Choosing the Right Approach For SD-WAN Connectivity

Business customers are lining up to buy SD-WAN connectivity, so service providers are rushing to sell it. But before launching this service, be sure you're offering what customers are looking for.

By Sean Buckley / *Broadband Communities*

To meet businesses' needs for low-cost, flexible connectivity, many service providers now offer software-defined wide area networking (SD-WAN) services. SD-WAN fits in with providers' broader initiatives to virtualize network functions. But a service provider's SD-WAN success hinges on being able to satisfy customers' diverse needs – and that rules out using a one-size-fits-all approach.

By separating networking hardware from the network control mechanism, SD-WAN simplifies WAN management and operation. For example, an SD-WAN network configuration could replace a business branch office router with virtualization appliances that can control application-level policies and offer a network overlay. The business's internet links can then serve as a dedicated circuit. This reduces the burden on corporate IT departments to configure and maintain the networks that link their sites and simplifies the use of the cloud-based applications that businesses are rapidly adopting.

Service providers are scrambling to deploy SD-WAN to open up new revenue streams or protect their existing revenues from enterprise customers. Depending on their history, they are approaching SD-WAN from different angles. Incumbent telcos focus on augmenting current MPLS networks; cable operators and competitive providers may either displace or augment existing services. A regional fiber provider could use its network to offer consistent

service levels that are not subject to the varying performance of public internet connections.

Although SD-WAN is still in early stages, customer interest in it is growing.

Take Windstream Enterprise's customer Dunn-Edwards, for example. The painting retailer found that broadband-based SD-WAN gave it low-cost bandwidth and better network redundancy than copper-based T-1 circuits for work areas in its buildings.

To offer SD-WAN services, besides investing in SD-WAN platforms, a service provider must support connectivity options either within or outside its region and must equip the back office to bill customers. Connectivity options include the following:

- **Broadband:** The most widely available, low-cost solutions are cable and DSL broadband, which are shared asymmetrical services. GPON is also used for SD-WAN.
- **Dedicated Internet Access (DIA):** Enabling symmetrical internet access over fiber Ethernet or TDM circuits, DIA is a private, dedicated, premium-priced network service. Customers can purchase DIA with service-level agreements (SLAs) and high speeds.
- **Wireless:** Initially used for backup, 4G LTE wireless has become a primary SD-WAN connection for some businesses.

A recent Sapio Research study revealed that business customers in the United States and the

United Kingdom span three camps: 38 percent of respondents wanted MPLS, 22 percent required public internet and another 20 percent desired a hybrid internet and MPLS solution.

Additionally, business customers have different preferences for suppliers of SD-WAN services. Sapio said 39 percent were considering SD-WAN vendors such as Cisco or Nuage Networks, 24 percent preferred telecom providers and another 24 percent preferred to buy services from management consultants. Only 8 percent expressed interest in using a specialized SD-WAN vendor.

Charlie Reed, a partner with Atlantic-ACM, a strategic consulting firm, says service providers are taking flexible approaches to connectivity.

"Service providers are happy to use their SD-WAN offerings and help connect businesses with broadband or dedicated internet access," Reed says. "I think most service providers with large MPLS bases will talk about the benefits of keeping some MPLS in place."

Regardless of the circuit deployment strategy, SD-WAN is an opportunity too big to pass up. By 2021, research firm IDC estimates, worldwide SD-WAN infrastructure and services revenues will experience a compound annual growth rate (CAGR) of 69.6 percent and reach $8.05 billion.

MPLS CANNIBALIZATION: FACT OR MYTH?

As businesses turn to broadband or wireless connectivity for SD-WAN, will this trend cannibalize the incumbents' MPLS revenue base? Competitive providers and cable operators that lack large-scale legacy bases can either replace or complement MPLS with broadband-based SD-WAN, but traditional telcos risk taking a hit to a major revenue stream.

MPLS accelerates and shapes traffic flows across enterprise WANs and service provider networks. What makes MPLS attractive to businesses is that it guarantees real-time traffic performance. As a virtual private network (VPN), MPLS can separate traffic from the public internet. However, the drawback is that it is expensive.

The SD-WAN market is expected to reach $8 billion by 2021.

Alternatively, SD-WAN can route traffic along the most efficient path over low-cost internet links, but it can't offer performance guarantees once the IP packets reach the public internet.

Industry forecasts make clear that MPLS has plenty of teeth. A Research and Markets forecast estimated that global MPLS revenues will reach a CAGR of 4.1 percent between 2016 to 2021.

As in the migration from ATM to Ethernet, Reed says, MPLS will fade slowly, declining slightly this year.

"Everyone pendulums back and forth, [saying] 'SD-WAN is replacing MPLS' or 'No it's not,' and I think the answer is both," Reed says. "We think that 1 to 4 percentage points a year will be pulled out of MPLS."

CenturyLink continues to win large-scale customers that request a mix of MPLS and broadband. In the third quarter of 2018, CenturyLink secured the primary provider hybrid SD-WAN network status for an unnamed customer. This customer will use CenturyLink's MPLS, broadband, SD-WAN and managed enterprise services at several hundred locations.

Jeff Storey, CEO of CenturyLink, told investors during its third quarter earnings call that MPLS is still growing.

"I don't know the exact rate, but it's low single digits," Storey said, according to a Seeking Alpha transcript. "And yes, it is still growing."

AT&T sees a similar scenario and is accommodating customers in two ways. For customers setting up a new SD-WAN configuration, AT&T deploys one MPLS link, DIA and broadband. Additionally, AT&T equips existing MPLS customers with its network-based SD-WAN solution, which provides a phased path while maintaining the existing VPN connections.

Rupesh Chokshi, associate vice president of product marketing management for AT&T Business, says customers are using both methods.

"We don't see SD-WAN as a killer of MPLS," Chokshi says. "If you think about what's happened – and that's why hybrid networks for SD-WAN are important – MPLS provided the reach, predictability, performance and the experience in what is a highly secure network."

However, Cogent, which is just starting to offer SD-WAN, believes customers will eventually ditch MPLS.

"Ultimately, some customers will move directly to an SD-WAN solution, while others will do it in a stepped approach," says Dave Schaeffer, CEO of Cogent. "In the stepped approach, I think SD-WAN will be deployed at some of the more difficult-to-serve sites or those sites that have lower bandwidth requirements. As customers get comfortable with the stability and cost advantages of SD-WAN, the hybrid approach is a temporary approach."

GOING ALL BROADBAND

MPLS may be a dominant connection method, but interest in broadband-based SD-WAN is rising. With a broadband-only approach, service providers procure broadband circuits and install SD-WAN devices or software at each site. Using only broadband for SD-WAN is hardly a slam dunk because these circuits are best effort.

Although managed services provider TPx continues to sell MPLS, one of its retail customers recently adopted an all-broadband solution.

"We had one 300-site customer, which had an extensive MPLS network, complete [its] migration to broadband earlier this year," says Jared Martin, VP of MSx managed services for TPx Communications. "They replaced all the MPLS circuits with internet and got more bandwidth for less money, and we put SD-WAN in to connect everything."

An additional factor for TPx is wireless. In 2017, TPx equipped a major winery in Napa, California, with LTE-based SD-WAN.

"We have a high attachment rate with 4G LTE," Martin says. "In markets where we see LTE Advanced, we have customers getting LTE speeds of over 100 Mbps."

However, CenturyLink says that broadband-only solutions aren't a panacea.

"Moving away from MPLS to broadband doesn't meet the problem statement we see our customers deal with," says Eric Barrett, senior director of product management for CenturyLink. "Their issues are all around the right combination of redundancy and bandwidth combined with the SD-WAN tools to manage at the right price point."

BRING YOUR OWN BROADBAND

Depending on the customer's size and focus, some businesses are managing connections via a bring-your-own-broadband (BYOB) approach.

A larger business that has the IT resources could manage the connections itself. Likewise, a smaller business with a handful of sites and a low-priced broadband deal can also manage connections.

Even if a customer goes the BYOB route, service providers still have an opportunity to manage circuits and ensure quality of service (QoS).

Mike Frane, vice president of product management for Windstream Enterprise, says that when customers opt for BYOB, Windstream uses SD-WAN as an entry point for further business.

"In a lot of cases, customers will already be under contract for their existing access, and the beautiful thing with SD-WAN is that we can overlay it right on top," Frane says. "As those come out of contract, we can take over those circuits."

Large businesses favor a managed approach, according to AT&T and Sprint.

Through its broadband aggregation program, AT&T can procure any variety of wireline or wireless broadband offerings. Sprint can procure services for customers and conduct trouble management directly with the broadband provider.

Sean Chavis, marketing manager of managed services and SD-WAN for Sprint, agrees that whether customers prefer managed broadband or BYOB depends on the customer.

"Smaller customers that may have only a handful of sites may not have any issues with getting broadband connectivity," Chavis says. "Larger enterprises that may have thousands of sites look for a provider like Sprint to be that aggregator, even if we can't provide all the transport they need."

Other providers such as Cogent, while supporting BYOB, caution that they can't guarantee QoS.

"We allow customers to bring their own bandwidth if it's a single-unit connection, and if we can't service the location, we will still allow the customer to purchase SD-WAN using our backbone and our equipment," says Schaeffer. "If a customer wishes to bring a second circuit into a Cogent site where we are providing the primary circuit, by activating that circuit we no longer can guarantee the 85 percent of throughput we could guarantee if we were the sole bandwidth provider."

HYBRID NETWORK EQUATION

Given the wide – and still growing – MPLS base, service providers are offering a hybrid SD-WAN option. Hybrid SD-WAN enables customers to simultaneously retain MPLS and use broadband.

For service providers such as AT&T and CenturyLink, which have launched ambitious SD-WAN expansion plans, the hybrid option provides a transitional path. AT&T will soon reach 28,000 locations with SD-WAN, and CenturyLink is extending its SD-WAN footprint to 30 countries. The breadth of these expansions requires AT&T and CenturyLink to leverage a mix of technologies to complement and sometimes replace MPLS connections.

CenturyLink reports nearly 90 percent of its SD-WAN customers incorporate MPLS as part of a hybrid solution that also includes broadband.

"The increased prominence of hybrid networks means customers are looking for additional redundancy and bandwidth in their current network

to accommodate the growth of cloud in their businesses," Barrett says. "The result: They are keeping MPLS but adding broadband for that redundancy and additional bandwidth and using SD-WAN to optimize and manage those multinetwork scenarios."

A case in point is Koch Trucking. By employing an integrated hybrid network that incorporates MPLS and broadband transport for greater efficiency and performance, it achieved centralized security, control and visibility for all its locations across 30 states.

Frane agrees the hybrid approach raises the SD-WAN comfort level.

"A lot of our customers are using a hybrid approach because it allows them to test the validity of SD-WAN," Frane says. "They will have a foot in each world, and it gives them the confidence they can move forward."

CABLE COMPANIES FORGE A PATH

Cable operators are using hybrid fiber-coax (HFC) and fiber to enable SD-WAN. As insurgent providers that don't have legacy revenue bases, Charter, Comcast and Cox want to complement customers' existing MPLS services.

Coinciding with its DOCSIS 3.1 build, Comcast launched SD-WAN in 2017. During its SD-WAN beta trial, Comcast Business let customers test various SD-WAN configurations. Customers could implement MPLS and SD-WAN connections side by side or put MPLS on one side and let the SD-WAN controller manage the traffic on the broadband or MPLS connection.

Cox Business Services, which signaled its SD-WAN plans in April via its RapidScale acquisition, said hybrid service offers businesses a graceful migration path.

"The hybrid SD-WAN approach allows customers to leverage the 'best of both worlds' depending on their application and security requirements," says Brian Rose, senior director of product development for Cox Business. "Existing VPNs are highly secure private networks that provide a very predictable performance level for your more demanding applications. Internet VPNs can provide a lower-cost option for less demanding applications as

well as a backup path for your existing MPLS / Metro-E VPNs."

MEF SETS QUALITY FRAMEWORK

In scaling SD-WAN, service providers will have to ensure QoS with metrics and address performance issues. However, the lack of an established standard means service providers don't have a common blueprint.

A joint MEF and Vertical Systems Group survey revealed 80 percent of respondents cited the lack of a standard service definition as a "significant challenge" in offering SD-WAN services.

The MEF 3.0 SD-WAN Service Attributes and Service Definition standard will provide a common standard for several access types: Carrier Ethernet, IP, optical and SD-WAN. All these will be orchestrated over programmable networks using Lifecycle Service Operation (LSO) Application Program Interfaces (APIs).

Set to be released next year, MEF's service definition specifies and sets forth requirements for an application-aware, over-the-top WAN service that uses policies to determine how application flows are forwarded over multiple overlay networks regardless of underlying technologies. Support for the new standard is high, with more than 30 service and technology providers contributing to the effort.

In the meantime, service providers will continue to manage circuits and provide QoS metrics.

According to CenturyLink, the onus of circuit management depends on the service arrangement.

"In the hybrid solution case, the customer is buying SD-WAN and hybrid WAN access from us, meaning it's on us to solve – which is why we are seeing several customers looking for a managed hybrid solution instead of a do-it-yourself SD-WAN solution," Barrett says.

Windstream says SD-WAN software will enable it to pinpoint problems with the access circuits, regardless of the source.

"SD-WAN enables us to help customers diagnose issues they may have with another broadband vendor," Frane says. "We can show them there's high jitter or high latency being delivered into their network from certain circuits, and they can use that data to go back to those underlying providers for remediation."

SD-WAN offers many circuit choices, but service providers will fit each business site with the best price and speed solution. Being flexible will allow service providers to not only attract new SD-WAN customers but also retain existing customers. ❖

Sean Buckley is the associate editor of Broadband Communities. He can be reached at sean@bbcmag.com.