Frost Radar™: North American Managed SD-WAN Services Market, 2021

A Benchmarking System to Spark Companies to Action - Innovation that Fuels New Deal Flow and Growth Pipelines

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Strategic Imperative and Growth Environment
The Strategic Imperative

• The North American managed software-defined wide area network (SD-WAN) services market is in the growth phase of the product life cycle. Across industries, businesses are embracing these services as an integral part of their WAN transformation strategy, largely to gain cost and operational efficiencies. In 2020, market revenues exceeded $2 billion, with more than 180,000 sites operational today.

• However, as SD-WAN deployments have increased in the last 3 years, businesses realize that installing and managing multiple SD-WAN sites is complex. The process can be daunting when it involves multiple transport and access providers from across the globe. A managed service provider with the expertise and technology needed to integrate disparate operations and management systems from various access providers can help address the complexity. Hence, fully managed SD-WAN services continue to gain traction.

• Multiprotocol label switching (MPLS) and Ethernet WAN services are deeply embedded in business WAN networks, and SD-WAN is challenging the status quo of these technologies. While some customers have chosen to create hybrid SD-WAN networks by adding broadband links to MPLS or Ethernet WANs, others have chosen to disconnect private networks and instead utilize a combination of broadband, dedicated internet access (DIA), and wireless links.

• Managed SD-WAN presents service providers with upsell opportunities for hosted voice over internet protocol (VoIP) and unified communication-as-a-service (UCaaS) offerings while creating customer stickiness. Combining managed SD-WAN services with hosted voice and collaboration services represents a compelling value proposition. In the past, these services have relied on MPLS links for superior performance. With an SD-WAN solution, enterprise users can benefit from improved application performance using dual internet-based links.

Source: Frost & Sullivan
The Strategic Imperative (continued)

• The growth of Internet of Things (IoT) applications and the need to process data faster for latency-sensitive applications are driving demand for edge computing. 5G mobile networking is critical to the success of edge computing because of its high-speed and low-latency bandwidth features. SD-WAN facilitates automated, optimized, and secure connectivity over 5G between endpoints (users or things) and edge compute nodes. The network slicing feature of 5G enables an SD-WAN platform to request virtualized slices on the network for different applications, based on centrally defined policies. SD-WAN vendors are looking to ship SD-WAN appliances with integrated 5G support to tap into edge computing and 5G trends, which will open up more opportunities for service providers to include wireless as part of their managed SD-WAN offering.

• Most managed SD-WAN providers have a multi-vendor partner strategy with an average of 3-partner solutions. The Cisco Meraki solution, which is prevalent in the enterprise LAN and security space, is gaining traction for SD-WAN functionality, especially down market, in the small and lower end of midmarket segments. The solution’s simplicity, which allows fast deployment at low costs, is attracting customers. Whether this interest is temporary, due to the COVID-19 pandemic, or long term remains undetermined as the solution is limited in features and bandwidth as business needs change.

• Cost-effective branch site connectivity, fast deployment times, centralized network management, and optimized cloud connectivity are some the drivers for managed SD-WAN adoption. In particular, a cloud-first business strategy has made SD-WAN highly relevant in the market. As companies look to improve business efficiency by embracing cloud, connectivity becomes a critical component of their digital transformation strategy. Enterprise IT will distribute their applications across multiple clouds, and SD-WAN enables them to predefine business policies through the SD-WAN controller and to specify which cloud applications are suitably accessed directly through the Internet versus backhauled to a hub site.
The Strategic Imperative (continued)

• Secure access service edge (SASE) combines network and security functions in one framework, which is software-defined and delivered from the cloud through distributed SASE points of presence (PoPs). Users (and devices) connect to the nearest SASE PoP (deployed in on-premises or at third-party data centers, network POPs, security PoPs, or cloud PoPs), which determines the optimal routing and security policies for the endpoint trying to access cloud (IaaS, SaaS, and PaaS) applications. The routing and security policies for each application are applied based on the identity of the entity, real-time context, enterprise security/compliance policies, and continuous assessment of risk/trust throughout the sessions. While the aim of SASE is to deliver a comprehensive set of virtual security services (that were typically deployed on-premises on a physical appliance at enterprise data centers) from the cloud, the critical components included are next-generation firewall, SD-WAN, zero trust network access (ZTNA), and secure web gateway (SWG).

• SASE has become somewhat of an industry buzzword right now with vendors and service providers rushing to brand their SD-WAN and security offerings as SASE. Discussions with enterprise IT decision makers indicate that most of them do not even fully understand the definition of SASE, and most certainly, a small percentage of the businesses have deployed all of the SASE components. Interviews with vendors and service providers validate this market perception as they are getting requests for information about the SASE solutions they are capable of delivering, now and in the future, but adoption is limited so far. Leading service providers have added security-centric SD-WAN vendors (such as Fortinet and Palo Alto Networks) to their portfolio to position themselves competitively to tap into emerging SASE opportunities.

• Frost & Sullivan believes there is value in delivering both networking and security functions from the cloud. However, existing enterprise WAN architectures and needs are way too complex to depend solely on a cloud-based model. A hybrid model consisting of on-prem and cloud-delivered secure SD-WAN (that combines SD-WAN and some security components) is more ideal to address businesses’ needs. A SASE solution is more of a spectrum, which should have an on-prem anchor and some cloud elements, and it should be able to slide between the two.

Source: Frost & Sullivan
The Strategic Imperative (continued)

- When the COVID-19 pandemic hit the global workforce in March 2020, remote work became the new norm. Businesses across industries use the public cloud to host key applications, and with advances in residential broadband and wireless speeds, remote workers can access most enterprise applications from home. Yes, remote workers, remote students, and video streamers under one roof compete for bandwidth, so optimizing and prioritizing business applications on home networks is a challenge. SD-WAN solutions leverage real-time performance monitoring of transport networks to make application-aware, policy-based network link selections and steer traffic over the best available link. The rise in remote working creates opportunities for managed SD-WAN providers to bundle business-grade broadband/Internet and business wireless services with SD-WAN to tap the market opportunity.

- The concept of self-healing WAN has been at the core of SD-WAN discussion since its inception, owing to its SDN roots. Vendors and providers alike are investing in and integrating artificial intelligence (AI) and machine learning (ML) tools to deliver on the promise of application-aware or intent-based networking to automate routine network operation tasks, set policies, measure network performance against set targets, and respond to and rectify the networks as needed. Solutions available today are capable of predicting events and notifying about them, with providers working on incorporating robotic process automation to eliminate manual intervention and instead have the WAN self-correct. Today, Masergy and Windstream Enterprise are two service providers that have enabled AIOps capability with their managed SD-WAN offerings.
The Strategic Imperative (continued)

- While the market is currently flooded with purpose-built SD-WAN appliances, the network function virtualization (NFV)-based universal customer premises equipment (uCPE) approach is clearly gaining prominence, with most managed SD-WAN providers featured in this report supporting it. The cost of uCPE and the complexity of service chaining were two challenges service providers faced in the past, which resulted in businesses choosing the easier route of installing an SD-WAN appliance approach. That trend is changing fast. The uCPE price has decreased by more than 50% in the last two years, and service providers have invested in network management tools and orchestration platforms to enable seamless service chaining. The ability to deploy multiple key network functions in virtual formats—routing, security, WAN optimization, session border controllers—is of immense value to businesses in terms of network scalability, manageability, and reducing appliance sprawl. In the 2021 Frost & Sullivan Global WAN Virtualization Trends end-user survey, IT decision makers listed virtual network services as the third-most important technology trend of priority for the next 24 months.

- As the NFV-based approach gains traction, the ability to instantiate VNFs on the uCPE, in the cloud, at the edge, and on any virtualized platform becomes critical. Service providers are focused on developing domain orchestration capabilities to seamlessly deploy and manage network functions when needed.

- As SDN, NFV, and SD-WAN technologies converge, advanced self-service portals that provide a single pane of glass view gain importance among network administrators. While most managed SD-WAN providers offer insights into overlay and underlay performance metrics through their portals, some service providers are offering self-service portals that provide a comprehensive view of key network solutions (VoIP, UCaaS, security) as well as SD-WAN and underlay networks.

Source: Frost & Sullivan
The Growth Environment

**Managed SD-WAN Defined:** In managed SD-WAN, the service provider acts as a single point of contact for the complete SD-WAN solution, including the SD-WAN appliance, software license, WAN services, and managed services.

Provider responsibilities in a managed SD-WAN service include:

- Procuring, installing, configuring, and managing the SD-WAN edge device (physical or virtual) and software
- Installing and managing the WAN links—their own, from a partner, or provided by the customer—that support the SD-WAN solution
- Managing (at least partially) moves, adds, and changes across the SD-WAN solution
- Monitoring the service 24x7, troubleshooting, and restoring it in case of a problem
- Offering a service level agreement (SLA) for the entire solution and ensuring that performance guarantees offered in the SLA are met
- Creating optional value-added services such as WAN aggregation and continuity configurations, third-party access management, additional security features, or WAN optimization, to list a few
- Supporting IT managers with a self-service portal interface that provides a granular level of visibility and control
- Billing for the service in a subscription-based model, where the customer pays a monthly recurring charge (MRC) for the managed SD-WAN
  - While some providers bill managed SD-WAN services as a single MRC for the edge device, bandwidth, and management, others charge bandwidth fees separately

*Source: Frost & Sullivan*
The Growth Environment (continued)

A managed SD-WAN service can either be fully managed, with the provider managing all aspects of the solution, or partially managed/co-managed, with the enterprise IT team retaining control over some aspects. Service provider interviews indicate that while enterprises want to retain some control over the SD-WAN deployment, particularly related to policy management rights given to select employees, most want the service provider to assume troubleshooting responsibilities. In the fully-managed option, customers still have visibility into network performance characteristics.

The managed SD-WAN market consists of the following 4 segments:

**Network service providers (NSPs):** This segment includes companies such as AT&T and Verizon that can combine their own network services with networks the customer decides to bring. However, most often, the customer stands to benefit from the network services owned by the provider because doing so offers tighter integration of SD-WAN solutions with the network and enables the provider to offer better SLAs.

**Managed service providers (MSPs):** This segment includes companies such as Masergy and TPx that offer managed services for a plethora of enterprise solutions, for example, network, security, unified communications, and cloud services. They generally have partnerships with several network and solution vendors and are in a position to combine SD-WAN with managed network services and offer optional value-added services as the end customers’ needs grow. While a handful of large providers dominate this segment, several small regional providers offer managed SD-WAN services to compete.

*Source: Frost & Sullivan*
System integrators (SIs): This segment includes companies such as Tech Mahindra and IBM that have long been key participants in the managed network services space; large enterprise customers prefer working with SIs that can bring IT and network solutions together and reduce the burden of dealing with multiple network and solution vendors. SIs are quickly expanding their portfolios to include managed SD-WAN services, in response to customer demand.

Value-added resellers (VARs): This segment includes companies such as Avant and Telarus. VARs have emerged as a key channel through which some enterprises prefer to buy managed SD-WAN. VARs are able to bring the optimal set of solutions by partnering with various providers. Customers benefit from working through one channel to procure solutions that are from different vendors but that appear as one cohesive solution. It also helps customers future-proof technology investments, as VARs are in a position to migrate their customers to evolving technologies. Some VARs partner directly with SD-WAN vendors, combining their SD-WAN solutions with networks from different service providers to offer managed SD-WAN to end customers. VARs also act as channel partners for NSPs and MSPs selling managed SD-WAN in the market.
Frost Radar™: North American Managed SD-WAN Services Market

Source: Frost & Sullivan
Frost Radar™: Competitive Environment

• The North American managed SD-WAN service market remains fragmented with NSPs, MSPs, SIs, and VARs competing for opportunities across business segments. While large NSPs and MSPs have significant SD-WAN deployments to their credit, the VARs and master agents channels dominate a large share of market revenues today. VARs resell a plethora of communication services (e.g., network services, VoIP, UCaaS, security, SD-WAN) from several providers, giving them the flexibility to tap into a larger market opportunity. NSPs and MSPs partner with SIs and VARs to resell or white label their SD-WAN offering along with other solutions they deliver.

• In this Radar™ report, Frost & Sullivan focuses on leading NSPs and MSPs that have full-fledged managed SD-WAN offerings in the market. Service providers are primarily analyzed based on their managed SD-WAN portfolios, which include but are not limited to: Choice of SD-WAN vendor solutions; the underlay choices; managed service support before, during, and after deployment; self-service portals and network management capabilities; and the ability to deliver on value-added services to create customer stickiness (security, routing, VoIP, UCaaS). The competitive Radar™ mapping is based on full year 2020 quantitative data (a combination of operational sites and revenues) and features and functionalities that have been generally available in the market for at least six months.

• AT&T leads the North American SD-WAN market, and is a Growth leader on the Frost Radar™ because of the completeness of its offering. The company has the largest number of operational managed SD-WAN sites in the market. AT&T’s focus on offering hybrid networking solutions, which allows customers to adapt SD-WAN at their own pace, has been a successful strategy.
Companies to Action
Companies to be Considered First for Investment, Partnerships, or Benchmarking
AT&T

INNOVATION

• AT&T offers one of the most comprehensive portfolios of managed SD-WAN solutions. While the company has partnered with VMware and Cisco for some time, AT&T has added Palo Alto Networks, Aruba Networks (Silver Peak), and Fortinet to the mix of vendors.

• AT&T offers customers the choice to deploy over-the-top (OTT) SD-WAN (using vendor-specific appliance), network-based SD-WAN (using FlexWare device), or a hybrid of the two.

• As security and networking continue to converge and make way for secure SD-WAN or SASE services, AT&T is betting big on the shift by building a robust portfolio of SASE solutions. Currently, the company offers SASE solutions from Palo Alto Networks and Fortinet, with future plans to add VMware and Cisco to the mix.

GROWTH

• AT&T has the most SD-WAN sites deployed in the North American market.

• The company’s ability to support a broad set of SD-WAN vendor solutions, combined with a transport-agnostic approach, has resulted in its continued growth.

• The Expert Engineer role that AT&T has created offers post-sale support for SD-WAN customers with a high-touch, deep network design verification covering WAN, LAN, and applications. The high-touch service helps in quick and seamless deployment of global sites.

• The integrated service experience (ISE) further eliminates complexity by acting as a single point of contact for managed services support across overlay, underlay, and security solutions. Customers get an immediate response for any kind of incident and outage.

FROST PERSPECTIVE

• The company’s focus on offering hybrid networking solutions, which allows customers to grow at a pace their WAN infrastructure calls for, has been a successful strategy. Customers have a broad range of network service choices (DIA, broadband, wireless, Ethernet, MPLS, and IP VPN) with SD-WAN that creates customer stickiness.

• Businesses are evaluating security in a holistic manner as cloud deployments continue to grow, and the users accessing these cloud-based deployments get increasingly distributed due to the rise in remote working trends. While SASE is still in the early stages of evolution, it offers a framework with some components that are now more relevant than ever, ZTNA being key among them. AT&T’s early focus on building and supporting managed SASE services offers a simplified approach to security and SD-WAN services for businesses.

Source: Frost & Sullivan
Strategic Insights
Strategic Insights

1. The economic downturn caused by the COVID-19 pandemic affected technology spending in 2020 as highly distributed verticals such as retail and manufacturing were negatively impacted. However, vendors report that the market started to recover in Q4 2020. With the vaccination rollout, the North American and European markets are beginning to slowly recover. As businesses reassess their technology spend, SD-WAN will emerge as a top choice for their networking needs, which will contribute to higher growth rates beyond 2022.

2. SASE has become somewhat of an industry buzzword right now with vendors and service providers rushing to brand their SD-WAN and security offerings as SASE. Interviews with vendors and service providers validate this market perception as they are getting requests for information about the SASE solutions they are capable of delivering, now and in the future, but adoption is limited so far.

3. MPLS and Ethernet WAN services are deeply embedded in business WAN networks, and SD-WAN is challenging the status quo of these technologies. While some customers have chosen to create a hybrid SD-WAN network by adding broadband links to MPLS or Ethernet WANs, others have chosen to disconnect private networks and instead utilize a combination of broadband, DIA, and wireless links. Managed SD-WAN provider interviews indicate that a majority of the SD-WAN sites in operation today use DIA, broadband, and wireless links.

Source: Frost & Sullivan
Next Steps: Leveraging the Frost Radar™ to Empower Key Stakeholders
Significance of Being on the Frost Radar™

Companies plotted on the Frost Radar™ are the leaders in the industry for growth, innovation, or both. They are instrumental in advancing the industry into the future.

GROWTH POTENTIAL
Your organization has significant future growth potential, which makes it a Company to Action.

BEST PRACTICES
Your organization is well positioned to shape Growth Pipeline™ best practices in your industry.

COMPETITIVE INTENSITY
Your organization is one of the key drivers of competitive intensity in the growth environment.

CUSTOMER VALUE
Your organization has demonstrated the ability to significantly enhance its customer value proposition.

PARTNER POTENTIAL
Your organization is top of mind for customers, investors, value chain partners, and future talent as a significant value provider.

Source: Frost & Sullivan
Frost Radar™ Empowers the CEO’s Growth Team

STRATEGIC IMPERATIVE

• Growth is increasingly difficult to achieve.
• Competitive intensity is high.
• More collaboration, teamwork, and focus are needed.
• The growth environment is complex.

LEVERAGING THE FROST RADAR™

• The Growth Team has the tools needed to foster a collaborative environment among the entire management team to drive best practices.
• The Growth Team has a measurement platform to assess future growth potential.
• The Growth Team has the ability to support the CEO with a powerful Growth Pipeline™.

NEXT STEPS

• Growth Pipeline Audit™
• Growth Pipeline as a Service™
• Growth Pipeline™ Dialogue with Team Frost

Source: Frost & Sullivan
Frost Radar™ Empowers Investors

STRATEGIC IMPERATIVE

• Deal flow is low and competition is high.
• Due diligence is hampered by industry complexity.
• Portfolio management is not effective.

LEVERAGING THE FROST RADAR™

• Investors can focus on future growth potential by creating a powerful pipeline of Companies to Action for high-potential investments.
• Investors can perform due diligence that improves accuracy and accelerates the deal process.
• Investors can realize the maximum internal rate of return and ensure long-term success for shareholders.
• Investors can continually benchmark performance with best practices for optimal portfolio management.

NEXT STEPS

• Growth Pipeline™ Dialogue
• Opportunity Universe Workshop
• Growth Pipeline Audit™ as Mandated Due Diligence

Source: Frost & Sullivan
Frost Radar™ Empowers Customers

**STRATEGIC IMPERATIVE**

- Solutions are increasingly complex and have long-term implications.
- Vendor solutions can be confusing.
- Vendor volatility adds to the uncertainty.

**LEVERAGING THE FROST RADAR™**

- Customers have an analytical framework to benchmark potential vendors and identify partners that will provide powerful, long-term solutions.
- Customers can evaluate the most innovative solutions and understand how different solutions would meet their needs.
- Customers gain a long-term perspective on vendor partnerships.

**NEXT STEPS**

- Growth Pipeline™ Dialogue
- Growth Pipeline™ Diagnostic
- Frost Radar™ Benchmarking System

Source: Frost & Sullivan
Frost Radar™ Empowers the Board of Directors

**STRATEGIC IMPERATIVE**

- Growth is increasingly difficult; CEOs require guidance.
- The Growth Environment requires complex navigational skills.
- The customer value chain is changing.

**LEVERAGING THE FROST RADAR™**

- The Board of Directors has a unique measurement system to ensure oversight of the company’s long-term success.
- The Board of Directors has a discussion platform that centers on the driving issues, benchmarks, and best practices that will protect shareholder investment.
- The Board of Directors can ensure skillful mentoring, support, and governance of the CEO to maximize future growth potential.

**NEXT STEPS**

- Growth Pipeline Audit™
- Growth Pipeline as a Service™

Source: Frost & Sullivan
Frost Radar™ Analytics
**Frost Radar™: Benchmarking Future Growth Potential**

2 Major Indices, 10 Analytical Ingredients, 1 Platform

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**GROWTH INDEX ELEMENTS**

- **GI1: MARKET SHARE (PREVIOUS 3 YEARS)**
  This is a comparison of a company’s market share relative to its competitors in a given market space for the previous 3 years.

- **GI2: REVENUE GROWTH (PREVIOUS 3 YEARS)**
  This is a look at a company’s revenue growth rate for the previous 3 years in the market/industry/category that forms the context for the given Frost Radar™.

- **GI3: GROWTH PIPELINE™**
  This is an evaluation of the strength and leverage of a company’s growth pipeline™ system to continuously capture, analyze, and prioritize its universe of growth opportunities.

- **GI4: VISION AND STRATEGY**
  This is an assessment of how well a company’s growth strategy is aligned with its vision. Are the investments that a company is making in new products and markets consistent with the stated vision?

- **GI5: SALES AND MARKETING**
  This is a measure of the effectiveness of a company’s sales and marketing efforts in helping it drive demand and achieve its growth objectives.

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**VERTICAL AXIS**

**Growth Index (GI)** is a measure of a company’s growth performance and track record, along with its ability to develop and execute a fully aligned growth strategy and vision; a robust growth pipeline™ system; and effective market, competitor, and end-user focused sales and marketing strategies.
Frost Radar™: Benchmarking Future Growth Potential
2 Major Indices, 10 Analytical Ingredients, 1 Platform

INNOVATION INDEX ELEMENTS

**HORIZONTAL AXIS**

**Innovation Index (II)** is a measure of a company’s ability to develop products/services/solutions (with a clear understanding of disruptive Mega Trends) that are globally applicable, are able to evolve and expand to serve multiple markets, and are aligned to customers’ changing needs.

- **II1: INNOVATION SCALABILITY**
  This determines whether an organization’s innovations are globally scalable and applicable in both developing and mature markets, and also in adjacent and non-adjacent industry verticals.

- **II2: RESEARCH AND DEVELOPMENT**
  This is a measure of the efficacy of a company’s R&D strategy, as determined by the size of its R&D investment and how it feeds the innovation pipeline.

- **II3: PRODUCT PORTFOLIO**
  This is a measure of a company’s product portfolio, focusing on the relative contribution of new products to its annual revenue.

- **II4: MEGA TRENDS LEVERAGE**
  This is an assessment of a company’s proactive leverage of evolving, long-term opportunities and new business models, as the foundation of its innovation pipeline. An explanation of Mega Trends can be found [here](#).

- **II5: CUSTOMER ALIGNMENT**
  This evaluates the applicability of a company’s products/services/solutions to current and potential customers, as well as how its innovation strategy is influenced by evolving customer needs.
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