



**Hewlett Packard  
Enterprise**

# **HPE FCoE Configuration for Cavium- Based Adapters User Guide**

## **Abstract**

This document is for the person who installs, administers, and troubleshoots servers and storage systems. HPE assumes that you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

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# Introduction

## Performing a local boot with an FCoE-enabled network adapter

This guide details FCoE configuration of Cavium-based HPE FlexFabric and StoreFabric adapters to perform a local boot only.

Certain adapters might support both hardware-accelerated FCoE and hardware-accelerated iSCSI protocols on the adapter ports. See the adapter-specific documentation for any setup and configuration requirements. See the [HPE Boot from SAN Configuration Guide](#) to configure a boot from SAN for a remote boot.

## About Cavium-based, multifunction device drivers

Cavium-based, multifunction devices use a tiered driver model, and the driver components contain multiple drivers that support the device. The component version is the virtual bus driver version as contained in the component. The virtual bus driver is a system device listed under Device Manager. The network device is a separate driver that is also contained in the component. The network device version is different from the component version. NCU device properties display both driver versions, and the driver versions are also listed in Device Manager.

## Downloading files

### Procedure

1. Go to the [Hewlett Packard Enterprise website](#).
2. Enter your user ID and password, and then click **Sign in**.

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**NOTE:** If you do not have a user ID and password, click **Create an account** and follow the on-screen instructions.

---

3. Enter the adapter name into the **Products, software, drivers, documents... search** field.  
For example, enter HPE Ethernet 562T adapter.

Results with the potential match for the adapter you enter appear.

4. From the search results list, do one of the following:
  - Click **Drivers & Software** for the desired adapter.
    - Select the Operating environment for the product to download drivers and firmware as needed.

---

**!** **IMPORTANT:** Filtering the results by Operating environment narrows down the list of results that display. You can further filter the results by **Software type** and **Driver language**.

---

- Click **Documents** for the desired adapter.

---

**NOTE:** You can further filter the results by **Document type**, **Document details**, **Operating environment**, **Language**, and **Relevance**.

---

# Configuration for Cavium 578xx Adapters in BIOS (HPE Legacy Boot mode) Environment

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**NOTE:** The following adapters are Cavium 578xxx Series Adapters:

- HPE FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter
  - HPE FlexFabric 10Gb 2-port 533FLR-T Adapter
  - HPE FlexFabric 10Gb 4-port 536FLR-T Adapter
  - HPE FlexFabric 10Gb 2-port 536FLB Adapter
  - HPE FlexFabric 10Gb 2-port 534M Adapter
  - HPE FlexFabric 20Gb 2-port 630FLB Adapter
  - HPE FlexFabric 20Gb 2-port 630M Adapter
  - HPE StoreFabric CN1100R Dual Port Converged Network Adapter
  - HPE StoreFabric CN1100R 10GBASE-T Dual Port Converged Network Adapter
- 

## Installing the software

Install the software in the following order:

### Procedure

1. **Setting the storage personality (if required)**
2. **Configuring an adapter to enable FCoE**
  - a. **Windows OS**
  - b. **Linux OS**

#### **Enabling FCoE on the adapter**

- c. **VMware**
    - **Enabling FCoE hardware offload on the adapter**
    - **Verifying the interface is working**
3. **Installing multi-path software**
    - **Installing multi-path software on Windows**
    - **Installing multi-path software on Linux**

## Setting the storage personality

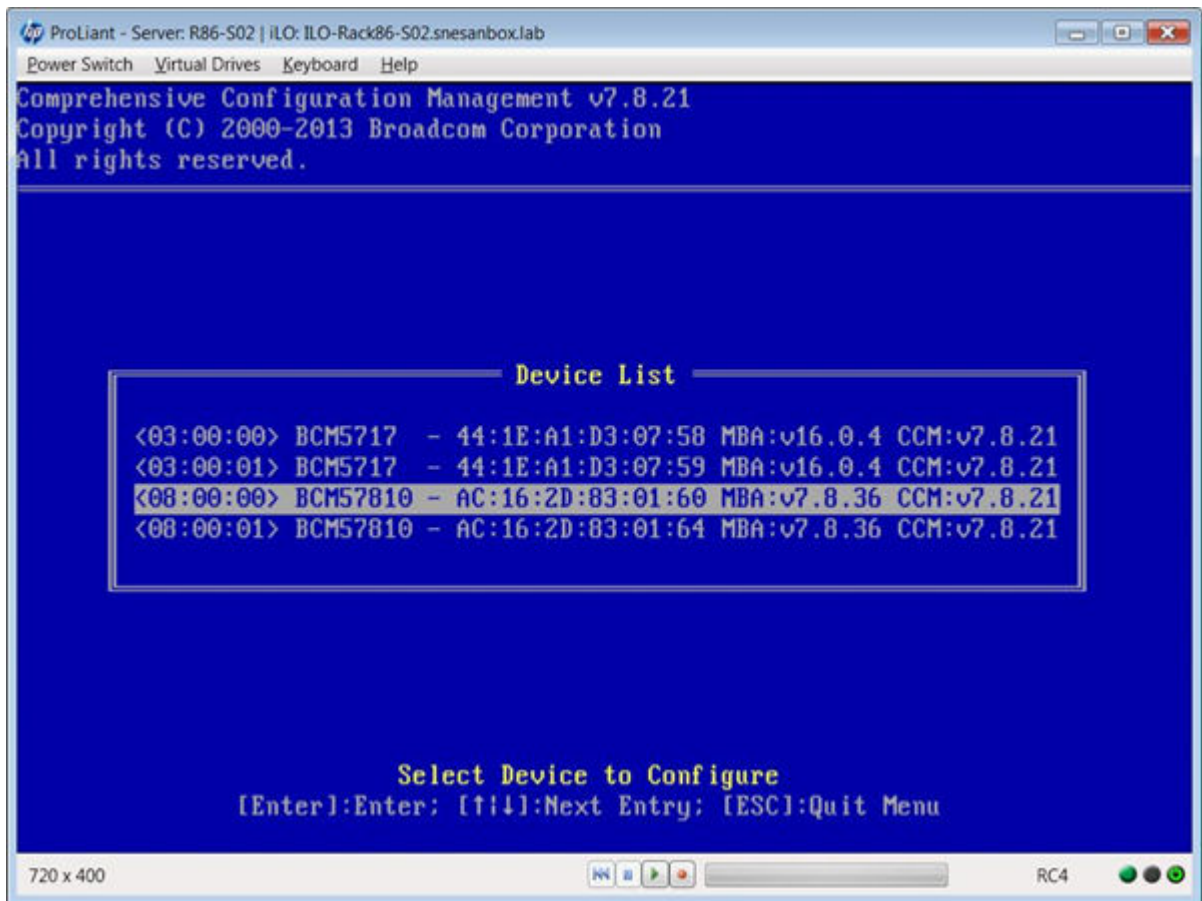
HPE Cavium-based adapters are preconfigured with FCoE enabled on all ports by default. Hardware-accelerated iSCSI is also supported but is disabled by default. To change an adapter configured to enable iSCSI on either port, use the following procedure to change a port to FCoE. In a Virtual Connect environment, Virtual Connect configures the storage personality, and the following procedure is not required.

### Setting the storage personality in Legacy BIOS Servers

#### Procedure

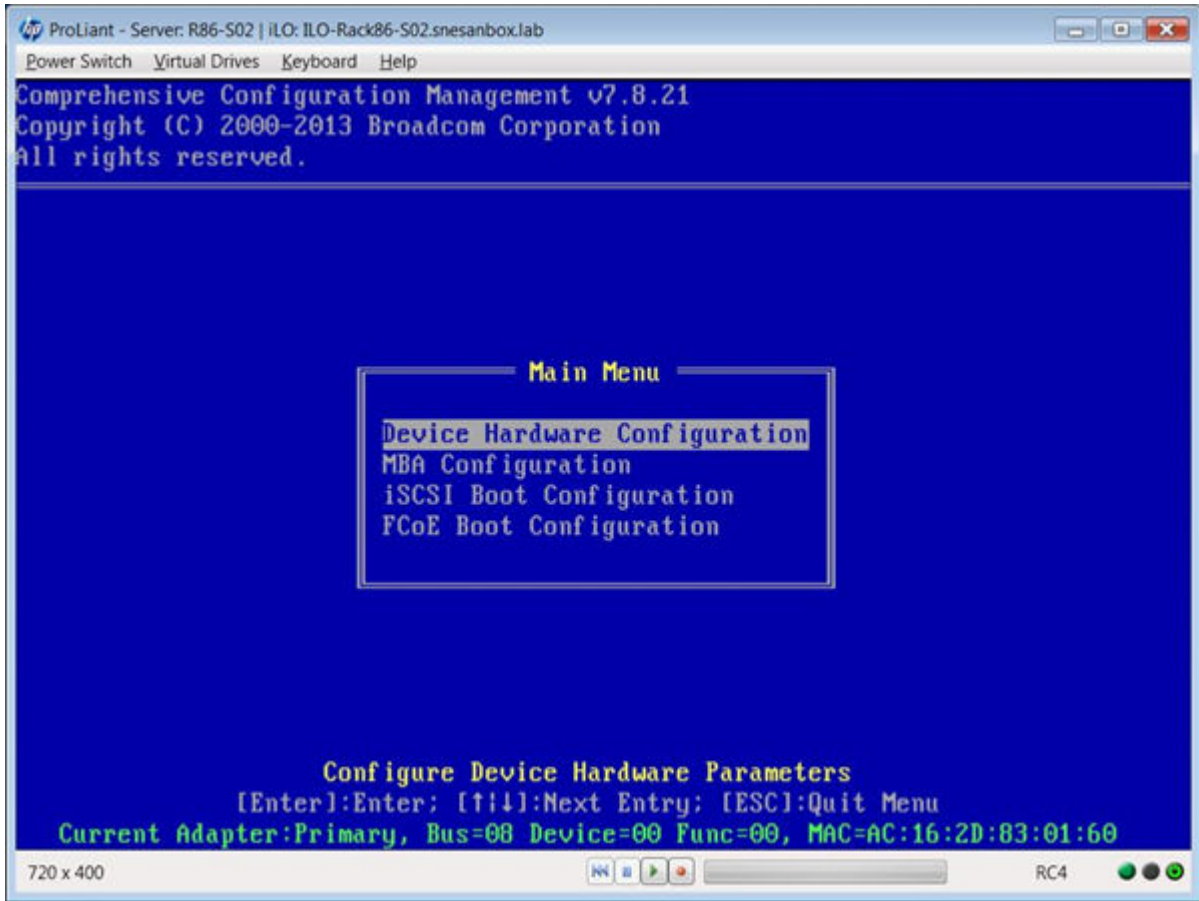
1. Power up the server.
2. Enter **Ctrl+S** when the Cavium BIOS message appears to launch the CCM.

The CCM **Device List** shows every port of all Cavium adapters in the system.



3. Select a port with arrow keys, and then press **Enter**.

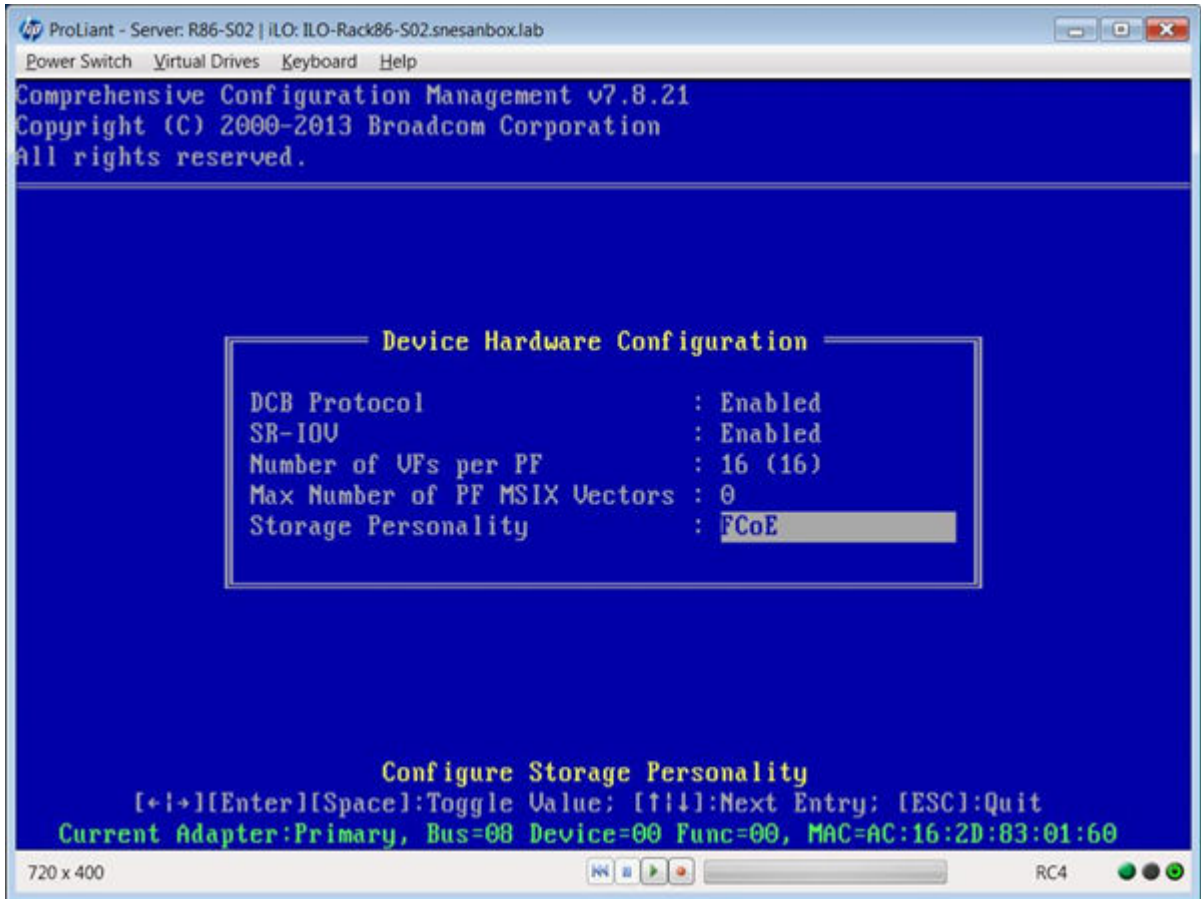
The CCM **Main Menu** appears.



4. Select **Device Hardware Configuration**, and then press **Enter**.

The **Device Hardware Configuration** Menu appears.



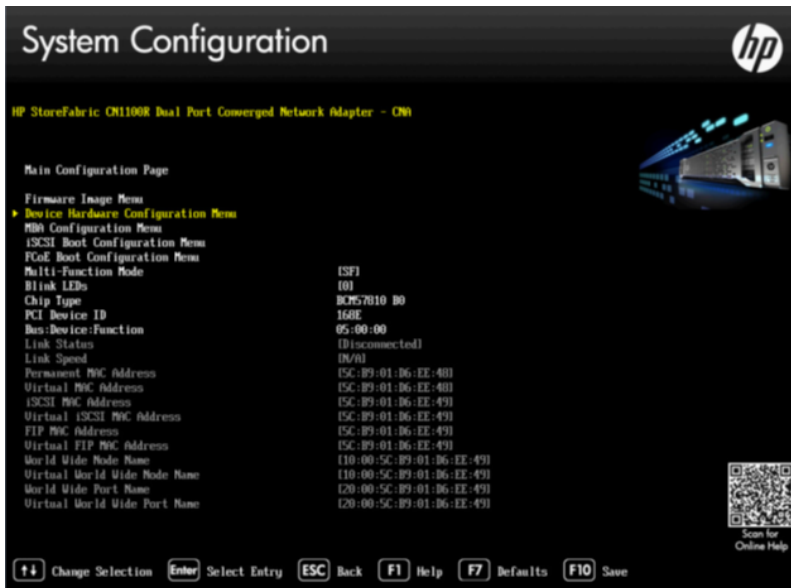


5. To toggle between options, select the **Storage Personality** field with the arrow keys, press **Enter** or the **space bar**, and then select the **FCoE storage personality**.
6. To exit the **Device Hardware Configuration** Menu and save the changes, press **ESC**.
7. To exit the CCM **Main Menu**, press **ESC**.
8. Select another port for modification from the Device List, or press **ESC** to exit the CCM.
9. To reset the storage personality, reboot the server.  
The selected storage controllers appear in the operating system.

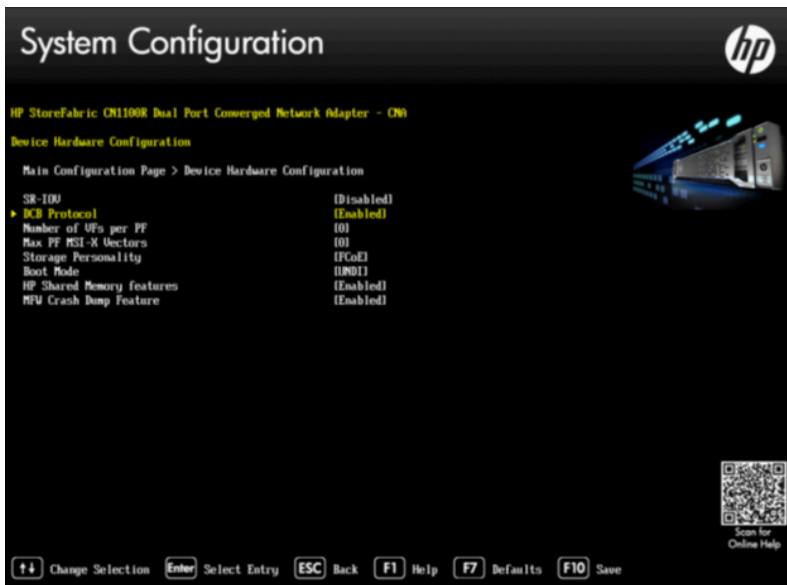
## Setting the storage personality in HPE UEFI Servers

### Procedure

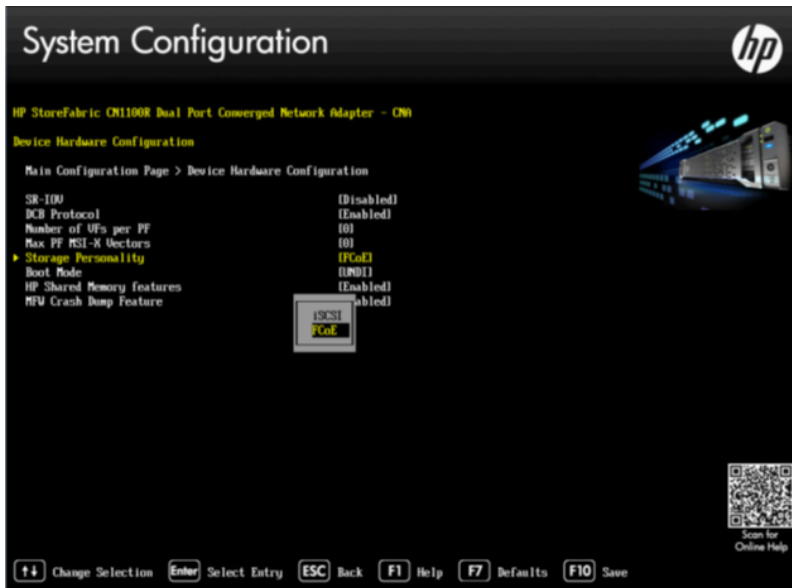
1. Power up the server.
2. Press **F9** when prompted to enter the System Configuration menu.
3. Select the ROM-based Setup utility, and then select the desired QLogic device.  
The System Configuration menu displays.



4. Select **Device Hardware Configuration Menu**, and then press **Enter**.
5. Be sure that **DCB Protocol** is **Enabled**.



6. Select **Storage Personality**, and then select **FCoE**.



**IMPORTANT:** In NPAR 1.5, the Storage Personality option is not in the Device Hardware Configuration menu. This option must be set in the NIC Partitioning Configuration menu for the appropriate function.

**NOTE:** Consult the [HPE Boot from SAN Configuration Guide](#) for more information about how to configure the adapter to boot from SAN.

## Configuring an adapter to enable FCoE

Configure an adapter to enable FCoE for one of the following OSEs:

### Procedure

1. [Windows OS](#)
2. [Linux OS](#)
3. [VMware](#)

## Installing the drivers on the Windows OS

### Procedure

1. Obtain the latest Windows driver Smart Component kit for your configuration, and then copy it to the Windows server.
2. Double-click the Smart Component executable, and then click **Install**.  
The Smart Component automatically installs the drivers without any user intervention.
3. Click **Finish** after the installation is finished, and then click **Reboot** to complete the installation.

## Installing the drivers on the Linux OS

### Procedure

1. Download the appropriate driver kit for your distribution.
2. Install the in-box FCoE prerequisites (Open-FCoE).
  - For RHEL, the package is `fcoe-utils`.
  - For SLES, the package is `open-fcoe`.

The packages and dependencies are located on the OS installation media.

For additional instructions on installing the RPM, see the included Read Me file.

3. Configure FCoE on the adapter.

For SLES, enter the following commands to turn on the FCoE and LLDPAD services:

```
# chkconfig boot.lldpad on
# chkconfig boot.fcoe on
```

4. Reboot the server to be sure that the newly installed drivers are active.

## Enabling FCoE on the adapter

### Procedure

1. Create configuration files for all FCoE ethX interfaces:

```
# cd /etc/fcoe
# cp cfg-ethx cfg-<ethX FCoE interface name>
```

Some distributions might have a different naming scheme for Ethernet devices, such as pXpX or emX instead of ethX.

2. Modify `/etc/fcoe/cfg-<interface>`:

```
Set DCB_REQUIRED=yes to DCB_REQUIRED=no.
```

3. Turn on all ethX interfaces:

```
# ifconfig <ethX> up
```

4. For SLES, to configure the Ethernet interfaces with YaST to start automatically at boot, do one of the following:

- Set a static IP address.
- Enable DHCP on the interface.

5. To disable LLDPAD for Cavium-based CNA interfaces, which is required because Cavium uses an offloaded DCBX client:

```
# lldptool set-lldp -i <ethX> adminStatus=disabled
```

---

**!** **IMPORTANT:** In a FlexFabric environment, LLDPAD must be disabled on all network adapters, and HBA ports must be associated with a given physical interface.

---

6. Check that `/var/lib/lldpad/lldpad.conf` is created, and then do one of the following:

- Check that each `<ethX>` block does not specify `adminStatus`.
- If `adminStatus` is specified, be sure that the setting is 0 (`adminStatus=0`) for all interfaces, including interfaces not enabled for FCoE:

```
lldp :
{
eth5 :
{
tlvid00000001 :
{
info = "04BC305B017B73";
};
tlvid00000002 :
{
info = "03BC305B017B73";
};
};
```

7. To apply new settings, restart the LLDPAD service:

- For RHEL: `# service lldpad restart`
- For SLES11: `# rlldpad restart`

8. To apply new settings, Restart the FCoE service:

- For RHEL: `# service fcoe restart`
- For SLES11: `# rcfcoe restart`

9. Verify that the driver installed correctly, and then verify that the switch sees the host port.

- a. Confirm proper DCB sync and operational DCB through BACS, BACScLi, or the directly connected switch interface.

Correct FCoE operation requires proper DCB connectivity.

- b. To check all created FCoE interfaces and status, run `fcoeadm -i`:

If an FCoE interface is not present, check that the operating system is configured to enable the required network interfaces automatically.

## Installing the drivers on VMware

### Procedure

1. Download the appropriate driver kit for your distribution.
2. To install the driver, follow the instructions in the Read Me file included in the driver kit.
3. Reboot the system, and then enable FCoE on VMware.

## Enabling FCoE hardware offload on the adapter

### Procedure

1. Access the host machine through SSH.
2. To determine which ports are FCoE capable, enter the following command:

```
# esxcli fcoe nic list
```

The following example shows a common output:

```
vmnic4
User Priority: 3
Source MAC: FF:FF:FF:FF:FF:FF
Active: false
Priority Settable: false
Source MAC Settable: false
VLAN Range Settable: false
```

3. Enable the FCoE interface:

```
# esxcli fcoe nic enable - n vmnicX
```

where X is the interface number gained from `esxcli fcoe nic list`.

---

**!** **IMPORTANT:** This step might not be necessary on adapters that use the `qfle3f` driver because that driver might automatically attach and enable FCoE connectivity.

---

4. Verify that the FCoE interface is working:

```
# esxcli fcoe adapter list
```

5. Check that the output of the `# esxcli fcoe adapter list` command shows valid values for the following parameters:

- FCF MAC
- VN-Port MAC
- Priority
- VLAN ID for the fabric that is connected to the adapter

---

**NOTE:** When using stateless installs with Auto Deploy, FCoE adapter discovery might not persist across system reboots. If this occurs, create an auto deploy rule that runs the commands in step 3 to work around this issue.

---

## Verifying the interface is working

### Procedure

1. Enter the command:

```
#esxcfg-scsidevs -a
```

2. Check that the output of the `#esxcfg-scsidevs -a` command looks similar to the following example:

```
vmhba34 bnx2fc link-up fcoe.1000<mac address>:2000<mac address> () Software FCoE
vmhba35 bnx2fc link-up fcoe.1000<mac address>:2000<mac address> () Software FCoE
```

The label Software FCoE is a VMware term used to describe initiators that depend on the in-box FCoE libraries and utilities. The Cavium FCoE solution is a fully state-connection-based hardware offload solution designed to reduce the CPU burden encumbered by a nonoffload software initiator significantly.

The command output example is from an ESXi 5.0 system. The command output on an ESXi 5.1 system replaces the term Software FCoE with Cavium Corporation FCoE Adapter.

The command output example is from a system using the bnx2fc driver. The qfle3f driver has replaced the bnx2fc driver in ESXi 6.5 and later.

3. To verify that the driver installed correctly and that the switch sees the host port, determine if the host WWPN shows in the switch FLOGI database:
  - For Cisco FCF: `show flogi database`
  - For Brocade FCF: `fcoe --loginshow`

## Installing multi-path software

### Procedure

- [Installing multi-path software on Windows](#)
- [Installing multi-path software on Linux](#)

## Installing multi-pathing software on Windows

Multi-pathing software is optional.

### Prerequisites

An HPE passport is required for access.

### Procedure

1. Locate the MPIO DSM specific to the arrays and operating system version.
2. Download the MPIO DSM to your server.

## Installing multipathing software on Linux

Multipathing software is optional.

### Prerequisites

An HPE passport is required for access.

### Procedure

See the *Native Linux Device-Mapper Multipath for HPE StorageWorks Arrays Reference Guide* on the [SPOCK website](#).

## Viewing or changing the adapter properties

### Procedure

1. Open the QCC GUI.
2. Click the **Advanced** section of the **Configurations** tab.



# Configuration for Cavium 41xxx/45xxx Adapters

## Installing the software

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**NOTE:** The following adapters are Cavium 41xxx/45xxx Series Adapters:

- HPE StoreFabric CN1200R 10GBASE-T Converged Network Adapter
  - HPE StoreFabric CN1300R 10/25Gb Converged Network Adapter
  - HPE Synergy 4820C 10/25Gb CNA
  - HPE Synergy 6820C 25/50Gb CNA
- 

Install the software in the following order:

### Procedure

1. Setting the storage personality (if required).
2. Configuring an adapter to enable FCoE.
  - a. Windows OS
  - b. Linux OS
  - c. VMware
    - Enabling FCoE hardware offload on the adapter.

## Setting the storage personality

HPE Cavium-based adapters are preconfigured with FCoE enabled on all ports by default. Hardware accelerated iSCSI is also supported but is disabled by default. To change an adapter configured to enable iSCSI on either port, use the following procedure to change a port to FCoE. In a Virtual Connect environment, Virtual Connect configures the storage personality, and the following procedure is not required.

### To configure the Storage Personality:

#### Procedure

1. During system boot, press the **F9** key to enter the system configuration menu.
2. Select **System Configuration** and then press the **Enter** key.
3. Navigate to one of the desired adapter ports and then press **Enter**.

The CNA's Main Configuration Page should appear.
4. Select **Port Level Configuration** and then press **Enter**.
5. Select **Boot Mode**, and set the parameter to **FCoE**.

6. Enable **FCoE Offload** and set **RDMA Operational Mode** to **None**.
7. Save changes by pressing **F10**.

## Configuring an adapter to enable FCoE

Configure an adapter to enable FCoE for one of the following OSES:

### Installing the drivers on the Windows OS

#### Procedure

##### To install the Windows drivers:

1. The Preferred method to update the windows drivers is to use the SPP. See HPE Software Depot site: [http://h17007.www1.hpe.com/us/en/enterprise/servers/products/service\\_pack/spp/index.aspx](http://h17007.www1.hpe.com/us/en/enterprise/servers/products/service_pack/spp/index.aspx)
2. Verify that the Windows drivers have been installed:
  - a. Click **Start** and then click **Control Panel**.
  - b. In the Control Panel, click **Programs**, and then click **Programs and Features**.
  - c. In the installed programs list, locate **QLogic FastLinQ Driver Installer**.

Alternatively, the Windows drivers can also be installed by using the Windows driver Smart component kit.

- a. Obtain the latest Windows driver Smart Component kit for your configuration, and then copy it to the Windows server.
- b. Double-click the Smart Component executable, and then click **Install**.

##### To remove the Windows drivers:

3. In the Control Panel, click **Programs**, and then click **Programs and Features**.
4. In the list of programs, select **QLogic FastLinQ Driver Installer**, and then click **Uninstall**.
5. Follow the instructions to remove the drivers.

##### To view or change the Adapter properties:

6. In the Control Panel, click **Device Manager**.
7. On the properties of the selected adapter, click the **Advanced** tab.
8. On the Advanced page (Figure 3-1), select an item under **Property** and then change the **Value** for that item as needed.

### Installing the drivers on the Linux OS

#### Procedure

1. The preferred method to update the Linux drivers is to use the SPP (Service Pack for ProLiant) ISO image using the online method. See HPE Software Depot site: <https://h20392.www2.hpe.com/portal/swdepot/displayProductsList.do?category=SPP>
2. The Linux drivers can also be installed using the Red Hat Package Manager (RPM) method:

- a. Obtain the driver from the Hewlett Packard Enterprise Support Center and copy to the system OS
- b. Execute the smart component .scexe
- c. Reboot the system
- d. No further configuration is required

## Installing the VMware driver

### Procedure

1. The preferred method to update the VMware drivers is to use the SPP (Service Pack for ProLiant) ISO image using the online method. See HPE Software Depot site:

<https://h20392.www2.hpe.com/portal/swdepot/displayProductsList.do?category=SPP>

2. Alternatively, the drivers can be installed on a new installation with the HPE VMWare Custom .iso. This image is preloaded with the necessary VMWare drivers.

## Enabling FCoE hardware offload on the adapter

### Procedure

1. Determine which ports are FCoE capable by issuing the following command:

```
# esxcli fcoe nic list
```

2. Enable the FCoE interface by issuing the following commands (from previous command):

```
# esxcli fcoe nic enable -n vmnicX  
# esxcli fcoe nic discover -n vmnicX
```

3. Verify Link is up by:

```
#esxcfg-scsidevs -a (to list storage adapters and drivers)  
#esxcfg-nics -l (to list network adapters and drivers)
```

# Troubleshooting

## Linux installation and configuration known issues

The following issues are for Linux installation and configuration.

### Procedure

- Memory considerations for the Linux OS
- Multipath configuration for the Linux OS
- Boot from SAN on RHEL 6 for the Linux OS

## Memory considerations for the Linux OS

The Cavium bnx2x driver uses virtual memory for DMA operations. Normally, the driver requires a virtual memory size of 8,264 kB per physical function at the probe stage. At the open stage, the driver requires more than 256 kB of virtual memory per physical function. On architectures that the default `vmalloc` size is relatively small and not sufficient to load many interfaces, use `vmalloc=<size>` during the boot to increase the size.

A 32-bit Linux operating system has a limited amount of memory space available for kernel data structures. To decrease the amount of memory preallocated by the driver to use the Cavium bnx2x driver on the platform, do one of the following:

- Limit the number of RX queues with the `num_queues` driver parameter.
- Limit the number of RX buffers for each queue with the `ethtool -G` option.

During the installation of a 32-bit Linux operating system, HPE recommends setting `bnx2x.num_queues=1` in the kernel command line when the system boots up from the installation media to install the OS. The `bnx2x.num_queues=1` setting avoids potential out-of-memory issues.

## Multipath configuration for the Linux OS

HPE recommends the guidelines in *Native Linux Device-Mapper Multipath for HPE Storage Disk Arrays Reference Guide* to configure multipath on Linux systems. For more information, search *Native Linux Device-Mapper Multipath for HPE Storage Disk Arrays Reference Guide* on the **HPE SPOCK** website. For Cavium CNAs, HPE also recommends a `fast_io_fail_tmo` value of 25 in `multipath.conf` for each storage array. Add the line `fast_io_fail_tmo 25` to any array that does not already have the value defined. The adjustment avoids a race condition that can result in unexpected target and LUN loss.

## Boot from SAN on RHEL 6 for Linux OS

Certain RHEL 6 configurations might experience boot-time IO errors when configured to boot from SAN. To avoid a potential problem, when the RHEL 6 installer prompts for the initial reboot after installation, press **Ctrl-Alt-F2** to enter a shell. Edit `/mnt/sysimage/boot/grub/menu.lst`, and then enter `bnx2x.disable_tpa=1` in the default kernel command line.

## VMware installation and configuration known issues

The following issues are known for VMware installation and configuration.

### **Procedure**

- Boot from SAN is not supported on ESXi 5.0x for VMware
- Multipath configuration for VMware

## **Boot from SAN is not supported on ESXi 5.0x for VMware**

Boot from SAN is not supported on ESXi 5.0x for VMware.

## **Multipath configuration for VMware**

To set up multipath on an ESXi 5.x host, add a default FCoE transport SATP rule. For instructions, search for the article 2045934 on the VMware Knowledge Base website <http://kb.vmware.com/>.

# Websites

## **General websites**

**Hewlett Packard Enterprise Information Library**

**[www.hpe.com/info/EIL](http://www.hpe.com/info/EIL)**

**Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix**

**[www.hpe.com/storage/spock](http://www.hpe.com/storage/spock)**

**Storage white papers and analyst reports**

**[www.hpe.com/storage/whitepapers](http://www.hpe.com/storage/whitepapers)**

For additional websites, see **[Support and other resources](#)**.

# Acronyms and abbreviations

**BACS**

Broadcom Advanced Control Suite

**BACSCLI**

Broadcom Advanced Control Suite command line interface

**CNA**

Converged Network Adapter

**DCB**

Datacenter Bridging Capability

**DCBX**

Datacenter Bridging Capability Exchange protocol

**DHCP**

Dynamic Host Configuration Protocol

**DMA**

Direct Memory Access

**DSM**

Distributed State Machine

**FCF**

Fibre Channel Forwarder

**FCoE**

Fibre Channel over Ethernet

**FLOGI**

Fabric Login (Fibre Channel)

**HBA**

Host Bus Adapter

**ID**

Identification

**LLDPAD**

Link Layer Discovery Protocol Agent Daemon

**LUN**

Logical Unit Number

**MAC**

Media Access Control

**MPIO**

Multipath I/O

**RHEL**

Red Hat Enterprise Linux

**RX**

Receive

**SATP**

Storage Array Type Plug-in

**SLES**

SUSE Linux Enterprise Server

**SPOCK**

Single Point of Connectivity Knowledge

**SSH**

Secure Shell

**VLAN**

Virtual Local-area Network

**VN**

Virtual Node

**WWPN**

Worldwide Port Name

**YaST**

Yet Another Setup Tool



# Support and other resources

## Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:  
<http://www.hpe.com/assistance>
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:  
<http://www.hpe.com/support/hpesc>

### Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

## Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates:  
**Hewlett Packard Enterprise Support Center**  
[www.hpe.com/support/hpesc](http://www.hpe.com/support/hpesc)  
**Hewlett Packard Enterprise Support Center: Software downloads**  
[www.hpe.com/support/downloads](http://www.hpe.com/support/downloads)  
**Software Depot**  
[www.hpe.com/support/softwaredepot](http://www.hpe.com/support/softwaredepot)
- To subscribe to eNewsletters and alerts:  
[www.hpe.com/support/e-updates](http://www.hpe.com/support/e-updates)
- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:  
[www.hpe.com/support/AccessToSupportMaterials](http://www.hpe.com/support/AccessToSupportMaterials)

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**!** **IMPORTANT:** Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HPE Passport set up with relevant entitlements.

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## Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

<http://www.hpe.com/support/selfrepair>

## Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

### Remote support and Proactive Care information

#### HPE Get Connected

[www.hpe.com/services/getconnected](http://www.hpe.com/services/getconnected)

#### HPE Proactive Care services

[www.hpe.com/services/proactivecare](http://www.hpe.com/services/proactivecare)

#### HPE Proactive Care service: Supported products list

[www.hpe.com/services/proactivecaresupportedproducts](http://www.hpe.com/services/proactivecaresupportedproducts)

#### HPE Proactive Care advanced service: Supported products list

[www.hpe.com/services/proactivecareadvancedsupportedproducts](http://www.hpe.com/services/proactivecareadvancedsupportedproducts)

### Proactive Care customer information

#### Proactive Care central

[www.hpe.com/services/proactivecarecentral](http://www.hpe.com/services/proactivecarecentral)

#### Proactive Care service activation

[www.hpe.com/services/proactivecarecentralgetstarted](http://www.hpe.com/services/proactivecarecentralgetstarted)

## Warranty information

To view the warranty information for your product, see the links provided below:

#### HPE ProLiant and IA-32 Servers and Options

[www.hpe.com/support/ProLiantServers-Warranties](http://www.hpe.com/support/ProLiantServers-Warranties)

#### HPE Enterprise and Cloudline Servers

[www.hpe.com/support/EnterpriseServers-Warranties](http://www.hpe.com/support/EnterpriseServers-Warranties)

#### HPE Storage Products

[www.hpe.com/support/Storage-Warranties](http://www.hpe.com/support/Storage-Warranties)

#### HPE Networking Products

[www.hpe.com/support/Networking-Warranties](http://www.hpe.com/support/Networking-Warranties)

# Regulatory information

To view the regulatory information for your product, view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the Hewlett Packard Enterprise Support Center:

[www.hpe.com/support/Safety-Compliance-EnterpriseProducts](http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts)

## Additional regulatory information

Hewlett Packard Enterprise is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council). A chemical information report for this product can be found at:

[www.hpe.com/info/reach](http://www.hpe.com/info/reach)

For Hewlett Packard Enterprise product environmental and safety information and compliance data, including RoHS and REACH, see:

[www.hpe.com/info/ecodata](http://www.hpe.com/info/ecodata)

For Hewlett Packard Enterprise environmental information, including company programs, product recycling, and energy efficiency, see:

[www.hpe.com/info/environment](http://www.hpe.com/info/environment)

# Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback ([docsfeedback@hpe.com](mailto:docsfeedback@hpe.com)). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.