair nodes. You can then run prechecks and apply the SVM configurations on all these projects. However, only one project can be in the critical section window at a given time. A project is in the critical section window if the project is in any of the phases from export to commit, or if a rollback operation has been initiated for the project. You can proceed with the export and halt operation for another project only after the commit or rollback operation is completed for the project in the critical section window.

Copy-free transition project planning worksheets

You can use the copy-free transition planning worksheets to record information about node mapping, SVM mapping, volume mapping, and LIFs to transition. The worksheets are useful when creating a transition project by using the 7-Mode Transition Tool. You should be aware of the guidelines for completing the worksheets.

You can follow these guidelines to complete the worksheets:

- Map each vFiler unit to an SVM.

  If there are no vFiler units in the 7-Mode controller, map the controller to a single SVM.

- Record the 7-Mode volume name and the corresponding Data ONTAP volume name.

  The ONTAP volume name might be different from the 7-Mode volume name.

- Identify the LIFs to be configured on each SVM.

  The IP addresses for the LIFs can either be existing on the 7-Mode system or can be new LIFs.

Node mapping

7-Mode controller	Mapped cluster node

SVM and volume mapping

7-Mode controller	vFiler unit or controller	Mapped SVM	7-Mode volume	SVM volume

LIF mapping (7-Mode IP addresses)

7-Mode controller	vFiler unit or controller	Mapped SVM	7-Mode IP address	Netmask	Default gateway	Home node	Home port

7-Mode controller	vFiler unit or controller	Mapped SVM	7-Mode IP address	Netmask	Default gateway	Home node	Home port

LIF mapping (new LIFs)

SVM	New IP address	Netmask	Default gateway	Home node	Home port

Example

The following table shows an example of completed worksheets for a 7-Mode HA pair with the controllers hostA_7mode and hostB_7mode.

Node mapping

7-Mode controller	Mapped cluster node
hostA_7mode	cluster1_01
hostB_7mode	cluster1_02

SVM and volume mapping

7-Mode controller	Mapped cluster node	vFiler unit or controller	Mapped SVM	7-Mode volume	SVM volume
hostA_7mode	cluster1_01	vfilerA	svm1	volA	volA
				volB	volB
		vfilerB	svm2	vol1	vol_nfs
				vol2	vol_cifs
hostB_7mode	cluster1_02	Not applicable	svm3	vol3	vol3
				vol4	vol4
				vol5	vol5
				vol6	vol6

LIF mapping (7-Mode IP addresses)

7-Mode controller	vFiler unit or controller	Mapped SVM	Existing 7-Mode IP	Netmask	Default gateway	Home node	Home port
hostA_7mode	vfilerA	svm1	192.0.2.129	255.255.255.128	192.40.0.1	cluster1_01	e0a
			192.0.2.135	255.255.255.128	192.40.0.1	cluster1_02	e0b
	vfilerB	svm2	-				
			-				
hostB_7mode	Not applicable	svm3	192.0.2.110	255.255.255.128	192.40.0.1	cluster1_01	e0c
			192.0.2.111	255.255.255.128	192.40.0.1	cluster1_02	e0d

LIF mapping (new LIFs)

SVM	New IP address	Netmask	Default gateway	Home node	Home port
svm1	-				
	-				
svm2	192.0.2.130	255.255.255.128	192.40.0.1	cluster1_01	e1c
	192.0.2.131	255.255.255.128	192.40.0.1	cluster1_02	e1d
svm3	192.0.2.136	255.255.255.128	192.40.0.1	cluster1_01	e0c
	192.0.2.137	255.255.255.128	192.40.0.1	cluster1_02	e0d

Adding controllers and clusters

Before you start the transition, you must add the 7-Mode controllers, including both nodes of a 7-Mode HA pair, and the clusters that are required for the transition. You should add the clusters using the cluster-management interface.

- For a copy-free transition, you must add the cluster, and not the cluster nodes that are the target of transition.
- The 7-Mode controllers and clusters information that you provide is not persistent.

  If the 7-Mode Transition Tool service is restarted, the tool prompts in the project dashboard for information about controllers and cluster that are part of active projects.

Steps

1. From the top pane, click **Storage Systems**.
2. In the **Hostname** field, enter the FQDN or IP address of the 7-Mode controller or the ONTAP system.

   For a cluster, you can specify the IP address or FQDN of the cluster-management interface. For a 7-Mode controller, you must specify the IP address of the default vFiler unit, because the IP addresses of individual vFiler units are not accepted.

3. Enter the administrator credentials for the specified host, and then click **Add**.

   The 7-Mode controllers are added to the “7-Mode Controllers” table and clusters are added to the “Clustered Data ONTAP Systems” table.

4. Repeat Steps 2 and 3 to add all of the controllers and clusters that you require for the transition.
5. If the Status column indicates that the credentials of the system are missing or the credentials have changed from what was initially entered in the tool, click the  icon, and then enter the credentials again.
6. Click **Next**.

   The Select Source Systems screen is displayed.

Creating a copy-free transition project

The first step in planning a transition project is to select the source 7-Mode HA pair from which you want to transition the disk shelves, aggregates, volumes, and configurations, and then create a transition project.

- The 7-Mode controllers in the HA pair must be running a supported ONTAP version on a platform that is supported for a copy-free transition.

  NetApp Interoperability Matrix Tool

- Both controllers in the HA configuration must be healthy.

  1. Select the **Copy-Free Transition** migration method from the homepage and click **Start Planning**.

     If the controller and cluster required for a new project are not added, you can enter the details in the Enter Device Credentials pane.

  2. Select the source 7-Mode HA pair that you want to transition.
  3. Click **Create Project**.

     a. In the Project Details window, provide a name for the project.

     b. Select a project group to which the project should be added.

        You can either create a new project group or add the project to the default group.

        Creating a project group enables you to group and monitor related projects.

     c. Click **Save**.

        The Select Target Cluster screen is displayed.

Selecting the target cluster nodes for transition

You can select the target cluster HA pair and map each 7-Mode controller in the HA pair to a corresponding target cluster node. The mapped node specifies the cluster node to which the disk shelves from the corresponding 7-Mode controller must be connected.

The target cluster must be running Data ONTAP 8.3.2 or later.

You can transition the 7-Mode disk shelves to a target HA pair that has preexisting data aggregates and volumes.

For a two-node cluster, you must have a data aggregate to host the root volumes of the target SVMs. For a cluster with four or more nodes, the root volumes of the SVMs can be hosted either on the target nodes of the transition or on other nodes in the cluster.

Steps

1. Select the target HA pair to which the 7-Mode disk shelves must be connected.

   The tool automatically maps each 7-Mode storage system to a target cluster node.

   > The disk and aggregate ownership from each 7-Mode controller is transferred to its corresponding mapped target cluster node during the import phase.

2. Click **Swap Node Mapping** to change the automatic assignment of source-to-target node mapping.
3. Click **Save and Continue**.

   The SVM and Volume Mapping screen is displayed.

Mapping SVMs and volumes

You should map each 7-Mode controller in the HA pair to a target SVM. If you have vFiler units, you should select a target SVM for each vFiler unit. The volumes from the 7-Mode controller or vFiler unit are transitioned to the mapped SVM.

You must have created the SVMs on the target cluster.

Cluster management with System Manager

System administration

A vFiler unit can be mapped only to a single SVM. Volumes from any other 7-Mode controller or vFiler unit cannot be transitioned to a mapped SVM.

Steps

1. In the SVM and Volume Mapping tab, select the target SVM to which you want to transition the volumes from each 7-Mode controller or vFiler unit.

   The target SVM can be in the default or non-default IPspace.

2. Depending on whether you want to apply the same junction path policy for the volumes in all the SVMs or a different junction path policy for the volumes in each SVM, choose one of the following actions:

If you want to…	Then…
Apply the same junction path policy to all the SVMs	a. Click **Apply**. b. Select an option for the junction path policy. c. Click **OK**.
Specify the junction path policy for each SVM	Select the junction path policy from the drop-down list for each target SVM.

The junction path policy specifies the path with which the target clustered Data ONTAP volumes must be mounted for client access. You can add one of the following values for the junction path policy:

- **Preserve 7-Mode mount paths**

  Retains the same junction paths as that being used on the source 7-Mode volumes and the volumes are mounted with junction paths in the format `/vol/source_volume_name` after transition.

- **Use clustered Data ONTAP volume name**

  All the target clustered Data ONTAP volumes are mounted with junction paths with the clustered Data ONTAP volume name in the format `/target_volume_name` after transition.

- **Use 7-Mode volume name**

  All the target clustered Data ONTAP volumes are mounted with junction paths with the 7-Mode volume name in the format `/source_volume_name` after transition.

3. Click  to modify the name of the target clustered Data ONTAP volume.

   By default, the target clustered Data ONTAP volume has the same name as the 7-Mode volume. If a volume with the same name as the 7-Mode volume already exists on the SVM, the target volume is automatically assigned a new name.

4. Click **Save Mapping** for each mapped SVM.
5. Click **Next**.

   The Networking screen is displayed.

Selecting LIFs for transition

You can optionally specify the LIFs that you want to configure on the SVMs after transition. These LIFs can be existing IP addresses on the 7-Mode systems or they can be new LIFs. Only NAS LIFs are transitioned. FC and iSCSI LIFs must be manually configured before the SVM provision phase.

The LIFs that are selected for transition are configured on the SVMs during the SVM provision phase in the following ways:

- Existing 7-Mode IP addresses that are selected for transition are created in the administrative down state.

These IP addresses can continue to serve data in 7-Mode until the cutover starts. During the import phase, these IP addresses are configured in the administrative up state.

- New IP addresses are created in the administrative up state.

  You can use these LIFs to test the connectivity of the SVMs to the name servers after the SVM provision phase.

Steps

1. In the LIF configuration tab, choose one of the following options:

If you want to transition…	Then…
An existing IP address on the 7-Mode system	a. Click **Select 7-Mode LIF**. b. Select the IP address that you want to transition, and then specify the target SVM and other network parameters. c. Click **Save**.
A new IP address	a. Click **Add New LIF**. b. Specify the IP address that you want to configure, the target SVM, and other network parameters. c. Click **Save**.

> The target ports must be in the same IPspace as the target SVM.

2. Click **Next**.

   The Plan Configuration tab is displayed.

Customizing the transition of 7-Mode configurations

When planning the transition of configurations from 7-Mode to ONTAP, you can customize the configuration transition in two ways. You can ignore or skip the transition of one or more configurations. You can consolidate the 7-Mode NFS export rules, and then reuse an existing NFS export policy and Snapshot policy on the target SVM.

The 7-Mode Transition Tool does not perform prechecks for the configuration that is excluded.

By default, all 7-Mode configurations are selected for transition.

It is a best practice to run the prechecks with all configurations first, and then exclude one or more configurations in the subsequent run of the prechecks. This helps you to understand which configurations are excluded from transition and which prechecks are skipped subsequently.

Steps

1. From the Plan Configuration page, select the following options from the **SVM Configuration** pane:

- For excluding the transition of configurations, clear the check box for those configurations.
- For consolidating similar 7-Mode NFS export rules to a single export policy in ONTAP, which can then be applied to the transitioned volume or qtree, select the **Consolidate NFS Export Policies on 7-Mode** check box.
- For reusing an existing NFS export policy on the SVM that matches the export policy that will be created by the tool, which can then be applied to the transitioned volumes or qtrees, select the **Reuse Export Policies of SVM** check box.
- For consolidating similar 7-Mode Snapshot schedules to a single Snapshot policy in ONTAP, which can then be applied to the transitioned volume, select the **Consolidate 7-Mode Snapshot Policies** check box.
- For reusing an existing Snapshot policy on the SVM that matches the Snapshot policy that will be created by the tool, which can then be applied to the transitioned volumes, select the **Reuse Snapshot Policies of SVM** check box.

2. Click **Save and go to Dashboard**.

Related information

NFS transition: supported and unsupported configurations, and required manual steps

Supported and unsupported CIFS configurations for transition to ONTAP

Data protection transition: supported and unsupported configurations

Name services transition: supported and unsupported configurations, and required manual steps

Examples of consolidating NFS export rules and Snapshot schedules for transition

You might want to review examples of how similar 7-Mode export rules and 7-Mode Snapshot schedules are consolidated to a single NFS export policy and a single Snapshot policy in ONTAP. You might also want to understand how the consolidated policies are assigned to the transitioned volumes or qtrees with or without reusing a matching existing policy on the target SVM.

Example of consolidating NFS export rules for transition

NFS export rules in 7-Mode and ONTAP before transition

7-Mode export rules

```
/vol/vol1       -sec=sys,rw,nosuid
/vol/vol2       -sec=sys,rw,nosuid
/vol/vol3       -sec=sys,rw,nosuid
```

Export policies existing in ONTAP

```
cluster-2::> vserver export-policy show -vserver vs1
Vserver          Policy Name
---------------  -------------------
vs1              default
vs1              export_policy_1
```

The existing export policy export_policy_1 has the following export rule:

```
cluster-2::> vserver export-policy rule show -vserver vs1 -policyname
export_policy_1
             Policy          Rule    Access   Client                RO
Vserver      Name            Index   Protocol Match                 Rule
------------ --------------- ------  -------- ---------------------
---------
vs1          export_policy_1 1       nfs      0.0.0.0/0             sys
```

Export policies in ONTAP after transition with consolidation (no reuse)

Volumes vol1, vol2, and vol3 have similar export rules in 7-Mode; therefore, a new consolidated export policy, transition_export_policy_1, is assigned to these volumes after transition:

```
cluster-2::> vserver export-policy show -vserver vs1
Vserver          Policy Name
---------------  -------------------
vs1              default
vs1              export_policy_1
vs1              transition_export_policy_1
3 entries were displayed.
```

```
cluster-2::> vserver export-policy rule show -vserver vs1 -policyname
transition_export_policy_1
             Policy          Rule    Access   Client                RO
Vserver      Name            Index   Protocol Match                 Rule
------------ --------------- ------  -------- ---------------------
---------
vs1          transition_export_policy_1
                             1       nfs      0.0.0.0/0             sys
```

```
cluster-2::> volume show -vserver vs1 -volume vol1,vol2,vol3 -fields
policy
vserver volume policy
------- ------ --------------------------
vs1     vol1   transition_export_policy_1
vs1     vol2   transition_export_policy_1
vs1     vol3   transition_export_policy_1
3 entries were displayed.
```

Export policies in ONTAP after transition with consolidation and reuse

Volumes vol1, vol2, and vol3 have similar export rules in 7-Mode; therefore, a consolidated export policy is assigned to these volumes after transition. The export policy, export_policy_1, which matches the 7-Mode export rules, already exists on the SVM. Therefore, the policy is applied to these volumes:

```
cluster-2::> vserver export-policy show -vserver vs1
Vserver          Policy Name
---------------  -------------------
vs1              default
vs1              export_policy_1
2 entries were displayed.
```

```
cluster-2::> vserver export-policy rule show -vserver vs1 -policyname
export_policy_1
             Policy          Rule    Access   Client                RO
Vserver      Name            Index   Protocol Match                 Rule
------------ --------------- ------  -------- ---------------------
---------
vs1          export_policy_1 1       nfs      0.0.0.0/0             sys
```

```
cluster-2::> volume show -vserver vs1 -volume vol1,vol2,vol3 -fields
policy
vserver volume policy
------- ------ --------------------------
vs1     vol1   export_policy_1
vs1     vol2   export_policy_1
vs1     vol3   export_policy_1
3 entries were displayed.
```

Example of consolidating Snapshot policies for transition

Snapshot schedules in 7-Mode and ONTAP before transition

7-Mode schedule

7-Mode volume	7-Mode Snapshot schedule
vol1	0 2 4@8,12,16,20 (weekly Snapshot copies: 0, daily Snapshot copies: 2, hourly Snapshot copies: 6 at 2, 4, 8, 12, 16, 20 hours)
vol2	0 2 4@8,12,16,20
vol3	0 2 4@8,12,16,20
vol4	1 2 3@8,12,16 (weekly Snapshot copies: 1, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)
vol5	2 2 3@8,12,16 (weekly Snapshot copies: 2, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)

Snapshot policies existing in ONTAP

Snapshot policy name	Policy details
ScheduleWeekly	Weekly, count: 1
ScheduleDailyHourly4	**Schedule details** • Schedule1: daily, count1: 2 • Schedule2: hourly, count2: 4 every 8, 12, 16, 20 hours
ScheduleHourly1	Hourly at 8, 12, 16, 20 hours, count: 4

Snapshot policy in ONTAP after transition with consolidation (no reuse)

7-Mode volume	7-Mode Snapshot schedule	Snapshot policy in ONTAP
vol1	0 2 4@8,12,16,20 (weekly Snapshot copies: 0, daily Snapshot copies: 2, hourly Snapshot copies: 4 at 8, 12, 16, 20 hours)	**Consolidated policy for vol1, vol2, and vol3** • Name: transition_snapshot_policy_0 • Schedule details ◦ Schedule1: daily, count1: 2 ◦ Schedule2: hourly, count2: 4 every 8, 12, 16, 20 hours

7-Mode volume	7-Mode Snapshot schedule	Snapshot policy in ONTAP
vol2	0 2 4@8,12,16,20	vol3
0 2 4@8,12,16,20	vol4	1 2 3@8,12,16 (weekly Snapshot copies: 1, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)
• Name: transition_snapshot_policy_1 • Schedule details ◦ Schedule1: weekly, count1: 1 ◦ Schedule2: daily, count2: 2 ◦ Schedule3: hourly, count3: 3 every 8,12,16 hours	vol5	2 2 3@8,12,16 (weekly Snapshot copies: 2, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)

Snapshot policy in ONTAP after transition with consolidation and reuse

7-Mode volume	7-Mode Snapshot schedule	Snapshot policy in ONTAP
vol1	0 2 4@8,12,16,20 (weekly Snapshot copies: 0, daily Snapshot copies: 2, hourly Snapshot copies: 4 at 2, 4, 8, 12, 16, 20 hours)	Consolidated policy for vol1, vol2, and vol3 for which the existing ONTAP policy is reused Name: ScheduleDailyHourly4
vol2	0 2 4@8,12,16,20	vol3
0 2 4@8,12,16,20	vol4	1 2 3@8,12,16 (weekly Snapshot copies: 1, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)
• Name: transition_snapshot_policy_1 • Schedule details ◦ Schedule1: weekly, count1: 1 ◦ Schedule2: daily, count2: 2 ◦ Schedule3: hourly, count3: 3 every 8,12,16 hours	vol5	2 2 3@8,12,16 (weekly Snapshot copies: 2, daily Snapshot copies: 2, hourly Snapshot copies: 3 at 8,12,16 hours)

Running prechecks

You can run prechecks to identify any issues before you start a transition. Prechecks verify that the 7-Mode sources, ONTAP targets, and configurations are valid for your transition. You can run prechecks any number of times.

The prechecks run more than 200 different checks. For example, the tool checks for items such as if volumes are online and network access exists between the systems.

1. From Dashboard, select the project for which you want to run the prechecks.
2. Click **Run Prechecks**.

   After the prechecks are complete, the result summary is displayed in the dialog box.

   > ⓘ The prechecks usually take only a few minutes to run, but the duration of the precheck phase depends on the number and type of errors or warnings that you resolve.

Steps

1. Choose an option under **Apply Type Filter** to filter the results:
   - To view all messages related to security, select **Error**, **Warning**, **Informational**, and **Security Only**.
   - To view all error messages related to security, select **Error** and **Security Only**.
   - To view all warning messages related to security, select **Warning**and **Security Only**.
   - To view all informational messages related to security, select **Informational** and **Security Only**.
2. To save the raw results in comma-separated values (CSV) format and export the results, click **Save As CSV**.

   You can view the transition operations that have been performed during the transition along with the operation type, status, start time, end time, and results in the Operation History tab on the Dashboard pane.

You must resolve all the errors detected by the prechecks before you start data copy. It is also a best practice to resolve all warnings prior to proceeding with the migration process. Resolution can be resolving the source issue of the warning message, implementing a workaround, or accepting the result of the issue.

Severity levels for precheck messages

You can verify whether the 7-Mode volumes can be transitioned by running the transition precheck operation. Transition precheck reports all the transition issues. Transition issues are assigned different severity levels, depending on the impact of the issue on the transition process.

The issues detected by the prechecks are classified into the following categories:

- **Error**

  Configurations that cannot be transitioned.

  You cannot continue the transition if there is even one error. The following are a few example configurations on the 7-Mode system that cause an error:

    ◦ Traditional volumes
    ◦ SnapLock volumes
    ◦ Offline volumes

- **Warning**

  Configurations that can cause minor problems after transition.

  Features that are supported in ONTAP, but are not transitioned by the 7-Mode Transition Tool, also generate a warning message. You can continue the transition with these warnings. However, after the transition you might lose some of these configurations or might have to complete some manual tasks for enabling these configurations in ONTAP.

  The following are a few example configurations on the 7-Mode system that generate a warning:

    ◦ IPv6
    ◦ NFSv2
    ◦ NDMP configurations
    ◦ Interface groups and VLANs
    ◦ Routing Information Protocol (RIP)

- **Information**

  Configurations that have been successfully transitioned.

Applying SVM configurations

You must manually apply some configurations before the SVM provision phase. You can then apply all configurations that are defined in the 7-Mode controller (files in the `/etc` directory) or at the vFiler unit level to the mapped SVMs by using the tool.

If you do not want to transition all configurations to the target SVMs, you must have set the properties for the configurations to be excluded on the SVMs.

Customizing the transition of 7-Mode configurations

- Configurations such as NFS exports, CIFS shares, and LUN mapping are not applied to the SVM in the SVM provision phase.
- The following configurations are applied by the tool on the SVMs in the SVM provision phase:
    ◦ **Name services**
        ▪ DNS configuration
        ▪ LDAP configuration
        ▪ NIS configuration
        ▪ Name service switch configuration
        ▪ Hosts configuration
        ▪ UNIX users and groups
        ▪ Netgroups configuration

- **Networking**
  - Existing 7-Mode IP addresses that are selected for transition are created in the administrative down state.

    During the import phase, these IP addresses are configured in the administrative up state.

  - New IP addresses are created in the administrative up state.
- **NFS**

  NFS options

- **CIFS**
  - CIFS preferred DC configuration
  - User mapping configuration
  - Widelinks configuration
  - CIFS options
  - Audit configuration
- **SAN**

  FC and iSCSI services

> You cannot rerun this operation after it is completed successfully.
>
> Therefore, if you make any changes to the 7-Mode controller-level configurations after this operation, you must manually transition the configurations to the target SVMs before the export phase. For example, if you add a new vFiler unit to the 7-Mode controller and map it to an SVM after this operation, you must manually transition the configurations of that vFiler unit to the mapped SVM. Another example is if you add some UNIX users on the 7-Mode controller after the SVM provision phase, you must create these UNIX users manually on the mapped SVMs.

Steps

1. Click **Apply SVM Config** to apply the 7-Mode configurations to the target SVMs.

   A confirmation message that lists important considerations for this operation is displayed.

2. Click **Yes** to continue.
3. After the operation is complete, perform the following steps:

   a. Click **Save as CSV** to save the operation results in a file.

   b. Click **Collect Project Logs** to create a backup of all of the transition log files.

      It is a best practice to save the log files after each transition operation.

   c. Click **Close** to close the operation results window.

   If the operation takes a long time to complete, you can click **Run in Background** to exit the operation results window. You should not edit the project or perform any other task when the operation is running in the background. You can then view the operations results from the Operation History tab.

4. Verify and test the configurations that are applied to the target SVMs manually and make the required changes.
5. Manually verify the connectivity to external name servers.

Verifying that 7-Mode systems are ready for cutover

Before disconnecting client access, you can verify the readiness of the 7-Mode system for storage cutover, such as verifying whether the SP or RLM is configured on the 7-Mode system and whether the disk shelves, aggregates, and volumes are ready for transition. You can manually fix any issues before the export operation, thereby reducing the downtime.

You can run this operation multiple times before the export and halt operation is initiated.

Steps

1. Click **Check Readiness** to verify that the 7-Mode systems are ready for cutover.

   Although this operation is optional, it is a best practice to verify the readiness of the systems and fix issues before the export operation in order to minimize the storage cutover window.

2. Wait for the operation to complete and do the following:

   a. Click **Save as CSV** to save the operation results in a file.

   b. Click **Collect Tool Logs** to take a backup of all the transition log files.

      It is a best practice to save the log files after each transition operation.

   c. Click **Close** to close the operation results window.

   If the operation takes a long time to complete, you can click **Run in Background** to exit the operation results window. You should not edit the project or perform any other task when the operation is running in the background. You can then view the operations results from the Operation History tab.

Exporting storage configurations and halting 7-Mode systems

The cutover window for the transition starts from the export phase. In this phase, the tool collects system information, disk shelf details, and storage configurations from the 7-Mode systems, and then halts the 7-Mode storage systems.

- The Service Processor (SP) or Remote LAN Module (RLM) must be configured with an IPv4 address on the 7-Mode system.
- All clients must be disconnected from the 7-Mode systems (by unmounting NFS exports, disconnecting CIFS shares, and shutting down SAN hosts), but the applicable NAS and SAN services must be running on the 7-Mode systems.

  > You must not stop any protocol services because they are required for collecting the protocol configurations from the 7-Mode storage systems.

- Any data written to the 7-Mode volumes during this operation is lost.
- You must not perform any management operations on the 7-Mode systems during this operation.

* The tool performs the following operations in the export phase:
  * Collects all volume and storage configurations
  * Creates a Snapshot copy of each transitioning aggregate

    If you decide to revert to 7-Mode at any stage of transition, these Snapshot copies are used by the tool for the revert operation.
  * Boots the 7-Mode controllers in maintenance mode
  * Removes disk ownerships from the 7-Mode controllers
  * Disables disk autoassignment on the target cluster nodes

Steps

1. Click **Export & Halt**.

   A message that lists important considerations for this operation is displayed.
2. Click the **Confirm that the client access is disconnected** check box.
3. Click **Yes** to continue with the export and halt operation.

   The operation results are displayed.
4. Wait for the operation to complete and perform the following steps to save the operation results and collect the tool logs:

   a. Click **Save as CSV** to save the operation results in a file.

   b. Click **Collect Tool Logs** to create a backup of all the transition log files.

      It is a best practice to save the log files after each transition operation.

   c. Click **Close** to close the operation results window.

   If the operation takes a long time to complete, you can click **Run in Background** to exit the operation results window. You should not edit the project or perform any other task when the operation is running in the background. You can then view the operations results from the Operation History tab.

Disconnecting disk shelves from the 7-Mode system and connecting to cluster nodes

Cabling the 7-Mode disk shelves to the target cluster nodes is a manual process. After cabling the disk shelves, it is a best practice to verify the cabling by using Config Advisor. You can then verify the cabling by using the 7-Mode Transition Tool. The tool performs only a subset of the checks that are performed by Config Advisor.

You must have recorded the information about disk shelf connectivity to the 7-Mode controller ports.

You must be aware of some of the considerations for connecting SAS disk shelves:

* You must follow the rules for cabling SAS square and circle ports.
* IOM6 and IOM3 shelves can be mixed in the same stack, but there should be no more than a single transition between shelves that are using different IOM types.

For example, IOM6e (controller)--IOM6 (shelf)--IOM3 (shelf)--IOM3 (shelf) is a supported configuration. But IOM6e (controller)--IOM3 (shelf)--IOM6 (shelf)--IOM3 (shelf) is not a supported configuration.

Steps

1. Check the disk shelf IDs in the 7-Mode HA pair and the target cluster nodes:
   a. If there are duplicate shelf IDs (if the 7-Mode disk shelf IDs are used for the disk shelves in the target cluster nodes), change the disk shelf IDs.
      - For SAS disk shelves, a valid shelf ID is 00 through 99.
      - SAS shelf IDs must be unique within the HA pair.
        SAS Disk Shelves Installation and Service Guide for DS4243, DS2246, DS4486, and DS4246
      - For FC disk shelves, a valid shelf ID is 1 through 7.
      - FC shelf IDs must be unique within each FC loop.
        DS14mk2 FC, and DS14mk4 FC Hardware Service Guide
   b. Power cycle the disk shelves for the new IDs to take effect.
2. Power off the 7-Mode disk shelves.
3. Depending on whether additional ports are available on the target cluster nodes, choose one of the following options:

If…	Then…
Additional ports are available to connect the disk shelves	Connect the disk shelves in a new stack to the target cluster nodes in a multipath configuration. ⓘ It is the best practice to connect the disk shelves to a separate stack. The 7-Mode Transition Tool detects the availability of the required number of ports on the target cluster nodes when prechecks are run.
Ports are not available to connect the disk shelves	Perform one of the following actions: • Add a new expansion card and connect the disk shelves in a new stack to the target cluster nodes in a multipath configuration. You must have verified that the expansion card is supported on the destination platform. • Connect the disk shelves to an existing stack in a multipath configuration.

SAS Disk Shelves Installation and Service Guide for DS4243, DS2246, DS4486, and DS4246

DiskShelf14mk2 AT Hardware Service Guide

DS14mk2 FC, and DS14mk4 FC Hardware Service Guide

4. Power on the disk shelves.

   You must wait for at least 70 seconds before you proceed.

5. Use Config Advisor to verify the connections.

   You must fix any cabling issues identified by Config Advisor.

   NetApp Downloads: Config Advisor

6. From the 7-Mode Transition Tool, click **Verify Cabling**.

   A message listing the important considerations for this operation is displayed.

   Troubleshooting: If there are missing disks in an aggregate, the aggregate becomes degraded and the cabling verification fails. If the number of missing disks is within a permissible limit, you can continue the transition with the degraded aggregates by running the following command from the 7-Mode Transition Tool CLI:

   transition cft aggregate degraded-transition -p *project_name* -n *7-mode_host_name* -a *7-mode_aggregate_name* -i acknowledge

   You can then rerun the cabling verification operation and continue with the transition. You must ensure that there are enough spare disks in the target cluster node to reconstruct these RAID groups after the aggregates are transitioned.

7. Click **Yes** to continue.
8. Wait for the operation to complete and perform the following steps to save the operation results and collect the tool logs:

   a. Click **Save as CSV** to save the operation results in a file.
   b. Click **Collect Tool Logs** to create a backup of all the transition log files.

      It is a best practice to save the log files after each transition operation.

   c. Click **Close**.

   If the operation takes a long time to complete, you can click **Run in Background** to exit the operation results window. You should not edit the project or perform any other task when the operation is running in the background. You can then view the operations results from the Operation History tab.

Related information

Gathering cabling information for transition

Importing 7-Mode data to ONTAP

After verifying the cabling and resolving any issues, you can run the import operation. In this phase, the disk ownership is assigned to the mapped cluster nodes, and the 7-Mode aggregates, volumes, and LUNs are converted to the ONTAP format. All the volume-level and LUN-level configurations are also applied.

The following operations are performed by the tool in this phase:

- 7-Mode disks are assigned to the mapped target cluster nodes.
- All the 7-Mode aggregates, volumes, and LUNs are converted to the ONTAP format.
- The 7-Mode IP addresses that were selected for transition are configured on the SVMs in the administrative up state.
- The following configurations are applied:
  - NFS export rules
  - CIFS shares
  - CIFS ACLs configuration
  - CIFS home directory configuration
  - CIFS symbolic links
  - Quota configuration
  - Snapshot copy schedules
  - LUN maps and igroups

Steps

1. Click **Import**.

   Troubleshooting: If there are missing disks in an aggregate, the aggregate becomes degraded and the import operation fails. If the number of missing disks is within a permissible limit, you can continue the transition with the degraded aggregates by running the following command from the 7-Mode Transition Tool CLI:

   `transition cft aggregate degraded-transition -p` ***`project-name`*** **`-n`** ***`7-mode-host-name`*** **`-a`** ***`7-mode-aggregate-name`*** **`-i acknowledge`**

   You can then rerun the cabling verification operation and continue with the transition. You must make sure that there are enough spare disks in the target cluster node to reconstruct these RAID groups after the aggregates are transitioned.

   A warning message is displayed, listing the important considerations for this operation.

2. Click **Yes** to continue.

   The operation results are displayed.

3. Wait for the operation to complete and do the following:

   a. Click **Save as CSV** to save the operation results in a file.

   b. Click **Collect Tool Logs** to take a backup of all the transition log files.

      It is a best practice to save the log files after each transition operation.

   c. Click **Close** to close the operation results window.

   If the operation takes a long time to complete, you can click **Run in Background** to exit the operation results window. You should not edit the project or perform any other task when the operation is running in the background. You can then view the operations results from the Operation History tab.

Completing the transition

Completing the transition involves manually verifying the transitioned volumes and configurations, testing your workload, starting production, and then committing the copy-free transition project. Because rollback is not allowed after the commit operation, you should verify all workloads and start production for a brief duration to evaluate if rollback is required.

Restrictions during preproduction testing

Some operations are blocked and some operations are not recommended during preproduction testing. These restrictions are imposed for allowing a rollback to 7-Mode if you do not want to commit the transition.

Operations that are blocked

Operation	Description
Automatically deleting (autodelete) aggregate Snapshot copies	Because the 7-Mode aggregate-level Snapshot copies created during the export operation are required in case of a rollback, the Snapshot copies are not deleted automatically when the used space in the aggregate grows. ⓘ You must monitor the free physical space in the aggregate and ensure that the aggregates do not run out of space during the testing.
Moving volumes to another aggregate	• You cannot move volumes to the transitioned aggregates. • You can move volumes from the transitioned aggregates to aggregates in the cluster.
Copying or moving LUNs across volumes	• You cannot copy or move LUNs to the transitioned volumes. • You can copy or move LUNs from the transitioned volumes to other volumes in the cluster.
Creating an aggregate	This operation is restricted on the target cluster HA pair. You can create aggregates on other nodes in the cluster.
Destroying an aggregate	Because the 7-Mode aggregate-level Snapshot copies created during the export operation are required in case of a rollback, the transitioned aggregates cannot be destroyed.

Operation	Description
Setting up a transitioned aggregate as the root aggregate	The transitioned aggregates cannot be selected as root aggregates. Additionally, you cannot modify the HA policy of the transitioned aggregates to CFO.
Performing file copy operations	• You cannot move or copy files (single file copy-on-demand) to the transitioned volumes. • You can move or copy files from the transitioned volumes to other volumes in the cluster.
Mirroring an existing aggregate	The operation is blocked on all the aggregates in the cluster.
Upgrading or reverting the Data ONTAP version on the target cluster nodes	You must commit the project before upgrading or reverting the target cluster nodes.
Adding disks	You cannot run the `storage aggregate add-disks` command in the admin privilege level. However, you can run this command in the advanced privilege level. You must ensure that only the spare disks from the 7-Mode disk shelves are added for increasing the space in the transitioned aggregates. You must add spare disks by using the `-disklist` parameter (the `-diskcount` parameter must not be used).
Designating a transitioned volume as the SVM root volume	You cannot run the `volume make-vsroot` command on the transitioned volumes.

Operations that are not recommended

Operation	Corrective action before rollback
Relocating aggregates The ownership of the transitioned aggregate is changed to its HA partner.	Swap the aggregate ownership before rollback because the 7-Mode Transition Tool maps the aggregates to the 7-Mode controllers based on the target node mapping information saved in the project.
Creating volumes on the transitioned aggregates	You must delete these volumes or move them to different aggregates.
Renaming aggregates or volumes	Rename the aggregates or volumes to their original names.

Operation	Corrective action before rollback
Changing the RAID type	The RAID type must match the 7-Mode RAID type if you decide to roll back to 7-Mode.

Related information

ONTAP 9 commands

Rehosting transitioned volumes to a different SVM

Volume rehost enables you to migrate a transitioned volume from one SVM to another SVM without data copy. The rehost operation enables you to consolidate all volumes that have FC LUNs to a single SVM, thereby preserving the 7-Mode single-system image (SSI) semantics. You can also rehost transitioned NAS volumes.

- The volume that you want to rehost must be online.
- Volume management operations, such as volume move or LUN move, must not be running.
- Data access to the volume that is being rehosted must be stopped.

  Rehosting is a disruptive operation.

The following volume policies, policy rules, and configurations are lost from the source volume and must be manually reconfigured on the rehosted volume after the rehost operation:

- Volume and qtree export policies
- Antivirus policies
- Volume efficiency policy
- Quality of Service (QoS) policies
- Snapshot policies
- Quota rules
- CIFS shares
- igroups associated with a portset

Steps

- **Rehosting FC and iSCSI volumes**
  a. Switch to the advanced privilege level:

     `set -privilege advanced`

  b. Rehost the volume on the destination SVM:

If you want to…	Run the following command…
Unmap the LUNs after rehosting	**volume rehost -vserver *source_svm* -volume *vol_name* -destination-vserver *destination_svm* -force-unmap-luns true**
Remap the LUNs to the same igroups after rehosting	**volume rehost -vserver *source_svm* -volume *vol_name* -destination-vserver *destination_svm* -auto-remap-luns true**

- **Rehosting NFS volumes**

  a. Record information about the NFS export policies.

  b. Unmount the volume from the parent volume:

     volume unmount

  c. Switch to the advanced privilege level:
     set -privilege advanced

  d. Rehost the volume on the destination SVM:

     volume rehost -vserver *source_svm* -volume *vol_name* -destination-vserver *destination_svm*

     The default export policy of the destination SVM is applied to the rehosted volume.

  e. Create the export policy:

     vserver export-policy create

  f. Update the export policy of the rehosted volume to a user-defined export policy:

     volume modify

  g. Mount the volume under the appropriate junction path in the destination SVM:

     volume mount

  h. Verify that the NFS service is running on the destination SVM:

     vserver nfs status

  i. Resume NFS access to the rehosted volume.

     Because the volume access path (LIFs and junction path) has undergone changes, you must update the NFS client credentials and LIF configurations to reflect the destination SVM LIFs.

  NFS management

- **Rehosting CIFS volumes**

  a. Record information about the CIFS shares.

b. Unmount the volume from the parent volume:

volume unmount

c. Switch to the advanced privilege level:

set -privilege advanced

d. Rehost the volume on the destination SVM:

volume rehost -vserver *source_svm* -volume *vol_name* -destination-vserver *destination_svm*

e. Mount the volume under the appropriate junction path in the destination SVM:

volume mount

f. Create CIFS shares for the rehosted volume:

vserver cifs share create

g. If the DNS domains differ between the source and destination SVMs, create new users and groups.

h. Update the CIFS client with the new destination SVM LIFs and junction path to the rehosted volume.

SMB/CIFS management

- **Rehosting volumes in SnapMirror relationships**

a. Record the SnapMirror relationship type:

snapmirror show

b. From the destination cluster, delete the SnapMirror relationship:

snapmirror delete

> You must not break the SnapMirror relationship; otherwise, the data protection capability of the destination volume is lost and the relationship cannot be reestablished after the rehosting operation.

c. From the source cluster, release the SnapMirror relationship information:

snapmirror release

You set the -relationship-info-only parameter to true so that the Snapshot copies are not deleted and only the source relationship information is removed.

d. Switch to the advanced privilege level:

set -privilege advanced

e. Rehost the volume on the destination SVM:

volume rehost -vserver *source_svm* -volume *vol_name* -destination-vserver *destination_svm*

f. Create the SVM peer relationship between the source and destination SVMs:

   `vserver peer create`

g. Create the SnapMirror relationship between the source and destination volumes:

   `snapmirror create`

   The rehosted volume can be the source or destination of the SnapMirror relationship.

h. Resynchronize the data protection relationship:

   `snapmirror resync`

Data protection

You must manually create the autovolume workloads for the rehosted volumes by performing the following steps:

1. Create a user-defined policy group for the SVM:

   `qos policy-group create -vserver` ***`destination-vserver`*** **`-policy-group`** ***`policy-group-name`***

2. Assign the QoS policy group to the rehosted volume:

   `volume modify -vserver` ***`destination-vserver`*** **`-volume`** ***`rehosted-volume`*** **`-qos-policy-group`** ***`policy-group-name`***

You must manually reconfigure the policies and the associated rules on the rehosted volume.

> ⓘ If the rehosting operation fails, you might need to reconfigure the volume policies and the associated rules on the source volume.

Related information

ONTAP 9 commands

Verifying the transitioned configurations

After successfully importing the 7-Mode volumes and configurations, you must manually verify the transitioned aggregates, volumes, LUNs, and configurations.

Steps

1. Verify that the 7-Mode aggregates, volumes, and LUNs as well as the CIFS shares, NFS exports, and LUN mappings are transitioned.
2. Verify that all the 7-Mode configurations are retained.

Performing manual configuration tasks after transition

You must manually perform some configuration tasks that are required for the workloads and applications that are accessing the transitioned volumes. You can obtain the list of manual tasks from the precheck results.

Steps

1. Perform the tasks listed in the precheck results for configuring features that were not transitioned by the tool or that require customization for your environment.

   Name services transition: supported and unsupported configurations, and required manual steps

   NFS transition: supported and unsupported configurations, and required manual steps

   Supported and unsupported CIFS configurations for transition to ONTAP

   SAN transition: supported and unsupported configurations, and required manual steps

   Transitioning a SnapMirror relationship

Testing the workloads and applications

You should manually test all workloads and applications in the preproduction environment. You can then start production for a brief duration to evaluate if rollback is required before committing the project.

The transitioned aggregates must have at least 5% free physical space.

> The best practice is to have at least 20% free space in the transitioned aggregates.

Some operations are restricted during preproduction testing.

Restrictions during preproduction testing

Steps

1. Connect clients to the transitioned volumes.
2. If you have SAN workloads, perform the post-transition host remediation tasks on the SAN hosts.

   SAN host transition and remediation

3. Test all the workloads and applications that use the transitioned data and configurations.
4. Verify that the transitioned aggregates are not running out of space by monitoring the free physical space in the transitioned aggregates from the Aggregates tab in the 7-Mode Transition Tool dashboard.

   Troubleshooting: If you run out of space on the transitioned aggregates, you can add disks.

   a. Log in to the advanced privilege level:

      `set -privilege advanced`

   b. Select the spare disks from the 7-Mode disk shelves and add disks to increase the space in the transitioned aggregates:

      `storage aggregate add-disks -aggregate` ***`aggr_name`*** **`-disklist`** ***`disk1`***

      If 7-Mode spare disks are not available, you can use spare disks from the disk shelves in the cluster nodes; however, doing so complicates the rollback process.

You can start serving production data.

> You can serve data in the production environment for a brief duration to ensure that the workloads are operating correctly in a production environment and a rollback to 7-Mode is not required. You must not prolong this phase and must not delay committing the copy-free transition project for the following reasons:
>
> - The probability of running out of space in the transitioned aggregates increases as new data is written to the volumes.
> - Any new data written to the volumes during this stage will not be available during rollback.

Related information

Performing a transition rollback to 7-Mode

ONTAP 9 commands

Committing the copy-free transition project

The final step in transition is to commit the copy-free transition project. After committing the aggregates, you cannot perform a rollback to 7-Mode.

You must have manually verified the transitioned data and configurations and tested workloads and applications.

All the aggregate-level Snapshot copies that were created in the export phase are deleted.

Steps

1. Click **Commit**.
2. In the warning message that is displayed, click **Yes**.

All the preproduction testing phase restrictions are removed and the transitioned volumes can serve production data, if not done in the preproduction testing phase.

Transitioning a SnapMirror relationship

You can transition the secondary HA pair first, set up a staggered SnapMirror relationship between the 7-Mode primary volumes and clustered Data ONTAP secondary volumes, and then transition the primary HA pair later. In some scenarios, you must transition the secondary and primary HA pairs of a 7-Mode SnapMirror relationship in parallel.

If all the primary volumes belong to one HA pair and all the secondary volumes belong to the other HA pair, you can transition by using the staggered method.

If either HA pair has a mix of primary and secondary volumes, you must transition by using the parallel method.

After transitioning the primary and secondary HA pairs, you must manually set up the volume SnapMirror relationship in clustered Data ONTAP after transition. For a successful resynchronization, at least one common Snapshot copy, which is created in Data ONTAP 8.1 or later, must exist between the primary and secondary volumes of the SnapMirror relationship.

Related information

Cluster management with System Manager

Transitioning HA pairs in a SnapMirror relationship in a staggered configuration

You can transition the secondary HA pair first, set up a staggered SnapMirror relationship between the 7-Mode primary volumes and ONTAP secondary volumes, and then transition the primary HA pair later.

You must have prepared the source and destination clusters for transitioning the SnapMirror relationships.

Preparing the cluster for transitioning volume SnapMirror relationships

Steps

1. From the 7-Mode Transition Tool, perform a copy-free transition of the HA pair that contain the secondary volumes of the 7-Mode volume SnapMirror relationships.

   Before transitioning the 7-Mode HA pair that contains the secondary volumes, no manual intervention is required for the 7-Mode SnapMirror relationships. This ensures that the 7-Mode secondary volumes are transitioned as read-only volumes to ONTAP.

   Transitioning 7-Mode aggregates using copy-free transition

2. During the precommit testing phase of the secondary HA pair, create a disaster recovery relationship between the 7-Mode primary volume and ONTAP secondary volume:

   a. From the secondary destination cluster, use the `vserver peer transition create` command to create an SVM peer relationship between the 7-Mode primary volume and the ONTAP secondary volume.

   b. Use the `job schedule cron create` command to create a job schedule that matches the schedule configured for the 7-Mode SnapMirror relationship.

   c. Use the `snapmirror create` command to create a SnapMirror relationship of type TDP between the 7-Mode primary volume and the ONTAP secondary volume.

   d. Use the `snapmirror resync` command to resynchronize the ONTAP secondary volume.

      For successful resynchronization, a common 7-Mode Snapshot copy must exist between the 7-Mode primary volume and the ONTAP secondary volume.

3. Perform the required testing of the transitioned aggregates and volumes.

4. From the 7-Mode Transition Tool, commit the transition of the project for the secondary HA pair.

   Committing the copy-free transition project

5. Perform a copy-free transition of the HA pair that contains the primary volumes of the 7-Mode volume SnapMirror relationships.

   Transitioning 7-Mode aggregates using copy-free transition

6. During the precommit testing phase of the primary HA pair, create a SnapMirror relationship between the transitioned secondary and primary volumes.

a. From the destination cluster, create an intercluster SVM peer relationship between the SVMs that contain the transitioned primary and secondary volumes.

   System administration

b. Use the `snapmirror delete` command to delete the TDP SnapMirror relationship between the 7-Mode primary volume and the ONTAP secondary volume that was created in Step #SUBSTEP_D528769DF8EC49058D1958565914CF47.

c. Delete the cron job schedule that was created in Step #SUBSTEP_EB470706425C45759EAAE8F0A87BA547:

   `job schedule cron delete`

d. Create a volume SnapMirror relationship between the transitioned primary and secondary volumes.

   Volume disaster recovery express preparation

e. On the destination volume, resynchronize the source volume and destination volume of the SnapMirror relationship:

   `snapmirror resync`

   > At least one common Snapshot copy must exist between the source and destination volumes.

   Troubleshooting: SnapMirror resynchronization fails if the common Snapshot copy was created in a Data ONTAP release earlier than 8.1. You can use the `-fs-version` parameter with the `volume snapshot show` command in the advanced privilege level to view the release in which the Snapshot copy is created. If this issue occurs, break the SnapMirror relationship and then perform the resynchronization.

f. Monitor the status of the SnapMirror data transfers:

   `snapmirror show`

   > You must not perform any operation, such as volume move or SnapMirror break, on the source and destination volumes until the resynchronization is completed successfully. Ensure that the resynchronization does not get aborted and completes successfully; otherwise, the volumes can go to an inconsistent state.

7. Commit the transition of the primary project.

   Committing the copy-free transition project

Related information

7-Mode data transition using SnapMirror

ONTAP 9 commands

Transitioning primary and secondary systems in a SnapMirror relationship in parallel

You can transition the primary and secondary HA pairs that contain the volumes of a 7-Mode SnapMirror relationship in parallel. You must then manually set up the volume SnapMirror relationship in clustered Data ONTAP after transition. The SnapMirror relationship is retained after transition without requiring a rebaseline.

You must have prepared the source and destination clusters for transitioning the SnapMirror relationships.

Preparing the cluster for transitioning volume SnapMirror relationships

You must transition both the secondary and primary HA pairs in the same cutover window.

Steps

1. From the 7-Mode Transition Tool, perform a copy-free transition of the two HA pairs that contain the primary and secondary volumes of the 7-Mode volume SnapMirror relationship.

   Before transitioning the 7-Mode HA pair that contains the secondary volumes, no manual intervention is required for the 7-Mode SnapMirror relationships. This ensures that the 7-Mode secondary volumes are transitioned as read-only volumes to ONTAP.

   Transitioning 7-Mode aggregates using copy-free transition

2. Create an intercluster SVM peer relationship between the SVMs that contain the transitioned primary and secondary volumes.

   System administration

3. Create a volume SnapMirror relationship between the transitioned primary and secondary volumes.

   Volume disaster recovery express preparation

4. On the destination volume, resynchronize the source volume and destination volume of the SnapMirror relationship:

   `snapmirror resync`

   > At least one common Snapshot copy must exist between the source and destination volumes.

   Troubleshooting: SnapMirror resynchronization fails if the common Snapshot copy was created in a Data ONTAP release earlier than 8.1. You can use the `-fs-version` parameter with the `volume snapshot show` command in the advanced privilege level to view the release in which the Snapshot copy was created. If you encounter this issue, break the SnapMirror relationship and then perform the resynchronization.

5. Monitor the status of the SnapMirror data transfers:

   `snapmirror show`

> You must not perform any operation, such as volume move or SnapMirror break, on the source and destination volumes until the resynchronization is completed successfully. Ensure that the resynchronization does not get aborted and completes successfully; otherwise, the volumes can go to an inconsistent state.

6. Commit the transition of the secondary project, followed by the primary project.

   Committing the copy-free transition project

Related information

ONTAP 9 commands

System Manager

Troubleshooting transition issues

You should be aware of how to troubleshoot issues with the 7-Mode Transition Tool and where to look for log files. When you use the 7-Mode Transition Tool, you might see error messages that identify the issue and provide the solution.

Continuing with the transition if ignorable errors occur

During the transition, you might encounter some errors that block the transition. You can choose to ignore some of these errors by acknowledging the issues through the 7-Mode Transition Tool CLI. You should rerun the failed operation after ignoring the error to continue with the transition.

When you acknowledge an error, it means that you have understood the impact of these errors and acknowledged them.

You must rerun the transition operation after ignoring the error. In some cases, after you acknowledge the issue, Data ONTAP performs corrective actions on the affected aggregates and volumes when the operation is run the next time.

Steps

1. If the transition operation results in any ignorable errors, run the following command from the 7-Mode Transition Tool CLI:

   `transition cft ignorableerrors add -p` *`project_name`* `-c` *`ignorable_errorcategory`*

   `ignorable_errorcategory` is the type of error that you can ignore.

   Ignorable errors during transition

2. Rerun the transition operation.

   The blocking error changes to a warning and the error is shown as `acknowledged`. You can continue the transition with the warning.

Ignorable errors during transition

You might encounter some ignorable errors during the transition. These errors can occur during the precheck, cabling, import, or commit operation of a copy-free transition project. You must acknowledge these errors before continuing with transition.

When you add any ignorable error category to the copy-free transition project by using the 7-Mode Transition Tool CLI, it means that you have understood the impact of the error. You must rerun the transition operation after ignoring the error. At this time, the blocking error changes to a warning message, and the error is shown as “acknowledged”. You can continue the transition with the warning.

Precheck operation: ignorable error categories

Category	When the error is displayed
`ignore-source-not-multipath`	7-Mode disk shelves are not in a multipath configuration.
`ignore-target-not-multipath`	Disk shelves in the target cluster nodes are not in a multipath configuration.
`ignore-source-storage-fault`	7-Mode disk shelves have some fault (as displayed in the output of the `storage show fault` command).
`ignore-target-storage-fault`	Disk shelves in the target cluster nodes have some fault (as displayed in the output of the `system node run -node node_name -command storage show fault` command).
ignore-target-port-requirement	Target cluster nodes do not have a sufficient number of ports available to connect the 7-Mode disk shelves.
`ignore-aggr-space-less-than-5-percent`	7-Mode aggregates are out of space because the free space in the 7-Mode aggregates is less than 5% of physical space.
`ignore-aggr-logical-space-more-than-97-percent`	7-Mode aggregates are out of space because the logical space in the aggregate is more than 97% full.
`ignore-aggr-snapshot-spill-more-than-4-percent`	7-Mode aggregates are out of space because Snapshot copies occupy more space than that allocated for the Snapshot copy reserve.
`ignore-aggr-physical-space-more-than-89-percent-and-snapshot-spill`	7-Mode aggregates are out of space because the total used physical space is more than 89% and the Snapshot copies occupy more space than that allocated for the Snapshot copy reserve.

Category	When the error is displayed
`ignore-volumes-with-file-gurantee`	7-Mode volumes have space guarantee set to `file`, which is not supported in ONTAP.
`ignore-volumes-with-disabled-gurantees`	Space guarantee of volumes is currently disabled due to lack of space in the volumes.
`nfs-qtrees-exported`	Qtree export rules are present in the 7-Mode system. Acknowledging this error means that you have understood the differences in the qtree export rules between Data ONTAP operating in 7-Mode and ONTAP. You might have to perform some manual steps after the NFS exports rules are applied by the 7-Mode Transition Tool. 7MTT Precheck 10111 - Transitioning 7-Mode volumes that have qtree-level exports
`ignore-configuration-limits-check`	Objects and configurations to be transitioned exceed a certain limit.The storage cutover can take a long time and you must prepare for the downtime. Considerations for reducing the storage cutover time during Copy-Free Transition
`ignore-cifs-ad-domain-mismatch`	The 7-Mode Transition Tool continues with the transition of the CIFS configuration even if the CIFS Active Directory domain of the 7-Mode system is different from the CIFS Active Directory domain of the target SVM. You must ensure that the CIFS Active Directory domains of the 7-Mode system and the target SVM are trusted domains. Otherwise, the transition of CIFS configurations to the target SVM fails. How to transition CIFS configurations when Active Directory Domain of CIFS server on 7-Mode and target SVM are different

Cabling verification operation: ignorable error categories

Category	When the error is displayed
`ignore-missing-spare-disks`	One or more 7-Mode spare disks are not detected by the target cluster nodes.

Category	When the error is displayed
`ignore-missing-degraded-aggr-disks`	Cannot detect up to two disks from any of the 7-Mode RAID-DP RAID groups or one disk from any of the 7-Mode RAID-4 RAID groups on the target cluster nodes. Continuing with the transition makes such aggregates degraded after the aggregates are transitioned.

Import operation: ignorable error categories

If you add an ignorable error category to the copy-free transition project during the import operation, Data ONTAP performs some corrective action on the aggregates and volumes in addition to changing the blocking error to a warning.

Category	When the error is displayed	Corrective action if the error is acknowledged and import operation is run again
`ignore-aggregates-with-32bit-snapshot-for-import`	32-bit Snapshot copies are detected in the 7-Mode aggregate.	32-bit Snapshot copies are deleted from all of the 7-Mode aggregates that are part of this project.
`transition-dirty-aggregates-during-import`	One of the transitioning aggregates was not cleanly shut down on the 7-Mode storage system.	All of the 7-Mode aggregates that were not cleanly shut down are transitioned.This might result in data loss after transition.
`ignore-aggregates-not-being-online-for-import`	The aggregate was not online when the 7-Mode storage system was halted.	All of the offline aggregates are brought online.
`ignore-volumes-with-32bit-snapshot-for-import`	32-bit Snapshot copies are detected in the 7-Mode volume.	32-bit Snapshot copies are deleted from all of the 7-Mode volumes that are part of this project.
`ignore-volumes-with-dirty-file-system-for-import`	One of the transitioning volumes was not cleanly shut down on the 7-Mode storage system.	All of the 7-Mode volumes that were not cleanly shut down are transitioned.This might result in data loss after transition.
`transition-offline-volumes-during-import`	The volume was not online when the 7-Mode storage system was halted.	All of the offline volumes are brought online.
`transition-restricted-volumes-during-import`	The volume was in the restricted state when the 7-Mode storage system was halted.	All of the restricted volumes are brought online.

Commit operation: ignorable error categories

If you add an ignorable error category to the copy-free transition project during the commit operation, ONTAP performs some corrective action on the aggregates and volumes in addition to changing the blocking error to a warning.

Category	When the error is displayed	Corrective action if the error is acknowledged and commit operation is run again
`ignore-commit-offline-aggregates`	Some of the transitioned aggregates are offline.	All of the offline aggregates are brought online.

Downloading transition log files

The 7-Mode Transition Tool creates log files that provide processing details of the transition assessment and migration operations run on your system.

Steps

1. Click **Logs** in the top menu.
2. Click **Collect Project Logs** to collect logs related to all of the projects.
3. To collect logs for a given projects, locate the projects from the project list, and then click **Download**.

   The logs are downloaded as a `.zip` file, and the folder name is the timestamp.

Related information

How to upload a file to NetApp

Log files for the 7-Mode Transition Tool

The 7-Mode Transition Tool creates log files that provide processing details of the transition operations that have occurred on your system. The log files are located in the logs directory of the path where 7-Mode Transition Tool is installed.

You can also use the EMS messages related to SnapMirror logs from the 7-Mode system and the cluster to troubleshoot issues.

The following table lists the log files that are related to a particular transition project:

Log file path	Contains information about…
project_name/`transition.log`	Debug messages that are specific to a project
project_name/`zapi-outbound.log`	Output of all the Data ONTAP APIs that are executed by 7-Mode Transition Tool for a particular project

The following table lists the log files that are not related to any particular project:

Log file path	Contains information about…
`transition-gui.log`	Entries of all the actions performed by using the web interface
`default/audit.log`	• All the parameters, such as HTTP or HTTPS port and log directory path, that are used by the tool every time 7-Mode Transition Tool is run • All the transition commands that are executed with the outputs
`default/default/transition.log`	Debug messages that are not specific to any project
`default/STREAM_MANAGEMENT/stream_management.log`	Debug messages that are logged by the scheduler while managing the schedules and which do not belong to any project
`default/default/zapi-outbound.log`	Output of all the Data ONTAP APIs that are executed by 7-Mode Transition Tool and which do not belong to any project
`default/STREAM_MANAGEMENT/zapi-outbound.log`	Output of all the Data ONTAP APIs that are executed by the 7-Mode Transition Tool scheduler while managing the schedules and which do not belong to any project
`server-console.log`	Log entries of all the packet exchanges done with the 7-Mode Transition Tool server. This file helps in troubleshooting issues related to a server crash.

Recovering from a failed LUN transition

If the transition of volumes with LUNs fails, you can use the lun transition 7-mode show command to check which LUNs were not transitioned to ONTAP, and then determine a corrective action.

Steps

1. Change to advanced privilege level:

   `set -privilege advanced`

2. Check which LUNs failed:

   `lun transition 7-mode show`

3. Review the EMS logs and determine the corrective action that you must take.
4. Perform the required steps shown in the EMS message to correct the failure.
5. If any supported LUNs failed the transition, then to complete the transition:

lun transition start

6. View the transition status of the volumes:

   lun transition show

   The transition status can be one of following values:

   - `active`: The volume is in an active SnapMirror transition relationship and not yet transitioned.
   - `complete`: All supported LUNs are transitioned for this volume.
   - `failed`: LUN transition failed for the volume.
   - `none`: The volume did not contain LUNs to transition from 7-Mode systems.

```
cluster1::*> lun transition show
Vserver              Volume             Transition Status
-------------------- ------------------ -----------------
vs1                  vol0               none
                     vol1               complete
                     vol2               failed
                     vol3               active
```

Related information

Space considerations when transitioning SAN volumes

Failed to boot the 7-Mode controller in maintenance mode

The export and halt operation fails with the error message: `Failed to boot the 7-Mode controller in maintenance mode`. You must manually halt and boot the controller in the maintenance mode and rerun the operation.

Workaround

1. Halt the 7-Mode storage system:

   halt -f -t 0

2. At the LOADER prompt, record the values set for the **bootarg.init.console_muted** and **bootarg.init.console_level boot** boot parameters:

   printenv bootarg.init.console_muted

   printenv bootarg.init.console_level

3. Disable the console messages by setting the following boot parameters:

   setenv bootarg.init.console_muted "true"

```
setenv bootarg.init.console_level "-1"
```

4. From the 7-Mode Transition Tool, rerun the export and halt operation.
5. From the 7-Mode storage system, set the boot parameters to their original values, as recorded in Step 2:

If the boot parameters are…	Enter the following commands…
Not set previously with any value (undefined)	`unsetenv bootarg.init.console_muted` `unsetenv bootarg.init.console_level`
Set with a value previously	`unsetenv bootarg.init.console_muted "original_value"` `unsetenv bootarg.init.console_level "original_value"`

Performing a transition rollback to 7-Mode

Rollback refers to discontinuing the transition to ONTAP system and reverting to 7-Mode system. Transition rollback is manual; however, the 7-Mode Transition Tool provides the list of manual tasks you have to perform for a rollback.

You can roll back a transition project in the SVM provision, export, cabling, import, or preproduction testing phase. You cannot roll back after the transition project is committed.

Any new data written or modified, such as LUNs or LUN clones, in the transitioned volumes will be lost after a rollback. The volumes will be reverted to their original 7-Mode state.

When to roll back a transition and when to call technical support

You can roll back without assistance when performing a rollback on test or lab clusters, but you must call technical support if you encounter problems during or after transition, or if you want to roll back a transition performed on a production cluster.

> You should not attempt to roll back a transition in a production environment without assistance from technical support.

If you encounter any of the following circumstances, contact technical support immediately:

- The transition process fails and cannot finish, and you are unsure of what to do next.
- The transition process finishes, but the cluster is unusable in a production environment.
- The transition process finishes and the cluster goes into production, but you are not satisfied with its behavior.
- The transition process finishes for some but not all of the data and configuration, and you decide that you want to roll back the transition.
- You have a problem with the transition process and cannot resolve the problem with the error response

messages in the 7-Mode Transition Tool, in the Data ONTAP EMS event messages, and NetApp Knowledgebase.

NetApp Knowledgebase

Related information

Downloading transition log files

Rolling back a copy-free transition project

You can roll back a transition if you want to revert to 7-Mode at any stage of the copy-free transition before the transitioned aggregates are committed. Rollback is a manual operation. You can use the 7-Mode Transition Tool to generate the manual steps that you have to perform for a rollback.

- You must ensure that no volume or aggregate transition operations are running on the cluster.

  You can use the `job show -jobtype transition` command.

- None of the 7-Mode aggregates must be committed.

  > You cannot perform the rollback if even one 7-Mode aggregate is committed.

- The target cluster nodes must not be in takeover mode.

Steps

1. Click **Rollback Prechecks** to verify that the project is eligible for a rollback.

   If the precheck reports issues, you must fix them manually and rerun the precheck operation. For example, if you have created any new volumes or LUNs during preproduction testing, you must delete them manually.

2. Click **Generate Rollback Steps** to generate the list of manual steps that you have to perform for a successful rollback.
3. Click **Save As CSV** to save the manual steps in a file.

   You can copy the rollback commands from the file and run them.

4. Depending on the transition phase from which you decide to roll back, perform the required manual steps:

   - **Import or preproduction testing phase**
     i. Run the rollback commands on the cluster and click **Confirm**.
     ii. Connect the 7-Mode disk shelves to the 7-Mode controllers, verify the cabling manually, and click **Confirm**.
     iii. Run the rollback commands on the 7-Mode controllers and click **Confirm**.
     iv. View the configurations that are applied on the SVMs from the Operations History tab.
     v. Manually remove all configurations that were applied by the tool from the SVMs.
   - **Cabling phase**

i. Connect the 7-Mode disk shelves to the 7-Mode controllers, verify the cabling manually, and click **Confirm**.

   You must ensure that the 7-Mode cabling matches the way it was at the start of the project.

   > You should use Config Advisor to verify the cabling.

ii. Run the rollback commands on the 7-Mode controllers and click **Confirm**.

iii. Manually remove all configurations that were applied by the tool from the SVMs.

   You can view the configurations that are applied on the SVMs from the Operations History tab.

- **Export phase**
  i. Run the rollback commands on the 7-Mode controllers and click **Confirm**.
  ii. Manually remove all configurations that were applied by the tool from the SVMs.

     You can view the configurations that are applied on the SVMs from the Operations History tab.

- **SVM provision phase**

  Manually remove all configurations that were applied by the tool from the SVMs.

  You can view the configurations that are applied on the SVMs from the Operations History tab.

Manual steps for rolling back the transition

5. After completing all the manual steps, click **Verify 7-Mode** from the 7-Mode Transition Tool to verify that the 7-Mode controllers are ready to serve data.

Manually rolling back the transition

You must perform some manual steps on the cluster and 7-Mode systems if you decide to roll back the transition. The list of manual rollback steps is generated by the 7-Mode Transition Tool.

The rollback steps vary depending on the stage at which you decide to roll back. You must perform all steps in this task if you decide to roll back after a successful import operation. If you decide to roll back at an earlier stage, you have to perform a subset of these steps.

Steps

1. Log in to the cluster.
2. If any transitioned volume is in a SnapMirror relationship, choose one of the following actions:
   - If a transitioned volume is the destination of a SnapMirror relationship, delete the SnapMirror relationship:

     `snapmirror delete -destination-path` ***`destination-path`*** **`-source-path`** ***`source-path`***
   - If a transitioned volume is the source of a SnapMirror relationship, release the SnapMirror relationship: **`snapmirror release -destination-path destination-path -source-path source-path`**

3. From the cluster, verify that the following operations are not running on the transitioned volumes:
   a. Volume move operation:

      volume move show

   b. LUN move operation:

      lun move show

   c. LUN copy operation:

      lun copy show

4. Perform the rollback for all of the 7-Mode aggregates:
   a. Log in to the diagnostic privilege level:

      set -privilege diagnostic

   b. Revert the aggregates to the 7-Mode state by using the `storage transition revert start` command.

      This command requires additional parameters, such as the transition project ID and aggregate attributes. You should use the complete command with the parameters and its values, as generated by the 7-Mode Transition Tool.

   c. Verify that the rollback is successful for all of the transitioned aggregates:

      storage transition revert show-status

      The `status-code` field for an aggregate is displayed as `revert_complete` when the rollback is successful.

5. Reassign the disk ownerships from the target cluster nodes to the 7-Mode controllers:
   a. Assign disk ownership to the 7-Mode controllers:

      disk assign –disk *disk_id* –s *system_id* -force true

   b. Verify that the disk ownership is assigned to the 7-Mode controllers:

      storage disk show -fields owner-id

6. Remove the 7-Mode LIFs from the SVMs:

   network interface delete -vserver *svm_name* -lif *lif_name*

7. Remove the copy-free transition restrictions on the target cluster nodes from the diagnostic privilege level:

   storage transition pre-commit end -session-id *transition_project_id*

   You can also perform this step after the rollback operation is completed and the 7-Mode controllers are operational.

8. Delete the transition project information about the target cluster nodes by using the following diagnostic privilege level command:

storage transition purge-info -session-id *transition_project_id*

You can also perform this step after the rollback operation is completed and the 7-Mode controllers are operational.

9. If disk ownership autoassigment was disabled on the cluster nodes during the export and halt operation, enable it:

   storage disk assign -auto true

10. Manually remove all of the configurations that the tool has transitioned to the target SVMs.

    You can view the results of the SVM provision and import operations for information about the configurations transitioned by the tool.

11. Remove the disk shelves from the target cluster nodes, and then reconnect them to the 7-Mode controllers.

    You should use the Config Advisor tool to verify the cabling.

12. If any 7-Mode disk shelf IDs were changed to resolve the conflicts with the disk shelf IDs of the target cluster nodes, manually change them to the old IDs and power-cycle the disk shelves for the new IDs to take effect.
13. Boot the source 7-Mode controllers in to the normal mode.
14. From one of the source 7-Mode controllers, enable the takeover capability:

    cf enable

15. If automatic deletion of aggregate Snapshot copies was disabled during the export and halt operation, enable it:

    options snap autodelete *aggr_name* on

Host and Storage Information Collection Guide

This guide describes how to collect information about ONTAP and 7-Mode systems, switches, hosts, and host applications, and generate an inventory report that you can use with the 7-Mode Transition Tool for assessing whether the systems are ready for transition.

Collecting storage and host inventory information

Inventory Collect Tool enables you to collect information about clustered Data ONTAP and 7-Mode systems, switches, hosts, and the applications running on these hosts and to create an inventory report. You can then import the inventory report to the 7-Mode Transition Tool for transition assessment.

The tool generates an inventory report workbook and an inventory report XML file that contain configuration details of the storage and host systems.

The Inventory Collect Tool uses TLS or SSL protocols for communicating with the 7-Mode storage systems and SSH or WMI for communicating with hosts. The tool communicates with the storage system using the TLS protocol if TLS is enabled on the storage system. If TLS is disabled and SSLv3 is enabled on a storage system, the tool uses SSLv3 to communicate with the storage system.

> The best practice is to enable TLS and disable SSLv3 on the storage system in order to avoid SSLv3 security vulnerabilities (CVE-2014-3566).

If you cannot install the 7-Mode Transition Tool in your environment due to security reasons, then you can import the inventory report XML file generated by the Inventory Collect Tool to 7-Mode Transition Tool (installed outside your data center) for generating an assessment report. You can use the assessment report for assessing the features and functionalities of your systems and identify how these features and functionalities work in the clustered Data ONTAP version selected for transition.

Inventory Collect Tool is a stand-alone utility that does not require any installation.

Be sure to consult the current 7-Mode Transition Tool Release Notes for the latest information about supported target releases and known issues.

ONTAP target releases supported by the 7-Mode Transition Tool

Release support for ONTAP transition target clusters depends on the transition method you want to use, copy-based or copy-free, and on the version of the 7-Mode Transition Tool.

Be sure to consult the current 7-Mode Transition Tool Release Notes for the latest information about supported target releases and known issues.

Copy-based transitions are supported to these ONTAP target releases.

If your transition target is running …	You must use this 7-Mode Transition Tool version …
ONTAP 9.10.1, ONTAP 9.11.1 or earlier supported release	3.5.0
ONTAP 9.9.1 or earlier supported release	3.4.0
ONTAP 9.8 or earlier supported release	3.3.3
ONTAP 9.7P2 or later 9.7 P release Earlier 9.7 releases are not supported.	3.3.2
ONTAP 9.6P7 or later 9.6 P release Earlier 9.6 releases are not supported.	3.3.2
ONTAP 9.5 or earlier ONTAP 9 release	3.3.2 or 3.3.1
Clustered Data ONTAP 8.1.4P4 and later 8.x releases.	3.3.2 or 3.3.1

Copy-free transitions are supported to these ONTAP target releases using 7-Mode Transition Tool 3.3.1.

- ONTAP 9.4 and earlier ONTAP 9 releases.
- Clustered Data ONTAP 8.3.2 and later 8.x releases.

> You cannot use the 7-Mode Transition Tool to transition to ONTAP 9.5 or later using the copy-free method. To do so, you must first transition to ONTAP 9.4 using 7-Mode Transition Tool 3.3.1 and then upgrade your cluster to ONTAP 9.5 or later. 7-Mode Transition Tool 3.3.2 does not support copy-free transitions.

System requirements for running the Inventory Collect Tool

You can download and run the Inventory Collect Tool on a Windows system. The Windows system must have the required configuration to run the Inventory Collect Tool.

- The Windows system must be one of the following:
  - 64-bit Windows 7 Enterprise
  - Windows Server 2008 R2 Enterprise with SP1 or later
  - Windows Server 2012 R2 Standard

> You can use a Windows virtual machine that meets the required software and hardware requirements to install the Inventory Collect Tool.

- Dual-core x64 processor (1.0 GHz or more)
- 4-GB RAM
- 40-GB HDD

Storage, host, and FC switches version requirements for inventory collection

You must be aware of the versions of Data ONTAP operating in 7-Mode, hosts, and FC switches from which you can collect inventory information.

For the list of 7-Mode versions, hosts, and FC switches that are supported for assessment by the Inventory Collect Tool, see the Interoperability Matrix.

NetApp Interoperability Matrix Tool

Preparing the 7-Mode systems and hosts for inventory collection

You must ensure that the 7-Mode systems and hosts meet certain network and protocol requirements for successfully generating an inventory report.

Steps

1. Enable HTTPS on the 7-Mode system:

   `options httpd.admin.ssl.enable on`

2. Enable TLS on the 7-Mode system:

   `options tls.enable on`

   > The best practice is to enable TLS because of the security vulnerabilities in SSLv3.

3. Enable SSL and disable SSLv2 and SSLv3 on the 7-Mode system:
   a. Set up and start SSL:

      `secureadmin setup ssl`

   b. Enable SSL:

      `options ssl.enable on`

   c. Disable SSLv2 and SSLv3:

      `options ssl.v2.enable off`

      `options ssl.v3.enable off`

      > The best practice is to disable SSLv2 and SSLv3 to avoid security vulnerabilities.

4. Enable SSH on the 7-Mode system:
   a. Set up SSH on the 7-Mode system:

secureadmin setup -f ssh

The -f option forces the setup to run even if the SSH server is already configured.

b. Enable SSH:

secureadmin enable ssh2

c. Enable password authentication on the SSH server:

options ssh.passwd_auth.enable

d. Enable SSH access to the host:

options ssh.access

5. Prepare your Windows host systems:
   - Enable WMI access.

     For more information about enabling WMI access, see the host documentation.

   - If you have Windows Server 2003, verify that you have installed the Microsoft Fibre Channel Information Tool (fcinfo) package and run the tool once on your Windows host system.

     This tool enables you to collect the HBA configuration information of the host.

6. Enable SSH on the Linux or ESXi host.

   For more information about enabling SSH, see the host documentation.

7. Verify that you have installed the latest NetApp Host Utilities software for each host.

   For information about downloading and installing the NetApp Host Utilities software, see the NetApp Support Site.

8. Verify that all the hosts and storage systems can be reached by the Windows system from which the Inventory Collect Tool is run.

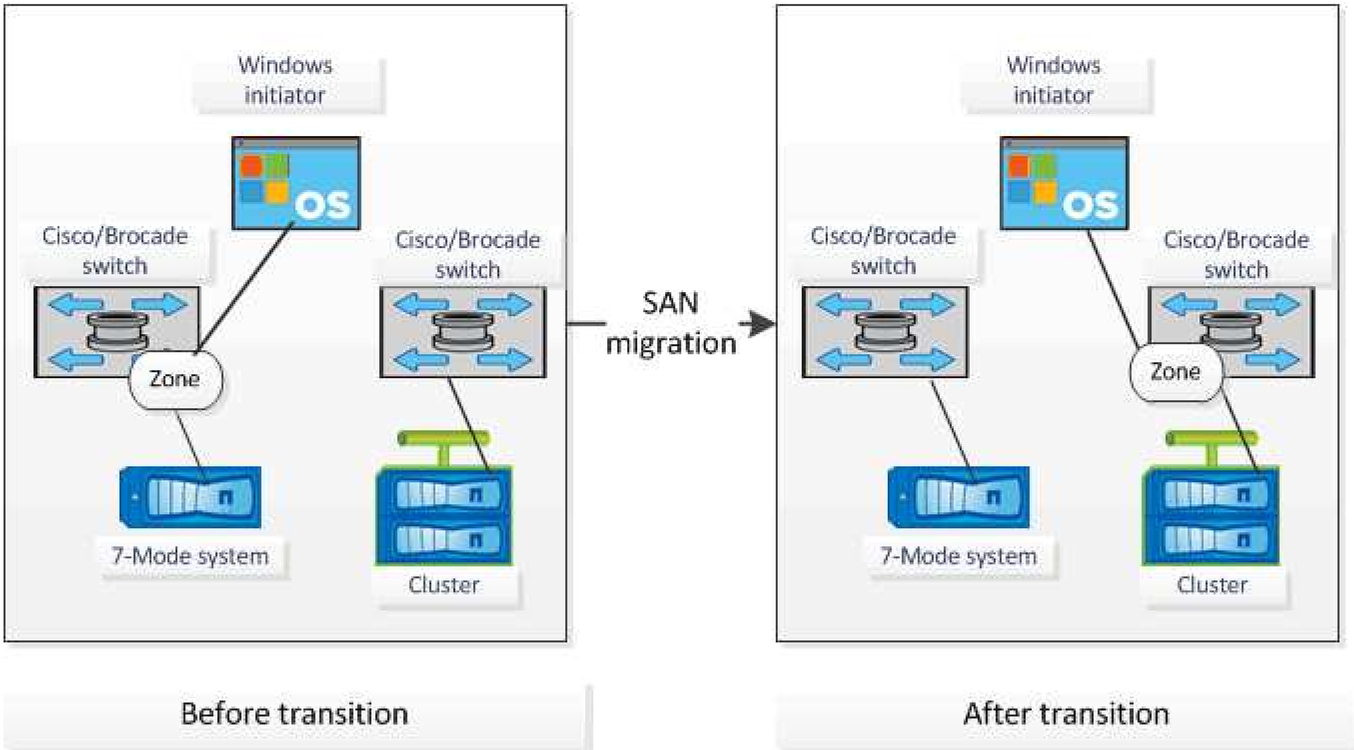
Supported configurations for generating an FC zone plan

You must be aware of the supported configurations of 7-Mode systems, hosts, FC switches, and the cluster to generate the FC zone plan. You should use the plan to configure zones for the cluster after migration.

The 7-Mode systems (single controller or an HA pair), hosts, and cluster can be connected either to the switches in the same fabric or different fabrics, depending on the data center requirements.

The following figure illustrates a configuration in which the 7-Mode systems, hosts, and cluster are connected to the switches in the same fabric:

The following figure illustrates a configuration in which the 7-Mode systems and cluster are connected to switches in different fabrics:



Syntax and options

Inventory Collection Tool (ICT) commands collect configuration and inventory information from controllers and hosts that are specified either in the command-line interface (CLI) or in a text file that contains system details. You can use syntax and options with the ICT commands.

Syntax

- **ict --cmd collect [--output <inventory.xml>] <uri> [<uri> …]**
- **ict --cmd collect [--output <inventory.xml>] --input <credential_file.txt>**
- **ict --cmd generate-fc-zones --source-filers <filer-ip>[,<filer-ip>] --dest-svm <cluster-name:svm-name> --fc-switches <switch-ip>[:<vsan-id>][,<switch-ip>[:<vsan-id>] …] <inventory_xml> [<inventory_xml> …]**
- **ict --cmd generate-fc-zones --source-filers <filer-ip>[<filer-ip>] --dest-svm <cluster-name:svm-name> --fc-switches <switch-ip>[:<vsan-id>][,<switch-ip>[:<vsan-id>] …] --fc-switches-target <switch-ip>[:<vsan-id>][,<switch-ip>[:<vsan-id>] …] <inventory_xml> [<inventory_xml> …]**
- **ict --help**
- **ict --version**

Options

The text file must contain system details of each system in a separate line:

- uri1

- uri2
- uri3

If a password is `*` or omitted either in the CLI or text file, then the user is prompted to enter a password in the CLI. The following options are available to run the ICT:

- `--help`

  Shows the help message and exits.

- `--version`

  Prints the tool version and exits.

- `--cmd [collect|generate-fc-zones]`

  collect: Collects configuration and inventory information from controllers and hosts.

  generate-fc-zones: Generates FC Zone planner document on a given inventory.

- `--output <filename[.xml[.gz]]>`

  Specifies the location where the files are generated. If the file name is suffixed with ".gz" , then the file is compressed. This option generates two files (reports): Inventory Report and Inventory Report Workbook.

- `--input <credentials_file.txt>`

  Specifies the location where the file with system credentials is saved. This option is not used in `--cmd generate-fc-` zones.

  > Only ASCII encoded text file is supported.

- uri format(`ontap|windows|vmware|linux|cisco|brocade)://[(<user>|<domain_user>)[:(<password>|*)]@](<hostname>|<ip>`)

  Specifies the system type, IP address, and credentials of the controller or host. If the password provided is `*`, or if no passwords are provided, then the user is prompted to enter a password in the command line.

- `--source-filers`

  Specifies comma-separated IP address of the source controllers to be used in generating the FC Zone Plan.

- `--dest-svm`

  Specifies the destination clustered Data ONTAP SVM formatted as *`cluster-name:svm-name`* to be used in generating the FC Zone Plan.

- `--fc-switches`

  Lists the FC switches for which the FC Zone Plan has to be generated. It is a comma-separated list of switch identifiers. For Cisco, FC switches should be formatted as *`switch-ip:vsan-id`* and for Brocade, FC switches should be formatted as *switch-ip*. For example, 10.61.187.6:200,10.61.187.7:200 (Cisco) or 10.61.187.4,10.61.187.5 (Brocade)

- `--fc-switches-target`

  Specifies the list of FC switches (connected to the cluster) for which the FC Zone Plan has to be generated. It is a comma-separated list of target switch identifiers that are listed in the same sequence as origin FC switches (--fc-switches). The FC zoning script is generated for each origin switch added to the fc-switches parameter list. This is an optional parameter.

For FC Zone Planner, input inventory XMLs are given as unnamed arguments.

Collecting inventory and generating inventory report

You can collect information about the Data ONTAP systems (7-Mode systems and nodes of the cluster), switches, hosts, and host applications. By using this information, you can generate inventory report that contains detailed information about the 7-Mode systems, hosts, and host applications for transition assessment.

- You must have downloaded the `ict.exe` file from the NetApp Support Site.
- You must have the user name, password, and IP addresses of the storage systems and hosts for which the inventory report is required.
- The user name for the storage system and hosts must have sufficient privileges to execute the commands.
- If you are adding multiple systems for inventory collection, you must have created a text file that is encoded in ASCII or UTF-8 format and contains the system details, one system per line.

  Each system detail must be in the following format:

  `(ontap|windows|vmware|linux|cisco|brocade)://[(`*`domain_user\\user):[password]@]`*
  `(host_name|ip)`

  If you provide `*` as the password, you are prompted to enter the password at the command line.

- All features must be configured and their licenses must be enabled so that the workbook can contain the inventory information about the features.
- All storage system configurations, such as CIFS share names, user names, and group names, must be in the UTF-8 format.
- For the FC zone plan, the 7-Mode systems and hosts must be connected to the switch.

  The cluster can be connected either to the same switch as the 7-Mode system or to a new switch in the same fabric.

The Inventory Collect Tool can collect configuration information from a maximum of four controllers and 20 hosts simultaneously. However, for scaled configurations with quotas, qtrees, exports, or UNIX users and groups, it might take a significantly longer time for the inventory report to be generated.

> You should avoid performing inventory collection operations on active storage controllers during peak hours.

1. In the Windows command prompt, navigate to the path where the Inventory Collect Tool is downloaded.
2. Generate the inventory report by running the `ict` command with the system IP address and credentials:

If you want to provide information…	Enter the following command…
For each system by using the command-line interface	**`ict --cmd collect --output *filename* (ontap|windows|vmware|linux|cisco|brocade)://[(*user*|*domain_user*)[:(*password*|*)]@]*hostname*) …**  • *`filename`* is the name you want to provide for the inventory report. • `ontap|windows|vmware|linux` is the system type. For example, for a 7-Mode storage system, the system type is ontap and for a Linux host, the system type is linux. • `cisco|brocade` are the supported FC switches. • *`user|domain_user`* and *`password`* are the system credentials. If the controller has no password, you can enter the characters `\"\"` as the password. • *`hostname`* is the IP address or host name of the controller, host, or switch.
For multiple systems in a text file	**`ict --cmd collect --output` *`filename`* `--input` *`credentials_file.txt`*** *`credentials_file.txt`* is the text file that contains the system details and credentials for multiple systems: • Only text files encoded in ASCII format are supported. • If you provide `*` as the password, you are prompted to enter the password at the command line. • If the controller has no password, then you can enter `""` as the password.

If your storage system is running Windows 7 or later and you have restricted privileges to the folder where the output XML file for the inventory report will be stored, the output files are automatically stored in the `VirtualStore` directory and the application runs as usual.

The inventory report is created for a storage system and a Linux host. The reports generated are `collected_data.xml` and `collected_data_InventoryWorkbook.xml`:

```
ict --cmd collect --output collected_data ontap://root:test123@hostname1
linux://root@hostname2
```

The estimated time required for collecting inventory information per controller is displayed.

The inventory workbook and inventory report are generated in XML format.

3. View the inventory workbook in Microsoft Excel by using Microsoft Office 2007 or later versions.

You are ready to import the inventory report XML to the 7-Mode Transition Tool to assess the features and functionalities of the 7-Mode controller and hosts, and to identify how the features and functionalities work in the clustered Data ONTAP version selected for transition.

Generating the FC zone plan

After collecting information about the Data ONTAP systems, hosts, and FC switches, you can generate the FC zone plan, which is used to configure the switches in the cluster after migration.

- The 7-Mode systems, hosts, and the cluster must be connected to the switch.
- Information about the cluster, SVMs, FCP LIFs, and switches must be collected.

  The cluster can be connected either to the same switch as the 7-Mode system or to a new switch in the same fabric.

  Supported configurations for generating an FC zone plan

Steps

1. In the CLI, navigate to the ICT directory.
2. From the CLI, generate the FC zone plan:

   `ict --cmd generate-fc-zones --source-filers` ***`7-mode-ip1,7mode-ip2`*** **`--dest-svm`** ***`cluster-name:vserver-name`*** **`--fc-switches`** ***`switch-name:vsan-id1,vsan-id2`*** **`7mode_cdot_switch_inventory.xml`**

   You must enter the VSAN ID for the Cisco switches.

```
...bin\ict>ict --cmd generate-fc-zones --source-filers system1,system2
--dest-svm vs1:fc_zone1
 --fc-switches brocade-1,brocade-2 7mode_cdot_switch_inventory.xml
```

   The FC zone plan contains zones created per the igroup configurations on the 7-Mode systems. Each zone contains a single initiator WWPN and multiple SVM target WWPNs.

In a copy-based transition, you can use the FC zone plan to configure the zones either during the precutover read/write mode to verify the cluster configuration by using the test hosts, or after the cutover phase to provide data access to the initiator hosts from the cluster.

In a copy-free transition, you must use the FC zone plan to configure the zones to group the initiator hosts and targets for providing data access from the cluster during apply configuration phase.

Collection and assessment commands

The Inventory Collect Tool (ICT) collects inventory information from controllers, hosts, and FC switches by using a list of commands to generate an inventory XML report; assesses the features and functionalities of these systems; and identifies how these features and functionalities work in the clustered Data ONTAP version that is selected for transition.

ONTAP 7-Mode APIs

- `aggr-list-info`
- `cf-status`
- `cifs-homedir-paths-get`
- `cifs-list-config`
- `cifs-nbalias-names-get`
- `cifs-share-acl-list-iter-start`
- `cifs-share-list-iter-start`
- `cifs-status`
- `disk-list-info`
- `fcp-adapter-list-info`
- `fpolicy-list-info`
- `igroup-list-info`
- `iscsi-interface-list-info`
- `iscsi-node-get-name`
- `license-list-info`
- `license-v2-list-info`
- `lun-get-comment`
- `lun-list-info`
- `lun-map-list-info`
- `net-config-get-active`
- `nfs-exportfs-list-rules`
- `nfs-exportfs-list-rules-2`
- `nfs-exportfs-list-rules-2`
- `nfs-status`

- `options-get`
- `options-list-info`
- `qtree-list-iter-start`
- `quota-list-entries-iter-start`
- `quota-report-iter-start`
- `registry-list-info-iter-start`
- `sis-status`
- `snapmirror-get-status`
- `snapmirror-list-schedule`
- `snapmirror-list-sync-schedule`
- `snapshot-get-schedule`
- `snapshot-list-info`
- `snapshot-volume-info`
- `snapvault-primary-relationship-status-list-iter-start`
- `snapvault-secondary-relationship-status-list-iter-start`
- `snmp-status`
- `storage-disk-get-iter`
- `system-available-replication-transfers`
- `system-get-info`
- `system-get-ontapi-version`
- `system-get-version`
- `useradmin-group-list`
- `useradmin-role-list`
- `useradmin-user-list`
- `vfiler-get-allowed-protocols`
- `vfiler-get-status`
- `vfiler-list-info`
- `volume-charmap-get`
- `volume-get-filer-info`
- `volume-get-language`
- `volume-list-info-iter-start`
- `volume-options-list-info`

ONTAP 7-Mode CLI

- cifs shares
- ic primary show
- ifconfig -a
- ifconfig vip
- ifgrp status
- ls $volumes_path/metadir/slag/
- printflag wafl_metadata_visible
- rdfile $root_vol/etc/cifsconfig_share.cfg
- rdfile $root_vol/etc/group
- rdfile $root_vol/etc/hosts
- rdfile $root_vol/etc/krb5auto.conf
- rdfile $root_vol/etc/mcrc
- rdfile $root_vol/etc/netgroup
- rdfile $root_vol/etc/nsswitch.conf
- rdfile $root_vol/etc/passwd
- rdfile $root_vol/etc/resolv.conf
- rdfile $root_vol/etc/snapmirror.conf
- rdfile $root_vol/etc/symlink.translations
- rdfile $root_vol/etc/usermap.cfg
- rdfile $vfiler_roots/etc/cifsconfig_share.cfg
- rdfile $vfiler_roots/etc/group
- rdfile $vfiler_roots/etc/hosts
- rdfile $vfiler_roots/etc/krb5auto.conf
- rdfile $vfiler_roots/etc/mcrc
- rdfile $vfiler_roots/etc/netgroup
- rdfile $vfiler_roots/etc/nsswitch.conf
- rdfile $vfiler_roots/etc/passwd
- rdfile $vfiler_roots/etc/resolv.conf
- rdfile $vfiler_roots/etc/snapmirror.conf
- rdfile $vfiler_roots/etc/symlink.translations
- rdfile $vfiler_roots/etc/usermap.cfg
- rlm status

* `routed status`
* `route -sn`
* `setflag wafl_metadata_visible 0`
* `setflag wafl_metadata_visible 1`
* `snapvault status -l`
* `sysconfig -A`
* `uptime`
* `vfiler status -a`
* `vlan stat`

ONTAP 7-Mode NetApp Manageability SDK

* `cluster-identity-get`
* `cluster-node-get-iter`
* `fcp-adapter-get-iter`
* `fcp-initiator-get-iter`
* `fcp-interface-get-iter`
* `lun-get-iter`
* `lun-map-get-iter`
* `net-interface-get-iter`
* `system-get-node-info-iter`
* `system-get-version`
* `volume-get-iter`
* `vserver-get-iter`

Windows

* `HKEY_LOCAL_MACHINE\\SOFTWARE\\NetApp*
* `HKEY_LOCAL_MACHINE\\SOFTWARE\\Wow6432Node\\Microsoft\\Windows\\CurrentVersion\\Uninstall`
* `select * from MPIO_Registered_DSM`
* `select * from MSCluster_Cluster`
* `select * from MSCluster_Disk`
* `select * from MSCluster_Node`
* `select * from MSCluster_NodeToActiveResource`
* `select * from MSCluster_Resource`
* `select * from MSCluster_ResourceToDisk`

- select * from MSFC_FCAdapterHBAAttributes
- select * from MSFC_FibrePortHBAAttributes
- select * from MSiSCSI_HBAInformation
- select * from MSiSCSIInitiator_MethodClass
- select * from Win32_ComputerSystem
- select * from Win32_DiskDrive
- select * from Win32_OperatingSystem
- select * from Win32_PnPSignedDriver where DeviceClass = "SCSIADAPTER"
- select * from Win32_Product

Linux CLI

- blkid
- cat /boot/grub/device.map
- cat /etc/grub.conf
- cat /etc/iscsi/initiatorname.iscsi
- cman_tool nodes
- cman_tool status
- df -h
- dmidecode -t system
- find /etc -maxdepth 1 -name *-release -type f -print -exec cat -v {} \;
- for file in /sys/block/sd***; do echo ${file/#\/sys}; scsi_id -p 0x80 -g -x -a -s ${file/#\/sys}; done
- for file in /sys/class/scsi_host/*; do echo; for ent in ${file}/*; do echo -n "$ent: "; if [-f "${ent}"]; then if [-r "${ent}"]; then cat -v -s ${ent} 2>/dev/null; if ["$?" != "0"]; then echo; fi; fi; else echo; fi; done; done
- for file in /sys/class/fc_host/*; do echo; for ent in ${file}/*; do echo -n "$ent: "; if [-f "${ent}"]; then if [-r "${ent}"]; then cat -v -s ${ent} 2>/dev/null; if ["$?" != "0"]; then echo; fi; fi; else echo; fi; done; done
- iscsiadm -m node
- lsb_release -a
- lvdisplay -m
- mount
- rpm -qa --qf "%{NAME}%{SUMMARY}%{VENDOR}___%{PROVIDEVERSION}\n"
- sanlun fcp show adapter -v
- sanlun lun show -pv
- sanlun lun show -v

* `sanlun version`
* `san_version`
* `sfdisk -uS -l`
* `uname -a`
* `vxclustadm nidmap`
* `vxclustadm -v nodestate`

VMware CLI

* `esxcfg-info -a -F xml`
* `esxcfg-mpath -l`
* `esxcfg-scsidevs -a`
* `esxcfg-scsidevs -l`
* `esxcli software vib get`
* `find /proc/scsi -type f | while read line; do echo $line; cat $line; done`
* `san_version`
* `uname -m`
* `uname -n`
* `/usr/lib/vmware/vmkmgmt_keyval/vmkmgmt_keyval -a`
* `/usr/lib/vmware/vm-support/bin/dump-vmdk-rdm-info.sh $vmx_paths`
* `vim-cmd /vmsvc/getallvms`
* `vim-cmd vmsvc/snapshot.get $vm_ids`
* `vmkload_mod -s nmp`
* `vmware -l`
* `vmware -v`

Cisco CLI

* `show fcdomain domain-list`
* `show flogi database`
* `show switchname`
* `show version`
* `show vsan`
* `show zoneset`
* `show zoneset active`
* `uname -m`

* `nsshow`
* `switchshow`
* `version`
* `zoneshow`
* `vim-cmd vmsvc/snapshot.get $vm_ids`
* `vmkload_mod -s nmp`
* `vmware -l`
* `vmware -v`

Brocade CLI

* `nsshow`
* `switchshow`
* `version`
* `zoneshow`

Where to find information about transition assessment

You can find information about assessing storage systems, hosts, and host applications to verify that they are ready for transition in the 7-Mode Transition Tool Copy-Based Transition Guide. The guide provides details about how to import the inventory report you created for controllers and hosts and how to assess these controllers and hosts to verify that they are ready for transition.

7-Mode Data Transition Using SnapMirror® Technology

Describes the transition of data from 7-Mode systems to ONTAP by using SnapMirror commands.

Transitioning 7-Mode volumes using SnapMirror

Beginning with ONTAP 9.12.1, you can no longer transition 7-Mode volumes using SnapMirror technology.

However, for ONTAP 9.11.1 and earlier releases you can transition 7-Mode volumes in a NAS and SAN environment to clustered Data ONTAP volumes by using clustered Data ONTAP SnapMirror commands. You must then set up the protocols, services, and other configurations on the cluster after the transition is complete.

Recommendation: You should use the 7-Mode Transition Tool for copy-based transition to transition 7-Mode volumes for ONTAP 9.11.1 and earlier releases because the tool provides pre-checks to verify both 7-Mode and the cluster in every step of the migration process, which helps you to avoid many potential issues. The tool significantly simplifies the migration of all protocols, network, and service configurations along with the data migration.

7-Mode Transition Tool Release Notes

This procedure provides the high-level tasks you have to perform for transition using SnapMirror.

> Before upgrading to ONTAP 9.12.1, you must do the following:
>
> **Steps**
>
> 1. Run the following command to make the SnapMirror destination volume writable: `snapmirror break`
> 2. Run the following command to delete all TDP SnapMirror relationships: `snapmirror delete`

1. Verify that the volumes you plan to transition are supported for transition.
2. Prepare the 7-Mode system for transition.
3. Prepare the cluster for transition.
4. Create a transition peer relationship between the 7-Mode system as the source and the SVM as the destination.
5. Copy the data from the 7-Mode volume to the clustered Data ONTAP volume by creating a SnapMirror relationship between the two volumes.

After data migration finishes, you must perform the following tasks:

- Optional: Create a data LIF on the SVM to enable client access.

  Network and LIF management.

- Configure protocols, networking, and services on the SVM.

    - Network and LIF management.
    - SMB/CIFS management
    - NFS management
- Create igroups and map LUNs

  SAN administration

- If you transition volumes with LUNs, you must perform the required post-transition tasks on the hosts before restoring access to the transitioned clustered Data ONTAP volumes.

  SAN host transition and remediation

NetApp Support

Planning for transition

Before copying data from 7-Mode volumes to clustered ONTAP volumes, you must understand when to use SnapMirror to perform the transition and review the information for supported 7-Mode versions and supported volumes for transition. You must also be aware of certain transition considerations.

You should review the *Release Notes* for the transition target release in case there are any transition issues.

ONTAP 9 Release Notes

SnapMirror relationships between 7-Mode and clustered ONTAP volumes are supported in the following releases:

- ONTAP 9.8 and later releases
- ONTAP 9.7P2 and later 9.7 releases
- ONTAP 9.6P7 and later 9.6 releases
- ONTAP 9.0 to ONTAP 9.5
- ONTAP 9.9.1 and later releases
- ONTAP 9.10.1 and later releases

Beginning with ONTAP 9.12.1, you can no longer transition 7-Mode volumes using SnapMirror technology.

You can use SnapMirror to transition data in the following scenarios:

- The 7-Mode Transition Tool does not support your requirements for transition; for example, the 7-Mode Transition Tool requires a Windows or Linux host that might be unavailable in your environment.

  Recommendation: You should use the 7-Mode Transition Tool to transition 7-Mode volumes because the tool provides prechecks to verify the feasibility of transition and migrates all protocol, network, and services configurations along with the data.

  You can install and use the 7-Mode Transition Tool to perform the prechecks for transitioning and then use SnapMirror commands to perform the data migration from the 7-Mode volume to the clustered ONTAP volume.

- The cluster and storage virtual machine (SVM) are already configured and only the data has to be transitioned from the 7-Mode volumes to the clustered ONTAP volumes.

Features and volumes not supported for transition

You cannot transition certain 7-Mode volumes, such as traditional volumes, and certain 7-Mode features, such as synchronous SnapMirror relationships, because some features might not be available in clustered Data ONTAP.

You can transition a 7-Mode volume only to an SVM.

You cannot transition the following 7-Mode volumes or configurations:

- Restricted or offline volumes
- Traditional volumes
- Volumes with NFS-to-CIFS character mapping (charmap)
- Volumes with Storage-Level Access Guard configurations
- Volumes that contain qtrees with Storage-Level Access Guard configurations

  If the target cluster is running Data ONTAP 8.3.1 or later, you can transition volumes that contain qtrees with this configuration.

- Volumes with the `no_i2p` option enabled.
- FlexCache volumes
- 32-bit volumes and 64-bit volumes that have 32-bit Snapshot copies if the destination cluster is running Data ONTAP 8.3 or later
- FlexClone volumes

  FlexClone volumes can be transitioned as FlexVol volumes, but the clone hierarchy and storage efficiency will be lost.

- Root volume of a vFiler unit, where the root volume is based on a qtree that belongs to the default vFiler unit
- Synchronous SnapMirror configuration
- Qtree SnapMirror relationships
- IPv6 configurations
- SnapVault relationships
- Network compression for SnapMirror
- Restoring the destination volume to a specific Snapshot copy (SnapMirror `break -s` command)
- Volume move operation

Features not supported for SAN transition

You should be aware of the 7-Mode SAN features that are not supported in clustered Data ONTAP so that you can take any necessary actions before the transition.

The following 7-Mode SAN features are not supported in clustered Data ONTAP:

- Snapshot copy-backed LUN clones

  Snapshot copy-backed LUN clones present in the Snapshot copies are not supported for any restore operation. These LUNs are not accessible in clustered Data ONTAP. You must split or delete the 7-Mode Snapshot copy backed LUN clones before transition.

- LUNs with ostype of `vld`, `image`, or `any user-defined string LUNs`

  You must either change the ostype of such LUNs or delete the LUNs before transition.

- LUN clone split

  You must either wait for the active LUN clone split operations to complete or abort the LUN clone split and delete the LUN before transition.

- The `lun share` command

  Sharing a LUN over NAS protocols is not supported in clustered Data ONTAP.

- SnapValidator

7-Mode version requirements for transition

You should be aware of the versions of Data ONTAP operating in 7-Mode that are supported for transitioning to clustered Data ONTAP 8.3 or later.

If the 7-Mode system has only 64-bit aggregates and volumes, you can transition volumes from systems running the following 7-Mode versions to clustered Data ONTAP 8.3 or later:

- Data ONTAP 8.0
- Data ONTAP 8.0.1
- Data ONTAP 8.0.2
- Data ONTAP 8.0.3
- Data ONTAP 8.0.4
- Data ONTAP 8.0.5
- Data ONTAP 8.1
- Data ONTAP 8.1.2
- Data ONTAP 8.1.3
- Data ONTAP 8.1.4
- Data ONTAP 8.2
- Data ONTAP 8.2.1
- Data ONTAP 8.2.2
- Data ONTAP 8.2.3
- Data ONTAP 8.2.4
- Data ONTAP 8.2.5

If the 7-Mode system is running Data ONTAP 8.0.x, 8.1.x, or 8.2 and has 32-bit aggregates or volumes with 32-

bit Snapshot copies, you must upgrade to 8.1.4 P4 or 8.2.1. After upgrading, you must expand the 32-bit aggregates to 64-bit, and then find and remove any 32-bit data.

You must upgrade the following 7-Mode versions to Data ONTAP 8.1.4 P4 before transitioning to clustered Data ONTAP 8.3 or later:

- Data ONTAP 7.3.3
- Data ONTAP 7.3.4
- Data ONTAP 7.3.5
- Data ONTAP 7.3.6
- Data ONTAP 7.3.7

Considerations for using SnapMirror for transition

You must be aware of certain considerations when running transition operations simultaneously with SnapMirror or SnapVault operations occurring in the 7-Mode system, such as the maximum number of concurrent SnapMirror transfers, data copy schedules, and using multiple paths for transition.

Maximum number of concurrent SnapMirror transfers

During transition, the maximum number of concurrent SnapMirror transfers supported on the 7-Mode and ONTAP systems depend on the number of volume SnapMirror replication operations allowed for a specific storage system model.

For information about the maximum number of concurrent volume SnapMirror transfers for your system model, see the Data ONTAP Data Protection Online Backup and Recovery Guide for 7-Mode.

Data copy schedules

Data copy schedules for transition operations should not overlap with the existing schedules for SnapMirror or SnapVault operations running on the 7-Mode system.

Using multiple paths for transition

You can specify two paths for transition by using a data copy IP address and a multipath IP address. However, both paths can be used only for load-balancing, not for failover.

Space considerations when transitioning SAN volumes

You must ensure that sufficient space is available in the volumes during transition. In addition to the space required for storing data and Snapshot copies, the transition process also requires 1 MB of space per LUN for updating certain filesystem metadata.

Before cutover, you can use the `df -h` command on the 7-Mode volume to verify whether free space of 1 MB per LUN is available in the volume. If the volume does not have sufficient free space available, the required amount of space must be added to the 7-Mode volume.

If the transition of LUNs fails due to lack of space on the destination volume, the following EMS message is generated: `LUN.vol.proc.fail.no.space: Processing for LUNs in volume vol1 failed due to lack of space.`

In this case, you must set the `filesys-size-fixed` attribute to false on the destination volume, and then add 1 MB per LUN of free space to the volume.

If there are volumes containing space-reserved LUNs, growing the volume by 1MB per LUN might not provide sufficient space. In such cases, the amount of additional space that has to be added is the size of the Snapshot reserve for the volume. After space is added to the destination volume, you can use the `lun transition start` command to transition the LUNs.

Related information

NetApp Documentation: ONTAP 9

Guidelines for transitioning SnapLock volumes

To transition 7-Mode SnapLock volumes to ONTAP 9, you must be aware of these requirements and guidelines.

- Transition of 7-Mode SnapLock volumes is not supported if the SnapLock volumes contain LUNs.
- You can transition 7-Mode SnapLock Enterprise volumes to SnapLock Enterprise volumes in any ONTAP 9 release, except for ONTAP 9.6.
- You can transition 7-Mode SnapLock Compliance volumes to SnapLock Compliance volumes in any ONTAP 9 release, except for ONTAP 9.6.
- When transitioning a 7-Mode volume SnapMirror relationship, you can use staggered transition (transition secondary first and then primary) only for SnapLock Enterprise volumes.

  SnapMirror disaster recovery (DR) relationship between 7-Mode primary volumes and ONTAP secondary volumes is supported only for SnapLock Enterprise volumes, but not for SnapLock Compliance volumes.

  Transitioning a volume SnapMirror relationship in a staggered configuration
- You must transition a 7-Mode volume SnapMirror relationship between SnapLock Compliance volumes by transitioning the primary and secondary volumes in parallel.

  Transitioning a volume SnapMirror relationship in parallel
- Starting with ONTAP 9.10.1, SnapLock and non-SnapLock volumes can be created in the same aggregate.

  To transition 7-Mode SnapLock volumes to ONTAP 9.10.1 or later, you must manually create the ONTAP volumes with the `-snaplock-type {non-snaplock|compliance|enterprise}` flag. After manually creating the volumes, manage the transition with the 7-Mode Transition Tool.

  If you use the 7-Mode Transition Tool to create a volume in ONTAP 9.10.1 or later, the volume is not created as a SnapLock volume and this results in a failed SnapMirror baseline.

Related information

Archive and compliance using SnapLock technology

Preparing for transition

Before you start the transition, you must prepare the 7-Mode storage system and cluster before transitioning 7-Mode volumes to clustered Data ONTAP. You must also create a transition peer relationship between the 7-Mode system and the storage virtual machine (SVM).

License requirements for transition

Before you transition a volume from 7-Mode to clustered Data ONTAP, you must ensure that SnapMirror is licensed on the 7-Mode storage system. If you are transitioning a 7-Mode volume SnapMirror relationship, SnapMirror licenses are also required on the source and destination clusters.

If SnapMirror is already licensed on your 7-Mode system, you can use the same license for transition. If you do not have the 7-Mode SnapMirror license, you can obtain a temporary SnapMirror license for transition from your sales representative.

Feature licenses that are enabled on the 7-Mode system must be added to the cluster. For information about obtaining feature licenses on the cluster, see the System Administration Reference.

Preparing the 7-Mode system for transition

Before starting a transition, you must complete certain tasks on the 7-Mode system, such as adding the SnapMirror license and the 7-Mode system to communicate with the target cluster.

All the 7-Mode volumes that you want to transition must be online.

Steps

1. Add and enable the SnapMirror license on the 7-Mode system:
    a. Add the SnapMirror license on the 7-Mode system:

       `license add` ***`license_code`***

       `license_code` is the license code you purchased.

    b. Enable the SnapMirror functionality:

       `options snapmirror.enable on`

2. Configure the 7-Mode system and the target cluster to communicate with each other by choosing one of the following options:
    - Set the `snapmirror.access` option to all.
    - Set the value of the `snapmirror.access` option to the IP addresses of all the LIFs on the cluster.
    - If the `snapmirror.access` option is `legacy` and the `snapmirror.checkip.enable` option is `off`, add the SVM name to the `/etc/snapmirror.allow` file.
    - If the `snapmirror.access` option is `legacy` and the `snapmirror.checkip.enable` option is `on`, add the IP addresses of the LIFs to the `/etc/snapmirror.allow` file.
3. Depending on the Data ONTAP version of your 7-Mode system, perform the following steps:
    a. Allow SnapMirror traffic on all the interfaces:

options interface.blocked.snapmirror ""

b. If you are running Data ONTAP version 7.3.7, 8.0.3, or 8.1 and you are using the IP address of the e0M interface as the management IP address to interact with 7-Mode Transition Tool, allow data traffic on the e0M interface:

options interface.blocked.mgmt_data_traffic off

Preparing the cluster for transition

You must set up the cluster before transitioning a 7-Mode system and ensure that the cluster meets requirements such as setting up LIFs and verifying network connectivity for transition.

- The cluster and the SVM must already be set up.

  Software setup

  The target SVM must not be in an SVM disaster recovery relationship.

- The cluster must be reachable by using the cluster management LIF.
- The cluster must be healthy and none of the nodes must be in takeover mode.
- The target aggregates that will contain the transitioned volumes must have an SFO policy.
- The aggregates must be on nodes that have not reached the maximum volume limit.
- For establishing an SVM peer relationship when transitioning a volume SnapMirror relationship, the following conditions must be met:
  - The secondary cluster should not have an SVM with the same name as that of the primary SVM.
  - The primary cluster should not have an SVM with the same name as that of the secondary SVM.
  - The name of the source 7-Mode system should not conflict with any of the local SVMs or SVMs that are already peered.

You can set up local LIFs that are in the default IPspace or intercluster LIFs on each node of the cluster to communicate between the cluster and 7-Mode systems. If you have set up local LIFs, then you do not have to set up intercluster LIFs. If you have set up both intercluster LIFs and local LIFs, then the local LIFs are preferred.

1. Create an intercluster LIF on each node of the cluster for communication between the cluster and 7-Mode system:

   a. Create an intercluster LIF:

   network interface create -vserver *svm_name* -lif *intercluster_lif* -role intercluster -home-node *home_node* -home-port *home_port* -address *ip_address* -netmask *netmask*

   ```
   cluster1::> network interface create -vserver cluster1 -lif
   intercluster_lif -role intercluster -home-node cluster1-01 -home-port
   e0c -address 192.0.2.130 -netmask 255.255.255.0
   ```

b. Create a static route for the intercluster LIF:

network route create -vserver *svm_name* -destination *IP_address/mask* -gateway *ip_address*

```
cluster1::> network route create -vserver vs0 -destination 0.0.0.0/0
-gateway 10.61.208.1
```

c. Verify that you can use the intercluster LIF to ping the 7-Mode system:

network ping -lif *intercluster_lif* -vserver *svm_name* -destination *remote_inetaddress*

```
cluster1::> network ping -lif intercluster_lif -vserver cluster1
-destination system7mode
system7mode is alive
```

For multipathing, you must have two intercluster LIFs on each node.

Network and LIF management

Related information

Creating a transition peer relationship

NetApp Documentation: Product Library A-Z

Creating a transition peer relationship

You must create a transition peer relationship before you can set up a SnapMirror relationship for transition between a 7-Mode system and a cluster. As a cluster administrator, you can create a transition peer relationship between anSVM and a 7-Mode system by using the `vserver peer transition create` command.

- You must have ensured that the name of the source 7-Mode system does not conflict with any of local SVMs or already peered SVMs.
- You must have created a clustered Data ONTAP volume of type DP to which the 7-Mode data must be transitioned.

  The size of the clustered Data ONTAP volume must be equal to or greater than the size of the 7-Mode volume.
- You must have ensured that the SVM names do not contain a "."
- If you are using local LIFs, you must have ensured the following:
  - Local LIFs are created in the default IPspace
  - Local LIFs are configured on the node on which the volume resides
  - LIF migration policy is same as the volume node, so that both can migrate to the same destination

node

When creating a transition peer relationship, you can also specify a multipath FQDN or IP address for load balancing the data transfers.

Steps

1. Use the `vserver peer transition create` command to create a transition peer relationship.
2. Use the `vserver peer transition show` to verify that the transition peer relationship is created successfully.

Example of creating and viewing transition peer relationships

The following command creates a transition peer relationship between the SVM vs1 and the 7-Mode system src1 with the multipath address src1-e0d and local LIFs lif1 and lif2:

```
cluster1::> vserver peer transition create -local-vserver vs1 -src-filer
-name src1 -multi-path-address src1-e0d -local-lifs lif1,lif2
```

The following examples show a transition peer relationship between a single SVM (vs1) and multiple 7-Mode systems:

```
cluster1::> vserver peer transition create -local-vserver vs1 -src-filer
-name src3
Transition peering created

cluster1::> vserver peer transition create -local-vserver vs1 -src-filer
-name src2
Transition peering created
```

The following output shows the transition peer relationships of the SVM vs1:

```
cluster1::> vserver peer transition show
Vserver  Source Filer  Multi Path Address   Local LIFs
-------  ------------  -----------------    ---------
vs1      src2               -                      -
vs1      src3               -                      -
```

Configuring a TCP window size for SnapMirror relationships

You can configure a TCP window size for SnapMirror relationships between the 7-Mode volume and the ONTAP volume to improve the SnapMirror transfer throughput so that the replication operations are completed faster.

The `window-size-for-tdp-mirror` option is provided with the snapmirror policy command to configure the TCP window size for SnapMirror relationships between the 7-Mode and ONTAP volumes (TDP). Using this option, you can configure a higher/lower TCP window size. You must be aware of the following considerations when setting this option:

- The `window-size-for-tdp-mirror` option can be configured only for policies of type `async-mirror`.
- The `window-size-for-tdp-mirror` option can be configured in the range of `256 KB` to `7 MB`. Otherwise configuration fails.
- The default value for the `window-size-for-tdp-mirror` option is `2 MB`.

> The `window-size-for-tdp-mirror` option is hidden and tab complete does not work. Make sure to type the full option to use it.

The following example displays how to configure a TCP window size of `5 MB` for a SnapMirror relationship of type `TDP`:

Steps

1. Create a SnapMirror policy of type `async-mirror` that has a TCP window size of `5 MB`:

   `snapmirror policy create`

   ```
   cluster01::> snapmirror policy create -vserver vserverA -policy
   tdp_window_size_policy -window-size-for-tdp-mirror 5MB -type async-
   mirror
   ```

2. Create a SnapMirror relationship of type `TDP` and apply the policy:

   `snapmirror create`

   ```
   cluster01::> snapmirror create -source-path filerA:volA -destination
   -path vserverA:volA -type TDP -policy tdp_window_size_policy
   ```

3. View the configured window size in the SnapMirror policy:

   `snapmirror policy show`

   ```
   cluster01::> snapmirror policy show -vserver vserverA -policy
   tdp_window_size_policy -fields window-size-for-tdp-mirror
   ```

Transitioning volumes

You can transition a stand-alone volume or volumes that are in data protection relationships (in volume SnapMirror relationships) by using SnapMirror technology.

If an ongoing scheduled update is aborted due to an NDO operation (takeover or aggregate relocation), then the update will automatically resume after the NDO operation is complete.

If you transition a stand-alone volume or a volume SnapMirror relationship with LUNs, you must create igroups and map LUNs. You must then perform the required post-transition tasks on the hosts before configuring access to the transitioned clustered Data ONTAP volumes.

SAN host transition and remediation

Related information

Transitioning 7-Mode volumes using SnapMirror

Transitioning a stand-alone volume

Transitioning a stand-alone volume involves creating a SnapMirror relationship, performing a baseline transfer, performing incremental updates, monitoring the data copy operation, breaking the SnapMirror relationship, and moving client access from the 7-Mode volume to the clustered Data ONTAP volume.

- The cluster and SVM must already be set up.
- You must have reviewed the information about preparing for transition.

  Preparing for transition

NetApp recommends you provision the destination ONTAP volume to match the attributes of the 7-mode source volume. Some of the attributes to match include:

- Volume size: The ONTAP volume must be at least the size of the 7-Mode volume.
- Language: The ONTAP volume setting should match the setting of the 7-Mode volume.

The 7-Mode Transition Tool automatically provisions the ONTAP volume with attributes that match the 7-Mode volume.

Steps

1. Copy data from the 7-Mode volume to the clustered Data ONTAP volume:
   a. If you want to configure the TCP window size for the SnapMirror relationship between the 7-Mode system and the SVM, create a SnapMirror policy of type `async-mirror` with the `window-size-for-tdp-mirror` option.

      You must then apply this policy to the TDP SnapMirror relationship between the 7-Mode system and the SVM.

      You can configure the TCP window size in the range of 256 KB to 7 MB for improving the SnapMirror transfer throughput so that the transition copy operations get completed faster. The default value of TCP window size is 2 MB.

      ```
      cluster1::> snapmirror policy create -vserver vs1 -policy tdp_policy
      -window-size-for-tdp-mirror 5MB -type async-mirror
      ```

   b. Use the `snapmirror create` command with the relationship type as TDP to create a SnapMirror relationship between the 7-Mode system and the SVM.

      If you have created a SnapMirror policy to configure the TCP window size, you must apply the policy to this SnapMirror relationship.

```
cluster1::> snapmirror create -source-path system7mode:dataVol20
-destination-path vs1:dst_vol -type TDP -policy tdp_policy
Operation succeeded: snapmirror create the relationship with
destination vs1:dst_vol.
```

c. Use the `snapmirror initialize` command to start the baseline transfer.

```
cluster1::> snapmirror initialize -destination-path vs1:dst_vol
Operation is queued: snapmirror initialize of destination
vs1:dst_vol.
```

d. Use the `snapmirror show` command to monitor the status.

```
cluster1::>snapmirror show -destination-path vs1:dst_vol

                            Source Path: system7mode:dataVol20
                       Destination Path: vs1:dst_vol
                      Relationship Type: TDP
                Relationship Group Type: none
                    SnapMirror Schedule: -
                 SnapMirror Policy Type: async-mirror
                      SnapMirror Policy: DPDefault
                            Tries Limit: -
                      Throttle (KB/sec): unlimited
                           **Mirror State: Snapmirrored**
                    Relationship Status: Idle
                File Restore File Count: -
                 File Restore File List: -
                      Transfer Snapshot: -
                      Snapshot Progress: -
                         Total Progress: -
              Network Compression Ratio: -
                    Snapshot Checkpoint: -
                        Newest Snapshot: vs1(4080431166)_dst_vol.1
              Newest Snapshot Timestamp: 10/16 02:49:03
                      Exported Snapshot: vs1(4080431166)_dst_vol.1
            Exported Snapshot Timestamp: 10/16 02:49:03
                                Healthy: true
                       Unhealthy Reason: -
               Constituent Relationship: false
                Destination Volume Node: cluster1-01
                        Relationship ID: 97b205a1-54ff-11e4-9f30-
```

```
005056a68289
                   Current Operation ID: -
                          Transfer Type: -
                         Transfer Error: -
                       Current Throttle: -
              Current Transfer Priority: -
                     Last Transfer Type: initialize
                    Last Transfer Error: -
                     Last Transfer Size: 152KB
Last Transfer Network Compression Ratio: 1:1
                 Last Transfer Duration: 0:0:6
                     Last Transfer From: system7mode:dataVol20
            Last Transfer End Timestamp: 10/16 02:43:53
                  Progress Last Updated: -
                Relationship Capability: 8.2 and above
                               Lag Time: -
           Number of Successful Updates: 0
               Number of Failed Updates: 0
           Number of Successful Resyncs: 0
               Number of Failed Resyncs: 0
            Number of Successful Breaks: 0
                Number of Failed Breaks: 0
                   Total Transfer Bytes: 155648
         Total Transfer Time in Seconds: 6
```

e. Depending on whether you want to update the clustered Data ONTAP volume manually or by setting up a SnapMirror schedule, perform the appropriate action:

<table>
<tr><th>If you want to…</th><th>Then…</th></tr>
<tr><td>Update transfers manually</td><td>

i. Use the `snapmirror update` command.

```
cluster1::> snapmirror update
-destination-path vs1:dst_vol
```

ii. Use the `snapmirror show` command to monitor the data copy status.

```
cluster1::> snapmirror show
-destination-path vs1:dst_vol

Source Path:
system7mode:dataVol20

Destination Path: vs1:dst_vol

Relationship Type: TDP
                Relationship
Group Type: none

SnapMirror Schedule: -
                 SnapMirror
Policy Type: async-mirror

SnapMirror Policy: DPDefault

Tries Limit: -

Throttle (KB/sec): unlimited

Mirror State: Snapmirrored
 ...
               Number of
Failed Updates: 0
           Number of
Successful Resyncs: 0
               Number of
Failed Resyncs: 0
            Number of
Successful Breaks: 0
                Number of
Failed Breaks: 0
                   Total
Transfer Bytes: 278528
         Total Transfer Time
in Seconds: 11
```

</td></tr>
</table>

<table>
<tr><th>If you want to…</th><th>Then…</th></tr>
<tr><td>Perform scheduled update transfers</td><td>
i. Use the <code>job schedule cron create</code> command to create a schedule for update transfers.
<pre>cluster1::> job schedule cron
create -name 15_minute_sched
-minute 15</pre>
ii. Use the <code>snapmirror modify</code> command to apply the schedule to the SnapMirror relationship.
<pre>cluster1::> snapmirror modify
-destination-path vs1:dst_vol
-schedule 15_minute_sched</pre>
iii. Use the <code>snapmirror show</code> command to monitor the data copy status.
</td></tr>
</table>

2. If you have a schedule for incremental transfers, perform the following steps when you are ready to perform cutover:

   a. Use the `snapmirror quiesce` command to disable all future update transfers.

   ```
   cluster1::> snapmirror quiesce -destination-path vs1:dst_vol
   ```

   b. Use the `snapmirror modify` command to delete the SnapMirror schedule.

   ```
   cluster1::> snapmirror modify -destination-path vs1:dst_vol -schedule
   ""
   ```

   c. If you quiesced the SnapMirror transfers earlier, use the `snapmirror resume` command to enable SnapMirror transfers.

   ```
   cluster1::> snapmirror resume -destination-path vs1:dst_vol
   ```

3. Wait for any ongoing transfers between the 7-Mode volumes and the clustered Data ONTAP volumes to finish, and then disconnect client access from the 7-Mode volumes to start cutover.
4. Use the `snapmirror update` command to perform a final data update to the clustered Data ONTAP volume.

```
cluster1::> snapmirror update -destination-path vs1:dst_vol
Operation is queued: snapmirror update of destination vs1:dst_vol.
```

5. Use the `snapmirror show` command to verify that the last transfer was successful.

```
cluster1::> snapmirror show
system7mode:dataVol20
Group Type: none
SnapMirror Schedule:
SnapMirror Policy: DPDefault
Tries Limit: -
           Number of
Failed Updates: 0
           Number of
Successful Resyncs: 0
            Number of
Failed Breaks: 0
               Total
Transfer Bytes: 278528
       Total Transfer Time
in Seconds: 11
```

6. Use the `snapmirror break` command to break the SnapMirror relationship between the 7-Mode volume and the clustered Data ONTAP volume.

```
cluster1::> snapmirror break -destination-path vs1:dst_vol
[Job 60] Job succeeded: SnapMirror Break Succeeded
```

7. If your volumes have LUNs configured, at the advanced privilege level, use the `lun transition 7-mode show` command to verify that the LUNs were transitioned.

   You can also use the `lun show` command on the clustered Data ONTAP volume to view all of the LUNs that were successfully transitioned.

8. Use the `snapmirror delete` command to delete the SnapMirror relationship between the 7-Mode volume and the clustered Data ONTAP volume.

```
cluster1::> snapmirror delete -destination-path vs1:dst_vol
```

9. Use the `snapmirror release` command to remove the SnapMirror relationship information from the 7-Mode system.

```
system7mode> snapmirror release dataVol20 vs1:dst_vol
```

You must delete the SVM peer relationship between the 7-Mode system and the SVM when all of the required volumes in the 7-Mode system are transitioned to the SVM.

Related information

Resuming a failed SnapMirror baseline transfer

Recovering from a failed LUN transition

Configuring a TCP window size for SnapMirror relationships

Transitioning a volume SnapMirror relationship in a staggered configuration

You can transition a 7-Mode volume SnapMirror relationship and retain the data protection relationship by transitioning the secondary volume before the primary volume. In this method, you set up a staggered SnapMirror DR relationship between the 7-Mode primary volumes and clustered Data ONTAP secondary volumes.

- The primary and secondary clusters and SVMs must already be set up.
- For establishing anSVM peer relationship when transitioning a volume SnapMirror relationship, the following conditions must be met:
  - The secondary cluster should not have anSVM with the same name as that of the primary SVM.
  - The primary cluster should not have anSVM with the same name as that of the secondary SVM.
  - You must have reviewed the information about preparing for transition.

    Preparing for transition

Related information

Resuming a failed SnapMirror baseline transfer

Transitioning a secondary volume

Transitioning a secondary volume involves creating a SnapMirror relationship, performing a baseline transfer, performing incremental updates, and setting up a SnapMirror relationship between the 7-Mode primary volume and the clustered Data ONTAP secondary volume.

The secondary cluster and storage virtual machine (SVM) must already be set up.

Steps

1. Copy data from the 7-Mode volume to the clustered Data ONTAP volume:
   a. Use the `snapmirror create` command with the relationship type as TDP to create a SnapMirror

relationship between the 7-Mode system and the SVM.

```
sec_cluster::> snapmirror create -source-path sec_system:dst_7_vol
-destination-path dst_vserver:dst_c_vol -type TDP
Operation succeeded: snapmirror create the relationship with
destination dst_vserver:dst_c_vol.
```

b. Use the `snapmirror initialize` command to start the baseline transfer.

```
sec_cluster::> snapmirror initialize -destination-path
dst_vserver:dst_c_vol
Operation is queued: snapmirror initialize of destination
dst_vserver:dst_c_vol.
```

c. Depending on whether you want to update the clustered Data ONTAP volume manually or by setting up a SnapMirror schedule, perform the appropriate action:

<table>
<tr><th>If you want to…</th><th>Then…</th></tr>
<tr><td>Update transfers manually</td><td>i. Use the <code>snapmirror update</code> command.
<pre>sec_cluster::> snapmirror
update -destination-path
dst_vserver:dst_c_vol</pre>ii. Use the <code>snapmirror show</code> command to monitor the data copy status.</td></tr>
</table>

<table>
<tr><th>If you want to…</th><th>Then…</th></tr>
<tr><td>Perform scheduled update transfers</td><td>
i. Use the <code>job schedule cron create</code> command to create a schedule for update transfers.
<pre>sec_cluster::> job schedule
cron create -name
15_minute_sched -minute 15</pre>
ii. Use the <code>snapmirror modify</code> command to apply the schedule to the SnapMirror relationship.
<pre>sec_cluster::> snapmirror
modify -destination-path
dst_vserver:dst_c_vol
-schedule 15_minute_sched</pre>
iii. Use the <code>snapmirror show</code> command to monitor the data copy status.
</td></tr>
</table>

2. If you have a schedule for incremental transfers, perform the following steps when you are ready to perform cutover:

   a. Use the `snapmirror quiesce` command to disable all future update transfers.

   ```
   sec_cluster::> snapmirror quiesce -destination-path
   dst_vserver:dst_vol
   ```

   b. Use the `snapmirror modify` command to delete the SnapMirror schedule.

   ```
   sec_cluster::> snapmirror modify -destination-path
   dst_vserver:dst_vol -schedule ""
   ```

   c. If you quiesced the SnapMirror transfers earlier, use the `snapmirror resume` command to enable SnapMirror transfers.

   ```
   sec_cluster::> snapmirror resume -destination-path
   dst_vserver:dst_vol
   ```

3. Wait for any ongoing transfers between the 7-Mode volumes and the clustered Data ONTAP volumes to finish, and then disconnect client access from the 7-Mode volumes to start cutover.

4. Use the `snapmirror update` command to perform a final data update to the clustered Data ONTAP volume.

   ```
   sec_cluster::> snapmirror update -destination-path dst_vserver:dst_vol
   Operation is queued: snapmirror update of destination
   dst_vserver:dst_vol.
   ```

5. Use the `snapmirror show` command to verify that the last transfer was successful.

6. Use the `snapmirror break` command to break the SnapMirror relationship between the 7-Mode secondary volume and the clustered Data ONTAP secondary volume.

   ```
   sec_cluster::> snapmirror break -destination-path dst_vserver:dst_vol
   [Job 60] Job succeeded: SnapMirror Break Succeeded
   ```

7. If your volumes have LUNs configured, at the advanced privilege level, use the `lun transition 7-mode show` command to verify that the LUNs were transitioned.

   You can also use the `lun show` command on the clustered Data ONTAP volume to view all of the LUNs that were successfully transitioned.

8. Use the `snapmirror delete` command to delete the SnapMirror relationship between the 7-Mode secondary volume and the clustered Data ONTAP secondary volume.

```
sec_cluster::> snapmirror
show -destination-path

sec_system:dst_7_vol

Destination Path:

                Relationship
Group Type: none

SnapMirror Policy: DPDefault

Tries Limit: -

Successful Updates: 1
               Number of
Failed Updates: 0
          Number of

Successful Breaks: 0
                Number of
Failed Breaks: 0
                   Total
Transfer Bytes: 278528
        Total Transfer Time
in Seconds: 11
```

```
sec_cluster::> snapmirror delete -destination-path dst_vserver:dst_vol
```

9. Use the `snapmirror release` command to remove the SnapMirror relationship information from the 7-Mode system.

```
system7mode> snapmirror release dataVol20 vs1:dst_vol
```

10. Establish a disaster recovery relationship between the 7-Mode primary volume and clustered Data ONTAP secondary volume:

    a. Use the `vserver peer transition create` command to create an SVM peer relationship between the 7-Mode primary volume and the clustered Data ONTAP secondary volume.

    ```
    sec_cluster::> vserver peer transition create -local-vserver
    dst_vserver -src-filer-name src_system
    Transition peering created
    ```

    b. Use the `job schedule cron create` command to create a job schedule that matches the schedule configured for the 7-Mode SnapMirror relationship.

    ```
    sec_cluster::> job schedule cron create -name 15_minute_sched -minute
    15
    ```

    c. Use the `snapmirror create` command to create a SnapMirror relationship between the 7-Mode primary volume and the clustered Data ONTAP secondary volume.

    ```
    sec_cluster::> snapmirror create -source-path src_system:src_7_vol
    -destination-path dst_vserver:dst_c_vol -type TDP -schedule
    15_minute_sched
    Operation succeeded: snapmirror create the relationship with
    destination dst_vserver:dst_c_vol.
    ```

    d. Use the `snapmirror resync` command to resynchronize the clustered Data ONTAP secondary volume.

    For successful resynchronization, a common 7-Mode Snapshot copy must exist between the 7-Mode primary volume and the clustered Data ONTAP secondary volume.

    ```
    sec_cluster::> snapmirror  resync -destination-path
    dst_vserver:dst_c_vol
    ```

    - If the target cluster is running Data ONTAP 8.3.2 or later, you must create the required igroups and map the LUNs manually.

- If the target cluster is running Data ONTAP 8.3.1 or earlier, you must map the secondary LUNs manually after completing the storage cutover of the primary volumes.
- You must delete the SVM peer relationship between the secondary 7-Mode system and the secondary SVM when all of the required volumes in the 7-Mode system are transitioned to the SVM.
- You must delete the SnapMirror relationship between the 7-Mode primary and the 7-Mode secondary systems.

Related information

Recovering from a failed LUN transition

Configuring a TCP window size for SnapMirror relationships

Transitioning a primary volume

Transitioning a primary volume involves copying data from the 7-Mode primary volumes to the clustered Data ONTAP primary volumes, deleting the disaster recovery relationship between the 7-Mode primary and clustered Data ONTAP secondary volumes, and establishing a SnapMirror relationship between the clustered Data ONTAP primary and secondary volumes.

The primary cluster and SVM must already be set up.

Steps

1. Copy the data from the 7-Mode primary volume to the clustered Data ONTAP primary volume:
   a. Use the `snapmirror create` command with the relationship type as TDP to create a SnapMirror relationship between the 7-Mode system and the SVM.

      ```
      pri_cluster::> snapmirror create -source-path src_system:finance
      -destination-path src_vserver:src_c_vol -type TDP
      Operation succeeded: snapmirror create the relationship with
      destination src_vserver:src_c_vol.
      ```

   b. Use the `snapmirror initialize` command to start the baseline transfer.

      ```
      pri_cluster::> snapmirror  initialize -destination-path
      src_vserver:src_c_vol
      Operation is queued: snapmirror initialize of destination
      src_vserver:src_c_vol.
      ```

   c. Depending on whether you want to update the clustered Data ONTAP volume manually or by setting up a SnapMirror schedule, perform the appropriate action:

If you want to…	Then…
Update transfers manually	i. Use the `snapmirror update` command. `pri_cluster::> snapmirror update -destination-path src_vserver:src_c_vol` ii. Use the `snapmirror show` command to monitor the data copy status.

If you want to…	Then…

Perform scheduled update transfers	i. Use the `job schedule cron create` command to create a schedule for update transfers.
	`pri_cluster::> job schedule cron create -name 15_minute_sched -minute 15`
	ii. Use the `snapmirror modify` command to apply the schedule to the SnapMirror relationship.
	`pri_cluster::> snapmirror modify -destination-path src_vserver:src_c_vol -schedule 15_minute_sched`
	iii. Use the snapmirror show command to monitor the data copy status.

2. If you have a schedule for incremental transfers, perform the following steps when you are ready to perform cutover:

   a. Use the `snapmirror quiesce` command to disable all future update transfers.

   ```
   pri_cluster::> snapmirror quiesce -destination-path
   src_vserver:src_c_vol
   ```

   b. Use the `snapmirror modify` command to delete the SnapMirror schedule.

   ```
   pri_cluster::> snapmirror modify -destination-path
   src_vserver:src_c_vol -schedule ""
   ```

   c. If you quiesced the SnapMirror transfers earlier, use the `snapmirror resume` command to enable SnapMirror transfers.

   ```
   pri_cluster::> snapmirror resume -destination-path
   src_vserver:src_c_vol
   ```

3. Create an SVM peer relationship between the clustered Data ONTAP secondary and primary SVMs.

   a. Use the `cluster peer create` command to create a cluster peer relationship.

   ```
   pri_cluster::> cluster peer create -peer-addrs cluster2-d2,
   10.98.234.246 -timeout 60

   Notice: Choose a passphrase of 8 or more characters. To ensure the
   authenticity of the peering relationship, use a phrase or sequence of
   characters that would be hard to guess.

   Enter the passphrase: ********
   Confirm the passphrase: ********
   ```

   b. From the source cluster, use the `vserver peer create` command to create the SVM peer relationship between the clustered Data ONTAP primary and secondary volumes.

   ```
   pri_cluster::> vserver peer create -vserver src_vserver -peervserver
   src_c_vserver -applications snapmirror -peer-cluster sec_cluster
   ```

   c. From the destination cluster, use the `vserver peer accept` command to accept the SVM peer request and establish the SVM peer relationship.

```
pri_cluster::> snapmirror
show -destination-path
pri_system:src_7_vol
Destination Path:
                     Relationship
Group Type: none
SnapMirror Policy: DPDefault
Tries Limit: -
Successful Resyncs: 0
               Number of
Failed Resyncs: 0
                          Total
Transfer Bytes: 473163808768
          Total Transfer Time
in Seconds: 43405
```

```
sec_cluster::> vserver peer accept -vserver dst_vserver -peervserver
src_vserver
```

4. From the destination cluster, use the `snapmirror quiesce` command to suspend any data transfers between the 7-Mode primary volume and the clustered Data ONTAP secondary volume if a schedule is set up for update transfers.

```
sec_cluster::> snapmirror quiesce -destination-path
dst_vserver:dst_c_vol
```

5. Monitor the data copy operation and initiate cutover:
   a. Wait for any ongoing transfers from the 7-Mode primary volumes to the clustered Data ONTAP primary and clustered Data ONTAP secondary volumes to finish, and then disconnect client access from the 7-Mode primary volume to start cutover.
   b. Use the `snapmirror update` command to perform a final data update to the clustered Data ONTAP primary volume from the 7-Mode primary volume.

   ```
   pri_cluster::> snapmirror update -destination-path
   src_vserver:src_c_vol
   ```

   c. Use the `snapmirror break` command to break the SnapMirror relationship between the 7-Mode primary volume and clustered Data ONTAP primary volume.

   ```
   pri_cluster::> snapmirror  break -destination-path
   src_vserver:src_c_vol
   [Job 1485] Job is queued: snapmirror break for destination
   src_vserver:src_c_vol.
   ```

   d. If your volumes have LUNs configured, at the advanced privilege level, use the `lun transition 7-mode show` command to verify that the LUNs have been transitioned.

      You can also use the `lun show` command on the clustered Data ONTAP volume to view all of the LUNs that were successfully transitioned.

   e. Use the `snapmirror delete` command to delete the relationship.

   ```
   pri_cluster::> snapmirror  delete -destination-path
   src_vserver:src_c_vol
   ```

   f. Use the `snapmirror release` command to remove the SnapMirror relationship information from the 7-Mode system.

```
system7mode> snapmirror release dataVol20 vs1:dst_vol
```

6. From the destination cluster, break and delete the disaster recovery relationship between the 7-Mode primary volume and clustered Data ONTAP secondary volume.

   a. Use the `snapmirror break` command to break the disaster recovery relationship between the 7-Mode primary volume and clustered Data ONTAP secondary volume.

   ```
   sec_cluster::> snapmirror  break -destination-path
   dst_vserver:dst_c_vol
   [Job 1485] Job is queued: snapmirror break for destination
   dst_vserver:dst_c_vol.
   ```

   b. Use the `snapmirror delete` command to delete the relationship.

   ```
   sec_cluster::> snapmirror  delete -destination-path
   dst_vserver:dst_c_vol
   ```

   c. Use the `snapmirror release` command to remove the SnapMirror relationship information from the 7-Mode system.

   ```
   system7mode> snapmirror release dataVol20 vs1:dst_vol
   ```

7. From the destination cluster, establish a SnapMirror relationship between the clustered Data ONTAP primary and secondary volumes:

   a. Use the `snapmirror create` command to create a SnapMirror relationship between the clustered Data ONTAP primary and secondary volumes.

   ```
   sec_cluster::> snapmirror create -source-path src_vserver:src_c_vol
   -destination-path dst_vserver:dst_c_vol -type DP -schedule
   15_minute_sched
   ```

   b. Use the `snapmirror resync` command to resynchronize the SnapMirror relationship between the clustered Data ONTAP volumes.

      For successful resynchronization, a common Snapshot copy must exist between the clustered Data ONTAP primary and secondary volumes.

   ```
   sec_cluster::> snapmirror  resync -destination-path
   dst_vserver:dst_c_vol
   ```

   c. Use the `snapmirror show` command to verify that the status of SnapMirror resynchronization shows

`SnapMirrored`.

> You must ensure that the SnapMirror resynchronization is successful to make the clustered Data ONTAP secondary volume available for read-only access.

You must delete the SVM peer relationship between the 7-Mode system and the SVM when all the required volumes in the 7-Mode system are transitioned to the SVM.

Related information

Recovering from a failed LUN transition

Configuring a TCP window size for SnapMirror relationships

Transitioning a volume SnapMirror relationship in parallel

You can transition the primary and secondary volumes of a 7-Mode SnapMirror relationship in parallel and in the same cutover window. You must then manually set up the volume SnapMirror relationship in the ONTAP clusters after transition. You must use this method for transitioning SnapLock Compliance volumes.

- You must have set up the primary and secondary clusters and SVMs.
- For establishing anSVM peer relationship when transitioning a volume SnapMirror relationship, the following conditions must be met:
  - The secondary cluster should not have an SVM with the same name as that of the primary SVM.
  - The primary cluster should not have an SVM with the same name as that of the secondary SVM.
  - You must have reviewed the information about preparing for transition.

    Preparing for transition

A 7-Mode SnapMirror relationship between SnapLock Compliance volumes must be transitioned in parallel because SnapMirror resynchronization of a transition data protection (TDP) relationship with SnapLock Compliance volumes is not supported. Therefore, you cannot establish a SnapMirror disaster recovery (DR) relationship between 7-Mode primary volumes and ONTAP secondary volumes with SnapLock Compliance volumes.

1. Transition the secondary and primary volumes of the SnapMirror relationship by following the steps for transitioning a standalone volume.

   Before transitioning the 7-Mode secondary volumes, no manual intervention is required for the 7-Mode SnapMirror relationships. This ensures that the 7-Mode secondary volumes are transitioned as read-only volumes to ONTAP.

   Transitioning a stand-alone volume

2. Create an intercluster SVM peer relationship between the SVMs that contain the transitioned primary and secondary volumes.

   System administration

3. Create a volume SnapMirror relationship between the transitioned primary and secondary volumes.

Volume disaster recovery express preparation

4. On the destination volume, resynchronize the source volume and destination volume of the SnapMirror relationship.

   At least one common Snapshot copy must exist between the source and destination volumes.

5. Monitor the status of the SnapMirror data transfers.

   You must not perform any operation, such as volume move or SnapMirror break, on the source and destination volumes until the resynchronization is completed successfully. You must ensure that the resynchronization is not aborted and completes successfully; otherwise, the volumes can change to an inconsistent state.

Related information

Guidelines for transitioning SnapLock volumes

Transitioning a disaster recovery relationship between vFiler units

You can transition the disaster recovery (DR) relationship between the primary vFiler unit and the secondary vFiler unit on 7-Mode systems to a disaster recovery relationship between the source SVM and destination SVM in clusters.

During the transition process, the primary vFiler unit is transitioned to the source SVM, and the secondary vFiler unit is transitioned to the destination SVM.

Steps

1. Transition the primary vFiler unit to the source SVM, and the secondary vFiler unit to the destination SVM.
2. Stop the destination SVM by using the `vserver stop` command.

   You must not rename any volume or add any new volumes on the destination SVM.

3. For each transitioned primary volume, create a volume-level SnapMirror relationship with the corresponding secondary volume by using the `snapmirror create` command.

```
destination_cluster::> snapmirror create -source-path src_vserver:c_vol
-destination-path dst_vserver:c_vol -type DP
```

4. Resynchronize the volume-level SnapMirror relationships between the transitioned primary and secondary volumes by using the `snapmirror resync` command.

   For successful resynchronization, a common Snapshot copy must exist between the primary and secondary volumes.

```
destination_cluster::> snapmirror resync -destination-path
dst_vserver:c_vol
```

5. Verify that the resynchronization operation is complete, and the SnapMirror relationship is in the `Snapmirrored` state by using the `snapmirror show` command.
6. Create an SVM disaster recovery relationship between the source and destination SVMs by using the `snapmirror create` command with the `-identity-preserve` option set to `true`.

```
destination_cluster::> snapmirror create -source-path src_vserver:
-destination-path dst_vserver: -type DP -throttle unlimited -policy
DPDefault -schedule hourly -identity-preserve true
```

7. Resynchronize the destination SVM from the source SVM by using the `snapmirror resync` command.

```
destination_cluster::> snapmirror resync dst_vserver:
```

8. Verify that the resynchronization operation is complete, and the SnapMirror relationship is in the `Snapmirrored` state by using the `snapmirror show` command.

```
destination_cluster::> snapmirror show

Progress
Source               Destination     Mirror       Relationship  Total
Last
Path           Type  Path            State        Status        Progress
Healthy  Updated
--------       ---- ------------     -------      --------------
--------- ------- --------
src_vserver     DP    dst_vserver    Snapmirrored  Idle           -
true    -
```

Recovering from a disaster at the 7-Mode site during transition

If you have established a SnapMirror disaster recovery (DR) relationship between the 7-Mode primary volume and the clustered Data ONTAP secondary volume and if a disaster occurs at the 7-Mode primary site, you can direct client access to the clustered Data ONTAP secondary volume. After the 7-Mode primary volume is brought back online, you have to perform additional steps to redirect the clients to the clustered Data ONTAP primary volume.

To retain any data written on the clustered Data ONTAP secondary volume after the disaster, you must transition the 7-Mode primary volume after the 7-Mode primary volume is back online and establish a SnapMirror relationship between the clustered Data ONTAP primary and secondary volumes. You can then redirect the clients to the clustered Data ONTAP primary volumes.

SnapMirror resynchronization from clustered Data ONTAP volumes to the 7-Mode volumes is not supported. Therefore, if you reestablish the DR relationship between the 7-Mode primary volume and the clustered Data ONTAP secondary volume after the disaster, any data written on the secondary clustered Data ONTAP will be lost.

Redirecting clients to the clustered Data ONTAP secondary volume after a disaster

If you have established a SnapMirror disaster recovery (DR) relationship between the 7-Mode primary volume and the clustered Data ONTAP secondary volume and if a disaster occurs at the 7-Mode primary site, you must redirect client access to the clustered Data ONTAP secondary volume.

Steps

1. From the secondary cluster, use the `snapmirror break` command to break the SnapMirror relationship between the 7-Mode primary volume and the clustered Data ONTAP secondary volume.

   ```
   sec_cluster::> snapmirror break -destination-path dst_vserver:dst_c_vol
   ```

2. From the secondary cluster, use the `snapmirror delete` command to delete the SnapMirror relationship between the 7-Mode primary volume and the clustered Data ONTAP secondary volume.

   ```
   sec_cluster::> snapmirror delete -destination-path dst_vserver:dst_c_vol
   ```

3. Redirect client access to the clustered Data ONTAP secondary volume.

   For more information about setting up client access in clustered Data ONTAP, see the Clustered Data ONTAP File Access and Protocols Management Guide.

Transitioning the 7-Mode primary as a stand-alone volume

After the 7-Mode primary volume is back online after a disaster, you must transition the 7-Mode primary volume. Because all SnapMirror relationships to the 7-Mode primary volume are broken and deleted at this stage, you can transition a stand-alone volume for this type of transition.

Steps

1. Copy data from the 7-Mode volume to the clustered Data ONTAP volume:
   a. If you want to configure the TCP window size for the SnapMirror relationship between the 7-Mode system and the SVM, create a SnapMirror policy of type `async-mirror` with the `window-size-for-tdp-mirror` option.

      You must then apply this policy to the TDP SnapMirror relationship between the 7-Mode system and the SVM.

You can configure the TCP window size in the range of 256 KB to 7 MB for improving the SnapMirror transfer throughput so that the transition copy operations get completed faster. The default value of TCP window size is 2 MB.

```
cluster1::> snapmirror policy create -vserver vs1 –policy tdp_policy
-window-size-for-tdp-mirror 5MB -type async-mirror
```

b. Use the `snapmirror create` command with the relationship type as TDP to create a SnapMirror relationship between the 7-Mode system and the SVM.

   If you have created a SnapMirror policy to configure the TCP window size, you must apply the policy to this SnapMirror relationship.

```
cluster1::> snapmirror create -source-path system7mode:dataVol20
-destination-path vs1:dst_vol -type TDP -policy tdp_policy
Operation succeeded: snapmirror create the relationship with
destination vs1:dst_vol.
```

c. Use the `snapmirror initialize` command to start the baseline transfer.

```
cluster1::> snapmirror initialize -destination-path vs1:dst_vol
Operation is queued: snapmirror initialize of destination
vs1:dst_vol.
```

d. Use the `snapmirror show` command to monitor the status.

```
cluster1::>snapmirror show -destination-path vs1:dst_vol

                            Source Path: system7mode:dataVol20
                       Destination Path: vs1:dst_vol
                      Relationship Type: TDP
                Relationship Group Type: none
                    SnapMirror Schedule: -
                 SnapMirror Policy Type: async-mirror
                      SnapMirror Policy: DPDefault
                            Tries Limit: -
                      Throttle (KB/sec): unlimited
                           **Mirror State: Snapmirrored**
                    Relationship Status: Idle
                File Restore File Count: -
                 File Restore File List: -
                      Transfer Snapshot: -
```

```
                       Snapshot Progress: -
                          Total Progress: -
               Network Compression Ratio: -
                     Snapshot Checkpoint: -
                         Newest Snapshot: vs1(4080431166)_dst_vol.1
               Newest Snapshot Timestamp: 10/16 02:49:03
                       Exported Snapshot: vs1(4080431166)_dst_vol.1
             Exported Snapshot Timestamp: 10/16 02:49:03
                                 Healthy: true
                        Unhealthy Reason: -
                Constituent Relationship: false
                 Destination Volume Node: cluster1-01
                         Relationship ID: 97b205a1-54ff-11e4-9f30-
005056a68289
                    Current Operation ID: -
                           Transfer Type: -
                          Transfer Error: -
                        Current Throttle: -
               Current Transfer Priority: -
                      Last Transfer Type: initialize
                     Last Transfer Error: -
                      Last Transfer Size: 152KB
Last Transfer Network Compression Ratio: 1:1
                  Last Transfer Duration: 0:0:6
                      Last Transfer From: system7mode:dataVol20
             Last Transfer End Timestamp: 10/16 02:43:53
                   Progress Last Updated: -
                 Relationship Capability: 8.2 and above
                                Lag Time: -
            Number of Successful Updates: 0
                Number of Failed Updates: 0
            Number of Successful Resyncs: 0
                Number of Failed Resyncs: 0
             Number of Successful Breaks: 0
                 Number of Failed Breaks: 0
                    Total Transfer Bytes: 155648
          Total Transfer Time in Seconds: 6
```

e. Depending on whether you want to update the clustered Data ONTAP volume manually or by setting up a SnapMirror schedule, perform the appropriate action:

If you want to…	Then…

Update transfers manually	i. Use the `snapmirror update` command.
	
	`cluster1::> snapmirror update -destination-path vs1:dst_vol`
	
	ii. Use the `snapmirror show` command to monitor the data copy status.
	
	`cluster1::> snapmirror show -destination-path vs1:dst_vol`
	
	`Source Path: system7mode:dataVol20`
	
	`Destination Path: vs1:dst_vol`
	
	`Relationship Type: TDP Relationship Group Type: none`
	
	`SnapMirror Schedule: - SnapMirror Policy Type: async-mirror`
	
	`SnapMirror Policy: DPDefault`
	
	`Tries Limit: -`
	
	`Throttle (KB/sec): unlimited`
	
	`Mirror State: Snapmirrored`
	`...`
	`Number of Failed Updates: 0`
	`Number of Successful Resyncs: 0`
	`Number of Failed Resyncs: 0`
	`Number of Successful Breaks: 0`
	`Number of Failed Breaks: 0`
	`Total Transfer Bytes: 278528`
	`Total Transfer Time in Seconds: 11`

If you want to…	Then…

Perform scheduled update transfers	i. Use the `job schedule cron create` command to create a schedule for update transfers.
	`cluster1::> job schedule cron create -name 15_minute_sched -minute 15`
	ii. Use the `snapmirror modify` command to apply the schedule to the SnapMirror relationship.
	`cluster1::> snapmirror modify -destination-path vs1:dst_vol -schedule 15_minute_sched`
	iii. Use the `snapmirror show` command to monitor the data copy status.

2. If you have a schedule for incremental transfers, perform the following steps when you are ready to perform cutover:

   a. Use the `snapmirror quiesce` command to disable all future update transfers.

   ```
   cluster1::> snapmirror quiesce -destination-path vs1:dst_vol
   ```

   b. Use the `snapmirror modify` command to delete the SnapMirror schedule.

   ```
   cluster1::> snapmirror modify -destination-path vs1:dst_vol -schedule
   ""
   ```

   c. If you quiesced the SnapMirror transfers earlier, use the `snapmirror resume` command to enable SnapMirror transfers.

   ```
   cluster1::> snapmirror resume -destination-path vs1:dst_vol
   ```

3. Wait for any ongoing transfers between the 7-Mode volumes and the clustered Data ONTAP volumes to finish, and then disconnect client access from the 7-Mode volumes to start cutover.

4. Use the `snapmirror update` command to perform a final data update to the clustered Data ONTAP volume.

```
cluster1::> snapmirror update -destination-path vs1:dst_vol
Operation is queued: snapmirror update of destination vs1:dst_vol.
```

5. Use the `snapmirror show` command to verify that the last transfer was successful.

```
cluster1::> snapmirror show
-destination-path vs1:dst_vol
system7mode:dataVol20
Destination Path: vs1:dst_vol
Group Type: none
SnapMirror Schedule:
15-minute-sched
SnapMirror Policy: DPDefault
Tries Limit: -
                Number of
Failed Updates: 0
                Number of
Successful Resyncs: 0
                Number of
                Number of
Failed Breaks: 0
                   Total
Transfer Bytes: 278528
        Total Transfer Time
in Seconds: 11
```

6. Use the `snapmirror break` command to break the SnapMirror relationship between the 7-Mode volume and the clustered Data ONTAP volume.

```
cluster1::> snapmirror break -destination-path vs1:dst_vol
[Job 60] Job succeeded: SnapMirror Break Succeeded
```

7. If your volumes have LUNs configured, at the advanced privilege level, use the `lun transition 7-mode show` command to verify that the LUNs were transitioned.

   You can also use the `lun show` command on the clustered Data ONTAP volume to view all of the LUNs that were successfully transitioned.

8. Use the `snapmirror delete` command to delete the SnapMirror relationship between the 7-Mode volume and the clustered Data ONTAP volume.

```
cluster1::> snapmirror delete -destination-path vs1:dst_vol
```

9. Use the `snapmirror release` command to remove the SnapMirror relationship information from the 7-Mode system.

```
system7mode> snapmirror release dataVol20 vs1:dst_vol
```

Redirecting clients to the clustered Data ONTAP primary volume

After the 7-Mode primary volume comes back online, you can transition the 7-Mode primary volume, establish a SnapMirror relationship with the clustered Data ONTAP secondary volume, and redirect client access to the clustered Data ONTAP primary volume.

Steps

1. Create the SVM peer relationship between the primary and secondary SVMs.
   a. Use the `cluster peer create` command to create the cluster peer relationship.

   ```
   pri_cluster::> cluster peer create -peer-addrs cluster2-d2,
   10.98.234.246 -timeout 60

   Notice: Choose a passphrase of 8 or more characters. To ensure the
   authenticity of the peering relationship, use a phrase or sequence of
   characters that would be hard to guess.

   Enter the passphrase: ********
   Confirm the passphrase: ********
   ```

   b. From the source cluster, use the `vserver peer create` command to create anSVM peer relationship between the clustered Data ONTAP primary volume and clustered Data ONTAP secondary volume.

   ```
   pri_cluster::> vserver peer create -vserver src_vserver -peervserver
   src_c_vserver -applications snapmirror -peer-cluster sec_cluster
   ```

   c. From the destination cluster, use the `vserver peer accept` command to accept the SVM peer request and establish the SVM peer relationship.

   ```
   sec_cluster::> vserver peer accept -vserver dst_vserver -peervserver
   src_vserver
   ```

2. Use the `snapmirror create` command to create a SnapMirror relationship with the clustered Data ONTAP secondary volume as the source and the clustered Data ONTAP primary volume as destination.

```
pri_cluster::> snapmirror create -source-path dst_vserver:dst_c_vol
-destination-path src_vserver:src_c_vol
```

3. From the primary cluster, use the `snapmirror resync` command to resynchronize the clustered Data ONTAP secondary volume.

```
pri_cluster::> snapmirror resync -source-path dst_vserver:dst_c_vol
-destination-path src_vserver:src_c_vol
```

   You must wait till the resynchronization finishes. The SnapMirror state changes to `SnapMirrored` when resynchronization is complete.

4. When you are ready to switch over to the clustered Data ONTAP primary volume, disconnect client access from the clustered Data ONTAP secondary volume.
5. From the primary cluster, use the `snapmirror update` command to update the primary volume.

```
pri_cluster::> snapmirror update -destination-path src_vserver:src_c_vol
```

6. From the primary cluster, use the `snapmirror break`` command to break the SnapMirror relationship between the clustered Data ONTAP primary and secondary volumes.

```
pri_cluster::> snapmirror break -destination-path src_vserver:src_c_vol
```

7. Enable client access to the clustered Data ONTAP primary volume.
8. From the primary cluster, use the `snapmirror delete` command to delete the SnapMirror relationship between the clustered Data ONTAP primary and secondary volumes.

```
pri_cluster::> snapmirror delete -destination-path src_vserver:src_c_vol
```

9. From the secondary cluster, use the `snapmirror create` command to create a SnapMirror relationship with the clustered Data ONTAP primary volume as the source and the clustered Data ONTAP secondary volume as destination, with a schedule similar to the previous schedule between the 7-Mode primary volume and clustered Data ONTAP secondary volume.

```
sec_cluster::> snapmirror create -source-path src_vserver:src_c_vol
-destination-path dst_vserver:dst_c_vol -schedule 15_minute_sched
```

10. From the secondary cluster, use the `snapmirror resync` command to resynchronize the clustered Data ONTAP primary volume.

```
sec_cluster::> snapmirror resync -source-path src_vserver:src_c_vol
-destination-path dst_vserver:dst_c_vol
```

Troubleshooting transition issues when using SnapMirror

Troubleshooting information helps you to identify and resolve issues that occur when transitioning 7-Mode data using SnapMirror commands.

Resuming a failed SnapMirror baseline transfer

During transition, SnapMirror baseline transfers can fail due to a number of reasons, such as loss of network connectivity, transfer aborted, or controller failover. After rectifying the cause of failure, you can resume the SnapMirror transfers if a restart checkpoint is available.

If the restart checkpoint for the baseline transfer is not available, you must delete and re-create the volume, reestablish the SnapMirror relationship, and initiate the transition again.

Steps

1. From the destination cluster, use the `snapmirror show` command with the `-snapshot-checkpoint` parameter to view the status of the baseline transfer and the restart checkpoint.

```
cluster2::> snapmirror show -destination-path dest_vserver:vol3 -fields
snapshot-checkpoint
source-path          destination-path snapshot-checkpoint
-------------------- ---------------- -------------------
src_system:vol3    dest_vserver:vol3 50MB
```

2. If the SnapMirror checkpoint exists, use the `snapmirror initialize` command to resume the baseline transfer.

```
cluster2::> snapmirror initialize -destination-path dest_vserver:vol3
```

Recovering from a failed LUN transition

If the transition of volumes with LUNs fails, you can use the `lun transition 7-mode show` command to check which LUNs were not transitioned to ONTAP, and then determine a corrective action.

Steps

1. Change to advanced privilege level:

   `set -privilege advanced`

2. Check which LUNs failed:

   `lun transition 7-mode show`

3. Review the EMS logs and determine the corrective action that you must take.
4. Perform the required steps shown in the EMS message to correct the failure.
5. If any supported LUNs failed the transition, then to complete the transition:

   `lun transition start`

6. View the transition status of the volumes:

   `lun transition show`

   The transition status can be one of following values:

   - `active`: The volume is in an active SnapMirror transition relationship and not yet transitioned.
   - `complete`: All supported LUNs are transitioned for this volume.
   - `failed`: LUN transition failed for the volume.
   - `none`: The volume did not contain LUNs to transition from 7-Mode systems.

```
cluster1::*> lun transition show
Vserver              Volume             Transition Status
-------------------- ------------------ -----------------
vs1                  vol0               none
                     vol1               complete
                     vol2               failed
                     vol3               active
```

Related information

Space considerations when transitioning SAN volumes

SAN Host Transition and Remediation Guide

If you are transitioning data and configurations from Data ONTAP operating in 7-Mode to clustered Data ONTAP 8.3 or later using the 7-Mode Transition Tool (7MTT) 2.2 or later, you must perform remediation steps for SAN hosts before and after transition.

The *7-Mode Transition Tool SAN Host Transition and Remediation Guide* provides the necessary pretransition and post-transition steps for VMware ESXi, Windows, Red Hat Enterprise Linux (RHEL), HP-UX, and AIX hosts.

Related information

Copy-based transition

Copy-free transition

7-Mode Transition Tool installation and administration

ONTAP target releases supported by the 7-Mode Transition Tool

Release support for ONTAP transition target clusters depends on the transition method you want to use, copy-based or copy-free, and on the version of the 7-Mode Transition Tool.

Be sure to consult the current 7-Mode Transition Tool *Release Notes* for the latest information about supported target releases and known issues.

7-Mode Transition Tool Release Notes

Copy-based transitions are supported to these ONTAP target releases.

If your transition target is running …	You must use this 7-Mode Transition Tool version …
ONTAP 9.7P2 or later 9.7 P release ⓘ Earlier 9.7 releases are not supported.	3.3.2
ONTAP 9.6P7 or later 9.6 P release ⓘ Earlier 9.6 releases are not supported.	3.3.2
ONTAP 9.5 or earlier ONTAP 9 release	3.3.2 or 3.3.1
Clustered Data ONTAP 8.1.4P4 and later 8.x releases.	3.3.2 or 3.3.1

Copy-free transitions are supported to these ONTAP target releases using 7-Mode Transition Tool 3.3.1.

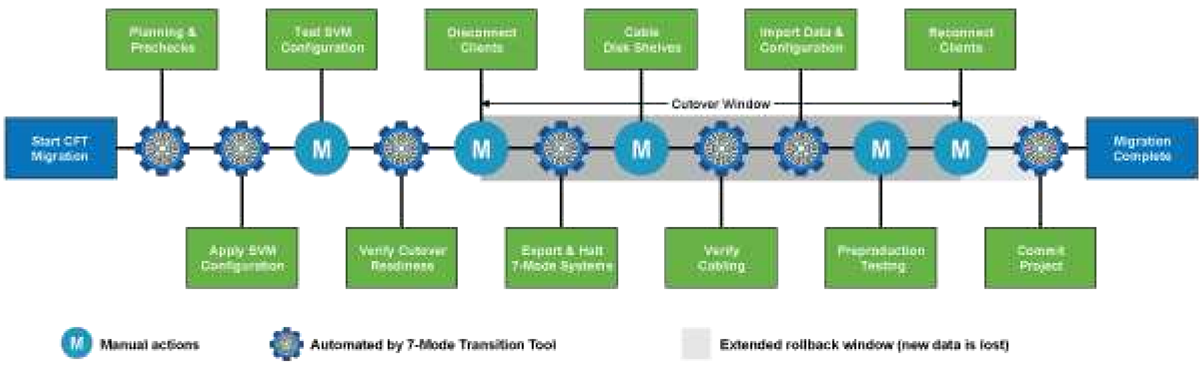
- ONTAP 9.4 and earlier ONTAP 9 releases.
- Clustered Data ONTAP 8.3.2 and later 8.x releases.

> You cannot use the 7-Mode Transition Tool to transition to ONTAP 9.5 or later using the copy-free method. To do so, you must first transition to ONTAP 9.4 using 7-Mode Transition Tool 3.3.1 and then upgrade your cluster to ONTAP 9.5 or later. 7-Mode Transition Tool 3.3.2 does not support copy-free transitions.

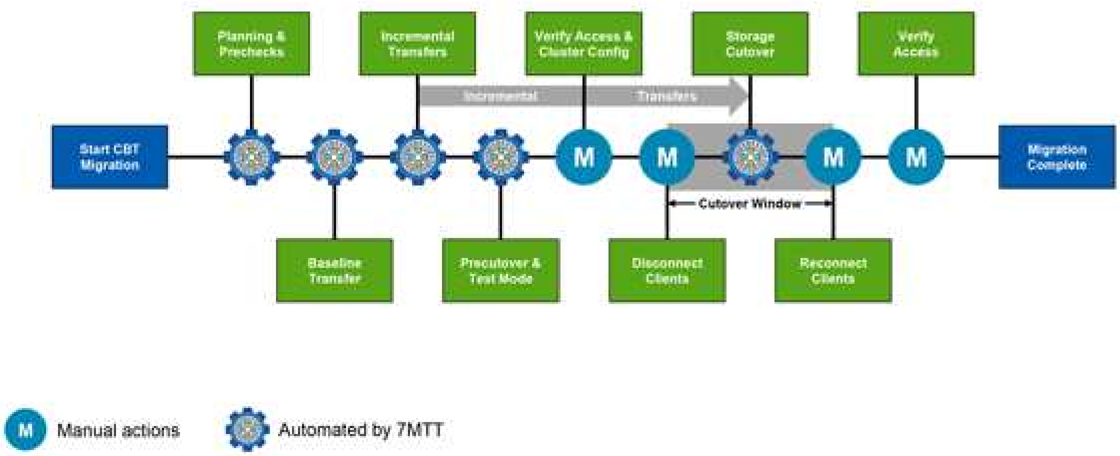
7-Mode Transition Tool transition phases

You can use the 7-Mode Transition Tool (7MTT) to perform a copy-free transition (CFT) or a copy-based transition (CBT) from Data ONTAP operating in 7-Mode to clustered Data ONTAP. You must know the phases of each transition method so that you also understand when to perform the specific remediation steps required for your hosts.

The CFT phases are as follows:



The CBT phases are as follows:



VMware ESXi host remediation

If you are using the 7-Mode Transition Tool (7MTT) to move from Data ONTAP operating in 7-Mode to clustered Data ONTAP in a SAN environment, you must perform a series of steps on your VMware ESXi hosts before the Data ONTAP transition. You must power down your hosts before cutover and you must perform another series of steps after transition before you can begin servicing data.

Related information

Testing transitioned LUNs and ESXi host applications before the cutover phase of copy-based transitions

Post-transition remediation requirements for ESXi hosts

ESXi versions and features supported for SAN transitions using 7MTT

Only certain versions and features of ESXi are supported for SAN transitions using the 7-Mode Transition Tool (7MTT).

The following versions and features are supported as listed in the NetApp Interoperability Matrix Tool

- ESXi 5.0, 5.1, 5.5, and later

  You must upgrade hosts running ESX/ESXi 4.x or earlier to ESX/ESXi 5.0 or later to transition them.

- VMFS3 and VMFS5 datastores
- SAN boot configurations
- RDM (RAW device map) devices
- All Guest OS supported in the Interoperability Matrix
- All SAN protocols (FC/FCoE/iSCSI)

Preparing for transition of ESXi hosts

You must complete several prerequisite tasks before you use the 7-Mode Transition Tool (7MTT) to transition your ESXi hosts from Data ONTAP operating in 7-Mode to ONTAP.

Steps

1. Configure clustered Data ONTAP as described in the 7-Mode Transition Tool Copy-Based Transition Guide or the 7-Mode Transition Tool Copy-Free Transition Guide based on the type of transition that you are performing.
2. Gather the following information for the ESXi hosts that you are transitioning:
   - IP address
   - Host name
   - Authentication details
3. Complete the zoning between FC or FCoE hosts and new clustered Data ONTAP nodes.

   You can use the Collect and Assess feature to generate the zoning plan.

4. Use the NetApp Interoperability Matrix Tool to verify that the following are supported for transition to clustered Data ONTAP:
   - Your version of Data ONTAP operating in 7-Mode

     In some cases, you might have to upgrade your version of Data ONTAP operating in 7-Mode to a 7MTT SAN compatible version. For example, Data ONTAP 7.3.7 operating in 7-Mode is not compatible for transitions using the 7MTT. If you are running this version, you must upgrade it before initiating transition.

  - Your ESXi host configuration
  - Your HBA driver and firmware

    For iSCSI, only software initiators are supported. For FC and FCoE, only QLogic and Emulex initiators are supported. If your ESXi FC or FCoE initiator is not supported, you must upgrade to a version that is supported by clustered Data ONTAP as described in the Interoperability Matrix.

5. If configured, disable VMware high availability (HA) and Distributed Resource Scheduler (DRS).

   VMware HA and DRS are not supported during transition.

Related information

Retaining resource pools when disabling VMware DRS clusters in the vSphere Web Client

Disabling VMware High Availability (HA)

What the Inventory Collect Tool is

The Inventory Collect Tool (ICT) is a stand-alone utility for collecting configuration and inventory information about 7-Mode storage controllers, hosts attached to controllers, and applications running on these hosts for assessing the transition readiness of these systems. You can use the ICT to generate information about your LUNs and the configuration that you need for transition.

The ICT generates an *Inventory Assessment Workbook* and an Inventory Report XML file that contains configuration details of the storage and host systems.

The ICT is available for ESXi, 5.x, ESXi 6.x, and Windows hosts.

Preparing Linux guest operating systems for transition

If have 7-Mode LUNs mapped as physical compatible RDM (PTRDM) to Linux virtual machines (VMs) for the boot device, there are steps you must perform to prepare your Linux VMs for transition.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. Obtain the SCSI device serial numbers:

   `cat /boot/grub/menu.lst`

   In the following example, 360a9800032466879362b45777447462d-part2 and 360a9800032466879362b45777447462d-part1 are SCSI device numbers:

```
# cat /boot/grub/menu.lst
...
kernel /boot/vmlinuz-3.0.13-0.27-default root=/dev/disk/by-id/scsi-
360a98000324668793 62b45777447462d-part2 resume=/dev/disk/by-id/scsi-
360a98000324668793 62b45777447462d-part1
```

2. Determine the mapping between the SCSI device serial numbers and SCSI devices/partitions:

   `# ls -l /dev/disk/by-id`

   The following example shows how the relationship mapping is displayed. The `SCSI devices/partitions` are displayed following the `SCSI device/partition serial numbers`. In this example, `../../sda, ../../sda1, and ../../sda2` are SCSI devices/partitions.

```
lrwxrwxrwx 1 root root 9 Oct 27 06:54 scsi-
360a98000324668793 62b45777447462d -> ../../sda
   lrwxrwxrwx 1 root root 10 Oct 27 05:09 scsi-
360a98000324668793 62b45777447462d-part1 -> ../../sda1
   lrwxrwxrwx 1 root root 10 Oct 27 02:21 scsi-
360a98000324668793 62b45777447462d-part2 -> ../../sda2
```

3. Determine the mapping between the SCSI device paths and the UUIDs:

   `ls -l /dev/disk/by-uuid`

   The following example shows how the relationship mapping is displayed. In this example, `33d43a8b-cfae-4ac4-9355-36b479cfa524` is the UUID for SCSI device/partition sda2`, `603e01f8-7873-440a-9182-878abff17143` is the UUID for SCSI device/partition sdb, and `c50b757b-0817-4c19-8291-0d14938f7f0f` is the UUID for SCSI device/partition sda1.

```
 lrwxrwxrwx 1 root root 10 Oct 27 02:21 33d43a8b-cfae-4ac4-9355-
36b479cfa524 -> ../../sda2
   lrwxrwxrwx 1 root root 9 Oct 27 06:54 603e01f8-7873-440a-9182-
878abff17143 -> ../../sdb
   lrwxrwxrwx 1 root root 10 Oct 27 05:09 c50b757b-0817-4c19-8291-
0d14938f7f0f -> ../../sda1
```

4. Use the UUID to update the device reference in the grub boot `menu.lst` file by matching it with the SCSI device path and SCSI serial number.

```
#blkid
/dev/sda1: UUID="c50b757b-0817-4c19-8291-0d14938f7f0f" TYPE="swap"
/dev/sda2: UUID="33d43a8b-cfae-4ac4-9355-36b479cfa524" TYPE="ext3"
/dev/sdb: UUID="603e01f8-7873-440a-9182-878abff17143" SEC_TYPE="ext2"
TYPE="ext3"
```

5. Use the UUID you just retrieved to update the device reference in the grub boot `menu.lst` file.

   The following example shows the `menu.lst` file after it has been updated:

```
# Modified by YaST2. Last modification on Fri Oct 17 02:08:40 EDT 2014
default 0
timeout 8
##YaST - generic_mbr
gfxmenu (hd0,1)/boot/message
##YaST - activate
###Don't change this comment - YaST2 identifier: Original name: linux###
title SUSE Linux Enterprise Server 11 SP2 - 3.0.13-0.27
root (hd0,1)
kernel /boot/vmlinuz-3.0.13-0.27-default root=/dev/disk/by-
uuid/e5127cdf-8b30-
418e-b0b2-35727161ef41 resume=/dev/disk/by-uuid/d9133964-d2d1-4e29-b064-
7316c5ca5566
splash=silent crashkernel=128M-:64M showopts vga=0x314
initrd /boot/initrd-3.0.13-0.27-default
```

6. Update the `/etc/fstab` file:

   a. Use the UUID you just retrieved to update the device reference in the `/etc/fstab` file.

      The following example shows an `/etc/fstab` file with a SCSI serial number:

```
/dev/disk/by-id/scsi-360a9800032466879362b45777447462d-part1 swap
swap
defaults 0 0
/dev/disk/by-id/scsi-360a9800032466879362b45777447462d-part2 / ext3
acl,user_xattr 1 1
proc /proc proc defaults 0 0
sysfs /sys sysfs noauto 0 0
debugfs /sys/kernel/debug debugfs noauto 0 0
devpts /dev/pts devpts mode=0620,gid=5 0 0
```

   b. Replace the reference to the SCSI serial number with the UUID.

The following example shows an `/etc/fstab` file that has been updated to replace the SCSI serial number with the UUID:

```
cat /etc/fstab
UUID="c50b757b-0817-4c19-8291-0d14938f7f0f swap swap defaults
0 0
UUID="33d43a8b-cfae-4ac4-9355-36b479cfa524 / ext3 acl,user_xattr
1 1
proc /proc proc defaults 0 0
sysfs /sys sysfs noauto 0 0
debugfs /sys/kernel/debug debugfs noauto 0 0
devpts /dev/pts devpts mode=0620,gid=5 0 0
```

Preparing Windows guest operating systems for transition

If your Windows VMs use physical compatible RDM (PTRDM) devices, you must take the disks offline on the Windows VM before transition. You can use Disk Manager to take the disks offline.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

How to identify VM snapshots that must be removed before transition

Snapshots virtual machines (VMs) with Virtual RDM attached do not survive transition from Data ONTAP operating in 7-Mode to clustered Data ONTAP. These snapshots must be removed before transition. Snapshots of VMs with only VMFS vDisks and Physical RDM (PTRDM) do survive transition and do not have to be removed.

You can use the *Inventory Assessment Workbook* generated by the Inventory Collect Tool to identify all VMs with Virtual RDMs attached. Snapshots listed in the *Inventory Assessment Workbook* under the VM Snapshots column and the NPTRDM column with a value greater than 0 are VMs that have a Virtual RDM attached with VM snapshots.

Deleting VM snapshots copies using vSphere Client

If you are not familiar with the ESXi CLI or if it is more convenient for your environment, you can delete Virtual Machine (VM) snapshots using vSphere Client.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. Open the ESXi host or vCenter Server managing the ESXi host.
2. Right-click the VM from which you need to remove snapshots.
3. Open the **Snapshot** > **Snapshot Manager** Snapshots window.
4. Click **Delete All**.

Removing VM snapshots using the ESXi CLI

You can choose to use the ESXi CLI to remove the snapshots if you are using the Host Remediation Tool (HRT), or if you prefer the flexibility of CLI usage.

You must have the VMID from the Host VMs tab in the *Inventory Assessment Workbook* generated by the 7-Mode Transition Tool (7MTT).

Steps

1. Use SSH to log in to the ESXi console.
2. Remove all VM snapshots of the VM with the applicable VMID:

   ```
   # vim-cmd vmsvc/snapshot.removeall VMID
   ```

After deleting snapshots, you must regenerate the *Inventory Assessment Workbook* to collect information related to Data ONTAP operating in 7-Mode and your ESXi hosts.

Testing transitioned LUNs and ESXi host applications before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to transition an ESXi host, you can test your transitioned clustered Data ONTAP LUNs to verify that you can bring your host and applications online before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

- The new test host must be provisioned in a new test environment.

  To avoid IP/MAC or UUID duplication or conflicts, test hosts must be configured in a private network.

- If you are transitioning a host booted from a local hard disk, the test host must have the same ESXi version and drivers as the source host.
- Zoning must be complete between FC or FCoE hosts and new clustered Data ONTAP nodes.
- Zoning must not exist between the source host and the new clustered Data ONTAP host.

  If transitioned clustered Data ONTAP LUNs are visible to the source host during test mode, you might experience unexpected service disruptions on the source host.

- If you are transitioning a SAN booted host, your network adapter must be disabled.

You must maintain hardware parity between the test host and the source host and you must perform the following steps on the test host:

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. Zone the clustered Data ONTAP nodes on the test host.
4. Log in to the clustered Data ONTAP node, and then add new test host initiators to the igroup created by the 7MTT during the test phase.
5. Navigate to `C:\Program Files\NetApp\operating in 7-Mode Transition Tool\`.
6. Generate the 7-Mode to clustered Data ONTAP LUN mapping file from the Linux host where the 7MTT is installed:

   `transition cbt export lunmap -p` *`project-name`* `-o` *`file_path`*

   For example:

   `transition cbt export lunmap -p SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv`

7. Bring the test host online.
   - Reconfigure your VMware software iSCSI initiator after transition
   - Set up your ESXi hosts configured for SAN boot after transition
8. Verify that all transitioned clustered Data ONTAP LUNs are discovered.
9. If you are transitioning a non-SAN booted host, reregister your VMs.

   Re-registering VMs after transition of ESXi host.

10. Complete the necessary post-transition steps for ESXi hosts.

    Post transition requirements for ESXi hosts

11. Bring the host and applications online.
12. Perform your testing as needed.
13. Shut down the test host.
14. In the 7MTT UI, click **Finish Testing**.

    The new clustered Data ONTAP LUNs are now read-only, and the data from the source 7-Mode LUNs is resynchronized.

15. If you plan to use the same source after you complete your transition, then edit the igroup on the clustered Data ONTAP node to add the appropriate initiator.

    If you are planning to promote your test host to production, then you do not need to edit the igroup.

After you complete your test, plan time to shut down the source host connected to your controllers running Data ONTAP operating in 7-Mode. When you click **Complete Transition**, your source 7-Mode volumes and LUNs go offline and the transitioned clustered Data ONTAP LUNs become read/write.

Related information

Copy-based transition

Downtime at apply configuration (precutover) phase of ESXi host transition

You must plan for downtime at the apply configuration (precutover) phase while transitioning ESXi hosts.

After you complete the prerequisites for ESXi host transitions, you can use the 7-Mode Transition Tool (7MTT) to transition your LUNs from Data ONTAP operating in 7-Mode to ONTAP. ESXi hosts, VMs, and applications can be online until the apply configuration (precutover) phase of the 7MTT transition. However, at the apply configuration (precutover) phase, all applications and guest operating systems must be powered down. If ESXi hosts are SAN booted, or if SAN booted LUNs are part of the transition, the ESXi hosts must also be powered down at the apply configuration (precutover) phase.

If the host is not SAN booted and you need to keep your service running to non-transitioning LUNs or array LUNs that are not made by NetApp, you can choose not to shut it down. However, if you do not shut it down, you might experience the all-paths-down (APD) condition. To avoid the APD condition, you can mask Data ONTAP operating in 7-Mode LUNs. See the VMware Knowledgebase ID 1009449 for more information.

Post-transition remediation requirements for ESXi hosts

After you transition LUNs for ESXi hosts from Data ONTAP operating in 7-Mode to clustered Data ONTAP using the 7-Mode Transition Tool (7MTT), you must perform a series of remediation tasks to bring your LUNs online and begin servicing data.

Related information

Preparing for post-transition ESXi host remediation

Reregistering VMs after transition on non-SAN boot ESXi hosts using vSphere Client

Setting up ESXi hosts configured for SAN boot after transition

Determining whether VMFS volumes need to be remounted after transition

Reattaching RDM LUNs to VMs

Enabling CAW on a datastore using the ESXi CLI

Post-transition remediation for Linux and Windows guest operating systems

Recommended settings for ESXi hosts after transition remediation

Preparing for post-transition ESXi host remediation

After the 7-Mode Transition Tool (7MTT) transition is complete, you must perform various ESXi host remediation tasks. There are several steps you must complete before you can perform those tasks.

- For copy-based transitions (CBTs), perform these steps before initiating the Storage Cutover operation in the 7MTT.
- For copy-free transitions (CFTs), perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. Generate the 7-Mode to ONTAP LUN mapping file:
   - For CBTs, run the following command from the Linux host where 7MTT is installed:

     transition cbt export lunmap -p *project-name* -o *file_path*

     For example:

     transition cbt export lunmap -p SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv

   - For CFTs, run the following command from the system where the 7MTT is installed:

     transition cft export lunmap -p *project-name* -s *svm-name* -o *output-file*

     For example:

     transition cft export lunmap -p SanWorkLoad -s svm1 -o c:/Libraires/Documents/7-to-C-LUN-MAPPING-svm1.csv

     > You must run this command for each of your storage virtual machines (SVMs).

2. Verify that igroup and initiator mappings are present.

   7MTT re-creates the same igroup with initiators used in Data ONTAP operating in 7-Mode, and remaps the clustered Data ONTAP LUN to the host.

3. Verify that zoning is appropriate for the new clustered Data ONTAP target.
4. If you are doing a copy-free transition (CFT), run `vol rehost`.

   See the 7-Mode Transition Tool Copy-Free Transition Guide for `vol rehost` procedures.

Reregistering VMs after transition on non-SAN boot ESXi hosts using vSphere Client

After you transition a non-SAN booted host, you must reregister your Virtual Machines (VMs).

The host must be online and the LUNs must be discovered.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool.
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. Open the *Inventory Assessment Workbook* generated by the Inventory Collect Tool (ICT).
2. Navigate to the Host VMs tab, and then record the **VM Config File** path and **Location/Datastore Name** of the VM.
3. Use vSphere Client to log in to the ESXi host or the vCenter Server managing the ESXi host.
4. Under **Host and Clusters**, select the ESXi host.

5. Navigate to **Configuration** > **Hardware** > **Storage**.
6. Select the datastore with the datastore name you previously noted.
7. Right click and select **Browse Datastore**.

   The Datastore Browser window opens.

8. Navigate to the **VM Config File** path you previously noted.
9. Right click the `.vmx `file, and then select **Add To Inventory**.
10. Repeat these steps for each VM listed in the **Host VMs** tab in the *Inventory Assessment Workbook* generated by the ICT.

Reconfiguration of VMware software iSCSI initiator after transition

If your ESXi host accessed your Data ONTAP operating in 7-Mode system with the VMware software iSCSI initiator, then after transition from 7-Mode to clustered Data ONTAP, you must reconfigure the VMware software iSCSI initiator on your ESXi host and enable it to discover the new clustered Data ONTAP target.

For copy-based transitions, you must reconfigure your VMware software iSCSI initiator before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT). For copy-free transitions, you must reconfigure your VMware software iSCSI initiator before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

During the reconfiguration, you must retrieve the iSCSI IP and IQN used by the new clustered Data ONTAP target. If the target IP subnet has changed, the respective IP subnet changes are required on the host iSCSI initiator ports as well.

To make the required changes to the software iSCSI initiator on the VMware ESXi host, see the *VMWare vSphere ESXi5.x Storage Guide*.

Related information

System administration

Setting up ESXi hosts configured for SAN boot after transition

If your ESXi host was configured for SAN boot before transition from Data ONTAP operating in 7-Mode, you must perform several steps before using the host after transition.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7MTT.
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. Reconfigure your FC and FCoE HBA BIOS to boot from the SAN boot LUN of the clustered Data ONTAP system.
2. Boot the ESXi host.

3. Reset the host configurations to the pretransition settings.
4. For iSCSI hosts, see how to reconfigure your VMware iSCSI initiator.

   Reconfigure your VMware iSCSI initiator

5. Remount the VMFS datastores created from the boot LUN in the default installation.

Related information

Remounting VMFS volumes after transition using vSphere Client

Remounting VMFS volumes after transition using the ESXi CLI

SAN administration

Determining whether VMFS volumes need to be remounted after transition

After transitioning from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you might have VMFS volumes that need to be remounted to bring VMFS datastores and VMs to their pretransition states.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. Open the *Inventory Assessment Workbook* generated by the Inventory Collect Tool (ICT).
2. Click the **SAN Host Filesystems** tab.
3. Check the **Drive / Mount / Datastore Name** column for the filesystems and datastores mounted on the host before transition.
4. Make a note of the corresponding LUN naa IDs in the **SCSI Device ID/Device Name** column for the datastore.
5. Check whether the naa IDs noted for the datastore are listed in the 7MTT mapping file that was generated after the transition.
   - If none of the naa IDs are present in the 7MTT mapping file, the datastore and its underlying LUNs were not part of the 7MTT transition and no remediation is required.
   - If only part of the naa IDs are present in the 7MTT mapping file, your transition is incomplete and you cannot proceed.
   - If all naa IDs are present, you must remount your VMFS volumes.

Related information

Remounting VMFS volumes after transition using vSphere Client

Remounting VMFS volumes after transition using the ESXi CLI

What the Inventory Collect Tool is

Remounting VMFS volumes after transition using vSphere Client

After transition, you must remount your VMFS volumes to bring your datastores and virtual machines (VMs) to their pretransition states. If you are not familiar with the ESXi CLI or it is more convenient in your environment, you can use vSphere Client to remount your volumes.

These steps apply to volumes and spanned volumes.

Steps

1. Log in to the ESXi host or the vCenter Server managing the ESXi host.
2. Under **Hosts and Clusters**, select the ESXi host.
3. Navigate to **Configuration** > **Hardware** > **Storage**.
4. In the upper-right corner, click **Add storage**.
5. Select **Disk/LUN**.
6. Click **Next**.
7. In the list of LUNs, locate the **VMFS_label** column displaying the name of the datastore.
8. Select the LUN to complete the remount operation.

   If you are remounting a spanned VMFS volume, the first LUN in the span is marked “head”. You must select the “head” LUN to complete the remount operation.
9. Click **Next**.
10. In the Select VMFS Mount Options window, select **Keep the existing signature**.
11. Complete the wizard.
12. Repeat these steps for all of the LUNs displaying the datastore name in the VMFS_label column.

    Datastores are remounted and VMs are active.

Remounting VMFS volumes after transition using the ESXi CLI

After transition, you can use the ESXi CLI to remount your volumes and bring your datastores and VMs to their pretransition states.

The original 7-Mode LUN must be unmapped or offline.

These steps apply to volumes and spanned volumes.

Steps

1. Log in to the ESXi console using SSH.
2. List the newly added LUNs with existing VMFS signatures and VMFS labels:

   ```
   # esxcfg-volume -l
   ```

   The following is an example of the LUNs listed with VMFS signatures and VMFS labels.

```
# esxcfg-volume -l
VMFS UUID/label: 53578567-5b5c363e-21bb-001ec9d631cb/datastore1
Can mount: Yes
Can resignature: Yes
Extent name: naa.600a098054314c6c445d446f79716475:1 range: 0 - 409599
(MB)
```

3. Remount the VMFS volumes persistently with the same signature:
   - For regular volumes:

     esxcfg-volume -M|--persistent-mount *VMFS UUID|label*
   - For spanned volumes:

     # esxcfg-volume -M vmfs-span-ds

Related information

VMware KB: vSphere handling of LUNs detected as snapshot LUNs

Reattaching RDM LUNs to VMs

For VMs attached to Raw Device Mapped (RDM) LUNs to function after transition, you must remove the RDM disks hosting the LUN from the VM. Then you must reattach the RDM disks to the VM based on the LUN serial number provided by the 7-Mode Transition Tool (7MTT).

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7MTT.
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. In the *Inventory Assessment Workbook*, navigate to the **Host VM Disk Details** tab.
2. Identify the ESXi host VM with PTRDM or NPTRDM in the **Type** column.
3. Note the VM name, the disk path details in the **Disk** column, and the naa ID from the **Device Mapped** column.
4. Verify that the naa ID is listed in the 7MTT mapping file that was generated after transition.
5. Verify that the naa ID has a corresponding new naa ID in the **LUN WWID** column of the mapping file.

   This is the new clustered Data ONTAP LUN naa ID.
6. Use the clustered Data ONTAP LUN naa ID from the **LUN WWID** column and the disk path details to reattach the clustered Data ONTAP LUN to the VM.

Related information

Removing stale RDMs using vSphere Client

[Reattaching RDM to VMs using vSphere Client](#)

[Reattaching RDM using ESXi the CLI/console](#)

Removing stale RDMs using vSphere Client

All RDM LUNs become stale during the transition from ONTAP operating in 7-Mode to clustered Data ONTAP. After transition, the RDMs must be removed and reattached before the LUNs can begin servicing data.

You must have the VM name and disk path of the RDM from the *Inventory Assessment Workbook*.

Steps

1. Open the ESXi host or vCenter Server managing the ESXi host.
2. Right-click the VM, and then select **Edit Settings**.

   The VM Properties window is displayed.

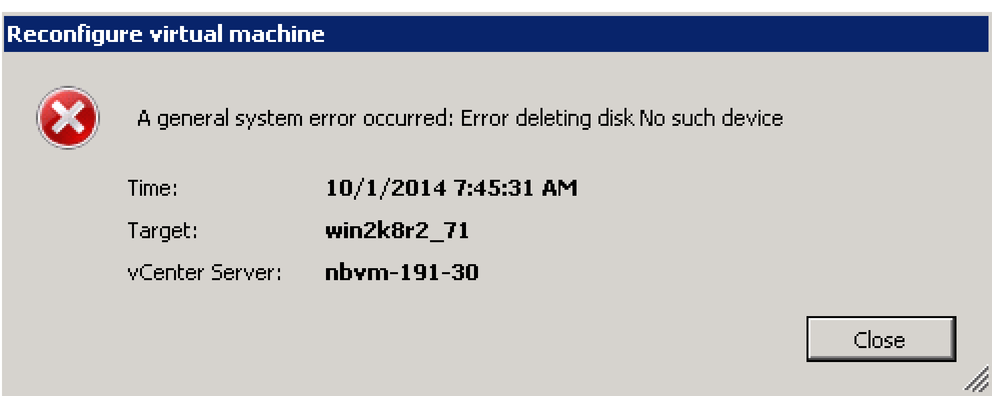
3. Select the hard disk from the list of devices using the disk path from the *Inventory Assessment Workbook*.
4. Make note of the **Virtual Device Node** and **Compatibility Mode** from the VM Properties window.

   Virtual Device Node: SCSI 0:2

   Compatibility Mode: Physical

5. Click **Remove**.
6. Select **Remove from virtual machine and delete files from disk**.
7. Click **OK**.

   An error message similar to the following appears. You can ignore this message.

8. Click **Close**.

Reattaching RDM to VMs using vSphere Client

After transition of an ESXi host using the 7-Mode Transition Tool (7MTT), you must reattach your RDMs to virtual machines (VMs).

Your stale Raw Device Mappings (RDMs) must have been removed.

Steps

1. Open the ESXi host or vCenter server managing the ESXi host.
2. Right-click the VM, and then select **Edit Settings**.

   The VM Properties window opens.

3. Click **Add**.

   The Add Hardware window opens.

4. Click **Hard Disk**.
5. Click **Next** to select the disk.
6. Select **Raw Device Mappings**.
7. Click **Next** to select the target LUN.
8. Select the LUN with the new clustered Data ONTAP NAA ID that you noted from the 7MTT mapping file.
9. Click **Next**.
10. Choose **Select Datastore**.
11. Select the datastore that matches the disk path that you noted in the 7MTT mapping file.
12. Click **Next**.
13. Choose either **Physical** or **Virtual** for the **Compatibility Mode**.

    Choose the compatibility mode noted when your stale RDM was removed.

14. Click **Next**.
15. Choose **Advance Options**.
16. Select the **Virtual Device Node**.

    Select the virtual device mode that you noted when you removed the stale RDM.

17. Click **Next**.
18. Click **Finish** to submit your changes.
19. Repeat the steps for all VMs with RDM attached.

Related information

Removing stale RDMs using vSphere Client

Reattaching RDM using ESXi the CLI/console

After transition from Data ONTAP operating in 7-Mode to clustered Data ONTAP you must reattach your raw device mapping (RDM).

- You must retrieve the RDM disk file listed in the Disk column of the *Inventory Assessment Workbook*.
- You must retrieve the new clustered Data ONTAP LUN naa ID from the 7MTT mapping file.

Steps

1. Log in to the ESXi console using SSH.

2. Use the mv command to make a backup of the RDM disk file and the associated device file.

   The RDM disk file is listed in the Disk column of the *Inventory Assessment Workbook*.

   If the RDM disk file is `/vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-win-bus-A/VM2-winbus-A.vmdk`, you would issue the following command:

   mv /vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-win-bus-A/VM2-winbus-A.vmdk /vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-win-bus-A/VM2-win-bus-A.vmdk _bak

   - For physical compatibility RDM (PTRDM):

     mv *RDM_disk_file_name*-rdmp.vdmk *RDM_disk_file_name*-rdmp.vdmk_bak

     For example:

     mv/vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-win-bus-A/VM2-winbus-A-rdmp.vmdk/vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-winbus-A/VM2-win-bus-A-rdmp.vmdk _bak

   - For virtual compatibility RDM (NPTRDM):

     mv *RDM_disk_file_name*-rdmp.vdmk *RDM_disk_file_name*-rdmp.vdmk_bak

     For example:

     mv/vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-win-bus-A/VM2-winbus-A-rdmp.vmdk/vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-winbus-A/VM2-win-bus-A-rdmp.vmdk _bak

3. Use the new clustered Data ONTAP LUN naa ID and the RDM disk file to re-create the RDM configuration and device files.

   - For PTRDM:

     # vmkfstools –z /vmfs/devices/disks/*new_clustered_Data_ONTAP_naa_ID*.vmdk

     For example:

     vmkfstools –z /vmfs/devices/disks/naa.600a098054314c6c442b446f79712313 /vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-win-bus-A/VM2-win-bus-A.vmdk

   - For NPTRDM:

     # vmkfstools –r /vmfs/devices/disks/*new_clustered_Data_ONTAP_naa_ID*.vmdk

     For example:

     vmkfstools –r /vmfs/devices/disks/naa.600a098054314c6c442b446f79712313 /vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-win-bus-A/VM2-win-bus-A.vmdk

4. Confirm that the configuration and pointer files are created:

   # ls /vmfs/volumes/*datastore*/*VM_directory*

   #ls /vmfs/volumes/53a3ac3d-df5aca03-3a94-001ec9d631cb/VM2-win-bus-A

   The new configuration and pointer files are displayed under the VM directory path.

5. Repeat the steps for all VMs with RDM attached.
6. Restart the hostd and vpxa agents in the ESXi host:

   /etc/init.d/hostd/restart

   /etc/init.d/vpxa/restart

Post-transition remediation for Linux and Windows guest operating systems

Linux and Windows guest operating systems might require additional remediation after transition of LUNs from Data ONTAP operating in 7-Mode to clustered Data ONTAP.

For copy-based transitions, do the following after completing the Storage Cutover operation in the 7MTT. For copy-free transitions, do the following after the Import Data & Configuration operation in the 7MTT is complete.

- Linux

  If the mount points are defined in the `/etc/fstab `file, you must mount the LUN (`mount --a`).

- Windows

  If Failover Cluster is configured on the VM, you must bring the disks online from Failover Cluster Manager.

Recommended settings for ESXi hosts after transition remediation

After you complete the post-transition remediation steps for your ESXi host, you should apply the recommended ESXi host settings for clustered Data ONTAP on the host.

You can use Virtual Storage Console (VSC) to configure ESXi host settings. VSC is the standard NetApp plug-in that enables vSphere vCenter to configure ESXi host settings for Data ONTAP. ESXi hosts and virtual machines (VMs) deployed on the source 7-Mode system should be configured using VSC. Alternatively, you can configure VMs manually by using the information in the following Knowledgebase articles:

- *Guest OS tunings*
- *Task Set Full (QFull) Tunables for LUNs in vSphere 5.1*
- *Storage Array Type Plugin option for a NetApp array on VMware vSphere*
- *HardwareAcceleratedLocking setting required for VMware deployment*

Enabling CAW on a datastore using the ESXi CLI

If you did not have support for Compare and Write (CAW) in Data ONTAP operating in 7-

Mode, you must manually enable CAW support when you transition to clustered Data ONTAP. Clustered Data ONTAP supports CAW by default.

- There must be no I/O or VMs actively running on the VMFS datastore.
- The datastore must be remounted, if it was migrated.
- You must have the new ONTAP LUN naa ID from the 7-Mode Transition Tool (7MTT) mapping file.

CAW must be enabled only when no I/O or VMs are actively running on the VMFS datastore.

- CAW must be enabled only when no I/O or VMs are actively running on the VMFS datastore.
- For copy-based transitions, perform these steps after completing the Storage cutover operation in the 7MTT.
- For copy-free transitions, perform these steps after the Import Data & Configuration operation in the 7MTT is complete.

Steps

1. Open the *Inventory Assessment Workbook* generated by the Inventory Collect Tool (ICT).
2. Navigate to the SAN Host Filesystems tab.
3. Verify the CAW status for the datastore.

   The **ATS/CAW** value for the datastore should display **Disabled**, and the Filesystem column should display **VMFS.x**.

4. Note the name of the datastore in the Disk column
5. Log in to the ESXi console using SSH.
6. List the device and partition details:

   ```
   ~ # vmkfstools -Ph -v1 datastore_path
   ```

   datastore_path is the datastore name from the Disk column of the *Inventory Assessment Workbook*.

   ```
   # vmkfstools -Ph -v1 /vmfs/volumes/datastorename
   ```

```
VMFS-5.60 file system spanning 1 partitions.
File system label (if any): datastorename
Mode: public
Capacity 9.8 GB, 8.2 GB available, file block size 1 MB, max file size
64
TB
Volume Creation Time: Mon Dec 9 10:29:18 2013
Files (max/free): 27408/27394
Ptr Blocks (max/free): 64512/64495
Sub Blocks (max/free): 3968/3964
Secondary Ptr Blocks (max/free): 256/256
File Blocks (overcommit/used/overcommit %): 0/1593/0
Ptr Blocks (overcommit/used/overcommit %): 0/17/0
Sub Blocks (overcommit/used/overcommit %): 0/4/0
Volume Metadata size: 590675968
UUID: 52a59b7e-52d2fb6c-11d6-001ec9d631cb
Partitions spanned (on "lvm"):
naa.600a098044314c6c442b446d51376749:1
naa.600a098054314c6c445d446f79716431:1
naa.600a098054314c6c445d446f79716433:1
Is Native Snapshot Capable: YES
```

7. Note the first device name and partition number.

   In the preceding example, `naa.600a098044314c6c442b446d51376749:1` is the device name and partition number.

8. Use the device ID and partition number to enable CAW on the datastore:

   `~# vmkfstools --configATSOnly 1 /vmfs/devices/disks/`*`device-ID:Partition`*

9. Verify that the VMFS volume has been configured with ATS only:

   `# vmkfstools -Ph -v1 /vmfs/volumes/VMFS-volume-name`

```
VMFS-5.54 file system spanning 1 partitions.
File system label (if any): ats-test-1
Mode: public ATS-only
```

Related information

Remounting VMFS volumes after transition using vSphere Client

Remounting VMFS volumes after transition using the ESXi CLI

VMware documentation

RHEL host remediation

If you are using the 7-Mode Transition Tool (7MTT) to move from Data ONTAP operating in 7-Mode to clustered Data ONTAP in a SAN environment, you must perform a series of steps on your Red Hat Enterprise Linux (RHEL) hosts based on your LUN type before and after the transition to avoid transition complications.

7MTT transitions only support RHEL 5 and RHEL 6.

Related information

Transitioning RHEL DMMP devices without file systems

Transitioning LUNs with mount points using DMMP device names

Transitioning LUNs with mount points using DMMP alias names

Transitioning Linux host file systems on LVM devices

Transitioning of SAN boot LUNs

Gathering pretransition information from the Inventory Assessment Workbook

There is information in the *Inventory Assessment Workbook* that you need in various phases of the transition. You should gather and record this information before you begin the transition so that you can reference it as needed throughout the process.

Steps

1. Use the Inventory Collect Tool (ICT) to generate the *Inventory Assessment Workbook*.
2. Open the *Inventory Assessment Workbook*.
3. Go to the **LUN** tab.
4. In the **LUN name** column, identify and record the name of the LUN to be transitioned.
5. Go to the **SAN Host LUNs** tab.
6. In the **SCSI Device ID** column, identify and record the SCSI device name.
7. In the **OS Device ID** column, identify and record the DMMP device name for the LUN to be transitioned.
8. In the **Filesystems** column, identify and record the file system configured on the DMMP device.
9. In the **UUID** column, identify and record the UUID number for the LUN.
10. In the **Mount** column, identify and record the directory on which the DMMP device is mounted.
11. Go to the **LVMs** tab.
12. In the **Physical Volume Name** column, identify and record the DMMP devices that are used by the logical volume.
13. Go to the **SAN Host LVMs** tab.
14. In the **Volume Group Name** column, identify and record the volume group.
15. In the **Logical Volume Path** column, identify and record the logical volume.
16. Go to the **SAN Host Filesystems** tab.

17. In the **Filesystem** column, identify and record the file system configured on the logical volume.
18. In the **Mount** column, identify and record the directory to which the logical volumes are mounted.
19. Go to the **GRUB Configuration** tab.
20. In the **initrd** column, identify and record the initrd image to be modified.
21. Go to the **SAN Host HBAs** tab.

    You can also see the **iSCSI SAN Interfaces** tab to identify the iSCSI IQN number and IP addresses that are configured on 7-Mode controllers.

22. In the **Target IPs (iSCSI)** column identify and record the iSCSI sessions for the 7-Mode controllers.

Related information

What the Inventory Collect Tool is

What the Inventory Collect Tool is

The Inventory Collect Tool (ICT) is a stand-alone utility for collecting configuration and inventory information about 7-Mode storage controllers, hosts attached to controllers, and applications running on these hosts for assessing the transition readiness of these systems. You can use the ICT to generate information about your LUNs and the configuration that you need for transition.

The ICT generates an *Inventory Assessment Workbook* and an Inventory Report XML file that contains configuration details of the storage and host systems.

The ICT is available for ESXi, 5.x, ESXi 6.x, and Windows hosts.

Transitioning RHEL DMMP devices without file systems

Before transition of a Red Hat Enterprise Linux (RHEL) DMMP device without a file system, you must verify that the DMMP device does not have a file system. You must also perform specific steps to prepare for the cutover phase, and after transition you must replace the WWID.

Related information

Verifying that RHEL LUNs are ready for transition using the Inventory Assessment Workbook

Verifying that RHEL 5 LUNs are ready for transition using the CLI

Verifying that RHEL 6 DDMP devices are ready for transition using CLI

Preparing for cutover when transitioning a Linux host DMMP device without a file system

Replacing 7-Mode LUN WWIDs on Linux hosts after transition of LUNs

Verifying that RHEL LUNs are ready for transition using the Inventory Assessment Workbook

If your Red Hat Enterprise Linux (RHEL) 5 or RHEL 6 LUN is configured with a device mapper multipath (DMMP), you should verify that a file system is not configured before you transition the LUN from Data ONTAP operating in 7-Mode to clustered Data ONTAP.

This procedure applies to copy-based transitions and copy-free transitions.

Steps

1. Gather pretransition information from the *Inventory Assessment Workbook*.
2. Check whether the DMMP device entry is present under the **SAN Host File system** tab.

   If the DMMP device entry is not present, a file system is not configured and you can transition the LUN.

Verifying that RHEL 5 LUNs are ready for transition using the CLI

If your Red Hat Enterprise Linux (RHEL) 5 LUN is configured with a device mapper multipath (DMMP), you should verify that a file system is not configured before you transition the LUN from Data ONTAP operating in 7-Mode to clustered Data ONTAP.

Steps

1. Locate the SCSI device name for the LUN to be transitioned:

   `sanlun lunshow`

2. Identify the DMMP device name for the LUN:

   `multipath -11`

   The DMMP device name can be a device handle ID (WWID) such as `360a980003753456258244538554b4b53`, or it can be an alias, such as, `dmmp_raw_lun`.

3. Verify that the LUN does not have a file system:

   `dumpe2fs/dev/mapper/`*`DMMP device name`*

   If the LUN does not have a file system, Couldn't find valid filesystem superblock is displayed in the output.

Verifying that RHEL 6 DDMP devices are ready for transition using CLI

Before you transition your Red Hat Enterprise Linux (RHEL) 6 DMMP device, you must verify that it is not part of a Logical Volume Manager (LVM) and that it does not have a file system.

Steps

1. Gather pretransition information from the *Inventory Assessment Workbook*.
2. Verify that the DMMP device exists in the `/dev/mapper` directory:

   `ls /dev/mapper/`*`DMMP_device_name`*

   If the DMMP device is not displayed, the device might be using an alias or a user-friendly name.

3. Determine whether the DMMP device is part of an LVM and whether the DMMP device has a file system:

blkid

If the DMMP device is not part of an LVM and has no file system the device entry should not be displayed in blkidoutput.

Testing DMMP devices without file systems on RHEL hosts before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to transition your Red Hat Enterprise Linux (RHEL) 5 host, you can test your transitioned clustered Data ONTAP LUNs to verify that you can bring your host and applications online before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your new clustered Data ONTAP LUNs must be mapped to your test host and your LUNs must be ready for transition.

You should maintain hardware parity between the test host and the source host and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. Rescan your new clustered Data ONTAP LUNs on the test host:

   rescan-scsi-bus.sh

4. Obtain the new SCSI device names for the clustered Data ONTAP LUNs:

   sanlun lun show

   In the following example, `/dev/sdl` is the SCSI device name for the `lun_dmmp_raw` LUN, and `/dev/sdk` is the SCSI device name for the `lun_dmmp_raw_alias` LUN:

```
[root@ibmx3550-229-108 /]# sanlun lun show
controller(7mode/E-Series)/
vserver (cDOT/FlashRay lun-pathname   filename
---------------------------------------------------------------------------------
vs_brb   /vol/dmmp_raw_vol/lun_dmmp_raw             /dev/sdl
vs_brb   /vol/dmmp_raw_alias_vol/lun_dmmp_raw_alias /dev/sdk
```

5. Obtain the device handle IDs (WWIDs) for the clustered Data ONTAP LUNs:

   /sbin/scsi_id -g-u-s /block/*SCSI_device_name*

   The following is an example of a WWID: “3600a09804d532d79565d47617679764d”

6. Check whether an alias is defined in the `/etc/multipath.conf` file on the source host.
7. If there is an alias defined on the source host, add the alias to the `/etc/multipath.conf` file on the test host, but replace the 7-Mode device handle ID with the clustered Data ONTAP LUN ID.
8. Update the DMMP alias settings:

   `multipath`

9. Verify that the DMMP alias name correctly references the clustered Data ONTAP LUN:

   `multipath -ll`

10. Perform your testing as needed.
11. After you have completed your testing, shut down the test host:

    `shutdown -h -t0 now`

12. In the 7MTT UI, click **Finish Testing**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Verifying that RHEL LUNs are ready for transition using the Inventory Assessment Workbook

Preparing for cutover when transitioning a Linux host DMMP device without a file system

Preparing for cutover when transitioning a Linux host DMMP device without a file system

If you are transitioning a DMMP device without a file system from a Linux host, there are several steps you must perform before entering the cutover phase.

For FC configurations, you must have fabric connectivity and zoning to clustered Data ONTAP controllers.

For iSCSI configurations, your iSCSI sessions must be discovered and logged in to your clustered Data ONTAP controllers.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode operation in 7MTT.

Steps

1. Stop I/O to the mount points.
2. Shut down the applications that are accessing the LUNs according to the application vendor's recommendations.
3. Flush the 7-Mode LUN DMMP device or alias:

   `multipath -f` ***`device_name`***

If needed, you can get the DMMP device name from the **OS Device ID** column under the SAN Host LUNs tab in the *Inventory Assessment Workbook*.

Replacing 7-Mode LUN WWIDs on Linux hosts after transition of LUNs

After LUN transition, the 7-Mode LUN WWID changes. You must replace it with the corresponding ONTAP LUN WWID before you can begin servicing data.

If you are doing a copy-free transition (CFT), then procedures for vol rehost must be complete.

See the [7-Mode Transition Tool Copy-Free Transition Guide]for details.

- For copy-based transitions (CBTs), perform these steps after completing the Storage cutover operation in the 7MTT.
- For CFTs, perform these steps after the Import Data & Configuration operation in the 7MTT is complete.

Steps

1. Generate the 7-Mode to ONTAP LUN mapping file:
   - For CBTs, run the following command from the Linux host where the 7MTT is installed:

     transition cbt export lunmap -p project-name -o *file_path*

     For example:

     transition cbt export lunmap -p SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv
   - For CFTs, run the following command from the system where the 7MTT is installed:

     transition cft export lunmap -p *project-name* -s *svm-name* -o *output-file*

     For example:

     transition cft export lunmap -p SanWorkLoad -s svml -0 c:/Libraries/Documents/7-to-C-LUN-MAPPING-svml.csv

     You must run this command for each of your storage virtual machines (SVMs).
2. Make a note of the new ONTAP LUN device handle ID from the LUN mapping file.
3. Remove the SCSI devices created for 7-Mode LUNs:
   - To remove all of the SCSI devices:

     rescan-scsi-bus.sh -r
   - To remove each SCSI device individually:

     echo 1> /sys/block/*SCSI_ID*/delete

     This command must be executed on all 7-Mode LUN SCSI devices. See the SCSI Device ID column on the SAN Host LUNs tab of the *Inventory Assessment Workbook* to identify the SCSI device IDs for the LUNs.

4. Discover new ONTAP LUNs:

   rescan-scsi-bus.sh

5. Identify the SCSI devices of the new ONTAP LUNs:

   sanlun lun show

6. Get the WWIDs for the new ONTAP LUNs:

   /lib/udev/scsi_id -g -u -d /dev *SCSI_dev*

7. If a DMMP alias is defined, then update the /etc/multipath.conf file to replace the 7-Mode LUN WWID with its corresponding ONTAP LUN WWID, so that the DMMP alias points to the clustered Data ONTAP LUN:

   cat /etc/multipath.conf

8. Configure the DMMP devices:

   multipath

9. Verify that the DMMP alias is correctly referencing the ONTAP LUN WWID:

   multipath -ll

   In the following sample output, the DMMP alias `dmmp_raw_lun` is referencing `3600a098051764b2d4f3f453135452d31` as the ONTAP WWID:

```
root@IBMx3550M3-229-169 ~]# multipath -ll dmmp_raw_lun
dmmp_raw_lun (3600a098051764b2d4f3f453135452d31) dm-8 NETAPP, LUN C-Mode
[size=1.0G] [features=3 queue_if_no_path pg_init_retries 50]
[hwhandler=1 alua] [rw]
\_round-robin 0 [prio=50][enabled]
 \_5:0:0:6 sdx  65:112 [active][ready]
    \_8:0:0:6 sdab 65:176 [active][ready]
\_round-robin 0 [prio=10][enabled]
 \_6:0:0:6 sdy  65:128 [active][ready]
    \_7:0:0:6 sdaa 65:160 [active][ready]
```

Transitioning LUNs with mount points using DMMP device names

Before transitioning a LUN with a mount point using a DMMP device name, you must replace the DMMP device name with its corresponding file system UUID number. You must perform specific steps to prepare for the cutover phase and you must remount the DMMP devices on the host after transition. You perform the same procedures for Red Hat Enterprise Linux (RHEL) 5 and RHEL 6.

Related information

Preparing RHEL LUNs with mount points using DMMP device names for transition using the Inventory Assessment Workbook

Preparing RHEL LUNs with mount points using DMMP alias names for transition using the CLI

Preparing for the cutover phase when transitioning LUNs with mount points using DMMP device names on Linux hosts

Remounting DMMP devices on Linux hosts after transition

Preparing RHEL LUNs with mount points using DMMP device names for transition using the Inventory Assessment Workbook

Before transition of a LUN with a mount point using a DMMP device name, you must replace the DMMP device name with its respective file system UUID number. This applies to Red Hat Enterprise Linux (RHEL) 5 and RHEL 6.

This procedure applies to copy-based transitions and copy-free transitions.

Steps

1. Gather pretransition information from the *Inventory Assessment Workbook*.

   Specifically, you need the following information:

   - The file system configured on the DMMP device
   - The directory on which the DMMP device is mounted
   - The file system UUID for the DMMP device

Steps

1. Verify that the mount points for the DMMP device are defined in the `/etc/fstab `file.
2. Create a backup of the file:

   ```
   cp /etc/fstab /etc/fstab_pre_transition
   ```

3. Edit the `/etc/fstab` file to replace the DMMP device name with its respective file system UUID number.

   In the following example, the DMMP device /dev/mapper/360a9800037534562572b453855496b41 is replaced by UUID a073547e-00b6-4bf9-8e08-5eef08499a9c:

```
[root@IBMx3550M3-229-169 ~]# cat /etc/fstab
/dev/VolGroup00/LogVol00 /   ext3   defaults   1 1
LABEL=/boot /boot  ext3     defaults         1 2
tmpfs   /dev/shm    tmpfs    defaults         0 0
devpts /dev/pts    devpts   gid=5, mode=620  0 0
sysfs   /sys        sysfs           defaults  0 0
proc    /proc       proc           defaults   0 0
/dev/VolGroup00/LogVol01 swap   swap  defaults 0 0
/dev/mapper/test_vg-test_lv /mnt/lvm_ext3 ext3 defaults,_netdev 0 0
UUID=a073547e-00b6-4bf9-8e08-5eef08499a9c /mnt/dmmp_ext3 ext3
defaults,_netdev 0 0
```

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Preparing RHEL LUNs with mount points using DMMP alias names for transition using the CLI

Before transition of a mount point using a DMMP device name, you must replace the DMMP device name with its respective file system UUID number.

This procedure applies to copy-based transitions and copy-free transitions.

Steps

1. Identify and record the SCSI device ID for the LUN to be transitioned:

   `sanlun lun show`

   The SCSI device ID is listed under the filename column in the output.

2. Identify and record the DMMP device name for the LUN to be transitioned:

   `multipath -ll` ***`SCSI_device_ID`***

   In the following example, `360a98000375345625 72b453855496b41` is the DMMP device name:

   ```
   [root@IBMx3550M3-229-169 ~]# multipath -ll /dev/sdc
   dmmp_fs_lun (360a9800037534562572b453855496b41) dm-3 NETAPP, LUN
   [size=1.0G] [features=3 queue_if_no_path pg_init_retries 50]
   [hwhandler=0][rw]
   \_ round-robin 0 [prio=2][active]
       \_ 9:0:0:1 sdc 8:32  [active][ready]
       \_ 9:0:0:1 sdg 8:96  [active][ready]
   ```

3. Identify the file system configured on the DMMP device:

   `blkid | grep -i` ***`DMMP_device_name`***

The TYPE value in the output identifies the file system.

In the following example, the file system is `ext3`.

```
[root@ibmx3550-229-108 ~]#blkid | grep -i
3600a09804d532d79565d47617679658
/dev/mapper/3600a09804d532d79565d47617679658:
UUID="450b999a-4f51-4828-8139-29b20d2f8708" TYPE="ext3" SEC_TYPE="ext2"
```

4. Identify the UUID number for the LUN:

   `dumpe2fs` ***`device_path_name`*** **`| grep UUID`**

5. Identify the directory on which the DMMP device is mounted:

   `df -h`

   In the following example, `/mnt/dmmp_ext3` represents the directory on which the DMMP device is mounted:

```
[root@IBMx3550M3-229-169 ~]# df -h
Filesystem Size Used Avail Use% Mounted on
/dev/mapper/dmmp_fs_lun
1008M 34M 924M 4% /mnt/dmnp_ext3
```

6. Verify in the `/etc/fstab` file that the mount points for the DMMP device are defined:

   `cat /etc/fstab`

   The DMMP device name and mount directory should be displayed in the output.

7. Create a backup of the `/etc/fstab` file:

   `cp /etc/fstab /etc/`***`fstab_pre_transition_bkup`***

8. Edit the `/etc/fstab` file to replace the DMMP device name with its respective file system UUID number.

Testing DMMP devices with file systems on RHEL hosts before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to perform a copy-based transition of your Red Hat Enterprise Linux (RHEL) host, you can test your transitioned clustered Data ONTAP LUNs to verify that you can mount your DMMP device before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your new clustered Data ONTAP LUNs must be mapped to your test host and your LUNs must be ready for transition.

You should maintain hardware parity between the test host and the source host.

Perform these steps on the test host.

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. Obtain the new SCSI device names for the clustered Data ONTAP LUNs:

   `sanlun lun show`

   In the following example, `/dev/sdl` is the SCSI device name for the `lun_dmmp_raw` LUN, and `/dev/sdk` is the SCSI device name for the `lun_dmmp_raw_alias` LUN:

   ```
   [root@ibmx3550-229-108 /]# sanlun lun show
   controller(7mode/E-Series)/
   vserver (cDOT/FlashRay) lun-pathname               filename
   -----------------------------------------------------------
   vs_brb  /vol/dmmp_raw_vol/lun_dmmp_raw              /dev/sdl
   vs_brb  /vol/dmmp_raw_alias_vol/lun_dmmp_raw_alias  /dev/sdk
   ```

4. Configure the DMMP devices for your clustered Data ONTAP LUNs:

   `multipath`

5. Obtain the device handle ID for the clustered Data ONTAP LUNs:

   `multipath -ll`

   The following is an example of a device handle ID: “3600a09804d532d79565d47617679764d”

6. Identify the file system configured on the DMMP device:

   `blkid | grep -i` ***`device_handle_ID`***

7. Determine whether a mount point entry for the logical volume exists in the `/etc/fstab` file on the source host.
8. If a mount point entry exists for the logical volume on the source host, manually edit the `/etc/fstab` file on the test host to add the mount point entries.
9. Mount the LUN:

   `mount -a`

10. Verify that the DMMP device is mounted:

    `mount`

11. Perform your testing as needed.
12. After you have completed your testing, shut down the test host:

```
shutdown -h -t0 now
```

13. In the 7MTT UI, click **Finish Testing**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Preparing for the cutover phase when transitioning LUNs with mount points using DMMP device names on Linux hosts

Preparing for the cutover phase when transitioning LUNs with mount points using DMMP device names on Linux hosts

If you are transitioning a LUN with a mount point using an alias name on a Linux host, there are several steps you must perform before entering the cutover phase.

For FC configurations, you must have fabric connectivity and zoning to clustered Data ONTAP controllers.

For iSCSI configurations, your iSCSI sessions must be discovered and logged in to your clustered Data ONTAP controllers.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. Stop I/O to the mount points.
2. Shut down the applications that are accessing the LUNs according to the application vendor's recommendations.
3. Unmount DMMP devices:

   ```
   umount dir_name
   ```

4. Flush the 7-Mode LUN DMMP device ID:

   ```
   multipath -f device_name
   ```

   If needed, you can get the DDMP device name from the **OS Device ID** column under the **SAN Host LUNs** tab in the *Inventory Assessment Workbook*.

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Remounting DMMP devices on Linux hosts after transition

After transition from ONTAP operating in 7-Mode to clustered Data ONTAP, you must remount your DMMP devices for RHEL 5 and RHEL 6. Your 7-Mode LUNs are not accessible to the host until your DMMP devices are mounted.

If you are doing a copy-free transition (CFT), procedures for vol rehost must be complete. See the 7-Mode Transition Tool Copy-Free Transition Guide for details.

- For copy-based transitions, perform these steps after completing the Storage cutover operation in the 7-Mode Transition Tool (7MTT).
- For CFTs perform these steps after the Import Data & Configuration operation in the 7MTT is complete.

Steps

1. Generate the 7-Mode to ONTAP LUN mapping file:
   - For copy-based transitions, run the following command from the Linux host where the 7MTT is installed:

     transition cbt export lunmap -p ***project-name*** **-o** ***file_path***

     For example:

     transition cbt export lunmap -p SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv

   - For copy-free transitions, run the following command from the system where the 7MTT is installed:

     transition cft export lunmap -p ***project-name*** **-s svm-name -o** ***output-file***

     For example:

     transition cft export lunmap -p SanWorkLoad -s svml -0 c:/Libraries/Documents/7-to-C-LUN-MAPPING-svml.csv

     ⓘ You must run this command for each of your storage virtual machines (SVMs).

2. Make a note of the new ONTAP LUN device handle ID from the LUN mapping file.
3. Remove the SCSI devices created for 7-Mode LUNs:
   - To remove all of the SCSI devices:

     rescan-scsi-bus.sh -r

   - To remove each SCSI device individually:

     echo 1> /sys/block/*SCSI_ID*/delete

     This command must be executed on all 7-Mode LUN SCSI devices. See the SCSI Device ID column on the SAN Host LUNs tab of the *Inventory Assessment Workbook* to identify the SCSI device IDs for the LUNs.

4. Discover new ONTAP LUNs:

rescan-scsi-bus.sh

5. Verify that the ONTAP LUNs are discovered:

   sanlun lun show

   The ONTAP LUN's SCSI devices should be listed under the filename column.

6. Configure DMMP devices for ONTAP LUNs:

   multipath

7. Verify that the DMMP devices are present:

   multipath -ll *LUN_SCSI_device_name*

   In the following example, 3600a098051764937303f4479515a7451 represents the DMMP device handle ID:

```
[root@IBMx3550M3-229-169 ~]#multipath -ll /dev/sdq
3600a098051764937303f4479515a7451 dm-6 NETAPP,LUN C-Mode
```

8. Mount the LUN:

   `*mount` *`device_name mountpoint`*

   If the mount points are defined in the `/etc/fstab` file, you can run the `mount -a` command to mount all of the mount points.

9. Verify the mount points:

   mount

Transitioning LUNs with mount points using DMMP alias names

When you transition a LUN with a mount point using an alias name, you must perform specific steps to prepare for the cutover phase and you must remount the LUNs after the transition.

Related information

Preparing for the cutover phase when transitioning LUNs with mount points using DMMP device names on Linux hosts

Remounting LUNs with mount points using DMMP alias names on Linux hosts after transition

Preparing RHEL LUNs with mount points using DMMP alias names for transition using the CLI

Before transition of a mount point using a DMMP device name, you must replace the DMMP device name with its respective file system UUID number.

This procedure applies to copy-based transitions and copy-free transitions.

Steps

1. Identify and record the SCSI device ID for the LUN to be transitioned:

   sanlun lun show

   The SCSI device ID is listed under the filename column in the output.

2. Identify and record the DMMP device name for the LUN to be transitioned:

   multipath -ll *SCSI_device_ID*

   In the following example, `360a9800037534562572b453855496b41` is the DMMP device name:

   ```
   [root@IBMx3550M3-229-169 ~]# multipath -ll /dev/sdc
   dmmp_fs_lun (360a9800037534562572b453855496b41) dm-3 NETAPP, LUN
   [size=1.0G] [features=3 queue_if_no_path pg_init_retries 50]
   [hwhandler=0][rw]
   \_ round-robin 0 [prio=2][active]
       \_ 9:0:0:1 sdc 8:32  [active][ready]
       \_ 9:0:0:1 sdg 8:96  [active][ready]
   ```

3. Identify the file system configured on the DMMP device:

   blkid | grep -i *DMMP_device_name*

   The TYPE value in the output identifies the file system.

   In the following example, the file system is `ext3`.

   ```
   [root@ibmx3550-229-108 ~]#blkid | grep -i
   3600a09804d532d79565d47617679658
   /dev/mapper/3600a09804d532d79565d47617679658:
   UUID="450b999a-4f51-4828-8139-29b20d2f8708" TYPE="ext3" SEC_TYPE="ext2"
   ```

4. Identify the UUID number for the LUN:

   dumpe2fs *device_path_name* | grep UUID

5. Identify the directory on which the DMMP device is mounted:

   df -h

   In the following example, `/mnt/dmmp_ext3` represents the directory on which the DMMP device is mounted:

```
[root@IBMx3550M3-229-169 ~]# df -h
Filesystem Size Used Avail Use% Mounted on
/dev/mapper/dmmp_fs_lun
1008M 34M 924M 4% /mnt/dmnp_ext3
```

6. Verify in the `/etc/fstab` file that the mount points for the DMMP device are defined:

   `cat /etc/fstab`

   The DMMP device name and mount directory should be displayed in the output.

7. Create a backup of the `/etc/fstab` file:

   `cp /etc/fstab /etc/`*`fstab_pre_transition_bkup`*

8. Edit the `/etc/fstab` file to replace the DMMP device name with its respective file system UUID number.

Testing LUNs with mount points using DMMP alias names on RHEL hosts before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to perform a copy-based transition of your Red Hat Enterprise Linux (RHEL) host, you can test your transitioned clustered Data ONTAP LUNs with mount points using alias names before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your new clustered Data ONTAP LUNs must be mapped to your test host and your LUNs must be ready for transition.

You should maintain hardware parity between the test host and the source host and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. Obtain the new SCSI device names for the clustered Data ONTAP LUNs:

   `sanlun lun show`

   In the following example, `/dev/sdl` is the SCSI device name for the `lun_dmmp_raw` LUN, and `/dev/sdk` is the SCSI device name for the

   `lun_dmmp_raw_alias` LUN:

```
[root@ibmx3550-229-108 /]# sanlun lun show
controller(7mode/E-Series)/
vserver (cDOT/FlashRay)     lun-pathname                 filename
-------------------------------------------------------------------
vs_brb     /vol/dmmp_raw_vol/lun_dmmp_raw                /dev/sdl
vs_brb     /vol/dmmp_raw_alias_vol/lun_dmmp_raw_alias   /dev/sdk
```

4. Configure the DMMP devices for your clustered Data ONTAP LUNs:

   `multipath`

5. Obtain the device handle IDs for the clustered Data ONTAP LUNs:

   `multipath -ll`

   The following is an example of a device handle ID: “3600a09804d532d79565d47617679764d”

6. Check whether an alias is defined in the `/etc/multipath.conf` file on the source host.
7. Manually copy the alias configuration to the `/etc/multipath.conf` file on the test host, but replace the 7-Mode device handle ID with the corresponding clustered Data ONTAP device handle ID.
8. Use the `multipath` command to configure DMMP devices for your clustered Data ONTAP LUNs.
9. Identify the file system created on the DMMP alias device:

   `blkid` ***`dmmp_device_name`***

10. Mount the DMMP device:

    `mount`

11. Perform your testing as needed.
12. After you have completed your testing, shut down the test host:

    `shutdown -h -t0 now`

13. In the 7MTT UI, click **Finish Testing**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Preparing for the cutover phase when transitioning LUNs with mount points using DMMP device names on Linux hosts

Preparing for the cutover phase when transitioning LUNs with mount points using DMMP device names on Linux hosts

If you are transitioning a LUN with a mount point using an alias name on a Linux host, there are several steps you must perform before entering the cutover phase.

For FC configurations, you must have fabric connectivity and zoning to clustered Data ONTAP controllers.

For iSCSI configurations, your iSCSI sessions must be discovered and logged in to your clustered Data ONTAP controllers.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode Systems operation in the 7MTT.

Steps

1. Stop I/O to the mount points.
2. Shut down the applications that are accessing the LUNs according to the application vendor's recommendations.
3. Unmount DMMP devices:

   `umount dir_name`

4. Flush the 7-Mode LUN DMMP device ID:

   `multipath -f device_name`

   If needed, you can get the DDMP device name from the **OS Device ID** column under the **SAN Host LUNs** tab in the *Inventory Assessment Workbook*.

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Remounting LUNs with mount points using DMMP alias names on Linux hosts after transition

After transition from ONTAP operating in 7-Mode to clustered Data ONTAP, you must remount your LUNs with mount points. The7-Mode volumes are offline and the 7-Mode LUNs are not accessible to your hosts.

If you are doing a copy-free transition (CFT), procedures for `vol rehost` must be complete.

See the 7-Mode Transition Tool Copy-Free Transition Guide for details.

- For copy-based transitions (CBTs), perform these steps after completing the Storage Cutover operation in the 7MTT.
- For CFTs, perform these steps after the Import Data & Configuration operation in the 7MTT.
  1. Generate the 7-Mode to ONTAP LUN mapping file:
     - For copy-based transitions, run the following command from the Linux host where the 7MTT is

installed:

transition cbt export lunmap -p *project-name* -o *file_path*

For example:

transition cbt export lunmap -p SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv

- For copy-free transitions, run the following command from the system where the 7MTT is installed:

  `*transition cft export lunmap -p *project-name* -s *svm-name* -o *output-file*`

  For example:

  transition cft export lunmap -p SanWorkLoad -s svml -0 c:/Libraries/Documents/7-to-C-LUN-MAPPING-svml.csv

  > You must run this command for each of your storage virtual machines (SVMs).

2. Make a note of the ONTAP device handle ID in the LUN mapping file.
3. Remove the SCSI devices created for 7-Mode LUNs:
   - To remove all of the SCSI devices:

     rescan-scsi-bus.sh -r

   - To remove each SCSI device individually:

     `*echo 1> /sys/block/*SCSI_ID*/delete_`

     This command must be executed on all 7-Mode LUN SCSI devices. See the SCSI Device ID column on the SAN Host LUNs tab of the *Inventory Assessment Workbook* to identify the SCSI device IDs for the LUNs.
4. Discover the new ONTAP LUNs:

   rescan-scsi-bus.sh
5. Verify that the ONTAP LUNs are discovered:

   sanlun lun show

   The ONTAP LUN's SCSI devices should be listed in the `device filename` column.

   An example of a SCSI device name is `/dev/sdp`.
6. In the `/etc/multipath.conf` file, replace the 7-Mode device handle ID with the clustered Data ONTAP LUN's device handle ID so that the `alias name` points to the clustered Data ONTAP LUN ID.

   You should update the multipaths section as displayed below. The following example shows the `/etc/multipath.conf file`, before replacing the 7-Mode LUN ID. In this example, the LUN ID `360a9800037534562572b453855496b43` is pointing to the `dmmp_fs_lun` alias name.

```
multipaths {
        multipath {
             wwid   360a980003753456257 2b453855496b43
             alias      dmmp_fs_lun
    }
}
```

After replacing the 7-Mode LUN ID with the ONTAP LUN ID `360a9800037534562572b453855496b43`, the example files looks as follows:

```
multipaths {
        multipath {
             wwid   3600a098051764937303f4479515a7452
             alias      dmmp_fs_lun
    }
}
```

7. Configure DMMP devices for ONTAP LUNs:

   `multipath`

8. Verify that the DMMP alias points to the ONTAP LUN device handle ID:

   `multipath -ll` ***`device_handle_ID`***

9. Mount the ONTAP LUN to its mount point directory:

   `mount /dev/mapper/`***`alias_namemount_dir_name`***

   If the mount points are defined in the /etc/fstab file, use the mount -a command to mount the LUN.

10. Verify that the DMMP device is mounted:

    `mount`

Transitioning Linux host file systems on LVM devices

When you transition a Linux host file system on a Logical Volume Manager (LVM), you must perform specific steps to prepare for the cutover phase and you must mount the logical volumes after the transition.

Related information

Preparing for cutover phase when transitioning Linux host file systems on LVM devices

Mounting logical volumes on Linux hosts after transition

Testing LUNs with file systems on LVM devices before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to perform a copy-based transition of your Red Hat Enterprise Linux (RHEL) host, you can test your transitioned clustered Data ONTAP LUNs with file systems on LVM devices before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

- Your new clustered Data ONTAP LUNs must be mapped to the test host.
- Your LUNs must be ready for transition.

You should maintain hardware parity between the test host and the source host and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

During test mode you do not deactivate or export the volume group. For this reason, you might see file system errors when you mount the logical volumes on the test host.

Steps

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. On the test host, discover your new clustered Data ONTAP LUNs:

   `rescan-scsi-bus.sh`

4. Verify that your new clustered Data ONTAP LUNs have been discovered:

   `sanlun lun show`

5. Configure DMMP devices for your clustered Data ONTAP LUNs:

   `multipath`

6. Obtain the device handle ID for the clustered Data ONTAP LUNs:

   `multipath -ll`

   The following is an example of a device handle ID: “3600a09804d532d79565d47617679764d”

7. Identify the DMMP devices used by the LVM:

   `pvscan`

   3600a09804d532d79565d476176797655 is an example of a DMMP device used by the LVM.

8. Identify the volume group:

   `vgscan`

9. Identify the logical volume:

lvscan

10. Enable the logical volumes:
*

vgchange -ay *volume_group*

11. Verify the logical volume status:
*

lvdisplay

The `LV Status` column in the output should display available.

12. Determine whether a mount point entry for the logical volume exists in the `/etc/fstab` file on the source host.

In the following example, logical volume `/dev/mapper/vg_7MTT-lv1` is displayed in the `/etc/fstab` file:

```
# /etc/fstab
...
tmpfs    /dev/shm  tmpfs   defaults        0 0
devpts   /dev/pts  devpts  gid=5, mode=620 0 0
sysfs    /sys      sysfs   defaults        0 0
proc     /proc     proc    defaults        0 0
/dev/mapper/vg_7MTT-lv1 /7MTT  ext4  defaults 0 0
```

13. If a mount point entry for the logical volume exists in the `/etc/fstab` file on the source host, manually edit the `/etc/fstab` file on the test host to add the mount point entry.
14. Mount the mount point:

mount -a

15. Verify that the mount points are mounted:

mount

16. Perform your testing as needed.
17. After you have completed your testing, shut down your host:

shutdown -h -t0 now

18. In the 7MTT UI, click **Finish Testing**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Preparing for cutover phase when transitioning Linux host file systems on LVM devices

If you are transitioning a Linux host file system on a Logical Volume Manager (LVM) device, there are steps you must perform before the cutover phase.

- For FC configurations, you must have fabric connectivity and zoning to clustered Data ONTAP controllers.
- For iSCSI configurations, your iSCSI sessions must be discovered and logged in to your clustered Data ONTAP controllers.
- You must have the following pretransition information gathered from the *Inventory Assessment Workbook*:
  - The DMMP device names used by the LVM
  - The volume group name
  - The logical volume name
  - The file system configured on the logical volume device
  - The directory on which the logical volumes are mounted
- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode operation in the 7MTT.

Steps

1. Stop I/O to LV mount points.
2. Shut down the applications accessing the LUNs according to application vendor's recommendations.
3. Unmount the LV mount point:

   `umount` ***`dir_name`***

4. Disable the logical volume:

   `vgchange -an` ***`vg_name`***

5. Verify the logical volume status:

   `lvdisplay` ***`dir_name`***

   The LV status should display “NOT available”.

6. Export the volume group:

   `vgexport` ***`vg_name`***

7. Verify the VG status:

   `vgdisplay` ***`vg_name`***

   The VG status should display “exported”.

8. Flush the 7-Mode DDMP device IDs:

   `multipath -f device_name`

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Mounting logical volumes on Linux hosts after transition

After the transition from ONTAP operating in 7-Mode to clustered Data ONTAP, your logical volumes are offline. You must mount those logical volumes for your LUNs to be accessible to your hosts.

If you are doing a copy-free transition (CFT), procedures for vol rehost must be complete. See the 7-Mode Transition Tool Copy-Free Transition Guide for details.

- For copy-based transitions (CBTs), perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For CFTs, perform these steps after the Import Data & Configuration operation in the 7MTT.

1. Generate the 7-Mode to clustered Data ONTAP LUN mapping file:
   - For copy-based transitions, run the following command from the Linux host where the 7MTT is installed:

     `transition cbt export lunmap -p project-name -o file_path`

     For example:

     `transition cbt export lunmap -p SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv`

   - For copy-free transitions, run the following command from the system where the 7MTT is installed:

     `transition cft export lunmap -p p_roject-name_ -s svm-name -o output-file`

     For example:

     `transition cft export lunmap -p SanWorkLoad -s svml -0 c:/Libraries/Documents/7-to-C-LUN-MAPPING-svml.csv`

     You must run this command for each of your storage virtual machines (SVMs).

2. Remove the SCSI devices created for 7-Mode LUNs:
   - To remove all of the SCSI devices:

     `rescan-scsi-bus.sh -r`

   - To remove each SCSI device individually:

     `echo 1> /sys/block/SCSI_ID/delete`

This command must be executed on all 7-Mode LUN SCSI devices. See the SCSI Device ID column on the SAN Host LUNs tab of the *Inventory Assessment Workbook* to identify the SCSI device IDs for the LUNs.

3. Discover new ONTAP LUNs:

   `rescan-scsi-bus.sh`

4. Configure DMMP devices for ONTAP LUNs:

   `multipath`

5. Verify that ONTAP LUNs are discovered:

   `sanlun lun show`

6. Determine the new ONTAP LUN device handle ID:

   `multipath -ll` ***`Device_handle_name`***

7. Import the volume group:

   `vgimport` ***`vg_name`***

8. Verify the volume group status:

   `vgdisplay`

9. Enable logical volumes:

   `vgchange -ay` ***`vg_name`***

10. Verify the logical volume status:

    `lvdisplay`

    The LV status should be displayed as “available”.

11. Mount the logical volumes from the ONTAP LUN to its respective mount point directory:

    `mount` *`lv_namemount_point`*

    If the mount points are defined in the `etc/fstab` file, you can use the `mount -a` command to mount the logical volumes.

12. Verify the mount points:

    `mount`

Transitioning of SAN boot LUNs

You must reboot SAN boot LUNs before you transition from Data ONTAP operating in 7-Mode to clustered Data ONTAP using the 7-Mode Transition Tool (7MTT). You must perform specific steps to prepare for the cutover phase, and after transition you must discover your LUNs.

Related information

Preparing for transition of FC or FCoE SAN boot LUNs on RHEL hosts

Preparing for transition of iSCSI SAN boot LUNs

Discovering SAN boot LUNs after transition

Types of SAN boot LUNs supported for transition

Only certain types of SAN boot LUNs are supported for transition from Data ONTAP operating in 7-Mode to clustered Data ONTAP.

The following SAN boot LUNs are supported for transition:

- FC or FCoE SAN boot LUNs
- iSCSI SAN boot LUNs for Red Hat Enterprise Linux (RHEL) 6

Transition of iSCSI SAN boot LUNs for RHEL 5.x is not supported.

Preparing for transition of FC or FCoE SAN boot LUNs on RHEL hosts

Before you transition an FC or FCoE SAN boot LUN, you must perform specific steps on your Red Hat Enterprise Linux (RHEL) host.

You must have the following information from the *Inventory Assessment Workbook*:

- 7-Mode LUN name on which RHEL 5 or RHEL 6 is installed
- SCSI device name for the transition LUN
- DMMP device name for the transition LUN
- Mount directory
- File system configured on the DMMP device
- UUID number of the /boot partition
- Name of the `initrid` image

This procedure applies to copy-based transitions and copy-free transitions.

1. Verify that the DMMP device exists in the /dev/mapper directory:

   `ls /dev/mapper/ DMMP_device_name`

   If you cannot locate the DMMP device, then it might be using an alias or user-friendly name.

2. Identify the DMMP devices and Logical Volume Manager (LVM) names on which the RHEL 5 or RHEL 6 operating system /boot and root (/) directories are installed:

   `df - h`

By default, RHEL 5 and RHEL 6 are installed on the root (/) partition on the logical volume. If the root partition is installed on the logical volume, then no pretransition changes to the configuration are required.

3. If the /boot partition is installed on the DMMP device, confirm how the /boot partition is referenced to mount in `/etc/fstab` at boot time.
4. If the /boot partition is referenced in `/etc/fstab` by its DMMP device name, replace the DMMP device name with the file system UUID name.
5. Make a backup of the `/etc/fstab` file:

   `cp /etc/fstab /etc/`*`fstab_pre_transition_file_name`*

6. Edit the `/etc/fstab` file to replace the DMMP device name with its respective file system UUID number.
7. Make a backup of the `initrd` image file:

   `cp /boot/`*`initrd_image_file_nameinitrd_image_file_name`*`.bak`

8. For RHEL 5 only:
   a. In the `/etc/mutipath.conf` file, identify the SWAP partition device.

      In the following example, `/dev/VolGroup00/LogVol01` is the SWAP partition device:

      `/dev/VolGroup00/LogVol01 swap swap defaults 0 0`

   b. Create a label for mounting the swap partition:

      `swapoff` ***`swap-partition_device`***

      `mkswap -L` ***`label-for-swapswap-partition-device`***

      `swapon` ***`swap-partition_device`***

   c. Replace the SWAP partition device name in the `/etc/fstab` file with THE SWAP label.

      The updated line in the `/etc/fstab` file should be as follows:

      ```
      LABEL=SwapPartition  swap  swap   defaults    0 0
      ```

9. Re-create the initrd image.
   - For RHEL5:

     `mkinitrd -f/boot/ initrd-"'uname-r'".img 'uname-r' --with multipath`

   - For RHEL 6:

     `dracut --force --add multipath --verbose`

10. Restart the host to boot from the new `initrd` image.

Related information

[Gathering pretransition information from the Inventory Assessment Workbook]

Preparing for transition of iSCSI SAN boot LUNs

Before you transition an iSCSI SAN boot LUN, you must perform specific steps on the host. Transition of Red Hat Enterprise Linux (RHEL) 5.x is not supported. Transition of RHEL 6 is supported.

You must have the following information from the *Inventory Assessment Workbook*:

- Name of the LUN that RHEL 6 is installed on
- DMMP device name for the transition LUN
- Logical volume (LV) name
- Volume group (VG) name
- Physical volume (PV) devices
- Logical Volume Manager (LVM) names and mount directories on which RHEL 6 /boot and root (/) partitions are installed
- File system configured on DMMP
- iSCSI sessions for 7-Mode controllers
- Grub information
- IQN number of the storage virtual machine (SVM) where the iSCSI SAN boot LUN will be created
- LIF IP address of the clustered Data ONTAP SVM where the iSCSI SAN boot LUN will be created

This procedure applies to copy-based transitions and copy-free transitions.

Steps

1. Verify that the DMMP device exists in the /dev/mapper directory:

   `ls /dev/mapper/`***`DMMP_device_name`***

   If the DMMP device is not displayed, the device might be using an alias or a user-friendly name.

2. Determine whether the DMMP device is part of an LVM:

   `blkid`

   If the DMMP device `TYPE` value is `LVM2_member`, the DMMP is part of an LVM.

3. Obtain the mount point details of the `/` and `/boot` partitions from the `/etc/fstab` file:
   - If the `/boot` partition is installed on a DMMP device, check how it is referenced to mount in the `/etc/fstab` file at boot time.
   - If the `/boot` partition is mounted using the file system UUID that you obtained using the `blkid` command output, then no pretransition change are required.
4. If the /boot partition is referenced in `/etc/fstab` file by its DMMP device name, replace the DMMP device name with the file system UUID name.
5. For iSCSI SAN booted hosts, edit the `/boot/grub/grub.conf` file to create a new kernel command-line

entry that includes the clustered Data ONTAP controller’s IQN number and iSCSI session information.

This example shows the `/boot/grub/grub.conf` file before editing. The kernel command line has the 7-Mode controller’s IQN number and iSCSI session information.

```
title Red Hat Enterprise Linux Server (2.6.32-431.el6.x86_64)
        root (hd0,0)
    kernel /vmlinuz-2.6.32-431.el6.x86_64 ro
root=/dev/mapper/vg_ibmx3550m3229-LogVol00 ifname=eth0:5c:f3:fc:ba:46:d8
rd_NO_LUKS netroot=iscsi:@10.226.228.241::3260::iqn.1992-
08.com.netapp:sn.1574168453 LANG=en_US.UTF-8
rd_LVM_LV=vg_ibmx3550m3229/LogVol01 rd_LVM_LV=vg_ibmx3550m3229/LogVol00
rd_NO_MD netroot=iscsi:@10.226.228.155::3260::iqn.1992-
08.com.netapp:sn.1574168453 iscsi_initiator= iqn.1994-
08.com.redhat:229.167 crashkernel=auto ip=eth0:dhcp
    initrd /initramfs-2.6.32-431.el6.x86_64.img
```

This example shows the `/boot/grub/grub.conf` file after adding a new title with the cDOT suffix, and the new kernel command line with the clustered Data ONTAP controller’s IQN number and iSCSI session information:

```
title Red Hat Enterprise Linux Server (2.6.32-431.el6.x86_64) - cDOT
        root (hd0,0)
    kernel /vmlinuz-2.6.32-431.el6.x86_64 ro
root=/dev/mapper/vg_ibmx3550m3229-LogVol00 ifname=eth0:5c:f3:fc:ba:46:d8
rd_NO_LUKS netroot=iscsi:@10.226.228.99::3260:: ::iqn.1992-
08.com.netapp:sn.81c4f5cc4aa611e5b1ad00a0985d4dbe:vs.15 LANG=en_US.UTF-8
rd_LVM_LV=vg_ibmx3550m3229/LogVol01 rd_LVM_LV=vg_ibmx3550m3229/LogVol00
rd_NO_MD netroot=iscsi:@10.226.228.98::3260:: ::iqn.1992-
08.com.netapp:sn.81c4f5cc4aa611e5b1ad00a0985d4dbe:vs.15
netroot=iscsi:@10.226.228.97::3260:: ::iqn.1992-
08.com.netapp:sn.81c4f5cc4aa611e5b1ad00a0985d4dbe:vs.15
netroot=iscsi:@10.226.228.96::3260:: ::iqn.1992-
08.com.netapp:sn.81c4f5cc4aa611e5b1ad00a0985d4dbe:vs.15 iscsi_initiator=
iqn.1994-08.com.redhat:229.167 crashkernel=auto ip=eth0:dhcp
    initrd /initramfs-2.6.32-431.el6.x86_64.img
```

6. Back up the existing `initramfs` file.

```
# cd /boot
# cp initramfs-2.6.32-71.el6.x86_64.img initramfs-2.6.32-
71.el6.x86_64.img.img_bak
```

7. Update the 7-Mode kernel line in the `/boot/grub/grub.conf` file with the backup `initrd` image name.

For RHEL 6.4 and later, verify that the clustered Data ONTAP kernel line is appended with “rdloaddriver=scsi_dh_alua” in the `/boot/grub/grub.conf` file.

8. If the `/boot/grub/grub.conf` file is updated, then update the kernel initial RAM disk (`initramfs`).

   The `initramfs` file must be re-created so that the new clustered Data ONTAP IQN number and iSCSI sessions are referenced, and so that the host establishes an iSCSI connection with clustered Data ONTAP controllers at boot time.

9. Re-create the `initrd` image by using the `dracut -force --add multipath --verbose` command.

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Testing SAN boot LUNs on RHEL hosts before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later, and Data ONTAP 8.3.2 or later to perform a copy-based transition your Red Hat Enterprise Linux (RHEL) host, you can test your transitioned ONTAP SAN boot LUNs before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your new ONTAP LUNs must be mapped to your test host and your LUNs must ready for transition.

You should maintain hardware parity between the test host and the source host.

- For copy-based transitions, you must perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool.
- For copy-free transitions, you must perform these steps after the Import Data and Configuration operation in the 7-Mode Transition Tool.

Steps

1. For FC and FCoE configurations only:
   a. Enter the HBA BIOS settings mode.
   b. Choose **Rescan** to discover the ONTAP SAN boot LUNs on the host.
   c. Remove the 7-Mode boot LUN ID.
   d. Add the ONTAP boot LUN ID in the HBA BIOS.
   e. Exit the HBA BIOS settings mode, and then reboot the host.
2. After the host reboots, change the IP address and host name on the test host.
3. Verify that your new ONTAP LUNs have been discovered:

   `sanlun lun show`

4. Configure DMMP devices for your ONTAP LUNs:

   `multipath -ll`

5. Perform your testing as needed.
6. Shut down the test host:

```
shutdown -h -t0 now
```

7. In the 7-Mode Transition Tool user interface (UI), click **Finish Testing**.

If your ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Related information

Gathering pretransition information from the Inventory Assessment Workbook

Preparing for the cutover phase when transitioning SAN boot LUNs

Preparing for the cutover phase when transitioning SAN boot LUNs

If you are transitioning SAN boot LUNs from Data ONTAP operating in 7-Mode to clustered Data ONTAP, there are certain prerequisites you must be aware of before entering the cutover phase.

You must have fabric connectivity and zoning to your clustered Data ONTAP controllers for FC configurations. For iSCSI configurations, your iSCSI sessions must be discovered and logged in to your clustered Data ONTAP controllers. You must also shut down your host.

- For copy-based transitions, you should shut down your host before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT). Copy-free transitions are not supported on HP-UX hosts.
- For copy-free transitions, you should shut down your host before initiating the Export & Halt 7-Mode operation in the 7MTT.

Discovering SAN boot LUNs after transition

After transition of your SAN boot LUNs from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must discover the SAN boot LUNs on your host. This is necessary for copy-based transitions (CBTs) and copy-free transitions (CFTs). This applies to FC, FCoE, and iSCSI configurations.

If you are doing a CFT, procedures for `vol rehost` must be complete. See the 7-Mode Transition Tool Copy-Free Transition Guide for details.

1. Boot the host.
2. For FC and FCoE configurations only:
   a. Enter the HBA BIOS settings mode.
   b. Choose **Rescan** to discover the clustered Data ONTAP SAN boot LUNs on the host.
   c. Remove the 7-Mode boot LUN ID.
   d. Add the clustered Data ONTAP boot LUN ID in the HBA BIOS.
   e. Exit the HBA BIOS settings mode, and then reboot the host.
3. After the reboot is complete, verify the clustered Data ONTAP LUNs:

```
sanlun lun show
```

4. Verify the DMMP device:

   multipath -ll

Windows host remediation

If you are using the 7-Mode Transition Tool (7MTT) to move from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must perform specific steps to prepare your Windows host for transition. You must also perform specific steps to prepare for the cutover phase, and after transition, you must bring your Windows host online.

Related information

Preparing Windows hosts for transition

Preparing for cutover phase when transitioning Windows hosts

Bringing Windows hosts online after transition

Preparing Windows hosts for transition

There are steps you must perform before you transition Windows hosts from Data ONTAP operating in 7-Mode to clustered Data ONTAP.

This procedure applies to copy-based transitions and copy-free transitions.

> If you are using Windows 2003, you must upgrade to Windows 2008. The Host Remediation Tool (HRT) is not supported on Windows 2003 and needs Windows 2008 or later to run properly.

Steps

1. Identify the LUN serial numbers, LUN IDs, and corresponding Windows physical disk numbers of the LUNs being transitioned.
   - If your system is running Data ONTAP DSM, use the Data ONTAP DSM Management Extension Snap-In (accessible through Server Manager or the `get-sandisk` Windows PowerShell cmdlet).
   - If your system is running MSDSM, use the Inventory Collect Tool (ICT).
2. Prepare to make the LUNs visible to the host after transition is complete.
   - If the LUNs being transitioned are FC or FCoE LUNs, create or modify fabric zoning.
   - If the LUNs being transitioned are iSCSI LUNs, create iSCSI sessions that connect to the clustered Data ONTAP controller.
3. Use the ICT to generate the Inventory Assessment workbook.

Related information

SAN configuration

What the Inventory Collect Tool is

The Inventory Collect Tool (ICT) is a stand-alone utility for collecting configuration and inventory information about 7-Mode storage controllers, hosts attached to controllers, and applications running on these hosts for assessing the transition readiness of these systems. You can use the ICT to generate information about your LUNs and the configuration that you need for transition.

The ICT generates an *Inventory Assessment Workbook* and an Inventory Report XML file that contains configuration details of the storage and host systems.

The ICT is available for ESXi, 5.x, ESXi 6.x, and Windows hosts.

Testing transitioned LUNs on Windows hosts before the cutover phase

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to transition your Windows host LUNs, you can test your transitioned clustered Data ONTAP LUNs to verify that you can bring your disk online and that your application operations work as expected before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your 7-Mode LUNs must be ready for transition.

You should maintain hardware parity between the test host and the source host, and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply configuration**.
3. Generate the 7-Mode to clustered Data ONTAP LUN mapping file:
   - For copy-based transitions, run the following command from the host where the 7MTT is installed:

     `transition cbt export lunmap -p` ***`project-name`*** **`-o`** ***`file_path`***

     For example:

     `transition cbt export lunmap -p SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv`

   - For copy-free transitions, run the following command from the system where the 7MTT is installed:

     `*transition cft export lunmap -p` *`project-name`* `-s` *`svm-name`* `-o` *`output-file`*

     You must run this command for each of your storage virtual machines (SVMs).

     For example:

     `transition cft export lunmap -p SANWorkLoad -s svml -o c:/Libraries/Documents/7-to-C-LUN-MAPPING-svml.csv`

4. Bring the transitioned disks and applications online:
    - If the transitioned disks are not part of Cluster Failover, use the Windows Disk Manager to bring the disks online.
    - If the transitioned disks are part of Cluster Failover, use the Cluster Failover Manager to bring the disks online.
5. Perform your testing as needed.
6. After your testing is complete, take your applications and disks offline:
    - If the transitioned disks are not part of Cluster Failover, use the Windows Disk Manager to take the disks offline.
    - If the transitioned disks are part of Cluster Failover, use the Cluster Failover Manager to take the disks offline.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Preparing for cutover phase when transitioning Windows hosts

If you are transitioning a Windows host from Data ONTAP operating in 7-Mode to clustered Data ONTAP, there are steps you must perform after the transition begins, but before the cutover phase begins.

If you are running Data ONTAP DSM, the version of Data ONTAP DSM installed on the server must be supported for the version of Data ONTAP that is running on the target clustered Data ONTAP node.

If you are running MSDSM, the version of Windows Host Utilities installed on the server must be supported for the version of Data ONTAP that is running on the target clustered Data ONTAP node.

- For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode operation in the 7MTT.

Steps

1. Use Disk Manager to take offline the disks to be transitioned.
2. If the host is booted from SAN and the boot LUN is being transitioned, shut down the boot host.
3. If the host is clustered, use Failover Cluster Manager to take offline the clustered disks, including the quorum disk.
4. If the host is running Windows Server 2003 and you need to migrate the quorum device, stop the cluster services on all cluster nodes.
5. If you are transitioning LUNs on a server that has Hyper-V enabled, perform the appropriate host side transition steps for your guest operating system.
6. If you are transitioning LUNs on a server that has Hyper-V enabled and the boot device of the guest OS resides on a Data ONTAP LUN that is being transitioned, do the following:
    a. Shut down the guest OS.
    b. Take offline the corresponding disk on the parent system.

Bringing Windows hosts online after transition

After you transition your LUNs using the 7-Mode Transition Tool (7MTT) for Windows hosts, you must complete several steps to bring your host online and begin servicing data again.

If you are doing a copy-free transition (CFT), procedures for `vol rehost` must be complete. See the 7-Mode Transition Tool Copy-Free Transition Guide for details.

- For copy-based transitions (CBTs), perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).
- For CFTs, perform these steps after completing the Import & Data Configuration operation in the 7MTT.

1. Generate the 7-Mode to ONTAP LUN mapping file:
   - For copy-based transitions, run the following command from the host where the 7MTT is installed:

     `transition cbt export lunmap -p` ***`project-name`*** **`-o`** ***`file_path`***

     For example:

     `transition cbt export lunmap -p SanWorkLoad -o c:/Libraires/Documents/7-to-C-LUN-MAPPING.csv`

   - For copy-free transitions, run the following command from the system where the 7MTT is installed:

     `transition cft export lunmap -p` ***`project-name`*** **`-s`** ***`svm-name`*** **`-o`** ***`output-file`***

     > You must run this command for each of your storage virtual machines (SVMs).

     For example:

     `transition cft export lunmap -p SANWorkLoad -s svml -o c:/Libraries/Documents/7-to-C-LUN-MAPPING-svml.csv`

2. If the Windows host is SAN-booted and the boot LUN was transitioned, power on the host.
3. Update the FC BIOS to enable the system to boot from the LUN on the clustered Data ONTAP controller.

   See the HBA documentation for more information.

4. On the Windows host, rescan the disks from the Disk Manager.
5. Obtain the LUN serial numbers, LUN IDs, and corresponding Windows physical disk numbers of the LUNs mapped to the host.
   - For systems running Data ONTAP ONTAPDSM: Use the Data ONTAPDSM Management Extension Snap-In or the get-sandisk Windows PowerShell cmdlet.
   - For systems running MSDSM: Use the Inventory Collect Tool (ICT).

     The LUN ID, LUN serial number, and corresponding serial number is captured under the SAN Host LUNs tab.

6. Use the LUN serial numbers, LUN IDs, and corresponding Windows physical disk numbers of the

LUNs along with the LUN map output and the data collected in the pretransition state, to determine whether the LUNs have transitioned successfully.

7. Note whether the physical disk numbers of the transitioned LUNs have changed.
8. Bring your disks online.
   - Use Windows Disk Manager to bring online disks that are not part of Cluster Failover.
   - Use Failover Cluster Manager to bring online disks that are part of Cluster Failover.
9. If the host you are transitioning is running Windows Server 2003 and you have migrated the quorum device, start the cluster services on all of the cluster nodes.
10. If Hyper-V is enabled on the host and pass-through devices are configured to the VMs, modify the settings from Hyper-V Manager.

    The physical disk number of the LUN corresponding to the pass-through device might have changed as a result of the transition.

Related information

What the Inventory Collect Tool is

Exceptions and known issues when transitioning SAN hosts to ONTAP

You should be aware of certain exceptions and known issues when transitioning SAN hosts from Data ONTAP operating in 7-Mode to later versions of ONTAP.

- For transitioning Hyper-Virtual Machine (VMs) with only VHD or VHDX file types, you can use storage live migration instead of the 7-Mode Transition Tool (7MTT).

  For details about Hyper-V storage live migration, see the Microsoft documentation.

- If you used the same igroup name on both nodes of the 7-Mode controller, the transition tool might fail to resolve the igroup conflict.

  Bug ID 769715.

HP-UX host remediation

If you are using the 7-Mode Transition Tool (7MTT) to move from Data ONTAP operating in 7-Mode to clustered Data ONTAP in a SAN environment, you must perform a series of steps on your HP-UX host before and after the transition to avoid transition complications.

Related information

Making a SAN boot LUN the primary boot LUN for HP-UX Emulex HBAs after transition

Making a SAN boot LUN the primary boot LUN for HP-UX QLogic HBAs after transition

Transitioning HP-UX host LUNs with file systems

If you transition an HP-UX host LUN with a file system from Data ONTAP operating in 7-Mode to clustered Data ONTAP using the 7-Mode Transition Tool (7MTT), you must perform specific steps before and after transition to remediate transition issues on the host.

Preparing to transition HP-UX host LUNs with file systems

Before you transition HP-UX host LUNs with file systems from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must gather information you need for the transition process.

Steps

1. Display your LUNs to identify the name of the LUNs to be transitioned:

   `lun show`

2. Locate the SCSI device name for the LUNs to be transitioned and the Agile name for the SCSI device:

   `sanlun lun show -p`

   In the following example, the transition LUNs are lun1 and lun3. The SCSI device names for lun1 are `/dev/dsk/c14t0d1`, `/dev/dsk/c27t0d1`, `/dev/dsk/c40t0d1`, and `/dev/dsk/c31t0d1`. The SCSI device names for `lun3` are `/dev/dsk/c14t0d2`, `/dev/dsk/c27t0d2`, `/dev/dsk/c40t0d2`, and `/dev/dsk/c31t0d2`.

   The Agile name for SCSI device `/dev/dsk/c31t0d1` is `/dev/rdisk/disk11`.

```
         ONTAP Path: f8040-211-185:/vol/vol185_n1/lun3
                LUN: 1
           LUN Size: 3g
        Host Device: /dev/rdisk/disk11
               Mode: 7
Multipath Provider: None
host      vserver   /dev/dsk
path      path      filename           host     vserver
state     type      or hardware path   adapter  LIF
-----     --------- ----------------   -------  -------
up        secondary /dev/dsk/c14t0d1   fcd0     fc4
up        primary   /dev/dsk/c27t0d1   fcd0     fc2
up        primary   /dev/dsk/c40t0d1   fcd1     fc1
up        secondary /dev/dsk/c31t0d1   fcd1     fc3
```

```
        ONTAP Path: f8040-211-183:/vol/vol183_n1/lun1
               LUN: 3
          LUN Size: 3g
       Host Device: /dev/rdisk/disk14
              Mode: 7
Multipath Provider: None
host      vserver   /dev/dsk
path      path       filename           host     vserver
state     type      or hardware path   adapter   LIF
-----     --------- ----------------   -------   -------
up        secondary /dev/dsk/c14t0d1   fcd0      fc4
up        primary   /dev/dsk/c27t0d1   fcd0      fc2
up        primary   /dev/dsk/c40t0d1   fcd1      fc1
up        secondary /dev/dsk/c31t0d1   fcd1      fc3
```

3. Identify the WWID for the LUN on the host:

   scsimgr get_info -D *Agile_name_for_SCSI_device*

   In this example, the LUN WWID for device `/dev/rdisk/disk11` is 0x600a09804d537739422445386b755529:

```
bash-2.05# scsimgr get_info -D /dev/rdisk/disk11 |grep WWID
World  Wide Identifier (WWID)     = 0x600a09804d537739422445386b755529
```

4. List and record your volume groups:

   vgdisplay

5. List and record your volume groups, logical volumes, and physical volumes:

   vgdisplay -v *vg_name*

6. Write the VGID and logical volumes for the volume group to a mapfile:

   vgexport -p -s -m /tmp/mapfile/vg01 vg01

7. Make a backup copy of the `mapfile.vg01` to an external source.
8. List and record the mount points:

   bdf

   The following example shows how the mount points should be displayed:

```
bash-2.05# bdf
Filesystem     kbytes       used         avail    used   Mounted on
/dev/vg01/lvol 123592960   1050952   22189796   5%   /mnt/qa/vg01
/dev/vg01/lvol2 23592960   588480    22645044   3%   /mnt/qa/vg02
```

Testing data LUNs on HP-UX hosts before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to perform a copy-based transition of your HP-UX host data LUNs, you can test your transitioned clustered Data ONTAP LUNs to verify that you can mount your MPIO device before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your new ONTAP LUNs must be mapped to your test host and your LUNs must be ready for transition

You should maintain hardware parity between the test host and the source host, and you should perform the following steps on the test host.

Your ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. On the test host, rescan your new ONTAP LUNs:

   `ioscan -fnC disk`

4. Verify that your ONTAP LUNs are present:

   `sanlun lun show`

5. Copy the `/tmp/mapfile.vg01 mapfile` previously copied to your external source to your new host.
6. Use the mapfile to import the volume group:

   `vgimport -s -m /tmp/mapfile/vg01 vg01`

7. Verify that the `VG Status` is displayed as `available`:

   `vgdisplay`

8. Convert the legacy Device Special Filename (DSF) to persistent DSF:

   `vgdsf -c /dev/vg01`

9. Use the mount command to manually mount each of the logical volumes.
10. Run the `fsck` command if you are prompted to do so.

11. Verify the mount points:

```
bdf
```

12. Perform your testing as needed.
13. Shut down the test host.
14. In the 7MTT UI, click **Finish Test**.

If your ONTAP LUNs must be remapped to your source host, then you must prepare your source host for the cutover phase. If your ONTAP LUNs must remain mapped to your test host, then no further steps are required on the test host.

Preparing for cutover phase when transitioning HP-UX host data LUNs with file systems

If you are transitioning an HP host data LUN with a file system from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must perform certain steps before entering the cutover phase.

If you are using an FC configuration, fabric connectivity and zoning to the clustered Data ONTAP nodes must be established.

If you are using an iSCSI configuration, the iSCSI sessions to the clustered Data ONTAP nodes must be discovered and logged in.

For copy-based transitions, perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool (7MTT). Copy-free transitions are not supported for HP-UX hosts.

Steps

1. Stop I/O on all mount points.
2. Shut down each application accessing the LUNs according to the recommendations of the application vendor.
3. Unmount all of the mount points:

   umount ***mount_point***

4. Export your volume group and write the VGID and logical volumes for the volume group to a mapfile:

```
vgexport -p -s -m /tmp/mapfile.vg01 vg01
```

5. Make a backup copy of the mapfile.vg01 file to an external source.
6. Disable the volume group:

   vgchange -a n ***vg_name***

7. Export the volume group:

   vgexport ***vg_name***

8. Verify that the volume group has been exported:

```
vgdisplay
```

The exported volume group information should not be displayed in the output.

Mounting HP-UX host LUNs with file systems after transition

After transitioning HP-UX host LUNs with file systems from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must mount the LUNs.

For copy-based transitions, perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool (7MTT). Copy-free transitions are not supported for HP-UX hosts.

Steps

1. Discover new clustered Data ONTAP LUNs:

   `ioscan -fnC disk`

2. Verify that the clustered Data ONTAP LUNs have been discovered:

   `sanlun lun show`

3. Verify that the `lun-pathname` for the clustered Data ONTAP LUNs is the same as the `lun-pathname` for the 7-Mode LUNs prior to transition.
4. Verify that the output in the mode column has changed from `7` to `C`.
5. Use the `mapfile` file to import the volume group:

   `vgimport -s -v -m /tmp/mapfile.vg01 /dev/vg01"`

6. Activate the logical volumes:

   `vgchange -a y` ***`vg_name`***

7. Convert the legacy Device Special Filename (DSF) to persistent DSF:

   `vgdsf -c /dev/vg01`

8. Verify that the VG Status is displayed as available:

   `vgdisplay`

9. Manually mount each of the devices:

   `mount -F vxfs -o largefiles` ***`device_name mount_point`***

10. Run the fsck command if you are prompted to do so.
11. Verify the mount points:

    `bdf`

    The following example shows how the mount points should be displayed:

```
bash-2.05# bdf
Filesystem          kbytes     used     avail     used   Mounted on
/dev/vg01/lvol1   23592960   1050952   22189796    5%   /mnt/qa/vg01
/dev/vg01/lvol2   23592960    588480   22645044    3%   /mnt/qa/vg02
```

Transitioning HP-UX host SAN boot LUNs with FC/FCoE configurations

If you transition an HP host SAN boot LUN with an FC or FCoE configuration from Data ONTAP operating in 7-Mode to clustered Data ONTAP using the 7-Mode Transition Tool (7MTT), you must perform specific steps before and after transition to remediate transition issues on the host.

Preparing to transition SAN boot LUNs on HP-UX hosts with FC configurations

Before you transition a SAN boot LUN on an HP-UX host with an FC configuration, you must record the name of the 7-Mode LUN on which HP-UX is installed, the SCSI device name for that LUN, the Agile naming convention, and the WWID.

1. From the console of the 7-Mode controller, display your 7-Mode LUNs to identify the LUN name on which the “HPUX11v3 March 2014” operating system is installed:

   `lun show`

2. Obtain the SCSI device name for the LUN:

   `sanlun lun show -p`

   In this example, the transition LUN is bootlun_94. The SCSI devices for this LUN are `/dev/dsk/c14t0d0`, `/dev/dsk/c27t0d0`, `/dev/dsk/c40t0d0`, and `/dev/dsk/c31t0d0` .

```
        ONTAP Path: f8040-211-183:/vol/vol_183/bootlun_94
               LUN: 0
          LUN Size: 100g
       Host Device: /dev/rdisk/disk6
              Mode: 7
Multipath Provider: None
host      vserver   /dev/dsk
path      path      filename           host     vserver
state     type      or hardware path   adapter  LIF
-----     -------   ----------------   -------  -------
up        secondary /dev/dsk/c14t0d0   fcd0     fc4
up        primary   /dev/dsk/c27t0d0   fcd0     fc2
up        primary   /dev/dsk/c40t0d0   fcd1     fc1
up        secondary /dev/dsk/c31t0d0   fcd1     fc3
```

3. Identify the WWID for the LUN on the host:

   `scsimgr get_info -D *SCSI_device_name* |grep WWID`

   In the following example, the LUN WWID for device `/dev/rdisk/disk6` is 0x600a09804d537739422445386b75556:

```
bash-2.05# scsimgr get_info -D /dev/rdisk/disk6 | grep WWID
World Wide Identifier (WWID)      = 0x600a09804d537739422445386b755564
bash-2.05#
```

Testing transitioned SAN boot LUNs on HP-UX hosts before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to transition your HP-UX host SAN boot LUNs, you can test your transitioned clustered Data ONTAP LUNs before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your new clustered Data ONTAP LUNs must be mapped to your test host and your LUNs must be ready for transition

You should maintain hardware parity between the test host and the source host, and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. On the test host, enter the HBA BIOS.
4. Change the IP address and host name on the test host.
5. Verify that your clustered Data ONTAP LUNs are present on the test host:

   `sanlun lun show`

6. Perform your testing as needed.
7. Shut down the test host:

   `shutdown -h -y 0`

8. In the 7MTT UI, click **Finish Testing**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Preparing for the cutover phase when transitioning SAN boot LUNs

If you are transitioning SAN boot LUNs from Data ONTAP operating in 7-Mode to clustered Data ONTAP, there are certain prerequisites you must be aware of before entering the cutover phase.

You must have fabric connectivity and zoning to your clustered Data ONTAP controllers for FC configurations. For iSCSI configurations, your iSCSI sessions must be discovered and logged in to your clustered Data ONTAP controllers. You must also shut down your host.

- For copy-based transitions, you should shut down your host before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT). Copy-free transitions are not supported on HP-UX hosts.
- For copy-free transitions, you should shut down your host before initiating the Export & Halt 7-Mode operation in the 7MTT.

Making a SAN boot LUN the primary boot LUN for HP-UX Emulex HBAs after transition

If your Data ONTAP operating in 7-Mode HP-UX host was SAN booted, you must make the SAN boot LUN the primary boot LUN after transition to clustered Data ONTAP.

Your data migration must be complete and your boot LUN must be mapped to your host from your clustered Data ONTAP node.

For copy-based transitions, perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool. Copy-free transitions are not supported on HP-UX hosts.

Steps

1. From the shell prompt, list the Emulex HBAs:

   `drivers`

2. Select the Emulex HBA, and then press Enter.
3. Select **Setup Utility**.
4. Select **Configure Boot Parameters**.
5. Select **Configure Boot Devices**.
6. Select any device from the list, and then press Enter.
7. Select **Scan Targets**.
8. Select the LUN with the boot path you want, and then press Enter.
9. Select **Peripheral dev** as the Mode, and then press Enter.
10. Select **Boot this device via WWN**, and then press Enter.

    Your boot LUN is displayed.

11. Press **Esc** until you return to the shell prompt.
12. Display your LUN to obtain the path of the LUN from which you want to boot:

    `map -r`

    The LUN paths are listed under the Device column. The bootable SAN disk are displayed under the mapping table column and have “WWN” and “Part 1” in the output string.

13. Enter the LUN path of your SAN boot LUN.

    An example of a LUN path is fs0.

14. Exit the EFI shell:

    cd efi

15. Enter the HPUX directory:

    cd hpux

16. Make the new clustered Data ONTAP SAN boot LUN the primary boot LUN:

    bcfg boot add 1 hpux.efi "HP-UX-Primary Boot"

17. Manually update the HBA BIOS by making an entry in the EFI for the SAN boot LUN.
18. Create an alternate boot path:

    bcfg boot add 2 hpux.efi “HPUX alternate boot”

19. Create a third boot path:

    bcfg boot add 2 hpux.efi “HPUX third boot”

20. Create a fourth boot path:

    bcfg boot add 2 hpux.efi “HPUX fourth boot”

Making a SAN boot LUN the primary boot LUN for HP-UX QLogic HBAs after transition

If your Data ONTAP operating in 7-Mode HP-UX host was SAN booted, you must make the SAN boot LUN the primary boot LUN after transition to clustered Data ONTAP.

- Your data migration must be complete.
- Your boot LUN must be mapped to your host from your clustered Data ONTAP node.

SAN boot is supported for HP-UX 11.3x on HP 9000 systems using the BCH menu and on HP Integrity servers using the HP-UX Loader (EFI).

For copy-based transitions, perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool. Copy-free transitions are not supported on HP-UX hosts.

Steps

1. Open the shell prompt:

    Ctrl B

2. Boot to the EFI shell.

    The EFI shell is available only on HP Integrity systems.

3. Use a serial console to access the login to the service processor (MP).
4. Access the console list: `CO`

   This opens the EFI Boot Manager menu.
5. From the EFI Boot Manager menu, select the EFI shell menu option to access the EFI shell environment.
6. Identify your QLogic driver numbers:

   `drivers`

   The driver numbers are located in the DRV column.
7. Identify the corresponding controller number for each driver:

   `drvcfg` ***`driver_number`***

   In the following example, `27` is the corresponding controller number for driver `23` and `26` is the corresponding controller number for driver `24`:

```
Shell> drvcfg 23
Configurable Components
        Drv[23]     Ctrl[27]            Lang[eng]

Shell> drvcfg 24
Configurable Components
        Drv[24]     Ctrl[26]            Lang[eng]
```

8. Open the driver BIOS:

   `drvcfg` ***`drv_number ctrl_number`*** **`-s`**
9. Enter **`4`** to select **4. Edit Boot Settings**.
10. In Edit Boot Settings, enter `6` to select **6. EFI Variable EFIFCScanLevel**.
11. Enter **`1`** to change the value of EFI Variable EFIFCScanLevel from 0 to 1.
12. Enter **`7`** to select **7. Enable World Login**.
13. Enter **`y`** to enable world login.
14. Enter **`0`** to go to the previous menu.
15. In the Main Menu, enter **`11`** to save your changes.
16. Enter **`12`** to quit.
17. In the shell prompt, rescan your devices:

   `reconnect -r`
18. Display the LUN to obtain the path of the LUN from which you want to boot:

```
map -r
```

The LUN paths are listed under the Device column. The bootable SAN disk are displayed under the mapping table column and have “WWN” and “Part 1” in the output string.

19. Enter the LUN path of your SAN boot LUN.

    An example of a LUN path is fs0.

20. Exit the EFI shell:

    ```
    cd efi
    ```

21. Enter the HPUX directory:

    ```
    cd hpux
    ```

22. Make the new clustered Data ONTAP SAN boot LUN the primary boot LUN:

    ```
    bcfg boot add 1 hpux.efi "HP-UX-Primary Boot"
    ```

23. Manually update the HBA BIOS by making an entry in the EFI for the SAN boot LUN.
24. Create an alternate boot path:

    ```
    bcfg boot add 2 hpux.efi “HPUX alternate boot”
    ```

25. Create a third boot path:

    ```
    bcfg boot add 2 hpux.efi “HPUX third boot”
    ```

26. Create a fourth boot path:

    ```
    bcfg boot add 2 hpux.efi “HPUX fourth boot”
    ```

AIX host remediation

If you are using the 7-Mode Transition Tool (7MTT) to move from Data ONTAP operating in 7-Mode to clustered Data ONTAP in a SAN environment, you must perform a series of steps on your AIX host before and after transition to avoid transition complications.

Transition of SAN boot LUNs on AIX hosts with FC/FCoE configurations

If you transition a SAN boot LUN on an AIX host with an FC or FCoE configuration from Data ONTAP operating in 7-Mode to clustered Data ONTAP using the 7-Mode Transition Tool (7MTT), you must perform specific steps before and after transition to remediate transition issues on the host.

Preparing to transition SAN boot LUNs on AIX hosts with FC/FCoE configurations

Before you transition a SAN boot LUN on an AIX host with an FC/FCoE configuration, you must record the name of the 7-Mode LUN on which AIX is installed and the SCSI device name for that LUN.

1. From the console of your Data ONTAP operating in 7-Mode controller, identify the 7-Mode LUN name on which AIX 7.1 and AIX 6.1 operating system is installed:

   `lun show`

2. Obtain the SCSI device name for the LUN on the host:

   `sanlun lun show`

   In the following example, the transition LUN is `lun_sanboot_fas3170_aix04` and the SCSI device for this LUN is `hdisk0`.

```
[04:02 AM root@822-aix03p1/]: sanlun lun show
controller[7mode]/
vserver[Cmode] lun-pathname
----------------------------------------------------------------------
fas3170-aix04  /vol/vol_fas3170_aix04_sanboot/lun_sanboot_fas3170_aix04
kit            /vol/kit/kit_0
kit            /vol/kit/kit_0
filename    adapter protocol    size        mode
-------------------------------------
hdisk0     fcs0       FCP      100g   7
hdisk1     fcs0       FCP      5g       C
hdisk2     fcs0       FCP      5g       C
```

Testing transitioned SAN boot LUNs on AIX hosts before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to transition your 7-Mode Windows host LUNs, you can test your transitioned clustered Data ONTAP LUNs before the cutover phase to verify that they are functioning as desired.

Your 7-Mode LUNs must be ready for transition.

You should maintain hardware parity between the test host and the source host, and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. On the test host, log in to the Hardware Management Console, and then boot your host in the **SMS** menu.
4. After the host boots, change the IP address and host name.

5. Verify that your clustered Data ONTAP LUNs are present:

   ```
   sanlun lun show
   ```

6. Perform your testing as needed.
7. Shut down the test host:

   ```
   shutdown -h
   ```

8. In the 7MTT UI, click **Finish Testing**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Preparing for the cutover phase when transitioning AIX hosts with FC/FCoE configurations.

Before entering the cutover phase for AIX hosts with FC or FCoE configurations, you must perform specific steps.

Fabric connectivity and zoning to the clustered Data ONTAP nodes must be established.

For copy-based transitions, perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool. Copy-free transitions are not supported on AIX hosts.

Steps

1. Shut down your host:

   ```
   shutdown -h
   ```

Booting from SAN boot LUN on AIX hosts with FC/FCoE configurations after transition

After transitioning a SAN boot LUN on an AIX host with an FC or FCoE configuration, you must perform certain steps to boot your host from the SAN boot LUN.

For copy-based transitions, you must perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool. Copy-free transitions are not supported on AIX hosts.

1. Log in to the Hardware Management Console (HMC), and then boot your host in the SMS menu.
2. Select the host.
3. Select **Operations** > **Activate** > **Profile**.
4. Click the Advanced tab.
5. Select **SMS**, and then click **OK**.
6. In the SMS Main Menu, enter `5` to select **5. Select Boot Options**.
7. Enter `1` to select **1. Select Install/Boot Device**.
8. Enter `5` to select **5. List all Devices**.
9. Enter the device number of the ONTAP SAN boot LUN that you want to boot with.

In the following example, the desired LUN is option 5:

```
Select Device
Device  Current     Device
Number      Position    Name
1.   -   PCIe2 4-port 1GbE Adapter
     ( loc=U78CB.001.WZS062Y-P1-C12-T1 )
2.   -   PCIe2 4-port 1GbE Adapter
     ( loc=U78CB.001.WZS062Y-P1-C12-T2 )
3.   -   PCIe2 4-port 1GbE Adapter
     ( loc=U78CB.001.WZS062Y-P1-C12-T3 )
4.   -   PCIe2 4-port 1GbE Adapter
     ( loc=U78CB.001.WZS062Y-P1-C12-T4 )
5.   -   107 GB     FC Harddisk, part=2 (AIX 7.1.0)
     ( loc=U78CB.001.WZS062Y-P1-C7-T1-W232200a09830ca3a-
L0000000000000000 )
6.   -   107 GB     FC Harddisk, part=2 (AIX 7.1.0)
     ( loc=U78CB.001.WZS062Y-P1-C7-T2-W232200a09830ca3a-
L0000000000000000 )
---------------------------------------------------------------
Navigation keys:
M = return to Main Menu  N = Next page of list
ESC key = return to previous screen   X = eXit System Management
Services
---------------------------------------------------------------
Type menu item number and press Enter or select Navigation keys: 5
```

10. Enter **2** to select **2. Normal Mode Boot**.
11. Enter **1** to exit the SMS menu.
12. Wait for your operating system to boot.
13. Display the LUN path name:

    `sanlun lun show`

    The output in the mode column should have changed from `7` to `C`.

Transitioning AIX host data LUNs with file systems

If you transition an AIX host data LUN with a file system from Data ONTAP operating in 7-Mode to clustered Data ONTAP using the 7-Mode Transition Tool (7MTT), you must perform specific steps before and after transition to remediate transition issues on the host.

Preparing to transition AIX host data LUNs with file systems

Before you transition AIX host data LUNs with file systems from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must gather information you need for the transition process.

1. On the 7-Mode controller, identify the name of the LUN to be transitioned:

   `lun show`

2. On the host, locate the SCSI device name for the LUN:

   `sanlun lun show`

   The SCSI device name is located in the device filename column.

3. List and record the physical volumes used by the volume group configured in the data LUNs to be transitioned:

   `lsvg -p` ***`vg_name`***

4. List and record the logical volumes used by the volume group:

   `lsvg -l` ***`vg_name`***

Testing transitioned LUNs on AIX hosts before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to transition your AIX host LUNs, you can test your transitioned clustered Data ONTAP LUNs to verify that you can mount your MPIO device before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your LUNs must be prepared for transition.

You should maintain hardware parity between the test host and the source host and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. After the Baseline Data Copy is complete select **Test Mode** in the 7MTT user interface (UI).
2. In the 7MTT UI, click **Apply Configuration**.
3. On the test host, rescan your new clustered Data ONTAP LUNs:

   `cfgmgr`

4. Verify that your new clustered Data ONTAP LUNs are present:

   `sanlun lun show`

5. Verify the volume group status:

   lsvg vg_name

6. Mount each of the logical volumes:

   mount -o log/dev/loglv00 *file_system_mount_point*

7. Verify the mount points:

   df

8. Perform your testing as needed.
9. Shut down the test host:

   shutdown -h

10. In the 7MTT UI, click **Finish Testing**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Preparing for cutover phase when transitioning AIX host data LUNs with file systems

If you are transitioning an AIX host data LUN with a file system from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must perform certain steps before entering the cutover phase.

Fabric connectivity and zoning to the clustered Data ONTAP nodes must be established.

For copy-based transitions, perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool. Copy-free transitions are not supported on AIX hosts.

Steps

1. Stop I/O on all of the mount points.
2. Shut down each application accessing the LUNs according to the recommendations of the application vendor.
3. Unmount all of the mount points:

   umount *mount_point*

4. Disable the volume group:

   varyoffvq *vg_name*

5. Export the volume group:

   exportvg *vg_name*

6. Verify the volume group status:

```
lsvg
```

The exported volume group should not be listed in the output.

7. If there are any stale entries, remove them:

```
rmdev -Rdl hdisk#
```

Mounting AIX host data LUNs with file systems after transition

After transitioning AIX host data LUNs with file systems from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must mount the LUNs.

After LUN transition, the Logical Volume Manager (LVM) attributes, such as the logical volume name and volume group name, do not change. You continue to use the pretransition logical volume name and volume group name for post-transition configuration.

For copy-based transitions, perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool. Copy-free transitions are not supported on AIX hosts.

Steps

1. Discover your new clustered Data ONTAP LUNs:

   ```
   cfgmgr
   ```

2. Verify that your clustered Data ONTAP LUNs have been discovered:

   ```
   sanlun lun show
   ```

   Your clustered Data ONTAP LUNs should be listed and the output in the mode column should be changed from 7 to C.

3. Import your volume group:

   ```
   importvg -y vg_name pv_name
   ```

   You can use any physical volume name in your volume group.

4. Verify that your volume group was imported:

   ```
   lsvg vg_name
   ```

5. Mount each device:

   ```
   mount -o log=/dev/loglv00 file_system mount_point
   ```

6. Verify the mount points:

   ```
   df
   ```

Solaris host remediation

If you are using the 7-Mode Transition Tool (7MTT) to move from ONTAP operating in 7-Mode to clustered ONTAP in a SAN environment, you must perform a series of steps on your Solaris host before and after transition to avoid transition complications.

The following scenarios are not supported for any transition workflow (support for copy-based or copy-free transitions):

- Transition of SAN boot LUNs

  You can set up a SAN boot LUN to work in a Veritas dynamic multipathing (DMP) environment or a Solaris MPxIO environment by running the Solaris Host Utilities and using the FC protocol. The method you use to set up a SAN boot LUN can vary, depending on your volume manager and file system.

  Solaris Host Utilities 6.2 Installation and Setup Guide

- Solaris host clustering transition
- Veritas configuration

Transitioning Solaris host data LUNs with ZFS file systems

If you transition a Solaris host data LUN with ZFS file system from Data ONTAP operating in 7-Mode to clustered Data ONTAP using the 7-Mode Transition Tool (7MTT), you must perform specific steps before and after transition to remediate transition issues on the host.

Preparing to transition Solaris host data LUNs with ZFS file system

Before you transition Solaris host LUNs with ZFS file systems from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must gather information you need for the transition process.

This applies to copy-based transitions and copy-free transitions.

Steps

1. On the 7-Mode controller, identify the name of the LUN to be transitioned:

   `lun show`

```
 fas8040-shu01> lun show
        /vol/ufs/ufs1                  5g (5368709120)    (r/w, online,
mapped)
        /vol/ufs/ufs2                  5g (5368709120)    (r/w, online,
mapped)
        /vol/zfs/zfs1                  6g (6442450944)    (r/w, online,
mapped)
        /vol/zfs/zfs2                  6g (6442450944)    (r/w, online,
mapped)
```

2. On the host, locate the SCSI device file name for the LUN:

   `sanlun lun show`

   The SCSI device file name is located in the `device filename` column.

```
# sanlun lun show
controller(7mode)/                  device
host                  lun
vserver(Cmode)       lun-pathname      filename
adapter    protocol   size    mode
------------------------------------------------------------------------
--------------------------------------------------
fas8040-shu01        /vol/zfs/zfs2
/dev/rdsk/c0t60A98000383035356C2447384D396550d0s2 scsi_vhci0 FCP
6g      7
fas8040-shu01        /vol/zfs/zfs1
/dev/rdsk/c0t60A98000383035356C2447384D39654Ed0s2 scsi_vhci0 FCP
6g      7
fas8040-shu01        /vol/ufs/ufs2
/dev/rdsk/c0t60A98000383035356C2447384D39654Ad0s2 scsi_vhci0 FCP
5g      7
fas8040-shu01        /vol/ufs/ufs1
/dev/rdsk/c0t60A98000383035356C2447384D396548d0s2 scsi_vhci0 FCP
5g      7
```

3. List the zpool:

   `zpool list`

4. Record the zpool and get the disks associated with the zpool:

   `zpool status` ***`pool-name`***

```
# zpool list
NAME      SIZE  ALLOC   FREE  CAP  HEALTH  ALTROOT
n_pool  11.9G  2.67G  9.27G  22%  ONLINE  -

# zpool status
  pool: n_pool
 state: ONLINE
 scan: none requested
config:

        NAME                                         STATE     READ WRITE
CKSUM
        n_pool                                       ONLINE       0     0
0
          c0t60A98000383035356C2447384D396550d0  ONLINE       0     0
0
          c0t60A98000383035356C2447384D39654Ed0  ONLINE       0     0
0

errors: No known data errors
```

5. List and record the ZFS datasets within a ZFS storage pool:

`zfs list`

```
# zfs list
NAME           USED  AVAIL  REFER  MOUNTPOINT
n_pool        2.67G  9.08G   160K  /n_pool
n_pool/pool1  1.50G  2.50G  1.50G  /n_pool/pool1
n_pool/pool2  1.16G  2.84G  1.16G  /n_pool/pool2
```

Testing data LUNs on Solaris hosts with ZFS file system before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to transition your Solaris host ZFS data LUNs, you can test your transitioned clustered Data ONTAP LUNs to verify that you can mount your MPIO device before the cutover phase.

- Your source host with ZFS data LUNs need to be offline before starting the test phase transition.

  See *Oracle Doc ID 1316472.1: LUN Copy Is Not Supported While ZFS Zpool Is Online* for details.

- Your new clustered Data ONTAP LUNs must be mapped to your test host and your LUNs must be ready for transition.

- Exporting the zpool on the production host causes application disruption; all I/O operations should be stopped prior to 7-Mode LUN.

You should maintain hardware parity between the test host and the source host, and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

1. On the production (source) host, export the zpool:

   #zpool export *pool-name*

   ```
   # zpool export n_pool

   # zpool import
     pool: n_pool
       id: 5049703405981005579
    state: ONLINE
   action: The pool can be imported using its name or numeric identifier.
   config:

           n_pool                                  ONLINE
             c0t60A98000383035356C2447384D396550d0  ONLINE
             c0t60A98000383035356C2447384D39654Ed0  ONLINE
   ```

2. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
3. In the 7MTT UI, click **Apply Configuration**.

   > After this step, you can set the application back to online and start I/O operations to 7-Mode LUNs. Subsequent steps do not cause any application disruptions.

4. On the production host, import the zpool:

   #zpool import *pool-name*

   ```
   # zpool import n_pool
   ```

5. On the test host, rescan your new clustered Data ONTAP LUNs:
   a. Identify the FC host ports (type fc-fabric):

      #cfgadm -l

   b. Unconfigure the first fc-fabric port:

      #cfgadm -c unconfigure c1

   c. Configure the 1st fc-fabric port:

#cfgadm –c unconfigure c2

d. Repeat the steps for other fc-fabric ports.

e. Display information about the host ports and their attached devices:

 # cfgadm –al

f. Reload the driver:

 # devfsadm –Cv

 # devfsadm –i iscsi

6. Verify that your clustered Data ONTAP LUNs are present:

#sanlun lun show

```
# sanlun lun show
controller(7mode)/                   device
host                  lun
vserver(Cmode)        lun-pathname     filename
adapter    protocol   size    mode
------------------------------------------------------------------------
--------------------------------------------------
vs_5           /vol/zfs/zfs2
/dev/rdsk/c5t600A0980383030444D2B466542485935d0s2 scsi_vhci0 FCP
6g      C
vs_5           /vol/zfs/zfs1
/dev/rdsk/c5t600A0980383030444D2B466542485934d0s2 scsi_vhci0 FCP
6g      C
vs_5           /vol/ufs/ufs2
/dev/rdsk/c5t600A0980383030444D2B466542485937d0s2 scsi_vhci0 FCP
5g      C
vs_5           /vol/ufs/ufs1
/dev/rdsk/c5t600A0980383030444D2B466542485936d0s2 scsi_vhci0 FCP
5g      C
```

7. Verify that the zpool planned to test is available for import:

#zpool import

```
# zpool import
  pool: n_pool
    id: 5049703405981005579
 state: ONLINE
action: The pool can be imported using its name or numeric identifier.
config:

        n_pool                                   ONLINE
          c5t600A0980383030444D2B466542485935d0  ONLINE
          c5t600A0980383030444D2B466542485934d0  ONLINE
```

8. Import the zpool using the pool name or the pool ID:
   - **`#zpool import pool-name`**
   - **`#zpool import pool-id`**

```
#zpool import n_pool
```

+

```
#zpool import 5049703405981005579
```

9. Verify that the ZFS datasets are mounted:
   - **`zfs list`**
   - **`df -ah`**

```
# zfs list
NAME            USED  AVAIL  REFER  MOUNTPOINT
n_pool         2.67G  9.08G   160K  /n_pool
n_pool/pool1  1.50G  2.50G  1.50G  /n_pool/pool1
n_pool/pool2  1.16G  2.84G  1.16G  /n_pool/pool2
```

10. Perform testing as needed.
11. Shut down the test host.
12. In the 7MTT UI, click **Finish Test**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Preparing for cutover phase when transitioning Solaris host data LUNs with ZFS file systems

If you are transitioning a Solaris host data LUN with ZFS file system from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must perform certain steps before entering the cutover phase.

If you are using an FC configuration, fabric connectivity and zoning to the clustered Data ONTAP nodes must be established.

If you are using an iSCSI configuration, the iSCSI sessions to the clustered Data ONTAP nodes must be discovered and logged in.

For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).

For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode operation in 7MTT.

Steps

1. Stop I/O on all mount points.
2. Shut down each application accessing the LUNs according to the recommendations of the application vendor.
3. Export the zpool:

   `zpool export` ***`pool-name`***

   ```
   # zpool export n_pool
   ```

4. Verify that the zpools are exported:

   - Should list the zpool that is exported:
     +
     `zpool import`
   - Should not list the zpool that is exported:
     +
     `zpool list`

```
# zpool export n_pool

# zpool list
no pools available

# zpool import
  pool: n_pool
    id: 5049703405981005579
 state: ONLINE
action: The pool can be imported using its name or numeric identifier.
config:

        n_pool                                   ONLINE
          c0t60A98000383035356C2447384D396550d0  ONLINE
          c0t60A98000383035356C2447384D39654Ed0  ONLINE
```

Mounting Solaris host LUNs with ZFS file systems after transition

After transitioning Solaris host LUNs with ZFS file systems from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must mount the LUNs.

For copy-based transitions, you perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).

For copy-free transitions, you perform these steps after the Import Data & Configuration operation in the 7MTT is complete.

1. Discover your new clustered Data ONTAP LUNs by rescanning the host.
   a. Identify the FC Host Ports (type fc-fabric):

      #cfgadm –l

   b. Unconfigure the 1st fc-fabric port:

      #cfgadm –c unconfigure c1

   c. Unonfigure the second fc-fabric port:

      #cfgadm –c unconfigure c2

   d. Repeat the steps for other fc-fabric ports.
   e. Verify that the information about the host ports and their attached devices is correct:

      # cfgadm –al

   f. Reload the driver:

      # devfsadm –Cv
      # devfsadm –i iscsi

2. Verify that your clustered Data ONTAP LUNs have been discovered:

   `sanlun lun show`
   The `lun-pathname` values for the clustered Data ONTAP LUNs should be the same as the `lun-pathname` values for the 7-Mode LUNs prior to transition.
   The `mode` column should display “C” instead of “7”.

```
# sanlun lun show
controller(7mode)/                    device
host                  lun
vserver(Cmode)       lun-pathname     filename
adapter    protocol   size    mode
--------------------------------------------------------------------------
--------------------------------------------------
vs_sru17_5           /vol/zfs/zfs2
/dev/rdsk/c5t600A0980383030444D2B466542485935d0s2 scsi_vhci0 FCP
6g      C
vs_sru17_5           /vol/zfs/zfs1
/dev/rdsk/c5t600A0980383030444D2B466542485934d0s2 scsi_vhci0 FCP
6g      C
vs_sru17_5           /vol/ufs/ufs2
/dev/rdsk/c5t600A0980383030444D2B466542485937d0s2 scsi_vhci0 FCP
5g      C
vs_sru17_5           /vol/ufs/ufs1
/dev/rdsk/c5t600A0980383030444D2B466542485936d0s2 scsi_vhci0 FCP
5g      C
```

3. Check for zpools that are available to import:

   `zpool import`

```
# zpool import
  pool: n_vg
    id: 3605589027417030916
 state: ONLINE
action: The pool can be imported using its name or numeric identifier.
config:

        n_vg                                     ONLINE
          c0t600A098051763644575D445443304134d0  ONLINE
          c0t600A098051757A46382B445441763532d0  ONLINE
```

4. Import the zpools that were used for transition by pool name or using the pool ID:

   - **`zpool import`** ***`pool-name`***

◦ **`zpool import pool-id`**

```
# zpool list
no pools available

# zpool import
  pool: n_pool
    id: 5049703405981005579
 state: ONLINE
action: The pool can be imported using its name or numeric identifier.
config:

        n_pool                                   ONLINE
          c0t60A98000383035356C2447384D396550d0  ONLINE
          c0t60A98000383035356C2447384D39654Ed0  ONLINE

# zpool import n_pool
```

+

```
# zpool import 5049703405981005579

[59] 09:55:53 (root@sunx2-shu04) /tmp
# zpool list
NAME      SIZE  ALLOC   FREE  CAP  HEALTH  ALTROOT
n_pool  11.9G  2.67G  9.27G  22%  ONLINE  -
```

5. Check whether the zpool is online by doing one of the following:

   ◦ **`zpool status`**

   ◦ **`zpool list`**

```
# zpool status
  pool: n_pool
 state: ONLINE
 scan: none requested
config:

        NAME                                      STATE     READ WRITE
CKSUM
        n_pool                                    ONLINE       0     0
0
          c0t60A98000383035356C2447384D396550d0  ONLINE       0     0
0
          c0t60A98000383035356C2447384D39654Ed0  ONLINE       0     0
0

errors: No known data errors
```

+

```
# zpool list
NAME     SIZE  ALLOC   FREE  CAP  HEALTH  ALTROOT
n_pool  11.9G  2.67G  9.27G  22%  ONLINE  -
```

6. Verify the mount points by using one of the following commands:
   - **zfs list**
   - **df –ah**

```
# zfs list
NAME           USED  AVAIL  REFER  MOUNTPOINT
n_pool        2.67G  9.08G   160K  /n_pool
n_pool/pool1  1.50G  2.50G  1.50G  /n_pool/pool1
n_pool/pool2  1.16G  2.84G  1.16G  /n_pool/pool2

#df -ah
n_pool                  12G   160K   9.1G     1%    /n_pool
n_pool/pool1           4.0G   1.5G   2.5G    38%    /n_pool/pool1
n_pool/pool2           4.0G   1.2G   2.8G    30%    /n_pool/pool2
```

Transitioning Solaris host data LUNs with Sun Volume Manager

If you transition a Solaris host data LUN with Solaris Volume Manager from Data ONTAP operating in 7-Mode to clustered Data ONTAP using the 7-Mode Transition Tool (7MTT), you must perform specific steps before and after transition to remediate transition issues on the host.

Preparing to transition Solaris host LUNs with Sun Volume Manager

Before you transition Solaris host data LUNs with Sun Volume Manager from ONTAP operating in 7-Mode to clustered ONTAP, you must gather information you need for the transition process.

This task applies to copy-based transitions and copy-free transitions.

Steps

1. Display your LUNs to identify the name of the LUNs to be transitioned:

   `lun show`

   ```
    fas8040-shu01> lun show
           /vol/ufs/ufs1                    5g (5368709120)    (r/w, online,
   mapped)
           /vol/ufs/ufs2                    5g (5368709120)    (r/w, online,
   mapped)
           /vol/zfs/zfs1                    6g (6442450944)    (r/w, online,
   mapped)
           /vol/zfs/zfs2                    6g (6442450944)    (r/w, online,
   mapped)
   ```

2. On the host, locate the device file name for the LUN:

   `#sanlun lun show`

   The device file name is listed in the `device filename` column.

```
# sanlun lun show
controller(7mode)/                    device
host                  lun
vserver(Cmode)       lun-pathname     filename
adapter    protocol   size    mode
------------------------------------------------------------------------
--------------------------------------------------
fas8040-shu01        /vol/zfs/zfs2
/dev/rdsk/c0t60A98000383035356C2447384D396550d0s2 scsi_vhci0 FCP
6g      7
fas8040-shu01        /vol/zfs/zfs1
/dev/rdsk/c0t60A98000383035356C2447384D39654Ed0s2 scsi_vhci0 FCP
6g      7
fas8040-shu01        /vol/ufs/ufs2
/dev/rdsk/c0t60A98000383035356C2447384D39654Ad0s2 scsi_vhci0 FCP
5g      7
fas8040-shu01        /vol/ufs/ufs1
/dev/rdsk/c0t60A98000383035356C2447384D396548d0s2 scsi_vhci0 FCP
5g
```

3. List and record the SVM, and then get the disks associated with the SVM:

   metaset

   metaset -s *set-name*

```
# metaset
Set name = svm, Set number = 1
Host                Owner
  Solarisx2-shu04        Yes
Drive                                               Dbase
/dev/dsk/c0t60A98000383035356C2447384D39654Ad0   Yes
/dev/dsk/c0t60A98000383035356C2447384D396548d0   Yes
```

```
# metastat -s svm
svm/d2: Concat/Stripe
    Size: 10452992 blocks (5.0 GB)
    Stripe 0:
        Device                                             Start Block
Dbase   Reloc
        /dev/dsk/c0t60A98000383035356C2447384D396548d0s0          0
No      Yes

svm/d1: Concat/Stripe
    Size: 10452992 blocks (5.0 GB)
    Stripe 0:
        Device                                             Start Block
Dbase   Reloc
        /dev/dsk/c0t60A98000383035356C2447384D39654Ad0s0          0
No      Yes

Device Relocation Information:
Device                                           Reloc  Device ID
/dev/dsk/c0t60A98000383035356C2447384D396548d0   Yes
id1,sd@n60a98000383035356c2447384d396548
/dev/dsk/c0t60A98000383035356C2447384D39654Ad0   Yes
id1,sd@n60a98000383035356c2447384d39654a
```

4. List and record the mount points:

   df -ah

```
# df -ah
Filesystem             size   used  avail capacity  Mounted on
/dev/md/svm/dsk/d1     4.9G   1.5G   3.4G    31%    /d1
/dev/md/svm/dsk/d2     4.9G   991M   3.9G    20%    /d2
```

Testing data LUNs on Solaris hosts with Sun Volume Manager before the cutover phase of copy-based transitions

If you are using the 7-Mode Transition Tool (7MTT) 2.2 or later and Data ONTAP 8.3.2 or later to transition your Solaris host ZFS data LUNs, you can test your transitioned clustered Data ONTAP LUNs to verify that you can mount your MPIO device before the cutover phase. Your source host can continue to run I/O to your source 7-Mode LUNs during testing.

Your source host with Sun Volume Manager data LUNs needs to be offline before starting the test phase transition.

Your new clustered Data ONTAP LUNs must be mapped to your test host and your LUNs must be ready for transition

You should maintain hardware parity between the test host and the source host, and you should perform the following steps on the test host.

Your clustered Data ONTAP LUNs are in read/write mode during testing. They convert to read-only mode when testing is complete and you are preparing for the cutover phase.

Steps

1. On the production host, disable the disk sets:

   `metaset -s svm -t`

   `metaset -s svm -A disable`

   `metaset -s svm -r`

   `metaset -s svm -P`

   `metaset`

2. After the baseline data copy is complete, select **Test Mode** in the 7MTT user interface (UI).
3. In the 7MTT UI, click **Apply Configuration**.
4. In the production host, import the disk sets:

   `metaimport –s` ***`set-name`***

```
# metaimport -s svm
Drives in regular diskset including disk
c0t60A98000383035356C2447384D39654Ad0:
  c0t60A98000383035356C2447384D39654Ad0
  c0t60A98000383035356C2447384D396548d0
More info:
  metaimport -r -v c0t60A98000383035356C2447384D39654Ad0


[22] 04:51:29 (root@sunx2-shu04) /
# metastat -s svm
svm/d2: Concat/Stripe
    Size: 10452992 blocks (5.0 GB)
    Stripe 0:
        Device                                             Start Block
Dbase   Reloc
        /dev/dsk/c0t60A98000383035356C2447384D396548d0s0          0
No      Yes

svm/d1: Concat/Stripe
    Size: 10452992 blocks (5.0 GB)
    Stripe 0:
        Device                                             Start Block
Dbase   Reloc
        /dev/dsk/c0t60A98000383035356C2447384D39654Ad0s0          0
No      Yes

Device Relocation Information:
Device                                           Reloc  Device ID
/dev/dsk/c0t60A98000383035356C2447384D396548d0   Yes
id1,sd@n60a98000383035356c2447384d396548
/dev/dsk/c0t60A98000383035356C2447384D39654Ad0   Yes
id1,sd@n60a98000383035356c2447384d39654a
```

5. On the test host, rescan your new clustered Data ONTAP LUNs:
   a. Identify the FC host ports (type fc-fabric):

      #cfgadm –l

   b. Unconfigure the first fc-fabric port:

      #cfgadm –c unconfigure c1

   c. Configure the first fc-fabric port:

      #cfgadm –c unconfigure c2

d. Repeat the steps for the other fc-fabric ports.

e. Display information about the host ports and their attached devices:

 # cfgadm –al

f. Reload the driver:

 # devfsadm –Cv

 # devfsadm –i iscsi

6. Verify that your clustered Data ONTAP LUNs are present:

sanlun lun show

```
# sanlun lun show
controller(7mode)/                    device
host                  lun
vserver(Cmode)        lun-pathname        filename
adapter    protocol   size    mode
------------------------------------------------------------------------
--------------------------------------------------
vs_5           /vol/zfs/zfs2
/dev/rdsk/c5t600A0980383030444D2B466542485935d0s2 scsi_vhci0 FCP
6g      C
vs_5           /vol/zfs/zfs1
/dev/rdsk/c5t600A0980383030444D2B466542485934d0s2 scsi_vhci0 FCP
6g      C
vs_5           /vol/ufs/ufs2
/dev/rdsk/c5t600A0980383030444D2B466542485937d0s2 scsi_vhci0 FCP
5g      C
vs_5           /vol/ufs/ufs1
/dev/rdsk/c5t600A0980383030444D2B466542485936d0s2 scsi_vhci0 FCP
5g      C
```

7. Verify that the Sun Volume Manager planned to test is available for import:

metaimport –r –v

```
# metaimport -r -v
Import: metaimport -s <newsetname> c5t600A0980383030444D2B466542485937d0
Device                                              offset       length replica
flags
c5t600A0980383030444D2B466542485937d0                   16         8192      a m
luo
c5t600A0980383030444D2B466542485936d0                   16         8192      a
luo
```

8. Import the metaset with a new name:

   `metaimport –s` ***`set-name disk-id`***

   Disk-id is obtained from the `metaimport --r --v` command.

```
# metaimport -s svm c5t600A0980383030444D2B466542485937d0
Drives in regular diskset including disk
c5t600A0980383030444D2B466542485937d0:
  c5t600A0980383030444D2B466542485937d0
  c5t600A0980383030444D2B466542485936d0
More info:
  metaimport -r -v c5t600A0980383030444D2B466542485937d0
```

9. Check whether the metaset is available:

   `metaset`

10. Run the file system check:

    `fsck -F ufs /dev/md/svm/rdsk/d1`

11. Use the mount command to manually mount.
12. Perform testing as needed.
13. Shut down the test host.
14. In the 7MTT UI, click **Finish Test**.

If your clustered Data ONTAP LUNs are to be remapped to your source host, you must prepare your source host for the cutover phase. If your clustered Data ONTAP LUNs are to remain mapped to your test host, no further steps are required on the test host.

Preparing for cutover phase when transitioning Solaris host Sun Volume Manager data LUNs

If you are transitioning a Solaris host data LUN with Sun Volume Manager from Data ONTAP operating in 7-Mode to clustered Data ONTAP, you must perform certain steps before entering the cutover phase.

If you are using an FC configuration, fabric connectivity and zoning to the clustered Data ONTAP nodes must be established.

If you are using an iSCSI configuration, the iSCSI sessions to the clustered Data ONTAP nodes must be discovered and logged in.

For copy-based transitions, perform these steps before initiating the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).

For copy-free transitions, perform these steps before initiating the Export & Halt 7-Mode operation in 7MTT.

1. Stop I/O on all mount points.
2. Shut down each application accessing the LUNs according to the recommendations of the application vendor.
3. Unmount all of the mount points:

   `umount` ***`mount_point`***

   ```
   #umount /d1
   #umount /d2
   ```

4. Perform the following operations on metaset:

   `metaset –s` ***`set-name`*** **`–A disable`**

   `metaset –s` *`set-name`* `–r`

   `metaset –s` ***`set-name`*** **`–P`**

   ```
   metaset -s n_vg -A disable
   metaset -s n_vg -r
   metaset -s n_vg -P
   ```

Mounting Solaris host LUNs with Solaris Volume Manager after transition

After transitioning Solaris host LUNs with Solaris Volume Manager from ONTAP operating in 7-Mode to clustered ONTAP, you must mount the LUNs.

For copy-based transitions, you perform these steps after completing the Storage Cutover operation in the 7-Mode Transition Tool (7MTT).

For copy-free transitions, you perform these steps after the Import Data & Configuration operation in the 7MTT is complete.

Steps

1. Discover your new clustered ONTAP LUNs by rescanning the host.
   a. Identify the FC host ports (type fc-fabric):

#cfgadm –*l*

b. Unconfigure the first fc-fabric port:

#cfgadm –c unconfigure *c1*

c. Unconfigure the second fc-fabric port:

#cfgadm –c unconfigure *c2*

d. Repeat the steps for other fc-fabric ports.

e. Verify the host ports and their attached devices:

 # cfgadm –*al*

f. Reload the driver:

 # devfsadm –Cv

 # devfsadm –i iscsi

2. Verify that your clustered ONTAP LUNs have been discovered:

sanlun lun show

   - The `lun-pathname` values for the clustered ONTAP LUNs should be the same as the `lun-pathname` values for the 7-Mode LUNs prior to transition.
   - The `mode` column should display “C” instead of “7”.

```
# sanlun lun show
controller(7mode)/                    device
host                  lun
vserver(Cmode)       lun-pathname     filename
adapter    protocol   size    mode
------------------------------------------------------------------------
--------------------------------------------------
vs_sru17_5           /vol/zfs/zfs2
/dev/rdsk/c5t600A0980383030444D2B466542485935d0s2 scsi_vhci0 FCP
6g      C
vs_sru17_5           /vol/zfs/zfs1
/dev/rdsk/c5t600A0980383030444D2B466542485934d0s2 scsi_vhci0 FCP
6g      C
vs_sru17_5           /vol/ufs/ufs2
/dev/rdsk/c5t600A0980383030444D2B466542485937d0s2 scsi_vhci0 FCP
5g      C
vs_sru17_5           /vol/ufs/ufs1
/dev/rdsk/c5t600A0980383030444D2B466542485936d0s2 scsi_vhci0 FCP
5g      C
```

3. Import disk sets into existing Solaris Volume Manager configurations, using the same disk set name:

metaimport -s *set-name*

```
# metaimport -s svm
Drives in regular diskset including disk
c0t60A98000383035356C2447384D39654Ad0:
  c0t60A98000383035356C2447384D39654Ad0
  c0t60A98000383035356C2447384D396548d0
More info:
  metaimport -r -v c0t60A98000383035356C2447384D39654Ad0

# metastat -s svm
svm/d2: Concat/Stripe
    Size: 10452992 blocks (5.0 GB)
    Stripe 0:
        Device                                             Start Block
Dbase   Reloc
        /dev/dsk/c0t60A98000383035356C2447384D396548d0s0          0
No      Yes

svm/d1: Concat/Stripe
    Size: 10452992 blocks (5.0 GB)
    Stripe 0:
        Device                                             Start Block
Dbase   Reloc
        /dev/dsk/c0t60A98000383035356C2447384D39654Ad0s0          0
No      Yes

Device Relocation Information:
Device                                             Reloc  Device ID
/dev/dsk/c0t60A98000383035356C2447384D396548d0   Yes
id1,sd@n60a98000383035356c2447384d396548
/dev/dsk/c0t60A98000383035356C2447384D39654Ad0   Yes
id1,sd@n60a98000383035356c2447384d39654a
```

4. Run file system check:

   fsck -F ufs /dev/md/svm/rdsk/d1

```
# fsck -F ufs /dev/md/svm/rdsk/d1
** /dev/md/svm/rdsk/d1
** Last Mounted on /d1
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3a - Check Connectivity
** Phase 3b - Verify Shadows/ACLs
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cylinder Groups
3 files, 1573649 used, 3568109 free (13 frags, 446012 blocks, 0.0%
fragmentation)
```

5. Manually mount each of the devices using the `mount` command.

```
# /sbin/mount -F ufs -o largefiles /dev/md/svm/dsk/d1  /d1
  # /sbin/mount -F ufs -o largefiles /dev/md/svm/dsk/d2  /d2
```

6. Verify the mount point:

   `df -ah`

Rolling back LUNs to 7-Mode after transition

If you are not satisfied with the performance of your clustered Data ONTAP LUNs, you can rollback from clustered Data ONTAP to Data ONTAP operating in 7-Mode for copy-free transitions (CFTs). Rollback is not supported for copy-based transitions (CBTs). Rollback is only supported on certain hosts.

You can rollback from clustered Data ONTAP to Data ONTAP operating in 7-Mode at any point before you click **commit** in the 7-Mode Transition Tool (7MTT). After you click **commit**, you cannot rollback.

The following hosts support rollback:

- Windows
- Red Hat Enterprise Linux (RHEL)
- ESXi

The following hosts do not support rollback:

- HP-UX
- AIX

Rolling back ONTAP LUNs to 7-Mode LUNs on RHEL hosts

If your ONTAP LUNs are not performing as you expect after transition from Data ONTAP operating in 7-Mode, you can rollback from ONTAP to 7-Mode LUNs on a Red Hat Enterprise Linux (RHEL) 5 or RHEL 6 host.

Your 7-Mode LUNs must be mapped back to your RHEL 5 or RHEL 6 host.

Steps

1. Discover the 7-Mode LUNs:

   `rescan-scsi-bus.sh`

2. Configure your DMMP devices for 7-Mode LUNs:

   `multipath`

3. Verify your 7-Mode LUNs:

   `sanlun lun show`

4. Determine the 7-Mode LUN device handle ID:

   `multipath -ll` ***`device_handle_name`***

5. If the host was configured with Logical Volume Manager (LVM), do the following:

   a. Import the volume group:

      `vgimport` ***`vg_name`***

   b. Verify the volume group status:

      `vgdisplay`

   c. Enable logical volumes:

      `vgchange -ay` ***`vg_name`***

   d. Verify logical volume status:

      `lvdisplay`

      The LV Status should be displayed as available.

   e. Mount the logical volumes from the ONTAP LUN to its respective mount point directory:

      `mount` ***`lv_name mount_point`***

      If the mount points are defined in the `etc/fstab` file, you can also use the `mount -a` command to mount the logical volumes.

   f. Verify the mount points:

      `mount`

Rolling back ONTAP LUNs to 7-Mode LUNs on Windows hosts

If your ONTAP LUNs are not performing as you expect after transition from Data ONTAP operating in 7-Mode, you can rollback from ONTAP to 7-Mode LUNs on a Windows host.

Your 7-Mode LUNs must be remapped to your host.

Steps

1. Use Hyper-V Manager to shut down all virtual machines (VMs) running on the LUNs.
2. Use Windows Disk Manager to take the LUNs offline.
3. Use Cluster Disk Manager to take the cluster disks offline.
4. Shut down the host.
5. Revert back to Data ONTAP operating in 7-Mode.
6. Boot the host.
7. Use Windows Disk Manager to bring your 7-Mode LUNs online.
8. Use Cluster Disk Manager to bring cluster disks online.
9. Use Hyper-V Manager to bring your VMs online.

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