

CCNP Service Provider



The Cisco Certified Network Professional Service Provider (CCNP Service Provider) certification is for service provider network engineers, systems engineers, and network specialists who are responsible for delivering a scalable carrier-grade infrastructure capable of rapid expansion to support ongoing introduction of new managed services and other customer requirements.

Prerequisites: Valid Cisco CCNA Service Provider, or any CCIE Certification can act as a prerequisite.

Recommended Training: Deploying Cisco Service Provider Network Routing (SPROUTE), Deploying Cisco Service Provider Advanced Routing (SPADVROUTE), Implementing Cisco Service Provider Next-Generation Core Network Services (SPCORE), Implementing Cisco Service Provider Next-Generation Edge Network Services (SPEDGE)

Exams : 642-883 SPROUTE, 642-885 SPADVROUTE, 642-887 SPCORE, 642-889 SPEDGE

Syllabus:

642-883 SPROUTE

1.0 OSPFv2 and OSPFv3 Routing in Service Provider Environments

- 1.1 Describe multi-area OSPFv2 and OSPFv3 operations
- 1.2 Implement multi-area OSPFv2 and OSPFv3 on IOS-XR and IOS-XE
- 1.3 Implement different OSPF areas (stubby, totally stubby, NSSA) on IOS-XR and IOS-XE
- 1.4 Implement OSPF neighbor authentication on IOS-XR and IOS-XE
- 1.5 Troubleshoot OSPF IOS-XR and IOS-XE configuration errors

2.0 IS-IS, IPv4, and IPv6 in Service Provider Environments

- 2.1 Describe multi-area IS-IS operations
- 2.2 Implement multi-area IS-IS for IPv4 and IPv6 on IOS-XR and IOS-XE
- 2.3 Implement IS-IS neighbor authentication on IOS-XR and IOS-XE
- 2.3 Troubleshoot IS-IS IOS-XR and IOS-XE configuration errors

3.0 BGP Routing in Service Provider Environments

- 3.1 Describe the Internet routing hierarchy: Network Service Providers (NSP), Network Access Point (NAP), ISP Tiers (Tier 1, 2 and 3)
- 3.2 Describe connectivity between an enterprise network and an SP that requires the use of BGP
- 3.3 Describe connectivity between a SP and upstream SPs
- 3.4 Describe BGP transit AS operations
- 3.5 Implement EBGP and IBGP on IOS-XR and IOS-XE
- 3.6 Implement BGP neighbor authentication on IOS-XR and IOS-XE
- 3.7 Optimize BGP IOS-XR configurations using af-groups, session-groups, and neighbor-groups
- 3.8 Optimize BGP IOS-XE configurations using peer-groups
- 3.9 Influence BGP route selection by using various BGP attributes on IOS-XR and IOS-XE
- 3.10 Troubleshoot BGP IOS-XR and IOS-XE configuration errors

4.0 Route Manipulations in Service Provider Environments

- 4.1 Implement Routing Policy Language (RPL) to configure a desired routing policy on IOS-XR
- 4.2 Implement Route-Maps to configure a desired routing policy on IOS-XE
- 4.3 Implement route filterings using prefix-list, distribute-list, and as-path list on IOS-XEs
- 4.4 Implement route redistributions on IOS-XR and IOS-XE

5.0 High Availability Routing Features

- 5.1 Implement NSF/NSR/Graceful Restart for OSPF on IOS-XR and IOS-XE
- 5.2 Implement NSF/NSR/Graceful Restart for IS-IS on IOS-XR and IOS-XE
- 5.3 Implement Bidirectional Forwarding Detection (BFD) for OSPF on IOS-XR and IOS-XE
- 5.4 Implement Bidirectional Forwarding Detection (BFD) for IS-IS on IOS-XR and IOS-XE

642-885 SPADVROUTE

1.0 BGP Routing Features in a Service Provider IP NGN Environment

- 1.1 Describe the BGP routing processes in IOS-XR
- 1.2 Configure the BGP timers on IOS-XR and IOS-XE
- 1.3 Describe the need for BGP confederations in BGP transit backbones
- 1.4 Design and implement BGP route reflectors to scale IBGP in BGP transit backbones on IOS-XR and IOS-XE
- 1.5 Implement BGP in SP IP NGN IOS-XR and IOS-XE PE routers to support multi-homed BGP Customers
- 1.6 Implement Remote Triggered Blackhole Filtering (RTBF) on IOS-XR and IOS-XE
- 1.7 Implement BGP TTL security on IOS-XR and IOS-XE
- 1.8 Implement BGP maximum-prefix on IOS-XR and IOS-XE
- 1.9 Implement BGP route dampening on IOS-XR and IOS-XE

- 1.10 Troubleshoot BGP IOS-XR and IOS-XE configuration errors in service provider environments
- 1.11 Optimize BGP IOS-XR configurations using af-groups, session-groups, and neighbor-groups
- 1.12 Optimize BGP IOS-XE configurations using peer-groups

2.0 Multicast Routing in a Service Provider IP NGN Environment

- 2.1 Describe Multicast Concepts (multicast distribution trees, multicast routing protocols and IGMP operations)
- 2.2 Describe Any-source multicast (ASM) versus Source Specific Multicast (SSM)
- 2.3 Describe Intra Domain versus Inter Domain Multicast Routing
- 2.4 Describe the mapping of multicast IP addresses to MAC addresses
- 2.5 Describe and illustrate how RFP check can fail if the unicast and multicast topologies are non-congruent
- 2.6 Describe multiprotocol BGP functions in mroute distribution
- 2.7 Describe the principles and operations of PIM-SM
- 2.8 Describe multicast source discovery protocol (MSDP) operations
- 2.9 Describe methods used to secure multicast
- 2.10 Implement PIM-SM operations on IOS-XR and IOS-XE
- 2.11 Implement Auto-RP, PIMv2 BSR, Anycast RP on IOS-XR and IOS-XE
- 2.12 Implement Bi-Dir PIM operations in SP IP NGN environment on IOS-XR and IOS-XE
- 2.13 Implement SSM operations on IOS-XR and IOS-XE
- 2.14 Implement MSDP operations on IOS-XR and IOS-XE
- 2.14 Troubleshoot multicast routing IOS-XR and IOS-XE configurations errors in service provider environments

3.0 IPv6 in a Service Provider IP NGN Environment

- 3.1 Describe DNS and DHCP operation in IPv6
- 3.2 Describe the fields that are used in the IPv6 header to support QoS functions
- 3.3 Describe Cisco IOS/IOS-XE and IOS-XR IPv6 network management and troubleshooting tools like traceroute/ping
- 3.4 Describe dual-stack implementations
- 3.5 Describe IPv6 tunneling mechanisms
- 3.6 Configure IPv6 multicast routing
- 3.7 Configure static IPv6-in-IPv4 tunnels on IOS-XR and IOS-XE
- 3.8 Configure dynamic 6to4 tunnels on IOS-XR and IOS-XE

4.0 High Availability Routing Features

- 4.1 Implement NSF/NSR/Graceful Restart for BGP on IOS-XR and IOS-XE
- 4.2 Implement Bidirectional Forwarding Detection (BFD) for BGP on IOS-XR and IOS-XE
- 4.3 Implement high availability and optimization multicast routing features on IOS-XR and IOS-XE

642-887 SPCORE

1.0 VPN in Service Provider IP NGN Environments

- 1.1 Describe VPN implementation models (overlay, peer-to-peer)
- 1.2 Describe VPN technologies (L2TPv3, GRE, IPsec VPN, SSLVPN, DMVPN, GETVPN)
- 1.3 Describe layer 2 vs layer 3 VPNs

2.0 MPLS layer 3 VPNs in Service Provider IP NGN Environments

- 2.1 Describe MPLS layer 3 VPN architecture and operations (RDs, RTs, VRFs, MP-BGP, PE-CE routing)
- 2.2 Describe the design models for combining Internet access with MPLS Layer 3 VPN services Manager
- 2.3 Describe the various methods used to deploy IPv6 over MPLS (6PE and 6VPE)
- 2.4 Implement MP-BGP between PE routers on IOS-XR and IOS-XE
- 2.5 Implement PE-CE routings (static, EIGRP, OSPF, BGP) on IOS-XR and IOS-XE
- 2.6 Implement complex MPLS layer 3 VPNs on IOS-XR and IOS-XE
- 2.7 Implement carrier supporting carrier (CSC) on IOS-XR and IOS-XE
- 2.8 Troubleshoot MPLS layer 3 VPNs IOS-XR and IOS-XE configuration errors in service provider environments

3.0 Layer 2 VPNs in Service Provider IP NGN Environments

- 3.1 Describe L2TPv3 VPNs over an IP core network
- 3.2 Describe layer 2 VPNs (AToM and VPLS) over an IP/MPLS core network
- 3.3 Describe AToM Interworking
- 3.4 Implement AToM on IOS-XR and IOS-XE

4.0 Carrier Ethernet in Service Provider IP NGN Environments

- 4.1 Describe Carrier Ethernet forums and standards (MEF, IEEE, IETF)
- 4.2 Describe the concepts of User PE (U-PE) and Network PE (N-PE)
- 4.3 Describe E-Line vs E-LAN vs E-Tree
- 4.4 Describe QinQ tunneling
- 4.5 Describe Provider Backbone Bridge (PBB - aka MAC-in-MAC)
- 4.6 Describe VPWS vs VPLS
- 4.7 Describe VPLS vs H-VPLS
- 4.8 Describe VPLS signaling using LDP or BGP
- 4.9 Implement QinQ on Cisco ME 3400 switches
- 4.10 Implement VPLS on IOS-XR and IOS-XE

642-889 SPEDGE

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