



MPLS Augmentation for Multi-Location Enterprises

A multi-location enterprise would normally connect the branch offices to its central hub, headquarters or data center through private links such as MPLS lines. The following figure illustrates a simplified network with traditional WAN:

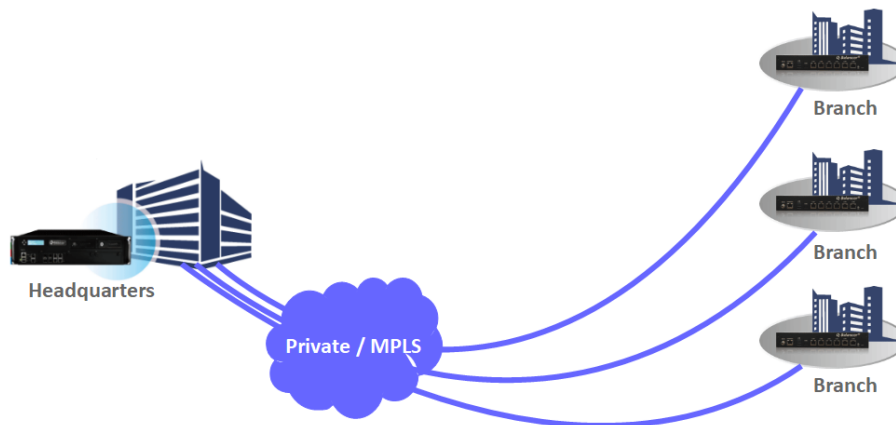


Figure 1: Traditional WAN

This type of design is common for enterprise networks, but it brings some issues:

- > Private WAN often used technology which required special proprietary hardware. However, enterprises today are demanding more flexible, open, and cloud-based WAN technologies, rather than installing proprietary or specialized WAN technology that often involves expensive, fixed circuits, or proprietary hardware.
- > Depending on a single WAN path or carrier has become a liability that enterprises should avoid when deploying and upgrading their WAN.
- > For the purpose of failover, some enterprises might apply other forms of WAN connections like broadband for backup purposes, which mostly stays idle and literally wastes the bandwidth resources. Besides, a failover also meant all the current sessions would be lost and typically the failover process and time frame was not ideal.
- > As enterprises move towards cloud-based services, traditional WAN based on conventional routers are not addressing the performance need for cloud applications. The reason being is that they typically require backhauling all traffic, including cloud and general web traffic, from branch offices to a central hub. Moreover, some enterprises have the mechanism of advanced security inspection deployed at the central hub. These things aforementioned will delay cloud applications, resulting in a poor user experience and lower productivity.

MPLS Augmentation and Replacement

MPLS still play an important role in multi-location enterprise network today, while broadband bandwidth is more economical than it. For the enterprise networks that rely on MPLS services, Internet connections can be used to build secondary connections. By augmenting or even replacing traditional MPLS with affordable Internet bandwidth, Q-Balancer SD-WAN solution delivers a business-class, secure, simple, and cloud-enabled WAN connection with as much open and software-based technology as possible.

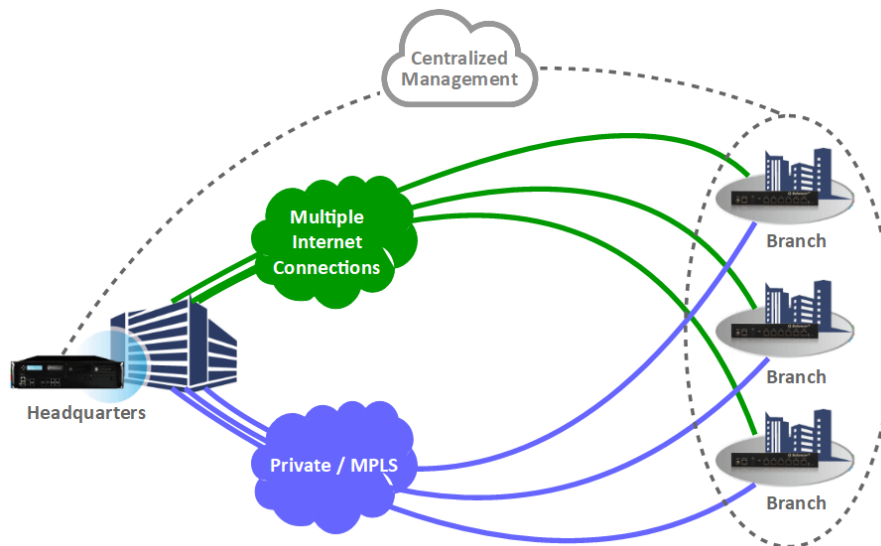


Figure 2: Hybrid SD-WAN for Multi-Location Enterprises

As depicted in the figure 2 above, the appliances are respectively deployed at both headquarters and branch offices. The Internet connections in this case can be wired or wireless broadband Internet, while the backhaul is with MPLS line. Cloud-based applications from branch offices will be primarily directed out via public WAN, rather than via the headquarters site. Internet-bound traffic is offloaded from the private backhaul through the ability of local internet breakout, and thus increased backhaul capacity is achieved. The intelligent path selection has the ability to direct applications between public and private clouds, and it helps improve the application performance.

Solution Components

Edge Devices – Edge devices come with enterprise-grade features including load balancing, tunnel bonding, QoS, firewall, etc, with all of which edge devices provide branch networks a reliable and responsive WAN connectivity.

Gateway – Gateway devices work to maintain overlay tunnels to branches and data centers, and provide scalable bandwidth capacity and WAN redundancy. Gateway devices can be physically or virtually deployed on site or in the cloud.

Central Management System (CMS) – QManager provides an enterprise-wide monitoring, reporting, and configuration from a central location. QManager can be virtually deployed on site or in the cloud.

Benefits and Business Outcomes

With Q-Balancer SD-WAN solution, enterprises can build an intelligent and agile network to meet the business demand in a timely manner and cope with the changing network conditions. Real-time applications are prioritized for bandwidth resources and best-performing path selected from hybrid WAN network is dynamically assigned to critical applications. The solution ensures network continuity and predictable application performance, and keeps business moving at optimal speed.

Reduced Downtime – The ability of automatic WAN failover is critical for business to provide 99.99% network uptime, and it maximizes business continuity and employee productivity.

Increased Bandwidth – High amount of bandwidth capacity would be achieved by leveraging types of WAN links. This provides faster connectivity as the solution is able to combine bandwidth of all connected links.

Cost Saving – Replace or augment the expensive MPLS WAN links with less expensive broadband links and still get same or higher level of user experience.

WAN Transport Agnostic – WAN transport-agnostic turns bandwidth and connectivity management from multiple carriers complexity into a competitive advantage.

Better Application Delivery – Path selection is dynamically made for types of traffic based on the metrics such as bandwidth consumption, packet loss, delay, jitter, etc. This ensures that the delivery of critical applications will not be impacted when the WAN conditions change.

Quick Provisioning – The overlay networks between branch office and corporate headquarters and their corresponding routing policies would be provisioned automatically. As the deployment of broadband connections is

usually easier and faster than MPLS connections at branch sites, this means branch networks can be brought online faster if they would be connected via broadband technology.

Network Simplification – The comprehensive network features such as routing, DNS, DHCP, QoS, VPN, and stateful firewall consolidate network infrastructure and potentially eliminate network devices at branch offices.

Centralized Control – Reduce administrative workload at the branch sites as management, monitoring, and maintenance can be conducted from a central location, leading to minimal or quick configuration for branch networks.