NetApp

Complete upgrade

Upgrade controllers

NetApp
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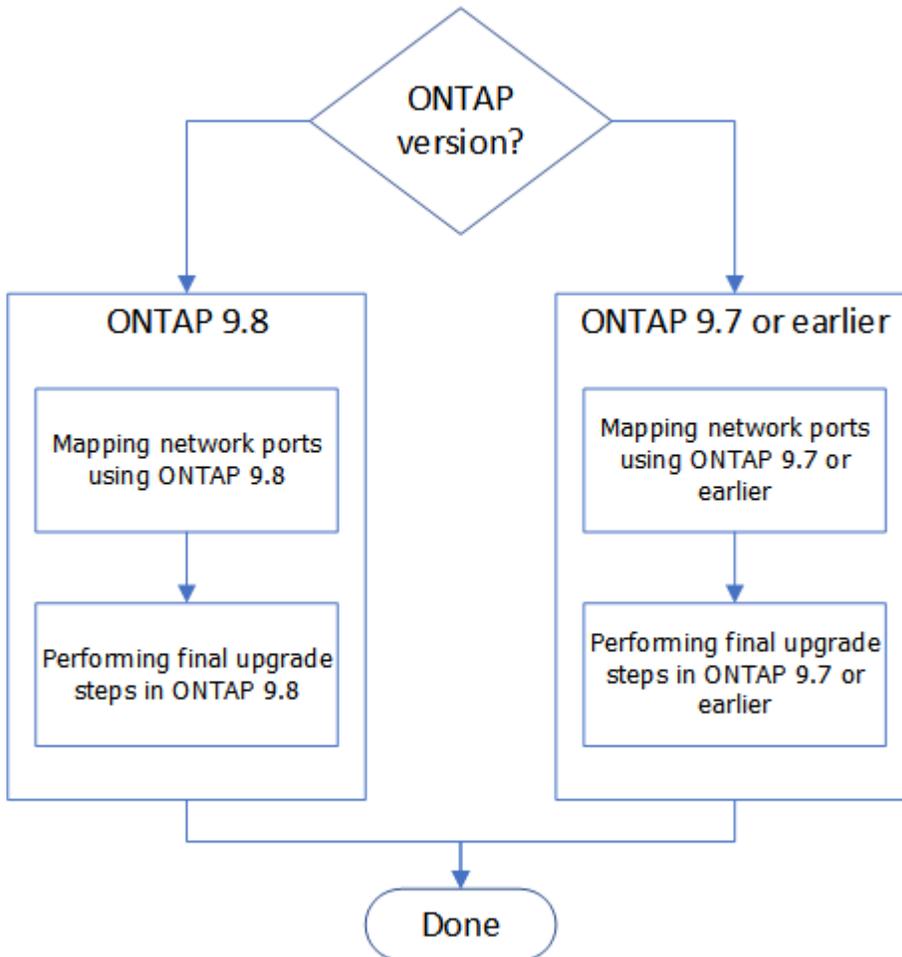# Table of Contents

Complete upgrade

Complete the move storage upgrade workflow

Complete the upgrade in ONTAP 9.8 or later, or ONTAP 9.7 or earlier.

You must use the procedure for your version of ONTAP.

- Complete the upgrade in ONTAP 9.8 or later
- Complete the upgrade in ONTAP 9.7 or earlier

Complete in ONTAP 9.8 or later

Map network ports using ONTAP 9.8 or later

To enable node3 and node4 to communicate with each other in the cluster and with the network after the upgrade, you must confirm that the physical ports are correctly configured with the settings for the intended use, such as cluster, data, and so on.

Before you begin

These steps apply to systems running ONTAP 9.8 or later. If you are running ONTAP 9.7 or earlier, you must

use the procedure in Map network ports using ONTAP 9.7 or earlier.

About this task

You must perform these steps on node3 and node4.

> (i) The following command examples refer to "node1" because at this stage in the procedure the replacement nodes "node3" and "node4" are actually named "node1" and "node2".

Steps

1. If your system is running ONTAP 9.7 or earlier, **STOP**. You must use the procedure in Map network ports using ONTAP 9.7 or earlier.

2. Locate the port and LIF configuration information for node1 and node2 that you recorded in *Prepare for upgrade when moving storage*, Step 3.

3. Locate the information for ports, broadcast domains, and IPspaces that you recorded in *Prepare for upgrade when moving storage*, Step 3.

   NetApp Hardware Universe

4. Make the following changes:

   a. Boot and log in to node3 and node4 if you have not already done so.

   b. Modify ports that will be part of Cluster broadcast domain:

   ```
   network port modify -node node_name -port port_name -mtu 9000 -ipspace
   Cluster
   ```

   This example adds `Cluster` port e1b on "node1":

   ```
   network port modify -node node1 -port e1b -ipspace Cluster -mtu 9000
   ```

   c. Migrate the cluster LIFs to the new ports, once for each LIF:

   ```
   network interface migrate -vserver vserver_name -lif lif_name -source-node
   node1 -destination-node node1 -destination-port port_name
   ```

   When all cluster LIFs are migrated and cluster communication is established, the cluster should come into quorum.

   d. Modify the home port of the Cluster LIFs:

   ```
   network interface modify -vserver Cluster -lif lif_name -home-port port_name
   ```

   e. Remove the old ports from the `Cluster` broadcast domain:

   ```
   network port broadcast-domain remove-ports -ipspace Cluster -broadcast
   -domain Cluster -ports node1:port
   ```

   f. Display the health state of node3 and node4:

   ```
   cluster show -node node1 -fields health
   ```

   g. Depending on the ONTAP version running on the HA pair being upgraded, take one of the following

actions:

If your ONTAP version is…	Then…
9.8 to 9.11.1	Verify that the cluster LIFs are listening on port 7700: `::> network connections listening show -vserver Cluster`
9.12.1 or later	Skip this step and go to Step 5.

Port 7700 listening on cluster ports is the expected outcome as shown in the following example for a two-node cluster:

```
Cluster::> network connections listening show -vserver Cluster
Vserver Name      Interface Name:Local Port      Protocol/Service
----------------  ---------------------------    --------------------
Node: NodeA
Cluster           NodeA_clus1:7700                   TCP/ctlopcp
Cluster           NodeA_clus2:7700                   TCP/ctlopcp
Node: NodeB
Cluster           NodeB_clus1:7700                   TCP/ctlopcp
Cluster           NodeB_clus2:7700                   TCP/ctlopcp
4 entries were displayed.
```

h. For each cluster LIF that is not listening on port 7700, set the administrative status of the LIF to `down` and then `up`:

```
::> net int modify -vserver Cluster -lif cluster-lif -status-admin down; net
int modify -vserver Cluster -lif cluster-lif -status-admin up
```

Repeat substep (g) to verify that the cluster LIF is now listening on port 7700.

5. Modify the broadcast domain memberships of physical ports hosting data LIFs. You can do this manually, as shown in Map network ports using ONTAP 9.7 or earlier, Step7. NetApp recommends using the enhanced network reachability scan and repair procedure introduced in ONTAP 9.8, as shown in the following Step 5, substeps (a) to (g).

a. List the reachability status of all ports:

```
network port reachability show
```

b. Repair the reachability of the physical ports, followed by VLAN ports, by running the following command on each port, one port at a time:

```
reachability repair -node node_name -port port_name
```

A warning like the following is expected. Review and enter `y` or `n` as appropriate:

```
Warning: Repairing port "node_name:port" may cause it to move into a
different broadcast domain, which can cause LIFs to be re-homed away
from the port. Are you sure you want to continue? {y|n}:
```

c. To enable ONTAP to complete the repair, wait for about a minute after running the `reachability repair` command on the last port.

d. List all broadcast domains on the cluster:

```
network port broadcast-domain show
```

e. As the reachability repair is performed, ONTAP attempts to place the ports in the correct broadcast domains. However, if a port's reachability cannot be determined and does not correspond to any of the existing broadcast domains, ONTAP will create new broadcast domains for these ports. As required, you can delete the newly created broadcast domains if all their member ports will become member ports of the interface groups. Delete broadcast domains:

```
broadcast-domain delete -broadcast-domain broadcast_domain
```

f. Review the interface group configuration, and as required, add or delete member ports. Add member ports to interface group ports:

```
ifgrp add-port -node node_name -ifgrp ifgrp_port -port port_name
```

Remove member ports from interface group ports:

```
ifgrp remove-port -node node_name -ifgrp ifgrp_port -port port_name
```

g. Delete and re-create VLAN ports as needed. Delete VLAN ports:

```
vlan delete -node node_name -vlan-name vlan_port
```

Create VLAN ports:

```
vlan create -node node_name -vlan-name vlan_port
```

> (i) Depending on the complexity of the networking configuration of the system being upgraded, you might be required to repeat Step 5, substeps (a) to (g) ountil all ports are placed correctly where needed.

6. If there are no VLANs configured on the system, go to Step 7. If there are VLANs configured, restore displaced VLANs that were previously configured on ports that no longer exist or were configured on ports that were moved to another broadcast domain.

a. Display the displaced VLANs:

```
cluster controller-replacement network displaced-vlans show
```

b. Restore the displaced VLANs to the desired destination port:

```
displaced-vlans restore -node node_name -port port_name -destination-port
destination_port
```

c. Verify that all displaced VLANs have been restored:

```
cluster controller-replacement network displaced-vlans show
```

d. VLANs are automatically placed into the appropriate broadcast domains about a minute after they are created. Verify that the restored VLANs have been placed into the appropriate broadcast domains:

```
network port reachability show
```

7.   Beginning with ONTAP 9.8, ONTAP will automatically modify the home ports of LIFs if the ports are moved between broadcast domains during the network port reachability repair procedure. If a LIF's home port was moved to another node, or is unassigned, that LIF will be presented as a displaced LIF. Restore the home ports of displaced LIFs whose home ports either no longer exist or were relocated to another node.

a. Display the LIFs whose home ports might have moved to another node or no longer exist:

```
displaced-interface show
```

b. Restore the home port of each LIF:

```
displaced-interface restore -vserver vserver_name -lif-name lif_name
```

c. Verify that all LIF home ports have been restored:

```
displaced-interface show
```

When all ports are correctly configured and added to the correct broadcast domains, the network port reachability show command should report the reachability status as ok for all connected ports, and the status as no-reachability for ports with no physical connectivity. If any ports are reporting a status other than these two, repair the reachability as outlined in Step 5.

8. Verify that all LIFs are administratively up on ports belonging to the correct broadcast domains.

a. Check for any LIFs that are administratively down:

```
network interface show -vserver vserver_name -status-admin down
```

b. Check for any LIFs that are operationally down: `network interface show -vserver vserver_name -status-oper down`

c. Modify any LIFs that need to be modified to have a different home port:

```
network interface modify -vserver vserver_name -lif lif -home-port home_port
```

(i)   For iSCSI LIFs, modification of the home port requires the LIF to be administratively down.

d. Revert LIFs that are not home to their respective home ports:

```
network interface revert *
```

After you finish

You have completed mapping the physical ports. To complete the upgrade, go to Perform final upgrade steps

Perform final upgrade steps in ONTAP 9.8 or later

To complete the procedure of upgrading by moving storage, you must delete any unused ports and LIFs from the new nodes, re-enable storage failover or high availability, configure the Service Processor (SP), install new licenses, and set up AutoSupport. You might also need to set up Storage or Volume Encryption and configure the FC or CNA ports.

Before you begin

These steps apply to systems running ONTAP 9.8 or later. If you are running ONTAP 9.7 or earlier, you must use the procedure in Performing final upgrade steps in ONTAP 9.7 or earlier.

Steps

1. If your system is running ONTAP 9.7 or earlier, **STOP**. You must use the procedure in Performing final upgrade steps in ONTAP 9.7 or earlier.

2. From the storage system prompt, display information about LIFs:

   `network interface show`

3. If you are in a SAN environment, delete unused LIFs from the port set so that you can remove them:

   a. Display the port set list:

      `lun portset show`

   b. Remove any unused LIFs from the port set:

      `lun portset remove`

4. Remove each unused LIF from the new nodes:

   `network interface delete`

5. Re-enable storage failover or high availability on the new node pair as needed:

If you have a…	Then…
Two-node cluster	Re-enable high availability: `cluster ha modify -configured true`
A cluster with more than two nodes	Re-enable storage failover: `storage failover modify -node node_name -enabled true`

6. Configure the SP on the new nodes as needed:

   `system service-processor network modify`

7. Install new licenses on the new nodes as needed:

```
system license add
```

8. Set up AutoSupport on the new nodes:

```
system node autosupport modify
```

9. From each new node, send a post-upgrade AutoSupport message to technical support:

```
system node autosupport invoke -node node_name -type all -message "MAINT=END
node_name successfully upgraded from platform_old to platform_new"
```

10. Restore Storage or Volume Encryption functionality by using one of the following procedures, depending on whether you are using onboard or External Key Management:

   - Restore onboard key management encryption keys
   - Restore external key management encryption keys

11. If the new nodes have FC ports (onboard or on FC adapters), onboard CNA ports, or a CNA card, configure the FC or CNA ports by entering the following command at the storage system prompt:

```
system node hardware unified-connect modify -node node-name -adapter adapter-
name -mode {fc|cna} -type {target|initiator}
```

SAN management with the CLI

You can modify the CNA configuration only when the CNA adapters are offline.

12. Set up a switchless cluster on the new nodes if necessary.

Migrating to a two-node switched cluster with Cisco cluster switches

Migrating to a two-node switched cluster with NetApp CN1610 cluster switches

13. If required, re-create the non-default user accounts that you had for the baseboard management controller (BMC) on the old system:

   a. Change or reset the BMC admin user account password.

      The BMC admin user account password is either blank (no password) or the same as the system admin user account password.

   b. Re-create the non-default BMC user accounts by using the `security login create` command with `application` set to "service-processor", as shown in the following example:

```
security login create -user-or-group-name bmcuser -application service-
processor -authentication-method password -role admin
```

   ⓘ | Admin privileges are required to create a user account in the BMC.

14. As needed, decommission the original systems through the NetApp Support Site to inform NetApp that the systems are no longer in operation and can be removed from support databases:

   a. Log in to the NetApp Support site.

   b. Click the link **My Installed Systems**.

   c. On the Installed Systems page, enter the serial number of the old system in the form and then click **Go!**

    d. On the Decommission Form page, fill out the form and click **Submit**.

After you finish

You have completed the upgrade procedure.

Complete in ONTAP 9.7 or earlier

Map network ports using ONTAP 9.7 or earlier

To enable node3 and node4 to communicate with each other in the cluster and with the network after the upgrade, you must confirm that the physical ports are correctly configured with the settings for the intended use, such as cluster, data, and so on.

Before you begin

These steps apply to systems running ONTAP 9.7 or earlier. If you are running ONTAP 9.8 or later, you must use the procedure in Map network ports using ONTAP 9.8 or later.

About this task

You must perform these steps on node3 and node4.

> ⓘ The following command examples refer to "node1" because at this stage in the procedure the replacement nodes "node3" and "node4" are actually named "node1" and "node2".

Steps

1. If your system is running ONTAP 9.8 or later, **STOP**. You must use the procedure in Map network ports using ONTAP 9.8 or later.

2. Locate the port and LIF configuration information for node1 and node2 that you recorded in *Prepare for upgrade when moving storage*, Step 3.

3. Locate the information for ports, broadcast domains, and IPspaces that you recorded in *Prepare for upgrade when moving storage*, Step 3.

   NetApp Hardware Universe

4. Make the following changes:

   a. Boot node3 and node4 to the cluster prompt if you have not already done so.

   b. Add the correct ports to the `Cluster` broadcast domain:

   ```
   network port modify -node node_name -port port_name -mtu 9000 -ipspace
   Cluster
   ```

   This example adds `Cluster` port e1b on "node1":

   ```
   network port modify -node node1 -port e1b -ipspace Cluster -mtu 9000
   ```

   c. Migrate the LIFs to the new ports, once for each LIF:

   ```
   network interface migrate -vserver vserver_name -lif lif_name -source-node
   node1 -destination-node node1 -destination-port port_name
   ```

SAN data LIFs can be migrated only when they are offline.

d. Modify the home port of the Cluster LIFs:

```
network interface modify -vserver Cluster -lif lif_name –home-port port_name
```

e. Remove the old ports from the Cluster broadcast domain:

```
network port broadcast-domain remove-ports -ipspace Cluster -broadcast
-domain Cluster -ports node1:port
```

f. Display the health state of node3 and node4:

```
cluster show -node node1 -fields health
```

g. Each cluster LIF must be listening on port 7700. Verify that the cluster LIFs are listening on port 7700:

```
::> network connections listening show -vserver Cluster
```

Port 7700 listening on cluster ports is the expected outcome as shown in the following example for a two-node cluster:

```
Cluster::> network connections listening show -vserver Cluster
Vserver Name      Interface Name:Local Port      Protocol/Service
---------------   --------------------------     -------------------
Node: NodeA
Cluster           NodeA_clus1:7700                  TCP/ctlopcp
Cluster           NodeA_clus2:7700                  TCP/ctlopcp
Node: NodeB
Cluster           NodeB_clus1:7700                  TCP/ctlopcp
Cluster           NodeB_clus2:7700                  TCP/ctlopcp
4 entries were displayed.
```

h. For each cluster LIF that is not listening on port 7700, set the administrative status of the LIF to `down` and then `up`:

```
::> net int modify -vserver Cluster -lif cluster-lif -status-admin down; net
int modify -vserver Cluster -lif cluster-lif -status-admin up
```

Repeat substep (g) to verify that the cluster LIF is now listening on port 7700.

5. Modify the VLAN and `ifgrp config` to match the new controller physical port layout.

6. Delete the node1 and node2 ports that no longer exist on node3 and node4 (advanced privilege level):

```
network port delete -node node1 -port port_name
```

7. Adjust the node-management broadcast domain and migrate the node-management and cluster-management LIFs if necessary:

a. Display the home port of a LIF:

```
network interface show -fields home-node,home-port
```

    b. Display the broadcast domain containing the port:

```
network port broadcast-domain show -ports node_name:port_name
```

    c. Add or remove ports from broadcast domains as necessary:

```
network port broadcast-domain add-ports
```

```
network port broadcast-domain remove-ports
```

    d. Modify a LIF's home port if necessary:

```
network interface modify -vserver vserver_name -lif lif_name -home-port port_name
```

8. Adjust the intercluster broadcast domains and migrate the intercluster LIFs, if necessary, using the commands in Step 7.

9. Adjust any other broadcast domains and migrate the data LIFs, if necessary, using the commands in Step 7.

10. Adjust all the LIF failover groups:

```
network interface modify -failover-group failover_group -failover-policy failover_policy
```

The following command sets the failover policy to broadcast-domain-wide and uses the ports in failover group "fg1" as failover targets for LIF "data1" on "node1":

```
network interface modify -vserver node1 -lif data1 -failover-policy broadcast-domain-wide -failover-group fg1
```

11. Display node3 and node4 's network port attributes:

```
network port show -node node1
```

After you finish

You have completed mapping the physical ports. To complete the upgrade, go to Perform final upgrade steps in ONTAP 9.7 or earlier.

Perform the final upgrade steps in ONTAP 9.7 or earlier

To complete the procedure of upgrading by moving storage, you must delete any unused ports and LIFs from the new nodes, re-enable storage failover or high availability, configure the Service Processor (SP), install new licenses, and set up AutoSupport. You might also need to set up Storage or Volume Encryption and configure the FC or CNA ports.

Before you begin

These steps apply to systems running ONTAP 9.7 or earlier. If you are running ONTAP 9.8 or later, you must use the procedure in Perform the final upgrade steps in ONTAP 9.8 or later.

Steps

1. If your system is running ONTAP 9.8 or later, **STOP**. You must use the procedure in .

2. From the storage system prompt, display information about LIFs:

   ```
   network interface show
   ```

3. Delete any unused ports from the new nodes (advanced privilege level):

   ```
   network port delete
   ```

4. If you are in a SAN environment, delete unused LIFs from the port set so that you can remove them:

   a. Display the port set list:

   ```
   lun portset show
   ```

   b. Remove any unused LIFs from the port set:

   ```
   lun portset remove
   ```

5. Remove each unused LIF from the new nodes:

   ```
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   ```

6. Re-enable storage failover or high availability on the new node pair as needed:

If you have a…	Then…
Two-node cluster	Re-enable high availability: `cluster ha modify -configured true`
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   ```
   system service-processor network modify
   ```

8. Install new licenses on the new nodes as needed:

   ```
   system license add
   ```

9. Set up AutoSupport on the new nodes:

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   system node autosupport modify
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10. From each new node, send a post-upgrade AutoSupport message to technical support:

    ```
    system node autosupport invoke -node node_name -type all -message "MAINT=END
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Migrating to a two-node switched cluster with Cisco cluster switches

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After you finish

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