

SD-WAN Advanced Operations & Troubleshooting Bootcamp (SDWOTS)

Course Summary

Description

SD-WAN: Advanced Operations & Troubleshooting Bootcamp (SDWOTS) is a five-day course. We will cover Cisco Software-Defined WAN (SD-WAN) which is an overlay architecture that overcomes the biggest drawbacks of traditional WAN. Students will be able to operate a Cisco SD-WAN over any transport (MPLS, Broadband, LTE, VSAT etc.) and provide troubleshooting, management, policy control and application visibility across the enterprise. This hands-on Course covers the Cisco SD-WAN product and contains extensive labs to reinforce the knowledge learned.

Objectives

By the end of this course, students will be able to:

- Describe how to deploy SD-WAN
- Configure SD-WAN environment
- Deploy Zero-Touch Provisioning
- Implement SD-WAN Security
- Configure SD-WAN Policies
- Operate SD-WAN Devices and software
- Troubleshoot SD-WAN environment

Topics

- Cisco SD-WAN Introduction
- Cisco SD-WAN Orchestration
- Site Architecture and Deployment Models
- Zero Touch Provisioning
- Cisco SD-WAN Solution
- Operations Best Practices
- Application Monitoring
- Troubleshooting Methods
- General Troubleshooting
- Troubleshooting: Data Plane Issues
- Troubleshooting: Routing Issues
- Application-Aware Routing
- Interface Troubleshooting
- Network Operations
- Security Certificate Troubleshooting
- Viptela Devices Maintenance
- Viptela Device Operation and Troubleshooting
- Working with Viptela Support

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

Prerequisite

The knowledge and skills that a learner should have before attending this course is a familiarity with WAN Networks.

Duration

Five Days

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Course Outline

- I. Cisco SD-WAN Introduction**
 - A. High-level Cisco SD-WAN Deployment models
 - B. Application level SD-WAN solution
 - C. Cisco SDWAN high availability solution
 - D. Cisco SD-WAN Scalability
 - E. Cisco SD-WAN Solution Benefits
- II. Cisco SD-WAN Orchestration**
 - A. Introduction
 - B. vManage NMS
 - C. vSmart Controller
 - D. vBond Orchestrator
 - E. Controller Resiliency Architecture
- III. Site Architecture and Deployment Models**
 - A. Site Capabilities
 - B. vEdge Router
 - C. vEdge form factors
- IV. Zero Touch Provisioning**
 - A. Overview
 - B. User Input Required for the ZTP Automatic Authentication Process
 - C. Authentication between the vBond Orchestrator and a vEdge Router
 - D. Authentication between the vEdge Router and the vManage NMS
 - E. Authentication between the vSmart Controller and the vEdge Router
- V. Cisco SD-WAN Solution**
 - A. Overlay Management Protocol (OMP)
 - B. Cisco SDWAN Circuit Aggregation Capabilities
 - C. Secure Connectivity in Cisco SD-WAN
 - D. Performance Tracking Mechanisms
 - E. Application Discovery
 - F. Dynamic Path Selection
 - G. Performance Based Routing
 - H. Dynamic Cloud Access
- VI. Operations Best Practices**
 - A. Config: Test Configuration Changes Before Committing
 - B. NAT: Secure Routers Acting as NATs
 - C. vEdge Routers: Connect to the Console Port
 - D. vEdge Routers: Use the Poweroff Command
 - E. Viptela Devices: Site ID Naming Conventions
 - F. Viptela Devices: Using the System IP Address
 - G. vManage NMS: Disaster Recovery
- VII. Application Monitoring**
 - A. vManage
 - B. vAnalytics
 - C. Ecosystem Partner Solutions
- VIII. Troubleshooting Methods**
 - A. Remote Access
 - B. Console Access
 - C. LAN Interfaces
 - D. WAN Interfaces
 - E. Control Connections
- IX. General Troubleshooting**
 - A. Check Application-Aware Routing Traffic
 - B. Collect Device Data to Send to Customer Support
 - C. Monitor Alarms and Events
 - D. Monitor TCP Optimization
 - E. Ping a Viptela Device
 - F. Run a Traceroute
 - G. Simulate Flows
 - H. Troubleshoot Cellular Interfaces
 - I. Troubleshoot Device Bringup
 - J. Troubleshoot WiFi Connections
 - K. Use Syslog Messages
 - L. Tunnel Health

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Course Outline (cont)

- X. Troubleshooting: Data Plane Issues**
 - A. BFD Session Information
 - B. Cflowd Information
 - C. Data Policies
 - D. DPI Information
 - E. Symptom: Site Cannot Reach Applications in Datacenter
 - F. Symptom: vManage Showing vEdge or Interface Down
 - G. Symptom: Site-Wide Loss of Connectivity (Blackout)
 - H. Symptom: Poor Application Performance (Brownout)
 - I. Issue Severity Assessment
- XI. Troubleshooting: Routing Issues**
 - A. BGP Information
 - B. Multicast Information
 - C. OMP Information
 - D. OSPF Information
 - E. PIM Information
 - F. Symptom: Some or All Routes Missing from vEdge Routing table
 - G. Symptom: Data Traffic Using Suboptimal Path
 - H. Symptom: Data Traffic Not Using All Transports
- XII. Application-Aware Routing**
 - A. Application Performance with CloudExpress Service
 - B. Tunnel Latency Statistics
 - C. Tunnel Loss Statistics
- XIII. Interface Troubleshooting**
 - A. Reset an Interface
 - B. All Interfaces
 - C. ARP Table Entries
 - D. Cellular Interface Information
 - E. DHCP Server and Interface Information
 - F. Interface MTU Information
 - G. Management Interfaces
 - H. VRRP Information
 - I. WAN Interfaces
- XIV. Network Operations**
 - A. Check Alarms and Events
 - B. Check User Accounts and Permissions
 - C. Deploy the Viptela Overlay Network
 - D. Determine the Status of Network Sites
 - E. Control Connections
 - F. Data Connections
 - G. Network Performance with vAnalytics Platform
 - H. OMP Status
- XV. Security Certificate Troubleshooting**
 - A. Generate a Certificate
 - B. Upload the vEdge Serial Number File
 - C. Certificate
 - D. CSR
- XVI. Viptela Devices Maintenance**
 - A. Decommission a vEdge Cloud Router
 - B. Determine the Status of a Network Device
 - C. Locate a Viptela Device
 - D. Migrate a Controller's Virtual Machine Using vMotion
 - E. Reboot a Device
 - F. Remove a vEdge Router's Serial Number from the vManage NMS
 - G. Replace a vEdge Router
 - H. Restore the vManage NMS
 - I. Set Up User Accounts to Access Viptela Devices
 - J. Validate or Invalidate a vEdge Router
 - K. Software Versions Installed on a Device
 - L. Status of a vBond Orchestrator
 - M. Status of a vEdge Router
 - N. Status of a vSmart Controller

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Course Outline (cont.)

XVII. *Viptela Device Operation and Troubleshooting*

- A. Determine Changes to a Configuration Template
- B. Determine Why a Device Rejects a Template
- C. Alarm Severity Levels
- D. Hardware Alarms
- E. Checking Alarms and Notifications
- F. LEDs
- G. Additional Information
- H. Restore a vEdge Router
- I. Remove vEdge Router Components

XVIII. *Working with Viptela Support*

- A. Case Priority Levels and Response Times
- B. Information for Opening Cases
- C. Viptela Customer Support Portal
- D. Other Ways to Contact Support
- Lab Outline
 - Introduction to the Cisco SD-WAN
 - Add vEdge to vManage Inventory
 - Control-Plane Connectivity
 - Overlay Network
 - Zero-Touch Provisioning
 - vManage Templates
 - vManage Basic Policies
 - Application Aware Policies
 - Advanced Policies
 - Analytics
 - MultiTenant Mode and Tenants
 - Troubleshooting Methods
 - Troubleshooting Data Plane Issues
 - Troubleshooting Routing Issues
 - Best Practices