

# DELL EMC NFV READY BUNDLE FOR VMWARE

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 NFV Ready Bundle for VMware to meet your needs.

## Dell EMC NFV Ready Bundle for VMware Overview

The Dell EMC NFV Ready Bundle for VMware 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 or Dell EMC ScaleIO.

The solution is pre-validated with VMware vCloud NFV Platform, 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. In addition, the solution provides carrier-grade reliability to meet SLA requirements.

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.

As an alternative to vSAN, Dell EMC ScaleIO can be used as the software-defined storage option for the Dell EMC NFV Ready Bundle for VMware if it is more suitable for your storage needs.

In addition, there are two VIM options available with the Dell EMC NFV Ready Bundle for VMware. You can select either VMware vCloud Director or VMware Integrated OpenStack depending on which option best fits your VIM requirements.

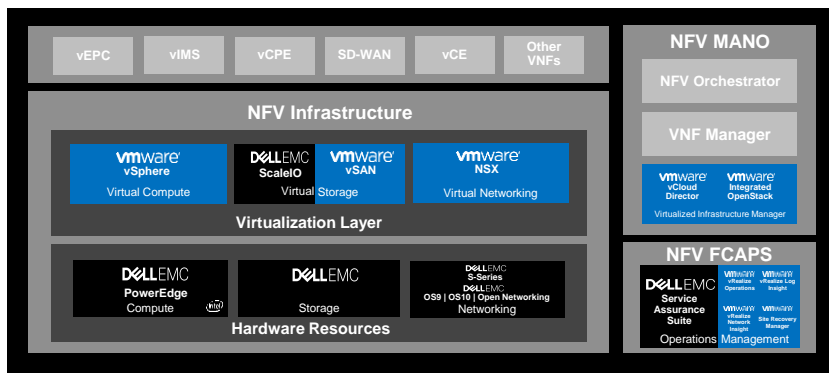


Figure 1: Dell EMC NFV Ready Bundle for VMware

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 NFV Ready Bundle for VMware Configuration

Dell EMC NFV Ready Bundle for VMware 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 Virtual SAN
- VMware vRealize Operations Advanced
- VMware vRealize Log Insight
- VMware vSphere Replication
- VMware vSphere Data Protection
- VMware vCenter Server
- VMware NSX for vSphere
- VMware Site Recovery Manager
- Dell EMC ScaleIO

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

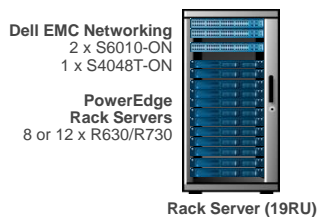


Figure 2: Dell EMC NFV Ready Bundle for VMware Rack Configuration

## Dell EMC Professional Services

Dell EMC NFV Ready Bundle for VMware 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 bundle. 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 or Dell EMC ScaleIO	
Management Cluster Nodes	
Hardware Node	4 x PowerEdge R630/R730 servers (carrier grade available)
Processor	Two Intel® Xeon® E5-2650 v4
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 X520 + I350 DP 1Gb RJ45 (NDC) Intel DP 10Gb X520 with SR Optics (PCIe)
Edge and Resource Nodes	
Hardware Node	4 or 8 x PowerEdge R630/R730 servers (carrier grade available)
Processor	Two Intel® Xeon® E5-2650 v4
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 X520 + I350 DP 1Gb RJ45 (NDC) Intel DP 10Gb X520 with SR Optics (PCIe)
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	<ul style="list-style-type: none"> <li>1x S4048T-ON 1/10/40GbE Ethernet switch (alternative: S4820T)</li> <li>- 48x 1/10GbE BASE-T autosensing, non-blocking, line rate ports (100M/1G/10G)</li> <li>- 4x 40GbE QSFP+ ports</li> <li>- 1.28Tbps fabric capacity</li> <li>- L2/L3 capable</li> </ul>
<b>NFV Platform Manager (VIM, SAH)</b>	
Dell EMC Software	<ul style="list-style-type: none"> <li>- OpenManage Network Manager</li> <li>- OpenManage Essentials</li> </ul>
Dell EMC Optional Components	<ul style="list-style-type: none"> <li>- Optional customer/partner provided VNF software</li> <li>- Optional customer/partner provided management and orchestration software</li> <li>- Optional Dell/customer/partner NFVI management, monitoring, and additional software and services available</li> <li>- Open Source or Standard Software requiring separate download includes: Cacti, Nagios, Gangli</li> </ul>

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. vSAN Ready is required for the vCloud NFV with vSAN option, but not required for the vCloud NFV with Dell EMC ScaleIO option.



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