

## Deploying Cisco Service Provider Network Routing (CS-SPROUTE) 1.2

**Modality:** Virtual Classroom

**Duration:** 3.5 Days

**SUBSCRIPTION:** Master Plus

### **About this course:**

The SPROUTE course is designed to provide service provider professionals with information on the use of advanced routing in implementing scalability for Cisco routers that are connected to LANs and WANs. The goal is to train professionals to dramatically increase the number of routers and sites using these techniques instead of redesigning the network when additional sites or wiring configurations are added. The SPROUTE training reinforces the instruction by providing students with hands-on labs to ensure that they thoroughly understand how to implement advanced routing within their networks.

This SPROUTE course has been developed to supply the professionals who work as service providers vital information on how the advanced routing in applying the scalability of Cisco routers is connected to LANs and VLANs. The main goal here is the training of professionals which will help dramatically elevate the amount of sites and routers using these techniques rather than designing the network again when the wiring configurations or extra sites are added. The SPROUTE training will reinforce the instruction through provision of hands-on labs to the students making sure that they properly engrain the method of implementation of advanced routing in the networks.

The course also includes classroom activities with remote labs that are useful to gain practical skills on deploying Cisco IOS/IOS XE and Cisco IOS XR features to operate and support a service provider network. This course also helps the students in the preparation for the Cisco: 642-883 SPROUTE exam.

The course will also hold remote labs as part of classroom activities which will be useful to gain skills that are practical in deploying Cisco IOS XE features and Cisco IOS/IOS XE features that will help support and operate service provider network. This course will also aid the students in preparing for the the cisco 642-883 SPROUTE exam.

This course is part of the following Boot Camps:

- CCNP Service Provider Boot Camp (CS-CCNP-SP)

The average salary for Cisco Certified Network Engineer is **\$77,484** per year.

A Cisco Certified Network Engineer takes \$77,484 each year on average.

### **Course Objectives:**

- Identify the typical routing requirements and list the routing protocols in service provider

networks

- Pinpoint the typical routing requirements and then list out the routing protocols in the service provider networks
- Describe steps needed to implement OSPF in the service provider network
- Detail out the steps that are needed in order to successfully OSPF in the service provider network
- Describe the importance of the Integrated IS-IS routing protocol for internal routing and list the steps in implementing Integrated IS-IS into the service provider network
- Implement BGP to connect an enterprise to a service provider, and a service provider to an upstream service provider
- Apply BGP to connect a service provider with the enterprise and the service provider with an upstream service provider.
- Describe tools used for routing protocol manipulation, route redistribution, and BGP route selection

### **Audience:**

- Network administrators, network engineers, network managers, and systems engineers who would like to implement IP routing in service provider environments.
- Network designers and project managers.
- Individuals preparing for CCNP Service Provider certification.
- Program managers.

### **Prerequisites:**

- Intermediate knowledge of Cisco IOS/IOS XE and Cisco IOS XR Software configuration
- Skills and knowledge that are equivalent to those learned in the Building Cisco Service Provider Next-Generation Networks, Part 1 (SPNGN1) v1.0 course and the Building Cisco Service Provider Next-Generation Networks, Part 2 (SPNGN2) v1.0 course

### **Suggested prerequisite courses:**

- Implementing Cisco IOS Network Security v3.0 (IINS)

- Cisco 640-554 CCNA Security - Implementing Cisco IOS Network Security - IINS

## **Course Outline:**

### **Module 1: Service Provider Routing**

#### Lesson 1: Understanding Service Provider Routing Protocols

- Overview of Routing Protocols
- Overview of OSPF
- Overview of IS-IS
- Overview of BGP

### **Module 2: Implement OSPF in the Service Provider Network**

#### Lesson 1: Introducing OSPF Routing

- OSPF Characteristics
- Structure of OSPF Network
- OSPF Operation
- OSPF Link-State Database

#### Lesson 2: Understanding OSPF Operation

- OSPF Packets
- OSPF Neighbor States
- OSPF Network Types
- Enabling OSPF on a Link

#### Lesson 3: Implementing OSPF Routing

- Implement OSPF
- Advanced OSPF Setup
- Secure OSPF

#### Lesson 4: Implementing OSPF Special Area Types

- OSPF Summarization
- OSPF Area Types
- OSPF Stub Area
- OSPF Not-So-Stubby Area

### **Module 3: Implement Integrated IS-IS in the Service Provider Network**

## Lesson 1: Introducing IS-IS Routing

- IS-IS Routing
- IS-IS Addressing
- IS-IS Router Types
- IS-IS Packets
- IS-IS Network Types

## Lesson 2: Implementing Integrated IS-IS Routing

- Implement OSI Area Routing
- Implement IS-IS Routing

## **Module 4: Implement BGP in the Service Provider Network**

### Lesson 1: Introducing BGP Routing

- Connecting a Service Provider with BGP
- BGP Operation

### Lesson 2: Implementing Basic BGP Routing

- Implement Basic BGP
- BGP Neighbor Authentication and Neighbor Reset
- BGP Route Selection Process and Path Attributes

## **Module 5: Routing Protocol Tools and Route Manipulation**

### Lesson 1: Introducing Routing Protocol Tools

- Routing Protocol Tools Overview
- Prefix Lists
- AS Path-Based Filtering
- Route Maps
- Routing Policy Language

### Lesson 2: Implementing Route Redistribution

- Need for Redistribution
- Implement Redistribution

### Lesson 3: Influencing BGP Route Selection

- BGP Weight
- BGP Local Preference
- AS Path Prepending
- BGP Multi-Exit Discriminators
- BGP Communities

## Lab Outline

- Lab 2-1: Implement OSPF Routing
- Lab 2-2: Implement OSPF Special Area Types
- Lab 3-1: Implement Integrated IS-IS Routing
- Lab 4-1: Implement Basic BGP Routing
- Lab 5-1: Implement Route Redistribution
- Lab 5-2: Influence BGP Route Selection

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