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The Definitive Guide to SD-WAN

SD-WAN:
The Future Is Now

As digital disruption has led businesses to re-evaluate and reimagine almost every aspect of their operations, many have found that their traditional wide-area network (WAN) "pipes" just aren't keeping up. Your business needs more bandwidth and network performance to power technologies like cloud-based applications and storage, connected smart devices, and video conferencing. At the same time, you must keep data highly secure and employ constant threat monitoring to protect your business from disruption. You need agility as you open more branches, scale your workforce up or down, and implement new technologies like the Internet of Things (IoT).

Your organization has a few options. You can continue business as usual, but it's likely bandwidth issues will multiply as technology needs grow more complex. Your IT team can do it themselves, but that necessitates shipping out multiple appliances (ISP routers, switches, IDS/IPS, secure web gateway, firewall, WAN optimization) to each of your locations, implementing multiple products to patch together the security you need—and hoping that local IT staff can manage everything.

Or, you can consider SD-WAN. Software-defined WAN decouples the control and operations of your WAN from the hardware. This gives your organization the agility to use a number of "pipes" to power the bandwidth each location needs, whether that's DSL, 4G/LTE, 5G, or MPLS. Control and security are unified across the platform, and you gain agility that's simply unavailable with traditional WANs.

Now is the time to get a step ahead and prepare your organization for continuing digital disruption. Start with this guide. As you read on, you'll learn why SD-WAN is the best choice for business networking needs, today and in the future, and how your organization can make the transformation.

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Chapter 1:
SD-WAN Defined

SD-WAN is, simply put, software-defined networking deployed within a wide-area network (WAN). And in the past few years, SD-WAN has emerged as a valuable solution for increased bandwidth needs caused by digital disruption, software-as-a-service (SaaS), infrastructure-as-a-service (IaaS), cloud storage, and other new technologies like artificial intelligence (AI) and the Internet of Things (IoT).

The technology helps organizations connect office and production sites spread over vast geographic areas with remote data centers, the internet, and multiple cloud environments. By decoupling the hardware from the software—using cloud-based technologies and specialized software to create an abstraction layer—organizations have greater flexibility and control over how data transfers take place. In addition, SD-WANs help businesses boost agility, availability, and performance, while potentially lowering costs.
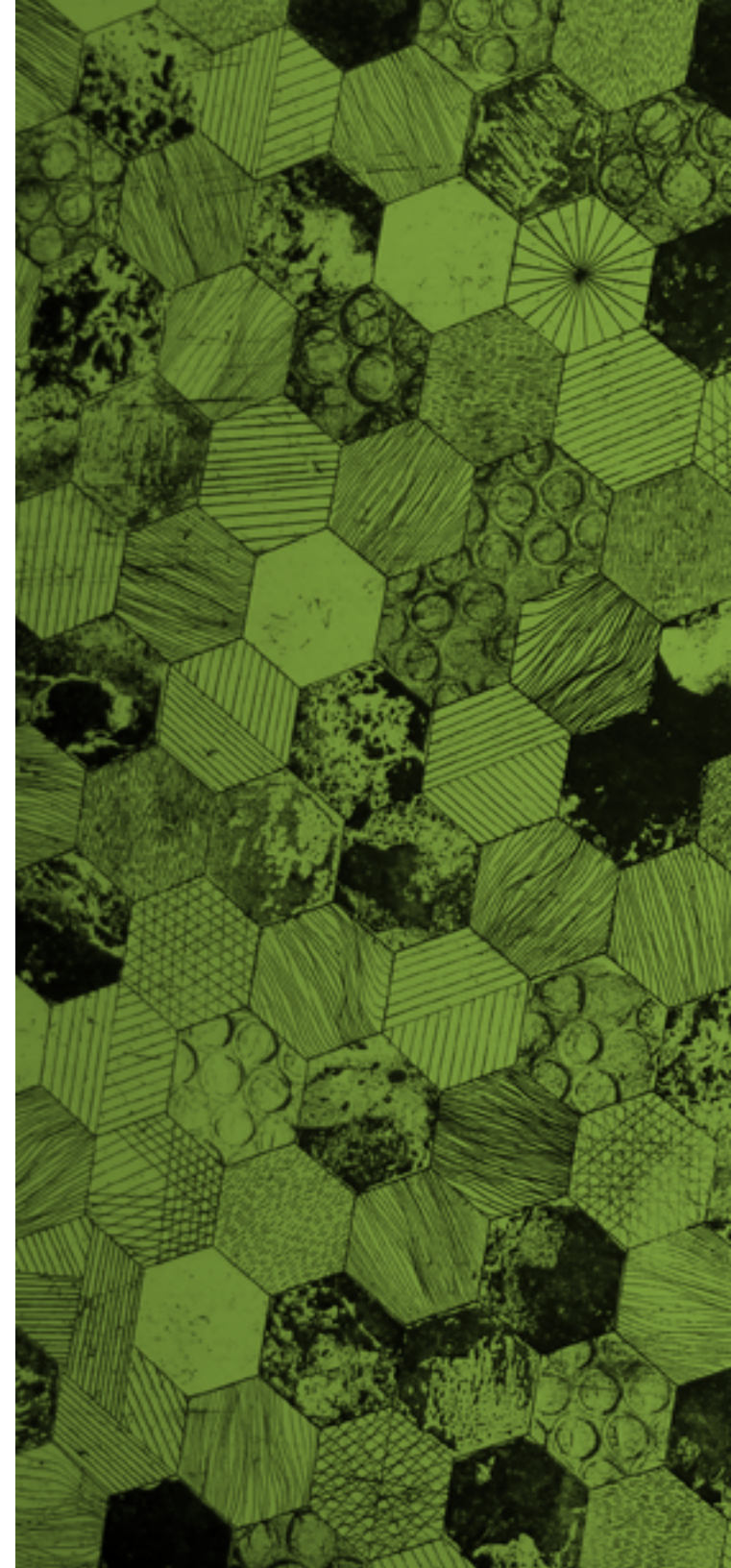
Fact:

51% of organizations cited reduced downtime as the biggest benefit of SD-WAN technology. 45% mentioned reduced security risk and 34% cited reduced OpEx and personnel costs.[1]

What makes SD-WAN technology so attractive is that it can incorporate the best networking technology available for a specific location. It also alleviates some of the challenges related to traditional WANs and Multiprotocol Label Switching (MPLS) lines. Since the WAN is managed through software rather than hardware, SD-WAN:

- Eliminates the need to deploy conventional routers across the network

- Allows for easy scalability as bandwidth demand increases

- Supports applications and production workloads running outside the classic enterprise perimeter

- Eliminates the constraint of an inflexible MPLS hub-and-spoke architecture, adding nearly unlimited flexibility in the transport layer

- Allows you to configure the WAN based on business needs without becoming locked into one provider

According to Gartner, traditional WANs are often "cumbersome and expensive to manage."[2] As a result, the consulting firm predicts that more than 40% of enterprises will adopt SD-WAN by the end of 2019.

The market for SD-WANs is growing at an annual rate of 76%.[3]

SD-WAN owes at least some of its popularity to a changing business and IT landscape. Large enterprises increasingly require a more flexible and agile approach that supports cloud technology, SaaS, and IaaS applications, which require solid security, high availability, and a high level of performance. It's simply not acceptable for many applications—particularly tools such as video conferencing and real-time data analytics—to display any level of latency. This can result in unacceptable performance or an unusable system.
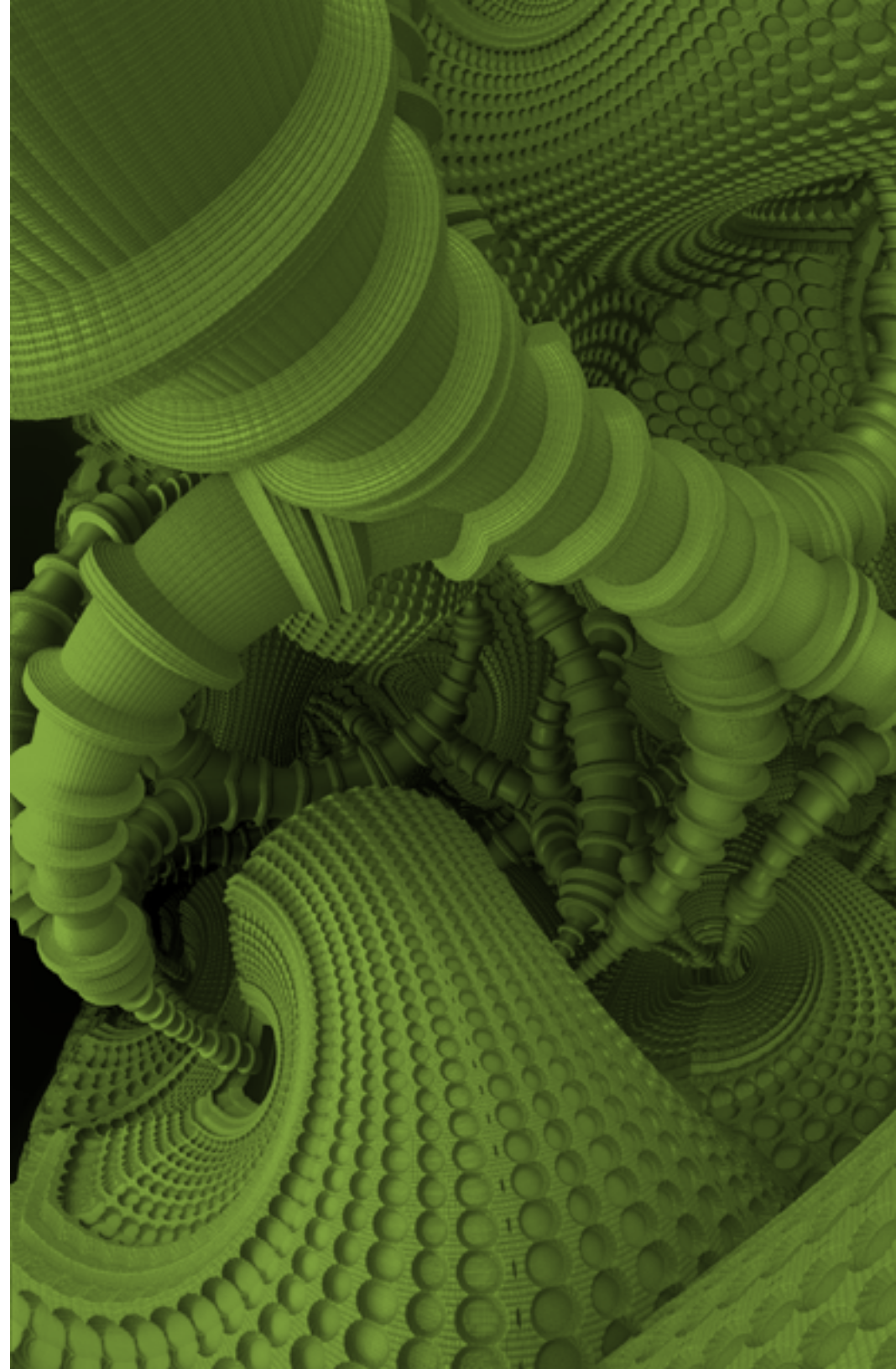
Evolving technologies are further complicating networking needs. The emergence of the IoT, 5G mobile, robotics, drones, 3D printing, AI, blockchain, quantum computing, nanotechnology, and more have placed greater demands on businesses—and their networks. These technologies often require cloud implementation and decentralized storage, or they must be deployed on the WAN edge. All of this change means that organizations must take a forward-oriented view of networking, so that they're prepared for what the future holds.

Fact:

## Organizations face major challenges related to WANs.
These include: rising costs (30%), rapid changes in business requirements (29%), cultural and leadership issues within IT (28%), and rapid business growth (26%).[4]

Chapter 2:
The Hybrid Landscape

MPLS is one of the mainstays of modern WANs. This technology framework boosts speed and performance by delivering data from one network node to another based on short path labels, rather than long network addresses, thereby avoiding lookups in routing tables. It's efficient and secure, and it fits nicely with the networking needs of organizations across a spectrum of industries. According to industry reports, the percentage of large organizations using MPLS is as high as 80% in many regions.[5]

There are some drawbacks: high cost, complexity of setting up hardware in new locations, bandwidth issues, long lead times for circuit provisioning, and architectural challenges to provide internet, cloud, and partner access per site, among others. In many cases, MPLS is just too expensive and unwieldy. It also can undermine the agility and flexibility required for today's businesses.
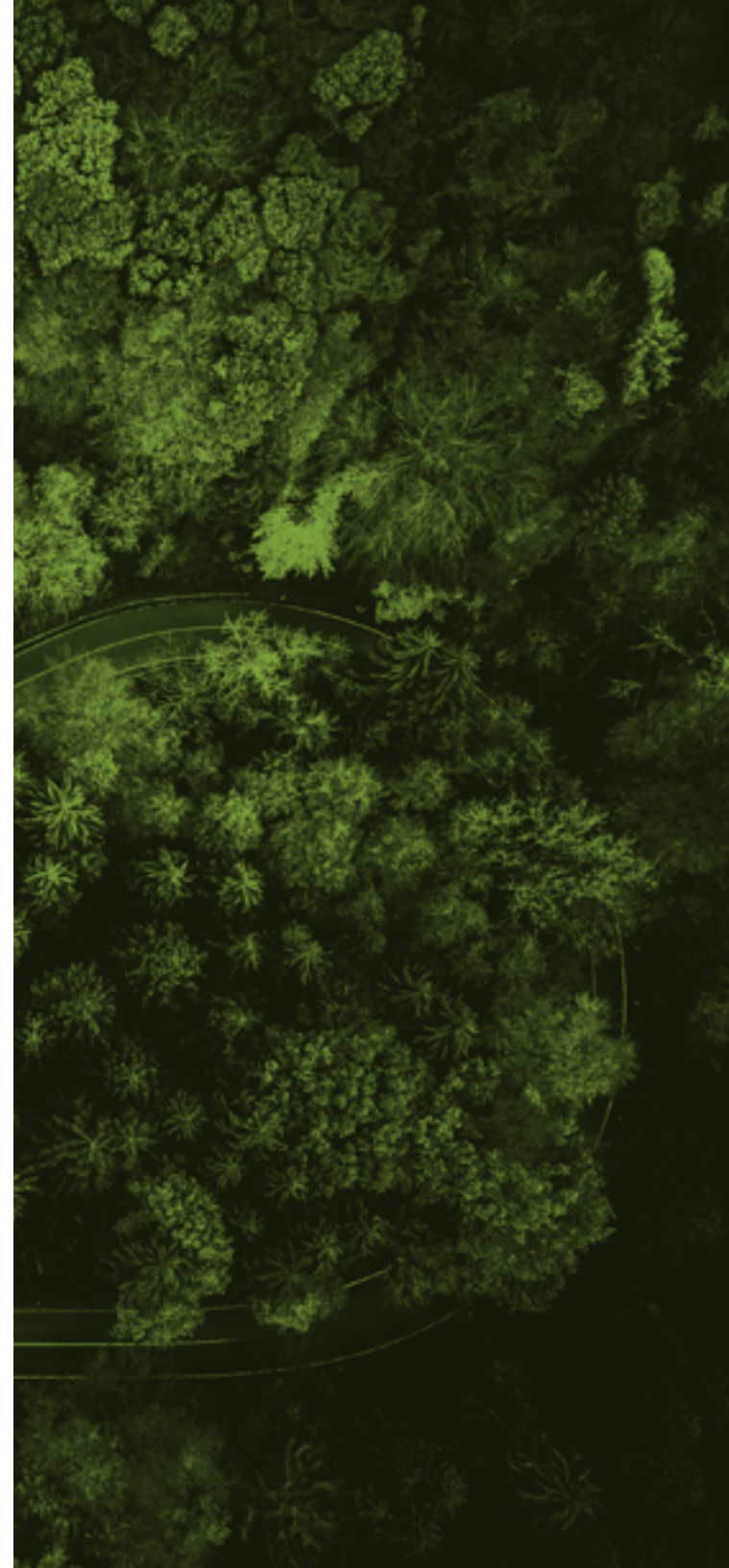
Fact:

Gartner estimates that switching to SD-WAN can result in 50% to 80% cost savings as a result of a smaller technology footprint and reduced need for staff.[6]

As organizations integrate newer technologies, adopt IaaS and SaaS cloud services, and provide high-speed internet access in all sites and for their mobile workforce, a growing number of enterprises are turning to hybrid approaches that encompass clouds, LTE, Wi-Fi, and other communications methods that comprise software-defined networks.

Because even as SD-WAN matures, MPLS will continue to play a key role. By implementing a hybrid architecture, organizations can gain the agility and capabilities of SD-WAN without the investment required to re-architect their WANs from the ground up. They now have the flexibility to continue to leverage MPLS technology where it makes business sense, while still simplifying and unifying their networks.

Things to Consider:

"Enterprise demands for greater agility, higher performance, and network expense optimization continue to grow. To meet these demands, the options available to enterprises for SD-WAN services are expanding in tandem with the growth of SD-WAN technology itself."

— Gartner[7]

Chapter 3: Next Generation SD-WAN Takes Shape

There is a variety of options for organizations looking to install or upgrade an SD-WAN. Some vendors simply overlay software-defined networking on a WAN. Others are adopting a more comprehensive SD-WAN framework that supports a flexible hybrid environment. As organizations look to connect digital technologies with branch offices, regional offices, smaller and more boutique manufacturing facilities, and partner offices—all while supporting remote workers—the need for this advanced framework becomes critical.
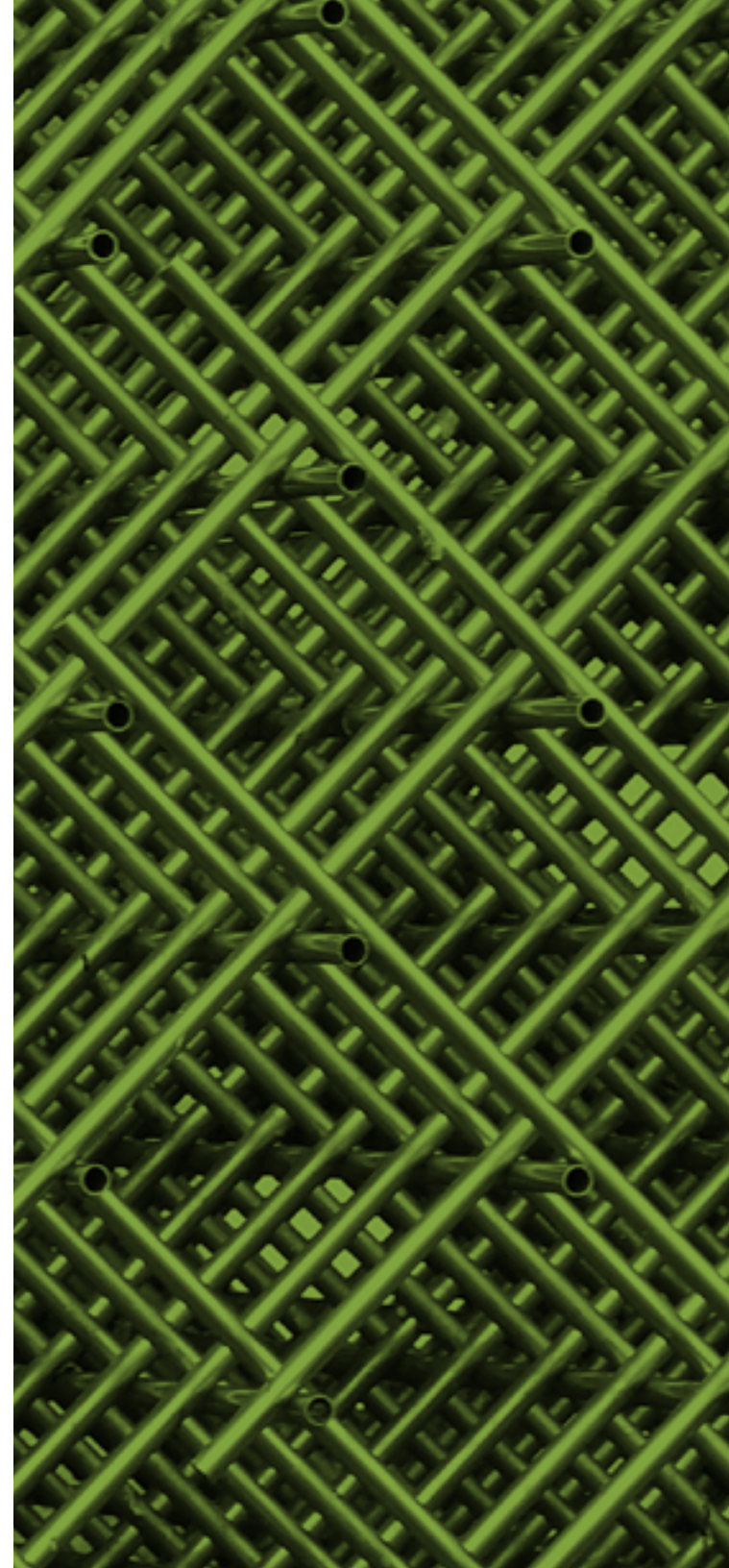
A comprehensive solution should include these six key components:

- **Security.** While SD-WAN technology in general improves security, more advanced SD-WAN partners offer a security layer that is integrated across a unified technology platform to support best practice security. In addition, vendors have begun to emerge that offer internal expertise and collaboration that can aid in building a solution that protects an enterprise's unique configuration. With a secure SD-WAN, your organization will benefit from broader and deeper visibility, combined with a simpler and more streamlined network infrastructure.

Tip:

Offering a collection of services under the same umbrella is not the same as a unified and highly integrated platform. In the SD-WAN space, businesses should look for vendors that offer the integration required for today's complex business environments.

- **Flexibility.** The ability to roll out the best and most cost-effective solution for a particular location and combine technologies seamlessly is the core of SD-WAN. An office in Africa or South America may require a DSL line or a 4G/LTE connection. A large office in Europe or Japan may benefit from a cable connection or MPLS. What's more, as 5G rolls out and IoT gains momentum, the need for flexibility will grow. A flexible transport layer ensures that business critical applications will perform adequately. It also allows businesses to dial up or dial down cloud workloads and SaaS applications more dynamically.

Tip:

Conventional WAN technology, and even some SD-WANs, require considerable configuration of systems, tools, and assets. The key to managing this complexity is an SD-WAN partner with simplified processes that have been proven with global customers.

- **Agility.** A more advanced SD-WAN framework allows organizations to reconfigure connections and deploy channels to new offices or locations on the fly. This is especially important for organizations using large applications like Salesforce that run in an outside data center. SD-WAN can extend availability and dynamically adjust to maximize quality of experience.

- **Visibility.** The growing complexity of digital business platforms, including IoT, make it more difficult to drill down into systems and technologies and understand performance issues. SD-WANs, by design, simplify the task by delivering broader and deeper visibility into network devices, users, and performance. It's possible to know how much traffic is on Salesforce, SAP, YouTube, or email. However, not all SD-WAN solutions provide the granular visibility and precise controls needed.

Tip:

Traditional WANs can be difficult to configure and manage with emerging technologies such as AI, robotics, IoT, and real-time analytics. They also present challenges for conventional apps such as CRM and email, which are increasingly cloud-based.

Tip:

Next-gen SD-WAN technology that operates within a unified platform offers unparalleled central management and troubleshooting functions. It also eliminates expensive upgrades and lengthy deployment cycles.

- **Redundancy.** Another benefit of SD-WAN is the ability to deliver greater redundancy, which is essential for high availability. It's no longer acceptable to have systems and applications go down, whether due to a line outage or the need for an update or fix; high quality of service (QoS) has become the norm. The most advanced SD-WAN solutions can distribute applications over different links so that the best available transport mechanism is used at any given moment.

Tip:

Implementing a modern SD-WAN solution requires considerable analysis, assessment, and expertise. What's more, not all point solutions play nicely with each other. Organizations should request referrals so that they can evaluate the vendors' solutions and capabilities, as well as their commitment to working collaboratively with clients.

- **Collaborative partnership.** Organizations that put all the pieces of an SD-WAN together effectively achieve a highly flexible, scalable, and agile platform for managing digital technologies. They are able to update and adjust the SD-WAN as needed. However, a new class of SD-WANs also delivers a collaborative approach. With expertise in architecture design, project management, implementation, and security, these providers become collaborative partners, designing and building unique solutions for their clients. They provide 24/7 service when needed, but allow organizations to maintain control as desired.

Tip:

Ensure that your business objectives closely align with a vendor's focus prior to making a selection. Key considerations for SD-WAN partners include SLA, security, pricing structure, and future roadmaps.

Chapter 4:
How to Make
the Transition to
Next-Gen SD-WAN

A starting point for any organization looking to transition to SD-WAN or update an existing networking framework is an assessment of the current environment. It's also necessary to understand what's possible with a more advanced SD-WAN framework to be able to identify current gaps and determine the specific steps required to make the transition. This demands a holistic view of the organization's current mode of operations (CMO), which can be accomplished with a survey of the location of all branches and users, technology in use, where applications are located, how applications are used, and what types of systems and devices are being used to access data.

Tip:

Manual configuration errors are a common cause of network outages and failures. Zero-touch configuration (ZTC) addresses this problem.

An update or upgrade may require new or different types of lines. In some cases, existing network access methods just need to be extended. An analysis may reveal that the current mix of lines is not optimal—or that it doesn't support network quality and data-intensive solutions, like video conferencing, IoT, virtual and augmented reality, AI, or 3D printing.

All of this makes it necessary, too, to ensure that an organization is working with the right SD-WAN vendor. Not surprisingly, vendors take very different approaches and often have very different ideas about how to design, implement, and operate an SD-WAN. They also offer markedly different pricing models.

A new class within the SD-WAN space is a collaborative approach that comprehensively addresses the entire task, from analysis to design to operations. This approach may reduce or eliminate the need for multiple MPLS or SD-WAN providers. It can dramatically alter total cost of ownership.

Key Questions to Ask Vendors:

- What capabilities and services do you offer?

- How are you different from other vendors?

- What is your philosophy and approach regarding support?

- How many projects are you rolling out and where do we fit into the mix?

- What SLA do you offer?

- What security protections do you have in place?

- What is your roadmap for the future?

- What ratings or references do you have?

With this information on hand, it's possible to select the right approach and vendor. At this point, an enterprise should know where MPLS and other existing lines can be used and where they need to be replaced or supplemented by other types of lines. An enterprise should also have a clear idea of how monitoring and management of the SD-WAN will take place. The ultimate goal is to integrate different products, solutions, and tools to build a seamless framework. Yet it's also necessary to understand where to deploy the technology first—something that depends on ease of installation, risk, and current needs and deficiencies at specific locations.

Only then it is possible to deploy an SD-WAN or perform the upgrades and updates necessary in phases that maximize benefits and minimize risks and costs. Not surprisingly, it's crucial to monitor a rollout closely and ensure that the enterprise is following the plan, but also gathering feedback about what's working, what's falling short, and what can be improved as the initiative ripples out to other sites, offices, and facilities. With this information and feedback, it's possible to adjust and adapt the plan as the rollout takes place.

Tip:

When weighing SLAs from vendors, check response times, reaction times, and change management processing times. These are critical metrics.

Chapter 5:
Taking SD-WAN Into the Future

The SD-WAN marketplace continues to advance and mature. Solutions offer increasingly sophisticated features and tools that can aid and simplify wide-area networking. Organizations looking to take a hybrid approach using SD-WAN technology should weigh different vendors' products and solutions to find the best partner that can boost flexibility, agility, and security—while reducing overhead costs. The right partner can also provide a more modular and scalable foundation for IoT and other emerging digital technologies, which often require fundamentally different networks, data access, and performance requirements.

Ultimately, emerging next-generation SD-WANs build a framework that's equipped for digital innovation and transformation. This framework is designed for cloud, mobility, and persistent connectivity, optimizing technologies and applications in the most efficient and effective way possible. At the same time, it is future-ready, incorporating emerging 5G and other advanced technologies. When an enterprise adopts an efficient SD-WAN model, it's possible to deliver transformative results—and at a more effective cost point than ever before.

For more information about how you can take your SD-WAN to a best-practice level, contact Open Systems to <u>request an assessment</u>.

Sources

[1] Enterprise Management Associates, Inc. (EMA) study. October 23, 2018

[2] Gartner, *SD-WAN is Causing Disruption in the Enterprise WAN Edge*, June 16, 2017

[3] Gartner, *Market Guide for WAN Edge Infrastructure*, March 23, 2017

[4] EMA, *Wide-Area Network Transformation*, December 2018

[5] Gartner, *Is MPSL Dead?*, 2013

[6] Gartner, *SD-WAN Economics: Shift from Tactical to Strategic Thinking*, February 2018

[7] Gartner, *Market Guide for Managed SD-WAN Services*, May 2018

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