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Are SD-WAN Solutions Created Equal? The SD-WAN Market vs. Cisco Meraki & Viptela

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INTRODUCTION

WAN networking technologies have undergone significant transformation over the last several years with SD-WAN emerging as a new standard for both small and large enterprises alike. The SD-WAN market grew to $1.9B in 2020 and is expected to grow to $8.4B by 2025. Some of the major drivers for the increase in SD-WAN adoption are the rising demand for mobility services and intent-based networks, increase in the need to have reliable cloud connectivity, and large enterprise adoption of SDWAN[1]. The COVID-19 pandemic also helped to set the stage for explosive growth in the SD-WAN market due to the increased need to work from home and to enable secure, intelligent, remote offices[2].

The major drivers for SD-WAN are the need for a reduction in network complexity, movement away from carrier-centric services in favor of carrier-agnostic services, WAN edge security, ease of deployment, and the realization of cost savings over traditional WAN technologies such as MPLS. There are many SD-WAN vendors but the companies leading the charge right now are Cisco, VMWare, Palo Alto (CloudGenix), Silverpeak, and others[3].

The traditional WAN is still fairly primitive and does not focus on the cloud-centric architectures that enterprises are moving towards. The traditional WAN was meant to move packets without much regard to security architectures, rather just getting the traffic where it needed to go. It did not take into account SaaS applications, public cloud providers, multipathing based upon intelligent data, and is frequently overly complex to manage. SD-WAN takes a different approach. SD-WAN creates a unified WAN overlay that takes the best of the traditional MPLS WAN architecture and builds upon that with intelligent diverse path selection, improved manageability, less complexity, and better analytics.

SD-WAN promises to revolutionize the way we look at the WAN and the WAN edge. To begin let's discuss the WAN underlay connectivity. For too long, enterprises have been locked into carrier centric connectivity options such as MPLS which tend to be expensive and might not be available to every location in the enterprise. This creates far too much reliance on a single provider and doesn't provide much real flexibility, and what flexibility is there usually takes a long time for a carrier to implement. An organization is then left with building on top of that MPLS using complex technologies that requiring incremental management in order to create the WAN functionality really required.

SD-WAN solves this problem as we can take a carrier and transport agnostic approach by buying the bandwidth that you want without sacrificing needs. Further, backup connectivity via wireline broad-

1. Markets and Markets – Market Research Data
2. Yahoo Finance - Network as a Service Adoption to Accelerate by 38% Within the Next Two Years as Businesses Adapt to COVID-19
3. Gartner 2020 SD-WAN Magic Quadrant

band plus LTE and 5G provide cost-effective redundant connectivity options from any carrier that fits the network requirements. This ultimately gives control back to the business and reduces both cost and reliance on a single carrier.

SD-WAN enables a more secure network edge. Security has always been important but never as important as it is today. It is challenging to manage the security of many WAN and teleworker locations. Part of this is due to requiring specialized security equipment at the WAN edge, such as we see in traditional architectures. This includes items like Intrusion Prevention Systems (IPS), Web Filtering & Data Loss Prevention (DLP), etc. The integration of these technologies into a single WAN edge device has changed the game and has allowed the Secure Access Service Edge (SASE) to rise. This integrates all of these rich security features without having to manage the cost and control of a lot of separate devices. We get this integration with SD-WAN.

CHALLENGES WITH EVALUATION

As stated earlier, there are many vendors in this space and each vendor offers a slightly different take on SD-WAN. The problem is that not all SD-WAN solutions are created equal and there can be vast differences in the underlying technologies that can greatly affect the outcome of any SD-WAN deployment. This leaves organizations with a critical choice to make and making the incorrect choice can leave an enterprise with a complex and difficult to manage infrastructure that just doesn't fit their needs.

There's also the question of which technology do I use and when? What does my enterprise really need? Given all of these questions and potential issues around identifying the right features, organizations must assess and refine their requirements to find the right fit.

A frequent issue is that a lot of organizations simply do not understand what they have deployed in production today. A complete assessment of the current enterprise network infrastructure is critical to gain this understanding and then identify requirements. When considering SD-WAN, it is important that these items are completed, otherwise the architecture can tend to be fuzzy and not as concise. As an example, organizations need to identify items such as applications and services, public cloud requirements, security, cloud application requirements, teleworkers, etc. All of these requirements drive the SD-WAN architecture and ultimately vendor selection.

Compounding the current issues discussed above, connectivity issues still create havoc in organizations today. This isn't just the reliability of circuits (though this is an issue), but a lack of control and flexibility. Enterprises have to rely on the carrier to ensure the Quality of Service of their applications, bandwidth, and lack of diverse-path resiliency just to name a few. Layer on the lack of selection for the bandwidth, lack of options for locations, over-complexity, and lack of visibility and management. Many organizations get locked into long-term contracts for connectivity that barely meets their needs and continue to have some subset of these problems. All of this ultimately results in a more costly and inflexible architecture.

BACKGROUND OF COMPETITIVE LANDSCAPE

Why should you evaluate an SD-WAN solution for your organization? As discussed previously, SD-WAN offers a very rich feature set as compared to traditional WAN technologies. This begins with infrastructure flexibility and cost savings. SD-WAN networks are not beholden to a single provider with limited connectivity choices. In fact, you can choose any provider you'd like and mix and match connectivity types to fit the organization's needs and price point. The application experience is another key point. SD-WAN vastly improves the application experience through dynamic path selection over multiple circuits with intelligent path control, high availability, and multiple links which can be used for the application aware routing as well as traffic offloading. SD-WAN security adds a layer of advanced protection at the network edge that would have otherwise had to be built in layers and layers of equipment versus being integrated into the solution. This includes features such as integrated Next-Generation Firewall (NGFW), Policy Enforcement at the Edge, Advanced Threat Protection (ATP/IPS), web filtering integration, and more.

Given the cloud-centric enterprise architecture that most organizations are migrating to, SD-WAN offers a more cloud-optimized approach. This includes extension of the SD-WAN edge directly to the major public cloud providers, optimized connectivity for your SaaS applications (Salesforce, Office 365, and many others), and optimized application routing. In addition the management of the SD-WAN infrastructure is typically far less complex when compared to traditional WAN. Pairing simplified management with deep analytical insights is a game changer. Gone are the days of requiring different network management and reporting tools to troubleshoot, gain actionable insights, and complex setups to get there.

We've discussed the SD-WAN features and the reasons why you should be looking at SD-WAN as a replacement for your traditional WAN, but how do you evaluate your requirements? Fundamentally there are key requirements that each SD-WAN should have. First, it should be able to actually replace your current circuits. From a connectivity perspective, it still must be able to meet the existing application performance and availability requirements. This is important because if you're leaving a provider with dedicated SLAs, the SD-WAN network will need to be able to meet those. Intelligent and simplified traffic control is one of the reasons why SD-WAN is a great fit for a traditional WAN replacement. This brings us to another key evaluation point which is that your SD-WAN network should also support intelligent and dynamic path control. If the solution cannot make intelligent and dynamic path selection based upon best path, it is not going to be a good fit .

Another critical evaluation point is how the SD-WAN network is deployed over your existing infrastructure. In this case we want to evaluate by splitting this into two parts. The first part is the underlay. The underlay is the carrier infrastructure, cellular backup, etc. As discussed, the underlay is where there is a lot of choice given the fact that the organization can move to a carrier/transport agnostic network. Once evaluated and competed this should provide a sizable cost savings. In summary the underlay network is all of your connectivity to the Internet. With an underlay network in mind, we go to part two, the overlay. The overlay network is the SD-WAN itself which ties

everything together logically. How that logical overlay works is very important. You typically want to choose an overlay with options to isolate traffic and segment it for security purposes. This is typically the case for regulated industries like finance or healthcare. Finally for this part of the evaluation, you may want to select something that can integrate with your existing network versus having to replace WAN edge equipment. Both implementation methods are available, and it will depend on what is in place today, its lifecycle status, and overall features.

After the underlay and overlay considerations, we have two additional evaluation factors. The first is another question for the organization. Can the chosen SD-WAN solution completely replace what you have at the WAN edge today? This means, does the solution replace routing, next-generation firewalls, provide deep security features, and integrate directly into the network past the WAN edge. These are all very important questions, and the organization should thoroughly evaluate each area to ensure that the solution is a good fit[4].

The existing WAN infrastructure will likely be more complex than it needs to be with a lot of peering relationships, older iWAN type technologies such as DMVPN, WAN QoS policies that have been developed over the years, route manipulation, and more. This makes a one-to-one shift from the traditional WAN to SD-WAN a little more complex but thankfully it does not have to be. You can implement SD-WAN alongside the traditional WAN and cutover without worrying about the complexities of the old network. With a solid solution architecture, good planning, and sound execution, the migration is a lot easier regardless of the size of the existing WAN.

As mentioned previously, this is a crowded market and selecting the correct solution is a bit of a challenge. Take VMWare's Velocloud for example. On the surface, it looks like it meets all of the requirements we've laid out. While Velocloud is a good solution overall, it still ties you to a carrier or partner due to the way it has to flow through partner network gateways. Velocloud can also be purchased through some ISPs as well. Ultimately, whether you buy the underlay network or build it with many providers, the enterprise will still be tied to a third-party versus having total control over the SD-WAN infrastructure. You get SD-WAN, but it's not really your own. You will still traverse partner gateways and your traffic has to sit in line with traffic of other organizations. You don't want to move to SD-WAN only to play red light, green light.

What about the other vendors in this space such as Palo Alto (CloudGenix), Silverpeak, etc.? Palo Alto has the benefit of coming from a security focused foundation and it is geared towards SASE. The drawback here is that they don't have the pedigree of a proven routing and switching architecture. There's every reason to be security-first focused, but there is also the concern of just not having the WAN background. Similarly, Silverpeak has a good SD-WAN product focused on optimization. However, the same holds true for Silverpeak as it does for Palo Alto. Their roots are not in WAN technologies. So, who is, who has WAN technology in their DNA? This is where we look to a company who has done this for a long time, who has invented or improved upon a lot of the WAN technologies we've used for decades, Cisco.

4. Network World Key SD-WAN Evaluation Criteria

CISCO ANSWERS THE CALL

Cisco has been a leader in the WAN space for as long as most of us can remember. There are two offerings from Cisco today. These are Cisco Viptela and Cisco Meraki, and while the two are similar they each provide solutions for different use cases. Let us profile these two and why an organization should use one vs. the other.

The Meraki SD-WAN solution will be our starting point. The Cisco Meraki solution supports the majority of the features that the other SD-WAN vendors support and that one would expect to see in an SD-WAN solution. For example Meraki SD-WAN provides for dynamic path selection, multiple connectivity options including cellular, intelligent routing, and advanced security features. The advanced security features include advanced malware protection, next-generation firewall, IPS, and Umbrella integration for URL filtering. If you have a small to medium enterprise with existing Meraki equipment in place now, that can also be a driver. The Meraki SD-WAN solution supports high-availability and is very easy to manage. The solution supports up to two (2) links, three (3) if you include cellular. The solution is totally cloud managed and is a great addition for IT teams that are lean. The solution supports zero-touch deployment for rapid provisioning of remote and teleworker locations and has deep technical analytics through Meraki Insights. The bottom line is that if you are looking for an easy to deploy solution without technical hang-ups, easy management via the cloud, and easy monitoring, then the Meraki solution is a good fit. It's a full SD-WAN product without the hassle.

What happens when the architecture is more complex or if the enterprise requires advanced features? This is where we look to Cisco Viptela. What are the key differences though? Viptela supports a wide range of advanced enterprise features should you need them. Viptela supports end-to-end segmentation across on-prem and the cloud via VRF. The solution also supports more complex WAN environments. For example, if your organization has a need to mix existing MPLS circuits with Direct Internet Access (DIA) and if you have more than two (2) circuits. The Viptela solution supports up to eight (8) circuits per router. Further, the Viptela solution supports WAN optimization. Viptela can be managed either on-prem or via the cloud with vManage. If you already have the Cisco ISR 4000 series routers, this also makes Viptela a great choice given the investment that has already been made into a newer WAN edge routing platform that will integrate with the solution via code upgrade.

In summary, the Viptela solution has a more enterprise look and feel and is more configurable and better suited where advanced features are needed. This is especially true for traffic segmentation via VRF across the SD-WAN. Viptela is also well suited for IT teams that are more on the experienced side. The Cisco Meraki solution while similar, is a better fit for lean IT teams that prefer a cloud-only based dashboard, simplified management and where more advanced existing WAN technologies don't exist (such as more than 3 circuits, need to keep MPLS for a long-period of time, etc.)

Zivaro offers experience in architecting, deploying, and managing SD-WAN solutions for a range of clients. We have a proven track record of successfully transitioning client networks from traditional MPLS and IWAN infrastructures to next-generation SD-WAN solutions. Our partnership with Cisco enables our customers to realize the benefits of having SMEs perform WAN assessments, identify cost-savings, assist in SD-WAN requirements definition, implementation, and ongoing management.

Zivaro has also partnered with Criterion Networks to provide a comprehensive approach to SD-WAN evaluation and adoption. Organizations can greatly benefit from the Criterion Networks' cloud platform and its full suite of on-demand learning, design validation and sandboxing capabilities for Cisco SD-WAN. These as-a-service solution environments would also serve as dev environments for ongoing release/software testing addressing the full lifecycle needs.

Criterion Networks offers an industry-leading Enablement Cloud to accelerate the network transformation needs. Criterion SDCloud® platform equips customers with custom enablement cloud and hosted services to meet lifecycle needs across learning, planning, design, proof-of-concept, deployment and operations. Criterion supports requirements for all networking use-case solutions of interest including SD-WAN, Security, VNS, Container Networking and 5G Network Services.

CONCLUSION

SD-WAN adoption is growing at an extraordinary rate and organizations need to prepare for this next-generation WAN technology. The adoption of SD-WAN will only drive the total cost of WAN ownership down and provide organizations with flexibility and choice. This paper discussed why proper evaluation of the SD-WAN vendors is critical and how you should evaluate your network first to determine requirements. Finally, we have laid out the two best solutions on the market today in Cisco Meraki and Viptela as well as have highlighted the key differences and use cases for each. Zivaro can be the trusted partner to bring deep expertise in SD-WAN and can assist any organization to realize a polished journey to SD-WAN.

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