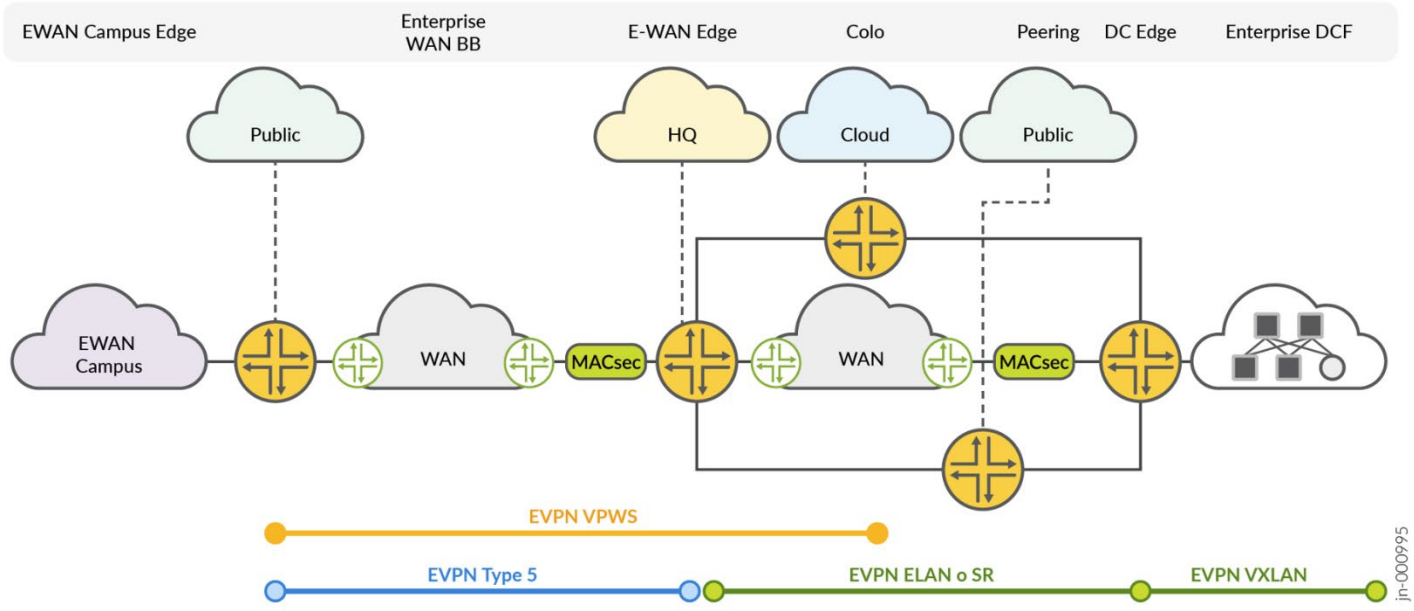
Juniper® Validated Design

JVD Solution Overview: Enterprise WAN Advanced Core and Edge Services

Executive Summary

An enterprise WAN is vital for connecting multiple disparate sites within an enterprise, allowing seamless communication and collaboration. This Enterprise WAN Advanced Core and Edge Services validated design introduces a validated solution for a more simplified and secure EWAN infrastructure. This JVD utilizes advanced protocols like Ethernet virtual private network (EVPN) and segment routing (SR) to reduce network complexity while ensuring reliability, stability, and Layer 2/Layer 3 VPN connectivity between enterprise sites. This solution also provides advanced network security via MACsec functionality ensuring data integrity and DDoS protection, thereby preventing malicious traffic flows from spreading across the entire WAN. Overall, the solution offers numerous benefits, including enhanced network stability, security, and scalability, all while reducing operational costs.

Figure 1: Typical EWAN with EVPN as Unified Service Protocol



Solution Overview

This JVD covers migration scenarios from legacy L2/L3 services to advanced VPN services based on an EVPN and SR underlay infrastructure. Essentially, EVPN over Segment Routing is used as a universal method to enable L2/L3 multipoint-to-multipoint and L2 point-to-point connections, replacing a range of traditionally used L3VPN, L2VPN, Martini L2 circuits, and Virtual Private LAN service (VPLS) offerings. This JVD emphasizes the utilization of the latest Juniper Networks products with embedded MACsec functionality, enhanced network security, and data integrity.

The latest Juniper ACX and MX platforms are deployed to support various port speeds to build a simpler and more secure EWAN infrastructure. This JVD outlines the preferred choice of MX304, MX10004, and ACX7000 series routers as enterprise WAN Edge devices, while PTX10000 series routers act as the backbone of the private WAN and aims to validate all the platforms as part of a coherent enterprise WAN solution. This solution introduces DDoS protection mechanisms, such as BGP flowspec at the edge, to safeguard edge devices against ICMP flood attacks. Unicast reverse-path forwarding (unicast RPF) is also activated to protect against attacks originating from unexpected source addresses.

About JVDs

A Juniper Validated Design (JVD) is a cross-functional collaboration between Juniper solution architects and test teams to develop coherent multidimensional solutions for domain-specific use cases. The JVD team comprises technical leaders in the industry with a wealth of experience supporting complex customer use cases.

Using JVDs, you can significantly reduce the risk of costly mistakes while saving time and money in the deployment of network solutions. JVDs provide benefits such as a more stable network with fewer bugs and a shorter time to resolution if bugs are discovered. The validation process ensures that the network is optimized for maximum performance, leading to a better user experience for enterprise or SP operation and network service consumers. Furthermore, the design concepts deployed are formulated around best practices, leveraging relevant technologies to deliver the scope of the solution. Key Performance Indicators (KPIs) are identified as part of an extensive test plan that focuses on functionality, performance integrity, and service delivery. With JVDs, you can shorten the time to market when implementing new network solutions, reducing the lead time to generate revenue from new services.

For more information, see Juniper Networks Design Center for Service Provider Metro and Edge:
https://www.juniper.net/documentation/validated-designs/us/en/service-provider-edge/

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