

DELIVER BUSINESS FLEXIBILITY AND AGILITY WITH VIRTUAL CPE

Transforming Network Delivery for Service Providers

Market Trends for vCPE

Virtual Customer Premises equipment (vCPE) was among the earliest use cases for network functions virtualization (NFV), and it remains the leading business case for service providers (SPs). By taking advantage of open, modular and carrier-grade network virtualization solutions to offer vCPE, carriers are able to accommodate increasing network complexity, meet continued growth in demand for capacity and add new services.

vCPE allows service providers to apply the broader advantages of NFV to customer-facing deployments from the enterprise to the consumer, including elastic, remote deployment, personalization, scalability and automated provisioning of services. The primary benefits of vCPE for enterprises is the ability to reduce IT and networking costs, as well as deliver IT services to the business more efficiently and effectively. By eliminating proprietary physical equipment and moving deployment to the cloud, vCPE enables both faster time to market for new value-added services and significant cost improvement in service delivery.

However, a [2015 Analysis Mason report](#) predicts \$1.34 billion in net cost savings in residential vCPE for service providers first to market with vCPE enabled services. Furthermore, the report projected a 156 percent ROI and a payback period of 3.1 years on the enterprise side, and a 48 percent ROI and 4.9-year payback on the residential side.

Service Provider Challenges

Service providers today are challenged more than ever by their customers to deliver additional valuable network services at lower costs. The traditional truck-roll model of service deployment is no longer fast or cost effective enough. Only by leveraging cloud-based virtualized network services can service providers meet these exponentially aggressive market demands.

Service providers' ability to operate, manage, or up-sell new services is not only challenged, it's cost prohibitive today. From the simpler configuration management and software upgrades to the more complex service and equipment augment, the multi-vendor end-to-end testing, validation, and roll-out takes typically months. New business models to supplement a value-added service such as IDS, content filtering, malware protection, and so on, are a tough proposition.

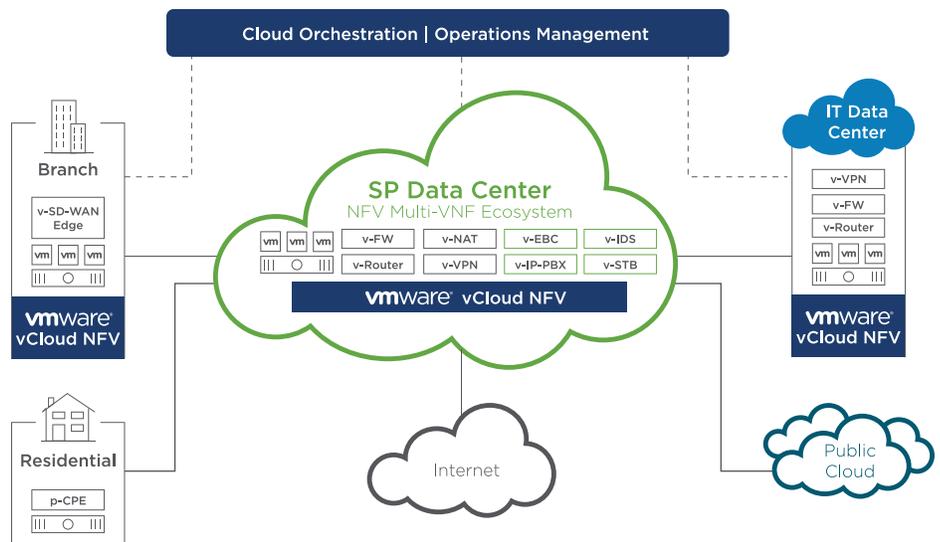
Historically, complex processing functions have been moved out from the core of the network to the edge. Now, however, the economic case for virtualizing these functions is stronger than ever, both for the service provider and the service provider's customers. A virtualized, vendor-agnostic platform running on commercial, off-the-shelf (COTS) equipment means carriers will not become locked in to proprietary hardware and technology, as network virtualization frees them to implement the most cost-effective solutions.

Virtual CPE: New Business Models. Agile network.

vCPE from a growing ecosystem of VMware Ready™ for NFV Certified vCPE vendors represents an immediate opportunity for service providers, both for the residential and enterprise markets. Service providers already have a tremendous customer base where they can identify new vCPE opportunities, regardless of where they are in their transformation to virtualized network functions. Beyond the value-added services it allows, vCPE makes the IT, operating and management aspects of a network simpler and more cost-effective:

VIRTUAL CPE BENEFITS

- **Accelerate** and simplify the delivery of services
 - **Automate** configuration of physical or virtual devices
 - **Self-provisioning** gives subscribers the ability to change or add services on demand
 - **New revenue** opportunities through customized applications and services
 - **Efficient** deployment and servicing models eliminate truck rolls
 - **Reduce** network capital and operating expenses
- **Improved flexibility** - Service providers employ CPE equipment to drive connectivity for new business models for the consumer, enterprise, and wholesale segments. Service providers can now deliver improved performance and multi-vendor solutions with better SLAs. vCPE services allow carriers to be more agile in response to customer needs and provide flexibility for future business models.
 - **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. Metro virtual edges along with centralized cloud enable the hybrid topology needed to deliver services at lower operating costs.
 - **Residential services** - Virtual customer edge PoP sites pave the way to virtualizing equipment like residential gateways, set-top boxes, and so on, which currently need to be delivered and installed on premises via a truck roll. vCPE not only obviates the need for these physical installations, but also opens doors to supplementary offerings from carriers like virtual home security services, telephony and multimedia services that also can be deployed and managed remotely.
 - **Enterprise services** - vCPE can drastically reduce the number of physical devices delivering network service appliances like routers, wide area network (WAN) optimization controllers, firewalls, NAT, and VPN services. This is an acute opportunity for distributed enterprises supporting numerous regional offices, as vCPE's centralized management and automation streamline and simplify the orchestration of difficult-to-manage branch office networks.
 - **New value-added services** - Once the basic foundations of network virtualization are in place, vCPE opens up a whole new world of value-added services at a reduced time to market. Value added services like differentiated QoS, premium VPN services, traffic and content management, intrusion detections, collaboration tools, premise security, multimedia services and many more can be service chained rapidly. Integrated services, deployment models, and TTM will help service providers customize and differentiate their offerings from the rest of the market.
 - **Lower operating costs and service risks** - Software defined network functions not only assure lower service on-boarding and operating risks but also simplified service delivery through centralized cloud management and automation. Not to mention the reduced costs for service providers with the ability to consolidate operations and management into a VMware NFV virtualized cloud to use infrastructure hardware in the most efficient way possible.



VMWARE vCLOUD NFW DELIVERS:

- **Reliability:** Tested, optimized and proven NFVi in over 70 NFV implementations worldwide
- **Interoperability:** 100+ Telecom TAP 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

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

VMware vCloud NFW is a highly available, multi-tenancy platform that has been tested and proven for service provider requirements. With optimized resource management and prioritization of resources based on service provider workloads, vCloud NFW ensures top performance, scalability and high resiliency for critical communications network services.

Service providers enjoy numerous benefits from teaming up with VMware:

- **Faster deployment and agility with advanced networking and security** - vCloud NFW 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 NFW deliver a highly scalable NFVI platform that meets carrier-grade network requirements.
- **Automate and orchestrate network infrastructure** - vCloud NFW 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, service providers 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 service providers greater control of their network. With policy based automation, service providers can streamline key network processes and allocate and provision VM resources to rapidly provision and deploy VNFs. In addition, service providers 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 vCPE in hours or days as opposed to months.

Learn More

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

