What is NFV?

Telecoms networks contain an increasing variety of proprietary hardware appliances. To launch a new network service often requires yet another appliance and finding the space and power to accommodate these boxes is becoming increasingly difficult, in addition to the complexity of integrating and deploying these appliances in a network.

Moreover, hardware-based appliances rapidly reach end of life: hardware lifecycles are becoming shorter as innovation accelerates, reducing the return on investment of deploying new services and constraining innovation in an increasingly network-centric world.

Network Functions Virtualization (NFV) aims to address these problems by evolving standard IT virtualization technology to consolidate many network equipment types onto industry standard high volume servers, switches and storage. It involves implementing network functions in software that can run on a range of industry standard server hardware, and that can be moved to, or instantiated in, various locations in the network as required, without the need to install new equipment. Network Functions Virtualization is highly complementary to Software Defined Networking (SDN). These topics are mutually beneficial but are not dependent on each other. Network functions can be virtualized and deployed without an SDN being required and vice-versa.

Benefits for network operators and their customers

- Reduced operator CAPEX and OPEX through reduced equipment costs and reduced power consumption
- Reduced time-to-market to deploy new network services
- Improved return on investment from new services
- Greater flexibility to scale up, scale down or evolve services
- Openness to the virtual appliance market and pure software entrants
- Opportunities to trial and deploy new innovative services at lower risk

Network Functions based on specialized hardware
One physical node per role. Physical install per site
Static. Hard to scale up & out

Network Functions are software-based
Multiple roles over same hardware. Remote operation
Dynamic. Extremely easy to scale
Scalable number of virtual machines
Ensuring that virtualized network platforms will be simpler to operate than what exists today.

Achieving high performance virtualized network appliances which are portable between different hardware vendors, and with different hypervisors.

Achieving co-existence with legacy hardware-based network platforms whilst enabling an efficient migration path to fully virtualized network platforms which re-use network operator BSS and OSS.

Management and orchestration of virtual network appliances (particularly alongside legacy management systems) while ensuring security from attack and misconfiguration.

Maintaining network stability and service levels without degradation during appliance load and relocation.

Ensuring the appropriate level of resilience to hardware and software failures.

Enabling the creation of virtual network appliances which will run, ideally without recompilation, on any hypervisor and hardware configuration, and integrate “on the fly” into the network operators’ existing management and orchestration systems.

Analyzing requirements for future technical specifications and standards in relevant standardization organization and groups to be identified or created at ETSI and other ad hoc standards development organizations.

Minimizing energy consumption

In less than 10 months of operation, the NFV ISG produced its first five Group Specifications. These specifications cover NFV use cases, requirements, the architectural framework, and terminology. The fifth specification defines a framework for coordinating and promoting public demonstrations of Proof of Concept (PoC) platforms illustrating key aspects of NFV. The objective of the PoC is to encourage the development of an open ecosystem by integrating components from different players.

By the end of 2014, the NFV ISG will deliver about 15 documents in Release 1, a full set of coherent and consistent publications. Release 1 will cover management and orchestration, compute domain infrastructure, hypervisor domain, network domain infrastructure and virtualized network function architecture. Other publications outside the release plan will address security issues as well as performance and portability best practices.

For details about ETSI’s current NFV activities, please visit:

www.etsi.org/nfv