
Advanced Cisco SD-WAN Routing, Templates, Policy Configure, and Tshoot

DURATION: 5 DAYS

COURSE CODE: ADV-SDWAN-CT

FORMAT: LECTURE/LAB

COURSE DESCRIPTION

In this Advanced Lab focused SD-WAN Course, students will learn Advanced Techniques to Deploy Templates with the theme of reusability. Students will then focus on deploying advanced Security Policies and learning how to troubleshoot security issues. Students will then focus on deploying advanced Local Policies and learning how to troubleshoot Local Policy issues. Students will then focus on deploying Advanced Central Policies and learning how to troubleshoot Central Policy issues.

In this Advanced Lab focused SDWAN Course, Students will:

- Explore and Troubleshoot the initial environment
- 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 Advanced Security Policies
- Design, Configure, and Troubleshoot Local Policies
- Design, Configure, and Troubleshoot Application Aware Routing
- Design, Configure, and Troubleshoot Quality of Service
- Design, Configure, and Troubleshoot Central Policies Including 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

PREREQUISITES

Implementing and Configuring Cisco SDWAN (ICSDWAN-CT) or Implementing Cisco SD-WAN Solutions (SDWAN300)

LEARNING OBJECTIVES

SD-WAN Review

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

COURSE OUTLINE

1. Cisco SD-WAN Overview

Dashboard
SD-WAN Architecture
SD-WAN WAN Edges

- cEdges
- vEdges

SD-WAN Controllers

- vBond
- vSmart
- vManage

SD-WAN Fabric

2. SD-WAN Advanced Settings

Advanced Controller Settings
Overlay and vEdge Recommended Settings
Forward Error Correction (FEC)
Packet Duplication
System IP Design
LTE Operation

3. SD-WAN High Availability

Controller High Availability
Controller Scalability
Active vManage, Backup Inactive vManage
Clustering vManages
Disaster Recovery

4. SD-WAN Templates

Template Overview
Future Templates
Device template using Future Templates
Device template using CLI Templates
Designing templates for Reusability
Attaching Devices to Templates

5. Bridging

Transparent Bridging
Bridging Template Configuration
cEdge Bridging Template Configuration
vEdge Bridging Template Configuration
Monitoring Bridging

6. Routing Protocols

Static Routes
Dynamic Routing Protocols

- OMP Templates
- OMP Policies
- BGP Templates
- BGP Policies
- OSPF Templates

- OSPF Policies
- EIGRP Templates
- EIGRP Policies

7. Multicast

Multicast Terms
Requirements
vEdge Multicast Support
cEdge Multicast Support
Multicast RPs
Multicast Replicators
PIM IGMP

8. Network Optimization

Optimization Overview
TCP Optimization
vEdge Optimization Requirements
vEdge Optimization Implementation
cEdge (IOS-XE) Optimization Requirements
cEdge (IOS-XE) Optimization Implementation
AppNAV
Per Tunnel QoS

9. Direct Internet Access (DIA) Overview

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
Cisco SD-WAN Direct Internet Access Monitoring

10. Unified Communications

Voice Integration in SD-WAN
Voice Feature Templates

- Call Routing
- SRST
- Voice Card

Voice Policies

- FXO
- FXS
- FXS DID

IOS-XE UC Device Template

11. SD-WAN Security Policy

Authentication/Encryption/Integrity
Firewall
IPS (Snort)
URL Filtering

Web Layer Security

Pairwise IPsec Keys

12. SD-WAN Local Policy

Policy Configuration Overview

Policy Framework-Localized Policies

Local Control Policy

Local Control (Route) Policy

Localized Control Policy Configuration

Local Data Policy

Configure Localized Data Policy for IPv4

13. SD-WAN Central Policy

Policy Creation and Management Guidelines

Centralized Data Policies

Application Aware Routing

Service Chaining

Traffic Flow Monitoring with Cflowd

Policy Construction

Platform Support and Scalability

14. SDWAN Migration

Sequence of Migration

Migration Planning

DC/Hub Site Migration

Branch/Spoke Site Migration

LABS

1:Review & Troubleshoot Initials SDWAN Environment

Review Environment

Troubleshooting Initial Connectivity

Troubleshooting Initial Control Connections

2:Template

Advance 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

3: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

4: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

5: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

6: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

7:Monitoring the Environment

Monitoring using vManage

Monitoring using the CLI

Monitoring using vAnalytics

8:Troubleshooting

Troubleshooting Hardware Issues

Troubleshooting Control Connections

Troubleshooting Certificate Issues

Troubleshooting Controllers

Troubleshooting BFD Sessions

Troubleshooting Templates

Troubleshooting Local Policies

Troubleshooting Central Policies