# DCID - DESIGNING CISCO DATA CENTER INFRASTRUCTURE V8.0

Course Code: 100489

The Designing Cisco Data Center Infrastructure (DCID) course focuses on data center design based on Cisco solutions and technologies. The training includes theoretical content and design-oriented case studies that are in the form of activities. The training includes information on designing data centers with Cisco components and technologies. It covers network designs with virtualization, Layer 2 and Layer 3 technologies and routing protocols, and data center interconnect design options. Also covered are device virtualization technologies such as virtualized network devices with virtual appliances, including virtual switches, virtual routers, and virtual firewalls. Storage and SAN design is covered, including an explanation of Fibre Channel networks. Design practices for the Cisco Unified Computing System (UCS) solution based on Cisco UCS B-Series and C-Series servers, Cisco UCS-X are covered. Management and orchestration topics feature Cisco UCS Manager, Nexus Dashboard Fabric Controller (NDFC), and Cisco Intersight, with additional emphasis on automation solutions such as programmability, Ansible, and Terraform. The training also addresses the integration of artificial intelligence, real-world use cases, and the design of AI-ready infrastructure.

This training prepares you for the 300-610 DCID v1.2 exam. If passed, you earn the Cisco Certified Specialist – Data Center Design certification and satisfy the concentration exam requirement for the Cisco Certified Network Professional (CCNP) Data Center certification

**This training also earns you 40 Continuing Education (CE) credits toward recertification.**

## What You'll Learn

At the conclusion of this course, you should be able to:

- Describe the physical design of modern data centers and different network types
- Describe how to design and manage the physical layer infrastructure of modern data centers
- Understand the multi-layered concept of data center redundancy, encompassing hardware, software, topological, and site-level resiliency

- Describe the Layer 2 forwarding options and protocols that are used in a data center
- Describe the Layer 3 forwarding options and protocols that are used in a data center
- Describe virtual infrastructure options and their considerations when deploying
- Describe overlay networks and operation of VXLAN and ACI
- Describe Fabric Interconnect operation and connectivity
- Describe Cisco UCS hardware options and hardware design
- Describe UCS connectivity for LAN and SAN
- Describe design aspects of UCS servers, networking, and hardware
- Describe physical design of modern data centers and different network types
- Describe the storage options for the compute function and the different RAID levels from a high-availability and performance perspective
- Describe Fibre Channel concepts and architecture
- Describe Fibre Channel concepts and architecture
- Describe Fibre Channel topologies and design
- Describe the hyperconverged solution and integrated systems
- Describe security threats and solutions in the data center
- Describe advanced data center security technologies and best practices
- Describe security options in the storage network
- Describe RBAC and integration with directory servers to control access rights on UCS Manager
- Describe key concepts in artificial intelligence, focusing on traditional AI, machine learning, and deep learning techniques and their applications.
- Describe generative AI, its challenges, and future trends, while examining the nuances between traditional and modern AI methodologies
- Explain how AI enhances network management and security through intelligent automation, predictive analytics, and anomaly detection
- Describe the importance of AI-specific hardware in reducing training times and supporting the advanced processing requirements of AI tasks
- Describe key network challenges from the perspective of AI/ML application requirements
- Explain the mechanisms and operations of RDMA and RoCE protocols
- Describe the role of optical and copper technologies in enabling AI/ML data center workloads
- Understand the compute hardware required to run AI/ML solutions
- Describe sustainable AI infrastructure practices, focusing on environmental and economic sustainability
- Describe Cisco network management models and license management approaches
- Provide learners with knowledge and skills to manage and automate compute infrastructure lifecycle using Cisco Intersight and related platforms for scalable, secure hybrid data centers
- Gain expertise in orchestrating, automating, and monitoring modern data center networks using Cisco Nexus Dashboard and its suite of integrated

services
- Describe the design considerations of datacenter automation through programmability
- Analyze and plan for using orchestration with Ansible and Terraform to deploy, configure and operate Cisco data centers

## Who Needs to Attend

- Network Designers
- Network Administrators
- Network Engineers
- Systems Engineers
- Data Center Engineers
- Consulting Systems Engineers
- Technical Solutions Architects
- Cisco Integrators and Partners
- Server Administrators
- Network Managers
- Storage Administrators
- Program Managers
- Project Managers

## Prerequisites

There are no prerequisites for this training. However, the knowledge and skills you are recommended to have before attending this training are:

- Implement data center networking, including Local Area Network (LAN) and Storage Area Network (SAN)
- Describe data center storage
- Implement data center virtualization
- Implement Cisco Unified Computing System
- Implement data center automation and orchestration with the focus on Cisco Application Centric Infrastructure (ACI), Cisco Nexus Dashboard, and Cisco Intersight
- Describe products in the Cisco Data Center Nexus and Multilayer Director Switch (MDS) families

These skills can be found in the following Cisco Learning Offerings:

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|---|---|---|
| CLASSROOM LIVE | $4,095 USD | 5 Day |

## Classroom Live Outline

**Section 1: Data Center Topologies**

- Data Center Traffic Flows
- SANs
- Access Layer
- Aggregation Layer
- Core Layer
- Spine-and-Leaf Topology
- Data Center Network Hardware
- Practice Activity: Design a Data Center Topology for a Customer

**Section 2: Layer 1 C**

- Layer I Connectivity
- Direct-Connect vs. Distributed Cabling
- EoR vs. MoR vs. ToR
- Optical and Copper Cabling
- Ethernet Cables
- InfiniBand Cables
- Organizing Data Center Cabling

**Section 3: Data Center Redundancy**

- Redundancy Options
- Hardware-Based High Availability
- DC Ethernet Extensions over Optical Connections
- Ethernet Extensions over MPLS
- Ethernet Extensions over IP

**Section 4: Layer 2 Connectivity**

- Loop Prevention Mechanisms

- Lossless Fabric Design
- Layer 2 High Availability
- Practice Activity: Design vPCs

**Section 5: Layer 3 Connectivity**

- Layer 3 Redundancy
- Exchanging Layer 3 Information
- Layer 3 Scalability and Robustness
- Practice Activity: Design FHRP
- Practice Activity: Design Routing Protocols

**Section 6: Virtual Resources**

- Virtual Infrastructure
- Device Virtualization
- Server Virtualization Defined
- Virtual Machine
- Hypervisor
- Container Engine
- Virtual Networks
- Virtual Infrastructure Deployment Options

**Section 7: Overlay Networks**

- Types of Overlays
- Layer 2 and Layer 3 VXLAN Overlay
- VXLAN Overlay
- VXLAN MP-BGP EVPN Control Plane
- VXLAN Data Plane
- VXLAN EVPN Multisite
- Cisco ACI Architecture
- Overlay Network Design
- Practice Activity: Design Your VXLAN Network

**Section 8: Fabric Interconnect Connectivity**

- Fabric Interconnect Interfaces
- Southbound Connections
- Northbound Connections
- Practice Activity: Design a Cisco UCS Fabric Interconnect Network and Storage Connectivity

**Section 9: Cisco Unified Computing System Server Options**

- Cisco UCS Server Platforms
- Cisco UCS B-Series Blade Servers
- Cisco UCS C-Series Rack Servers
- Cisco UCS X-Series Modular Systems
- Practice Activity: Design a Cisco UCS-X Direct Solution

**Section 10: Cisco UCS Network Design**

- Virtual Network Overview

- LAN Connectivity Controls
- Fabric Selection and Failover
- SAN Connectivity Controls
- Virtual Access Layer
- Cisco UCS Traffic Management
- Practice Activity: Design Network-Specific Adapters and Policies in a Cisco UCS Solution

**Section 11: Cisco Unified Computing System Server Design**

- Cisco UCS Hardware Abstraction
- Cisco UCS Server Management
- Cisco UCS Server Centralized Management
- Practice Activity: Design a Cisco UCS C-Series Server Implementation

**Section 12: Cisco Unified Computing System Configuration**

- UCS Pool Concepts
- Practice Activity: Design Pools for Service Profiles in a Cisco UCS Solution
- Cisco UCS Policies

**Section 13: Storage Options and Design**

- Direct Attached Storage
- Network-Attached Storage
- SAN Storage
- Hyperconverged Storage
- S3-Compatible Storage
- Storage Technology Design

**Section 14: Fibre Channel Networks**

- Fibre Channel Connections, Layers, and Addresses
- Fibre Channel Concepts
- Fibre Channel Communication
- FSPF Routing

**Section 15: Storage Virtualization**

- Virtualization in Fibre Channel SAN
- NPV Mode and Fibre Channel Switching Mode Comparison
- Storage SAN Virtualization
- Storage Trunking and Fibre Channel Port Channels

**Section 16: Fibre Channel Topologies**

- SAN Topologies
- Fibre Channel Oversubscription
- Fibre Channel Core-Edge Design
- Fibre Channel Collapsed Core-Edge Design
- Fibre Channel Edge-Core-Edge Design
- Fibre Channel Design Solutions
- Fibre Channel SAN Extension Solutions
- Scale Numbers on Cisco MDS Series Switches

- Practice Activity: Design a Fibre Channel Network

**Section 17: Hyperconverged and Integrated Systems**

- Hyperconverged and Integrated Systems Overview
- Converged and Hyperconverged Systems Storage Design
- Cisco Integrated Systems
- Cisco Hyperconverged Systems
- Describe Considerations for designing Cisco hyperconverged system

**Section 18: Basic Data Center Security**

- Threat Mitigation
- Attack and Countermeasure Examples
- Management Plane Security
- Control Plane Protection
- Cisco Nexus RBAC and AAA
- Alternative Authentication Methods
- Two-Factor Authentication

**Section 19: Advanced Data Center Security**

- Cisco TrustSec Overview
- Cisco TrustSec Operation
- Firewalls
- Positioning the Firewall Within Data Center Networks
- Cisco Secure Firewall Portfolio
- Firewall Virtualization
- Threat Mitigation Design

**Section 20: Storage Security**

- Common SAN Security Features
- Zones
- SAN Security Enhancements
- Cryptography in SAN
- Practice Activity: Design a Secure SAN

**Section 21: Cisco Unified Computing System Role-Based Access Control**

- Cisco UCS AAA
- Cisco Intersight Organizational Structure
- Cisco Intersight Users and Identity Providers
- Cisco Intersight RBAC
- Practice Activity: Design an LDAP Integration with a Cisco Intersight PVA

**Section 22: Fundamentals of AI**

- Traditional AI
- Traditional AI Process Flow
- Traditional AI Challenges
- Modern Applications of Traditional AI
- Machine Leaming vs. Deep Learning
- ML vs. DL Techniques and Methodologies

- ML vs. DL Applications and Use Cases

**Section 23: Generative AI**

- Generative AI
- Generative Adversarial Frameworks
- GenAI Use Cases
- Generative AI Inference Challenges
- GenAI Challenges and Limitations
- GenAI Bias and Fairness
- GenAI Resource Optimization

**Section 24: AI Use Cases**

- Analytics
- Network Optimization
- Network Automation and Self-Healing Networks
- Capacity Planning and Forecasting
- Cybersecurity
- Predictive Risk Management
- Threat Detection
- Incident Response
- Collaboration and Communication
- Internet of Things (IoT)

**Section 25: AI-Enabling Hardware**

- CPUs, GPUs, and DPUs
- GPU Overview
- NVIDIA GPUs for AI/ML
- Intel GPUs for AI/ML
- DPU Overview
- SmartNIC Overview
- Cisco Nexus SmartNIC Family
- NVIDIA BlueField SuperNIC

**Section 26: Key Network Challenges and Requirements for AI Workloads**

- Bandwidth and Latency Considerations
- Scalability Considerations
- Nonblocking Lossless Fabric
- Congestion Management Considerations

**Section 27: Application-Level Protocols**

- RDMA Fundamentals
- RDMA Architecture
- RDMA Operations
- RDMA over Converged Ethernet > NEW title RoCE/RoCEv2

**Section 28: AI Transport**

- Ethernet Connectivity
- InfiniBand Connectivity

- Hybrid Connectivity

**Section 29: AI Compute Resources**

- Compute Hardware Overview
- GPU Sharing
- Total Cost of Ownership
- AI/ML Clustering

**Section 30: AI Sustainability**

- Green AI vs. Red AI
- Cost Optimization
- AI Accelerators
- Power and Cooling

**Section 31: Network and License Management**

- Management Design
- License Management

**Section 32: Compute Management and Orchestration**

- Cisco Intersight
- Cisco Intersight Editions
- Cisco Intersight Licensing
- Cisco Intersight Automation

**Section 33: Network Orchestration**

- Introduction to Cisco Nexus Dashboard Platform
- Cisco Nexus Dashboard Fabric Controller
- Cisco Nexus Dashboard Insights
- Cisco Nexus Dashboard Orchestrator

**Section 34: Data Center Programmability and Automation**

- Model-Driven Programmability Overview
- NETCONF and RESTCONF Protocols
- Cisco NX-API Overview
- Programmability Using Python
- Cisco Intersight Programmability

**Section 35: Infrastructure as Code Automation**

- Ansible Orchestration
- Terraform Orchestration
- Utilization of Terraform

## Classroom Live 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

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| VIRTUAL CLASSROOM LIVE | $4,095 USD | 5 Day |

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- Access Layer
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- Core Layer
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- AI/ML Clustering

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- AI Accelerators
- Power and Cooling

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- License Management

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- Cisco Intersight Automation

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- Introduction to Cisco Nexus Dashboard Platform
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- Cisco Nexus Dashboard Insights
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**Section 34: Data Center Programmability and Automation**

- Model-Driven Programmability Overview
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- Cisco Intersight Programmability

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- Ansible Orchestration
- Terraform Orchestration
- Utilization of Terraform

## Virtual Classroom Live 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

Feb 23 - 27, 2026 | 8:30 AM - 4:30 PM EST

Apr 20 - 24, 2026 | 8:30 AM - 4:30 PM EDT

Jun 22 - 26, 2026 | 8:30 AM - 4:30 PM EDT

Aug 24 - 28, 2026 | 8:30 AM - 4:30 PM EDT

Oct 26 - 30, 2026 | 8:30 AM - 4:30 PM EDT

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| ON-DEMAND | $1,500 USD |

## On-Demand Outline

- 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 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 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 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 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
- 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

## On-Demand Labs

- Design Virtual Port Channels
- Design First Hop Redundancy Protocol (FHRP)

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