

Optimizing Global Enterprise Connectivity

A Teridion White Paper



It's Time to Rethink Routing

The Internet uses Border Gateway Protocol (BGP), a protocol that governs the way traffic is routed online. BGP, which was formalized in 1989, makes routing decisions based on paths, network policies, or rule-sets configured by a network administrator.

While this protocol served Internet users well- and still does- it has two main drawbacks that are exceptionally detrimental to enterprises. First, BGP selects routes based on what is best for the Internet provider, which is not necessarily the best route for the user. Second, the routing rules don't adapt to congestion. The protocol lacks a feedback mechanism that would allow it to change the route based on traffic. Routing into congestion, therefore, is a common occurrence. Relying entirely on BGP fails to meet the needs of the modern network, and in the case of enterprises, can significantly hurt business productivity.

Over the last decade, the shift to cloud computing and SaaS applications has exponentially increased the complexity of the modern network. Enterprises reduced their dependence on dedicated MPLS lines to cut costs, placing more traffic on the general Internet.

This pressure was increased in 2020 with COVID-19, as businesses pushed more traffic onto the Internet and employees connected from various off-premises locations.

Those hurdles are even more prominent in areas of the world where Internet traffic is heavily regulated, such as China and Russia.



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Today, almost two-thirds of US and European enterprises experience reduced productivity due to weak and unreliable connectivity. It's clear that enterprises must find a better way to connect their employees and applications and maintain acceptable levels of productivity to survive, let alone succeed.

Pros and Cons of Common Solutions

Until recently, enterprises have focused on three different technologies to address these issues:

- Multiprotocol Label Switching (MPLS)
- SD-WAN
- SASE

Each technology has advantages and disadvantages, and they are sometimes used in parallel, as a way to address multiple use cases in the optimal manner.

The MPLS Approach

MPLS technology was first used to connect multiple corporate sites. It is essentially a routing technique that directs data from one node to the next using short path labels rather than long network addresses. The short path labels identify virtual links between nodes. As a result, data travels faster than standard Internet traffic.

MPLS can encapsulate packets using different protocols and supports a range of access technologies. It's partitioned off from the public Internet, which makes it a secure transport service. In terms of connectivity, it is a highly reliable solution with a long history of supporting connectivity. Notably, it can guarantee specific SLAs, and is used for mission-critical applications.

Yet for all its strengths, MPLS has some considerable drawbacks. MPLS was designed for a world where the majority of traffic was on-net to enterprise data centers. Today, however, the majority of enterprise traffic goes to and from cloud providers. MPLS became inefficient, routing traffic through corporate hubs rather than taking a more efficient path directly to the cloud. Moreover, it doesn't address the challenges of remote employees' connectivity.

MPLS is also an expensive solution that takes months to deploy. While it enables scaling, any change takes months to implement. Due to these and other drawbacks, most IT professionals don't consider MPLS to be a viable, long-term solution.

Deploying SD-WAN

SD-WAN was introduced in 2014 to add more flexibility to the corporate network. SD-WAN uses several technologies to create a private network with the ability to dynamically share network bandwidth across connection points.

SD-WAN solutions handle the connectivity issues that occur in the last mile of the network, and that last mile determines the traffic route. Since it still relies on the BGP protocol along the mid-mile, however, SD-WAN suffers from the same drawbacks mentioned earlier. This means that unlike MPLS solutions, it cannot guarantee SLAs. Deployment is not plug-and-play, as SD-WAN usually depends on end devices from a specific vendor, and switching between vendors has cost implications.

The main benefit of SD-WAN - in contrast to MPLS solutions - is its flexibility. It contains many cloud-like attributes, such as centralized policy management and security. It scales easily and can handle cloud workloads.

Deploying SASE

In late 2019, Gartner coined the term SASE, which is not a technology per se, but an approach. For enterprises, connectivity challenges are inseparable from security ones. The Secure Access Service Edge (SASE) enhances SD-WAN by combining it with several security functions, including cloud access security brokers (CASB) and secure web gateways (SWG). This is a highly beneficial approach, which we see many enterprises taking as they consolidate security and network departments and seek out holistic solutions. While many security solutions can negatively impact throughput and latency, a good SASE solution addresses both issues effectively.

SASE services include traffic prioritization, WAN optimization, and converged backbones. SASE enhances reliability and maximizes performance, making it a good option for enterprises.

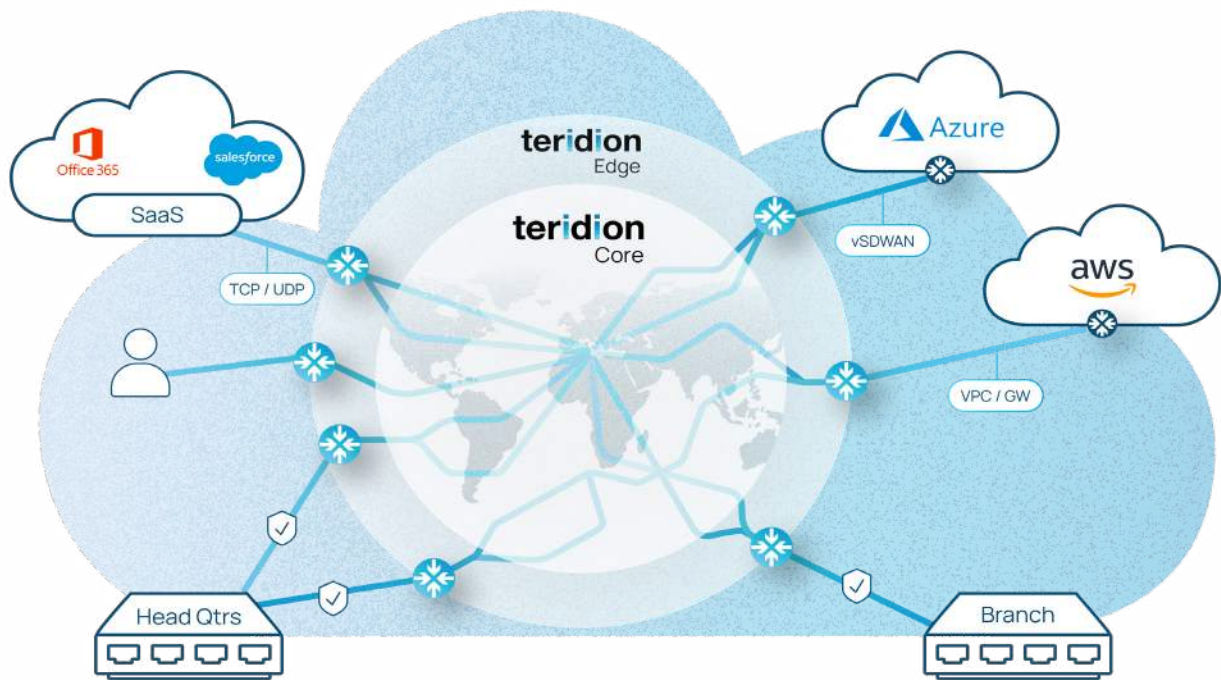
A Better Approach to Enterprise Networks

Over the last decade, different solutions have come forward to address changing enterprise network needs. Unfortunately, none of the existing solutions address Internet routing, which has taken on further importance now that employees are working from various off-premises locations. The ideal solution must have the following components:

Performance: Enterprises require networks that use AI and machine learning to identify the best available route, which enables uploads and downloads to move across the Internet with higher throughput.

Flexibility & Scale: As enterprises continue to scale up their cloud workloads, WAN connectivity must become frictionless to meet the highest performance standards. Optimal enterprise connectivity can only be reached through cloud-based software solutions due to their flexibility and continuous development.

Risk Management: High-performance Internet can only be reached when enterprises diversify risk, to avoid vendor lock-in and a single point of failure. On the deployment and implementation side, this means taking a best-of-breed, multi-vendor approach, rather than a single solution vendor. On the network side, a multi-cloud approach is critical to an enterprise's connectivity backbone.



The Teridion Connect Solution

Teridion Connect provides enterprises with an on-demand, fast-lane approach to the Internet, using machine learning to identify the fastest path between any two points. Teridion's software routers select the most efficient routes through public clouds and avoid more congested paths, enabling higher throughput of both uploads and downloads.

Teridion Connect deploys thousands of monitoring nodes over the world's leading public cloud providers. The nodes collect real-time performance and reachability data that feeds Teridion's machine learning and artificial intelligence routing algorithms. This data is used to construct a dynamically generated, per-customer Internet underlay network that predictively routes traffic around congestion and outages that create performance problems.

When conditions change across the Internet backbone, Teridion automatically adjusts the route taken. Teridion's Internet underlay network spans multiple cloud providers, so that overall performance is always optimized. When the best route crosses two or more providers, Teridion Connect ensures that the data moves through the providers to arrive faster at its destination.

Teridion Connect's multi-cloud approach provides users with a higher level of flexibility, security, application performance, and network performance, as well as a corporate-grade SLA.

Optimized Flexibility and Network Performance

Teridion Connect is cloud-agnostic by design. It is compatible with any cloud infrastructure and can route via different cloud environments without any operational issues. As a result, it can choose the best available route.

Optimized Application Performance

Organizations prefer to use cloud providers that improve application performance. Using a multi-cloud approach, enterprises can use an ideal cloud provider for a specific application. For example, the following applications work best on specific clouds.

- Enterprise Microsoft Office 365 and Active Directory on Azure
- TensorFlow AI platform on Google Cloud Platform
- Elastic Development Environments on AWS
- Oracle database applications on Oracle Cloud Infrastructure

Global research conducted by the Business Performance Innovation (BPI) network found that two-thirds of companies deployed enterprise applications over two or more public clouds, and more than a third had moved more than half of their applications to the cloud.

Additional research from Kentik found that 76% of respondents were using cloud services, and of those, 47% were using a multi-cloud strategy.

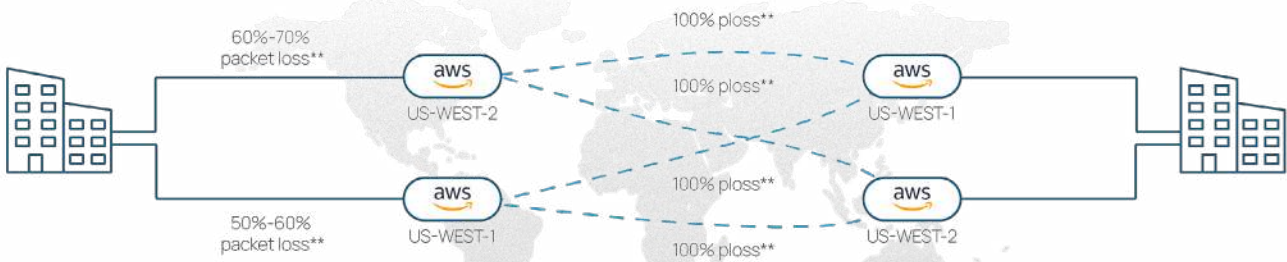
Guaranteed Network SLA

Teridion is the only Network as a Service that leverages 25 public cloud providers in over 500 global points of presence. Since the solution is not dependent on any single cloud provider, we can consistently offer optimized routes with guaranteed network SLAs. Using machine learning algorithms and artificial intelligence to dynamically direct traffic in real-time along the best-performing paths, Teridion avoids network congestion and supports network resilience to ensure carrier-grade reliability without committing to expensive, long-term contracts. From an end-users' perspective, changing routes is seamless, and users are never aware that different cloud providers may be suffering an outage. IT teams get full transparency in their monitoring dashboard, but don't actually have to respond to anything since any arising network issues are handled automatically.

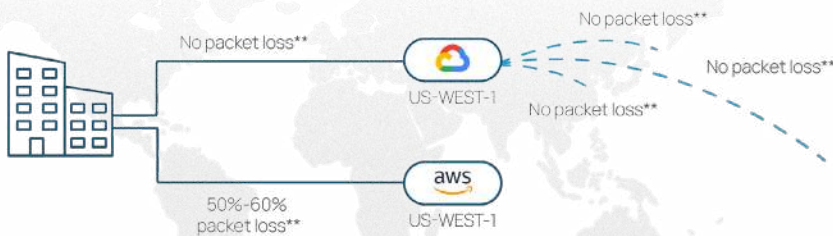
For example, in December 2021, AWS suffered an outage. At the time of the outage, Teridion's preferred SLA committed to zero packet loss, while AWS could only commit to 20%-30% packet loss. During the outage, AWS' packet loss reached 100% while Teridion Connect maintained its zero-packet loss. This is due to Teridion spreading services across multiple clouds to ensure uptime of critical applications.



How AWS customers experienced Site to Internet usage, December 15th 2021, 15:30-16:00 UTC Outage



How AWS customers experienced Site to Site usage, December 15th 2021, 15:30-16:00 UTC Outage



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About Teridion

In a world where network resilience is increasingly complex, Teridion's AI-powered Network as a Service makes end-to-end connectivity unbelievably simple. Telcos and technology partners like Deutsche Telekom, Zscaler, and Barracuda trust Teridion to easily bypass ANY connectivity challenge, from latency to full-blown outage. That's because it is the only WAN with a global backbone that spans 25 public cloud providers in over 500 global PoPs to always find the optimal path between any two points on the internet. And it deploys in less than 24 hours. Just switch on Teridion to get a high-performance network with zero downtime, headaches, or middle-of-the-night phone calls to your IT team

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1. <https://www.embeddedcomputing.com/application/networking-5g/global-enterprises-experience-reduced-productivity-and-efficiency-due-to-poor-connectivity>
 2. <https://www.kentik.com/press-releases/networking-teams-ready-for-automation-and-machine-learning-in-network-management/>
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Get Started

Ready to connect enterprise sites at the highest performance?
Contact us for any further questions.

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