



## Application Note

# VMware Definitions for Software Versus Hardware FCoE for Marvell® FastLinQ® Adapters in ESXi Environments

### Products Affected

Marvell FastLinQ Adapters
8400 Series (based on BCM57840)
578xx-ASIC based
41000/45000 Series

This application note explains how VMware® systems classify Marvell FastLinQ Fibre Channel over Ethernet (FCoE) adapters.

For customers deploying FCoE in VMware ESXi environments, the FCoE adapters that VMware supports are typically classified by VMware as either *hardware* or *software*.

According to VMware ESXi architecture, VMware's classification of the different types of FCoE adapters is as described in the following locations:

<https://docs.vmware.com/en/VMware-vSphere/6.5/com.vmware.vsphere.storage.doc/GUID-D13ED348-BB52-4F4C-BFB4-0E4CF0CE7E29.html>

<https://docs.vmware.com/en/VMware-vSphere/6.7/com.vmware.vsphere.storage.doc/GUID-D13ED348-BB52-4F4C-BFB4-0E4CF0CE7E29.html>

The adapters have the following characteristics:

- **Hardware FCoE Adapters.** Hardware FCoE adapters include completely offloaded specialized Converged Network Adapters (CNAs) that contain network and Fibre Channel capabilities on the same card. When this type of adapter is installed, the host detects and can use both CNA components. In the vSphere® client, the networking component appears as a standard network adapter (vmnic), and the Fibre Channel component appears as an FCoE adapter (vmhba). You do not have to configure a hardware FCoE adapter to be able to use it.
- **Software FCoE Adapters.** A software FCoE adapter uses software library code that performs some of the FCoE processing. The adapter can be used with a number of NICs that support partial FCoE offload. Unlike the hardware FCoE adapter, the software adapter must be activated.

Although VMware classifies the Marvell FastLinQ 8400 Series and 578xx-ASIC based Adapters (using the bnx2fc driver) as software FCoE

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adapters, these adapters fully offload the I/O path to hardware while utilizing the software-based libfcOE module in VMware only for non-I/O related traffic.

On ESXi 6.7 (and later), the Marvell FastLinQ 8400 Series and 578xx-ASIC based Adapters are classified as Hardware FCoE and use the native qlfe3f driver.

Other competitive adapters classified as software FCoE adapters do not offload the I/O traffic to the NIC; instead, they use only the VMware-provided interfaces.

Marvell FastLinQ Adapters are the field-proven leader in Fibre Channel and FCoE adapters. The Marvell portfolio of FCoE adapters is shown in the following table.

Marvell FastLinQ Converged Network Adapters	VMware Architecture Classification Nomenclature
8400 Series (based on the BCM57840)	Software FCoE Adapter (using the legacy bnx2fc driver) Hardware FCoE Adapter (using native qlfe3f driver)
578xx-ASIC based	Software FCoE Adapter (using the legacy bnx2fc driver) Hardware FCoE Adapter (using native qlfe3f driver)
41000/45000 Series	Hardware FCoE Adapter

Even though the classification by VMware might indicate that the FastLinQ 8400 Series and 578xx-ASIC based FCoE adapters (using the legacy bnx2fc driver) are software FCoE adapters, these adapters perform hardware FCoE offload and offer best-in-class performance for FCoE. The 8400 Series and the 578xx-ASIC based adapters are considered hardware FCoE adapters when using the new native qlfe3f drivers, which are available in VMware ESXi 6.7 and later. See the industry analyst performance report comparing the 578xx-ASIC based adapters against both “hardware and software FCoE” competitive adapters here:

[https://demartek.principledtechnologies.com/Demartek\\_QLogic\\_57810S\\_FCoE-i\\_SCSI\\_Adapter\\_Evaluation\\_2014-05.html](https://demartek.principledtechnologies.com/Demartek_QLogic_57810S_FCoE-i_SCSI_Adapter_Evaluation_2014-05.html)

As is evident from this report, Marvell FastLinQ 578xx-ASIC based adapters offer the **industry’s best FCoE performance**.

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## Document Revision History

Revision A, March 30, 2017

Revision B, July 31, 2018

Revision C, June 4, 2019

Revision D, January 31, 2020

### Changes

Page 1: removed links to VMware 5.5 and 6.0 docs, as these versions are EOL. Updated links to VMware 6.5 and 6.7 docs.

In the bullet Software FCoE Adapters, added a new third paragraph indicating that on ESXi 6.7 (and later), the Marvell FastLinQ 8400 Series and 578xx-ASIC based Adapters are classified as Hardware FCoE and use the native qfle3f driver.

On page 2, updated the link to the industry analyst performance report comparing the 578xx-ASIC based adapters against both “hardware and software FCoE” competitive adapters.



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