

# Implementing Cisco SD-WAN Solutions (ENSDWI)

**Course Duration: 40 Hours**

**Course code: ENSDWI**

## 1. Course Overview

In this course, you will learn how to design, deploy, configure, and manage your Cisco® Software-Defined WAN (SD-WAN) solution in a large-scale live network, including how to migrate from a legacy WAN to SD-WAN. You will learn best practices for configuring routing protocols in the data center and the branch, as well as how to implement advanced control, data, and application-aware policies.

## 2. What you'll learn?

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

- Describe the Cisco SD-WAN solution and how modes of operation differ in traditional WAN versus SD-WAN.
- Describe options for Cisco SD-WAN cloud and on-premises deployment.
- Explain how to deploy WAN Edge devices.
- Compare the Zero-Touch Provisioning (ZTP) and traditional Plug-n-Play processes and examine technical specifics for on-premises deployment.
- Describe configuration groups and feature profiles for configuration management.
- Describe device and feature configuration templates.
- Describe options for providing scalability, high availability, and redundancy.
- Explain how dynamic routing protocols are deployed in an SD-WAN environment, on the service side and transport side.
- Describe Cisco SD-WAN policy concepts, which includes how policies are defined, attached, distributed, and applied.
- Define and implement advanced control policies, such as policies for custom topologies and service insertion.

- Describe the Multi-Region SD-WAN fabric feature.
- Define and implement advanced data policies, such as policies for traffic engineering and QoS.
- Describe the Application Quality of Experience (AppQoE) capabilities available in Cisco SD-WAN.
- Define and implement an Application-Aware Routing (AAR) policy.
- Implement Direct Internet Access (DIA) and Cisco SD-WAN Cloud OnRamp options.
- Describe Cisco SD-WAN security components and integration.
- Describe how to design pure and hybrid Cisco SD-WAN solutions, as well as how to perform a migration to Cisco SD-WAN.
- Describe the different tools and options available for managing a Cisco SD-WAN fabric.
- Describe the different tools and options available for monitoring the Cisco SD-WAN fabric.
- Describe Cisco SD-WAN support for multicast.

### 3. Target Audience

Engineers involved in the design, planning, deployment, maintenance and troubleshooting of a Cisco SD-WAN solution.

### 4. Pre-Requisites

**Attendees should meet the following prerequisites:**

- Knowledge of Software-Defined Networking (SDN) concepts as applied to large-scale live network deployments
- Strong understanding of enterprise WAN design
- Strong understanding of routing protocol operation, including both interior and exterior routing protocol operation
- Familiarity with Transport Layer Security (TLS) and IP Security (IPSec)

### Recommended prerequisites:

- CCNA - Implementing and Administering Cisco Solutions
- ENCOR - Implementing and Operating Cisco Enterprise Network Core Technologies

## 5. Course content

### 1- Examine the Cisco SD WAN Architecture

- Software-Defined Networking for the WAN
- SD-WAN Components and Functions
- Underlay and Overlay Network
- SD-WAN Terminology
- Secure Control Plane
- Secure Data Plane
- SD-WAN Platforms
- IOS XE and IOS XE SD-WAN Software

### 2- Examine Cisco SD-WAN Deployment Options

- Flexible Controller Deployment Options
- SD-WAN Cloud Deployment
- SD-WAN Managed Service Provider Deployment
- SD-WAN On-Premises Deployment
- Using an Enterprise CA
- Controller Placement and Challenges

### 3- Deploying WAN Edge Devices

- Onboard WAN Edge Devices
- Deploy Cisco Catalyst 8000v IOS XE Devices
- ZTP Process Overview - Pure Play Viptela operating system
- Cisco Plug-and-Play Process Overview
- Working with NAT

#### **4- Manage Device Configuration**

- Configuration Groups Overview
- Configuration Group Feature Profile Overview
- Device Configuration Template Overview
- Device Configuration Template Features

#### **5- Explore Redundancy, High Availability, and Scalability**

- Horizontal Solution Scale
- Cisco vManage, vSmart and vBond Redundancy
- Routed and Bridged Site Design

#### **6- Enabling Service-Side and Transport-Side Routing**

- Implement OSPF
- Implement BGP
- Implement EIGRP
- Implement TLOC Extensions
- Loop Prevention Mechanism

#### **7- Explore SD-WAN Policy Configuration Basics**

- Policy Configuration Overview
- Policy Attachment, Distribution and Operation

#### **8- Define Advanced Control Policies**

- Control Policy Overview
- Control Policy Application
- Using Arbitrary VPN Topology
- Using Hierarchical Topology
- VPN Membership Policies
- Multi-Region Fabric
- Implementing Traffic Engineering

- Implementing Service Insertion and Chaining
- Implementing Shared Services
- Dynamic On-Demand Tunnels

## **9- Define Advanced Data Policies**

- Data Policy Overview
- Implementing Traffic Engineering
- Data Forwarding and Qos
- Implementing Qos in Cisco SD-WAN

## **10- Implement Application Quality of Experience**

- Application Quality of Experience Overview
- TCP Optimization
- Data Redundancy Elimination
- Packet Duplication
- Forward Error Correction
- AppNav-XE

## **11- Implement Application-Aware Routing**

- AAR Overview
- Implement AAR Policy

## **12- Examine Direct Internet Access and Cloud Deployment Options**

- Implement Direct Internet Access
- Cisco SD-WAN Cloud OnRamp for SaaS
- Cisco SD-WAN Cloud onRamp for IaaS
- Cisco SD-WAN Cloud onRamp for Multicloud
- Cisco SD-WAN Cloud OnRamp for Colocation
- Cisco Enterprise NFV Infrastructure Software (NFVIS) SD-Branch

### **13- Explore Cisco SD-WAN Security**

- Cisco SD-WAN Intent Based Security Use Cases
- Cisco SD-WAN Security Components
- Cisco Umbrella DNS Security and SIG Integration
- Cisco Legacy and Unified Policy
- Describe Cisco SD-WAN TrustSec

### **14- Design and Migrate to Cisco SD-WAN**

- Design Considerations for Hybrid Scenarios
- Enabling Cisco SD-WAN in the Data Center
- Migrating the Branch to Pure SD-WAN
- Migrating a Branch to a Hybrid Model

### **15- Perform Cisco SD-WAN Network Management and Troubleshooting**

- Managing Cisco SD-WAN
- Monitoring Cisco SD-WAN
- Troubleshooting Cisco SD-WAN
- Upgrading Cisco SD-WAN Components

### **16- Examine Cisco SD-WAN Multicast Support**

- Multicast Overlay Routing
- Multicast Protocol Support
- Traffic Flow in Multicast Overlay Routing