Without Upgrade Advisor

ONTAP 9

NetApp
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Plan your upgrade without Upgrade Advisor

It is a best practice to use Upgrade Advisor in Active IQ to plan your upgrade. If you do not have an active SupportEdge contract for Active IQ, you should perform the necessary pre-upgrade checks and create your own upgrade plan.

How long will my upgrade take?

You should plan for at least 30 minutes to complete preparatory steps, 60 minutes to upgrade each HA pair, and at least 30 minutes to complete post-upgrade steps.

If you are using NetApp Encryption with an external key management server and the Key Management Interoperability Protocol (KMIP), you should expect the upgrade for each HA pair to be longer than one hour.

Our upgrade duration guidelines are based on typical configurations and workloads. You can use these guidelines to estimate the time it will take to perform a nondisruptive upgrade in your environment. However, the actual duration of your upgrade process will depend on your individual environment and the number of nodes.

Resources to read before you upgrade

If you don't use Active IQ Upgrade Advisor, you need to review a number of NetApp resources before upgrading your ONTAP software. These resources will help you understand issues you must resolve, new system behavior in the target release, and confirm hardware support.

1. Review the *Release Notes* for the target release.

   ONTAP 9 Release Notes

   The "Important cautions" section describes potential issues that you should be aware of before upgrading to the new release. The "New and changed features" and "Known problems and limitations" sections describe new system behavior after upgrading to the new release.

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 can upgrade in a transitional state, but ultimately your NX-OS (cluster network switches), IOS (management network switches), and reference configuration file (RCF) software versions should be compatible with the version of ONTAP to which you are upgrading.

   NetApp Interoperability Matrix Tool

4. If your cluster and management switches do not have the minimum software versions for the target ONTAP release, upgrade to supported software versions.

   NetApp Downloads: Cisco Ethernet Switch

NetApp Downloads: NetApp Ethernet Switch

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

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

   NetApp Interoperability Matrix Tool

6. If you are transitioning from 7-Mode using the 7-Mode Transition Tool, confirm that the tool supports transition to the ONTAP version to which you are upgrading.

   All the projects in the tool must be in the completed or aborted state before you upgrade the 7-Mode Transition Tool that supports the ONTAP version to which you are upgrading.

   7-Mode Transition Tool installation and administration

What to verify before upgrading

If you don't use Active IQ Upgrade Advisor to plan your upgrade, you should verify your cluster upgrade limits and your cluster activity before you upgrade.

Verify cluster upgrade limits

If you don't use Active IQ Upgrade Advisor, you need to verify that your cluster does not exceed the platform system limits. SAN also has limits that you should verify in addition to the platform system limits.

1. Verify that the cluster does not exceed the system limits for your platform.

   NetApp Hardware Universe

2. If your cluster is configured for SAN, verify that it does not exceed the configuration limits for FC, FCoE, and iSCSI.

   NetApp Hardware Universe

3. Determine the CPU and disk utilization: `node run -node node_name -command sysstat -c 10 -x 3`

   You should monitor CPU and disk utilization for 30 seconds. The values in the **CPU** and **Disk Util** columns should not exceed 50% for all 10 measurements reported. No additional load should be added to the cluster until the upgrade is complete. NOTE: CPU and disk utilization can vary at different times in your environment. Therefore, it is best to check your CPU and disk utilization during the timeframe of your anticipated upgrade window.

Verify current cluster activity

If you don't use Active IQ Upgrade Advisor, before upgrading, you should manually verify that no jobs are running and that any CIFS sessions that are not continuously available are terminated.

Verify that no jobs are running

Before upgrading the ONTAP software, you must 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 must allow the jobs to finish successfully or stop the queued entries.

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

```
cluster1::> job show
                            Owning
Job ID Name                 Vserver    Node           State
------ -------------------- ---------- -------------- ----------
8629   Vol Reaper           cluster1   -              Queued
       Description: Vol Reaper Job
8630   Certificate Expiry Check
                            cluster1   -              Queued
       Description: Certificate Expiry Check
.
.
.
```

2. If there are any running jobs, allow them to finish successfully.
3. Delete any of the queued aggregate, volume, or Snapshot copy jobs: `job delete -id job_id`

```
cluster1::> job delete -id 8629
```

4. 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
                            Owning
Job ID Name                 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
```

Identifying active CIFS sessions that should be terminated

Before upgrading the ONTAP software, you should identify and gracefully terminate any CIFS sessions that are not continuously available.

Continuously available CIFS 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.

1. Identify any established CIFS sessions that are not continuously available: `vserver cifs session show -continuously-available Yes -instance`

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

```
cluster1::> vserver cifs session show -continuously-available Yes
-instance

                        Node: node1
                     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: CIFSLAB\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 CIFS 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.
```

Related information

Considerations for session-oriented protocols

How firmware is updated during the ONTAP upgrade

Because upgrading ONTAP includes upgrading your firmware, you do not need to update firmware manually. When you perform an ONTAP upgrade, the firmware for your cluster included with the ONTAP upgrade package is copied to each node's boot device, and the new firmware is installed automatically.

Firmware for the following components is updated automatically if the version in your cluster is older than the firmware that is bundled with the ONTAP upgrade package:

- System and diagnostics:
  - BIOS
  - Flash Cache
  - Service Processor (SP)
- Disk
- Disk shelf

If desired, you can also update firmware manually in between ONTAP upgrades.