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TECHNOLOGY

SD-WAN for a multi-cloud world

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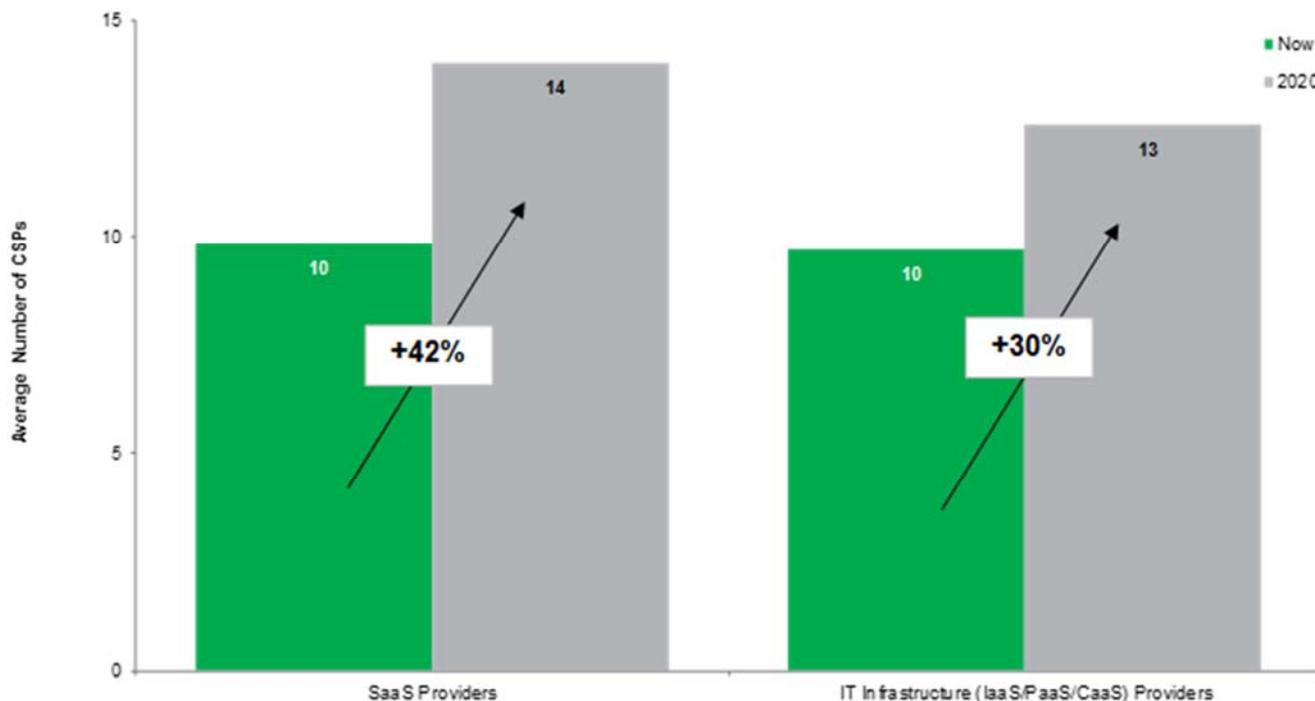
Towards the multi-cloud...

With a large number of enterprises marching towards digital transformation, the consumption of off-premises cloud services (IaaS and SaaS) from multiple providers is on the rise. As a result, enterprises are creating their own custom "cloud of clouds", or multi-cloud, forcing them to re-think their WAN strategy and focus on computing at the edge. Connecting the enterprise branch and on-premises data centers to each cloud service provider (CSP) data center creates a level of WAN management complexity for internal NetOps and DevOps teams.

The transition to the multi-cloud is not an element of the future; it is happening now. Respondents of our *Cloud Service Strategies and Leadership North American Enterprise Survey – 2018* indicate they are using 10 different CSPs for SaaS (growing to 14 by 2020) and 10 for infrastructure (growing to 13 by 2020). This result is not surprising given last year's study, where respondents were using an average of 8 CSPs in 2017 with plans to use 11 by 2019.

One key opportunity multi-clouds offer is that enterprises consuming cloud services from different providers will seek support to manage the delivery of their services, ultimately avoiding adding the extra burden to their in-house IT teams. We expect users to continue using off-premises cloud services from numerous specialized players to address their specific needs; providers may, for example: offer assurances that all operations (including company management) are in region, provide branded applications as SaaS, such as SAP, Salesforce, and Office 365, or offer various flavors of IaaS that provide virtualized or bare metal servers with specific OS builds.

Exhibit 1: Number of CSPs in use



Source: IHS Markit *Cloud Service Strategies and Leadership North American Enterprise Survey, 2018*

SD-WAN will provide connectivity for the multi-cloud...

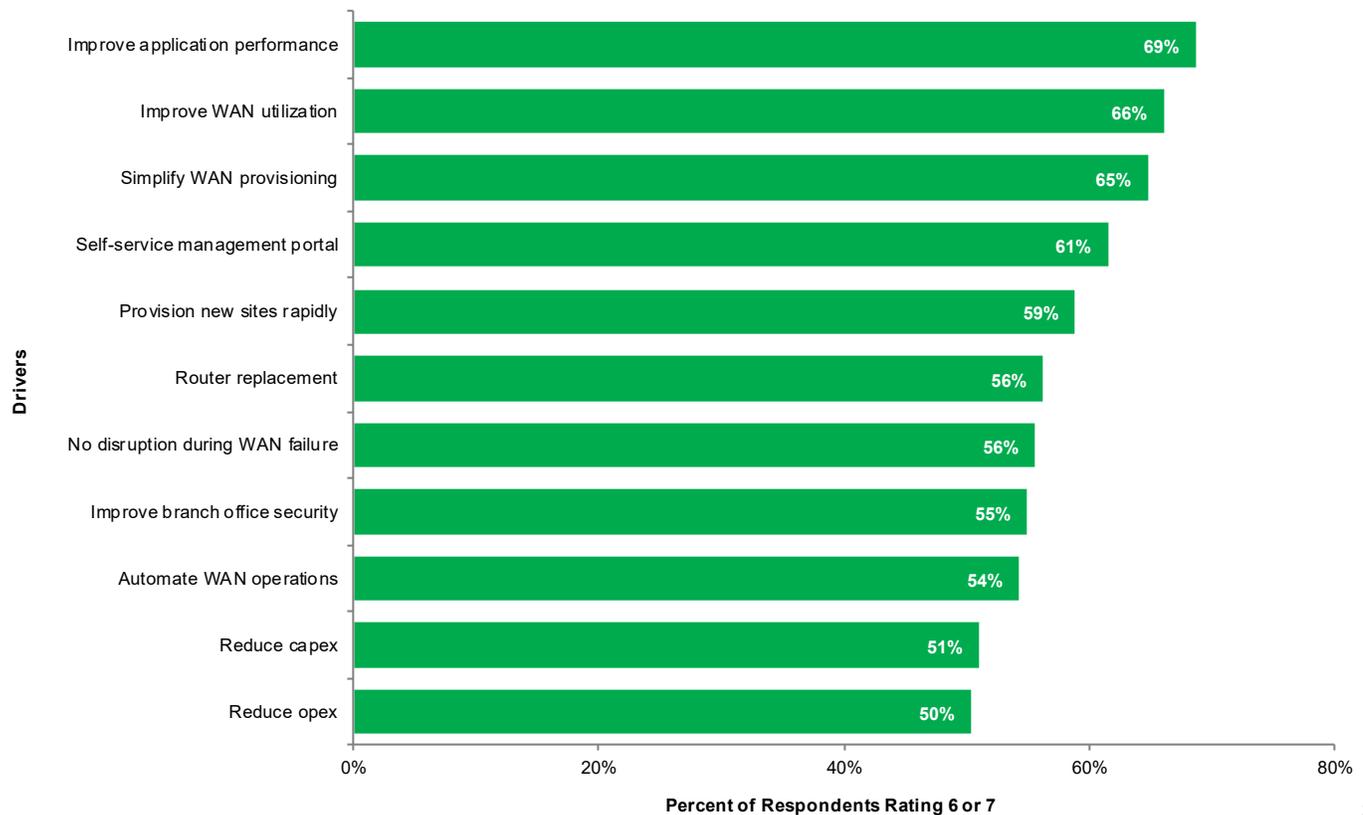
SD-WAN is a next-generation automated networking technology that provides control and agility through virtualizing WAN links, visibility into application performance, enhanced security, and dynamic load balancing.

SD-WAN solutions not only solve the transportation issue but also assist enterprises in creating a fabric for the multi-cloud. Features such as analytics for understanding end user behavior, enhanced branch security, and the ability to have a centralized management portal all make SD-WAN an enticing proposition for enterprises looking to adopt a multi-cloud approach and keep WAN management simple.

As the consumption of SaaS- and IaaS-based traffic increases, improving application performance helps to make organizations create better end user experiences while also increasing employee productivity. SD-WAN provides improved application performance through policy-determined priority application traffic steering and the ability to monitor application performance via analytics features wherever the application is being hosted.

From our survey, other drivers for SD-WAN include improving WAN utilization, simplifying provisioning, and provisioning new sites rapidly—indicating that enterprises deploy SD-WAN to reduce reliance on costly MPLS and enable quick reaction to changing traffic patterns as new applications are put into service or existing applications are modified. SD-WAN significantly reduces the complexity to bring on board new sites, making it an important technology for growing enterprises. Self-service management portals often assist in the control and management of the network for NetOps teams, hence why 61% of respondents to our survey (see Exhibit 2) indicated self-service portals to be a deployment driver.

Reducing both capex and opex appears to be less of a driver to enterprises; however, when we split survey respondents into two groups, SD-WAN-using respondents and respondents using traditional WAN architectures, it became clear that the WAN expenditures of SD-WAN-using respondents are much higher (~30% on average) and faster growing (22% in 2019) than traditional WAN respondents, which might lead one to conclude that the cost reduction promise of SD-WAN is not true. However, when we factor in the much higher bandwidth deployed by SD-WAN respondents, their annual cost per Mbps is ~30% lower than WAN respondents, and they expect costs to decline at a faster rate (24% vs 21%), indicating that SD-WAN is indeed a crucial tool to bring run-away traffic growth in line with budget reality.

Exhibit 2: SD-WAN drivers, automated connectivity for the multi-cloud

Source: IHS Markit *Enterprise Edge Connectivity Strategies, North American Enterprise Survey, 2018*

Source:

...and the multi-cloud will fuel SD-WAN adoption

As seen in IHS Markit's latest *Data Center Networks Equipment Tracker – Regional Q3 2018*, the SD-WAN market is maturing in 2018 with revenue to SD-WAN vendors forecasted to reach \$1B, up 115% YoY. This maturation can also be made evident based on survey respondents indicating 39% were in production trial by end of 2018, with 2019 seeing 52% of respondents in live production.

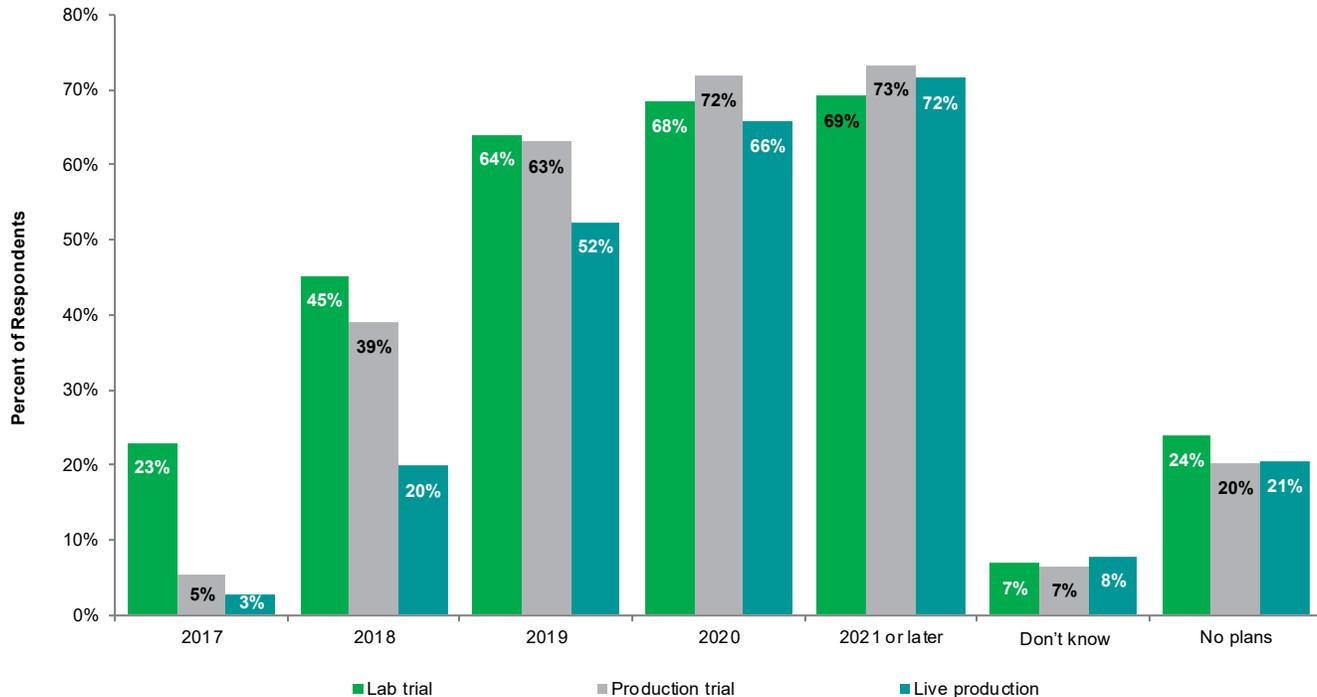
This is due to a number of factors, but most prominent will be that as deployments have matured with early adopters and the benefits of deploying SD-WAN are proven, confidence in SD-WAN is increasing as deployment issues found by early adopters are ironed out and network performance gains of implementation are made evident.

66% of respondents are expected to be in live production by end of 2020. Enterprises are also seeking greater cloud connectivity while adopting a multi-cloud strategy and re-thinking how they provide connectivity for the enterprise edge. SD-WAN provides the fabric for the multi-cloud, and SD-WAN vendors have been relatively successful in encouraging enterprise adoption through partnering with several CSPs, enabling enterprises to pursue their multi-cloud strategy.

In addition to CSPs contributing to SD-WAN adoption, telco service providers have been working hard to position themselves by offering multiple virtual network functions (VNFs) such as firewalls, load balancers, WAN optimization control, and VPNs bundled with SD-WAN. Moving forward, we believe enterprises will look to service providers for managing their SD-WAN-enabled infrastructure while also providing connectivity.

Finally, the rise of the universal CPE (uCPE) market will also fuel SD-WAN adoption. uCPEs are appliances capable of hosting VNFs, such as routing, firewall, acceleration, and more. Consolidating these functions on a single device lowers hardware costs and improves agility by making it easier to manage remote offices and roll out new networking services. Interest in uCPE is growing strongly from enterprises that want to automate management of their edge connectivity and is an important element used by service providers to deliver SD-WAN.

Exhibit 3: SD-WAN deployment timeline



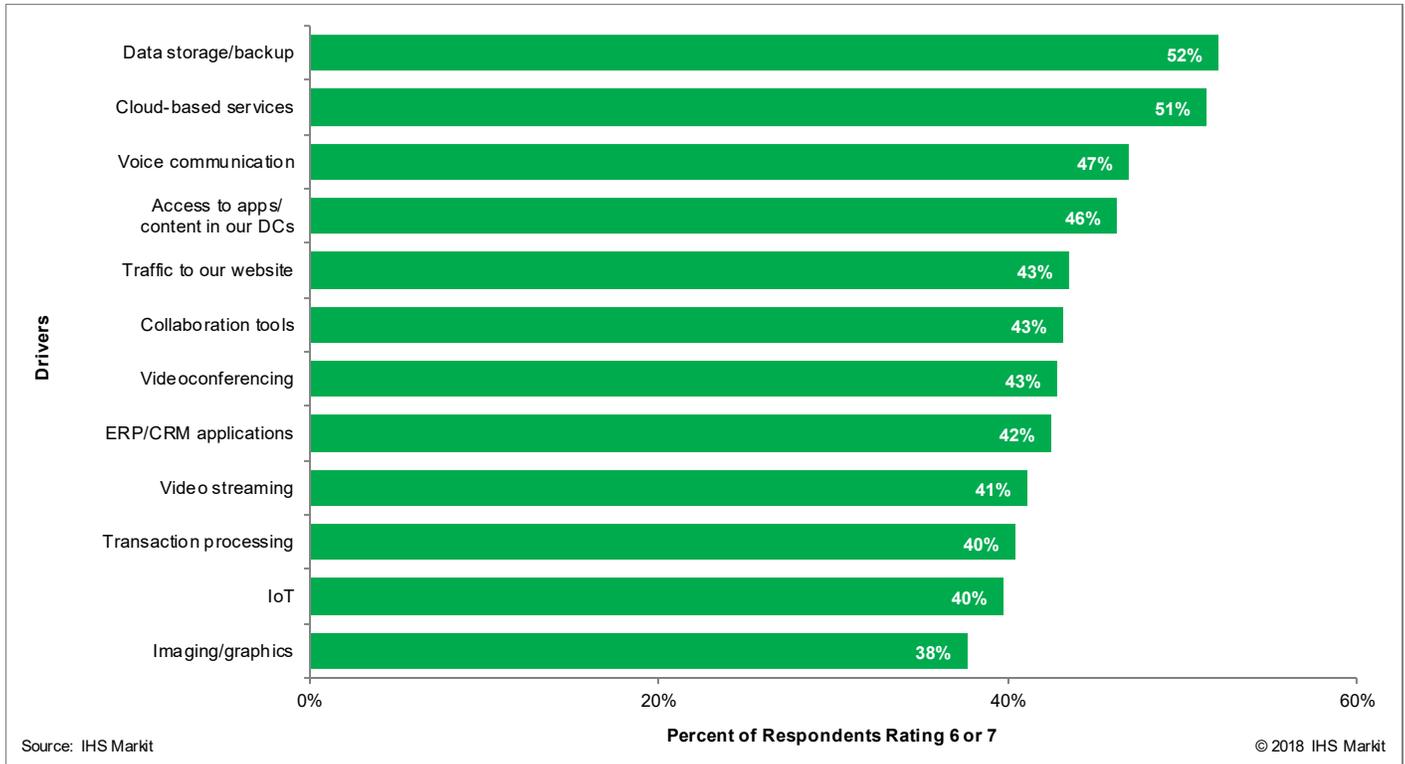
Source: IHS Markit *Enterprise Edge Connectivity Strategies, North American Enterprise Survey, 2018*

Multi-cloud will extend to the enterprise edge

The growth of cloud (IaaS and SaaS) and IoT applications is driving an increased focus on computing at the edge. In the IHS Markit *Cloud Service Strategies and Leadership North American Enterprise Survey - 2018*, we found that ~1/3 of IT will be spent on cloud services by 2019, and cloud-based services is ranked #2 as a driver of WAN bandwidth by respondents of our *Enterprise Edge Connectivity Strategies, North American Enterprise Survey -2018*.

One could look at “cloud services” and say it’s a very broad category with the applications having nothing in common. That is somewhat correct, as Webex is very different than Salesforce or Office 365. However, there is one point of commonality: they are all hosted in the cloud. With legacy WANs, all cloud apps come in through the central data center Internet connection, hop over the WAN, hit the branch, and then reverse the cycle creating a “trombone” effect that introduces latency, making it a significant WAN challenge. SD-WANs can be configured with secure local Internet breakout with specialized cloud on-ramp features so those at the enterprise edge can access cloud services directly, cutting down dramatically on branch to data center traffic. This saves money and increases available bandwidth, but more importantly, dramatically improves application performance.

Currently, IoT is ranked low as a bandwidth driver by traditional WAN respondents to our survey (as shown in Exhibit 4); however, SD-WAN-using respondents are heavily involved in IoT deployments. IoT is a much bigger investment driver for them, has a higher contribution to traffic growth, and IoT gateway is the fastest growing WAN feature functionality for SD-WAN-using respondents.

Exhibit 4: WAN bandwidth drivers, cloud and IoT forces expanding enterprise edge

Source: IHS Markit *Enterprise Edge Connectivity Strategies, North American Enterprise Survey*

Bottom line

With digitization of the enterprise, the consumption of off-premises cloud services (IaaS and SaaS) from multiple providers is on the rise. Enterprises are creating their own custom “cloud of clouds”, or multi-cloud, forcing them to re-think their WAN strategy to avoid WAN management complexity.

SD-WAN solutions not only solve the transportation issue but assist enterprises in creating a fabric for the multi-cloud. Features such as analytics for understanding end user behavior, enhanced branch security, and the ability to have a centralized management portal all make SD-WAN an enticing proposition for enterprises looking to adopt a multi-cloud approach and keep WAN management simple. Zero-touch provisioning for SD-WAN significantly reduces the complexity to bring on board new sites, making it an important technology for growing enterprises. Self-service management portals often assist in the control and management of the network for NetOps teams.

Today’s SD-WAN-using enterprises’ bandwidth usage is much higher and faster growing than traditional WAN respondents’. Further, IoT is a much bigger investment driver for them, has a higher contribution to traffic growth, and IoT gateway is the fastest growing WAN feature functionality for SD-WAN-using respondents.

Moving forward, we believe many enterprises will look to service providers for managing their SD-WAN-enabled infrastructure while also providing connectivity.

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To Learn More

Join us for “**SD-WAN in a multi-cloud world**”
a free webinar presented by IHS Markit and Sponsor name:

LIVE: March 5, 2019
8:00 AM PT, 11:00 AM ET, 15:00 UTC

REPLAY: Watch on-demand any time

Both the live event and replay can be accessed at: <https://bit.ly/2Vu1uUs>



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