Evaluating SD-WAN: your top 10 questions answered

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Digital transformation challenges IT organizations to rapidly deploy new applications and provide quality user experience for all applications—data center or cloud-based. The Wide Area Network (WAN) has an important role to play, providing a platform to connect a distributed workforce to mission-critical applications. To address these needs (and many more), an increasing number of organizations are adopting SD-WAN strategies.

When it comes to understanding SD-WAN, there's a lot to take in. So, whether you're considering implementing SD-WAN yourself, or if you're evaluating managed SD-WAN service providers, the purpose of this ebook is to help you to understand more about SD-WAN.

The SD-WAN advantage

SD-WAN (Software-Defined Wide Area Network) offers significant advantages to distributed enterprises with branch operations. These include improved business agility, increased application performance and enhanced security. With the increased popularity of SaaS/cloud-based applications, as well as pervasive IoT deployments, SD-WAN is rapidly becoming the preferred platform for connecting organizations worldwide. It brings with it a range of operational benefits too—rapid provisioning, improved quality of user experience and better in-branch customer experience to name just a few.

Implementing SD-WAN

SD-WAN deployments can be complex and difficult to integrate with an existing network and security infrastructure. As a result, IT organizations of all types and sizes are opting to outsource the challenges of WAN connectivity—and thus driving significant growth in managed SD-WAN services.

It's important that you carefully evaluate your SD-WAN implementation options. By understanding your specific needs for network scope, application prioritization, reliability, performance and security, you become better positioned to select the solution that's right for you.

Finding the right solution for your organization

We expect SD-WAN-based offerings to become the standard for distributed organizations over the next five years. There are, however, several key differentiating factors to consider when evaluating competing SD-WAN solutions.

In addition to the factors outlined above, the service provider should also have extensive experience to provide customized, end-to-end network engineering.

SD-WAN is a software-based network overlay technology that provides abstraction for WAN services. It enables service providers to rapidly deploy new hybrid WAN services—for example, internet plus MPLS—with significant improvements in ease of deployment, centralized management, application prioritization and security.

Managed business service is a model where networking services are fully outsourced to a managed or communications service provider. For SD-WAN services, this reduces the complexity for IT teams and in parallel, enables the full benefits of the technology. The service provider typically provides the hardware, software and transport services required to deliver connectivity for several branches with appropriate service level agreements, such as uptime and performance.

Once deployed, the service provider is responsible for the monitoring, management and security of the WAN service.

1. What are the benefits of SD-WAN

The WAN is a key platform for digital transformation as it connects distributed users to cloud-based applications. It must provide continuous operations, security and low latency. Any disruption of WAN service is likely to impact user productivity, customer satisfaction and ultimately the profitability (or efficiency) of the organization.

In addition, the popularity of software as service (SaaS) has shifted WAN traffic flow from the data center to the cloud (via the Internet). Organizations with traditional WAN architectures now find that they have insufficient bandwidth and that backhauling all cloud traffic to central locations creates unacceptable latency for their cloud applications. Enterprises which depend on communications to their remote sites (e.g., financial services, retailers and distributed manufacturing companies) are rapidly adopting SD-WAN to provide reliable, secure, high-speed connections to their applications.

Software intelligence

The software-based intelligence of SD-WAN provides you with a flexible platform to deliver advanced WAN services. This includes the rapid deployment of new services and branch locations with a "plug and play" architecture, and the ability to leverage high speed Internet circuits to meet increasing bandwidth requirements with the requisite security.

Improved user experiences, from IT departments to end-users

Quality of user experience is always paramount for IT organizations. SD-WAN technology identifies applications and can apply granular prioritization to make sure critical applications receive the bandwidth they require. Many organizations have found that SD-WAN significantly improves the responsiveness of applications such as Office 365, VoIP and video conferencing.

SD-WAN enables "rapid deployment" where an appliance is shipped to the branch, plugged in to AC power and the Internet and configured remotely by a centralized console. This ease of installation, with the ability to pre-set templates for configuration for dozens or hundreds of branches, provides smooth, rapid SD-WAN installation at any number of branch locations. Many distributed organizations large and small, across a wide variety of verticals (including retail, restaurants, financial services, healthcare, manufacturing, transportation, etc.) have experienced the benefits of SD-WAN technology.

Managed SD-WAN
Managed SD-WAN provides the following benefits:

Application prioritization
IT organizations should be able to easily set and adjust the performance of specific mission-critical applications, including real-time voice/video and cloud-based offerings.

Circuit diversity
The solution should offer multiple connectivity options, including MPLS, Internet and wireless 4G/5G which run across diverse paths.

Powerful and flexible security
Ability to easily enhance and integrate with your specific security environment and incumbent suppliers.

Cloud connectivity
The SD-WAN service should streamline connectivity to the leading cloud platforms, including Amazon AWS, Microsoft Azure and Google Cloud.

Management and orchestration
The solution should be easy and fast to provision with management portals that clearly illustrate application performance and can adjust traffic patterns in real time.

2. How should my organization migrate from MPLS to SD-WAN?

Today, many IT organizations are deploying SD-WAN technologies with hybrid WAN architectures. These may or may not maintain existing MPLS connections for secure connectivity from the branch to the data center. By adding one or more Internet circuits (and or 4G/5G links) they can provide additional bandwidth along with direct connectivity to cloud-based applications.

It's important that you carefully evaluate the wealth of SD-WAN solutions available in the market. Each solution (managed or do-it-yourself) will offer its own specific advantages and disadvantages. Here are some questions you should ask as you evaluate which SD-WAN capabilities you require.

+ What are the critical applications at your branch locations?

+ What are your most important SaaS or cloud-based applications?

+ Have you deployed latency sensitive voice or video applications at the branch?

+ What is your current branch security architecture? What are its security requirements?

+ Do you frequently change branch locations or spin up new branch sites (e.g., pop up stores)?

Internet links combined with the intelligence and security built into SD-WAN will (over time) carry the majority of branch WAN traffic. Wireless 4G/5G services will also play an increasing role.

3. How does SD-WAN accelerate the performance of critical applications?

Application performance is a core requirement for just about every distributed organization. The WAN needs to be highly reliable, secure and of course, low latency. It must also be agile to deploy, simple to operate and built for cloud-based applications. To ensure ongoing high performance, the network should be continually monitored and adapted for optimal application delivery and security.

Traffic prioritization

SD-WAN allows for traffic prioritization for critical applications. For example, it identifies real-time traffic (e.g., VoIP and video) and provides prioritized transport to ensure high-quality communications. It constantly monitors the status of each WAN link and can intelligently steer traffic according to WAN traffic conditions, link status and application priority. SD-WAN management consoles can provide excellent visibility into the status and health of WAN traffic and application performance. SD-WAN also enables you to set prioritization policies for quality of service for mission-critical or latency-sensitive (e.g., voice and video) applications. It identifies the traffic type (coming to or from the branch) and routes it over the best WAN link to meet its associated policy.

Multi-cloud flexibility

Today's organizations are adopting a multi-cloud architecture in which applications run on the best platform, regardless of location. SD-WAN technology facilitates this with secure, reliable and high-quality connectivity to the leading IaaS cloud platforms. To achieve this, it must seamlessly connect users to private cloud, IaaS and SaaS platforms based on defined business policies and with proactive traffic steering and prioritization. Numerous SD-WAN technology providers also partner with leading IaaS providers, including Amazon, Google and Microsoft, to make sure remote traffic headed for the cloud receives priority access. Many now offer direct access to local, edge cloud on-ramps—which accelerates traffic over the cloud providers' private network.

4. Would network reliability be compromised by SD-WAN?

The reliability of your network is of course a key factor in business continuity. Many organizations lose significant revenues when their network is down. SD-WAN enables traffic to flow over two or more independent WAN links. A typical configuration would feature a combination of

MPLS, Internet and wireless 4G/5G services to provide link and path diversity. This provides the redundancy to provide highly available communications for remote branch offices. Many organizations have implemented dual Internet architectures—which when delivered over diverse

circuits—provides highly reliable WAN services. A combination of wired (Internet) links and wireless (4G/5G) can be particularly effective in offering a dependable architecture for smaller branch sites.

5. How does SD-WAN offer security for Internet traffic?

Security at the branch presents a challenge for many organizations due to the increased number of devices that must be managed. PCs, tablets, phones, point of sale devices and IoT end points must all be considered.

These devices offer opportunities for malware to infect the corporate network and for hackers to access sensitive data. The lack of trained staff at remote locations and the complexity of managing multiple security appliances (e.g., VPNs, IPS and firewalls) exacerbates branch network security challenges.

SD-WAN provides enhanced security for branch locations and for traffic coming to and from the Internet. It uses packet-based identification to

look into traffic flows and to analyze traffic patterns. For example, where is the traffic going to (public cloud or private data center)? Is this a trusted location and what data is being sent? Its security includes advanced firewalls, VPNs and encryption, data loss prevention, content filtering, endpoint identification and management, and policy enforcement capabilities.

Leveraging cloud-based security intelligence

Security integrated with SD-WAN technology enables you to safely leverage (potentially insecure) Internet links. Increasingly, SD-WAN platforms

employ cloud-based intelligence to address direct security threats and identify changes in traffic flows that can indicate potential data loss.

Security and networking technology are converging in the Secure Access Service Edge (SASE)—a term coined by Gartner. Over time, SASE will provide an architecture for comprehensive cloud-based networking/security at the edge. In the near term, effective SD-WAN implementation requires additional security within the enterprise infrastructure. This ensures that your corporate security policy is enforced throughout the organization.

6. What are the advantages of a managed SD-WAN service?

Deploying SD-WAN can be a complex process, especially for organizations with lean IT philosophies. Selecting the right or best SD-WAN option requires you to evaluate a selection of leading SD-WAN technology solutions. Having done this, the SD-WAN technology typically must be integrated with an existing network and security architecture.

DIY implementation challenges

The multitude of networking and security devices at the branch, including routers, WiFi, WAN optimization and network security devices creates complexity for centralized IT teams that opt for a DIY approach. WAN operators must select and integrate equipment—often from multiple suppliers—each with their diverse management consoles. They also need to provision multiple WAN circuits (ideally with each on different physical fiber links) at each location, thus engaging with multiple Internet providers in different geographies for ethernet, cable or wireless 4G/5G services.

Managed SD-WAN expertise

Managed SD-WAN services provide end-to-end connectivity, application acceleration and security. And by adopting a unified management strategy, link and application performance can be easily tracked in a single, easy-to-use console. Distributed organizations who have deployed managed SD-WAN solutions report significant operational benefits. They include the agility to rapidly deploy new locations, increased end-user satisfaction and improved security. For customer-facing operations, the benefits include faster response and improved in-branch services.

7. What traffic management capabilities does SD-WAN provide?

SD-WAN enables IT organizations to set prioritization policies for quality-of-service for mission critical or latency sensitive (e.g., voice and video) applications. This is achieved by identifying the traffic type (coming to or from the branch) and then routing it over the best WAN link to meet its associated policy.

The ability to "see" traffic in real time and understand end-to-end performance is a powerful tool. Dashboards can graphically illustrate the health of the network (e.g., slowdowns, brownouts) and the current performance of key applications. This can help you to quickly identify the location of any problem, the likely cause, and in some cases, provide you with an automated recovery. In addition, SD-WAN management systems also provide automation tools to assist IT in making changes to locations, user groups, adding new applications and updating security policies.

8. How important is last mile connectivity to an SD-WAN solution?

SD-WAN provides highly reliable connectivity by utilizing two or more independent WAN circuits—for example, dual Internet services from different service providers. In the event of a failure of one link, the prioritized traffic automatically switches to the other circuits. Deployment of multiple broadband services such as cable, DSL, or fiber and combined with the dynamic routing capabilities of SD-WAN can deliver reliability that exceed that of a single MPLS circuit. Service providers with WAN diversity can ensure uninterrupted connectivity by leveraging distinct physical WAN links. So that in the event of a fiber cut due to construction or natural disaster for example, at least one of the WAN links will remain in service. It's an important consideration, If you rely on the WAN as a critical aspect of your IT operations, you should ask your service provider about the last mile path diversity of their service.

9. How do remote access requirements relate to SD-WAN?

There are many similarities to the challenges of securely, reliably connecting small branch offices and connecting employees in their home office. Home users need to access all key applications and data from any location, any device and via any network. They need streamlined access to popular IaaS and SaaS applications, and they require application prioritization and security. With no on-site IT support, home solutions also need to be easy to deploy. And with work-at-home becoming increasingly important, it needs to be scalable, cost effective and monitored and managed from centralized consoles. SD-WAN technology can solve many of the performance and security challenges present in work-at-home situations. As we've already discussed, it enables traffic to be steered to the most appropriate link based on application prioritization settings, a crucial feature given domestic bandwidths are often less than the typical office. Secure networking is also a vital benefit when managing home set-ups that are inevitable all slightly different. Over time, I believe remote access and SD-WAN technologies will converge into unified solutions.

10. What key attributes when selecting a managed SD-WAN provider?

There are a wide variety of managed SD-WAN services available—all with different options, capabilities and performance. Here are some of the leading questions you should be asking when selecting your partner for a managed SD-WAN service:

+ Is the offer compatible with my current network infrastructure?

+ What is the cost of the SD-WAN managed service compared to existing offerings? How will costs change as WAN traffic patterns or bandwidth requirements evolve?

+ Does the service provider offer multiple, physically diverse connectivity options across all my branch locations?

+ What is reliability of the WAN service? What service-level agreements are being offered?

+ What level of network reliability is required? Would you like to employ dual broadband or 4G/5G wireless as part of the solution?

+ What level of network security is provided with the managed SD-WAN services offering? What are my security options?

+ Are there dashboards available for me to see and manage the performance of my WAN circuits and key applications?

+ What expertise does my provider offer to engineer and support my WAN footprint?

Proven managed SD-WAN solutions

Provisioning (and managing) the required level of connectivity across global organizations can challenge even experienced IT organizations—especially given the requirement for multiple circuits (with diverse paths) from different service providers at each location to meet bandwidth and reliability needs.

Managed SD-WAN offerings are a proven solution to reduce the complexity and management challenges. Many organizations can benefit from the simplicity of outsourcing SD-WAN deployment and management via a managed service. It allows customers to maximize the benefits without the risks of unpredictable costs and network complexity.

Managed SD-WAN services should seamlessly integrate with your existing IT/network/security environment. The service provider should have access to a high-speed global backbone and offer a wide range of last mile connectivity options, including ethernet, cable and wireless (4/5G) options. You should evaluate managed SD-WAN services based on the following criteria:

+ Guaranteed application performance

+ High reliability with diverse access technologies

+ Integrated security

+ Cloud connectivity

+ Managed services experience

The managed SD-WAN solution that you select should offer rapid provisioning, bandwidth agility and easy-to-use management consoles enabling you to see the health of your network and observe application performance. When offered by experienced service providers with a global network and a wealth of WAN connectivity options, managed SD-WAN services can solve many challenges faced by distributed organizations especially those with lean IT philosophies.

Conclusions and recommendations

Digital transformation is pushing distributed organizations to rapidly deploy new applications, improve reliability and to provide quality user and customer experience for all applications (data center or SaaS based). The WAN is the essential element to securely connecting a distributed, mobile workforce to mission critical applications.

With the majority of network traffic traveling over the internet directly to cloud/SaaS applications, the WAN is the glue to securely link users with their applications and data. Growth in network traffic is challenging organizations to upgrade their WAN bandwidth without increasing overall spending. SD-WAN, with its flexibility, reliability and abundant bandwidth, has been embraced by enterprises to address their remote branch connectivity requirements. Its architecture is a proven approach with compelling operational advantages for distributed organizations with critical branch office operations.

The benefits of SD-WAN include business agility, increased security and improved application performance.

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