CCIE Data Center Written Exam Topics (19-03-2012)

The topic areas listed are general guidelines for the type of content that is likely to appear on the exam. Please note, however, that other relevant or related topic areas may also appear.

All exam materials are provided and no outside reference materials are allowed.

Exam Sections and Sub-task Objectives

Cisco Data Center Architecture

- Describe the Cisco Data Center Architecture
- Describe the products used in the Cisco Data Center Architecture
- Describe Cisco unified I/O solution in access layer
- Determine which platform to select for use in the data center different layers

Cisco Data Center Infrastructure—NX-OS

- Describe NX-OS features
  Describe the architecture of NX-OS
  Describe NX-OS Process Recovery
  Describe NX-OS Supervisor Redundancy
  Describe NX-OS Systems file management
  Describe Virtual Output Queuing (VoQ)
  Describe Virtual Device Contexts
  Configure and Troubleshoot VDCs
  Describe fabric extension via the nexus family

- Design and implement NX-OS Layer 2 and Layer 3 functionality
  Describe VLANs
  Describe PVLANs
  Describe Spanning-Tree Protocols
  Describe Port-Channels and Virtual Port Channels
  Compare and contrast VPC options
  Describe basic features of routing protocols in a data center environment
  Implement jumbo frames end-to-end in a data center
  Describe FabricPath
  Describe VRF lite in a data center environment
  Validate configurations and troubleshoot problems and failures using command line, show and debug commands.

- Describe Multicast
  Describe Multicast Operation in a data center environment
  Describe Basic PIM configuration
  Describe IGMP operation and configuration on the Nexus Platform
  Validate Configurations and troubleshoot problems and failures using command line, show and debug commands

- Describe basic NX-OS Security features
  AAA Services
  RBAC, SSH, and SNMPv3
  Control Plane Protection and Hardware Rate Limiting
  IP ACLs, MAC ACLs, and VLAN ACLs
  Port Security
  DHCP Snooping, Dynamic ARP Inspection, and IP Source Guard
  Validate configurations and troubleshoot problems and failures using command line, show and debug commands

- Implement NX-OS high availability features
  Describe First-Hop Routing Protocols
  Describe Graceful Restart and nonstop forwarding
  Describe OTV
  Describe the ISSU process
  Validate configurations and troubleshoot problems and failures using command line, show and debug commands

- Implement NX-OS management
  Describe DCNM LAN features
  Implement SPAN and ERSPAN
  Implement embedded Ethernet analyzer and Netflow
  Describe XML for network management and monitoring
  Describe SNMP for network management and monitoring
  Describe Implement Embedded Event Management
  Describe configuration management in Data Center Network Manager
  Describe Smart Call Home
  Detail connectivity and credentials required for Data Center Network Manager
  Validate configurations and troubleshoot problems and failures using command line, show and debug commands

Cisco Storage Networking

- Describe Standard-based SAN Protocols
  Describe Fiber Channel Standards and protocols
  Describe SCSI standards and protocols
  Describe iSCSI standards and protocols
  Describe FCIP standards and protocols

- Implement Fiber Channel Protocols features
  Describe Port Channel, ISL, trunking and VSANs
  Design basic and enhanced zoning
  Describe FC domain parameters
  Describe Cisco Fabric services and benefits
  Design and implement proper oversubscription in an FC environment
  Validate proper configuration of FC storage based solutions

- Implement IP Storage based solution
  Implement FC over IP (FCIP)
  Describe iSCSI and its features
  Validate proper configuration of IP Storage based solutions

- Design and describe NX-OS Unified Fabric features
  Describe Fiber Channel features in the NX-OS environment
  Describe Fiber Channel over Ethernet Protocol and technology
  Design and implement data center bridging protocol and lossless Ethernet
  Design and implement QoS features
  Describe NPV and NPIV features in a Unified Fabric environment
  Describe FCoE NPV features
  Describe Unified Fabric Switch different modes of operations
  Describe multihop FCoE
  Describe and configure universal ports
  Validate configurations and troubleshoot problems and failures using command line, show and debug commands

- Design high availability features in a standalone server environment
  Describe server-side high availability in the Cisco Unified I/O environment
  Describe Converged Network Adapter used in FCoE topologies
  Configuring NIC teaming

- Implement SAN management
  Describe Device Manager for element management
  Describe configuration management in Data Center Network Manager
  Describe connectivity and credentials required for DCNM-SAN
  Describe how to monitor and trend utilization with DCNM Dashboard

Cisco Data Center Virtualization

- Implement Data Center Virtualization with Nexus1000v
  Describe the Cisco Nexus1000v and its role in a virtual server network environment
  Describe Virtual Ethernet Module (VEM) on Nexus1000v
  Describe Virtual Supervisor Module (VSM)
  Describe the Cisco Nexus 1010 physical appliance and components
  Describe Port Profiles and use cases in Nexus1000v
  Describe QoS, Traffic Flow and IGMP Snooping in Nexus1000v
  Describe Network monitoring on Nexus1000v
  Explain the benefits of DHCP snooping in a VDI environment
  Describe how to intercept traffic using Vpath and its benefits
  Describe and implement Nexus1000v port channels
  Describe Virtual Service Domain
  Validate configurations and troubleshoot problems and failures using command line, show and debug commands

Cisco Unified Computing

- Unified Computing System components and architecture
  Describe Cisco Unified Computing System components and architecture
  Describe the Cisco Unified Computing server deployment and implementation model
  Describe Cisco UCS Management features
  Describe Cisco UCS Connectivity from both LAN and SAN perspective
  Describe Cisco UCS High Availability
  Describe what the capability catalog is and how it is used
  Describe Cisco UCS C Series Integration
  Describe the functional differences between physical and virtual adaptors

- Describe LAN connectivity in a Cisco Unified Computing environment
  Describe Fabric Interconnect for LAN connectivity
  Implement server and uplink ports
  Describe End Host Mode
  Implement Ethernet Switching Mode
  Implement VLANs and port channels
  Implement Pinning and PIN groups
  Describe Disjoint Layer 2 and design consideration
  Describe Quality of Service (QoS) options and configuration restrictions
  Design and verify scalable Cisco Unified computing systems

- Describe Implement SAN connectivity in a Cisco Unified Computing environment
  Describe Fabric Interconnect for SAN connectivity
  Describe End Host Mode
  Implement NPIV
  Implement FC Switch mode
  Implement FC ports for SAN connectivity
  Implement Virtual HBA (vHBA)
  Implement VSANs
  Implement SAN port channels
  Describe and implement direct attach Storage connectivity options
  Describe and implement FC trunking and SAN pinning

- Describe Cisco Unified Computing Server resources
  Describe Service Profiles in Cisco UCS including templates and contrast with cloning
  Describe Server Resource Pools
  Implement updating and initial templates
  Describe Boot From remote storage
  Detail best practices for creating pooled objects
  Explain how to use the Cisco UCS KVM with Vmedia and session management
  Describe local disk options and configuration protection
  Describe power control policies and their effects

- Describe role-based Access Control Management Groups
  Understand Cisco UCS Management Hierarchy using ORG and RBAC
  Describe roles and privileges
  Implement integrated authentication

- Cisco Unified Computing troubleshooting and maintenance
  Understand backup and restore procedures in a unified computing environment
  Manage high availability in a Cisco Unified Computing environment
  Describe monitoring and analysis of system events
  Implement External Management Protocols
  Analyze statistical information
  Understand Cisco Unified Computing components system upgrade procedure
  Describe how to manage BIOS settings
  Describe memory extension technology

Cisco Application Networking Services—ANS

- Data center application high availability and load balancing
  Describe standard ACE features for load balancing
  Describe different Server Load Balancing Algorithm
  Describe health monitoring and use cases
  Describe Layer 7 load balancing
  Describe sticky connections
  Understand SSL offload in SLB environment
  Describe Protocol Optimization
  Describe Route Health Injection (RHI)
  Describe Server load balancing Virtual Context and HA
  Describe Server load balancing management options

- Global load balancing
  Describe basic DNS resolution process
  Describe the benefits of the Cisco Global Load Balancing Solution
  Describe how the Cisco Global Load Balancing Solution integrate with local Cisco load balancers
  Implement a Cisco Global Load Balancing Solution into an existing network infrastructure