

# UNDERSTANDING THE USE CASE & TRENDS OF NETWORK FUNCTION VIRTUALIZATION



## Executive Summary

Network Functions Virtualization aims to leverage standard IT virtualization technology to consolidate many network equipment types onto industry standard high volume servers, switches and storage, which could be located in Datacenter's, Network Nodes and in the end user premises.

## Business Use Case

We believe the application of Network Functions Virtualization brings many benefits to network operators, contributing to a dramatic change in the telecommunications industry landscape forcing major network equipment manufactures to consider offering virtualized versions of their products that run on industry standard hardware.

There are only two use cases from business perspective:

- » Either you are attempting to reduce CAPEX/OPEX by replicating the existing functionality at same or close to same performance using commodity hardware.
- » You are attempting to REDUCE TIME TO MARKET for new services at lower upfront cost by not locking into proprietary hardware and hence building new services geared towards future that can adapt to changing business needs fast with faster and cheaper while improving the overall ROI of the business.

While NFV was at first touted as a road to capital investment savings, now operators are finding that it will prove a clearer path to operational savings and potentially even to revenue generation. SDN and NFV both enable automated service chaining, or the dynamic provisioning of network services that support applications. Whereas network operators once had to manually build firewalls and load balancers to support fluid applications, they can now provision them dynamically. This will eventually allow service providers to charge for specialized network services that will no longer be difficult to deploy.

Either case it will help operators improve balance sheet, de-risk business by neutralizing vendor lock-in while transforming business to adapt to changing business needs quicker while unfolding newer opportunities for incremental revenue.



## Technical Use Case

Given the broader definition and application possibilities with NFV, any potential network function can be a candidate for deployment.

### CPE

Functions contained in home routers and set top boxes to create virtualised home environments.

### Edge of the Network

- » NGN signalling: SBCs, IMS.
- » Converged and network-wide functions: AAA servers, policy control and charging platforms.

### Core of the Network

- » **Switching elements:** BNG, CG-NAT, routers.
- » **Mobile network nodes:** HLR/HSS, MME, SGSN, GGSN/PDN-GW, RNC, Node B, eNode B.
- » **Tunneling gateway elements:** IPSec/SSL VPN gateways
- » **Traffic analysis:** DPI, QoE measurement
- » **Service Assurance:** SLA monitoring, Test and Diagnostics
- » **Application-level optimization:** CDNs, Cache Servers, Load Balancers, Application
- » **Accelerators Security functions:** Firewalls, virus scanners, intrusion detection systems, spam protection

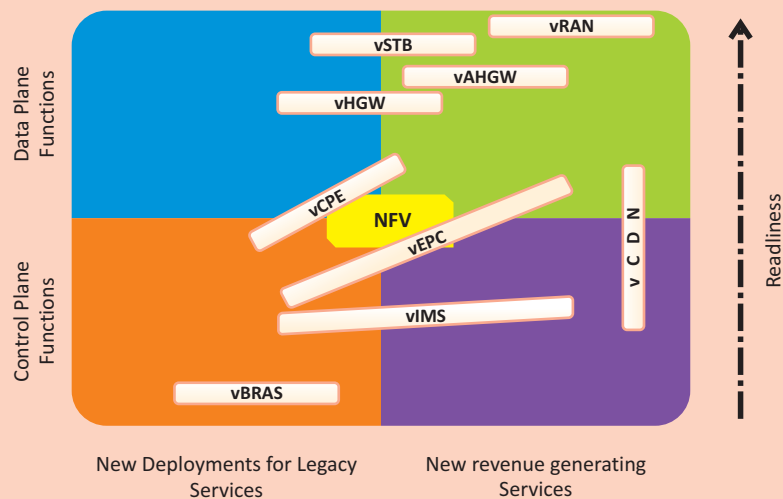


## Trends

The adoption and initial planning for PoCs and deployments by carriers with are indicating trends characterized by several common factors. Upon closer look some of these are coming out as important considerations for these use cases. Key among them:

- » Legacy services versus New revenue opportunities
- » Data processing intensive services vs. Control or Policy services
- » Maturity of the current NFV solution
- » Scale of deployment needed
- » End user market segment
- » Network traffic

The following figure summarizes several of the potential use cases against some of the key factors described and the readiness based on maturity of solutions available.



Today, much of the talk is about propagating NFV from the data center to the network backbone or core. However, there are not a lot of activation, configuration changes and/or equipment refresh cycles at the core of the network. In contrast, the edge of the network is where services originate, and that is where NFV may enable some very valuable automation, service innovation allowing possibility of dynamic connections to cloud services, on a self-serve basis at a fraction of a cost. This is the type of innovation that makes SDN & NFV interesting.

While there are still challenges in using NFV to impact service velocity in a significant way, the technology can already enable a new range of service features that will be used to produce revenue. We at ACL Digital has been one of the early implementers of NFV and have a demonstrable experience across - virtualization, abstraction, programmability, and orchestration the four key characteristics of a successful NFV implementation. As the NFV story unfolds we would be here to share our experience which can be leveraged by Service Providers to realize their virtualized network goals.



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