CCIE® Routing & Switching Written

Duration: 5 Days **Course Code: CCIERSW** **Version: 5** **Delivery Method: Class Connect HD**

Overview:

This instructor-led theory course is designed to build upon the knowledge gained from the professional level routing and switching or service provider certifications. The focus will be on refreshing and enhancing your knowledge on the key topics covered in the version 5 written exam: Network Principles, Layer 2 technologies, Layer 3 Technologies, VPN Technologies, Infrastructure Security and Infrastructure Services.

Class-Connect™ HD

This is live hands-on interactive learning where you can attend a course from different training centres. This premium experience uses HD quality audio and video that connects the classrooms over a high capacity managed network to ensure a 'real time' experience. The instructor will be presenting from one location and students attending from other centres are able to interact with the instructor and other delegates using video and voice conferencing.

Target Audience:

This course is aimed at anyone studying for the CCIE® Routing & Switching Written exam (400-101).

Objectives:

- **After attending this course you should be able to:**
- Confidently sit the CCIE® Routing & Switching Written Exam 400-101.
- Detail the theory behind configuring complex Routing and Switching networks.
- Have an enhanced knowledge of Cisco Routing & Switching technology and methodology.

Prerequisites:

Attendees whould meet the following prerequisites:

- CCNP Routing and Switching - ROUTE, SWITCH, TSHOOT,
- QoS - Implementing Cisco Quality of Service (QoS)

Testing and Certification

Recommended as preparation for exam(s):

- 400-101 CCIE® Routing & Switching WrittenExam v5.0

Follow-on-Courses:

The following courses are recommended for further study:

- **CIERS1** - CCIE 360 R&S Advanced Workshop 1
- **CIERS2** - CCIE 360 R&S Advanced Workshop 2

Please note passing the written Exam is a prerequisite for attending either of these courses.

Content:

1.1 Network theory

- Describe basic software architecture differences between IOS and IOS XE
- Identify Cisco express forwarding concepts
- Explain general network challenges
- Explain IP operations
- Explain TCP operations

1.2 Network implementation and operation

- Evaluate proposed changes to a network

1.3 Network troubleshooting

- Use IOS troubleshooting tools
- Apply troubleshooting methodologies
- Interpret packet capture

2.1 LAN switching technologies

- Implement and troubleshoot switch administration
- Implement and troubleshoot layer 2 protocols
- Implement and troubleshoot VLAN
- Implement and troubleshoot trunking
- Implement and troubleshoot EtherChannel
- Implement and troubleshoot spanning-tree
- Implement and troubleshoot other LAN switching technologies
- Describe chassis virtualization and aggregation technologies
- Describe spanning-tree concepts

2.2 Layer 2 multicast

- Implement and troubleshoot IGMP
- Explain MLD
- Explain PIM snooping

2.3 Layer 2 WAN circuit technologies

- Implement and troubleshoot HDLC
- Implement and troubleshoot PPP
- Describe WAN rate-based ethernet circuits

3.1 Addressing technologies

- Identify, implement and troubleshoot IPv4 addressing and subnetting
- Identify, implement and troubleshoot IPv6 addressing and subnetting

3.2 Layer 3 multicast

- Troubleshoot reverse path forwarding
- Implement and troubleshoot IPv4 protocol independent multicast
- Implement and troubleshoot multicast source discovery protocol
- Describe IPv6 multicast

3.3 Fundamental routing concepts

- Implement and troubleshoot static routing
- Implement and troubleshoot default routing
- Compare routing protocol types
- Implement, optimize and troubleshoot administrative distance
- Implement and troubleshoot passive interface
- Implement and troubleshoot VRF lite
- Implement, optimize and troubleshoot filtering with any routing protocol
- Implement, optimize and troubleshoot redistribution between any routing protocol
- Implement, optimize and troubleshoot manual and auto summarization with any routing protocol
- Implement, optimize and troubleshoot policy-based routing
- Identify and troubleshoot sub-optimal routing
- Implement and troubleshoot bidirectional forwarding detection
- Implement and troubleshoot loop prevention mechanisms
- Implement and troubleshoot routing protocol authentication

3.4 RIP [v2 and v6]

- Implement and troubleshoot RIPv2
- Describe RIPv6 [RIPng]

3.5 EIGRP [for IPv4 and IPv6]

- Describe packet types
- Implement and troubleshoot neighbor relationship
- Implement and troubleshoot loop free path selection
- Implement and troubleshoot operations
- Implement and troubleshoot EIGRP stub
- Implement and troubleshoot load-balancing
- Implement EIGRP [multi-address] named mode
- Implement, troubleshoot and optimize EIGRP convergence and scalability

3.6 OSPF [v2 and v3]

- Describe packet types
- Implement and troubleshoot neighbor relationship
- Implement and troubleshoot OSPFv3 address-family support
- Implement and troubleshoot network types, area types and router types
- Implement and troubleshoot path preference
- Implement and troubleshoot operations
- Implement, troubleshoot and optimize

5.1 Device security

- Implement and troubleshoot IOS AAA using local database
- Implement and troubleshoot device access control
- Implement and troubleshoot control plane policing
- Describe device security using IOS AAA with TACACS+ and RADIUS

5.2 Network security

- Implement and troubleshoot switch security features
- Implement and troubleshoot router security features
- Implement and troubleshoot IPv6 first hop security
- Describe 802.1x

6.1 System management

- Implement and troubleshoot device management
- Implement and troubleshoot SNMP
- Implement and troubleshoot logging

6.2 Quality of service

- Implement and troubleshoot end-to-end QoS
- Implement, optimize and troubleshoot QoS using MQC
- Describe layer 2 QoS

6.3 Network services

- Implement and troubleshoot first-hop redundancy protocols
- Implement and troubleshoot network time protocol
- Implement and troubleshoot IPv4 and IPv6 DHCP
- Implement and troubleshoot IPv4 network address translation
- Describe IPv6 network address translation

6.4 Network optimization

- Implement and troubleshoot IP SLA
- Implement and troubleshoot tracking object
- Implement and troubleshoot netflow
- Implement and troubleshoot embedded event manager
- Identify performance routing [PfR]

OSPF convergence and scalability

3.7 BGP

- Describe, implement and troubleshoot peer relationships
- Implement and troubleshoot IBGP and EBGP
- Explain attributes and best-path selection
- Implement, optimize and troubleshoot routing policies
- Implement and troubleshoot scalability
- Implement and troubleshoot multiproctocol BGP
- Implement and troubleshoot AS path manipulations
- Implement and troubleshoot other features
- Describe BGP fast convergence features

3.8 ISIS [for IPv4 and IPv6]

- Describe basic ISIS network
- Describe neighbor relationship
- Describe network types, levels and router types
- Describe operations
- Describe optimization features

4.1 Tunneling

- Implement and troubleshoot MPLS operations
- Implement and troubleshoot basic MPLS L3VPN
- Implement and troubleshoot encapsulation
- Implement and troubleshoot DMVPN [single hub]
- Describe IPv6 tunneling techniques
- Describe basic layer 2 VPN —wireline
- Describe basic L2VPN — LAN services

4.2 Encryption

- Implement and troubleshoot IPsec with preshared key
- Describe GET VPN

Further Information:

For More information, or to book your course, please call us on Head Office 01189 123456 / Northern Office 0113 242 5931

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