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## SD-WAN: Advanced Operations & Troubleshooting Bootcamp

**Duration: 5 Days**    **Course Code: SDWOTS**    **Version: 1.0**

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### Overview:

SD-WAN: Advanced Operations & Troubleshooting Bootcamp focuses on the Cisco Software-Defined WAN (SD-WAN) solution. It is an overlay architecture that overcomes the biggest drawbacks of a 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.

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### Target Audience:

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

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### Objectives:

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|---|---------------------------------------|
| ■ <b>After completing this course you should be able to :</b> | ■ Implement SD-WAN security           |
| ■ Describe how to deploy SD-WAN                               | ■ Configure SD-WAN policies           |
| ■ Configure a SD-WAN environment                              | ■ Operate SD-WAN devices and software |
| ■ Deploy Zero-Touch provisioning                              | ■ Troubleshoot a SD-WAN environment   |
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### Prerequisites:

**Attendees should meet the following prerequisites:**

- Familiarity with WAN Networks
- ROUTE - Implementing Cisco IP Routing
- SWITCH - Implementing Cisco Switched Networks

### Testing and Certification

**Recommended as preparation for the following exams:**

- There are no exams currently aligned to this course
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## 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

### 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

### 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

### 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

### Application Monitoring

- vManage

### 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 Connections
- 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 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

### 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

### 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 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

- 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

- Troubleshooting Routing Issues
- Best Practices

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### Further Information:

For More information, or to book your course, please call us on Head Office Tel.: +974 40316639

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