SVM data mobility

ONTAP 9

NetApp
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SVM data mobility overview

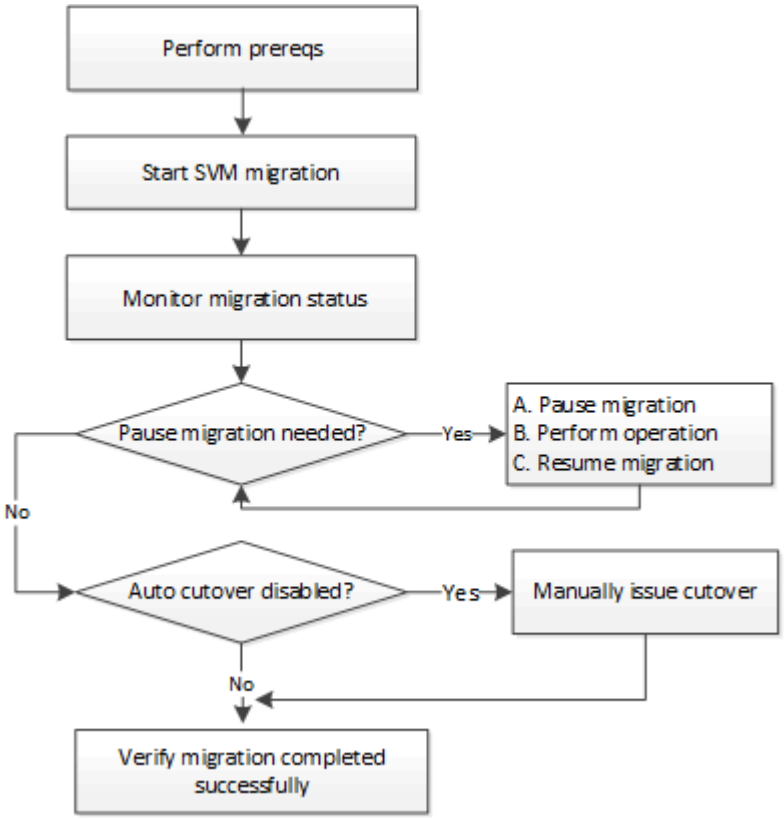
Beginning with ONTAP 9.10.1, cluster administrators can non-disruptively relocate an SVM from a source cluster to a destination cluster to manage capacity and load balancing, or to enable equipment upgrades or data center consolidations by using the ONTAP CLI.

This non-disruptive SVM relocation capability is supported on AFF platforms in ONTAP 9.10.1 and 9.11.1. Beginning with ONTAP 9.12.1, this capability is supported on both FAS and AFF platforms and on hybrid aggregates.

The SVM's name and UUID remain unchanged after migration, as well as the data LIF name, IP address, and object names, such as the volume name. The UUID of the objects in the SVM will be different.

SVM migration workflow

The diagram depicts the typical workflow for an SVM migration. You start an SVM migration from the destination cluster. You can monitor the migration from either the source or the destination. You can perform a manual cutover or an automatic cutover. An automatic cutover is performed by default.



SVM migration platform support

Controller family	ONTAP versions supported
AFF A-series	ONTAP 9.10.1 and later

AFF C-series	ONTAP 9.12.1 patch 4 and later
FAS	ONTAP 9.12.1 and later

When migrating from an AFF cluster to a FAS cluster with hybrid aggregates, auto volume placement will attempt to perform a like to like aggregate match. For example, if the source cluster has 60 volumes, the volume placement will try to find an AFF aggregate on the destination to place the volumes. When there is not sufficient space on the AFF aggregates, the volumes will be placed on aggregates with non-flash disks.

Scalability support by ONTAP version

ONTAP version	HA pairs in source and destination
ONTAP 9.14.1	12
ONTAP 9.13.1	6
ONTAP 9.11.1	3
ONTAP 9.10.1	1

Network infrastructure performance requirements for TCP round trip time (RTT) between the source and the destination cluster

Depending on the ONTAP version installed on the cluster, the network connecting the source and destination clusters must have a maximum round trip time as indicated:

ONTAP version	Maximum RTT
ONTAP 9.12.1 and later	10ms
ONTAP 9.11.1 and earlier	2ms

Maximum supported volumes per SVM

Source	Destination	ONTAP 9.14.1	ONTAP 9.13.1	ONTAP 9.12.1	ONTAP 9.11.1 and earlier
AFF	AFF	400	200	100	100
FAS	FAS	80	80	80	N/A
FAS	AFF	80	80	80	N/A
AFF	FAS	80	80	80	N/A

Prerequisites

Before initiating an SVM migration, you must meet the following prerequisites:

- You must be a cluster administrator.
- The source and destination clusters must be peered to each other.
- The source and destination clusters must have the SnapMirror synchronous license installed. This license

is included with ONTAP One.

- All nodes in the source cluster must be running ONTAP 9.10.1 or later. For specific ONTAP array controller support, see Hardware Universe.
- All nodes in the source cluster must be running the same ONTAP version.
- All nodes in the destination cluster must be running the same ONTAP version.
- The destination cluster must be at the same or no more than two major newer effective cluster versions (ECV) as the source cluster.
- The source and destination clusters must support the same IP subnet for data LIF access.
- The source SVM must contain fewer than the maximum number of supported data volumes for the release.
- Sufficient space for volume placement must be available on the destination
- Onboard Key Manager must be configured on the destination if the source SVM has encrypted volumes

Best practice

When performing an SVM migration, it is a best practice to leave 30% CPU headroom on both the source cluster and the destination cluster to enable the CPU workload to execute.

SVM operations

You should check for operations that can conflict with an SVM migration:

- No failover operations are in progress
- WAFLIRON cannot be running
- Fingerprint is not in progress
- Vol move, rehost, clone, create, convert or analytics are not running

Supported and unsupported features

The table indicates the ONTAP features supported by SVM data mobility and the ONTAP releases in which support is available.

Feature	Release first supported	Comments
Autonomous Ransomware Protection	ONTAP 9.12.1	
Cloud Volumes ONTAP	Not supported	
External key manager	ONTAP 9.11.1	
FabricPool	ONTAP 9.11.1	Learn more about FabricPool support.
Fanout relationship (the migrating source has a SnapMirror source volume with more than one destination)	ONTAP 9.11.1	

FC SAN	Not supported	
Flash Pool	ONTAP 9.12.1	
FlexCache volumes	Not supported	
FlexGroup	Not supported	
IPsec policies	Not supported	
IPv6 LIFs	Not supported	
iSCSI SAN	Not supported	
Job schedule replication	ONTAP 9.11.1	In ONTAP 9.10.1, job schedules are not replicated during migration and must be manually created on the destination. Beginning with ONTAP 9.11.1, job schedules used by the source are replicated automatically during migration.
Load-sharing mirrors	Not supported	
MetroCluster SVMs	Not supported	Although SVM migrate does not support MetroCluster SVM migration, you might be able to use SnapMirror Asynchronous replication to migrate an SVM in a MetroCluster configuration. You should be aware that the process described for migrating an SVM in a MetroCluster configuration is *not* a non-disruptive method.
NetApp Aggregate Encryption (NAE)	Not supported	Migration is not supported from an unencrypted source to an encrypted destination.
NDMP configurations	Not supported	
NetApp Volume Encryption (NVE)	ONTAP 9.10.1	

NFS and SMB audit logs	ONTAP 9.13.1	Audit log redirect is only available in cloud-mode. For on-premises SVM migration with audit enabled, you should disable audit on the source SVM and then perform the migration. Before SVM migration: • Audit log redirect must be enabled on the destination cluster. • The audit log destination path from the source SVM must be created on the destination cluster.
NFS v3, NFS v4.1, and NFS v4.2	ONTAP 9.10.1	
NFS v4.0	ONTAP 9.12.1	
NFSv4.1 with pNFS	ONTAP 9.14.1	
NVMe over Fabric	Not supported	
Onboard key manager (OKM) with Common Criteria mode enabled on source cluster	Not supported	
Qtrees	ONTAP 9.14.1	
Quotas	ONTAP 9.14.1	
S3	Not supported	
SMB protocol	ONTAP 9.12.1	SMB migrations are disruptive and require a client refresh post migration.
SnapMirror Cloud relationships	ONTAP 9.12.1	Beginning with ONTAP 9.12.1, when you migrate an SVM with SnapMirror Cloud relationships, the destination cluster must have the SnapMirror Cloud license installed, and it must have enough capacity available to support moving the capacity in the volumes that are being mirrored to the cloud.
SnapMirror asynchronous destination	ONTAP 9.12.1	

SnapMirror asynchronous source	ONTAP 9.11.1	• Transfers can continue as normal on FlexVol SnapMirror relationships during most of the migration. • Any ongoing transfers are canceled during cutover and new transfers fail during cutover and they cannot be restarted until the migration completes. • Scheduled transfers that were canceled or missed during the migration are not automatically started after the migration completes. When a SnapMirror source is migrated, ONTAP does not prevent deletion of the volume after migration until the SnapMirror update takes place. This happens because SnapMirror-related information for migrated SnapMirror source volumes is available only after migration is complete, and after the first update takes place.
SMTape settings	Not supported	
SnapLock	Not supported	
SnapMirror Business Continuity	Not supported	
SnapMirror SVM peer relationships	ONTAP 9.12.1	
SnapMirror SVM disaster recovery	Not supported	
SnapMirror Synchronous	Not supported	
Snapshot copy	ONTAP 9.10.1	
Tamperproof Snapshot copy locking	ONTAP 9.14.1	Tamperproof Snapshot copy locking is not equivalent to SnapLock. SnapLock remains unsupported.
Virtual IP LIFs/BGP	Not supported	
Virtual Storage Console 7.0 and later	Not supported	VSC is part of the ONTAP Tools for VMware vSphere virtual appliance beginning with VSC 7.0.
Volume clones	Not supported	

vStorage	Not supported	

FabricPool support

SVM migration is supported with volumes on FabricPools for the following platforms:

- Azure NetApp Files platform. All tiering policies are supported (snapshot-only, auto, all, and none).
- On-premises platform. Only the "none" volume tiering policy is supported.

Supported operations during migration

The following table indicates volume operations supported within the migrating SVM based on migration state:

Volume operation	SVM migration state		
	In progress	Paused	Cutover
Create	Not allowed	Allowed	Not supported
Delete	Not allowed	Allowed	Not supported
File System Analytics disable	Allowed	Allowed	Not supported
File System Analytics enable	Not allowed	Allowed	Not supported
Modify	Allowed	Allowed	Not supported
Offline/Online	Not allowed	Allowed	Not supported
Move/rehost	Not allowed	Allowed	Not supported
Qtree create/modify	Not allowed	Allowed	Not supported
Quota create/modify	Not allowed	Allowed	Not supported
Rename	Not allowed	Allowed	Not supported
Resize	Allowed	Allowed	Not supported
Restrict	Not allowed	Allowed	Not supported
Snapshot copy attributes modify	Allowed	Allowed	Not supported
Snapshot copy autodelete modify	Allowed	Allowed	Not supported
Snapshot copy create	Allowed	Allowed	Not supported
Snapshot copy delete	Allowed	Allowed	Not supported
Restore file from Snapshot copy	Allowed	Allowed	Not supported

Migrate an SVM

After an SVM migration has completed, clients are cut over to the destination cluster automatically and the unnecessary SVM is removed from the source cluster. Automatic cutover and automatic source cleanup are enabled by default. If necessary, you can disable client auto-cutover to suspend the migration before cutover occurs and you can

also disable automatic source SVM cleanup.

- You can use the `-auto-cutover false` option to suspend the migration when automatic client cutover normally occurs and then manually perform the cutover later.

  Manually cutover clients after SVM migration

- You can use the advance privilege `-auto-source-cleanup false` option to disable the removal of the source SVM after cutover and then trigger source cleanup manually later, after cutover.

  Manually remove source SVM after cutover

Migrate an SVM with automatic cutover enabled

By default, clients are cut over to the destination cluster automatically when the migration is complete, and the unnecessary SVM is removed from the source cluster.

Steps

1. From the destination cluster, run the migration prechecks:

   ```
   dest_cluster> vserver migrate start -vserver SVM_name -source-cluster
   cluster_name -check-only true
   ```

2. From the destination cluster, start the SVM migration:

   ```
   dest_cluster> vserver migrate start -vserver SVM_name -source-cluster
   cluster_name
   ```

3. Check the migration status:

   ```
   dest_cluster> vserver migrate show
   ```

   The status displays migrate-complete when the SVM migration is finished.

Migrate an SVM with automatic client cutover disabled

You can use the -auto-cutover false option to suspend the migration when automatic client cutover normally occurs and then manually perform the cutover later. See Manually cutover clients after SVM migration.

Steps

1. From the destination cluster, run the migration prechecks:

   ```
   dest_cluster> vserver migrate start -vserver SVM_name -source-cluster
   cluster_name -check-only true
   ```

2. From the destination cluster, start the SVM migration:

   ```
   dest_cluster> vserver migrate start -vserver SVM_name -source-cluster
   cluster_name -auto-cutover false
   ```

3. Check the migration status:

`dest_cluster> vserver migrate show` The status displays ready-for-cutover when SVM migration completes the asynchronous data transfers, and it is ready for cutover operation.

Migrate an SVM with source cleanup disabled

You can use the advance privilege -auto-source-cleanup false option to disable the removal of the source SVM after cutover and then trigger source cleanup manually later, after cutover. See Manually remove source SVM.

Steps

1. From the destination cluster, run the migration prechecks:

   ```
   dest_cluster*> vserver migrate start -vserver SVM_name -source-cluster
   cluster_name -check-only true
   ```

2. From the destination cluster, start the SVM migration:

   ```
   dest_cluster*> vserver migrate start -vserver SVM_name -source-cluster
   cluster_name -auto-source-cleanup false
   ```

3. Check the migration status:

   ```
   dest_cluster*> vserver migrate show
   ```

   The status displays ready-for-source-cleanup when SVM migration cutover is complete, and it is ready to remove the SVM on the source cluster.

Monitor volume migration

In addition to monitoring the overall SVM migration with the `vserver migrate show` command, you can monitor the migration status of the volumes the SVM contains.

Steps

1. Check volume migration status:

   ```
   dest_clust> vserver migrate show-volume
   ```

Pause and resume SVM migration

You might want to pause an SVM migration before the migration cutover begins. You can pause an SVM migration using the `vserver migrate pause` command.

Pause migration

You can pause an SVM migration before client cutover starts by using the `vserver migrate pause` command.

Some configuration changes are restricted when a migration operation is in progress; however, beginning with ONTAP 9.12.1, you can pause a migration to fix some restricted configurations and for some failed states so that you can fix configuration issues that might have caused the failure. Some of the failed states that you can fix when you pause SVM migration include the following:

- setup-configuration-failed
- migrate-failed

Steps

1. From the destination cluster, pause the migration:

```
dest_cluster> vserver migrate pause -vserver <vserver name>
```

Resume migrations

When you're ready to resume a paused SVM migration or when an SVM migration has failed, you can use the `vserver migrate resume` command.

Step

1. Resume SVM migration:

```
dest_cluster> vserver migrate resume
```

2. Verify that the SVM migration has resumed, and monitor the progress:

```
dest_cluster> vserver migrate show
```

Cancel an SVM migration

If you need to cancel an SVM migration before it completes, you can use the `vserver migrate abort` command. You can cancel an SVM migration only when the operation is in the paused or failed state. You cannot cancel an SVM migration when the status is "cutover-started" or after cutover is complete. You cannot use the `abort` option when an SVM migration is in progress.

Steps

1. Check the migration status:

```
dest_cluster> vserver migrate show -vserver <vserver name>
```

2. Cancel the migration:

```
dest_cluster> vserver migrate abort -vserver <vserver name>
```

3. Check the progress of the cancel operation:

```
dest_cluster> vserver migrate show
```

   The migration status shows migrate-aborting while the cancel operation is in progress. When the cancel operation completes, the migration status shows nothing.

Manually cut over clients

By default, client cutover to the destination cluster is performed automatically after the SVM migration reaches "ready-for-cutover" state. If you choose to disable automatic client cutover, you need to perform the client cutover manually.

Steps

1. Manually execute client cutover:

   ```
   dest_cluster> vserver migrate cutover -vserver <vserver name>
   ```

2. Check the status of the cutover operation:

   ```
   dest_cluster> vserver migrate show
   ```

Manually remove source SVM after client cutover

If you performed the SVM migration with source cleanup disabled, you can remove the source SVM manually after client cutover is complete.

Steps

1. Verify they status is ready for source cleanup:

   ```
   dest_cluster> vserver migrate show
   ```

2. Clean up the source:

   ```
   dest_cluster> vserver migrate source-cleanup -vserver <vserver_name>
   ```

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