NFV and What it Means to You

From ETSI to MANO to YANG – Making Sense of it All

By: GigaSpaces Research, Cloudify Team
Contributors: Nati Shalom, Yaron Parasol, Shay Naeh, Yoram Weinreb

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The Road to NFV

For the last few decades networking was mainly a physical thing. The most basic building blocks like switches and routers were physical devices with their own configuration and management system.

More complex network functions were provided as blades and racks where the vendor controlled both the hardware and the software, largely built in a black-box approach, that albeit provided the safety of control, at the dire expense of complete lack of scalability paired with a long time to market, and very specialized staff to run and manage these systems.

With the need for agility and scale these days, this has started to hit a wall. However, the problem with scaling up of network functions is that in order to do so, you have to change boxes as demand fluctuates, and when you reach peak time you need to be elastic on the fly - and this is nearly impossible with manual configurations.

As NFV (network function virtualization) becomes a real pain point more network vendors are working on a solution of how to take their existing investment in network products and make them NFV-enabled. The decision to move to NFV is based on the growing need for standardized architecture built on commodity hardware, elasticity and scale based on software-driven networking, which would then enable flexibility that would reduce vendor lock-in, all enabling faster time to market, and representing a growth engine for this highly-competitive industry.

The target is that eventually everything (OSS and BSS combined) will run as virtual software components on commoditized hardware - migrating from core systems based on dedicated hardware & software into standardized software-driven virtualized network functions.

With open source cloud being software driven infrastructure that exposes the networking APIs to the users, it is now possible to build customizable Software Defined Networks (SDN) to fill this gap where we can automate this as part of our application deployment. That said, working with SDN requires knowing a bit more about how information moves around between your cloud resources, and ensuring they are application-oriented and are able to communicate with the layers above and below.

However, the crux of the matter is that typically network components require substantial code changes to turn an existing NF into a VNF (virtualized network function). This, in turn, becomes an NFV service running on virtualized hardware & software, which then ultimately runs on the cloud. This becomes an even more daunting challenge when we want to do this in a standardized way and without losing control.

Each of these components was typically built to run in a legacy environment, while not taking into account virtualization and cloud requirements.

ETSI, MANO and Modeling Languages

To this end, many Telcos and Enterprises these days are searching for modeling languages to help achieve the goal of application and network orchestration, and they are betting on OpenStack and the nature of standards-driven open source cloud to help deliver this in the real world.

ETSI, the European Telecommunications Standards Institute, has defined a standard reference architecture to achieve NFV, which includes the stages of rewriting the previous OSS black boxes to become VNFs, which is then built upon a VNFI (virtualized network functions infrastructure - AKA the IaaS, in many cases OpenStack).