The New World of Networking

SD-WAN delivers the agility and flexibility to meet companies’ needs for modernization and transformation today—and tomorrow.
Executive summary

More than ever, organizations are rapidly modernizing and transforming their networking strategy with SD-WAN.

AT&T research suggests that organizations already embracing SD-WAN have achieved results that broadly match the positive expectations and aspirations of those organizations still considering or planning an SD-WAN implementation. Increased performance and centralized management, which provide significant business and IT benefits, are at the top of the list for current and prospective SD-WAN adopters.

However, organizations of all sizes that are considering SD-WAN are apprehensive about the amount of time and expertise that IT staff will need to implement, operate, and troubleshoot SD-WAN infrastructure. Managed SD-WAN offerings can resolve the competing needs to conserve staff time, while providing greater reliability, higher security, and simplicity in networking.

Insights on tap

To glean insights into the perceived challenges and benefits of SD-WAN, AT&T surveyed more than 500 IT professionals in a variety of roles across industries, specifically focusing on retail/wholesale, finance, manufacturing, and healthcare. The research was conducted in February and March of 2020. The survey included respondents from small and medium-sized organizations (48%), as well as large enterprises (52%), representing organizations with 10–99 sites (34%) as well as ones with more than 100 sites (66%).

This report is based on the responses of IT professionals looking to chart a course for successful networking strategy by understanding the real-world experiences that others have had with SD-WAN implementation. The survey considered the challenges that organizations face with SD-WAN, and ways that managed SD-WAN is used to overcome those challenges.

“As a 911 center having SD-WAN providing multiple paths for internet connectivity allows us to stay connected.”

– Government, SMB
An important consideration about this research: The unexpected shifts in network use as a result of the worldwide coronavirus outbreak have both strained IT departments and heightened the need to re-examine and update organizations' networking infrastructure to accommodate remote work by a variety of transport means. The speed of those shifts underscores the need that many organizations have for expertise and available personnel in actually transforming their networks, and the need for organizations to plan for business continuity despite networking challenges.

This report is the latest in our series of white papers devoted to helping organizations understand the current networking landscape, as well as practical ways that network transformation can yield benefits throughout an enterprise.
A changing network, from edge to cloud to core

The variety of networking options available to companies today far outpaces that of just a few years ago. IT departments are naturally interested in ways to take advantage of the economic and technological advantages that each transport type can deliver. They want to efficiently provide access to endpoints representing users who may be in an office, in the field, or working from home. But getting the greatest benefit from those networking options is complicated by the variety, the increasing need to rely on multiple types of transport, and the changing needs of users.

“Network segmentation with SD-WAN allows for increased network security and traffic flow. Thus, increased availability and speeds.”

– Higher EDU, LE

Both within corporate networks and via intermediate service providers, data can now be carried to end users not just over high-speed fiber, DSL, or fiber-coax hybrid networks, but over a variety of wireless delivery systems including 4G, LTE, and increasingly available 5G. Companies may also employ dedicated lines, municipal networks, commercial ISPs, dedicated lines, or other means. Each of those transport methods offers a mix of qualities important to a business, from security features and maximizing speed to cost and reliability requirements. SD-WAN serves to consolidate and complement an organization’s current networking strategies, such as MPLS and VPN access, while allowing a cost-effective transformation from legacy technologies, such as the T1 lines upon which many businesses still rely.

For any particular transport type, customers experience throughput and features based on each transport’s underlying capabilities, as well as carrier-specific service level agreements (SLAs).

Given the complexity that this wide range of transport represents, the need to connect disparate endpoints, and the speed at which network transport is evolving can make organizations reluctant to make a long-term commitment to any particular transport method.
The data center isn’t what it used to be

It’s not only transport types that are rapidly evolving. The destinations that users need to reach now include cloud services and distributed data stores, not just servers or other endpoints. The sheer bandwidth that organizations need is also increasing as users rely on highly interactive, high-bandwidth applications for communications, from VoIP to rich messaging apps to video conferencing. Organizations are also seeking solutions for transferring huge datasets and other files across the network.

Taken together, these factors explain why SD-WAN is transforming organizations’ networks. SD-WAN enables IT professionals to simplify and manage data transport by transparently assigning traffic to the most appropriate available channel, all while allowing easy scalability for adding network capacity as needed.

Three important themes were revealed in the research:

- The significance of transport methods and diversity
- The advantages of SD-WAN and managed SD-WAN in particular
- The role of SD-WAN in providing business continuity, especially in light of recent shifts in business operations driven by an ongoing, worldwide pandemic
Transport matters

In examining the SD-WAN adoption landscape, the current networking challenges faced by enterprise-class networks are important to consider, as well as their expectations for future networking solutions. Because SD-WAN offers a way to aggregate or flexibly switch between networking providers and transport types, it allows companies to more confidently make networking decisions based on their total bandwidth needs rather than on particular transport methods.

**Bandwidth provisioning challenges**

IT decisionmakers in small and large organizations cited numerous challenges with their existing bandwidth. The three most-cited problems with network bandwidth are:

- **29%** Speed fluctuations
- **26%** Inconsistent connectivity by region
- **25%** App or network performance degradation

These factors are significant. Considered together, 67% of respondents identified issues stemming from network speed and coverage as chief drivers in selecting newer network technologies. This is a larger percentage than the other problems cited by responders, which include providers’ general ability to meet current needs (55%), troubleshooting protocols (48%), or price (37%).

**Current vs. future needs**

Respondents are mostly satisfied with the capability of their networks to deliver the bandwidth that their organizations currently require (with 64% describing their network capacity as at least “adequate”). However, they also anticipate the need to upgrade in the short-term to avoid exhausting current capacity. Fully 85% of respondents say they expect having to provision more bandwidth within the next two years to meet their growing needs.
Estimating current and anticipated demands, and matching those demands to available or upcoming high-speed last-mile solutions, are important parts of planning for or implementing SD-WAN. Whatever their degree of SD-WAN adoption, 76% of respondents say they are researching or evaluating new solutions and vendors for bandwidth, with 65% saying that current WAN solutions struggle to keep pace with workloads. Further, a wide majority of respondents (81%) reported that their organizations are evaluating potential updates to current WAN solutions.

Despite its promised increased bandwidth, the growth of 5G networking is not yet a major driver among the organizations surveyed. Enabling 5G technology fell well short of IT automation, the most commonly cited investment driver at 37%.

Responses to this question varied by industry. Retail and wholesale organizations were more likely to strongly agree that their current WAN solutions struggle to keep pace with their bandwidth and performance needs. They were most likely to say that 5G networking could help increase their SD-WAN capabilities.

How IT pros see their network capabilities now, and in the near-term future

- **Current Network Bandwidth Requirements**
  - Significantly exceeds: 18%
  - Slightly exceeds: 18%
  - Adequate: 36%
  - Somewhat inadequate: 18%
  - Completely inadequate: 10%

- **Future Network Bandwidth Requirements**
  - Significantly more: 12%
  - Slightly more: 45%
  - No change: 12%
  - Slightly/significantly less: 3%
**SD-WAN: Greater than the sum of its parts**

Besides automating the bonding of diverse network connections to increase throughput, SD-WAN solutions can implement quality of service rules. This means that different data streams are treated according to their requirements for latency, resilience to dropped packets, and needs for security or other requirements. VoIP calls, for instance, require highly reliable speed. But a well-designed VoIP system can tolerate dropped packets and constrained bandwidth while still providing high-quality voice transmissions. Crucial file transfers may not require that packets reach their destination with consistent speed, but those packets must arrive with certainty. SD-WAN can also deepen security, with end-to-end encryption by default.

The organizations surveyed are rapidly transforming, or preparing to transform, their networking strategy with SD-WAN. As an upgrade to conventional, more constrained networking infrastructure, SD-WAN is widely and strongly perceived as a solution for increasing an organizations’ efficiencies and capabilities. In fact, 74% of respondents say SD-WAN would strongly complement their other WAN solutions. Awareness or familiarity with SD-WAN was another factor in the research, with 44% of survey respondents having already deployed SD-WAN to some degree.

Most SD-WAN adopters have had positive experiences, especially with connectivity and cost. The research also revealed sentiments about the perceived benefits of SD-WAN.

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**Network control**

“SD-WAN simplifies the management and operation of a WAN by decoupling the networking hardware from its control mechanism.”

– Financial Services, LE

**Network costs**

“SD-WAN is a less expensive and more dynamic alternative to MPLS.”

– Consulting, SMB

**Routing and connectivity**

“SD-WAN would give us another option for connecting our remote offices to our main location.”

– Health Care, SMB

**Workload efficiency**

“SD-WAN allows me to develop disaster recovery procedures that don’t require a Cisco Certified Network Associate to operate in the event of a disaster.”

– Retail/Wholesale, SMB
Reflecting these sentiments, current adopters and prospects named the same top two reasons driving them to adopt or consider SD-WAN from an IT perspective: improved network performance and increased security.

Similarly, both current users (45%) and prospective adopters (39%) named “Simplify IT operations and eliminate network complexity” as their top business reason for adopting SD-WAN.

**Additional benefits of SD-WAN**

Respondents also provided very similar answers about what they have found (or expect) SD-WAN to deliver overall. However, both current and prospective adopters need help in understanding the full range of SD-WAN benefits, including:

- Multiple paths for connectivity
- Higher speeds
- Flexible use of modern high-speed infrastructure (rather than or in addition to legacy infrastructure)

**Caveats, challenges, considerations**

For all its benefits, SD-WAN infrastructure doesn't come without some concerns. Respondents noted the possibility of increased costs (cited by 24% of respondents to the survey), as one of the biggest hurdles in adopting SD-WAN. Other barriers included:

- 33% IT staff time and resources deploying / configuring the solution
- 28% IT staff time and resources troubleshooting the solution
- 25% Training the IT staff to manage / maintain it
Managed SD-WAN adds value

While organizations can assemble an SD-WAN infrastructure on their own, it may not be the most efficient solution. The reservations that many respondents expressed about shortfalls in IT staff availability and expertise in designing, implementing and troubleshooting an SD-WAN environment are significant.

Experienced SD-WAN providers are well positioned to estimate costs and timelines for SD-WAN implementation. They can anticipate problems likely to be encountered in moving from existing networking structure to SD-WAN, and they know the most efficient solutions for reaching an organization’s current needs while leaving room for growth.

Once an SD-WAN infrastructure has been established, a dedicated service provider can take on the burden of management as well, allowing that internal team to focus on issues specific to the organization itself, such as training and troubleshooting software issues for users, rather than day-to-day network infrastructure management.

Finally, if and when problems do arise in the network, a managed SD-WAN provider can use its expertise to quickly resolve any issues. When a business system is stressed, the ability to provide ready-made solutions is the hallmark of an experienced outside provider—especially relevant when it comes to business continuity.

These operational advantages of a managed SD-WAN approach are matched by an important business advantage: by relying on an SD-WAN provider to accomplish regular management and provide help when it's needed, the organization avoids the need to purchase new hardware or expand their physical infrastructure.
SD-WAN and business continuity

Keeping customers and employees connected is key to every enterprise.

The need for business continuity—consistent experience across various location types, role flexibility as business needs change, and dependable access for customers—has been highlighted by the current pandemic, which has created a rapid shift for many businesses to work-from-remote locations.

SD-WAN can provide employees working at different locations with transparent access to the same resources they would have at headquarters locations, across a variety of transport methods.

“SD-WAN provides a means of simplifying the individual WAN endpoint architecture and provides seamless options for fault tolerance and failover connectivity.”

– Adopter, Manufacturing, LE

Making the most of available connections—fast

In retail environments, SD-WAN can contribute to business continuity by enabling new sales locations to be quickly provisioned with multi-mode networking to support employees and customers. SD-WAN offers the agility organizations need to their network infrastructure. As network conditions change, additional or more economical bandwidth can be smoothly integrated.

Every organization needs consistent availability and security for distributed workforces to collaborate effectively. Because SD-WAN provides application-aware network traffic management, traffic with the highest business priority can be given the highest network priority as well.
**SD-WAN is integral to business continuity**

Robust networking is a requirement of today’s networking environments. Business continuity is based on many factors, including failover plans for individuals, job functions, equipment, and connectivity.

While it’s not the only element, SD-WAN is integral to that continuity. It offers a framework for connecting other critical elements of a continuity plan, such as integrating varied network infrastructure to present that infrastructure transparently to users, and formulating a communication platform to facilitate business operations even when network bandwidth is strained.

**Managed SD-WAN for continuity planning**

While many organizations have IT staffs could be trained in managing SD-WAN solutions, IT staffs do not have the time to learn, implement or troubleshoot SD-WAN infrastructure. By relying on the expertise on an experienced managed SD-WAN provider, organizations can avoid the obstacles inevitable in a system managed in-house.

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**The need for business continuity**

- **Small-scale network disruption:** Physical infrastructure faults, scheduled maintenance, or software glitches may slow or block a particular network path for minutes or hours.

- **Site, regional or global disaster:** Regional or global conditions, whether man-made or natural, may render large segments of a network, or particular transport types, unusable or unreliable for days or even longer.
Looking forward

One important conclusion from the research is that while network operational costs are not the most important factor driving adoption of or interest in SD-WAN, costs matter nonetheless. The single largest factor in whether an organization can actually go through with SD-WAN adoption is whether there’s room in the budget for that move.

An increased number of remote users is also a driving factor, and is especially salient as many millions of knowledge workers are now working remotely.

The advantages of SD-WAN may be even more important for smaller organizations, which must rely on nimble business practices to compete with larger firms, and who may be even better poised to quickly step in with changes to their business practices when needed.

A plurality (35%) of those considering SD-WAN infrastructure say that the information they most want to learn during or in advance of adoption is the full extent of SD-WAN capabilities. For their organizations to move forward with SD-WAN, both IT and business decision makers will need to see that SD-WAN offers a wide range of advantages compared to less flexible networking paths.

The desire to learn more about SD-WAN’s capabilities, not simply to implement it straightaway, explains why 45% of those surveyed say they are looking for a forward-looking SD-WAN provider which can build a network that addresses their current challenges and can be easily scaled in the future.
Conclusion

SD-WAN offers advantages to businesses in flexibility, speed, security, application support, and other aspects.

AT&T has state-of-the-art expertise and a range of related services, including managed SD-WAN with VMware. As leaders in this space, AT&T can assist you in managing the modernization and transformation of your network infrastructure. Visit us and receive a free assessment and recommendations for network enhancements.

About the survey

AT&T commissioned Spiceworks to conduct an online survey in February-March 2020 to gain insights on the experiences and aspirations that both midsized and large organizations have in planning for and implementing SD-WAN. There were 514 respondents in the U.S., all at organizations with more than 10 sites. The IT decision-makers were required to have purchase influence on network services or solutions for their organizations, representing a mix of both current and prospective SD-WAN users.