

Fibre Channel over Ethernet (FCoE)

What may be the most “disruptive” I/O interface technology since Fibre Channel burst onto the scene is the development a standard for transporting Fibre Channel frames over Ethernet (FCoE). With this technology, the dream of a “converged” network for the data center is on the road to becoming a reality. No longer will servers require different, or even separate interfaces for networking and storage — both can be accomplished with the same low-cost Ethernet — already the universal standard for networking. With one set of cables, switches and skills, systems, servers (especially blade servers) can provide increased functionality with reduced cost and complexity.

Course Outline

FCoE Introduction and Concepts

The “Converged” Data Center Network

What is FCoE?

FC and FCoE Roadmap

Benefits of FCoE

Hardware vs. Software FCoE

FCoE, Fibre Channel and Ethernet Standards

FCoE Deployment Scenarios

Blade Server Environments

Rack Server Environments

FCoE Switching

FCoE Servers and Virtual Machines

FCoE Configurations

Point-to-Point

FCoE Attachment to an FCoE Switch

FCoE Attachment via Ethernet Switches

Looking at the Benefits

Blade Server Case Study Example

FCoE Technology

FCoE and Enhanced Ethernet

FCoE Frame Encapsulation

Architecture Models and Configurations

MAC Addressing

Discovery and Virtual Link Initialization

Introduction to Ethernet

Ethernet Frame Format

Ethernet Topologies

Ethernet Physical Link Variants

Virtual LANs (VLANs)

Making Ethernet “Lossless”

Link Aggregation

Ethernet and Fibre Channel's R_A_TOV

Architecture Models

FCoE Virtual Links

FCoE Link Endpoints

Node and Node Port Models

Fabric and Fabric Port Models

FCoE Addressing

Fibre Channel and Ethernet Addresses

Server Provided MAC Addresses (SPMA)

Fabric Provided MAC Addresses (FPMA)

FCoE Discovery and Virtual Link Initialization

FCoE Discovery

ENode Virtual Link Initialization

Inter-switch Link Discovery and Initialization

FCoE Initialization Protocol (FIP)

FIP Protocol

FIP Solicitation

FIP Advertisement

FIP FLOGI

FIP NPIV

FIP Clear Virtual Link

FIP Keep Alive

FCoE Encapsulation

SOF and EOF

Determining the Ethernet Destination Address

Fibre Channel and Ethernet Frame Sizes

Ethernet and Fibre Channel Comparison

Encapsulation/Decapsulation Flow

Access Control

Fibre Channel Zoning

Ethernet Access Control Lists (ACLs)

FCoE Error Scenarios

Duplicate MAC Address Errors

Rogue Host Attacks

Ethernet Forwarding Errors

Summary of FCoE Changes

Data Center Ethernet (DCE)

What is Data Center Ethernet?

Per-Priority Pause Flow Control

Priority and Bandwidth Management

Ethernet Congestion Management

Link Level Discovery Protocol (LLDP)

Data Center Bridge Exchange Protocol (DCBX)

Summary, Q&A, and Conclusion

Who Should Attend:

This seminar is targeted towards developers, integrators, managers and others with a need for an understanding of this exciting new storage interface technology.

Prerequisites:

An understanding of Fibre Channel protocols and current computer interfaces and networks is desirable, although not absolutely necessary.

Course Length: 3 days

Public Course Price 1,100 UK Pounds