

## The Time Is Now for Service Provider SD-WAN

In the market for enterprise network services, few technologies are getting as much buzz as software-defined wide-area networking (SD-WAN). Check the numbers behind the headlines though, and you will see we are just scratching the surface of what is possible. Currently, SD-WAN has penetrated just 2% of the worldwide total addressable market for enterprises, that is, businesses with more than 1,000 employees. However, as more organizations look to cut costs, improve users' experiences, and gain greater flexibility in how they manage network applications, that number is growing quickly. ACG expects nearly a third of enterprises worldwide to adopt SD-WAN by 2023.

Service providers have played a supporting role in the SD-WAN story to this point, but now they are stepping into the spotlight. The biggest reason: as more enterprises look to lower costs and gain more control over their networks, they are recognizing that SD-WAN is much more complicated than some early vendors claimed. They are looking for a partner that can make SD-WAN as easy to deploy and use as any other managed service. Service providers that can meet this need have a huge opportunity to dominate this exploding market.

Before they can, however, they must do two things. First, they need to recognize SD-WAN for what it is. SD-WAN is not just another virtualized network function (VNF); it is a platform for innovation. Once an SD-WAN beachhead has been established with a customer, operators can deliver all manner of value-added virtualized services on top of it, including managed security, network analytics and many others. Second and most critically, service providers must get into the SD-WAN game now. The longer they wait, the more competition they will face in what amounts to a zero-sum game in the battle for enterprise SD-WAN business. Once a service provider's customer begins working with a third-party SD-WAN platform or service provider, the advantages that customer will realize (and the multi-year contracts they will sign) will make them very difficult to bring back into the fold. This means those service providers that wait will see much higher acquisition costs and much lower total value for their SD-WAN investments.

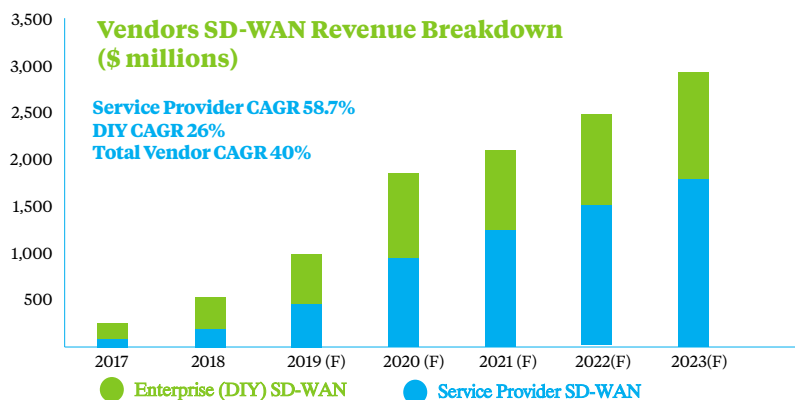
## Envisioning a New Kind of WAN

When it comes to WAN connections, enterprises' demands have stayed largely the same for many years. They want reliable, high-performing connectivity, and requests for new service delivered in a reasonable timeframe at an equitable price. Service providers just want a WAN offering that keeps their customers happy, generates strong recurring margins and, if possible, differentiates them from the competition.

It sounds simple in theory but in practice service providers and their enterprise customers have settled on an unhappy middle ground where all sides are dissatisfied. Enterprises complain of high costs and long timelines—often months, sometimes even years—to bring up new locations and services. Service providers are seeing their MPLS offers commoditized, their margins shrinking, and their customers becoming increasingly restless. It is a situation ripe for disruption, especially as enterprises' existing MPLS contracts expire and they begin looking at alternatives. SD-WAN vendors are seizing the opportunity and have happily stepped into the breach.

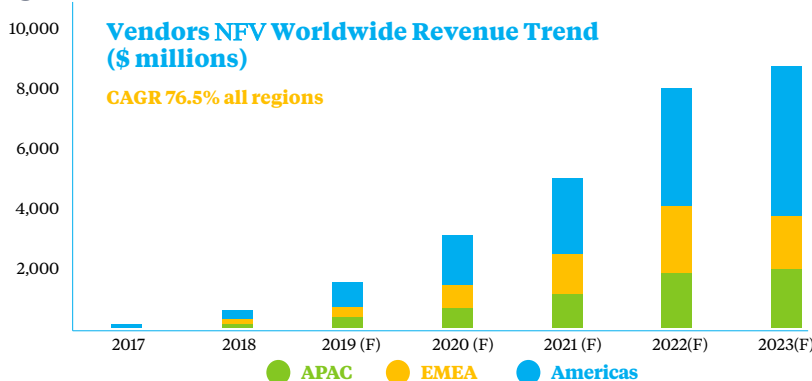
SD-WAN provides a virtual overlay network to connect distributed enterprises in more flexible, intelligent, and cost-effective ways. Although still a relatively new technology, enterprises are enthusiastically embracing it. ACG expects the total worldwide revenue for vendor SD-WAN solutions to reach \$2.9 billion by 2023, up from \$539 million in 2018, a CAGR of 40.4%. Figure 1 provides a breakdown of those revenues for both service provider-delivered SD-WAN and vendors' solutions sold directly to customers.

**Figure 1. SD-WAN Revenue Projections**



Combined with other virtualized network functions often delivered alongside SD-WAN (WAN optimization, firewall, intrusion prevention, and others), the global market is expected to reach \$9 billion by 2023, a CAGR of 76.5%. (Figure 2).

**Figure 2. Worldwide SD-WAN Revenue Growth**



The first wave of SD-WAN solutions has been driven primarily by vendors selling both directly to enterprises and to service providers that then re-sell them to enterprise customers as a managed service. Direct-to-customer (or DIY) solutions have led the market to date, but they have been losing momentum as more enterprises realize that deploying and operating SD-WAN is far more complicated than they expected. Increasingly, they want a partner that can deliver SD-WAN as a managed service. The accelerating growth rate for service providers' solutions reflects this shift. As Figure 3 details, service provider-led SD-WAN solutions are expected to comprise a nearly \$2.5 billion market by 2023 with a CAGR of 56%.

**Figure 3. Service Provider SD-WAN Solutions Growing Rapidly**

Vendors	SD-WAN		
	Market size 2018(\$M)	Market size 2023(\$M)	Total CAGR
DIY	\$361	\$1,145	59%
SP	\$178	\$1,791	26%
<b>Total Vendors</b>	<b>\$539</b>	<b>\$2,937</b>	<b>40%</b>
<b>Service Providers</b>	<b>\$270</b>	<b>\$2,490</b>	<b>56%</b>

Service providers building an SD-WAN business stand to capitalize on this growth, both from SD-WAN itself and the other virtualized services and business opportunities that typically accompany it. For example, operators delivering SD-WAN as a managed service can also offer customers:

- **Virtualized value-added services:** Once operators are delivering SD-WAN as a managed service they have an opportunity to deliver a wide range of additional VNFs over the same SD-WAN platform. WAN optimization, firewall, and other solutions can support new enterprise managed services and revenue streams.
- **Security:** Many enterprises using SD-WAN shift to direct Internet access at branch locations, letting users connect directly to cloud and software-as-a-service (SaaS) applications instead of backhauling traffic through a central corporate data center. When they do, however, they potentially expose their branches to a wider range of Internet threats. This creates an excellent opportunity for service providers to package cloud-based security solutions with SD-WAN offers.
- **Cloud Connect Infrastructure-as-a-Service (IaaS):** Similarly, service providers can bundle Cloud Connect as a service offer with SD-WAN, making it easier for branch users to reliably connect to workloads running on cloud IaaS.
- **Network analytics and visibility:** When operators deliver a managed SD-WAN service for an enterprise, they inherently gain deep visibility into application traffic over that customer's network. This puts them in an excellent position to resell those insights to customers. Operators can, for example, create portals for customers to monitor the behavior and performance of their applications over the WAN and use this visibility as a competitive differentiator. They can also directly sell network and application analytics as an additional value-added service.
- **Differentiated customer relationships:** SD-WAN can be a huge benefit to managed service providers that do not own the last-mile connectivity for their customers' networks. With SD-WAN, they can offer a wider range of customized, differentiated network experiences and value-added services. Now, they can shift the conversation from simply selling a circuit to solving business problems. They can evolve in the customers' eyes from undifferentiated utility provider to strategic business partner.

## The SD-WAN Advantage

Why are enterprises embracing SD-WAN? Because it addresses several critical business needs that conventional MPLS circuits cannot:

- **Digital agility:** For modern enterprises, success is increasingly dictated by the ability to adapt to change faster than the competition. Enterprises need scalable, flexible, on-demand network services. They need a network that can readily accommodate new business models without having to wait weeks to bring up a new service or make a change.
- **More visibility and control:** Cloud applications, Internet of Things, massive mobility, and other trends have made the enterprise IT landscape far more complicated. Businesses need to simplify, automate, and cut costs wherever possible. They want unified, self-service network experiences and the flexibility and control to manage costs dynamically.
- **Better application and service performance:** By 2023, ACG expects more than \$165 billion in annual IT spending will shift to cloud. As businesses rely more heavily on cloud applications, the WAN becomes even more critical. Enterprises need reliable, consistently high-performing service and, ideally, networks that can optimize themselves automatically.

Legacy MPLS circuits provide reliable connectivity, but enterprises increasingly view them as inflexible and expensive. The research ACG conducted indicates that legacy MPLS circuits can be 40x–100x more expensive than IP circuits in an enterprise WAN. SD-WAN, a virtual overlay that enables centralized, software-based management of connectivity resources across the distributed enterprise, offers a compelling alternative. With SD-WAN, enterprises can:

- » Prioritize applications to optimize performance and bandwidth utilization.
- » Gain visibility into bandwidth consumption on a per-site and per-application basis.
- » Simplify network management and more easily scale across multiple locations, whether local or cloud based.
- » Apply dynamic, intelligent, application-aware routing to improve uptime, efficiency, and the end-user's experience.
- » Reduce bandwidth constraints, the leading cause of poor application performance.

At the same time, SD-WAN offers significant advantages for service providers delivering it as a managed service. More and more, enterprises prefer service provider-led SD-WAN, as they get all the benefits (lower costs, increased flexibility and visibility) without having to take on the time, resources, and complexity of deploying and operating SD-WAN. The research conducted by ACG Research indicates that 70% of enterprises expect to make an SD-WAN decision this year with 75 percent of those businesses choosing an existing managed WAN provider for their managed branch needs.

By investing in growing their SD-WAN business, operators can benefit from:

- **Automation:** With SD-WAN intelligence, service providers can automate many aspects of service provisioning and management and even give customers the ability to make self-service changes. The results: lower capital and operating expenses (capex and opex) and much shorter timelines to bring up new sites and services, from months to days or even hours. This, in turn, means faster time-to-revenue for the service provider and faster time-to-service and increased satisfaction for customers.
- **Dynamic deployment:** Today, most enterprise network services are still provisioned on a one-off basis, typically after a lengthy series of manual configurations and expensive truck rolls. When service providers build a multi-tenant SD-WAN solution, however, they gain a platform to quickly, continually redeploy network functions, both WAN connections and the value-added VNFs that run on top of them, such as virtual firewall, IPS, and other security services. Operators typically deliver services like WAN optimization and virtual firewall in separate silos, each with their own separate infrastructure and management. When these services are delivered as VNFs over an SD-WAN, they can now be controlled centrally. Operators can bring up new virtualized services, make changes, and tear them down as needed, quickly and easily, anywhere across the customers' SD-WAN. As a result, they can lower capex and improve their return on assets and invested capital.
- **Service velocity:** With virtualized branches and end-to-end interoperability, service providers can design, test, and deploy new services much more quickly at a much lower cost. This allows them to increase the number, breadth, and granularity of services they offer. Service providers can also dynamically string together service chains of multiple VNFs to create customized network solutions, increasing differentiation as they cultivate new revenue streams.
- **Increased visibility:** SD-WAN gives operators deep visibility into the behavior and performance of applications running over their customers' WANs. Service providers can use these insights to improve the customer's experience, identify new business opportunities (such as managed security and WAN optimization), and even sell network and application analytics to customers as a value-added service.
- **Off-the-shelf equipment or "Vendor Greybox":** SD-WAN gives operators a framework to deliver both WAN connectivity and value-added VNFs via software running on commodity servers instead of dedicated appliances. As a result, they can reduce capex, improve capital productivity, and increase the return on existing assets and invested capital. Depending on the service provider's skill set and the targeted enterprise customer type, it might consider a greybox solution, a vendor's customer premises equipment (CPE) device that is optimized for certain network functions while still offering the flexibility to support multiple types of VNFs. This option can eliminate operational complexities while offering a high-availability CPE and reducing opex.

## SD-WAN Use Cases

For enterprise customers, four use cases typically drive SD-WAN adoption:

- **Hybrid WAN:** Enterprises often use two dedicated MPLS links from two different providers with one kept in standby mode, activated only in the case of a failure. With SD-WAN, that expensive backup MPLS link can be replaced by low-cost broadband Internet or even LTE. (As operators roll out higher-bandwidth 5G fixed and mobile services in the coming years, wireless 5G connectivity will become a viable and likely increasingly popular option.) Enterprises can then use the second link in active-active mode with load balancing, increasing available bandwidth while lowering costs.
- **Cloud application offload:** Modern enterprises rely heavily on cloud-based SaaS applications, like Salesforce, Office365, and others. In most cases, however, they still backhaul all applications traffic through the corporate headquarters. This leads to higher WAN costs, as well as more congested, higher-latency MPLS links, diminishing the users' experience. With SD-WAN, enterprises can dynamically route certain types of traffic (such as business-critical applications) over MPLS while routing others directly to the cloud over broadband. SD-WAN lets enterprises manage multiple connectivity types and define granular business policies for handling each application.
- **Visibility and application-based routing:** With SD-WAN, operators can give enterprises unprecedented visibility into application performance with the ability to track bandwidth consumption, packet loss, jitter, and latency on a per-site and per-application basis. With this multi-level visibility, enterprises (and their service provider partners) can gain insight into application and network performance, which they can use to adjust network capacity as needed. Enterprises can dynamically allocate bandwidth to applications based on priority and utilization, delivering better performance and a superior user experience. Additionally, in-depth network and application analytics can become a source of differentiation, as well as new revenue streams for service providers.
- **Branch connectivity and performance:** For many businesses, most actual revenues are generated at branches. As a result, more enterprises are ramping up their branch investments, deploying gigabit connections to support the growing reliance on cloud and SaaS applications. SD-WAN gives enterprises new tools to prioritize applications, gain deeper visibility into resource utilization, and deliver better end-user and customer experiences. Additionally, SD-WAN empowers enterprises to bring up new sites much more quickly. For example, an enterprise could connect a new branch with LTE and be up and running in a matter of hours doing revenue-generating business while it waits to secure permanent WAN connectivity.

## Capitalize on the SD-WAN Opportunity

Clearly, service providers have an enormous opportunity to use SD-WAN to boost revenues and improve customers' satisfaction and loyalty. To take full advantage of the SD-WAN trend they should align their efforts around three major considerations: diversifying their portfolios, focusing on VNFs, and building multi-tenant platforms.

### *Diversify the Portfolio*

ACG does expect SD-WAN to eventually displace MPLS, ultimately becoming synonymous with just WAN, but this transition will not happen overnight. Many large enterprises still value the inherent reliability of MPLS. They will likely run hybrid networks in the short and medium term, using MPLS for mission-critical applications until they develop the right comfort level with SD-WAN. At that point, they will gradually phase out MPLS, typically in a cap-and-grow strategy.

Currently, SD-WAN has displaced just 2% of the existing MPLS market, and it will be several years before SD-WAN begins to have a major impact on service providers' existing MPLS revenues. In the meantime, service providers launching an SD-WAN business may even see MPLS revenues increase. Today, 62% of enterprises adopting SD-WAN report an increased or unchanged investment in MPLS, and 43% of enterprises purchasing SD-WAN from a service provider also purchased IP/MPLS connectivity or higher-speed Metro Ethernet as an add-on.

Bottom line: investing in growing an SD-WAN business likely will not erode MPLS revenues for now. In the long term when declining MPLS revenues do become more meaningful, those service providers with a diversified portfolio of SD-WAN and VNF options, like managed security, will be best positioned to offset those losses.

### *Focus on Value-Added VNFs*

In the current SD-WAN market, many players blur the lines between SD-WAN connectivity and the various virtualized network services (VNFs for WAN optimization, stateful firewall, and others) that enterprises consume. These network capabilities are essential for modern enterprises and can be hugely profitable for service providers, but they are not SD-WAN. When evaluating SD-WAN business then, service providers should not bundle the revenues associated with the delivery of those VNFs services with SD-WAN. (As a corollary, vendors today sell routers with security modules, but typically measure routing and security separately to accurately size up each segment.)

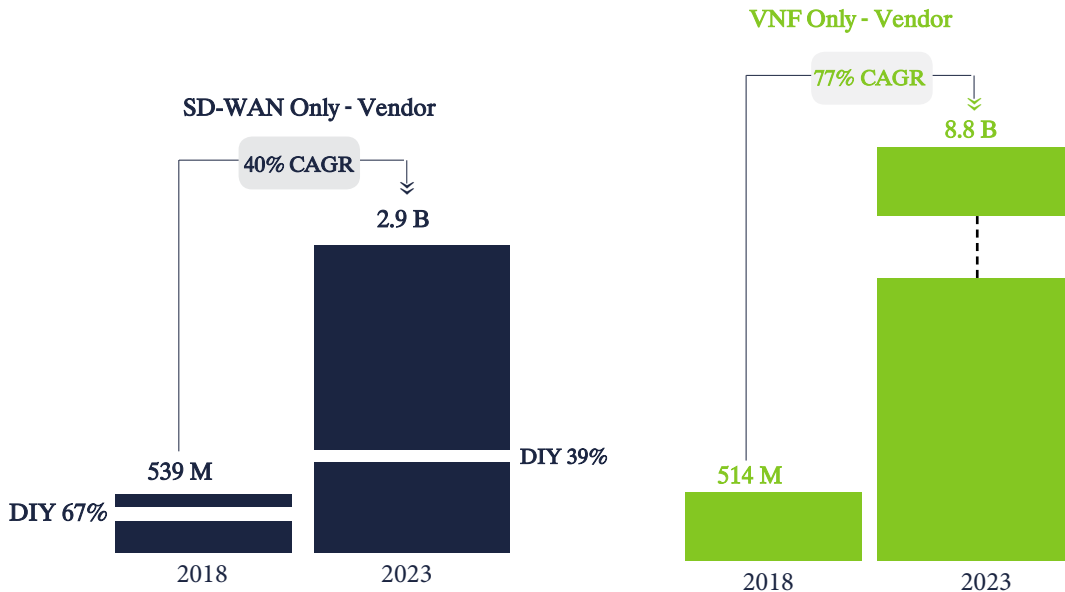
It is better to think of SD-WAN as a platform rather than an application on which service providers can layer multiple VNFs to deliver tailored solutions that could be service chained. As an analogy, think of SD-WAN as an iPhone with VNFs as the apps. Not viewing SD-WAN as a platform is like using a separate iPhone for each app (Figure 4).

**Figure 4. Viewing VNFs as Apps**



It is also useful to unbundle SD-WAN and VNF revenues for economic reasons. Although SD-WAN itself represents a huge market opportunity, projected revenues for VNFs that service providers can deliver on top of a software-defined WAN add up to even more. In all, ACG expects the larger VNF market to more than double the size of the SD-WAN-only market by 2023 with nearly twice the CAGR (Figure 5).

**Figure 5. SD-WAN and VNF Revenue Projections**



**Build a Multi-Tenant Platform**

The other key to fully capitalizing on SD-WAN is multi-tenancy. Service providers can build profitable businesses around premises-based SD-WAN and VNF offers, but they will have to continue delivering them as one-off solutions to each customer on a piecemeal basis.

By building out the SD-WAN portfolio with multi-tenant cloud-based SD-WAN and VNFs, operators can continually reuse the same SD-WAN platform to support multiple customers. This does not just simplify operations; it has a huge impact on profit margins. On average, we see a potential gain of 15–20% profit margin for multi-tenant solutions (Figure 6).

**Figure 6. Profit Margin Differential for On-Premises vs. Multi-Tenant Cloud SD-WAN**





## Going to Market with SD-WAN

For service providers launching new SD-WAN businesses, the go-to-market strategy is straightforward: grow existing MPLS markets while expanding into new ones.

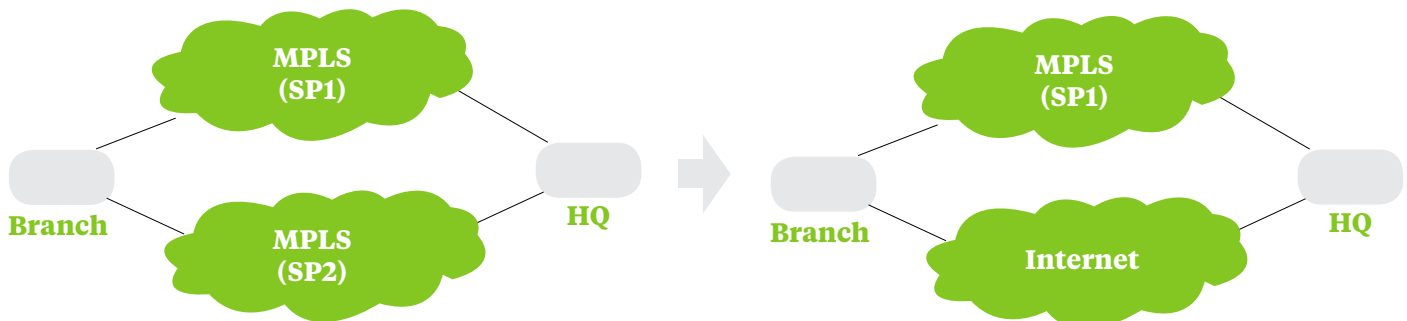
For current MPLS customers, service providers should offer hybrid-WAN solutions. Start slow, migrating one service at a time (such as voice-over-IP) to SD-WAN. Pair SD-WAN with low-cost broadband and 3GPP backup options to lower costs compared to MPLS backup. Show customers how you can improve application and users' experiences by segmenting application traffic and services. Layer on additional value-added VNFs, such as firewall and WAN optimization, as well as value-added services such as network and application analytics. Give customers the option to lease hardware and VNFs so they can avoid high upfront costs.

To capture new SD-WAN customers, build tailored SD-WAN solutions that target specific vertical needs. Show customers the cost savings and performance improvements they can realize by migrating application traffic to the cloud instead of routing it through the company headquarters. Combine SD-WAN with VNFs to deliver a single, simple branch in a box solution. Wherever possible, host the SD-WAN controller on the service provider's network rather than the customer's premises to keep operation simple and costs low.

### The Race to Own the Customer Platform

Service providers can build up hugely profitable SD-WAN businesses but only if they start laying the groundwork now. Although timing may be an overblown factor in some aspects of the market, it is crucial for SD-WAN, which often amounts to a winner-take-all proposition. Why? Consider one of the primary SD-WAN use cases previously discussed, hybrid WAN (Figure 7).

**Figure 7. Moving from Multi-Provider MPLS to Hybrid WAN**

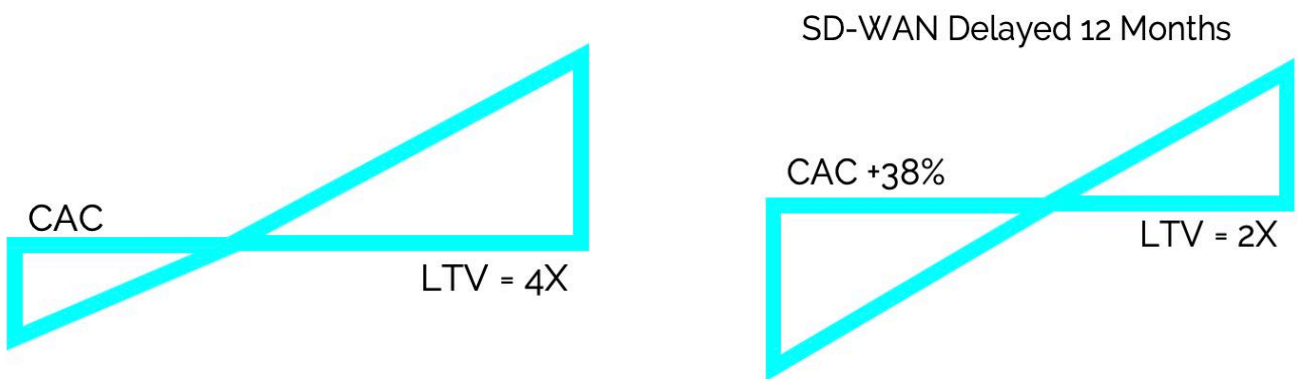


The left side of Figure 7 shows the current state of many enterprises: a customer using MPLS circuits from two different service providers (SP1 and SP2) in active/standby mode to ensure the resiliency of the WAN connection. The right side of the figure shows what happens when one of those providers (SP1) launches an SD-WAN solution that gives the customer more bandwidth at a lower cost. What happens to SP2? In most cases, it gets replaced by a low-cost broadband Internet connection.

Now, SP1 is delivering a better service, and it can start layering multiple VNFs on top of it to give this customer more capabilities in a customized all-in-one solution. SP2 could have done the same thing, but instead it is now sitting on the sidelines. If SP2 wants to compete for that customer, it will need to wait years for those service contracts to expire or devote significant resources to buying them out.

It is very much a race to own the customer's SD-WAN platform, which means the longer a service provider waits, the higher the customer acquisition costs (CAC), and the lower the long-term value (LTV). As Figure 8 illustrates, service providers delaying their SD-WAN rollout by 12 months will face 38% higher acquisitions costs as those starting now and ultimately realize just half the long-term value. It is a clear area where the cost of doing nothing quickly gets expensive.

**Figure 8. Rising Costs, Declining Long-Term Value for Service Providers that Delay SD-WAN**



### Get Started

With global penetration at just 2% and estimated revenues of \$9 billion by 2023, the market for SD-WAN is still in its infancy, but for service providers contemplating a serious move into this business, the clock is ticking. Customers will be moving to SD-WAN with or without their current service providers; the advantages in cost savings, agility, cloud readiness and more are just too great to ignore. Those service providers ready to make the leap soonest stand to reap the biggest gains.

To learn more about SD-WAN and how you can capitalize on this growing market:

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