

DRIVE BUSINESS AGILITY WITH SD-WAN

Accelerating New Services for Service Providers

Market Demands for SD-WAN

Higher bandwidth services such as video and mobile access to cloud services and applications are all driving growing internet usage. As the myriad of connected devices and appetite for services and bandwidth continue to skyrocket, enterprises are faced with challenges to support and manage the exponential increases in bandwidth demand alongside the growing demands to support branch offices. With the bandwidth rates in the traditional model of deploying MPLS networks becoming cost prohibitive, along with the long deployment times and high CapEx and OpEx costs associated with supporting branch offices with multiple services and added IT resources, a transformation in enterprise WAN architecture is needed to address these challenges.

Software-defined wide area networks (SD-WAN) promises to revolutionize the wide area network (WAN) to deliver optimal connectivity, reduced complexity, centralized management, and lower costs. Gartner estimates that by the end of 2019, 30 percent of enterprises will have deployed SD-WAN technology in their branches, up from less than 1 percent in 2015.

Why SD-WAN Is Picking Up Momentum

SD-WAN's goal, as one example of SDN and NFV in general, is to virtualize network hardware and services in order to make Service Providers' networks more flexible and agile. Traditional WANs, built on single-purpose physical devices and fixed circuits, offered enterprise customers guaranteed performance, reliability and control, but fell short on flexibility. With the growing demand for enterprise networks, Internet of Things (IoT), and data center connectivity, Service Providers are faced with increased operational costs to provision new or upgraded WAN services. The sheer volume of equipment, as well as the manual processes required to conduct moves, adds, and changes, make static WANs complex and expensive for both Service Providers and customers.

Additionally, moving to cloud services presents Service Providers (SPs) with new revenue opportunities around SD-WAN. With simple provisioning and orchestration tools, service providers can support support new, highly elastic cloud computing services and VPNs, IPS, IDSM anti-virus, policy based routing, cloud computing services, as well as offer their customers Network as a Service (NaaS), Infrastructure as a Service (IaaS) and Software Defined Data Centers (SDDC).

"VMware helps us deliver new revenue-generating services, and transforms our infrastructure and operations through the adoption of NFV. VMware's carrier-grade solution for NFVI (network function virtualization infrastructure) combines production-proven virtualized compute, networking and storage."

TIER 1 OPERATOR

KEY BENEFITS

- **Accelerate** time to market with new services through policy-based, on-demand service creation of VNFs
- **Automate** the instantiation, provisioning and management of SD-WAN and other VNF services in the network lowering operational costs and increasing profitability
- **Gain deep visibility** and real-time analytics of network services for accurate capacity management and optimal resource allocations for VNFs and the health of the network
- **Simplify** infrastructure lifecycle operations and obtain comprehensive management capabilities
- **Take advantage** of an open standards based ETSI platform supporting multiple vendor VNFs and the VMware NFV Ready certification program

Deliver Differentiated Services with VMware vCloud NFV

SD-WAN solutions from a growing ecosystem of certified VMware Ready™ for NFV partners, and powered by the VMware vCloud NFV platform, allow Service Providers to deliver to enterprises differentiated SD-WAN performance, reliability, and quality of experience. Such SD-WAN solutions:

- Lay foundations for future-proofed, dynamically scaling and flexible architecture across distributed hybrid clouds and customer sites
- Centralize cloud management centered on business processes and requirements
- Ensure flexibility for growth, network agility and streamlined branch implementations
- Deliver secure, policy driven, and optimized access to cloud services, private datacenters and enterprise applications
- Enable new revenue streams for Service Providers through integrated advanced service offerings
- Guarantee increased flexibility and QoS while delivering elastic transport and performance for cloud applications, all via a simplified deployment model.
- Ease operations with integrated data analytics for faster issue remediation and reduction in customer care

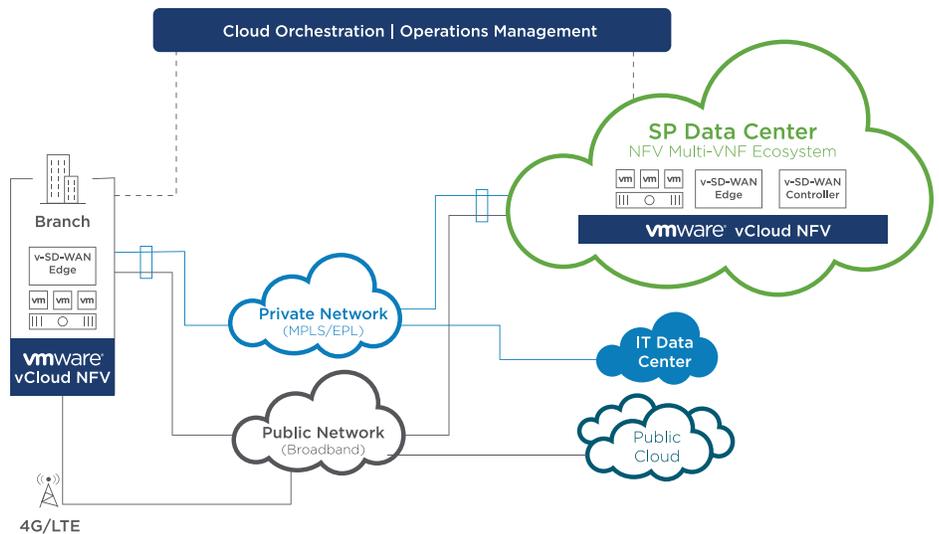
SD-WAN capabilities such as traffic shaping over multiple links enables Enterprises and Service Providers to benefit from the multi-tenant cloud gateway architecture and the ability to support real-time applications over a choice of links, from traditional MPLS to ordinary broadband links with stability and predictable performance while reducing costs. The SD-WAN solutions on VMware's vCloud NFV, the only production-proven, carrier grade network function virtualization platform.

SD-WAN: New business models. Agile network.

From modernization of branch environments to virtual managed services, SD-WAN offers new revenue stream opportunities for Service Providers looking to grow in the mid-to-large enterprise market. Service Providers can now offer:

- **Customer-desired flexibility** - SD-WAN complements MPLS and provides the flexibility that customers demand, while also providing them the freedom to reduce costs on premium MPLS connections, by augmenting them with less expensive connections like broadband or 4G. Scaling up or down based on application type, latency requirements and usage peaks as well as having fault tolerant network connections for the fraction of the cost. In addition, SPs can now deliver improved performance, multi-vendor solutions with better SLAs.
- **Additional services** - Service Providers can now offer a new service while also being able to provide new, enhanced capabilities to existing local loop customers. By offering additional services rapidly in the changing market, Service Providers can insulate themselves from the emerging competitive landscape of OTT and alternative network providers. Value added services like differentiated QoS, virtual CPE, additional service chain bundling, premium VPN services, traffic and content management, intrusion detections, collaboration tools, and many more will help Service Providers customize and differentiate their offerings from the rest of the market.

- **Additional security** - Configuring security parameters and class of service over MPLS networks is not only cumbersome, but also time consuming. Centralized orchestration and management pave the way for Micro-segmented security profiling and policies at network and service layers, helping to address key networking concerns for enterprises.
- **Virtual hosting** - Rather than relying on multiple physical and virtual appliances deployed at customers' locations, Service Providers can reduce their reliance on hardware and move that functionality to a customer virtual edge cloud, which brings tremendous savings and agility to customer operations.
- **End-user enablement** - Centralized policy driven service management enables end-user access to control and customize the consumption of cloud services - minimizing the trombone effect, approval processes and provisioning delays.
- **Service resiliency** - Backup resiliency with LTE Advanced Pro and 5G, service providers can offer higher uptime SLA's for mission critical applications at a fraction of the cost, and with more flexible and dynamic failover options.
- **Accelerated operations** - Service Providers can provision and deploy new services or resolve issues remotely rather than through a "truck roll".
- **Minimize integration and service risks** - IT teams also eliminate the risks associated with integrating new technology into their data centers, by choosing proven, production-ready and carrier-grade solutions that guarantee performance through end-to-end service level agreements (SLAs) through VMware and its growing ecosystem of SD-WAN partners.



Why VMware is the Service Providers' Partner of Choice for SD-WAN Roll-Outs

vCloud NFV is a highly available, multi-tenancy platform that has been tuned for Service Provider requirements. With optimized resource management and prioritization of resources based on Service Provider workloads, vCloud NFV ensures top performance, scalability and high resiliency for critical network services.

By teaming up with VMware, Service Providers benefit from:

VMWARE vCLOUD NFV DELIVERS:

- **Reliability:** Tested, optimized and proven NFVi in over 70 NFV implementations worldwide
 - **Interoperability:** 100+ Telecom Technology Alliance Partners, 15+ Certified NFV Partners through VMware Ready for NFV program
 - **Extensibility:** Ability to extend and unify automation and control in a cross-cloud environment: IT, NFV, public and managed clouds
 - **Operations:** End-to-end operational intelligence and management from physical layer to Applications and VNFs
 - **Support:** VMware first Carrier-Grade Support for NFV
- **Faster deployment and agility with advanced networking and security** - vCloud NFV embeds networking and security functionality and provides a complete set of logical networking elements and services including switching, routing, QoS and monitoring that can be programmatically provisioned and managed. Networks and VNFs are secure from any outside threats with automated, fine grained policies tied to the virtual machines.
 - **Carrier-grade platform** - The high performance capabilities offered in vCloud NFV deliver a highly scalable NFVI platform that meets carrier-grade network requirements.
 - **Automate and orchestrate network infrastructure** - vCloud NFV provides a Virtualized Infrastructure Manager (VIM) that controls and manages the NFVI compute, storage and network resources. Service Providers can automate and orchestrate network infrastructure without worrying about the underlying physical configuration of resources. As a result, SPs can accelerate and simplify network provisioning and launch new services faster to market.
 - **Simplify operations and improve network performance with end to end operations management and analytics** - vCloud NFV delivers a single pane of glass with 360 degree visibility and monitoring of the platform along with predictive analytics and logging insights to give SPs greater control of their network. With policy based automation, SPs can streamline key network processes and allocate and provision VM resources to rapidly provision and deploy VNFs. In addition, SPs can optimize and manage capacity by dynamically allocating and balancing VMs to guarantee optimal access to VNF resources.
 - **Growing partner ecosystem** - VMware has also brought together the largest partner ecosystem of VNFs. Working with those partners, VMware offers pre-certified VMware Ready™ for NFV turn-key solutions that can deliver SD-WAN in hours or days as opposed to months.

VMware NFV: Removing Key Barriers for Business Transformation

VMware vCloud NFV is a fully integrated, modular and extensible NFV Infrastructure platform. It allows multi-vendor VNFs to share a pooled capacity of resources that can be intelligently orchestrated and automated for the provisioning and delivery of services in a cross-cloud environment. This enables SPs to support an elastic business model of multi-cloud services and personalized offerings while simplifying and automating networks, accelerating time-to-market and reducing TCO.

Learn More

For more information on the VMware vCloud NFV platform, visit <http://www.vmware.com/go/nfv>

