



Prepare for an ONTAP revert

ONTAP 9

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Table of Contents

- Prepare for an ONTAP revert 1
- Resources to review before you revert an ONTAP cluster 1
- System verifications to perform before you revert an ONTAP cluster 1
- Perform ONTAP version specific pre-revert checks 6

Prepare for an ONTAP revert

Resources to review before you revert an ONTAP cluster

Before you revert an ONTAP cluster, you should confirm hardware support and review resources to understand issues you might encounter or need to resolve.

1. Review the [ONTAP 9 Release Notes](#) for the target release.

The “Important cautions” section describes potential issues that you should be aware of before downgrading or reverting.

2. Confirm that your hardware platform is supported in the target release.

[NetApp Hardware Universe](#)

3. Confirm that your cluster and management switches are supported in the target release.

You must verify that the NX-OS (cluster network switches), IOS (management network switches), and reference configuration file (RCF) software versions are compatible with the version of ONTAP to which you are reverting.

[NetApp Downloads: Cisco Ethernet Switch](#)

4. If your cluster is configured for SAN, confirm that the SAN configuration is fully supported.

All SAN components—including target ONTAP software version, host OS and patches, required Host Utilities software, and adapter drivers and firmware—should be supported.

[NetApp Interoperability Matrix Tool](#)

System verifications to perform before you revert an ONTAP cluster

Before you revert an ONTAP cluster, you should verify your cluster health, storage health, and system time. You should also verify that no jobs are running on the cluster.

Verify cluster health

Before you revert an ONTAP cluster, you should verify that the nodes are healthy and eligible to participate in the cluster, and that the cluster is in quorum.

Steps

1. Verify that the nodes in the cluster are online and are eligible to participate in the cluster:

```
cluster show
```

In this example, all nodes are healthy and eligible to participate in the cluster.

```
cluster1::> cluster show
Node           Health Eligibility
-----
node0          true  true
node1          true  true
```

If any node is unhealthy or ineligible, check EMS logs for errors and take corrective action.

2. Set the privilege level to advanced:

```
set -privilege advanced
```

Enter `y` to continue.

3. Verify the configuration details for each RDB process.

- The relational database epoch and database epochs should match for each node.
- The per-ring quorum master should be the same for all nodes.

Note that each ring might have a different quorum master.

To display this RDB process...	Enter this command...
Management application	<pre>cluster ring show -unitname mgmt</pre>
Volume location database	<pre>cluster ring show -unitname vlodb</pre>
Virtual-Interface manager	<pre>cluster ring show -unitname vifmgr</pre>
SAN management daemon	<pre>cluster ring show -unitname bcomd</pre>

This example shows the volume location database process:

```
cluster1::*> cluster ring show -unitname vldb
Node          UnitName Epoch      DB Epoch DB Trnxs Master      Online
-----
node0         vldb      154          154      14847   node0      master
node1         vldb      154          154      14847   node0      secondary
node2         vldb      154          154      14847   node0      secondary
node3         vldb      154          154      14847   node0      secondary
4 entries were displayed.
```

4. Return to the admin privilege level:

```
set -privilege admin
```

5. If you are operating in a SAN environment, verify that each node is in a SAN quorum:

```
event log show -severity informational -message-name scsiblade.*
```

The most recent scsiblade event message for each node should indicate that the scsi-blade is in quorum.

```
cluster1::*> event log show -severity informational -message-name
scsiblade.*
Time          Node          Severity      Event
-----
MM/DD/YYYY TIME node0         INFORMATIONAL scsiblade.in.quorum: The
scsi-blade ...
MM/DD/YYYY TIME node1         INFORMATIONAL scsiblade.in.quorum: The
scsi-blade ...
```

Related information

[System administration](#)

Verify storage health

Before you revert an ONTAP cluster, you should verify the status of your disks, aggregates, and volumes.

Steps

1. Verify disk status:

To check for...	Do this...
Broken disks	<p>a. Display any broken disks:</p> <pre>storage disk show -state broken</pre> <p>b. Remove or replace any broken disks.</p>
Disks undergoing maintenance or reconstruction	<p>a. Display any disks in maintenance, pending, or reconstructing states:</p> <pre>storage disk show -state maintenance pending reconstructing</pre> <p>b. Wait for the maintenance or reconstruction operation to finish before proceeding.</p>

2. Verify that all aggregates are online by displaying the state of physical and logical storage, including storage aggregates:

```
storage aggregate show -state !online
```

This command displays the aggregates that are *not* online. All aggregates must be online before and after performing a major upgrade or reversion.

```
cluster1::> storage aggregate show -state !online
There are no entries matching your query.
```

3. Verify that all volumes are online by displaying any volumes that are *not* online:

```
volume show -state !online
```

All volumes must be online before and after performing a major upgrade or reversion.

```
cluster1::> volume show -state !online
There are no entries matching your query.
```

4. Verify that there are no inconsistent volumes:

```
volume show -is-inconsistent true
```

See the Knowledge Base article [Volume Showing WAFL Inconsistent](#) on how to address the inconsistent volumes.

Related information

[Disk and aggregate management](#)

Verify the system time

Before you revert an ONTAP cluster, you should verify that NTP is configured, and that the time is synchronized across the cluster.

Steps

1. Verify that the cluster is associated with an NTP server:

```
cluster time-service ntp server show
```

2. Verify that each node has the same date and time:

```
cluster date show
```

```
cluster1::> cluster date show
Node          Date                Timezone
-----
node0         4/6/2013 20:54:38   GMT
node1         4/6/2013 20:54:38   GMT
node2         4/6/2013 20:54:38   GMT
node3         4/6/2013 20:54:38   GMT
4 entries were displayed.
```

Verify that no jobs are running

Before you revert an ONTAP cluster, you should verify the status of cluster jobs. If any aggregate, volume, NDMP (dump or restore), or Snapshot jobs (such as create, delete, move, modify, replicate, and mount jobs) are running or queued, you should allow the jobs to finish successfully or stop the queued entries.

Steps

1. Review the list of any running or queued aggregate, volume, or Snapshot jobs:

```
job show
```

In this example, there are two jobs queued:

```
cluster1::> job show
```

Job ID	Name	Owning Vserver	Node	State
8629	Vol Reaper	cluster1	-	Queued
	Description: Vol Reaper Job			
8630	Certificate Expiry Check	cluster1	-	Queued
	Description: Certificate Expiry Check			

2. Delete any running or queued aggregate, volume, or Snapshot copy jobs:

```
job delete -id <job_id>
```

3. Verify that no aggregate, volume, or Snapshot jobs are running or queued:

```
job show
```

In this example, all running and queued jobs have been deleted:

```
cluster1::> job show
```

Job ID	Name	Owning Vserver	Node	State
9944	SnapMirrorDaemon_7_2147484678	cluster1	node1	Dormant
	Description: Snapmirror Daemon for 7_2147484678			
18377	SnapMirror Service Job	cluster1	node0	Dormant
	Description: SnapMirror Service Job			

2 entries were displayed

Perform ONTAP version specific pre-revert checks

Pre-revert tasks required for your ONTAP version

Depending upon your ONTAP version, you might need to perform additional preparatory tasks before you begin the revert process.

If you are reverting from ...	Do the following before you start the revert process...
Any ONTAP 9 version	<ul style="list-style-type: none"> • Terminate SMB sessions that are not continuously available. • Review reversion requirements for SnapMirror and SnapVault relationships. • Verify deduplicated volumes have enough free space. • Prepare snapshots. • Set the autocommit period for SnapLock volumes to hours. • If you have a Metrocluster configuration, disable automatic unplanned switchover.
ONTAP 9.16.1	<ul style="list-style-type: none"> • If you have TLS configured for NVMe/TCP connections, disable the TLS configuration on the NVME hosts. • If you have extended qtree performance monitoring enabled, disable it. • If you are using CORS to access your ONTAP s3 buckets, remove the CORS configuration.
ONTAP 9.14.1	<p>If you have enabled trunking for client connections, disable trunking on any NFSv4.1 servers.</p>
ONTAP 9.12.1	<ul style="list-style-type: none"> • If you have configured S3 client access for NAS data, remove the S3 NAS bucket configuration. • If you are running the NVMe protocol and have configured in-band authentication, disable in-band authentication. • If you have a Metrocluster configuration, disable IPsec.
ONTAP 9.11.1	<p>If you have configured Autonomous Ransomware Protection (ARP), check the ARP licensing.</p>
ONTAP 9.6	<p>If you have SnapMirror synchronous relationships, prepare the relationships for revert.</p>

Any ONTAP 9 version

Terminate certain SMB sessions before reverting ONTAP

Before you revert an ONTAP cluster from any version of ONTAP 9, you should identify and gracefully terminate any SMB sessions that are not continuously available.

Continuously available SMB shares, which are accessed by Hyper-V or Microsoft SQL Server clients using the SMB 3.0 protocol, do not need to be terminated before upgrading or downgrading.

Steps

1. Identify any established SMB sessions that are not continuously available:

```
vserver cifs session show -continuously-available No -instance
```

This command displays detailed information about any SMB sessions that have no continuous availability. You should terminate them before proceeding with the ONTAP downgrade.

```
cluster1::> vserver cifs session show -continuously-available No  
-instance
```

```
                Node: nodel  
                Vserver: vs1  
                Session ID: 1  
                Connection ID: 4160072788  
Incoming Data LIF IP Address: 198.51.100.5  
                Workstation IP address: 203.0.113.20  
                Authentication Mechanism: NTLMv2  
                Windows User: CIFS\user1  
                UNIX User: nobody  
                Open Shares: 1  
                Open Files: 2  
                Open Other: 0  
                Connected Time: 8m 39s  
                Idle Time: 7m 45s  
                Protocol Version: SMB2_1  
                Continuously Available: No  
1 entry was displayed.
```

2. If necessary, identify the files that are open for each SMB session that you identified:

```
vserver cifs session file show -session-id session_ID
```

```

cluster1::> vserver cifs session file show -session-id 1

Node:      node1
Vserver:   vs1
Connection: 4160072788
Session:   1
File      File      Open Hosting
Continuously
ID        Type        Mode Volume          Share              Available
-----
-----
1         Regular    rw   vol10             homedirshare      No
Path:    \TestDocument.docx
2         Regular    rw   vol10             homedirshare      No
Path:    \file1.txt
2 entries were displayed.

```

ONTAP revert requirements for SnapMirror and SnapVault relationships

The `system node revert-to` command notifies you of any SnapMirror and SnapVault relationships that need to be deleted or reconfigured for the revert process to be completed. However, you should be aware of these requirements before you begin the reversion.

- All SnapVault and data protection mirror relationships must be quiesced and then broken.

After the reversion is completed, you can resynchronize and resume these relationships if a common Snapshot copy exists.

- SnapVault relationships must not contain the following SnapMirror policy types:

- `async-mirror`

You must delete any relationship that uses this policy type.

- `MirrorAndVault`

If any of these relationships exist, you should change the SnapMirror policy to `mirror-vault`.

- All load-sharing mirror relationships and destination volumes must be deleted.
- SnapMirror relationships with FlexClone destination volumes must be deleted.
- Network compression must be disabled for each SnapMirror policy.
- The `all_source_snapshot` rule must be removed from any `async-mirror` type SnapMirror policies.



The Single File Snapshot Restore (SFSR) and Partial File Snapshot Restore (PFSR) operations are deprecated on the root volume.

- Any currently running single file and Snapshot restore operations must be completed before the reversion can proceed.

You can either wait for the restore operation to finish, or you can abort it.

- Any incomplete single file and Snapshot restore operations must be removed by using the `snapmirror restore` command.

Verify free space for deduplicated volumes before reverting ONTAP

Before you revert an ONTAP cluster from any version of ONTAP 9, you must ensure that the volumes contain sufficient free space for the revert operation.

The volume must have enough space to accommodate the savings that were achieved through the inline detection of blocks of zeros. See the Knowledge Base article [How to see space savings from deduplication, compression, and compaction in ONTAP 9](#).

If you have enabled both deduplication and data compression on a volume that you want to revert, then you must revert data compression before reverting deduplication.

Steps

1. View the progress of the efficiency operations that are running on the volumes:

```
volume efficiency show -fields vserver,volume,progress
```

2. Stop all active and queued deduplication operations:

```
volume efficiency stop -vserver <svm_name> -volume <volume_name> -all
```

3. Set the privilege level to advanced:

```
set -privilege advanced
```

4. Downgrade the efficiency metadata of a volume to the target version of ONTAP:

```
volume efficiency revert-to -vserver <svm_name> -volume <volume_name>  
-version <version>
```

The following example reverts the efficiency metadata on volume VolA to ONTAP 9.x.

```
volume efficiency revert-to -vserver vs1 -volume VolA -version 9.x
```



The volume efficiency revert-to command reverts volumes that are present on the node on which this command is executed. This command does not revert volumes across nodes.

5. Monitor the progress of the downgrade:

```
volume efficiency show -vserver <svm_name> -op-status Downgrading
```

6. If the revert does not succeed, display the instance to see why the revert failed.

```
volume efficiency show -vserver <svm_name> -volume <volume_name> -  
instance
```

7. After the revert operation is complete, return to the admin privilege level:

```
set -privilege admin
```

Learn more about [Logical storage management](#).

Prepare Snapshots before reverting an ONTAP cluster

Before you revert an ONTAP cluster from any version of ONTAP 9, you must disable all Snapshot copy policies and delete any Snapshot copies that were created after upgrading to the current release.

If you are reverting in a SnapMirror environment, you must first have deleted the following mirror relationships:

- All load-sharing mirror relationships
- Any data protection mirror relationships that were created in ONTAP 8.3.x
- All data protection mirror relationships if the cluster was re-created in ONTAP 8.3.x

Steps

1. Disable Snapshot copy policies for all data SVMs:

```
volume snapshot policy modify -vserver * -enabled false
```

2. Disable Snapshot copy policies for each node's aggregates:

a. Identify the node's aggregates:

```
run -node <nodename> -command aggr status
```

b. Disable the Snapshot copy policy for each aggregate:

```
run -node <nodename> -command aggr options aggr_name nosnap on
```

c. Repeat this step for each remaining node.

3. Disable Snapshot copy policies for each node's root volume:

a. Identify the node's root volume:

```
run-node <node_name> -command vol status
```

You identify the root volume by the word **root** in the **Options** column of the `vol status` command output.

```
vs1::> run -node node1 vol status

      Volume State           Status           Options
      vol0 online           raid_dp, flex   root, nvfail=on
                        64-bit
```

b. Disable the Snapshot copy policy on the root volume:

```
run -node <node_name> vol options root_volume_name nosnap on
```

c. Repeat this step for each remaining node.

4. Delete all Snapshot copies that were created after upgrading to the current release:

a. Set the privilege level to advanced:

```
set -privilege advanced
```

b. Disable the snapshots:

```
snapshot policy modify -vserver * -enabled false
```

c. Delete the node's newer-version Snapshot copies:

```
volume snapshot prepare-for-revert -node <node_name>
```

This command deletes the newer-version Snapshot copies on each data volume, root aggregate, and root volume.

If any Snapshot copies cannot be deleted, the command fails and notifies you of any required actions you must take before the Snapshot copies can be deleted. You must complete the required actions and then rerun the `volume snapshot prepare-for-revert` command before proceeding to the next step.

```
cluster1::*> volume snapshot prepare-for-revert -node node1
```

```
Warning: This command will delete all Snapshot copies that have the
format used by the current version of ONTAP. It will fail if any
Snapshot copy polices are enabled, or
        if any Snapshot copies have an owner. Continue? {y|n}: y
```

d. Verify that the Snapshot copies have been deleted:

```
volume snapshot show -node nodename
```

e. If any newer-version Snapshot copies remain, force them to be deleted:

```
volume snapshot delete {-fs-version 9.0 -node nodename -is
-constituent true} -ignore-owners -force
```

f. Repeat these steps for each remaining node.

g. Return to the admin privilege level:

```
set -privilege admin
```



You must perform these steps on both the clusters in MetroCluster configuration.

Set autocommit periods for SnapLock volumes before reverting ONTAP

Before you revert an ONTAP cluster from any version of ONTAP 9, the value of the autocommit period for SnapLock volumes must be set in hours, not days. You should check the autocommit value for your SnapLock volumes and modify it from days to hours, if necessary.

Steps

1. Verify that there are SnapLock volumes in the cluster that have unsupported autocommit periods:

```
volume snaplock show -autocommit-period *days
```

2. Modify the unsupported autocommit periods to hours

```
volume snaplock modify -vserver <vserver_name> -volume <volume_name>
-autocommit-period value hours
```

Disable automatic unplanned switchover before reverting two-node and four-node MetroCluster configurations

Before reverting a two-node or four-node MetroCluster configuration running any version of ONTAP 9, you must disable automatic unplanned switchover (AUSO).

Step

1. On both the clusters in MetroCluster, disable automatic unplanned switchover:

```
metrocluster modify -auto-switchover-failure-domain auso-disabled
```

Related information

[MetroCluster management and disaster recovery](#)

ONTAP 9.16.1

Disable TLS on NVMe hosts before reverting from ONTAP 9.16.1

If you have TLS secure channel for NVMe/TCP connections configured on an NVMe host, you need to disable it before you revert your cluster from ONTAP 9.16.1.

Steps

1. Remove the TLS secure channel configuration from the host:

```
vserver nvme subsystem host unconfigure-tls-for-revert -vserver  
<svm_name> -subsystem <subsystem> -host-nqn <host_nqn>
```

This command removes the host from the subsystem, and then recreates the host in the subsystem without the TLS configuration.

2. Verify that TLS secure channel is removed from the host:

```
vserver nvme subsystem host show
```

Disable extended Qtree performance monitoring before reverting from ONTAP 9.16.1

Beginning with ONTAP 9.16.1, you can use the ONTAP REST API to access the extended qtree monitoring capabilities which includes latency metrics and historical statistics. If extended qtree monitoring is enabled on any qtrees, before you revert from 9.16.1, you must set `ext_performance_monitoring.enabled` to `false`.

Learn more about [reverting clusters with extended qtree performance monitoring](#).

Remove CORS configuration before reverting from ONTAP 9.16.1

If you are using Cross-Origin Resource Sharing (CORS) to access ONTAP S3 buckets, you must remove it before you revert from ONTAP 9.16.1.

Learn more about [reverting ONTAP clusters with using CORS](#).

ONTAP 9.14.1

Disable NFSv4.1 session trunking before reverting from ONTAP 9.14.1

If you have enabled trunking for client connections, you must disable trunking on any NFSv4.1 servers before reverting from ONTAP 9.14.1.

When you enter the `revert-to` command, you will see a warning message advising you to disable trunking before proceeding.

After reverting to an ONTAP 9.13.1, the clients using trunked connections fall back to using a single connection. Their data throughput will be affected, but there will be no disruption. The revert behavior is the same as modifying the NFSv4.1 trunking option for the SVM from enabled to disabled.

Steps

1. Disable trunking on the NFSv4.1 server:

```
vserver nfs modify -vserver _svm_name_ -v4.1-trunking disabled
```

2. Verify that NFS is configured as desired:

```
vserver nfs show -vserver _svm_name_
```

ONTAP 9.12.1

Remove S3 NAS bucket configuration before reverting from ONTAP 9.12.1

If you have configured S3 client access for NAS data, you should use the ONTAP command line interface (CLI) to remove the NAS bucket configuration and to remove any name mappings (S3 users to Windows or Unix users) before reverting from ONTAP 9.12.1.

About this task

The following tasks are completed in the background during the revert process.

- Remove all partially completed singleton object creations (that is, all entries in hidden directories).
- Remove all hidden directories; there might be one on for each volume that is accessible from the root of the export mapped from the S3 NAS bucket.
- Remove the upload table.

- Delete any default-unix-user and default-windows-user values for all configured S3 servers.

Steps

1. Remove S3 NAS bucket configuration:

```
vserver object-store-server bucket delete -vserver <svm_name> -bucket <s3_nas_bucket_name>
```

2. Remove name mappings for UNIX:

```
vserver name-mapping delete -vserver <svm_name> -direction s3-unix
```

3. Remove name mappings for Windows:

```
vserver name-mapping delete -vserver <svm_name> -direction s3-win
```

4. Remove the S3 protocols from the SVM:

```
vserver remove-protocols -vserver <svm_name> -protocols s3
```

Disable NVMe in-band authentication before reverting from ONTAP 9.12.1

If you are running the NVME protocol, you must disable in-band authentication before you revert your cluster from ONTAP 9.12.1. If in-band authentication using DH-HMAC-CHAP is not disabled, revert will fail.

Steps

1. Remove the host from the subsystem to disable DH-HMAC-CHAP authentication:

```
vserver nvme subsystem host remove -vserver <svm_name> -subsystem <subsystem> -host-nqn <host_nqn>
```

2. Verify that the DH-HMAC-CHAP authentication protocol is removed from the host:

```
vserver nvme subsystem host show
```

3. Add the host back to the subsystem without authentication:

```
vserver nvme subsystem host add vserver <svm_name> -subsystem <subsystem> -host-nqn <host_nqn>
```

Disable IPsec in MetroCluster configurations before reverting from ONTAP 9.12.1

Before reverting a MetroCluster configuration from ONTAP 9.12.1, you must disable IPsec.

A check is performed before revert to ensure there are no IPsec configurations within the MetroCluster configuration. You must remove any IPsec configurations present and disable IPsec before continuing with the revert. Reverting ONTAP is blocked if IPsec is enabled, even when you have not configured any user policies.

ONTAP 9.11.1

Check Autonomous Ransomware Protection licensing before reverting from ONTAP 9.11.1

If you have configured Autonomous Ransomware Protection (ARP) and you revert from ONTAP 9.11.1 to ONTAP 9.10.1, you might experience warning messages and limited ARP functionality.

In ONTAP 9.11.1, the Anti-ransomware license replaced the Multi-Tenant Key Management (MTKM) license. If your system has the Anti_ransomware license but no MT_EK_MGMT license, you will see a warning during revert that ARP cannot be enabled on new volumes upon revert.

The volumes with existing protection will continue to work normally after revert, and ARP status can be displayed using the ONTAP CLI. System Manager cannot show ARP status without the MTKM license.

Therefore, if you want ARP to continue after reverting to ONTAP 9.10.1, be sure the MTKM license is installed before reverting. [Learn about ARP licensing.](#)

ONTAP 9.6

Considerations for reverting systems from ONTAP 9.6 with SnapMirror synchronous relationships

You must be aware of the considerations for SnapMirror synchronous relationships before reverting from ONTAP 9.6 to ONTAP 9.5.

Before reverting, you must take the following steps if you have SnapMirror synchronous relationships:

- You must delete any SnapMirror synchronous relationship in which the source volume is serving data using NFSv4 or SMB.

ONTAP 9.5 does not support NFSv4 and SMB.

- You must delete any SnapMirror synchronous relationships in a mirror-mirror cascade deployment.

A mirror-mirror cascade deployment is not supported for SnapMirror synchronous relationships in ONTAP 9.5.

- If the common Snapshot copies in ONTAP 9.5 are not available during revert, you must initialize the SnapMirror synchronous relationship after reverting.

After two hours of upgrade to ONTAP 9.6, the common Snapshot copies from ONTAP 9.5 are automatically replaced by the common Snapshot copies in ONTAP 9.6. Therefore, you cannot resynchronize the SnapMirror synchronous relationship after reverting if the common Snapshot copies from ONTAP 9.5 are not available.

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