



Course:	DCNX7K v3.0 - Configuring Cisco Nexus 7000 Series Switch
Duration:	5 days lecture course and hands-on lab
Fees:	\$3,395 USD
Cisco Learning Credits:	34
Kit:	Digital Version

## **Course Details**

The Configuring Cisco Nexus 7000 Switches (DCNX7K) v3.0 course is a 5-day ILT training program that is designed for systems and field engineers who install and implement Cisco Nexus 7000 Series Switches. This course covers the key components and procedures you need to know to configure, manage, and troubleshoot Cisco Nexus 7000 Series Switch platform.

Configuring Cisco Nexus 7000 Switches (DCNX7K) v3.0 prepares you for implementing a Cisco Nexus 7000 Series Switches in the data center solution, including coverage of new features introduced in Cisco NX-OS 6.2 and introductory coverage of Cisco Nexus Series Switches

A certification exam is not associated with this course. The course focuses on the product hardware, its architecture, key features, and market differentiators, with extensive feature configuration and hands on labs.

## Laptop requirements

Students registering for this course will be receive digital format course kit. To be able to view digital kit students will need to bring a laptop. The recommended system requirements are as under;

- Windows 7 or 8.1 or 10 is recommended. Mac OSX 10.6 or greater is supported as well.
- Intel Celeron or better processors are preferred.
- 1 GB or more of RAM
- Browser requirement: Internet Explorer 10 or Mozilla Firefox. (Safari, Mozilla Firefox for Mac OSX)
- Note: Our labs currently cannot run on Microsoft Edge (Windows 10) due to it not supporting Extensions/Add-ons or Google Chrome due to Java being removed from the platform itself.
- All students are required to have administrator rights to their PCs and cannot be logged in to a domain using any Group Policies that will limit their machine's capabilities.
- If you do not have administrator rights to your PC, you at least need permissions to download, install, and run Cisco Any Connect Client and Java.
- All PCs require the latest Java Runtime Environment, which can be downloaded from www.java.com.



# Prerequisite Skills and Knowledge

The knowledge and skills that a learner must have before attending this course are as follows:

- Good understanding of data center technologies, networking protocols, routing and switching.
- Recommended CCNA Data Center Certification
- Recommended attendance at the Implementing Cisco IP Routing (ROUTE) class
- Recommended attendance at the Implementing Cisco IP Switched Networks (SWITCH) class

## Objective

After completing this course the students should be able to:

- *i.* Identify specific products that make up Cisco Nexus product families and provide a high level overview of their features and common deployment models.
- *ii.* Recognize the advanced data center class features and functionality of Cisco Nexus 7000 Series Switch. Presentation on common network architecture implementation using the products and features of the Cisco Nexus product family.
- iii. Cisco Nexus 7000 Series Switch hardware components, like the chassis, supervisor, and line cards, determine the device features and role in data center architecture. In this module, students will learn to identify the chassis and components of the Cisco Nexus 7000 Switch, including Cisco Nexus 7000 and 7700 Series packet flow and the VOQ operation.
- *iv.* Understand an overview of the Cisco Nexus 2000 hardware and support of the Cisco Nexus 2000 with Cisco Nexus 7000 Series
- v. Learn how to perform hardware installation, verify and troubleshoot system hardware of Cisco Nexus 7000 Series Switches. Understand the architecture, usage, high availability, and licensing features of the Cisco NX-OS Software
- vi. Learn to use the management, configure, support management infrastructure and trouble-shooting process basic of the available features and tools on Cisco Nexus 7000 Series Switch
- vii. Understand Cisco Prime DCNM management tool that can be implemented to manage Cisco Nexus 7000 Series Switches in a consolidated network environment
- viii. Understand the concept of Cisco Dynamic Fabric and how it is used on Cisco Nexus 7000 Series Switches
- *ix.* Understand the purpose, architecture, and use of VDCs on Cisco Nexus 7000 Series Switch; configure and verify its operation
- x. Understand and configure the Layer 2 switching with related features on Cisco Nexus 7000 Series Switch
- *xi.* Learn the port channel configuration, the concept of vPC and how to configure and troubleshoot vPC on Cisco Nexus 7000 Series Switch
- xii. Understand the operation of Cisco FabricPath and how it can be utilized and configured to build scalable and highly available Layer 2 networks on Cisco Nexus 7000 Series Switch.
- xiii. Understand and configure the Layer 3 switching features, manage the routes and IP traffic through the use of the Route Policy Manager and policy-based routing on Cisco Nexus 7000 Series Switch.
- *xiv.* Understand MPLS features available on Cisco Nexus 7000 Series Switch, configure MPLS, MPLS Layer 2 and Layer 3 Virtual Private Networks (VPNs and MPLS Traffic Engineering (TE).





- xv. Understand basic and advanced Cisco OTV features, configuration of OTV along with some advanced OTV features that are available on Cisco Nexus 7000 Series Switches
- xvi. Understand the concept, use, and configuration of the Locator/ID Separation Protocol (LISP) on the Cisco Nexus 7000 Switch
- xvii. Understand FCoE and FCoE features, configure and verify their operation on Cisco Nexus 7000 Series Switch
- xviii. Understand the security features available, configure and verify their operation on Cisco Nexus 7000 Series Switch
- *xix.* Understand the QoS features available, configure and verify their operation on Cisco Nexus 7000 Series Switch
- *xx.* Understand the concept of the Intelligent Traffic Director feature, configure and verify ITD on Cisco Nexus 7000 Series Switch

# Course Outline

This course includes 19 Modules and 16 Labs.

### Module 1: Cisco Nexus 7000 Series Switches

Lesson 1: Describing the Cisco Nexus Product Family

- Cisco Unified Fabric: Trends in the Data Center
- Cisco Nexus Product Family
- Cisco Nexus 7000 Series Switch
- Lesson 2: Describing the Cisco Nexus 7000 Series Switch Deployment Models
  - Data Center Architecture Design Evolution
  - Single-Layer Data Center Models
  - Multitier Data Center Model
  - Scalable Spine-Leaf Data Center Fabric

### Module 2: Cisco Nexus 7000 Series Switch Hardware

Lesson 1: Describing the Cisco Nexus 7000 and 7700 Series Switch Chassis

- Cisco Nexus 7000 and 7700 Series Switch Common Foundation
- Cisco Nexus 7000 Series Switch Chassis Family
- Cisco Nexus 7700 Series Switch Chassis Family
- Key Chassis Components
- Cisco Nexus 7000 Series Switch Power Supplies
- Fan Cooling

Lesson 2: Describing Cisco Nexus 7000 Series Switch Supervisor, I/O, and Fabric Modules

- Supervisor Modules
- Cisco Nexus 7000 Series Switch Product Identification Scheme
- Cisco Nexus 7000 and 7700 Series Switch I/O Module Families
- Cisco Nexus 7000 Series Switch M1 and M2 I/O Modules



- Cisco Nexus 7000 Series F2, F2E, and F3 I/O Modules
- I/O Modules Forwarding Engine
- Cisco Nexus 7000 and 7700 Series Switch I/O Module Scalability
- Crossbar Switch Fabric Modules
- Cisco Nexus 7000 Series Network Analysis Module Hardware
- High-Availability Features

Lesson 3: Describing Cisco Nexus 7000 Series Switch Forwarding and Packet Flow

- Virtual Output Queuing
- Packet Flow and Arbitration
- Layer 2 and Layer 3 Forwarding

## Module 3: Cisco Nexus 2000 Series Fabric Extender

Lesson 1: Describing Cisco Nexus 2000 Series Fabric Extender Hardware

- Cisco FEX Technology
- Cisco Nexus 2000 Series Fabric Extender Models

## Lesson 2: Describing Cisco Nexus 2000 Series Fabric Extender Support on Cisco Nexus 7000 Series Switches

- Cisco Nexus 7000 Parent Switch Cabling Options
- Cisco Nexus 7000 Series Switch and Cisco Nexus 2000 Series Fabric Extender Topologies
- Cisco Nexus 7000 Series Switch and Cisco Nexus 2000 Series Fabric Extender Features

### Module 4: Cisco NX-OS Software

Lesson 1: Describing Cisco NX-OS Architecture, Key Features, and Capabilities

- Cisco NX-OS Software Architecture
- Cisco NX-OS High-Availability Infrastructure Components
- Cisco NX-OS Software Key Features
- Cisco IOS to NX-OS Conversion tool
- Verify Hardware Installation Using show Commands
- Troubleshoot Common Hardware Issues

### Lesson 2: Describing the Cisco Nexus 7000 Series Licensing Model

- Cisco NX-OS Software Licensing for Cisco Nexus 7000 Series
- Obtaining and Installing the License Key File

### Lab 1: Cisco Nexus 7000 Platform Discovery

- Management Connectivity
- Validation
- Interface configuration
- Layer 3 connectivity
- Checkpoints and Rollback



## Module 5: Cisco Nexus 7000 Series Switch Administration, Management, and Troubleshooting

Lesson 1: Using Cisco Nexus 7000 Series Switch Management Interfaces and Setup Utilities

- Cisco Nexus 7000 Series Switch CLI and GUI Management Interfaces
- Cisco NX-OS Setup Utility
- PowerOn Auto Provisioning

## Lesson 2: Managing Cisco Nexus 7000 Series Switch User Access with Cisco NXOS

- Cisco NX-OS User Management
- User Account and Role Configuration
- Password Recovery Procedure
- AAA Configuration for Integration with RADIUS, TACACS+, and LDAP

### Lesson 3: Configuring Cisco Nexus 7000 Series Switch System Management Features

- System Management Features
- Secure Shell
- SNMP
- The XML Interface
- Cisco Fabric Services
- Cisco Smart Call Home
- Scheduler
- NTP and PTP
- Pong Service
- Cisco NX-OS IP SLA
- Configuration Backup and Restore
- In-Service Software Upgrades and Downgrades
- Cisco NX-OS Image Recovery
- EPLD Image Upgrade

## Lab 2: Configuring User Management

This activity includes these tasks:

- Management Connectivity
- AAA Server
- AAA
- User and Roles

Lesson 4: Using Troubleshooting Processes and Tools

- Troubleshooting Process
- Cisco NX-OS Tools
- Embedded Ethanalyzer
- SPAN and ERSPAN
- NetFlow
- System Message Log Configuration





- Configuring Online Diagnostics
- Using the OBFL Feature
- Configuring RMON
- Configuring Cisco EEM
- Embedded Logic Analyzer Module

Lesson 5: Troubleshooting Memory and Packet Flow Issues

- Evaluating Memory Using the Built-in Platform Monitoring Tool
- Evaluating Platform Memory Utilization on a High Level
- Evaluating Platform Memory Utilization on a Detailed Level
- Troubleshooting Packet Flow Issues

Lesson 6: Describing the Cisco Nexus 7000 Series NAM-NX1

Cisco Network Analysis Module

Lesson 7: Describing Cisco RISE

Cisco RISE Overview

Module 6: Cisco Prime DCNM

Lesson 1: Describing Cisco Prime DCNM

- Cisco Prime DCNM
- Cisco Prime DCNM Components
- Cisco Prime DCNM Licensing
- Cisco Prime DCNM Features

### Lab 3: Configuring System Management

This activity includes these tasks:

- Management Connectivity and Preparation
- Cisco Fabric Services
- Scheduler
- Cisco Smart Call Home
- Cisco DCNM

### Lab 4: Configuring Troubleshooting Features

- Management Connectivity
- RMON
- EEM
- SPAN



## Module 7: Virtual Device Contexts on Cisco Nexus 7000 Series Switches

Lesson 1: Describing Virtual Device Contexts

- Virtual Device Contexts
- Virtualization Hierarchy
- Communicating Between VDCs
- Virtualization Scalability
- VDC Types
- VDC Resources
- VDC Management

Lesson 2: Configuring VDCs

- VDC Licensing Overview
- VDC Guidelines and Limitations
- Configure VDCs
- Verify VDCs
- Allocate VDC Resources
- Configure Resource Templates

Lesson 3: Describing Management Settings for VDCs

- Management Settings for Virtual Device Contexts
- Allocate Interfaces to a VDC
- VDC Navigation
- Manage VDC Configurations
- Nondefault VDC Suspension and Reload
- VDC High-Availability Policies

### Module 8: Layer 2 Switching Features on Cisco Nexus 7000 Series Switches

Lesson 1: Describing and Configuring Security Features

- Configure Basic Interface Parameters
- Dedicated vs. Shared Mode
- UniDirectional Link Detection

Lesson 2: Configuring Cisco Nexus 2000 Series Fabric Extenders

- Configure Cisco Nexus 2000 Series Fabric Extenders
- Configure FEX Layer 2 Interfaces
- Configure FEX Layer 3 Interfaces
- Verify Cisco Nexus 2000 Series Fabric Extenders Configuration

### Lesson 3: Configuring VLANs and Advanced VLAN Features

- Configure Layer 2 Interfaces
- Configure VLANs
- Port Profiles





- Configure VTP
- Configure Private VLANs
- Configure MVRP

## Lesson 4: Configuring STP and STP Extensions

- STP Overview and Configuration
- Configure STP Extensions

## Lesson 5: Configuring Q-in-Q

- Q-in-Q VLAN Tunnels
- Configure Q-in-Q VLAN Tunnels

## Lab 5: Configuring Layer 2 Switching

This activity includes these tasks:

- Management Connectivity
- Configure the Cisco Nexus 5000 Switch Interfaces
- Configuring Layer 2 Interfaces and Rapid PVST+
- Using STP Enhancements
- Implementing and Verifying MST
- Implementing and Verifying Q-in-Q Tunnels

## Module 9: Port Channels and Virtual Port Channels on Cisco Nexus 7000 Series Switches

Lesson 1: Describing Port Channels

- Port Channel Operation
- Configure Layer 2 and Layer 3 Port Channels
- Verify Port Channels
- Configure Port Channel Load Balancing

## Lesson 2: Describing vPCs

- vPC Concept and Benefits
- vPC Architecture
- vPC Control and Data Plane Operation
- vPC Peer Link Failure
- vPC Peer Switch Layer 3 and vPC Interactions
- Supported Layer 3 and vPC Designs
- vPC and FHRPs
- Multicast with vPC

## Lesson 3: Configuring vPCs

- vPC-Supported Hardware
- Configure vPCs



- Verify the vPC
  - Optimizing vPCs

## Lesson 4: Troubleshooting vPC

- Initial Troubleshooting Checklist
- Troubleshoot vPC Initialization
- Troubleshoot vPC Peer Keepalives
- Troubleshoot vPC Cisco Fabric Services
- Troubleshoot Common vPC Issues

## Lab 6: Configuring vPC

This activity includes these tasks:

- Management Connectivity and Preparation
- vPC Domain
- vPC Keepalive Link
- vPC Peer Link
- vPC Configuration and Optimization
- FEX Configuration

## Module 10: Cisco FabricPath on Cisco Nexus 7000 Series Switches

## Lesson 1: Describing Cisco FabricPath Architecture

- Cisco FabricPath Architecture
- Cisco FabricPath MAC Address Learning
- Basic Cisco FabricPath Data Plane Operation
- Cisco FabricPath Interaction with Spanning Tree
- FabricPath and IP Multicast Routing
- Virtual Port Channel+
- vPC+ and HSRP
- Anycast HSRP
- Cisco Fabric Extenders with Cisco FabricPath

## Lesson 2: Configuring Cisco FabricPath

- Cisco FabricPath on Cisco Nexus 7000 Series Switches
- Configure Cisco FabricPath
- Configure vPC+

## Lesson 3: Troubleshooting Cisco FabricPath

- Troubleshooting Cisco FabricPath
- Cisco FabricPath Pong





## Lab 7: Configuring Cisco FabricPath

This activity includes these tasks:

- Management Connectivity and Preparation
- Configure Cisco FabricPath Interfaces and VLANs
- Configure the vPC+

### Lab 8: Troubleshooting vPCs and Cisco FabricPath

This activity includes these tasks:

- Troubleshooting Ticket TT1-vPC
- Identify the Problem
- Resolve the Problem
- Troubleshooting Ticket TT2-FP
- Identify the Problem
- Resolve the Problem

### Module 11: Cisco DFA

### Lesson 1: Describing Cisco DFA Architecture

- Cisco DFA Architecture
- Optimized Networking
- Virtual Fabrics
- *Fabric Management*
- Cisco DFA Service Support
- Workload Automation
- Cisco DFA Deployment Requirements
- Cisco Prime DCNM Release 7.0 and Cisco DFA

### Module 12: Layer 3 Switching Features on Cisco Nexus 7000 Series Switches

### Lesson 1: Describing the Cisco NX-OS Forwarding Architecture

- Cisco NX-OS Routing and Forwarding
- Unicast and Multicast RIB and FIB

### Lesson 2: Configuring Routing Protocols

- Routing Protocol Configuration Overview
- Configure Static Route
- Configure OSPF
- Configure EIGRP Configuration
- Configure IS-IS
- Configure BGP



## Lesson 3: Describing and Configuring Route Policy Manager and PBR

- Configure Route Policy Manager
- Configure PBR

## Lesson 4: Configuring Layer 3 Virtualization

Layer 3 Virtualization Overview

## Lesson 5: Configuring FHRP Protocols

- DCNX7K v3.0 Page 10/14 www.skyline-ats.com Configuring Cisco Nexus 7000 Series Switches
- Configure HSRP
- Configure VRRP
- Configure GLBP

## Lesson 6: Describing and Configuring BFD

- BFD Overview
- BFD on Cisco Nexus 7000 Series Switches
- Configure BFD

## Lesson 7: Configuring Multicast

Configure Multicast

## Lab 9: Configuring Layer 3 Switching

This activity includes these tasks:

- Management Connectivity and Preparation
- Configuring VRF with Static Routing
- Configuring VRFs with OSPFv2
- Configuring VRFs and EIGRP
- Configuring BGP

## Lab 10: Configuring FHRP (Optional)

- Management Connectivity and Preparation
- Configure HSRP
- Virtual Router Redundancy Protocol
- Gateway Load Balancing Protocol



### Module 13: MPLS on Cisco Nexus 7000 Series Switches

### Lesson 1: Describing MPLS

- Multiprotocol Label Switching Overview
- Layer 3 Unicast VPN
- Layer 2 VPN
- MPLS Traffic Engineering

### Lesson 2: Configuring MPLS on Cisco Nexus 7000 Switches

- MPLS on Cisco Nexus 7000 Series Switches
- Configure the MPLS Feature Set
- Configure MPLS LDP

### Lesson 3: Configuring MPLS Layer 3 VPNs

- MPLS Layer 3 VPNs General Configuration Steps
- Configure MPLS in the Core Configure
- MPLS Layer 3 VPN Customers

### Lesson 4: Configuring MPLS Layer 2 VPNs

- MPLS Layer 2 VPN Features on Cisco Nexus 7000 Series Switches
- MPLS Layer 2 VPNs General Configuration Steps
- Configure the MPLS Layer 2 VPN Feature
- Configuration Example: EoMPLS
- Configuration Example: VPLS

### Lesson 5: Configuring MPLS TE

Configure MPLS TE

### Lab 11: Configuring MPLS

This activity includes these tasks:

- Management Connectivity and Preparation
- Configure Basic MPLS
- Configure MPLS Layer 3 VPNs
- Configure MPLS Traffic Engineering

### Module 14: Cisco OTV on Cisco Nexus 7000 Series Switches

### Lesson 1: Describing Cisco OTV

- Cisco OTV Overview
- Cisco OTV Terminology
- Cisco OTV Control Plane
- Cisco OTV Data Plane



- Cisco OTV Unicast-Only Transport Infrastructure
- Cisco OTV Data Plane Encapsulation
- Spanning Tree and Cisco OTV
- Unknown Unicast and Cisco OTV
- ARP Traffic Control
- Multihoming
- FHRP Isolation
- Cisco OTV and QoS
- Cisco OTV Fast Convergence

## Lesson 2: Configuring Basic Cisco OTV

- Cisco OTV Guidelines
- Configure Basic Cisco OTV
- Verify Cisco OTV

## Lesson 3: Configuring Cisco OTV Advanced Features

- Configure Cisco OTV Authentication
- Configure FHRP Isolation
- Configure a Dedicated Broadcast Group
- Configure OTV VLAN Translation
- Configure OTV Fast Convergence and Fast Failure Detection
- Configure OTV Tunnel Depolarization with Secondary IP

## Lab 12: Configuring Cisco OTV

This activity includes these tasks:

- Management Connectivity and Preparation
- Configure Basic Cisco OTV
- Configure Advanced OTV

## Module 15: LISP on Cisco Nexus 7000 Series Switches

Lesson 1: Describing LISP

- Locator/ID Separation Protocol
- LISP VM Mobility LISP ESM Multihop Mobility
- LISP VPN Virtualization

## Lesson 2: Configuring LISP on Cisco Nexus 7000 Series Switches

- LISP on Cisco Nexus 7000 Series Switches
- General LISP Configuration Steps
- Configure LISP Infrastructure
- Configure LISP Site Devices





- Configure LISP Internetworking Devices
- Configure LISP VM Mobility

## Lab 13: Configuring LISP

This activity includes these tasks:

- Management Connectivity and Preparation
- Configure LISP
- Configure LISP VM Mobility

## Module 16: FCoE on Cisco Nexus 7000 Series Switches

Lesson 1: Describing FCoE

- Fiber Channel over Ethernet
- FCoE Requirements
- Data Center Bridging
- Fibre Channel Forwarder and Fibre Channel Bridge
- FCoE Addressing Scheme
- FCoE Initialization Protocol
- DCNX7K v3.0 Page 12/14 www.skyline-ats.com Configuring Cisco Nexus 7000 Series Switches
- FCoE Port Types
- FCoE Design
- Multihop FCoE Design

Lesson 2: Describing FCoE Support on Cisco Nexus 7000 Series Switches

- FCoE Requirements
- Storage VDC
- Supported FCoE Ports

## Lesson 3: Configuring FCoE on Cisco Nexus 7000 Series Switches

- FCoE Configuration Steps
- Licensing an FCoE Module
- Enable FCoE
- Create a Dedicated Storage VDC
- Allocate Shared Interfaces
- VSAN-to-VLAN Mapping
- Create a Virtual Fibre Channel Interface
- Verify a Virtual Interface
- Configure Multihop FCoE
- Configure a Virtual Fibre Channel Port Channel Interface
- Configure the FC-MAP





## Lab 14: Configuring FCoE

This activity includes these tasks:

- Management Connectivity and Preparation
- Basic Configuration on the Cisco MDS Switch
- Configuring FCoE on the Nexus 5000 Switch

### Module 17: Security Features on Cisco Nexus 7000 Series Switches

Lesson 1: Describing and Configuring Security Features

- Security Features
- Integrated Intrusion Detection Security
- Configure ACLs
- Configure Port Security
- Configure DHCP Snooping
- Configure DAI
- Configure IP Source Guard
- Configure uRPF
- Configure Traffic Storm Control
- Configure CoPP

### Lesson 2: Describing and Configuring Cisco TrustSec on Cisco Nexus 7000 Series Switches

- Cisco TrustSec Overview
- Cisco TrustSec on Cisco Nexus 7000 Series Switches
- Configure Cisco TrustSec

### Lab 15: Configuring Security Features (Optional)

- Management Connectivity and Preparation
- Configuring ACLs
- Configuring Port Security
- Configuring Traffic Storm Control
- Configuring 802.1ae Data Encryption





### Module 18: QoS on Cisco Nexus 7000 Series Switches

### Lesson 1: Describing QoS in the Data Center

- QoS in the Data Center
- DCNX7K v3.0 Page 13/14 www.skyline-ats.com Configuring Cisco Nexus 7000 Series Switches
- Diversity of Data Center Application Flows
- Data Center QoS Requirements
- Priority Flow Control
- Priority-Based Bandwidth Management
- DCBX Protocol

Lesson 2: Configuring QoS on the Cisco Nexus 7000 Series Switches

- QoS on the Cisco Nexus 7000 Switch
- Configure Queuing and Scheduling on M Series I/O Modules
- Configure Network QoS, Queuing and Scheduling, and Priority Flow Control on F Series Modules
- Monitoring QoS Statistics

### Lab 16: Configuring QoS (Optional)

This activity includes these tasks:

- Management Connectivity and Preparation
- Configuring Class Map
- Configuring Policy Map
- Configuring Service Policies

### Module 19: Cisco ITD on Cisco Nexus 7000 Series Switches

#### Lesson 1: Describing Cisco ITD

- Cisco ITD: Multiterabit Load Balancing with Cisco Nexus 7000 Series Switches
- Cisco ITD Deployment Models

### Lesson 2: Configuring Cisco ITD

- Configure Cisco ITD
- Cisco ITD Verification