SVM data mobility

ONTAP 9

NetApp
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SVM data mobility overview

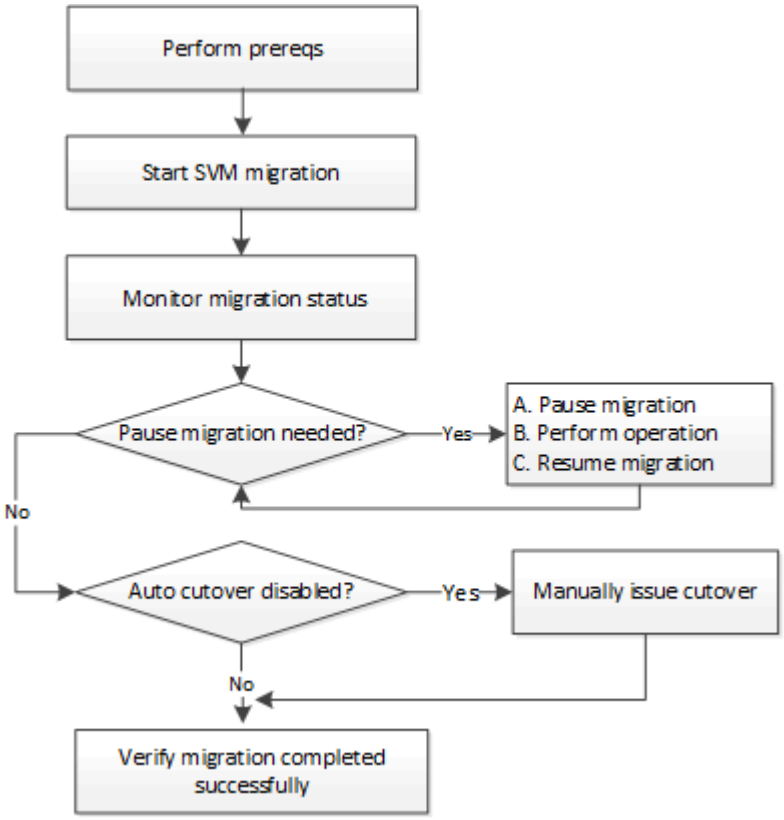
Beginning with ONTAP 9.10.1, cluster administrators can non-disruptively relocate an SVM from a source cluster to a destination cluster to manage capacity and load balancing, or to enable equipment upgrades or data center consolidations by using the ONTAP CLI.

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.



Supported configurations

The table indicates the configurations supported and the ONTAP releases in which support is available.

Configuration supported in…	ONTAP 9.10.1	ONTAP 9.11.1	ONTAP 9.12.1	ONTAP 9.13.1

AFF arrays	Yes	Yes	Yes	Yes
FAS platforms and mixed platforms (AFF-FAS,FAS-AFF, AFF-FAS with hybrid aggregates)	No	No	Yes	Yes
Total arrays/Node pairs	1	3	3	6
Migrate within a data center and a max network latency of:	2ms	2ms	10ms	10ms

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 no sufficient space on the AFF aggregates, the volumes will be placed on aggregates with non-flash disks.

Prerequisites

- You must be a cluster administrator
- The source and destination clusters must peered to each other

  Create a cluster peer relationship

- The source and destination clusters must have the Data Protection Bundle license installed
- All nodes in the source cluster must be running ONTAP 9.10.1 or later
- 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 newer effective cluster version (ECV) as the source cluster
- The source and destination clusters must support the same IP subnet for data LIF access
- The network connecting the source and destination clusters must have a maximum round trip time (RTT) of less than 10ms
- The source SVM must contain fewer than the maximum number of supported data volumes for the release. The maximum number of data volumes supported is as follows:
  - AFF arrays: 200 data volumes with clusters running ONTAP 9.13.1 and later releases, and 100 data volumes with clusters running ONTAP 9.12.1 and earlier releases.
  - FAS platforms: 80 data volumes
- 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

Conflicting 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 features

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

Feature supported in…	ONTAP 9.10.1	ONTAP 9.11.1	ONTAP 9.12.1	ONTAP 9.13.1	Additional information
Asynchronous SnapMirror copy-to-cloud relationships	No	No	Yes	Yes	Beginning with ONTAP 9.12.1, when you migrate an SVM with SnapMirror Copy to Cloud relationships, the migrate destination cluster must have the copy to cloud license installed and must have enough capacity available to support moving the capacity in the volumes that are being mirrored to the cloud.
Asynchronous SnapMirror destination	No	No	Yes	Yes	

Asynchronous SnapMirror source	No	Yes	Yes	Yes	• 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 migrate completes. When a SnapMirror source is migrated, ONTAP does not prevent deletion of the volume after migration until the SnapMirror update takes place after. This happens because SnapMirror-related information for migrated SnapMirror source volumes is known only after first update after migrate is complete.
Autonomous Ransomware Protection	No	No	Yes	Yes	
External key manager	No	Yes	Yes	Yes	
FabricPool	No	Yes	Yes	Yes	Learn more about FabricPool support.
Fanout relationships (the migrating source has a SnapMirror source volume with more than one destination)	No	Yes	Yes	Yes	
Flash Pool	No	No	Yes	Yes	

Job schedule replication	No	Yes	Yes	Yes	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.
NetApp Volume Encryption	Yes	Yes	Yes	Yes	
NFS and SMB audit logging	No	No	No	Yes	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	Yes	Yes	Yes	Yes	
NFS v4.0	No	No	Yes	Yes	
NFS v4.0 protocol	No	No	Yes	Yes	
SMB protocol	No	No	Yes	Yes	Beginning with ONTAP 9.12.1, SVM migrate includes disruptive migration with SMB.
SVM peering for SnapMirror applications	No	Yes	Yes	Yes	

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.

Unsupported features

The following features are not supported with SVM migration:

- Cloud Volumes ONTAP
- FlexCache volumes
- FlexGroup volumes
- IPsec policy
- IPv6 LIFs
- iSCSI workloads
- Load-sharing mirrors
- MetroCluster

- NDMP
- SAN, NVMe over fiber, VSCAN, vStorage, S3 replication
- SMTape
- SnapLock
- SVM-DR
- SVM migration when the source cluster's Onboard Key Manager (OKM) has Common Criteria (CC) mode enabled
- Synchronous SnapMirror, SnapMirror Business Continuity
- Qtree, Quota
- VIP/BGP LIF
- Virtual Storage Console for VMware vSphere (VSC is part of the ONTAP Tools for VMware vSphere virtual appliance beginning with VSC 7.0.)
- Volume clones

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 cut over 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 clean up source after cutover.”

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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