NFV
The emerging Services Value Chain

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Introduction

The combined challenge for CSPs has always been to get new services quickly off the block and also make it easy to manage them at the infrastructure, service, process and support system layers. This has led to several attempts towards reducing complexity and non-uniform semantics in network, devices, capacity, product and OSS systems. While the industry pursues several approaches to address this challenge in the traditional network architecture, it gets more complicated in the new era of Network Function Virtualization (NFV) & Software Defined Networking (SDN). As a member of the Industry Specification Group (ISG) under auspices of ETSI, Open Network Forum (ONF) and a Catalyst partner of TM Forum, we have helped create virtualised network capabilities through development of standards and architecture frameworks for the industry. Our experiences have led us to believe that there is a compelling need for CSPs to view their NFV evolution through a different lens - one that showcases the changed paradigm of services value chain; and plan their NFV lifecycle carefully in order to achieve the desired objectives.

The Services maturity curve

SDN/NFV architectures will pose their own challenges & complications right from design through realizing the desired functionality and achieving launch readiness. The first questions for a CSP remain on when this technology will enable next-generation network architecture to take over from legacy at some future point and also how their management could co-exist with today's OSS.

In this environment, we propose a sequential approach for CSPs to adopt NFV, in the following order:

(1) Realize the existing portfolio and target to achieve improved efficiencies & productivity -
   (a) OpEx reduction through automation of Service Assurance as a first step in the NFV technology lifecycle.
   (b) Reduced time to market through new process design and/or re-engineering and if successfully matured through these two phases,
(2) Embark on introduction of new offerings for additional revenue streams.

OpEx Reduction

We see **Management and Orchestration**, an essential aspect of NFV service capability being most effectively provided through a Service Factory that will be both a dynamic manufacturer and controller of services. Real-time traffic measurement/ analysis as well as dynamic resource optimization would be key services offered by the factory. In order to improve productivity, CSPs will additionally need to implement automation in Fulfillment and Assurance functions to enable improved SLAs. This can be achieved by deploying **cognitive Artificial Intelligence (AI) platforms, virtual probes and bots**. We have achieved remarkable success in initial global deployments and continue to invest in maturing our AI framework for both fixed and mobile network services. Since the move from resource-centric to service-centric end to end management would be critical, **service KPIs** around resiliency, zero-touch business, user based service initiation and pro-active monitoring will need to be modelled and/or fine-tuned at application layers of the hybrid network. We can also expect changed Service Assurance benchmarks for **service level differentiation**. An eventual outcome would be to bring **Service Assurance functions to the customer through an Omni-channel experience.**

Reduced Time to market

Virtualized and Cloud Services routers will offer major reductions in network CapEx. However routing and security services for traffic that crosses network domains would have to be designed so as to support traffic exit from virtual network, pass through router, firewall and VPN hardware and back into the virtual network because some services will always be tied to non-virtualized hardware. **Network design automation, migration and implementation** of services would therefore be an important capability for CSPs using a variety of hypervisors such as VMware, Hyper-V, KVM, and Xen as well as Amazon Web Services within a network OS with configurable APIs. **New business process** applications engineering and re-design will be needed to leverage programmability of the network infrastructure using the new APIs exposed by it, thereby shortening service provisioning time to hours and even permitting software interfaces for real time customer self-service provisioning and configuration. It will be imperative for CSPs to therefore build a **strong partner ecosystem** for diverse set of capabilities across supply, design, integration & validation in addition to application development skills. This will help CSPs mature to the stage of rolling out new services.

New Revenue streams

With such **high levels of management automation**, CSPs would need to rethink their organizational design beyond the traditional Sales, Network and IT silos. They would also need to embrace a new "layered" business to generate significant benefits and reduce cost base. "**aaS**" is likely to be the new business model and CSPs who have matured through the two phases of NFV evolution as described before, would end up being mature enough to create new revenue streams for themselves. Some examples of new offerings would be providing **VNFs as a service**, setting up a **network on demand** in the Enterprise market or even helping other CSPs **manage their hybrid environment** of conventional and virtualized networks. This stage in the NFV lifecycle for the CSP will be driven by their capability to instantiate and manage services with quick returns over an environment of public and enterprise networks with diverse access technologies.

Conclusion

CSPs who embrace NFV need to shift quickly from traditional methods for procuring, building and managing networks. They need to take incremental steps in the right direction to align to the emerging NFV services value chain revolving around technology and process redesign. Open source, collaboration and innovation would be key in this intense, dynamic world of network virtualization and Wipro with core Innovation and Technology development experiences in the Digital, Cloud and Hyper automation space can prove to be a valuable and effective partner to CSPs through this journey.