SD-WAN for service providers
Threat or opportunity?

Service providers have more to gain than fear from the latest WAN technology
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Telecommunication Service providers have more to gain than fear from the latest WAN technology

Service providers face a changing landscape when it comes to market trends affecting wide area networks (WANs). New competitive options are cutting into their MPLS revenues; this price erosion is already beginning to appear in negative growth rates for MPLS VPN in Europe this year, with North America following suit by 2018.

Other enterprise trends are also having an impact on service providers. For instance, enterprises have changing needs when it comes to their WANs. Bandwidth-intensive, business-critical applications require the intelligent routing of traffic through multiple WAN links to optimize cost. Increased numbers of branch offices and remote users are driving enterprises to find more-efficient and lower-cost methods to add new network connections. Finally, increased use of cloud services and applications by enterprises calls for more secure and reliable network connectivity through public broadband.

Figure 1: Key WAN Trends

At the same time, software-defined WANs are exhibiting a great deal of growth potential. According to IDC, by 2020, SD-WAN market size is projected to grow to $6 billion, with a CAGR of 93% from 2015 to 2020.

This shift in the marketplace represents new revenue opportunities for service providers. To compete, service providers need a flexible hybrid network solution at lower total cost of ownership. SD-WAN can provide it. SD-WAN can help service providers increase profitability while accommodating WAN market trends.

1 Source: PwC conducted Enterprise Survey
The technologies that make SD-WAN important to service providers

SD-WAN is an ecosystem of hardware (including customer-premises equipment, such as edge devices), software (including controllers), and services that enables enterprise-grade WAN performance, reliability, and security in a variety of ways. First, it allows dynamic and efficient policy-based routing of traffic across multiple WAN connections. Service providers can use MPLS, the public Internet, LTE, wireless, broadband, or other methods, in order to optimize bandwidth usage at the least possible cost. Second, the “software-defined” element gives service providers and their customers greater flexibility when it comes to automating key processes; this both speeds up and simplifies the process of configuring, adding, removing, and managing network services based on business demands and competitive concerns.

Figure 2: SD-WAN Architecture

Key Components of SD-WAN:

Controller: Automated service management and policy-based routing that defines how network traffic is prioritized and routed.

Analytics provides visibility into WAN performance and informs routing improvements.

CPEs: Devices enforce routing policy and enable easy deployment & management.

Branch Office

Remote Users

Campus

MPLS

Enterprise Data Center

Cloud-based Applications

Non-critical Applications

Broadband

4G/LTE
Its software-defined elements bring considerable advantages to service providers. Most importantly, Service Providers can reduce TCO, because they simplify delivery of WAN services to branch offices with zero-touch deployment and management. In turn, this means that they may be able to put employees closer to where their customers are or where the employees want to live. Because service providers can more quickly deploy and provision branch offices, they can start getting revenue faster. And because they can utilize multiple types of WAN links across the enterprise WAN, they can offer more flexibility.

By deploying an SD-WAN framework, service providers can implement more intelligence and logic in software rather than in hardware. This goes a long way toward increasing flexibility and automation, because it is faster to reprogram devices than it is to procure them and install them. Using a software abstraction policy layer lets service providers dynamically set up and manage all branch office Layer 3 WAN connections for the enterprise. Why is this capability important? Because it in turn triggers considerable deployment and management advantages. First, the intelligence can be distributed among the branch device, the service provider edge, and the cloud as it’s appropriate for the deployment and use case. Second, SD-WAN enhances reliability and security of network traffic over untrusted broadband links, which allows providers to route a greater percentage of their network traffic through lower cost WAN channels such as public broadband.

Service providers can offer other capabilities with SD-WANs. For instance, they can shift SLAs from network-based metrics to application-based metrics, which gives their customers a better sense of which applications are using the network (and thereby more easily chargeback different departments.)

All told, these capabilities help service providers add value by enhancing MPLS infrastructure; increase revenue potential by offering additional services on SD-WAN; and, perhaps most important, by being responsible for the intelligence (both logic and analytics) in the controller means that the SPs can retain customers who may be enticed by other SPs offering similar services.

**Figure 3: Business Outcomes for Service Providers**

<table>
<thead>
<tr>
<th>Business Goals</th>
<th>Options</th>
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<tbody>
<tr>
<td><strong>Enable New Revenue Streams</strong></td>
<td>- Acquire new customer segments (e.g. SMBs)</td>
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<td></td>
<td>- Provide Cloud based NFV Enabled Services</td>
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<td>- Increase out-of-region coverage (Monetize customers not physically connected to the SPs network)</td>
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<tr>
<td><strong>Enhance MPLS Infrastructure</strong></td>
<td>- Upsell more bandwidth. Increase customer experience</td>
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<td></td>
<td>- Leverage SD-WAN to integrate with cloud connectivity services</td>
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<td></td>
<td>- Bundle higher value-add services to increase stickiness (e.g. analytics, security)</td>
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<tr>
<td><strong>Manage TCO &amp; Risk</strong></td>
<td>- Offer an integrated and complete platform that enables deployment of multiple solutions quickly</td>
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<td></td>
<td>- Respond to customer needs by scaling down as well as scaling up effortlessly</td>
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<tr>
<td></td>
<td>- Automate service delivery</td>
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<td></td>
<td>- Lower service cost by managing resources intelligently</td>
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The new SD-WAN value chain

The availability of SD-WANs changes the traditional WAN value chain, particularly by allowing the entry of new players. For instance, networking companies traditionally sell devices to both service providers and enterprises, while service providers offer the infrastructure and services to enterprises; the enterprises, in turn, manage the WAN in-house or utilize service providers.

That is changing now. SD-WAN startups are entering the market, as are vendors that have traditionally been in the virtualization and even the security space. Even multiple system operators (MSOs) are entering the value chain by offering enterprise customers a “good enough” transport network. SD-WAN startups and networking incumbents selling directly to enterprises is also a huge threat to the service providers.

Figure 4: SD-WAN Value Chain
But service providers can take advantage of these shifts too. Based on their experience, they too bring value and create new potential revenue streams, such as:

- offering SD-WANs as a more-flexible, cost-effective alternative to MPLS, or branch out to new customer segments, such as small or midsize businesses
- managing interconnects with cloud providers for enterprises
- providing a single point-of contact for customers not physically connected to the service provider’s network
- providing cloud-based network function virtualization (NFV) services

That is what they can offer enterprise customers, but they can also improve their own revenues with many of these services, such as:

- increasing their revenues by handling peak or burst network traffic
- bundling higher value-add services to increase customer retention
- analyzing an enterprise’s network traffic and sharing those analytics so that they can help the customer reconfigure their network for greater efficiency

Indeed, there are a number of use cases for service providers thinking about providing SD-WAN services for enterprises.

**High-bandwidth application support:** Enterprises want to take advantage of videoconferencing and collaboration applications, but they don’t want to over-provision their network bandwidth; SD-WANs let them use the bandwidth they need when they need it, and then turn it off.

**Policy-based forwarding:** SD-WANs let enterprises prioritize their communications in the case of a bandwidth limitation, so that network traffic related to salespeople accessing a CRM application have a higher priority than those related to background software updates.

**Accelerate branch office deployment:** Enterprises can bring new offices online more quickly.

**Support mergers and acquisitions:** When a company makes an acquisition and has to integrate sites more quickly, SD-WAN speeds up the process.

**Enable the Internet-of-Things:** When sensors and other devices become intelligent, the SD-WAN will support millions of connections and the data flowing between them.
The New SD-WAN competitive landscape

In the new SD-WAN competitive landscape, there are three different categories of vendors. These include the traditional routing/networking companies that have offered networking solutions for many years and are augmenting their offerings with SD-WAN solutions. They also include vendors with specialized offerings for WAN optimization and virtualization. Finally, there are a number of startups offering point solutions for SD-WAN.

The question is, how much can they offer in terms of key competitive capabilities? With SD-WAN, most of the components (e.g. edge devices) in the solution will be commoditized, and the ease of configuration, monitoring, and visibility capabilities offered by controllers will be the main differentiators for SD-WAN vendors.

That means service providers may need to focus on differentiation in other areas, such as interoperability with other hardware products, or the ability to augment the current service provider infrastructure with other tools, in addition to having a CPE that is carrier-grade, has strong routing features and functionality. Enterprises should look for service providers that offer APIs for OSS/BSS integration, flexible licensing models, and function modularity.

At the same time, an SD-WAN solution should allow for these key capabilities:

- automated provisioning of services
- cloud orchestration
- direct path to enterprise and cloud applications
- scalable and redundant cloud network
- dynamic multi-path optimization
- automatic monitoring and capacity testing
- application steering and link remediation

Key considerations for service providers

How can service providers capture and retain customer value as they move into the SD-WAN market? They can choose to procure SD-WAN solutions as resellers for all SD-WAN components. Alternatively, SPs can partner with SD-WAN vendors to expand market reach and provide input regarding SD-WAN feature roadmap.

That option reduces their control of their customers. Service providers should focus on augmenting their existing enterprise relationships to offer a broader portfolio of products and services. They should think about how they can offer industry-specific solutions, addressing specific network needs of highly secure and regulated industries such as healthcare and financial services, or solutions for industries with high-bandwidth content-streaming needs.

They should also focus on acting as a cloud broker or aggregator, providing important cloud-to-cloud connectivity, QoS, or security needs. As noted, they should also offer value-add services such as analytics. In order to help to establish a successful SD-WAN adoption, we believe that Service Providers should consider a phased approach as depicted in Figure 6.
Figure 6: Successful adoption of SD-WAN requires a phased approach with ongoing assessment of proof points

Service providers should take the following approach when evaluating and adopting SD-WAN:

**Test Solution in Telco Environment:**
1. Expand the footprint of Telco cloud
2. Leverage NFV to virtualize environment
3. Virtualize edge routers

**Define Industry and Business Needs:**
1. Define industry-specific SLAs
2. Define business-specific SLAs
3. Create business-specific reference architecture
4. Align SD-WAN strategy with roadmap

**Test and Evaluate:**
1. Identify top 3 – 5 criteria for evaluation (e.g. configuration, performance, time to deploy)
2. Attain proofs of concept for potential vendors to test in the lab and then in simulated production environment

**Implement in Phases:**
1. Implement components point by point to maintain system security and integrity:
   a. Controller at centralized location
   b. Orchestration at centralized location
   c. CPEs at branch offices
**Threat vs. opportunity**

Ultimately, in tackling the SD-WAN market, service providers face both threats and opportunities. The threats include the potential cannibalization of MPLS revenues and managed services revenues.

But outnumbering the threats are the opportunities. SD-WAN has the potential to enable new revenue streams cost effectively. They can offer enterprises differentiated services, and do it in such a way that they can reduce time-to-market for those features (thanks to automated deployment). They can offer metering to enterprises so they can take advantage of consumption-based pricing models. They can offer alternative WAN links to enterprises - according to a recent PwC survey, broadband can cost up to 97% less than traditional MPLS per Mbps per month. In addition, zero-touch deployment reduces the need for on-site personnel for branch office deployment and maintenance. They can capture new customer segments such as SMBs and enterprises in geographical areas where MPLS links are not feasible.

That allows the service providers to improve customer value through a number of operational efficiencies, from providing enterprises with visibility into WAN performance via self-service portal to add-on services that service providers can offer at lower cost. At the same time, service providers themselves can more easily monitor WAN traffic and lower their troubleshooting and ongoing network management costs.

**Bottom Line: SD-WAN opportunities outweigh threats for service providers**

In short, service providers face three options when it comes to taking advantage of SD-WAN technology. They can choose not to adopt SD-WAN. The advantage is that they can focus on maintaining their MPLS revenues, while they may lose customers who turn to another service provider or even a SD-WAN vendor to transform their WAN.

Another option: to resell SD-WAN services for another vendor. This lets them retain customers who want SD-WAN benefits, allows them to capture new customer segments (for whom MPLS was not feasible earlier), but the disadvantage is that the service provider forgoes additional revenue growth opportunities.

The most logical option for service providers who want to stay competitive is to integrate SD-WAN offerings with their existing MPLS network. The advantage: they retain customers who want SD-WAN benefits, and they increase revenue potential by offering additional services on SD-WAN platform. They also create a foundation for easily offering new network services and features in the future. This option gives SPs the differentiation and helps them combat OTT threats and SD-WAN threats. This option requires making internal changes – both organizational and infrastructure – in order to support and sell SD-WAN services, but this is a small sacrifice in light of the potential upside.

In the face of increased demand from enterprise customers for augmenting traditional offerings such as MPLS and the threat of new entrants, the path to SD-WAN is clearly the one that provides the most value over time. It optimizes use of WAN links such as MPLS, public broadband, and LTE based on business policies, which can lead to potentially lower TCO. It enables reliability and security over untrusted broadband links. It enables automated provisioning, leading to faster activation of branch sites and improve time to value for customers and the service provider.

Ultimately, the advantages to SD-WAN overcome the disadvantages. Service providers can tap into new SD-WAN-enabled revenue streams to offset declining MPLS revenues, as well as diversify their revenue base. Additionally, SD-WAN adoption enables service providers to respond much faster to demands for new services from their enterprise customers thereby enabling better customer experience, improve customer lifetime value, and increase efficiencies. And perhaps most important, they can stay abreast of cutting-edge technology in order to respond to new shifts in the WAN landscape in the ever-changing future.
Sources:

2 IDC: “Cloud and Drive for WAN Efficiencies Power Move to SD-WAN,” IDC, March 2016. Please follow the URL below to access the report link.

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