



# **Manage systems with FC adapters**

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# Manage systems with FC adapters

## Manage systems with FC adapters

Commands are available to manage onboard FC adapters and FC adapter cards. These commands can be used to configure the adapter mode, display adapter information, and change the speed.

Most storage systems have onboard FC adapters that can be configured as initiators or targets. You can also use FC adapter cards configured as initiators or targets. Initiators connect to back-end disk shelves, and possibly foreign storage arrays (FlexArray). Targets connect only to FC switches. Both the FC target HBA ports and the switch port speed should be set to the same value and should not be set to auto.

### Related information

[SAN configuration](#)

## Commands for managing FC adapters

You can use FC commands to manage FC target adapters, FC initiator adapters, and onboard FC adapters for your storage controller. The same commands are used to manage FC adapters for the FC protocol and the FC-NVMe protocol.

FC initiator adapter commands work only at the node level. You must use the `run -node node_name` command before you can use the FC initiator adapter commands.

### Commands for managing FC target adapters

| If you want to...                                                                         | Use this command...                                   |
|-------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Display FC adapter information on a node                                                  | <code>network fcp adapter show</code>                 |
| Modify FC target adapter parameters                                                       | <code>network fcp adapter modify</code>               |
| Display FC protocol traffic information                                                   | <code>run -node node_name sysstat -f</code>           |
| Display how long the FC protocol has been running                                         | <code>run -node node_name uptime</code>               |
| Display adapter configuration and status                                                  | <code>run -node node_name sysconfig -v adapter</code> |
| Verify which expansion cards are installed and whether there are any configuration errors | <code>run -node node_name sysconfig -ac</code>        |
| View a man page for a command                                                             | <code>man command_name</code>                         |

## Commands for managing FC initiator adapters

| If you want to...                                                                         | Use this command...                                                 |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Display information for all initiators and their adapters in a node                       | <code>run -node <i>node_name</i> storage show adapter</code>        |
| Display adapter configuration and status                                                  | <code>run -node <i>node_name</i> sysconfig -v <i>adapter</i></code> |
| Verify which expansion cards are installed and whether there are any configuration errors | <code>run -node <i>node_name</i> sysconfig -ac</code>               |

## Commands for managing onboard FC adapters

| If you want to...                          | Use this command...                                                          |
|--------------------------------------------|------------------------------------------------------------------------------|
| Display the status of the onboard FC ports | <code>run -node <i>node_name</i> system hardware unified-connect show</code> |

## Configure FC adapters

Each onboard FC port can be individually configured as an initiator or a target. Ports on certain FC adapters can also be individually configured as either a target port or an initiator port, just like the onboard FC ports. A list of adapters that can be configured for target mode is available in the [NetApp Hardware Universe](#).

Target mode is used to connect the ports to FC initiators. Initiator mode is used to connect the ports to tape drives, tape libraries, or third-party storage with FlexArray Virtualization or Foreign LUN Import (FLI).

The same steps are used when configuring FC adapters for the FC protocol and the FC-NVMe protocol. However, only certain FC adapters support FC-NVMe. See the [NetApp Hardware Universe](#) for a list of adapters that support the FC-NVMe protocol.

### Configure FC adapters for target mode

#### Steps

1. Take the adapter offline:

```
node run -node node_name storage disable adapter adapter_name
```

If the adapter does not go offline, you can also remove the cable from the appropriate adapter port on the system.

2. Change the adapter from initiator to target:

```
system hardware unified-connect modify -t target -node node_name adapter adapter_name
```

3. Reboot the node hosting the adapter you changed.
4. Verify that the target port has the correct configuration:

```
network fcp adapter show -node node_name
```

5. Bring your adapter online:

```
network fcp adapter modify -node node_name -adapter adapter_port -state up
```

## Configure FC adapters for initiator mode

### What you'll need

- LIFs on the adapter must be removed from any port sets of which they are members.
- All LIF's from every storage virtual machine (SVM) using the physical port to be modified must be migrated or destroyed before changing the personality of the physical port from target to initiator.



NVMe/FC does support initiator mode.

### Steps

1. Remove all LIFs from the adapter:

```
network interface delete -vserver SVM_name -lif LIF_name,LIF_name
```

2. Take your adapter offline:

```
network fcp adapter modify -node node_name -adapter adapter_port -status-admin  
down
```

If the adapter does not go offline, you can also remove the cable from the appropriate adapter port on the system.

3. Change the adapter from target to initiator:

```
system hardware unified-connect modify -t initiator adapter_port
```

4. Reboot the node hosting the adapter you changed.
5. Verify that the FC ports are configured in the correct state for your configuration:

```
system hardware unified-connect show
```

6. Bring the adapter back online:

```
node run -node node_name storage enable adapter adapter_port
```

## View adapter settings

You can use specific commands to view information about your FC/UTA adapters.

## FC target adapter

### Step

1. Use the `network fcp adapter show` command to display adapter information: `network fcp adapter show -instance -node node1 -adapter 0a`

The output displays system configuration information and adapter information for each slot that is used.

## Unified Target Adapter (UTA) X1143A-R6

### Steps

1. Boot your controller without the cables attached.
2. Run the `system hardware unified-connect show` command to see the port configuration and modules.
3. View the port information before configuring the CNA and ports.

## Change the UTA2 port from CNA mode to FC mode

You should change the UTA2 port from Converged Network Adapter (CNA) mode to Fibre Channel (FC) mode to support the FC initiator and FC target mode. You should change the personality from CNA mode to FC mode when you need to change the physical medium that connects the port to its network.

### Steps

1. Take the adapter offline:

```
network fcp adapter modify -node node_name -adapter adapter_name -status-admin down
```

2. Change the port mode:

```
ucadmin modify -node node_name -adapter adapter_name -mode fcp
```

3. Reboot the node, and then bring the adapter online:

```
network fcp adapter modify -node node_name -adapter adapter_name -status-admin up
```

4. Notify your admin or VIF manager to delete or remove the port, as applicable:

- If the port is used as a home port of a LIF, is a member of an interface group (ifgrp), or hosts VLANs, then an admin should do the following:
  - i. Move the LIFs, remove the port from the ifgrp, or delete the VLANs, respectively.
  - ii. Manually delete the port by running the `network port delete` command.

If the `network port delete` command fails, the admin should address the errors, and then run the command again.

- If the port is not used as the home port of a LIF, is not a member of an ifgrp, and does not host VLANs,

then the VIF manager should remove the port from its records at the time of reboot.

If the VIF manager does not remove the port, then the admin must remove it manually after the reboot by using the `network port delete` command.

```
net-f8040-34::> network port show
```

```
Node: net-f8040-34-01
```

| Port | IPspace | Broadcast Domain | Link | MTU  | Speed (Mbps)<br>Admin/Oper | Health<br>Status |
|------|---------|------------------|------|------|----------------------------|------------------|
| ...  |         |                  |      |      |                            |                  |
| e0i  | Default | Default          | down | 1500 | auto/10                    | -                |
| e0f  | Default | Default          | down | 1500 | auto/10                    | -                |
| ...  |         |                  |      |      |                            |                  |

```
net-f8040-34::> ucadmin show
```

| Admin           | Current | Current | Pending | Pending |      |
|-----------------|---------|---------|---------|---------|------|
| Node            | Adapter | Mode    | Type    | Mode    | Type |
| Status          |         |         |         |         |      |
| net-f8040-34-01 | 0e      | cna     | target  | -       | -    |
| offline         |         |         |         |         |      |
| net-f8040-34-01 | 0f      | cna     | target  | -       | -    |
| offline         |         |         |         |         |      |
| ...             |         |         |         |         |      |

```
net-f8040-34::> network interface create -vs net-f8040-34 -lif m
-role
node-mgmt-home-node net-f8040-34-01 -home-port e0e -address 10.1.1.1
-netmask 255.255.255.0
```

```
net-f8040-34::> network interface show -fields home-port, curr-port
```

| vserver                       | lif | home-port | curr-port |
|-------------------------------|-----|-----------|-----------|
| Cluster net-f8040-34-01_clus1 | e0a | e0a       |           |
| Cluster net-f8040-34-01_clus2 | e0b | e0b       |           |
| Cluster net-f8040-34-01_clus3 | e0c | e0c       |           |
| Cluster net-f8040-34-01_clus4 | e0d | e0d       |           |
| net-f8040-34                  |     |           |           |
| cluster_mgmt                  | e0M | e0M       |           |
| net-f8040-34                  |     |           |           |

```

m                                e0e        e0i
net-f8040-34
    net-f8040-34-01_mgmt1 e0M        e0M
7 entries were displayed.

net-f8040-34::> ucadmin modify local 0e fc

Warning: Mode on adapter 0e and also adapter 0f will be changed to
fc.
Do you want to continue? {y|n}: y
Any changes will take effect after rebooting the system. Use the
"system node reboot" command to reboot.

net-f8040-34::> reboot local
(system node reboot)

Warning: Are you sure you want to reboot node "net-f8040-34-01"?
{y|n}: y

```

5. Verify that you have the correct SFP+ installed:

```
network fcp adapter show -instance -node -adapter
```

For CNA, you should use a 10Gb Ethernet SFP. For FC, you should either use an 8 Gb SFP or a 16 Gb SFP, before changing the configuration on the node.

## Change the CNA/UTA2 target adapter optical modules

You should change the optical modules on the unified target adapter (CNA/UTA2) to support the personality mode you have selected for the adapter.

### Steps

1. Verify the current SFP+ used in the card. Then, replace the current SFP+ with the appropriate SFP+ for the preferred personality (FC or CNA).
2. Remove the current optical modules from the X1143A-R6 adapter.
3. Insert the correct modules for your preferred personality mode (FC or CNA) optics.
4. Verify that you have the correct SFP+ installed:

```
network fcp adapter show -instance -node -adapter
```

Supported SFP+ modules and Cisco-branded Copper (Twinax) cables are listed in the *Hardware Universe*.

### Related information

[NetApp Hardware Universe](#)



# Supported port configurations for X1143A-R6 adapters

The FC target mode is the default configuration for X1143A-R6 adapter ports. However, ports on this adapter can be configured as either 10-Gb Ethernet and FCoE ports or as 16-Gb FC ports.

When configured for Ethernet and FCoE, X1143A-R6 adapters support concurrent NIC and FCoE target traffic on the same 10-GBE port. When configured for FC, each two-port pair that shares the same ASIC can be individually configured for FC target or FC initiator mode. This means that a single X1143A-R6 adapter can support FC target mode on one two-port pair and FC initiator mode on another two-port pair.

## Related information

[NetApp Hardware Universe](#)

[SAN configuration](#)

## Configure the ports

To configure the unified target adapter (X1143A-R6), you must configure the two adjacent ports on the same chip in the same personality mode.

### Steps

1. Configure the ports as needed for Fibre Channel (FC) or Converged Network Adapter (CNA) using the `system node hardware unified-connect modify` command.
2. Attach the appropriate cables for FC or 10 Gb Ethernet.
3. Verify that you have the correct SFP+ installed:

```
network fcp adapter show -instance -node -adapter
```

For CNA, you should use a 10Gb Ethernet SFP. For FC, you should either use an 8 Gb SFP or a 16 Gb SFP, based on the FC fabric being connected to.

## Prevent loss of connectivity when using the X1133A-R6 adapter

You can prevent loss of connectivity during a port failure by configuring your system with redundant paths to separate X1133A-R6 HBAs.

The X1133A-R6 HBA is a 4-port, 16 Gb FC adapter consisting of two 2-port pairs. The X1133A-R6 adapter can be configured as target mode or initiator mode. Each 2-port pair is supported by a single ASIC (for example, Port 1 and Port 2 on ASIC 1 and Port 3 and Port 4 on ASIC 2). Both ports on a single ASIC must be configured to operate in the same mode, either target mode or initiator mode. If an error occurs with the ASIC supporting a pair, both ports in the pair go offline.

To prevent this loss of connectivity, you configure your system with redundant paths to separate X1133A-R6 HBAs, or with redundant paths to ports supported by different ASICs on the HBA.

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