SDWOTS: Cisco SD-WAN Operations, Troubleshooting, and Best Practices

COURSE 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 Orchestration

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

Module 3: Site Architecture and Deployment Models

- Site Capabilities
- cEdge Router
- Upgrading a current ISR router to support SD-WAN

Module 4: Plug and Play Connect Portal - Zero Touch Provisioning

- Overview
- Understanding Cisco Plug and Play Connect Portal
- cEdge registration, licensing and onboarding
- Understanding the legacy ZTP Portal for vEdge
- User Input Required for the ZTP Automatic Authentication Process
- Authentication between the vBond Orchestrator and a cEdge Router
- Authentication between the cEdge Router and the vManage NMS
- Authentication between the vSmart Controller and the cEdge 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
- Understanding the Cisco SD-WAN Onramp
- Understanding Direct Internet Access (DIA) and it's advantages
- Zone Based Firewall
- Umbrella integration
- SD-WAN security features overview

Module 6: Operations Best Practices

- Config: Test Configuration Changes Before Committing
- NAT: Secure Routers Acting as NATs
- cEdge / vEdge Routers: Connect to the Console Port
- cEdge / vEdge Routers: Use the Poweroff Command
- cEdge / Viptela Devices: Site ID Naming Conventions
- Edge 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 an vEdge Cloud Router
- Determine the Status of a Network Device
- Locate an Edge Device
- Migrate a Controller's Virtual Machine Using vMotion
- Reboot a Device
- Remove an Edge Router's Serial Number from the vManage NMS
- Replace an Edge 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 cEdge / 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 cEdge / vEdge Router
- Remove cEdge / 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