Can Broadband Change the WAN?

Delivering private-line-like performance with broadband economics

Executive Summary

Competitive environments are forcing businesses to change their IT to drive more agility, enabling them to deploy new software and services quickly to capture more opportunity. This is driving many to use cloud-based applications where ready-made enterprise solutions can be deployed quickly, but what most do not consider is that this move can have a dramatic impact on their business. Wide Area Networks (WANs), which are the dedicated connections between the main headquarters and branch offices, have been feeling this pain. The Multiprotocol Label Switching (MPLS) links that provide all of the internal connectivity and bandwidth for modern enterprises are already being overrun by web, rich media, video, and an explosion of client access devices. Now, these links need to support the much more critical line of business (LOB) applications that are moving out of the datacenter as well. The need for more bandwidth is further complicated by both the types of applications and data; it is not about just delivering more bandwidth but also about better managing that overall mix to drive the best economics. Broadband internet, once the domain of consumer and small business, is becoming an attractive alternative to MPLS for corporate datacenters. But to get there, IT needs to be able to manage QoS of multiple WAN links and optimize for applications, not just traffic flows. Silver Peak, known for its WAN solution expertise, is now delivering optimized software-defined (SD) WAN applications for orchestration that also enable hybrid WANs for better efficiency. These solutions help customers get the most out of their MPLS by bridging that link with broadband internet.

Today's Customer Needs

Companies today continually strive to be more agile, to move faster, and to take advantage of new capabilities. This is why there is such an interest in cloud technologies. These applications are becoming more mature and less risky, allowing companies to move faster by switching to software-as-a-service (SaaS). These applications enable rapid time-to-market by removing the typical deployment pains in the corporate datacenter. However, in doing so, companies are finding that moving the applications out of the datacenter brings a new set of challenges, as end users have an anticipated level of service and performance. With cloud applications now being choked by MPLS constraints, these critical business applications just do not run like they do in the datacenter. Making matters worse, if end users log in from home they probably see better performance on these applications, as their broadband bandwidth does not have the same constraints of the MPLS backhaul at work.

Additionally, it is no secret that data bandwidth is rapidly growing. With IoT, mobility, rich media, Big Data, analytics, and cloud all increasing demand for bandwidth, customers are at the breaking point. Gartner estimates that enterprises are planning for 28% more bandwidth, a compounded annual growth rate, each year through 2017. Such growth creates a problem with both the cost and management of bandwidth and data. The

growth of free cloud storage options is also putting strains on IT; as end users scoff at paltry network storage quotas, they either contract for outside services or go around IT altogether to have access to more data. All of this chokes WAN connections, by pushing more files over the wire, joining in with all of the other non-business application usages (like YouTube, Facebook, DropBox, *etc.*) that consume bandwidth and block those critical SaaS applications. The rise of multiple devices means that every user is now doubling or tripling the number of connections to the network, increasing the amount of consumption and traffic that must move through the firewall and outside the company.

But bandwidth is just one aspect of the MPLS challenge that companies face, because as they try to make changes or negotiate services they are really at the mercy of their providers. Customers are not empowered to make changes, only the provider is; every little tweak can take months for their carrier to complete. Customers have little or no leverage with their carriers. The idea of renegotiating with carriers is a pipedream at best, because it could involve ripping out all of the existing links and starting over with a new carrier (and potentially falling back into the same situation anyway).

Is Broadband the Savior?

Many do not believe that broadband is even a serious option for helping corporate IT tackle this problem, because they see broadband internet as a consumer offering for watching movies on Netflix or using Skype to talk to that uncle in Sweden. But in reality, broadband has the capability to address corporate WAN bandwidth constraints, because it can deliver far more bandwidth with much better economics. Deploying and reprovisioning can happen very quickly, mostly because the market is competitive, leading to the other key benefit: transportability. Unlike MPLS, once a broadband service is initiated, it is relatively easy to switch broadband vendors with little or no change on the customer end. So this must be the silver bullet, right?

Unfortunately no, because while broadband has plenty of benefits, there are some significant drawbacks that must first be addressed. To begin with, broadband does not have the QoS or resiliency of MPLS—something that is absolutely essential for enterprise-class applications. MPLS has a much better ability to deal with packet loss and out-of-order packets, where broadband does not inherently feature those capabilities. While broadband is less expensive, more readily available, and has more competition, latency can vary greatly, far from a guarantee that an IT department could build into an SLA. Broadband infrastructure is a shared medium that does not offer the same level of security as a private line. The lack of good enterprise-class tools for broadband makes it much harder for administrators to look into the connection to see what is going on, who is in there, and what applications are responsible for which traffic. All in, these limitations make it a very difficult sell to bring broadband internet to the WAN with the exception of smaller, less critical branch offices.

## Silver Peak Brings WAN Quality to Broadband

With a rich legacy of WAN solutions, Silver Peak has been addressing the WAN space for quite some time, delivering products that fill in many of the gaps in customer needs that the industry leader Cisco has not addressed. Silver Peak's background and

experience separate them from WAN startups as well, as these are generally less-experienced companies bringing first generation products to market and lacking the depth of knowledge and product traction; this limits their focus and generates more risk.

Silver Peak is now introducing three new products designed to help customers build even more functional hybrid WANs and take advantage of broadband in a WAN—without having to suffer through the current broadband limitations that would normally make it impractical for a business environment.

The concept of a hybrid WAN and software-defined (SD) WAN are often confused by customers, but they are in fact two distinct entities. A hybrid WAN involves the use of **multiple carrier connections of different media** (like MPLS, DSL, LTE, broadband, *etc.*) to create a WAN fabric that builds resiliency and traffic balancing. An SD WAN is a **software overlay** that enables a business to easily orchestrate, deploy, and manage remote connectivity. While often intertwined, an SD WAN does not require a hybrid WAN as the underlay; it could, in fact, be built on a single connection (MPLS, broadband, or other). Likewise, a hybrid WAN does not require an SD WAN overlay.

Figure 1: Hybrid WAN & SD WAN
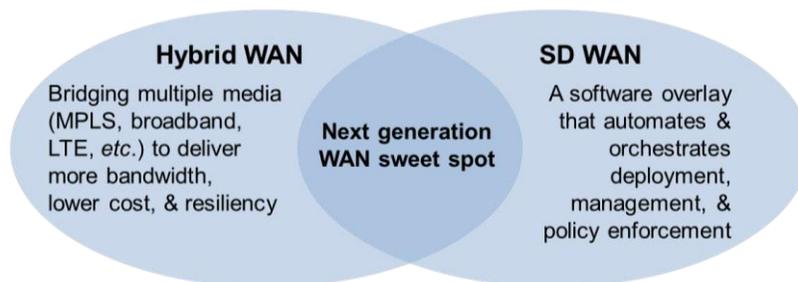
These new products make it easier for businesses to have more flexibility, **making it easier deploy, configure, and manage hybrid WANs by adding broadband**. This function also brings additional flexibility for vendor choice. Broadband vendors are inherently easier to deal with, because the customer is more in the driver's seat than with MPLS carriers; the center of control moves to the IT department, where it can be more naturally aligned to the business needs.

With a hybrid WAN, because there are two (or more) connections, failover can occur to build in more resiliency. But unlike dual MPLS failover which can take 30 seconds or more, with Silver Peak the failover can happen in a fraction of a second. With such rapid failover, applications are more apt to continue running without interruption instead of timing out or hanging due to a longer MPLS failover. Further adding to the reliability of a Silver Peak solution is its ability to handle packet loss and out-of-sequence packets, enabling the broadband connection to act more like a more expensive private line. Additionally, with two connections it is easier to balance load across the connections. But contrary to some load balancing (that generally tries to either equally balance traffic or balance traffic while trying to enforce a QoS), with a hybrid WAN and two different media types, Silver Peak can align traffic to the value of the underlying data streams. It

can move more important business applications to the higher-end MPLS connection while pushing less critical bulk traffic to the broadband connection.

Branch office deployment is greatly simplified, reducing the need for an engineer to travel to the remote location; connecting the new device is no more difficult than connecting a cable modem to a home network. Once plugged in and powered up, the unit sends a message back to the headquarters indicating that it is now online. Templates can be created ahead of time for policies / applications that are then automatically assigned to each branch as they come online. The main office automatically pushes the overlay for each application tunnel and sets up the policies indicating which applications can be run over which link (such as VOIP only being run over broadband or an order entry application only being run over MPLS). This automation allows hundreds of sites to be rolled out without any manual intervention, taking much of the manual labor out of setting up remote locations and driving down operational costs all along the way. A recent Silver Peak customer was able to set up more than 200 remote branch offices at the rate of more than 40 branches a week—a task that was previously impossible to complete in a significantly longer time horizon through the manual process, because the network was the bottleneck.

These new products complement their current portfolio which includes the hardware-based Silver Peak NX (physical WAN optimization appliance) and the software-based Silver Peak VX (virtualized WAN optimization appliance that can run on any x86 server platform). In addition, Silver Peak recently introduced Unity, an SD WAN that creates a software-based overlay to handle WAN orchestration and enable hybrid WANs.

Targeted Products for Today's WAN Challenges

To tackle the challenges of today's remote connectivity, Silver Peak is introducing three new products that help to deliver private-line-like performance, but do so with the economics of broadband.

Unity EdgeConnect is a zero-touch virtual or physical appliance for branch office connectivity. Featuring Dynamic Path Control, this product puts the customer in control, allowing them to determine which traffic is routed over which connection based on the needs of the business. Security can be brought to broadband, as all traffic is sent through IPSEC tunnels with 256-bit encryption (which is better than MPLS). Unlike other broadband solutions, traffic not originating from a Silver Peak tunnel is automatically dropped and cannot get into the customer's network, meaning denial of service attacks cannot overload the network. Through Path Conditioning, Silver Peak is bringing the QoS benefits of private lines to broadband, along with the cloud intelligence to help manage that quality in real-time, helping align traffic to business needs. Packets being dropped or arriving out-of-order, two challenges with broadband, can be corrected automatically with Packet Error Correction and Packet Order Correction. The physical appliance has several models to choose from based on anticipated usage (think shirt sizes S, M, L, XL), and the virtual product has a single license to cover any size business. Physical appliance buyers also have the ability to move to a virtual appliance later with no charge.

The **Unity Orchestrator** is a single-screen global management console for managing an SD WAN, bringing visibility into both legacy and cloud applications with the ability to set, apply, and maintain policies. The in-depth reporting capabilities enable extensive intelligence into applications and end user productivity. The cloud intelligence system monitors cloud applications, enabling it to report back on where traffic is going, what type of traffic it is (HTTP / HTTPS), and the destinations (applications, websites, or physical locations). Through a subscription to an SaaS optimization package, IT can use this data to determine the most intelligent routing decisions. To support the hybrid WAN goal of driving better bottom-line savings, the Unity Orchestrator can generate bandwidth cost savings reports that are critical in helping businesses manage both their operational costs and their carrier costs. With the ability to consolidate many of the management functions, this product can reduce the number of management panes required. This consolidation helps drive better productivity for administrators as they can see patterns for both the datacenter applications as well as the cloud-based applications along with their adherence to policies.

The third component, **Unity Boost**, is an optional on-demand subscription to enable full application acceleration, bringing a unified solution where competitors would be forced to add on an additional third-party WAN optimization product. Unity Boost is an aggregate license for bandwidth that is flexible, allowing it to be applied to whichever overlay network customers are looking to optimize. Tackling the challenges that have traditionally plagued MPLS deployments, Silver Peak is able to bring these advantages to broadband as well. With Unity Boost, customers can drive better efficiency by accelerating applications like archiving and replication, as well as others that have a usage profile that relies on large amounts of data movement over the WAN. Cloud applications can now benefit from acceleration that makes them perform more like traditionally hosted datacenter applications, despite being run from the cloud. WAN compression and deduplication help reduce the amount of data being driven over the WAN while the utility is also scouring traffic looking for repetitive patterns for local delivery that can be reduced or optimized.

Driving Better WAN Efficiency and Economics

The first step in driving better efficiency for WAN communications is taking back control and injecting choice into the process. For many customers, choice is not an option, as changing backhaul providers and replacing carriers may mean ripping out equipment and renegotiating a new service contract. But those tasks pale in comparison to having to reprovision all of the existing policies to manage security, access, and other application stack services of the new connection. This service provider lock-in has traditionally resulted in higher long term costs and lower levels of service.

Through a hybrid WAN, companies can actually breathe new life into their MPLS service, offloading much of the traffic onto less expensive broadband connections that leave the MPLS with less congestion and better efficiency, providing plenty of headroom for future growth and holding off the need to upgrade until much further in the future. The cost effectiveness of broadband as a connectivity choice has the potential to bring data services to branch locations where businesses may not have had the ability to

justify data services in the past. There are even customers today who already have broadband for their remote locations but simply leave the connection dormant as a backup in case there is a disruption in the MPLS. A hybrid WAN allows these customers to easily use these connections to get the most out of that investment by routing traffic over both connections instead of just one.

By getting better visibility and control, customers have the ability to manage their applications and communication paths to optimize both for accessibility as well as operational cost. With everything fully encrypted, Silver Peak customers can deploy with the confidence that their connections are secure. That control also extends out to the business where the policies established can be applied and controlled to drive the business intent down to the traffic flows.

The performance advantages are obvious, as Silver Peak helps to boost the available bandwidth of MPLS by allowing for broadband connectivity with similar QoS parameters as traditional private lines. All new connections can have a similar level of quality, reliability, performance, and resiliency regardless of which path customers take. This helps to lessen the reliance on MPLS for businesses, allowing them to adjust their communications strategy over time, as it makes sense for their business. With the performance enhancements that Silver Peak brings, customers can experience "datacenter like" performance from cloud applications at their own pace.

Savings come from multiple vectors, scaling up by the amount of money saved by businesses, starting with hardware costs, through operational costs, and finally up to the largest savings in carrier costs through the addition of multiple connectivity options. But these savings are not from cutting corners or doing without, as resiliency is actually boosted with the combination of broadband and MPLS, resulting in sub-second recovery versus 30 seconds or more from the more expensive dual MPLS strategy.

But best of all, Silver Peak puts customers in a position of comfort by allowing them to make the changes that they need to make today to drive better business outcomes, **without having to make a wholesale change to their WAN infrastructure**. As an overlay and an additive technology (not necessarily a replacement), customers can begin by folding Silver Peak into their existing infrastructure as their needs dictate. Then over time, as they become more familiar with the products and have more time to study the actual usages and patterns in their networks, they can expand out, adding more products and services where it makes sense. This prevents the dreaded "rip and replace" changes that prevent most customers from tackling some of the nagging issues in their WAN infrastructure.

Taking on the Incumbent

While there are many companies attacking the WAN space with SD WAN or hybrid WAN products, the real competitor in this space is the 800lb gorilla, Cisco Systems. With a strong hold on the market and the purse strings of so many company IT budgets, getting past Cisco will be the biggest challenge for competitors in this market. But this may not be as hard as it appears, because while Cisco owns the bulk of the share, they are in the classic "innovator's dilemma" when it comes to SD WAN. Just as the move to

hybrid WAN brings the opportunity for more customer choice, the move to SD WAN adds more choice for customers, making it easier to pull away from the networking giant that has been slower to innovate in this space.

The Cisco IWAN solution is really not a single solution; it is a combination of products from Cisco and its partners to try to fill in all of the checkboxes for what a customer would demand in building out an SD WAN solution. In addition to the licensing of all of these individual products, there is also the challenge of management, because IWAN has multiple products and consoles to address. If IWAN sees dropped packets or out-of-order packets it will try to route around the problem, where Silver Peak can use Forward Error Correction and Packet Order Correction to handle these disruptions.

When it comes to routing paths, Cisco relies on their Performance Routing (PfR) which is a highly complex and time-consuming function that must be set up in multiple locations. PfR is difficult to use and creates additional headaches for customers in managing exceptions and fluctuations as dynamic network environments change. Silver Peak uses Dynamic Path Selection which allows the administrator to set the parameters from a single console and apply those parameters globally, allowing the system to make seamless intelligent routing decisions on the fly.

Call to Action

Because market changes are driving the need for businesses to be more agile, customers are clearly weighing their options when it comes to their WAN. The rigid and inflexible strategies of the past have been played out and have little additional life left in them. It is important for customers to consider new strategies that can help align their communications resources with the new technologies of today. Customers should consider lower-cost options like broadband for offloading traffic along with SD WAN overlays that can help drive better operational efficiency.

With large shifts to SaaS and cloud-based solutions, IT is discovering that the end user (IT's own customer) is seeing a significantly different user experience as the applications that they rely on for their day-to-day productivity are being choked by the backhaul bottlenecks that never existed within the walls of the corporate datacenter. The agility that cloud-based strategies bring are also carrying with them a new cost as well which is measured in poorer access times, leaving the end user wondering where the progress is as companies move to these new cloud environments.

Customers who are feeling the bandwidth pains of their current WAN solutions should investigate the new products that Silver Peak is bringing to the market which allow businesses to more easily build and manage remote connectivity, whether it is to branch offices or even just to their cloud provider.

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