

Cisco CCNP Designing Cisco Data Center Infrastructure for Traditional and AI Workloads (300-610 DCID) v1.2

Architect scalable, AI-ready data center environments as you work toward your CCNP Data Center certification. This Cisco DCID 300-610 training teaches you to design modern Cisco data center infrastructure for traditional enterprise workloads and emerging AI requirements. You'll learn up-to-date architectural frameworks for network, compute, storage, and automation, with new emphasis on AI/ML workloads, lossless Ethernet, and high-performance fabrics. In this DCID 300-610 training, you'll deep give into technologies like RoCEv2, VXLAN EVPN, UCS X-Series, NVMe-oF, and centralized management with Cisco Intersight and Nexus Dashboard.

[CBT Nuggets course material](#) →

 STUDY PLAN

WEEK 1

Identify Data Center Foundations

- The Purpose of the Data Center
- Data Center Availability
- The Physical Data Center
- State of the Data Center
- Design Challenge

Describe AI/ML Concepts

- AI/ML Concepts
- Deep Learning Concepts
- Training and Inference
- Hardware and Network Requirements
- Design Challenge

Evaluate Networking for AI Workloads

- Remote Direct Memory Access (RDMA)
- InfiniBand (IB)
- RDMA over Converged Ethernet (RoCEv2)
- Lossless Ethernet
- Design Challenge

Describe Data Center L2 Architecture

- Three-Tier Model
- The Spine-Leaf Architecture
- SDN and ACI
- Design Challenge

Evaluate Data Center L2 Connectivity

Endpoint Mobility

Data Center Interconnects (DCIs)

L2 Storage Traffic

Design Challenge

Describe Data Center Port-Channels

LACP and Static Port Channels

Virtual Port Channels (VPCs)

VPC Traffic Flow

VPC Failure Scenarios

Design Challenge

Design VPCs in the Data Center

VPC and FHRPs

VPC and STP

VPC L2 Topologies

VPC L3 Topologies

Design Challenge

Explain VXLAN at the Data Plane

VXLAN and VNIs

VXLAN and Spine-Leaf

VXLAN Data Plane

STP and VXLAN Fabrics

Design Challenge

Explain VXLAN at the Control Plane

VXLAN Flood-and-Learn

VXLAN BGP-EVPN

VNIDs and VLAN IDs

Design Challenge

Describe Data Center L3 Architecture

IPv4 and IPv6

Hierarchical Network Design

Collapsed Core-DC

Design Challenge

Evaluate Data Center L3 Routing

Data Center Routing

Scalable Data Center Routing

IP Mobility

Optimized L3 Forwarding

Design Challenge

Evaluate Data Center Routing Virtualization

VRF-Lite

Spine-Leaf Routing

L3 VNIs

Design Challenge

Evaluate Data Center L3 Services

Load Balancers

North-South Security

East-West Security

Services Insertion

Design Challenge

Evaluate L2 and L3 High Availability

STP Bridge Assurance

VPC Object Tracking

NSF, Graceful Restart, and SSO

FHRPs and Anycast Gateways

Design Challenge

Evaluate QoS for Lossless Ethernet

Priority Flow Control (PFC)

Explicit Congestion Notification (ECN)

WRED and AFD

Designing Lossless Ethernet

Design Challenge

Evaluate Traditional Data Center Interconnects

The Need for DCIs

L2 DCI Considerations

L3 DCI Considerations

DCI WAN Technologies

Design Challenge

Evaluate Overlay-Based Data Center Interconnects

VXLAN as DCI

ACI Multipod

ACI Multisite

Overlay Transport Virtualization (OTV)

Design Challenge

Describe Data Center Redundancy

Hardware Redundancy

Power Redundancy

Remote and OOB Management

Design Challenge

Evaluate Data Center Management Options

Nexus Mgmt Interfaces

Management Networks

Nexus Dashboard

Nexus Dashboard Clustering

Design Challenge

Evaluate Redundancy Options

Backups

Backup Solutions

Disaster Recovery

Disaster Recovery Solutions

Design Challenge

Evaluate Disaster Recovery Objectives

Recovery Point Objective (RPO)

Recovery Time Objective (RTO)

Local Failovers

Cloud Failover and DRaaS

Design Challenge

Describe ACI Concepts

ACI Foundations

ACI Hardware

APIC Clustering

Design Challenge

Identify the ACI Logical Model

Mapping the Logical Model

Endpoint Groups (EPGs)

Contracts

Bridge Domains (BDs)

Contexts and Tenants

Diagram Challenge

Describe ACI Features

Spine Proxies

Bounce Entries

Microsegmentation EPGs

Northbound and Southbound APIs

Design Challenge

Compare Cisco Fabric Offerings

ACI

Nexus Dashboard

HyperFabric

Solution Comparison

Design Challenge

Describe the UCS Value Proposition

Intro

Network Integration

Stateless Computing

Unified Fabric and Storage

Design Challenge

Identify UCS Server Series

X-Series Modular System

B-Series Blade Servers

C-Series Rack Servers

Edge Servers

Design Challenge

Explain UCS Network Device Virtualization

Cisco VIC

Cisco VIC Visualization

FEX and VIC Tagging

vNIC Networking

Design Challenge

Explain UCS Ethernet Connectivity

Ethernet End Host Mode

Pinning and Redundancy

VLANs and Broadcasts

Deja Vu and RPF Checks

Design Challenge

Explain UCS Traffic Flows

IFM and VIC Connectivity

IFM and VIC Pathing

Bandwidth and Oversubscription

Design Challenge

Explain UCS Network Configuration

vNIC Templates

VLAN Groups and LAN Pin Groups

Multiple VICs and vCons

Design Challenge

Design UCS Network Pathing

IFM Connectivity

Fabric Communication

Hypervisor Switching

UCS Traffic Engineering

Design Challenge

Design UCS Quality of Service

UCS Classification and Marking

UCS Congestion Management

QoS Design Principles

Design Challenge

Design UCS Service Profile Policies

Resource and Server Pools

Disk Policies

Maintenance Policies

Host Firmware Packages

AI/ML Tuning Policies

Design Challenge

Design with UCS Templates

Service Profile Overview

Service Profile Templates

Primary and Secondary Templates

Template Design

Design Challenge

Explain Storage Networking Principles

SCSI and Networking

SAN and NAS

SAN Protocols

Design Challenge

Explain Storage Innovations

HDDs and SSDs

Non-Volatile Memory Express (NVMe)

NVMe over Fabrics (NVMe-oF)

Storage Arrays

Design Challenge

Design iSCSI Deployment

iSCSI Packets

iSCSI Traffic Forwarding

iSCSI Addressing

Design Challenge

Perform iSCSI Tuning

iSCSI Performance

iSCSI Isolation

iSCSI MPIO

WEEK 2

iSCSI Boot

Design Challenge

Explain Fibre Channel Fabrics

Fibre Channel Protocol

Fibre Channel Fabrics

FC Port Types

Design Challenge

Explain Fibre Channel Mechanisms

FLOGI, PLOGI, and PRLI

Domain IDs and FSPF

WWNs and FCIDs

End-to-End FC

BB and EE Credits

Design Challenge

Describe Fibre Channel Configurations

VSANs

Fibre Channel Zoning

SAN Port-Channels

Design Challenge

Design Fibre Channel Fabrics

Core-Edge and Edge-Core-Edge

SAN Oversubscription

FC Hardware

FC QoS

Design Challenge

Explain Fibre Channel Connectivity Options

N_Port Virtualization (NPV)

N_Port Identifier Virtualization (NPIV)

NPV Pinning

FC Transceiver Types

Design Challenge

Describe Storage Array Concepts

Storage Arrays

RAID Concepts

RAID Types

Backups and Replication

Design Challenge

Design FC and iSCSI in UCS

SAN Architecture

FC Uplinks

FCOE Uplinks and Unified Uplinks

Design Challenge

Design UCS Storage Connectivity

FI/SAN Integration

iSCSI VLAN and Isolation

SAN Elimination

SAN Boot

Design Challenge

Explain Network Automation Concepts

Automation Solutions

CLI, SNMP, and APIs

Northbound and Southbound APIs

Design Challenge

Explain Data Languages and Models

XML and JSON

YAML

Python

YANG

Design Challenge

Describe Configuration Management

Configuration Management Tools

Ansible

Terraform

Terraform CLI

Design Challenge

Explain Nexus Programmability

NX-API

NX-SDK

Bash on Nexus

Scripting with Python on Nexus

Design Challenge

Describe Nexus Dashboard Features

Nexus Dashboard Overview

Nexus Dashboard Controller Cluster

Nexus Dashboard Fabric Controller (NDFC)

NDO, NDI, and NDB

Design Challenge

Design Compute Orchestration

Intersight

UCS Automation

Intersight Cloud Orchestrator

Cloud Orchestrator Workflows

Design Challenge

Design Data Center Transceivers and Cabling

SFP Technology

QSFP Technology

Fiber Cabling

Twinax and AOC

Design Challenge

Identify Cisco Optics and Cables

Optic Types

10G Transceiver Options

25G and 50G SFP Transceiver Options

40G QSFP Transceiver Options

100G and 200G Transceiver Options

400G and 800G Transceiver Options

Verify Compatibility with the Compatibility Matrix

Design Challenge

Meet the Requirements of a DC Design

Meeting Technical Requirements

Meeting Physical Requirements

Meeting Migration Requirements

Meeting Financial Requirements

Design Challenge

Review DCID Networking

Quiz Questions 1-7

Quiz Questions 8-14

Quiz Questions 15-21

Quiz Questions 22-28

Review DCID Compute, Storage, and Automation

UCS Quiz Questions 1-11

Storage Quiz Questions 12-23

Automation Quiz Questions 24-29