

Automating a Dell EMC OpenSwitch OPX Data Center Fabric with Apstra AOS

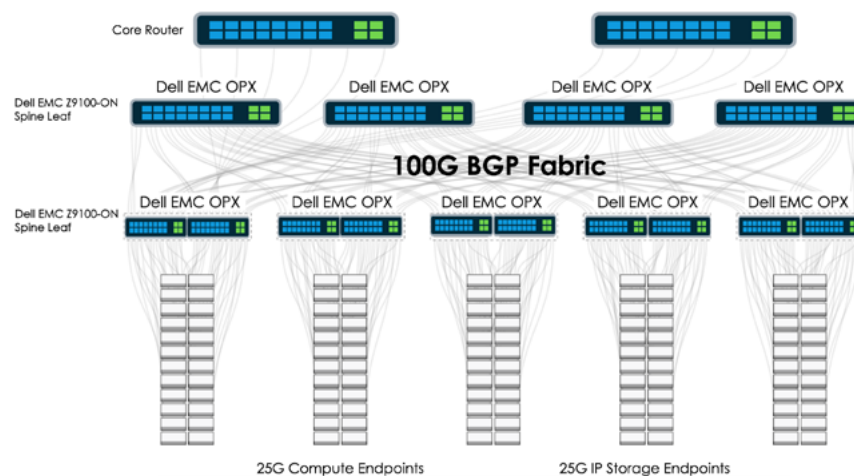
Dell EMC OpenSwitch OPX and Apstra AOS

Overview

The Success of Disaggregated Networking Requires Reaggregation

Open networking, the practice of disaggregating the switch network OS (NOS) from switch hardware, is spreading from cloud companies to web scale companies to enterprises and service providers. While new to the network switch world, disaggregation has already happened in spaces like the evolution from Unix workstations to x86 servers with Windows and Linux, where compute is now treated as simply a pool of resources. As a company, how do you approach a future of disaggregated networking? While the hardware is there, you may not want to consume your network engineers' valuable time by building a home grown solution to reaggregate and automate your infrastructure. By leveraging OpenSwitch OPX as your network operating system, and Apstra AOS as your automation and analytics engine, you conserve your network engineers' and operators' time for more mission critical tasks, while OPX and Apstra automate your network infrastructure.

Not only does Apstra now provide automation and analytics for OPX, Apstra also acts as the first full line of support for both OPX and switch hardware, closing the loop on network re-aggregation. If you encounter an issue with OPX, you can call Apstra. Because of Apstra's tight-knit relationships with vendors, even if the issue is found to be related to hardware, Apstra can quickly hand off the case to the hardware vendor. This greatly reduces the risk some fear with disaggregated networks.



CHALLENGES

- How to reaggregate the disaggregated networking stack
- Dependencies between networking elements are unlike compute and storage
- Lengthy and risky operational procedures

SOLUTION

- Apstra AOS: build and operate leaf-spine networks using Dell EMC OpenSwitch OPX - with speed and reliability

RESULTS

- AOS works in minutes to provide intent-based automation and orchestration

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Challenges

How to Reaggregate the Disaggregated Networking Stack

To turn disaggregated networking elements into an agile and reliable system, fundamental problems must be solved:

1. Dependencies between networking elements are unlike compute and storage:

Unlike compute and storage, where you can boil things down to a pool of CPU, memory and storage, networking has many more interdependent elements that not only impact the network itself, but also compute and storage nodes outside the network fabric.

Even for a small spine-leaf 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.

2. Lengthy and risky operational procedures:

Managing a large and dynamic data center network is complex and error-prone. Everyday, network engineers perform numerous and diverse tasks such as configuration changes, IP allocations, performance tuning, leaf or spine device replacements, and problem diagnosis across the underlay fabric and overlay networks. Most of these tasks are done manually box-by-box and interface-by-interface. Network admins have to conduct numerous tedious testing and validations in their head, to support fast changing application needs, or roll their own scripts.

Solution

Apstra AOS: Build and Operate Leaf-Spine Networks Using Dell EMC OpenSwitch OPX — with Speed and Reliability

Apstra AOS can help you solve these problems by automating OPX configuration on network nodes. 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 intent for the system with a few mouse clicks, such as the number of compute and IP storage endpoints, bandwidth needs, latency requirements, and ideal placement in the fabric.



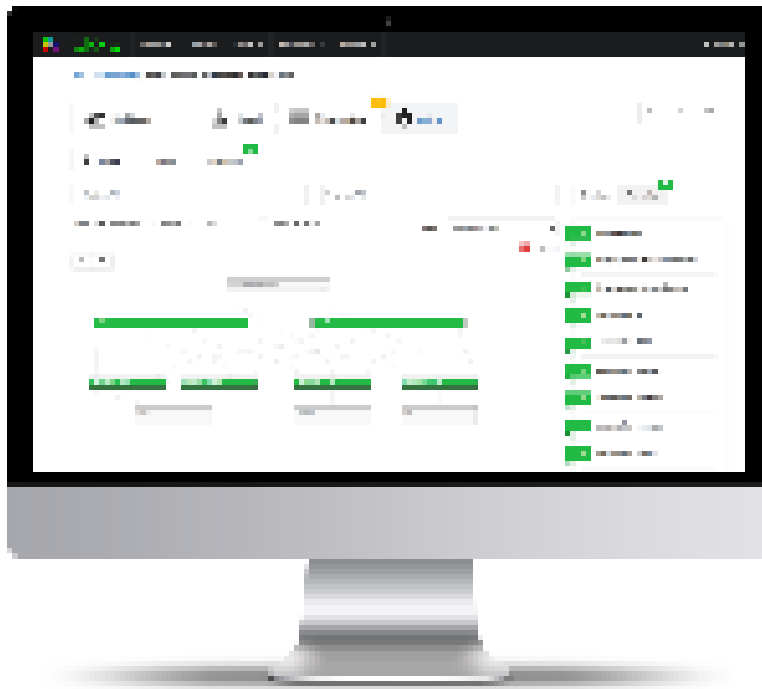
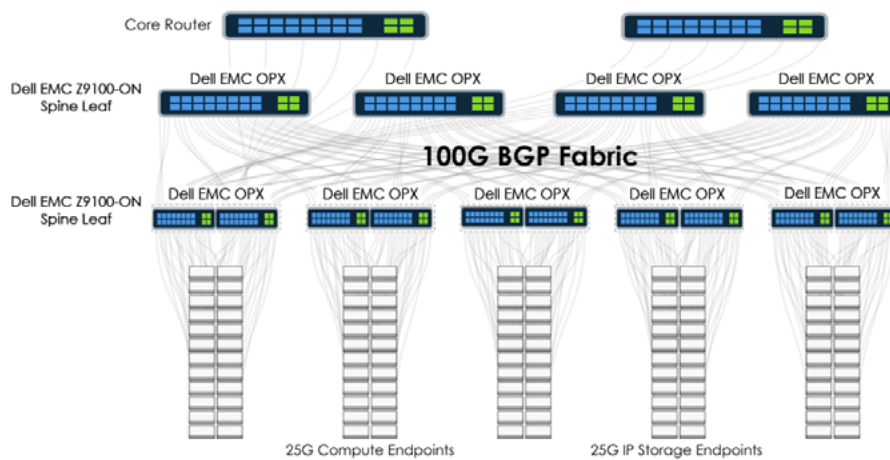


FIGURE 2:
APSTRA OPERATING SYSTEM



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 OpenSwitch OPX 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 compute and IP storage endpoints
- Swap out hardware (Dell Z9100-ON, S4048, S6000, etc.)

Customer Testimonials

“We need the network to rival compute 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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