Go Beyond SD-WAN

The Next Evolution of Enterprise Networking

SD-WAN in Crisis

The story of networking infrastructure—and all infrastructure for that matter—is the same. No matter how much capability and capacity you build, no matter how much power you pack into it, there will come a day when it is no longer fit for purpose. As computing and the digital world have evolved into the 2020s, enterprise networking has struggled to keep up. Networking is a dynamic and living practice driven by business needs, available technological innovation, and human ingenuity. Sometimes networks surge ahead of practical applications, and in other cases, a once-dazzling technology outlives its useful life and new technologies emerge to meet the developing need.

For wide-area networks (WANs), that moment last came when businesses' demand for more immersive, cloud-based applications increased and eventually reached a tipping point. Multiprotocol label switching (MPLS), once the hallmark of the enterprise, could not connect remote locations without becoming too expensive and slow to provision. This business-class internet connected these branches to multiple clouds, eliminating the extra latency induced by backhauling traffic to the data center.

Of course, we now know that software-defined wide-area networking (SD-WAN) arrived to be the solution to MPLS woes. This game-changing technology provided branches direct internet access to all the cloud-delivered applications and enabled centralized control through software within a distributed infrastructure, resolving many of the pressures that cloud applications put on WAN networking. SD-WAN is inherently able to overcome the network performance issues associated with internet links through various forward error correction techniques.

Today, we are at another inflection point. Businesses across the globe rely on SD-WAN for smart, and reliable, one-to-many networking. That is great, but opening direct internet access to the branches has created a gaping security hole at the branches. Initially this was addressed by multiple devices at the branch, or by running SD-WAN and security services as virtual network functions (VNFs), and service chaining them within a big fat SD-WAN appliance. Over time, the industry has proved that cloud-delivered security was the right approach.
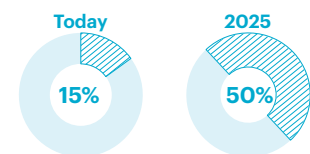
Facts:

63%

Approximately two-thirds (63%) of IT directors are not very confident in their IT infrastructure's ability to fully support hybrid working.[1]

64%

Multi-cloud is the most common deployment model today and adoption is forecasted to increase to 64% in the next three years.[2]

Today 15%   **2025** 50%

According to a Gartner® Article, "Gartner expects that by 2025, 50% of enterprise wireless endpoints will use networking services that deliver additional capabilities beyond communication, which will be up from less than 15%.".[3]

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[1] "Defining The Future of the Workplace," Apogee, February 2022.
[2] "Enterprise Cloud Index," Nutanix, February 2022.
[3] "Gartner, Capturing Value from Next-Generation Wireless", September 14, 2022. GARTNER is a registered trademark and service mark of Gartner, Inc. and/or its affiliates in the U.S. and internationally and is used herein with permission. All rights reserved.

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However, just as WANs outlived their usefulness and were replaced, it's now clear that SD-WANs are falling under similar pressures. The catalysts: enterprises' digital transformation efforts and their embrace of hybrid working models, which accelerated during the COVID-19 pandemic. Putting it simply, SD-WAN users were primarily in brick-and-mortar buildings, but applications have proliferated and are now hosted everywhere. Even a "small branch" is no longer a rare use case.

Today, we are in a new era of borderless enterprise in which users, devices, sites, and clouds are all connected in numerous ways. We have a remote-first perspective and have moved beyond the four walls of the traditional corporate office. The growth of micro-branches, multi-cloud, remote-work, telehealth, mobile fleet, and IoT assets in manufacturing are examples of how the perimeter has expanded in once-inconceivable ways.

Organizations are rapidly diverging from the practices of the past. Increasingly, the modern enterprise is cloud first and data driven, while workers and businesses alike are seeing the benefits of providing people with flexibility over where they work. Today, 91% of businesses have adopted or have plans to adopt a digital-first business strategy[4], and 74% of them offer hybrid working options[5].

These are among a range of key trends that are emerging, creating a borderless world and reshaping the existing landscape to a point where what we might now think of as "traditional SD-WAN" is no longer sufficient. Here is a brief view of those key trends:

Trend 1: App and IoT Device Proliferation

Application and Internet of Things (IoT) device proliferation matter now more than ever. Traditional SD-WAN supported a few thousand applications, which served it well at the time, but the sheer volume of cloud applications and IoT devices has since exploded. Enterprises need solutions that provide visibility and control over tens of thousands of apps and devices. IT architects require simplicity, so they are not configuring these apps one at a time, which is simply not scalable.

Furthermore, lack of visibility and granular control of IoT poses risks to the network. For this, fine-grained AI/ML-driven segmentation is required rather than traditional VLAN-based segmentation.

Trend 2: Cloud On-ramp and Multi-cloud Networking

To accelerate cloud adoption, organizations leveraged SD-WAN to control the flow of traffic from users in branch offices to the destinations they wanted to connect to. However, today approximately 90% of enterprises have deployed multi-cloud networks[6], where they leverage cloud services from a range of providers. Companies may have dozens of different clouds they access, with workloads in each. And they are looking for a networking solution that connects all these clouds securely, enables automation, and is Terraform compliant. As one of the most popular Infrastructure-as-Code tools, Terraform allows users to define, configure, and deploy infrastructure resources across multiple clouds in a safe and repeatable manner, resulting in speed and efficiency.

Multi-cloud networking is a challenge for SD-WAN. To fill the gap, some vendors now provide a cloud networking solution that threads all these clouds together, providing application-to-application access. These multi-cloud networking vendors solve an important problem: They enable companies to migrate their workloads to these clouds from a unified dashboard that provides the insights needed to orchestrate them effectively.

More and more users need to access multiple clouds, and customers are looking for seamless connectivity from branch to any cloud with flexibility, integrated security, and on-demand scale. Traditional SD-WAN can't deliver all that. On top of those challenges, customers are looking for cloud on-ramps that automate connectivity and unified policy across clouds by integrating public cloud infrastructure into the same SD-WAN fabric. Additionally, customers want to optimize their voice/video experience by consuming premier collaboration services like Zoom that are delivered as SaaS.

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[4] "Businesses increase tech investments to expand digital business initiatives," Foundry, 2021.

[5] "Employee Benefits Survey: 2022 Results," International Foundation of Employee Benefit Plans, 2022.

[6] "90% Of Companies Have A Multicloud Destiny: Can Conventional Analytics Keep Up?", Forbes, March 4, 2022.

Trend 3: Hybrid Work & Wireless First

Hybrid work needs secure, reliable, and optimized access to all enterprise applications, no matter where the users or applications are. As such, a good user experience is the key to productivity. Just like how security follows the data, performance should follow the user and enable that same seamless experience that does not rely on location or hardware. For example, if the user's Zoom experience is important at the branch, then the same Zoom experience is just as important in any remote location and the user should expect it to be delivered as such.

To be able to work anywhere at any time in a many-to-many world, we need more on the wireless front than what SD-WAN has provided. What's required is fast and reliable connectivity in every location, whether it's in a field vehicle that is always on the move, or a stationary, enterprise access point on a wall that provides a strong signal inside IT closets.

Wireless-first connections are needed for a range of different scenarios. Branch offices may need wireless access but so will mobile equipment like trucks or robots or locations that have hundreds or thousands of sensors. Sometimes this connectivity comes from the device and other times from a separate fixed or mobile location that serves many devices or applications. As a result, expanded support for 4G/5G wireless must not be an afterthought. Depending on the deployment needs, more ruggedized CID2- and IP-rated devices are needed. For example, wireless gateways are desired for situations where providing strong wireless signal strength is a must-have requirement, such as remote locations where broadband is not available or takes a long time to set up.

Trend 4: Edge Compute

As the network is moving to the cloud, computing is moving closer to the edge. Many SD-WAN vendors started on the path of service chaining SD-WAN VM with on-premises partner security VM on a large appliance. However, a lot of the security and networking functions have since moved to the cloud. What has also changed is the requirement to have lightweight compute functions closer to the data source. More containerized applications are being deployed at the network edge and this creates significant application management challenges that current "fat" SD-WAN architectures are not built for. These apps could enable different use cases. As an example, a retailer that wants a POS system to be available 100% of the time would move the POS system onto their edge compute to maintain high availability. Or it could be a manufacturing app that pre-aggregates sensor data instead of streaming all data over cellular, which easily becomes cost prohibitive, or running an app like ThousandEyes to eliminate appliance sprawl.

Trend 5: Cloud-delivered Security

Traditional SD-WAN allowed branches to communicate directly over the internet to multiple clouds, opening a gaping security hole in the process. Some enterprises opted for distributed security at each site, which was complex to manage and scale. SD-WAN vendors therefore started throwing around the term "good enough security" at the branch level. But "good-enough" network security is no substitute for the best-in-breed security you get with SASE. Time has proven that cloud-delivered security is the right approach. SASE enables unified architecture with simplification and context sharing between SD-WAN and cloud-delivered security.

SD-WAN for a Borderless World

The previous generation of SD-WAN enabled dynamic and efficient use of the internet, which allowed businesses to reduce their networking costs even as they improved performance and enabled one-to-many connectivity. However, given the disruptive trends facing enterprises today, it's time to look beyond SD-WAN to a solution that meets the needs of a hybrid, borderless enterprise—one that provides both many-to-many and any-to-any connectivity. Welcome to the world of the "borderless SD-WAN."

What does a borderless SD-WAN look like? In short, the borderless SD-WAN compliments and extends legacy SD-WAN networking through the integration of security service edge (SSE) capabilities. The result is a SASE network capable of seamlessly connecting branches, homes, devices, people, clouds, and data centers in a high-performing and secure network.

The Network of Tomorrow

Every technology has its moment under the sun, before being replaced by a newer, more relevant, and powerful alternative. Local area networks (LANs) gave way to WANs, WANs to SD-WANs, and now the sun is setting on that era of SD-WANs. In its place, borderless SD-WANs are emerging as the next big thing in enterprise networking. This evolution is enabling seamless delivery of secure, context-aware connectivity from anywhere to anywhere, purpose-built for our new age of cloud-first, hybrid working. Organizations that embark on this upgrade journey sooner rather than later stand to get out ahead of their competitors with a more flexible, secure, and performant IT infrastructure.

What should leaders look for in a modern SD-WAN?

☐ A comprehensive single-software architecture is non-negotiable, as it is simply not possible for enterprises to patch their way from siloed, legacy edge solutions to a borderless SD-WAN

☐ AI-driven operations that simplify management with automated troubleshooting and insights into end-user experience with per-user AppX score, traffic flows, policy violations, and anomaly detection

☐ High-performance connectivity for critical voice, video, and data applications with fast and reliable connections, application-aware prioritization, and dynamic path selection, that automatically remediates poor performance on the last mile

☐ Optimized user experience to eliminate single-tunnel shortcomings of existing remote access VPN by connecting with multiple public and private data centers simultaneously, enabling users to receive the most optimized experience with policy-based direct-to-app access

☐ 360° protection by smoothly delivering SD-WAN, ZTNA, SWG, CASB, DLP, cloud firewall, and other security services

☐ Unified architecture and consistent context-aware policy that extends context-aware zero trust policy, SD-WAN, and SSE across the entire solution portfolio, providing every remote user, device, and site with simple, secure, high-performance access to hybrid and multi-cloud environments

☐ Comprehensive support for 4G/5G wireless across the broad range of wireless use cases modern enterprises need to support

☐ The ability to provision edge applications and computing to allow services to operate remotely and to be managed and updated from a central location

☐ A scalable policy framework that allows a much larger and more complex set of policies to be applied in real time when people are using the system to meet the needs of different cohorts

☐ Cloud on-ramping capabilities to simplify and automate the process of connecting users to multiple clouds

☐ Unified policy with a consistent experience for users across remote users, branches, and multi-cloud