

CCIE Data Center Unified Exam Topics v2.1

The Cisco CCIE® Data Center version 2.1 unifies written and lab exam topics documents into a unique curriculum, while explicitly disclosing which domains pertain to which exam, and relative weight of each domain.

The Cisco CCIE Data Center written exam version 2.1 (400-151) validates the expertise that candidates to have to design, implement, diagnose, and troubleshoot advanced data center technologies. Candidates must understand the requirements of data centers and how different components in the data center interoperate, and must be able to translate that understanding into the device configurations. The exam is a two-hour test with 90 to 110 questions. The exam is closed book, and no outside reference materials are allowed.

The Cisco CCIE Data Center lab exam version 2.1 is an eight-hour, hands-on exam that requires a candidate to configure, diagnose, and troubleshoot a series of complex data center scenarios for a given specification. Troubleshooting is an important skill, and candidates are expected to diagnose and solve issues as part of the CCIE lab exam.

The following topics are general guidelines for the content likely to be included on the exam. However, other related topics may also appear on any specific delivery of the exam. To better reflect the contents of the exam or to improve clarity, the guidelines below may change at any time without notice.

*NOTE: This CCIE Data Center unified exam topics version 2.1 includes Evolving Technologies version 1.1 domain and should be referenced for written exams scheduled **on** August 30, 2018 and beyond.*

Domain Number	Domain	Written Exam Percentage (%)	Lab Exam Percentage (%)
1.0	Data Center Layer 2/Layer 3 Connectivity	25	28
2.0	Data Center Network Services	15	17
3.0	Data Center Storage Networking and Compute	18	20
4.0	Data Center Automation and Orchestration	10	10
5.0	Data Center Fabric Infrastructure	22	25
6.0	Evolving Technologies	10	N/A
Total %		100	100

- 1.0 Data Center Layer 2/Layer 3 Connectivity**
 - 1.1 Design, implement, and troubleshoot Layer 2 technologies
 - 1.1.a Link aggregation
 - 1.1.b Tagging/trunking
 - 1.1.c Spanning Tree Protocol
 - 1.2 Design, implement, and troubleshoot overlays
 - 1.2.a VXLAN
 - 1.2.b EVPN
 - 1.2.c OTV
 - 1.3 Design, implement, and troubleshoot routing protocols and features

- 1.3.a OSPF
- 1.3.b IS-IS
- 1.3.c BGP
- 1.3.d BFD
- 1.3.e FHRP
- 1.4 Design, implement, and troubleshoot multicast protocols
 - 1.4.a PIM
 - 1.4.b IGMP
- 1.5 Describe interfabric connectivity
 - 1.5.a Multipod
 - 1.5.b Multisite
- 1.6 Design, implement, and troubleshoot external fabric connectivity
 - 1.6.a L2/L3Out
 - 1.6.b VRF-Lite
- 1.7 Design, implement, and troubleshoot traffic management
 - 1.7.a Queueing
 - 1.7.b Policing
 - 1.7.c Classification/marketing
 - 1.7.d RoCE

2.0 Data Center Network Services

- 2.1 Design, implement, and troubleshoot network services insertion and redirection
 - 2.1.a Policy-based routing
 - 2.1.b Policy-based redirection
 - 2.1.c VRF stitching
 - 2.1.d BD/VLAN stitching
- 2.2 Design, implement, and troubleshoot services
 - 2.2.a PTP
 - 2.2.b NTP
 - 2.2.c DNS
 - 2.2.d DHCP
- 2.3 Design, implement, and troubleshoot RBAC
 - 2.3.a RADIUS
 - 2.3.b TACACS+
 - 2.3.c LDAP
 - 2.3.d AAA
- 2.4 Design, implement, and troubleshoot maintenance tasks
 - 2.4.a Backup and restore
 - 2.4.b Firmware upgrades and downgrades
- 2.5 Design, implement, and troubleshoot monitoring services
 - 2.5.a Flow export
 - 2.5.b SPAN
 - 2.5.c SNMP
 - 2.5.d Syslog
- 2.6 Design, implement, and troubleshoot security features
 - 2.6.a CoPP
 - 2.6.b Storm control
 - 2.6.c ACLs
 - 2.6.d First-hop security

- 2.6.e Contracts
- 2.6.f Port security
- 2.6.g MACsec
- 2.6.h Private VLANs

3.0 Data Center Storage Networking and Compute

- 3.1 Describe, configure, and troubleshoot infrastructure to support block storage protocols
 - 3.1.a Fibre Channel
 - 3.1.b FCoE
 - 3.1.c iSCSI
- 3.2 Design, implement, and troubleshoot data center storage networking features
 - 3.2.a Zoning
 - 3.2.b NPV/NPIV
- 3.3 Design, implement, and troubleshoot compute policies and profiles
 - 3.3.a Cisco UCS Manager
 - 3.3.b Cisco Intersight
- 3.4 Design, implement, and troubleshoot data center connectivity
 - 3.4.a SAN/LAN uplinks
 - 3.4.b Rack server integration
 - 3.4.c Fabric ports
 - 3.4.d Appliance ports

4.0 Data Center Automation and Orchestration

- 4.1 Implement and troubleshoot data center tasks using provided Python scripts
 - 4.1.a Create, read, update, delete using RESTful APIs
 - 4.1.b Deploy and modify configurations
 - 4.1.c Data collection and statistics
- 4.2 Describe and design data center orchestration using tools
 - 4.2.a Cisco Intersight
 - 4.2.b Cisco UCS Director
 - 4.2.c Cisco CloudCenter

5.0 Data Center Fabric Infrastructure

- 5.1 Configure and troubleshoot physical fabric components
 - 5.1.a Fabric discovery
 - 5.1.b Controllers/network managers
 - 5.1.c Switches
- 5.2 Design, implement, and troubleshoot fabric policies
 - 5.2.a Access policies
 - 5.2.b Layer 2/Layer 3 multitenancy
 - 5.2.c Troubleshooting policies
 - 5.2.d Monitoring policies
- 5.3 Design, implement, and troubleshoot tenant policies
 - 5.3.a Application profiles
 - 5.3.b Networking
 - 5.3.c Security
- 5.4 Analyze and troubleshoot logical fabric elements
 - 5.4.a Faults
 - 5.4.b Events

- 5.4.c Health indicators
- 5.5 Design, implement, and troubleshoot virtual networking
 - 5.5.a Cisco AVE
 - 5.5.b vSphere Distributed Switch
 - 5.5.c Hyper-V switch

6.0 Evolving Technologies v1.1

- 6.1 Cloud
 - 6.1.a Compare and contrast public, private, hybrid, and multicloud design considerations
 - 6.1.a (i) Infrastructure, platform, and software as a service (XaaS)
 - 6.1.a (ii) Performance, scalability, and high availability
 - 6.1.a (iii) Security implications, compliance, and policy
 - 6.1.a (iv) Workload migration
 - 6.1.b Describe cloud infrastructure and operations
 - 6.1.b (i) Compute virtualization (containers and virtual machines)
 - 6.1.b (ii) Connectivity (virtual switches, SD-WAN and SD-Access)
 - 6.1.b (iii) Virtualization functions (NFVi, VNF, and L4/L6)
 - 6.1.b (iv) Automation and orchestration tools (CloudCenter, DNA-center, and Kubernetes)
- 6.2 Network programmability (SDN)
 - 6.2.a Describe architectural and operational considerations for a programmable network
 - 6.2.a (i) Data models and structures (YANG, JSON and XML)
 - 6.2.a (ii) Device programmability (gRPC, NETCONF and RESTCONF)
 - 6.2.a (iii) Controller based network design (policy driven configuration and northbound/southbound APIs)
 - 6.2.a (iv) Configuration management tools (agent and agentless) and version control systems (Git and SVN)
- 6.3 Internet of things (IoT)
 - 6.3.a Describe architectural framework and deployment considerations for IoT
 - 6.3.a (i) IoT technology stack (IoT Network Hierarchy, data acquisition and flow)
 - 6.3.a (ii) IoT standards and protocols (characteristics within IT and OT environment)
 - 6.3.a (iii) IoT security (network segmentation, device profiling, and secure remote access)
 - 6.3.a (iv) IoT edge and fog computing (data aggregation and edge intelligence)

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