

MPLS + SD-WAN BETTER TOGETHER

Why an enterprise network combining MPLS and SD-WAN is better equipped to meet modern infrastructure requirements.



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EXECUTIVE SUMMARY

Business requirements for networking are changing, brought about by increasing levels of cloud adoption and rising bandwidth consumption. These changing business conditions are demanding organizations embrace new modernized networking models to better manage rising network demand, facilitate and enable business in the cloud, realize efficiency and control costs.

For many enterprises, MPLS, the traditional “gold standard” for corporate networking, is no longer the sole answer. While MPLS has long been prized for its faster packet processing, traffic engineering capabilities, Quality of Service (QoS), and uptime and reliability, it is costly and lacks the flexibility IT organizations now require to respond to ever-changing business demands.

While SD WAN technology offers significant cost, transparency and centralized management benefit, few enterprises are prepared to abandon tried and true MPLS for a pure SD WAN enabled network.

A Hybrid WAN offers enterprises a “better together” approach that combines traditional MPLS-enabled WAN with SD-WAN to solve many of the cost/bandwidth capacity/security/transparency concerns that impact networks today. Hybrid WAN also provides businesses seeking to modernize their network strategy with a low-risk way to introduce SD-WAN into the network mix.

This whitepaper looks at the concept of a Hybrid WAN and examines some of the factors that business leaders must consider before adopting this strategy.

This includes carefully reviewing potential migration challenges, an evaluation of timelines, and the merits of a phased transition. All told, it is recommended that IT organizations seek out a partner that is conversant with networking options to guide them through the network modernization journey.

MPLS and a Changing Enterprise Landscape

For years, MPLS has been the 'gold standard' of corporate networking. Reliable, stable, and secure, MPLS has helped accelerate and shape traffic flows across the enterprise wide area and service provider networks since its introduction to market in the late 1990s.

MPLS benefits include the ability for enterprises to assure QoS, its neutrality (MPLS is not tied to one protocol or transport medium), and its support for traffic separation and creation of virtual private networks (VPNs). Traditionally, a primary WAN using MPLS was deployed to facilitate connections between branch offices and the data center, providing a dedicated connection to geographically distributed offices.

But much has changed since MPLS was introduced to the enterprise. Growing demand for increased network bandwidth is one of the most critical issues facing data centers today, driven by social media usage, increased virtualization, cloud computing, the proliferation of big data applications across the enterprise.¹ According to networking giant Cisco, we are now entering the era of the zettabyte, with annual global IP traffic expected to increase at a CAGR of 24% per year to reach 3.3B ZB by 2021.²

Enterprises are also increasingly conducting business in the cloud. Mission critical applications -- everything from CRM, to ERP, to HR and payroll systems -- are SaaS-enabled. Based on recent IT professional survey data, 81% of enterprises today have a multi-cloud strategy, with 75% of enterprises operating a private cloud and 92% adopting a public cloud.³

All of this means that the burden on the traditional MPLS-enabled WAN will continue to grow, and IT leaders must find a way to manage and support this growth.

So, what is the way forward for mid to large size enterprises seeking to modernize their network?

Is SD-WAN the Only Answer?

While estimated to have less than 5% of the networking market today, software-defined wide area network (SD-WAN) is often presented as the answer.⁴

The merits of SD-WAN present a tantalizing promise to enterprise IT organizations. Marketed as a fresh alternative to MPLS, SD-WAN offers speed, ease of use, security, and centralized manageability, all at a significantly lower cost than traditional MPLS networking. Seemingly, it presents enterprises with a feasible, low-cost pathway to cloud-enabled communications.

But is it practical, easy, or even economically viable for mid to large-sized enterprises to abandon decades-old investments in MPLS and its underlying technology and make the leap to SD WAN?

The answer for most mid to large-sized businesses is, quite simply, no.

Here are some reasons why a complete cut over to SD-WAN is impractical for many enterprises:

- 1.** SD-WAN is most effective for small branches (typically with a bandwidth requirement <1 G).
- 2.** Mid to large enterprises that require stringent levels of SLA for their business-critical applications may prefer to retain their existing MPLS infrastructure.
- 3.** Depending on where the business operates in the world a pure Internet-based connection may not provide the kind of reliability required (for instance developing markets).
- 4.** A conversion from tried and true MPLS to SD-WAN is a major IT undertaking. It represents significant costs and potentially means downtime and other business interruption which creates risk for the business.

Nor is there any real evidence of dissatisfaction among IT leaders with traditional MPLS. In a recent study from GlobalData, SDxCentral asked network IT professionals about their satisfaction with their WAN provider. None reported being dissatisfied. While most respondents expressed a desire for lower WAN costs, the level of service they received from their vendor offset any cost-related reason to change. This led SDxCentral to conclude that enterprise dissatisfaction

with MPLS is overstated and companies still have compelling reasons to rely on it for both mission critical and non-mission critical traffic.⁵

This is further supported by market growth data. The market for MPLS connections continues to be healthy and strong. MPLS is expected to achieve 4.4% CAGR over the next few years, with global MPLS revenues reaching a CAGR of 4.1% over the same time. Developing markets -- where Internet connectivity and telecommunications infrastructure immaturity is still a very real concern -- will see the fastest growth of MPLS connections, with Asia leading at a CAGR of 8%.⁶

So, while SD-WAN certainly offers many security, transparency, and centralized management benefits, it should be viewed as one part of a modern networking solution. For all the reasons stated above, SD-WAN alone is rarely the full answer to today's enterprise networking challenges.

Five Reasons Businesses May Want to Retain a Private MPLS-Enabled WAN

- 1.** To guarantee an end-to-end SLA.
- 2.** To satisfy regulatory requirements that dictate the use of private WAN
- 3.** The business is operating facilities or branch locations in geographies with poor/immature broadband infrastructure.
- 4.** The business is reluctant to use the Internet as its backbone and prefers a private service.
- 5.** The business wants to use the private WAN for mission critical traffic and offload all other traffic to a business broadband service to reduce networking costs but minimize risk.⁷

Hybrid WAN – a ‘Better Together’ Strategy

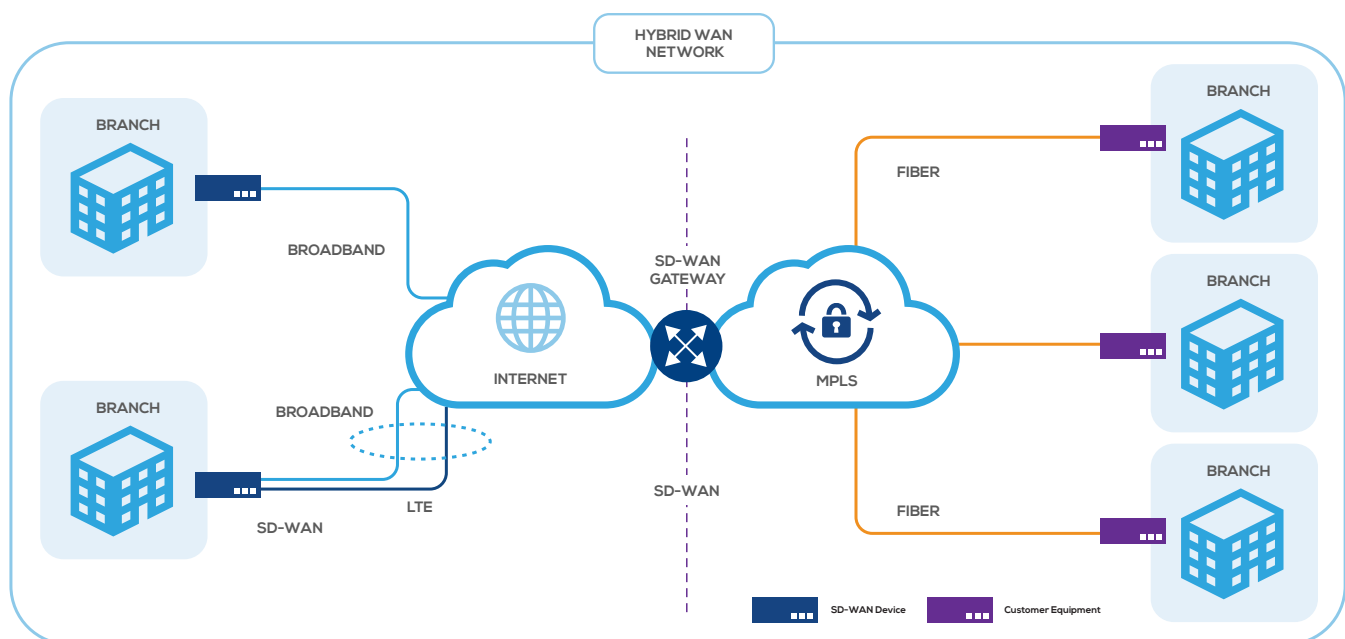
For the majority of mid- to large-sized enterprises, the answer to a modern networking strategy lies neither in MPLS nor SD-WAN alone, but rather, in a Hybrid WAN, which offers a ‘better together’ strategy providing enterprises with an opportunity to take a gradual, lower-risk approach to network modernization.

By augmenting an existing MPLS network with SD-WAN, or by connecting only new branches with SD-WAN, enterprises can better manage growing network demands, maximize network efficiency, reduce costs, and better facilitate business in a cloud-based world.

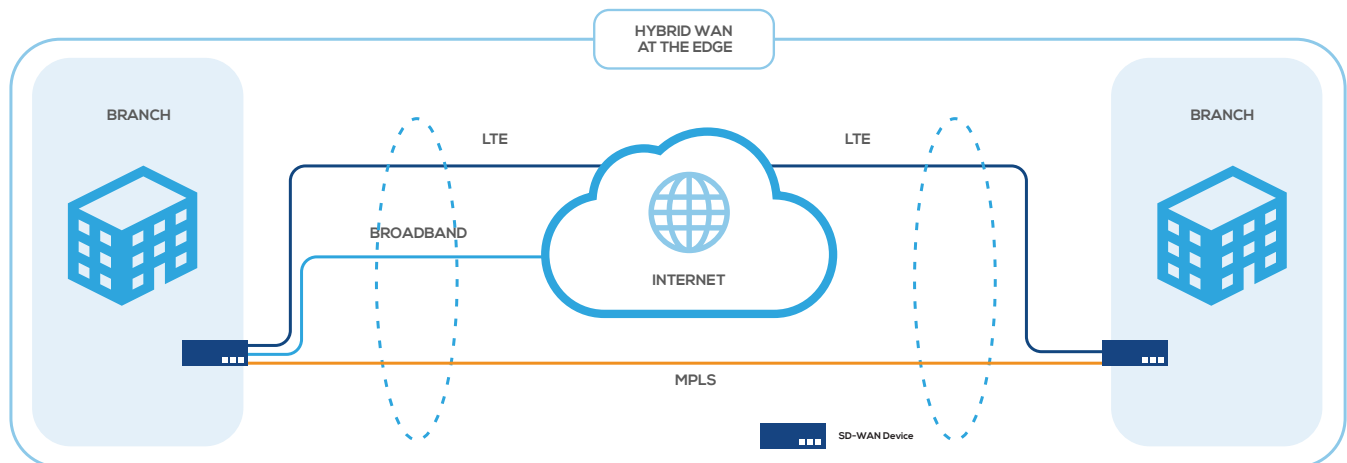
What is a Hybrid WAN and how does it work?

A hybrid approach in general is anything that is a mixture of two or more things. In the context of the WAN, a Hybrid WAN can be defined in a couple of ways:

1. It can connect two geographically separate WANs to a branch office using two different types of connections to carry the traffic. One branch could have a traditional MPLS connection to the data center. The other connection is made through a broadband connection to the Internet or as a VPN connection to the data center. There could be a smaller branch office that uses Internet and SD-WAN. Hybrid WAN technology can seamlessly integrate the two (or more) underlying transport technologies at the different branch locations to communicate with each other.



2. Pure SD-WAN players also define a Hybrid WAN as the ability to multiplex different transport technologies at one branch or edge. In this circumstance, SD-WAN becomes an overlay technology that enables controlling, defining, and configuring end-to-end application flows across all the elements of the Hybrid WAN.



Hybrid WAN Benefits

A Hybrid WAN solves many of the common concerns associated with a WAN because it funnels traffic directly to the Internet, eliminating the extra hops and latency that sometimes occur when traffic goes through a data center. A Hybrid WAN is also more cost efficient because it directs traffic over the Internet, which is less costly than using an MPLS link.⁸

Key benefits of Hybrid WAN:

- The ability to use asymmetrical optimization techniques that employ both the MPLS link and the Internet connection.
- Simplified and improved management orchestration of WAN traffic and devices.
- Improved and unified visibility and monitoring traffic.
- Better security.
- Ability to define policies to route and distribute WAN traffic intelligently.
- Easier and quicker reconfiguration of branch offices.
- Seamless traffic flow between the links without any loss of quality and with a great application experience. For example, if one line is lost or experiences latency, jitter or loss of packets, the other line can take over and meet any service level agreement.⁹

A Hybrid WAN enterprise use case

To illustrate a Hybrid WAN in action, let's examine a typical enterprise use case.

ABC Company is a global multi-national manufacturer headquartered in Toronto, Canada with more than 100 locations serving 150 countries, the company has branch offices in the UK and the United States, a design house in France and manufacturing operations in China. It is also expanding into emerging international markets and has recently launched new subsidiaries in Mexico, Cuba and Milan.

To support the organization's rapid and continued growth, ABC Company's IT department recently implemented a Product Lifecycle Management (PLM) tool, centralized its messaging system, and introduced video conferencing via the Skype for Business suite (IM, audio, video, and application sharing). In addition, there is a high degree of R&D-related traffic traveling (via dedicated secure network) between ABC Company's headquarters location in Toronto, its design house in France and branch offices. The organization must also synchronize massive amounts of data for machine specifications and schematics moving between its headquarters and its manufacturing location in China.

Key goals for the ABC Company's IT team:

- Seamless and quick integration of new subsidiaries (branches) with access to full range of IT services offered by the parent company. This includes:
- Access to centralized applications from emerging countries.
- Transfer of local backup information to data centers.
- Flawless QoS for new applications implemented.
- Support increasing pressure on the group's network and bandwidth coming from new applications and locations
- Keep costs down

Benefits of a Hybrid WAN for ABC Company:

- Launch new international subsidiaries quickly
- Maintain QoS and uptime guarantees
- Retain high degree of network security surrounding business-critical data
- Hold or reduce networking costs
- Prevent data duplication

Hybrid WAN Business Drivers

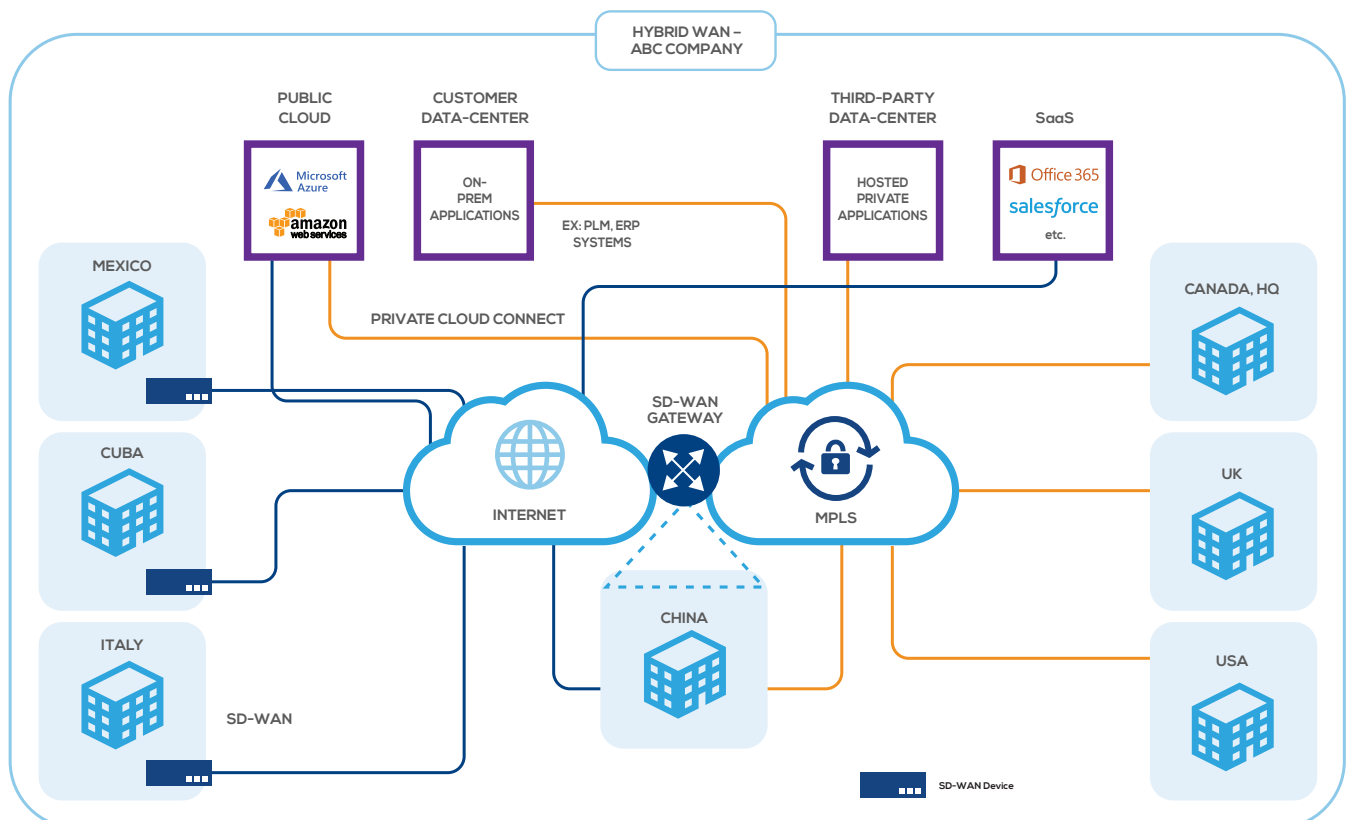
Where and when does it make sense for you to consider a Hybrid WAN?
Let's outline some common business drivers behind a hybrid approach:

The enterprise is expanding and deploying new sites.

When organizations expand globally, setting up MPLS for connectivity can be time-consuming depending on the location of the new site/branch/office. Using the Internet combined with SD-WAN is a great option to deploy a site quickly and connect it to the rest of the organization's network. Once the site is up and running, depending on its evolving needs, a MPLS link can then be added without disrupting connectivity.

The business is transitioning applications to the cloud.

A major transition to the cloud puts new demands on the business, the Internet and other enterprise connectivity approaches. Applications are no longer hosted



in on-premise data centers or in data centers at all. The network must allow the business to seamlessly connect to cloud applications. It also must provide enterprise-grade security for all users and enterprise resources, and in particular, for the most dynamic and volatile ones. SD-WAN adds an additional layer of security for a business's cloud-hosted applications.

The business needs to scale bandwidth

One of the best ways to handle spiking bandwidth demands is to route them through multiple connections by augmenting existing MPLS bandwidth with Internet bandwidth through an SD-WAN defined overlay.

The business has asymmetrical application requirements

Not all applications have the same QoS needs, bandwidth requirements or even response time implications. A hybrid approach combining MPLS with SD-WAN allows the enterprise to flexibly route traffic on diverse links matched to specific application requirements.



Defining your Hybrid WAN Strategy and Key Considerations

Are you currently reliant on MPLS-enabled WAN but in need of more? How do you know if a Hybrid WAN is the right modernization solution for your business? Much depends on your environment, your business, and its networking demands. Here are some key considerations that can help shape your modern enterprise network strategy.

#1

Understand the complexity of your networking environment

- What connectivity technologies are required to support different branch locations?
- Do you require interoperability between the different connectivity methods?

#2

Determine your application-specific traffic requirement

- What are the SLA needs of the applications used by the business?
- Outline the different QoS and response time requirements for voice, video and application traffic.
- Where are applications are hosted?
- Combination of cloud and on-premise?
- How will these applications be accessed?

#3

Determine the distribution of cloud services and identify connectivity options to cloud providers

- Are your cloud delivered applications hosted in a private or public cloud?
- Do your private cloud providers offer the ability to connect directly via a private connection?
- Which of your cloud providers require Internet connectivity?
- Do your access methods align to the performance requirements of specific applications?

#4

Outline the geographic distribution of business sites and identify each site's connectivity requirements

- Are there offices that do not require MPLS and can be supported by a SD-WAN connection?
- Which offices operate mission-critical applications requiring an MPLS connection?
- Do certain offices have SLAs that require an MPLS connection?
- Do you have offices operating in geographies with unstable or immature telecommunications infrastructure?

#5

Determine how much control and visibility into the network you need.

- Does the business require end-to-end (single pane of glass) visibility so IT can quickly detect, diagnose, and resolve issues?

#6

Identify the level of network security required.

- Does your business operate within an industry vertical which demands a high degree of network security?
- Do you have specific security requirements associated with applications running on the network?

#7

Determine how much flexibility and scalability is demanded from your Hybrid WAN

- Are your bandwidth requirements consistently increasing?
- Will the business be expanding and adding new sites (branch offices, manufacturing locations etc.?)
- Are any of these new sites located in regions with immature telecommunications infrastructure?
- What is the timeframe for expansion?

#8

Build a plan to implement, manage and administer your network

- How big is your IT team?
- Do you have enough networking expertise on staff with knowledge of SD-WAN and Hybrid WAN?
- Does the team have the capacity to take on a project of this sophistication, scale, and size?
- Who are your vendor partners and technology providers?
- Do you plan to augment or outsource through a managed service provider?

Taking the Next Step

When seeking to modernize your networking strategy, rarely does a one-dimensional approach work. No one solution can fully address all the factors outlined above. A Hybrid WAN offers a “better together” approach that combines traditional MPLS-enabled WAN with SD-WAN to solve many of the cost/bandwidth capacity/security/visibility concerns that impact networks today. A Hybrid WAN also offers enterprises a low-risk way to introduce SD-WAN into the network mix.

In taking the next step toward a Hybrid WAN strategy, IT leaders should carefully review potential migration challenges, evaluate timelines, and consider the possibility for a phased transition. In such cases, working with one provider who has the expertise in multiple connectivity methods makes good business sense.

IT organizations considering a Hybrid WAN strategy should seek out a partner with deep networking expertise, that is experienced in implementing Hybrid WAN, and that is prepared to partner with you on this journey of transformation.



About Cogeco Peer 1

Cogeco Peer 1 is a wholly-owned subsidiary of Cogeco Communications Inc. (TSX:CCA) and is a global provider of essential business-to-business products and services, such as colocation, network connectivity, hosting, cloud, and managed services that allow customers across Canada, Mexico, the United States and Western Europe to focus on their core business. With 17 data centers extensive FastFiber Network® and more than 50 points of presence in North America and Europe combined, Cogeco Peer 1 is a trusted partner to businesses small, medium, and large, providing the ability to access, move, manage, and store mission-critical data worldwide, backed by superior customer support.

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