Enterprise SD-WAN Architecture and Implementation Course

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Cairo (Egypt)



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Introduction:

Enterprise SD-WAN architecture, design and implementation is the systematic deployment of software-defined wide area network overlays to optimise multi-carrier connectivity across distributed organisations. This one-week course prepares network engineers to design resilient transport topologies and construct an enterprise SD-WAN architecture and deployment blueprint. Delivered at practitioner depth through structured lab sessions, delegates apply service frameworks defined by MEF 70, an international standard that establishes technical attributes for SD-WAN services and interfaces. Telecommunications professionals examine enterprise SD-WAN architecture, design and implementation with Blackbird Training Centre to modernise wide area infrastructure.

Course Objectives:

- Distinguish between underlay connectivity services and encrypted overlay tunnel virtual connections across multi-carrier wide area networks.
- Apply MEF 70 service attributes to establish standardised application-aware traffic steering and performance objectives.
- Compare centralised controller planes against distributed edge forwarding engines to maintain fabric scalability and control isolation.
- Select policy-driven path selection rules to balance mission-critical enterprise workloads across diverse hybrid transport paths.
- Interpret network security segmentation requirements to enforce traffic isolation and cryptographic controls across hybrid cloud interconnections.
- Justify direct internet access topologies versus centralised backhaul routing models to reduce branch latency and bandwidth consumption.

Target Audience:

- Telecommunications engineers responsible for wide area connectivity who must decide when to replace legacy multi-protocol label switching links with hybrid internet paths.
- Enterprise network infrastructure specialists responsible for transport availability who must select dynamic routing policies across diverse underlay carrier circuits.
- Network security administrators responsible for boundary perimeter protection who must determine segmentation rules across multi-tenant virtual edge fabrics.
- Systems integration technicians responsible for remote branch turn-up who must judge whether zero-touch provisioning profiles meet baseline site deployment criteria.



Course Outline:

Day 1: Foundations and Underlay Architecture

- Underlay Connectivity Services vs Overlay Virtual Connections: Evaluating Transport Performance Across Hybrid Links
- MEF 70 Standard Constructs: Defining User Network Interfaces And Edge Service Boundaries
- Carrier Service Level Metrics: Measuring Packet Loss Latency And Jitter Thresholds
- Legacy Multi-Protocol Label Switching: Assessing Migration Dependencies And Current State Topologies
- Bidirectional Forwarding Detection: Monitoring Transport Link Health Across Multi-Carrier Circuits Continuously

Day 2: Control Plane and Security Frameworks

- Centralised Controllers vs Distributed Forwarding Planes: Isolating Policy Distribution From Data Transit
- MEF 70.1 Performance Attributes: Specifying Granular Application Flow Objectives Across Virtual Tunnels
- Edge Cryptographic Authentication: Enforcing Public Key Infrastructure And Device Identity Validation
- Zero-Touch Provisioning Frameworks: Automating Branch Edge Onboarding Using Secure Staging Certificates
- Virtual Route Forwarding Instances: Isolating Multi-Tenant Enterprise Traffic Over Shared Physical Underlays

Day 3: Application-Aware Routing and Policy Design

- Application-Aware Path Selection vs Destination-Based Routing: Directing Traffic Using Real-Time Link Metrics
- Quality of Service Profiles: Prioritising Real-Time Voice And Critical Enterprise Applications
- Dynamic Path Remediation: Mitigating Forwarding Impairments Through Packet Duplication And Parity
- Deep Packet Inspection Engines: Classifying Layer Seven Business Workloads Across Remote Branches
- Bandwidth Aggregation Policies: Distributing Asymmetric WAN Traffic Across Dissimilar Access Circuits Efficiently



Day 4: Cloud Connectivity, Risk, and Edge Security

- Direct Internet Access vs Centralised Gateway Routing: Evaluating Branch Security Risks And Latency
- Cloud OnRamp Interconnections: Optimising Software-As-A-Service Workloads Through Preferred Path Probing Mechanics
- Application Firewall Integration: Enforcing Layer Four And Layer Seven Threat Inspection Rules
- Transport Failover Edge Cases: Resolving Black Hole Scenarios During Upstream Carrier Degradation
- Software-Defined Boundary Segmentation: Hardening Inter-Branch Traffic Policies Against Unauthorised Lateral Transit

Day 5: Lab Deployment and Blueprint Assembly

- Virtual Fabric Segmentation vs Physical Network Partitioning: Implementing Layered Isolation Controls
- Underlay Carrier Integration Lab: Provisioning Multi-Path Tunnels Across Emulated Transport Circuits Successfully
- Policy Steering Verification Lab: Simulating Real-Time Packet Degradation To Validate Dynamic Rerouting
- Direct Cloud Edge Configuration: Establishing Automated SaaS Probing Profiles Under Laboratory Conditions
- Final Deliverable Assembly: Finalising The Enterprise SD-WAN Architecture And Deployment Blueprint

Skills You Will Gain:

- MEF 70 Service Modelling
- Application-Aware Traffic Steering
- Zero-Touch Provisioning Configuration
- Transport Path Health Monitoring
- Overlay Tunnel Encryption
- Cloud Interconnect Policy Design
- Virtual Route Forwarding Segmentation

Why Attend This Course:

- From relying on static routing protocols to deploying dynamic policy-driven application steering based on real-time transport health.
- From configuring branch edge routers individually by command line to centrally distributing standardized templates via automated controllers.
- From navigating proprietary transport definitions to implementing standardized wide area network service attributes governed by MEF 70.
- From maintaining fragmented site diagrams to producing a verified enterprise SD-WAN architecture and deployment blueprint.



Conclusion:

Enterprise SD-WAN architecture, design and implementation establishes a centralised, policy-driven software fabric across varied telecommunications underlays to secure and accelerate modern digital workloads. The curriculum clarifies the core operational distinctions between transport underlays and encrypted overlays, centralised control planes and distributed edge forwarding, and local breakout models versus centralised cloud filtering. Structured for telecommunications engineers and network infrastructure specialists seeking practitioner depth, this course equips professionals to execute disciplined deployments and validate fabric performance reliably in multi-carrier operating environments.

Frequently Asked Questions FAQ:

What is enterprise SD-WAN architecture, design and implementation?

Enterprise SD-WAN architecture, design and implementation is the engineering process of decoupling wide area network control from physical transport circuits. It creates a centralised, software-directed overlay fabric across hybrid underlays such as broadband, cellular, and multi-protocol label switching to dynamically steer traffic based on application requirements.

What is the difference between underlays and overlays in enterprise SD-WAN architecture, design and implementation?

Underlays are the physical connectivity services provided by carriers, including internet circuits and private transport, that deliver raw packet forwarding. Overlays are the encrypted, software-managed virtual tunnels that sit on top of underlays to enforce policy-based path selection, encryption, and performance monitoring dynamically across enterprise sites.

Which standards does enterprise SD-WAN architecture, design and implementation follow?

Enterprise SD-WAN architecture, design and implementation follows the MEF 70 and MEF 70.1 standards established by the MEF Forum. These standards define the formal technical attributes for SD-WAN services, subscriber edge interfaces, virtual connection tunnels, and measurable application performance metrics across diverse underlying carrier networks.

Is enterprise SD-WAN architecture, design and implementation right for a network infrastructure specialist?

Yes. This course provides network infrastructure specialists with practical skills to migrate legacy branch routing to automated software-defined overlays. Participants learn to configure controller policies, implement dynamic traffic steering, enforce security segmentation, and assemble actionable deployment blueprints for enterprise-grade wide area telecommunications networks.

