

SDN: THE NEW NORMAL?

Carrier Trends and How Customers Can Benefit

ISG Transformation and Cloud Services Team



EXECUTIVE SUMMARY

Originally conceived in the mid-1990s, Software Defined Networking (SDN) as an approach to managing network services offers significant advantages in terms of network applications adaptability, manageability and cost. Despite these benefits, SDN has primarily been limited to an experimental technology deployed by smaller startups and research networks. Major carriers, meanwhile, have focused on proprietary implementations, their network planning decisions driven in part by equipment manufacturers seeking to lock providers in to their hardware and features sets.

This is changing, due in part to another emerging technology trend – Network Function Virtualization (NFV). Created by a consortium of service providers, NFV is designed to speed up deployment of new network services, reduce OPEX and accelerate service innovation and provisioning.

Today, carriers are recognizing that the combined capabilities of NFV/SDN can significantly reduce their reliance on expensive and proprietary hardware platforms, as well as enable entry into new markets and services – a critical priority for carriers seeking new revenue streams. As a result, carriers are aggressively implementing SDN/NFV across a wide range of areas.

This ISG white paper examines NFV/SDN adaptation trends by carriers and service providers and potential implications and opportunities for enterprise clients.



SDN IN THE CARRIER MARKET

US-based carrier investment into SDN/NFV is estimated to reach \$18B by 2018 and exceed \$22B by 2020. In part, this rapid growth reflects hardware manufacturers such as Cisco finally embracing mainstream open SDN/NFV and shifting focus away from traditional integrated proprietary systems. Cisco has been late to the SDN game, having in recent years developed Application-Centric Infrastructure (ACI), an SDN-flavored but proprietary alternative that found little traction in a market moving to a totally open SDN approach. More specifically, Cisco's strategic shift toward open SDN was prompted by competitors such as HP and Brocade gaining market share as carrier equipment suppliers by virtue of their earlier adoption of SDN philosophy.

As SDN adoption drives diminished carrier dependency on proprietary hardware, equipment manufacturers must either embrace SDN or lose market share and ultimately get left behind in the innovation race.

US CARRIER MARKET SDN ADOPTION

AT&T leads the way in SDN/NFV adoption in the United States. John Donovan, Senior Vice President of Technology and Operations, has stated that AT&T's goal by 2020 is to virtualize and control more than 75 percent of its network using a software-driven architecture. AT&T is also starting to virtualize critical network functions to improve cycle time, elasticity and operational efficiency.

Level3 is also making significant investments into SDN. CEO Jeff Storey stated that a central element of the company's enterprise sales strategy is to capitalize on "the largest SDN deployment in our industry to deliver a differentiated customer experience."

Level3 recently completed the rollout of a SDN-based standardized Ethernet platform in North America, and plans to start integrating its Content Distribution Network (CDN) into a SDN framework in the near future.

Meanwhile, Verizon – while trailing AT&T and Level3 on implementation – has announced that it will be implementing SDN throughout its network to improve service timelines, focusing initially on migrating legacy network elements and functions onto software-based platforms.

SDN/NFV is being rapidly adopted by major US carriers seeking to increase agility, reduce cost, significantly improve service delivery timeframes, simplify network management and increase revenue. Furthermore, carriers such as AT&T and Level3 have not only adopted SDN and NFV to manage their internal infrastructure and services, but are already introducing products and services based on SDN and NFV.

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In addition, smaller and less prominent carriers are entering the market with SDN/NFV-based solutions, levelling the playing field and increasing their share of the overall market. The tipping point of SDN and NFV adoption as mainstream technologies has been reached, with investments and implementations rapidly accelerating.

NON-US CARRIER MARKET SDN ADOPTION

Japan-based NTT is the most notable non US-based carrier in terms of SDN and NFV adoption and investment. In early 2014, NTT announced that a shift to SDN technology would offer greater flexibility to enterprise clouds, including the ability to accelerate business expansion while reducing workloads. NTT has stated that SDN technology can be used to directly manage network settings for computing, storage and networking along with Internet and VPN settings.

These announcements, along with ongoing implementation in its data centers, show that NTT is clearly committed to SDN.

British Telecom has also recently announced a shift towards SDN, but with a focus on data center management and NFV to reduce operational cost. Rather than utilizing SDN to operate its network or provide SDN-based services to clients, BT's focus at present is on research and on leveraging SDN to improve internal operational processes. Citing lack of demand from its customer base, BT is overall taking a cautious approach to SDN, viewing it more as an evolution than a revolution and taking a case-by-case approach to adoption.

Tata Communications is similarly cautious, arguing that "the SDN sweet spot is intra-data-center, not inter-data-center." Tata's focus remains on IZO, its recently unveiled hybrid network strategy that, while proprietary to Tata, offers some level of SDN-like controls and flexibility to clients. For Tata, how deep SDN can or will go in a service provider market remains open to debate.

The global carrier market outside the United States remains very uneven on SDN and NFV adoption, with clear leaders such as NTT, a middle-of-the-road approach from BT and skeptics such as Tata. A concern on the horizon for slow adopters: smaller players offering SDN and NFV solutions are rapidly entering the service provider market, with the potential of re-shaping the overall carrier market in the near future.

CHALLENGES ON THE SDN PATH

Growing interest notwithstanding, especially among US-based carriers, challenges certainly remain for SDN adoption. These include:

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Talent Management and Development: SDN provides – but also requires – a completely new way of thinking about networks and network architecture. More specifically, an evolution from a system-centric, and in some cases hardware vendor-driven world, to SDN requires a fundamentally new perspective. Given the overall technology evolution, defining the right architecture is more important than evaluation and influence of specific solutions on network design. Significant investment in talent development that can shift thinking to a SDN philosophy will be required to address the multi-dimensional nature of the technology.

Net Neutrality: The concept of a SDN Federation is becoming increasingly relevant. Carriers will need to establish some level of service and control federation between each other in order to deliver services such as last-mile access. The effect of net neutrality on a SDN Federation and standards is yet unknown and is under constant debate.

Adoption of open standards: Shifting from custom-built hardware to NFV remains a challenge for equipment manufacturers, particularly in terms of support of Open Flow by hardware manufactures. By abstracting and commoditizing hardware, Open Flow threatens vendors' product lines. Some might shift to developing SDN Controller technologies, but this will take time. At present, hardware manufacturer support remains uneven and inconsistent, particularly for flow-based SDN.

CUSTOMER PERSPECTIVE

SDN and NFV technologies are rapidly emerging and will significantly change the carrier market in the near future. To stay relevant, carriers must adapt to and embrace SDN as a new norm for networking. As more carriers adopt SDN architecture, customers will – at least in theory – enjoy better network performance. Time to implement high-bandwidth circuits should be reduced, and network capacity should increase. That said, the gating factor of available access facilities will still remain. Customers should engage with providers to better gauge their roadmap to SDN and how they can enhance their teams and their respective capabilities to ensure a positive experience.

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