

# How a Software-Defined Network Advances Digital Transformation

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## COMPANIES THAT DEPLOY SOFTWARE-DEFINED, OR ADAPTIVE, NETWORKING TECHNOLOGIES REPORT IMPROVEMENTS IN NETWORK CONTROL, IT PRODUCTIVITY AND EFFICIENCY, APPLICATION SPEED AND PERFORMANCE, AND SECURITY.

To facilitate digital transformation, most businesses are focused on ways to improve IT efficiency and productivity, provide instant network control, enhance application speed and performance, and mitigate security risks.

That's where a software-defined networking platform can add value and accelerate efforts. This "adaptive network" enhances performance while providing greater visibility and control over data.

And there's evidence that companies are moving toward such a platform, according to a new study sponsored by CenturyLink and conducted by IDG. Enterprises that have deployed SD-WAN, hybrid WAN, Ethernet WAN, or a mix of all three—and who measure these technologies' benefits—cited the following impacts:

- 91% see improvements in network speed/performance of up to 29%.
- 90% see improvements in networking costs of up to 28%.
- 79% see improvements in multilayered network response to security threats of up to 31%.
- 74% see improvements in on-demand connections of data center to public cloud of up to 34%.

The IDG study surveyed 252 IT decision-makers and included 10 in-depth interviews (see the "About the IDG Survey" box). This paper examines the results of the research in detail, including:

- The need for adaptive network technologies to address digital transformation challenges
- The benefits and measured successes of companies that have deployed adaptive networking
- Best practices and words of advice

### » Adapting the Network

The IDG research defined the adaptive network this way:


"A software-defined adaptive networking platform enhances application performance, simplifies network management, accelerates the digital business, and provides greater visibility and control over valuable business information assets."

Of the in-depth interviews conducted by IDG, eight out of 10 of the IT decision-makers completely agreed with the above statement whereas the remaining two participants said they agreed with most of it.

Essentially, there is a need to modernize the network for data security, network speed/

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performance, revenue growth, and digital innovation. To do so, enterprises are deploying SD-WAN, hybrid WAN, and Ethernet WAN technologies. And they are adopting a mix of these platforms (see Figure 1).

From the technology perspective, these platforms ensure that enterprise networks are flexible enough to accommodate remote cloud workloads, mobility, digitization, and the Internet of Things (IoT), for example.

“Fundamentally, the adaptive network must provide the agility that allows developers uninhibited access to data center and cloud resources,” says Dave Cooper, vice president, Global Network Architecture at CenturyLink. “The faster developers are tasked with executing on their enterprises’ digital transformation objectives and the more agile the network is to provide access to the data center and cloud resources, the faster they can develop and implement new capabilities—in some cases, in near-real-time fashion, which is synonymous with the DevOps movement.”

And by extension, the more agility developers have, the faster the business can execute on digital transformation objectives, such as improving the customer experience, shortening time to market, or accelerating innovation efforts. The adaptive network enables enterprises to move agilely and efficiently, scaling up or down, according to where they are in their digital experience (DX) journey.

This is a critical point: The adaptive network enables companies to evolve at their own pace, leveraging highly available, cost-efficient Internet connectivity wherever and whenever they need it.

“The fundamental proposition for adaptive networking is to satisfy the enterprise’s various stages of digital transformation, and it’s largely a function of how far along they are with application development and cloud adoption,” says Cooper. “The network should let them be as progressive as possible while addressing some of the cost challenges they have in the short term.”

## » The Measured Realities of Adaptive Networking

Enterprise executives and IT decision-makers recognize the need to evolve their networks. IDG respondents indicated that their priorities are to improve:

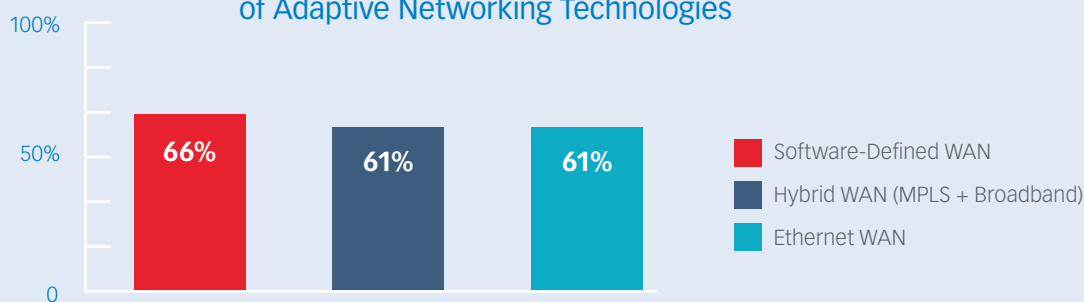
- Data security
- Network speed/performance
- Revenue growth
- Digital innovation
- Customer experience

In return for their investments, companies expect an evolved network infrastructure that gives them a competitive advantage.

Most of the IDG research participants have measured success via KPIs: 66% of SD-WAN users, 61% of hybrid WAN users, and 61% of the Ethernet WAN adopters. The results are impressive. No matter the platform, these enterprises see improvements in control, productivity and efficiency, application speed and performance, and security (see Figures 2 and 3).

FIGURE 1.

### Companies Have Deployed a Mix of Adaptive Networking Technologies



Base = 252

Source: IDG, January 2019

In an open-ended survey question, the 252 participants were asked to specify how adaptive networking provides competitive advantage. Respondents cited at least a dozen benefits—including increased security, greater business agility, lower costs, an improved customer experience, network resilience, and improved response times.

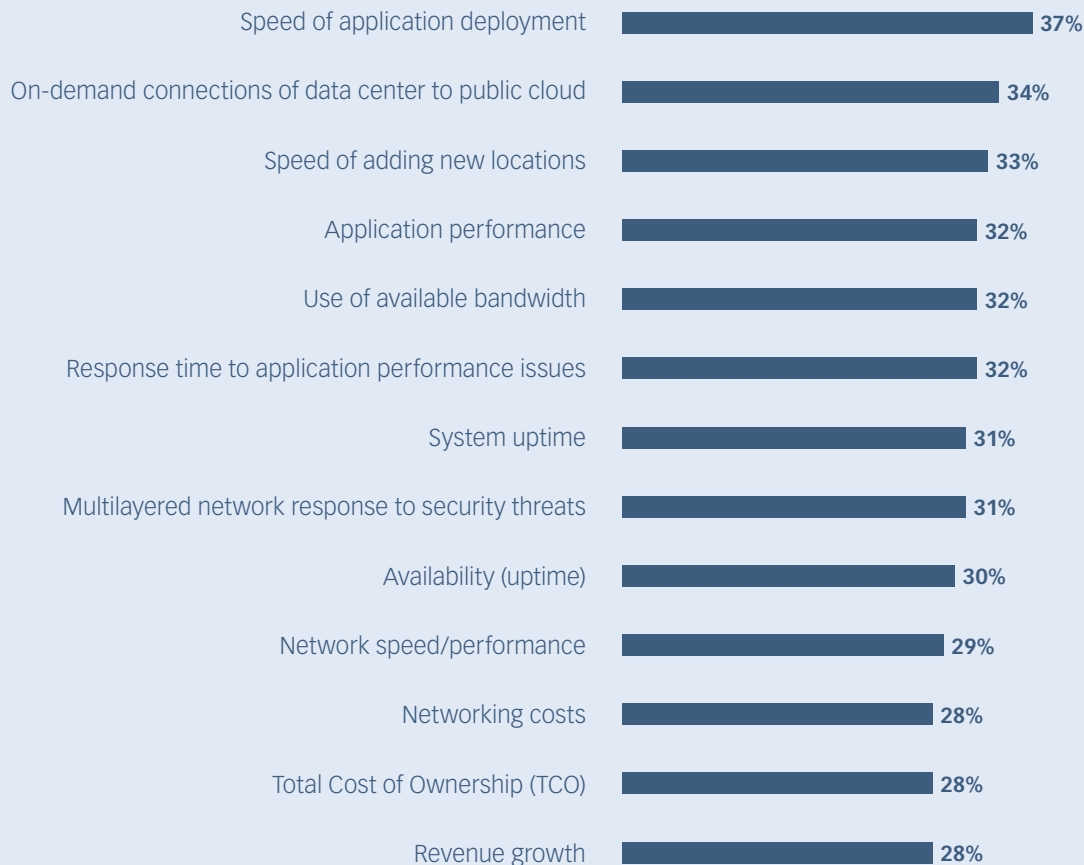
- “Software-defined WAN technology gives my company a competitive advantage. We are less likely to experience downtime than if we were on different LANs, and it reduces budget costs, saving us valuable IT resources for use on other things.”

- “[Software-defined WAN technology is] built to our business and way of business, so it has improved efficiency and applicability.”

### » The Adaptive Network: Best Practices

The advent of cloud computing—and the cost savings therein—has kicked off a drive toward improving and digitizing multiple facets of the business. As “born in the cloud” companies such as Airbnb, Uber, and Warby Parker have demonstrated, soaring revenues, speed to market, agility, and a personalized customer experience are benefits worth targeting.

**FIGURE 2.**  
**Adaptive Networking Benefits Both IT and the Business**  
 KPI Improvements Since Modernization (Mean Percentage)



(Among respondents who track KPIs) Source: IDG, January 2019

However, to attain these transformational objectives, the enterprise network must modernize. The adaptive network offers many opportunities to help companies achieve their digital transformation goals. Yet, just as DX is challenging, so too is modernizing the network. Here is a checklist of best practices.

↓ *Set out a cloud strategy.*

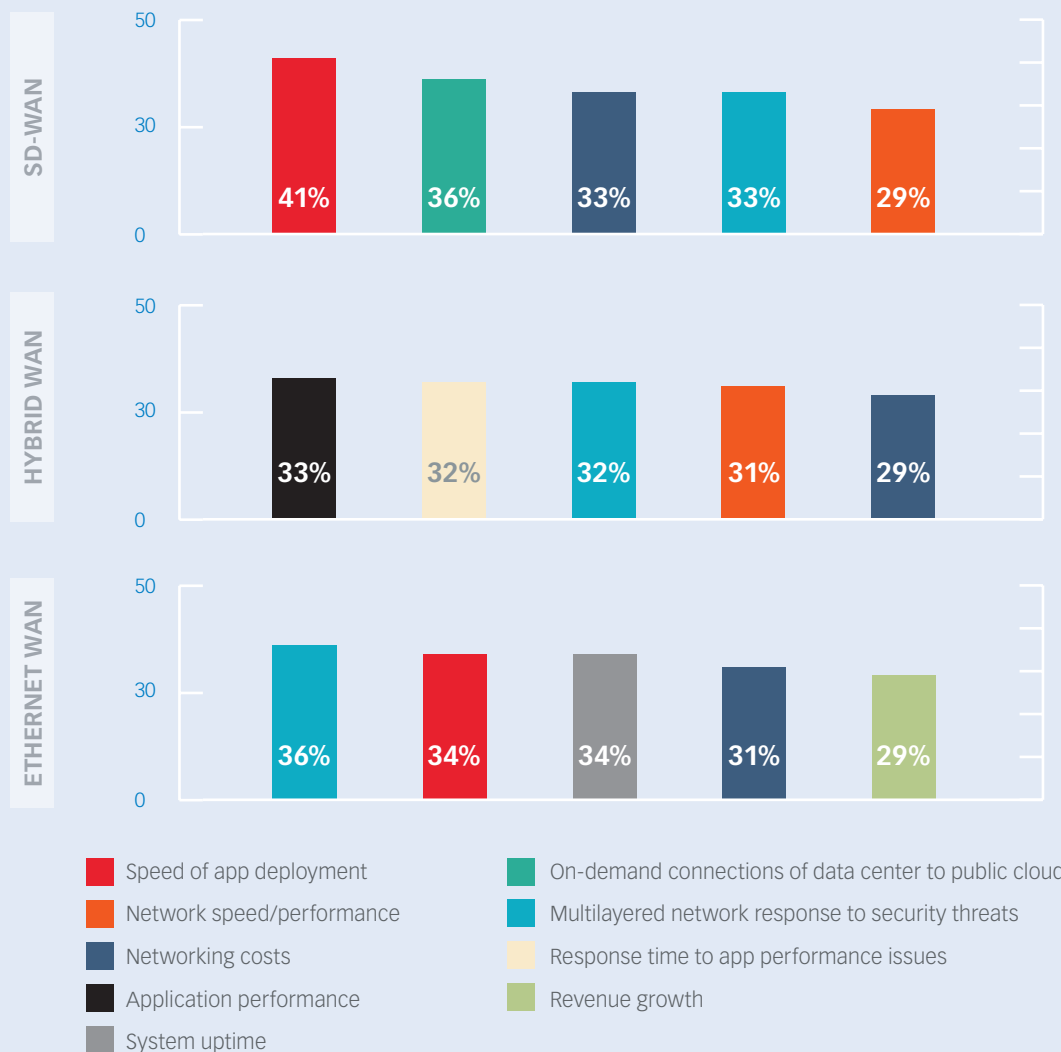
There is no need to rush 100% to the cloud. Focus on meeting short-term fiscal objectives while balancing the need to transform the business.

“I think the first place to start is understanding where you are in the digital transformation journey and then understanding where you are in terms of customer-facing applications,” Cooper says.

↓ *Aim for quick cloud wins.*

“Migrate the applications that make sense while developing applications with all the resilience and availability you need for the customer experience,” Cooper says. “The cloud and Internet broadband options provide a significant amount of choice that

**FIGURE 3.**  
All Adaptive Networking Platforms Provide Benefits



(Average KPI improvements among those who saw improvements) Source: IDG, January 2019

then ultimately helps you improve costs and other benefits.”

Cost-effectiveness and optimization successes will inherently help achieve other business objectives for digital transformation—such as efficiency, productivity, and customer experience enhancements.

#### ↓ *Recognize cloud limitations.*

“Most enterprises are well aware that they’re not going to necessarily be 100% cloud-based,” Cooper says.

For example, a healthcare organization may face inordinate privacy and security challenges with moving a legacy app to the cloud. It’s important to straddle both the new (cloud, mobile) and old (on-premises infrastructure, legacy) worlds during the digital journey.

#### ↓ *Map an approach for applications and the network.*

“While applications may be served in places outside of traditional data centers—like in colocation centers with bare metal and various other different approaches—there are ways to develop an infrastructure network approach that doesn’t focus on the least common denominator to support a legacy application,” Cooper says.

While focusing on applications, conduct an inventory of fixed sites, mobile employee requirements, and mobile consumer requirements—and their interactions with applications.

Consider the feasibility and financial implications of connecting remote locations to determine which network platform works best—whether that’s SD-WAN, hybrid WAN, and/or Ethernet WAN. The reality is, in some cases, that these sites and requirements are unique and will necessitate multiple options.

#### ↓ *Over time, dig deeper into adaptive networking.*

Deploying adaptive networking platforms accelerates everything. Achieving network uptime, availability, and instant control will enable higher speed-to-market and improved customer experiences. In addition, the more deeply connected the network, the better companies can adapt security capabilities.

In essence, the goal is “to eliminate the network as a bottleneck or an impediment to application developers,” Cooper says. “This necessitates a hyperflexible, any-to-any-based network with greater portability.”

#### ↓ *Partner up.*

As enterprises progress on their DX journey, they will transition into the new world. And to do so, an agnostic approach to network connectivity will be required. That means being able to intelligently deliver the right application to the right users on the right connection—examining packet flow and seamlessly directing apps to the optimal path, based on access restrictions, latency requirements, and data sensitivity.

It’s critical to align with a partner that has the underlying network assets to deliver this seamless connectivity. In addition, the dynamic nature of the digital ecosystem, with an ever-expanding number of endpoints, means that enterprises must work with a vendor that is deeply and widely connected throughout world markets. This ensures that the network does not become an impediment to progress.

#### » *The Bottom Line*

Adaptive networking helps companies push forward and meet the challenges of digital transformation. SD-WAN, hybrid WAN, and Ethernet WAN offer proven benefits, including increased control, productivity and efficiency, application speed and performance, and security.

One of the IDG research respondents, a vice president of IT operations at a biotech company, offered this perspective:

“Things like simplifying network management and providing greater visibility and generally accelerating the business I certainly agree with. We are certainly getting a much clearer view of network traffic. Lower overall costs, both opex and capex, via less reliance on equipment,” he said. “We have improved some of our metrics in terms of quality of service and performance. One of the benefits of SD-WAN is to realize various different paths between two locations. I think the monitoring and visibility have helped with a lot of different aspects.”

As the research demonstrates, the use of these adaptive networking technologies is a win-win for both the business and IT and for both digital transformation and the state of the network.

## Peer-to-Peer Words of Advice

IDG respondents who have deployed SD-WAN, hybrid WAN, Ethernet WAN, or a mix of these platforms offered some critical advice for anyone starting to explore adaptive networking technologies.

### *Educate yourself and others*

- “Educate yourself and the team; bring in vendors. Do a thorough application rationalization.”
- “Contact your peer group, and find out what software-defined networking services and technologies your peers are using for your industry.”
- “One of the things we did not do, because we were under the gun and wanted to do things quickly, was to go out and speak to other companies that have implemented this technology. That would have been nice—just to see if they hit their expectations and got what they were expecting. That would have given us a comfort level that we didn’t have at the time.”

### *Have a plan*

- “Think through how you will break down the current network as the new one is implemented. That requires a very thorough plan. That’s where some of our consultants helped us.”
- “Before you try to delve into these technologies to see what they can do, you need to understand your own profile and your road map vis-à-vis cloud. That will drive a lot of choices and decisions that you will make.”
- “One main thing that really sticks in my mind is ... a phased approach. There have to be different phases, and that’s really for business optimization and reducing risk.”

### *Take a full view*

- “Look at things holistically, not just looking at the networking aspects. Look at software-defined everything! All of these things should be considered and architected and designed holistically. Otherwise you improve on one thing and you make things worse on another side.”

## About CenturyLink

CenturyLink supports one of the largest Internet networks in the world and is one of the most interconnected data center providers—whether private or public. The company has peering relationships that deliver deep, unrestricted market reach, shortening the distance between the adaptive networking customer and CenturyLink network backbone access in various markets throughout the U.S. as well as the rest of the world.

“We believe fundamentally that if the customer is on the CenturyLink network, we can provide a better performance experience in terms of latency, reduced packet loss, and various other different performance attributes,” says Dave Cooper, vice president, Global Network Architecture at CenturyLink. “We also provide an exceptional customer experience when it comes to support for the network, the infrastructure, and the end-to-end experience.

“Our ability to offer adaptive networking, coupled with our network breadth and the need for a hyperinterconnected cloud ecosystem is where we provide significant value to our enterprise customers,” he says.

For more information, visit [centurylink.com](http://centurylink.com).

## About the IDG Survey

In late December 2018 and early January 2019, IDG conducted a quantitative survey of 252 respondents at the IT manager level or above (C-level/VP, director/architect/engineer, and manager/administrator) with purchasing involvement at companies with more than 500 employees.

These enterprises have all deployed SD-WAN, hybrid WAN, and/or Ethernet WAN technologies. In addition, IDG conducted 10 in-depth interviews to better understand the IT and business outcomes associated with these adaptive networking technologies.