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Flashpoint

Emerging telecom networking technologies

Shifting model brings new considerations for communications service providers

Evolving digital realm offers new life for an old model

Two key computing and networking architecture trends—software-defined networks (SDNs) and network function virtualization (NFV)—stand to radically reshape how communications service providers (CSPs) operate and bring opportunities to streamline operations, reduce costs, and improve service. These approaches are real and ripe today, already adopted broadly for computing needs in a variety of industries. Both revolve around a simple concept: separate basic hardware and related network functions from application service functions that then operate as virtual networks, existing solely in the software realm. For example, switches become virtual switches, and voice calls use strictly software functions on a virtual network, operating across general-purpose hardware.

The vision is one of simplicity—and one that can position you for a more digital, consumer-driven future. For the most part, however, migration toward the new model has been slow. Many CSPs want to adapt to the new landscape but remain cautious—recognizing that the network must never be down and realizing that detailed planning is required for transitioning to a new environment.

So what can you do amid the shifting landscape? Go into stand-by mode and wait for the enabling technologies to mature to avoid acquiring and deploying proprietary hardware that can be expensive to maintain? Or perhaps you are waiting for the revenue potential and cost curves to adequately diverge, mitigating the risk of cannibalizing high-margin legacy services. With fast-moving software-centric companies changing the communication game, waiting is probably a luxury you cannot afford, and your organization will need to work with other CSPs to collectively figure out how to move faster.

Digital drivers

Companies across the technology and telecom spectrum are under pressure to launch or support new data-driven services. Consumer demand for anywhere/anytime access to over-the-top services such as streaming content means technologies that can ensure a smooth, uninterrupted experience for the consumer must be embraced.

The need to move toward the new SDN/NFV model becomes even more pressing as the Internet of Things (IoT) vision takes shape. Flexibility provided by the model can allow you to shape your network to enable IoT applications, so that cars on the road can "talk" to one another and systems can make decisions at light speed.

Making the case for virtual

Moving to the SDN/NFV model presents a variety of benefits. First, capital spending on network hardware can be redeployed to other opportunities that generate new value for the bottom line. It is also a service innovation play since it creates an opportunity to develop new offerings and capabilities that fit the digital economy. There is also an operational play, since it helps to automate, analyze, monitor, and enforce an abundance of procedures and transactions.

To unlock the potential of the new model, your organization will need to evolve to effectively adopt these new approaches. Simultaneously, the new networking technologies will have to evolve to integrate effectively with existing operations. The real value of SDN/NFV capabilities resides in how companies choose to commercialize them and weave them throughout business systems support, extending to billing, policy, and analytics functions.

What do you, as a leader, need to think about as you prepare for the SDN/NFV world? Here's a look at a few key issues that are emerging.

About *Flashpoints*

Every day brings new ideas and possibilities to the Technology, Media, and Telecommunications sectors. *Flashpoints* is your tool for gaining the context you need to make sense of these critical developments—as they emerge.

Key observations

Old and new networks exist together

The transition to a virtual network won't happen overnight. Organizations must learn to bridge old and new network demands as both networks will be running simultaneously.

5G on the horizon

As the new industry standard emerges, a strong SDN/NFV infrastructure will be needed to deliver on customer expectations.

Cyber risks grow

A new network based on software rather than hardware could be more vulnerable to cyber risks, requiring the development of a new set of cyber skills.

Mandate for innovation

Building out the SDN/NFV vision, unlocking value, and keeping up with market demands will require a higher level of innovation.

Opening up to open source

Operating more in the realm of open-source solutions will become more important as specialized, purpose-built hardware makes its exit, requiring a new mindset and a new focus on collaboration.

Old and new networks exist together

How do you migrate from today's network to a future of SDNs and NFV? The quick answer is that a strategic path based on the demands of the consumer will need to be developed, letting business concerns, not technology, guide decisions.

For most companies, a hybrid/phased approach is likely, with the key question being: How do you keep old technologies and new ones running together? Migration won't happen overnight. Companies won't wake up and find themselves operating their networks exclusively in the cloud. Instead, some assets will reside on premises while others exist in the SDN/NFV realm.

All these things will exist together, which will require organizations to adopt different methods for working with each type of asset. It will entail an ability to bridge those methods and develop a "middle ground" view when it comes to processes and technology that span both old and new networks.

How long will this hybrid phase last? It depends on when an operator chooses to start its transition. Once the transition begins, however, it is expected to be completed in about five years.

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5G on the horizon

By the end of 2018, the standard for 5G mobile networks should be complete. 5G customers will expect unparalleled service quality and enhanced data-driven functionality supported by evolutionary digital capabilities. A robust SDN/NFV capability will become almost a prerequisite for operating a 5G network.

With the new standard, being first to market could matter more than ever. Organizations that can deliver as expected stand to attract and retain customers. Those that stumble with 5G could blow an opportunity to pull ahead of the competition.

Becoming successful on the 5G front requires building and testing end-to-end virtualized cloud networks. Organizations that have not yet planned trials with vendors might find themselves lagging and at a competitive disadvantage.

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Cyber risks grow

With SDNs and NFV defining a clear next step for the telecommunications industry, a variety of new concerns emerge when it comes to cyber risk. For one, the move away from proprietary hardware to virtual SDNs means that networks could suddenly become more attractive to cyberattacks.

With more potential points of attack to monitor and defend, network owners and operators will have to work to ensure third-party service or software providers are following leading practices for cybersecurity and cyber risk management. An increased level of sophistication on software patch management, physical security, and cyber threat intelligence will be required. Similarly, new incident response capabilities will be critical—to return to normal as quickly as possible in the wake of an attack.

The shift toward more software and virtual functions will necessitate a new way of thinking about the network and risk, demanding a new understanding of what it takes to become a secure, vigilant, and resilient organization.

Helping to fuel the need to focus on cyber risk and security is the concern for human safety and privacy. Emerging network-dependent applications such as self-driving cars will require solid layers of security to prevent auto accidents. Meanwhile, a wealth of digital transactions and personally identifiable information flowing through the networks of the future will present an attractive target for cyberattacks. For the CSPs of tomorrow, there will be a lot more at stake than dropped calls.

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Mandate for innovation

Embracing the new SDN/NFV model will involve a lot more than choosing vendors and replacing hardware-based network with virtualized software networks. For many telecom-specific needs, the technology does not yet exist. You will need to think about how to create software versions of vendors' current technologies and capabilities, which will require collaboration with a variety of partners and vendors.

Collaboration on new solutions that go beyond today's network needs will become mandatory, for responding to market forces and unlocking new value. You will require SDN/NFV-enabled capabilities to support new types of transactions in the evolving digital economy and to help deliver the IoT vision. New analytics capabilities can help derive intelligence from the data flowing through the new SDNs, to make meaningful strategic and operational decisions.

As enterprise customers innovate and roll out new sets of management tools—effectively enabling decision-making to occur in more pockets throughout the enterprise—you will also need a new governance framework to help ensure activities align with business objectives, corporate standards, and regulatory requirements.

Building out the SDN/NFV vision, unlocking value, and keeping up with market demands will require a higher level of innovation.

Opening up to open source

Developing a posture of innovation will require a critical shift in thinking. Decades of operating within the bounds of proprietary network infrastructure has fostered a proprietary view of technology within many organizations. SDNs and NFV, however, depend heavily on open-source solutions—technologies that represent a large portion of business in today's hyperconnected, digital economy.

To take full advantage of the evolving virtual telecommunications ecosystem, your organization will have to innovate in cooperation with other CSPs—at least when it comes to core functionality. In addition to cooperatively developed innovations, you can leverage existing open-source innovations developed by major technology companies and communities. All organizations will, however, be required to play their part and open up some of their own intellectual property. Those that fail to embrace open-source thinking and continue to develop technology in a vacuum will be unable to evolve with the market speed.

Ultimately, learning how to operate outside of an exclusive innovation comfort zone is fundamental to competing effectively. You should seek to maintain a healthy balance between the required open-source thinking and the need to invent unique value-added services and capabilities that set you apart from the competition.

Operating more in the realm of open-source solutions will be required as specialized, purpose built hardware makes its exit, requiring a new mindset and a new focus on collaboration.

Let’s talk

With software-defined networks and network function virtualization emerging as the clear destination for telecommunications, your organization will face a bevy of decisions and an abundance of work in coming years. Moving forward will not only require the adoption of new technologies and new mindsets, but will also require development of new business processes and strategies. We can help. Want to know how to start aligning your business with a future dominated by SDNs and NFV? We should talk.

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