Cisco Data Center Networking Infrastructure-2

Length
5 days

Format
Lecture/lab

Track
Design & Deploy

Version
3.3

DCNI-2

Course Description

In this 5-day course, you will learn how to implement an enterprise Data Center routing and switching infrastructure with the next-generation Cisco Nexus 5000 and Cisco Nexus 7000 platforms. This course provides a technical overview of the Cisco Nexus platform architecture, design guidelines, deployment and operations, including Fibre Channel over Ethernet, Virtual Device Contexts, Layer 2 and Layer 3 features, QoS, and Security.

NEW! We have enhanced this course with new content on Nexus hardware and software, including significantly more hands-on time, while keeping the course to 5 days. New features not found in the standard DCNI-2 course include Virtual PortChannels, FabricPath (L2MP), Overlay Transport Virtualization, several new hardware platforms such as the Nexus 2248T, and enhanced troubleshooting information.

Who Should Attend

This course is designed for experienced Network Field Engineers who are already capable of implementing Layer 2 and Layer 3 services using Cisco IOS and the Cisco Catalyst switching platform.

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
- Ability to configure Layer 3 routing services
- Basic working knowledge of Fibre Channel and Storage Networking
- Understanding of Cisco data center architecture

Learning Objectives

After completing this course, you will be able to:

- Describe the features of the Cisco Nexus 7000 chassis, Supervisor Engine, and line cards
- Describe the architecture of NX-OS
- Describe the Connectivity Management Processor
- Configure switch management features like Call Home, Logging, AAA, RBAC
- Use configuration checkpoints and rollbacks
- Configure Virtual Device Contexts
- Configure Layer 2 and Layer 3 services
- Configure Overlay Transport Protocol
- Describe FabricPath
- Configure NX-OS Process Recovery
- Configure NX-OS Supervisor Redundancy
- Configure Hardware Rate Limiting
- Configure Quality of Service
- Configure traffic integrity features and Control Plane Protection
- Configure access and admission control
- Use SPAN and Ethanalyzer to monitor traffic
- Describe how FCoE operates within SAN and LAN environments
- Describe the ASIC-level architecture of the Cisco Nexus 5000 switch and CNAs
- Configure the Cisco Nexus 5000 in switch mode and NPV mode
- Configure the Cisco Nexus 2000 as a remote line card
- Configure Virtual PortChannels

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Course Outline

Module 1: Deploying the Cisco Nexus 7000

Lesson 1: Overview of the Nexus 7000
Cisco Nexus 7000 Series Chassis Overview
Supervisor Engine and Line Cards
Fabric Modules
Virtual Output Queuing Overview
VoQ Operation
Power Supplies and Cooling
Connectivity Management Processor
Site Preparation

Lesson 2: Overview of NX-OS
Introducing NX-OS
NX-OS Process Recovery
NX-OS Supervisor Redundancy
ISSU

Lesson 3: Introduction to Virtual Device Contexts
Introducing Virtualization
VDC Design
VDC Configuration
High Availability

Lesson 4: Managing the Nexus 7000
SNMP and XML
Generic OnLine Diagnosis
Embedded Event Manager
SMART Call Home
Data Center Network Manager
System Message Logging
AAA
Role-Based Access Control
Configuration Rollback

Lesson 5: Layer 2 Protocols and Features
Nexus 7000/NX-OS Layer 2 Overview
VLANs and PVLANs
Spanning-Tree Protocols
Port-Channels
Virtual Port-Channels (vPC)
IGMP Snooping
Unidirectional Link Detection
Overlay Transport Protocol (OTV)
FabricPath (L2MP)
Nexus 2248TP

Lesson 6: Layer 3 Protocols and Features
Layer 3 Unicast Routing Overview
First-Hop Routing Protocols
Object Tracking
Routing Virtualzation
Routing Protocols
Bidirectional Forwarding Detection (BFD)
Policy Routing
Tunnels
Layer 3 Multicast

Lesson 7: Quality of Service
Nexus 7000 Series QoS Overview
Port QoS
Forwarding Engine QoS
Modular QoS CLI Overview
Table Maps
Class Map
Policy Map
Service Policy

Lesson 8: Security
Introduction to Nexus/NX-OS Security
Traffic Integrity
Storm Contol
Control Plane Protection
Hardware Rate Limiting
Access Control
Admission Control
Data Confidentiality

Lesson 9: Troubleshooting Tools
Ethanalyzer: Wireshark in NX-OS
SPAN and RSPAN
Troubleshooting Checklist

Lesson 10: Troubleshooting Process
Cisco NX-OS Software Troubleshooting Process

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Course Outline

Module 2: Introduction to the Cisco Nexus 5000

Lesson 1: Overview of the Nexus 5000
Challenges in the Data Center
I/O Consolidation
Cisco Nexus 5000 Switch Products
Cisco NX-OS Software Architecture
Network Design
FCoE Adapters and Software Stack
Cisco Nexus 5000 Switch Management Tools
Managing a Cisco Nexus 5000 Switch with Cisco Device Manager
Monitoring an FCoE Network with Cisco Fabric Manager

Lesson 2: Overview of the Nexus 2000
Cisco Nexus 2000 Fabric Extender
Cisco Nexus 2000 Forwarding

Lesson 3: FC Protocol Primer
Fibre Channel Layering and Services
Fibre Channel Addressing
Fibre Channel Frames
Fibre Channel Flow Control
Zoning Overview
Fibre Channel Routing
The RSCN Process

Lesson 4: Understanding the FCoE Protocol
Current FCOE Architecture
FCOE Enode MAC Addresses
FCOE Initialization Protocol

Lesson 5: Data Center Architecture
Access Layer and DC Design
Cisco Nexus 5000 vPC
Nexus Supported Layer 2 and FCOE Topologies Summary

Lesson 6: Understanding Ethernet Enhancements
Converged Enhanced Ethernet
Priority Flow Control
Bandwidth Management
Data Center Bridging Exchange
Congestion Management

Lesson 7: Configuring NPV Mode
N_Port Identifier Virtualization
Understanding NPV Mode
Configuring NPV Mode

Lesson 8: Configuring the Cisco Nexus 5000 in Switch Mode
Switch Configuration Overview
Configuring Connectivity and Administrative Access
Configuring Nexus 5K Interfaces
Configuring Ethernet Uplink Ports
Configuring the FC Uplink Ports
Verifying the Configuration
Additional Configuration Components
Configuring the Cisco Nexus 2000

Lesson 9: Managing Traffic Flow
Understanding QoS Policy Management
Tuning the MTU Value
Configuring Priority Flow Control
Nexus 5000 QoS from 4.1(3)N1(1)
IGMP Snooping

Lesson 10: Configuring HA
High Availability in an FCoE Network
Configuring Server-Side HA
Understanding Port-Channels
Configuring Ethernet PortChannels
Configuring Fibre Channel PortChannels
Configuring Virtual PortChannels

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Course Labs

Cisco Nexus 7000 Labs

Lab 1: Exploring the Nexus 7000 Hardware Platform
Lab 2: Create and Configure VDCs
Lab 3: First-Hop Redundancy Protocols
Lab 4: Configuring Routing Protocols
Lab 5: Configuring OTV
Lab 6: VDC and VRF Interoperation
Lab 7: QoS on the Cisco Nexus 7000
Lab 8: Security
Lab 9: Troubleshooting the Nexus Control Plane

Cisco Nexus 5000 Labs

Lab 1: Configuring the Switch for Administrative Access
Lab 2: Configuring the Cisco Nexus 5000 Switch for FCoE Connectivity
Lab 3: Configuring the Cisco Nexus 5000 in NPV Mode
Lab 4: Traffic Engineering
Lab 5: Configuring the Nexus 2000 as a Remote Line Card
Lab 6: Configuring Nexus 2000 with VPC