VMWARE INTEGRATED OPENSTACK

The fastest and most reliable path to 5G, edge computing telco services on OpenStack

AT A GLANCE

VMware Integrated OpenStack is a VMware-supported OpenStack distribution that provides the fastest path for CSPs to deploy and operationalize NFV services on OpenStack. As part of the transformative vCloud NFV platform, VMware Integrated OpenStack allows CSPs to accelerate time to market and increase revenue with new services, streamline operations, reduce network infrastructure costs and deploy elastic business models for telecommunication workloads.

VMware Integrated OpenStack overview

OpenStack is playing an important role in communications service provider (CSP) business transformation as carriers look for a reliable, open network function virtualization (NFV) platform to manage their cloud infrastructure and drive revenue through new business models and communication services. However, as CSPs strive to make speed and scale of deployment their key differentiators, they are often exposed to the complexity, hidden costs, inconsistent tooling and lack of carrier-grade support characteristic of several OpenStack implementations.

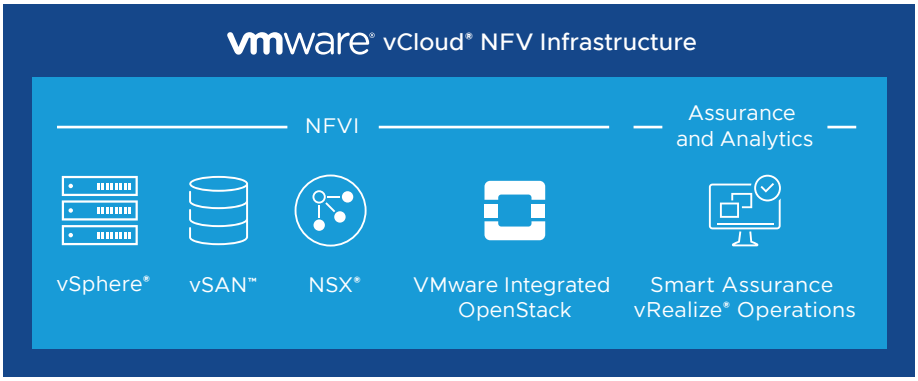


FIGURE 1: VMware vCloud NFV OpenStack Edition

The latest release of VMware Integrated OpenStack is based on the OpenStack Train release and introduces several new features to help CSPs simplify, scale and secure production OpenStack environments. Through open, vendor-neutral API access to VMware's industry-leading virtualized infrastructure, CSPs have a proven, high-performance platform based on an open architecture with strengthened support of a cloud-native architecture, advanced networking capabilities and real-time automated service coupled with intelligent operations to accelerate deployment of key CSP use cases including NFV, edge and supporting the network evolution to 5G.

KEY BENEFITS

- Provides rapid deployment and simplified operations
- Runs on the proven VMware SDDC, and leverages in-house expertise and skillsets
- Supports edge computing—build micro data centers in remote locations to gain a competitive advantage
- Runs OpenStack at scale—tested and validated CMS
- Complies with the OpenStack Foundation's interoperability guideline

Accelerate and Simplify Your Path to OpenStack for NFV

As a significant contributor to OpenStack and many other open source projects, VMware is committed to integrating OpenStack capabilities into its core NFV platform. VMware Integrated OpenStack enables easy deployment, upgrades and operation of an OpenStack cloud on a robust VMware NFVI platform while utilizing open source software and standard APIs, offering several benefits to CSPs:

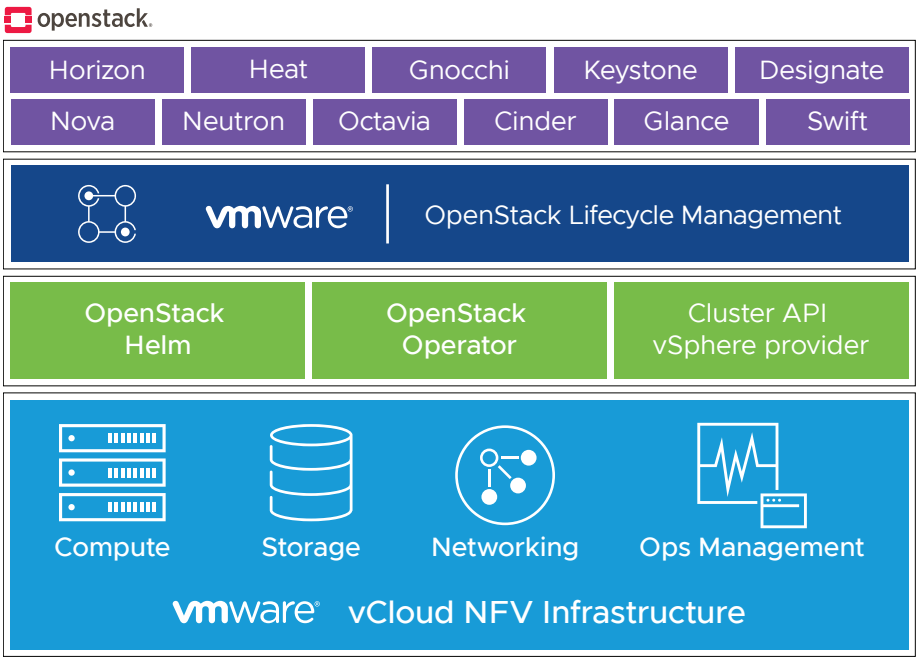
Simplified OpenStack installation and deployment — VMware Integrated OpenStack provides the fastest path to a fully operational OpenStack environment. Using templated install and deployment as a downloaded application within the VMware vSphere web client, a production-grade OpenStack infrastructure can be easily deployed.

Seamless and hitless OpenStack upgrades — The separation of control plane and data plane in VMware Integrated OpenStack offers hitless upgrades and patch updates with VMware vCenter® maintenance mode providing network service continuity during maintenance cycles. Supported upgrade paths include the direct upgrade from VIO 5.1 or VIO 6.0 to VIO 7.0.

Simplified operations — vCloud NFV delivers unique NFVI operational automation with 360-degree visibility, proactive and predictive analytics, issue isolation, root cause analysis and fast remediation. VMware vRealize Operations Manager™, vRealize Log Insight™ and vRealize Network Insight are fully integrated within vCloud NFV and provide real-time operations monitoring, analytics and remediation from a single pane of glass, further reducing operational costs.

VMware Integrated OpenStack: Infrastructure for CSPs

VMware Integrated OpenStack is an OpenStack-powered distribution that implements a standard OpenStack northbound interface and APIs, along with out-of-the-box integration with VMware software-defined data center (SDDC) infrastructure components.



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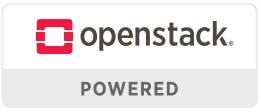


Automation, performance, scale and simplicity for NFV OpenStack deployments

Integration with latest versions of VMware products: Achieve significant improvements in network monitoring and troubleshooting capabilities, reduce network latency and achieve high I/O workloads via support of native vSphere Distributed Switch (VDS) 7.0 built into VMware vSphere 7.0 and NSX-T Data Center 3.0.

Elastic, multi-tenant resource scaling: Provide resource guarantees and isolation so that other tenants can neither consume from, nor access, a given resource pool. Elastic resource scaling enables CSPs to add resources dynamically across different vSphere clusters to adapt to traffic conditions or transition from pilot to production in place. This enables CSPs to isolate one type of workload/virtual network functions (VNF) from another, as well as maintain resource availability as load increases.

Enhanced multi-tenancy and high availability: Achieve complete data plane tenant isolation through vRF Lite support. Provides high availability and improve ROI for Telco NFV workloads through the support of SRIOV networks and select vCPU pinning for latency-sensitive workloads.

Networking enhancements: The OpenStack Neutron plugin for NSX-T has been enhanced to allow multiple networks to be connected to an instance using single virtual NIC through Network Trunk Services and operators can now configure additional IPv6 features using the NSX-T Data Center™ policy plugin.

OpenStack "in-a-box" for 5G and edge computing: Leverage a small footprint and highly resilient micro data center form factor that enables deployment "in a box" for 5G and edge computing. CSPs have full control over these micro data centers and apps at the edge via API-driven orchestration and lifecycle management. The solution helps CSPs tackle telco-oriented use cases such multi-access edge computing (MEC), latency sensitivity VNF deployments and operational support systems (OSS).

Self-driving operations and service assurance: Achieve 360-degree visibility with real-time insights, service impact and root cause analysis and remediation for OpenStack environments. Leverage advanced workload analytics, predictive resource scheduling and balancing, and high-scale monitoring for virtual machines (VMs) and containers across a single virtualized infrastructure manager (VIM). Out-of-the-box VMware vRealize Operations, vRealize Log Insight, and vRealize Business™ for Cloud integrations provide faster and easier monitoring, troubleshooting and cost visibility of your OpenStack cloud.

HOW TO BUY

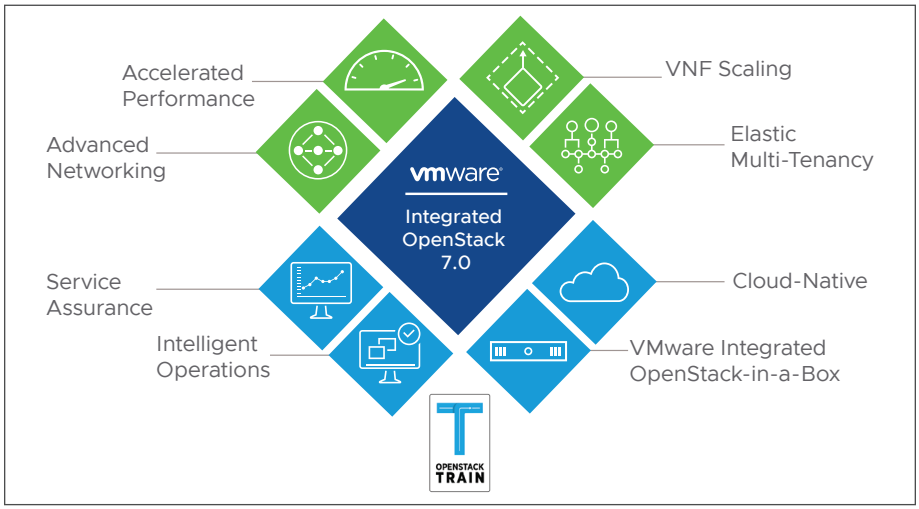
The VMware vCloud NFV bundle runs on a broad set of x86-based platforms, and includes support services for commercial-scale deployments. With a single purchase, CSPs can deploy an NFV platform that supports applications at all stages of NFV evolution. vCloud NFV is designed for vSphere environments and available as a single bundle.

SUPPORT

VMware offers a broad spectrum of support options, ranging from self- help and basic support to business and mission-critical offerings, including:

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

Cloud-native architecture: Deploy, orchestrate and manage next-generation applications and services with a flexible secure cloud platform using VMware Integrated OpenStack powered by an intent-based VMware Tanzu Kubernetes grid control plane.



Enhanced scale, availability and security

VMware Integrated OpenStack enables CSPs to make the most of advancements in OpenStack Train to support mission-critical workloads across container and cloud-native application environments. VMware has added significant development to VMware Integrated OpenStack on top of what is delivered via the Train release.

Massive scale: VMware Integrated OpenStack has been validated to run on many hosts and VMs in a single region with support for multiple regions at once with monitoring and metrics at scale leveraging Gnocchi, Panko and Aodh. VMware configuration maximums can be found at *https://configmax.vmware.com*.

Rapid scale-out of individual services: Scale replica counts of Neutron, Keystone, etc. up or down with a one-line configuration change or a few mouse clicks in the user interface. Adding control plane capacity (e.g. more controller nodes on which to run pod replicas) is equally simple.

Unified virtualized environment: Deploy both VMs and container workloads on a single VIM and with a single network fabric based on VMware NSX-T Data Center. This architecture allows CSPs to run all their applications on an open platform using OpenStack APIs helping to increase productivity enabling faster time to innovation combined with necessary enhanced security, stability and governance. In addition, it greatly simplifies the deployment with no VM traffic distribution.

Advanced security: Consolidate and simplify user and role management based on enhancements to Keystone, including the use of application credentials and system role assignment. Enhanced security in VMware Integrated OpenStack includes encryption of internal API traffic, Keystone to Keystone federation, and support for major identity management providers including VMware Identity Manager.

LEARN MORE

For additional information about VMware vCloud NFV, call 1-877-VMWARE (outside North America, dial +1-650-427-5000), or visit *telco.vmware.com*.

Optimized DNS services: Experience scalable, on-demand DNS as a service via Designate. Delegated control allows tenants to auto-register VMs or Virtual Network Functions (VNFs) with a corporate DNS server instead of manually registering newly provisioned hosts through Designate.

Improved user interface: Simplify multi-tier and L3 routed network implementations using the latest Horizon dashboard. Managing NAT on the OpenStack NSX tenant router and associating with Neutron availability zones directly from the Horizon user interface allows developers to tailor the network to fit their apps.

Streamlined deployment and operations

Rapid reconfiguration of services: Ability to automatically propagate changes using a single command on custom resource (CR).

vSphere Web Client–based deployment: Deploy VMware Integrated OpenStack with an OVA file using the vSphere Web Client. The vSphere Web Client then deploys all the VMs and components needed to create a highly available, production-ready OpenStack cloud in a few simple steps.

Patching and upgrade: VMware Integrated OpenStack employs a blue-green upgrade model that allows administrators to easily perform patching and upgrades, as well as rollbacks, with minimal disruption to the OpenStack infrastructure or the applications running on it.

Back up and restore: Back up and restore OpenStack services and configuration data.

Auto scaling: Set up metrics to scale up or down with application components. Development teams can address unpredictable changes in demand for app services. Ceilometer provides the alarms and triggers, heat orchestrates the creation (or deletion) of scale-out components, and load balancer as a service (LBaaS) provides load balancing for the scale-out components.

Self-healing control plane: If nodes go down or pods crash, the intent-based control plane will spawn new replicas to replace those that were lost with no human intervention.

Manage VIO infrastructure as code: Public API for managing Day 1 deployment and Day 2 management of VIO services.

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Item No: VMW-SO-TELCO-INTOPENSTACK-USLET-101 5/20