JVD Solution Overview: Campus Fabric Core Distribution CRB

Executive Summary

Enterprise networks are undergoing massive transitions to accommodate the growing demand for cloud-ready, scalable, and efficient network. There's also demand for the plethora of Internet of Things (IoT) and mobile devices. As the number of devices grows, so does network complexity with an ever-greater need for scalability, segmentation, and security. To meet these challenges, you need a network with Automation and Artificial Intelligence (AI) for operational simplification. A Juniper Networks Campus Fabric Core Distribution Centrally-Routed Bridging (CRB) is a highly scalable architecture that is simple, programmable, and built on a standards-based architecture (**https://www.rfc-editor.org/rfc/rfc8365**). This framework coupled with Mist AI's use of AI, machine learning, and data science optimizes user experiences and simplifies operations across wireless, wired and Software-defined wide area networking (SD-WAN) domains.

Solution Overview

To provide endpoint flexibility, Juniper's Campus Fabric Core Distribution CRB EVPN-VXLAN decouples the underlay network (physical topology) from the overlay network (virtual topology). By using overlays, you gain the flexibility of providing Layer 2 and Layer 3 connectivity between endpoints across campus and data centers, while maintaining a consistent underlay architecture.

There are several benefits of a standards-based Campus Fabric Core Distribution CRB in an Enterprise Campus:

1. Reduced flooding and learning—Control plane-based Layer 2 and Layer 3 learning reduces the flood and learn issues associated with data plane learning. Learning MAC addresses in the forwarding plane has an adverse impact on network performance as the number of endpoints grows. This is because more management traffic consumes the bandwidth which leaves less bandwidth available for production traffic. The EVPN control plane handles the exchange and learning of MAC addresses through eBGP routing, rather than a Layer 2 forwarding plane.

2. Scalability—More efficient control-plane based Layer 2 and Layer 3 learning. L3 default gateways at the core layer provide higher scale than if placed at the distribution or access layers. This is due to higher performance platforms supported at this layer.

3. Return on Investment—Access Switches connect using standards based LACP/LAG without requiring investment in new hardware or software.

4. Consistency—A universal EVPN-VXLAN-based architecture across disparate campus and data center deployments enables a seamless end-to-end network for endpoints and applications.

5. Location-agnostic connectivity—The EVPN-VXLAN campus architecture provides a consistent endpoint experience no matter where the endpoint is located. Some endpoints require Layer 2 reachability, such as legacy building security systems or IoT devices. VXLAN overlay provides Layer 2 extension across campuses without any changes to the underlay network. Juniper uses optimal BGP timers between the Core and Distribution of the Campus Fabric with Bidirectional Forwarding Detection (BFD) that supports fast convergence in event of a node or link failure and Equal cost multipath (ECMP).

Campus Fabric Core Distribution: CRB
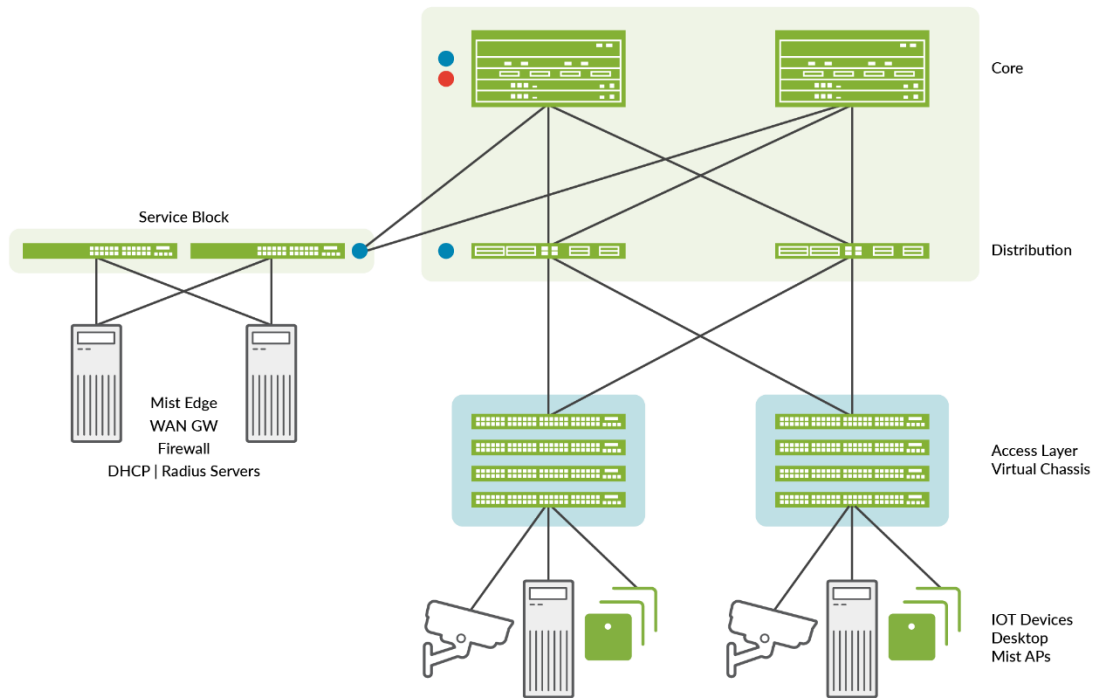
Problem
- Need scalable standards-based fabric
- Need L2 mobility across fabric

● L2 VXLAN Gateway
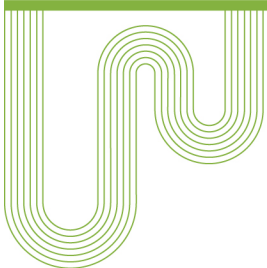● L3 VXLAN Gateway

Benefits
- Create BGP-based IP fabric between Core and Distribution Layers
- L3 Gateways at Core Layer
- L2 stretch with EVPN/VXLAN
- Active-active multihoming
- Fast convergence during link failure with ECMP and BFD tuning
- Easy to implement with non-VXLAN devices at the Access Layers
- Services Block to interconnect with critical infrastructure components and the external network
- L2 roaming of WIFI clients supported by Mist Edge

Juniper's campus fabrics, based on a VXLAN overlay with an EVPN control plane, is an efficient and scalable way to build campuses and interconnect multiple campuses, data centers, and public clouds. With a robust BGP/EVPN implementation on all QFX Series and EX Series switches, Juniper Networks is uniquely positioned to bring EVPN technology to its full potential by providing optimized, seamless, and standards compliant L2 or L3 connectivity, both within and across today's evolving campuses and data centers.

sol-overview-campus-fabric-core-distribution-crb-wired-assurance Revision 1.0