

Course : Routing Technology and Network Security

Duration : 102 hrs

Module 1:

Network Fundamentals

- OSI and TCP/IP models
- TCP and UDP protocols
- Impact of infrastructure components in an enterprise network
- Effects of cloud resources on enterprise network architecture
- Collapsed core and three-tier architectures
- Network topologies
- Cabling type based on implementation requirements
- Troubleshooting methodologies to resolve problems
- IPv4 addressing and subnetting
- IPv4 address types
- Need for private IPv4 addressing
- "12. IPv6 addressing scheme to satisfy addressing requirements in a LAN/WAN environment"
- IPv6 addressing
- IPv6 Stateless Address Auto Configuration
- IPv6 address types

Module 2:

LAN Switching Technologies

- Switching concepts
- Ethernet frame format
- Interface and cable issues (collisions, errors, duplex, speed)
- VLANs (normal/extended range) spanning multiple switches
- Interswitch connectivity
- STP protocols
- STP related optional features
- Layer 2 protocols
- (Layer 2/Layer 3) Ether Channel
- Switch stacking and chassis aggregation

Module 3: Routing Technologies

- Routing concepts
- Components of a routing table
- How a routing table is populated by different routing information sources
- Inter-VLAN routing
- Static routing and dynamic routing
- Distance vector and link state routing protocols
- Interior and exterior routing protocols
- IPv4 and IPv6 static routing
- Single area and multi-area OSPFv2 for IPv4 (excluding authentication, filtering, manual summarization, redistribution, stub, virtuallink, and LSAs)
- Single area and multi-area OSPFv3 for IPv6 (excluding authentication, filtering, manual summarization, redistribution, stub, virtuallink, and LSAs)
- EIGRP for IPv4 (excluding authentication, filtering, manual summarization, redistribution, stub)
- EIGRP for IPv6 (excluding authentication, filtering, manual summarization, redistribution, stub)"
- RIPv2 for IPv4 (excluding authentication, filtering, manual summarization, redistribution)"
- Basic Layer 3 end-to-end connectivity issues

Module 4: WAN Technologies

- PPP and MLPPP on WAN interfaces using local authentication
- PPPoE client-side interfaces using local authentication
- Directives, Filters, and Routes
- GRE tunnel connectivity
- WAN topology options
- WAN access connectivity options
- Single-homed branch connectivity using eBGP IPv4 (limited to peering and route advertisement using Network command only)
- Basic QoS concept

Module 5: Infrastructure Services

- DNS lookup operation
- Client connectivity issues involving DNS
- DHCP on a router (excluding static reservations)
- Client- and router-based DHCP connectivity issues
- Basic HSRP
- Inside source NAT
- NTP operating in a client/server mode

Module 6: Infrastructure Security

- Port security
- Common access layer threat mitigation techniques
- IPv4 and IPv6 access list for traffic filtering
- ACLs using the APIC-EM Path Trace ACL Analysis tool
- Basic device hardening
- Device security using AAA with TACACS+ and RADIUS

Module 7: Infrastructure Management

- Device-monitoring protocols
- Network connectivity issues using ICMP echo-based IP SLA
- Device management
- Initial device configuration
- Device maintenance
- Cisco IOS tools to troubleshoot and resolve problems
- Network programmability in enterprise network architecture