Cisco Certified Internetwork Expert (CCIE)

The CCIE is the crème-de-la-crème of Networking certifications, and there are less than 50,000 CCIEs worldwide across all specializations. To get into this exclusive club, you need to get trained with the very best people who have decades of expertise in teaching, implementing and managing enterprise class networking projects. ZOOM provides the highest quality of CCIE Mapped training, with world class professionals and state of the art lab infrastructure. We offer the CCIE across three specializations - Routing and Switching, Security and Collaboration (which replaces CCIE Voice).

We also offer something which no other training institute does - a full scale, 8 hour challenge lab which replicates the lab exam, bundled for FREE with our CCIE course.

☞ **CCIE Routing and Switching:**

- Network Principles
- Layer 2 Technologies
- Layer 3 Technologies
- VPN Technologies
- Infrastructure Security
- Infrastructure Services

☞ **CCIE Security**

- Infrastructure, Connectivity, Communications, and Network Security
- Security Protocols
- Application and Infrastructure Security Threats, Vulnerability Analysis, and Mitigation
- Cisco Security Products, Features, and Management
- Cisco Security Technologies and Solutions
- Security Policies and Procedures, Best Practices, and Standards

☞ **CCIE Collaboration (replaces CCIE Voice)**

- Telephony Standards and Protocols
- Cisco Unified Communications Manager (CUCM)
- Cisco IOS UC Applications and Features
- Quality of Service and Security in Cisco Collaboration Solutions
- Cisco Unity Connection
- Cisco Unified Contact Center Express
- Cisco Unified IM and Presence

CCIE Routing & Switching V-5.0

Course Curriculum

1.0 Network Principles

1.1 Network theory
- Software architecture differences between IOS and IOS XE
- Identify Cisco express forwarding concepts
- Explain general network challenges
- Explain IP/TCP/UDP operations

1.2 Network implementation and operation
- Evaluate proposed changes to a network

1.3 Network troubleshooting
- Use IOS troubleshooting tools
- Apply troubleshooting methodologies

2.0 Layer 2 Technologies

2.1 LAN switching technologies
- Switch administration
- Layer 2 protocols, VLAN & trunking
- Spanning-tree & EtherChannel
- Other LAN switching technologies SPAN, RSPAN, ERSPAN
- Chassis virtualization and aggregation technologies
- Describe spanning-tree concepts

2.2 Layer 2 multicast
- Implement and troubleshoot IGMP
- Explain MLD & PIM snooping
- Layer 2 WAN circuit technologies
- Implement and troubleshoot HDLC/PPP
- Describe WAN rate-based Ethernet circuits

3.0 Layer 3 Technologies

3.1 Addressing technologies
- IPv4/IPv6 addressing and subnetting

3.2 Layer 3 multicast
- Troubleshoot reverse path forwarding
- IPv4 protocol independent multicast
- Multicast source discovery protocol

3.3 Fundamental routing concepts
- Static routing/default routing
- Compare routing protocol types
- Administrative distance
- Passive interface/VRF lite
- Filtering with any routing protocol
- Redistribution between any routing protocol
- Manual & auto summarization with any routing protocol
- Policy base routing
- Identify and troubleshoot sub-optimal routing
- Bidirectional forwarding detection/loop prevention
- Routing protocol authentication

3.4 RIP (v2 and v6)
- RIPv2
- Describe RIPv6 (RIPng)

3.5 EIGRP (for IPv4 and IPv6)
- Describe packet types
- Implement and troubleshoot
- Neighbor relationship/free path selection/operations
- EIGRP stub/load-balancing
- Implement EIGRP (multi-address) named mode
- EIGRP convergence and scalability

3.6 OSPF (v2 and v3)
- Describe packet types
- Neighbour relationship/OSPFv3 address-family support
- Network types, area types and router types
- Path preference/operations
- Implement, t-shoot & optimize OSPF convergence & scalability

3.7 BGP
- Peer relationships
- IBGP and EBGP
- Explain attributes and best-path selection
- Routing policies
- Scalability/multiprotocol BGP/AS path manipulations
- Describe BGP fast convergence features

3.8 ISIS (for IPv4 and IPv6)
- Describe basic ISIS network
- Single area, single topology
- Neibor relationship, Network types, Levels and router types
- NSAP addressing
- Point-to-point, broadcast
- Describe operations & optimization features
- Metrics

4.0 VPN Technologies

4.1 Tunneling
- MPLS, Basic MPLS L3VPN, Encapsulation, DMVPN (single hub)
- Describe IPv6 tunneling techniques
- Describe basic layer 2 VPN-wireline/L2VPN-LAN services

4.2 Encryption
- IPsec with preshared key
- IPv4 site to IPv4 site & IPv6 in IPv4 tunnels
- Virtual tunneling Interface (VTI)
- Describe GET VPN

5.0 Infrastructure Security

5.1 Device security
- IOS AAA using local database
- Device access control/control plane policing
- Device security using IOS AAA with TACACS+ & RADIUS

5.2 Network security
- Switch security features/router security features
- 802.1x, EAP, RADIUS

6.0 Infrastructure Services

6.1 System management
- Implement and troubleshoot device management
- Console and VTY, telnet, HTTP, HTTPS, SSH (T) FTP
- SNMP/v2c, v3, logging, Local logging
- Syslog, debug, conditional debug

6.2 Quality of service
- End-to-End QoS, CoS and DSCP mapping
- QoS using MQC, Classification
- Network based application recognition (NBAR)
- Marking using IP precedence, DSCP, CoS
- Policing, shaping
- Congestion management (queuing)
- Congestion avoidance (WRED)
- Describe layer 2 QoS
- Queuing, scheduling, Classification & marking

6.3 Network services
- First-hop redundancy protocols
- HSRP, GLBP, VRRP
- Network time protocol/IPv4 and IPv6 DHCP
- IPv4 network address translation
- Describe IPv6 network address translation
- Network optimization
- IP SLA, Tracking object, Netflow
- Embedded event manager
- Identify performance routing (PfR)

7.0 Evolving Technologies

7.1 Cloud
7.2 SDN
7.3 Internet of Things