Office WAN Simplified

An Introduction to vMPLS
Low Cost SD-WAN Solution

Simplewan

Any sufficiently advanced technology is indistinguishable from magic.
- Arthur C. Clarke

Simplewan

Simplify the WAN

Executive Summary

The use of IP technology is allowing companies with geographically dispersed workforces and resources to connect and collaborate in ways never imagined of just twenty years ago. By leveraging the use of Voice over IP (VoIP) telephone services and a well-designed Wide Area Network (WAN) businesses can reap the rewards of advanced technology in their business in the same way that the iPhone has advanced the cordless telephone at home.

By eliminating cost of purchasing and maintaining equipment at each office, as well as operating more efficiently by pooling resources and departments companies can operate at a fraction of the cost per office and provide superior service to their clients. The goal of this paper is to provide an introduction to vMPLS SD-WAN and how it can provide a simple and cost-effective MPLS alternative for multi-location organizations who are looking for a faster, cheaper, and more reliable WAN service.

Introduction

By definition, a Wide Area Network (WAN) is a network that covers a broad area, linking across metropolitan, state, or national boundaries. In today's fast-paced and highly mobile environment, the traditional WAN solutions are not meeting the needs of many organizations. Next generation WAN solutions are desperately needed in order to not only connect individual branches together, but also to centralize resources and allow remote access by employees working from home and on the road.

The advent of Cloud-Computing, Off-Site Data Centers, VoIP, and IP Video has completely changed the WAN landscape. Like most technologies, the need for Wide Area Networks is constantly evolving and most WAN services are not flexible enough to meet the demands of today's businesses. The cost and complexity associated with fully integrating offices, networks, and systems has kept many companies from even exploring the long-term benefits associated with these measures.

One barrier to entry that has denied these fruits of technology from companies, has been the traditionally high cost of WAN bandwidth. While the cost for Internet access has gone down significantly over the past decade, WAN bandwidth has not seen this same decline. Additionally, traditional WAN solutions that are capable of providing the per-

formance needed are complex and costly to implement and manage. Add expensive hardware and software licenses and these costs have made it difficult to justify the expense of integrating remote workers and smaller satellite offices with traditional solutions like Point to Point, Frame Relay, and MPLS.

Furthermore, most geographically dispersed companies cannot find a single Internet Service Provider (ISP) who can provide cost-effective service to all of their locations. Typical MPLS networks require T1 or Fiber-Optics from the local telephone company. The speed limitations of T1s create major bottleneck issues because 1.544Mbps is too slow for many of today's bandwidth-heavy offices. On top of that, satellite offices can't justify the cost associated with T1s, which can cost upwards of $500 per Mbps. However, without full integration an organization can never truly reap the rewards of these advanced technologies.

SD-WAN means software defined Wide Area Network or its more broader term SDN - Software Defined Networking. By letting software control intelligent networking communication decisions, it drastically reduces the costs against traditional static infrastructure. Most old static networking infrastructures are implementing some type of software controlled networking to improve functionality and reduce cost. Most appliance based or backhauled SD-WAN solutions are still very CAPX costly or has an expensive monthly recurring revenue component. In many of the SD-WAN solutions currently available all of the traffic is backhauled to a single point of presences introducing a new layer of failure to a solution.

The improvement in broadband access speeds, coupled with the ever-increasing need for more WAN bandwidth for applications like VoIP, Colocation, and Cloud-based storage provides the optimal opportunity for organizations to avoid the inherently high cost of WAN bandwidth by upgrading to vMPLS. vMPLS simplifies the WAN experience by eliminating most of the headaches associated with dispersed networking. By leveraging multiple Internet access types and providers, and incorporating SimpleWan's patent-pending routing technology, vMPLS provides a robust private and secure 'Cloud' environment. The result is a drastic reduction in monthly recurring WAN costs and an increase in the overall speed and reliability of the network. The migration from Frame Relay or MPLS to vMPLS provides returns in the form of 30-60% cost savings, while at the same time increasing the speed of the WAN by tenfold or more, and providing simple and automatic disaster recovery capabilities which were previously economically unfeasible for the average business.

What is vMPLS (SD-WAN)?

vMPLS is a subscription-based service connects multiple locations and users together across a secure, carrier-neutral platform. Referred to as "Plug n Play virtual MPLS," it provides the benefits of application priority and WAN optimization for real-time applications like VoIP/Video. Built on fully-meshed and self-healing architecture, vMPLS is specifically designed to maximize the efficiency of network-based applications. It allows organizations to converge their voice and data networks without having to change Internet Service Providers or purchase expensive hardware. Once vMPLS has been deployed, existing infrastructure and physical resources are able to easily be shared to any user on the vMPLS network.

The anytime-anywhere access that is provided by vMPLS can be used as a stair-step approach towards centralization and virtualization. Companies can see the cost-savings and improved efficiency of cloud-based networking without the risk and hassles associated with moving and storing sensitive data in a Public Cloud environment. By providing the high-availability and simplicity that is normally associated with cloud-based solutions, coupled with the networking benefits of MPLS, and the flexibility to use ANY Internet connection at each location means vMPLS is uniquely positioned to succeed as a Next Generation WAN solution.

What Makes vMPLS Unique?

Although there are many areas where vMPLS shines, carrier-neutrality is the most distinguishing factor between vMPLS and other SD-WAN services. This approach provides flexibility that has not been available in the past. With vMPLS, any Internet connection can be used as a transport medium, and all locations are accessible from any other location. Even with this flexibility, there is no complicated equipment to calibrate or maintain. SimpleWan will take care of the integration and link together all of the locations via a fully-meshed Private Cloud. This ability to design a Wide Area Network that is customized to each location, leveraging broadband access types where appropriate and integrating more expensive connections where necessary, simplifies the process of network design. Additionally, companies are able to benefit from new technologies, like Ethernet over Copper, as they come to market without making major network changes.

vMPLS is the only completely carrier-neutral, service-based solution that will fully integrate users regardless of their locality, allowing companies to truly take advantage of advanced IP technologies. While other solutions offer some of these advantages, only vMPLS provides a completely infrastructureless deployment.

How Does vMPLS Work?

vMPLS works from the opposite perspective of almost all other WAN services on the market, by putting the client in control instead of the ISP. vMPLS unifies multiple different Internet Service Providers and multiple Internet access types onto a single fully-meshed network. Instead of focusing on trying to find a single ISP to network together remote locations across their backbone, SimpleWan allows the client to leverage all of the individual ISPs available to maximize traffic routing options. This design offers more flexibility by offering more speed choices and access types. This makes it easy to implement the appropriate Internet service level that fits each individual location's needs and the IT budget.

Deployment of a vMPLS network consists of both a hardware appliance at each site, or node, and a subscription-based service. The Private Cloud as a Service (PCaaS) model eliminates expensive hardware solutions that eventually become obsolete, and ensures that as regulations and technologies evolve, the WAN solution being utilized will always be up to date .

As our name implies, simplicity is the name of the game, which means we make vMPLS extremely easy to deploy. Unlike with traditional leased line WAN solutions, you won't have to wait a month or longer to start using your vMPLS network. Most networks are fully operational in about a week. Since many companies are operating without on-site IT staff at each branch office, the SimpleWan edge routers come pre-configured so that deploying your Private Cloud is as easy as plugging it in and forgetting about it. Once the local ISP connection is connected and the device is powered up, the system will automatically create an encrypted connection back to the vMPLS Cloud. With two or more devices plugged in the WAN is built and routes between the two are optimized. The more locations on-line and the more ISPs being utilized the better that vMPLS will perform.

The vMPLS Cloud is comprised of geographically dispersed clusters located within multiple top-tier data centers, as well as virtualized replications in the public cloud. Without giving away all of the trade secrets involved with our patent-pending technology, the edge devices communicate with this vMPLS backbone, which is actively monitoring all available traffic routes in real-time. Traffic is encrypted and directed across an optimized route as determined by current conditions.

Typical networks rely on the ISP's Border Gateway Protocol (BGP) to route traffic, which means there is no control over how and where the data goes. vMPLS however, will override these routes, when necessary, sending traffic the best route available. Optimal routes are logically determined in real-time by proprietary algorithms that are analyzing a variety of variables including: network congestion, packet loss, route distance, and number of hops. This intelligence is then utilized to provide dynamic routing tables, which are constantly being updated. When traffic needs to be re-routed, the Layer 3 BGP routes provided by the local ISP will be overridden. The solution will also identify problems and automatically re-route packets before they are affected to ultimately improve network efficiency and minimize downtime.

While Internet traffic is handed off directly to the ISP without interference, WAN traffic is analyzed and optimized depending on the Application Priority Level (Voice, Video, Secure HTTP, ERP, RDP, etc). vMPLS will make the necessary routing decisions between locations as well as provide prioritization at the head of the Local Area Network. This is done to ensure Quality of Service when streaming applications like voice and video across the network. Application Priority levels can be adjusted by the client or managed by SimpleWan, along with all other rules and policies. Further simplifying the experience, these policies are able to be maintained and updated via a single interface.

It's About the Economics

Like almost every other business expense, choosing the right WAN solution often comes down to economics. No matter how networks are designed or deployed, there are four main cost centers to be compared: Internet Access, WAN Connectivity, Hardware, and Maintenance/Support. When the Total Cost of Ownership (TCO) of vMPLS is compared with other methods of connecting together locations and remote users, the true value becomes evident very quickly.

Internet Access: SimpleWan is carrier-neutral and compatible with any Internet connection, and vMPLS will direct Internet traffic directly to the Internet avoiding costly congestion associated with back-hauling Internet traffic to the Hub.

WAN Connectivity: vMPLS leverages the Internet access at each location to also run the WAN connectivity, optimizing the routes to ensure high-performance and availability. There is no need to pay for additional services like some legacy WAN solutions require.

Hardware: While some hardware devices cost several thousand dollars each, and require annual licenses and software upgrades, not vMPLS. SimpleWan Edge Routers are extremely affordable and all upgrades and licenses are included with the service.

Ongoing Maintenance & Support: Whether using a simple hardware-based VPN or an MPLS backbone provided by the local carrier, Wide Area Networks require ongoing support and maintenance. Sometimes these costs are incurred from the carrier or hardware vendor, but often these costs are incurred through IT/IS staff, whether that is a third party resource or in-house employees. Since these costs do not show up on an invoice they are often not considered at all during the buying process which can lead to a cost-effective network strategy quickly becoming much more expensive than budgeted. When dealing with dozens or hundreds of locations, the amount of support required to maintain a reliable and robust network increases exponentially.

With vMPLS however, 24/7 Technical Support and Maintenance is inclusive with the subscription. There is no added costs to make changes, diagnose connection problems or update the network. vMPLS addresses the economic concerns as a whole by providing several areas of savings, ultimately cutting the total cost of vMPLS to a fraction of what other WAN solutions cost. Let's look at a quick example

:   Not only is the CFO happy with the savings provided by upgrading to vMPLS, but this transition helps IT department heads achieve strategic objectives like unified communications and VoIP implementation. Having the freedom and flexibility to choose the best available bandwidth at each location allows companies to benefit from the local high-speed/low-cost solutions available at individual locations even though they may not be available to ALL of the locations.

This type of network design provides the greatest ability to control costs and purchase the appropriate bandwidth and service level for each office. No two offices are the same and SimpleWan recognizes that leveraging these differences instead of designing the WAN with a "One Size Fits All" mentality provides the best opportunity to truly cut costs. By shopping for the proper connection type at each location, and taking advantage of the high-speed/low-cost broadband connections readily available, organizations can significantly reduce their WAN service costs; sometimes by as much as 80%. At the same time, network speeds can increase by ten or twenty times the speed of T1s.

Redundancy

One of the most expensive, and least quantifiable, costs associated with technology and networking in the 21st century is the cost of down-time. The more companies rely on technology for day-to-day operations the more costly any amount of down-time becomes. Traditional WAN solutions rarely offer a truly redundant solution. Most, so-called redundant solutions, are provided by a single ISP. If the ISP has trouble on their backbone it doesn't matter how many different circuits enter the building -- network access will be affected.

vMPLS, however, allows companies to have multiple ISPs providing a truly redundant solution. By using two Internet connections, vMPLS will automatically fail-over in the event of an outage on the primary connection, which can increase up-time to near 100%, thereby eliminating the high costs associated with network outages, or unavailability.

Simple to Deploy, Even Simpler to Manage

Most WAN solutions are complicated to implement. Hardware-based solutions are expensive and usually require an IT professional to be on-site at each location in order to configure the necessary hardware. Deployment of carrier-based MPLS networks is slow. Often it can take 6-8 weeks or more for the local ISP to provision and turn-up circuits. Upgrading to vMPLS is so much easier. vMPLS routers are, "Plug n Play," so by simply connecting the ISP's Ethernet cable into the WAN port, plugging another Ethernet cable into the LAN port (Connected to the LAN Switch), and plugging the power cable into an electrical outlet, your Private Cloud is provisioned, configured, and ready to use.

Network Monitoring

Managing and using the vMPLS network is even easier than implementation with SimpleWan as long as you have an Internet connection and electricity, you have an optimized and functional WAN. Should there be an Internet or electrical failure at one of the remote locations, the vMPLS Cloud will instantly notify you via text and/or email, including detailed logs. This type of proactive management ensures that the IT staff can focus their time on other projects and not constantly be managing network connectivity between data centers, offices, and remote users.

A simple to use web-based Dashboard is provided to all vMPLS customers and provides a high-level overview of the entire WAN, along with detailed information on each site. This type of full network visibility is extremely useful when managing several remote locations to ensure that you are purchasing the right circuits and not over-spending on Internet access just because employees complain about 'slowness'.

In addition to providing real-time information like active sessions, traffic type, latency, etc. Historical data is maintained providing a simple way to determine if the current issue is chronic or anomalous. Also, easily make changes, optimize, and control the flow of your connectivity in real-time without spending the time and resources to do manual research. All these features and more are included with any vMPLS solution ,and are accessible from any Internet connected device, including PC, Laptop, iPad, iPhone, and Android devices.

Proactive Cyber Security

It is far too common these days to read about companies being ,"hacked,"and customer data stolen. The scary part is how many,"hackings," don't make the news. Network security is as vital today as an alarm system on the office front door. You would never leave the office door open when nobody was there. That would make you a prime target. Just like with office security, the best network security includes making sure that you aren't an easy target for on-line criminals, or your competition.

SimpleWan meets all national network security guidelines and is both HIPAA and PCI compliant, providing stateful packet inspection, network monitoring alerts, and remote access policies in addition to many other requirements. But we even take it one step further and employ guerrilla security tactics designed to make sure your network isn't one of the,"easy ones."These tactics include utilizing random port numbers, advanced traffic encryption, network aliases, and automatic updates, and configuration back-ups. With these methods in place, some hacker,"listening for open ports," or sniffing IP addresses isn't going to even see your network. It's like hiding in plain sight.

What About Mobility and BYOD?

The landscape has changed. No longer is business constrained to the office. Today's fast-paced world demands that workers on the go have access to the corporate Intranet, file servers, and their office PC from wherever, whenever. Users working from home can easily log into the vMPLS Cloud to access files on their office PC or connect to the Intranet. Not to worry, these connections are just as secure as if they were at the office and behind the firewall; all connections into the vMPLS Cloud are encrypted with advanced 1024 Bit security.

Workers who utilize their own devices (BYOD - Bring Your Own Device...Cell phone, iPad, Laptop, etc), present an entirely new challenge for IT Administrators to deal with, but, SimpleWan has their back when it comes to connectivity. The security risks associated with utilizing Public Wi-Fi connections at hotels and coffee shops are widely known, but, there are times when Mobile Workers do not have a choice but to connect to these risky Internet connections. vMPLS provides the ability for these mobile workers to encrypt their session over these connections ensuring that hackers are not collecting private data or accessing these assets; thus providing the IT department with a little peace of mind when their staff is out working in the field.

Only vMPLS

In conclusion, vMPLS incorporates the simplicity of Plug n Play with the advanced routing technologies typically attributed to MPLS networks. This allows the solution to be customized to fit the needs of each business and business location, no matter how big or small; whether it is in the big city or an oil rig off the coast - vMPLS can connect them all.

vMPLS is a service-based solution that provides instant and secure, fully-meshed connectivity between offices, data centers, and remote users, no matter what type of Internet connection they use, or where they are located. Designed with scalability and flexibility in mind, vMPLS will grow with your organization at a fraction of the cost traditionally associated with WAN solutions. By leveraging multiple ISPs and access types, a VMPLS network is faster, smarter, simpler, and cheaper. While other hardware solutions out there will cost upwards of $30,000 per location, only SimpleWan is able to provide all of these benefits in a cost-effective solution that the average business can easily afford.

Faster network speeds, greater visibility, more security, and less downtime -- all wrapped up in one service no matter where the office is or what kind of Internet access they use. That is Simplifying the WAN.

How Does SimpleWan SD-WAN Stack Up?

The table below shows how vMPLS provides the low-cost and flexibility associated with Hardware VPNs along with the robust features associated with MPLS, and other SD-WAN.

vMPLS Offers the Best of Both Worlds	Hardware Solution	Traditional MPLS	Other SD-WAN	SimpleWan vMPLS
Easy Zero Touch Deployment Provisioning				x
Full Deployment in Less Than 15 Days	x		x	x
Automatic Failover to Redundant Carrier			x	x
3G/4G VPN Support	x		x	x
Cloud-Monitored Firewall		x		x
Realtime Network Monitoring		x		x
Application Priority (CoS/Qos) (Voice/Video)		x	x	x
Fully Meshed Topology (Any to Any)		x	x	x
Mobile Cloud Access for Remote Users	x			x
Real-Time Packet Re-Routing				x
Real-Time Bandwidth Utilization Graphs			x	x
Internet vs. WAN Smart Routing	x			x
BGP Override for Shortest Optimal Route				x
Site By Site Historical Utilization Stats				x
Self Healing L3 Network Resolution				x
Cloud Managed Wireless				x
Nat+ 1:1 Natting	x			x
Remote L2 Mobile User Support	x			x
Works with Broadband (DSL/Cable)	x		x	x
Reduces Bandwidth Wasting Net Broadcasts				x
Stateful Packet Inspection Firewall	x			x
HIPAA Compliant	x	x		x
PCI Compliant	x	x		x
Content Filtering				x
Cyber Security	x			x