# SD-WAN Without Limits:

## Understanding the Benefits of AireSpring's Platinum SD-WAN Solution

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# Introduction

In a world where multilocation enterprises are embracing cloud applications for even the most sensitive, mission-critical tasks, and where video and mobile communications have become the norm, the demand for reliable, high-performance bandwidth and wide-area networking (WAN) is greater than ever before. But businesses often find themselves relying on legacy WAN network solutions, which often can't scale up quickly or cost-effectively to meet the needs of an always-on, on-demand business.

At the same time, the perimeter of the cloud-native enterprise is much more fluid than that of the WANs of the past, meaning that modern-day business infrastructure is often too complex and multifaceted to manage and support efficiently with traditional "hub-and-spoke" solutions.

Fortunately, software-defined WAN (SD-WAN) technology has burst on the scene, offering today's digital enterprises a compelling way forward. SD-WAN utilizes bandwidth more efficiently and economically, optimizing the WAN infrastructure to lower costs while increasing application and network reliability and performance.

Thanks to the elegance of the solution – and the positive business outcomes that it delivers – SD-WAN has been gaining in popularity, and new choices are flooding into the market all the time. As of July 2018, there were 40+ offerings in the market.

Adoption is ramping up: 360iResearch expects the global market to grow from $843 million in revenue last year to $15 billion by the end of 2024, at a whopping CAGR of 51 percent.

In a recent Frost & Sullivan SD-WAN report, market revenue in North America alone exceeded $300 million in 2017. About 7 percent of enterprise IT decision-makers said they have deployed SD-WAN; and about a quarter (23 percent) of them said they plan to deploy SD-WAN in the next 12 to 24 months.

Amid all of this activity, AireSpring is fulfilling its mission to be a best-of-breed resource for multilocation enterprises. Its Platinum SD-WAN package is built to deliver a tailored, managed solution with an array of differentiating aspects providing superior performance, versatility and savings. It's important to AireSpring to ensure that businesses get the right SD-WAN package for their needs: call it SD-WAN without limits.

# Section I: AireSpring's Platinum SD-WAN Package

Platinum SD-WAN is an innovative and customizable package that allows companies to leverage advanced SD-WAN features and functionality together with AireSpring's nationwide, end-to-end managed connectivity and professional services, for an enhanced, fully managed, easy-to-deploy solution.

The package stands apart thanks to AireSpring's multilocation expertise as an aggregator of carriers, circuits and technology. AireSpring's Platinum SD-WAN offers a holistic experience, complete with design engineering, dedicated project management, and white-glove implementation and support from an experienced team of technology experts. The idea is to let companies focus on their core business goals, while AireSpring devotes itself to the technology that enables them.

AireSpring has built several notable differentiators into its Platinum SD-WAN offering, including bandwidth and carrier aggregation, VeloCloud integration, IP mobility and a bevy of behind-the-scenes functions for guaranteeing the reliability and quality of the SD-WAN experience.
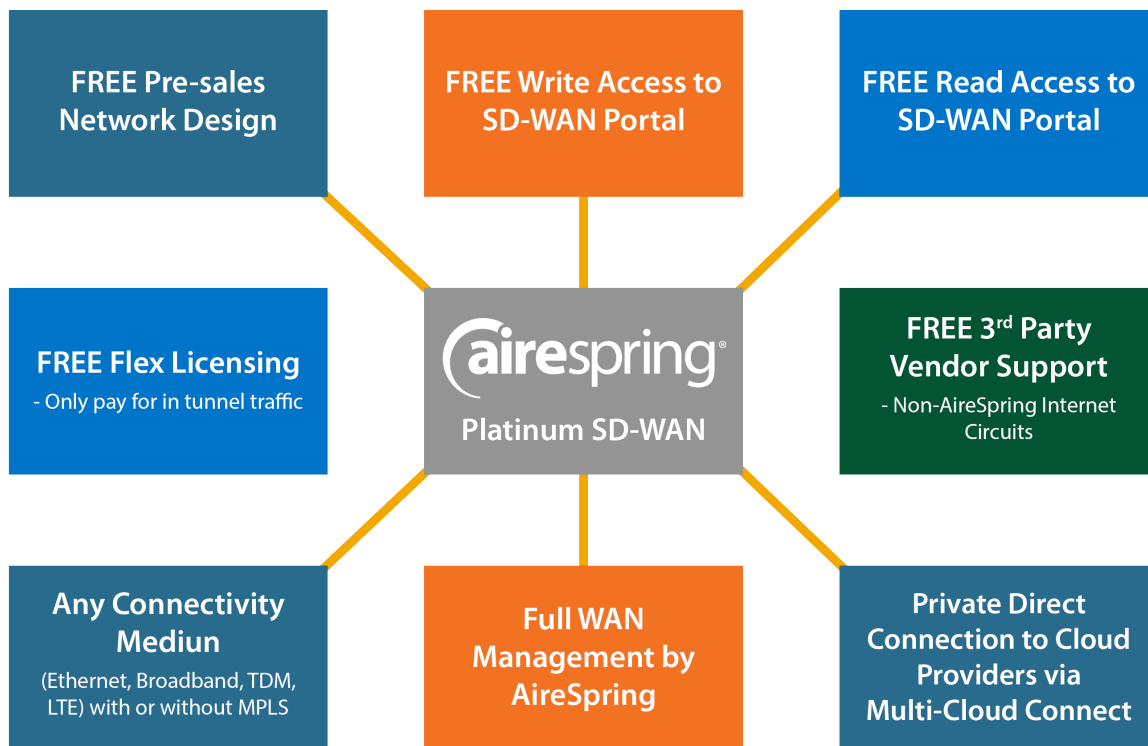


**Figure 1.** AireSpring Platinum SD-WAN differentiators

## The Right Bandwidth for the Location

SD-WAN allows businesses to optimize their legacy MPLS footprints by delivering a top-tier experience over a variety of bandwidth types, including affordable broadband links, fiber, satellite, LTE and microwave wireless connections, along with AireSpring's MPLS Mesh network and other private/point-to-point lines.

Platinum SD-WAN users can take full advantage of this flexibility by mixing-and-matching the types of connections used at their branch and remote locations. AireSpring's design team can provide unbiased advice on which connectivity type fits the location's cost profile and bandwidth needs, customizing the footprint accordingly. Meanwhile, AireSpring provides one umbrella of unified support, billing, provisioning and direct cloud connectivity across all locations.

AireSpring's own nationwide, managed, advanced IP network is connected to over 20 carriers allowing customers the widest possible choice of circuits while leveraging one team, one point of contact for support and one bill as part of a unified network offering.

## VeloCloud Integration

AireSpring offers an integrated solution that leverages VeloCloud's SD-WAN platform, which was renamed the VMware NSX® SD-WAN by VeloCloud after its acquisition by VMware.

The combined product brings the latest VeloCloud SD-WAN features together with AireSpring's nationwide end-to-end managed connectivity and white glove service, for a fully managed, fully engineered and architected solution.

Each location's SD-WAN appliance arrives on-premises preconfigured to meet each customer's unique specifications, eliminating the need for expert IT staff to install, configure and manage the device onsite.

Furthermore, AireSpring doesn't just make VeloCloud's owned/operated gateways available to customers in a "hosted" fashion, like most competitive products do. Instead, AireSpring has taken the unique step of installing its own VeloCloud gateways on its core network which it operates across the country.

The result is an additional raft of functionality not seen in other offerings. These installations permit end-to-end QoS and failover capabilities, and it also means that businesses can fully mesh and interconnect their VeloCloud SD-WAN with a wide range of AireSpring solutions, including MPLS, IPsec services, UCaaS and AireSpring's SIP/ fax/HPBX/PRI/analog/voice services, and much, much, more.

Also, AireSpring's owned-and-operated VeloCloud gateways are a dedicated resource for AireSpring customers only; these gateways are never subject to priorities/demands from other carriers and other sets of customers.

## IP Mobility

AireSpring's Platinum SD-WAN package also makes portability a snap. When using public Internet IP blocks assigned by AireSpring, those IPs stay with the SD-WAN box they are originally assigned to, regardless of what Internet carrier or circuit is utilized to connect SD-WAN. That means that front-end carriers and circuits can change without businesses having to worry about reassigning the addresses; with no reconfiguration required, a company can change the location of these boxes at will, even flying them halfway around the world, with no impact to traffic backhaul or the ability to route and manipulate traffic paths based on network conditions. AireSpring-assigned public Internet IPs delivered using IP mobility may also be virtually re-assigned remotely to already enabled alternate SD-WAN locations.

## Reliability and Control for the Quality of Experience

One of SD-WAN's hallmark benefits is the ability to boost application performance. The AireSpring Platinum SD-WAN takes this a step further by giving companies ultimate control over their traffic – and ultimate reliability.

Firstly, the solution supports the ability to craft specific backhaul parameters for individual applications. For instance, video traffic, which is real-time and benefits from having the fastest possible route to the desktop, can be allowed to enter and exit locally at a branch location. Secondly, traffic that needs to be filtered for security threats, like web, FTP or Facebook traffic, can be earmarked for backhauling to a security platform in a data center.

Similarly, other policies can be implemented, like automatic downgrading of all HD YouTube requests (which typically consume 7 Mbps of bandwidth per user). Instead, the streams can be set to be delivered into SD (which only takes up 1 Mbps per user).

Other benefits of the AireSpring solution include the ability to mitigate negative network conditions on a per-circuit basis for VoIP, video and other real-time applications; AireSpring's Platinum SD-WAN offering delivers consistent QoS with end-to-end quality of experience, combining granular advanced real-time metrics with packet routing decisions.
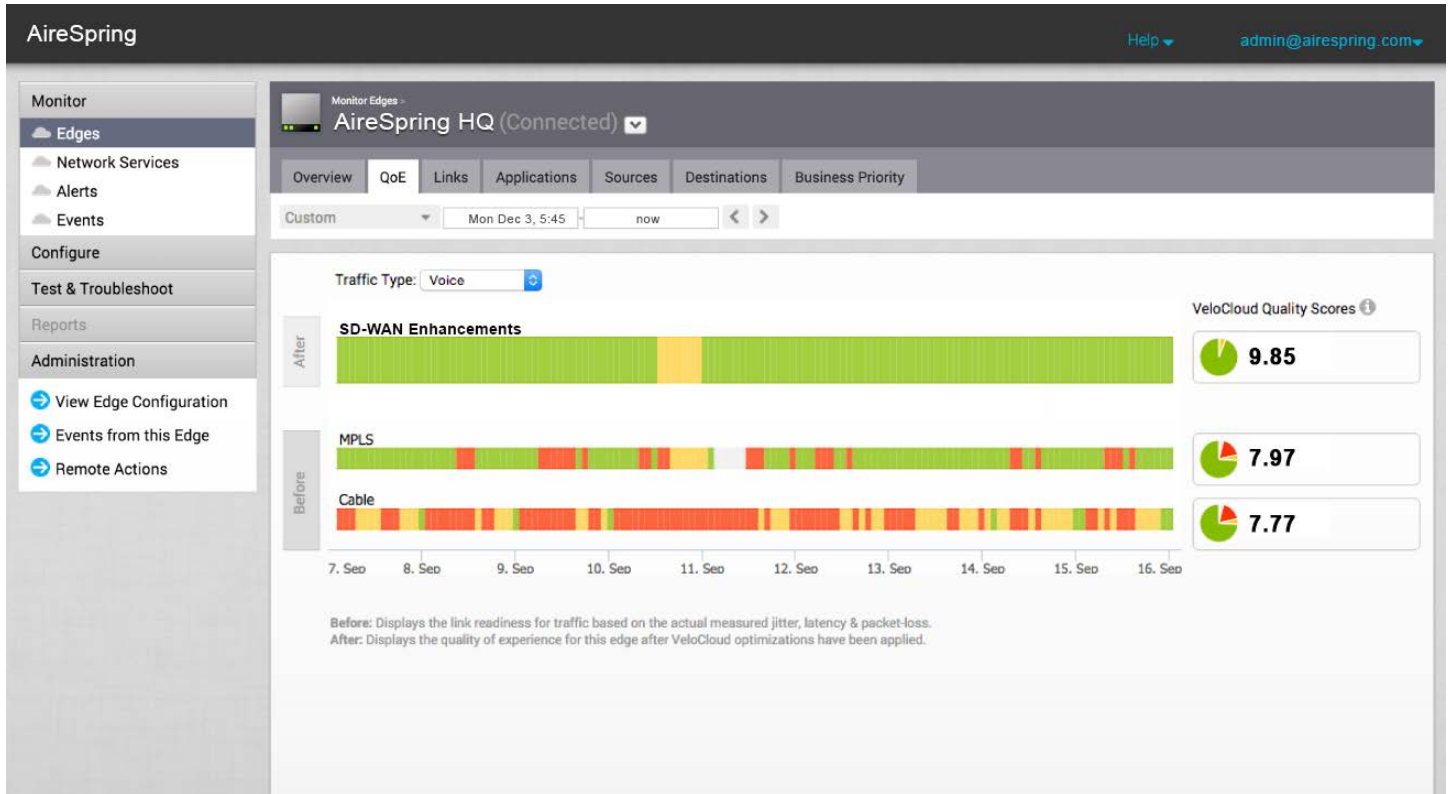
**Figure 2.** Monitor Quality of Experience (QoE) with SD-WAN Enhancements in real-time view

To address packet loss, the AireSpring solution will send enough duplicate packets as needed to statistically overcome the current percentage of packet loss on the pipe. It also uses jitter buffers to offer consistent application performance no matter the wild variability of latency; and it automatically re-orders out-of-sequence packets. The platform's advanced metrics determine which paths will result in sequence issues or not.

And finally, on the failover front, regardless of circuit type, AireSpring implements a Hypersonic two-millisecond "hitless" failover/failback. This is so fast that VoIP, video, stateful protocols and all apps will feel zero impact from the primary circuit's failure.

# Section II: Beyond the Hype: Understanding What SD-WAN Can Do for You

SD-WAN can be transformative for businesses that are looking to embrace the power of the cloud. As they make the shift to cloud applications, it creates twin needs: in particular, bandwidth requirements increase (along with MPLS costs); and mission-critical cloud applications require redundancy and Quality of Service (QoS), which is something that basic broadband circuits cannot guarantee.
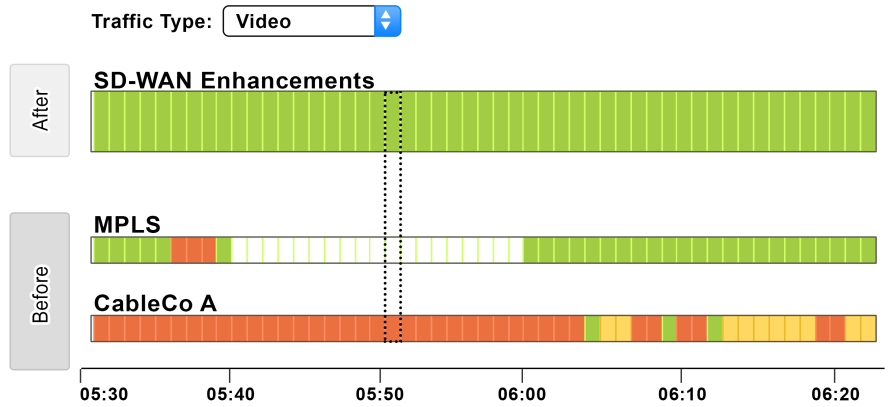
As such, for multilocation businesses, there are two major use cases: Application performance and WAN optimization.

## *Application Performance*

SD-WAN supplies affordable intelligent networking as part of its core functionality, with performance-based routing. This can be used to govern how applications are routed across the network to achieve the best possible Quality of Experience (QoE), including hosted PBX, firewalls, unified communications, voice and video, customer relationship management tools, ERP and other services.

Essentially, companies can customize their network resources to support specific needs and applications. SD-WAN involves placing edge devices at customer sites; traffic from connections into the customer sites then flows through these appliances. These intelligent devices "cloudify" this traffic, offering businesses real-time, centralized management and visibility into what's happening on the network. They can thus control routing and key parameters of the network, like jitter, latency and packet loss, to ensure that traffic is travelling optimally across the WAN at all times—and the appliances can do this automatically.

"With SD-WAN solutions, transport routing changes can be made in real-time," explained Frost & Sullivan in a recent report. "The underlying transport infrastructure is abstracted, pooled and assigned to applications, based on software-defined policies. This enables transport links to be used in active-active mode to provide the best possible QoS leveraging multipath optimization and forward error correction."

Traffic Type: [ Video ▲▼ ]

**SD-WAN Enhancements**

After

**MPLS**

Before

**CableCo A**

05:30    05:40    05:50    06:00    06:10    06:20

**Before:** Displays the link readiness for traffic based on the actual measured jitter, latency & packet
**After:** Displays the quality of experience for this Edge after optimizations have been applied.

**CableCo A**
Monday, December 3, 2018 5:51 AM
(a minute)

| | Latency | Good |
| | Jitter | Fair |
| | Packet Loss | Critical |

Upstream jitter measured at 9msec. Edge
enabled jitter buffering to mitigate the issue.

Upstream packet loss measured at 1.56%
Edge enabled forward error correction to
mitigate the issue.

**Figure 3.** Breakdown of Traffic Prioritization for Mission Critical functions

In addition, all applications are prioritized and are routed in order of importance, based on how they are defined by the enterprise. This allows for traffic prioritization for mission-critical functions. For companies that already have broadband in place to support their cloud activities but are having problems with quality, implementing SD-WAN can thus be a game-changer.

For example, Office 365 is a very "chatty" application, encompassing not only emails via Microsoft Outlook, but also cloud backups for documents. As such, it is bandwidth-intensive, and many businesses find that their existing WAN is limiting its performance. An SD-WAN could ensure that Office 365 traffic for a certain location has priority for network connectivity above bandwidth-hogging traffic like streaming video and social media – thus boosting quality.

The network can also use this real-time, packet-level intelligence aspect to find the best available route for the most important applications in the event of an outage.
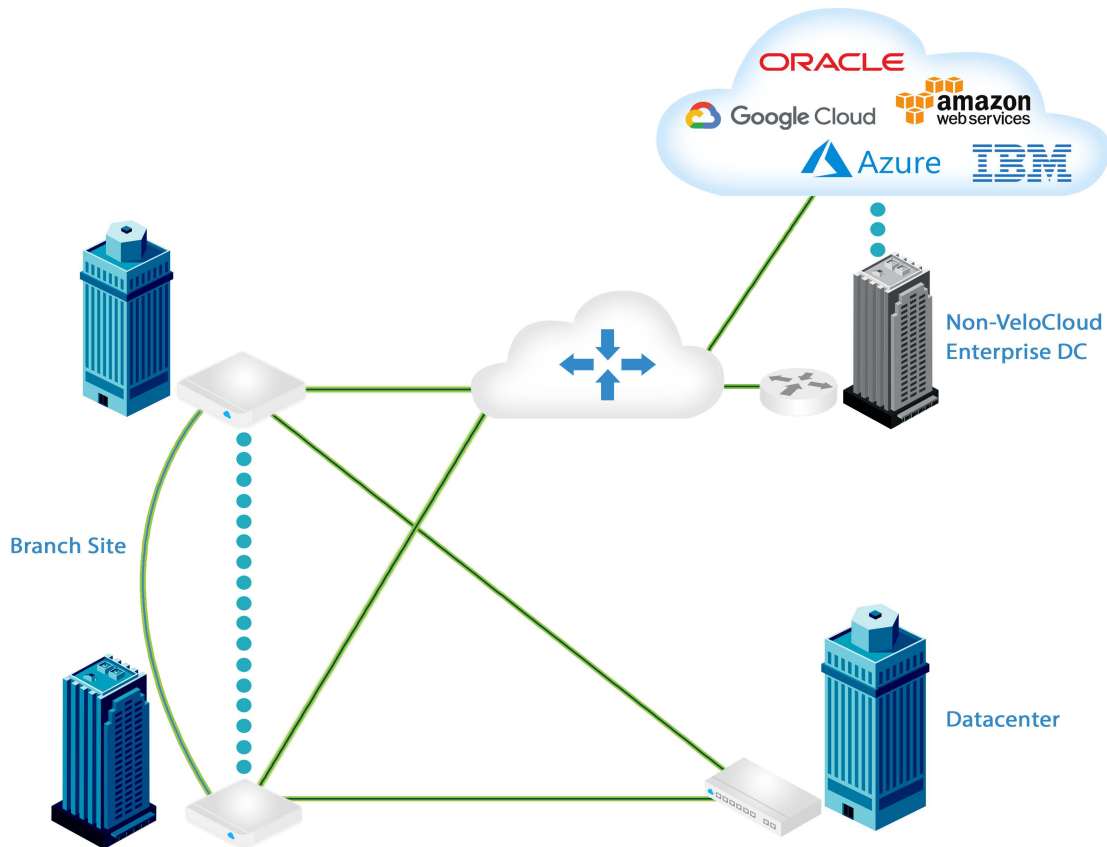
**Figure 4.** MPLS/WAN Optimization for Multilocation Companies

## *MPLS/WAN Optimization*

For decades, branch locations have been closed environments, connected via MPLS networks to company resources that are hosted in a data center at headquarters. To get to cloud applications in a traditional environment, traffic is typically backhauled to that central location, and then connected with the internet via a secure gateway. But this model creates latency, cost and additional bandwidth requirements, and it doesn't support the dynamism promised by the cloud.

SD-WAN promises multilocation companies a way to connect all of their resources via the cloud, over any kind of connection, including simple broadband connections. As such, it's often billed as a way to eliminate MPLS networks in favor of much cheaper basic internet circuits. In theory this is true, but that story doesn't match most customers' needs. SD-WAN instead should be seen as optimizing the use of resources. Call it a marriage of circuits – not a divorce from MPLS; the overall upshot is that enterprises can free up MPLS resources and significantly reduce costs.

SD-WAN is transport-agnostic—the connections could be MPLS, a cable connection, satellite or even a 4G link. With SD-WAN's performance-based routing, companies can customize their network resources to specific needs and applications. For customers with MPLS, they could choose to route real-time communications via MPLS and put everything else on a broadband pipe—freeing up MPLS resources and significantly reducing connectivity costs by switching to less expensive circuits where appropriate.

On top of this, enterprises can also quickly deploy new branches or connect remote locations to the central headquarters without the longer installation times that can come with traditional WAN solutions.

## *Securely Connecting Your Network to the Cloud*

Relying on the public internet to access the cloud comes with risks. How can you take advantage of the flexibility and efficiency of your cloud applications without sacrificing the performance and security of a private network?

AireSpring's **Multi-Cloud Connect** provides an enhanced, secure connection between AireSpring's Platinum SD-WAN, MPLS or an AireSpring IP circuit and leading cloud providers. The Multi-Cloud connection enables on-demand access to a full roster of leading cloud providers like Amazon Web Services, Microsoft Azure, IBM, Oracle and Google Cloud as if they were a node on your own private network. AireSpring's core network is pre-integrated with leading cloud providers, allowing customers to access Multi-Cloud Connect without an additional circuit.

Devices that service the network edge today are commonly termed Universal Customer Premise Equipment ("uCPE") because they are smarter and more capable than their network predecessors. Connectivity to Cloud, SaaS, Colo, MSPs, carriers and other providers is done through virtual cross connection (vXConnect™) with redundant fiber optics.

AireSpring's pairing of SD-WAN uCPE with Multi-Cloud Connect marries the combined solution through over-the-top ("OTT") connections to any of 20-plus carriers, multiple circuit types and numerous technologies. The result—Multi-Cloud Connect delivers all of these benefits:

- Cloud connectivity to AWS, Microsoft Azure, IBM, Oracle, Google Cloud and others

- Connectivity to Datacenter/Colo providers worldwide

- Access to SaaS providers worldwide, including Office365, Skype, SalesForce

- Integration with carrier services including

    ° SIP trunks
    ° POTS/PRI via SIP
    ° UCaaS (hosted phones)
    ° CCaaS (call center)
    ° Internet with IP mobility

Speed of delivery for all these services worldwide is now accomplished in a fraction of the time needed in the past. High speed, redundant, differentiated and prioritized with QoS, Multi-Cloud connect works with SD-WAN to guarantee the most efficient use of upstream connectivity and bandwidth, at low price and with AireSpring's 24/7/365 support.

## Section III: Getting SD-WAN Right

SD-WAN is a better way to WAN: Applications and network resources can be accessed on-demand, and performance management, security and routing prioritization combined with the scalability and cost-effectiveness of the cloud to make it a major improvement over legacy technologies, especially for businesses that are investing in digital transformation.

However, SD-WAN is not for the faint of heart, and it comes with a requirement for managing complexity. While it's true that the appliances involved are plug-and-play devices that often have a zero-touch provisioning feature that enables the devices to automatically connect to the controller and self-configure, implementations are not that simple.

More and more enterprises are embracing infrastructure as a service (IaaS) and software-as-a-service (SaaS) applications, meaning that large parts of their network footprints now fall outside of the traditional business perimeter. As customers make the shift to cloud applications, there is an ancillary effect of creating complex, multi-domain transport environments that connect branches, data centers, headquarters, mobile and remote workers, applications and APIs in the cloud. There may even be third-party supplier data lakes or other resources in play.

Traditional WAN architecture can't adequately adapt to the changes; but SD-WAN helps unite these disparate pieces of the modern enterprise by offering dynamic path selection and complex path routing for multi-domain networks; and, as such, users can set app-specific failover and routing, with advanced analytics. However, as one might surmise, implementing this aspect of SD-WAN is not a plug-and-play endeavor.

The moving pieces don't stop there: Many businesses have multiple types of connections in place. In addition to adding broadband and SD-WAN to an existing MPLS network as a cost-optimization strategy, they might also install dual MPLS links or add LTE or satellite for failover to the mix. As such, most deployments will involve using SD-WAN to assure applications over broadband or LTE in combination with MPLS, especially when businesses look to set up these failover configurations.

Yet other enterprises may be looking for high availability, which involves two SD-WAN boxes and two instances of the service at each site.

In any of these scenarios, designing a network to accommodate the resulting "sprawl" can become a complicated design and management effort, which is why many businesses are turning to a managed service.

Because of the complexity involved in most multilocation deployments, IT departments may not be comfortable with a do-it-yourself approach to SD-WAN, as it requires a whole new set of tools with a lot of capabilities, new skill sets and more overhead.

In fact, a majority of enterprise respondents to a Frost & Sullivan end-user survey indicated a preference toward a managed SD-WAN solution versus the self-managed approach. This is because a managed service provider can not only combine underlying transport services with SD-WAN functionality, but also manage the solution end-to-end to mask much of the complexity involved.

The right managed SD-WAN offers a centralized, cloud-based service that can provide full operational visibility with network security and monitoring, and troubleshooting – along with WAN connectivity aggregation so the enterprise doesn't have to manage multiple supplier relationships. It also reduces the costs of provisioning, maintenance and local network staff, and simplifies branch-office networking. It cuts down on operational overhead too, eliminating the need to stand up, maintain and patch controllers, for instance – and going the managed route even alleviates basic tasks such as shipping devices and regional spares to branches.

And finally, managed service also frees up often under-resourced IT staff to spend more time providing value back to the organization with other, higher-value IT projects.

# Conclusion

The AireSpring Platinum SD-WAN is, put simply, SD-WAN without limits.

There's no doubt that SD-WAN has become one of the most talked-about technologies on the enterprise technology scene, enticing distributed businesses with the promise of cost savings and operational streamlining – as well as the ability to get the most out of their digital transformation strategies.

AireSpring has built its Platinum SD-WAN to deliver on the full promise of SD-WAN – including providing application performance gains and WAN optimization at a lower cost. But the AireSpring platform also takes into account that every multilocation enterprise is different, and brings a unique, end-to-end, tailored approach to the table.

Some businesses may be in the middle of bringing in hosted voice, or adding cybersecurity applications. Some are interested in beefing up their data network for redundancy and reliability, while others are retooling their network to support cloud video.

Regardless of the specific business requirements, AireSpring brings its engineering expertise to the table to design a WAN architecture that's finely tuned to support the individual customer. Our Network Solutions Engineering team partners with customers to determine the right-sized SD-WAN package for their business. Unlike many one-size-fits-all solutions on the market today, AireSpring customers never pay for more than what they need.

SD-WAN is not plug-and-play, despite the hype in the market: Businesses, especially complex multilocation businesses, don't need to be stuck doing it themselves. Knowing this, AireSpring also offers a better method for managed service.

Most carrier offerings are "dumbed down" managed services that offer very little flexibility or customization, and have limited network footprints. AireSpring's service ensures that custom policies are accommodated, helps identify and reduce potential gaps in security, and brings not only its own nationwide IP network to the table, but works with over 20 other carriers to offer the ultimate in choice.

Each Platinum SD-WAN appliance arrives on-premises preconfigured to meet a business' unique specifications, eliminating the need for expert IT staff to install, configure and manage the device. And all of this is backed with white-glove service and a 100-percent track record of getting installs completed in complex situations where competitor's turnups have often failed.

# About AireSpring

Founded in 2001, AireSpring is an award-winning provider of cloud communications and managed connectivity solutions, serving thousands of businesses nationwide. AireSpring provides fully managed and connected end-to-end, next-generation solutions for multi-location enterprise customers. Services include Multi-Cloud Connect, SD-WAN, AirePBX™ Cloud Business Phone Systems, AireContact® Cloud Contact Center, SIP Trunking, MPLS, Disaster Recovery, Managed Security, and Business Internet. AireSpring's solutions are offered through a diversified network of channel partners that includes distributors, master agents, managed service providers (MSPs), and value added resellers (VARs). AireSpring's services are delivered over its revolutionary nationwide MPLS Mesh network, providing customers a fully integrated, end-to-end solution from a single vendor.

AireSpring has received numerous industry awards for "Internet Telephony Product of the Year 2018," "2018 Excellence in SD-WAN," "Next-Gen Solution Provider,"  and "Top Midmarket Vendor Executive." AireSpring is privately held, diversified, debt-free, and renowned in the industry for delivering a broad range of innovative cloud communications and connectivity solutions at competitive rates. To find product information or to become an AireSpring partner or agent, please visit www.airespring.com or contact us at (888) 389-2899.