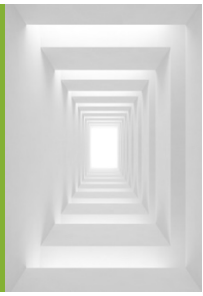
Juniper® Validated Design

JVD Solution Overview: Datacenter Interconnect Design with Juniper Apstra



Executive Summary

JVD-DCI-MULTISITE-01-01

Data center operators must deliver and maintain a reliable network infrastructure while managing complexity and meeting scalability needs. Data centers are hosting increasingly varied workloads with a growing diversity of networking requirements. Meeting these needs with bespoke network designs introduces a unique troubleshooting burden on networking teams. The Data Center Interconnect (DCI) Design with Juniper Apstra is a Juniper Validated Design Extension (JVDE) that provides organizations with methods to reliably interconnect multiple Data centers deployed with Juniper Hardware that are deployed using 3-Stage Data Center Design with Juniper Apstra (JVD), 5-Stage EVPN-VXLAN Data Center (JVD) and Collapsed Data Center Fabric with Juniper Apstra (JVD).

Solution Overview

The DCI design is an EVPN-VXLAN based design that focuses on Interconnecting data centers built using Juniper Apstra which is based on Edge-Routed Bridging (ERB). The DCI design covers three interconnect designs:

- **Over-the-top (OTT)**: In over-the-top interconnect design, VXLAN tunnels are formed across all leaf devices spanning the two data centers. Because the number of tunnels can increase based on the VXLAN/VNIs and the tenants, this solution is better suited for smaller data centers that are not prone to change.
- **Type 2 Seamless Stitching**: In contrast to the OTT design, only a subset of VLAN/VNIs are selectively stretched between data centers in Type 2 Seamless stitching design. Due to this, VXLAN tunnels are not formed automatically each time a new leaf switch is added (as is the case with OTT). This increases the scale performance and simplifies the configurations needed to achieve the Layer 2 extensions.
- **Type 2 and Type 5 seamless stitching**: Lastly the Type 2 and Type 5 seamless stitching is merely an extension of the Type 2 seamless stitching where the layer 3 context is stretched across data centers.

The OTT design and the Type 2 seamless stitching design also included MACSEC encryption between Border leaf switch (gateways) so as to encrypt the traffic between data centers.

Juniper Apstra automation and network management fully support this design. As with all Juniper data center JVDs, this solution follows best practices as determined by Juniper's subject matter experts, including Juniper support teams. This JVD is the result of extensive consultation and testing to find the balance between capability, performance, and cost efficiency to meet the needs of scalable data center deployments. The recommended setup for each of the DCI designs is shown below.

Figure 1 : Over the Top (OTT) Design

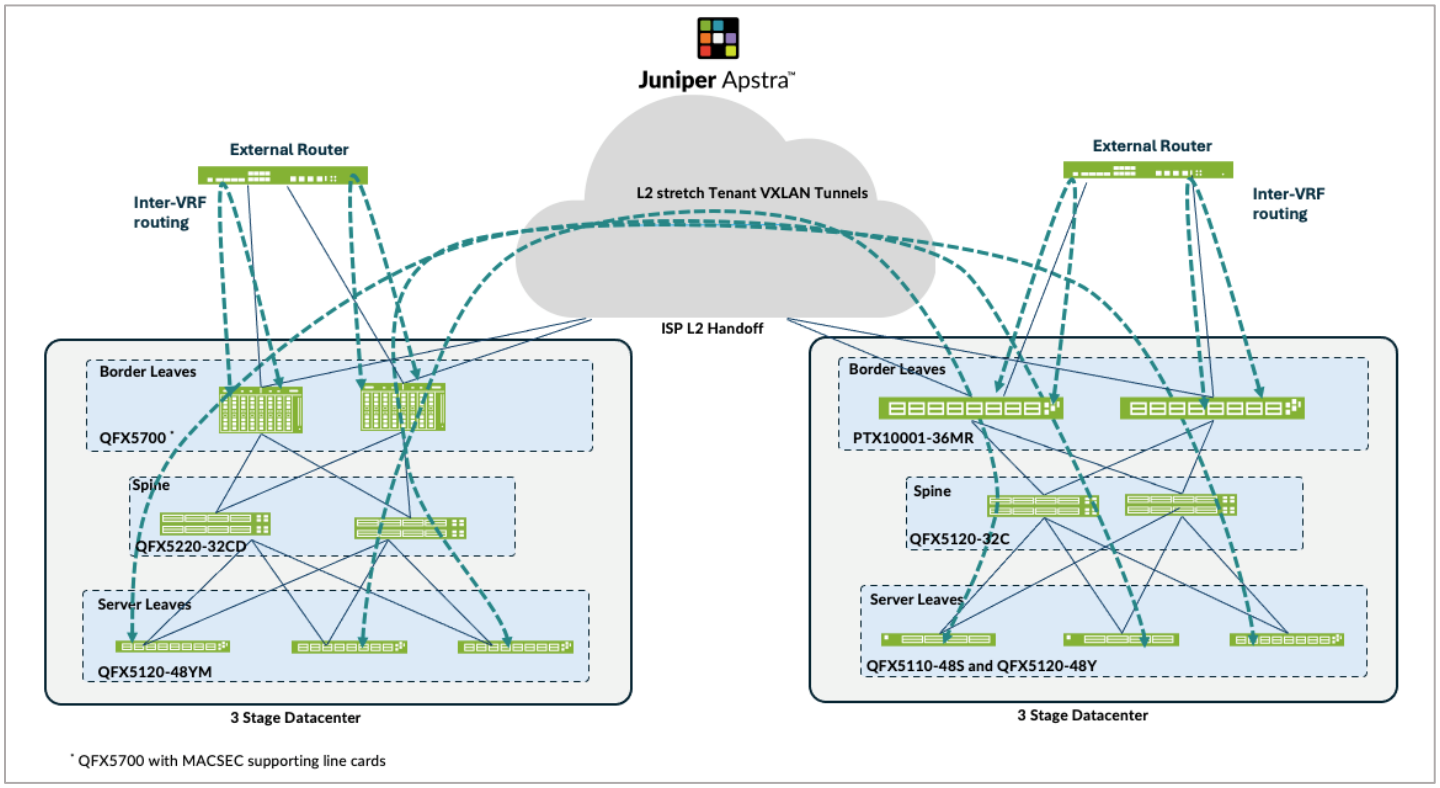


Figure 2 : Type-2 Seamless Stitching

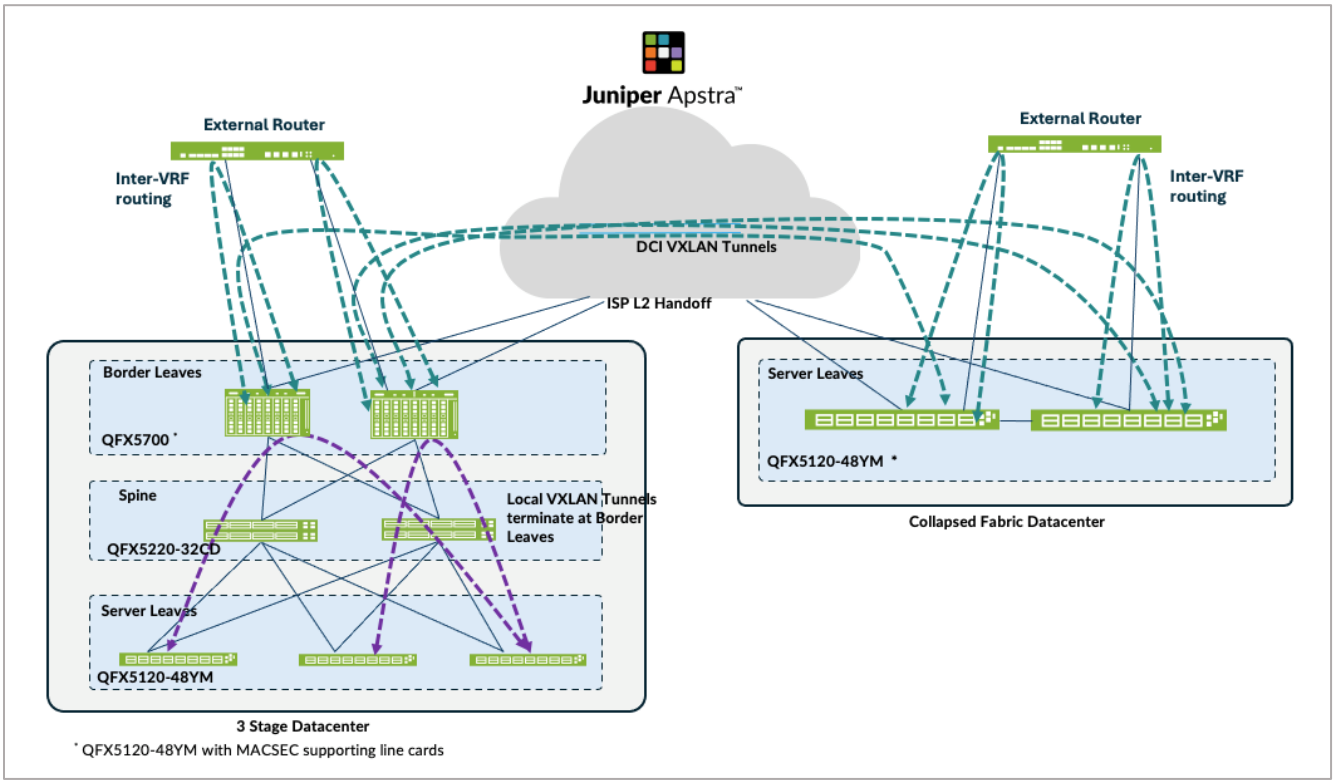
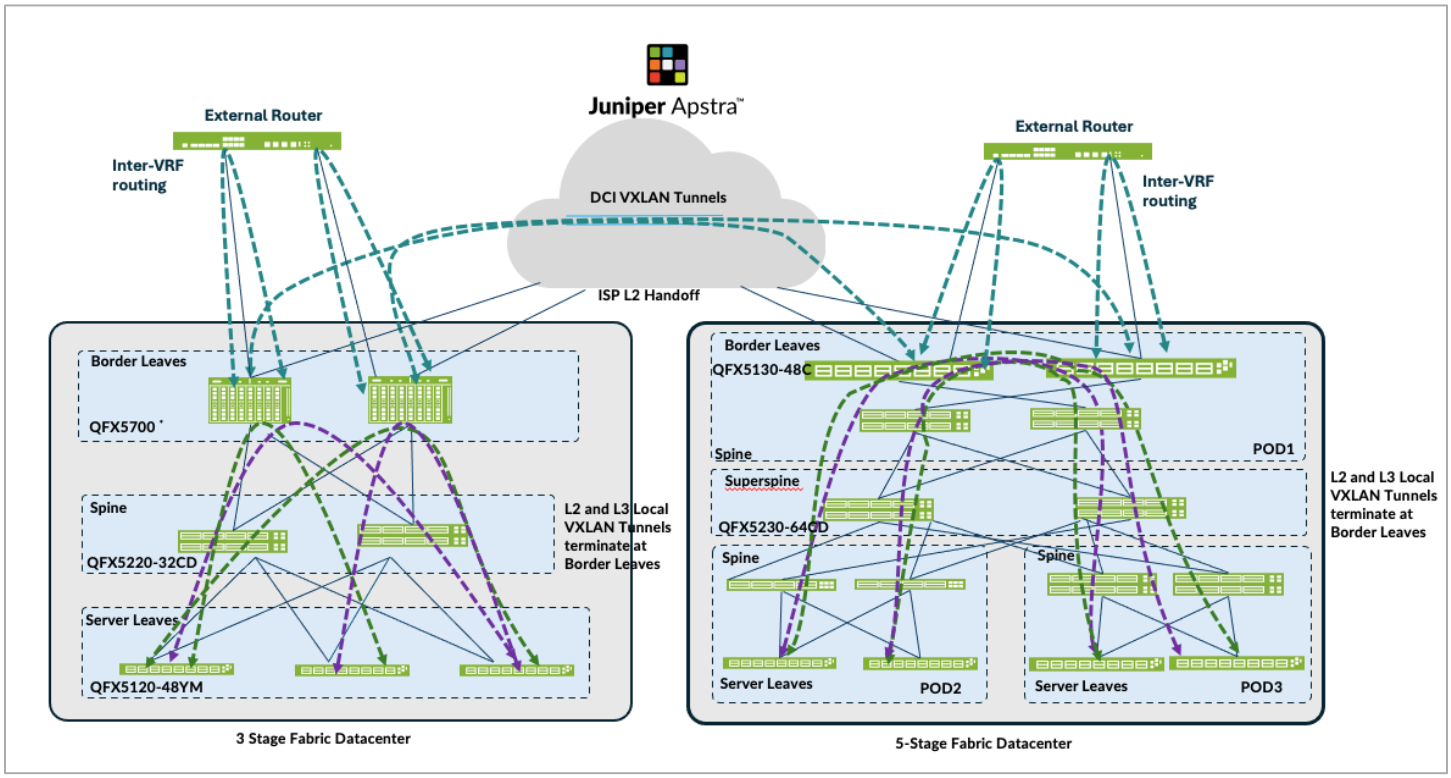


Figure 3: Type-2 and Type-5 seamless stitching



Juniper has extensively tested the design, with customers deploying it across the globe. Advanced JVD testing combined with widespread adoption simplify troubleshooting and shorten the support cycle, leading to a more stable data center fabric and reduced operational costs. This JVD consists of an ERB-based network architecture with spine, leaf, and border leaf switches in a high-availability configuration. All hardware components and software versions are tested extensively with simulated and real-world traffic.

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