Course Content

Course Description:

SD-WAN: Advanced Operations & Troubleshooting Bootcamp (SDWOTS) v1.0 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.

At Course Completion:

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 Zero-Touch Provisioning
- Implement SD-WAN Security
- Configure SD-WAN Policies
- Operate SD-WAN Devices and software
- Troubleshoot SD-WAN environment

Target Student:

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

Prerequisites:

The knowledge and skills that a learner should have before attending this course are as follows:
- Familiarity with WAN Networks

Topics:

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 Orchestration
- Introduction
- vManage NMS
- vSmart Controller
- vBond Orchestrator
- Controller Resiliency Architecture

Module 3: Site Architecture and Deployment Models
- Site Capabilities
- vEdge Router
- vEdge form factors

Module 4: Zero Touch Provisioning
- Overview
- User Input Required for the ZTP Automatic Authentication Process
- Authentication between the vBond Orchestrator and a vEdge Router
- Authentication between the vEdge Router and the vManage NMS
- Authentication between the vSmart Controller and the vEdge Router

Module 5: Cisco SD-WAN Solution
- Overlay Management Protocol (OMP)
- Cisco SDWAN Circuit Aggregation Capabilities
- Secure Connectivity in Cisco SD-WAN
- Performance Tracking Mechanisms
- Application Discovery
- Dynamic Path Selection
- Performance Based Routing
- Dynamic Cloud Access

Module 6: Operations Best Practices
- Config: Test Configuration Changes Before Committing
- NAT: Secure Routers Acting as NATs

- vEdge Routers: Connect to the Console Port
- vEdge Routers: Use the Poweroff Command
- Viptela Devices: Site ID Naming Conventions
- Viptela Devices: Using the System IP Address
- vManage NMS: Disaster Recovery

Module 7: Application Monitoring
- vManage
- vAnalytics
- Ecosystem Partner Solutions

Module 8: Troubleshooting Methods
- Remote Access
- Console Access
- LAN Interfaces
- WAN Interfaces
- Control Connections

Module 9: General Troubleshooting
- Check Application-Aware Routing Traffic
- Collect Device Data To Send to Customer Support
- Monitor Alarms and Events
- Monitor TCP Optimization
- Ping a Viptela Device
- Run a Traceroute
- Simulate Flows
- Troubleshoot Cellular Interfaces
- Troubleshoot Device Bringup
- Troubleshoot WiFi Connnections
- Use Syslog Messages
- Tunnel Health

Module 10: Troubleshooting: Data Plane Issues
- BFD Session Information
- Cflowd Information

- Data Policies
- DPI Information
- Symptom: Site Cannot Reach Applications in Datacenter
- Symptom: vManage Showing vEdge or Interface Down
- Symptom: Site-Wide Loss of Connectivity (Blackout)
- Symptom: Poor Application Performance (Brownout)
- Issue Severity Assessment

Module 11: Troubleshooting: Routing Issues
- BGP Information
- Multicast Information
- OMP Information
- OSPF Information
- PIM Information
- Symptom: Some or All Routes Missing from vEdge Routing table
- Symptom: Data Traffic Using Suboptimal Path
- Symptom: Data Traffic Not Using All Transports

Module 12: Application-Aware Routing
- Application Performance with CloudExpress Service
- Tunnel Latency Statistics
- Tunnel Loss Statistics

Module 13: Interface Troubleshooting
- Reset an Interface
- All Interfaces
- ARP Table Entries
- Cellular Interface Information
- DHCP Server and Interface Information
- Interface MTU Information
- Management Interfaces

- VRRP Information
- WAN Interfaces

Module 14: Network Operations
- Check Alarms and Events
- Check User Accounts and Permissions
- Deploy the Viptela Overlay Network
- Determine the Status of Network Sites
- Control Connections
- Data Connections
- Network Performance with vAnalytics Platform
- OMP Status

Module 15: Security Certificate Troubleshooting
- Generate a Certificate
- Upload the vEdge Serial Number File
- Certificate
- CSR

Module 16: Viptela Devices Maintenance
- Decommission a vEdge Cloud Router
- Determine the Status of a Network Device
- Locate a Viptela Device
- Migrate a Controller's Virtual Machine Using vMotion
- Reboot a Device
- Remove a vEdge Router's Serial Number from the vManage NMS
- Replace a vEdge Router
- Restore the vManage NMS
- Set Up User Accounts to Access Viptela Devices
- Validate or Invalidate a vEdge Router
- Software Versions Installed on a Device
- Status of a vBond Orchestrator
- Status of a vEdge Router
- Status of a vSmart Controller

Module 17: Viptela Device Operation and Troubleshooting
- Determine Changes to a Configuration Template
- Determine Why a Device Rejects a Template
- Alarm Severity Levels
- Hardware Alarms
- Checking Alarms and Notifications
- LEDs
- Additional Information
- Restore a vEdge Router
- Remove vEdge Router Components

Module 18: Working With Viptela Support
- Case Priority Levels and Response Times
- Information for Opening Cases
- Viptela Customer Support Portal
- Other Ways to Contact Support