

Length

3 Days

Format

Lecture/Lab

Track

Design and
Deploy

Version

2.2



www.fireflycom.net
sales@fireflycom.net

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Overview

In this 3-day course, you will learn how to implement Access Layer infrastructures using next-generation Cisco Nexus 5000 and 5500 switches, the Nexus 4000 and Nexus 2000 Fabric Extenders. This course provides a technical overview of the Nexus 5x00 platform features, design guidelines, deployment and operations, including Fibre Channel over Ethernet, Layer 2, QoS, and security.

You will explore the features of NX-OS up to rel 5.0(2)N2.1 and the Nexus platform by performing hands-on labs using real Nexus 5000 and Nexus 2000 labs. Labs include basic FCoE configuration, NPV mode deployment, FEX and Virtual Port-Channels, security in both Ethernet and FCoE environments, QoS, and troubleshooting.

Who Should Attend

This course is designed for experienced data center engineers who are familiar with Cisco Catalyst or MDS switching products.

Recommended Prerequisites

You will gain the most from this course if you have a basic understanding of the following topics:

- Ability to configure advanced Layer 2 Ethernet services
- Basic working knowledge of Fibre Channel and Storage Networking
- Understanding of Cisco data center architecture

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Objectives

After completing this course, you will be able to:

- Understand the product offerings for the Cisco Nexus 5000, 5548, 2000 and 4000.
- Describe the architecture of the Cisco Nexus Operating System (NX-OS)
- Describe Data Center access layer architecture and designs across all Nexus products
- Understand FC and FCoE protocols, design and implementations
- Configure Layer 2 services
- Configure FCoE on Nexus 5000 and CNA's.
- Understand and configure Quality of Service
- Understand Data Center Bridging Ethernet enhancements.
- Configure the Cisco Nexus 5000 in switch mode and NPV mode
- Explain and configure Virtual PortChannels (VPC)
- Configure the Cisco Nexus 2000 for Access Layer extension
- Understand high availability and failover signals in Nexus 5x00 LAN and SAN deployments
- Understand how to manage the Nexus 5x00 products

Course Outline

Module 1: Introduction to the Cisco Nexus 5x00

Lesson 1: Nexus 5x00 Overview

- Challenges in the Data Center
- I/O Consolidation
- Nexus 5000 and 5548 Switch Products
- Nexus 4000 Blade Switch
- Nexus 5000 Software Architecture
- Overview Network Design
- FCoE Adapters and Software Stack
- Nexus 5x00 Switch Management Tools

Lesson 2: Nexus 2000 Overview

- Cisco Nexus 2000 Fabric Extender models including the 2148, 2224, 2248 and 2232, and features comparison,
- TOR and EOR access deployment architectures
- Port pinning mechanisms with the FEX
- Interface and Transceiver options
- VN Tagging mechanism with the FEX
- Connecting FEX to the upstream N5x00
- Relationship of FEX to Spanning-Tree

Lesson 3: Fibre Channel Primer

- Fibre Channel Layering and Services
- Fibre Channel Addressing
- Fibre Channel Frames
- Fibre Channel Flow Control
- Zoning Overview
- Fibre Channel Routing
- The Registered State Change Notification Process

Lesson 4: Ethernet Primer

(Optional lesson for classes of students with mainly storage background)

- Exploring the Packet Delivery Process
- VLANs and Trunking
- Loop Prevention with Spanning Tree Protocol
- Understanding the TCP/IP Transport Layer

Lesson 5: Fibre Channel over Ethernet

- Current and future FCoE architectures
- MAC addresses used by an FCoE ENode
- FCoE and FCoE Initialization Protocol function and framing
- FIP Snooping

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Lesson 6: Data Center Architecture

- Access Layer Designs
- Cisco Nexus Data Center Designs for the complete Nexus range from 1000v, through 2000, 4000, 5x00 and 7000 including supported FCoE topologies
- Cisco Nexus 5x00 vPC
- Nexus Supported Layer 2 and FCoE topologies
- FEX to 5x000 connectivity

Lesson 7: Understanding Ethernet Enhancements

- Converged Enhanced Ethernet
- Priority Flow Control
- Bandwidth Management
- Data Center Bridging Exchange

Module 2: Implementation and Configuration

Lesson 1: Configuring FCoE Server Connectivity

- Converged Network Adapters
- NIC teaming and MPIO
- Host-Based Failover
- QLogic CNAs
- Emulex CNAs
- Using the FCoE Protocol Stack

Lesson 2: Configuring the Cisco Nexus 5x00 Switch in Switch Mode

- Configuring Basic Connectivity and Administrative Access
- Configuring Virtual FC Interfaces
- Configuring Ethernet Uplink Ports
- Configuring the FC Uplink Ports
- Configuring the Cisco Nexus 2000
- Verifying the Configuration
- Additional Configuration Components

Lesson 3: Configuring NPV Mode

- N_Port Identifier Virtualization
- Understanding NPV Mode
- Configuring NPV Mode

Lesson 4: Managing Traffic Flow

- Understanding QoS Policy Management and System Classes
- Ingress and Egress Policies
- Default QoS Policies on Nexus 5x00
- Differences between 5000 and 5548 policies
- Tuning the MTU Value



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Course Outline

Module 2: Lesson 4 (continued)

- Configuring Priority Flow Control
- Configuring Bandwidth Management
- IGMP Snooping

Lesson 5: Configuring High Availability

- High Availability in an FCoE Network
- High Availability on a Cisco Nexus 5x00 Switch with SPT designs
- High Availability with Virtual PortChannels designs
- Configuring Server-Side High Availability
- Understanding PortChannels
- Configuring Ethernet PortChannels
- Configuring Fibre Channel PortChannels
- Configuring Virtual PortChannels
- Using config-sync and auto-recovery features

Lesson 6: Securing the Switch

- Understanding Private VLANs
- Configuring Private VLANs
- Understanding Access Control Lists
- Configuring Access Control Lists
- Port Security
- Configuring Zoning

Lesson 7: Managing the Switch and Switch Software

- Role-Based Access Control
- SNMP and XML Support
- GOLD and EEM
- System Logging
- Smart Call Home
- Managing NXOS
- Software Upgrades
- Recovery from bootloader

Lesson 8: Monitoring and Troubleshooting

- Diagnostics and Monitoring
- SPAN
- Ethalyzer
- Configuring SPAN
- Troubleshooting Interface Errors
- Troubleshooting Logical Interface Errors
- Password Recovery
- Corrupted Image Recovery

Course Labs

- Lab 1: Analyzing FCoE Packet Traces
- Lab 2: Configuring the Switch for Administrative Access
- Lab 3: Configuring the Cisco Nexus 5x00 Switch for FCoE Connectivity
- Lab 4: Configuring the Cisco Nexus 5x00 Switch in NPV Mode
- Lab 5: Traffic Engineering
- Lab 6: Configuring the Cisco Nexus 2000 as a Remote Line Card
- Lab 7: Configuring Cisco Nexus 2000 with VPC
- Lab 8: Configuring and Monitoring Security Features
- Lab 9: Troubleshooting FCoE Issues on the Cisco Nexus 5x00 Switch



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