

Designing and Implementing Cisco Service Provider Cloud Network Infrastructure

Duration: 5 Days **Course Code: SPCNI** **Version: 1.0** **Delivery Method: Virtual Learning**

Overview:

The **Designing and Implementing Cisco Service Provider Cloud Network Infrastructure** course teaches you how to design and implement virtualization cloud infrastructures in a service provider network. You will learn about virtualized network function infrastructures and how to use programmability and orchestration to manage virtualization cloud infrastructures. You will also learn about cloud computing and implementation of cloud interconnect and data center interconnect solutions. In addition, you will learn how to monitor and secure virtualization cloud infrastructures and provide optimization and high availability within the infrastructures.

This training prepares you for the 300-540 SPCNI v1.0 exam. If passed, you earn the Cisco Certified Specialist – Service Provider Cloud Network Infrastructure certification and satisfy the concentration exam requirement for the Cisco Certified Networking Professional (CCNP) Service Provider certification.

This course is worth 40 Continuing Education (CE) credits.

Virtual Learning

This interactive training can be taken from any location, your office or home and is delivered by a trainer. This training does not have any delegates in the class with the instructor, since all delegates are virtually connected. Virtual delegates do not travel to this course, Global Knowledge will send you all the information needed before the start of the course and you can test the logins.

Target Audience:

Individuals looking to design and implement virtualization cloud infrastructures in a service provider network.

Objectives:

- **After completing the course you should be able to:**
- Get an overview of Cisco Network Function Infrastructure, Cisco Network Infrastructure Manager, Cisco Virtualized Infrastructure Manager (VIM), and Cisco Network Service Orchestrator (NSO) Virtualized Infrastructure Manager
- Understand the concept of networking and deployment operation in OpenStack platform
- Get an overview the security features available in Cisco Network Functions Virtualization (NFVI) solution
- Describe the application hosting architecture on a Cisco IOS XR router
- Introduce containers and describe container architecture
- Describe Kubernetes concepts, such as Kubernetes objects, and how nodes, pods, and clusters fit into them
- Describe cloud computing, cloud deployment models, cloud service models, and Carrier-Neutral Facilities (CNFs)
- Implement and configure Multi-Protocol Label Switching (MPLS), Segment Routing (SR), and SRv6
- Describe the operation and data flow of the Layer 3 Virtual Private Network (VPN) control plane
- Configure Label Distribution Protocol (LDP) and Border Gateway
- Configure unicast reverse path forwarding, Media Access Control Security (MACsec), and remote-triggered black-hole filtering
- Get an overview of high-availability technologies and multi-homing scenarios in the service provider network
- Describe the benefits, enablement, implementation, and configuration of Segment Routing Traffic Engineering (SR-TE)
- Describe Quality of Service (QoS) options for public cloud connectivity
- Discuss high availability mechanisms used in routing (anycast) and services Domain Name System (DNS)
- Implement On-Demand Next Hop
- Comprehend and implement model-driven telemetry and use Cisco ThousandEyes for enhanced network visibility and management
- Describe the basic concepts, history, and purpose of telemetry, including the telemetry push model and telemetry collectors
- Discuss the efficiency and ease of use of various encoding methods, including Google Protocol Buffers (GPB), Compact GPB, and Key-value GPB, as well as JavaScript Object Notation (JSON) and transport protocols
- Describe gNMI subscription modes, gRPC outputs, performance with different encodings, and key ideas related to gRPC

Protocol (BGP) security and optimization options

- Describe Interior Gateway Protocol (IGP) control plane security mechanisms

- Describe features, the architecture, and components of Cisco Crosswork Network Controller (CNC)

Prerequisites:

Attendees should meet the following prerequisites:

- Routing protocol configuration experience with BGP, Intermediate System-to-Intermediate System (IS-IS), and Open Shortest Path First (OSPF)
- Knowledge of Layer 2 IEEE switching and related protocols, including MPLS configuration and troubleshooting of Cisco routers in a large network environment
- CCNA - Implementing and Administering Cisco Solutions
- SPFNDU - Understanding Cisco Service Provider Network Foundations
- SPCOR - Implementing and Operating Cisco Service Provider Network Core Technologies

Testing and Certification

Recommended as preparation for the following exams:

- **300-420** - SPCNI: Designing and Implementing Cisco Service Provider Cloud Network Infrastructure

Content:

Cisco NFV Infrastructure

- NFVI and SDN Architecture Overview
- Cisco VIM Overview
- Cisco VIM Deployment Models: Pods
- Cisco VIM Network Plumbing
- OpenStack Networking
- VNF Deployment with OpenStack
- NFVI Security
- Technologies for High Availability

Cloud Computing

- Cloud Computing Fundamentals
- Cloud Deployment Models
- Cloud Service Models
- Carrier-Neutral Facilities

Service Provider Model-Driven Programmability

- Model-Driven Programmability Basics
- NETCONF Fundamentals
- RESTCONF Fundamentals
- gRPC Fundamentals
- Cisco IOS XR Software Service Layer

Network Orchestration using NSO

- NSO Functionality Overview
- Cisco NSO Components
- Cisco NSO Services
- NFV Orchestration Using NSO

Container Orchestration

- Introduction to Containers
- Benefits of Containers
- Docker Containment Enablement
- Kubernetes Fundamentals
- Application Hosting Basics

Cisco Crosswork Network Controller

- Cisco CNC Overview
- Cisco CNC Architecture Overview
- Cisco CNC Components
- Traffic Engineering Policies
- Network Topology and Inventory
- Optimizing Networks using Closed-Loop Automation

Cloud Interconnect Solutions

- Direct Connection to Cloud
- Connect to the Cloud Using IPSec VPN
- Connect to the Cloud Using SR-MPLS VPN
- Cross-Cloud Interconnect

Data Center Interconnect Solutions

- Pseudowires
- EVPN VXLAN in DCI Solutions
- EVPN over MPLS and Segment Routing in DCI Solutions
- Cisco ACI
- Cisco ACI in Multi-Site Environments
- Cisco ACI in Multi-Cloud Environments

Service Provider High Availability

- Multi-Homing
- Segment RoutingTopology-Independent Loop-Free Alternate
- Segment Routing Traffic Engineering
- SLA and QoS
- High Availability Design Considerations for Routing and Services

Service Provider Core Optimization

- Segment Routing Performance Measurement
- On-Demand Next Hop
- Segment Routing Flexible Algorithm

Service Provider Performance Monitoring

- Examining Telemetry Fundamentals
- Model-Driven Telemetry
- Telemetry Encoding and Transport Methods
- gRPC Fundamentals
- Configuring Telemetry
- Telemetry Collectors
- Cisco ThousandEyes Visibility
- How Cisco ThousandEyes Does It
- Cisco ThousandEyes Cloud Agents
- Cisco ThousandEyes Enterprise Agents
- Cisco ThousandEyes Endpoint Agents
- Cisco ThousandEyes Test
- Agent Test Capabilities
- Agent Locations
- Share Links and Saved Events
- Troubleshooting with Cisco ThousandEyes Example

Service Provider Control Plane Security

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

Service Provider Data Plane Security

- ACL Implementation
- uRPF Implementation
- Media Access Control Security 802.1AE
- RTBH Filtering Implementation

Labs:

- Discovery Lab 1: Deploy a VNF Using OpenStack
- Discovery Lab 2: Configure and Verify Devices by Using Model-Driven Programmability
- Discovery Lab 3: Network Orchestration using NSO
- Discovery Lab 4: Configure and Verify Application Hosting Within a Docker Container
- Discovery Lab 5: Configure and Verify Layer 3 VPN
- Discovery Lab 6: Configure and Verify EVPN VPWS
- Discovery Lab 7: Configure and Verify SR TI-LFA Using IS-IS
- Discovery Lab 8: Configure and Verify SR TI-LFA Using OSPF
- Discovery Lab 9: Configure and Verify SR-TE Using IS-IS
- Discovery Lab 10: Configure and Verify SR-TE Using OSPF
- Discovery Lab 11: Configure and Verify ODN and Flexible Algorithm
- Discovery Lab 12: Configure and Verify

Model-Driven Telemetry

■ Discovery Lab 13: Implement BGP
Security

■ Discovery Lab 14: Implement RTBH
Filtering

Further Information:

For More information, or to book your course, please call us on 00 971 4 446 4987

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