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

Cisco Storage Networking

Validate configurations and troubleshoot problems and failures using command line, show and debug commands

• 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