

DELL EMC READY SOLUTION FOR VMWARE NFV PLATFORM

A turnkey solution optimized to simplify and accelerate production deployments. With this solution, Dell EMC has built a fully integrated and validated solution that enables service providers to immediately launch their own services on top of this Network Function Virtualization (NFV) platform, minimizing, if not eliminating, the need to apply engineering resources to develop their own infrastructure.

Dell EMC Cloud Infrastructure Overview

Dell EMC cloud infrastructure is a scaled-down version of the Dell EMC solutions and supports all foundational elements for NFV Infrastructure (NFVI) and virtualized infrastructure manager (VIM). The cloud infrastructure includes hardware and software elements from Dell EMC (server, storage, networking) as well as software elements from industry leaders for virtualization, orchestration, automation, analytics, security and cloud services. Key benefits:

- **100 percent open and standards-based:** Aligned to ETSI, OPNFV and built on industry-standard Intel x86 servers combined with industry-leading open networking platforms and a rich set of open interfaces for maximum interoperability, manageability and investment protection.
- **Scalability in any direction:** Scale easily — up, down or out — to accommodate a wide range of design goals, service capabilities and environmental conditions. Ideal for small, unstaffed points of presence, central office environments or hyperscale data centers.
- **Maximum choice and flexibility:** Supports the widest range of software configurations with mix-and-match modularity. Choose from various guest OS, data plane acceleration technologies, service chaining and orchestration packages that tailor the Dell EMC Ready Solution for VMware NFV Platform to meet your needs.

Dell EMC Ready Solution for VMware NFV Platform Overview

The Dell EMC Ready Solution for VMware NFV Platform combines hardware, software, and Dell EMC engineering and is designed to create a more flexible, scalable, and agile platform for CSPs. It includes open standards-based Dell EMC cloud infrastructure hardware (compute, networking) and a choice of a Virtual Infrastructure Manager (vCloud Director or VMware Integrated OpenStack) with vSAN. The solution now supports the latest 14th generation PowerEdge Servers based on Intel® Xeon® Scalable Processors.

The solution is pre-validated with VMware vCloud NFV Platform Edition 3.0, and it encompasses both hardware and software. This specific software is optimized for Dell EMC cloud infrastructure. The pre-validated solution minimizes adoption time and significantly reduces time to service from weeks to days/hours. The solution also provides carrier-grade reliability for SLA requirements.

Based on internal Dell EMC testing, an expert resource required an average of 5 days to deploy the baseline infrastructure of the solution. Automation tools, included with the solution, reduce deployment time to approximately 5 hours.

Other key features include support for Kubernetes to facilitate adoption of containers. Kubernetes is only supported with VMware Integrated OpenStack. In addition, leveraging Dell EMC's strength on Open Networking, the solution provides network fabric support with Big Switch Networks to help service providers build a data center fabric.

At its core, the VMware vCloud NFV Platform includes the vSphere virtualization platform, vSAN, NSX, vCloud Director or VMware Integrated OpenStack for the VIM, and vRealize Operations for operations management. Deploying VMware vSphere as host nodes and virtual machines will allow the gaining performance, security, and operational advantages.

In addition, there are two VIM options available with the solution. You can select either VMware vCloud Director or VMware Integrated OpenStack depending on which option is more suitable.

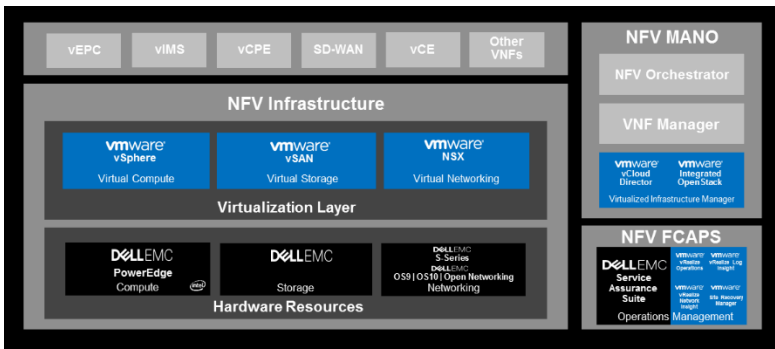


Figure 1: Dell EMC Ready Solution for VMware NFV Platform

Dell EMC and VMware designed this integrated solution to make it easy for CSP customers to build their own operational readiness cluster and design their initial offerings using current releases. Dell EMC provides the support and services customers need to stand up production-ready vCloud Director clusters.

Dell EMC Ready Solution for VMware NFV Platform Configuration

Dell EMC Ready Solution for VMware NFV Platform consists of the following components:

Hardware elements:

- 1x Out of band switch
- 2x Leaf switches
- 4x Management Cluster nodes
- 4x Edge Cluster nodes
- 4x Resource Cluster nodes

Virtualization software:

- VMware ESXi
- VMware vSphere Replication
- VMware vSAN Standard Edition
- VMware vRealize Orchestrator Appliance
- VMware vRealize Operations Manager Advanced Edition
- VMware vRealize Log Insight Full Edition

Networking software:

- Dell EMC Networking OS9.x or greater
- Open Networking options available

Management software:

- Dell EMC OpenManage Network Manager
- Dell EMC OpenManage Essentials

Orchestration/VIM software:

- VMware vCloud Director for Service Provider
- VMware Integrated OpenStack

<p>Dell EMC Networking</p> <p>2 x S6010-ON</p> <p>1 x S4048T-ON</p> <p>PowerEdge Rack Servers</p> <p>8 or 12 x R640/R740/R740xd</p>



Figure 2: Dell EMC Ready Solution for VMware NFV Platform Configuration

Dell EMC Professional Services

Dell EMC Ready Solution for VMware NFV Platform is supported by a comprehensive portfolio of Dell EMC professional services spanning consulting, design, deployment and world class extended lifecycle support.

Dell EMC Professional Services, Support, and Training:

- Dell EMC ProSupport Plus
- Complete lifecycle support for VMware vCloud NFV Platform from Dell EMC
- Consulting and deployment services available jointly
- Classroom, virtual, and self-paced training options through VMware training
- Expanded availability of solution presented upon request

Key Component Summary

The table below summarizes the components for the solution. It can be expanded with additional compute and storage upon request.

Rack Server NFV Starter Kit	
Form Factor	Fixed (19 RU)
vCloud NFV with vSAN	
Management Cluster Nodes	
Hardware Node	4 x PowerEdge R640/R740/R740xd servers (carrier grade available)
Processor	Two Intel® Xeon® Gold 6140
Memory	Minimum: 256GB (16GB RDIMM, 2400MT/s)
Local Disk	Default: - 7x 1TB 7.2K RPM SAS 12Gbps 2.5in Hot-plug Hard Drive - 1x HDD,800G SSD SAS,MU,MLC,12,2.5,HP,PX04SM
Communications	Intel DP 10Gb X710 + I350 DP 1Gb RJ45 (NDC) Intel DP 10Gb X710
Edge and Resource Nodes	
Hardware Node	4 or 8 x PowerEdge R640/R740/740xd servers (carrier grade available)
Processor	Two Intel® Xeon® Gold 6140
Memory	Minimum: 256GB (16GB RDIMM, 2400MT/s)
Local Disk	Default: - 7x 1TB 7.2K RPM SAS 12Gbps 2.5in Hot-plug Hard Drive - 1x HDD,800G SSD SAS,MU,MLC,12,2.5,HP,PX04SM
Communications	Intel DP 10Gb X710 + I350 DP 1Gb RJ45 (NDC) Intel DP 10Gb X710
Network Fabric 40GbE	
Spine	2x S6010 1/10/40/GbE Ethernet switch (alternative: S6000, Z9100@40GbE) - 32x 40GbE can break out to 96x 10GBE per unit - 2.56Tbps throughput at 600ns latency per unit - Quick Installation using ReadyRails™ - Energy efficient, lower power, Fresh Air® capable - Bare metal provisioning
Out-of-Band	1x S4048T-ON 1/10/40GbE Ethernet switch (alternative: S4820T) - 48x 1/10GbE BASE-T autosensing, non-blocking, line rate ports (100M/1G/10G) - 4x 40GbE QSFP+ ports - 1.28Tbps fabric capacity - L2/L3 capable

NFV Platform Manager (VIM, SAH)

Dell EMC Software	<ul style="list-style-type: none">- OpenManage Network Manager- OpenManage Essentials
Dell EMC Optional Components	<ul style="list-style-type: none">- Optional customer/partner provided VNF software- Optional customer/partner provided management and orchestration software- Optional Dell/customer/partner NFVI management, monitoring, and additional software and services available- Open Source or Standard Software requiring separate download includes: Cacti, Nagios, Gangli

Default starter kit is based of PowerEdge servers for all three clusters. Components can be changed according to need; primary objective is high availability with the ability to grow based on VNF use case requirements. Each cluster must have identical node configurations and be vSAN Ready certified by VMware.