

Course Outline

Cisco SD-WAN Service Provider Operations Course SDWSPO: 5 days Instructor Led

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About this course

Cisco SD-WAN Service Provider Operations v1.0 is a 5-day course which explores Cisco SD-WAN from the unique perspective of Service Provider Operations using advanced networking platforms like the ENCS, to support NFV for rapid scalable deployment operations with express focus on automation and orchestration utilities like MSX and NSO. This course progresses from Day 0 Deployment operations like the creation of templates, deployment of central and local policies and then progresses into the world of rapid deployment at scale using the SDWAN API inside Multi-Tenant environments unique to Multi-Service Providers (MSP).

Course Outline

Module 1: Introduction to Managed Services Accelerator (MSX)

- MSX Overview
- MSX Benefits
- MSX Features
 - Service Creation Platform
 - Multi-Tenant, Multi-Service
 - Open API and SDK
 - Rich Templating
 - Service Extensions
 - Pre-Built Service Packs
 - SD-WAN Service Pack
 - SD-Branch (vBranch) Service Pack
 - Managed Device Service Pack
 - OSS/BSS Integration
 - Billing API
 - Order Entry API
 - User Identity API
 - Service Assurance
 - Automated Orchestration
 - Fully-Automated Service Delivery
 - Model-Driven Orchestration using NSO
 - Cloud-Native Architecture
 - Support for Physical and Virtual devices

Course Outline

- Third party Support
- Virtual Networking Function (VNF) Support
- Simple, Customizable User Interface
- Zero Touch Provisioning
- Service Monitoring and Telemetry
- Role Based Access Control (RBAC)
- Deployment Alternatives
 - Amazon Web Services (AWS)
 - Private Clouds

Module 2: Tenants, Users, Roles, Settings and Permissions

- Creating and Managing Tenants
- User and Roles
 - Managing Users
 - Managing Roles
 - Administrator Role
 - SP Operator Role
 - Tenant Operator Role
 - Settings by Role
 - Role Permissions

Module 3: Service Catalog

- Service Catalog Overview
- Creating New Services from Scratch
 - Overview/Introduction/Fundamentals
- Using Pre-Built Services (Service Packs)
 - SD-WAN Service Pack
 - Overview
 - Navigate Sample Workflow
 - SD-Branch (vBranch) Service Pack
 - Overview
 - Navigate Sample Workflow
 - Managed Device Service Pack
 - Overview
 - Navigate Sample Workflow

Module 4: Programmability and Orchestration

Course Outline

- Introduction to Cisco NSO
 - Cisco NSO and Cisco MSX Relationship
 - Cisco Network Services Orchestrator Overview
 - ConfD
 - Multi-NSO Orchestrator Support in Cisco MSX
 - Understanding Day -1, Day 0, Day 1 and Day 2
 - Cisco NSO as PnP Server
 - Cisco MSX and NSO Templates
- ECNS and NFVIS
 - ENCS Overview
 - ENCS and NFVIS
 - The NFVIS Interface
 - NFVIS and MSX

Module 5: Cisco ENCS 5400 Networking

- Introduction to ENCS Architecture
 - Role and need of the Cisco ENCS Appliance
 - Cisco ENCS Architecture Deep Dive
 - Cisco ENCS 5100
 - Cisco ENCS 5400
 - Network Function Virtualization Infrastructure
 - Inside the Cisco ENCS 5400 Hardware
 - Managing the Cisco 5400 Appliance – Leveraging the Cisco IMC
 - Introduction to Virtual Network Functions
- Cisco ENCS 5400 Internal Networking
 - Understanding the X86 Architecture
 - Inbuilt Hardware switch ports with PoE
 - Working of the ENCS Internal Virtual Switch
 - Understanding the SR-IOV on the ENCS 5400
- Cisco ENCS Networks and Bridges
 - LAN Bridge Configuration
 - WAN Bridge Configuration
 - Creating Internal Networks
 - Cisco ENCS Default Network Configuration
 - Connecting the ENCS to the LAN and WAN Networks
 - Understanding ENCS OOB Management

Course Outline

Module 6: Deploying VNFs on the Cisco ENCS

- Understanding the VNF Lifecycle on the ENCS
- Virtual Network Function Requirements
- Creating NFVIS VM Packages
 - Bootstrap Packaging Options
 - Generating the Package file from the CLI and the GUI
- Perform VM image registration and deployment
- Create custom flavors—a flavor is the customized profile of the VM image
- Deploying Cisco and 3rd Party VNFs
 - Connecting the VNF to the Internal Networks
 - Accessing the VNF from the External network

Module 7: Deploying the Cisco ENCS using an Orchestrator

- Deep Dive into the Cisco ISRV – Preinstalled on the Cisco ENCS
- Overview of the Cisco DNA-Center and Cisco NSO
- Overview of the Cisco SD-WAN solution
- Deploying the Cisco ENCS using the Plug and Play – Zero Touch Provisioning

Module 8: Deploying the Cisco SD-Branch Solution on the ENCS 5400

- Deploying and managing the ENCS from the Cisco DNA-Center
- Deploying and managing the ENCS from the Cisco NSO
- Deploying the Cisco SD-WAN Cloud Router on the Cisco ENCS using the Cisco NSO
- Configuring the networking for the SD-WAN Cloud Router using the Cisco NSO
 - Defining a New Catalog
 - Register the NFVIS System into NSO
 - Register the remote VNF
 - Instantiate a VNF on the Remote Site

Module 9: SD-Branch/vBranch Templates

- SD-Branch Templates Overview
- Cisco NSO as Base for Cisco MSX Templates
- Understanding Branch Infra and Interfaces in NFVIS
- Templates Development Environment
- Using TDE to Create Cisco MSX Templates
- SD-Branch/vBranch Workflow

Module 10: Managed Device Templates

Course Outline

- Managed Device Templates Overview
- Creating Base XML File from Cisco NSO
- Using XML File to Create Cisco MSX Template
- Managed Device Workflow
- Testing Cisco MSX Managed Device Template

Module 11: SDWAN Cloud onramp

- Software as a service (SaaS)
 - Performance Challenges
 - SaaS Adopton
 - Security
 - Performance
 - Use Cases
 - No DIA
 - Single DIA
 - Dual DIA
 - Configuration and Monitoring
 - NAT
 - CloudExpress
 - AppQoE
- Infrastructure as a Server (IaaS)
 - State of Public Cloud
 - Extension of SD-WAN to Cloud
 - Cloud Fabric
 - Cloud Gateway
 - Cloud onramp

Lab Outline

- Login into MSX with different user/roles and explore available menu options.
- Creating a new Tenant.
- Creating a new role and user.
- Managing permissions and settings.
- Explore existing SD-Branch with SD-Branch Service Pack.
- Explore existing SD-WAN with SD-WAN Service Pack.
- Deploy a new device with Managed Device Service Pack (CSR1000V).
- Working with SD-Branch Templates.
- Create a new SD-Branch service in NSO.
- Use TDE to create the SD-Branch Template.

Course Outline

- Import SD-Branch Template into MSX.
- Deploy the SD-Branch Template.
- Verify the template results.
- Working with Managed Device Templates.
- Create a new Managed Device XML in NSO.
- Edit Managed Device XML.
- Import Managed Device Template into MSX.
- Deploy Managed Device Template.
- Verify the template results.