CCNP (350-401 ENCOR)

IMPLEMENTING CISCO ENTERPRISE NETWORK CORE TECHNOLOGIES

ARCHITECTURE
• Explain the different design principles used in an enterprise network ✓ Enterprise network design such as Tier 2, Tier 3, and Fabric Capacity planning ✓ High availability techniques such as redundancy, FHRP, and SSO • Analyze design principles of a WLAN deployment ✓ Wireless deployment models (centralized, distributed, controller-less, controller based, cloud, remote branch) ✓ Location services in a WLAN design • Differentiate between on-premises and cloud infrastructure deployments • Explain the working principles of the Cisco SD-WAN solution ✓ SD-WAN control and data planes elements ✓ Traditional WAN and SD-WAN solutions • Explain the working principles of the Cisco SD-Access solution ✓ SD-Access control and data planes elements ✓ Traditional campus interoperating with SD-Access • Describe concepts of wired and wireless QoS ✓ QoS components ✓ QoS policy • Differentiate hardware and software switching mechanisms ✓ Process and CEF ✓ MAC address table and TCAM ✓ FIB vs. RIB

VIRTUALIZATION

- Describe device virtualization technologies
  - ✓ Hypervisor type 1 and 2
  - ✓ Virtual machine
  - ✓ Virtual switching
- Configure and verify data path virtualization technologies
  - ✓ VRF
  - ✓ GRE and IPsec tunnelling
- Describe network virtualization concepts
  - ✓ LISP
  - ✓ VXLAN

INFRASTRUCTURE

- Layer 2
  - ✓ Troubleshoot static and dynamic 802.1q trunking protocols
  - ✓ Troubleshoot static and dynamic EtherChannels
  - ✓ Configure and verify common Spanning Tree Protocols (RSTP and MST)
- Layer 3
  - Compare routing concepts of EIGRP and OSPF (advanced distance vector vs. linked state, load balancing, path selection, path operations, metrics)
  - ✓ Configure and verify simple OSPF environments, including multiple normal areas, summarization, and filtering (neighbor adjacency, point-to-point and broadcast network types, and passive interface)
  - ✓ Configure and verify eBGP between directly connected neighbors (best path selection algorithm and neighbor relationships)
- Wireless
  - ✓ Describe Layer 1 concepts, such as RF power, RSSI, SNR, interference noise, band and channels, and wireless client devices capabilities
  - ✓ Describe AP modes and antenna types
  - ✓ Describe access point discovery and join process (discovery algorithms, WLC selection process)
  - ✓ Describe the main principles and use cases for Layer 2 and Layer 3 roaming
  - ✓ Troubleshoot WLAN configuration and wireless client connectivity issues
- IP Services
  - ✓ Describe Network Time Protocol (NTP)
  - ✓ Configure and verify NAT/PAT
  - ✓ Configure first hop redundancy protocols, such as HSRP and VRRP
  - ✓ Describe multicast protocols, such as PIM and IGMP v2/v3

NETWORK ASSURANCE
• Diagnose network problems using tools such as debugs, conditional debugs, trace route, ping, SNMP, and syslog • Configure and verify device monitoring using syslog for remote logging • Configure and verify NetFlow and Flexible NetFlow • Configure and verify SPAN/RSPAN/ERSPAN • Configure and verify IPSLA • Describe Cisco DNA Center workflows to apply network configuration, monitoring, and management • Configure and verify NETCONF and RESTCONF
SECURITY
• Configure and verify device access control ✓ Lines and password protection ✓ Authentication and authorization using AAA • Configure and verify infrastructure security features ✓ ACLs ✓ CoPP • Describe REST API security • Configure and verify wireless security features ✓ EAP ✓ WebAuth ✓ PSK • Describe the components of network security design ✓ Threat defense ✓ Endpoint security ✓ Next-generation firewall ✓ TrustSec, MACsec ✓ Network access control with 802.1X, MAB, and WebAuth

AUTOMATION
• Interpret basic Python components and scripts • Construct valid JSON encoded file • Describe the high-level principles and benefits of a data modeling language, such as YANG • Describe APIs for Cisco DNA Center and vManage • Interpret REST API response codes and results in payload using Cisco DNA Center and RESTCONF • Construct EEM applet to automate configuration, troubleshooting, or data collection • Compare agent vs. agentless orchestration tools, such as Chef, Puppet, Ansible, and SaltStack

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