



# SD-WANs enabling the move to a cloud-centric world

Ensuring application performance and availability for cloud-based workloads

The movement of applications and business-critical workloads to the cloud is putting unexpected demands on the current wide area network (WAN). Many of these networks are not capable of supporting cloud-based workloads in an efficient or effective manner. Enhancing the current network with a Software-Defined WAN (SD-WAN) will simplify supporting cloud-based applications and deliver many additional benefits to the business.

## Executive takeaways

**You will learn the following from this white paper:**

- 1 How the use of the cloud and the movement of workloads to the cloud puts unplanned stress on existing WANs
- 2 How SD-WAN solutions enhance the capabilities and performance of existing WANs to meet the needs of cloud workloads
- 3 The key business benefits of an SD-WAN to enable more effective use of cloud services
- 4 5 ways that Windstream Enterprise can support workload migration to the cloud

## The move to a cloud-centric world impacts the WAN

Organizations in a broad range of industries are embracing digital technology. The ensuing use of cloud architectures for IT infrastructure is exploding to enable this mega-trend. Cloud infrastructure is becoming the status quo. Consider the results of the latest [IDG Cloud Computing Survey](#). More than 73% of all organizations have at least one cloud app, and 17% of the remainder will in the next 12 months. The average enterprise budget for cloud services has expanded from \$1.6 million in 2016 to more than \$2.2 million in 2018. Perhaps the most startling statistic from this study is that 38% of the respondents expect to go “100% cloud” at some point in the future.

Yet, as organizations rush to the cloud, many have not developed an effective strategy for optimizing the WAN to enable cloud infrastructure. This is more problematic than it might appear at first glance. As compute and storage resources move off-site to cloud service providers (CSPs), the WAN becomes the determinant of application performance, user experience and other key IT success measures. Focusing on the WAN is now essential; demands on it will only grow moving forward. According to [Forbes](#), 83% of workloads will be run in the cloud by the end of 2020. Most current WANs were never designed to support this kind of traffic, meet a new set of application performance demands or simplify daily operations.

## Getting your WAN cloud-ready: The benefits of SD-WAN

The precedent for moving to a next-generation, SD-WAN environment is already in place. The migration of compute and storage resources to a software-defined status is the standard approach today. This started more than 10 years ago with the first wave of server virtualization. Many of the key benefits realized from this activity will also be delivered by SD-WAN. The fundamental concept of using software to describe resources is the future of IT for all three aspects of infrastructure (compute, storage and networking).

The first step on the path to deploying a cloud-ready WAN is to move away from legacy WAN processes and technologies and toward SD-WAN services that can meet the current and future challenges of supporting a cloud-driven IT environment. Utilizing SD-WAN will solve many problems that legacy WANs present for a cloud-centric organization. Much as hyperscale CSPs are already reaping the benefits of virtualization when it comes to compute and storage resources, expanding this approach to the WAN will optimize end-to-end app experience for business users. Most importantly, using SD-WAN will allow IT to:

---

**Eliminate/reduce network fragmentation.** With a unified approach to utilizing and managing individual WAN elements, it becomes possible to move traffic to the most appropriate WAN link, depending on the policies for a specific cloud workload. This is essential to delivering the consistent, enterprise-wide user experience that is expected in a modern digital business.

---

**Reduce management and operational complexity.** The ability to manage and employ different WAN resources as a single logical entity is a game-changer. Network admins will be able to focus on higher-level issues necessary to optimize cloud services, not the minutiae of trying to optimize individual links.

---

**Increase flexibility.** The single logical view (with the ability to drill down to the individual location as needed) allows network and IT operations teams to respond to changes or support new requirements far more quickly, in some cases in real time. This provides a step-function increase in network flexibility, necessary for successful cloud deployments.

---

---

**Ensure application performance.** As workloads move to the cloud, application performance will be seeing much greater impact from WAN performance and throughput issues. To ensure that cloud services meet Service Level Agreements, moving traffic to the optimal WAN link in real time is critical to delivering required performance levels.

---

**Improve reliability.** With the ability to move traffic in real time among different CSPs or corporate locations, SD-WAN ensures that an outage in one link doesn't take down connectivity to a cloud service or provider. This is vital as mission-critical workloads move to the cloud.

---

**Provide real-time management and visibility.** A digital business runs in real time. And the WAN that enables cloud infrastructure requires a management platform that can provide real-time measurements, information and status. Any delays in discovering bottlenecks, outages or other issues is highly problematic. Comprehensive visibility of the WAN is critical for effective management tools.

---

---

**Implement enhanced security.** Security is non-negotiable for cloud-enabled WANs. The starting point is comprehensive security policy implementation and the ability to modify/change policies in near-real time. As new threats, compliance demands and other issues arise, policy management is critical. Providing firewall devices at the network edge is another important defense. Finally, supporting compliance regimens for PCI DSS, HIPAA, and other regulations helps the organization meet expanding legal and compliance demands.

---

**Procure enhanced connectivity to critical CSPs.** As businesses focus on a small number of primary cloud partners, deploying enhanced WAN links directly to these CSPs is a very attractive option. Guaranteeing that key CSPs are always connected with necessary performance levels will become a mandate.

---

These capabilities are essential for the WAN to support a cloud-connected enterprise. Unlike legacy environments where compute and storage resources were often limiters of performance, in a cloud world, the WAN is the focal point. For this reason, the move to SD-WAN is critical to the success of the cloud strategy. The reality is that legacy WANs were designed for a very different IT environment.

## 5 ways Windstream Enterprise delivers SD-WAN services to optimize cloud migration

As a leader in the market for SD-WAN technologies and services, Windstream Enterprise delivers a comprehensive solution for organizations migrating to the cloud to upgrade legacy WANs to next-generation SD-WANs. With thousands of customers in North America, we have substantial real-world experience deploying SD-WAN solutions that are a perfect fit for a cloud-centric world.

There are 5 key elements that showcase the high quality of Windstream Enterprise solutions for businesses of all stripes. The optimal combination of these and other features is essential to success.

**1** Optimized connections between SD-WAN and the cloud. Windstream Enterprise has developed many different solutions that combine to optimize the use of SD-WAN — for enabling a cloud-connected IT strategy. These services and offerings are designed to optimize connections to the cloud in general and to specific CSPs.

It starts with our Cloud Core™ network architecture. With over 150,000 fiber route miles, it is designed from the ground up to optimize cloud applications. Cloud Core is a highly resilient, available and secure set of network services that optimizes the performance of the WAN and all the cloud-connected

applications that depend on it. These services are delivered in a cost-effective, on-demand and elastic manner utilizing a set of simplified APIs and user interfaces. This platform is enabled by software-defined networking (SDN) and support for network functions virtualization (NFV), which accelerates service delivery and ensures ideal performance levels. It also provides industry-leading support for cloud-native microservices. The architecture enables new levels of programmability, agility and simplicity for customers. In addition, the use of APIs to support a full abstraction of the underlying physical infrastructure simplifies deploying a state-of-the-art WAN for cloud-centric organizations. It all adds up to greater simplicity and improved performance, reliability and connectivity to cloud-based apps.

The Windstream Enterprise SD-WAN Cloud Connect offering delivers dramatically improved access to specific CSPs. Using this solution, a virtual Windstream Enterprise SD-WAN edge device at the CSP is made available as simply another location on your SD-WAN. This device at the CSP is then directly linked to your organization's other locations. The result is that apps are put closer to the user, which decreases latency. Cloud Connect provides a dedicated link to the CSP when a private core is needed. Using a direct connection to the CSP delivers several benefits. Among these are certainty for application performance, stronger security, enhanced visibility to the CSP and improved agility and efficiency. Cloud Connect also simplifies daily operations, allowing network admins to better support cloud services. Cloud services and enterprise networks are now seamlessly connected. Windstream Enterprise also offers managed services for Cloud Connect to support customers that may be resource-constrained or want to utilize this service more quickly.

**2** Effective and comprehensive SD-WAN management tools via the WE Connect portal. The WE Connect portal provides comprehensive SD-WAN management, with capabilities for both present and future needs. This portal provides network and IT operations staff with comprehensive management tools to support a real-time cloud environment. It starts with end-to-end visibility across the WAN, including customizable naming and tagging for better reporting in both detail and aggregate, and real-time traffic visibility for each location. Quickly eliminating blind spots and identifying underperforming links is a huge benefit. Best-in-class management tools also make it possible to reduce downtime.

Application control is a key component of effective management. Windstream Enterprise delivers granular application reporting to reveal bandwidth consumption

by each app. This provides clarity on out-of-bound or "bandwidth hog" workloads. It also provides the basis for performance monitoring across all connections and identifying any trouble spots. Data is retained for reporting on key application performance metrics over time. This essential information assists planning if a cloud-based application is going to scale up or go into broader use across the organization. Using application control and performance data, the Windstream Enterprise management platform allows operators to rate limit or block unauthorized apps to ensure peak performance for high-priority apps.

Another key benefit of the Windstream Enterprise management toolset is to reduce response intervals for network admin and operations staff by enabling staff to make changes quickly or use automation. Windstream Enterprise also provides granular management functionality, offering the ability to make changes focused on a specific location, device or user.

The management tools also remove the need for network or IT operations staff to spend time manually addressing low-level operational tasks. One example of this is the ability to aggregate policy management so that it is done once for the entire SD-WAN. Policies can also be set by location or application. Removing low-value tasks will free up network admin or operations resources to better support innovation or new activities.

**3** Enhanced security across the SD-WAN. Most of today's existing WANs were initially designed and deployed when cybersecurity challenges facing organizations — were vastly different. The only certainty is that the future will be impacted by smarter and more virulent attacks. New defenses are essential.

One critical step in deploying a strong defensive posture is the ability to modify, update and tightly control security policies. Windstream Enterprise SD-WAN services allow the business to manage these policies as necessary via a self-service management tool on the WE Connect customer portal. The SD-WAN service is also PCI DSS-compliant—a boon for any organization that processes credit cards, such as retailers and merchants, and needs to ensure compliance. The fact that Windstream Enterprise can offer this level of security is a testament to the overall security of our SD-WAN services. Windstream Enterprise provides a stateful firewall on every edge device, providing another layer of protection.

**4** A seamless path forward from your existing or legacy WAN. With few exceptions, most organizations rely on their existing WAN and don't have the option to — press the reset button on the whole network. Most SD-WAN upgrades involve an existing WAN, and most providers won't offer their SD-WAN as an over-the-top (OTT) solution. Windstream Enterprise is different. Our unique OTT solution provides real customer value by utilizing as much of the current WAN investment as possible. Further, leveraging existing WAN technology and services retains some operational familiarity for the network staff. Windstream Enterprise offers a very attractive OTT SD-WAN service that will use existing broadband and MPLS links. This OTT service puts an SD-WAN overlay on top of these links to add the critical functionality necessary for a cloud-centric firm. This is essentially the best of both worlds and may be a critical benefit when an organization has existing contractual agreements for WAN links that cannot be disconnected.

Effectively leveraging the legacy WAN delivers financial benefits by leveraging prior investments to extend their useful life, whether through deploying OTT technology or by reusing them. This enhances ROI and enables businesses to continue bandwidth contracts that still offer value. Bringing those savings forward will reduce the cost of the SD-WAN upgrade.

## Key takeaways

As organizations make the transition to digital, there is a corresponding migration of IT workloads to cloud services to support that transformation. However, as the cloud becomes the status quo, there will be new and different pressures on the WAN. Legacy approaches will not be an option. Organizations will find that leveraging next-generation SD-WAN services is the fastest, most efficient and most effective way to make the WAN cloud-ready.

In a cloud-first environment, SD-WAN makes it possible to support mission-critical workloads (CRM, ERP, UC and

**5** A customer-centric business model. Our focus on customers permeates our entire organization. Windstream Enterprise has a true partnership — model that allows businesses to mix products and services that best fit their needs. The engagement model has the flexibility to mesh with how the customer does business as the primary focus. This extends to the success of the engagement, since Windstream Enterprise uses the customer's own metrics as the determinant of that success.

We prove our commitment to customer centricity with leading-edge services. Our SD-WAN Concierge™ offering delivers outstanding service experiences. SD-WAN Concierge combines the industry-leading capabilities of SD-WAN with consulting and professional services that can be contracted for as needed. This allows the customer to design and deploy a customized hybrid WAN specifically for each customer and utilizes the most appropriate and effective access options. In addition, there is a dedicated technical service manager (TSM) for each enterprise customer. This individual will develop and foster deep relationships with key staff at the enterprise to ensure not only that the solution is optimized, but that the customer interaction with Windstream Enterprise is also as efficient as possible. This reduces the time demands on staff resources to interact with Windstream Enterprise.

others) with high performance, reliability, scalability and agility. Eliminating latency and security issues is critical to a successful cloud migration. Windstream Enterprise has the most compelling solution for supporting cloud migration and ensuring its success. By offering new SD-WAN services designed from the ground up for the cloud, we enable customers to successfully migrate or run workloads in the cloud.

For more information, please go to: [windstreamenterprise.com/sd-wan](http://windstreamenterprise.com/sd-wan).

## Why Windstream Enterprise?

Windstream Enterprise can help you navigate the complexity of network transformation with tailored solutions that align to your vision. With leading-edge solutions and expert, dedicated support, we'll help you adapt, evolve and reshape your IT infrastructure. Here's how.

### 1 Support for hybrid models

SD-WAN from Windstream Enterprise can support existing MPLS and broadband connections to create a hybrid WAN. Most service providers require you to purchase their access.

### 2 Greater control and visibility

Most SD-WAN providers offer a portal for visibility into performance, but only Windstream Enterprise gives you access to the unique WE Connect portal to control your own business and security policies.

### 3 Cloud-ready solutions

Cloud Connect supports all of our network and Unified Communications solutions, including highly secure and cost-effective connectivity to leading CSPs.

### 4 We keep your business "on"

Business continuity is provided by Windstream Enterprise Fixed Wireless and Diverse Connect to significantly improve the reliability and uptime for your critical applications.

### 5 Cloud to the core

Our networks are built on our Cloud Core architecture, which enables rapid deployments of any scale that can easily be expanded in the future.

### 6 PCI DSS compliance

Only SD-WAN from Windstream Enterprise is certified as PCI DSS-compliant, allowing your business to accept credit card payment and process cardholder data.

#### Cloud Core™ technologies:

**Software-defined networking (SDN):** Network architecture that virtualizes the control and configuration of networks.

**Network functions virtualization (NFV):** Network architecture that virtualizes entire classes of network functions into building blocks that connect to create communication services.

**Programmable network (PN) orchestration:** Network devices and flow control are handled by software that operates independently from network hardware.

#### About Windstream Enterprise

Windstream Enterprise collaborates with businesses across the U.S. to drive digital transformation by delivering solutions that solve today's most complex networking and communication challenges.

To learn more about network solutions, visit [windstreamenterprise.com](http://windstreamenterprise.com)