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EXECUTIVE SUMMARY

The Software-defined Wide Area Network (SD-WAN) market has evolved from the early adopter stage to the early growth stage of the product lifecycle. SD-WANs utilize intelligent, application-aware software to route traffic over the optimal network technology, based on business policies. This means that enterprises do not have to depend solely on Multiprotocol Label Switching (MPLS) links for multi-site connectivity, but instead can consider hybrid WAN deployments that make the best of internet (inexpensive and widely available) and MPLS (private and reliable) connections. The ability to ensure optimal application performance regardless of the underlying transport, and to control branch-site routing policies remotely, has attracted significant interest from enterprises, especially from verticals with highly distributed branch locations.

Frost & Sullivan’s previous survey, in 2016, provided insights into the SD-WAN market as it was navigating through the early adopter stage. In the last two years, enterprise decision makers have equipped themselves with a much better understanding of the benefits that SD-WAN brings to enterprise WANs. SD-WAN vendors and managed SD-WAN providers alike report witnessing a surge in sales and actual deployments. The Frost & Sullivan 2018 SD-WAN survey validates market trends, and captures insights into future adoption trends.
SURVEY METHODOLOGY AND RESPONDENTS’ DEMOGRAPHICS

To understand enterprise perceptions and activities regarding SD-WAN, Frost & Sullivan conducted an end-user survey in April 2018. The net result is a set of data, and conclusions drawn from that data, which provides directional insight regarding the SD-WAN market within the US. A web-based survey was administered to US-based IT decision makers, and returned responses from 350 companies.

**RESPONDENTS BY TITLE**

<table>
<thead>
<tr>
<th>Title</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director of Network/IT/Infrastructure/Security Operations</td>
<td>22%</td>
</tr>
<tr>
<td>Manager of Network/IT/Infrastructure/Security Operations</td>
<td>20%</td>
</tr>
<tr>
<td>Vice President of Network/IT/Infrastructure/Security Operations</td>
<td>15%</td>
</tr>
<tr>
<td>Chairman/President/CEO</td>
<td>14%</td>
</tr>
<tr>
<td>CIO/CTO/CISO (Chief Information Security Officer)/CRO (Chief Risk Officer)</td>
<td>11%</td>
</tr>
<tr>
<td>Network/IT Engineer/Administrator</td>
<td>10%</td>
</tr>
<tr>
<td>Network/IT/Cloud/Security Architect</td>
<td>8%</td>
</tr>
</tbody>
</table>

**RESPONDENTS ROLE IN IT/NETWORK DECISION MAKING**

- I am a **key influencer** for network and IT related purchases: 7%
- I am a decision maker for **some** of the network and IT related purchases: 16%
- I am a decision maker for **nearly all** network and IT related purchases: 77%

**RESPONDENTS BY VERTICALS**

- Technology: 15%
- Retail Trade: 15%
- Manufacturing: 15%
- Banking, Financial Services & Insurance (BFSI): 15%
- Healthcare: 15%
- Others: 25%
SD-WAN ADOPTION TRENDS (U.S.), 2018

15% of respondents indicated their organization has deployed SD-WAN (double the 7% of respondents who indicated they had deployed SD-WAN in our 2016 survey). Another 18% of respondents in our 2018 survey indicated they have an SD-WAN deployment underway. While the adoption percentages are slightly higher than what Frost & Sullivan expected, directionally, they validate the growth in sales that vendors are seeing in the market.
SD-WAN solutions have seen a slightly higher deployment rate within the retail vertical. However, when we combine responses of “have deployed” and “currently have an SD-WAN deployment underway,” deployment rates across retail, manufacturing and healthcare verticals are similar. Banking, financial services and insurance (BFSI) and healthcare verticals have been slower to deploy than other verticals, but a high percent of respondents indicated they plan to deploy SD-WAN in the next 12–24 months.
SD-WAN ADOPTION BY COMPANY SITES (U.S.), 2018

When we dissect the results by businesses’ branch sites, businesses with 500+ sites are more likely to deploy than other segments. However, if we consider those that either have deployed SD-WAN or currently have a deployment underway, businesses with under 200 branch sites come out ahead, comprising nearly 40% of respondents in those segments. Frost & Sullivan believes that the early adoption trends in these two categories are for completely different reasons. While cost savings and speed of deployment are the key drivers for businesses with 11–200 sites, optimized cloud connectivity and centralized network management are factors that matter most, alongside reduced WAN costs, to businesses with 500+ sites.

<table>
<thead>
<tr>
<th>Company Branch Sites</th>
<th>HAVE Deployed</th>
<th>DEPLOYMENT UNDERWAY</th>
<th>WILL DEPLOY IN 12–24 MONTHS</th>
<th>WILL NOT DEPLOY IN THE NEXT 24 MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>11–50</td>
<td>14%</td>
<td>25%</td>
<td>47%</td>
<td>14%</td>
</tr>
<tr>
<td>51–200</td>
<td>18%</td>
<td>20%</td>
<td>59%</td>
<td>9%</td>
</tr>
<tr>
<td>201–500</td>
<td>9%</td>
<td>12%</td>
<td>78%</td>
<td>1%</td>
</tr>
<tr>
<td>500+</td>
<td>20%</td>
<td>15%</td>
<td>56%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Key drivers of adoption: **cost savings and speed of deployment**

Key drivers of adoption: **optimized cloud connectivity and centralized network management**
Despite all the talk about MPLS decline in the market, our survey results indicate that a considerable percentage (38%) of respondents currently use and plan to use MPLS with Internet links. Respondents also indicated that their use of MPLS and mobile, and MPLS and satellite, would go up in the next 12–24 months. MPLS VPNs are the dominant type of WAN service used by enterprises that need to connect their distributed enterprises, globally. MPLS connections are private networks that never touch the Internet, and offer a high level of reliability and performance, as they enable traffic prioritization using the class of service (CoS) feature. Frost & Sullivan is of the opinion that most enterprises will retain MPLS links at some of their core sites (while replacing them with Internet/mobile links at less mission-critical sites), and augment them with high-speed broadband links while embracing SD-WAN.

Most enterprises will retain MPLS links at some of their core sites, and augment them with high-speed broadband links **WHILE EMBRACING SD-WAN.**
KEY REASONS COMPELLING ENTERPRISES TO ADOPT SD-WAN (U.S.), 2018

SD-WAN solutions leverage real-time performance monitoring of transport networks to make application-aware, policy-based network selections. The controller defines application-specific routing policies on branch routers to select a network service that best suits the application traffic. Real-time monitoring of network services ensures that deviations from policy parameters related to availability (sufficient bandwidth) and reliability (latency, jitter, and packet loss) are sensed before they affect end users; and traffic can be routed to a different network service; or other traffic-handling techniques can be applied (e.g., throttle less critical application traffic). All of these features ensure a high level of resiliency and superior WAN performance for enterprises.

- Ensure resiliency and business continuity 24X7: 78%
- Achieve superior WAN and application performance: 78%
- In-depth visibility into end-to-end network and application performance: 76%
- Apply granular security policies (for example, separate guest Wi-Fi, steer critical apps through an UTM appliance, or steer recreational traffic through cloud-based firewall): 76%
- Cost savings from use of Internet and wireless links, instead of relying on expensive MPLS links: 73%
- Helps us move from a router-centric architecture to an application-centric architecture, and centrally configure, manage and orchestrate all branch sites: 72%
- Use all network links in active-active mode and better link capacity utilization: 66%

SD-WAN solutions leverage real-time performance monitoring of transport networks to make APPLICATION-AWARE, POLICY-BASED NETWORK SELECTIONS.
In our 2018 survey, “Cloud-based network management,” “support edge device in physical and virtual form factors,” and “support for various routing protocols” are the top-rated vendor selection criteria. The choices reflect the evolution of the market in terms of understanding SD-WAN features and functionalities, and its value to enterprise WAN. Cloud-based centralized network management is a huge shift from router-centric management. With centralized orchestration and management that can be hosted in a cloud, on-prem, or procured as as-a-service, network and application policies can be defined and populated to edge appliances quickly via a GUI-based portal.

**SD-WAN VENDOR SELECTION CRITERIA (U.S.), 2018**

- Cloud-based network management: 75%
- Integrated unified threat management (UTM) functionality or next generation firewall: 74%
- Longevity and stability of vendor in the market with support across global locations: 74%
- Support edge devices in both physical and virtual form factors: 72%
- Support for various routing protocols (OSPF, BGP, IPv6): 69%
- Integrated WAN Optimization: 68%
- Support service chaining and GUI-based centralized network management: 66%
SD-WAN BUYING PREFERENCES: FULLY MANAGED SD-WAN ON THE RISE (U.S.), 2018

54% of the survey respondents indicate they would prefer a fully managed SD-WAN from a service provider; the remaining respondents are divided between the “DIY approach” and “co-managed approach.” Interviews with service providers and SD-WAN vendors confirm these trends. Frost & Sullivan believes that while a fully managed approach is the most preferred option today, as the SD-WAN market evolves, enterprises will gravitate towards the co-managed approach, as it helps them retain a certain level of control over their WAN operations.

As the SD-WAN market evolves, enterprises will gravitate towards the CO-MANAGED APPROACH.
Managed SD-WAN service providers’ ability to aggregate and manage network services from multiple providers, troubleshoot problems quickly, and simplify vendor management are the top three reasons respondents choose a managed SD-WAN service.

**REASONS COMPELLING ENTERPRISES TO BUY FULLY MANAGED SD-WAN (U.S.), 2018**

- **75%** Managed SD-WAN provider can aggregate and manage multiple network providers
- **74%** Service Providers can troubleshoot and restore services quicker than our internal team
- **73%** Simplified vendor management, unified billing and portal capabilities as the managed SD-WAN provider acts as the single point of contact

- **73%** Managed service provider provides a SLA for the SD-WAN service
- **71%** Unified management of all my network services—access, data, voice, security
- **71%** Gives us the flexibility to buy and pay for the service in a subscription-based billing
- **67%** Service providers have already vetted the providers making the decision process shorter
CONCLUSIONS

Frost & Sullivan’s 2018 SD-WAN survey confirms the growth trends and provides insight into enterprise IT decision makers’ perceptions about SD-WAN. Key highlights of the survey results include:

ADOPTION DOUBLED

Market adoption in 2018 doubled from 2016, with 15% of the enterprise respondents indicating they have deployed SD-WAN.

BUSINESS BENEFITS

There is deeper and broader appreciation of the benefits and value proposition of SD-WAN in the market currently, compared to two years ago. While the early adopters in our 2016 survey cited “cost savings” and “speed to deployment of branch sites,” 2018 survey respondents indicated “resiliency and business continuity” and “superior WAN performance” as top-rated benefits they expect from SD-WAN.

MPLS STILL RELEVANT

In terms of network services used with SD-WAN, dual broadband with Ethernet and Internet links are the mostly widely used. While there has been a lot of talk about rapid decline of MPLS links due to SD-WAN, our survey results indicated otherwise, with a significant percentage of respondents indicating they will continue to keep MPLS alongside Internet or wireless links.

PREFER MANAGED

Managed SD-WAN service continues to be popular among enterprises, with over 50% of the respondents indicating they prefer to buy a managed SD-WAN service.
BEYOND THE NUMBERS: FIVE STEPS TO ENSURE THE SUCCESS OF YOUR SD-WAN IMPLEMENTATION

The Frost & Sullivan 2018 SD-WAN End-User Survey provides valuable glimpses into the choices and experiences of a range of enterprises—perhaps including your peers, competitors, and even tomorrow’s industry disruptors. But what does it mean for your own SD-WAN journey? Whether you are just starting to research SD-WAN or are well into your deployment, here are five steps to facilitate success:

01 Align SD-WAN with your Digital Transformation Initiatives

**WHAT THE SURVEY SHOWS**
SD-WAN makes it easier for network managers to do their jobs, by simplifying network management functions, optimizing capacity utilization, and decreasing costs. But the top reasons for SD-WAN adoption are strategic business drivers that relate directly to digital transformation.

**“VERY” OR “EXTREMELY IMPORTANT” DRIVERS TO SD-WAN**

<table>
<thead>
<tr>
<th>Business resiliency</th>
<th>Superior application performance</th>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>78%</td>
<td>78%</td>
<td>76%</td>
</tr>
</tbody>
</table>

**WHAT IT MEANS TO YOUR BUSINESS**
By aligning the SD-WAN project with your company’s strategic business initiatives, you will be better positioned to gain executive support (and budget). Start early in the process by educating key stakeholders, including your colleagues in other business units, about the critical need for a flexible network to support next-generation technologies and architectures—such as cloud, Internet of Things, serverless compute, and streaming media.

Work with business leaders to quantify benefits associated with SD-WAN: for example, calculate the revenue or productivity impact of opening (or closing) a branch office weeks earlier than was possible with static network links; or the cost savings and higher application availability associated with deploying active-active links, compared with deploying idle backup links.

**AN EXPERIENCED PARTNER CAN HELP YOU BUILD A BUSINESS PLAN, AS NEEDED.**
CONTINUED
FIVE STEPS TO ENSURE THE SUCCESS OF YOUR SD-WAN IMPLEMENTATION

02 | Create an SD-WAN Roadmap

WHAT THE SURVEY SHOWS
Early adopters of SD-WAN tiptoed in, deploying a few sites as they assessed the value of the new technology, with nearly half of deployments comprising 50 sites or fewer. As the tremendous benefits of SD-WAN became apparent, enterprises are now hastening to implement all critical sites.

<table>
<thead>
<tr>
<th>NUMBER OF SITE DEPLOYMENTS</th>
<th>70%</th>
<th>15%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Branch Sites</td>
<td>50 +</td>
<td>250 +</td>
</tr>
</tbody>
</table>

WHAT IT MEANS TO YOUR BUSINESS
SD-WAN technology allows you to move at your own pace, rather than deploying all sites at once. But a lesson to be learned from the early adopters is that the greatest benefits—in terms of cost savings, management simplicity, and application consistency—accrue as more sites are deployed.

The smartest approach is to build a roadmap for your entire business, ranking sites according to the greatest need (for example, those sites with costliest network links or most critical applications). That way, the first sites deployed will be “quick wins” in which you can clearly measure the benefits.

BY SHARING THE POSITIVE RESULTS WITH THE BUSINESS, YOU CAN CONTINUE THE MOMENTUM OF THE SD-WAN PROJECT ACROSS ALL SITES.
CONTINUED
FIVE STEPS TO ENSURE THE SUCCESS OF YOUR SD-WAN IMPLEMENTATION

03 | Leverage your Preferred Network Technologies

WHAT THE SURVEY SHOWS
SD-WAN doesn’t mean giving up highly reliable enterprise networking services in favor of best-effort public internet or cellular services. The majority of businesses expect to continue to use proven technologies such as MPLS and Ethernet alongside lower-cost technologies at their SD-WAN sites. Application-aware routing on SD-WAN ensures that traffic is easily routed over the optimal network technology.

WHAT IT MEANS TO YOUR BUSINESS
Select an SD-WAN vendor that supports a range of connectivity options, including vendor-provided MPLS IP-VPN, internet and broadband aggregation, as well as enterprise-provided network options. THIS WAY, YOU CAN ENSURE THAT EVERY SITE DELIVERS OPTIMAL PERFORMANCE, SECURITY, AND AUTOMATION.

- 56% Combine ethernet and broadband or dedicated internet access
- 38% Use MPLS with internet access at their SD-WAN sites

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FIVE STEPS TO ENSURE THE SUCCESS OF YOUR SD-WAN IMPLEMENTATION

CONTINUED

04 Consider Managed SD-WAN Services

WHAT THE SURVEY SHOWS

Among current SD-WAN users, “do it yourself” deployments outpace managed services. However, over 75% of businesses say their future deployments will be either co-managed or fully-managed SD-WAN services. The number is even higher among the largest businesses: 84% of companies with over 500 sites plan to engage with a managed SD-WAN provider.

WHAT IT MEANS TO YOUR BUSINESS

For most businesses, a managed solution represents the fastest, most effective, and least expensive way to derive maximum value from SD-WAN.

As you assess whether a DIY or managed solution is right for your business, consider the following questions:

- Do you have sufficient expertise and available resources on-staff to build the roadmap, research vendors, and make a selection?
- Do you have sufficient expertise and resources on-staff to deploy and manage SD-WAN across all sites?
- Is your company willing to invest capital in on-site equipment, or do you prefer more flexible subscription-based operating expenditures?
- Are you prepared to provide an SLA for site deployments or availability to your internal clients (e.g., branch managers, application owners)?

TOP REASONS FOR SELECTING A MANAGED SD-WAN SOLUTION

- Faster troubleshooting and service restoration: 74%
- Simplified vendor management: 73%
- Vendor accountability in the form of service level agreements: 73%
CONTINUED

FIVE STEPS TO ENSURE THE SUCCESS OF YOUR SD-WAN IMPLEMENTATION

Choose the Right SD-WAN Partner

WHAT THE SURVEY SHOWS
What the survey shows: SD-WAN users have a long list of requirements for their SD-WAN partners. They expect a managed services provider to aggregate and manage multiple network providers (cited as very important by 75% of businesses); to serve as a single point of contact for all vendors (73%); and to manage all network services—access, data, voice, and security (cited by 71%). Users also expect the provider to incorporate best-of-breed appliances and platforms in their services.

WHAT IT MEANS TO YOUR BUSINESS
What it means to your business: Choosing the right partner can mean the difference between an SD-WAN deployment that strengthens your company’s ability to compete, and one that makes little difference to the business. To ensure that your deployment has the greatest chance for success, look for a partner that offers:

- Understanding that each enterprise is unique, and therefore has unique network needs
- Deep experience building networks and deploying managed network services
- Experience deploying SD-WAN across a range of enterprises, and therefore has the ability to anticipate and mitigate risks a customer may face during the transition
- Access- and vendor-agnostic solution
- A global network, owned and operated by the provider
- Support for private and public connectivity options, both vendor-provided and customer-provided.
- Expertise in traffic steering and network management, with deep peering and direct access to most cloud providers
- Options for do-it-yourself and managed services, allowing customers to choose the best option for their business
- Full complement of professional services and support, to assist your team with planning, needs assessment, business case development, and additional services as needed

PREFERRED FEATURES

<table>
<thead>
<tr>
<th>Feature</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud-based network management</td>
<td>75%</td>
</tr>
<tr>
<td>Integrated functionality (e.g., unified threat management and firewall)</td>
<td>74%</td>
</tr>
<tr>
<td>Choice of physical and virtual form factors for edge devices</td>
<td>72%</td>
</tr>
<tr>
<td>WAN optimization</td>
<td>68%</td>
</tr>
</tbody>
</table>
THE LAST WORD

For most multi-site businesses, the big decision is not whether to adopt SD-WAN, but when and how. As they deploy new and critical business applications (such as Internet of Things and cloud analytics) across branch locations, businesses need flexible, secure, and cost-effective networking options. In terms of “how” to deploy, an increasing number of businesses are choosing Managed SD-WAN services.

THE RIGHT PARTNER CAN ASSURE YOUR BUSINESS DERIVES MAXIMUM VALUE FROM YOUR SD-WAN DEPLOYMENTS, HELPING YOU MAKE THE BEST DECISIONS FOR YOUR UNIQUE COMPANY, AND SPEEDING TIME-TO-VALUE. With the right Managed SD-WAN Services partner, your business is well-poised for the digital future.

For more information about CenturyLink SD-WAN Services, click here
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