



Stage 3. Install and boot node3

AFF and FAS Controller Upgrade

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Stage 3. Install and boot node3

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During Stage 3, you install and boot node3, map the cluster and node-management ports from node1 to node3, verify the node3 installation, and move data LIFs and SAN LIFs belonging to node1 from node2 to node3. You also relocate all aggregates from node2 to node3, and move the data LIFs and SAN LIFs owned by node2 to node3.

Steps

1. [Install and boot node3](#)
2. [Set the FC or UTA/UTA2 configuration on node3](#)
3. [Map ports from node1 to node3](#)
4. [Verify the node3 installation](#)
5. [Move NAS data LIFs owned by node1 from node2 to node3 and verify SAN LIFs on node3](#)
6. [Relocate non-root aggregates from node2 to node3](#)
7. [Move NAS data LIFs owned by node2 to node3](#)

Install and boot node3

You must install node3 in the rack, transfer node1's connections to node3, boot node3, and install ONTAP. You must also reassign any of node1's spare disks, any disks belonging to the root volume, and any non-root aggregates not relocated to node2 earlier.

About this task

You must netboot node3 if it does not have the same version of ONTAP 9 that is installed on node1. After you install node3, boot it from the ONTAP 9 image stored on the web server. You can then download the correct files to the boot media device for subsequent system boots. See [Prepare for netboot](#).

However, you do not need to netboot node3 if it has the same or a later version of ONTAP 9 that is installed on node1.



Important: If you are upgrading a V-Series system connected to storage arrays or a system with FlexArray Virtualization software that is connected to storage arrays, you need to complete [Step 1](#) through [Step 5](#), leave this section at [Step 6](#) and follow instructions in [Configure FC ports on node3](#) and [Check and configure UTA/UTA2 ports on node3](#) as needed, entering commands in maintenance mode. You must then return to this section and resume with [Step 7](#). However, if you are upgrading a system with storage disks, you need to complete this entire section and then go to [Configure FC ports on node3](#) and [Check and configure UTA/UTA2 ports on node3](#), entering commands at the cluster prompt.

Steps

1. Make sure that you have rack space for node3.

If node1 and node2 were in separate chassis, you can put node3 in the same rack location as node1. However, if node1 was in the same chassis with node2, then you need to put node3 into its own rack space, preferably close to the location of node1.

2. Install node3 in the rack, following the *Installation and Setup Instructions* for your node model.



If you are upgrading to a system with both nodes in the same chassis, install node4 in the chassis as well as node3. If you do not, when you boot node3, the node will behave as if it were in a dual-chassis configuration, and when you boot node4, the interconnect between the nodes will not come up.

3. Cable node3, moving the connections from node1 to node3.

The following references help you make proper cable connections. Go to [References](#) to link to them.

- *Installation and Setup Instructions* or *FlexArray Virtualization Installation Requirements and Reference* for the node3 platform
- The appropriate disk shelf procedure
- The *High Availability management* documentation

Cable the following connections:

- Console (remote management port)
- Cluster ports
- Data ports
- Cluster and node management ports
- Storage
- SAN configurations: iSCSI Ethernet and FC switch ports



You might not need to move the interconnect card or the cluster interconnect cable connection from node1 to node3 because most platform models have a unique interconnect card model. For the MetroCluster configuration, you need to move the FC-VI cable connections from node1 to node3. If the new host does not have an FC-VI card, you might need to move the FC-VI card.

4. Turn on the power to node3, and then interrupt the boot process by pressing Ctrl-C at the console terminal to access the boot environment prompt.

If you are upgrading to a system with both nodes in the same chassis, node4 also reboots. However, you can disregard the node4 boot until later.



When you boot node3, you might see the following warning message:

```
WARNING: The battery is unfit to retain data during a power outage. This
is likely because the battery is discharged but could be due to other
temporary conditions.
```

```
When the battery is ready, the boot process will complete and services
will be engaged.
```

```
To override this delay, press 'c' followed by 'Enter'
```

5. If you see the warning message in [Step 4](#), take the following actions:

- a. Check for any console messages that might indicate a problem other than a low NVRAM battery, and, if necessary, take any required corrective action.
- b. Allow the battery to charge and the boot process to complete.



Attention: Do not override the delay; failure to allow the battery to charge could result in a loss of data.

6. Take one of the following actions:

| If your system... | Then... |
|---|--|
| Has disks and no back-end storage | Skip Step 7 through Step 12 and go to Step 13 . |
| Is a V-Series system or a system with FlexArray Virtualization software connected to storage arrays | <ol style="list-style-type: none"> a. Go to Set the FC or UTA/UTA2 configuration on node3 and complete the subsections Configure FC ports on node3 and Check and configure UTA/UTA2 ports on node3, as appropriate to your system. b. Return to this section and complete the remaining steps, beginning with Step 7. <p>Important: You must reconfigure FC onboard ports, CNA onboard ports, and CNA cards before you boot ONTAP on the V-Series or system with FlexArray Virtualization software.</p> |

7. Add the FC initiator ports of the new node to the switch zones.

If your system has a tape SAN, then you need zoning for the initiators. See your storage array and zoning documentation for instructions.

8. Add the FC initiator ports to the storage array as new hosts, mapping the array LUNs to the new hosts.

See your storage array and zoning documentation for instructions.

9. Modify the World Wide Port Name (WWPN) values in the host or volume groups associated with array LUNs on the storage array.

Installing a new controller module changes the WWPN values associated with each onboard FC port.

10. If your configuration uses switch-based zoning, adjust the zoning to reflect the new WWPN values.

11. Verify that the array LUNs are now visible to node3:

```
sysconfig -v
```

The system displays all the array LUNs visible to each of the FC initiator ports. If the array LUNs are not visible, you will not be able to reassign disks from node1 to node3 later in this section.

12. Press Ctrl-C to display the boot menu and select maintenance mode.

13. At the Maintenance mode prompt, enter the following command:

```
halt
```

The system stops at the boot environment prompt.

14. Take one of the following actions:

| If the system you are upgrading to is in a... | Then... |
|---|--|
| Dual-chassis configuration (with controllers in different chassis) | Go to Step 15 . |
| Single-chassis configuration (with controllers in the same chassis) | <p>a. Switch the console cable from node3 to node4.</p> <p>b. Turn on the power to node4, and then interrupt the boot process by pressing Ctrl-C at the console terminal to access the boot environment prompt.</p> <p>The power should already be on if both controllers are in the same chassis.</p> <p>Note: Leave node4 at the boot environment prompt; you will return to node4 in Install and boot node4.</p> <p>c. If you see the warning message displayed in Step 4, follow the instructions in Step 5</p> <p>d. Switch the console cable back from node4 to node3.</p> <p>e. Go to Step 15.</p> |

15. Configure node3 for ONTAP:

```
set-defaults
```

16. If NetApp Storage Encryption (NSE) is in use on this configuration, the `setenv bootarg.storageencryption.support` command must be set to `true`, and the `kmip.init.maxwait` variable needs to be set to `off` to avoid a boot loop after the node1 configuration is loaded:

```
setenv bootarg.storageencryption.support true
```

```
setenv kmip.init.maxwait off
```

17. If the version of ONTAP installed on node3 is the same or later than the version of ONTAP 9 installed on node1, list and reassign disks to the new node3:

```
boot_ontap
```



Warning: If this new node has ever been used in any other cluster or HA pair, you must run `wipeconfig` before proceeding. Failure to do so might result in service outages or data loss. Contact technical support if the replacement controller was previously used, especially if the controllers were running ONTAP running in 7-Mode.

18. Press CTRL-C to display the boot menu.
19. Take one of the following actions:

| If the system you are upgrading... | Then... |
|--|---------------------------------|
| Does <i>not</i> have the correct or current ONTAP version on node3 | Go to Step 20 . |
| Has the correct or current version of ONTAP on node3 | Go to Step 25 . |

20. Configure the netboot connection by choosing one of the following actions.



You must use the management port and IP as the netboot connection. Do not use a data LIF IP or else a data outage might occur while the upgrade is being performed.

| If Dynamic Host Configuration Protocol (DHCP) is... | Then... |
|---|--|
| Running | <p>Configure the connection automatically by entering the following command at the boot environment prompt:</p> <pre>ifconfig e0M -auto</pre> |
| Not running | <p>Manually configure the connection by entering the following command at the boot environment prompt:</p> <pre>ifconfig e0M -addr=<filer_addr> -mask=<netmask> -gw=<gateway> -dns=<dns_addr> domain=<dns_domain></pre> <p><filer_addr> is the IP address of the storage system.</p> <p><netmask> is the network mask of the storage system.</p> <p><gateway> is the gateway for the storage system.</p> <p><dns_addr> is the IP address of a name server on your network.</p> <p><dns_domain> is the Domain Name Service (DNS) domain name. If you use this optional parameter, you do not need a fully qualified domain name in the netboot server URL; you need only the server's host name.</p> <p>Note: Other parameters might be necessary for your interface. Enter <code>help ifconfig</code> at the firmware prompt for details.</p> |

21. Perform netboot on node3:

| For... | Then... |
|----------------------------|---|
| FAS/AFF8000 series systems | <pre>netboot http://<web_server_ip>/<path_to_webaccessible_directory>/netboot/kernel</pre> |
| All other systems | <pre>netboot http://<web_server_ip>/<path_to_webaccessible_directory>/<ontap_version>_image.tgz</pre> |

The `<path_to_the_web-accessible_directory>` leads to where you downloaded the `<ontap_version>_image.tgz` in [Step 1](#) in the section *Prepare for netboot*.



Do not interrupt the boot.

22. From the boot menu, select option **(7) Install new software** first.

This menu option downloads and installs the new ONTAP image to the boot device.



Disregard the following message:

This procedure is not supported for Non-Disruptive Upgrade on an HA pair.

The note applies to nondisruptive upgrades of ONTAP, and not upgrades of controllers.



Always use netboot to update the new node to the desired image. If you use another method to install the image on the new controller, the wrong image might install. This issue applies to all releases of ONTAP.

23. If you are prompted to continue the procedure, enter `y`, and when prompted for the package, enter the following URL:

```
http://<web_server_ip>/<path_to_web-  
accessible_directory>/<ontap_version_image>.tgz
```

24. Complete the following substeps:

- a. Enter `n` to skip the backup recovery when you see the following prompt:

```
Do you want to restore the backup configuration now? {y|n}
```

- b. Reboot by entering `y` when you see the following prompt:

```
The node must be rebooted to start using the newly installed  
software. Do you want to reboot now? {y|n}
```

The controller module reboots but stops at the boot menu because the boot device was reformatted and the configuration data needs to be restored.

25. Select **(5) Maintenance mode boot** by entering `5`, and then enter `y` when prompted to continue with the boot.
26. Before continuing, go to [Set the FC or UTA/UTA2 configuration on node3](#) to make any necessary changes to the FC or UTA/UTA2 ports on the node.

Make the changes recommended in those sections, reboot the node, and go into maintenance mode.

27. Find the system ID of node3:

```
disk show -a
```

The system displays the system ID of the node and information about its disks, as shown in the following example:

```
*> disk show -a
Local System ID: 536881109
DISK      OWNER                                POOL  SERIAL  HOME      DR
HOME                                NUMBER
-----
0b.02.23 nst-fas2520-2 (536880939) Pool0 KPG2RK6F nst-fas2520-
2 (536880939)
0b.02.13 nst-fas2520-2 (536880939) Pool0 KPG3DE4F nst-fas2520-
2 (536880939)
0b.01.13 nst-fas2520-2 (536880939) Pool0 PPG4KLAA nst-fas2520-
2 (536880939)
.....
0a.00.0   (536881109) Pool0 YFKSX6JG
(536881109)
.....
```



You might see the message `disk show: No disks match option -a.` after entering the command. This is not an error message so you can continue with the procedure.

28. Reassign node1’s spares, any disks belonging to the root, and any non-root aggregates that were not relocated to node2 earlier in [Relocate non-root aggregates from node1 to node2](#).

Enter the appropriate form of the `disk reassign` command based on whether your system has shared disks:

| If disk type is... | Then run the command... |
|----------------------|---|
| With shared disks | <code>disk reassign -s <node1_sysid> -d <node3_sysid> -p <node2_sysid></code> |
| Without shared disks | <code>disk reassign -s <node1_sysid> -d <node3_sysid></code> |

For the `<node1_sysid>` value, use the information captured in [Record node1 information](#). To obtain the value for `<node3_sysid>`, use the `sysconfig` command.



The `-p` option is only required in maintenance mode when shared disks are present.

The `disk reassign` command reassigns only those disks for which `<node1_sysid>` is the current owner.

The system displays the following message:

```
Partner node must not be in Takeover mode during disk reassignment from
maintenance mode.
Serious problems could result!!
Do not proceed with reassignment if the partner is in takeover mode.
Abort reassignment (y/n)?
```

29. Enter `n`.

The system displays the following message:

```
After the node becomes operational, you must perform a takeover and
giveback of the HA partner node to ensure disk reassignment is
successful.
Do you want to continue (y/n)?
```

30. Enter `y`

The system displays the following message:

```
Disk ownership will be updated on all disks previously belonging to
Filer with sysid <sysid>.
Do you want to continue (y/n)?
```

31. Enter `y`.

32. If you are upgrading from a system with external disks to a system that supports internal and external disks (AFF A800 systems, for example), set the node1 aggregate as root to confirm that node3 boots from the root aggregate of node1.



Warning: You must perform the following substeps in the exact order shown; failure to do so might cause an outage or even data loss.

The following procedure sets node3 to boot from the root aggregate of node1:

a. Check the RAID, plex, and checksum information for the node1 aggregate:

```
aggr status -r
```

b. Check the status of the node1 aggregate:

```
aggr status
```

c. Bring the node1 aggregate online, if necessary:

```
aggr_online <root_aggr_from_node1>
```

d. Prevent the node3 from booting from its original root aggregate:

```
aggr offline <root_aggr_on_node3>
```

- e. Set the node1 root aggregate as the new root aggregate for node3:

```
aggr options <aggr_from_node1> root
```

- f. Verify that the root aggregate of node3 is offline and the root aggregate for the disks brought over from node1 is online and set to root:

```
aggr status
```



Failing to perform the previous substep might cause node3 to boot from the internal root aggregate, or it might cause the system to assume a new cluster configuration exists or prompt you to identify one.

The following shows an example of the command output:

```
-----  
      Aggr State      Status      Options  
aggr0_nst_fas8080_15 online  raid_dp, aggr  root, nosnap=on  
                        fast zeroed  
                        64-bit  
  
      aggr0 offline      raid_dp, aggr  diskroot  
                        fast zeroed  
                        64-bit  
-----
```

33. Verify that the controller and chassis are configured as ha:

```
ha-config show
```

The following example shows the output of the ha-config show command:

```
*> ha-config show  
  Chassis HA configuration: ha  
  Controller HA configuration: ha
```

Systems record in a programmable ROM (PROM) whether they are in an HA pair or stand-alone configuration. The state must be the same on all components within the stand-alone system or HA pair.

If the controller and chassis are not configured as "ha", use the following commands to correct the configuration:

```
ha-config modify controller ha
```

```
ha-config modify chassis ha
```

If you have a MetroCluster configuration, use the following commands to modify the controller and chassis:

```
ha-config modify controller mcc
```

```
ha-config modify chassis mcc
```

34. Destroy the mailboxes on node3:

```
mailbox destroy local
```

The console displays the following message:

```
Destroying mailboxes forces a node to create new empty mailboxes, which
clears any takeover state, removes all knowledge of out-of-date plexes
of mirrored volumes, and will prevent management services from going
online in 2-node cluster HA configurations. Are you sure you want to
destroy the local mailboxes?
```

35. Enter `y` at the prompt to confirm that you want to destroy the local mailboxes.

36. Exit maintenance mode:

```
halt
```

The system stops at the boot environment prompt.

37. On node2, check the system date, time, and time zone:

```
date
```

38. On node3, check the date at the boot environment prompt:

```
show date
```

39. If necessary, set the date on node3:

```
set date <mm/dd/yyyy>
```

40. On node3, check the time at the boot environment prompt:

```
show time
```

41. If necessary, set the time on node3:

```
set time <hh:mm:ss>
```

42. Verify the partner system ID is set correctly as noted in [Step 28](#) under `-p` switch:

```
printenv partner-sysid
```

43. If necessary, set the partner system ID on node3:

```
setenv partner-sysid <node2_sysid>
```

Save the settings:

```
saveenv
```

44. Access the boot menu at the boot environment prompt:

```
boot_ontap menu
```

45. At the boot menu, select option **(6) Update flash from backup config** by entering 6 at the prompt.

The system displays the following message:

```
This will replace all flash-based configuration with the last backup to
disks. Are you sure you want to continue?:
```

46. Enter `y` at the prompt.

The boot proceeds normally, and the system then asks you to confirm the system ID mismatch.



The system might reboot twice before displaying the mismatch warning.

47. Confirm the mismatch as shown in the following example:

```
WARNING: System id mismatch. This usually occurs when replacing CF or
NVRAM cards!
Override system id (y|n) ? [n] y
```

The node might go through one round of reboot before booting normally.

48. Log in to node3.

Set the FC or UTA/UTA2 configuration on node3

If node3 has onboard FC ports, onboard unified target adapter (UTA/UTA2) ports, or a UTA/UTA2 card, you must configure the settings before completing the rest of the procedure.

About this task

You might need to complete [Configure FC ports on node3](#), or [Check and configure UTA/UTA2 ports on node3](#), or both sections.



NetApp marketing materials might use the term "UTA2" to refer to CNA adapters and ports. However, the CLI uses the term "CNA".

- If node3 does not have onboard FC ports, onboard UTA/UTA2 ports, or a UTA/UTA2 card, and you are upgrading a system with storage disks, you can skip to the [Map ports from node1 to node3](#).
- However, if you have a V-Series system or a system with FlexArray Virtualization software with storage

arrays, and node3 does not have onboard FC ports, onboard UTA/UTA ports, or a UTA/UTA2 card, return to *Install and boot node3* and resume at [Step 22](#).

Choices:

- [Configure FC ports on node3](#)
- [Check and configure UTA/UTA2 ports on node3](#)

Configure FC ports on node3

If node3 has FC ports, either onboard or on an FC adapter, you must set port configurations on the node before you bring it into service because the ports are not preconfigured. If the ports are not configured, you might experience a disruption in service.

Before you begin

You must have the values of the FC port settings from node1 that you saved in [Prepare the nodes for upgrade](#).

About this task

You can skip this section if your system does not have FC configurations. If your system has onboard UTA/UTA2 ports or a UTA/UTA2 card, you configure them in [Check and configure UTA/UTA2 ports on node3](#).



Important: If your system has storage disks, enter the commands in this section at the cluster prompt. If you have a V-Series system or have FlexArray Virtualization Software and are connected to storage arrays, enter commands in this section in maintenance mode.

Steps

1. Take one of the following actions:

| If the system that you are upgrading... | Then... |
|--|------------------------------|
| Has storage disks | Go to Step 5 |
| Is a V-Series system or has FlexArray Virtualization Software and is connected to storage arrays | Go to Step 2 |

2. Boot node3 and access maintenance mode:

```
boot_ontap maint
```

3. Take one of the following actions:

| If the system that you are upgrading... | Then... |
|---|--|
| Has storage disks | Enter the following command:

<code>system node hardware unified-connect show</code> |
| Is a V-series system or has FlexArray Virtualization Software and is connected to storage arrays. | Enter the following command

<code>ucadmin show</code> |

The system displays information about all FC and converged network adapters on the system.

4. Compare the FC settings of node3 with the settings that you captured earlier from node1.
5. Take one of the following actions:

| If the default FC settings on the new nodes are... | Then... |
|--|---------------------------------|
| The same as the ones you that captured on node1 | Go to Step 11 . |
| Different from the ones that you captured on node1 | Go to Step 6 . |

6. Take one of the following actions:

| If the system that you are upgrading... | Then... |
|--|--|
| Has storage disks | <p>Modify the FC ports on node3 as needed by entering one of the following commands:</p> <ul style="list-style-type: none">• To program target ports:
<code>system node hardware unified-connect modify -type -t target -adapter <port_name></code>• To program initiator ports:
<code>system node hardware unified-connect modify -type -t initiator -adapter <port_name></code> <p>-t is the FC4 type: target or initiator.</p> |
| Is a V-Series system or has FlexArray Virtualization Software and is connected to storage arrays | <p>Modify the FC ports on node3 as needed by entering the following command:</p> <pre>ucadmin modify -m fc -t initiator -f <adapter_port_name></pre> <p>-t is the FC4 type, target or initiator.</p> <p>Note: The FC ports must be programmed as initiators.</p> |

7. Take one of the following actions:

| If the system that you are upgrading... | Then... |
|---|---|
| Has storage disks | <p>Verify the new settings by entering the following command and examining the output:</p> <pre>system node hardware unified-connect show</pre> |

| If the system that you are upgrading... | Then... |
|--|--|
| Is a V-Series system or has FlexArray Virtualization Software and is connected to storage arrays | Verify the new settings by entering the following command and examining the output:

<code>ucadmin show</code> |

8. Exit maintenance mode by entering the following command:

```
halt
```

9. After you enter the command, wait until the system stops at the boot environment prompt.
10. Take one of the following actions:

| If the system you are upgrading... | Then... |
|--|--|
| Is a V-Series system or has FlexArray Virtualization software running clustered Data ONTAP 8.3 | Boot node3 and access maintenance at the boot environment prompt:

<code>boot_ontap maint</code> |
| Is not a V-Series system or does not have FlexArray Virtualization software | Boot node3 at the boot environment prompt:

<code>boot_ontap</code> |

11. Take one of the following actions:

| If the system that you are upgrading... | Then... |
|--|---|
| Has storage disks | <ul style="list-style-type: none"> If node3 has a UTA/UTA2 card or UTA/UTA2 onboard ports, go to Check and configure UTA/UTA2 ports on node3. If node3 does not have a UTA/UTA2 card or UTA/UTA2 onboard ports, skip Check and configure UTA/UTA2 ports on node3 and go to Map ports from node1 to node3. |
| Is a V-Series system or has FlexArray Virtualization Software and is connected to storage arrays | <ul style="list-style-type: none"> If node3 has a card or onboard ports, go to Check and configure UTA/UTA2 ports on node3. If node3 does not have a card or onboard ports, skip Check and configure UTA/UTA2 ports on node3, and return to <i>Install and boot node3</i> and resume at Step 7. |

Check and configure UTA/UTA2 ports on node3

If node3 has onboard UTA/UTA2 ports or a UTA/UTA2 card, you must check the configuration of the ports and possibly reconfigure them, depending on how you want to use the upgraded system.

Before you begin

You must have the correct SFP+ modules for the UTA/UTA2 ports.

About this task

If you want to use a Unified Target Adapter (UTA/UTA2) port for FC, you must first verify how the port is configured.



NetApp marketing materials might use the term UTA2 to refer to CNA adapters and ports. However, the CLI uses the term CNA.

You can use the `ucadmin show` command to verify the current port configuration:

```
*> ucadmin show

      Current   Current   Pending   Pending   Admin
Adapter Mode     Type      Mode      Type      Status
-----
0e      fc       target    -          initiator offline
0f      fc       target    -          initiator offline
0g      fc       target    -          initiator offline
0h      fc       target    -          initiator offline
1a      fc       target    -          -          online
1b      fc       target    -          -          online
6 entries were displayed.
```

UTA/UTA2 ports can be configured into native FC mode or UTA/UTA2 mode. FC mode supports FC initiator and FC target; UTA/UTA2 mode enables concurrent NIC and FCoE traffic sharing the same 10GbE SFP+ interface and supports FC targets.

UTA/UTA2 ports might be found on an adapter or on the controller, and have the following configurations, but you should check the configuration of the UTA/UTA2 ports on the node3 and change it, if necessary:

- UTA/UTA2 cards ordered when the controller is ordered are configured before shipment to have the personality you request.
- UTA/UTA2 cards ordered separately from the controller are shipped with the default FC target personality.
- Onboard UTA/UTA2 ports on new controllers are configured before shipment to have the personality you request.



Attention: If your system has storage disks, you must enter the commands in this section at the cluster prompt unless directed to enter maintenance mode. If you have a VSeries system or have FlexArray Virtualization Software and are connected to storage arrays, you must enter commands in this section at the maintenance mode prompt. You must be in maintenance mode to configure UTA/UTA2 ports.

Steps

1. Check how the ports are currently configured entering on of the following commands on node3:

| If the system... | Then... |
|-------------------|--|
| Has storage disks | <code>system node hardware unified-connect show</code> |

| If the system... | Then... |
|--|--------------|
| Is a V-Series system or has FlexArray Virtualization Software and is connected to storage arrays | ucadmin show |

The system displays output similar to the following examples:

```
cluster1::> system node hardware unified-connect show
```

| Node | Adapter | Current Mode | Current Type | Pending Mode | Pending Type | Admin Status |
|------|---------|--------------|--------------|--------------|--------------|--------------|
| f-a | 0e | fc | initiator | - | - | online |
| f-a | 0f | fc | initiator | - | - | online |
| f-a | 0g | cna | target | - | - | online |
| f-a | 0h | cna | target | - | - | online |
| f-b | 0e | fc | initiator | - | - | online |
| f-b | 0f | fc | initiator | - | - | online |
| f-b | 0g | cna | target | - | - | online |
| f-b | 0h | cna | target | - | - | online |

12 entries were displayed.

```
*> ucadmin show
```

| Adapter | Current Mode | Current Type | Pending Mode | Pending Type | Admin Status |
|---------|--------------|--------------|--------------|--------------|--------------|
| 0e | fc | initiator | - | - | online |
| 0f | fc | initiator | - | - | online |
| 0g | cna | target | - | - | online |
| 0h | cna | target | - | - | online |
| 0e | fc | initiator | - | - | online |
| 0f | fc | initiator | - | - | online |
| 0g | cna | target | - | - | online |
| 0h | cna | target | - | - | online |

```
*>
```

2. If the current SFP+ module does not match the desired use, replace it with the correct SFP+ module.

Contact your NetApp representative to obtain the correct SFP+ module.

3. Examine the output of the `system node hardware unified-connect show` or `ucadmin show` command to determine whether the UTA/UTA2 ports have the personality you want.
4. Take one of the following actions:

| If the UTA/UTA2 ports... | Then... |
|---|---|
| Do not have the personality that you want | Go to Step 5 . |
| Have the personality that you want | Skip Step 5 through Step 12 and go to Step 13 . |

5. Take one of the following actions:

| If the system... | Then... |
|--|--|
| Has storage disks and is running clustered Data ONTAP 8.3 | Boot node3 and enter maintenance mode:

<code>boot_ontap maint</code> |
| Is a V-Series system or has FlexArray Virtualization Software and is connected to storage arrays | Go to Step 6 .

You should already be in maintenance mode. |

6. Take one of the following actions:

| If you are configuring... | Then... |
|---------------------------|--|
| Ports on a UTA/UTA2 card | Go to Step 7 . |
| Onboard UTA/UTA2 ports | Skip Step 7 and go to Step 8 . |

7. If the adapter is in initiator mode, and if the UTA/UTA2 port is online, take the UTA/UTA2 port offline:

```
storage disable adapter <adapter_name>
```

Adapters in target mode are automatically offline in maintenance mode.

8. If the current configuration does not match the desired use, change the configuration as needed:

```
ucadmin modify -m fc|cna -t initiator|target <adapter_name>
```

- `-m` is the personality mode, `fc` or `cna`.
- `-t` is the FC4 type, `target` or `initiator`.



You need to use the FC initiator for tape drives, FlexArray Virtualization systems, and MetroCluster configurations. You need to use the FC target for SAN clients.

9. Verify the settings:

```
ucadmin show
```

10. Verify the settings:

| If the system... | Then... |
|--|---|
| Has storage disks | <p>a. Stop the system:</p> <pre>halt</pre> <p>The system stops at the boot environment prompt.</p> <p>b. Enter the following command:</p> <pre>boot_ontap</pre> |
| Is a V-Series system or has FlexArray Virtualization Software and is connected to storage arrays | <p>Reboot to maintenance mode:</p> <pre>boot_netapp maint</pre> |

11. Verify the settings:

| If the system... | Then... |
|---|--|
| Has storage disks | <code>system node hardware unified-connect show</code> |
| Is a V-Series or has FlexArray Virtualization Software and is connected to storage arrays | <code>ucadmin show</code> |

The output in the following examples show that the FC4 type of adapter "1b" is changing to initiator and that the mode of adapters "2a" and "2b" is changing to cna:

```
cluster1::> system node hardware unified-connect show
```

| Node | Adapter | Current Mode | Current Type | Pending Mode | Pending Type | Admin Status |
|------|---------|--------------|--------------|--------------|--------------|--------------|
| f-a | 1a | fc | initiator | - | - | online |
| f-a | 1b | fc | target | - | initiator | online |
| f-a | 2a | fc | target | cna | - | online |
| f-a | 2b | fc | target | cna | - | online |

4 entries were displayed.

```
*> ucadmin show
```

| Adapter | Current Mode | Current Type | Pending Mode | Pending Type | Admin Status |
|---------|--------------|--------------|--------------|--------------|--------------|
| 1a | fc | initiator | - | - | online |
| 1b | fc | target | - | initiator | online |
| 2a | fc | target | cna | - | online |
| 2b | fc | target | cna | - | online |

```
*>
```

12. Place any target ports online by entering one of the following commands, once for each port:

| If the system... | Then... |
|--|---|
| Has storage disks | <code>network fcp adapter modify -node <node_name> -adapter <adapter_name> -state up</code> |
| Is a V-Series system or has FlexArray Virtualization Software and is connected to storage arrays | <code>fcp config <adapter_name> up</code> |

13. Cable the port.
14. Take one of the following actions:

| If the system... | Then... |
|--|--|
| Has storage disks | Go to Map ports from node1 to node3 . |
| Is a V-series system or has FlexArray Virtualization Software and is connected to storage arrays | Return to <i>Install and boot node3</i> and resume at Step 7 . |

Map ports from node1 to node3

You must make sure that the physical ports on node1 map correctly to the physical ports on node3, which will let node3 communicate with other nodes in the cluster and with the network after the upgrade.

Before you begin

You must already have information about the ports on the new nodes from the *Hardware Universe*. (Go to [References](#) to link to the *Hardware Universe*). You use the information later in this section and in [Map ports from node2 to node4](#).

The software configuration of node3 must match the physical connectivity of node3, and IP connectivity must be restored before you continue with the upgrade.

About this task

Port settings might vary, depending on the model of the nodes.

You must make the original node's port and LIF configuration compatible with what you plan the new node's configuration to be. This is because the new node replays the same configuration when it boots, which means that when you boot node3, ONTAP will try to host LIFs on the same ports that were used on node1.

Therefore, if the physical ports on node1 do not map directly to the physical ports on node3, then software configuration changes will be required to restore cluster, management, and network connectivity after the boot. In addition, if the cluster ports on node1 do not directly map to the cluster ports on node3, node3 might not automatically rejoin quorum when it is rebooted until a software configuration change is made to host the cluster LIFs on the correct physical ports.

Steps

1. Record all the node1 cabling information for node1, the ports, broadcast domains, and IPspaces, in the following table:

| LIF | Node1 ports | Node1 IPspaces | Node1 broadcast domain | Node3 ports | Node3 ports | Node3 broadcast domains |
|--------------------|-------------|----------------|------------------------|-------------|-------------|-------------------------|
| Cluster 1 | | | | | | |
| Cluster 2 | | | | | | |
| Cluster 3 | | | | | | |
| Cluster 4 | | | | | | |
| Cluster 5 | | | | | | |
| Cluster 6 | | | | | | |
| Node management | | | | | | |
| Cluster management | | | | | | |
| Data 1 | | | | | | |
| Data 2 | | | | | | |
| Data 3 | | | | | | |
| Data 4 | | | | | | |
| SAN | | | | | | |
| Intercluster port | | | | | | |

Refer to [Record node1 information](#) for the steps to obtains this information.

2. Record all the cabling information for node3, the ports, broadcast domains, and IPspaces in the previous table using the same procedure in [Record node1 information](#).
3. Follow these steps to verify if the setup is a two-node switchless cluster:
 - a. Set the privilege level to advanced:

```
cluster::> set -privilege advanced
```

- b. Verify if the setup is a two-node switchless cluster:

```
network options switchless-cluster show
```

```
cluster::*> network options switchless-cluster show
Enable Switchless Cluster: false/true
```

The value of this command must match the physical state of the system.

- c. Return to the administration privilege level:

```
cluster::*> set -privilege admin
cluster::>
```

4. Get node3 into quorum by performing the following steps:

- a. Boot node3. See [Install and boot node3](#) to boot the node if you have not already done so.
- b. Verify that the new cluster ports are in the Cluster broadcast domain:

```
network port show -node <node-name> -port <port-name> -fields broadcast-
domain
```

The following example shows that port "e0a" is in the "Cluster" domain on node3:

```
cluster::> network port show -node node3 -port e0a -fields
broadcast-domain
```

| node | port | broadcast-domain |
|-------|------|------------------|
| node3 | e1a | Cluster |

- c. Add the correct ports to the Cluster broadcast domain:

```
network port modify -node <node-name> -port <port-name> -ipSPACE Cluster
-mtu 9000
```

This example adds Cluster port "e1b" on node3:

```
network port modify -node node3 -port e1b -ipSPACE Cluster -mtu 9000
```



For a MetroCluster configuration, you might not be able to change the broadcast domain of a port because it is associated with a port hosting the LIF of a sync-destination SVM and see errors similar to, but not restricted to the following message`:

```
command failed: This operation is not permitted on a Vserver that is
configured as the destination of a MetroCluster Vserver relationship.
```

Enter the following command from the corresponding sync-source SVM on the remote site to reallocate the sync-destination LIF to an appropriate port:

```
metrocluster vserver resync -vserver <Vserver-name>
```

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

```
network interface migrate -vserver Cluster -lif <LIF-name> -source-node
<node3> -destination-node <node3> -destination-port <port-name>
```

- e. Modify the home port of the cluster LIFs:

```
network interface modify -vserver Cluster -lif <LIF-name> -home-port <port-
name>
```

- f. If the cluster ports are not in the Cluster broadcast-domain, add them:

```
network port broadcast-domain add-ports -ipspace Cluster -broadcast-domain
Cluster -ports <node:port>
```

- g. Remove the old ports from the Cluster broadcast domain:

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

The following example removes port "e0d" on node3:

```
network port broadcast-domain remove-ports -ipspace Cluster
-broadcast-domain Cluster -ports <node3:e0d>
```

- h. Verify that node3 has rejoined quorum:

```
cluster show -node <node3> -fields health
```

5. Adjust the broadcast domains hosting your cluster LIFs and node-management and/or cluster-management LIFs. Confirm that each broadcast domain contains the correct ports. A port cannot be moved between broadcast domains if it is hosting or is home to a LIF, so you might need to migrate and modify the LIFs as follows:

- a. Display the home port of a LIF:

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

- b. Display the broadcast domain containing this port:

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

- c. Add or remove ports from broadcast domains:


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

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

d. Modify a LIF's home port:

```
network interface modify -vserver <Vserver-name> -lif <LIF-name> -home-port  
<port-name>
```

6. Adjust the intercluster broadcast domains and migrate the intercluster LIFs, if necessary, using the same commands shown in [Step 5](#).

7. Adjust any other broadcast domains and migrate the data LIFs, if necessary, using the same commands shown in [Step 5](#).

8. If there were any ports on node1 that no longer exist on node3, follow these steps to delete them:

a. Access the advanced privilege level on either node:

```
set -privilege advanced
```

b. Delete the ports:

```
network port delete -node <node-name> -port <port-name>
```

c. Return to the admin level:

```
set -privilege admin
```

9. Adjust all the LIF failover groups:

```
network interface modify -failover-group <failover-group> -failover-policy  
<failover-policy>
```

The following example sets the failover policy to "broadcast-domain-wide" and uses the ports in failover group "fg1" as failover targets for LIF "data1" on "node3":

```
network interface modify -vserver node3 -lif data1 failover-policy  
broadcast-domainwide -failover-group fg1
```

Go to [References](#) to link to *Network Management* or the *ONTAP 9 Commands: Manual Page Reference* for more information.

10. Verify the changes on node3:

```
network port show -node node3
```

11. 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.
```

12. If necessary, 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 Step 11 to verify that the cluster LIF is now listening on port 7700.

Verify the node3 installation

After you install and boot node3, you must verify that it is installed correctly, that it is part of the cluster, and that it can communicate with node2.

Steps

1. At the system prompt, log in to node3. Then, verify that node3 is both part of the same cluster as node2 and healthy:

```
cluster show
```

2. Verify that node3 can communicate with node2 and that all LIFs are up:

```
network interface show -curr-node <node3>
```

3. Take one of the following actions:

| If the cluster is... | Then... |
|--------------------------|--|
| In a SAN environment | Complete Step 4 and then go to the section Moving NAS data LIFs owned by node1 from node2 to node3 and verifying SAN LIFs on node3 . |
| Not in a SAN environment | Skip Step 4 and go to Moving NAS data LIFs owned by node1 from node2 to node3 and verifying SAN LIFs on node3 . |

4. Verify that node2 and node3 are in quorum by entering the following command on one of the nodes and examining its output:

```
event log show -messagename scsiblade.*
```

The following example shows the output when the nodes in the cluster are in quorum:

```
cluster::> event log show -messagename scsiblade.*
Time                Node    Severity    Event
-----
8/13/2012 14:03:51  node1    INFORMATIONAL  scsiblade.in.quorum: The scsi-
blade ...
8/13/2012 14:03:51  node2    INFORMATIONAL  scsiblade.in.quorum: The scsi-
blade ...
8/13/2012 14:03:48  node3    INFORMATIONAL  scsiblade.in.quorum: The scsi-
blade ...
8/13/2012 14:03:43  node4    INFORMATIONAL  scsiblade.in.quorum: The scsi-
blade ...
```

Move NAS data LIFs owned by node1 from node2 to node3 and verify SAN LIFs on node3

After you verify the node3 installation and before you relocate aggregates from node2 to node3, you must move the NAS data LIFs belonging to node1 that are currently on node2 from node2 to node3. You also need to verify the SAN LIFs on node3.

About this task

Remote LIFs handle traffic to SAN LUNs during the upgrade procedure. Moving SAN LIFs is not necessary for cluster or service health during the upgrade. SAN LIFs are not moved unless they need to be mapped to new ports. You will verify that the LIFs are healthy and located on appropriate ports after you bring node3 online.

Steps

1. List all the NAS data LIFs not owned by node2 by entering the following command on either node and capturing the output:

```
network interface show -role data -curr-node <node2> -is-home false -home-node
<node3>
```

2. If the cluster is configured for SAN LIFs, record the SAN LIFs adapter and switch-port configuration information in this [worksheet](#) for use later in the procedure.
 - a. List the SAN LIFs on node2 and examine the output:

```
network interface show -data-protocol fc*
```

The system returns output similar to the following example:

```

cluster1::> net int show -data-protocol fc*
(network interface show)

```

| Current Is | Logical | Status | Network | Current |
|---------------|-----------------------|------------|-------------------------|-------------|
| Vserver | Interface | Admin/Oper | Address/Mask | Node |
| Port | Home | | | |
| ----- | ----- | ----- | ----- | ----- |
| ----- | ----- | | | |
| svm2_cluster1 | lif_svm2_cluster1_340 | up/up | 20:02:00:50:56:b0:39:99 | cluster1-01 |
| 1b | true | | | |
| | lif_svm2_cluster1_398 | up/up | 20:03:00:50:56:b0:39:99 | cluster1-02 |
| 1a | true | | | |
| | lif_svm2_cluster1_691 | up/up | 20:01:00:50:56:b0:39:99 | cluster1-01 |
| 1a | true | | | |
| | lif_svm2_cluster1_925 | up/up | 20:04:00:50:56:b0:39:99 | cluster1-02 |
| 1b | true | | | |

4 entries were displayed.

b. List the existing configurations and examine the output:

```
fcip adapter show -fields switch-port,fc-wwpn
```

The system returns output similar to the following example:

```
cluster1::> fcp adapter show -fields switch-port,fc-wwpn
(network fcp adapter show)
node          adapter  fc-wwpn                      switch-port
-----
cluster1-01   0a          50:0a:09:82:9c:13:38:00     ACME Switch:0
cluster1-01   0b          50:0a:09:82:9c:13:38:01     ACME Switch:1
cluster1-01   0c          50:0a:09:82:9c:13:38:02     ACME Switch:2
cluster1-01   0d          50:0a:09:82:9c:13:38:03     ACME Switch:3
cluster1-01   0e          50:0a:09:82:9c:13:38:04     ACME Switch:4
cluster1-01   0f          50:0a:09:82:9c:13:38:05     ACME Switch:5
cluster1-01   1a          50:0a:09:82:9c:13:38:06     ACME Switch:6
cluster1-01   1b          50:0a:09:82:9c:13:38:07     ACME Switch:7
cluster1-02   0a          50:0a:09:82:9c:6c:36:00     ACME Switch:0
cluster1-02   0b          50:0a:09:82:9c:6c:36:01     ACME Switch:1
cluster1-02   0c          50:0a:09:82:9c:6c:36:02     ACME Switch:2
cluster1-02   0d          50:0a:09:82:9c:6c:36:03     ACME Switch:3
cluster1-02   0e          50:0a:09:82:9c:6c:36:04     ACME Switch:4
cluster1-02   0f          50:0a:09:82:9c:6c:36:05     ACME Switch:5
cluster1-02   1a          50:0a:09:82:9c:6c:36:06     ACME Switch:6
cluster1-02   1b          50:0a:09:82:9c:6c:36:07     ACME Switch:7
16 entries were displayed
```

3. Take one of the following actions:

| If node1... | Then... |
|---|--|
| Had interface groups or VLANs configured | Go to Step 4 . |
| Did not have interface groups or VLANs configured | Skip Step 4 and go to Step 5 . |

4. Perform the following substeps to migrate any NAS data LIFs hosted on interface groups and VLANs that were originally on node1 from node2 to node3:

- Migrate any data LIFs hosted on node2 that previously belonged to node1 on an interface group to a port on node3 that is capable of hosting LIFs on the same network by entering the following command, once for each LIF:

```
network interface migrate -vserver <vserver_name> -lif <LIF_name>
-destination-node <node3> -destination-port <netport|ifgrp>
```

- Modify the home port and home node of the LIF in [Substep a](#) to the port and node currently hosting the LIFs by entering the following command, once for each LIF:

```
network interface modify -vserver <vserver_name> -lif <LIF_name> -home-node
<node3> -home-port <netport|ifgrp>
```

- Migrate any data LIF hosted on node2 that previously belonged to node1 on a VLAN port to a port on node3 that is capable of hosting LIFs on the same network by entering the following command, once

for each LIF:

```
network interface migrate -vserver <vserver_name> -lif <LIF_name>
-destination-node <node3> -destination-port <netport|ifgrp>
```

- d. Modify the home port and home node of the LIFs in [Substep c](#) to the port and node currently hosting the LIFs by entering the following command, once for each LIF:

```
network interface modify -vserver <vserver_name> -lif <LIF_name> -home-node
<node3> -home-port <netport|ifgrp>
```

5. Take one of the following actions:

| If the cluster is configured for... | Then... |
|-------------------------------------|---|
| NAS | Complete Step 6 and Step 7 , skip Step 8, and complete Step 9 through Step 12 . |
| SAN | Disable all the SAN LIFs on the node to take them down for the upgrade:

<pre>network interface modify -vserver <vserver_name> -lif <LIF_name> -home-node <node_to_upgrade> -home-port <netport ifgrp> -status-admin down</pre> |

6. If you have data ports that are not the same on your platforms, then add the ports to the broadcast domain:

```
network port broadcast-domain add-ports -ipspace <IPspace_name> -broadcast
-domain mgmt -ports <node:port>
```

The following example adds port "e0a" on node "6280-1" and port "e0i" on node "8060-1" to broadcast domain "mgmt" in the IPspace "Default":

```
cluster::> network port broadcast-domain add-ports -ipspace Default
-broadcast-domain mgmt -ports 6280-1:e0a, 8060-1:e0i
```

7. Migrate each NAS data LIF to node3 by entering the following command, once for each LIF:

```
network interface migrate -vserver <vserver_name> -lif <LIF_name> -destination
-node <node3> -destination-port <netport|ifgrp>
```

8. Make sure that the data migration is persistent:

```
network interface modify -vserver <vserver_name> -lif <LIF_name> -home-port
<netport|ifgrp> -home-node <node3>
```

9. Confirm that the SAN LIFs are on the correct ports on node3:

- a. Enter the following command and examine its output:

```
network interface show -data-protocol iscsi|fcp -home-node <node3>
```

The system returns output similar to the following example:

```
cluster::> net int show -data-protocol iscsi|fc -home-node node3
```

| Current | Is | Logical | Status | Network | Current |
|---------|------|-----------|------------|-------------------|---------|
| Vserver | Home | Interface | Admin/Oper | Address/Mask | Node |
| Port | Home | | | | |
| ----- | | ----- | ----- | ----- | |
| vs0 | | | | | |
| | | a0a | up/down | 10.63.0.53/24 | node3 |
| a0a | true | | | | |
| | | data1 | up/up | 10.63.0.50/18 | node3 |
| e0c | true | | | | |
| | | rads1 | up/up | 10.63.0.51/18 | node3 |
| e1a | true | | | | |
| | | rads2 | up/down | 10.63.0.52/24 | node3 |
| e1b | true | | | | |
| vs1 | | | | | |
| | | lif1 | up/up | 172.17.176.120/24 | node3 |
| e0c | true | | | | |
| | | lif2 | up/up | 172.17.176.121/24 | node3 |
| e1a | true | | | | |

- b. Verify that the new and adapter and switch-port configurations are correct by comparing the output from the `fc adapter show` command with the configuration information that you recorded in the worksheet in [Step 2](#).

List the new SAN LIF configurations on node3:

```
fc adapter show -fields switch-port,fc-wwpn
```

The system returns output similar to the following example:

```
cluster1::> fcp adapter show -fields switch-port,fc-wwpn
(network fcp adapter show)
node          adapter fc-wwpn          switch-port
-----
cluster1-01 0a      50:0a:09:82:9c:13:38:00 ACME Switch:0
cluster1-01 0b      50:0a:09:82:9c:13:38:01 ACME Switch:1
cluster1-01 0c      50:0a:09:82:9c:13:38:02 ACME Switch:2
cluster1-01 0d      50:0a:09:82:9c:13:38:03 ACME Switch:3
cluster1-01 0e      50:0a:09:82:9c:13:38:04 ACME Switch:4
cluster1-01 0f      50:0a:09:82:9c:13:38:05 ACME Switch:5
cluster1-01 1a      50:0a:09:82:9c:13:38:06 ACME Switch:6
cluster1-01 1b      50:0a:09:82:9c:13:38:07 ACME Switch:7
cluster1-02 0a      50:0a:09:82:9c:6c:36:00 ACME Switch:0
cluster1-02 0b      50:0a:09:82:9c:6c:36:01 ACME Switch:1
cluster1-02 0c      50:0a:09:82:9c:6c:36:02 ACME Switch:2
cluster1-02 0d      50:0a:09:82:9c:6c:36:03 ACME Switch:3
cluster1-02 0e      50:0a:09:82:9c:6c:36:04 ACME Switch:4
cluster1-02 0f      50:0a:09:82:9c:6c:36:05 ACME Switch:5
cluster1-02 1a      50:0a:09:82:9c:6c:36:06 ACME Switch:6
cluster1-02 1b      50:0a:09:82:9c:6c:36:07 ACME Switch:7
16 entries were displayed
```



If a SAN LIF in the new configuration is not on an adapter that is still attached to the same switch-port, it might cause a system outage when you reboot the node.

- c. If node3 has any SAN LIFs or groups of SAN LIFs that are on a port that did not exist on node1 or that need to be mapped to a different port, move them to an appropriate port on node3 by completing the following substeps:

- i. Set the LIF status to "down":

```
network interface modify -vserver <vserver_name> -lif <LIF_name> -status
-admin down
```

- ii. Remove the LIF from the port set:

```
portset remove -vserver <vserver_name> -portset <portset_name> -port-name
<port_name>
```

- iii. Enter one of the following commands:

- Move a single LIF:

```
network interface modify -vserver <vserver_name> -lif <LIF_name> -home
-port <new_home_port>
```

- Move all the LIFs on a single nonexistent or incorrect port to a new port:

```
network interface modify {-home-port <port_on_node1> -home-node
```



```
<node1> -role data} -home-port <new_home_port_on_node3>
```

- Add the LIFs back to the port set:

```
portset add -vserver <vserver_name> -portset <portset_name> -port-name  
<port_name>
```



You must move SAN LIFs to a port that has the same link speed as the original port.

10. Modify the status of all LIFs to "up" so the LIFs can accept and send traffic on the node:

```
network interface modify -home-port <port_name> -home-node <node3> -lif data  
-status-admin up
```

11. Enter the following command on either node and examine its output to verify that LIFs have been moved to the correct ports and that the LIFs have the status of "up" by entering the following command on either node and examining the output:

```
network interface show -home-node <node3> -role data
```

12. If any LIFs are down, set the administrative status of the LIFs to "up" by entering the following command, once for each LIF:

```
network interface modify -vserver <vserver_name> -lif <LIF_name> -status-admin  
up
```

13. Send a post-upgrade AutoSupport message to NetApp for node1:

```
system node autosupport invoke -node <node3> -type all -message "node1  
successfully upgraded from <platform_old> to <platform_new>"
```

Worksheet: Information to record before moving NAS data LIFs to node3

To help verify that you have the correct configuration after moving SAN LIFs from node2 to node3, you can use the following worksheet to record the adapter and switch-port information for each LIF.

Record the LIF adapter information from the `network interface show -data-protocol fc*` command output and the switch-port information from the `fcport adapter show -fields switch-port, fc-wwpn` command output for node2.

After you complete the migration to node3, record the LIF adapter and switch-port information for the LIFs on node3 and verify that each LIF is still connected to the same switch-port.

| Node2 | | | Node3 | | |
|-------|---------|-------------|-------|---------|-------------|
| LIF | adapter | switch-port | LIF | adapter | switch-port |
| | | | | | |
| | | | | | |

| Node2 | | | Node3 | | |
|-------|--|--|-------|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Relocate non-root aggregates from node2 to node3

Before you can replace node2 with node4, you must send an AutoSupport message for node2 and then relocate the non-root aggregates that are owned by node2 to node3.

Steps

1. Send an AutoSupport message to NetApp for node2:

```
system node autosupport invoke -node <node2> -type all -message "Upgrading
<node2> from <platform_old> to <platform_new>"
```

2. Verify that the AutoSupport message was sent:

```
system node autosupport show -node <node2> -instance
```

The fields "Last Subject Sent:" and "Last Time Sent:" contain the message title of the last message that was sent and the time when the message was sent.

3. Relocate the non-root aggregates:
 - a. Set the privilege level to advanced:

```
set -privilege advanced
```

- b. List the aggregates that are owned by node2:

```
storage aggregate show -owner-name <node2>
```

- c. Start aggregate relocation:

```
storage aggregate relocation start -node <node2> -destination <node3>
-aggregate-list * -ndo-controller-upgrade true
```



The command locates only non-root aggregates.

- d. When prompted, enter *y*.

Relocation occurs in the background. It can take anywhere from a few seconds to a couple of minutes to relocate an aggregate. The time includes both client outage and non-outage portions. The command does not relocate any offline or restricted aggregates.

- e. Return to the admin privilege level:

```
set -privilege admin
```

4. Verify the relocation status of node2:

```
storage aggregate relocation show -node <node2>
```

The output will display "Done" for an aggregate after it has been relocated.



You must wait until all of the aggregates that are owned by node2 have been relocated to node3 before proceeding to the next step.

5. Take one of the following actions:

| If relocation of... | Then... |
|-------------------------------|--------------------------------|
| All aggregates was successful | Go to Step 6 . |

| If relocation of... | Then... |
|--------------------------------------|--|
| Any aggregates failed, or was vetoed | <p>a. Display a detailed status message:</p> <pre>storage aggregate show -instance</pre> <p>You can also check the EMS logs to see the corrective action that is needed.</p> <p>Note: The <code>event log show</code> command lists any errors that have occurred.</p> <p>b. Perform the corrective action.</p> <p>c. Set the privilege level to advanced:</p> <pre>set -privilege advanced</pre> <p>d. Relocate any failed or vetoed aggregates:</p> <pre>storage aggregate relocation start -node <node2> -destination <node3> -aggregate-list * -ndo-controllerupgrade true</pre> <p>e. When prompted, enter <code>y</code>.</p> <p>f. Return to the admin privilege level:</p> <pre>set -privilege admin</pre> <p>If necessary, you can force the relocation by using one of the following methods:</p> <ul style="list-style-type: none"> By overriding veto checks: <pre>storage aggregate relocation start -override -vetoes true -ndo-controller-upgrade</pre> By overriding destination checks: <pre>storage aggregate relocation start -override -destination-checks true -ndocontroller-upgrade</pre> <p>For more information about the storage aggregate relocation commands, go to References to link to <i>Disk and aggregate management with the CLI</i> and the <i>ONTAP 9 Commands: Manual Page Reference</i>.</p> |

6. Verify that all of the non-root aggregates are online on node3:

```
storage aggregate show -node <node3> -state offline -root false
```

If any aggregates have gone offline or have become foreign, you must bring them online, once for each

aggregate:

```
storage aggregate online -aggregate <aggr_name>
```

7. Verify that all of the volumes are online on node3:

```
volume show -node <node3> -state offline
```

If any volumes are offline on node3, you must bring them online, once for each volume:

```
volume online -vserver <Vserver-name> -volume <volume-name>
```

8. Verify that node2 does not own any online non-root aggregates:

```
storage aggregate show -owner-name <node2> -ha-policy sfo -state online
```

The command output should not display online non-root aggregates because all of the non-root online aggregates have already been relocated to node3.

Move NAS data LIFs owned by node2 to node3

After you relocate the aggregates from node2 to node3, you need to move the NAS data LIFs owned by node2 to node3.

About this task

Remote LIFs handle traffic to SAN LUNs during the upgrade procedure. Moving SAN LIFs is not necessary for cluster or service health during the upgrade. SAN LIFs are not moved unless they need to be mapped to new ports. You must verify that the LIFs are healthy and located on the appropriate ports after you move the LIFs from node3 to node4 and bring node4 online.

Steps

1. List all the NAS data LIFs owned by node2 by entering the following command on either node and capturing the output:

```
network interface show -data-protocol nfs|cifs -home-node <node2>
```

The following example shows the command output for node2:

```
cluster::> network interface show -data-protocol nfs|cifs -home-node
node2
```

| | Logical | Status | Network | Current | |
|------------|-----------|------------|-------------------|---------|------|
| Current Is | | | | | |
| Vserver | Interface | Admin/Oper | Address/Mask | Node | Port |
| Home | | | | | |
| ----- | ----- | ----- | ----- | ----- | |
| ----- | | | | | |
| vs0 | | | | | |
| | a0a | up/down | 10.63.0.53/24 | node2 | a0a |
| true | | | | | |
| | data1 | up/up | 10.63.0.50/18 | node2 | e0c |
| true | | | | | |
| | rads1 | up/up | 10.63.0.51/18 | node2 | e1a |
| true | | | | | |
| | rads2 | up/down | 10.63.0.52/24 | node2 | e1b |
| true | | | | | |
| vs1 | | | | | |
| | lif1 | up/up | 172.17.176.120/24 | node2 | e0c |
| true | | | | | |
| | lif2 | up/up | 172.17.176.121/24 | node2 | e1a |
| true | | | | | |

2. Take one of the following actions:

| If node2... | Then... |
|--|--|
| Has interface groups or VLANs configured | Go to Step 3 . |
| Does not have interface groups or VLANs configured | Skip Step 3 and go to Step 4 . |

3. Take the following steps to migrate NAS data LIFs hosted on interface groups and VLANs on node2:
 - a. Migrate any data LIFs hosted on an interface group on node2 to a port on node3 that is capable of hosting LIFs on the same network by entering the following command, once for each LIF:

```
network interface migrate -vserver <Vserver_name> -lif <LIF_name>
-destination-node <node3> -destination-port <netport|ifgrp>
```

- b. Modify the home port and home node of the LIFs in [Substep a](#) to the port and node currently hosting the LIFs by entering the following command, once for each node:

```
network interface modify -vserver <Vserver_name> -lif <LIF_name> -home-node
<node3> -homeport <netport|ifgrp>
```

- c. Migrate any LIFs hosted on VLANs on node2 to a port on node3 that is capable of hosting LIFs on the same network as that of the VLANs by entering the following command, once for each LIF:

```
network interface migrate -vserver <Vserver_name> -lif <LIF_name>
-destination-node <node3> -destination-port <netport|ifgrp>
```

- d. Modify the home port and home node of the LIFs in [Substep c](#) to the port and node currently hosting the LIFs by entering the following command, once for each LIF:

```
network interface modify -vserver <Vserver_name> -lif <LIF_name> -home-node
<node3> -homeport <netport|ifgrp>
```

4. Take one of the following actions:

| If the cluster is configured for... | Then... |
|-------------------------------------|---|
| NAS | Complete Step 5 through Step 8 . |
| SAN | Skip Step 5 through Step 8 and then complete Step 9 . |
| Both NAS and SAN | Complete Step 5 through Step 9 . |

5. If you have data ports that are not the same on your platforms, add the ports to the broadcast domain:

```
network port broadcast-domain add-ports -ipspace <IPspace_name> -broadcast
-domain mgmt -ports <node:port>
```

The following example adds port "e0a" on node "6280-1" and port "e0i" on node "8060-1" to broadcast domain "mgmt" in the IPspace "Default":

```
cluster::> network port broadcast-domain add-ports -ipspace Default
-broadcast-domain mgmt -ports 6280-1:e0a, 8060-1:e0i
```

6. Migrate each NAS data LIF to node3 by entering the following command, once for each LIF:

```
network interface migrate -vserver <Vserver_name> -lif <LIF_name> -destination
-node <node3> -destination-port <netport|ifgrp>
```

7. Verify that NAS LIFs have been moved to the correct ports and that the LIFs have the status of up by entering the following command on either node and examining the output:

```
network interface show -curr-node <node3> -data-protocol cifs|nfs
```

8. If any LIFs are down, set the administrative status of the LIFs to "up" by entering the following command, once for each LIF:

```
network interface modify -vserver <Vserver_name> -lif <LIF_name> -status-admin
up
```

9. If you have interface groups or VLANs configured, complete the following substeps:

- a. Remove the VLANs from the interface groups:

```
network port vlan delete -node <node_name> -port <ifgrp> -vlan-id <VLAN_ID>
```

- b. Enter the following command and examine its output to determine if there are any interface groups configured on the node:

```
network port ifgrp show -node <node_name> -ifgrp <ifgrp_name> -instance
```

The system displays interface group information for the node, as shown in the following example:

```
cluster::> network port ifgrp show -node node2 -ifgrp a0a -instance
      Node: node2
Interface Group Name: a0a
Distribution Function: ip
      Create Policy: multimode_lacp
      MAC Address: MAC_address
      Port Participation: partial
      Network Ports: e2c, e2d
      Up Ports: e2c
      Down Ports: e2d
```

- c. If any interface groups are configured on the node, record the names of the interface groups and the ports assigned to them and then delete the ports by entering the following command, once for each port:

```
network port ifgrp remove-port -node <node_name> -ifgrp <ifgrp_name> -port
<port_name>
```


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