Dell SDN solution overview
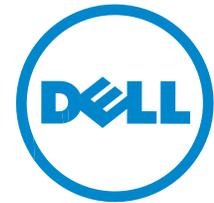
For years the networking industry has operated in a closed, mainframe-like state where the only option available to consumers has been a 'big-iron' approach, working with a single vendor that controls all aspects of network operation from the hardware to the operating system to applications and features. As a result innovation in the networking industry has become stifled; operations remain fragile, complex and expensive.

Today the **Software Defined (SDN)** and **Open Networking** Movements are presenting new, innovative approaches that offer profound business benefits and solve key enterprise challenges. This solution brief provides an overview of SDN and Open Networking, providing guidance to prepare an optimal technology strategy with the business, technical and operational benefits of these powerful emerging paradigms.

Dell Networking's SDN Solutions help you:

- Provides a common, easily scalable foundation optimized for all key emerging SDN technologies
- Deliver the performance and capabilities needed for next-generation applications and east-west traffic
- Streamline and automate operations with complete lifecycle management
- An open choice of network operating system*, providing the greatest breadth, flexibility and investment protection in a network solution today

At a glance

IT pain points

- New applications demand greater performance, lower latency, east-west traffic, dynamic provisioning, etc…
- Inefficient, manually-intensive operations, slow provisioning & low agility
- Challenges enforcing governance, policy compliance and cost allocations

Solution components:

- Dell M, N, S and Z-series Ethernet fabric switches
- Dell Networking Operating System, Cumulus Linux*, SwitchLight OS*
- Dell Active Fabric Manager, Active Fabric Controller, Active Systems Manager & Ecosystem Solutions

Dell SDN and Open Networking solution benefits:

- Dell Active Fabric Switches support traditional, programmable, overlay and controller-based networking solutions on one common platform
- Open Networking* provides greatest breadth of solutions, flexibility & investment protection
- High-performance Active Fabric architectures are optimized for next-generation traffic patterns and scale seamlessly to grow with your business
- Active Fabric Manager's simple & elegant lifecycle management tools make it easy to implement next-generation networking solutions while streamlining & automating operations

*Available only on select models

Dell—Fueling the **Open Networking** revolution
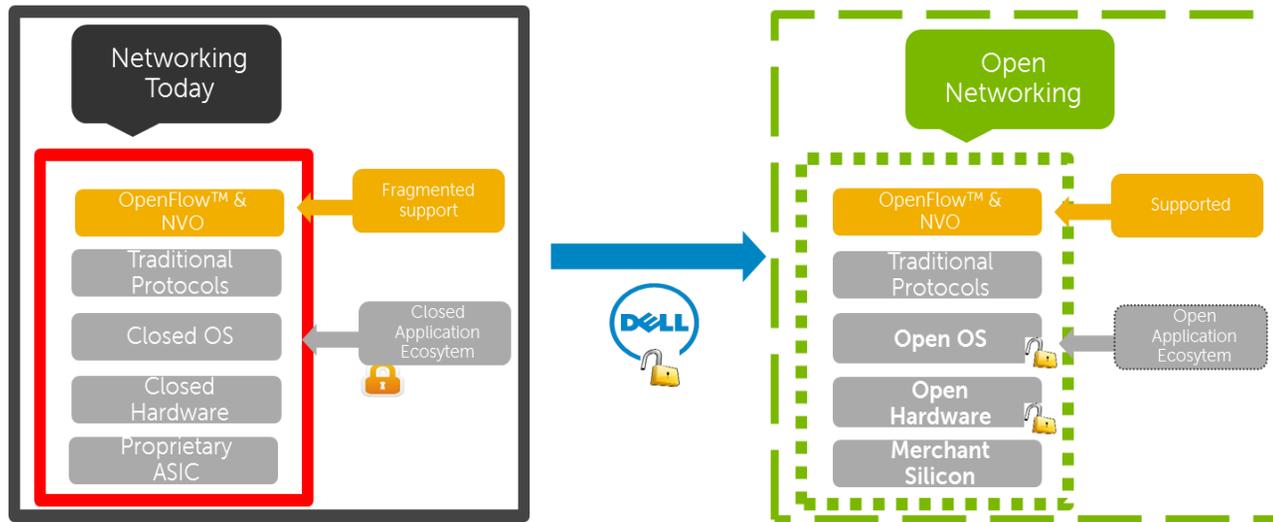
Welcome to the **Open Networking** revolution

Dell Open Networking*solutions are aligned with the Open Compute Project and enable our customers to choose between supported operating system choices including Dell Networking Operating System, Cumulus Linux and Switch Light OS/Open Network Linux. This model delivers access to the rapidly emerging new innovations now available through open software ecosystems, all with the stability and assurance of Dell's service and support, and the breadth and power of our global supply chain.

Dell.com/Networking

Dell's **Choice of SDN** approach
Open Standards, Open Protocols, Open Source

A uniquely open approach to SDN

While vendors are making more and more claims about being open, only Dell delivers true Open Networking*, allowing a choice of supported operating systems on Dell's Open Networking Switches. No other solution offers this breadth, flexibility & investment protection.

While there are differing definitions of exactly what SDN is or is not, Dell's approach centers around the needs of the application and use case. Today's businesses are complex environments with many needs – there is no one-size-fits all technology. Today multiple different approaches to SDN are evolving and can work together to offer a wide array of services for different use cases and application demands.

The primary approaches to SDN can be broken into 3 solution categories: **Programmable, Overlay** and **Controller**-based.

A programmable powerhouse

Dell Networking Operating System (OS9) delivers a best-in-class network OS which that includes an industry- standard command-line interface, ensuring that Cisco-trained networking-staff can immediately be comfortable and productive. But behind the scenes of the familiar and comfortable CLI, OS9 packs a powerhouse of next-generation automation, programmability and SDN capabilities.

OS9's powerful scripting capabilities leverage industry-standard languages and libraries, eliminating the need to learn proprietary languages with immature development environments and toolsets. OS9's extensive capabilities include support for Expect, PERL, Python, Tcl, UNIX and ZSH shell scripts, embedded Puppet and Chef agents**, RESTful API's, OpenFlow and more.

*Available only on select models
** Requires Dell Networking OS 9.7

Overlay/Hypervisor Solutions

VMware, Microsoft, OpenStack

vmware Microsoft openstack CLOUD SOFTWARE

Open Networking

DELL

RESTful API
GET PUT POST DELETE

TCL, Perl & Python, REST-API,
XML, OMI, Puppet, Chef

ONF
OPEN NETWORKING
FOUNDATION

SDN Controllers
Open Standards, Open Source

Programmable Solutions

Controller Solutions
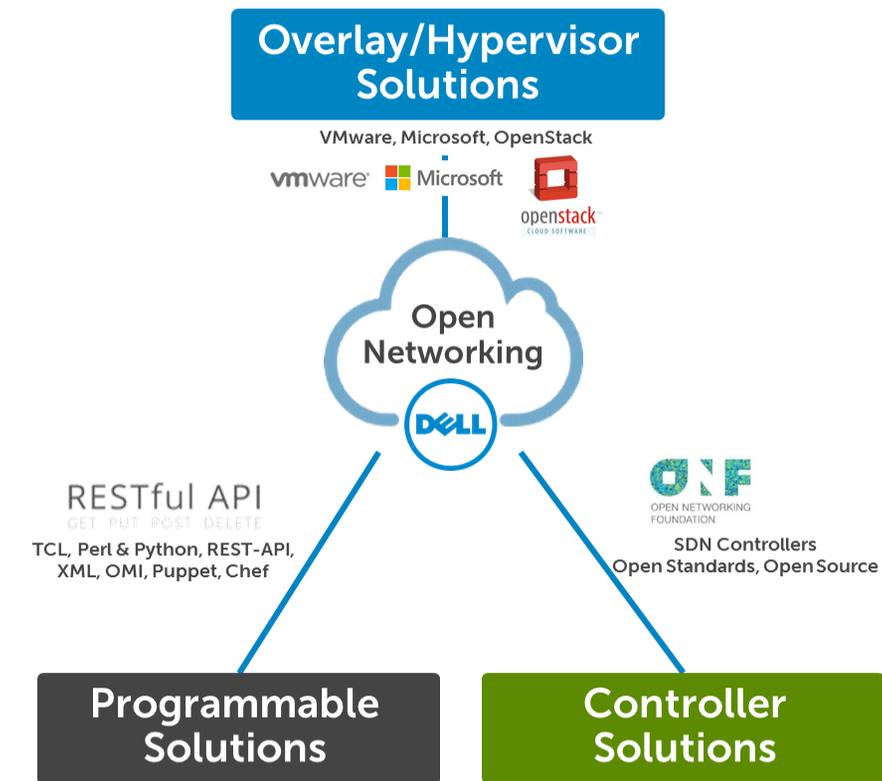
An open approach to OpenFlow

Dell was among the earliest supporters of OpenFlow and provides support on select models of the N, S and Z-series platforms where we have made significant innovations including support for up to 160,000 flows and 40 Gigabit Ethernet. Our open approach to SDN offers support for any standards compliant OpenFlow controller on the market, providing customer choice and investment protection.

For OpenStack Private Cloud environments Dell offers the Active Fabric Controller to deliver zero-touch deployment for OpenStack fabrics such that no operator intervention is required — simply rack, cable, power-on, and the fabric comes to life. AFC also offers network, endpoint and policy abstractions, together with a simple GUI and comprehensive API. This enables OpenStack applications to program the network to meet workload needs, and provides simplified visibility and comprehensive programmatic control of the access fabric.

An integrated Overlay and Underlay Solution

Network Virtualization Overlay (NVO) solutions allow server hypervisors to connect directly to other hypervisors via logical tunnels, enabling multiple virtual networks over one common physical network, This allows an application to be centrally packaged with its network and overall policy requirements in a portable and dynamically deployable container.

Dell is a leading strategic partner with Microsoft and VMware and on the board of the OpenStack foundation, enabling us to jointly develop infrastructure technologies that best complement and optimize each solutions approach to NVO.

Dell Active Fabric Switches are seamlessly supported in Microsoft System Center, deeply integrated into VMware vSphere and NSX, and deliver deep integration and network automation for the OpenStack Neutron framework.

A simple, evolutionary path to SDN

Dell Active Fabric solutions provides a simple, comfortable environment that can start with small deployments and grow as needed, at the pace of the business. The traditional CLI provides a comfortable environment, and the powerful programmability features and software tools can empower network and systems administrators to start automating operations and streamlining processes today

With full support for SDN and our unique Open Networking solution, Dell delivers the industry's most comprehensive breadth of next-generation solutions providing a dynamic and adaptable framework with unprecedented investment protection. Active Fabric delivers a simple and powerful model that leverages the power of software to deliver a new operational model that evolves with the pace of business.

To learn more, visit Dell.com/Networking, or contact your Dell representative

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