

# SD-WAN vs. MPLS:

## Key Considerations for Your Global Enterprise Network





## Introduction

Enterprises and service providers worldwide are rethinking how wide-area networking (WAN) services should be deployed. The market has changed due to a variety of long-term trends in the information technology (IT) and communications markets, demanding a more flexible and affordable access to cloud applications.

One of the biggest challenges for enterprises today is managing their WAN costs. Increasing demand for cloud applications, ballooning bandwidth needs, and expanding branch offices and international locations all present a challenge in managing costs.

In this special report, we take a look at how new trends in the WAN and the cloud, emerging software-defined global WAN (SD-WAN) networks can be used replace and augment existing MPLS services for enterprise connectivity – and reduce WAN costs.

## Is it Time to Replace Your MPLS?

There are significant advantages to moving away from legacy WAN technologies such as MPLS.

These include:

- Moving to open hardware models rather than being held captive to proprietary equipment.
- Taking advantage of an as-a-service model to manage and deploy software-defined WAN (SD-WAN) services via the cloud.
- Lowering both capital expense (CapEx) and operating expense (OpEx) through the use of commercial off-the-shelf hardware (COTS) and optimizing lower-cost WAN links including public Internet broadband.

Modern SD-WAN models for connecting the WAN directly to the cloud across optimized links also provide gains in flexibility, security, applications performance, and management. A global SD-WAN can now be implemented as a network as a service (NaaS) to adapt to constantly shifting bandwidth needs and connectivity to cloud applications.

## How Cloud has Changed the Enterprise WAN

The biggest driver toward a new global WAN is the growth in the cloud, which is forcing corporations and other organizations to rethink their private networks.

For decades, enterprises built private data centers and then connected these assets with private WAN links, using legacy protocols such as multiprotocol label switching (MPLS).

While MPLS is built to secure these point-to-point links between enterprise branch offices and data centers, it's not designed to connect to the public cloud. In fact, the use of MPLS can dramatically increase the costs of cloud access by forcing enterprises to backhaul cloud traffic to their data centers as user demand builds on the private network.

Despite the advantages of MPLS, times change. The new trend is cloud and cloud connectivity. As Aryaka recently showed in its "State of the WAN" report, cloud services and SaaS applications now make up nearly 50% of all enterprise WAN traffic, highlighting the importance of the cloud in the way business is conducted globally today.

## Volume of Enterprise WAN Traffic Is Growing



Some of the key points that were reinforced in the State of the WAN report:

1. **The volume of enterprise traffic is growing** rapidly across all global regions and verticals. Data is exploding worldwide, driven by Big Data, the Internet of Things (IoT), and video; the proliferation of network-attached and wireless devices; virtualization; and the adoption of both public and private cloud delivery models. We found that the largest growth regionally in Asia-Pacific (APAC) and across verticals is in the manufacturing industry.
2. **Nearly 50% of enterprise traffic is a combination of HTTP and HTTPS.** Applications are moving from on-premises to the cloud. Enterprises are replacing on-premises apps with cloud versions of those applications or entirely new applications that perform similar functions. The shift to the cloud is now non-negotiable.
3. Bandwidth at non-headquarters enterprise sites is reasonably good worldwide. Globally, only about **12% of global enterprises have links with bandwidth less than 10 Mbps**, which is more than a 50% decrease from last year. Twenty-five percent of our customers have one or more 100 Mbps links. Even in developing countries, access-site bandwidth is never below 2 Mbps.
4. While certain components of the enterprise WAN are improving, others are hindering the enterprise's ability to conduct business over the Internet. The biggest challenge comes in connecting long distances across the globe. **TCP application response times can be as high as 40 seconds and have a variation of nearly 200%** depending on the distance between the sites. As distance increases, the problem is further accentuated.
5. For some regions, inconsistency in the application response time cannot be solely attributed to the distance between locations, but is also dependent on the network infrastructure itself. With some geographies, such as the Middle East and some parts of Asia, the connectivity in place is more detrimental than distance alone. In some instances, **the variation in response time can be as high as 153%** with an average application response time around 1 second.
6. These trends show that today's enterprise is encountering major networking and communications challenges as it tries to keep up with the scale and dynamic nature of cloud connectivity, including connecting mobile users across the globe. **Dynamic SD-WAN and SD-WAN NaaS are a way to solve that**

## The Great MPLS Disconnect

So why does the cloud matter? The changing dynamic of global WAN networks has new requirements. CIOs and IT professionals have new demands to build efficient, high-performance WANs that can connect to the cloud and branch offices all over the world. This demands a new type of global WAN – based on software control and provisioning.

When it was introduced two decades ago, MPLS was a good fit for the growth of private networks. MPLS was also a boon to service providers, who saw selling MPLS as a premium service to drive growth. For many years, MPLS became the gold standard for high-quality managed WAN services offered by global service providers.

But the growth of cloud has changed that. Managers need to lower the cost of the WAN and retrofit it for the cloud and global access. Internet broadband and performance-boosting technologies such as WAN optimization and applications acceleration mean that private lines may not always be necessary, when Internet broadband is available. VPNs can now be delivered as a software overlay that does not require specialized MPLS hardware or services.

MPLS may still hold some advantages for enterprises that would like to maintain a hybrid WAN environment, but the drawbacks are becoming more glaring in the face of the evolution of the WAN. Here's a summary of the pros and cons:

### Some MPLS advantages:

- It's a reliable technology that has served enterprises for years with direct routes from one edge to another.
- It's a quality connection that offers a consistent user experience with no packet loss, fixed latency, and low jitter.

### Some MPLS drawbacks:

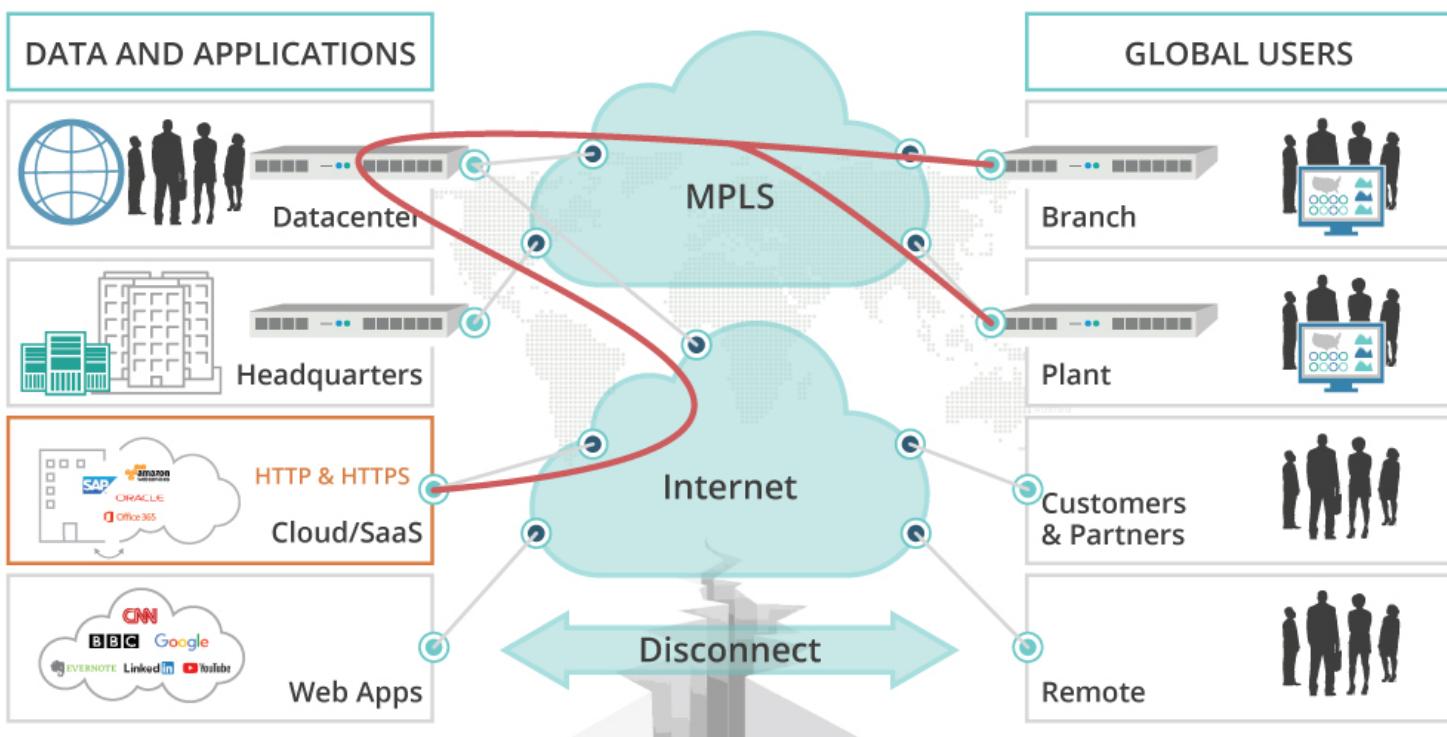
- It's optimized for point-to-point connectivity and not point to cloud (no cloud/SaaS connectivity).
- MPLS requires WAN Optimization.
- There is a big limitation on how long it takes to deploy
- High costs



The biggest challenges is that MPLS does not scale to the current global cloud architecture, because it creates islands of private service in a world of public cloud. This has led to the great MPLS disconnect.

As the diagram below shows, MPLS creates inefficiencies in WAN connectivity by requiring branch offices and remote employees to connect to private data centers over expensive leased lines before – backhauling traffic across the most expensive links – before they can connect to the cloud. Not only is this costly but it's enormously inefficient.

### Legacy WAN Application Delivery



With the boom in cloud connectivity from the employee base, why route them through the private data center when you don't need to? What's really needed is a global SD-WAN that optimizes cloud connectivity and improves business applications performance at low cost.

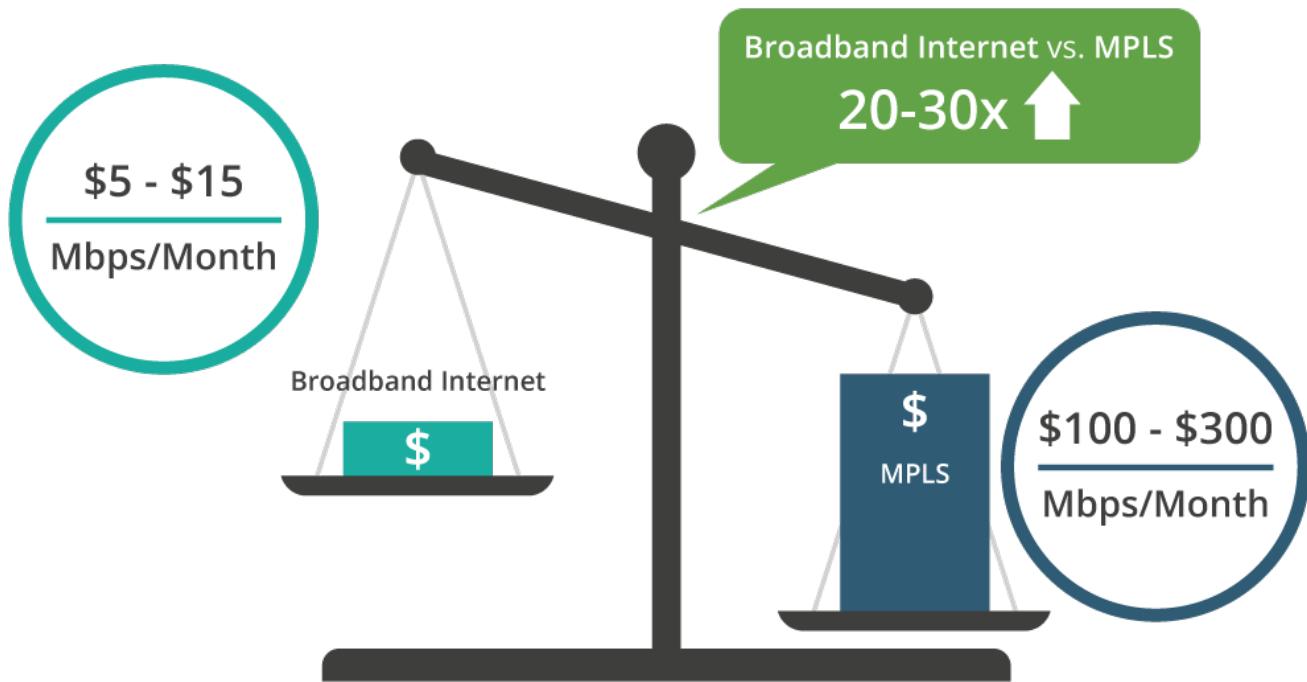
## Overcoming MPLS WAN Inertia

The biggest motivation to move away from MPLS leap out right away — cost.

Legacy MPLS networks have been proven to be very expensive, and the emerging alternatives present compelling price/performance benefits. For example, MPLS services are often priced at \$100 - \$300 per Mbps per month for the copper connectivity typically deployed at all but the very largest enterprise locations, while the monthly price of broadband has trended toward \$5- \$15 per Mbps per month and is dropping fast, according to analysis in Network World.

Competition between a variety of providers, including traditional service providers, cable companies, and wireless providers, will lower these costs further.

Even using more conservative numbers, this is as much as a 20-30x difference in cost.



[Source:<http://www.networkworld.com/article/2222196/cisco-subnet/why-does-mpls-cost-so-much-more-than-internet-connectivity-.html>]

Gartner recently estimated that the cost of a 250-branch WAN can be implemented for \$250,000 a year using cloud-based SD-WAN technology, versus \$1 million via a traditional WAN using technologies such as MPLS. Think about that — what could your organization do with an extra \$750,000 each year?

There are many reasons why the cost of legacy WAN is so high, and why the model has been slow to change:

- **Traditional service providers want to preserve the MPLS revenue stream.** Incumbent service providers have been slow to adapt to the cloud model and still depend on the relative high costs of private lines from their enterprise customer base. Moving to a cloud-based SD-WAN model will cannibalize their revenues.
- **Lack of competition for the WAN.** In many locations – especially internationally – the local loop is dominated by incumbent service-provider monopolies who have not been incentivized for change. However, the global SD-WAN represents a new threat to this model, because it is delivered by the cloud and does not require changes to the physical infrastructure.
- **Networking technology inertia.** Once private WANs are established using expensive proprietary hardware and private lines, managers are afraid to change things that took years to build – even if it will lower costs. But if WAN efficiency can be introduced, it could lead to new opportunities to look for more efficiencies in the network and IT infrastructure?
- **Concerns about Internet reliability.** Many IT managers have been afraid of depending on the public Internet for connectivity, especially for International connections. But with the introduction of better WAN optimization, routing, and application acceleration technology, this is all changing. Many of these features can now be implemented via a global WAN using cloud technologies, rather than requiring additional software or hardware installations.

In the past, overcoming these burdens to lower the cost of the WAN was not possible with a hardware-based deployment of point-to-point networks. But with the case of a global SD-WAN, that's all changed. Technology advancements in optimizing connectivity to the public cloud using publicly available broadband connectivity can deliver management and cost benefits – and it can all be set up in a matter of weeks.



## Change is Good: Benefits of the New Global SD-WAN

Advances in the performance of broadband Internet, the proliferation of cloud, and plummeting broadband prices are all providing reasons to shift from the legacy WAN model.

IT managers will find overcoming these burdens to lower the cost of the WAN easier over time. Using a global SD-WAN, technology advancements can deliver management and cost benefits – in a matter of weeks.

Platform Specialty Products, a diversified producer of high technology specialty chemical products and provider of technical services, uses the Aryaka Global SD-WAN to lower costs and improve the performance of cloud applications, including integration with Azure and Office365. The migration to a new WAN took four months and delivered a 20x performance improvement and \$2.5 million in annual savings. Other companies such as JAS, Samsung, and the Dover Corporation have seen similar results.

*"MPLS has become legacy technology. It is slowly dying. A company that wants to be aggressive in moving to the cloud is often restricted due to the network that delivers traditional workloads on-premises."*

Dustin Collins,  
VP, Global Infrastructure Services, Platform Specialty Products

A cloud-based global WAN can also provide easier management and software delivery via the cloud. You can now hook into a global SD-WAN in the cloud without building it yourself.

In a recent SDxCentral.com survey, both service providers and enterprise alike said more flexibility and manageability of networking technology were desirable and driving the search for new WAN technologies. Both the enterprise and service provider camps believe that moving away from the “box” model of delivering WAN services using point-to-point technologies is important to lowering management costs and hardware expense.

Moving to a software-based cloud NaaS model for delivering WAN services could lower both operating costs (OpEx) and capital costs (CapEx), providing a return on investment (ROI), whether it's an enterprise or a service provider.



To summarize, the benefits of a global SD-WAN include:

- Reducing the costs of WAN connectivity costs by leveraging lower-cost services such as Internet broadband or by optimizing the use of private lines.
- Lowering the costs of CPE hardware with the use of merchant silicon-based equipment and standard hardware.
- Providing OpEx benefits with cloud-based management.
- Speeding service agility by offering provisioning in the cloud.
- Automated management of SD-WAN routing in the cloud.
- Avoiding vendor lock-in and proprietary hardware.
- Using analytics to drive intelligence, dynamic traffic prioritization, and load balancing.
- Built-in WAN optimization and security.
- Increased performance of cloud applications such as SaaS.
- Broadband link redundancy leveraging public Internet connections.

Independent research proves that enterprises are looking at change the way they buy and deploy WAN services. As many as 60% of multinationals are evaluating regional providers to reduce WAN spending by as much as 40%, according to IT research firm Gartner.

Research firm IDC forecasts global SD-WAN revenues will rise to \$6 billion annually by 2020. Consistent security, price and reduced complexity were the three principal attributes enterprise businesses look at when it comes to SD-WANs, according to recent IDC market research.

## Moving Away from MPLS as a Strategic Initiative

With all the benefits offered by a modern, global SD-WAN, it's likely that enterprises are going to move away from the legacy infrastructure.

Staying on MPLS is simply too expensive. Enterprises expect their WAN expenditures to rise by more than 20 percent annually, exceeding \$1 million per year beginning in 2017, according to data from IHS Markit in its Wide Area Networking (WAN) Strategies North American Enterprise Survey. The IHS Markit analysis indicates that the acceleration in spending growth is being driven by digital transformation initiatives, as the WAN becomes a strategic for technology infrastructure, enabling commerce and communication between employees, customers and partners. This, represents a renewed focus on WAN security and performance.

It's likely that many new SD-WAN services will be deployed as a way to provide more capacity and efficiency with the trend toward increase demand for bandwidth. Over time, that means legacy MPLS technology will be replaced by the modern appeal of a global SD-WAN network delivered in the cloud.

## About Aryaka Networks

Aryaka is transforming how global enterprises connect sites and users worldwide, and use mission-critical applications to support modern business execution demands. Aryaka's Global SD-WAN combines a purpose-built private network, SD-WAN, optimization and acceleration techniques, connectivity to cloud platforms, and network visibility in a single solution that is delivered as a service.

## Next Steps

- Give it a try to experience the benefits for yourself.  
Sign up for a [Free Trial](#).
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