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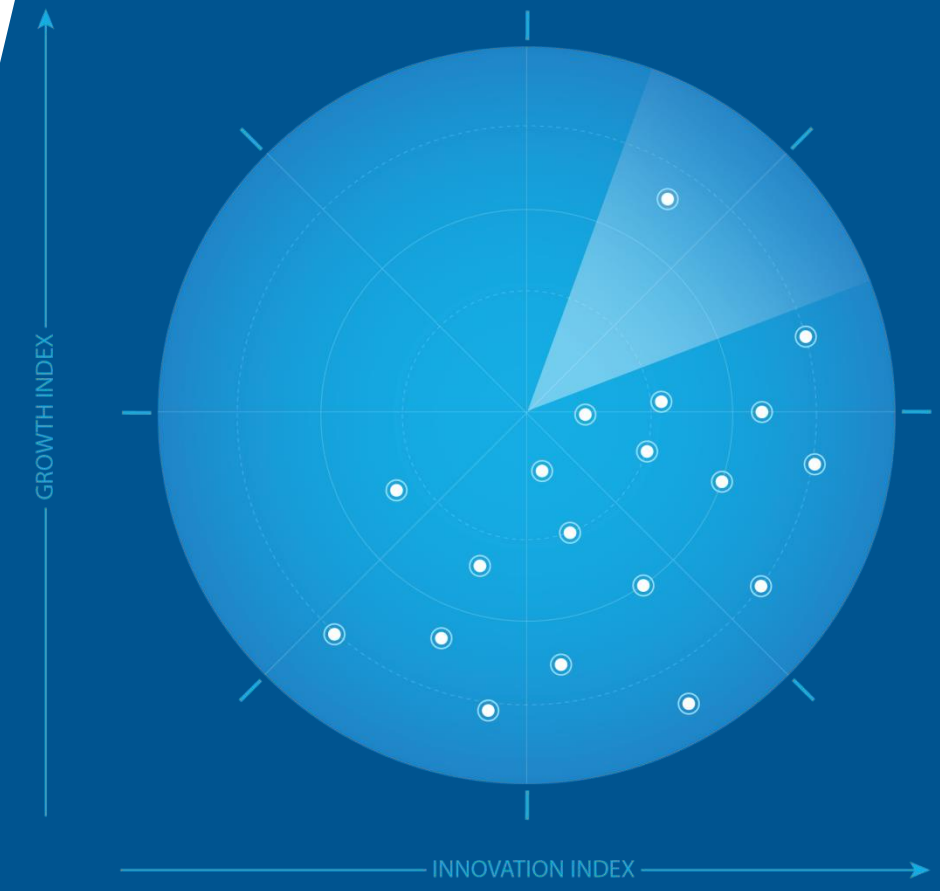
Frost Radar™: Asia-Pacific Managed SD-WAN Services Market, 2021

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



Global Information & Communications Technologies Research Team at Frost & Sullivan

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Strategic Imperative and Growth Environment

Strategic Imperative (continued)

- APAC is increasingly moving towards 5G at varying degrees of adoption across countries. With internet of Things (IoT) becoming key in most industries, the need for faster data processing is driving demand for edge computing. 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.
- Cost-effective branch site connectivity, improved application performance, fast deployment times, centralized network management, and optimized cloud connectivity are some of the drivers of managed SD-WAN adoption. As enterprise applications get distributed across multiple clouds, SD-WAN enables enterprise IT 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.

Source: Frost & Sullivan

Strategic Imperative (continued)

- Some telcos have started to use artificial intelligence/machine learning (AI/ ML) technologies in their SD-WAN solutions to improve speed and accuracy, enhance network management, provide faster real-time insights, and perform predictive detection of anomalies. These technologies provide accurate visibility into the network and generate smart analytics that help in decision-making regarding network performance. For instance, Telstra in Australia is using ML at its Data and Analytics Laboratory to proactively identify incidents and provide real-time updates through Telstra Connect (a digital dashboard service that allows managing the network infrastructure through a single view).
- A secure SD-WAN solution with integrated security and networking plus the option to manage through a single pane of glass holds immense promise for enterprises' cloud networking. In response, managed SD-WAN providers are increasingly partnering with SD-WAN vendors that offer native security functionality built into their SD-WAN platforms. For instance, many service providers in APAC are providing SD-WAN solutions integrated with security from Zscaler, Palo Alto Networks, and Fortinet.
- 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 gaining prominence, and most managed SD-WAN providers featured in this report support it. The cost of the uCPE and the complexity of service chaining were 2 challenges service providers faced using the previous approach, which resulted in businesses choosing the easier route of installing an SD-WAN appliance approach. That trend is fast changing. The ability to deploy multiple key network functions in virtual formats—routing, security, WAN optimization, session border controllers—is of major value to businesses in terms of reducing appliance sprawl and increasing both network scalability and manageability.

Source: Frost & Sullivan

Strategic Imperative (continued)

- 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 are important for network administrators. While most managed SD-WAN providers offer insights into overlay and underlay performance metrics through their portals, others 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.
- With the widespread emergence of COVID-19 in APAC, network managers need to focus on optimizing networks as businesses adapt to the economic impact of the pandemic. This might increase the attractiveness of broadband and wireless services with SD-WAN. 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.

Source: Frost & Sullivan

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 whole underlay network no matter if they are delivered from the service provider, the customer, or a third party
- Managing (at least, partially) moves, adds, and changes, end-to-end
- Monitoring and troubleshooting
- Offering a service level agreement (SLA) for the entire solution
- 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 from a subscription-based model, in which 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 charges, and management fees, others charge bandwidth fees separately.)

Source: Frost & Sullivan

Growth Environment (continued)

A managed SD-WAN service can be either fully-managed, with the provider managing all aspects of the solution, or partially-managed/co-managed, with the enterprise IT team retaining control of some aspects. Service provider interviews indicate that while enterprises want to retain some control of the SD-WAN deployment—particularly related to policy management rights given to select employees—most want the service provider to retain 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, 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

Growth Environment (continued)

Systems 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 enteprises 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 for procuring 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.

Source: Frost & Sullivan

Forecast Methodology and Taxonomy

Frost & Sullivan conducted primary interviews with leading managed SD-WAN service providers and reviewed their solution portfolios, SD-WAN overlay partnerships, underlay or physical network reach, managed services capabilities, and ability to offer other value-added services.

A top-down approach was used to arrive at the managed SD-WAN forecasts. We used the managed SD-WAN customer sites forecast to estimate the revenue earned per site on an annual basis (aggregate of monthly recurring charges for 12 months) for overlay, underlay, and managed services.

- The economic downturn caused by COVID-19 will impact SD-WAN spending in the near term.
  - Highly distributed verticals such as retail and manufacturing are impacted negatively by the pandemic, which will slow market growth for the next couple of years.
  - Frost & Sullivan expects that as businesses reassess their technology spend, SD-WAN will emerge as a top choice for meeting their networking needs, which will contribute to higher growth rates beyond 2022.

Managed SD-WAN Revenue Forecasts

- **Overlay:** Overlay comprises revenues earned by managed SD-WAN providers for the CPE (either an SD-WAN appliance provided by the vendor or a virtualized CPE provided by the service provider; for example, AT&T can deliver SD-WAN on a VeloCloud appliance or on its own FlexWare device), software licensing, and a managed services/professional services fee.

Source: Frost & Sullivan

Forecast Methodology and Taxonomy (continued)

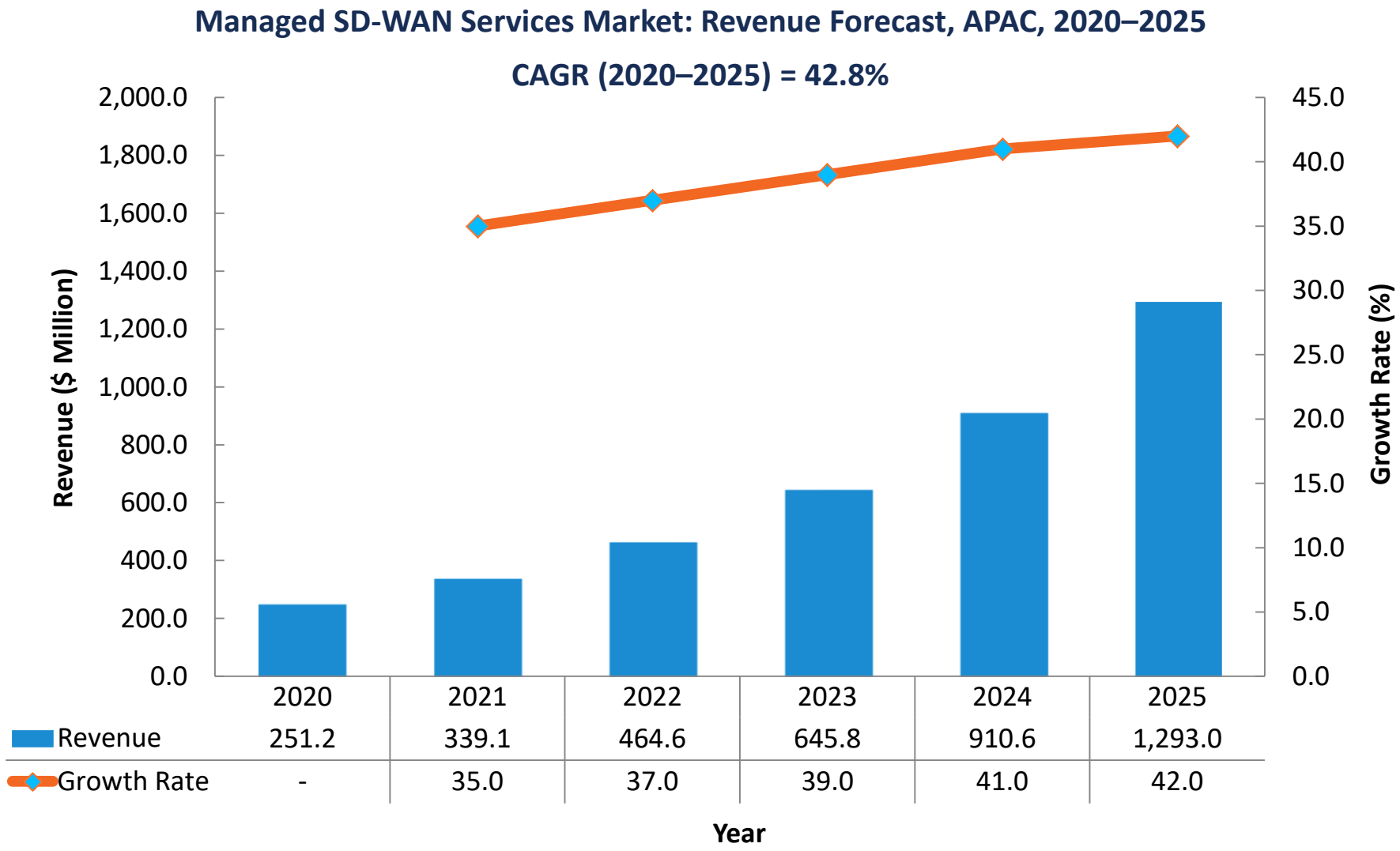
- **Underlay:** Underlay comprises revenues from the underlying transport network services that managed SD-WAN providers include with SD-WAN, usually MPLS, Ethernet, broadband, DIA, wireless, or satellite. The underlay segment forecasts represent a combination of existing and new revenues from WAN links. For example, a customer could retain existing MPLS links at some sites and add new broadband links at those sites, yet choose to drop MPLS links at other sites and add dual broadband links. Readers are encouraged to interpret the numbers accordingly; not all of these revenues are new or incremental revenues, but mostly revenues shifting from one service to another.
- **Value-added Services:** Managed SD-WAN providers are able to earn additional pull-through revenues from customers buying services such as security, WAN optimization, application and network performance monitoring tools, bandwidth on-demand services, and VoIP and UCaaS solutions. ***The pull-through revenues are not counted in the managed SD-WAN service forecast.*** Future updates of the report may carve out pull-through revenues as a separate segment. Interviews with service providers indicate that the current pull-through revenue (including network services) from managed SD-WAN is in the range of $5 to $8 (up from $3 to $5 in 2018) for every dollar earned on the overlay. However, providers agree that this includes revenue shifting from one product to another, and not just net-new revenues.

Customer Site Forecasts

Customer sites can be both physical and virtual, deployed either on-premises or in the cloud.

Source: Frost & Sullivan

Revenue Forecast



Note: All figures are rounded. The base year is 2020. Source: Frost & Sullivan

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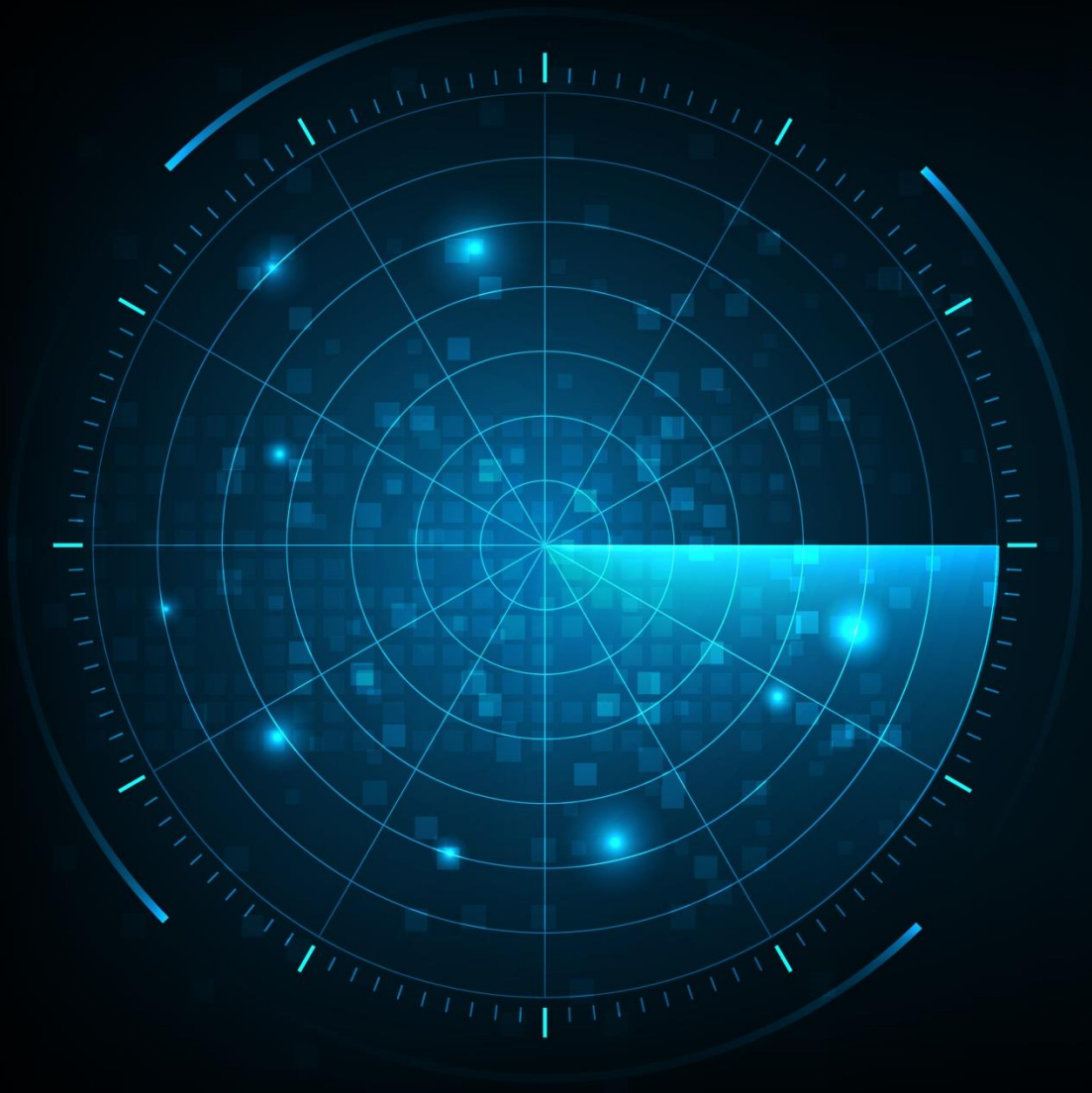
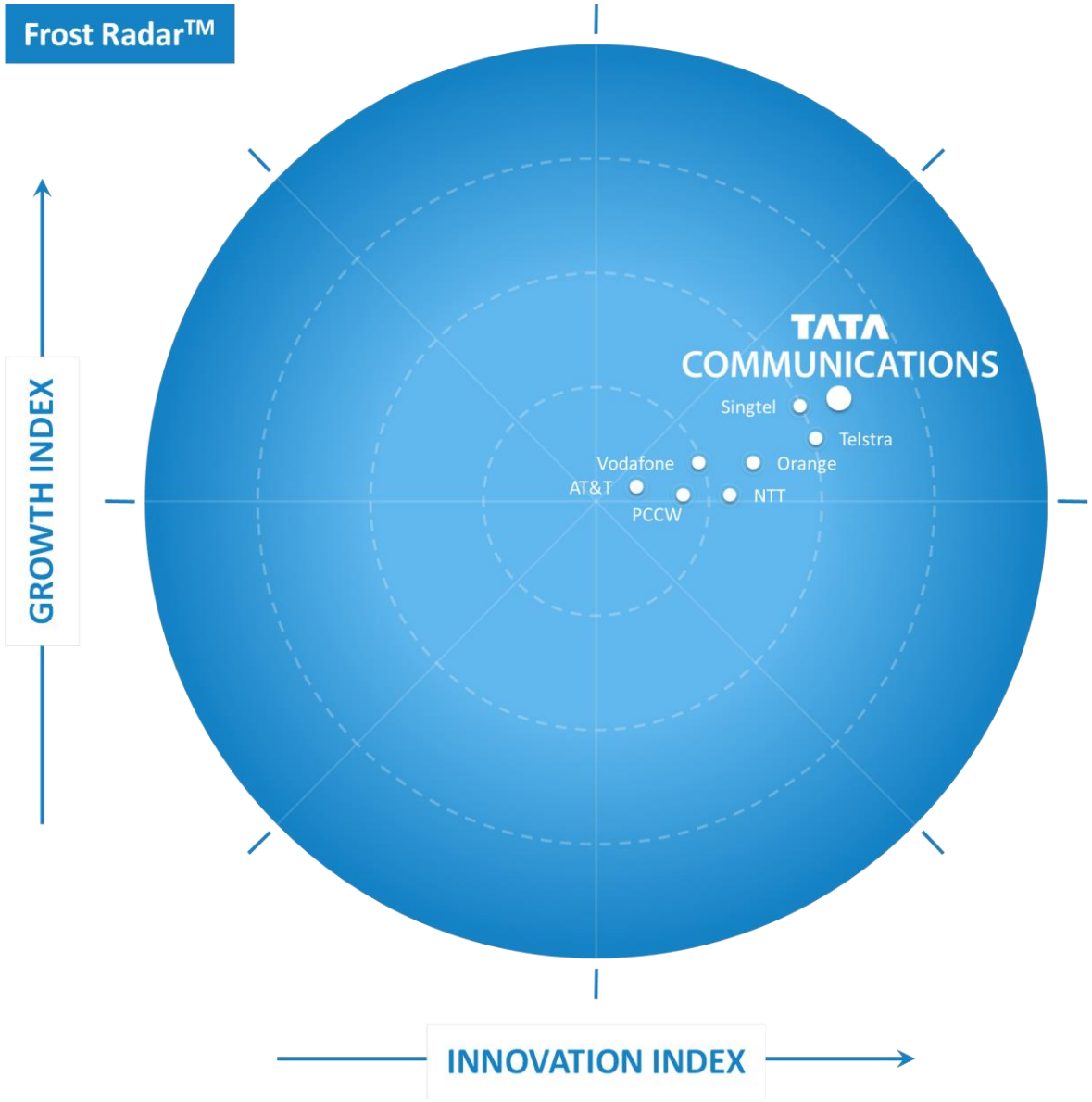


Frost Radar™

Asia-Pacific Managed SD-WAN Services Market

Frost Radar™: Asia-Pacific Managed SD-WAN Services Market



Source: Frost & Sullivan

Frost Radar™: Competitive Environment

- The APAC managed SD-WAN services 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. VARs resell numerous 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 their other solutions.
- In this Radar™ report, Frost & Sullivan focuses on leading telco providers 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 quantitative data (a combination of operational sites and revenues) for the complete year 2020 and features and functionalities that have been generally available in the market for at least 6 months.
- Tata Communications leads the overall APAC managed SD-WAN services market and is a Growth and Innovation leader on the Frost Radar™, as it provides a comprehensive SD-WAN portfolio with solutions from Cisco SD-WAN, Versa, and Fortinet. Tata Communications' SD-WAN services include a variety of underlay connectivity options, multiple services/cloud gateways, and support from a highly skilled and trained staff that enhances the offering.

Source: Frost & Sullivan

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Companies to Action

Companies to be Considered First for Investment, Partnerships, or Benchmarking

Tata Communications

INNOVATION

- Tata Communications is catering to the growing need for SD-WAN through its comprehensive portfolio by providing a multi-vendor, network-agnostic managed services model. A fully managed/co-managed option on a dedicated/multi-tenant centralized infrastructure is provided.
- Three key variants are offered:
  - **IZO™ SDWAN Select is based on Versa.** IZO SDWAN Select is designed for greenfield deployments. It has standardized and simple network designs using white box x86 CPE.
  - **IZO SDWAN Cisco is based on Cisco SD-WAN**. IZO SDWAN Cisco is suitable for large and complex deployments and supports both cloud-based and on-prem architecture. It provides direct access to SaaS apps and advanced analytics.
  - **IZO SDWAN Fortinet is based on Fortinet FortiGate**. IZO SDWAN Fortinet is suitable for small to medium sized deployments and meets the security centric SD-WAN customer needs.

GROWTH

- In 2020 alone, Tata Communications deployed more than 1,400 SD-WAN routers in approximately 1,200 locations. In the same year, the company recorded significant client wins in APAC, the majority of which involved complex deployments such as running SD-WAN over third-party networks (e.g., internet and MPLS).
- With the ability to offer a hybrid solution with modular components (e.g., IZO internet WAN, GVPN, IZO Private Connect, vProxy, SD-WAN, and Bring-Your-Own-Network), customers find Tata Communications managed SD-WAN offering very attractive.
- Tata Communications has built capabilities that enhance clients' ownership experience by offering them a dedicated team that can review SD-WAN deployments, taking corrective measures as required. Clients can also access the virtual lab for on-demand customer proof of concepts, demonstrations, and SD-WAN testing.

FROST PERSPECTIVE

- Frost & Sullivan recognizes that the company offers a comprehensive managed SD-WAN offering with a variety of underlay connectivity options, multiple services/cloud gateways, access to a strong partner ecosystem, and a highly skilled and trained staff. Further, the company is helping enterprises move toward digital transformation. Its comprehensive portfolio of managed SD-WAN solutions is supporting businesses' rapidly growing requirements as they move to the cloud.
- To further enhance SD-WAN capabilities and meet evolving customer needs, the company has been investing in AI/ML, natural language processing, network function proximity services, and uCPE.

Source: Frost & Sullivan

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Strategic Insights

Strategic Insights

1

With more and more APAC businesses adopting digital transformation, moving to the cloud has become imperative—and SD-WAN is playing a critical role in getting there. The increasing need to adopt SD-WAN was made more important than ever with the COVID-19 pandemic. With work-from-home models gaining prominence in APAC, enterprises are increasingly looking at ways to increase application performance and deliver a high quality user experience.

2

As enterprises start to adopt new network architectures, such as private, public, and hybrid clouds for improved agility and business outcomes, securing these highly dynamic environments has grown in complexity. Now companies need seamless integrated network security to defend against evolving threats. Most managed SD-WAN service providers in APAC are rapidly integrating security into their SD-WAN solutions to offer a one-stop network solution.

3

Enterprises are increasingly shifting away from DIY and toward managed SD-WAN service providers. With the extensive experience, technical expertise, and end-to-end delivery that service providers can offer, they are becoming the first choice. The ability to get insights from real-time data through a single pane of glass that leads to faster decision-making is creating a pull towards managed service providers. Going forward, managed service providers will increasingly partner with more and more vendors to offer a wide choice to customers.

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	LEVERAGING THE FROST RADAR™	NEXT STEPS
• Deal flow is low and competition is high. • Due diligence is hampered by industry complexity. • Portfolio management is not effective.	• 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.	• **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

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Frost Radar™ Analytics

Frost Radar™: Benchmarking Future Growth Potential

2 Major Indices, 10 Analytical Ingredients, 1 Platform

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.

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.

Frost Radar™: Benchmarking Future Growth Potential

2 Major Indices, 10 Analytical Ingredients, 1 Platform

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.

INNOVATION INDEX ELEMENTS

- **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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