COLLAPSED FABRIC FOR DATA CENTER MANAGEMENT

Juniper Apstra software expands the benefits of intent-based networking and assurance to smaller and remote edge data centers

Challenge

Enterprises and services providers experience operational complexities managing multiple edge data center sites and ensuring availability and reliability. Designing, deploying, and monitoring remote edge data centers are difficult without granular metrics and telemetry. These remote sites also struggle with a lack of available technical expertise or tribal knowledge.

Solution

The Juniper Apstra Collapsed Fabric reference design empowers enterprises, service providers, and cloud providers to expand the benefits of intent-based networking and assurance to more environments, including smaller and remote edge data centers.

Benefits

- *Intent-driven networking and analytics in smaller deployments*
- *Data centers that can be scaled at runtime while maintaining consistent network policy and security (enabling expansion to full Clos later)*
- *Simplified and reliable management of the entire data center network (both central locations and the distributed edge)*

Juniper® Apstra software provides a single solution for the design, deployment, and operations of data center networks in multivendor environments—and in the smaller data centers at the edge of networks. The platform leverages true intent-based networking to provide simple and reliable data center management with automation and assurance.

The Challenge

Enterprises and service providers are increasingly deploying small data centers at the edges of their networks. These edge data centers are as mission-critical as their classic counterparts, have the same components as a traditional data center, and are managed remotely as part of complex deployments involving multiple sites. New use cases such as industrial automation and augmented reality are creating requirements to bring data processing closer to the end user to minimize application latency and improve reliability and user experience. In some cases, security and privacy regulations and data sovereignty issues mandate local data storage and processing. In addition, processing data at the edge can save substantial networking costs by eliminating the need to send traffic back to centralized cloud data centers.

Juniper Apstra Collapsed Fabric Solution

Solution Components

Apstra Collapsed Fabric is a new reference design supported by Juniper Apstra. It empowers enterprises, service providers, and cloud providers to expand the benefits of intent-based networking and assurance to even more environments, including smaller and remote edge data centers. The Apstra software is installed as one or a set of virtual machines (VMs) to connect and manage devices via agents installed on or off the devices.

The operations team can design rack types and fabric networks using an Apstra template that addresses the requirements in distributed locations and topologies composed of one leaf pair (no spine) and (optionally) multiple L2-only access switches. The template also provides the ability to create an Ethernet Switch Identifier link aggregation group (ESI-LAG) design in small edge data centers or in the core of campus networks.

The topologies supported by this new reference design are:

- Access switches that can be single- or dual-homed to the leaf switch layer.
- Servers that can be single-homed to access switch or dual-homed. Note that the servers cannot be attached to both access and leaf layer as that creates a risk of loops.

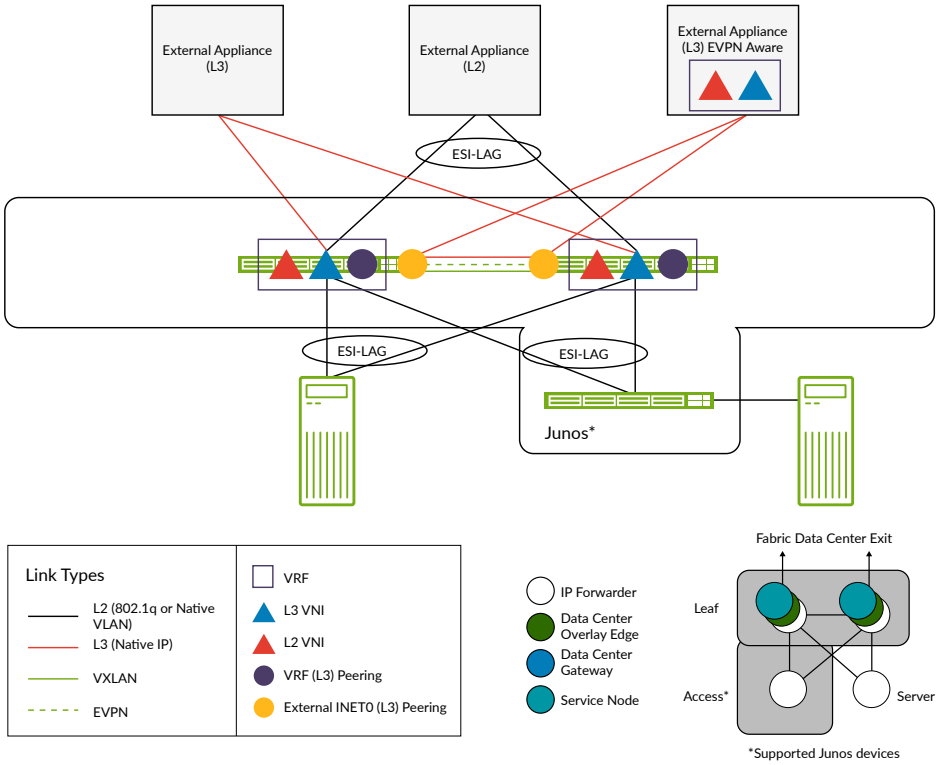

Figure 1: Nomenclature for Apstra Collapsed Fabric

Additionally, the leaf pair supports the full leaf feature set as the regular full leaf-and-spine (L3 Clos) reference designs:

- Layer 2
- L3 Virtual Extensible LAN (VXLAN) routing
- ESI-LAG
- External connectivity
- Data Center Interconnect (DCI) gateway

In Figure 2, the two-leaf devices are running services established at the leaf layer, and the L2-only access layer is single and dual-homed to the leaf layer. This capability satisfies situations where operators and enterprises desire the full suite of features for intent-based networking and closed-loop telemetry, but the design requirements do not compel an entire Clos, leaf-and-spine data center architecture.

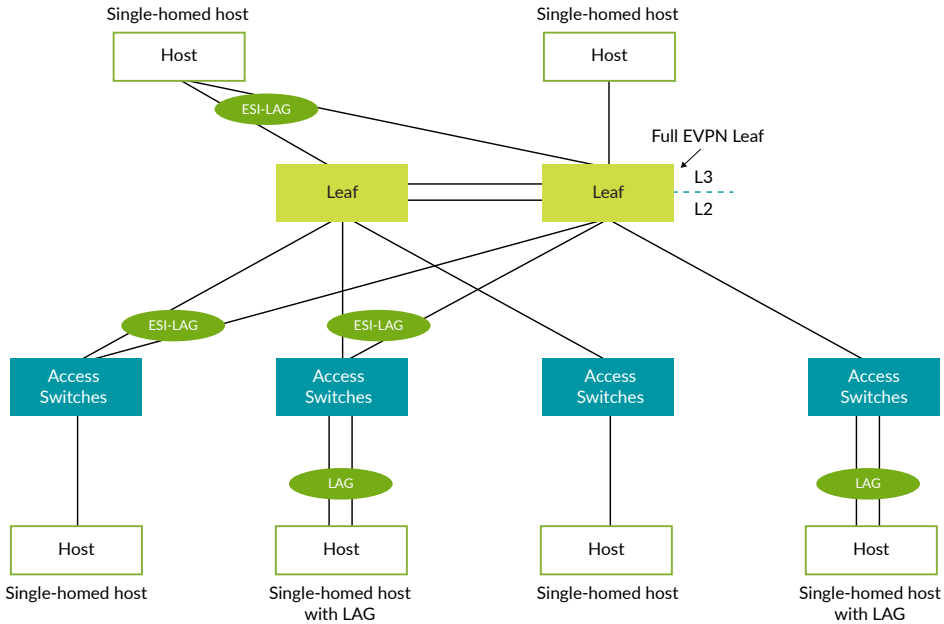

Figure 2: Design and implementation of Apstra Collapsed Fabric

Summary—Scalability and Management at the Distributed Edge

The Juniper Apstra Collapsed Fabric design allows organizations to benefit from intent-based networking and analytics in smaller deployments that don't need the scale of a centralized data center network. Additionally, customers can add access switches to the fabric whenever required, and Apstra will automatically register the new devices and apply the pre-validated configurations to them. With Apstra, data centers can be scaled in runtime while maintaining consistent network policy and security, at both the central location and the distributed edge. Apstra enables customers to reliably manage their entire data center network from a simple management platform that acts as a single source of truth for data center networks.

Next Steps

To learn more about Juniper Apstra Collapsed Fabric, please contact your Juniper account representative or go to www.juniper.net.

About Juniper Networks

At Juniper Networks, we are dedicated to dramatically simplifying network operations and driving superior experiences for end users. Our solutions deliver industry-leading insight, automation, security and AI to drive real business results. We believe that powering connections will bring us closer together while empowering us all to solve the world's greatest challenges of well-being, sustainability and equality.

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