Cisco SD-WAN Operations Troubleshooting and Best Practices

Duration: 5 Days   Course Code: SDWOTS   Version: 1.0   Delivery Method: Company Event

Overview:

SDWOTS is a 5-day course covering the deployment options, operations and features of 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.

Company Events

These events can be delivered exclusively for your company at our locations or yours, specifically for your delegates and your needs. The Company Events can be tailored or standard course deliveries.

Target Audience:

Individuals who are planning, implementing or administering a Cisco SD-WAN Solution.

Objectives:

- **After completing this course you should be able to :**

- Describe how to Deploy SD-WAN

- Configure a SD-WAN Environment

- Deploy Plug and Play Zero-Touch provisioning

- Implement SD-WAN Security

- Configure SD-WAN Policies

- Deploy, Maintain and Troubleshoot Edge Devices

- Operate SD-WAN Devices and Software

- Troubleshoot SD-WAN Environment

Prerequisites:

Attendees should meet the following prerequisites:

- Familiarity with WAN Networks

Testing and Certification

Recommended as preparation for the following exams:

- There are no exams currently aligned to this course

Content:

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

Cisco SD-WAN Orchestration

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

Site Architecture and Deployment Models

- Site Capabilities
- vEdge Router
- vEdge form factors

Plug and Play Connect Portal - Zero Touch Provisioning

- Overview
- Understanding Cisco Plug and Play Connect Portal
- Edge 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 an Edge Router
- Authentication between the Edge Routers and the vManage NMS
- Authentication between the vSmart Controller and the Edge Router

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

Operations Best Practices

- Config: Test Configuration Changes Before Committing

Troubleshooting Methods

- Remote Access
- Console Access
- LAN Interfaces
- WAN Interfaces
- Control Connections

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

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

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

Application-Aware Routing

- Application Performance with CloudExpress Service
- Tunnel Latency Statistics
- Tunnel Loss Statistics

Interface Troubleshooting

Security Certificate Troubleshooting

- Generate a Certificate
- Upload the vEdge Serial Number File
- Certificate
- CSR

Viptela Devices Maintenance

- Decommission a 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 vEdge Router
- Status of a vSmart Controller

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

Working With Viptela Support

- Case Priority Levels and Response Times
- Information for Opening Cases
- Viptela Customer Support Portal
- Other Ways to Contact Support

Labs:

- Introduction to the Cisco SD-WAN
- Add a vSmart Controller to the vManage Inventory
- Add a vEdge Router to the vManage Inventory
- Add a cEdge Router to the vManage Inventory
- Add vEdge to vManage Inventory
- Control-Plane Connectivity
- Overlay Network
- Zero-Touch Provisioning
- vManage Templates

- 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

Application Monitoring

- vManage
- vAnalytics
- Ecosystem Partner Solutions

- 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

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

- vManage Basic Policies
- Application Aware Policies
- Advanced Policies
- Internet Exit lab (DIA)
- Zone Based Firewall lab
- URL Filter
- AMP Lab
- Analytics from vManage
- MultiTenant Mode and Tenants
- Troubleshooting Methods
- Troubleshooting Data Plane Issues
- Troubleshooting Routing Issues
- Best Practices

Further Information:

For More information, or to book your course, please call us on 0800/84.009

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