

# VMWARE VCLLOUD NFV

## AT A GLANCE

VMware vCloud® NFV™ is a fully integrated, modular, multi-tenant network functions virtualization (NFV) platform. It provides the compute, storage, networking, and management and operations capabilities to enable operators to provide virtualized network services. Its transformative capabilities allow communications service providers (CSPs) to accelerate time to market and increase revenue with new services, streamline operations, reduce network infrastructure costs, and deploy elastic business models for telecommunications workloads.

## KEY BENEFITS

- Address new and emerging trends/ technologies such as 5G, Internet of Things, rich multimedia, multi-core, and vCPE quicker than ever.
- Accelerate service on-boarding with vendor-agnostic virtual network function (VNF) support from a mature and growing VMware certified NFV ecosystem.
- Automate, simplify, and enable an efficient service lifecycle.
- Streamline processes with integrated operations management across services, networks, virtualization, and physical domains.
- Deep visibility into networks and resources.
- Employ software-defined economies in service delivery over a horizontal/shared infrastructure.
- Use open APIs and an open platform to enhance agility.
- Deliver a superior customer quality of experience (QoE).
- Maintain high availability and service uptime.
- Guarantee resource SLA through complete isolation and secure multi-tenancy.

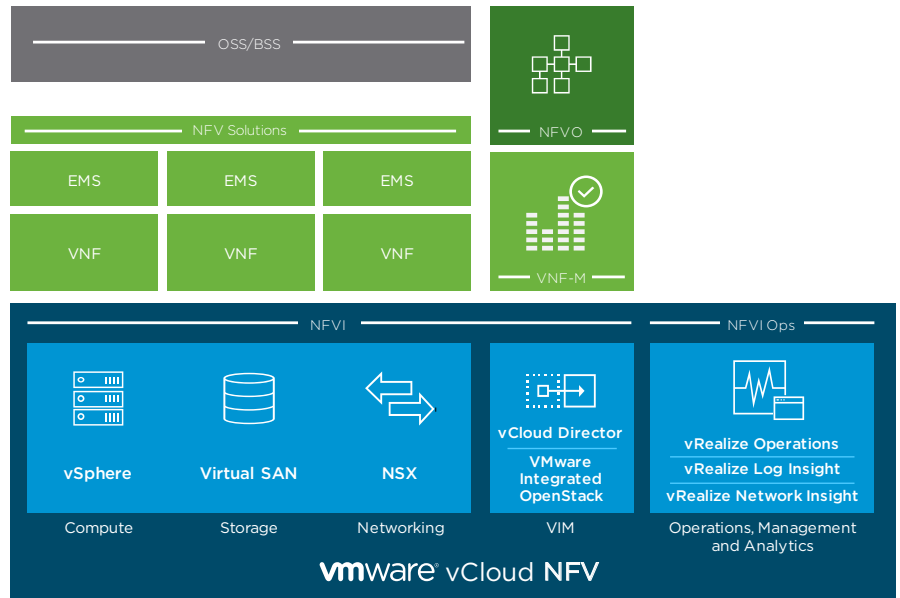


FIGURE 1: VMware vCloud NFV Architecture

## VMware vCloud NFV: Answering the Challenges

The allure of NFV has tantalized CSPs with its promise of agile, more dynamic, simplified operations, lower infrastructure costs, and accelerated time to market. However, challenges in NFV adoption have persisted, including issues with:

- On-boarding and supporting VNFs from multiple vendors
- Optimizing performance
- Gaining visibility into networks and correlating service-impacting disruptions
- Identifying the root cause of outages or issues ranging from VNFs to the NFV infrastructure (NFVI)
- Securing and isolating multiple tenants within the same NFV infrastructure
- Immature ecosystems
- Deploying a service and platform-aware network ensuring high availability and service continuity

VMware vCloud NFV surmounts these barriers with a modular architecture that smooths the transition from proof of concept (POC) to service deployment and supports multi-vendor VNF deployments. vCloud NFV has proven to deliver on the full range of requirements for NFV infrastructure (NFVI) while reducing total capital expenditures for telco-grade infrastructure. The result is a solution that is truly capable of transforming networks and accelerating service delivery.

With its advanced automation capabilities, operators can now accelerate service creation, VNF on-boarding processes, and infrastructure management. VMware vCloud NFV offers carrier-grade availability, performance, and service continuity; it provides native multi-tenanted network services achieving complete service isolation in a secure multi-tenant environment across NFVI resources. VMware vCloud NFV also features advanced and unique operations management with 360-degree visibility and proactive and predictive analytics offering fast remediation capabilities that deliver operational excellence.

#### BENEFITS OF V CLOUD NFV AUTOMATION

- Policy-based, on-demand service creation and resource allocation
- Streamlined VNF on-boarding
- Ease of deployment with predictable resource consumption
- Scalable infrastructure management and automation
- Proactive high availability through intelligent real-time system performance analytics
- VM-level self-healing through VMware vSphere® vMotion® (intra- and inter-vCenter)

#### BENEFITS OF V CLOUD NFV SECURE MULTI-TENANCY

- Fully isolated and secured workloads
- Guaranteed resource pools providing pre-defined SLAs to each tenant
- Single virtualization platform supporting multiple services and tenants
- Service-based deployment, isolation, and security
- Provider- and tenant-based roles and service policies
- Customized services and resource plans across tenants

#### Core Capabilities and Benefits

The VMware vCloud NFV platform provides advanced features and capabilities in four broad categories, which include:

##### Automation

To maximize the benefits of transforming their networks to NFV, operators need the ability to automatically and programmatically deploy service components rapidly. They need to automatically and intelligently allocate the appropriate resources to each virtual workload, where and when needed. And they need an infrastructure that can seamlessly automate the on-boarding of VNFs from multiple vendors in a truly open ecosystem. vCloud NFV includes features that enable operators to accomplish these goals, including:

- Enhanced policy-driven vApp templates that automatically associate resource requirements to appropriate resources in the target virtual data center (vDC)
- Automated VNF importing for existing VNF workloads into the VIM, including VMware vCloud Director® and VMware® Integrated OpenStack
- Service visibility and planning that automates the creation of recommendations to make micro-segmentation easier to deploy
- Enhanced REST APIs to manage the NFV infrastructure deployment lifecycle

##### Secure Multi-Tenancy

CSPs must ensure that each tenant is fully secure from attacks, breaches, or insecure communications from any other tenant. VMware vCloud NFV delivers complete service separation in a secure multi-tenant environment across NFVI functions (virtual compute to networking) via a range of capabilities and features including:

- NSX micro-segmentation with fine-grained access controls for provider and tenant administrators
- Transparent integration at the Virtual Infrastructure Management layer
- Delegated Role Based Access Control (RBAC) for fine-grained resource access
- Tenant-level operations management and visibility
- Cross-vCenter security policies, allowing operators to apply security policies consistently on objects across multiple VMware vCenter® services

### BENEFITS OF V CLOUD NFV OPERATIONAL INTELLIGENCE

- 360-degree single-pane-of-glass visibility into all layers
- Greater network control through proactive and predictive analytics and intelligent log analysis
- Fast time to resolution (TTR) with contextual troubleshooting and visual root-cause analysis
- Active remediation of workloads and northbound integration with OSS/BSS and third-party solutions
- Reduced operational costs through fast mean time to understand and repair (MTTU/MTTR)

### BENEFITS OF V CLOUD NFV CARRIER-GRADE CAPABILITIES

- Proven high-availability platform
- High service availability and continuity
- Simplified infrastructure lifecycle management for upgrades and patches
- Improved networking performance for data plane workloads
- Enhanced platform awareness that enables optimal performance and SLAs
- Increased network efficiency through predictive on-demand policy based scaling of workloads

### Operational Intelligence

Deploying NFV networks requires CSPs to transform their operational processes. They need to monitor the entire infrastructure for faults and performance issues, and they require the ability to dynamically and programmatically add resources when performance degrades or when a service-impacting disruption that may impact service level agreements (SLA) occurs. VMware vCloud NFV delivers:

- Pre-integrated and extensible operations management solution
- Converged visibility across overlay and underlay networks in virtual and physical environments
- Real-time network intelligence via VMware vRealize® Network Insight, which provides network flow-level analysis that matches VNF workloads
- Historical forensics and impact analysis that allows operators to go back in time and create an audit trail of network performance as well as providing what-if scenario modeling
- Fast root-cause analysis (RCA), which unifies alerts and offers comprehensive troubleshooting workflows between VMware vRealize Log Insight™ and vRealize Operations™
- Deep network visibility with automatic topology discovery
- APIs with northbound integration and automation for service assurance

### Carrier-Grade Capabilities

A key requirement for operators as they transform their service infrastructure, as well as comply with regulations, is to remain carrier-grade in order to meet and exceed customer expectations in terms of service continuity and SLAs. vCloud NFV delivers a carrier-grade NFVI platform with continuous five-nines availability, service continuity, guaranteed performance, and simplified management, enabling operators to extend the mean time to failure (MTTF) and shorten the mean time to repair (MTTR), resulting in exceptional availability to customers. VMware vCloud NFV accomplishes this by offering:

- Advanced high-availability capabilities via intelligent and predictive analytics based on VNF requirements
- Predictive and network-aware Distributed Resource Scheduler (DRS), which gives operators the ability to proactively monitor VNFs and resources and deliver closed loop remediation
- Advanced tuning parameters for enhanced performance, including native Intel NIC drivers for VMware vSphere and virtual remote direct memory access (vRDMA) for east-west traffic optimization
- Platform resiliency with enhanced NSX control plane redundancy to recover from host-controller disconnection

**HOW TO BUY**

The VMware vCloud NFV bundle runs on the broadest set of x86-based platforms, and includes carrier-grade managed support services to meet the most demanding commercial-scale deployments. VMware vCloud NFV enables CSPs to deploy a horizontal, secure multi-vendor NFV platform that supports any application at all stages of NFV cloud evolution, with a single purchase. The vCloud NFV bundle is designed for vSphere environments and available today as a single bundle option.

**CARRIER-GRADE SUPPORT**

VMware meets the carrier-grade requirements of CSPs with a broad spectrum of carrier-grade support options, ranging from self-help and basic support to business-critical and mission-critical support offerings, including:

- Add-on services to production support
- New SLAs for service restoration of NFV platform
- MCS SLAs for enterprise environments
- Dedicated support teams, 24/7
- Dedicated service account manager
- Enhanced proactive and reactive support offering
- Limited onsite support as required, or option to purchase onsite resident assistance

**LEARN MORE**

For additional information about VMware vCloud NFV:

**CALL**

1-877-VMWARE (outside North America, dial +1-650-427-5000)

**VISIT**

<http://vmware.com/go/nfv>

**vCloud NFV: Distinct Advantages**

Compared with competitive solutions, the VMware vCloud NFV platform is uniquely capable of empowering CSPs to achieve the full benefit of NFV. Its combination of modularity, freedom of choice through open standards and multi-vendor VNF support, mature ecosystem, future-ready agility, and carrier-grade support distinguish it from all competitive offerings. Additional advantages include:

- **Flexible deployment and management tools** – vCloud NFV employs a single architecture to manage multiple VIMs, adding flexibility to deployment and management.
- **Deep visibility and insight** – vCloud NFV provides holistic, 360-degree visibility and insight into all network layers along with smart alerts and recommendations.
- **NFV ready certification** – VMware has the largest number of certified VNF partners and the most comprehensive testing and certification program with the VMware Ready for NFV program.
- **Proven in production** – vCloud NFV has been deployed in over 80 product implementations in over 45 operators supporting over 300M subscribers.
- **Fast access to skilled resources** – CSPs can quickly and easily deploy vCloud NFV in their network with the current talent pool in their organization, due to the large number of VMware-certified individuals working across IT and network organizations.

**Net Result: Higher Business Value**

By delivering all of the capabilities described above, the VMware vCloud NFV platform is uniquely capable of providing a new level of business value to CSPs through three primary attributes:

- **Accelerated service delivery** – CSPs can accelerate delivery and activation of new services and innovations, cut time to revenue (TTR), transform networks from static to adaptive, and employ software-defined economies in service delivery.
- **Simplified operations** – CSPs can deepen visibility into networks and resources, automate the delivery of services, maintain high availability and uptime for networks, and reduce total cost of ownership (TCO) while delivering a superior customer experience.
- **Increased choice** – CSPs achieve freedom of choice and additional benefits from multi-vendor agnostic VNF support, a mature NFV ecosystem, a common multi-domain platform that is open and supports open APIs, an extensible platform, and multiple-VIM support.

