# SD-WAN: Driving Business Benefits

*A changing business landscape demands a different WAN approach*

## Executive Summary

Businesses today need to respond to very dynamic, fluid markets where moving quickly is paramount to success. While some organizations remain fairly stable, many are involved in acquiring other businesses, expanding overseas, or moving their resources to the cloud. Wide Area Network (WAN) connectivity has been a long, tenuous issue for companies, because Multi-Protocol Label Switching (MPLS) connections have a rigid nature, complexity, and high cost, making it more difficult for businesses to react effectively to market changes. For years, WAN connectivity was focused on remote branch offices, which rarely had the gravity to demand a better solution from headquarters IT; but with more cloud applications (which are being deployed outside of the datacenter), WAN architectures have come under greater scrutiny. Software-Defined-WANs (SD-WANs) are finally enabling businesses to break away from the constraints of the past and focus on a new flexibility to drive their businesses forward.

Today's WANs require more diverse connectivity options, improved visibility, more control, better automation, and faster deployment time. Customers are now embracing SD-WANs, because these solutions finally have technology that lets customers address those needs. SD-WAN's benefits are real, driving customers to go beyond just imagining a better way and actually testing and deploying it. Customers are now engaging with vendors to bring SD-WAN technology projects forward, typically starting with smaller deployments (a few branches) and then moving towards wider production deployments as those initial projects prove themselves.

## Today's Customer Needs

Almost all WAN deployments in the market today are based on older technology that was popular back when businesses did not have to run at breakneck speed. But with today's cloud-based applications and datacenters, where everything is virtualized and delivered as–a-service, the IT world has accelerated, leaving the WAN behind. While many view the WAN as "plumbing"—a point-to-point connection—the desire for updating the WAN with new technology is typically overlooked, as more pressing business needs pushed modernization of other areas instead. Unfortunately, when these new rapid changes happen in the business, the WAN can become more of a drag on the project, as older technology and manual processes inhibit progress.

Security concerns also amplify the inadequacies of most WANs. While security needs to be addressed from a more holistic standpoint, the WAN represents a channel for attackers to either enter the network or eavesdrop on communications, making it a prime area of concern for the IT staff.

With businesses more distributed than ever, increasing their footprint with more locations while also trying to tie in an increasingly mobile workforce, remote

SD-WAN: Driving Business Benefits     8 September 2015

communications and application delivery is increasingly challenged. This increasing number of endpoints is driving the need for more consistency through automation.

New business opportunities that may demand a shorter-term WAN deployment present additional complexity, because those opportunities may dissipate before IT can even get a connection established to a remote location.

Software–as-a-Service (SaaS) and cloud-based applications are straining the traditional datacenter, as businesses strive for agility with these on-demand or service-based applications. Businesses quickly find that as applications sit outside the datacenter, managing to a strict quality-of-service (QoS) is increasingly difficult, because IT has less control over all of the paths and variables.

All of these challenges exist against a backdrop of economic pressure that is squeezing IT, forcing them to "do more with less" as the list of demands from the business keeps ratcheting upwards. Any strategy that enables the business to reduce the cost and complexity of MPLS lines without compromising their current functions is a welcome respite, which is why there is serious interest in SD-WANs. But in this move to investigate SD-WANs, performance is a factor that should not be overlooked. Many assume that because SD-WANs represent new technology, there should be an inherent performance advantage, but that is not always the case as SD-WANs are primarily focused on solving operational issues.

## Bringing Flexibility and Connectivity

Though MPLS connections to remote locations provide a high level of service and reliability along with low latency performance, most IT organizations tend to characterize them as costly and inflexible. Branch locations are most often hosted on a single MPLS connection due to cost and management complexity, which leaves the WAN connection as a single point-of-failure. When multiple MPLS connections are used, it is usually to ensure redundancy through connection diversity, as the complexity of managing applications across multiple links prevents its use for load balancing or increasing bandwidth in many cases.

By introducing a Software-Defined-WAN (SD-WAN) to the environment, IT can increase flexibility, bringing multiple channels of connectivity and driving down the aggregate bandwidth costs. An SD-WAN makes it easier to manage a hybrid WAN, which combines multiple connectivity choices. The addition of a second connection along with MPLS, like business-class broadband for instance, enables greater bandwidth at a lower cost by using technologies like carrier Ethernet or DSL. And if failover is all that is required, a cellular connection using technologies like 3G, 4G, or LTE (with lower bandwidth but greater flexibility), can provide a backup channel should there be an interruption in the MPLS service. For customers who already have backup MPLS for redundancy, adding an SD-WAN overlay enables them to maximize their investment by using both MPLS connections simultaneously for increased overall bandwidth instead of just for failover.

As an example of a customer who might benefit from more flexibility or connectivity, consider a financial services company with multiple branch locations around the country that require a constant connection to the main headquarters to perform retail banking services. Branches in larger cities may already have multiple MPLS lines for redundancy, but as the company steps into middle markets and smaller markets, branches may only have a single MPLS line where the potential for outages can shake customer confidence, possibly representing a lost financial opportunity. By deploying SD-WANs across the different locations, the headquarters can institute hybrid WANs to eliminate outages and capture more opportunities. Because each location represents a different financial opportunity, the headquarters can determine the best connectivity choice that financially matches the revenue potential and physical location. For any out-of-the way location where it might not be feasible to commit to a more expensive option (or may not have additional cabling access), a cellular WAN backup can provide connectivity wirelessly for the ultimate flexibility.

## Easing Multi-Location Deployment

The economics of large branch offices are becoming less tenable. In the past, companies focused on larger branch offices with a higher concentration of employees, but technologies like the internet, cloud computing, mobile communications, video conferencing, and collaboration are allowing businesses to become more distributed. Employees are spending more time out in front of customers, working remotely, or clustered in more numerous, smaller locations. With fewer employees in each branch locations, the cost (per head) to deliver WAN connectivity increases because of the high fixed costs. As locations shrink or budgets are stretched thin, many branches additionally find themselves not being able to financially justify hiring a resource with the technical know-how at each remote site.

Along with the challenges for businesses trying to manage a large number of existing locations, businesses that need to expand and scale quickly are also feeling the pain. Spending a few days bringing a new location online may not seem very daunting, but if there are 40 locations to be brought online, that process could take the better part of a year, representing a tremendous hit to productivity and profits. Integrating a large number of locations is especially vexing for service providers who cannot count on a "standard configuration" at each location, because each location is a different customer with specific needs that must be maintained. For these service providers, time-to-revenue will be a critical measure for the business, so simplicity and automation are just as important as capital cost.

SD-WAN can help with handling a large number of locations by reducing the cost, time, and complexity of managing both the rollout and the operation of the WAN communications. The introduction of broadband options, as mentioned earlier, is a way to introduce a better economic model that helps financially scale WAN services to a wider range of locations. Rolling out services to a large number of locations is simplified through a zero-touch provisioning process where WAN devices can be plugged in and auto-connected to the network, "phoning home" to the headquarters. The automated

SD-WAN: Driving Business Benefits 8 September 2015
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process can then apply the proper pre-designed business intent policies / overlays to the WAN, completing the configuration without any administrator intervention.

This automation is of interest to many customers with multiple locations, but it is of particular importance to customers in the retail segment where regional expansion of either franchises or company-owned locations must happen quickly to meet the market's appetite for their goods or services. In these environments, the headquarters IT staff can register all of the WAN connection devices and then send them out to each of the locations. With a simple installation procedure, even a non-technical employee at a remote retail location can plug the device in and power it up. Once that happens, the rest of the process occurs automatically. This automation enables the headquarters to roll out services to a large number of locations and bring them online quickly, shrinking the time to revenue and boosting the bottom line.

## Optimizing for Cloud-Based Applications

With businesses decidedly turning to public cloud-based applications and SaaS strategies, QoS for enterprise applications is now more dependent on the quality of the WAN than the quality of the LAN from both a bandwidth and a prioritization standpoint. Cloud and SaaS help customers move faster and become more agile, but what happens when the application agility is being hampered by a WAN connection? Or when enterprise applications are fighting for bandwidth with other non-critical internet traffic? Most customers do not understand the options that are available to them that can help optimize for performance, leaving their SaaS applications at the mercy of an archaic, less agile MPLS environment.

SD-WAN provides the features that close the technology gap between MPLS and broadband, allowing broadband to fill the role alongside MPLS or actually replace it in some cases. Multi-path selection, for instance, helps steer applications over the best link available, regardless of the underlying technology, helping match the application performance to the desired QoS. Dropped packets and out-of-order packets, a common occurrence for public internet connections, can be handled by path conditioning, which helps bring an MPLS-like quality to a broadband internet connection.

As customers move their applications to cloud or SaaS solutions, an SD-WAN can help optimize and smooth out the performance, driving a more enterprise-like QoS, despite the application living outside of the datacenter in the cloud. Traditional enterprises that are adopting these more agile deployment methodologies are well served to investigate how an SD-WAN can help drive better end user productivity through a more stable QoS. One company in particular, Interroll, moved to a hybrid WAN using broadband and immediately saw productivity benefits from better access to SaaS applications like Office 365 and SharePoint. Further, access to centralized SAP and AutoCAD improved through the deployment of the Silver Peak Unity EdgeConnect overlay. Interroll found that it was not just the cost but also the complexity that made MPLS unsuitable for this new world of SaaS and cloud applications. While applications could change rapidly with the needs of the business, the MPLS connection could take weeks (or longer) to catch up which was just unworkable for the company.

## Establishing Temporary Networks

Opportunity is often fleeting, and businesses that can move quickly have the advantage, which is why so many companies cite "agility" as the biggest need as they evaluate future IT directions. Because of the time required to establish an MPLS connection (which can be months) these opportunities could potentially be gone before a business can capitalize on them, regardless of where they exist. Often, temporary projects may need WAN-style connectivity when enough critical mass exists at a location to make VPN unworkable. When many people think of these ad-hoc networks, often disaster sites or military deployments come to mind, but the scope is so much larger. From construction projects to manufacturing, there are opportunities to boost remote project teams simply and effectively with WAN connectivity.

With SD-WAN, companies can easily set up short-term networks that deliver access to all of the corporate applications at a remote site while also providing the security and partitioning of the WAN. With the ability to run over a broadband internet connection, remote teams can create an ad-hoc network with headquarters connectivity quickly through a connection to cable modem, DSL, or carrier Ethernet—all of which can be installed (and removed) far more quickly than an MPLS connection. Zero-touch configuration is critical for these ad-hoc opportunities, because it removes the lag time that is normally associated with having a WAN connection set up (after receiving an active MPLS circuit), which could be weeks or longer. And for opportunities that are actually more like a disaster recovery project or a military engagement that might occur in an out-of-bounds location, the fact that a WAN connection can be established over 3G, 4G, or LTE means that there are few places that can't be reached in one way or another.

An excellent example of the opportunity for an ad-hoc network with WAN connectivity is an onsite audit. Often auditors will need to set up at a customer location for days, weeks, or even months. In the process, compliance rules often state that they will need a secure, partitioned mechanism for communicating back to the headquarters without having to route their traffic over an auditee's network. With a zero-touch configuration and the ability to use a variety of connectivity options, auditors can get online quickly and focus on work, not technology. After the audit, the connection can be removed as quickly as it was set up, without having to worry about any long-term contracts.

## Silver Peak SD-WAN Products

A large part of deploying an SD-WAN is choosing the right tools to simplify the process—both from an installation perspective and then, more importantly, from an ongoing operational standpoint.

Silver Peak, a provider of SD-WAN solutions, is finding interest across a range of customers, because the limitations of their current WAN solutions can be overcome through Silver Peak's connection flexibility and application acceleration options. Silver Peak is addressing the market with their Unity EdgeConnect device. While this product is easy to install, the simplicity masks the true power and flexibility that it can deliver in establishing WAN connectivity. To enable more robust hybrid WAN capabilities, Silver

Peak includes features like Dynamic Path Control help to direct and balance traffic across multiple links, regardless of the media.

Support for broadband connections is enhanced by WAN security and Path Conditioning, which help overcome some of the limitations of public internet connectivity. By using 256-bit AES encrypted tunnels and specifically requiring that all traffic must originate from another Silver Peak managed device, the SD-WAN is secured, removing the need for having to manage dedicated firewalls or appliances.

Included with EdgeConnect is the Unity Orchestrator, which provides the overlay and management for visibility and control. Unity Orchestrator enables a centralized management console for assigning business intent policies that can be used to both setup and secure the traffic that is moving over the WAN, handling both cloud applications along with existing legacy applications.

Most SD-WAN RFPs focus on greater path selection, more flexible connectivity, and zero-touch provisioning, with the incorrect assumption that any new technology will naturally have better performance. But SD-WAN's primary focus is on operational and management efficiency, not necessarily higher performance. Unity Boost is a unique performance option that gives Silver Peak SD-WANs a competitive advantage by helping accelerate performance through removing latency and compressing / deduplicating traffic for better transmission efficiency, which makes broadband perform more like private line.

Additionally, Silver Peak has developed their own proprietary SaaS "traffic reports" that customers can subscribe to, enabling them to understand the best routing choices for their applications, all in real time.

## Call to Action

With the tools now available to establish SD-WAN capabilities, companies really need to be investigating the potential benefits of SD-WAN. Because of rapidly changing market needs, traditional WAN technologies cannot keep pace with the changes and expansion that businesses require to stay agile, grow share, and outpace the competition. Remote branch office connectivity has hardly been a primary topic of concern for most businesses, because there were always larger, more daunting issues to address. But the move to cloud and SaaS can become a catalyst for businesses, allowing them to see a more holistic view of communications. As they take steps to make these remote services-based applications more fluid and efficient, they can also use that opportunity to address their overall remote branch communications.

Silver Peak is definitely worth an investigation as a provider of SD-WAN solutions. Their ability to create hybrid WAN connectivity can help deliver not only flexibility for companies but also drive down total WAN communications cost, helping to better justify investment into these emerging SD-WAN technologies.

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