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Data Network Transformation with SD-WAN

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The transition to cloud-based applications and services has placed organizations under acute pressure to reduce both the complexity and cost of their computer-to-computer wide area networks (WANs). New network-as-a-service (NaaS) offerings that deliver WAN access through the cloud by using a software-defined wide area network (SD-WAN) can reduce both the costs and complexities of data services. As communication service providers begin to roll out new SD-WAN services, IDC has seen organizations adopt and show rising interest in them. This IDC Analyst Connection answers key questions regarding current and future adoption plans, benefits, and challenges of SD-WAN.

The following Q&A session, proposed by TELUS Communications, features Lawrence Surtees, Vice President, Communications Research, at IDC Canada.

Q. What is SD-WAN and how is it related to NaaS?

A. First, we should consider the concept of network as a service. NaaS is a broad umbrella term describing services for network connectivity that unify network and computing resources. Simply, NaaS applies virtualization and cloud-based computing to networking. Hosted or so-called "managed" NaaS offerings that reside in a provider's network can bundle access with a wide variety of value-added services, including proactive network management, built-in security and firewalls, storage, and application delivery. In a cloud delivery model, NaaS frees organizations from having to manage complex and expensive network resources, including wireless LANs, security appliances, switches, and application delivery controllers in an organization's datacentre or campus network. And when these resources reside in a provider's network, they can be shared easily and ubiquitously by an enterprise's branches.

SD-WAN is an emerging service that is a type of hybrid WAN that is flexible and resilient. It uses centralized, cloud-managed, policy-enabled network or service control to dynamically set up and manage all WAN connections for enterprise communications services such as virtual private networks (VPNs), managed internet access, voice over IP (VoIP), and network-based firewalls. While SD-WAN has a business case or purpose in single-site scenarios, it is especially relevant to vertical sectors and organizations that have branches such as retail, transportation, financial services, and municipal governments.

IDC perceives several other scenarios and use cases for SDN deployments and capabilities in enterprise deployments, including:

- Faster deployment and optimization of WAN bandwidth with automated self-provisioning providing network programmability and customization
- Maximizing value from server virtualization and providing elastic web scaling
- Supporting video streaming and collaboration applications and easily interfacing with new managed unified communication and collaboration (UCC) services
- Providing dynamically segmented networks, such as WiFi and VLANs

SD-WAN applies new software-defined networking (SDN) technology to WAN connections to connect enterprise networks – including branch offices and datacentres – over large geographic distances. SDN evolved from an approach called "policy-based networking" that first appeared in the late 1990s. The basic idea is to enable applications to "talk" to the network to request appropriate service levels such as quality of service (QoS), class of service (CoS), and bandwidth. SDN goes much further by moving network control into the cloud, using a software-based approach that enables dynamic provisioning of network resources to support real-time applications.

Q. Why are NaaS and SD-WAN important?

A. Businesses have entered a new era of digital transformation (DX) driven by the rise and mashup of 3rd Platform technologies of cloud computing, wireless, social and collaborative networking, and Big Data. The network has become a more critical element, especially in meeting the high expectations associated with cloud application performance and customer experience. This has spawned a need for a comparable network transformation to accommodate demand for increasing bandwidth and ubiquitous internet and application access from any branch and remote location – and on any device. Networks for this 3rd Platform era require greater simplicity, automation, and scale to improve business productivity and competitive advantage.

"DX represents a profound, technology-dependent organizational culture shift."

For additional insight on the relationship of DX to network and business transformation, see the blog post by Steven Shepard, *Network Infrastructure: The Beating Heart of Digital Transformation*, at: http://businessblog.telus.com/post/69180/techtrends/network-infrastructure-the-beating-heart-of-digital-transformation

Dynamic networking made possible by SDN provides the more robust and scalable architecture to support these new demands imposed on enterprise networks. Cloud-based SD-WAN services herald the ability to select, manage, and provision WAN services, just like buying a plane ticket on Expedia.

Reducing both the complexity and cost of enterprise WANs are the two chief benefits of SD-WAN. The need for more "consistent security," "price," and "reduced complexity" are the top

3 motivators identified in a global IDC survey of organizations that are considering SD-WAN adoption (36%, 35%, and 31% respectively). More than three-quarters (80%) of Canadian organizations agree that simplifying management of their networks would be a significant business benefit.

SD-WAN enables easier data network management, better bandwidth allocation and packet prioritization, and real-time provisioning – increasing speed to deployment – and promises substantial cost savings from other WAN methods, including MPLS VPN services.

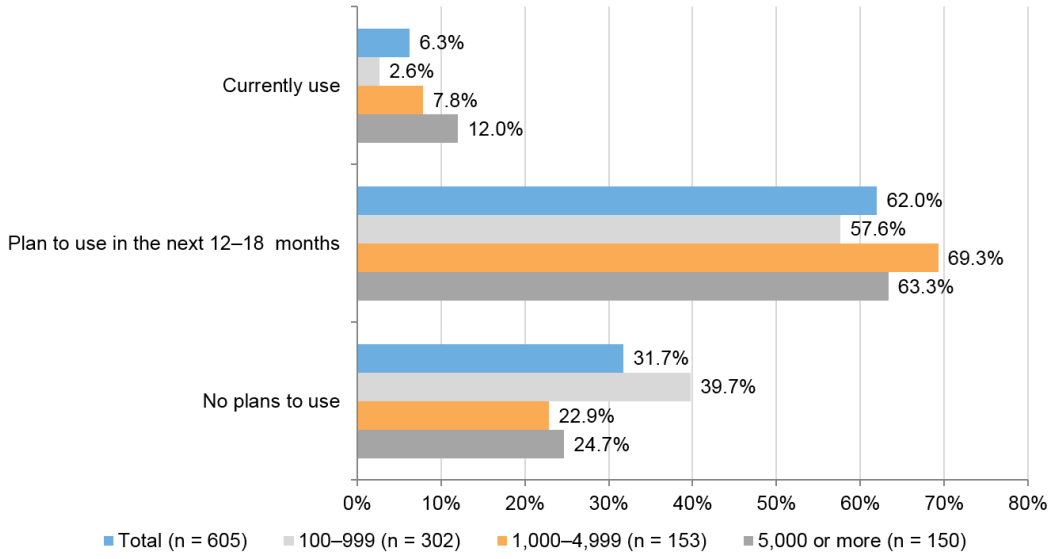
The value proposition of SD-WAN – predicated on the growth of cloud computing, the need for simplified VPN capabilities, and the business imperative of reducing MPLS costs – will be compelling for a growing number of enterprise customers seeking to provide cost-effective cloud-era networking to branch offices and remote sites. IDC finds there is clear demand for SD-WAN from organizations throughout the world.

Even though SD-WAN is still nascent, as commercial offerings first became available only in 2015, IDC surveys reveal that planned adoption of SDN is moving in lockstep with the advance of cloud computing and 3rd Platform technologies. *More than two-thirds (70%) of global firms surveyed by IDC say they will have adopted SD-WAN, in some form, by the beginning of 2018* (see Figure 1). IDC believes SD-WAN will be adopted by 60% of all organizations as a critical component of remote branch connectivity by 2018, making SD-WAN a US$6 billion market in 2020.

FIGURE 1

Worldwide Enterprise SD-WAN Adoption, 2016-2017 (% Respondents)

Q.: Does your organization currently use or plan to use SD-WAN?



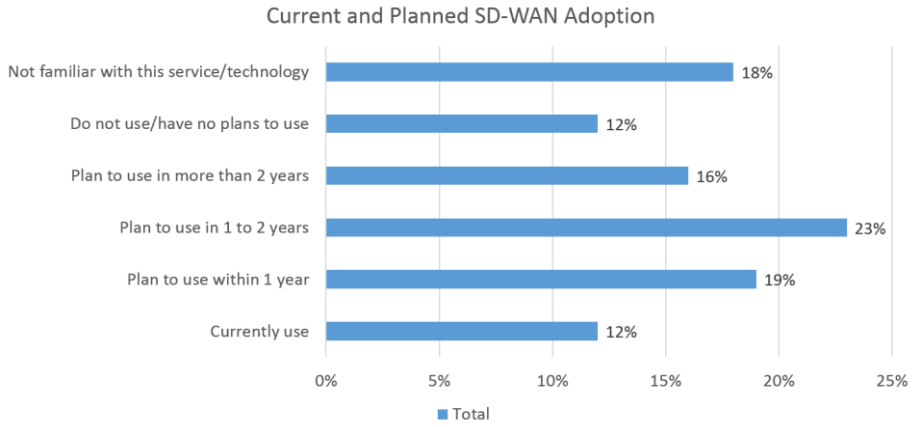
Note: Managed by IDC's Quantitative Research Group; data not weighted; n = 605 (50 from Canada); base = all respondents
Source: IDC, *Software-Defined WAN (SD-WAN) Survey*, April 2016

IDC Canada's most recent business telecom survey, conducted late last summer, also finds 70% of Canadian organizations either use or say they plan to use SD-WAN within two years (see Figure 2).

FIGURE 2

Canadian Enterprise SD-WAN Adoption, 2016 (% Respondents)

Q.: Software-defined WAN (SD-WAN) is a new hybrid WAN service that automates the ongoing configuration of branch office networks, running varied application traffic over a hybrid of public broadband, private MPLS links, and other WAN links such as LTE. Which statement best describes how you use or plan to use an SD-WAN solution?



70% of Canadian organizations either use or say they plan to use SD-WAN within two years.

Notes: Respondents are medium-sized and large firms with existing WANs; data is weighted; n = 179

Source: IDC Canada, *2016 Business Telecom Survey*, December 2016

Q. What are the top concerns about NaaS?

A. The fear of higher connectivity charges, equipment costs, and technology migration issues are the top 3 challenges that organizations say they encounter when deploying new WAN functions, according to IDC's global survey. Other concerns cited include:

- Complexity of solutions
- Shortage of adequate skill sets
- Security of cloud-based services and open standards software
- Need for firm standards
- Quality of service (QoS) and service level agreements (SLAs) to guarantee network performance
- Delivery of software-as-a-service (SaaS) applications

Q. How can organizations overcome these challenges?

A. Most of those concerns dissipate when SD-WAN is a NaaS – that is, managed by a provider.

Costs. Organizations expect an average of 20% cost savings from SD-WAN, according to IDC's global survey. SD-WAN delivers both *capital and operating cost savings* – capex costs associated with WANs can drop by as much as two-thirds through elimination of hardware purchases (such as routers) and refresh upgrades; ongoing operating costs can be lowered by a minimum of 15% from streamlined processes, reduced management, and maintenance costs. Actual savings vary widely between firms, depending on their existing WAN deployment. Additional ROI benefits are attainable by determining how much time is freed for IT staff, for example, to focus on increasing business productivity and customer experience.

Migration. Network evolution issues are minimized because SD-WAN supports both public and hybrid cloud and network deployments. The increasing migration of enterprise data traffic from branches directly to the internet is also a key factor in migration to SD-WAN and its adoption. SD-WAN service takes advantage of the internet for so-called "over-the-top" delivery enabling replacement of more expensive dedicated VPN WAN access methods – called "MPLS VPN offload."

SD-WAN service ideally goes hand in hand with new fibre optic connections for the last mile, which provide much higher speeds and bandwidth at dramatically lower prices per megabit than other connectivity methods – and makes SD-WAN applicable to most organizations, regardless of size.

IDC believes SD-WAN combined with improved broadband access will result in a paradigm shift in reducing IT opex.

Security. Security of enterprise networks is strengthened by the provider's real-time cybersecurity infrastructure. NaaS SD-WAN can also be combined with managed network security service from core to edge.

Skills and complexity. Lack of knowledge or experience is less of an issue when SD-WAN is managed by a network service provider.

Standards. SDN is based on open standards and therefore avoids vendor lock-in, enabling the use of services from multiple providers and benefiting from an open software community.

SLAs. SLAs, which are typically based on network-based metrics, can now be application-based and be visible in near real time through a web portal.

SaaS. Most enterprises are expected to migrate network services applications to internet SaaS providers and SD-WAN can provide a better experience by allowing direct access to the internet to reach the SaaS applications.

Finally, managed SD-WAN is "future proofed" by the service provider, thus eliminating software upgrade costs and hours of experimentation, further boosting ROI benefits.

Ultimately, software-defined networks will be liberating for organizations and their IT departments as today's static networks are transformed into flexible, programmable platforms that also accelerate application deployment and business innovation. While SD-WAN is an important network element enabling digital network transformation, its ultimate goal is to facilitate and improve *business* transformation for the enterprise of the 3rd Platform era.

ABOUT THIS ANALYST

Lawrence Surtees is vice president and principal analyst, Communications Research, at IDC Canada Ltd. He manages IDC Canada's communications research agenda and is IDC's lead analyst covering the Canadian communications services sector, including the wireline, wireless, and internet segments. He also works on related IDC consulting projects. Widely regarded as one of Canada's foremost experts on the telecommunications sector, he has covered the telecom sector, including both service providers and equipment makers, as well as related regulatory and policy issues, for 35 years. Prior to joining IDC Canada in September 2000, Surtees spent 17 years as a reporter at The Globe and Mail newspaper in Toronto, where the bulk of his tenure was spent on the Report on Business covering telecommunications and related high-technology companies. He is the author of two books on the history of telecoms in Canada, and is frequently sought as a speaker, lecturer, and media commentator.