

Government Agency Scales Multi-site Data Center with the Pluribus Adaptive Cloud Fabric

Highly scalable fabric enables unification of two data centers for active-active operations

Summary

A government agency needed to modernize its data center network infrastructure across two large primary data center sites to deliver private cloud services to multiple clients. The customer wanted to ensure the two data centers could be integrated into a seamless multi-site data center fabric to enable active-active operations for high application availability and low operational cost. The agency chose the Pluribus Adaptive Cloud Fabric because of its ability to deliver a unified, scalable data center fabric across both centers.

Objectives

The customer needed a fabric solution that could meet several requirements across their two data centers:

- Scale to 64 leaf switches per data center, a total of 128 leaf switches.
- High-density, high-performance switches supporting 10G and 25G server connections, 100G leaf-spine uplinks and high-scale 100G spine switches.
- Create a unified overlay network fabric across geographically separated data centers to enable simplified private cloud operations, workload mobility, active-active applications and a streamlined business continuity/disaster recovery (BC/DR) strategy.
- Enable multi-tenant operations with network segmentation to securely share the data center infrastructure among multiple government agencies and provide each one with independent visibility and management of its virtual private cloud network.
- Minimize total cost of ownership (TCO).

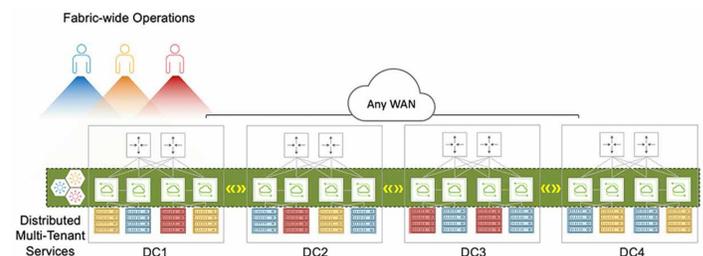
The customer broke the project into two phases. The first phase was designed to prove the new fabric architecture in a single data center and the second phase would extend it to a multi-site fabric.

Pluribus Solution

The customer chose the Pluribus Netvisor® ONE operating system and Adaptive Cloud Fabric™, running on high-performance open networking switches, based on Pluribus' ability to meet all of the program objectives and selection criteria. Keys to the Pluribus solution included the ability to unify the customer's data centers into a seamless multi-site fabric for operational simplicity and agility, and support for the demanding scalability requirements.

Unifying Multi-site Data Centers with the Adaptive Cloud Fabric

The Pluribus Adaptive Cloud Fabric was designed to meet all of the customer's requirements for a unified overlay network fabric across geographically separated data centers. With a controllerless SDN architecture incorporating network virtualization for secure multi-tenant segmentation, as well as built-in monitoring and analytics for pervasive network visibility, Pluribus delivers a comprehensive solution that is easier to deploy and manage than many alternatives.



Pluribus Multi-site Data Center Fabric

Unlike traditional data center interconnect approaches that stop at the edge of the data center, the Adaptive Cloud Fabric runs on every top-of-rack switch and creates a fully software-defined overlay network, based on industry-standard VXLAN technology, over any wide area transport network technology and topology (including over traditional DCI transport solutions). This approach abstracts away distance and underlay network complexity, supports insertion into existing "brownfield" network environments and enables seamless connectivity among endpoints and resources located within any site in the fabric.

Pluribus multi-site data center fabrics can help customers achieve several business goals:

- **Improve business continuity and disaster recovery** – improve application availability and reduce costly downtime by unifying geographically separated data centers to support active-active applications, graceful failover during planned maintenance or unplanned outages, and streamlined data back up and replication.

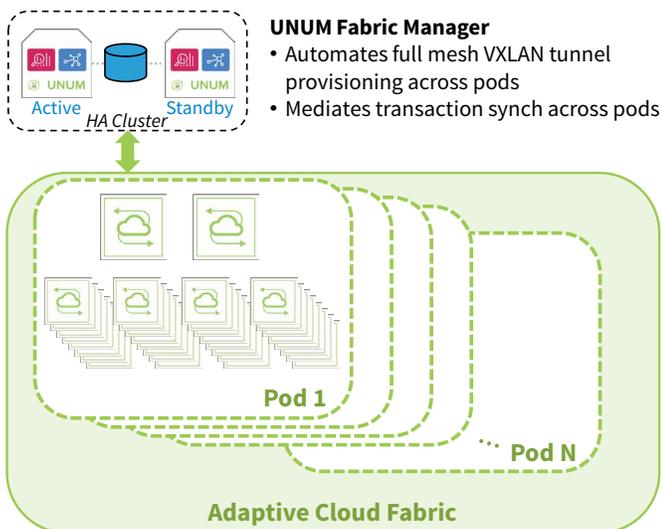
- **Reduce capital costs** – efficiently use capacity and resources across multiple sites to maximize utilization and minimize idle or stranded assets.
- **Increase operational agility and reduce operational costs** – support DevOps agility by easily moving workloads among sites for capacity or availability reasons with no IP readdressing needed.

Operational benefits of a Pluribus multi-site data center fabric include:

- **Comprehensive automation for simplified operations** – The Adaptive Cloud Fabric automates both the underlay network and overlay network virtualization with built-in monitoring and analytics enabling dramatically simplified operations and lower operational costs.
- **Cost-, space- and power-efficiency** – The controllerless SDN architecture running directly on open network switches eliminate the need for multiple redundant controllers at every site, enabling better cost-, space- and power-efficiency.
- **Secure network segmentation** – Deep network segmentation across the data, control, and management planes supports secure multi-tenant data center services and isolates applications and untrusted devices.
- **Pervasive visibility and insight** – Built-in wire-speed monitoring, which requires no external hardware and has no performance impact, provides full visibility into physical and virtual networks – every port, every flow, every application, from start to finish.

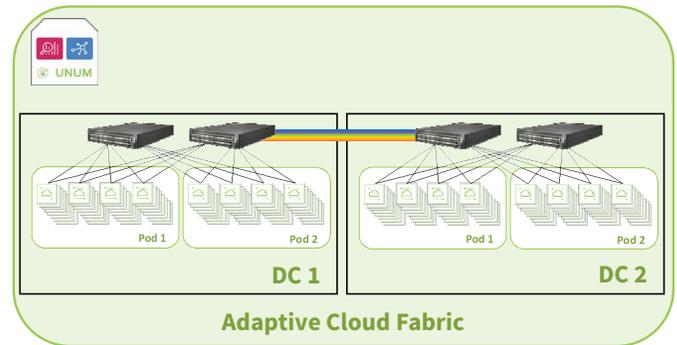
Adaptive Cloud Fabric Scalability

To meet the customer’s scaling requirements, the Pluribus Adaptive Cloud Fabric employs a multi-pod architecture, managed by the Pluribus UNUM Fabric Manager, that is capable of scaling to 256, 512 or even 1024 leaf switches.



Adaptive Cloud Fabric Multi-pod Architecture

In the first phase, a 64-node fabric was deployed in a single data center. The second phase design expands the fabric to encompass an additional 64 leaf switches in the second data center for a total of 128 leaf switches in a unified multi-site fabric. In this design, as in any Pluribus multi-site fabric, the entire 128-node fabric appears as simple as a single large virtual switch, completely abstracted from the underlying data center leaf-spine networks and DWDM data center interconnect (DCI) links.



128-node fabric across two DCs
(active-active architecture)
N x 100G WDM data center interconnect

Government Agency Unified Multi-site Fabric

High-density open networking leaf and spine switches were also important to meeting the customer’s scaling requirements cost-effectively. Pluribus supported a mix of 10G and 25G leaf switches, based on Broadcom’s Trident 3 switching ASIC, to match the customer’s requirements. The leaf switches were connected to redundant 64 x 100G spine switches based on the Broadcom Tomahawk 2 ASIC. These high-density, fixed-form factor spine switches, delivering 12.8 terabits per second (Tb/s) of capacity in only 2-rack units (2 RUs), offered a very compact and cost-effective solution to meet the customer’s scale requirements and avoided the need for more expensive, complex chassis-based spine switches.

Results

The Pluribus Adaptive Cloud Fabric solution is enabling the government agency to build and grow private cloud services with a unified fabric across two large data centers for high application availability and low operational cost. With support for very high scale, multi-site fabrics, the Adaptive Cloud Fabric is also well positioned to enable future growth as and when needed by the customer.