CCIE Data Center Written Exam (350-080) version 1.0

Exam Description: The Cisco CCIE® Data Center Written Exam (350-080) version 1.0 is a 2-hour test with 80–110 questions that will validate that a data center engineer has expert knowledge about planning, designing, implementing, operating, and troubleshooting Cisco data center technologies. The exam is closed book and no outside reference materials are allowed.

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. In order to better reflect the contents of the exam and for clarity purposes, the guidelines below may change at any time without notice.

10% 1.0 Cisco Data Center Architecture
1.1 Describe the Cisco data center architecture
1.2 Describe the products that are used in the Cisco data center architecture
1.3 Describe the Cisco unified I/O solution in access layer
1.4 Determine which platform to select for use in the different data center layers

20% 2.0 Cisco Data Center Infrastructure—Cisco NX-OS
2.1 Describe Cisco NX-OS features
   2.1.a Describe the architecture of Cisco NX-OS
   2.1.b Describe Cisco NX-OS process recovery
   2.1.c Describe Cisco NX-OS supervisor redundancy
   2.1.d Describe Cisco NX-OS systems file management
   2.1.e Describe Virtual Output Queuing (VOQ)
   2.1.f Describe virtual device contexts (VDCs)
   2.1.g Configure and troubleshoot VDCs
   2.1.h Describe fabric extension via the Cisco Nexus family
2.2 Design and implement Cisco NX-OS Layer 2 and Layer 3 functionality
   2.2.a Describe VLANs
   2.2.b Describe PVLANs
   2.2.c Describe Spanning Tree protocols
   2.2.d Describe port channels and virtual port channels
   2.2.e Compare and contrast vPC options
   2.2.f Describe basic features of routing protocols in a data center environment
   2.2.g Implement jumbo frames end-to-end in a data center
   2.2.h Describe Cisco FabricPath
   2.2.i Describe VRF-Lite in a data center environment
2.2. Validate configurations and troubleshoot problems and failures using command line, show, and debug commands.

2.3 Describe multicast
2.3.a Describe multicast operation in a data center environment
2.3.b Describe basic PIM configuration
2.3.c Describe IGMP operation and configuration on the Cisco Nexus platform
2.3.d Validate configurations and troubleshoot problems and failures using command line, show, and debug commands

2.4 Describe basic Cisco NX-OS security features
2.4.a Describe AAA services
2.4.b Describe RBAC, SSH, and SNMPv3
2.4.c Describe control plane protection and hardware rate limiting
2.4.d Describe IP ACLs, MAC ACLs, and VLAN ACLs
2.4.e Describe port security
2.4.f Describe DHCP snooping, dynamic ARP inspection and IP source guard
2.4.g Validate configurations and troubleshoot problems and failures using command line, show, and debug commands

2.5 Implement Cisco NX-OS high-availability features
2.5.a Describe first-hop routing protocols
2.5.b Describe graceful restart and nonstop forwarding
2.5.c Describe OTV
2.5.d Describe the ISSU process
2.5.e Validate configurations and troubleshoot problems and failures using command line, show, and debug commands

2.6 Implement Cisco NX-OS management
2.6.a Describe Cisco DCNM LAN features
2.6.b Implement SPAN and ERSPAN
2.6.c Implement embedded Ethernet analyzer and NetFlow
2.6.d Describe XML for network management and monitoring
2.6.e Describe SNMP for network management and monitoring
2.6.f Describe and implement EEM
2.6.g Describe configuration management in Cisco Data Center Network Manager
2.6.h Describe Smart Call Home
2.6.i Detail connectivity and credentials that are required for Cisco DCNM
2.6.j Validate configurations and troubleshoot problems and failures using command line, show, and debug commands

15% 3.0 Cisco Storage Networking
3.1 Describe standard-based SAN protocols
3.1.a Describe Fibre Channel standards and protocols
3.1.b Describe SCSI standards and protocols
3.1.c Describe iSCSI standards and protocols
3.1.d Describe FCIP standards and protocols
3.2 Implement the features of Fibre Channel protocols
   3.2.a Describe port channel, ISL, trunking, and VSANs
   3.2.b Design basic and enhanced zoning
   3.2.c Describe Fibre Channel domain parameters
   3.2.d Describe Cisco Fabric services and benefits
   3.2.e Design and implement proper oversubscription in a Fibre Channel environment
   3.2.f Validate proper configuration of Fibre Channel storage-based solutions

3.3 Implement IP storage-based solution
   3.3.a Implement FCIP
   3.3.b Describe iSCSI and its features
   3.3.c Validate proper configuration of IP storage-based solutions

3.4 Design and describe Cisco NX-OS Unified Fabric features
   3.4.a Describe Fibre Channel features in the Cisco NX-OS environment
   3.4.b Describe Fibre Channel over Ethernet protocol and technology
   3.4.c Design and implement data center bridging protocol and lossless Ethernet
   3.4.d Design and implement QoS features
   3.4.e Describe NPV and NPIV features in a Cisco Unified Fabric environment
   3.4.f Describe FCoE NPV features
   3.4.g Describe different Cisco Unified Fabric Switch modes of operations
   3.4.h Describe multihop FCoE
   3.4.i Describe and configure universal ports
   3.4.j Validate configurations and troubleshoot problems and failures using command line, show, and debug commands

3.5 Design high-availability features in a standalone server environment
   3.5.a Describe server-side high availability in the Cisco Unified I/O environment
   3.5.b Describe the converged network adapter that is used in FCoE topologies
   3.5.c Configure NIC teaming

3.6 Implement SAN management
   3.6.a Describe device manager for element management
   3.6.b Describe configuration management in Cisco Data Center Network Manager
   3.6.c Describe the connectivity and credentials that are required for DCNM-SAN
   3.6.d Describe how to monitor and trend utilization with the DCNM Dashboard

20% 4.0 Cisco Data Center Virtualization
   4.1 Implement data center virtualization with Cisco Nexus 1000V
     4.1.a Describe the Cisco Nexus 1000V and its role in a virtual server network environment
     4.1.b Describe VEM on Cisco Nexus 1000V
4.1.c Describe VSM
4.1.d Describe the Cisco Nexus 1010 physical appliance and components
4.1.e Describe port profiles and use cases in Cisco Nexus 1000V
4.1.f Describe QoS, traffic flow and IGMP snooping in Cisco Nexus 1000V
4.1.g Describe network monitoring on Cisco Nexus 1000V
4.1.h Explain the benefits of DHCP snooping in a VDI environment
4.1.i Describe how to intercept traffic using Cisco vPath and its benefits
4.1.j Describe and implement Cisco Nexus 1000V port channels
4.1.k Describe Virtual Service Domain
4.1.l Validate configurations and troubleshoot problems and failures using command line, show, and debug commands

30% 5.0 Cisco Unified Computing System
5.1 Cisco UCS components and architecture
5.1.a Describe Cisco UCS components and architecture
5.1.b Describe the Cisco UCS server deployment and implementation model
5.1.c Describe Cisco UCS management features
5.1.d Describe Cisco UCS connectivity from both LAN and SAN perspectives
5.1.e Describe Cisco UCS high availability
5.1.f Describe what the capability catalog is and how it is used
5.1.g Describe Cisco UCS C-Series integration
5.1.h Describe the functional differences between physical and virtual adapters

5.2 Describe LAN connectivity in a Cisco UCS environment
5.2.a Describe fabric interconnect for LAN connectivity
5.2.b Implement server and uplink ports
5.2.c Describe end-host mode
5.2.d Implement Ethernet switching mode
5.2.e Implement VLANs and port channels
5.2.f Implement pinning and PIN groups
5.2.g Describe disjoint Layer 2 and design considerations
5.2.h Describe QoS options and configuration restrictions
5.2.i Design and verify scalable Cisco UCS systems

5.3 Describe and implement SAN connectivity in a Cisco UCS environment
5.3.a Describe fabric interconnect for SAN connectivity
5.3.b Describe end-host mode
5.3.c Implement NPIV
5.3.d Implement Fibre Channel switch mode
5.3.e Implement Fibre Channel ports for SAN connectivity
5.3.f Implement vHBA
5.3.g Implement VSANs
5.3.h Implement SAN port channels
5.3.i Describe and implement direct-attach storage connectivity options
5.3.j Describe and implement Fibre Channel trunking and SAN pinning

5.4 Describe Cisco UCS resources
5.4. Describe service profiles in Cisco UCS, including templates and contrast with cloning
5.4.b Describe server resource pools
5.4.c Implement updating and initial templates
5.4.d Describe boot from remote storage
5.4.e Detail best practices for creating pooled objects
5.4.f Explain how to use the Cisco UCS KVM with VMedia and session management
5.4.g Describe local disk options and configuration protection
5.4.h Describe power control policies and their effects

5.5 Describe role-based access control management groups
5.5.a Understand Cisco UCS management hierarchy using ORG (Organization) and RBAC (Role Based Access Control)
5.5.b Describe roles and privileges
5.5.c Implement integrated authentication

5.6 Cisco UCS troubleshooting and maintenance
5.6.a Understand backup and restore procedures in a Cisco UCS environment
5.6.b Manage high availability in a Cisco UCS environment
5.6.c Describe monitoring and analysis of system events
5.6.d Implement external management protocols
5.6.e Analyze statistical information
5.6.f Understand the system upgrade procedure for Cisco UCS components
5.6.g Describe how to manage BIOS settings
5.6.h Describe memory extension technology

5.6.0 Cisco Application Networking Services
6.1 Data center application high availability and load balancing
6.1.a Describe standard ACE features for load balancing
6.1.b Describe different server load-balancing algorithms
6.1.c Describe health monitoring and use cases
6.1.d Describe Layer 7 load balancing
6.1.e Describe sticky connections
6.1.f Understand SSL offload in an SLB environment
6.1.g Describe protocol optimization
6.1.h Describe route health injection
6.1.i Describe server load-balancing virtual context and HA
6.1.j Describe server load-balancing management options

6.2 Global load balancing
6.2.a Describe the basic DNS resolution process
6.2.b Describe the benefits of the Cisco global load-balancing solution
6.2.c Describe how the Cisco global load-balancing solution integrates with local Cisco load balancers
6.2.d Implement a Cisco global load-balancing solution into an existing network infrastructure