ALTEN CALSOFTLABS
AN ALTEN GROUP COMPANY

Innovate, Integrate, Transform

UNDERSTANDING THE BUSINESS CASE OF NETWORK FUNCTION VIRTUALIZATION

Executive Summary

The Internet & telecommunications industry is in convergence mode to offer unified services to attract new customers and retaining them with customer relationship. Deregulation, advancements in both communication and computer technologies, Internet and its explosive growth, and the demands of the virtual corporation, customer demands services that provide them with the benefits of timeliness and flexibility at a faster speed.

While the competition in the telecommunications marketplace is becoming more intense, network operators are still struggling with disparate systems each with different access, delivery and presentation methods. Services often come from multiple vendors, and those who use these systems, spend valuable time accessing separate information services. Network operators' face additional issues; not only do their employees struggle with disparate information services, but also they incur additional costs in the implementation, maintenance and administration of these systems.

Additionally network operators' networks are populated with a large and increasing variety of proprietary hardware appliances. To launch a new network service often requires

» Yet another variety of box
» Finding the space to accommodate these boxes
» Power to accommodate these boxes

Leading to

» Increasing costs of real estate to accommodate these appliances,
» Increasing costs of energy
» Capital investment in related infrastructure
» Hiring manpower necessary to design, integrate and operate increasingly complex hardware-based appliances.
» Refresh cost- hardware-based appliances rapidly reach end of life, requiring refresh cost, reintegration cost, deploy cycle to be repeated with little or no revenue benefit.

Solution

Network Functions Virtualization aims to address these problems by leveraging standard IT virtualization technology to consolidate many network equipment types onto industry standard high volume servers, switches and storage, which could be located in Datacenters, Network Nodes and in the end user premises. We believe Network Functions Virtualization is applicable to any data plane packet processing and control plane function in fixed and mobile network infrastructures.

Why Now?

In order to win in this marketplace, Service Providers are concentrating on emerging technologies and customer demands. Major industry drivers behind this SHIFT are:

Revenue Threat

Service providers traditional sources of revenue, voice and video, are losing ground to services being provided over the top (OTT) on their data channels. While, the infrastructure needed to handle all that data traffic needs to grow to meet the expanding capacity requirements, it's resulting in, infrastructure costs growing faster than subscriber revenue growth. Operators who try to respond with new ways to monetize their services are realizing that their networks are not agile enough to introduce new services more quickly.

Cloud Computing

Modern technologies such as Network Functions Virtualization & SDN developed for cloud computing provide methods to enhance resource availability and usage by means of orchestration and management mechanisms, applicable to the automatic instantiation of virtual appliances in the network, to the management of resources.

The Industry Standard High Volume Servers

The use of industry standard high volume servers is a key element in the economic case for Network Functions Virtualization. Network Functions Virtualization leverages the economies of scale of the IT industry. We believe that ASICs will still be applicable for some types of very high throughput applications and will become increasingly uncompetitive against Merchant silicon applicable for commodity functions implemented at scale.

Use Cases

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

- Customer Premise Equipment
- Edge of the Network
- Core of the network

Technical Challenges

- Achieving high performance virtualized network appliances which are portable between different hardware vendors, and with different hypervisors.
- OSS/BSS development needs to move to a model in-line with Network Functions Virtualization and this is where SDN can play a role.
- Network Functions Virtualization will only scale if all of the functions can be automated.
- Ensuring the appropriate level of resilience to hardware and software failures.
- Integrating multiple virtual appliances from different vendors. Network operators need to be able to "mix & match" hardware from different vendors, hypervisors from different vendors and virtual appliances from different vendors without incurring significant integration costs and avoiding lock-in.

Operational Challenges

- Achieving co-existence with bespoke hardware based network platforms whilst enabling an efficient migration path to fully virtualized network platforms which re-use network operator OSS/BSS.
- Managing and orchestrating many virtual network appliances (particularly alongside legacy management systems) while ensuring security from attack and misconfiguration.
- Prove that a virtual network is just as secure as a physical network.

While operators are open and or are considering the idea of moving away from bespoke hardware to software-centric network architectures it is still an uphill for them to migrate there operations and skill base to software based networking environment while carefully re investing to maximize reuse of existing systems and processes.

For more than a decade, Calsoft Labs has been helping companies develop L4-L7 infrastructure and has a demonstrable experience across four key characteristics of a successful NFV implementation - virtualization, abstraction, programmability, and orchestration. With Calsoft Labs, Service Providers can realize their virtualized network goals.