Implementing Cisco Service Provider Advanced Routing Solutions v1.0 (300-510)

Exam Description: The Implementing Cisco Service Provider Advanced Routing Solutions v1.0 (SPRI 300-510) is a 90-minute exam associated with the CCNP Service Provider Certification. This exam tests a candidate's knowledge of implementing service provider advanced routing technologies including routing protocols, policy language, MPLS, and segment routing. The course, Implementing Cisco Service Provider Routing Solutions, helps candidates to prepare for this exam.

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. To better reflect the contents of the exam and for clarity purposes, the guidelines below may change at any time without notice.

35%	**1.0**	**Unicast Routing**
	1.1	Compare OSPF and IS-IS routing protocols
	1.2	Troubleshoot OSPF multiarea operations (IPv4 and IPv6)

    1.2.a   Route advertisement

    1.2.b   Summarization

    1.3   Troubleshoot IS-IS multilevel operations (IPv4 and IPv6)

    1.3.a   Route advertisement

    1.3.b   Summarization

    1.4   Describe the BGP scalability and performance

    1.4.a   BGP confederations

    1.4.b   Route reflectors

    1.5   Troubleshoot BGP

    1.5.a   Route advertisement

    1.5.b   Route reflectors

    1.5.c   Confederations

    1.5.d   Multihoming

    1.5.e   TTL security and inter-domain security

    1.5.f   Maximum prefix

    1.5.g   Route dampening

    1.5.h   Dynamic neighbors

    1.5.i   Communities

    1.6   Describe IPv6 tunneling mechanisms

    1.6.a   Static IPv6-in-IPv4 tunnels

    1.6.b   Dynamic 6to4 tunnels

    1.6.c   IPv6 provider edge (6PE)

1.7   Implement fast convergence
    1.7.a   Bidirectional forwarding detection
    1.7.b   Nonstop Forwarding
    1.7.c   NSR
    1.7.d   Timers
    1.7.e   BGP pic (edge and core)
    1.7.f   LFA
    1.7.g   BGP additional and backup path

15%   2.0   Multicast Routing

2.1   Compare multicast concepts
    2.1.a   Multicast domains, distribution trees, and IGMP operations
    2.1.b   Any-Source Multicast (ASM) versus Source Specific Multicast (SSM)
    2.1.c   Intra-domain versus inter-domain multicast routing

2.2   Describe multicast concepts
    2.2.a   Mapping of multicast IP addresses to MAC addresses
    2.2.b   Multiprotocol BGP for IPv4 and IPv6
    2.2.c   Principles and operations of PIM-SM
    2.2.d   Multicast Source Discovery Protocol (MSDP) operations
    2.2.e   MLDP/P2MP

2.3   Implement PIM-SM operations
    2.3.a   Auto-RP, PIMv2 BSR, anycast RP
    2.3.b   BIDIR-PIM operations
    2.3.c   SSM operations
    2.3.d   MSDP operations

2.4   Troubleshoot multicast routing
    2.4.a   Single domain
    2.4.b   Multidomain

25%   3.0   Routing Policy and Manipulation

3.1   Compare routing policy language and route maps
3.2   Describe conditional matching
    3.2.a   Operations
    3.2.b   Semantics of policy applications and statements
    3.2.c   Regular expressions
    3.2.d   Policy sets
    3.2.e   Tags
    3.2.f   ACLs
    3.2.g   Prefix lists and prefix sets
    3.2.h   Route types
    3.2.i   BGP attributes and communities
    3.2.j   Hierarchical and parameterized structures

3.3 Troubleshoot route manipulation for IGPs
    3.3.a   IS-IS
    3.3.b   OSPF

3.4 Troubleshoot route manipulation for BGP
    3.4.a   Route filtering
    3.4.b   Traffic steering

25%   4.0   MPLS and Segment Routing

4.1 Troubleshoot MPLS
    4.1.a   LDP
    4.1.b   LSP
    4.1.c   Unified BGP
    4.1.d   BGP free core
    4.1.e   RSVP TE tunnels

4.2 Implement segment routing
    4.2.a   Routing protocol extensions (OSPF, IS-IS, BGP)
    4.2.b   SRGB and SRLB
    4.2.c   Topology-Independent Loop-Free Alternate (TI-LFA)
    4.2.d   Migration procedures (SR prefer and mapping server)

4.3 Describe segment routing traffic engineering
    4.3.a   Automated steering and coloring
    4.3.b   Policies (constraints, metrics, and attributes)
    4.3.c   PCE-based path calculation

4.4 Describe segment routing v6 (SRv6)
    4.4.a   Control plane operations
    4.4.b   Data plane operations