CITRIX®

SD-WAN:
A Simplified Network for Distributed Enterprises

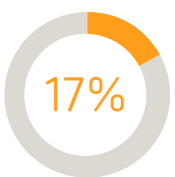
Table of Contents

Keeping up with changing technology

In the last decade, two major technology trends have converged and are set to have a significant effect on corporate networks: virtual computing and the rise of cloud technology. Both of these trends dramatically increase the importance of the corporate network on business performance.

The result is a significant increase in network traffic, from branch to datacenter, from branch to branch, and between various devices and the datacenter. And much of this traffic is real-time communications, including video and voice. This results in the necessity for more bandwidth, more latency-sensitive applications, and more reliance on network availability and quality.

30% of businesses are using public cloud-based services.



This trend is likely to increase 17% per year.[1]

The emergence of new technologies has meant that network traffic in distributed organizations is manipulated in new ways. Not only do remote users need more bandwidth, notably in areas such as video or media, but they now expect immediate access to cloud-based applications, Software as a Service (SaaS), and remote storage apps.

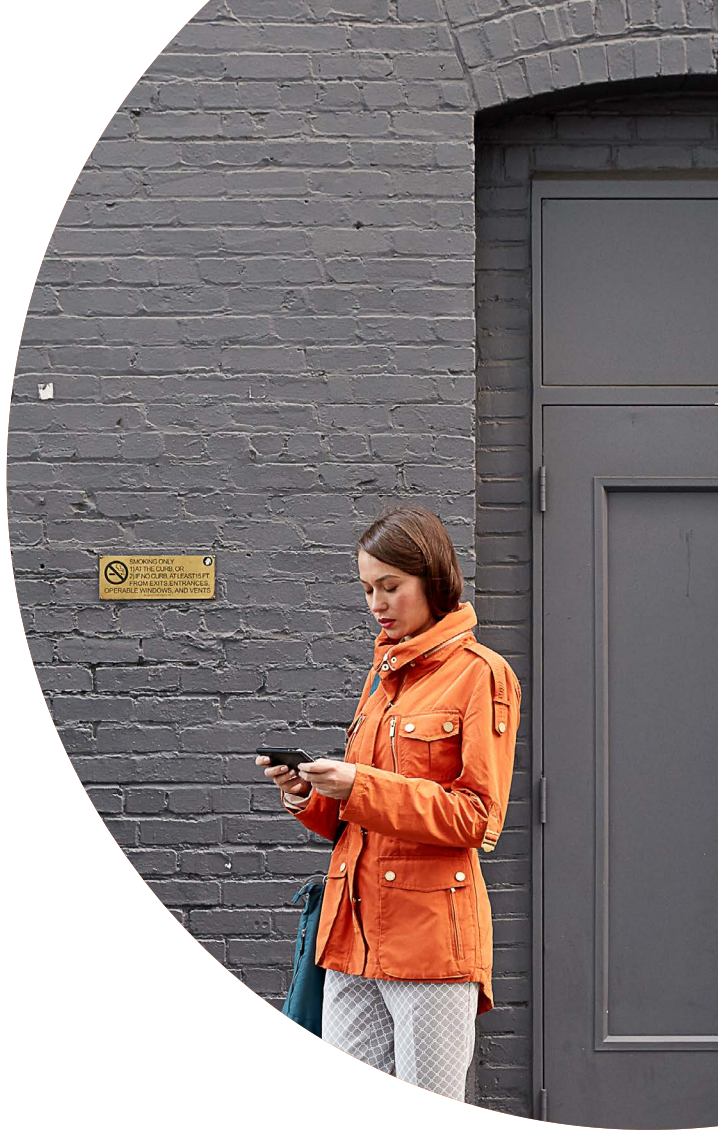
1. "Hybrid Will Be the New Normal for Next Generation Enterprise Wan," 2014, Gartner

The problem with traditional MPLS networks

Traditional multiprotocol label switching (MPLS) networks that carry traffic from remote offices to the datacenter cannot offer the high bandwidth, low latency, and high performance needed to access cloud-based applications. Combined with the complexity of remote operations and new management and security requirements, MPLS networks are out of their depth.

A 2014 ZK Research study indicates that the customer experience is one of the major concerns of network administrators.[2]

Current network architecture is more than a decade old and is therefore not prepared for today's challenges, marked by an increase in connected devices, mobility, cloud models, and security needs. The result? The current infrastructure is unable to comply with the security requirements and current business models. These require fast response times that are unavailable over an inflexible network. All this makes the evolution of the network a priority, not just for the CIO, but the entire management structure.

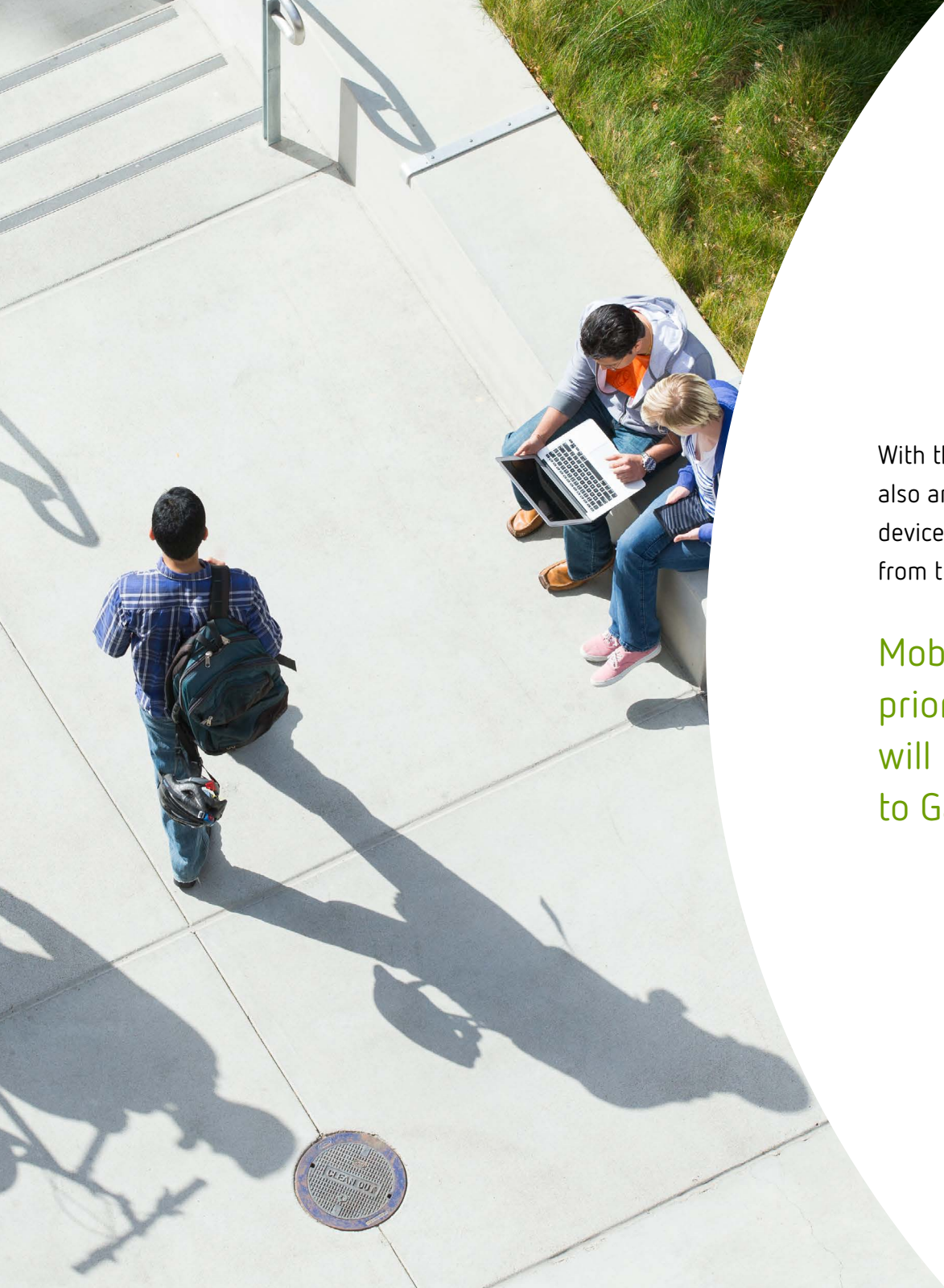


2. "Network Manager Survey," 2014, ZK Research

New networks must meet growing business needs

Business needs and market trends drive network evolution—a fact that can no longer be ignored by management. Enterprises need an intelligent network that can adapt accordingly. The new network concept must:

- Connect users to applications regardless of the desktop device or connectivity route and whether it resides in the private or public cloud.
- Provide a uniform experience irrespective of where the connection is made.
- Optimize traffic for cloud and mobility, providing the best user experience.
- Apply prioritization and optimization criteria depending on the data and applications used.
- Allow applications to be deployed without special network requirements.
- Simplify the management overhead of distributed services, even, ideally, automating them.
- Provide more visibility to network managers, allowing them to eliminate potential conflicts in the network.
- Integrate security into the network with multiple layers and multiple control points.
- Rapidly provision applications and services in order to maintain the business' competitive edge.



With the growth of mobile applications, network managers must also anticipate and plan alternative methods of connection for mobile devices in the corporate WAN to allow users better connectivity away from the office.

Mobile optimization is the second highest priority for CIOs, and by 2018 mobile devices will form half of the user base, according to Gartner.[3]

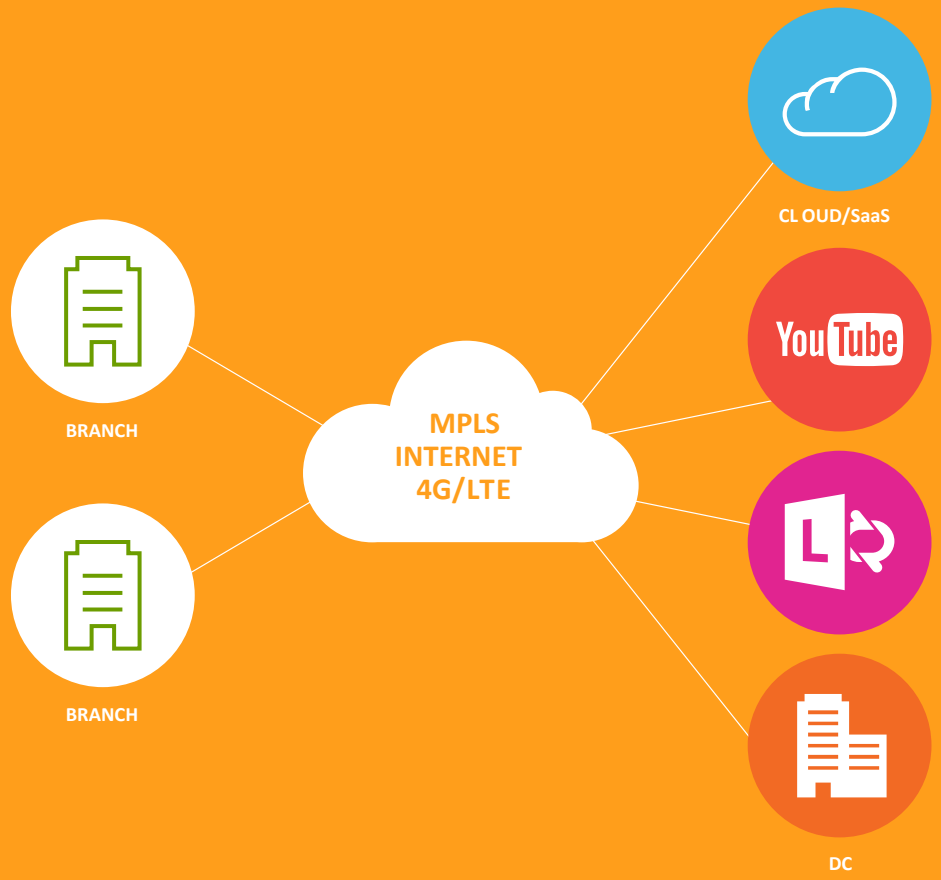
3. "Prediction 2015: Mobile and Wireless," 2015, Gartner

SD-WAN:

Responding to the needs of distributed enterprises

Companies are looking for cost-effective solutions that simplify operations. A software-defined wide area network (SD-WAN) integrates with your existing WAN architecture to streamline management and improve network efficiency.

SD-WAN uses software to identify the most effective way to route traffic to remote locations. SD-WAN transfers network monitoring and management from physical devices to a central controller, allowing network managers to configure and control traffic based on centralized security policies and rules.

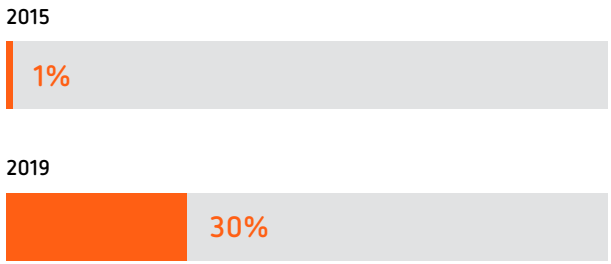


Simplify network management

SD-WAN uses cloud-based software and technology to simplify the delivery of WAN services to remote offices. Software-based virtualization enables network administrators to manage network services more easily through abstraction of higher-level functionality. SD-WAN allows IT and business managers to quickly and easily deploy internet-based connectivity that provides a secured and reliable connection, with better bandwidth and lower costs.

For businesses looking for an alternative solution for their remote offices and mobile device connectivity, SD-WAN is relatively easy to implement and will result in significant gains.

30% of businesses will be using SD-WAN by the end of 2019, compared to 1% in 2015, according to Gartner estimates in their Market Guide for Software Defined WAN.[4]



The network has become a strategic asset and the need has arisen to move to SD-WANs, which solves big issues for network administrators. This new way of looking at the network gives the needed flexibility and responsiveness, together with the control and security necessary to deliver on the needs to the new distributed enterprise.

Between $25 and $50 million in 2016 will be spent on SD-WAN end-user solutions, and it is likely to double in 2017.[4]

4. "Market Guide for Software Defined Wan," 2015, Gartner

Streamline multi-location organizations

So, what are the benefits of SD-WAN to distributed organizations?

They include the following:

Network reliability

By quickly detecting and routing around network outages or poor quality links, SD-WAN solutions can prevent problems on any one link from affecting users. This makes a reliable connection between users and their applications and prevents business downtime.

Business agility

SD-WAN enables the rapid rollout of WAN services to remote offices without the need for on-site IT support. New circuits can easily be added without disrupting operations and business policies can be changed from a centralized location and immediately pushed across the organization.

Bandwidth savings

Internet connections are readily available, quick to deploy, and come at a much lower cost than equivalent MPLS networks. SD-WAN provides the reliability and security benefits of WAN services at internet prices.

Architecture optimized for the cloud

SD-WAN frees you from the inconveniences and constraints of traditional MPLS networks and bundles security, performance, and connectivity between cloud and office, which significantly improves the experience for users in remote offices when they use SaaS or cloud-based applications.

SD-WAN:

Factors to consider

When evaluating SD-WAN deployment, network administrators and business managers should take into account certain factors:

It's easy to rollout and administer. A key benefit of SD-WAN is its ease and speed of deployment to remote offices. There's no need to send IT professionals to the offices and no need to individually configure each appliance.

Migration to hybrid networks is an option. Most organizations have distributed MPLS deployed in remote offices. Companies can deploy SD-WAN solutions without changing existing networks. Over time however, they can migrate to less expensive public broadband circuits.

Automated traffic management. SD-WAN provides the ability to prioritize traffic and mitigate the impact of network outages. The key is to provide network managers with intuitive tools to easily configure priorities automatically, based on real-time network load.

Cost:

SD-WAN vs. MPLS

With the conservative assumption that WAN traffic increases by 15% per year, communications costs are a major concern for enterprises. Consider that the cost of MPLS starts at $90 a month for a T1, on average, and scales up quickly for more bandwidth.

MPLS Pricing vs Broadband in the US

City	MPLS - T1N	PLS - 10 Mbps	B - 10 Mbps
Atlanta	$626	$1204	$95
Boston	$440	$1363	$95
Chicago	$419	$1401	$95
Cleveland	$531	$1311	$95
Dallas	$643	$1108	$95
Denver	$368	$1425	$95
Detroit	$452	$1066	$95
Houston	$689	$1228	$95
Los Angeles	$453	$1606	$95
Miami	$687	$1435	$95
Minneapolis	$645	$1198	$95
New York	$415	$1326	$95
Philadelphia	$550	$1001	$95
San Francisco	$684	$1301	$95
Seattle	$574	$1341	$95
St. Louis	$557	$1264	$95
Washington	$441	$1590	$95
Median	**$543**	**$1210**	**$95**

SD-WAN is between three and nine times less expensive for these communications. In addition to standard costs, installation and changes take an average of 90 days with traditional MPLS systems and usually involves a commitment to multiyear contracts, making it a more expensive and less flexible option.

Take a deeper look at MPLS and SD-WAN cost comparisons here.

NetScaler SD-WAN:

Citrix's challenge in the SD-WAN arena

Traditional WANs were not designed for today's bandwidth demands. Given this, the WAN solution offered by Citrix's NetScaler SD-WAN provides high levels of scalability, reliability, and adaptability to distributed enterprises. Citrix's offering combines the strengths its other products while leveraging smart WAN technologies, WAN optimization, and application management to create a unique solution that provides a high quality experience for users in remote offices and on the move.

Chalan Aras, Vice President and General Manager of Citrix NetScaler SD-WAN presents a brief overview of the solution in this video.

" Combining the flexibility of XenApp and XenDesktop with the cost effectiveness and efficiency of NetScaler SD-WAN gives customers anywhere-anytime access for their workforce, promoting productivity and effective working practices."

—

Christian Reilly,
VP and CTO,
Workspace Services,
Citrix

This solution reduces the bandwidth requirement needed to deliver such a user experience with minimum administration of remote offices, reducing the need for on-site technical support. And it can provide these features with less financial outlay due to significant savings in the remote communications infrastructure.

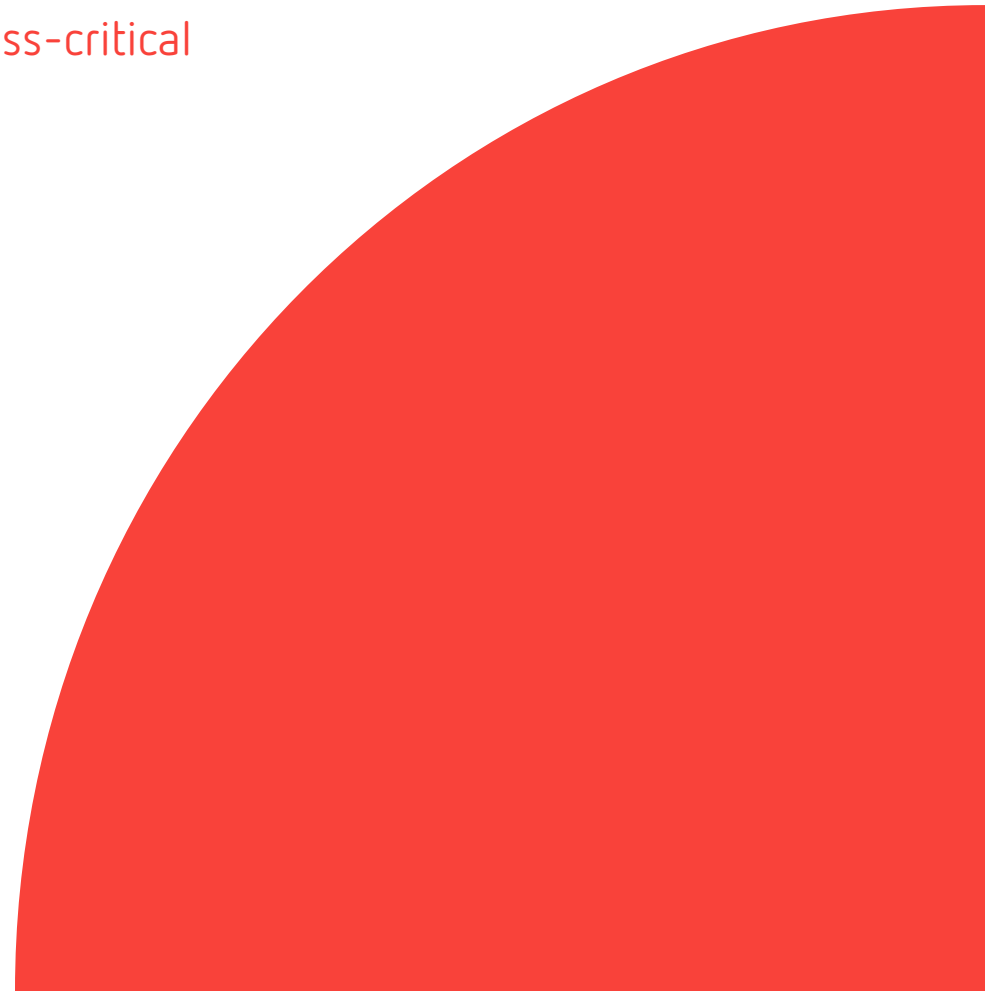
The principal benefits of NetScaler SD-WAN:

- Guaranteed business continuity and disaster recovery
- Reduced communication costs
- Improved application performance for mobile users, as well as those in remote branches and offices

"NetScaler SD-WAN ensures efficient use of increased network capacity, cost reduction, and better performance, as well as better reliability for business-critical applications."

—

Juan Rodríguez,
Director BDM,
Delivery Networks,
EMEA, Citrix Systems



Case study:

NetScaler SD-WAN improves the Danish Ministry of AgriFish's communications

The challenge:

Provide mobile connections to sailors

Agency employees work where mobile coverage is extremely limited — at sea. But they need access to applications to facilitate their work and communicate with mainland colleagues. Previous solutions required boats to sail close to the coast to find more robust connections or use satellite communications, two expensive and unsustainable options.

The solution:

A virtual WAN via satellite and mobile connections

Zentura, a Citrix partner, proposed a NetScaler SD-WAN solution to the Danish agency. The SD-WAN automatically selects cellular or satellite links depending on the conditions, so that traffic flows optimally and without manual intervention. Combined with Citrix XenDesktop and XenApp, it provides remote access to applications, mitigating performance problems.

Key Benefits
NetScaler SD-WAN provides reliable connectivity at sea, enabling users to stay connected without disruption to their workflow.

"Mobile coverage has increased significantly. We used to be lucky to have signal at 5/8 nautical miles from the coast—now we have coverage over 23 miles from Skagen. As a result, the crew can focus on their inspection tasks and not on how to maintain a connection."

—

Bjarne Lund,
Manager for Infrastructure Development, AgriFish

NetScaler SD-WAN integrates mobile and satellite connectivity options, using the best in each case. Connectivity changes automatically, depending on the quality and availability at any moment in time, avoiding manual intervention.

Before, the agency had to choose between low bandwidth with high latency, or more expensive connection options. NetScaler SD-WAN chooses the best option, which significantly improves network performance.

Of course, this isn't the only success story where customers have deployed the NetScaler SD-WAN solution.

HMS Host opted for a distributed application delivery solution to maintain efficient business operations.

Likewise, Groupe Promutuel has chosen NetScaler SD-WAN to support a dispersed organization with many remote sites.

And Cornerstone Home Lending sped up access to their software for users, and reduced the time and effort needed in the IT department.

Distributed enterprises need reliable solution to ensure network connections and simplify network management.

Learn how NetScaler SD-WAN can keep your users connected to the datacenter, the cloud, their applications, and each other with the following resources:

- Citrix NetScaler SD-WAN
- Try NetScaler SD-WAN
- Case Study

1. "Hybrid Will Be the New Normal for Next Generation Enterprise Wan," 2014, Gartner
2. "Network Manager Survey," 2014, ZK Research
3. "Prediction 2015: Mobile and Wireless," 2015, Gartner
4. "Market Guide for Software Defined Wan," 2015, Gartner