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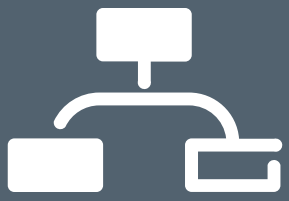

Navigating the SD-WAN Marketplace: A Guide to Selecting the Best Option for Your Business

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Overview

Businesses increasingly are turning to software-defined WAN (SD-WAN), and with good reason: SD-WAN is emerging as a legitimate and low-risk solution for businesses looking to increase agility, reduce WAN costs and simplify their network operations. Gartner expects that by 2020, sales of SD-WAN products and solutions will be worth about $1.24 billion, up from $129 million in 2016, representing a 15 percent compound annual growth rate (CAGR). In fact, IDC estimates that nearly 70 percent of companies expect to adopt SD-WAN by the end of 2017.

"Most organizations struggle with managing their carriers, bandwidth, and adding new applications to their WAN," says Jason Viera, Senior Director, Infrastructure Solutions, at Carousel Industries. "They're tired of the complexity and cost of managing these inflexible networks. Most changes require highly skilled resources and are time-consuming. That has a real impact on their ability to respond quickly and that, in turn, has real business impact. SD-WAN allows them to vastly simplify their network, not only making the network more agile, but the business more agile as well."

The rise of SD-WAN benefits from a confluence of factors including:

- An increase in performance of commodity internet services
- A price reduction of these same services
- A spike in the growth of applications moving from the data center to the public cloud
- Growing pressure to reduce operational expenditures

A wealth of companies—from incumbent router vendors to pure-play start-ups—have entered the SD-WAN space, providing a wide range of solutions to help businesses gain this network agility. Businesses also have a few different options when it comes to who is going to manage the network and the process.

In this white paper, we'll help readers understand:

1. The specific capabilities SD-WAN solutions should be delivering—the table stakes, so to speak
2. The SD-WAN vendor landscape
3. The predominant SD-WAN consumption models, and the benefits and pitfalls of each

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Key Capabilities

On the surface, most SD-WAN solutions look quite similar. "It takes some work to scratch beneath the surface to see if the capabilities of the solutions you're examining really meet the most important requirements for your business," Viera says. Yet the due diligence means you get exactly the solution you need for your specific business operations.

Some of the key benefits and feature sets that should be considered when evaluating SD-WAN offerings include:

- **Routing based on specific application**, with policies created based on business logic. Traditional routing architectures send traffic to its destination solely based on IP address, ignoring any ramifications to application type, quality of service (QoS) markings, or potential network brownout situations (e.g., high packet loss, jitter) which occur even in expensive MPLS networks. "With SD-WAN, you simply apply business logic to choose which applications you would like to run over which link based on network conditions, and the SD-WAN solution will dynamically move traffic around your diverse connections based on real-time network conditions," Viera says.
- **The ability to leverage any type of circuit**, including private MPLS, Layer 2 services, Point-to-Point circuits, dark fiber, LTE, satellite, cable, DSL, and other flavors of broadband Internet. SD-WAN aggregates different types of connectivity options together, creating one big pipe. Any transport can be leveraged based on the logic that the network operator defines and, through abstractions, the network will be programmed automatically.
- **Centralized management.** "Today's networks are stuck in a box-by-box management paradigm, which drastically increases the time to roll out new applications across the WAN," Carousel's Viera says. Even the addition of a simple QoS change can be extremely time-consuming on the command line. SD-WAN solutions should provide a centralized configuration, management and monitoring interface in an on-premises and/or cloud-based model.
- **Zero-touch provisioning (ZTP).** Network personnel should be able to take new equipment out of the box, plug it in, and have the configuration automatically pulled down, without requiring a heavily certified network engineer to turn up a new location. Typically, those SD-WAN solutions offering a cloud-based management interface provide out-of-the-box ZTP functionality.
- **Key security components.** There are five key considerations when it comes to security, Viera says. "The addition of internet links at the branch and the shift toward the cloud through SaaS/IaaS increases the attack surface for businesses," he says. "Security is growing more complex, and so too must solutions." The solutions should provide:
    - **Network-wide encryption capabilities.**
    - **Integrated PKI.** Automatic application of certificates to the devices for site-to-site VPN authentication, vs. using the traditional, less-secure method of a pre-shared key (PSK). Automatic application of certificates also simplifies certification deployment vs. traditional options and facilitates regular automated key rotation.

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- **Internal network segmentation over the WAN.** Companies have historically been at the mercy of the carrier or forced to work with carrier technology such as native MPLS (Layer 3 VPN) to provide basic segmentation over the WAN. Many of the SD-WAN options drastically simplify this process, allowing customers to more easily extend Campus/ Data Center segmentation across their WAN for true end-to-end seperation.

- **Firewall or NGFW capabilities.** "Many of the products in the SD-WAN space claim to have capabilities in next-generation firewalls, but most are very much lacking," Viera says. The customer must consider whether they will send traffic directly to the Internet at the branch, (and if so, what security controls might they need to augment SD-WAN), or if they will send all traffic to a regional data center to scrub the traffic through a traditional stack of security appliances. "There are definitely performance and security trade-offs that businesses must take into consideration," Viera says. Some solutions also provide for Services Insertion and Services Chaining on a per-application basis, which can help steer traffic to the appropriate locations/devices for deeper inspection.

- **Visibility and analytics.** For many solutions, visibility is limited—unless you pay for it. That can make troubleshooting difficult. However, visibility into the network goes beyond troubleshooting to also provide real business benefit: the ability to identify applications over the network and create business policies around which traffic is most important. "The key is simplicity—visibility shouldn't require an engineer. From a business level, companies should be able to identity the applications that are the highest priority and ensure they are treated appropriately," Carousel's Viera says.

- **A level of awareness as applications shift to the cloud.** Beyond a level of awareness, there are varying degrees of support for cloud connectivity across the available product-sets, including:

  - Software as a Service (SaaS) – Many SD-WAN solutions can help identify SaaS applications, routing those locally while backhauling user traffic for deeper levels of inspection. Some may even integrate Services Chaining to simplify the regional traffic inspection process.

  - Infrastructure as a Service (IaaS) – Some solutions provide for virtual instances of the SD-WAN appliance to be run in AWS/Azure to treat it as another DC/branch in the WAN. This drastically simplifies customer integration into public cloud environments. Prospective buyers should ensure that the offering integrates with existing or future public cloud provider environments.

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Vendor Options

As in any market with high-growth potential, there are dozens of vendors trying to make their mark in SD-WAN. These fall neatly into three categories: Incumbent routing vendors; incumbent WAN optimization and link aggregation vendors; and start-ups who emerged recently specifically to develop SD-WAN solutions.

Let's look at the broad offerings and the challenges each group faces:

1. **Traditional routing vendors.** "The routing vendors bring both maturity and complexity to the table," Viera says, with their solutions layering SD-WAN atop existing proven products and feature-sets with in some cases years of technical debt.

   While this may make sense for some very large customers requiring extensive functionality, for smaller businesses that are self-managing the network, this approach can be daunting. "These solutions weren't built from the ground up for SD-WAN," Viera says. "While such solutions might work well once implemented, with a large combination of independent features being brought together this makes these solutions difficult for the customer to initially consume and maintain."

2. **WAN Optimization/link aggregation vendors.** These vendors also have a legacy customer base, and all are transitioning their business models away from their legacy businesses to keep ahead of the SD-WAN curve. Analyst firm IDC reports the WAN optimization market has been down 20 percent a year for the past three years as applications shift to the public cloud. With direct internet and commodity broadband prices dropping, the value of pure-play WAN optimization capabilities is dropping outside of legacy application uses-cases where users are very globally dispersed.

   As for link aggregation vendors, who came on the scene a decade ago to aggregate bandwidth from cable, DSL, LTE and other connectivity technologies to create one big pipe, link aggregation functionality is now a standard feature for every vendor, so they are adding SD-WAN capabilities to remain relevant.

   The downside for WAN optimization and link aggregation vendors? They may be missing key functionality. "One of the 'gotchas' of many of these vendors is missing functionality, and it's not always easy to tell from the marketing materials or data sheets who supports what," Viera says. "They may not have brownout detection, or support dynamic routing protocols, or multicast, and those capabilities may be critical to your business."

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3. **Pure-play start-ups.** Start-ups are building solutions from the groups up specifically for SD-WAN, with some focusing on selling directly to the enterprise, and others to the service provider market.

   "The beauty of start-ups is they can address the enterprise's pain points day one, creating a centralized controller to push out updates without pushing out 1600 lines of code to each device [as the routing vendors might need to do]," Viera says. The downside: "Many start-ups are still missing features and functionality, such as multicast and network segmentation, and significantly lacking in the routing protocol support space—a huge issue in many cases," Viera says.
   In the direct-to-enterprise space, a case study from clothing retailer The Gap shows how effective a pure-play SD-WAN solution can be vs. traditional technologies. The retailer ripped out its routing hardware and curtailed its use of MPLS connections, saving millions of dollars a year in Opex through a plug-and-play SD-WAN solution and reducing its five-year WAN MPLS expense by more than 50 percent. Even more compelling: the retailer was able to deploy SD-WAN across 1,400 sites in just 4.5 months.

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In its recent SD-WAN webinar, Gartner analyst Joe Skorupa did not identify specific vendors and market share, but did indicate that of the approximately $130 million in SD-WAN sales during 2016, 50 percent of revenue is from just two startups. "With so much of the SD-WAN revenue share flowing to start-ups, it's only a matter of time before we see major consolidation through acquisition in this emerging space." Viera says,

The bottom line: Businesses need to know what their specific requirements are for their business, and start asking questions to ensure they're getting exactly what they need, Viera says.

What's the Best Match for My Business?

There are a few consumption models for SD-WAN, and businesses need to choose carefully based on their specific requirements—and how much they want to be involved in day-to-day management of the network. These models include:

- **Carrier-managed SD-WAN** – a.k.a, SD-WAN as a service. Many businesses—up to 40 percent—find it easiest for carriers to manage their network end to end, shifting their network spend entirely into an Opex model. "Carrier-managed SD-WAN is an 'Easy Button' for many businesses," Viera aid. "They don't own the equipment, and don't need extensive in-house expertise or technical knowledge of routing protocols." In a carrier-managed environment, if the SD-WAN vendor selected by the carrier does not survive, it's the carrier's issue, not the enterprise's.

  However, there are several trade-offs, and businesses may find they don't have the business agility they need or expected:

  - Service turn-up can be slow, which can have an impact on business processes and the company's bottom line. While design time may be reduced due to templatization of the offering, most carriers aren't known to be agile or fast.
  - Businesses may become beholden to one carrier, making it difficult to expand to other geographic areas where the provider may not offer service.
  - Cost may be higher. Carriers have built expensive MPLS networks and want to leverage them, when—in some cases—commodity broadband maybe more applicable. "Carriers see SD-WAN as a disruptive technology to their business of selling circuits," Carousel's Viera says. "However, for many businesses, the value proposition of MPLS alone doesn't make sense when a less-expensive transport might be a better fit."
  - Inability or unwillingness by carriers to customize the solution to meet specific business requirements. Customers shouldn't assume that because a carrier is leveraging a specific SD-WAN solution that all features will be supported.
  - Data privacy could be an issue. Businesses that choose this model are

putting a lot of data into the carrier's hands and need to be comfortable with that level of trust.

- **Customer managed SD-WAN**. In this scenario, the enterprise pays the carrier for the WAN service, but owns and manages the routing devices at the network edge themselves, and integrates it into the carrier network. This allows businesses to leverage the SD-WAN solution that aligns best with their business, providing the agility they need to customize services for their specific use case. The can also choose any carrier for the underlying network transport.

  However, in this model, businesses need to have expert-level resources in house to implement and manage SD-WAN solutions, and they are ultimately responsible for ensuring devices are configured correctly.

A partner-managed SD-WAN offers a "best of both worlds" level of flexibility and functionality.

Although the agility of the customer-managed model sounds appealing, with more than 30 SD-WAN vendors in the market, it's difficult to determine which solution is best for your business without knowing the challenges and caveats that the product sheets aren't exposing. A third option for businesses is a partner-managed SD-WAN, which offers a "best of both worlds" level of flexibility and functionality.

"Working with a partner such as Carousel Industries, businesses can have the agility they need to meet their business demands," Viera says. "We have the ability to bring together multiple carrier solutions and overlay the best SD-WAN solution for customer's specific business needs, as well as provide consolidated billing across a very large number of services."

Benefits of a partner-managed solution include:

- Flexibility to consumer SD-WAN services in a Capex or Opex model—or even a blended model if that best meets your unique requirements.
- Accelerated time to market
- Carrier-neutral solutions that increase agility by eliminating reliance on a single carrier
- Customized solutions without complex management requirements

The benefits of deploying SD-WAN are indisputable, and according to Gartner and IDC's estimates, adoption will skyrocket over the next few years as companies look to increase agility, reduce WAN costs and simplify their network operations. However, the task of choosing an SD-WAN solution can be daunting. Working with a vendor-agnostic partner like Carousel Industries can help businesses understand how much they currently spend on their WAN from an Opex perspective, and help them contain those costs by choosing the right SD-WAN solution to meet the specific requirements of their business.