Open Networking and Virtualization for the Software-Defined Data Center.

Dell Open Networking and VMware NSX®

With the rise of data center virtualization and cloud deployments, companies are experiencing growth pains where a traditional network architecture is no longer acceptable. Key challenges include:

- Complexity – networking management continues to grow in complexity, with time-consuming manual configuration of individual switches within the network.

- Agility – Slow network provisioning due to manual intervention, with time intensive configuration and human error, creates bottlenecks for workload deployment and unsustainable levels of network downtime.

- Security –Inflexible and expensive security models make security against lateral movements in the data center nearly impossible.

- Economics – closed proprietary networking environments with expensive management and support costs continue to increase.
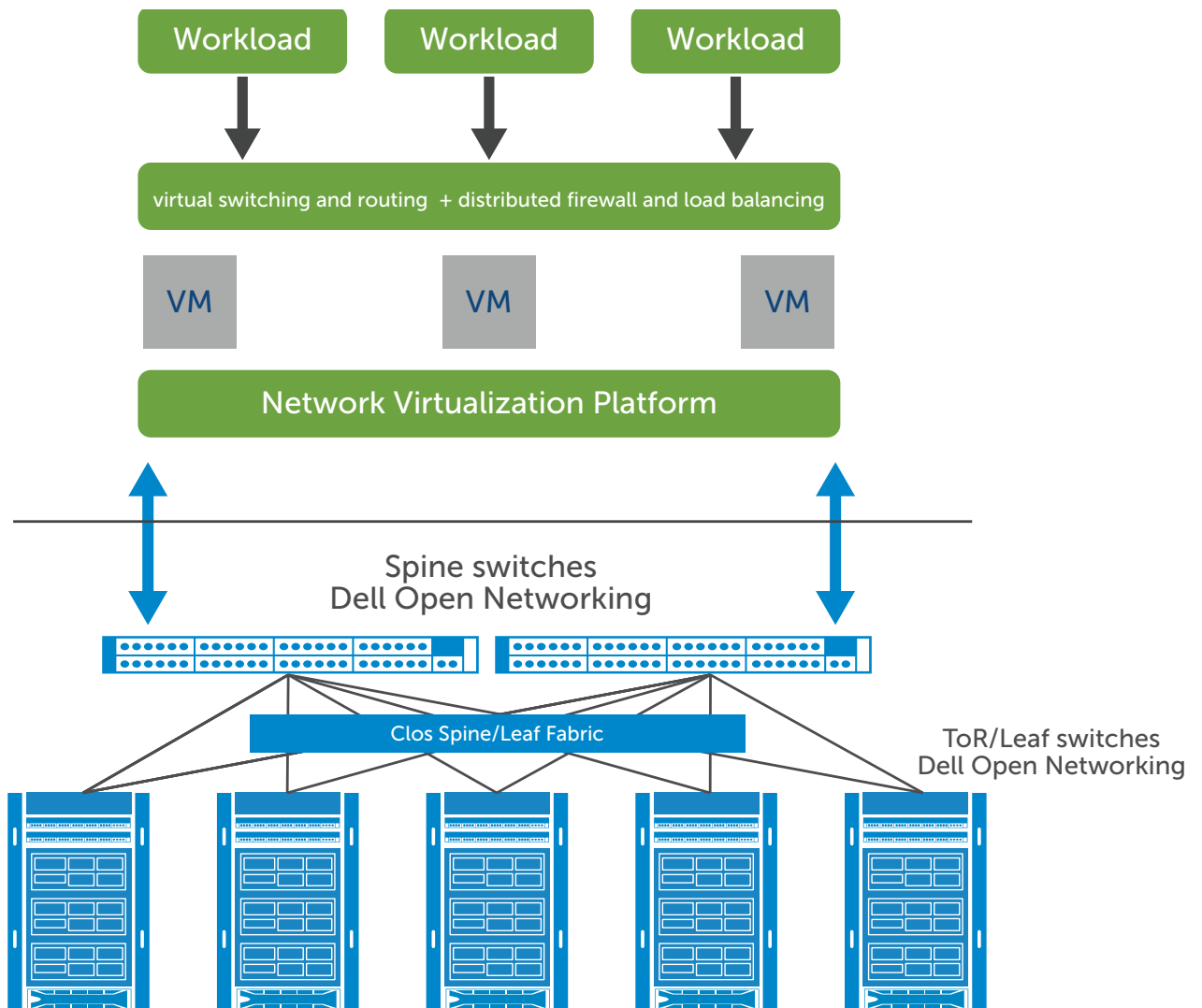
Real networking innovation through Open Networking and NSX

Through disaggregation of the networking hardware from the OS and network virtualization, organizations have the capability to increase automation and security while reducing costs. Dell is the first vendor to introduce Open Networking, disaggregating the hardware from the software, giving customers choice of OS and allowing them to benefit from a growing ecosystem of software for future ready networks.

Dell and VMware bring an operational model for networking that forms the foundation of the Software-Defined Data Center. Because NSX builds networks in software, data center operators can achieve levels of agility, security, and economics that were previously unreachable with traditional physical networks. NSX provides a complete set of logical networking elements and services—including logical switching, routing, firewalling, load balancing, VPN, quality of service (QoS), and monitoring. These services are provisioned in virtual networks through any cloud management platform leveraging the NSX APIs. Through Dell's open networking, companies are best able to take advantage of this disaggregation of a virtual network overlay and an open physical underlay.

Key Benefits of Dell Open Networking and VMware NSX

- **Open networking switching** provides customer choice in operating systems through disaggregation. Through an open networking platform, Dell delivers strong analytics, automated provisioning, programmability, and Layer 2 Gateway support for an NSX virtual overlay.

- **Best in class physical underlay** offers high performance spine/leaf switching with layer 2 gateways and non-blocking active/active forwarding for effective bridging to the NSX virtual overlay.

- **End-to-end data center product leadership** in server, storage, and networking solutions designed to work together.

- **Lower TCO**, through Dell Open Networking can save up to 55% on space, up to 70% on power and cooling, and up to 57% on hardware network costs.

- **Micro-segmentation and granular security** delivered to the individual workload

- **Reduced network provisioning time** from days to seconds and improved operational efficiency through automation.

- **Workload mobility** independent of physical network topology within and across data centers.

Workload Workload Workload

virtual switching and routing + distributed firewall and load balancing

VM   VM   VM

Network Virtualization Platform

Spine switches
Dell Open Networking

Clos Spine/Leaf Fabric

ToR/Leaf switches
Dell Open Networking

Key Features of Dell Open Networking and VMware NSX

Power of Choice	Choose from best-of-breed open networking platforms, operating systems and applications.
Accelerated innovation	Take advantage of open networking with open source standards-based tools and expertise to help accelerate innovation.
Open networking platform	All Dell Networking data center switches support the Open Network Install Environment (ONIE), allowing customers to choose between multiple operating systems and meet their unique needs.
Hardware VTEP Gateway	Layer 2 gateway through VXLAN Tunnel End Points (VTEP) bridges virtual and physical infrastructures.
Virtual Switching	VXLAN based network overlays enable logical layer 2 overlay extensions across a routed (L3) fabric within and across data center boundaries.
Virtual Routing	Dynamic routing between virtual networks performed in a distributed manner in the hypervisor kernel, and scale-out routing with active-active failover with physical routers.
Distributed Firewalling	Distributed stateful firewalling, embedded in the hypervisor kernel for up to 20 Gbps of firewall capacity per hypervisor host.
Load Balancing	L4-L7 load balancer with SSL offload and passthrough, server health checks, and App Rules for programmability and traffic manipulation.

Use Cases

Security

VMware NSX enables organizations through micro-segmentation to divide the data center into distinct security segments logically, down to the level of the individual workload – regardless of the workload's network subnet or VLAN. IT teams can use microsegmentation to define security policies and controls for each workload based on dynamic security groups, which ensures immediate responses to threats inside the data center and enforcement down to the individual virtual machine. Unlike in traditional networks, if an attacker gets through data center perimeter defenses, threats can't move laterally within the data center.

Automation

NSX addresses the challenge of lengthy network provisioning, configuration errors, and costly processes by automating labor-intensive, error-prone tasks. NSX creates networks in software, eliminating bottlenecks associated with hardware based networks. Native integration of NSX with cloud management platforms such as VMware vRealize® Automation or OpenStack® enable further automation.

Application continuity

Since NSX abstracts networking from the underlying hardware, networking and security policies are attached to their associated workloads. Organizations can easily replicate entire application environments to remote data centers for disaster recovery, move them from one corporate data center to another, or deploy them into a hybrid cloud environment—all in minutes, all without disrupting the applications, and all without touching the physical network.

Accelerated innovation and services

Dell delivers the ability to leverage open source, standards-based tools, applications & expertise based on their unique requirements. Customers have choice when leveraging Linux and open source standards-based tools & expertise to help optimize data center networks, drive innovation and future-proof network investments. Through Dell Open Networking, customers can take advantage of best of breed complete networking solutions that are tested, approved and supported globally.

Summary

Businesses that have deployed NSX find that it is quickly becoming the defining factor for the success of their IT organizations and a foundational part of their data center infrastructure. Today, thousands of NSX customers are accelerating the delivery of value to their business, delivering some of their most sensitive and critical applications on top of fast, agile, and secure virtual networks in a way that simply cannot be achieved on legacy hardware-based networks.

Customers are also finding that through the Dell Open Networking platform, the ability to disaggregate the hardware from the software brings greater flexibility and delivers the benefit of a broad ecosystem to complement and support an NSX deployment. In addition Dell's ability to provide services, support and an integrated end-to-end hardware/software solution brings real business value to deploying and managing a complete future ready software defined data center.

Learn more, visit Dell.com/Networking