



Begin Monetising SDN & NFV Today

Synopsis

Software defined networking and network functions virtualization have heralded in a new era of possibility for operators in a telecoms industry becoming progressively more fixated on delivering diverse, converged and cloud-based services. While SDN and NFV certainly have potential, it's the orchestration of virtual services that will make the potential of virtualization a more tangible reality.

There have been some early successes for telcos implementing virtualization platforms, and this Telecoms.com Intelligence paper, in association with Cisco, will investigate these increasingly prominent technologies and how telcos could go about claiming some important and tangible business wins.

INTRODUCTION

For service providers, existence in today's world is about far more than providing simple connectivity solutions. A society being driven by perennially increasing digital demand and technologies evolving at a rate of knots has presented the telecommunications industry with exciting opportunities and existential challenges in equal measure. For years, communications service providers (CSPs) and mobile network operators (MNOs) have been focussing increasingly on delivering new and unique services and applications for both consumers and enterprise customers, above and beyond rudimentary internet connectivity or mobility solutions.

Operators are increasingly diversifying their service offerings in the face of growing competition from external market forces, like over-the-top internet companies and new market entrants. Meanwhile, consolidation of the telecommunications industry, as seen in 2015 with the approved merger of BT and EE, is seeing telecoms companies entering new markets and treading previously untrodden ground.

Multiplay services, bundling and the delivery of new content services are all focal points of this new, converged industry paradigm. AT&T completed its takeover of satellite broadcaster DirecTV in the US, with BT investing heavily in sports programming rights, each of which serve to evidence the importance of domestic television services as a primary service offering of the future.

However, network infrastructure over which services are delivered has become strained in an age of constant connectivity and almost exponential growth of data-hungry services. It's not necessarily a given that infrastructure operated by service providers is capable of keeping up with growing demand and a wildly differentiated portfolio of products being piped down the network. It's not just a case of delivering faster and faster access speeds over fixed or mobile either; by all accounts operators need a vastly improved level of agility and flexibility, with the ability to roll out new services at scale in minimal time using fewer and fewer resources.

By adding industry-level revenue pressures and market demands, we're seeing that services and their features must be made available more quickly and with lower cost to ensure competitiveness and acceptable margins.

This paper will explore some of the options available to operators looking to implement emerging networking technologies, such as software defined networking (SDN), network functions virtualization (NFV) and cloud. Primarily, we'll explore how such technologies can enable network transformation, opening up new opportunities for operators looking to enter new markets, create and deliver new services, and inject flexibility and agility to network operations.

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A VIRTUAL REALITY

In order to begin the discussion of SDN and NFV and the potential benefits they pose to operators, laying out the technological philosophies and principles in play is a logical starting point.

Software defined networking essentially allows network managers, administrators and engineers to manage network services through abstracted points of control at a higher level. "To decouple the control plane from the data plane" is probably the earliest description of SDN to hit the market, and it is also the most succinct. Control of traffic flowing across the network is abstracted from individual network switches and routers into a central, software-based control point. The control plane is where the direction of traffic flowing across the network is determined, while the data plane is the collection of systems that actually gets the traffic to where it needs to be.

The primary benefit of implementing a central point of control is to simplify network management processes, it is widely suggested. One of the practical implications or use-cases for an SDN-enabled network is the increased level of agility and flexibility afforded to network administrators. In the real-world, this could manifest by way of a surge in demand for specific services at certain times or locations.

Take the case of a major convention, music festival or sporting event. While an overbuild addition to the network has, historically, helped in managing a surge in demand; it's not a guaranteed solution, and has the potential to result in high capital expenditure without necessarily being fully utilised. Overbuilds also require forward planning and advanced warning, which for a pre-planned, large-scale event is not a problem; but should a sudden and unpredicted congregation of people occurred, such as a protest, overbuilding is not solution. Utilising SDN, as well as other cloud-related technologies we'll come on to shortly, promises the ability to roll out services or allocate bandwidth to certain geographic areas to ensure continued availability of services on-the-fly.

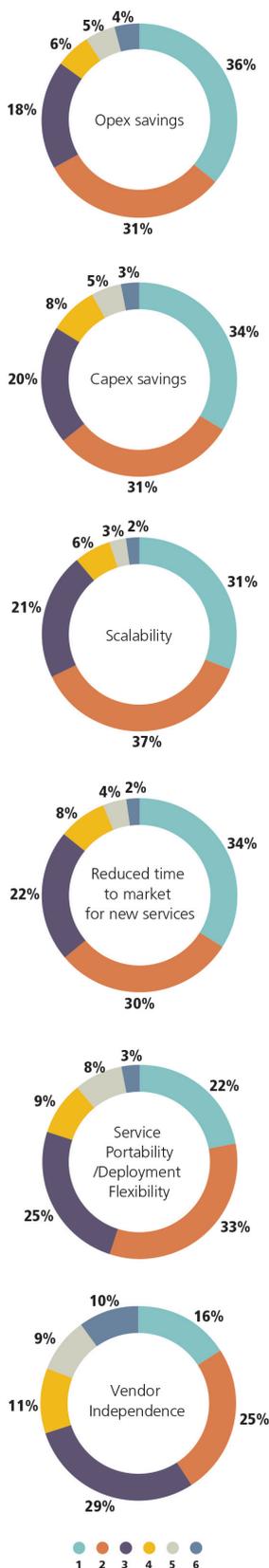
Often synonymised with SDN is network functions virtualization, an operator-driven initiative that made its way to prominence in late 2012. Three years later and more than 30 proof-of-concept trials determining the feasibility of use-case scenarios for the technology and NFV is beginning to make its way in to live network deployments.

The fundamental premise of NFV is to virtualize physical network functions, which occur at various points in the service provider network, on to high-capacity, common off the shelf virtual servers in the data centre. These virtualized functions can then be consolidated if needed or deployed as single network functions, which minimised redundancy of physical equipment in the network and subsequently increases service provisioning velocity and roll-out, while reducing both capital and operating expenditure.

Earlier this year, in the Telecoms.com Intelligence Annual Industry Survey, we ran a dedicated section relating to NFV and how its progress is being perceived within the telecommunications industry. First and foremost, we sought to understand why operators would want to implement an NFV initiative, and what they believed the main reason for doing so would be.

The first trend observed seems to corroborate with our earlier assertions surrounding the need for agility and flexibility when it comes to launching new services and deploying services to various parts of the network. Beyond the much-touted and popularised cost saving benefits, 68% of the 2,000 respondents believe scalability to be a highly beneficial motivator for adopting NFV-related technologies; while 64% and 55% saw reduced time to market for new services and service portability/deployment flexibility as primary benefits, respectively.

What do you see as the primary benefits of network virtualization? (Please order with one being the highest priority and six being lowest priority)



Having the ability to deliver services only when necessary is a major factor contributing to the telecoms industry’s excitement related to NFV. As evidenced, the primary driver for operators looking at deploying NFV is to benefit from significant gains in agility and service delivery abilities. But only by implementing sophisticated orchestration tools which possess the ability to coordinate virtualized network functions, while chaining them together, can operators achieve service automation and an element of self-service on behalf of the customer.

MAKING SENSE OF A VIRTUAL MESS

One of the biggest challenges associated with making these two new technologies more of a viable reality comes in the form of orchestration. Orchestration pertains to the organisation, interoperability and management of various virtualised network functions (VNFs), in order to expedite service creation and delivery to customers; made all the more complex by the open nature of the technology and the variety of vendors offering up solutions.

As SDN and NFV become more prevalent for carriers today, or at least a serious consideration among tier 1 operators; equipment vendors and telcos are looking to understand orchestration in this new and virtualised paradigm. Effective orchestration ties together physical infrastructure and virtual machines/functions in a heterogeneous network; defining policies and delivering a common language interface for multiple vendor devices and products.

In an NFV context, the orchestration layer provides an abstraction layer between the physical infrastructure and carrier network applications. Such abstraction allows carriers to configure and programme the network more simply, without need to manually type in hundreds, if not thousands, of lines of code across multiple network devices.

This simplification can be extended by solutions that can facilitate rapid services scale out and on-demand provisioning of infrastructure to meet the demands and requirements of the business and its customers.

With an automated and sophisticated orchestration layer effectively managing the build-up and roll out of carrier services, operators will be able to attain the desired agility and flexibility identified earlier in this paper as we move towards more converged and data-hungry service consumption.

As we mentioned earlier, operators are diversifying their service offerings, and the theory behind SDN, NFV and orchestration is all well and good; but so far there have been few use-cases which have seen operators prosper by using said technologies. That’s not to say that there have not been any, however, and here are a couple of successful case studies of operators deploying virtualization, cloud and orchestration to great benefit.

CASE STUDY 1: TELSTRA



Australian service provider, Telstra, offers a variety of cloud services to businesses. As its domestic and business customers adapt to the new digital, app-driven world, the ability to move quickly becomes a key differentiator. In fact, it's become critical to helping businesses large and small capture new opportunities. Yet, the ability to scale IT resources with speed, agility and security has been difficult to achieve.

Telstra utilised virtualization and orchestration services to implement a new suite of services to help businesses simplify their operations. By using Telstra's new innovation platform created on virtualized services, its customers were able to allow its staff to work with customers more closely to develop new ways of doing business. These business services can be rapidly deployed through a self-service portal that connects to both private and public clouds, and managed network services. Customers access services through a drag-and-drop

interface to simplify the provisioning of new network services.

"We want to transform our network services so they become instantaneous-purchased and provisioned in the same manner as cloud," said Kate McKenzie, Chief Operating Officer, Telstra. "The new services are a direct response to our customers' need to rapidly respond to changing marketing dynamics that pose direct challenges to IT."

The partnership that Telstra undertook with Cisco to upgrade its network service offerings helped to deliver numerous key areas of benefit. It meant product development and time to market of services was dramatically sped up; while customers then gained the ability to dynamically provision services in near-real time, on demand and on premises in the cloud. Finally, a simplified operations process meant Telstra was able to focus on other areas of R&D and innovation.

CASE STUDY 2: DEUTSCHE TELEKOM



Deutsche Telekom wanted to access what it saw as an underserved market, small and medium-sized businesses. Many SMBs lack access to critical IT infrastructure and technologies that larger companies can benefit from; but cost inefficiencies meant DT wasn't able to deliver comprehensive services to its smaller clients. Affordability was the biggest barrier in this instance, but new services for SMBs would need to be simple to manage, easy to deploy, secure and also compliant with governance and regulatory requirements.

DT ended up developing a cloud-based VPN service based on its pan-European IP network infrastructure. It harnessed the practise of DevOps and utilised OpenStack solutions to design and develop its services. The operator's customers

accessed services via a self-service portal online, through which SMBs could select, subscribe to and activate scalable IT resources; such as site-to-site and remote access encrypted VPNs, as well as firewall and web security on a monthly, cloud-based IT subscription.

"The digitisation of the SMB sector is key to economic growth across Europe. Virtualization and cloud open up new ways to bring enterprise-class IT services within easy reach of SMBs," said Dr. Elias Drakopoulos, SVP of Deutsche Telekom. "With the ever-increasing level of security threats, digitisation starts with highly secure access, and for that reason, we decided to start the rollout of our new generation of cloud-managed IT services with Cloud VPN."

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CASE STUDY 3: STC



Saudi Telecom Company was facing tremendous growth and customer demand for fixed-line and mobile broadband bandwidth. Its leaders wanted to deliver products and services faster, manage risk and security threats, and drive productivity throughout the organisation. To do so, they needed to accelerate and streamline cloud adoption.

To help solve the challenge, STC deployed an application centric infrastructure service from Cisco, which essentially provided visibility of all network and IT resources, both physical and virtual. It does so while focussed around the needs of applications. The ACI solution automated and unified all of the component parts

of the company's IT infrastructure, including networking, storage, computing, network services, applications and security. As a result, STC is now able to manage its network as a single entity, development cycles are shorter and business processes are sped up. Meanwhile, TCO has been reduced by up to 75%.

"This pioneering data centre project will ensure that we continue to deliver state-of-the-art network infrastructure to support the tremendous growth and demand from our customers in Saudi Arabia for fixed and mobile broadband bandwidth," said Eng. Abdulaziz A. Alsugair, Chairman and Managing Director of STC.

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CONCLUSION

It has been sufficiently documented the revenue and market pressures telecoms operators are under today; so it wouldn't be too far a stretch to say that the eager anticipation with which new technologies such as SDN, NFV and cloud are being met stems from an industry-wide desire to see innovative networking technology deliver innovative product development capabilities and revenue generation opportunities for operators.

During this paper, we have learned that:

- Convergence, multi-play and data consumption growth is forcing operators to examine new means of network innovation and service delivery.
- Despite challenging operating conditions, opportunities exist for operators to enter new markets by utilising agile service creation and delivery platforms.
- SDN enables operators to manage network infrastructure and its traffic from one centralised location, all through software.
- NFV, meanwhile, can reduce network complexity and enable dynamic rollout of network services for both the telco and its customers.
- Successful orchestration of network virtualized services allows operators to offer self-service portals for cloud customers, both enterprise-grade and SMB.
- Service agility and scalability is the most commonly identified benefit of NFV by operators.
- After years of marketing hype, operators around the world are beginning to harness the potential for entering new and untapped markets possessed by SDN, NFV and cloud technologies.



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