Course Outline of Cisco SD-WAN Service Provider Operations (SDWSPO)

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
- 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

- 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 witch 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

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

- 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
  - o Configuration and Monitoring
    - - NAT
    - - CloudExpress
    - - AppQoE
- Infrastructure as a Server (IaaS)
  - o State of Public Cloud
  - o Extension of SD-WAN to Cloud
  - o Cloud Fabric
    - - Cloud Gateway
    - - Cloud onramp