SDWOTS – SD-WAN Advanced Operations & Troubleshooting Bootcamp

Days: *5*

Prerequisites: Familiarity with WAN Networks

Audience: The primary audience for this course is as follows: Engineering and Planning team evaluating WAN evolution; personnel involved in SD-WAN Design, Implementation and Operation; Network Operations team with SD-WAN solution; Cisco partners who sell and support SD-WAN solutions.

Description: This five-day course covers the new deployment, options and features of version 20.16 Cisco Software-Defined WAN (SD-WAN). SD-WAN is an overlay architecture that overcomes the biggest drawbacks of traditional WAN. Students will learn how to design, configure and operate a Cisco SD-WAN utilizing any transport (MPLS, Broadband, LTE, VSAT etc.). Candidates will discuss and build an SD-WAN environment starting from Day 0 provisioning and will also be able to provide troubleshooting, management, policy control and application visibility across the enterprise network. This hands-on Course covers the Cisco SD-WAN product and contains extensive labs to reinforce the knowledge learned.

The course qualifies for 40 Cisco Continuing Education Credits (CE).

Course Objectives: Upon completing this course, the learner will be able to meet these overall objectives:

- Describe how to deploy SD-WAN
- Configure SD-WAN environment
- Deploy Plug and Play / Zero-Touch Provisioning
- Implement SD-WAN Security
- Configure SD-WAN Policies
- Deploy, maintain and troubleshoot cEdge devices
- Operate SD-WAN Devices and software
- Troubleshoot SD-WAN environment

OUTLINE:

MODULE 1: CISCO SD-WAN INTRODUCTION

- High-level Cisco SD-WAN Deployment models
- Application level SD-WAN solution
- Cisco SDWAN high availability solution
- Cisco SD-WAN Scalability
- Cisco SD-WAN Solution Benefits

MODULE 2: CISCO SD-WAN: CONTROL PLANE

- Deploying SD-WAN Control Plane
- SD-WAN Router Establishes Control Connection with vBond
- Devices and Controllers Identities
- Establishing the Control Plane
- Cisco SD-WAN Control Plane Overlay Management Protocol (OMP)
- Troubleshooting Control Connections

MODULE 3: CISCO SD-WAN: DATA PLANE

- Establishing the Data Plane

MODULE 4: TEMPLATES

MODULE 5: POLICY FRAMEWORK

- Control Policies
- Building, Applying, and Processing Centralized Control Policies
- Control, Data, Application Aware, VPN Membership, cFlowd, and Security Policies
- Central and Local Control Policy
- Central and Local Data Policy
- Application Aware Policy
- Creating a Centralized Policy
- VPN Membership Policies
- cFlowd Policy

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- Security Policies
- Application Quality of Experience

MODULE 6: DATA PLANE TROUBLESHOOTING

- Troubleshooting BFD and Data Plane Tunnels
- BFD Troubleshooting
- Control Connections Related Issues
- Firewalls – Port Requirements
- NAT – Related Problems
- OMP
- Security Configuration
- ISP Problems with DSCP 48
- cEdge: In-depth Datapath Debugging

MODULE 7: TROUBLESHOOTING POLICIES

- Control Policy Failure Scenario No. 1
- Control Policy Failure Scenario No. 2
- Troubleshooting Data Policies and App-Route Policies
- Centralized Policies – Points of Failure
- Example 1: vManage Policy Deployment Failure
- Example 2: Policy Deployment on vSmart
- Example 3: Policy Deployment on vEdge
- Example 4: Policy Deployment on cEdge
- Tricky Problem

MODULE 8: MANAGEMENT AND OPERATIONS

- Customer Deployment
- Use Case: Retail
- Controller Deployment
- Seamless Migration
- Multi-Segment Overlay
- Hub and Spoke Topology
- Secure Internet Access
- Cloud onRamp for SaaS
- Cloud onRamp for IaaS
- Redundancy

MODULE 9: SD-WAN MULTI-TENANT

APPENDIX

- Troubleshooting Common Issues
- Interface Troubleshooting
- Troubleshoot vManage Common Issues
- Cisco SD-WAN Best Practices

LAB OUTLINE

- Lab 0: Access the Lab Devices
  - Task 1: Access the EnterOne Lab
- Lab 1: Onboard vSmart Controller
- Lab 2: Prepare a vEdge Router for Onboarding
- Lab 3: Prepare a cEdge Router for Onboarding
- Lab 4: Add vEdge to vManage Inventory
- Lab 5: Configure and Deploy vEdge Router Control-Plane
- Lab 6: Configure and Deploy cEdge Router Control-Plane
- Lab 7: Decommission a cEdge from vManage Inventory
- Lab 8: Adding a cEdge to vManage Inventory
- Lab 9: Configure and Deploy an Overlay Network
- Lab 10: Exploring vManage GUI
- Lab 11: Provision and Deploy vManage Feature Templates
  - Task 1: Deploy Feature-Based Device Template
- Lab 12: Provision and Deploy vManage CLI Templates
- Lab 13: Provision and Deploy Policies (Part 1)
  - Task 1: Modify Controller Distribution Using a Control Policy
  - Task 2: Create a Hub and Spoke Control Policy
- Lab 14: Provision and Deploy Policies (Part 2)
  - Task 1: Create an Application Aware Routing Policy
  - Task 2: Create a Service Chain Policy
  - Task 3: Create Localized QOS Policies Using Feature Templates

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- Lab 15: Verifying and Troubleshooting Data Plane Issues
    - Task 1: Verifying the Data Plane
    - Task 2: Verifying BFD Information
    - Task 3: Determining the Makeup of Network Traffic Using DPI
    - Task 4: Simulating Flows
- Lab 16: TLOC Extension
- Lab 17: Troubleshooting Methods and Tools
    - Task 1: Ping and Traceroute
    - Task 2: vManage Alarms and Events
    - Task 3: vShell
    - Task 4: Viewing System Log Files
    - Task 5: Enabling and View Debuf Output
- Lab 18: Using the REST API and Python Scripting
    - Task 1: Python Installation and Introduction
    - Task 2: Examine and Run a Sample Python Script and View the Output
- Lab 19: Deploy Multitenant vManage
    - Task 1: Deploy Multitenant vManage
    - Task 2: Install vManage Certificates
    - Task 3: Add vBond Controller and Install Certificates
    - Task 4: Add a Tenant in vManage
    - Task 5: Access vManage as a Tenant