

CloudNFV™ unites the best of Cloud Computing, SDN and NFV.



An open platform for implementing Network Functions Virtualization (NFV) based on cloud computing and Software Defined Networking (SDN) technologies in a multi-vendor environment

Cloud computing, software defined networking, and network functions virtualization are all competing for media attention, but they really can't be deployed optimally if they also have to compete for budgets. We need one revolution with three faces, a revolution that says that the network and applications are not just equal, but **the same**—in the cloud. That's our goal with CloudNFV.

CloudNFV is a platform to test the integration of cloud computing, software defined networking, network functions virtualization, and the Telemanagement Forum (TMF) management in an open, real-world way. It's the product of cooperation between six companies who set about to prove the value of NFV in the era of the cloud: in alphabetical order, 6WIND, CIMI Corporation, Dell, EnterpriseWeb, Overture Networks, and Qosmos.

Designed to follow the NFV Industry Specification Group (ISG) of ETSI, CloudNFV deploys any mixture of virtual network functions, cloud application components, real network devices and services, and multi-operator federated services. It supports flexible management views based on services, virtual devices, or virtual functions using a service structure modeled on TMF's GB922 hierarchy. The activity is committed to support the interfaces specified by the NFV ISG but also to provide open access to services, composition, deployment, and management features outside the NFV scope.

The Architecture

The CloudNFV architecture is based on management and orchestration applications built around an agile data/process model called **Active Virtualization**, which provides for order/contract and policy storage ("Active Contract") and resource state information ("Active Resource") provided by **EnterpriseWeb**. Service orders are optimized through Active Virtualization then provisioned on cloud infrastructure using **Overture Network's**

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- **CIMI Corporation**
- **Dell**
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- **Qosmos**

Ensemble Service Orchestrator, which instantiates the virtual network functions through OpenStack Nova and connects them using OpenStack Neutron (formerly Quantum).

The CloudNFV software platform consists of **Linux, KVM, and OpenStack**. 6WIND's **6WINDGate data path acceleration software** is used to assure high network throughput, and **Qosmos DeepFlow DPI OEM traffic probes along with the Qosmos DPI engine VNF Component (VNFC)** are used to obtain traffic telemetry for network optimization and control. All of this is run on **Dell PowerEdge** data center servers and **EqualLogic** storage, interconnected by **Dell Active Fabric** SDN enabled switches. **Dell's Active Fabric Manager**, including its **OpenStack Neutron/Quantum** plugin, controls the data center switches and the Open vSwitch virtual overlay to form an Active Fabric that connects the virtual function elements, real network elements, and users.

Our architecture and data model were designed to support open interfaces, carrier federation at both the infrastructure level and the NFV virtual function and orchestration level. We also model services completely, end-to-end. This means we can create complete user services.

CloudNFV can deploy assets on a per-customer basis (firewall, load-balancing, etc) and also as "Infrastructure Services" shared among a community of users (IMS, CDN). Networks of mixed physical devices and virtual functions are supported providing that a management system integration with the EMS/NMS/SMS system of the devices is available. Finally, services can be composed using any combination of virtual functions and cloud-computing components.

