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## Deploying Cisco Service Provider Advanced Network Routing (642-885)

**Exam Description:** The 642-885, SPADVROUTE, Deploying Cisco Service Provider Advanced Network Routing exam is associated with the CCNP® Service Provider certification. This 90-minute, 65–75 questions exam tests a candidate’s knowledge in configuring, verifying, and troubleshooting IPv4 and IPv6 advanced BGP configuration, IP multicasting, and IPv6 transition mechanisms in implementing and supporting a service provider network. This exam covers the Cisco IOS, IOS-XE and IOS-XR operating systems. Candidates can prepare for this exam by taking the Deploying Cisco Service Provider Advanced Network Routing (SPADVROUTE) course. The exam is closed book and no outside reference materials are allowed.

The following topics are general guidelines for the content likely to be included on the exam. However, other related topics may also appear on any specific delivery of the exam. In order to better reflect the contents of the exam and for clarity purposes, the guidelines below may change at any time without notice.

- 24%**    **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
  
- 23%**    **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
  - 2.15 Troubleshoot multicast routing IOS-XR and IOS-XE configurations errors in service provider environments
- 27%**    **3.0    Layer 2 VPNs in Service Provider IP NGN Environments**
- 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
- 25%**    **4.0    Carrier Ethernet in Service Provider IP NGN Environments**
- 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