



Advanced Cisco SD-WAN Routing, Templates, Policy Configure, and Tshoot (ADV-SDWAN-CT)

In this 5-day Advanced SD-WAN Course, Students will learn Advanced Techniques to Deploy Advanced Features of SDWAN. This course focuses on High Availability, Advanced Settings, Templates and Configuration Groups, APP-QOE with FEC, TCP OPT DRE, SD-AVC, Per-Tunnel/Adaptive/VPN QoS, Security using SASE/ Cloud/On-Prem, Students will then focus on Routing, including OMP, Service Chaining, BGP, EIGRP, OSPF, On-Demand Routing, DIA Routing through Branches/Hubs/Data Centers. Students will then focus on deploying advanced features of Local Policies and learning how to troubleshoot Local Policy issues. Students will then focus on deploying Advanced features of Centralized Policies and learning how to troubleshoot Central Policy issues.

- Explore and Troubleshoot the initial environment
- Design, Configure, and Troubleshoot Clusters and High Availability
- Learn Advanced Techniques to Deploy Templates with the theme of reusability
 - Deploy and Troubleshoot Transport Bridging
 - Deploy and Troubleshoot Routing including OSPF, BGP, EIGRP
 - Deploy and Troubleshoot Multicast Routing
- Design, Configure, and Troubleshoot APP-QoE, SD-AVC and QoS Policies
- Design, Configure, and Troubleshoot Advanced Security Policies
- Design, Configure, and Troubleshoot SDWAN Direct Internet Access (DIA)
- Design, Configure, and Troubleshoot SDWAN Unified Communication Integrations
- Design, Configure, and Troubleshoot Local Policies
- Design, Configure, and Troubleshoot Application Aware Routing
- Design, Configure, and Troubleshoot Central Policies (Sites, Hub Spoke, Full Mesh and Custom Topologies)
- Design, Configure, and Troubleshoot Central Policies Including Service Chaining
- Design, Configure, and Troubleshoot Central Policies Including Traffic Rules & CFLOW
- Design, Configure, and Troubleshoot Migration from IWAN

Why Attend with Current Technologies CLC

- Our Instructors are the top 10% rated by Cisco
- Our Lab has a dedicated 1 Gig Fiber Connection for our Labs
- Our Labs run up to Date Code for all our courses

Prerequisites

- Implementing and Configuring Cisco SDWAN (ICSDWAN-CT)

Objectives

- SD-WAN Review
- Clusters and High Availability
- SD-AVC and QoS Policies
- Advanced Template Design and Troubleshooting
- Advanced Security Policies on vEdge and IOS-XE Platforms
- Advanced Local Policies on vEdge and IOS-XE Platforms
- Advanced Central Policies on vEdge and IOS-XE Platforms
- Advanced Troubleshooting of Policies on vEdge and IOS-XE Platforms

Outline

Module 0: Introductions

- Module Introduction
 - Topic List
- Lesson 1: Introductions
 - General Administration
 - WebEx Basics
 - Introductions
 - Questions Asked by Companies about SD-WAN
 - What is SD-WAN?
 - SD-WAN Desired Benefits
 - How does Cisco define SD-WAN?
 - Pre-Requisites for the Advanced SD-WAN
- Module Summary

Module 1: Cisco SD-WAN Overview

- Module Introduction
 - Topic List
- Lesson 1: Cisco SD-WAN Overview
 - Dashboard
 - SD-WAN Architecture
- Lesson 2: SD-WAN Platform Discussion
 - What's in a Name?
 - SD-WAN WAN Edges
 - cEdges
 - vEdges
 - SD-WAN Controllers
 - vBond
 - vSmart
 - vManage
 - SD-WAN Fabric
- Module Summary

Course Duration

5 day

Course Price

\$4,795.00 or 46 CLCs

Methods of Delivery

- Instructor Led
- Virtual ILT
- On-Site

Module 2: SD-WAN Advanced Settings

- Module Introduction
 - Topic List
- Lesson 1: Design Considerations and Scaling
 - SD-WAN Smart Licensing
 - Advanced Controller Settings
 - Overlay and WAN Edge Recommended Settings
- Lesson 2: Site Design
 - System IP Design
 - Multitenant Design
- Lesson 3: Advanced Settings
- Lesson 4: Ether Channel Support (20.6)
- Lesson 5: Hot Standby Router Protocol (HSRP)
- Lesson 6: LTE Design and Deployment
- Module Summary

Module 3: SD-WAN High Availability

- Module Introduction
 - Topic List
- Lesson 1: Common WAN Topologies Design and Deployment Considerations
 - High Availability
 - Controller Scalability
- Lesson 2: Active vManage, Backup Inactive vManage, Clustering vManage
 - Resource Groups
 - RBAC Enhancements
- Lesson 3: SD-WAN Disaster Recovery
- Lesson 4: Troubleshooting Cluster Operation
- Module Summary

Module 4: SD-WAN Templates

- Module Introduction
 - Topic List
- Lesson 1: Template Overview
 - Future Templates
 - Device template using Future Templates
 - Device template using CLI Templates
 - Designing templates for Reusability
 - Attaching Devices to Templates
- Lesson 2: Using Python to Import / Export Templates
- Lesson 3: Parsing JSON with Python
- Lesson 4: Create / Delete / Import / Export of Templates
- Module Summary

Module 5: SD-WAN APP-QoE, SD-AVC and QoS Policies

- Module Introduction
 - Topic List
- Lesson 1: Application Quality of Experience (APPQoE)
 - SD-AVC
 - Application Aware Routing
- Lesson 2: Custom Application Identification
- Lesson 3: Bidirectional Forwarding Detection (BFD)
 - BFD Hello Timer and Multiplier
 - BFD Measurements
- Lesson 4: Cloud onRamp for SaaS for Office 365
- Lesson 5: Per Tunnel QOS
- Lesson 6: Adaptive QOS
- Lesson 7: SD-WAN 17.6/20.6 - Per VPN QOS
 - vManage Configuration Workflow
- Lesson 8: TCP Optimization
- Lesson 9: Service Nodes for AppQoE
 - Data Redundancy Elimination (DRE)
 - APPNAV Deployment
 - WAAS Integration
- Lesson 10: Forward Error Correction (FEC)
- Lesson 11: Packet Duplication
- Module Summary

Module 6: Bridging

- Module Introduction
 - Topic List
- Lesson 1: Transparent Bridging
- Lesson 2: Bridging Template Configuration
- Lesson 3: cEdge Bridging Template Configuration
- Lesson 4: vEdge Bridging Template Configuration
 - Monitoring Bridging
- Module Summary

Module 7: Routing Protocols

- Module Introduction
 - Topic List
- Lesson 1: SD-WAN Underlay Routing
 - Service-Side Routing vs Transport-Side Routing vs Overlay Routing
 - Traffic Routing Decision Tree
- Lesson 2: Static Routes
- Lesson 3: VRRP Enhancements
- Lesson 4: Dynamic Routing Protocols
 - OMP Routing
 - OMP Templates
 - OMP Policies

- Border Gateway Protocol (BGP)
- BGP Review
- BGP Templates
- BGP Policies, Local Route Policies
- BGP Lists
- BGP Local Route Policies
- BGP Troubleshooting
- OSPF
- OSPF Review
- SD-WAN OSPF
- OSPF Templates
- OSPF Local Policies
- OSPF Monitoring
- OSPF Troubleshooting
- EIGRP
- EIGRP Template Configuration
- EIGRP Monitoring and Troubleshooting
- Lesson 5: Routing Information Protocols
- Lesson 6: SD-WAN On Demand Tunnels
- Lesson 7: Route Leaking
- Lesson 8: Hierarchical SD-WAN (Regions)
- Module Summary

Module 8: Multicast

- Module Introduction
 - Topic List
- Lesson 1: Complete Multicast Support on Cisco SD-WAN
- Lesson 2: vEdge Support
 - cEdge Multicast Support
 - Multicast RPs
 - Multicast Replicators
 - PIM IGMP
- Module Summary

Module 9: Direct Internet Access (DIA) Overview

- Module Introduction
 - Topic List
- Lesson 1: SD-WAN Direct Internet Access (DIA)
 - SD-WAN DIA Requirements
 - SD-WAN Direct Internet Access Use Cases
 - SD-WAN Direct Internet Access Design Components
 - SD-WAN Direct Internet Access Design Considerations
 - SD-WAN Direct Internet Access Failover Scenarios
- Lesson 2: Deploying DIA
- Lesson 3: Central Data Policy
- Lesson 4: NAT DIA Route
 - Cisco SD-WAN Direct Internet Access Monitoring

- Module Summary

Module 10: SD-WAN Voice Configuration

- Module Introduction
 - Topic List
- Lesson 1: Voice Integration in SD-WAN
 - T1, PRI
 - DSP Configuration
- Lesson 2: Voice Card Feature Templates
- Lesson 3: Call Routing Feature Templates
- Lesson 4: Survivable Remote Site Telephony (SRST)
- Lesson 5: Voice Policies
- Lesson 6: Create a Voice Port Policy
- Lesson 7: Voice Port Translation Profile
- Lesson 8: FXO Supervisory Disconnect
 - FXO, FXS, FXS DID
- Lesson 9: Cisco Unified Border Element (CUBE)
 - CUBE Functionality
 - IOS-XE UC Device Template
- Module Summary

Module 11: SD-WAN Security Policy

- Module Introduction
 - Topic List
- Lesson 1: SD-WAN Security
- Lesson 2: SD-WAN Base Security
- Lesson 3: SD-WAN Cloud Security
 - Umbrella for SD-WAN
 - Layer 7 Health Check
- Lesson 4: Zscaler Integration
- Lesson 5: SD-WAN Cloud Security Features
 - Web Layer Security
 - DNS Layer Security
 - Firewall
 - IPS (Snort)
 - Interactive Threat Intel
- Lesson 6: SD-WAN Integrated Security
 - TLS Decryption
- Lesson 7: 17.6/20.6 – Geo-Fencing
 - Geo-Fencing
- Lesson 8: SD-WAN Security Configuration
- Module Summary

Module 12: SD-WAN Local Policy

- Module Introduction
 - Topic List

- Lesson 1: Policy Configuration Overview
 - Policy Framework-Localized Policies
 - Local Control Policy
 - QOS Maps
 - Rewrite Policies
 - Policers
 - Device Access Policies
 - Access Control Lists
 - Local Control (Route) Policy
 - Localized Control Policy Configuration
 - Lesson 2: Local Data Policies
 - Local Data Policy
 - Configure Localized Data Policy for IPv4
- Module Summary

Module 13: SD-WAN Central Policy

- Module Introduction
 - Topic List
- Lesson 1: Centralized Control Policies
 - Policy Creation and Management Guidelines
 - Hub & Spoke / Mesh / Custom
- Lesson 2: Centralized Data Policies
- Lesson 3: Application Aware Routing
 - QOS Policies
- Lesson 4: Service Chaining
- Lesson 5: Traffic Flow Monitoring with Cflowd
 - cFlowd Policy
- Lesson 6: Policy Construction
- Lesson 7: Platform Support and Scalability
- Module Summary

Module 14: SD-WAN Migration

- Module Introduction
 - Topic List
- Lesson 1: SD-WAN Conversation Tool
- Lesson 2: Cisco Sure Tool
- Lesson 3: Migration and Deployment Models
- Lesson 4: Typical Migrations
- Lesson 5: Data Center / Hub Migration
- Lesson 6: Branch / Spoke Site Migration
- Module Summary

LAB OUTLINE

Lab 1: Review & Troubleshoot Initials SDWAN Environment

- Review Environment

- Troubleshooting Initial Connectivity
- Troubleshooting Initial Control Connections

Lab 2: Create and Troubleshoot SDWAN Clusters

- Create a 3 Node SDWAN Cluster
- Monitor Cluster Troubleshoot Cluster

Lab 3: Template / Configurations Groups

- Advanced Techniques for Template Creation
- Variable Naming Conventions for Reusability
- Create Feature Template for reuse across all vEdge devices
- Export and Import Templates via API
- Troubleshoot Template Deployment

Lab 4: Deploy and Troubleshoot Hardware Routers with ztp.

- Troubleshoot and Deploy 4331 Router
- Troubleshoot and Deploy vEdge Router

Lab 5: Implement Routing Protocol

- Configure Transparent Routing
- Configure BGP Template and Local Policy on the Transport VPN
- Configure OSPF Template and Local Policy on the Transport VPN
- Configure BGP Template and Local Policy on the Service Side (LAN) VPN
- Configure OSPF Template and Local Policy on the Service Side (LAN) VPN
- Configure EIGRP Template and Local Policy on the Service Side (LAN) VPN
- Configure Multicast on vEdge
- Configure Multicast on IOS-XE
- Monitor Routing
- Troubleshooting Routing Protocols

Lab 6: Advanced Firewall Policy Design

- Setup and deploy a realistic firewall Configuration on vEdge and IOS-XE
- Setup IPS/URL Filtering on IOS-XE Device
- Setup Web Layer Security
- Monitoring Security Policy
- Test and Troubleshoot a Firewall Policy

Lab 7: Designing and Implementing Local Policies and QoS Policies

- Design and Implement Lists to Support Local Policies
- Design Access List
- Advanced QoS Design on Interfaces / Sub Interfaces
- Creating Shapers and Policers
- Rewriting QoS for External MPLS Circuit
- Remarking for Cisco Enterprise QoS Model
- Setup Port Mirroring for traffic analysis

Lab 8: Create Advanced Central Policies

- Advanced List Design Techniques
- Advanced Site Design

- Design and Troubleshoot a Hub and Spoke Topology
- Design, Configure, and Troubleshoot a Full Mesh Topology
- Design, Configure, and Troubleshoot a Hub and Spoke Topology with a Full Mesh Core
- Design, Configure, and Troubleshoot Custom Control Policies with Traffic Engineering
- Design, Configure, and Troubleshoot a Service Chain with an ASA Firewall
- Design, Configure, and Troubleshoot a QoS Policy at the VPN Level
- Design, Configure, and Troubleshoot Extranet with a 3rd Party Provider
- Design, Configure, and Troubleshoot Application Aware Routing Policy

Lab 9: Monitoring the Environment

- Monitoring using vManage
- Monitoring using the CLI
- Monitoring using vAnalytics

Lab 10: Troubleshooting

- Troubleshooting Hardware Issues
- Troubleshooting Control Connections
- Troubleshooting Certificate Issues
- Troubleshooting Controllers
- Troubleshooting BFD Sessions
- Troubleshooting Templates
- Troubleshooting Local Policies
- Troubleshooting Central Policies