

## Cisco Certified Network Associate (CCNA)

### Describe how a network works

- Describe the purpose and functions of various network devices
- Select the components required to meet a network specification
- Use the OSI and TCP/IP models and their associated protocols to explain how data flows in a network
- Describe common networked applications including web applications
- Describe the purpose and basic operation of the protocols in the OSI and TCP models
- Describe the impact of applications (Voice Over IP and Video Over IP) on a network
- Interpret network diagrams
- Determine the path between two hosts across a network
- Describe the components required for network and Internet communications
- Identify and correct common network problems at layers 1, 2, 3 and 7 using a layered model approach
- Differentiate between LAN/WAN operation and features

### Configure, verify and troubleshoot a switch with VLANs and interswitch communications

- Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts
- Explain the technology and media access control method for Ethernet networks
- Explain network segmentation and basic traffic management concepts
- Explain basic switching concepts and the operation of Cisco switches
- Perform and verify initial switch configuration tasks including remote access management
- Verify network status and switch operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands
- Identify, prescribe, and resolve common switched network media issues, configuration issues, auto negotiation, and switch hardware failures
- Describe enhanced switching technologies (including: VTP, RSTP, VLAN, PVSTP, 802.1q)
- Describe how VLANs create logically separate networks and the need for routing between them
- Configure, verify, and troubleshoot VLANs
- Configure, verify, and troubleshoot trunking on Cisco switches
- Configure, verify, and troubleshoot interVLAN routing
- Configure, verify, and troubleshoot VTP
- Configure, verify, and troubleshoot RSTP operation
- Interpret the output of various show and debug commands to verify the operational status of a Cisco switched network.
- Implement basic switch security (including: port security, trunk access, management vlan other than vlan1, etc.)

## Implement an IP addressing scheme and IP Services to meet network requirements in a medium-size Enterprise branch office network.

- Describe the operation and benefits of using private and public IP addressing
- Explain the operation and benefits of using DHCP and DNS
- Configure, verify and troubleshoot DHCP and DNS operation on a router. (including: CLI/SDM)
- Implement static and dynamic addressing services for hosts in a LAN environment
- Calculate and apply an addressing scheme including VLSM IP addressing design to a network
- Determine the appropriate classless addressing scheme using VLSM and summarization to satisfy addressing requirements in a LAN/WAN environment
- Describe the technological requirements for running IPv6 in conjunction with IPv4 (including: protocols, dual stack, tunneling, etc).
- Describe IPv6 addresses
- Identify and correct common problems associated with IP addressing and host configurations

## Configure, verify, and troubleshoot basic router operation and routing on Cisco devices

- Describe basic routing concepts (including: packet forwarding, router lookup process)
- Describe the operation of Cisco routers (including: router bootup process, POST, router components)
- Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts
- Configure, verify, and troubleshoot RIPv2
- Access and utilize the router to set basic parameters. (including: CLI/SDM)
- Connect, configure, and verify operation status of a device interface
- Verify device configuration and network connectivity using ping, traceroute, telnet, SSH or other utilities
- Perform and verify routing configuration tasks for a static or default route given specific routing requirements
- Manage IOS configuration files. (including: save, edit, upgrade, restore)
- Manage Cisco IOS.
- Compare and contrast methods of routing and routing protocols
- Configure, verify, and troubleshoot OSPF
- Configure, verify, and troubleshoot EIGRP
- Verify network connectivity (including: using ping, traceroute, and telnet or SSH)
- Troubleshoot routing issues
- Verify router hardware and software operation using SHOW & DEBUG commands.
- Implement basic router security

## Explain and select the appropriate administrative tasks required for a WLAN

- Describe standards associated with wireless media (including: IEEE WI-FI Alliance, ITU/FCC)
- Identify and describe the purpose of the components in a small wireless network. (Including: SSID, BSS, ESS)
- Identify the basic parameters to configure on a wireless network to ensure that devices connect to the correct access point
- Compare and contrast wireless security features and capabilities of WPA security (including: open, WEP, WPA-1/2)
- Identify common issues with implementing wireless networks. (Including: Interface, misconfiguration)

## Identify security threats to a network and describe general methods to mitigate those threats

- Describe today's increasing network security threats and explain the need to implement a comprehensive security policy to mitigate the threats
- Explain general methods to mitigate common security threats to network devices, hosts, and applications
- Describe the functions of common security appliances and applications
- Describe security recommended practices including initial steps to secure network devices

## Implement, verify, and troubleshoot NAT and ACLs in a medium-size Enterprise branch office network.

- Describe the purpose and types of ACLs
- Configure and apply ACLs based on network filtering requirements. (including: CLI/SDM)
- Configure and apply an ACLs to limit telnet and SSH access to the router using (including: SDM/CLI)
- Verify and monitor ACLs in a network environment
- Troubleshoot ACL issues
- Explain the basic operation of NAT
- Configure NAT for given network requirements using (including: CLI/SDM)
- Troubleshoot NAT issues

## Implement and verify WAN links

- Describe different methods for connecting to a WAN
- Configure and verify a basic WAN serial connection
- Configure and verify Frame Relay on Cisco routers
- Troubleshoot WAN implementation issues
- Describe VPN technology (including: importance, benefits, role, impact, components)
- Configure and verify a PPP connection between Cisco routers