

Enterprise Edge Routing Reference Design Guide: Multi-Site Company SD-WAN Router Deployment

ENTERPRISE EDGE ROUTING REFERENCE DESIGN GUIDE: MULTI-SITE COMPANY SD-WAN ROUTER DEPLOYMENT

EXECUTIVE SUMMARY

This document serves as a definitive technical reference for the architectural design, hardware specifications, and operational deployment of the next-generation SD-WAN router platform purpose-built for multi-site enterprise environments. As organizations accelerate their digital transformation initiatives, the demand for a unified, secure, and highly available wide-area networking solution has become paramount. This guide details a carrier-grade, application-aware routing infrastructure that seamlessly integrates with existing network investments while providing a clear migration path to a software-defined future. The solution addresses the critical challenges of distributed branch connectivity, dynamic path selection, and centralized orchestration, ensuring that application performance and data security remain uncompromised across the entire corporate footprint.



ARCHITECTURE & CHASSIS DESIGN

The platform is engineered around a modular, high-density chassis architecture designed to scale from the smallest remote office to the largest regional hub. The core design philosophy emphasizes a distributed forwarding architecture, decoupling the control plane from the data plane to ensure deterministic performance even under peak load conditions. The hardware is built to support a wide array of physical interfaces, from standard Gigabit Ethernet to high-speed 10/25/40 Gigabit fiber uplinks, accommodating diverse WAN transport technologies including MPLS, broadband, and 5G/LTE. Redundancy is built into every critical subsystem, featuring dual, hot-swappable power supplies and a field-replaceable fan tray with N+1 fan redundancy, enabling a Mean Time Between Failures (MTBF) that exceeds industry standards for edge equipment.

HARDWARE FEATURES

The hardware feature set is meticulously curated to support the complex requirements of modern SD-WAN deployments. The system is powered by a high-performance, multi-core network processor optimized for line-rate encryption, deep packet inspection, and application identification. Key hardware features include a hardware-accelerated IPsec engine capable of supporting up to 4,000 concurrent VPN tunnels, a dedicated packet buffer memory of 16 GB to absorb micro-bursts, and a robust security co-processor for secure boot and trusted platform module (TPM) functions. The front panel provides a comprehensive array of status LEDs for rapid fault isolation, a console port for out-of-band management, and a dedicated management Ethernet port to ensure a clear separation between data and management traffic.

COMPLIANCE & STANDARDS

This platform adheres to a comprehensive suite of industry and regulatory standards to ensure seamless interoperability and global compliance. It is fully compliant with the IEEE 802.3 standard for Ethernet, supports a full complement of IP routing protocols including OSPF, BGP, and ISIS, and is

validated for interoperability with leading SD-WAN orchestration platforms via standard APIs (NETCONF/YANG). The hardware is certified to meet stringent environmental, safety, and electromagnetic compatibility standards, including RoHS, CE, UL, and FCC Part 15 Class A. The platform is also designed with a secure supply chain, ensuring that the hardware is verifiably free from tampering and meets the highest standards of integrity. This commitment to compliance ensures that the solution can be confidently deployed in any global theater, from enterprise data centers to government institutions.

TECHNICAL SPECIFICATIONS

The following technical specifications detail the base platform capabilities. The system has been rigorously tested to deliver consistent performance across a variety of network conditions and application profiles.

Parameter	Specification
Form Factor	2RU Rack-mountable Chassis
Switching Capacity	480 Gbps Full-Duplex
Power Supply	1+1 Redundant, 350W AC/DC
Management Ports	1x RJ45 Console, 1x 10/100/1000 Management Ethernet
Hardware Acceleration	Dedicated IPsec, QoS, and DPI

	Processors
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Relative Humidity	5% to 90% (non-condensing)
MTBF	> 350,000 hours

ORDERING OPTIONS

To facilitate procurement and ensure proper configuration for diverse deployment scenarios, the platform is available in multiple base models and can be enhanced with a variety of field-upgradable options. The base SKU includes the chassis, a single power supply, and a basic fan tray. A redundant power supply can be ordered as an accessory. For organizations requiring advanced routing capabilities or increased port density, modular line cards are available to add Ethernet SFP/SFP+ ports, T1/E1 interfaces, or dedicated LTE/5G modules. The ordering guide also includes a range of software licensing tiers, allowing customers to select the feature set that aligns with their operational needs, from basic connectivity to advanced application optimization and security services. To support global deployments, region-specific power cords and mounting kits are also offered. Please consult your account representative for a detailed quote and configuration assistance.

