



Solution Brief

Introducing a cost-effective MPLS virtualization solution from Dell and IP Infusion for enterprises

Dell and IP Infusion deliver affordable MPLS virtualization with Dell Open Networking switches, IP Infusion OcNOS software and worldwide support.

- Delivers an economical, scalable and secure method of separating network users and resources across a common infrastructure using MPLS network virtualization
- Enables enterprise organizations an alternative choice when looking to implement or expand use of MPLS-based platforms that take advantage of merchant silicon
- Backs each and every deployment with a comprehensive suite of design, deployment and management services to help customers of all sizes globally

Network Challenges for enterprise organizations

Today's enterprise networks are being challenged by demanding applications and users looking for anywhere and anytime connectivity real-time. Changing traffic patterns from high performance workloads and increased use of virtualization and cloud technologies are pushing networks to their limits. Unfortunately, traditional proprietary networking solutions are hardware-bound, inflexible and becoming increasingly difficult to manage and support.

To provide a scalable and secure method of separating network users and resources across a common infrastructure enterprises are following the lead of service providers by implementing multi-protocol label switching (MPLS) layer2/layer3 network virtualization. Unfortunately, they are forced to use expensive carrier-grade MPLS routers in their backbone and campus environments. They are also challenged with a lack of alternative vendor choices for cost-effective MPLS platforms based on merchant silicon.

A new approach to traditional MPLS virtualization

Dell is working closely with IP Infusion to help provide enterprise customers with a cost-effective and scalable MPLS-based network virtualization solution that provides secure connectivity and aggregated management. This joint solution will enable enterprise customers to adopt MPLS virtualization capabilities within their data centers and campus environments at a fraction of the cost, power, space and cooling requirements as compared to today's market offerings.

IP Infusion's full-featured network operating system OcNOSTM

IP Infusion's OcNOSTM is the first, full-featured network operating system for data center and enterprise networking, including advanced capabilities such as extensive protocol support for MPLS. OcNOS brings the power of the Open Compute Project, an open hardware movement and foundation, to data networking to reduce operational complexity.

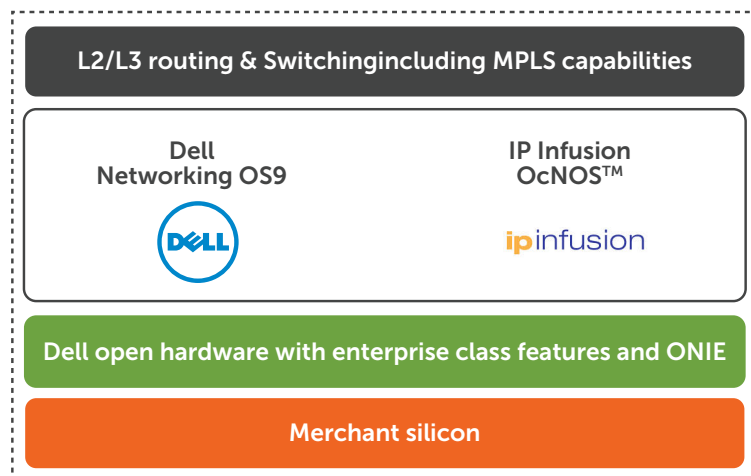


Figure 1: Open networking with Dell and IP Infusion

OcNOS, is a modular, multitasking networking operating system, that fills the void for an enterprise and service provider class standalone networking system that's fast, easy, affordable, and gives network equipment manufacturers and network carriers the tight integration capabilities with commodity hardware they need to develop highly robust, scalable, redundant solutions that can be used in multiple deployment scenarios.

Some of the key features and benefits of OcNOS includes:

- **Common software for multiple deployments and hardware** – OcNOS is designed using several inbuilt abstraction layers. The hardware abstraction layer allows the OcNOS software to run over multiple control plane CPU and forwarding chipset hardware.
- **Interoperation and ease of use** – OcNOS solution is built using standards-based definitions, as well as popular vendor specific extensions for device management. The OcNOS management plane can support a wide variety of management interfaces like CLI, SNMP, REST, NETCONF, SAF IMM-OI and more.
- **Modular software design** –OcNOS control plane software design is highly modular with multiple processes handling each individual key protocol. The processes are managed and contained by a process handler framework, which also monitors the processes, restarts and maintains event logging for them.
- **Support for disruptive networking technologies** - OcNOS supports technologies required for bandwidth scaling at data centers and interconnects. The OcNOS centralized transaction-based managed object modeling layer allows for multiple management interfaces. This in turn allows for central service level provisioning and chaining across multiple devices.
- **High availability** - OcNOS provides standards-based redundancy protocols like VRRP, BFD, ring failure recovery protocols, MLAG, UDLD and graceful restart mechanisms. This protocol-level redundancy provides guaranteed network-level redundancy.

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 1/10 Gigabit Ethernet S3048-ON, 10/40 Gigabit Ethernet S4048-ON and S6000-ON top-of-rack switches and 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

Having a robust, flexible and agile network infrastructure is critical for organizations striving to meet growing demands. Shifting to a software-defined networking environment can help these organizations to stay ahead and deliver superior services.

Together Dell and IP Infusion are helping organizations gain greater flexibility to build, run, and manage MPLS-based virtual networks independent of the physical network and provision services more quickly. This joint solution provides a competitive edge through maximum operational efficiency, agility and security that allows our customers the power to do more.

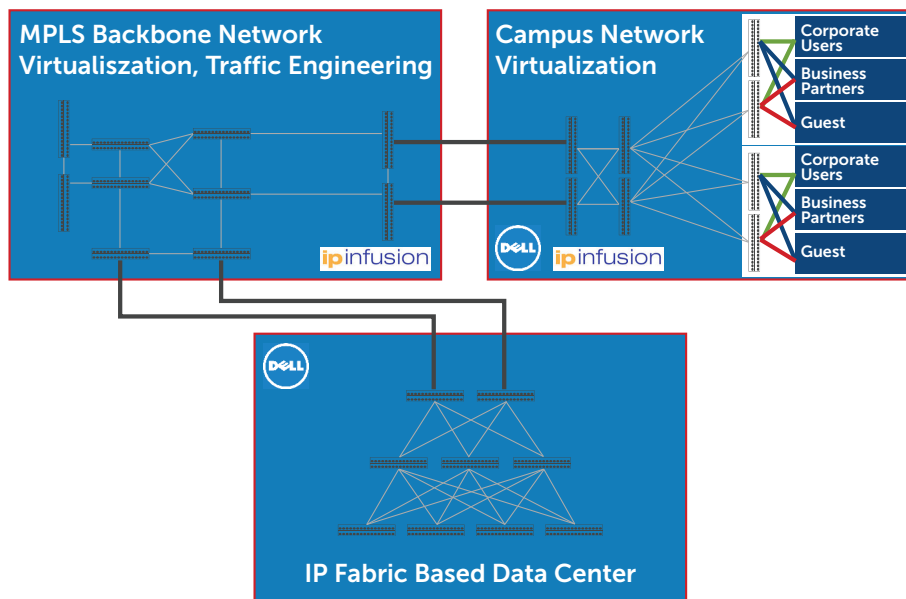


Figure 2: Dell and IP Infusion MPLS-based network virtualization

For more information go to Dell.com/Networking

