# SPCOR - CCNP Service Provider

Zetlan Technologies

# Online Course

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# Course Modules

**1. Describe Service Provider Architectures**

- Core architectures (Metro Ethernet, MPLS, unified MPLS, SR)
- Transport technologies (Optical, xDSL, DOCSIS, TDM, & xPON)
- Mobility (packet core, RAN xhaul transport for 4G and 5G)

**2. Describe Cisco network software architecture**

- IOS
- IOS XE
- IOS XR

**3. Describe service provider virtualization**

- NFV infrastructure
- VNF workloads
- OpenStack



**4. Describe QoS architecture**

- MPLS QOS models (Pipe, Short Pipe, and Uniform)
- MPLS TE QoS (MAM, RDM, CBTS, PBTS, and DS-TE)
- DiffServ and IntServ QoS models
- Trust boundaries between enterprise and SP environments
- IPv6 flow label

**5. Configure and verify control plane security**

- Control plane protection techniques (LPTS and CoPP)
- BGP-TTL security and protocol authentication
- BGP prefix suppression
- LDP security (authentication and label allocation filtering)
- BGP sec
- BGP flowspec

**6. Describe management plane security**

- Traceback
- AAA and TACACS
- RestAPI security
- DdoS

**7. Implement data plane security**

- uRPF
- ACLs
- RTBH

**8. Implement IS-IS (IPv4 and IPv6)**

- Route advertisement
- Area addressing
- Multitopology
- Metrics

**9. Implement OSPF (v2 and v3)**

- Neighbor adjacency
- Route advertisement
- Multiarea (addressing and types)
- Metrics

**10. Implement BGP (v4 and v6 for IBGP and EBGP)**

- Describe BGP path selection Algorithm
- Neighbours
- Prefix advertisement
- Address family
- Path selection
- Attributes
- Redistribution

**11. Implement routing policy language and route maps**

- BGP
- OSPF
- IS-IS

**12. Troubleshoot routing protocols**

- Neighbor adjacency (IS-IS, OSPF, BGP)
- Route advertisement (IS-IS, OSPF, BGP)

## 13. Describe IPv6 transition

- NAT44
- NAT64
- 6RD
- MAP
- DS Lite

## 14. Implement high availability

- NSF / graceful restart
- NSR
- BFD
- Link aggregation

## 15. Implement MPLS

- LDP sync
- LDP session protection
- LDP neighbours
- Unified MPLS
- MPLS OAM

## 16. Describe Traffic Engineering

- ISIS and OSPF extensions
- RSVP functionality
- FRR

**17. Describe segment routing**

- Segment types
- IGP control plane
- Segment routing traffic engineering
- TI-LFa
- PCE-PCC architectures

**18. Describe VPN services**

- EVPN
- Inter-AS VPN
- CSC
- mVPN

**19. Configure L2VPN and Carrier Ethernet**

- Ethernet services (E-Line, E-Tree, E-Access, E-LAN)
- IEEE 802.1ad, IEEE 802.1ah, and ITU G.8032
- Ethernet OAM
- VLAN tag manipulation

**20. Configure L3VPN**

- Intra-AS VPN
- Shared services (extranet and Internet)

## 21. Implement multicast services

- PIM (PIM-SM, PIM-SSM, and PIM-BIDIR)
- IGMP v1/v2/v3 and MLD

## 22. Implement QoS services

- Classification and marking
- Congestion avoidance, traffic policing, and shaping

## 23. Automation and Assurance

- Describe the programmable APIs used to include Cisco devices
- Interpret an external script to configure a Cisco device
- Describe the role of Network Services Orchestration (NSO)
- High-level principles and benefits of a data modelling language
- Compare agent vs. agentless configuration management tools
- Dscrb data analytics & model-driven telemetry in srvc provider
- Configure dial-in/out telemetry streams using gRPC
- Configure and verify NetFlow/IPFIX
- Configure and verify NETCONF and RESTCONF
- Configure and verify SNMP (v2c/v3)

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