

Lavelle Networks SD-WAN Improves Branch Office Cloud Access

Legacy MPLS services are highly reliable for access to data center applications, but are easily congested with cloud data. Lavelle's ScaleAon SD-WANs offload cloud traffic to IP networks for exceptional performance while helping maintain quality security.



The popularity of cloud services has meant big changes for branch office networks, which have been operating for years utilizing only dedicated multiprotocol label switching (MPLS) connections back to a corporate data center. Now, there's a need to add broadband connections for faster cloud access. But these links are less secure and complicate network management and policy enforcement. Software-defined wide area network (SD-WAN) systems enable branch offices to have both their broadband connections and to enforce policies designed to improve network security and performance.



Network Bottleneck of MPLS

For the modern day enterprise, cloud-based services are as business critical as internally hosted data center applications. Because critical applications and business data live both in the cloud and in the data center, enterprises must support multiple network connections at the branch office: legacy multiprotocol label switching (MPLS) services for connections back to the corporate data center, IP-based broadband, and analog voice network services for access to the cloud.

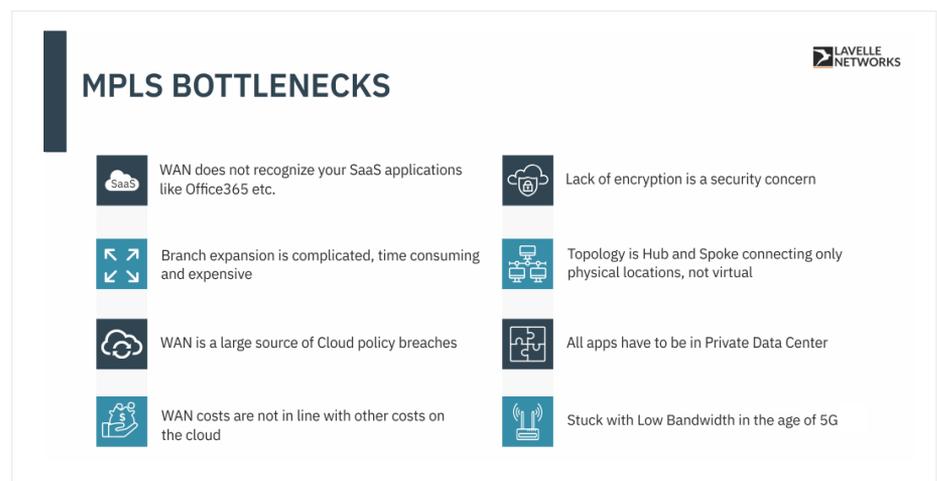


Figure 1. Factors that are causing bottlenecks in MPLS network connections.¹

The predominant branch office WAN service has been MPLS, which is a proven technology that offers reliable delivery and fixed latency service levels. More recently, broadband internet access has been utilized in the branch office and offers best-efforts delivery with low cost and high throughput, and it can be routed straight to the nearest cloud instance. Both services are needed in a

modern branch office where workers need secure network access to data center applications via MPLS links that have been established for years and access to cloud applications via the IP network.

This hybrid access network requirement, combined with a lack of built-in network security on broadband internet services, complicates branch office network design and has driven the adoption of SD-WAN software running on virtualized Intel® architecture servers.

SD-WAN excels in this environment because it is designed to allow for combining multiple network services from different service providers at branch locations without the need to rely on a single vendor, resulting in the ability to take the lowest price service with the best customer service.

Maintaining Policies to Help Protect Against Breaches

The use of broadband services in an SD-WAN model has the potential to reduce costs when compared to MPLS costs. If these services are installed by local branch management out of frustration with slow cloud service speeds, there is no way to centrally enforce data security and user access policies. The long-run cost of not enforcing these policies across broadband connections can be extreme if hackers target these services as network entry points for breaches or malware infections.

The use of SD-WAN helps to reduce this risk through enterprise-wide enforcement. Intel® Network Builders ecosystem partner Lavelle Networks has designed an SD-WAN solution with easy deployment and scalability to meet the needs of organizations with a growing number of branch offices that need increasingly sophisticated connectivity.

ScaleAon Means Scalable and Always On

To offer a SD-WAN solution that is both scalable from edge to data center and always on, Lavelle developed its ScaleAon architecture SD-WAN software. The Linux-based platform is cloud ready through the use of Kubernetes microservices and supports automation and machine learning features that can deliver intent-based networking. Components of the system include the following (see also Figure 2):

- **CloudPort Edge:** This WAN/edge software runs on a customer premises equipment (CPE) server providing SD-WAN services and on-site network connectivity. CloudPort Edge is available in small, medium, and large format instances with connectivity that ranges from four to six 1 GbE ports and support for other connections, including E1, V.35 serial, and USB.
- **CloudPort Gateway:** This server aggregates CloudPort Edge appliances and connects their users to data center resources. The CloudPort Gateway is architected with the capacity to process between 500 Mbps and 1 Gbps throughput with between two and six 1 GbE network interfaces. This capacity allows the gateway to handle up to thousands of VPN tunnels, large BGP, or OSPF network aggregation and peering.
- **CloudStation Network Controller:** This provides a software defined networking (SDN) controller that directs traffic through the network and facilitates intent-driven policies, modern dashboards, network segmentation, and other capabilities. The CloudStation Controller Models are available to manage smaller networks of up to 100 branch office locations, all the way to Fortune 100 deployments of 10,000 or more nodes. CloudStation is centralized, but it can be accessed also from the customer premises.

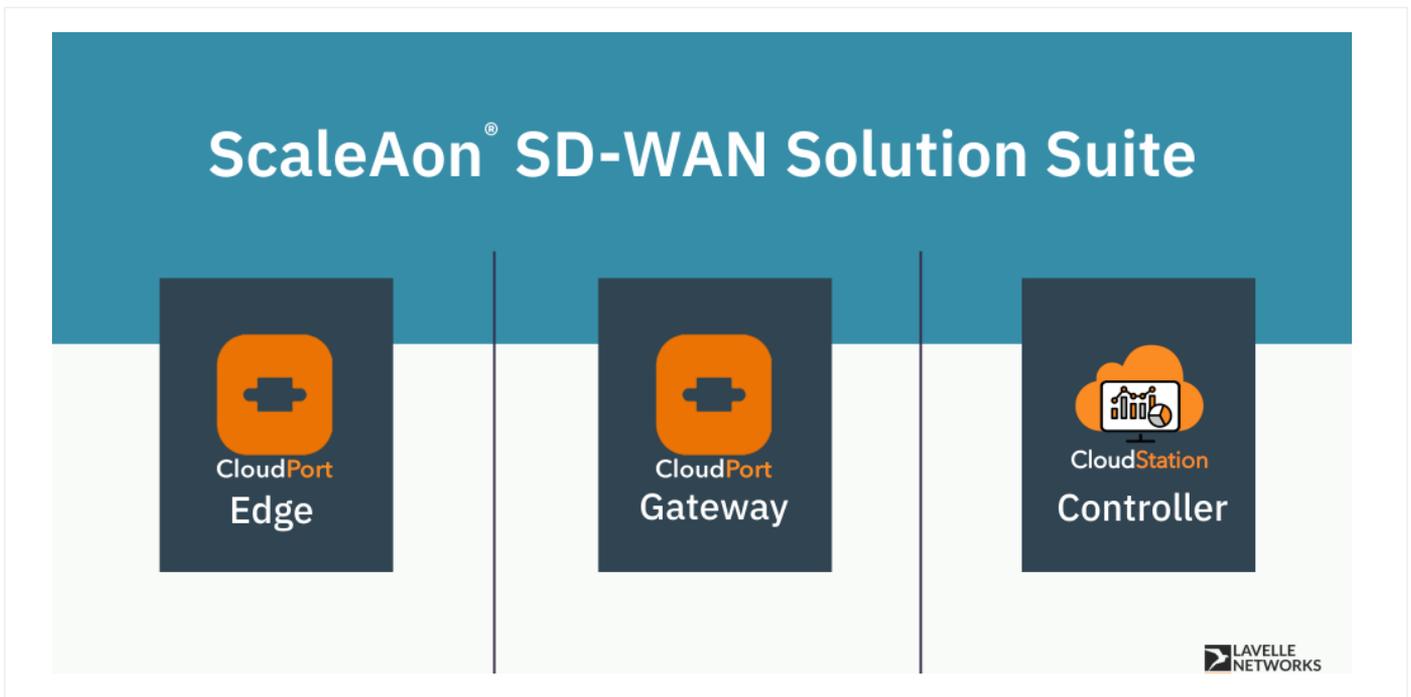


Figure 2. Components of ScaleAon SD-WAN solution.

ScaleAon SD-WAN Features

ScaleAon can be used to create a hybrid WAN that integrates legacy MPLS services with broadband internet or wireless internet connections. As shown in Figure 3, ScaleAon SD-WAN features a zero peering architecture and the use of a

dedicated IP address, both of which are designed to deliver “zero touch” provisioning by branch office staff. The complete SD-WAN feature set also includes path selection based on network parameters; support for GRE, IPSEC, and other tunneling protocols; and a traffic control capability to ensure policy-based QoS.

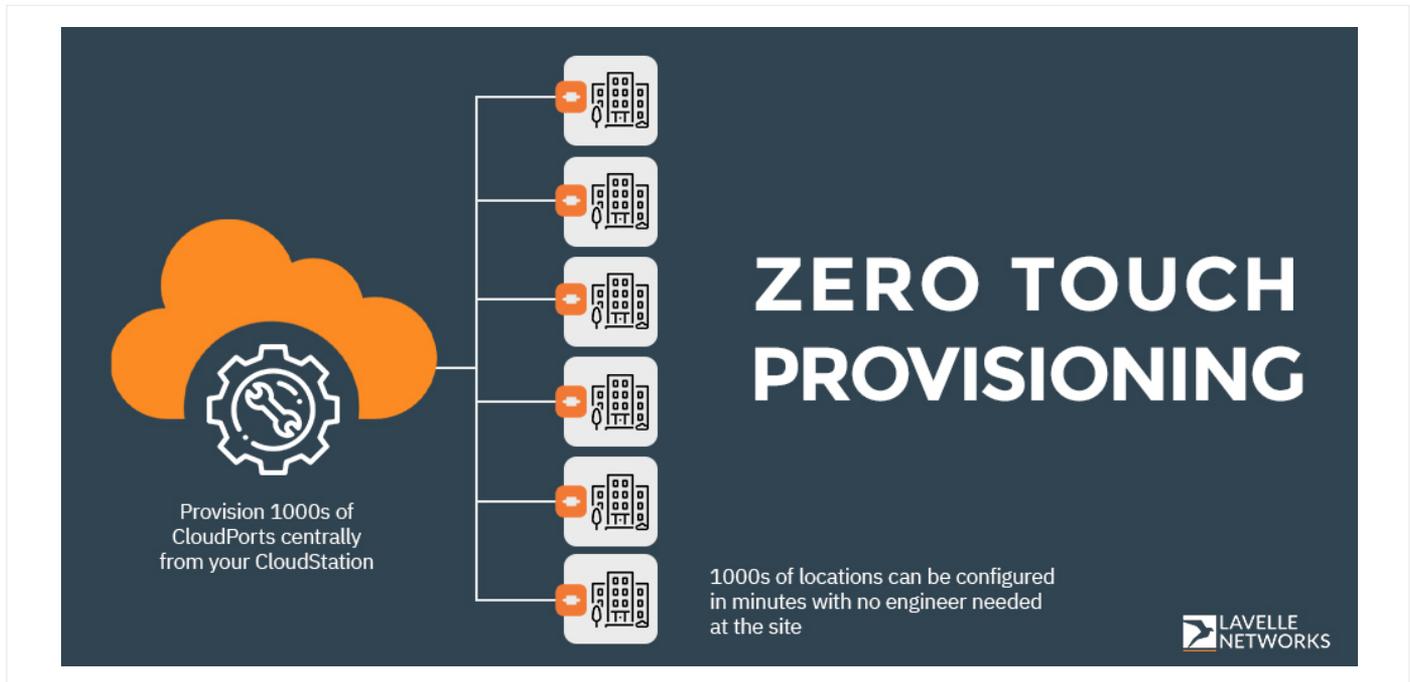


Figure 3. ScaleAon zero-touch provisioning capability.

Network Security Features

ScaleAon features flexible VPN capabilities via its Network Groups functionality that can span multiple WAN connections to establish a complete mesh VPN helping ensure encrypted data communications to both data center servers and cloud services. Additional security features include a built-in firewall with unified threat management features, web filtering and application access control, and the ability to lock down network devices to help protect against internal attacks.

As a complete branch office networking system, ScaleAon also delivers LAN connectivity for between 5 users and 100 or more users in branch offices using CPE servers. For larger offices, these LAN capabilities can be scaled up to much larger implementations with more powerful hardware. As part of its branch office LAN capabilities, ScaleAon features support for common LAN routing protocols, and LAN management features like DHCP and DNS proxy.

The ScaleAon system provides complete remote monitoring capabilities based on SNMP that provides real-time alerting and monitoring functionality. Monitoring functions can be customized through support of REST APIs in order to simplify control operations and allow network moves, adds, and changes of both users and locations within seconds. The network monitoring options also include the ability to export network statistics and data to be processed by an artificial intelligence (AI) engine for detailed analysis.

Hardware Designed to Support Scalability

The ScaleAon architecture is software centric and the use of Intel architecture servers ensures that the right price performance is delivered based on the nature of the deployment. The system uses four CPU cores for the native SD-WAN transport services and built-in security services. With the native containerized architecture and a multi-core Intel® processor, the CloudPort allows other services to run off the edge server, including non-networking services such as windows desktop services, video caching, or point of sales applications.

Lavelle recommends deployment on Intel architecture CPUs to fully deliver the ability to cost-effectively deploy SD-WAN at small and large branch offices. At the edge, Lavelle specifies CPE servers based on Intel Atom® processors that deliver performance and low power for edge networking and storage applications. The processors feature integrated Intel® QuickAssist Technology (Intel® QAT) for acceleration of encryption/decryption tasks, as well as integrated Intel® Ethernet.

For the performance needed for larger branch offices or for CloudStation, Lavelle specifies servers powered by Intel® Xeon® Scalable processors. These CPUs are next-generation platforms for cloud-optimized and virtualized networks. With an open architecture that scales and adapts to handle the demands of emerging applications, the platform provides a future-ready foundation for agile networks that

can operate with cloud economics, be highly automated and responsive, and support rapid and more secure delivery of new and enhanced services. With convergence of key workloads such as applications and services, control plane processing, high-performance packet processing, and signal processing onto the industry-standard Intel Xeon Scalable platforms, communications service providers can begin the transition to virtualized, software-defined infrastructure to enable cloud capabilities for agile service delivery throughout the network.

Conclusion

The ScaleAon SD-WAN solution from Lavelle Networks is designed to meet the LAN and hybrid WAN needs of organizations with expanding branch office networks. In addition to high-performance networking, the system enforces enterprise-wide policies that help protect against data breaches and malware infestations. The scalable, always-on SD-WAN architecture utilizes servers based on a variety of Intel architecture CPUs to provide cost-effective performance for both large and small branch offices.

About Lavelle Networks

Lavelle Networks offers an SDN networking platform that solves the biggest challenges in the WAN for distributed enterprises. All users, locations, and cloud networks are connected using a simple SD-WAN control panel, fast network convergence algorithms, and a true network-as-a-service experience. More information is at <https://lavelle.com>.

About Intel® Network Builders

Intel Network Builders is an ecosystem of infrastructure, software, and technology vendors coming together with communications service providers and end users to accelerate the adoption of solutions based on network functions virtualization (NFV) and software defined networking (SDN) in telecommunications and data center networks. The program offers technical support, matchmaking, and co-marketing opportunities to help facilitate joint collaboration through to the trial and deployment of NFV and SDN solutions. Learn more at <http://networkbuilders.intel.com>.



¹ Figures provided courtesy of Lavelle Networks.

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