



Product Bulletin

Fibre Channel over Ethernet (FCoE) Support

Revision History

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This product bulletin informs NetApp sales and NetApp partners about new or changed NetApp® products or services.

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1. Summary

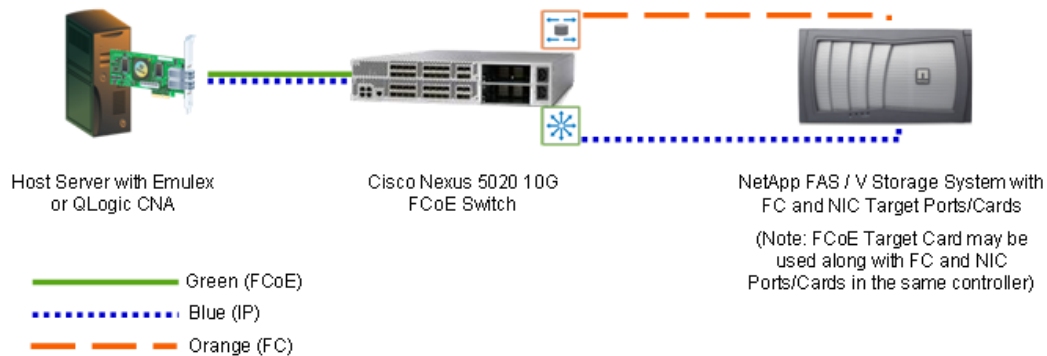
This product bulletin overviews NetApp support of the Fibre Channel over Ethernet protocol with host operating systems and I/O stacks, host server-based converged network adapters (CNAs), FCoE switches, and NetApp Fibre Channel (FC) and FCoE-enabled storage systems. The bulletin also provides product information for the NetApp FCoE Target Card.

FCoE is a standards-based protocol that transports Fibre Channel (FC) natively over 10 Gigabit Ethernet (GbE). In combination with the emerging IEEE Data Center Bridging (DCB) standard, FCoE enables the use of converged network adapters (akin to an FC HBA) at the host level that consolidate FCoE and IP traffic onto the same physical wire to the FCoE-enabled switch. This I/O consolidation enables simplified cabling deployments and management; reductions in host server slot and power consumption; and the ability to achieve capital and operational efficiencies by migrating to a single, consolidated network. FCoE preserves traditional FC latency and security and traffic management characteristics and is managed like FC from all typical operational functions such as the name server, host multipathing, and World Wide Port Names. This enables the integration of traditional, installed-based FC storage systems into an FCoE-enabled host and network environment.

The FCoE standard is being developed at the INCITS T11 committee for FC interfaces and was sent to letter ballot in October 2008, with ratification expected in the first half of 2009. DCB (also known as DCE, CEE, and EE) is an emerging IEEE standard that defines Ethernet extensions to enable FCoE to have lossless capability on 10GbE infrastructure and additional quality of service capabilities to benefit IP-based protocols such as iSCSI, NFS, and CIFS. Major host and network infrastructure vendors have delivered FCoE- and DCB-capable products that, in combination with NetApp's industry-first FCoE ecosystem and storage support, enable end users to perform proof-of-concept testing for unifying I/O onto Ethernet.

NetApp supports two primary FCoE topologies (note that the following images are for illustrative purposes only and do not reflect all possibilities or best practices):

Mixed FCoE-to-FC topology: FCoE and DCB from host server connections to the FCoE-enabled switch to existing FC SAN switch infrastructures that connect to NetApp 2Gb and 4Gb FC-enabled storage systems.



End-to-end FCoE topology (PVR required for FCoE Target Card): FCoE and DCB from host server connections to the FCoE-enabled switch to PVR-enabled FCoE storage systems.



2. What's New?

As part of its Ethernet storage leadership, NetApp was the first storage vendor to demonstrate native FCoE storage system support in October 2007 and is the first storage vendor to enable proof-of-concept deployments with native FCoE storage systems. Also, NetApp generally supports FC storage systems with traditional FC switch infrastructure integrated into an FCoE-enabled host and network environment. NetApp support of both FCoE topologies (FCoE native storage and traditional FC storage) is initially provided with Microsoft® Windows®, VMware® ESX, and Red Hat Linux® operating systems, with Emulex or QLogic CNAs consolidating FCoE and IP traffic to Cisco Nexus 5000 series FCoE switches. For the most recent NetApp FCoE configuration support, refer to the [NetApp Interoperability Matrix](#).

3. Sales Tools (Sales Guides, Training Presentations, SE Presentations)

N/A

4. Customer-Ready Tools (Customer Presentations, Datasheets)

N/A

5. System Requirements

- For the most recent NetApp FCoE configuration support, refer to the NetApp Interoperability Matrix at <http://now.netapp.com/NOW/products/interoperability>. FCoE is listed in the protocol column. FCoE

protocol support designates support of both FCoE and IP traffic at the host server to the FCoE-enabled switch. From the FCoE-enabled switch to the NetApp FCoE storage system, the FCoE protocol is currently supported on an independent 10GbE connection, from IP traffic, to the storage system.

- **FCoE Host Infrastructure.** NetApp currently supports, but does not sell, Emulex LP2100x and QLogic QLE8042 converged network adapters (CNAs) for host server configurations. FCoE host configurations use FC host utilities, as listed in the NetApp Interoperability Matrix; there are no distinct FCoE host utilities or installation guides.
- **FCoE Switch Infrastructure.** NetApp sells and supports the Cisco Nexus 5020 10GbE and FCoE-enabled switch and supports the Cisco Nexus 5010 switch (5010 is targeted for sale in the May 2009 Quote Tool). For more information, see the Cisco Nexus 5020 Product Bulletin. This bulletin outlines the configuration options for the Cisco Nexus 5020, including the FC expansion port modules that enable the switch to be connected to traditional FC switch infrastructures and FC storage systems. Note that the FCoE standard currently requires the use of FCoE switches (no direct host-to-storage connections).
- **FCoE Target Card.** NetApp offers via a feature product variance request (PVR) through CustomerEdge an FCoE Target Card (NetApp part number X1138A) with account-team funding for proof-of-concept deployments. See Section 6 (Product Information). The FCoE Target Card is dual-port (includes optics), PCI-Express (PCIe) based and is supported in the following PCIe-capable **FAS and V-Series storage systems: 3040, 3070, 3100 series, 6000 series**. The FAS2050 is not currently supported with the FCoE Target Card. The FCoE Target Card requires a d-patch for Data ONTAP® 7.3.1, which is distributed via the PVR. The NetApp FCoE Target Card currently supports only FCoE traffic and not IP traffic. A separate 10Gb NIC is required if 10Gb IP connectivity is required in addition to FCoE. The FCoE Target Card may be used along with FC and NIC target cards in the same storage controller.
- **FCoE Licensing.** FCoE protocol support in the applicable NetApp storage systems is currently enabled via the FC protocol license. Users with a valid FC protocol license for the storage system with which FCoE support is desired may enable FCoE with no additional protocol license.
- **FC Storage System Support.** All NetApp 2Gb and 4Gb FC storage systems (FAS and V-Series) that are qualified with the Data ONTAP versions specified in the NetApp Interoperability Matrix with the FCoE protocol support are supported in FCoE host and network configurations. Note that 8Gb FC storage systems are targeted for future support.
- **10GbE Cables.** NetApp supports FCoE configurations with 10G copper or optical cables using SFP+ connections from the host server to the FCoE switch, and 10G optical cables using SFP+ connections from the FCoE switch to NetApp FCoE-enabled storage. See the **NetApp 10G NIC (IP Target Cards) and Cables Product Bulletin** for storage connectivity. Cables for Cisco Nexus switch configurations are overviewed in the **Cisco Nexus 5020 Product Bulletin**.
- **NetApp Management Software.** NetApp SnapDrive® 6.0.1 for Windows is supported with FCoE configurations (to FC and FCoE storage systems). SnapDrive for UNIX® is targeted for future support. NetApp storage management software (e.g., Operations Manager) is targeted for future support with FCoE.
- **NetApp SnapMirror® and MetroCluster.** SnapMirror and MetroCluster are supported with FCoE host-to-storage system configurations (both FCoE and FC storage systems).
- **Professional Services.** NetApp Professional Services provides FCoE and DCB implementation guidelines, in conjunction with other NetApp 10G Ethernet Storage implementation practices.

6. Product Information

- **FCoE Host Infrastructure.** NetApp currently supports, but does not sell, Emulex LP2100x and QLogic QLE8042 converged network adapters (CNAs) for host server configurations. FCoE host configurations use FC host utilities, as listed in the NetApp Interoperability Matrix; there are no distinct FCoE host utilities or installation guides.
- **FCoE Switch Infrastructure.** NetApp sells and supports the Cisco Nexus 5020 10GbE and FCoE-enabled switch and supports the Cisco Nexus 5010 switch (5010 is targeted for sale in the May 2009 Quote Tool). For more information, see the Cisco Nexus 5020 Product Bulletin. This bulletin outlines the configuration options for the Cisco Nexus 5020, including the FC expansion port modules that enable the switch to be connected to traditional FC switch infrastructures and FC storage systems.
- **FCoE Target Card.** NetApp offers via a feature product variance request (PVR) through CustomerEdge an FCoE Target Card (NetApp part number X1138A) with account-team funding for proof-of-concept deployments. The FCoE Target Expansion Card is dual-port (includes optics), PCIe-based, and is

supported in the following PCIe-capable **FAS and V-Series storage systems: 3040, 3070, 3100 series, 6000 series**. The FAS2050 is not currently supported with the FCoE Target Expansion Card. The NetApp FCoE Target Expansion Card currently supports only FCoE traffic, and not IP traffic. A separate 10Gb NIC is required if 10Gb IP connectivity is required in addition to FCoE. The FCoE Target Expansion Card may be used along with FC and NIC target cards in the same storage controller.

- **FCoE Licensing.** FCoE protocol support in the applicable NetApp storage systems is currently enabled via the FC protocol license. Users with a valid FC protocol license for the storage system with which FCoE support is desired may enable FCoE with no additional protocol license.
- **10GbE Cables.** NetApp supports FCoE configurations with 10G copper or optical cables using SFP+ connections from the host server to the FCoE switch, and 10G optical cables using SFP+ connections from the FCoE switch to NetApp FCoE-enabled storage. See the NetApp 10G NIC (IP Target Cards) and Cables Product Bulletin for storage connectivity (NetApp part numbers X6553A-R6, 2M LC-LC; X6536A-R6, 5M LC-LC; X6554A-R6, 15M LC-LC; X6537A-R6, 30M LC-LC). Cables for Cisco Nexus switch configurations are overviewed in the Cisco Nexus 5020 Product Bulletin.

Part Number	Description	Discount Category Code
X1138A-R6	FCoE Target Card,2-Port (includes optics),PCIe,R6	A

Software Subscription Plans

NetApp does not currently provide an SSP for FCoE configurations beyond that provided for the FC protocol license or other NetApp products supported in an FCoE configuration.

Quoting

The FCoE Target Card is offered as an Add Part only via product variance request (PVR) through CustomerEdge and account-team funding for proof-of-concept deployments.

Downloading

FCoE configurations do not currently have specific software downloads. FCoE host configurations use FC host utilities as listed in the NetApp Interoperability Matrix that may be procured from the NOW™ (NetApp on the Web) site. Required Data ONTAP versions for support of the FCoE Target Expansion Card are fulfilled via approved PVRs.

Product Availability

The FCoE Target Card is available via a product variance request (PVR) in the December 2008 Quote Tool.

7. Regulatory Compliance

Products need to be validated against the NetApp Safety/EMI Regulatory Compliance List prior to order submission. This is required to make sure that products are being sold only in the countries in which NetApp has received regulatory compliance certification.

8. Warranty and Service

The **FCoE Target Card** offered by NetApp for PVR-based proof-of-concept deployments is warranted for the duration of the PVR, which is typically one year, and supported as defined in the approved PVR documentation. The Cisco Nexus 5020 switch and additional hardware equipment have a one-year limited hardware warranty. The warranty includes hardware replacement with a 10-day turnaround from Cisco on receipt of a return materials authorization (RMA). Each purchase of a Cisco Nexus 5020 also requires a SMARTnet service contract.

9. Additional Information

FCoE Configuration Support—Refer to the [NetApp Interoperability Matrix](#)

Contact information: Please contact your NetApp sales or channel partner representative with questions concerning this bulletin.

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495 E. Java Drive, Sunnyvale, CA 94089 USA

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