Designing Cisco Data Center Infrastructure

Course Code	DCID
Duration	5 days

Overview

The Designing Cisco Data Center Infrastructure (DCID) v7.0 course helps you master design and deployment options focused on Cisco® data center solutions and technologies across network, compute, virtualization, storage area networks, automation, and security. You will 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. You will also gain design experience with network management technologies including Cisco UCS Manager, Cisco Data Center Network Manager (DCNM), and Cisco UCS Director. You can expect theoretical content as well as design-oriented case studies in the form of activities.

Audience

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

Learning Objectives

By actively participating in this course, you will learn about the following:

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

- Describing the advantages of templates and the difference between initial and updated templates.
- Describing data center automation tools.

Pre-Requisites
Attended courses of has existing equivalent knowledge of:
- CCNA Routing and Switching or the new CCNA
- CCNA Data Center or DCFNDU - Understanding Cisco Data Center Foundations
- DCCOR - Implementing Cisco Data Center Core Technologies

Recommended courses:
- DCCOR - Implementing and Operating Cisco Data Center Core Technologies

Course Contents

Describing High Availability on Layer 2
- Overview of Layer 2 High-Availability Mechanisms
- Virtual Port Channels
- Cisco FabricPath
- Virtual Port Channel+

Designing Layer 3 Connectivity
- First Hop Redundancy Protocols
- Improve Routing Protocol Performance and Security
- Enhance Layer 3 Scalability and Robustness

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

Designing Data Center Interconnects with Cisco OTV
- Cisco OTV Overview
- Cisco OTV Control and Data Planes
- Failure Isolation
- Cisco OTV Features
- Optimize Cisco OTV
- Evaluate Cisco OTV

Describing Locator/ID Separation Protocol
- Locator/ID Separation Protocol
- Location Identifier Separation Protocol (LISP) Virtual Machine (VM) Mobility
- LISP Extended Subnet Mode (ESM) Multihop Mobility
- LISP VPN Virtualization

Describing VXLAN Overlay Networks
- Describe VXLAN Benefits over VLAN
- Layer 2 and Layer 3 VXLAN Overlay
- Multiprotocol Border Gateway Protocol (MP-BGP) Ethernet VPN (EVPN) Control Plane Overview
- VXLAN Data Plane

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

Describing 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

Describing Basic Data Center Security
- Threat Mitigation
- Attack and Countermeasure Examples
- Secure the Management Plane
- Protect the Control Plane
- RBAC and Authentication, Authorization, and Accounting (AAA)

Describing 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
- Design for Threat Mitigation

Describing Management and Orchestration
- Network and License Management
- Cisco UCS Manager
- Cisco UCS Director
- Cisco Intersight
- Cisco DCNM Overview

Describing Storage and RAID Options
- Position DAS in Storage Technologies
- Network-Attached Storage
- Fibre Channel, FCoE, and Internet Small Computer System Interface (iSCSI)
- Evaluate Storage Technologies

Describing Fibre Channel Concepts
- Fibre Channel Connections, Layers, and Addresses
- Fibre Channel Communication
- Virtualization in Fibre Channel SAN

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

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

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

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

Describing 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

Describing Fabric Interconnect Connectivity
- Use of 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

Describing 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

Describing Cisco UCS Manager Systemwide Parameters
- Cisco UCS Setup and Management
- Cisco UCS Traffic Management

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

Describing 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

Describing Network-Specific Adapters and Policies
- LAN Connectivity Controls
- SAN Connectivity Controls
- Virtual Access Layer
- Connectivity Enhancements

Describing Templates in Cisco UCS Manager
- Cisco UCS Templates
- Service Profile Templates
- Network Templates
- Designing Data Center Automation

Model-Driven Programmability
- Cisco NX-API Overview
- Programmability Using Python
- Cisco Ansible Module
- Use the Puppet Agent

Labs
- Design Virtual Port Channels
- Design First Hop Redundancy Protocol (FHRP)
- Design Routing Protocols
- Design Data Center Topology for a Customer
- Design Data Center Interconnect Using Cisco OTV
- 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 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

Exam Details

This course leads to the 300-610 - Designing Cisco Data Center Infrastructure (DCID) exam.

This is one of the concentration exams for the NEW CCNP Data Center Certification; to achieve the New CCNP Data Center Certification you will also need to take the 300-601 exam.

Further Information

For more information or to book this course, please contact our Course Enquiries Team on
01752 227330 (Option 2) or email us at **enquiries@skilltec.co.uk**.