

Understanding Cisco Service Provider Network Foundations (SPFNDU)

Course Duration: 40 Hours

Course code: SPFNDU

1. Course Overview

The Understanding Cisco Service Provider Network Foundations (SPFNDU) course provides foundational knowledge of Cisco service provider network operations, architecture, and infrastructure. Designed for professionals entering the service provider environment, this course covers the protocols, components, and functions essential for maintaining a scalable and resilient service provider network. Through theoretical learning and guided labs, learners gain a solid grounding in networking concepts, routing and switching, IP addressing, network virtualization, and security.

2. What you'll learn?

After completing this course you should be able to:

- Describe network architectures, devices, and software used by service providers
- Describe the various Internet governance organizations, their roles, and tools available for governance information verification
- Configure Cisco Internetwork Operating System (Cisco IOS®) and Cisco IOS XE routers
- Describe Cisco IOS XR software, perform initial configuration, and explain platform daily tasks
- Describe various access and core technologies used by service providers
- Describe various major switching technologies used by service providers
- Describe major overlay technologies and their usage, and configure Virtual Extensible LAN I (VxLAN)
- Describe various major routing protocols used by service providers

- Configure Layer 3 services used by service providers
- Describe Multiprotocol Label Switching (MPLS), components, protocols, and MPLS usage
- Describe usage of various services used and maintained by service providers
- Introduce Linux networking, Bourne Again Shell (BASH) scripting, and their usage within Cisco IOS XR software

3. Target Audience

Individuals looking to gain a foundation-level understanding of Cisco Service Provider architectures, protocols and software solutions.

4. Pre-Requisites

Attendees should meet the following prerequisites:

- Knowledge of IPv4 and IPv6 Transmission Control Protocol/Internet Protocol (TCP/IP) networking
- Familiarity with typical service provider environment
- Basic knowledge about networking devices and their roles

5. Course content

1- Introducing Service Provider Architectures

- Bus Topology
- Ring Topology
- Star Topology
- Mesh Topology
- Clos Topology
- Device Roles
- Physical Devices
- Virtual Devices

- Cisco IOS XE Software Overview
- Cisco IOS XR Software Overview
- Internet Service Providers
- Internet Exchange Points
- Cloud Service Providers

2- Describing Internet Governance Organizations

- Internet Engineering Task Force
- Institute of Electrical and Electronics Engineers
- International Telecommunication Union
- Metro Ethernet Forum
- European Telecommunications Standard Institute
- Internet Assigned Number Authority
- Regional and Local Internet Registries
- Network Operators Group
- Other Bodies and Tools

3- Configuring the Cisco IOS and Cisco IOS XE Router

- Access and Initial Configuration
- Configuration Management
- Day Zero Provisioning
- Connectivity and Connectivity Verification on Cisco IOS XE Software
- Monitoring Hardware

4- Configuring Cisco IOS XR Router

- Access and Initial Configuration
- Configuration Management
- Connectivity and Connectivity Verification on Cisco IOS XR Software
- Monitoring Hardware

5- Introducing Access and Core Technologies in the Service Provider Environment

- Optical Connectivity
- DWDM Connectivity
- xDSL Lines
- Cable Connectivity
- Wireless Usage in Service Providers
- Ethernet and Ethernet Evolution

6- Introducing Routing Technologies in Service Provider Environment

- Routing Protocols Overview
- Link-State Protocols
- IS-IS Overview
- OSPF Overview
- Distance Vector Protocols
- RIPv2 and RIPv6 Introduction
- BGP Introduction

7- Describing MPLS

- MPLS Overview
- MPLS Features and Benefits
- MPLS Architecture
- MPLS Labels
- Label Distribution Protocol
- Label-Switched Path
- MPLS Applications Overview

8- Implementing Layer 3 Services

- IP SLA Overview
- First Hop Redundancy Protocols

- Hot Standby Router Protocol
- Virtual Router Redundancy Protocol
- Gateway Load Balancing Protocol
- VRF Overview
- VRF Usage
- VRF Monitoring

9- Introducing Switching Technologies in the Service Provider Environment

- Metro Ethernet Overview
- E-Line Service
- E-LAN Service
- E-Access Service
- E-Tree Service
- VLAN Overview
- QinQ Overview
- Provider Backbone Bridging

10- Introducing Overlay Technologies

- VXLAN Overview
- VXLAN Gateway
- EVPN Overview

11- Implementing Service Provider Services

- DHCP Overview
- DHCP Configuration
- DNS Introduction
- NTP Overview
- Precision Time Protocol

12- Introducing Programmability on Cisco IOS XR Routers

- Linux Primer for Network Engineers
- Linux Networking
- Cisco IOS XR Application Hosting and Programmability

