

# CCNP DATA CENTER v3.1



Join us for the best CCNP  
Data Center v3.1 training

**Day 1**

- Introduction
  - Updates on the new version v3.0
  - Hardware and Software updates
  - Topics covered throughout the course
  - What is Data Centre?
  - Topologies in a Data Centre

**Nexus Module****Day 2 & 3**

- Introduction to NXOS
- Hardware
  - 9K
  - 7K
  - 5K
  - 2K

**Day 4**

- Virtual Device Context (VDC)
  - What is VDC?
  - Different types of VDC
    - Default VDC
    - Admin VDC
    - Non-Default VDC
  - Resource allocation, Templates, Boot-Order, HA- Policies.

**Day 5, 6 & 7**

- Virtual Port-Channel (VPC)
  - Introduction to vPC
  - vPC Terminologies
  - vPC Control Plane
  - vPC Data Plane (L2 + L3)
  - vPC with HSRP
  - vPC Loop avoidance
  - Types of VPC (Regular/E-vPC/Back to Back VPC)
  - vPC Lab (Regular/EVPC/B2B vpc/VPC + HSRP)

**Day 8**

- Multicast
  - IGMP (Internet Group Management Protocol)
  - PIM (Protocol Independent Multicast)
    - Sparse mode
      - ASM (Any Source multicast)
      - SSM (Source Specific multicast)
    - Dense mode

- Bidirectional PIM
  - Phantom RP

## Day 9, 10 & 11

- VXLAN
  - VXLAN Introduction
  - Advantage/Limitation of VXLAN
  - VXLAN Terminologies
  - VXLAN Packet Format
  - VXLAN Data Plane Based forwarding
    - HER (Head End Replication)
    - F&L (Flood & Learn)
  - VXLAN Control Plane Based forwarding
    - MP-BGP L2 EVPN

## Nexus Labs

## Day 12, 13, 14, 15 & 16

### Virtual Device Context (VDC)

Task 1: Check basic information of N7K

Task 2: Create a Non-Default VDC

Task 3: Allocate interfaces to the vdc

Task 4: Change the CPU-share and boot-order for the vdc

Task 5: Create a new resource template

Task 6: Assign the mgmt IP address to the vdc

Task 7: Create local users and check access

### Virtual Port-Channel (VPC)

Task 1: Building Virtual Port-Channel

Task 2: Changing the Role-Priority by bouncing the peer-link

Task 3: Changing the Role-Priority by enabling vPC Role Pre-empt

Task 4: Make the peer-keepalive link down and check the behavior

Task 5: Make the peer-link down and check the behavior

Task 6: Peer-Switch

Task 7: vPC with HSRP (Peer-Gateway)

Task 8: Dual-Sided vPC

### Virtual Extensible LAN (VXLAN)

Task 1: Same VLAN, Same VNI, Same Subnet, Same Mcast-group

Task 2: Same VLAN, Same VNI, Different Subnet, Same Mcast-group

Task 3: Different VLAN, Same VNI, Different Subnet, Same Mcast-group

Task 4: Different VLAN, Different VNID, Different Subnet, Same Mcast-group

Task 5: Different VLAN, Different VNID, Different Subnet, Different Mcast-group on both

VTEPs

Task 6: Different VLAN, Different VNID, Different Subnet, Different Mcast-group (Between VTEPs)

Task 7: Extending L2 Bridging using BGP-eVPN (Asymmetric IRB)

Task 8: Inter-VNI routing using L3 VNI and BGP-eVPN

Task 9: VXLAN + VPC

Task 10: Multicast (ASM/SSM)

### Application Centric Infrastructure (ACI) module

#### **Day 17 & 18**

- Introduction to SDN
- Nexus 9K Hardware Revisit
- ACI Introduction
- ACI Leaf & Spine architecture
- APIC Controller

#### **Day 19 & 20**

- Protocols in ACI
  - ISIS
  - MP-BGP
  - VXLAN
  - COOP
  - Opflex
  - LLDP
  - DHCP

#### **Day 21 & 22**

- APIC Initialization & Cluster
- ACI Fabric Discovery
- ACI Dashboard Overview

#### **Day 23 & 24**

- Terminologies in ACI
  - Tenant VRF & BD
  - Application Profile & EPG
  - Contracts & Filters
- ACI Policy Construct

#### **Day 25 & 26**

- 3 Tier Architecture in ACI
- ACI packet forwarding Bare Metal in ACI
- VMM integration

#### **Day 27 & 28**

- L2 Out
- VPC in ACI
- L3 out in ACI
- Transit Routing in ACI

**Day 29 & 30**

- > L4-L7 Integration in ACI
- > Inter-Tenant Communication in ACI
- Micro segmentation in ACI

**Day 31 & 32**

- > Introduction & Configuring/Implementing Multi Pod & Multi Site in ACI

**ACI Labs****Day 33, 34, 35, 36 & 37**

Task 1: ACI Fabric Initialization

Task 2: Configuring VLAN Pools

Task 3: Configuring Physical and External Domains

Task 4: Configuring Interface policies for Leafs and Spines

    Link Level Policy

    CDP Interface

    LLDP Interface

    Port-Channel Policy

Task 5: Creating Interface Policy Group

    Leaf Access Port

    PC Interface

    VPC Interface

Task 6: Configuring Interface Profiles

    Leaf Profile

    FEX Profile

Task 7: Creating Switch Profile

Task 8: Bare-Metal Host Communication

    End points in the same EPG under the same Application Profile.

Task 9: VMM Integration

Task 10: Intra-Tenant Communication

Task 11: Inter-Tenant Communication

Task 12: ASAv Integration in Transparent Mode

Task 13: ASAv Integration in Routed Mode

Task 14: L3Out OSPF Communication

Task 15: L3Out BGP Communication

Task 16: L2 Extension using OTV

Task 17: Configuring OOB Contracts for Fabric Management

Task 18: Configuring ACI fabric as DHCP Relay Agent

Task 19: Configuring Monitoring Sessions in ACI

Task 20: Configure ACI for Transit-Routing

Task 21: Configuring Loop-prevention Mechanism, BPDU Guard, End-Point Movement, End-point Retention Policy, IP Aging Policy/GARP

Task 22: Configuring Security Policies in ACI.

    AAA

    LDAP

    RADIUS

**Storage****Day 38**

- > Introduction to Storage
- > Topologies in Storage
  - DAS

- NAS
- SAN

**Day 39**

- JBOD, RAID
- Introduction to Storage Protocols
  - iSCSI
  - FC
  - FCoE

**Day 40**

- What is FC?
- Addressing schemes in FC
- Fabric Services
  - FLOGI
  - PLOGI
  - PRLI
  - PRLO

**Day 41 & 42**

- NPV, NPIV, Zoning
- What is FCoE?
- How FCoE is a lossless protocol?
  - PFC (Priority Flow Control)
  - ETS (Enhanced Transmission Selection)
  - DCBx (Data Center Bridging Exchange)
- FCoE Initialization Protocol (FIP)
- Configuring FCoE

**Unified Computing System****Day 43 & 44**

- What is UCS?
- Benefits
- Components
  - Fabric Interconnect
    - Clustering
    - Hardware models
    - Types of ports
    - Modes of FI
  - Chassis
    - Hardware model
    - SEEPROM
  - IOM (Input/output Module)
    - Hardware models
    - Components of IOM
  - VIC (Virtual Interface Card)
    - Hardware models
    - Pinning

**Day 44**

- Introduction to GUI
- Configuring interfaces on FI
- Aggregating Server ports into a port-channel
- Creating Port-channel
- Creating VLANs and allowing them through PCs.
- Creating MAC & IP Pool

- Day 45**
- > Creating vNIC Templates
  - > Creating LACP, LAN Connectivity, Network Control, Storage Disk Group Policies
  - > Creating Storage Profile
  - > Creating WWNN & WWPN Pool
  - > Creating VSANs
  - > Creating FC / FCoE Port-channels
  - > Creating vHBA Templates
  - > Creating SAN Connectivity Policy
  - > Configuring NTP on UCSM

- Day 46**
- > Creating UUID Pool
  - > Creating Scrub, Maintenance, KVM, Local Disk & Boot Policies
  - > Configuring zoning on N5K.
  - > Configuring FCoE on N5K.
  - > Creating a Service Profile Template
  - > Creating a Service Profile from the template.

### UCS Labs

#### **Day 46, 47, 48, 49 & 50**

- Task 1: Discovering compute devices and chassis
- Task 2: Understanding and configuring UCS Infrastructure Connectivity
- Task 3: Configuring UCS Global Policies
- Task 4: Configuring VLANs and VSANs
- Task 5: Configuring Resource Pools in UCS
- Task 6: Converting Interfaces on FI
- Task 7: Configuring Uplink Port-channels
- Task 8: Creating VLAN-GROUPs
- Task 9: Configuring NTP on UCS
- Task 10: Creating Policies
  - Network Control Policy*
  - Local-Disk Configuration Policy*
  - LACP Policy*
  - Storage Profile*
  - Storage Policy*
  - Multicast Policy*
  - vNIC Template*
  - LAN Connectivity Policy*
  - QoS Policy*
  - vHBA Template*
  - SAN Connectivity Policy*
  - vMedia Policy*
- Task 11: Converting Interfaces to FC on 5K
- Task 12: Configuring VSANs and Zone Distributions
- Task 13: Configuring FCoE on 5K
- Task 14: Checking FLOGI Database
- Task 15: Creating Boot Policies
- Task 16: Creating Service Profile Template
- Task 17: Creating Service Profile
- Task 18: Configure Boot from SAN
- Task 19: Configuring Appliance VLANs
- Task 20: Creating Overlay vNIC and Booting using SAN

## Data Center Automation and Programmability

### **Day 51, 52, 53**

Data Center Automation - Python – Beginner to Maestro

- Syntax and Integrated Development Environment
- Operators and Operands
- Control structures, Loops and Loop Controls
- Functions and Modules
- In-built Data Structures
- Functional programming
- Decorator and Generator
- Object Oriented Programming (OOP) concept
- Regular Expressions
- File and Exceptional Handling

### **Day 54 & 55**

Libraries for CLI automation

- Scripting practice using the open libraries available
- Paramiko
- Netmiko
- Napalm
- Telnetlib

### **Day 56**

Data serialization and libs

- json
- yaml
- xml
- Related libraries and how to use them

### **Day 57**

REST-API and Tools

- HTTP and its terminologies
- HTTP CRUD and ERROR codes (google CRUD now !!)
- API
- REST
- Curl
- Postman

### **Day 58**

ANSIBLE

- Basics of Linux environment
- Ansible components
- Hosts/inventory and .cfg
- Ad-hoc and modules
- Jinja templating



**Day 59 & 60**

## Cisco Devices Programmability

## NX-OS

- NX-API
- Overview of programmable features
- Developer Sandbox
- NX-OS Object
- Data Management Engine (DME)
- Management Information Tree (MIT)
- Visore

## ACI

- Tenant
- ACI GUI
- EPG
- Object Model
- Cobra, Arya and Toolkit
- CRUD a Tenant