



## Demystifying SD-WAN: Choose Your Flavor

Options Involve Cost/Benefit Tradeoffs  
and Considerations

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## ● **Summary**

In today's dynamic SD-WAN market, buyers confront a wide range of options in terms of cost, complexity, features and benefits. Selecting the right approach is a complex undertaking, and by no means a one-size-fits-all proposition. While an optimal approach must align technology to the specific requirements of the business, understanding the fundamentals of SD-WAN can help identify the key considerations and questions to address. With that in mind, this Point of View examines the basic categories of SD-WAN technology:

**“ WIDE RANGE OF OPTIONS  
IN TERMS OF COST, COMPLEXITY,  
FEATURES & BENEFITS. ”**

## **The SD-WAN Landscape**

By many accounts, SD-WAN represents the future of global networking. Benefits include:

- > Single-pane-of-glass visibility to monitor and manage global networks and external connections
- > Streamlined provisioning through a friendly GUI interface, without the need to worry about routing protocols or configuration commands
- > The ability to allow applications to automatically orchestrate network resources through a standard API – the stuff of an Enterprise Architect’s dream

Industry analysts report that SD-WAN is moving out of the early adopter phase and into mainstream deployment. Growth estimates certainly support that assertion. Research firm Global Market Insights expects the SD-WAN market to grow at over 58% CAGR from 2019 to 2025.

SDWAN

standardization efforts – led by the Metro Ethernet Forum – stand to boost this expansion by improving product/vendor interoperability and by facilitating the economies of scale needed for mass deployment of optimized SD-WAN solutions.

**“SD-WAN REPRESENTS  
THE FUTURE OF GLOBAL  
NETWORKING.”**

## ● Multiple Vendors

The vendor pool is similarly broad and deep. More than 60 vendors offer some type of SD-WAN solution. Recognizing the threat and opportunity, global telecommunications services carriers are developing managed SD-WAN service offerings, and cooperating with one or multiple infrastructure vendors. Established routing & switching, security and network optimization providers see SD-WAN as away to evolve their product portfolio to adapt to new customer requirements. Added to the mix are cloud-based pure-play newcomers, but in a crowded field only a few can ultimately be profitable.

Not surprisingly, this dynamic environment has fueled confusion; multi-faceted marketing campaigns that convey inaccurate or incomplete information don't help. Some have gone so far as to proclaim the imminent death of MPLS – a notion dismissed as myth by experts who broadly concur that SD-WAN will in fact coexist with and complement MPLS, private line and IP VPN technologies. And consider the axe-grinders who develop technology “comparisons” that are no more than dualside fallacies that argue for one point of view under the illusion of objective analysis.

As a first step to address this confusion, the features and functionalities of various SD-WAN offerings can be divided into three broad categories:

- > Edge SD-WAN Solutions
- > Cloud-Based SD-WAN Solutions
- > Managed SD-WAN Solutions

Each of these approaches is discussed below.

## ● Edge SD-WAN Solutions

These solutions – provided mainly by pure plays and infrastructure vendors lacking their own global network transport infrastructure – offer a low-cost, simple option. Edge SD-WAN facilitates rapid provisioning via premises-based network appliances, virtual network functions or white-box hardware. Depending on the vendor, additional features such as traffic optimization (including load sharing between different links) and security are available.

The downside: they rely entirely on the public Internet for transport, which, while resilient, is by nature a best effort transport media. As a result, Edge can't offer Quality of Service (QoS) and Service Level Agreements, and is inadequate for mission-critical applications that require high and consistent performance with low latency for a good end-customer experience.

To compensate, vendors often recommend two separate Internet connections for path diversity, or run the service in parallel with existing private networks to test the waters before jumping in. This can address variations in the public Internet's reliability, performance and security between different countries and carriers. China's Great Firewall, for example, enforces very strict controls over the traffic that traverses the Internet, which directly impacts the quality of services provided over the Internet. Peering agreements, meanwhile, often favor the largest carriers, making smaller players more susceptible to service quality issues due to latency or congestion.

While these redundancy measures provide a form of risk insurance, they add complexity. Moreover, most companies will still need to maintain an additional private network to support mission-critical applications and data traffic. Over the long run, this can dilute the simplicity benefits that make Edge-based SD-WAN solutions attractive in the first place.

**“ COST, COMPLEXITY &  
QUALITY TRADE-OFFS. ”**

## ● **Cloud-Based SD-WAN Solutions**

As with Edge solutions, Cloud-based SD-WAN routes traffic over the public Internet from end-to-end. The difference: the Cloud-based model strategically deploys SD-WAN Hubs globally to allow network traffic to select the best Internet carrier for each route. This approach can also leverage SD-WAN's Northbound API to support advanced analytics and (potentially) Artificial Intelligence applications. While delivering improved performance, the Cloud model can't ensure end-to-end QoS or SLAs, and results in a tradeoff between the quantity of in-route decision-making points and end-to-end service latency.

An alternative approach to Cloud-based SD-WAN is to deploy Points of Presence (POPs) and run a private network between these POPs using MPLS or private line connections. This improves performance and enables SLAs and QoS policies for the traffic flowing between the POPs. But since access is still via the public Internet, the location of the nearest POPs and Internet service quality must be assessed when considering this SD-WAN flavor.

While Cloud-based SD-WAN offers ease of provisioning and flexible network management, the inevitable cost/performance tradeoff remains. Bottom line: If you thought SD-WAN could completely replace private network technologies for all application scenarios at a lower cost – think again!

When evaluating vendors for specific Edge or Cloud-based solutions, buyers must consider the long-term availability of these solutions. Does the vendor have the necessary financial backing to remain in the market over the long run? What if – as often happens – a larger company acquires the vendor? Will the solution continue to be developed and supported? Or will customers be transitioned to another solution from the buying company, one that lessens the impact of cannibalization to the buying company's existing product portfolio?

## ● **Managed SD-WAN Solutions**

Global carriers adapting their current service offerings to meet the demands of enterprise customers and their architectures and applications are market leaders for these solutions, along with systems integrators offering best-of-breed solutions.

Managed SD-WAN is essentially an overlay of existing transport technologies, namely IP VPNs, MPLS and private lines. The value proposition lies in mixing and matching different transport technologies to different requirements. Private lines, for example, can address ultra-high performance and security requirements. MPLS can support mission-critical multipoint-to-multipoint traffic. And the public Internet can handle remaining traffic or access to SaaS applications via direct connection to centralized private data centers or the Public Cloud (AWS, Azure, etc.).

The advantages of Managed SD-WAN include end-to-end SLAs and flexible QoS levels to align with different types of business-critical traffic, improved availability and quality end-user experience. Network management is streamlined and simplified, as enterprise IT personnel and applications can orchestrate end-to-end network resources through the centralized SDN controller's GUI and API, respectively. And customers can have a single vendor point-of-contact for all their networking requirements.

Continued reliance on private network technologies, however, means longer provisioning times and higher prices. While some carriers can deploy services in 30 to 45 days, others require up to 6 months to set up a new private line or MPLS node. For carriers to offer private line (exclusive bandwidth between two points) and MPLS services, they must use and/or maintain a global Optical Transport Network (OTN) infrastructure of land-based and submarine optical fiber cables, which is by no means cheap.

That said, not all the enterprise data traffic requires private networks, as some traffic is better suited to the public Internet. Indeed, a strategically implemented Managed SD-WAN solution combines the simplicity and low cost of public transport, along with the performance, security and business continuity benefits of private networks.

The key is to select the SD-WAN offering that best matches specific business requirements, and to deploy different technology capabilities as needed, since a “one-size-fits-all” SD-WAN solution doesn’t exist in today’s market.

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## **About the Author**

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