Implementing and Operating Cisco Service Provider Network Core Technologies (SPCOR)

Course Duration: 40 Hours **Course code: SPCOR**

1. Course Overview

The Implementing and Operating Cisco Service Provider Network Core Technologies (SPCOR) course teaches you how to configure, verify, troubleshoot, and optimize next-generation, Service Provider IP network infrastructures. It provides a deep dive into Service Provider technologies including core architecture, services, networking, automation, quality of services, security, and network assurance.

2. What you'll learn?

After completing this course, you'll be able to:

- Configure and verify interior and exterior gateway protocols (OSPF, IS-IS, BGP)
- Implement MPLS and segment routing
- Deploy and troubleshoot Layer 2 and Layer 3 services
- Configure multicast services and protocols
- Apply QoS techniques for traffic engineering
- Implement infrastructure security features
- Utilize automation tools like NETCONF, RESTCONF, and model-driven telemetry
- Operate Cisco IOS XR, IOS XE, and NX-OS in a service provider environment

3. Target Audience

Individuals looking to verify, troubleshoot and optmize next-generation, Service

Provider IP network infrastructures.

4. Pre-Requisites

Attendees should meet the following prerequisites:

- Intermediate knowledge of Cisco IOS or IOS XE
- Familiarity with Cisco IOS or IOS XE and Cisco IOS XR Software configuration
- Knowledge of IPv4 and IPv6 TCP/IP networking
- Intermediate knowledge of IP routing protocols
- Understanding of MPLS technologies
- Familiarity with VPN technologies

Recommended prerequisites:

- CCNA - Implementing and Administering Cisco Solutions
- SPFNDU - Understanding Cisco Service Provider Network Foundations

5. Course content

Describing Cisco IOS Software Architectures

- Cisco IOS Software Introduction
- Cisco IOS XE Software Fundamentals
- Cisco IOS XR Architecture
- Cisco IOS XR 64-Bit and 32-Bit Differences
- Cisco IOS XR 64-Bit Operational Enhancements
- Cisco IOS XR Container and VM Architecture

Implementing OSPF for Cisco IOS XR

- OSPF Introduction
- OSPF Routing
- OSPF Link-State Database

- OSPF Operation
- OSPF Adjacencies and Modes
- OSPF Implementation
- Multiarea OSPF
- OSPFv3 Implementation
- Basic OSPF Troubleshooting

Implementing IS-IS for Cisco IOS XR

- IS-IS Introduction
- Integrated IS-IS Routing
- IS-IS Operation
- IS-IS Link-State Database
- Integrated IS-IS for IPv6
- IS-IS Configuration for IPv4
- IS-IS Configuration for IPv6
- Basic IS-IS Troubleshooting

Implementing BGP in Service Provider Network

- BGP Introduction
- BGP in Customer Connections
- BGP Routing
- BGP Implementation
- BGP Path Selection
- Weight and Local Preference
- Autonomous System Path Prepending and MEDs
- BGP Communities
- Route Redistribution Introduction
- Redistribution Implementation
- BGP Additional Paths
- BGP Prefix Independant Convergence

- Basic BGP Troubleshooting

Implementing Route Maps and RPL

- Routing Protocol Tools Overview
- Prefix Lists and AS Path Access Lists
- Route Map Introduction
- RPL Introduction
- RPL Parameters and Parameterization
- RPL Implementation

Implementing High Availability in Networking

- Cisco Nonstop Forwarding Overview
- Bidirectional Forwarding Detection Support
- Link Aggregation

Implementing MPLS for Cisco IOS XR

- MPLS Architecture
- MPLS Applications
- LDP Introduction
- MPLS Forwarding Introduction
- MPLS Forwarding Operation
- MPLS Configuration
- LDP Advanced Configuration
- MPLS Monitoring
- MPLS Troubleshooting
- Unified MPLS Architecture

Implementing Cisco MPLS Traffic Engineering

- Traffic Engineering Concepts
- Cisco MPLS TE Introduction

- Cisco MPLS TE Operation
- Constraint-Based Path Computation
- Cisco MPLS TE Tunnel Attributes
- Traffic Steering
- Cisco MPLS TE Implementation
- Protection of Cisco MPLS TE Traffic

Describing Segment Routing

- Segment Routing Concepts
- SR IGP Control Plane Overview
- Segment Types
- TI-LFA Fundamentals
- SR-TE Overview
- PCE-PCC Architecture
- Segment Routing Traffic Engineering
- Segment Routing IPv6
- Segment Routing Flexible Algorithm
- SRv6 Micro-Segment

Describing VPN Services

- VPN Introduction
- MPLS VPN Architecture
- MPLS VPN Routing
- Interdomain MPLS VPN Solutions
- CSC Overview
- Multicast VPN Overview
- EVPN Introduction
- EVPN Terminology and Concepts

Configuring L2VPN Services

- Layer 2 VPN Introduction
- MPLS Layer 2 VPN Types
- EoMPLS Configuration
- VPLS Configuration
- Ethernet OAM Review

Configuring L3VPN Services

- MPLS L3VPN Backbone Implementation
- VRF Configuration
- MP-BGP Configuration
- Basic PE-CE Routing Implementation
- OSPF as PE-CE Protocol
- BGP as PE-CE Protocol
- MPLS L3VPN Shared Services
- Internet Access in MPLS L3VP

Implementing Control Plane Security

- Control Plane Protection Overview
- LDP Security Implementation
- IGP Control Plane Security
- BGP Security Implementation
- BGP FlowSpec Implementation

Implementing Data Plane Security

- ACL Implementation
- uRPF Implementation
- RTBH Filtering Implementation
- Cisco MACsec Overview