

Supporting Dell EMC VxFlexOS with Fully Automated Leaf-Spine Network

Dell EMC VxFlexOS and Apstra AOS

Overview

The Success of HCI and SDS Hinges Upon Networking Agility

Enterprises rely on Hyperconverged Infrastructure (HCI) and Software-Defined Storage (SDS) to achieve agility. However, networking — the central nervous system intended to securely connect all compute and storage nodes — continues to lag behind HCI and SDS in both speed and reliability for change, hindering the overall success of HCI. Due to networking complexity and its many underlying disparate elements, many HCI systems have managed to exclude networking from their offerings. Invariably, very little attention is given to the network fabric; consequently, deadlines are missed and outages occur.

Challenges

Why Networking is Complex: The Root Problem

While compute and storage admins can quickly change HCI system capacity and performance to meet business needs, network admins still have to manually change and troubleshoot the network as many individual, yet highly interdependent elements. For example:

- **Complex dependencies unlike compute and storage** – Networking has many more interdependent elements. Even for a small leaf-spine network with just a handful of devices, network admins have to manually track and verify thousands of elements within the physical fabric, including logical elements like IP addresses and routing tables, virtual elements like virtual networks, and physical elements such as redundant links and transceivers. If any one of them is misconfigured or fails, a cascading effect causes multiple compute and storage nodes to suffer.
- **Lengthy and risky switch vendor selection and replacement** – SDS traffic requires the network to provide non-blocking east-west scalability, more deterministic latency, better resiliency, and deeper buffers. To meet these needs, network admins have to evaluate and onboard different switch offerings from multiple vendors. Each switch platform not only comes with different features, performance and cost, but also different operation and management procedures. These vendor-specific "idiosyncrasies" often lead to lengthy, risky, and suboptimal decisions. For example, if network admins want some ports to run at 25G while others as 4x10G breakouts, they have to be immersed in vendor-specific implementation details to make things work.

CHALLENGES

- Complex networking
- Dependencies unlike compute and storage
- Lengthy and risky switch vendor selection and replacement

SOLUTION

- Apstra Operating System (AOS®)

RESULTS

- Leaf-spine network managed as a cohesive system
- Change networks with precision and speed

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Solution

Apstra Operating System (AOS®): Build and Operate Leaf-Spine Networks with Speed and Reliability for Dell EMC VxFlexOS

Apstra AOS can help you solve these problems. Apstra AOS is software that knows the leaf-spine network as a system with precisely and dynamically coordinated individual elements. It builds this topology and its respective underlay and overlay configuration in minutes. AOS allows you to easily declare high-level goals for the system with a few mouse clicks, such as the number of Dell EMC VxFlexOS, formerly known as ScaleIO, endpoints, bandwidth needs, latency requirements, and ideal placement in the fabric.



FIGURE 1:
APSTRA OPERATING SYSTEM



When you change your high-level intent, the AOS software automatically renders all low-level dependencies. When you need to understand the health of the fabric, or troubleshoot a problem, the software allows you to dynamically query the real-time state of the leaf-spine network system across the underlay fabric and overlay VXLAN. As you change your query to drill down to a specific area of the network, the software dynamically calculates the most relevant pieces of telemetry, to give you actionable insights, along with the context you need.



Benefits

Key Benefits of Dell EMC VxFlexOS and Apstra AOS:

Imagine AOS as a dozen of virtual CCIEs, managing a leaf-spine network as a cohesive system, performing all networking drudgery with precision and speed, such as:

- Tracking your design goals and policies (capacity, redundancy, isolation, addressing and more)
- Turn-key best practice configuration
- Validate all dependencies to meet your goals
- Extract relevant insights from raw telemetry

Imagine AOS works in minutes to provide intent-based automation and orchestration, via a consistent operational experience, as you:

- Change the goals for latency, link saturation and throughput
- Add or delete SDS endpoints
- Change your SDS endpoint placement in the fabric
- Swap out multi-vendor hardware (Cisco, Arista, Juniper, Cumulus, Mellanox, Dell, etc.)

Customer Testimonials

"We need the network to rival HCI in agility and reliability. We also need network complexity to be invisible. AOS is the best solution we found."

- Global Manufacturing Company



About Apstra

Apstra pioneered Intent-Based Networking and Intent-Based Analytics™ to eliminate the complexities and inefficiencies that plague data center network operations today. Apstra's core mission is to deliver on the vision of a Self-Operating Network™ that delivers log scale improvements in CapEx, OpEx and capacity. Apstra was founded by leading experts in networking and abstraction (Arista, Juniper), distributed systems and automation (Google, VMware, Stanford). The company is privately funded and based in Menlo Park, California.

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