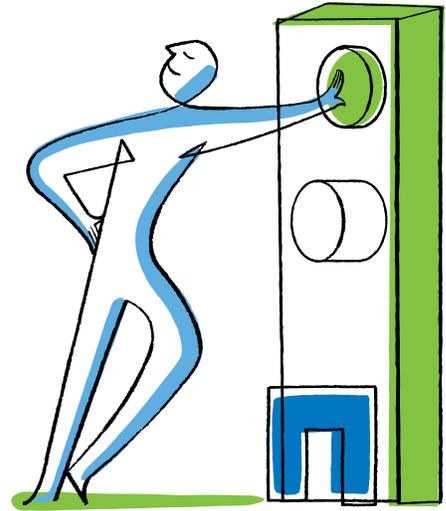




NetApp®

Solution Brief

NetApp FCoE SAN Solutions



KEY BENEFITS

Get High Performance

Achieve high-performance storage access over lossless 10 Gigabit Ethernet (10GbE) fabrics.

Simplify Management

Retain enterprise-proven Fibre Channel (FC) drivers and management tools.

Reduce Costs

Lower energy and cooling costs with less equipment and lower management overhead with a single unified storage fabric.

Increase Flexibility

Choose native support for FCoE, iSCSI, NFS, and CIFS concurrently over a shared port with NetApp® Unified Connect.

Increase Availability

Increase application availability by simplifying network and server configuration.

The Challenge

If you run a data center, chances are that you use Ethernet for local area network (LAN) communications and FC for storage area networks (SANs), requiring you to maintain two networks for separate purposes. SANs deliver well-understood value, including high performance and reliability, for applications such as storage consolidation, mail servers, and mission-critical databases. However, deploying and maintaining separate data center networks can be costly and complex.

The Solution

With NetApp, you can now consolidate your network infrastructure with Fibre Channel over Ethernet (FCoE) and a new set of 10GbE standards known as Data Center Bridging (DCB, also known as Data Center Ethernet or Converged Enhanced Ethernet). FCoE transports FC frames over an Ethernet network to offer increased data center efficiency by converging SAN and LAN data traffic on a shared Ethernet fabric. FCoE enables your data center to increase application performance while reducing costs, energy use, and manageability tasks by requiring fewer I/O adapters, cables, switch ports, and points of management.

FCoE is an evolution of FC that uses FC's network, service, and protocol layers to carry data packets over Ethernet physical and data link layers. Using FC's upper layers simplifies FCoE deployment by allowing you to leverage enterprise-proven FC software stacks, management tools, and trained administrators. Most important, you don't need to change mission-critical applications to benefit from the performance and potential cost benefits of FCoE.

Increase Performance and Reliability

To help deliver storage traffic reliably and quickly, FC protocols assume that the underlying fabric is lossless even during network congestion. Lossless characteristics for Ethernet to support FCoE are enabled by new Ethernet extensions associated with DCB, including Priority Flow Control and Enhanced Transmission Selection. DCB allows up to eight virtual lanes per link, with each lane supporting a different class of service, such as FCoE or IP traffic. Priority Flow Control pauses data traffic on a given virtual lane when congestion is high. Enhanced Transmission Selection improves overall performance by guaranteeing bandwidth for a given class of service or virtual lane.

Simplify Management

Lossless Ethernet and FCoE enable you to create a unified fabric by converging enterprise storage, networking, and management on a single fabric that is simple to manage, high-performing, and cost-effective.

Reduce Costs

Converging storage and networking on Ethernet fabrics can significantly lower operational and capital costs. Over time, converged network adapters and 10GbE FCoE switches reduce the number of adapters and cables required in the infrastructure. This helps reduce costs for energy, management, and maintenance and gives you the ability to leverage the cost and management knowledge efficiencies of broad-based Ethernet products.

Increase Flexibility with NetApp Unified Connect

NetApp supports the integration of traditional FC storage with converged fabrics as well as the industry's first native FCoE storage systems. We support these two deployment models with the NetApp Unified Storage Architecture, which includes multiprotocol support for FC, iSCSI, NFS, CIFS, and FCoE on a single storage platform.

With NetApp, moving to FCoE storage is simple. Existing NetApp customers with supported hardware can make the transition to FCoE today without affecting or moving data by using a NetApp unified target adapter with support for NetApp Unified Connect. NetApp Unified Connect increases the value of the NetApp Unified Storage Architecture by providing access to your data by using NFS, CIFS, iSCSI, and FCoE protocols over a shared network port. With NetApp Unified Connect you can build a flexible and efficient shared infrastructure today as your foundation for future-ready IT.

Migrating to an all-Ethernet storage environment doesn't have to happen all at once. You can consolidate your network ports at the server and reduce the number of cables and adapters required to support both your FC and Ethernet networks by using a converged network adapter or an Ethernet server adapter with support for an FCoE software initiator.

Most FCoE-enabled switches also offer optional traditional FC connectivity, allowing access between your Ethernet and FC networks and enabling a more gradual transition to an all-Ethernet network environment. A planned

transition is a likely scenario for your organization if you have large FC storage installations and want to extend that FC investment (Figure 1). To the nodes in the FC SAN, the FCoE initiators appear to be directly connected and can be managed with the same tools. When you are ready to retire your FC hardware, you can complete the migration to an all-FCoE supported infrastructure (Figure 2).

As a leader in Ethernet storage, first as a NAS pioneer, then as an early proponent of iSCSI, NetApp now leads with FCoE and NetApp Unified Connect. Thousands of our customers have deployed Ethernet storage to simplify data management, protect their investment, and reduce the total cost of ownership.

About NetApp

NetApp creates innovative storage and data management solutions that help you accelerate business breakthroughs and achieve outstanding cost efficiency. Discover our passion for helping companies around the world go further, faster at www.netapp.com.

Go further, faster®

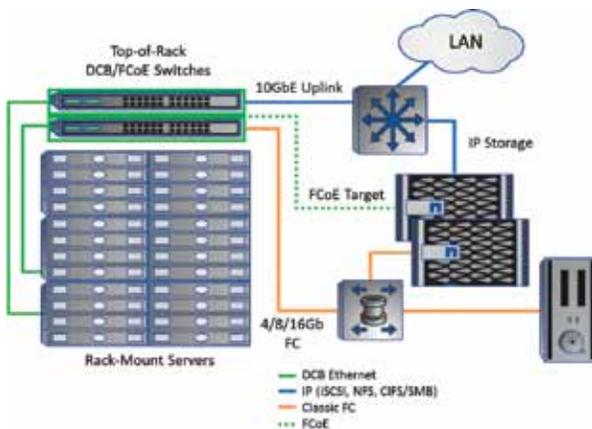


Figure 1) Phase I: Making the transition to DCB and FCoE.

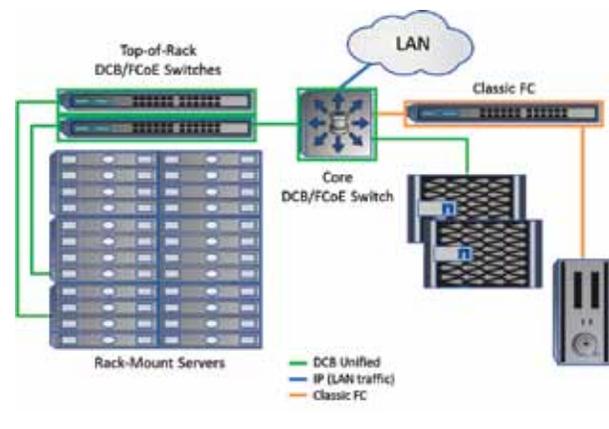


Figure 2) Phase II: Making the transition to all-FCoE and DCB.