

Course Catalog 2012-2013

CCIE (Routing & Switching)



Cisco Certified Internetworking Expert (CCIE) R&S Written

CCIE R&S Written Boot Camp offered by CSLiT Training is an intensive and accelerated program where IT professionals earn their CCIE R&S Written certification in just 15 days, one of the finest available. We use the best resources available; best-equipped training labs, and some of the highly respected instructors in the industry with real world experience. If you want to get real hands-on Cisco experience, get certified in less time, for less money than allow CSLiT to assist you. Your success is our success and we back our training by allow the student to re-take the class for free within one year.

Course Objectives

CSLiT Training CCIE R&S written boot camp covers the exam below:

This course is specifically designed to assist students in passing their CCIE Routing and Switching Written Exam. The CCIE (Cisco Certified Internetworking Expert) Routing and Switching certification validates the expert knowledge and mastery of skills required to configure and manage all elements found within the Cisco CCIE Routing and Switching Blueprint.

Who Should Attend

- Candidates that need to acquire their CCIE Routing and Switching certificate.
- Network engineers/designers that need to raise their knowledge to an expert level.

Prerequisite

Prior to attending this Bootcamp, the student should have:

- Completion of CCNP courseware is recommended training.
- Equivalent knowledge and skill that can be acquired by attending Cisco's CCNP training courses
- Practical experience with deploying and operating networks based on Cisco network devices and Cisco IOS is strongly recommended.

A basic understanding of all of the technologies listed on the Cisco CCIE Routing and Switching Written Exam Blueprint.

Course Duration

45 Hours, 15 Classes, 3 Hours per Class

Course Details

Lesson 01: Implement Layer 2 Technologies

- Implement Spanning Tree Protocol (STP)
- 802.1d , 802.1w , 801.1s
- Loop guard, Root guard
- Bridge protocol data unit (BPDU) guard
- Storm control , Unicast flooding
- Port roles, failure propagation, and loop guard operation
- Implement VLAN and VLAN Trunking Protocol (VTP)
- Implement trunk and trunk protocols, EtherChannel, and load -balance
- Implement Ethernet technologies
- Speed and duplex
- Ethernet, Fast Ethernet, and Gigabit Ethernet
- PPP over Ethernet (PPPoE)
- Implement Switched Port Analyzer (SPAN),
- Remote Switched Port Analyzer (RSPAN), and flow control
- Implement Frame Relay
- Local Management Interface (LMI)
- Traffic shaping
- Full mesh , Hub and spoke
- Discard eligible (DE)
- Implement High-Level Data Link Control (HDLC) and PPP

Lesson 02: Implement IPv4

- Implement IP version 4 (IPv4) addressing, subnetting, and variable-length subnet masking (VLSM)
- Implement IPv4 tunneling and Generic Routing Encapsulation (GRE)
- Implement IPv4 RIP version 2 (RIPv2)
- Implement IPv4 Open Shortest Path First (OSPF)
 1. Standard OSPF areas
 2. Stub area
 3. Totally stubby area
 4. Not-so-stubby-area (NSSA)
 5. Totally NSSA
 6. Link-state advertisement (LSA) types
 7. Adjacency on a point-to-point and on a multi-access network
 8. OSPF graceful restart
- Implement IPv4 Enhanced Interior Gateway Routing Protocol (EIGRP)
 1. Best path
 2. Loop-free paths
 3. EIGRP operations when alternate loop-free paths are available, and when they are not available
 4. EIGRP queries
 5. Manual summarization and autosummarization
 6. EIGRP stubs
- Implement IPv4 Border Gateway Protocol (BGP)
 1. Next hop
 2. Peering
 3. Internal Border Gateway Protocol (IBGP) and External Border Gateway Protocol (EBGP)
- Implement policy routing
- Implement Performance Routing (PFR) and Cisco Optimized Edge Routing (OER)
- Implement filtering, route redistribution, summarization, synchronization, attributes, and other advanced features

Course Details

Lesson 03 : Implement IPv6

- Implement IPv6 addressing and different addressing types
- Implement IPv6 neighbor discovery
- Implement basic IPv6 functionality protocols
- Implement tunneling techniques
- Implement OSPF version 3 (OSPFv3)
- Implement EIGRP version 6 (EIGRPv6)
- Implement filtering and route redistribution

Lesson 04: Implement MPLS Layer 3 VPNs

- Implement Multiprotocol Label Switching (MPLS)
- Implement Layer 3 virtual private networks (VPNs)
- Implement virtual routing and forwarding (VRF)
- Multi-VRF Customer Edge (VRF-Lite)

Lesson 05: Implement IP Multicast

- Implement Protocol Independent Multicast (PIM) sparse mode
- Implement Multicast Source Discovery Protocol (MSDP)
- Implement interdomain multicast routing
- Implement PIM Auto-RP, unicast RP, and BSR
- Implement multicast tools, features, and source-specific multicast
- Implement IPv6 multicast, PIM, and related multicast protocols
- Implement Zone Based Firewall
- Implement Unicast Reverse Path Forwarding (uRPF)
- Implement IP Source Guard
- Implement authentication, authorization, and accounting (AAA)
- Implement Control Plane Policing (CoPP)
- Implement Cisco IOS Firewall
- Implement Cisco IOS Intrusion Prevention System (IPS)
- Implement Secure Shell (SSH)
- Implement 802.1x
- Implement NAT
- Implement routing protocol authentication
- Implement device access control
- Implement security features

Lesson 06: Implement Network Services

- Implement Hot Standby Router Protocol (HSRP)
- Implement Gateway Load Balancing Protocol (GLBP)
- Implement Virtual Router Redundancy Protocol (VRRP)
- Implement Network Time Protocol (NTP)
- Implement DHCP
- Implement Web Cache Communication Protocol (WCCP)

Course Details

Lesson 07: Implement Quality of Service (QoS)

- Implement Modular QoS CLI (MQC)
 1. Network-Based Application Recognition (NBAR)
 2. Class-based weighted fair queuing (CBWFQ), modified deficit round robin (MDRR), and low latency queuing (LLQ)
 3. Classification
 4. Policing
 5. Shaping
 6. Marking
 7. Weighted random early detection (WRED) and random early detection (RED)
 8. Compression
- Implement Layer 2 QoS: weighted round robin (WRR), shaped round robin (SRR), and policies
- Implement link fragmentation and interleaving (LFI) for Frame Relay
- Implement generic traffic shaping
- Implement Resource Reservation Protocol (RSVP)
- Implement Cisco AutoQoS

Lesson 08: Troubleshoot a Network

- Troubleshoot complex Layer 2 network issues
- Troubleshoot complex Layer 3 network issues
- Troubleshoot a network in response to application problems
- Troubleshoot network services
- Troubleshoot network security

Lesson 09: Optimize the Network

- Implement syslog and local logging
- Implement IP Service Level Agreement SLA
- Implement NetFlow
- Implement SPAN, RSPAN, and router IP traffic export (RITE)
- Implement Simple Network Management Protocol (SNMP)
- Implement Cisco IOS Embedded Event Manager (EEM)
- Implement Remote Monitoring (RMON)
- Implement FTP
- Implement TFTP
- Implement TFTP server on router
- Implement Switch-module Configuration Protocol (SCP)
- Implement HTTP and HTTPS
- Implement Telnet

Lesson 10: Evaluate proposed changes to a Network

- Evaluate interoperability of proposed technologies against deployed technologies
 1. Changes to routing protocol parameters
 2. Migrate parts of a network to IPv6
 3. Routing Protocol migration
 4. Adding multicast support
 5. Migrate spanning tree protocol
 6. Evaluate impact of new traffic on existing QoS design
- Determine operational impact of proposed changes to an existing network
 1. Downtime of network or portions of network
 2. Performance degradation
 3. Introducing security breaches
- Suggest Alternative solutions when incompatible changes are proposed to an existing network
 1. Hardware/Software upgrades
 2. Topology shifts

