

Designing Cisco Data Center Infrastructure

Duration: 5 Days **Course Code: DCID** **Version: 7.1**

Overview:

Designing Cisco Data Center Infrastructure (DCID) focuses on data center design based on Cisco solutions and technologies. Topics covered include network designs with virtualization technologies, Layer 2 and Layer 3 technologies and routing protocols and data center interconnect design options.

You'll learn design practices for the Cisco Unified Computing System™ (Cisco UCS®) solution based on Cisco UCS B-Series and C-Series servers, Cisco UCS Manager, and Cisco Unified Fabric, while gaining experience with network management technologies including Cisco UCS Manager, Cisco Nexus Dashboard Fabric Controller and Cisco UCS Director.

This course is worth 40 (CE) Continuing Education Credits

Target Audience:

Engineers and Architects involved in the design of a Cisco Data Center or Cisco Data Center Solution.

Objectives:

- **After completing this courses you should be able to:**
- Describe the Layer 2 and Layer 3 forwarding options and protocols used in a data center
- Describe the rack design options, traffic patterns, and data center switching layer access, aggregation, and core
- Describe Locator/ID separation protocol
- Design a solution that uses Virtual Extensible LAN (VXLAN) for traffic forwarding
- Describe the hardware redundancy options; how to virtualize the network, compute, and storage functions; and virtual networking in the data center
- Describe solutions that use fabric extenders and compare Cisco Adapter Fabric Extender (FEX) with single root input/output virtualization (SR-IOV)
- Describe security threats and solutions in the data center
- Describe advanced data center security technologies and best practices
- Describe device management and orchestration in the data center
- Describe the storage options for the compute function and the different Redundant Array of Independent Disks (RAID) levels from a high-availability and performance perspective
- Describe Fibre Channel concepts and architecture
- Describe Fibre Channel topologies and industry terms
- Describe Fibre Channel over Ethernet (FCoE)
- Describe security options in the storage network
- Describe the management and automation options for the storage networking infrastructure
- Describe Cisco UCS servers and use cases for various Cisco UCS platforms
- Explain the connectivity options for fabric interconnects for southbound and northbound connections
- Describe the hyperconverged solution and integrated systems
- Describe the systemwide parameters for setting up a Cisco UCS domain
- Describe role-based access control (RBAC) and integration with directory servers to control access rights on Cisco UCS Manager
- Describe the pools that may be used in service profiles or service profile templates on Cisco UCS Manager
- Describe the different policies in the service profile
- Describe the Ethernet and Fibre Channel interface policies and additional network technologies
- Describe the advantages of templates and the difference between initial and updated templates
- Describe data center automation tools

Prerequisites:

Attendees should be able to:

- Implement data center networking (LAN and SAN)
- Describe data center storage
- Implement data center virtualizations
- Implement CiscoUnified Computing System (UCS)
- Implement data Center automation and orchestration with the focus on Cisco ACI and Cisco UCS Director
- Describe products in the Cisco Data Center and MDS Families
- CCNA - Implementing and Administering Cisco Solutions
- DCFNDU - Understanding Cisco Data Center Foundations
- DCCOR - Implementing and Operating Cisco Data Center Core Technologies

Testing and Certification

Recommended as preparation for exam:

- **300-610 - DCID** - Designing Cisco Data Center Infrastructure
This is one of the concentration exams for the CCNP Data Center Certification, to achieve the New CCNP Data Center Certification you will also need to take the **350-601** exam

Content:

High Availability on Layer 2

- Overview of Layer 2 High-Availability Mechanisms
- Virtual Port Channels

Layer 3 Connectivity

- First Hop Redundancy Protocols
- Improving Routing Protocol Performance and Security
- Enhance Layer 3 Scalability and Robustness

Data Center Topologies

- Data Center Traffic Flows
- Cabling Challenges
- Access Layer
- Aggregation Layer
- Core Layer
- Spine-and-Leaf Topology
- Redundancy Options

Locator/ID Separation Protocol

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

VXLAN Overlay Networks

- VXLAN Benefits over VLAN
- Layer 2 and Layer 3 VXLAN Overlay
- MP-BGP EVPN Control Plane Overview
- VXLAN Data Plane

Hardware and Device Virtualization

- Hardware-Based High Availability
- Device Virtualization
- Cisco UCS Hardware Virtualization
- Server Virtualization
- SAN Virtualization
- N-Port ID Virtualization

Cisco FEX Options

- Cisco Adapter FEX
- Access Layer with Cisco FEX
- Cisco FEX Topologies
- Virtualization-Aware Networking
- Single Root I/O Virtualization
- Cisco FEX Evaluation

Basic Data Center Security

- Threat Mitigation
- Attack and Countermeasure Examples
- Securing the Management Plane
- Protecting the Control Plane
- RBAC and Authentication, Authorization, and Accounting (AAA)

Management and Orchestration

- Network and License Management
- Cisco UCS Manager
- Cisco UCS Director
- Cisco Intersight
- Cisco NDFC Overview

Storage and RAID Options

- Positioning DAS in Storage Technologies
- Network-Attached Storage
- Fibre Channel, FCoE, and Internet Small Computer System Interface (iSCSI)
- Evaluating Storage Technologies

Fibre Channel Concepts

- Fibre Channel Connections, Layers, and Addressing
- Fibre Channel Communication
- Virtualization in Fibre Channel SAN

Fibre Channel Topologies

- SAN Parameterization
- SAN Design Options
- Choosing a Fibre Channel Design Solution

FCoE

- FCoE Protocol Characteristics
- FCoE Communication
- Data Center Bridging
- FCoE Initialization Protocol
- FCoE Design Options

Storage Security

- Common SAN Security Features
- Zones
- SAN Security Enhancements
- Cryptography in SAN

SAN Management and Orchestration

- Cisco DCNM for SAN
- Cisco DCNM Analytics and Streaming Telemetry
- Cisco UCS Director in the SAN
- Cisco UCS Director Workflows

Cisco UCS Servers and Use Cases

- Cisco UCS C-Series Servers
- Fabric Interconnects and Blade Chassis
- Cisco UCS B-Series Server Adapter Cards
- Stateless Computing
- Cisco UCS Mini

Fabric Interconnect Connectivity

Hyperconverged and Integrated Systems

- Hyperconverged and Integrated Systems Overview
- Cisco HyperFlex™ Solution
- Cisco HyperFlex Scalability and Robustness
- Cisco HyperFlex Clusters
- Cluster Capacity and Multiple Clusters on One Cisco UCS Domain
- External Storage and Graphical Processing Units on Cisco HyperFlex
- Cisco HyperFlex Positioning

Cisco UCS Manager Systemwide Parameters

- Cisco UCS Setup and Management
- Cisco UCS Traffic Management

Cisco UCS RBAC

- Roles and Privileges
- Organizations in Cisco UCS Manager
- Locales and Effective Rights
- Authentication, Authorization, and Accounting
- Two-Factor Authentication

Pools for Service Profiles

- Global and Local Pools
- Universally Unique Identifier (UUID) Suffix and Media Access Control (MAC) Address Pools
- World Wide Name (WWN) Pools
- Server and iSCSI Initiator IP Pools

Policies for Service Profiles

- Global vs. Local Policies
- Storage and Basic Input/Output System (BIOS) Policies
- Boot and Scrub Policies
- Intelligent Platform Management Interface (IPMI) and Maintenance Policies

Network-Specific Adapters and Policies

- LAN Connectivity Controls
- SAN Connectivity Controls
- Virtual Access Layer
- Connectivity Enhancements

Templates in Cisco UCS Manager

- Templates in Cisco UCS Manager
- Service Profile Templates
- Network Templates

Designing Data Center Automation

- Model-Driven Programmability
- Cisco NX-API Overview

Advanced Data Center Security

- Cisco TrustSec in Cisco Secure Enclaves Architecture
- Cisco TrustSec Operation
- Firewalling
- Positioning the Firewall Within Data Center Networks
- Cisco Firepower® Portfolio
- Firewall Virtualization
- Designing for Threat Mitigation

- Using Fabric Interconnect Interfaces
- VLANs and VSANs in a Cisco UCS Domain
- Southbound Connections
- Northbound Connections
- Disjoint Layer 2 Networks
- Fabric Interconnect High Availability and Redundancy

- Programmability Using Python
- Cisco Ansible Module
- Cisco Intersight Cloud Orchestration Overview

Practice Activities

- Design Virtual Port Channels
- Design First Hop Redundancy Protocol (FHRP)
- Design Routing Protocols
- Design Data Center Topology for a Customer
- Design Your VXLAN Network
- Create a Cisco FEX Design
- Design Management and Orchestration in a Cisco UCS Solution
- Design a Fibre Channel Network
- Design and Integrate an FCoE Solution
- Design a Secure SAN
- Design Cisco UCS Director for Storage Networking
- Design a Cisco UCS Domain and Fabric Interconnect Cabling
- Design a Cisco UCS C-Series Server Implementation
- Design a Cisco UCS C-Series Integration with Cisco UCS Domain
- Design a Cisco UCS Mini Solution
- Design a Cisco UCS Fabric Interconnect Network and Storage Connectivity
- Design Systemwide Parameters in a Cisco UCS Solution
- Design an LDAP Integration with a Cisco UCS Domain
- Design Pools for Service Profiles in a Cisco UCS Solution
- Design Network-Specific Adapters and Policies in a Cisco UCS Solution

Additional Information:

Students looking to achieve their CCNP in Data Center will also require: DCCOR - Implementing and Operating Cisco Data Center Core Technologies.

Further Information:

For More information, or to book your course, please call us on 00 966 92000 9278

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