CCNA (200-301) + Cisco Security

The CCNA (200-301) + Cisco security mapped course is focused on giving a network engineer a firm understanding of networking and security fundamentals coupled with configuration and deployment of Cisco networks. Starting from the basics of IP addressing, the course builds up and progresses into virtualization and automation and covers everything in between including IPv6, routing, VPNs, security threats and mitigation with firewalls. This is the go-to course for those who want to kick start their career in networking.

Course Outline

CCNA (200-301)

- Network Fundamentals
- Network Access
    - LAN Switching Technologies
- WAN Technologies
- IP Addressing IPv4 and IPv6
- Easy Subnetting
- IP Connectivity
    - Describe the Routing Concepts
    - Routing Technologies
- Describe IP Services
- Security Fundamentals
- NAT Technologies
- Troubleshooting
- Virtualization, Automation and Programmability
- Virtual Machine Fundamentals
- Virtualization Components
- Automation Components
- TCL Scripts

CISCO Security

- Common Security threats and attacks
- Cisco IOS Firewall Technologies
- Implementing Security on Cisco Routers
- Implementing Security on Cisco Switches
- Securing Administrative Access Using AAA and RADIUS
- Configuration on User Privileges
- VPN Technologies
- Secure Network Management and Reporting

Course Curriculum

Network Fundamentals

- Compare & contrast OSI & TCP/IP models
- Compare & contrast TCP & UDP protocols
- Impact of infrastructure components in a network
    - Firewalls, Access points, Wireless controllers
- Effects of cloud resources on network architecture
    - Traffic path to internal and external cloud services
    - Virtual services
    - Basic virtual network infrastructure
- Compare & contrast collapsed core and three-tier architecture
- Compare & contrast network topologies

    - Star, Mesh, Hybrid
- Select the appropriate cabling type (Straight & Cross)
- Apply troubleshooting methodologies to resolve problems
    - Perform and document fault isolation
    - Resolve or escalate
    - Verify & monitor resolution
- Configure, verify & troubleshoot IPv4 addressing & subnetting
- Compare & contrast IPv4 address types
    - Unicast, Broadcast, Multicast
- Describe the need for private IPv4 addressing
- Identify IPv6 addressing to use in LAN / WAN environment
- Configure, verify & troubleshoot IPv6 addressing
- Configure & verify IPv6 Stateless Address Auto Configuration
- Compare & contrast IPv6 address types
    - Global unicast, Unique local, Link local, Multicast, Modified EUI 64, Autoconfiguration, Anycast

LAN Switching Technologies

- Describe & verify switching concepts
    - MAC learning & aging, Frame switching, Frame flooding, MAC address table
- Interpret Ethernet frame format
- Troubleshoot interface & cable issues (collisions, errors, duplex, speed)
- Configure, verify, and troubleshoot VLANs (normal/extended range) spanning multiple switches
    - Access ports (data & voice), Default VLAN
- Configure, verify, and troubleshoot interswitch connectivity
    - Trunk ports, Add & remove VLANs on a trunk
    - DTP, VTP (v1&v2), and 802.1Q Native VLAN
- Configure, verify, & troubleshoot STP protocols
    - STP mode (PVST+ and RPVST+), STP root bridge selection
- Configure, verify & troubleshoot STP related optional features
    - PortFast, BPDU guard
- Configure & verify Layer 2 protocols
    - Cisco Discovery Protocol, LLDP
- Configure, verify, & troubleshoot (Layer 2/Layer 3) EtherChannel
    - Static, PAGP, LACP
- Describe the benefits of switch stacking & chassis aggregation

Routing Technologies

- Describe the routing concepts
    - Packet handling along the path through a network
    - Forwarding decision based on route lookup
    - Frame rewrite
- Interpret the components of a routing table

    - Prefix, Network mask, Next hop, Routing protocol code
    - Administrative distance, Metric
    - Gateway of last resort & Admin distance
- Configure, verify, & troubleshoot inter-VLAN routing
    - Router on a stick & SVI
- Compare & contrast static routing & dynamic routing
- Compare & contrast distance vector and link state routing protocols
- Compare & contrast interior and exterior routing protocols
- Configure, verify & troubleshoot IPv4 and IPv6 static routing
    - Default route, Network route, Host route, Floating static
- Configure, verify & troubleshoot single area & multi-area OSPFv2 for IPv4 & IPv6 (excluding authentication, filtering, annual summarization, redistribution, stub, virtual-link, and LSAs)
- Configure, verify & troubleshoot EIGRP for IPv4 & IPv6 (excluding authentication, filtering, manual summarization, redistribution, stub)
- Configure, verify, and troubleshoot RIPv2 for IPv4 (excluding authentication, filtering, manual summarization, redistribution)
- Troubleshoot basic Layer 3 end-to-end connectivity issues

WAN Technologies

- Configure & verify PPP and MLPPP on WAN interfaces using local authentication
- Configure, verify, & troubleshoot PPPoE client-side interfaces using local authentication
- Configure, verify, & troubleshoot GRE tunnel connectivity
- Describe WAN topology options
    - Point-to-point, Hub and spoke, Full mesh, Single vs dual-homed
- Describe WAN access connectivity options
    - MPLS, Metro Ethernet, Broadband PPPoE, Internet VPN (DMVPN, site-to-site VPN, client VPN)
- Configure and verify single-homed branch connectivity using eBGP IPv4 (limited to peering and route advertisement using Network command only)
- Describe basic QoS concepts
    - Marking, Device trust, Prioritization, (Voice, Video & Data)
    - Shaping, Policing, Congestion management

Infrastructure Services

- Describe DNS lookup operation
- Troubleshoot client connectivity issues involving DNS
- Configure and verify DHCP on a router (excluding static reservations)
    - Server, Relay, Client, TFTP, DNS, & gateway options

- Troubleshoot client- and router-based DHCP connectivity issues
- Configure, verify, and troubleshoot basic HSRP
    - Priority, Pre-emption, Version
- Describe common access layer threat mitigation techniques
    - Using CDP or LLDP for device discovery
    - Licensing, Logging, Time zone & Loopback
- Configure and verify initial device configuration
- Perform device maintenance
- Introduction to Controllers (Cisco DNA Center and WLC)
- Compare Cisco Wireless Architectures and AP modes
- Describe physical infrastructure connections of WLAN components (AP, WLC, access/trunk ports, and LAG)
- Describe AP and WLC management access connections (Telnet, SSH, HTTP, HTTPS, console, and TACACS+/RADIUS)
- Configure the components of a wireless LAN access for client connectivity using GUI only
    - Such as WLAN creation, security settings, QoS profiles, and advanced WLAN settings
- Describe wireless security protocols (WPA, WPA2, and WPA3)
- Configure WLAN using WPA2 PSK using the GUI

Network Automation and Programmability

- What is Network management automation
- Past-To-Current Methods of Network Management
- Introduction to Network Management Automation
- What Can Be Automated?
- Goals of Automation
- Network Management Automation Protocols and their Impact

Virtualization Fundamentals

- Virtualization Components
- Hypervisor
- Virtualization guest
- Virtual appliance
- Virtual Switch
- Shared storage
- Virtual Storage