



Solution Brief

Enabling Modern Data Centers with Hyperscale Networking

Dell and Big Switch Networks deliver modern data center network fabrics with Dell Open Networking switches, Big Switch Networks Big Cloud Fabric™ (BCF) and Dell's worldwide support

- Reduces CAPEX costs by over 50% using Dell's market-leading open networking switches
- Provides a flexible, scale-out fabric design based on hyperscale design that allows users to start at the size and scale they need while being able to grow as their needs do
- Reduces management consoles by over 30:1 with one centralized controller console that exposes a web-based GUI, a traditional networking-style CLI and REST APIs
- Enables rapid innovation through a streamlined configuration based on the concept of logical tenants
- Backs each and every deployment with a comprehensive suite of support and services to help customers of all sizes globally

Data center networking challenges

Applications are the engine for modern businesses—driving innovation, operational efficiency and revenue generation. They demand an infrastructure that is highly agile and easy to manage, while reducing costs. These applications, which include mission critical ERP systems, multi-tier Web applications, Big Data, etc. have placed new constraints on the networking infrastructure; support for high east-west traffic bandwidth, virtual machine (VM) mobility, and multi-tenancy.

Infrastructure teams have struggled to respond to those requirements. Unlike the rest of the portfolio they manage, legacy networks remain highly static and require extensive manual intervention and operational overhead. While the speed, scale and density of equipment offered by traditional networking vendors has increased over the last two decades, the underlying architectures and business operating models have stayed fundamentally unchanged.

A modern SDN fabric for the enterprise data center

Dell is working closely with Big Switch Networks to introduce the industry's first data center leaf-spine Clos fabric solution built using Dell's open networking switches and Big Switch Networks Big Cloud Fabric™ (BCF). This joint solution leverages the hardware-software disaggregation enabled by Dell and Big Switch networks SDN designs inspired by hyperscale data center architectures to provide significant cost savings and operational efficiencies for enterprise data centers.

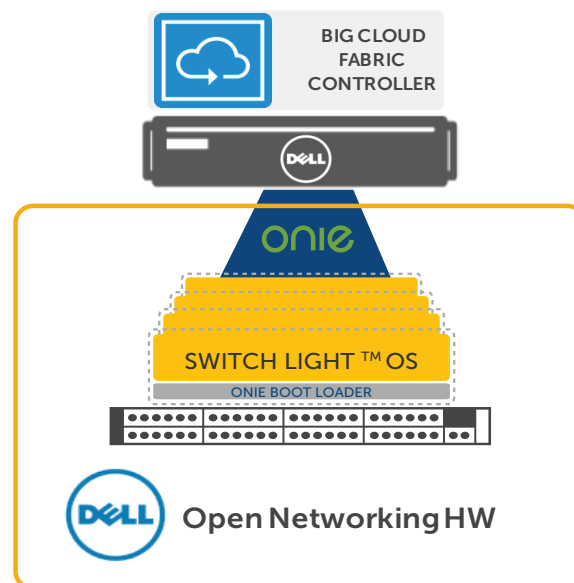


Figure 1: Dell and Big Switch Networks Joint Solution

Big Switch Networks Big Cloud Fabric™ (BCF) solution

Big Switch's Big Cloud Fabric (BCF) is the industry's first SDN data center fabric bringing hyperscale data center design principles to all enterprise data centers. Applications can now take advantage of high east-west bisectonal bandwidth, secure multi-tenancy, and workload elasticity natively provided by Big Cloud Fabric. Customers benefit from unprecedented application agility due to automation, massive operational simplification due to SDN and, dramatic cost reduction due to HW/SW disaggregation enabled by Dell Open Networking switches.

Big Cloud Fabric supports both physical and virtual (multi-hypervisor) workloads and choice of orchestration software. It provides L2 switching, L3 routing and, L4-7 service insertion and chaining while ensuring high bisectonal bandwidth. The scalable fabric is fully resilient with no single point of failure and supports head-less mode operations.

The Big Cloud Fabric architecture consists of a physical switching fabric to form a leaf-spine Clos architecture. Dell's Open Networking switching portfolio supports Big Switch Networks' Switch Light™ Operating System to form the individual nodes of this physical fabric. Intelligence in the fabric is hierarchically placed: most of it in the Big Cloud Fabric Controller (where configuration, automation and troubleshooting occur), and some of it off-loaded to Switch Light for resiliency and scale-out.

Big Cloud Fabric is available in two editions:

- **P-Clos** — Leaf-spine physical Clos fabric controlled via SDN Controller
- **Unified P+V Clos** — Leaf-spine plus virtual switches (vSwitches) controlled by SD Controller (future release)

Big Cloud Fabric solution components include:

- **Big Cloud Fabric Controller Cluster** — an external, hierarchically implemented SDN controller available as a cluster of virtual machines or hardware appliances for high availability (HA)
- **Dell-ON Ethernet Switches with Switch Light OS** — to support various fabric configurations and deployments.
- **OpenStack Plug-In (optional)** — a BSN Neutron plug-in or ML2 Driver Mechanism for integration with various distributions of OpenStack

- **VMware vCenter Extension** — built-in network automation and orchestration for vSphere server virtualization
- **CloudStack Plug-in (optional)** — a BSN Networking plug-in for integration with CloudStack

Dell Networking High-Performance Open Networking switches

Dell has been delivering high-performance, reliable networking solutions for over a decade and today powers some of the world's most demanding enterprise and cloud/Web 2.0 environments. For data centers, this means feature-rich Top-of-Rack and blade switching solutions and high-performance 10/40GbE networking fabrics that fit organizations business and budget.

The broad Dell data center switching product portfolio now includes options with its high-performance fixed form factor 1GbE S3048-ON, 10GbE S4048-ON, 40GbE S6000-ON top-of-rack switches and Z9100-ON 10/25/40/50/100 Gigabit Ethernet switch for modern data center fabric architectures. These Dell switch offerings support the industry standard Open Network Install Environment (ONIE) for zero touch installation of alternate operating systems.

Dell backs up each and every deployment with a comprehensive suite of design, deployment and management services to help customers of any size every step of the way. All of this translates directly into a capability set designed to fit any organization's needs, granting them and their business the power to do more.

Summary

Demands on data center network infrastructures will continue to grow and legacy networks are falling short of meeting the demands. Enterprise organizations need an infrastructure that will allow them to drive operational efficiency, revenue generation and innovation.

Together Dell and Big Switch Networks are providing organizations with a choice of open networking hardware and industry-leading software solutions across the layers of the networking stack and pay-as-you-grow economics, starting small scale and growing the fabric gradually when you need to.

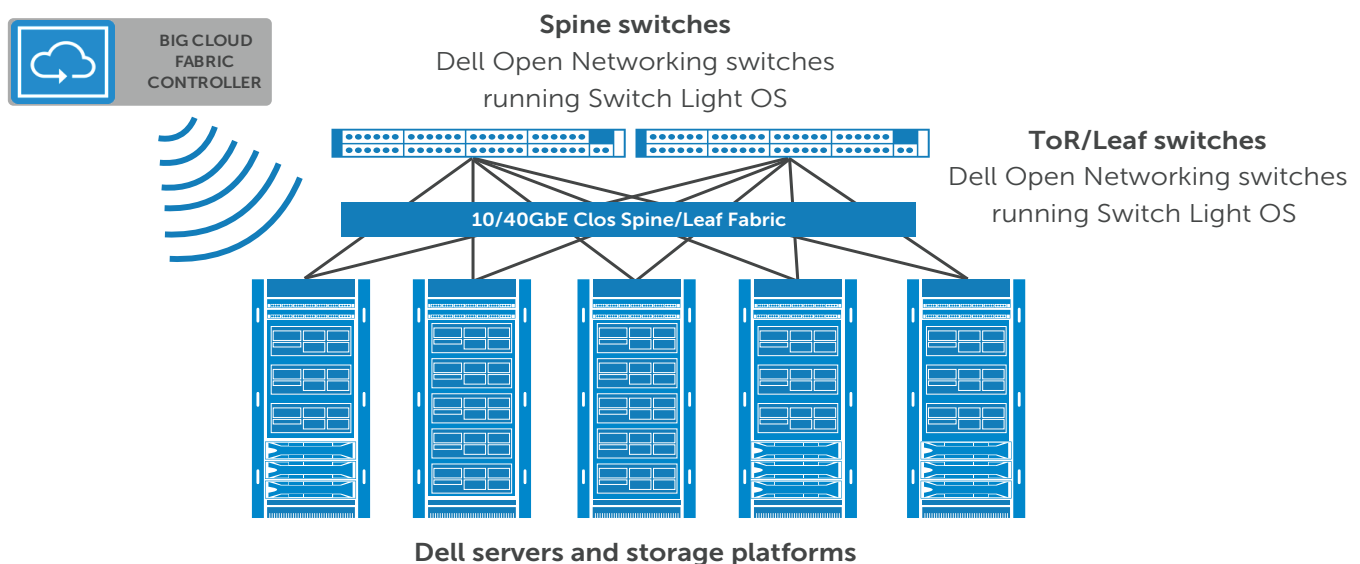


Figure 2: Open Networking SDN Fabric with Dell and Big Switch Networks

Transform and modernize your network at Dell.com/Networking

