ISG Provider Lens™

Network - Software Defined Solutions and Services

Global 2019

Quadrant Report

A research report comparing provider strengths, challenges and competitive differentiators

June 2019

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orange™ Business Services

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The research and analysis presented in this report includes research from the ISG Provider Lens™ program, ongoing ISG Research programs, interviews with ISG advisors, briefings with services providers and analysis of publicly available market information from multiple sources. The data collected for this report represents information that was current as of June, 2019. ISG recognizes that many mergers and acquisitions have taken place since that time but those changes are not reflected in this report.

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ISG Provider Lens™

ISG Provider Lens™

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EXECUTIVE SUMMARY

Existing managed LAN and WAN services, multiprotocol label switching (MPLS) and related technologies form the backbone of the enterprise customer installed base for telcos and other communication services providers and account for most of the revenues generated worldwide. This trend, however, is rapidly changing. The software-defined network (SDN), which is closely related to network function virtualization (NFV) and software-defined WAN (SD-WAN) technologies and services, is evolving and rapidly penetrating the market. A similar trend exists with related network services such as performance assurance (management), managed networks and devices (MND), and 4G and 5G mobility (4G/5G) with associated additional (non-core) mobile servicers based on those faster mobile data stream standards, along with their triggers and influences. The main factors that drive this rapid change for enterprises are:

Increasing flexibility and agility: Enterprises have become more focused on improving the integration, automation, orchestration and management of network resources and processes. This has evolved to encompass NFV and has since led onto software-defined networking in a wider sense. This trend is being driven by enterprises' desire to seamlessly add applications and network resources in order to meet business and user goals more efficiently and securely without creating silos or depending on vendors. This is often expressed by the business itself as "increasing flexibility and agility."

Improving customer satisfaction while boosting sales: The ability to respond quickly and seamlessly to customer queries and quickly provide (often automatically) new services via SDN helps in elevating client experience and boosting sales.

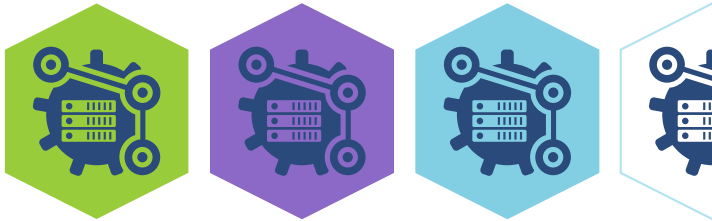
Reducing costs and improving usage efficiency: Enterprises can improve the utilization efficiency while reducing network usage costs even beyond the savings achieved by adopting an NFV strategy. This is particularly relevant with the explosion of data usage in mobile devices, often in areas that are not business critical, and while using social media applications or other related services. Traffic can be routed over lower cost connections and at reduced reliability and quality levels automatically via software-defined pathways with little or no human interaction involved.

The aforementioned factors, together with cloud networks, have been driving significant changes to networks and their operations over the past 30 years. Some telecommunication service providers, such as AT&T, have announced plans to make at least 75 percent of their networks SDN-compliant and functional by 2022. Others have introduced SD-WAN implementations to reap benefits in a shorter term.

Many service providers that are reviewed in this study are involved in pilot projects and are regularly converting them into production-level deployments. Some have already completed such activities or have many demonstrated instances of doing so on behalf of their clients. This progression, coupled with the relative newness of SDN, has led ISG to expect that many of the companies that are currently categorized as Product Challengers or Market Challengers in this study will be able to improve their positioning over the course of the year to enter leadership positions in their respective segments.

ISG Provider Lens™

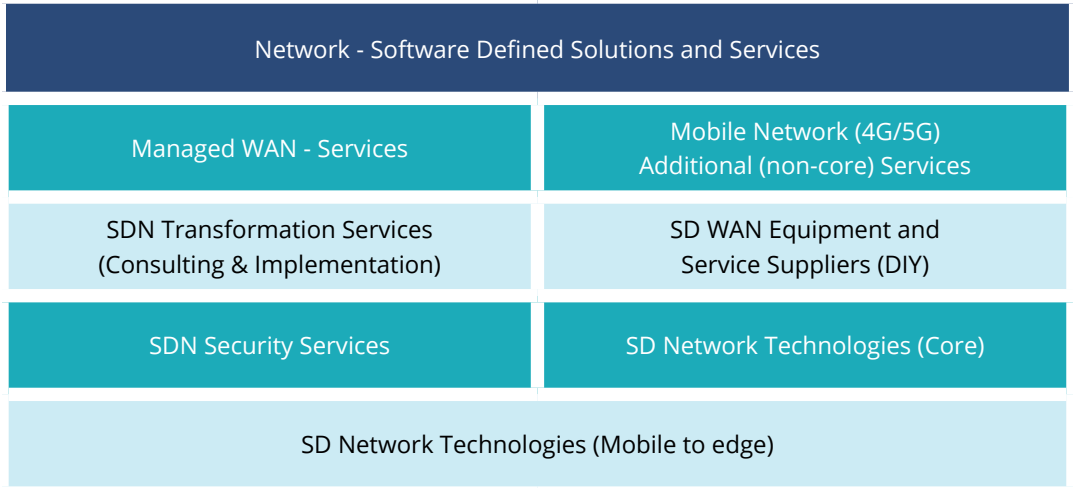
It must be noted that significant volatility exists in the constellation of market providers, partly due to the multitude of mergers and acquisitions that occurred during the last 18 months. This trend is set to continue and may even increase during the remainder of 2019 as SDN becomes mainstream.



ISG Provider Lens™

Introduction

Simplified illustration



Source: ISG 2019

Definition

The ISG Provider Lens™ study examines the different kinds of global network offerings related to SDN, SD-WAN and associated security, core-branch and mobility service offerings related to those segments. It also assesses the more traditional managed WAN market offerings. For users, both markets are extremely important. This study accounts for changing market requirements and provides a consistent market overview of the segments. It also offers concrete decision-making support to help user organizations to evaluate and assess the offerings and performance of service providers.

The areas described in the following sections are associated with SDN and more traditional managed WAN provisioning.

Definition (cont.)

Scope of the Report

Managed WAN Services

Managed WAN services cover the features and functionality that carriers offer in their WAN and at the customer point of demarcation. They are a collection of value-added services (VAS) that offer monitoring and reporting, security and outsourced customer-premises equipment (CPE) functions. Many enterprises see managed WAN services as a way to outsource IT functions and purchase them along with consulting and professional services to assess, design and implement their enterprise networks. At the basic level, the managed WAN services offered by carriers provide monitoring and alerts for critical problems such as network outages. Higher tiers of service can add configuration management, proactive troubleshooting and trouble resolution, service-level agreement (SLA) management, more sophisticated and granular monitoring and reporting, on-the ground CPE installation and hardware support to ensure that CPE software is up to date and configured correctly, and the overall lifecycle management. This section should cover all the major suppliers of managed WAN services for enterprises.

Mobile Network (4G/5G) Additional (non-core) Services

Fifth generation (5G) mobile networks and wireless systems are the next telecommunication standards after the current long-term-evolution (LTE) or 4G technology, operating in the millimeter wave bands (28, 38, and 60 GHz). 5G is aimed at a higher capacity than the current 4G, which would allow for an increased density of mobile broadband users and support more device-to-device, reliable and massive machine communications. It is also aimed at lowering latency and battery consumption compared to 4G equipment and is targeted at the internet of things (IoT). This segment covers specific mobility-targeted services or solutions, applications, management systems and methods, end-device control and management and related services. These services are either offered by service providers or suppliers as discrete solutions or as modules that will integrate with or are reliant on SDN or SD-WAN.

This section should cover all the suppliers of these additional services that make use of software-defined systems via LTE/4G or 5G delivery. **It does not cover the core licensed mobile telephony/data services themselves.**

Definition (cont.)

SDN Transformation Services (Consulting & Implementation)

SDN and SD-WAN provides the benefits of SDN technology to traditional hardware-based networking and is considered complementary to NFV. It is an overlay architecture with a networking foundation that is much easier to manage than legacy WANs. It essentially moves the control layer to the cloud and in the process, centralizes and simplifies network management. This overlay design abstracts software from hardware, enabling network virtualization and making the network more elastic. SD-WAN architecture reduces recurring network costs, offers network-wide control and visibility, and simplifies the technology with zero-touch deployment and centralized management. The key aspect of the SD-WAN architecture is its ability to communicate with all network endpoints without the need for external mechanisms or additional protocols. Suppliers have been increasingly active as advisors/consultants as well as implementation enactors of managed services to supply complete solutions to enterprises. Consulting companies, large vendors and managed network services providers have been actively involved in offering SD-WAN as managed service packages in this space (independently or as part of partnership/consortium deals).

This quadrant should cover all the advisory/consulting, hardware and software, management/reporting tools, applications and services associated with delivering SD-WAN to enterprises, starting from consulting to managed services delivery.

Definition (cont.)

SD-WAN Equipment and Service Suppliers (DIY)

SD-WAN provides the benefits of SDN technology to traditional hardware-based networking. It has an overlay architecture with a networking foundation that is much easier to manage than legacy WANs. It essentially moves the control layer to the cloud and then centralizes and simplifies network management. This overlay design abstracts software from hardware, enabling network virtualization and making it more elastic. SD-WAN architecture reduces recurring network costs, offers network-wide control and visibility, and simplifies the technology with zero-touch deployment and centralized management. The key aspect of the SD-WAN architecture is its ability to communicate with all network endpoints without the need for external mechanisms or additional protocols. Suppliers have been active in selling directly SD-WAN solutions to enterprises for their "DIY" (enterprise owned and non-managed) implementations. They are also increasingly partnering with licensed telco/service providers to offer delivery packages in this space.

This section should cover all hardware and software, management/reporting tools, applications and services associated with delivering SD-WAN for enterprise-owned operations.

SDN Security Services

An SD-WAN is a logical overlay network that encompasses any WAN transport — public, private, even LTE/4G or 5G, and is independent of any single carrier or service provider. The overlay occurs between any two SD-WAN nodes, called edges, which can be deployed at the branches and/or data centers. A cloud- delivered variation extends the overlay to any cloud point-of-presence (PoP) or data center. A key value in security services for the network is that SD-WAN unifies secure connectivity over all transports while supporting transport independence. There is no need to use/provide a different security mechanism for different transport types or to depend on the transport provider for their secure network. The network overlay can support a wide range of security capabilities and can enhance its inherent security capabilities by adding advanced security systems in the form of discrete overlays, services or applications. It can be managed both automatically and centrally as well as at local levels.

This section should cover all suppliers of software and/or hardware associated with additional and discrete security services based on SDN or SD-WAN systems.

Definition (cont.)

Network Technologies Suppliers (Core)

SDN technology is a networking approach that eliminates the complex and static nature of legacy distributed network architectures by using a standards-based software abstraction layer between the network control plane and underlying data forwarding plane in both physical and virtual devices. It is fundamentally different from NFV in terms of end results and ability, although both approaches are mutually supportive. A network virtualization program eliminates the conventional shortcomings and provisioning tasks related to legacy network segmentation technologies, such as switched VLANs, routed subnets, and firewall access lists (ACLs). An SDN-based network virtualization application supports arbitrary assignment of IP/MAC addressing schemes, automates network configuration tasks and enforces the expected network segmentation. Data plane abstraction provides a standards-based approach to dynamically provision the network fabric from a centralized (or distributed) software-based controller or multiple controllers.

SDN technologies enable improvements in network agility and automation and can substantially reduce the cost of network operations compared to traditional network deployments. The implementation of an industry-standard data plane abstraction protocol (such as OpenFlow) allows the use of any type and brand of data plane devices as all the underlying network hardware is addressable through a common abstraction protocol. It allows the dynamic and automatic provisioning of virtual network segments and virtual routing services on both physical and virtual networking devices. Security policies can be automatically provisioned via a cloud orchestration platform, such as OpenStack, or through workloads assigned according to attributes, such as MAC, subnet, VLAN and IP protocol, in an automated manner.

The main companies covered in this segment of this study will be vendors of SDN and NFV equipment and core services that are purchased either directly by enterprises or by service providers for specific enterprise projects.

Definition (cont.)

Network Technologies Suppliers (Mobile to Edge)

SDN technologies enable improvements in network agility and automation and can substantially reduce the cost of network operations when compared to traditional network deployments. The implementation of an industry-standard data plane abstraction protocol, such as OpenFlow, allows the use of any type and brand of data plane devices as all the underlying network hardware is addressable through a common abstraction protocol. It also allows for the dynamic and automatic provisioning of virtual network segments and virtual routing services on both physical and virtual networking devices. All edge components may be managed.

in the same manner as core and SD-WAN components. With software-defined access out to branch/edge, including all customer premises equipment (CPE, referenced as virtual CPE or vCPE in SDN terms) and associated Wi-Fi networks, access points (APs), software-defined mobile networks (SDMN), and SD-LAN (includes both wireless [SD-WLAN] or mobile [SD-WMLAN], the management protocol can be further improved.

This segment assesses all the main vendors and service providers (such as telcos) in the SD-LAN space, including vCPE, SDMN and SD-LAN specific vendors.

In this independent study, following the format of the internationally successful Provider Lens™ series, ISG sets out to deliver a comprehensive but defensible research program based on an extensive evaluation of criteria that cover all major telcos and service providers of relevance in the global, Germany, the Nordics, the U.K. and the U.S. regions.

Provider Classifications

The ISG Provider Lens™ quadrants were created using an evaluation matrix containing four segments, where the providers are positioned accordingly.

Leader

The "leaders" among the vendors/providers have a highly attractive product and service offering and a very strong market and competitive position; they fulfill all requirements for successful market cultivation. They can be regarded as opinion leaders, providing strategic impulses to the market. They also ensure innovative strength and stability.

Product Challenger

The "product challengers" offer a product and service portfolio that provides an above-average coverage of corporate requirements, but are not able to provide the same resources and strengths as the leaders regarding the individual market cultivation categories. Often, this is due to the respective vendor's size or their weak footprint within the respective target segment.

Market Challenger

"Market challengers" are also very competitive, but there is still significant portfolio potential and they clearly lag behind the "leaders." Often, the market challengers are established vendors that are somewhat slow to address new trends, due to their size and company structure, and have therefore still some potential to optimize their portfolio and increase their attractiveness.

Contender

"Contenders" are still lacking mature products and services or sufficient depth and breadth of their offering, while also showing some strengths and improvement potentials in their market cultivation efforts. These vendors are often generalists or niche players.

Provider Classifications (cont.)

Each ISG Provider Lens™ quadrant may include a service provider(s) who ISG believes has a strong potential to move into the leader's quadrant.

Rising Star

Rising stars are mostly product challengers with high future potential. When receiving the "rising stars" award, such companies have a promising portfolio, including the required roadmap and an adequate focus on key market trends and customer requirements. Also, the "rising stars" has an excellent management and understanding of the local market. This award is only given to vendors or service providers that have made extreme progress towards their goals within the last 12 months and are on a good way to reach the leader quadrant within the next 12-24 months, due to their above-average impact and innovative strength.

Not In

This service provider or vendor was not included in this quadrant as ISG could not obtain enough information to position them. This omission does not imply that the service provider or vendor does not provide this service.

Network - Software Defined Solutions and Services - Quadrant Provider Listing 1 of 5

	Managed WAN Services	Mobile Network (4G/5G) Additional (non-core) Services	SDN Transformation Services (Consulting & Implementation)	SD-WAN Equipment and Services (DIY)	SDN Security Services	SD Network Technologies (Core)	SD Network Technologies (Mobile to Edge)
Aerohive	Not in	Market Challenger	Not in	Not in	Not in	Not in	Not in
America Movil	Not in	Contender	Not in	Not in	Not in	Not in	Not in
Apcela	Not in	Rising Star	Rising Star	Rising Star	Contender	Rising Star	Rising Star
Arista	Not in	Not in	Not in	Contender	Not in	Product Challenger	Not in
Aryaka	Not in	Not in	Market Challenger	Market Challenger	Not in	Not in	Not in
AT&T	Leader	Leader	Leader	Not in	Product Challenger	Leader	Leader
ATOS	Not in	Not in	Not in	Not in	Contender	Not in	Not in
Belkin	Not in	Not in	Not in	Not in	Not in	Not in	Contender
BT	Leader	Leader	Product Challenger	Not in	Leader	Product Challenger	Leader
Cato Networks	Not in	Product Challenger	Product Challenger	Product Challenger	Not in	Product Challenger	Product Challenger
Centrify	Not in	Product Challenger	Not in	Not in	Product Challenger	Not in	Not in

Network - Software Defined Solutions and Services - Quadrant Provider Listing 2 of 5

	Managed WAN Services	Mobile Network (4G/5G) Additional (non-core) Services	SDN Transformation Services (Consulting & Implementation)	SD-WAN Equipment and Services (DIY)	SDN Security Services	SD Network Technologies (Core)	SD Network Technologies (Mobile to Edge)
CenturyLink	Leader	Not in	Leader	Not in	Product Challenger	Not in	Leader
China Telecom	Contender	Not in	Not in	Not in	Not in	Product Challenger	Not in
Cisco	Not in	Not in	Product Challenger	Leader	Product Challenger	Leader	Leader
Citrix	Not in	Product Challenger	Not in	Not in	Product Challenger	Not in	Not in
Cloudgenix	Not in	Not in	Not in	Not in	Not in	Product Challenger	Not in
Colt	Product Challenger	Not in	Not in	Not in	Not in	Not in	Not in
Computacenter	Not in	Not in	Product Challenger	Not in	Not in	Not in	Not in
Datto	Not in	Not in	Not in	Not in	Contender	Not in	Not in
Dell EMC	Not in	Not in	Market Challenger	Leader	Not in	Leader	Market Challenger
D-Link	Not in	Not in	Not in	Not in	Not in	Not in	Market Challenger
DXC	Not in	Not in	Not in	Not in	Product Challenger	Not in	Not in

Network - Software Defined Solutions and Services - Quadrant Provider Listing 3 of 5

	Managed WAN Services	Mobile Network (4G/5G) Additional (non-core) Services	SDN Transformation Services (Consulting & Implementation)	SD-WAN Equipment and Services (DIY)	SDN Security Services	SD Network Technologies (Core)	SD Network Technologies (Mobile to Edge)
Ericsson	Not in	Not in	Not in	Product Challenger	Not in	Product Challenger	Product Challenger
Extreme Networks	Not in	Product Challenger	Product Challenger	Product Challenger	Product Challenger	Product Challenger	Product Challenger
Fortinet	Not in	Not in	Not in	Not in	Product Challenger	Not in	Not in
GTT	Product Challenger	Not in	Contender	Not in	Not in	Not in	Product Challenger
Harman	Not in	Not in	Not in	Product Challenger	Not in	Product Challenger	Product Challenger
HCL	Product Challenger	Not in	Product Challenger	Leader	Market Challenger	Leader	Not in
HPE	Not in	Not in	Contender	Contender	Not in	Contender	Product Challenger
Huawei	Not in	Not in	Not in	Contender	Not in	Product Challenger	Not in
IBM	Leader	Product Challenger	Leader	Leader	Leader	Leader	Leader
Infosys	Not in	Not in	Product Challenger	Leader	Product Challenger	Product Challenger	Product Challenger
Juniper	Product Challenger	Not in	Leader	Leader	Not in	Market Challenger	Not in

Network - Software Defined Solutions and Services - Quadrant Provider Listing 4 of 5

	Managed WAN Services	Mobile Network (4G/5G) Additional (non-core) Services	SDN Transformation Services (Consulting & Implementation)	SD-WAN Equipment and Services (DIY)	SDN Security Services	SD Network Technologies (Core)	SD Network Technologies (Mobile to Edge)
Logicalis	Rising Star	Not in	Contender	Not in	Not in	Contender	Not in
Masergy	Market Challenger	Market Challenger	Not in	Market Challenger	Leader	Not in	Not in
Microsoft	Not in	Product Challenger	Not in	Not in	Product Challenger	Not in	Not in
NTT	Product Challenger	Product Challenger	Product Challenger	Product Challenger	Market Challenger	Product Challenger	Product Challenger
Nuage Networks (Nokia)	Not in	Product Challenger	Product Challenger	Product Challenger	Not in	Contender	Not in
Orange Business Services	Leader	Leader	Leader	Leader	Leader	Not in	Leader
PCCW	Market Challenger	Product Challenger	Not in	Not in	Not in	Market Challenger	Not in
Pica8	Not in	Contender	Not in	Not in	Not in	Not in	Not in
Prodapt	Not in	Not in	Product Challenger	Not in	Not in	Not in	Not in
Riverbed	Not in	Not in	Not in	Product Challenger	Not in	Not in	Not in
Silver Peak	Not in	Product Challenger	Product Challenger	Product Challenger	Not in	Not in	Not in

Network - Software Defined Solutions and Services - Quadrant Provider Listing 5 of 5

	Managed WAN Services	Mobile Network (4G/5G) Additional (non-core) Services	SDN Transformation Services (Consulting & Implementation)	SD-WAN Equipment and Services (DIY)	SDN Security Services	SD Network Technologies (Core)	SD Network Technologies (Mobile to Edge)
SingTel	Product Challenger	Leader	Product Challenger	Not in	Not in	Product Challenger	Not in
Sprint	Product Challenger	Product Challenger	Product Challenger	Product Challenger	Not in	Not in	Not in
Swisscom	Market Challenger	Product Challenger	Product Challenger	Not in	Not in	Not in	Not in
Symantec	Not in	Not in	Not in	Not in	Leader	Not in	Not in
Talari Networks	Not in	Not in	Not in	Product Challenger	Not in	Product Challenger	Not in
TCS	Product Challenger	Product Challenger	Product Challenger	Product Challenger	Product Challenger	Not in	Product Challenger
Tech Mahindra	Leader	Not in	Leader	Not in	Not in	Not in	Product Challenger
Telstra	Product Challenger	Not in	Product Challenger	Not in	Not in	Not in	Not in
Telus	Contender	Not in	Not in	Not in	Not in	Not in	Not in
TP-Link	Not in	Not in	Not in	Not in	Not in	Not in	Contender
Trend Micro	Not in	Not in	Not in	Not in	Product Challenger	Not in	Not in

Network - Software Defined Solutions and Services - Quadrant Provider Listing 6 of 6

	Managed WAN Services	Mobile Network (4G/5G) Additional (non-core) Services	SDN Transformation Services (Consulting & Implementation)	SD-WAN Equipment and Services (DIY)	SDN Security Services	SD Network Technologies (Core)	SD Network Technologies (Mobile to Edge)
T-Systems	Product Challenger	Leader	Leader	Not in	Leader	Not in	Not in
Verizon	Product Challenger	Leader	Leader	Not in	Not in	Not in	Product Challenger
Versa	Not in	Not in	Not in	Not in	Not in	Product Challenger	Not in
Vmware	Not in	Not in	Not in	Leader	Product Challenger	Not in	Not in
Vodafone	Product Challenger	Leader	Product Challenger	Not in	Leader	Leader	Leader
Wipro	Leader	Not in	Leader	Not in	Rising Star	Not in	Not in
ZTE	Not in	Not in	Not in	Not in	Not in	Not in	Contender

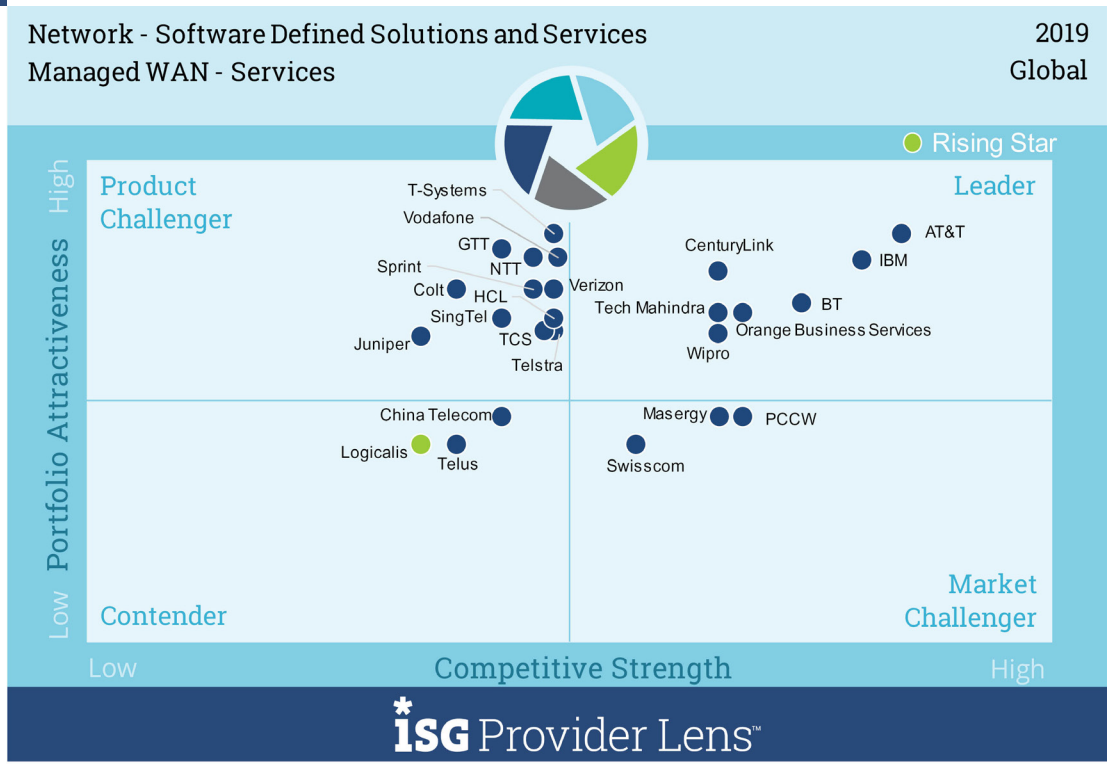
Network - Software Defined Solutions and Services Quadrants

MANAGED WAN SERVICES

Definition

Managed WAN services are increasingly described as traditional in light of the SD-WAN offensive globally. They cover the features and functionality that carriers offer in their network and at the customer point of demarcation. They are a collection of value-added services (VAS) that include monitoring and reporting, security and outsourced customer premise equipment (CPE) functions. Many enterprises choose managed WAN services to outsource IT functions and purchase them along with consulting and professional services to assess, design and implement their enterprise networks.

At the basic level, managed WAN services offer monitoring and alerts during critical problems such as network outages. They also include configuration management, proactive troubleshooting and trouble resolution, service-level agreement (SLA) management, on-the-ground equipment installation, hardware support and the overall lifecycle management.



Source: ISG Research 2019

MANAGED WAN SERVICES

Definition (cont.)

Managed WAN services cover the scope of services and functionalities of various network solutions, including core solutions such as the MPLS protocol for IP-VPN services and multiple access technology. WAN services allow end customers to access resources for network operation centers (NOCs), disaster recovery, active fault clearance and customer portals.

Traditional managed WAN services, often based on MPLS, have come under increased pressure due to the growing prominence and prospects of SD-WAN which would continue over the next two years. MPLS is the most widely used WAN technology in companies with distributed locations and is being developed continuously. Today, it is possible to prioritize types of applications depending on their respective jitter, packet loss and deceleration to allow a performance boost in individual applications based on customer requirements or policies. While MPLS VPNs provide certain advantages in connecting locations, they are an expensive medium when it comes to connecting mobile devices, especially with the growth of traffic that is not business critical. Mobile usage is also exploding due to the internet of things (IoT), the growing mobile workforce and the addition of decentralized locations within enterprises. In addition, enterprises are demanding networks to provide more flexibility and business-oriented SLA metrics such as performance per application and quality of experience. Such demands are causing a strain and affecting the smooth functioning of traditional WAN services and managed services. These newer flexibility and metric requirements require a more flexible infrastructure compared to what MPLS networks provide, making SDN increasingly relevant.

ISG does not expect MPLS networks to be replaced by alternate software-driven networks any time soon. Instead, these networks would be increasingly complemented by SD-WAN technologies during 2019–2021.

MANAGED WAN SERVICES

Eligibility Criteria

- Product/service portfolio coverage, completeness and scope
- Ability to deliver and manage all hardware and software aspects
- Management capability for the orchestration and control of the overall architecture
- Stability and roadmap planning
- Reference customer/site volume in deployment
- Competitiveness of offerings and commercial terms

Observations

- **AT&T** has a vast array of business and technology streams in the networking space and has a large client base in managed WAN services. The company is also a leading proponent of SDN/SD-WAN, making it well positioned in migration programs.
- **BT** has a strong global backbone with a commitment to continue delivering traditional managed WAN services as well as SDN/SD-WAN services and managed services for its domestic and international client base.
- **CenturyLink** has capabilities to extend management into IT infrastructure and application management in three services tiers in a complimentary manner for network management. It has been ranked consistently as one of the best-performing managed WAN companies on a global level.
- **IBM** has a strong portfolio of its own network, service and security solutions. It has also built a world-class partner ecosystem of major players in the managed network, SDN, SD-WAN, multi-cloud network and multi-network integration space. These assets, together with IBM's consulting and project management abilities, facilitate the delivery of a comprehensive, provider-agnostic solution for enterprises.

MANAGED WAN SERVICES

Observations (cont.)

- **Orange Business Services** covers a large area of managed network services. These include MPLS and SD-WAN and internet services, which can be integrated or combined with managed security, WAN optimization and application visibility services. They can be provided either on appliance or on virtual network functions (VNFs) as well as on various levels of service management. Orange Business Services also offers multi-sourcing integration (MSI) as a service.
- **Tech Mahindra** is globally known for its managed WAN and SD-WAN offerings at competitive price points with advanced service delivery. The company leverages its experience in traditional WAN services and SD-WAN transition programs to develop a strong portfolio of off-the-shelf framework offerings. It also has a strong consulting-led practice focused on customizing offerings to address the needs of each client.
- **T-Systems** provides high-quality services throughout Europe and many other international markets. It covers over 180,000 sites with more than 2,500 networks, delivering a four-fold redundancy at a platform level. The firm offers high-quality secure solutions that are custom packaged for specific industry verticals and enterprises.
- **Wipro's** managed network services are consulting led, covering both off-the-shelf and highly tailored client-specific solutions. These include Wipro Digital's Designit, ITIL integrated service platforms, governance via Wipro SmartView, Cloud Trust Security framework, Wipro HOLMES™ RPA/AI methods and toolsets and Wipro WANTAGE. It also offers partner solutions and products from companies such as Riverbed and Cisco.
- Rising Star **Logicalis** has an extensive portfolio of managed and hosted managed services that encompass the end-to-end management of multi-vendor, multi-technology ICT environments. It enables customers to take a flexible approach to IT operations and major transformation projects that are available on a global basis.

AT&T

Overview

AT&T caters to all enterprise sizes, including those that are undergoing NFV/SDN transformation or are retaining more traditional network infrastructures. The company uses a managed network services and automation strategy with a service-centric approach for network management and integrating heterogeneous infrastructures and support models. It offers modular enterprise tools and integration architecture and solutions, such as AT&T FlexWare℠, AT&T Network on Demand and AT&T Managed Network Services, to cover the full managed WAN spectrum in a modular and flexible manner.

Strengths

Quality staff: AT&T has highly experienced consultants and technologists who are focused on networks and network management services. Its multinational and multidisciplinary teams can be quickly brought in for specific client projects.

Long and successful track record: AT&T has a vast array of business and technology streams in the networking space along with a large client base in managed WAN services. It is a strong competitor in the SDN/SD-WAN area and has its own portfolio, making it well positioned to fend off other suppliers.

Standardized managed services portfolio: AT&T leverages its experience with the newest technologies and discrete solutions in the SDN and SD-WAN space to serve managed WAN clients. The company is thus able to improve its overall service delivery while reducing costs and improving performance.

Caution

AT&T should provide clarity on maintaining its client base for managed WAN and not de-emphasize its value. It should also focus on guiding the market in SD-WAN and SDN migration and conversion. This is a delicate balance to strike.

Enterprises (both medium and large) are increasingly adopting SDN to achieve more business flexibility and agility as well as to lower costs. AT&T should cater to a wider variety of enterprise sizes to overcome the perception that it is purely focused on large enterprises.

2019 ISG Provider Lens™ Leader

AT&T has a comprehensive managed network/WAN portfolio with excellent reference clients. It also has extensive capabilities in SD-WAN migration.

BT

Overview

BT is a longstanding leader in the managed WAN and network services space. It provides consulting, managed services, cloud, network, and enterprise improvement services and technology to its vast enterprise customer base. The company offers most of these services via the integration of pre-existing business units into focused transformational delivery teams under the Global Services banner. It has an extensive partner constellation as well as its own products and services, often provided via an integrated ecosystem of delivery. Some of its services are BT Connect Acceleration, BT UC, BT Branch UC, Connect Cisco SD-WAN, Connect Meraki SD-WAN, Connect Intelligence IWAN, Connect Intelligence InfoVista, Connect Intelligence Riverbed and Agile Connect. The company has a solid migration base for clients that are moving from traditional managed WAN to SD-WAN.

Strengths

Experienced resource mix: BT has highly experienced business and solution consultants as well as technology practitioners to advise and formulate delivery for client-specific projects. It has a mix of its own and partner solutions to deliver highly capable managed WAN solutions to different client sizes.

Proven results: The company has a wide, global range of reference projects in managed WAN services as well as in many industry types and focus areas.

Model flexibility: BT offers both in-house solutions and partner solutions off the shelf. It also provides highly customized solutions to meet specific client requirements.

Caution

BT has a larger portfolio than many of its competitors. However, due to the absence of a mobile arm, the company is believed (in some markets) to be holding back its fully converged services offerings, unlike some of its global competitors, especially with the market buzz around 5G.

The firm is believed to be more focused on EMEA instead of being a truly global player.

2019 ISG Provider Lens™ Leader

BT is a strong global provider of managed WAN services and has strong SD-WAN migration capabilities.

CENTURYLINK

Overview

CenturyLink has been ranked consistently as one of the top-performing managed WAN companies globally. It has a string of acquired companies such as Qwest, Time Warner Telecom, Global Crossing and Level 3. In the past year, the company has made various announcements on ethernet, ethernet-LAN, SD-WAN, wavelengths, security services, unified communications and collaborations (UCC) services VPN, VoIP and other internet applications, including access extensions. It has a wide infrastructure network in more than 60 countries, served by a staff of 47,000, along with an extensive partner network.

Strengths

Network management: CenturyLink offers three service sets with design and implementation for different levels of WAN management depending on the depth and skill set required. Managed services provide 24/7 monitoring throughout the year. Advanced managed services allocate a dedicated resource to monitor, manage and remediate contracted fault and performance criteria. Customer managed services offer a fully outsourced network management solution.

IT and data center management: CenturyLink uses three service tiers of network management to extend into IT infrastructure and application management in a complimentary manner.

Client and end-customer centric: The company has implemented a slew of new tools and methods to enhance customer experience for clients and end users. It incorporates artificial intelligence, fault and engineering fix information, order and remedial management, and billing and usage systems.

Caution

CenturyLink has a strong foothold in Europe and the Americas but lacks a deep presence in APAC and Africa. The company has been investing heavily to improve its position and gain strong client references over the next two years.

Despite its significant experience in acquisitions, CenturyLink faces some risk in its expansion plans and absorption capabilities while penetrating the markets in APAC and Africa.

2019 ISG Provider Lens™ Leader

CenturyLink is a highly capable managed WAN services provider with extensive experience and capabilities for further migration to SDN/NFV.

IBM

Overview

IBM has been at the forefront of enterprise network and digital transformation with its managed service offerings, led by IBM Global Technology Services (GTS) with additional focus from the telecom and media and entertainment divisions. The firm has a strong portfolio of its own solutions and a large, well-qualified partner ecosystem in the managed services and managed WAN markets, enabling it to deliver comprehensive, provider-agnostic solutions for enterprises. Solutions may be full, partial, hybrid, fully secure or an MPLS replacement and can be delivered as a variety of managed service offerings.

Strengths

Strong constellation of own and partner solution offerings: With a strong portfolio of its own solutions and a partner ecosystem of leading players in the managed services and managed WAN space, IBM has been able to deliver comprehensive, provider-agnostic solutions. The firm has demonstrated an ability to deliver multi-provider networks based on open standards and zero vendor lock-ins, thereby maximizing investment protection.

Multiple solutions options to suit client: Solutions may be full WAN, partial WAN, hybrid private/public cloud enabled, fully/highly secure, or an MPLS replacement. They could also involve datacenters and IT infrastructure and can be delivered in a variety of managed service types and options.

Unrivaled global coverage, portfolio and innovation: IBM has an almost unrivaled global footprint. The firm has a well-established network and technology infrastructure and offers integration and operations services globally. It was one of the first suppliers to offer a network as a service (NaaS) delivery and pricing model and is continuing to innovate in this area.

Caution

IBM appears to be positioned strongly in the large to high-end mid-market enterprise segments. The utilization of the NaaS model could turn the entire mid-sized enterprise segment into a potential client base. The firm may be able to achieve this by remodeling its sales channel costs and approach.

While prioritizing its strategy for SDN and SD-WAN, IBM should avoid raising concerns among its existing managed WAN clients or destabilizing the base.

2019 ISG Provider Lens™ Leader

IBM is a robust and world-leading provider with a vendor-agnostic managed WAN and network proposition and high innovation.

ORANGE BUSINESS SERVICES

Overview

Orange Business Services covers a large panel of managed network services worldwide (including MPLS, SD-WAN, internet services), which can be integrated or combined with managed security, WAN optimization and application visibility services. These can be provided either on appliance or on VNF and on various levels of service management. MSI takes care of multi-vendor and multi-network type integration and management. Orange Business Services provides consulting services, access sourcing, Orange certification programs, and process simplification services. It has a web portal to support managed network services for quotes, orders and self-service. The firm has 25,000 employees, 4 regional operation centers in more than 60 countries, and over 3,000 multinational enterprise customers.

Strengths

Excellent coverage and partnership constellation: Orange Business Services has a wide network coverage and many partnerships. It enables full compatibility with Flexible SD-WAN through virtual SD-WAN gateways, enabling easy migration from traditional managed WAN to SD-WAN.

Feature-rich advanced solutions: Orange Business Services offers a full set of access, continuity, and advanced features and architectures (for e.g., always-on, dual, dual load balancing with ME, LL, SDSL, ADSL, internet, 3/4G, sub-VPN, multiple VPN, multicast, voice and video connectivity).

Global and local data center and next-gen hub delivery: The company offers enhanced cloud connectivity with dedicated or hybrid networking. It is flexible to any underlying network, Orange MPLS network, internet with SD-WAN overlay and ethernet services.

Caution

Orange Business Services is positioning itself as a provider of next-gen SDN services. It has demonstrated strong operational skills for complex, global deployments and should continue to be diligent in handling its existing managed WAN clients or destabilizing the base while promoting this strategy.

The SME marketplace has many small and new companies that have a strong local presence, particularly in APAC. This may erode the price point of the supply of managed services.

2019 ISG Provider Lens™ Leader

Orange Business Services has a clear strategic roadmap along with highly developed technologies and services to ensure a smooth transition from managed WAN to SD-WAN.

TECH MAHINDRA

Overview

Tech Mahindra employs 115,000 people and has generated $4.8 billion in revenue globally. The company is a major business and technology consulting organization and is a strong player in global telecommunications. It provides managed WAN and SD-WAN offerings at competitive price points with advanced service delivery. The firm has leveraged its experience from many SD-WAN transition programs to develop a strong portfolio of off-the-shelf framework offerings. It also has a strong consulting-led practice that is focused on customizing solutions for specific client requirements. Tech Mahindra has a vast partner network and has made many strategic acquisitions and partnerships over the last three years to deliver robust managed network propositions.

Strengths

Managed service offerings in multiple industry types: Tech Mahindra has a comprehensive portfolio of industry specific as well as more generic managed network propositions. It has a team of highly experienced consultants and practitioners who are focused on providing managed network services in different industry sectors.

Strong portfolio and partnership offerings: Tech Mahindra has innovative solutions and products such as VNF Xchange and netOps.ai. The company also offers best-of-breed solutions from partners such as AT&T FlexWare℠, Silver Peak and Rakuten, for managed network clients.

Technical competence: The company's strength lies in consulting and its own technologies. It has decades of experience in delivering to telecom service providers globally. The firm has extensive expertise in managed networks and efficiency-boosting transition programs that make use of established methods and cloud/multi-cloud environments to deliver at a full-enterprise scale. Tech Mahindra works with other technology, software and provider companies to enable smooth deployments. It has many reference projects worldwide.

Caution

Changing the core focus from telco and engineering to enterprise and managed services can impact delivery methods and team deployments unless care is taken to ensure momentum and equal servicing of both client categories with adequate staffing availability.

2019 ISG Provider Lens™ Leader

Tech Mahindra efficiently delivers managed network services and transition programs in innovative ways, assisted by highly effective products.

T-SYSTEMS

Overview

T-Systems provides high quality services throughout Europe (100 percent coverage) and many other international markets. It covers more than 180,000 sites, utilizing more than 2,500 networks to deliver four-fold redundancy at a platform level. The company has a global reach of more than 180 countries and territories and has over 2,400 global points of presence (POPs), including 1,200 in Europe. Managed networks fall under its enterprise network services division. T-Systems offers custom and packaged solutions to specific industry verticals along with enterprise-wide packages.

Strengths

Planned and implemented advancements: T-Systems has adopted the SAFe, Tribes, Squads approach. It is engaged in delivering technology and service programs such as MPLS cloud connect, secure internet cloud connect, next-generation networks and ethernet access. The firm has planned to add more cloud solutions, gateways and automation this year.

Strong partner network: T-Systems has made many strategic partnerships with networks providers, including BT, Telefonica and PCCW as regional partners and ngena as a group association. It also has a strategic supplier arrangement with Viptela. Through this partnership ecosystem, the company is committed to delivering high quality and secure managed services.

Well-communicated on-roadmap: The firm's network portfolio is clearly structured, and its innovation initiatives are well funded. Its portfolio upgrades are strategically planned and executed, and the roadmap is shared with industry observers.

Caution

T-Systems has a larger portfolio than many of its competitors. However, it must provide visibility with respect to its offerings and improve specific use cases from its vast reference base for new and potential clients.

2019 ISG Provider Lens™ Leader

T-Systems provides a comprehensive enterprise managed service portfolio. It also has a vast international network and an excellent strategy roadmap for future development.

WIPRO

Overview

Wipro is an internationally renowned company with 171,500 employees in 57 countries, serving 1,115 global clients via 14 global delivery locations. Its managed network services portfolio is part of Cloud and Infrastructure Services (CIS) — Wipro's fastest-growing division, which includes its focused segment, Business Services Management. The firm follows a consulting-led approach to deliver off-the-shelf solutions and highly tailored client-specific solutions. Some of these include Wipro digital's Designit, ITIL integrated service platforms, Wipro SmartView for governance, Cloud Trust Security framework, Wipro HOLMES™ RPA/AI methods and toolsets and Wipro WANTAGE. It also offers partner solutions and products from companies such as Riverbed and Cisco.

Strengths

Wipro WANTAGE: Wipro offers innovative enterprise WAN optimization as a pay-as-you-grow model with comprehensive lifecycle services to enable one-day realization of cost savings with zero upfront investment. It incorporates primary/secondary data centers, headquarter/branch offices and mobile workers.

Wipro Insightix™ for existing network assessment and maturity, mapped to transition: This solution measures the maturity across 10 dimensions to assess the network readiness for the present, near future and future business growth. It provides a granular review of the network infrastructure with an expert analysis of the network's architecture, deployment and operational state.

Addressing the lifecycle: Wipro Digital Experience Platform, Wipro Integrated Agile DevOps Platform (WID) and the ServiceNXT initiative are aimed to ease the incorporation of managed services and prepare enterprises for a software-defined transition.

Caution

Wipro offers a plethora of tools and processes to clients in managed networking. It should provide unified and comprehensive models as enablers for new clients.

The market demand for additional industry-specific solutions and expertise may push Wipro to invest heavily in a retraining program to ensure that it has adequate knowledge for each vertical.

2019 ISG Provider Lens™ Leader

Wipro produces highly innovative solutions backed by expertise, toolsets, methods and processes, including AI and RPA.

RISING STAR: LOGICALIS

Overview

Headquartered in the U.K, Logicalis designs, builds and supports ICT solutions for customers throughout Europe, North and South America, Asia Pacific and Africa. Its primary focus for its 6,000 employees worldwide is the provision of workspace communication and collaboration, data center and cloud services, security and network infrastructure, data and information strategies and professional and managed services. Its managed services operation centers, based on ITIL best practices, are in the U.S., U.K., Germany, Argentina, Brazil, China and Malaysia. The firm has annualized revenues of $1.7 billion, has operations in 25 countries and serves more than 10,000 customers worldwide.

Strengths

Extensive portfolio: Logicalis has an extensive portfolio of managed and hosted managed services that encompass the end-to-end management of multi-vendor, multi-technology ICT environments. It enables customers to take a flexible approach to IT operations and major transformation projects.

Good partner ecosystem and excellent reference cases: The company has developed a large partner network of solution and service providers. It also has many reference customers in the enterprise, provider and carrier segments.

Caution

Not all enterprises consider Logicalis as a full-service, full spectrum core-to-edge provider on a global level but more of a local or regional managed services provider. The company must change this image to enable deeper penetration into the multi-national enterprises market

2019 ISG Provider Lens™ Rising Star

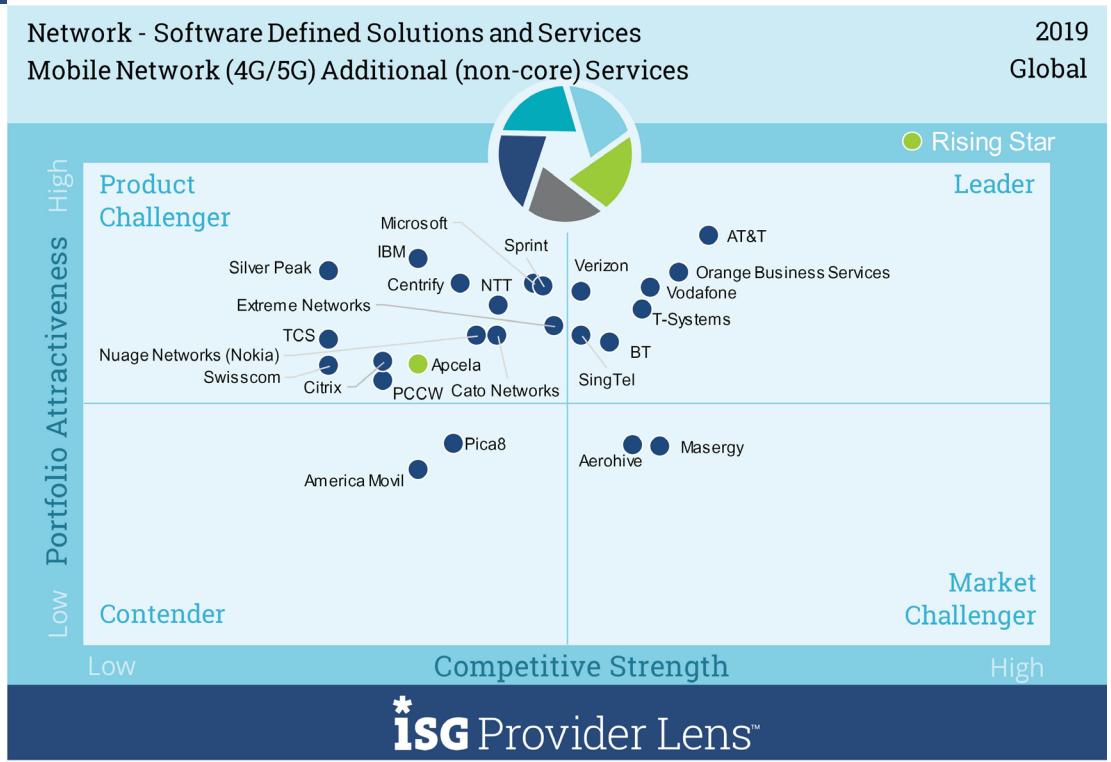
Logicalis is an increasingly important company in the managed WAN space globally with its combination of strong tools, NOCs and capabilities.

MOBILE NETWORK (4G/5G) ADDITIONAL (NON-CORE) SERVICES

Definition

5G mobile networks or wireless systems are the next telecommunications standards after the current long-term evolution (LTE) or fourth generation (4G) wireless system technology, operating in the millimeter wave bands (28, 38, and 60 GHz). It is aimed at providing higher capacity than current LTE/4G, thereby allowing a higher density of mobile broadband users, increased reliability and support for device-to-device and massive machine communications. It is also aimed at lowering latency and battery consumption compared to LTE/4G equipment and is targeted for mass internet of things (IoT) implementations.

However, this next-generation standard is being challenged by the increase in both speed and functionality of LTE/4G networks and equipment and their current rather than future availability. 5G coverage is planned to reach almost 73 percent of the European population by the end of 2025, although these plans are currently far from concrete. Capex spending is not expected to be a priority for most carriers before 2020–2021. Many pilots and proof of concept (POC) projects for specific use cases are planned for 2019–2021, resulting in most enterprises considering 5G for only long-term strategic planning.



Source: ISG Research 2019

MOBILE NETWORK (4G/5G) ADDITIONAL (NON-CORE) SERVICES

Definition (cont.)

The combination of improved network coverage, connected device proliferation (including IoT-type devices), higher speed demands and capabilities, enhanced service quality and reliability plus attractive package price points for users continues to drive the growth of mobile products and services. Mobility is also becoming increasingly important for enterprises.

ISG research has showed that around 85 percent of all employed adults in the U.S. and EMEA use their mobile services and devices for both business and personal purposes. However, recent multi-operator surveys in those regions have indicated that only 41 percent of mobile users were aware that they require enterprise-specific security and policy applications or enterprise software. This statistic is increasing rapidly due to the increase in enterprise-specific use cases and innovations based on new technologies and services. According to the GSMA, mobile data traffic is expected to grow at a CAGR of 42 percent to 15.5–16 exabytes per month during 2016–2022, partly attributed to these trends.

Operators are still investing heavily in LTE/4G and are actively rolling out LTE/4G to populations globally. In many circumstances, LTE/4G applications and bandwidth are already beginning to deliver results similar to those that are expected to be available in 5G. This has raised many questions among companies and analysts on when (or whether) the enterprise adoption of 5G will become a reality.

This segment covers specific mobility-targeted services or solutions, applications, management systems and methods, end-device control and management and related services. These services are either provided by service providers or suppliers as discrete solutions or as modules that will be integrated with or rely on SDN or SD-WAN. **This section does not cover the core licensed mobile telephony/data services themselves.**

MOBILE NETWORK (4G/5G) ADDITIONAL (NON-CORE) SERVICES

Eligibility Criteria

- Product/service portfolio coverage and scope
- Ability to deliver as a value-added service in a 4G/5G environment using software-defined methods
- Understanding of the overall market area and innovations/contributions to that area
- Scope of partnerships and offerings integration into a coherent solution delivery to customer
- Stability and roadmap planning
- Reference customer/solutions in POC/post pilot/commercial deployment
- Competitiveness of offering and types of commercial terms

Observations

- **AT&T** has a vast array of mobile applications such as dynamic traffic management, enhanced push to talk, messaging and enterprise app traffic management. Its business focus areas, such as field management, remote access mobile workplace, are regularly refreshed. Its offerings include SDN, NFV and SD-WAN capabilities and integration.
- **BT** has a global and high-quality network along with an impressive portfolio of solutions for many industry verticals. It offers enterprise-wide mobile business applications and value-added solutions. It also has a strong partner program along with its own offerings.
- **Orange Business Services** has a plethora of value-added mobile applications that are self-developed or offered by its partner ecosystem with an Orange-branded wrapper for enterprise clients.
- **Singtel** has a seemingly traditional mobile enterprise offering in terms of separation (for e.g. enterprise mobility and mobile device management). The services are highly robust and advanced. The firm has also integrated its services with some business-specific packaged solutions such as push to talk, mobile call recording, message retrieval and unified communications.

MOBILE NETWORK (4G/5G) ADDITIONAL (NON-CORE) SERVICES

Observations (cont.)

- **T-Systems** delivers comprehensive enterprise mobility management (EMM), including all the functionalities expected within a mobile device management (MDM) delivery. It also offers applications and services in the value-added service (VAS) category, such as expenses management, BYOD/COPE/COBO management and functionality, multi-level security add-ons and unified endpoint management (UEM).
- **Verizon** offers an array of mobile business solutions that give enterprises access to some of the industry's most innovative products and services, with the added benefit of working with one source and one bill. In addition to having its own consulting resources, the company works with more than 40 professional service companies globally.
- **Vodafone** along with its Vodafone Global Enterprise division provides telecommunication and IT services to corporate clients in 150 countries. It is a strong proponent of NFV/SDN and SD-WAN and is focused on offering enterprise-focused services in those areas. The group also offers mobile products with value-added services to enterprises.
- Rising Star **Apcela** is continuing its impressive transformation into an enterprise-centric provider of deterministic networking services, aligning enterprise application and network performance requirements. The firm has network as a service (NaaS)-oriented products that are based on its AppHUB platform. It also offers low latency with high frequency SD-WAN as a service based on its modular Alpha platform.

AT&T

Overview

AT&T has a competitive range of offerings in mobile, edge, access and application accelerators, security, cloud and SDN integration with extensive global business coverage. It has its own range of products and services such as AT&T FlexWare℠ that is delivered via AT&T Enterprise Mobility Management solutions. The company has an extensive partner network to deliver best-of-breed solutions that can be customized for specific client requirements.

Strengths

Continued SDN/NFV and SD-WAN implementation across own network and business centers: AT&T has 4G/LTE infrastructure and is also involved in extensive 5G trials. It has a range of new and advanced mobile applications to take advantage of these features present and more are expected to be rolled out in the future.

Portfolio size: AT&T has a vast array of mobile applications, including dynamic traffic management, enhanced push to talk, messaging and enterprise app traffic management. Some of its business focus areas are field management and remote access mobile workplace. The company has many industry verticals in various regions.

A-Z supplier: Through its business and government units, AT&T supplies partial or complete network solutions and replacements as well as upgrades/transitions to traditional network enterprises. It also offers discrete or integrated mobility value-added solutions.

Caution

AT&T must overcome the perception of many enterprises, particularly (but not exclusively) mid-sized businesses, that its solutions are only applicable to those with large staff and in-house technical solutions which they want to maintain.

2019 ISG Provider Lens™ Leader

AT&T has an impressive global reach and a deep understanding of customer requirements, coupled with an extensive range of mobility products and solutions.

BT

Overview

BT has a robust high-quality network with a pantheon of partner providers around the world in both the wire-line and mobile solution space. It delivers a range of value-added mobile solutions such as DyNS, BT Connect Acceleration, BT UC, BT Branch UC, Connect Cisco SD-WAN, Connect Meraki SD-WAN, Connect Intelligence IWAN, Connect Intelligence InfoVista, Connect Intelligence Riverbed and Agile Connect. BT was the first provider to market Cisco SD-WAN in 69 countries with a BT service wrap to help clients migrate from dedicated Cisco estates to managed SD-WAN operations.

Strengths

Portfolio strength: BT has a strong portfolio of its own offerings as well as from partners to deliver tailored client solutions within SDN and the "mobile first" enterprise space, often with the BT service wrap as the leading proposition. The company uses world-class solutions from Cisco, Nuage, Riverbed, Infovista and many other partners.

Application aware: BT is focused on providing application-aware services directed towards mobile management and application (mobile enterprise) solutions. The company is continuing to innovate its network services and actively positions SDN migration as the underlaying enabler for clients to use many of these services.

Standards driven: The company is future focused and has strong ties to many global associations and standard groups, which it leverages to adjust its roadmap.

Caution

BT has a larger portfolio than many of its competitors. However, the absence of a dedicated mobile network arm has created a perception in some markets that the company is holding back its fully converged service offerings, unlike some of its global competitors.

Many mobile operator and mobile-centric companies are expanding their market presence in specific regions to lure enterprise network customers into full network service propositions by offering mobile worker applications and solutions along with SD-WAN partner offerings.

2019 ISG Provider Lens™ Leader

BT is a longstanding leader in industry verticals and mobile workspace value-added solutions, backed by an innovative network and product portfolio.

ORANGE BUSINESS SERVICES

Overview

Orange Business Services has 25,000 employees and 4 regional operation centers with a presence in over 100 countries. It caters to more than 3,000 multinational enterprise customers. The company covers a large range of network services with highly capable consultants leading most engagements that require customized solutions. It has a plethora of value-added mobile applications that are self-developed or offered by its partner ecosystem with an Orange-branded wrapper to enterprise clients.

Strengths

Excellent VAS mobile portfolio and partnership constellation: Orange Business Services has a large coverage of core networks and partnerships, delivering value-added services (VAS) such as Shape & Fix (mobile solutions modelling), fleet management (MDM), enterprise messaging, team management (Aidoo mobile), Xpenditure (expense claims management) and PictBase Air (field service/customer intervention services application).

Well-known mobile and converged solutions: Orange Business Services has been ranked consistently among the top 10 mobile telephony application providers across the globe. It is also well known for its innovative and bundled approaches in this field.

Feature-rich advanced solutions: Feature sets are given for standard-level users, advanced level/requirement users as well as in customized mixes of applications as a client-specific bundle.

Caution

Orange Business Services is strongly positioning itself as the next-generation SDN service provider of the future. The perceived divide between its mobile and software-defined business units should be eliminated in order to shed light on its full convergence and usability for many enterprises.

2019 ISG Provider Lens™ Leader

The company is strongly positioned and well known for its wide range of VAS mobile services that are available globally.

SINGTEL

Overview

Singtel has 75 global offices in 29 countries with 428 point of presence (POPs) in 362 cities. It is one of the longest continuously running telephony service providers globally. It was also rated as one of the top three telco providers in APAC, India and Africa, serving 706 million mobile subscribers and more than 1,500 international enterprise clients. Singtel covers a large range of network services with a team of highly capable consultants to address specific client requirements. The company has a plethora of value-added mobile applications that are self-developed or offered by its partner ecosystem.

Strengths

Mature and capable: Singtel has a long history of delivering advanced and innovative network products and services, including solutions in the mobile business area, for enterprise customers around the world. Some of the applications and solutions in its VAS mobility portfolio are enterprise mobility, mobile device management, Corporate BRN, CIS, Connected Workforce, mobile and message recording, and mobile security.

Combination of features: Singtel combines a strong networking portfolio with professional monitoring and service-level agreement (SLA) fulfilment services across all network fulfilment areas from core to edge, including mobile end device. Some of these mobile and edge offerings, including mobile business enablement, are incorporated with SDN features.

Caution

Singtel is perceived as a more traditional provider in mobile enterprise compared to many of its competitors. Despite being known to be reliable, a more advanced portfolio may be required to ensure Singtel's leadership position for the next 12 months.

2019 ISG Provider Lens™ Leader

Singtel has a strong pedigree of innovative and reliable network delivery for enterprises, particularly in APAC.

T-SYSTEMS

Overview

T-Systems has a comprehensive portfolio of business mobility VAS products, particularly in the management and security areas, which are developed in-house as well as in conjunction with its wide partner network. EMM has all the functionalities that are expected in an MDM delivery. It also includes applications and services in the VAS category, such as expenses management, BYOD/COPE/COBO management and functionality, multi-level security add-ons, and unified endpoint management (UEM) by Workspace ONE (helps companies intelligently manage all endpoints, operating systems and applications).

Strengths

Consultative-led customized solutions: T-Systems can identify the most suitable components of EMM during an in-depth consultation process. It helps clients choose the provider and services that best fit their individual requirements.

Flexible device ownership models: From bring your own device (BYOD), corporate owned, personally enabled (COPE) and corporate owned, business only (COBO) to Extended Enterprise in a model allows clients to provide business partners with secure access (from their devices) to parts of the backend network via managed containers.

Vendor agnostic with different delivery models: The firm can choose among many differing technology leaders to ensure neutrality, with a choice of an optimum delivery method (including public cloud, private cloud, or on-premises) to address client requirements.

Caution

T-Systems has a significant and advanced portfolio of solutions. However, few of its off-the-shelf options appear available for light customization, with few use cases quoted. As a result, many enterprises tend to believe that the consulting and selection process is more time consuming than the implementation itself.

2019 ISG Provider Lens™ Leader

T-Systems provides a comprehensive mobile enterprise service portfolio (VAS), coupled with significant and deep consulting expertise for selection and implementation.

VERIZON

Overview

Verizon has a truly global operation with on-premises coverage in 184 global locations in 67 countries. Verizon has a long history of competing for enterprise market share by offering discrete and mobile value-added solutions (VAS) to enterprises. Although not initially an early adopter of SDN, the firm has embraced it as a delivery and enabling mechanism to support its network services mobility VAS offerings.

Strengths

Portfolio coverage and scope: Verizon has a comprehensive portfolio of mobility VAS focused on enterprises, covering critical areas such as mobile device management, voice cypher, (security) wireless private networks and business continuity. Discrete products such as push to talk, field force manager and business messaging are offered across industries.

Pantheon of partner and in-house solutions in business mobility applications: Verizon offers an array of mobile business solutions that gives enterprises access to some of the industry's most innovative products and services, with the added benefit of working with one source and one bill. With 15 partners as well as its own Verizon Connect product, the company covers spectrum of requirements, from MobileIron to Office365.

Strong in-house and partner consultancy-led engagement principle: Verizon advisors can help build a comprehensive digital strategy that prioritizes mobility, business security and productivity, and supports automated device deployments. The company has also partnered with more than 40 professional services companies, offering a broad variety of service specialties, geographic strengths and certifications.

Caution

Verizon must sustain its leadership position in the overall market. It must effectively fend off competitors, particular those from Asia which offer strong product portfolios from their partners, many of which are part of Verizon's network.

2019 ISG Provider Lens™ Leader

Verizon has a solid, innovative portfolio that is enhanced significantly by its partner offerings under the Verizon management banner.

VODAFONE

Overview

Vodafone primarily operates services in the regions of Asia, Africa, Europe and Oceania. Among the mobile operator groups globally, it has been ranked fourth in terms of mobile customer base (circa 650 million) as of 2018. The firm owns and operates networks in many countries and has partner networks in others. Its Vodafone Global Enterprise division provides telecommunications and IT services to corporate clients in 182 countries with own PoPs in 74. It is a strong proponent of NFV/SDN and SDN and supplies enterprise-focused services in those areas as well as mobile and VAS mobile products and services.

Strengths

Expert practitioners for customized solutions: Vodafone can identify the most suitable components of EMM for clients during an in-depth consultation process led by its professional services group. It does not apply a "one size fits all" approach.

Flexible applications and VAS groupings: The group applies different models to ensure that specific enterprise needs are met with VAS deployments. The practice areas of EMM, device lifecycle management, Vodafone device manager cloud (VDM Cloud), Red Flex, central ordering, global telecoms reporting and telecoms lifestyle assessment widely cover enterprise requirements.

Vendor agnostic with different delivery models: Many differing technology leaders can be chosen to ensure neutrality, with a choice of an optimum delivery method to suit the client.

Caution

Vodafone has an extensive and advanced portfolio of solutions but has few use cases and examples for reference. As a result, many enterprises believe that the consulting and customization process is demanding and time consuming.

Vodafone still lacks coverage (covers 25 cities directly, with partnering to reach others) and visibility in the critical North American region.

2019 ISG Provider Lens™ Leader

Vodafone provides a comprehensive mobile enterprise (VAS) service portfolio, coupled with deep professional services ability and industry vertical knowledge.

RISING STAR: APCELA

Overview

Apcela is continuing its impressive transition into an enterprise-centric provider of deterministic networking services, aligning enterprise application and network performance requirements. The firm offers NaaS-oriented products that are based on its AppHUB platform. It also offers low latency with high frequency SD-WAN as a service based on its modular Alpha platform. The company has an impressive private network ability and operates in 185 locations across 43 countries with more than 70 cloud hubs. Apcela's strong partnering capabilities with other providers and gateways enable it to efficiently deliver managed SD-WAN solutions including mobile accelerators and secure applications on mobile.

Strengths

Expanding products and service range: Apcela has expanded its range of offerings and services to include application acceleration for Office 365 and distributed security. This is further supported with Apcela's AppHub Platform, global network services and professional services practices, and mobility products accelerating applications.

Impressive growth and coverage: Apcela has a smaller revenue share compared to many leaders in the SDN transformation services space. However, its enterprise business units are growing rapidly at a 35 percent CAGR, accounting for over 60 percent of all revenues with 35 percent YoY growth in new enterprise clients. This has led to new practices and many new clients being added in new global locations.

Caution

The new SD reference cases (while mobility enabled) often move further away from mobile-focused trading or secure mobile accelerated applications, which were previously a delivery focus area for the company.

2019 ISG Provider Lens™ Rising Star

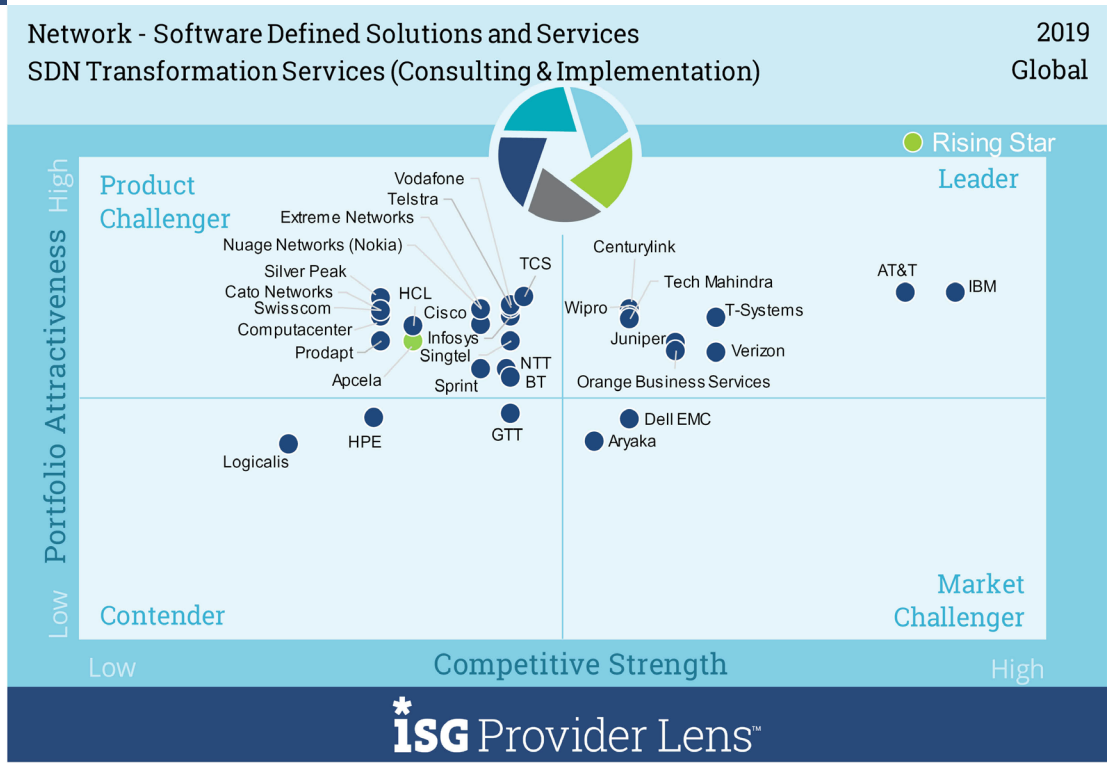
Apcela is rapidly gaining prominence in the SD-WAN and SD networking space, including mobile VAS globally.

SDN TRANSFORMATION SERVICES (CONSULTING & IMPLEMENTATION)

Definition

Traditionally, modifications or new installations of IT devices in a data center and its external WAN networks involved making changes to each network component, which could take days or longer. This traditional, rigid architecture has been increasingly challenged by today's business requirements for more agility, flexibility, automation and security enhancements. Private, public and hybrid cloud computing, explosive mobile application usage in the workplace, internet of things (IoT), Industry 4.0, big data and infrastructure as a service (or XaaS) now require a flexible network environment that can adapt to changes quickly and with minimum human intervention.

SDN and NFV are making strides towards responding to some of these issues using network abstraction. SDN and NFV differ in how they separate functions and abstract resources. SDN abstracts physical networking resources (switches, routers, etc.) and moves the decision-making process to a virtual network control plane that would determine where to send traffic, while the hardware continues to direct and handle the traffic. It uses an open source protocol, such as OpenFlow, to enhance/enable this. NFV is aimed at virtualizing all physical network resources beneath a hypervisor, which allows the network to



Source: ISG Research 2019

SDN TRANSFORMATION SERVICES (CONSULTING & IMPLEMENTATION)

Definition (cont.)

grow without the addition of more devices. NFV has higher vendor-dependant element reliance and does not benefit from an overriding protocol supported by multiple vendors in a consortium. While both SDN and NFV make networking architectures more flexible and dynamic, they perform different roles in defining those architectures and the infrastructure they support.

SDN architecture separates the control plane from the data plane and introduces several layers that are managed by software-defined policies and rule-based controls and management. The network elements are configured, administrated and controlled centrally by a separate software-based SDN controller or multiple SDN controllers. The data transport path and routing, including the quality of service level, bandwidth assignment, provisioning and modification of switches and hubs and their rules, are performed automatically. Overall security is maintained from the edge to the data center. Based on the centralized network infrastructure management and the open architecture provided by SDN product vendors, it is also possible to use SDN-enabled third-party switches, including white box switches at low price points (also used in hyperscale data centers). These switches help reduce costs and vendor lock-in risks. Applications and new network services can be provisioned rapidly on a management platform, which are all converged into a single-pane-of-glass type dashboard. This platform often combines a view of all network tasks and incidents plus all the applications and programs that are running. The controller provides a complete overview of applications, network components and data throughput rates; problems are detected and resolved quickly.

SD-WAN provides the benefits of SDN technology to traditionally hardware-based networking. It is an overlay architecture with a networking foundation that is much easier to manage than legacy WANs. It essentially moves the control layer to the cloud and, in the process, centralizes and simplifies network management. This overlay design abstracts software from hardware, enabling network virtualization and making the network more elastic. SD-WAN architecture reduces recurring network costs, offers network-wide control and visibility, and simplifies the technology with zero-touch deployment and centralized management. The key aspect of this architecture is its ability to communicate with all network endpoints without the need for external mechanisms or additional protocols.

SDN TRANSFORMATION SERVICES (CONSULTING & IMPLEMENTATION)

Definition (cont.)

Advisory and consulting companies have been highly active in assisting enterprises in the transition from traditional networking to NFV/SDN and SD-WAN. They are also increasingly engaged in project management, implementation assistance, or as the "front end" of partnering with vendors or consortiums related to implementation. Managed SD-WAN suppliers have been increasingly active as both managed network services providers (MNS) and as suppliers of complete and partial solutions to other traditional MNS companies. MNS providers have been aggressively marketing complete SD-WAN solutions as managed services packages to enterprises as replacements or alternatives to traditional managed WAN solutions.

SD-WAN is expected to see a high uptake by enterprises that are seeking a managed service alternative to their WANs, with aggressive growth in both pan-European and Asia Pacific regions during 2019–21.

Eligibility Criteria

- Product/service portfolio coverage, completeness and scope
- Ability to deliver in consulting and implementational areas
- Understanding of overall market and contributions to it
- Scope of partnerships and offerings; management capability for the needed orchestration within a customer project
- Stability and roadmap planning of the provider
- Reference customer/solutions in post pilot/commercial deployment
- Competitiveness of offering and types of commercial terms

SDN TRANSFORMATION SERVICES (CONSULTING & IMPLEMENTATION)

Observations

- **AT&T** has a vast array of business and technology streams in the networking space. It was early in realizing the potential benefits of SDN and SD-WAN, with its internal and external proofs of concept (POCs) taking place ahead of most of the other providers. The company has converted many of its POCs into commercial deployments, enabling it to issue dividends.
- **CenturyLink** has been ranked consistently as one of the top performing networking companies on the global stage. Its 2019 organization format, Adaptive Networking and IT Solutions, which include networking, hybrid cloud and IT solutions, security, voice and unified communications, and managed services & IT consulting business units, is an impressive new line-up fully supported by products and services.
- **IBM** has been at the forefront of enterprise network and digital transformation for some time. Its managed service offerings are provided by IBM Global Technology Services (GTS), with additional focus from its telecom and media and entertainment divisions. IBM has an extremely strong portfolio of its own solutions along with a vast and well-qualified partner ecosystem that includes leading players. This enables the firm to deliver comprehensive, provider-agnostic solutions for enterprises, locally and globally.
- **Juniper** is a highly respected and well-known network equipment and solutions provider for many carriers internationally. It was an early proponent of NFV/SDN and SD-WAN. Juniper's Contrail SD-WAN solutions, which can be bought or licensed, cover end-to-end software-defined delivery from the customer premises equipment (CPE) to the cloud or service provider. Juniper offers full orchestration and in-built security and also covers MPLS, broadband internet and 4G/LTE transport paths.
- **Orange Business Services** is primarily focused on providing consulting services to ensure client requirements are met. Its SDN offerings include Flexible SD-WAN with full multi-network compatibility that is ensured through virtual SD-WAN gateways globally.
- **Tech Mahindra** has innovative and robust solutions and products, coupled with the best-of-breed solutions from partners such as AT&T FlexWare℠, Silver Peak and Rakuten, which allows it to deliver optimized solutions from its SD portfolio.

SDN TRANSFORMATION SERVICES (CONSULTING & IMPLEMENTATION)

Observations (cont.)

- **T-Systems** has an SD portfolio that is vast in coverage and deep in scope. It includes integrated SD-WAN, (managed end-to-end SD-WAN), managed overlay (SD-WAN selection dependent upon technology), IntraSelect SD-WAN (Cisco/Viptela solutions), and managed services (based on Riverbed, Silver Peak or Citrix). T-Systems offers custom and packaged solutions to specific industry verticals along with enterprise-wide packages in the SDN space. It covers end-to-end enterprise deployments and offers enhanced security through its Magenta Security portfolio.
- **Verizon** has a very large and comprehensive portfolio of SDN products and services such as virtual network services, Intelligence Edge, SDN 2.0, CX platform and business outcomes. These cover many areas such as artificial intelligence (AI), orchestration, 4G/5G, SD-WLAN, containerization, bring your own switch (BYOS), SD-LAN/SD-WAN integration and multi-vendor/multi-cloud.
- **Wipro's** SD network services portfolio falls under its "connected future" practice and includes data center networks, WAN, SD-WAN and SDN/NFV areas, utilizing Swift SDN and WANFreedom. The company offers consulting-led delivery of both off-the-shelf solutions and highly tailored client-specific solutions. Delivery is supported throughout the operational deployment and is managed by a vast array of toolsets, products and processes.
- **Apcela** is continuing its impressive transformation into an enterprise-centric provider of deterministic networking services, aligning enterprise application and network performance requirements. The firm has network as a service (NaaS)-oriented products that are based on its AppHUB platform. It also offers low latency with high frequency SD-WAN as a service based on its modular Alpha platform.

AT&T

Overview

AT&T has a vast array of business and technology streams in the networking space. It was early in realizing the potential benefits of SDN and SD-WAN, with its internal and external proofs of concept (POCs) taking place ahead of most of the other providers. This has evolved over time to form a distinct focus and provisioning areas in SDN, SD-WAN and access, as well as integrated management and security of the whole offering. AT&T is continuing to implement SDN with NFV and SD-WAN across its own network and business centers.

Strengths

Strong positioning and capabilities: Through its business and government units, AT&T is positioned to supply partial or complete network solutions and replacements, upgrades/hybrids to existing networks, hybrid MPLS (existing)/private data net solutions, private IP VPN, cloud-based networking, application acceleration and mobile applications with SD network functionality and full or partial managed service solutions.

Industry wide influence: AT&T is involved in most of the industry groups related to SDN and it contributes to the overall roadmap of the technology in the global industry area.

Portfolio scale, depth and breadth: AT&T has a vast internally developed portfolio of products and services such as AT&T FlexWare℠ and AT&T Network on Demand. It also offers best-of-breed products and services from its extensive partner ecosystem, managed and steered by its highly skilled professional services/consulting arm that has deep expertise in technical, business and industry areas.

Caution

AT&T must overcome the perception of many enterprises, particularly (but not exclusively) mid-sized businesses, that its solutions are only applicable to enterprises with large staff and in-house technical solutions that they want to maintain.

2019 ISG Provider Lens™ Leader

AT&T has an extensive SD networking portfolio coupled with highly effective consulting resources and excellent reference clients globally.

CENTURYLINK

Overview

CenturyLink has been ranked consistently as one of the top-performing networking companies globally. Its 2019 organization format, Adaptive Networking and IT Solutions, has an impressive new line-up of fully supported products and services that cover networking, hybrid cloud and IT solutions, security, voice and unified communications, managed services, and IT consulting business units. With an extensive combination of its own portfolio assets, recent portfolio announcements, own infrastructure network and partner network of products, infrastructure and services, CenturyLink has a solid set of offerings for clients.

Strengths

Reach and scale: CenturyLink offers a full range of MPLS-VPN, hybrid WAN, ethernet, wavelength and broadband connectivity, public and private cloud connections. Its combined network reach and scale position it as a strong service provider on the global stage.

Breadth of offering in SD and beyond: CenturyLink has a range of offerings that cover network business units, SD-WAN, managed enterprise networks, Cisco Meraki, content services, managed services and IT consulting, making it a solid and dependable provider in the SD space. The company is extending its service offerings to other business units, which its consulting group takes into account. This makes it a one-stop shop for all current and future enterprise network needs.

Deep industry verticals know-how: CenturyLink has examples of numerous implementations and case studies of significant players from different industries such as manufacturing, precision engineering, food and beverage, and medical/recycling.

Caution

CenturyLink has a strong foothold in Europe and the Americas, but it lacks a deep presence in APAC and Africa. The firm is aiming to achieve a truly global position with strong client references in all regions by 2020.

2019 ISG Provider Lens™ Leader

The company has an extensive portfolio, robust infrastructure, vast partner ecosystem and competent consulting unit, which are important aspects for a provider to maintain its position on the global stage.

IBM

Overview

IBM has been at the forefront of enterprise network and digital transformation for some time. Its managed service offerings are provided by IBM GTS, with additional focus from telecom and media and entertainment divisions. It has a strong portfolio of its own solutions along with a vast partner ecosystem of leading players. The firm delivers comprehensive, provider-agnostic solutions locally and globally. IBM is continuing to expand its network engineering, integration and innovation services in GTS.

Strengths

Core to edge coverage: IBM has a strong visionary approach to SDN and SD-WAN. With the provisioning of SDN services, IBM is building a core-to-edge story from the integration of end-user devices, delivery of cloud-based applications, high security options and innovative network services.

Global coverage, portfolio and innovation: IBM has an almost unrivaled global footprint and is a well-established provider of network and technology infrastructure, integration and operation services. It was one of the first suppliers to offer a NaaS delivery and pricing model and is continuing to innovate in this area.

Unparalleled product portfolio: IBM has a strong portfolio of its own network, service and security solutions. The firm is also expanding its world-class partner ecosystem of major players in the SDN, SD-WAN, multi-cloud network and multi-network integration space, along with business and network products, applications and services. These assets, coupled with IBM consulting and project management abilities as well as deep industry vertical expertise, allow it to deliver comprehensive, provider-agnostic solutions for enterprises.

Caution

IBM appears to be positioned strongly in the large and high-end, mid-market enterprise segments. The adoption of NaaS could turn the entire mid-sized enterprise segment into a potential client base. To achieve this, the firm may have to re-model its sales channel costs and approach methods.

2019 ISG Provider Lens™ Leader

IBM has built a world-leading, end-to-end vendor-agnostic SDN proposition, coupled with high competence consulting and innovative pricing options.

JUNIPER

Overview

Juniper is a highly respected and well-known network equipment and solutions provider to many carriers internationally. It is an early proponent of NFV/SDN and SD-WAN. It has fully embraced the multi-vendor, agnostic supplier network concept as well as multi-delivery channel networks, turning them into a reality. Its Contrail, NorthStar, NFX series and WANDL IP/MPLS products have an open interface and can be interchangeable at strategic points as per clients' requirements.

Strengths

Positioned to deliver partial or full end-to-end services: Juniper is positioned to provide partial or complete network solutions and replacements, upgrades/hybrids to existing networks, hybrid MPLS (existing)/private data net solutions or even complete MPLS replacement solutions. It can also supply to carriers or enterprises globally.

Productized off-the-shelf solutions: Contrail SD-WAN solutions, which can be bought or licensed, cover end-to-end SD delivery from CPE to the cloud or service provider. The firm offers full orchestration and in-built security and also covers MPLS, broadband internet and 4G/LTE transport paths.

Future safe: Contrail is a scalable and highly secure solution for a multi-cloud environment. It is an open interface and is designed to be highly evolvable.

Caution

Many enterprises had considered Juniper as either a technical solution/upgrade choice or as a carrier supplier rather than an enterprise network solution supplier. Although this perception has changed, the company must put in more effort to prove that it has the expertise and products, including the knowledge and ability to deliver complete corporate-level network solutions, both independently and with its partners internationally.

2019 ISG Provider Lens™ Leader

Juniper is a well-respected mature provider with a deep technical understanding of the SDN/SD-WAN market and strong delivery capabilities.

ORANGE BUSINESS SERVICE

Overview

Orange Business Services covers a large range of network services worldwide such as MPLS, SD-WAN and internet services. These can be integrated or combined with managed security, WAN optimization and application visibility services, provided either on appliance or on VNF and on various levels of service management. Multi-sourcing integration (MSI) which is offered as a service takes care of multi-vendor and multi-network type integration and management. Orange Business Services is highly focused on providing consulting services to ensure client requirements are fully met.

Strengths

Excellent coverage and partnership constellation: Orange Business Services offers a large coverage through its core network and partnerships. It provides full compatibility with Flexible SD-WAN through virtual SD-WAN gateways, allowing easy migration from traditional WAN to SD-WAN.

Out-of-the-box ease, coupled with customization: Flexible SD-WAN is an automated, intelligent, global solution with on-demand virtualized services. It is centrally orchestrated for end-to-end performance and control. It ensures reliable performance, improved security and support for multiple connection types, cost control and high-quality end-user experience for business-critical applications.

Consultative, from POCs to commercial roll out: Orange Business Services adopts a highly collaborative, open and consultative approach. It demonstrates its trusted advisor capabilities to guide the client from the POC stage until commercial rollouts.

Caution

The SME marketplace has many small and new companies that have a strong local presence in APAC. This may erode the price point of the supply of managed services.

2019 ISG Provider Lens™ Leader

Orange Business Services offers strong consulting services and flexible products that can be easily customized as per client requirements in SD-WAN and transitional programs.

TECH MAHINDRA

Overview

Tech Mahindra has leveraged its experience from many SD-WAN transition programs worldwide to build a strong portfolio of off-the-shelf framework offerings as well as a strong consulting-led practice focused on customization to meet specific client requirements. It has a vast partner network and has made many strategic acquisitions and partnership investments over the last three years, all of which assist in the delivery of robust SD network propositions.

Strengths

Responsible approach: Tech Mahindra carries out significant and innovative developments, testing and quality assurance methods that leverage AI. It also offers continuous delivery models and established methods for streamlining and improving operations and management. All these services help the company accelerate and eliminate risk during SD deployments as clients move into commercial rollouts.

Strong portfolio and partnership offerings: Tech Mahindra has innovative and robust solutions and products, coupled with best-of-breed partner solutions such as AT&Ts FlexWare℠, Silver Peak and Rakuten, allowing it to deliver optimized solutions from its SD portfolio.

Technical competence: The company's strength lies in its consulting practice and in-house technologies. It has decades of experience in delivering to telecom service providers globally. Its extensive network expertise and transition programs make use of established methods and cloud/multi-cloud environments to deliver efficiently and at a full-enterprise scale

Caution

Shifting the core focus from telco and engineering to enterprise and managed services can impact delivery methods and team deployments unless care is taken to ensure momentum and equal servicing of both client categories with adequate staffing availability.

2019 ISG Provider Lens™ Leader

Tech Mahindra efficiently delivers comprehensive SDN products and services with a combination of innovative methods and tools and skilled consulting assets.

T-SYSTEMS

Overview

T-Systems provides high-quality service throughout Europe and many other international markets in the SDN space. It has strategic partnerships with network providers and many global industry group associations as well as best-of-breed solution providers of SDN products and services. Its SD portfolio includes Integrated SD-WAN (managed end-to-end SD-WAN), managed overlay (SD-WAN selection dependent on technology), IntraSelect SD-WAN (Cisco/Viptela solutions), and managed services (based on Riverbed, Silver Peak or VeloCloud). T-Systems offers custom and packaged solutions to specific industry verticals as well as enterprise-wide packages in this space. It also covers end-to-end enterprise deployments, together with enhanced security from its Magenta Security portfolio.

Strengths

Strong partner network: T-Systems has many strategic partnerships and supplier arrangements with providers such as Riverbed, Silver Peak, Cisco, VeloCloud. The company has coupled this ecosystem with a commitment to deliver high-quality and highly secure managed services.

Well-communicated on-track roadmap: The company's network portfolio is clearly structured and its innovation initiatives are defined and well-funded. Portfolio upgrades are strategically planned and executed, and the roadmap is shared with industry observers.

Ability and reliability: T-Systems has its own set of comprehensive and wide-reaching solutions along with deep knowledge in both the SDN space and traditional enterprise networks.

Caution

T-Systems has a larger portfolio compared to many of its competitors. However, it could provide more visibility on its offerings by publishing specific use cases for new and potential clients.

2019 ISG Provider Lens™ Leader

T-Systems provides a comprehensive, enterprise-wide SDN solution portfolio, along with reliability and scalability assurance.

VERIZON

Overview

Verizon runs global operations with on-premise coverage in 184 locations across 67 countries. The company has grown its enterprise business share over the year by adopting a strategic roadmap approach on SDN and SD-WAN. SDN is a major component of Verizon's technology platform for all service creation, provisioning and operations. It supports many products and is expected to underpin all wireless, fixed broadband, enterprise and converged wireless and wireline services. Verizon's strong technology strategy and flat monthly pricing models enable it to increase its market share and SDN product adoption.

Strengths

Portfolio coverage and scope: Verizon has a comprehensive portfolio of SDN products and services, including virtual network functions (VNFs), Intelligence Edge, SDN 2.0, CX platform and business outcomes. These services cover areas such as AI, orchestration, 4G/5G, SD-WLAN, containerization, BYOS, SD-LAN/SD-WAN integration and multi-vendor/multi-cloud — one of the widest portfolios we are aware of.

Huge array of partner and own solutions in SDN: Verizon has a variety of solutions, both managed and offered directly. Its clients have access to some of the industry's most innovative products and services from a huge array of partners, along with one source to work with and one integrated bill.

Strong in-house and partner consultancy-led engagement principle: Verizon's advisors can help build a comprehensive strategy that prioritizes SDN, business security and productivity while supporting business requirements. The firm has partnered with more than 40 professional services companies to offer a broad range of service and industry vertical specialties, geographic strengths and certifications.

Caution

Verizon should sustain its leadership position in the overall market. It must ward off competitors that offer innovative portfolios, including products from its partner base.

2019 ISG Provider Lens™ Leader

Verizon has an extensive innovative portfolio that is enhanced significantly by its partner offerings and business consulting capabilities.

WIPRO

Overview

Wipro's SD network services portfolio is based on the "connected future" practice and includes data center networks, WAN, SD-WAN and SDN/NFV areas, utilizing Swift SDN and WANFreedom services. Delivery is consulting-led, offering both off-the-shelf solutions and highly tailored client-specific solutions such as Wipro digital Designit, Insightix™, netFactory, ServiceNXT, Wipro SmartView for governance, Cloud Trust Security framework, Wipro HOLMES™ RPA/AI methods and toolsets. It also offers partner solutions and products from companies such as VMWare, Versa, Riverbed, HPE and Cisco and CloudGenix.

Strengths

Advanced productized SD-WAN offerings: Swift SDN is an approach wherein abstractions of lower level functions are used to programmatically control and manage network services. WANFreedom is an integration of multiple WAN tools and products that are bundled with single-pane-of-glass management. Its SDx security solution is an end-to-end highly secure SDN/SD-WAN system.

Existing network assessment and maturity, mapped to transition: Wipro Insightix™ measures maturity across 10 dimensions to assess the network readiness for the present, near future and future growth of the business. It gives a granular review of the network infrastructure along with an expert analysis of architecture, deployment and operational state of the network, which supports planning for SD transition.

Addressing rolling out to in-operation phases: Wipro provides a plethora of advanced tools and methods for commercially rolling out and managing SDN implementations. These also include AI and single-pane-of-glass management systems.

Caution

Wipro should focus more on industry-specific solution areas such as FSI, manufacturing and energy, medical, chemical production. The firm may be required to invest heavily in retraining to ensure and maintain the right level of expertise.

The firm has a plethora of tools and processes for clients in the SDN space. Clarity and use case models are required as enablers for new clients.

2019 ISG Provider Lens™ Leader

Wipro produces world-class innovative solutions backed by expertise, toolsets, methods and processes.

RISING STAR: APCELA

Overview

Apcela is continuing its impressive transition into an enterprise-centric provider of deterministic networking services, aligning enterprise application and network performance requirements. The company has NaaS-oriented products based on the AppHUB platform as well as low latency with high-frequency SD-WAN as a service based on the modular Alpha platform. It has an impressive private network ability, operating in 43 countries with more than 70 cloud hubs. Apcela has hybrid private/public offerings along with strong partnering capabilities to efficiently deliver its managed SD-WAN solutions to enterprises.

Strengths

Expanding products and service range: Apcela has expanded its range of offerings and services to include managed SD-WAN services, network analytics platform, application acceleration for Office 365, and distributed security. These are further supported by the AppHub platform, global network services and professional services practices.

Impressive growth and coverage: Apcela has a smaller revenue share compared to many leaders in this space. However, its enterprise business units are growing rapidly at a 35 percent CAGR, accounting for over 60 percent of all revenues with 35 percent YoY growth in new enterprise clients. This has led to new practices and many new clients being added in new global locations.

Heritage leveraged: Apcela has a highly reputable heritage in the financial services and trading markets. It also has an enviable track record of delivering managed trading platforms and SD-WAN in this critical and secure industry. The company has effectively leveraged this into new industry verticals and new markets, gaining excellent references in return.

Caution

Apcela must demonstrate new SD reference cases to a wider audience in order to increase awareness of its SD-WAN and managed SD-WAN offerings.

2019 ISG Provider Lens™ Rising Star

Apcela has become a prominent provider in the SD-WAN and SDN space owing to its high innovations and mission-critical toolsets.

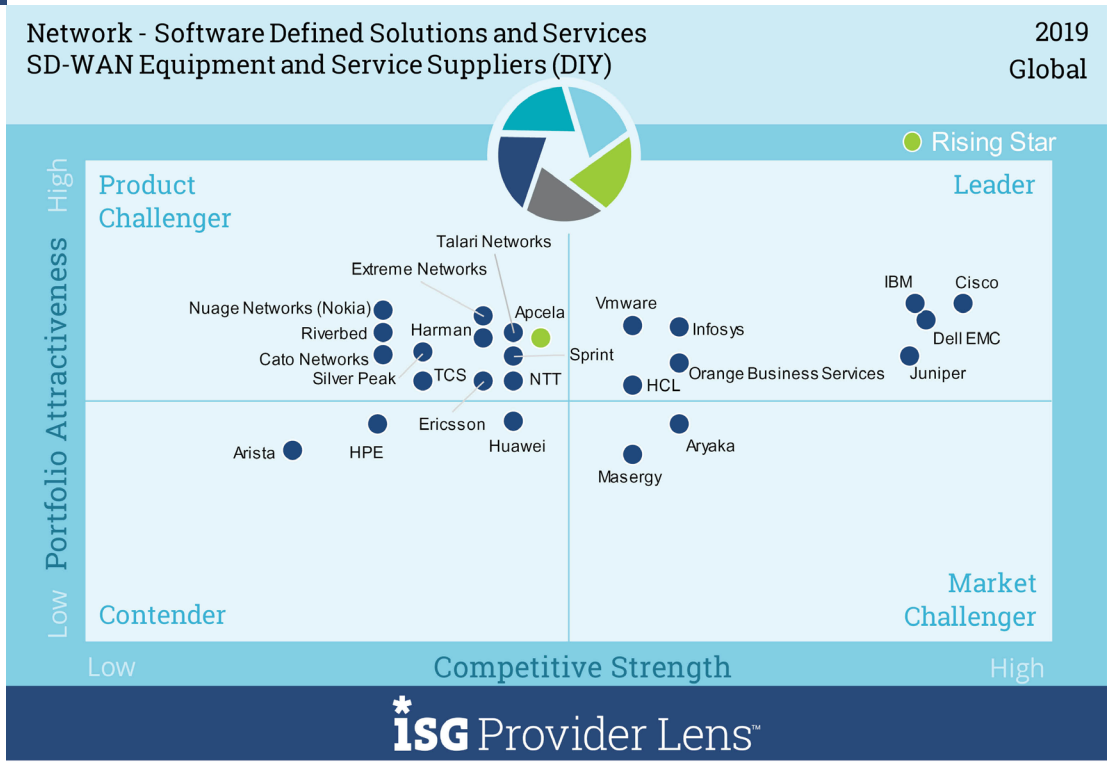
SD-WAN EQUIPMENT AND SERVICE SUPPLIERS (DIY)

Definition

This segment examines those providers of equipment and services (ranging from partial WAN supply to entire end-to-end SD-WAN offerings) directly for the enterprises' own (or third-party) operations rather than those delivering SD-WAN solutions as a managed service.

SD-WAN provides the benefits of SDN technology to traditional hardware-based networking. It is an overlay architecture providing a networking foundation that is much easier to manage than legacy WANs. It essentially moves the control layer to the cloud and, in the process, centralizes and simplifies network management. This overlay design abstracts software from hardware, enabling network virtualization and making it more elastic.

The SD-WAN architecture helps to reduce recurring network costs, offers network-wide control and visibility, and simplifies the technology with zero-touch deployment and centralized management. The key aspect of the architecture is its ability to communicate with all network endpoints without the need for external mechanisms or additional protocols.



Source: ISG Research 2019

SD-WAN EQUIPMENT AND SERVICE SUPPLIERS (DIY)

Definition (cont.)

During the last 10 years, most companies have used multi-protocol label switching (MPLS) technology to transport data packets from A to B — an expensive but reliable transmission option for business-critical applications. Partly due to the proliferation of non-business critical traffic over WANs (such as social media, non-enterprise application use, informal messaging and video stream communications between colleagues), many enterprises require fast and flexible WAN connections to cloud providers and their own global offices with high bandwidth but lower criticality guarantees and price points.

SD-WAN is a virtual WAN that allows enterprises to bundle multiple WAN technologies and connections, such as MPLS, broadband internet, LTE and ethernet, and provision them as overall bandwidth. SD-WAN determines the path for transmitting data packets and the medium to be used. If a connection has too much load, another path is taken automatically. The virtual connections consist of multiple paths that are used in parallel. If one path fails, transmission is continued by simply taking another path. Available products ensure 256-bit tunneled encryption. A policy-based controller is used to influence paths and connections. For example, a controller may transmit critical applications via MPLS only and other applications only via internet broadband connections or other technologies to ensure high-performance transmission of data, voice and video files. The controller or a management console is used to define rules that are applied automatically, for example, to speed up the data transfer of critical application or to route non-business-critical traffic to lower-cost transport methods. Based on the multiple paths of the virtual WAN environment, data transfers are accelerated, and bandwidths and costs can be reduced.

Cost reductions related to SD-WAN introduction can be highly significant. End users also have the option to give up parts of their high cost, rigid MPLS connections. They are not bound to use one carrier anymore but can order an optimal connection individually via a colocation hub provider in the short term. Although SD-WAN is still in its infancy, there is a growing interest in the technology as well as in associated NFV.

SD-WAN EQUIPMENT AND SERVICE SUPPLIERS (DIY)

Eligibility Criteria

- Product/service portfolio coverage, completeness and scope
- Ability to deliver equipment and service to customer, inclusive of prerequisite training
- Understanding of overall market area and contributions to that area
- Scope of partnerships and offerings, management capability for the needed orchestration within a customer project
- Openness of offering to avoid vendor lock-in
- Completeness of customer support and assistance post delivery
- Stability and roadmap planning of the provider
- Reference customer/solutions in post pilot/commercial deployment
- Competitiveness of offering and types of commercial terms

Observations

- **Cisco** is very successful with its Intelligent WAN (IWAN), Meraki SD-WAN company and branch technologies and solutions, as well as its Cisco SD-WAN (Viptela) product and service range. The firm also offers a full portfolio of SD-WAN hardware (ASR/ISR 1000, ISR 4000, routers, vEdge routers, etc.) and management systems, such as vManage, and cloud enablement such as Cisco Cloud onRamp.
- **Dell EMC** develops, delivers and supports information infrastructure and virtual infrastructure technologies, solutions and services. The company is traditionally known for its server and data center equipment and services but is rapidly growing in importance in the networking and SDN space following its acquisition of VMware – VeloCloud.
- **HCL** is continuing to invest in building industry-leading, differentiated tools for optimized network automation and management. These include NetBOT (automated network management), HCL Sensus (SDN), HCL TIS (SD-WAN), HCL Nucleus (automated wireless management), and HCL Rendezvous (AI-enabled collaboration). The company has an enviable list of reference clients and high visibility projects worldwide within its general and software-defined portfolio.

SD-WAN EQUIPMENT AND SERVICE SUPPLIERS (DIY)

Observations (cont.)

- **IBM's** solutions may be full-enterprise SD-WAN or partial/branch SD-WAN/intelligent edge and hybrid private/public cloud-enabled. SD-WAN migration services can be delivered as part of the overall engagement led by IBM's consulting resources.
- **Infosys** delivers network as a service (NaaS)-based enterprise network transformation to SD-WAN, with a "consumption made easy" approach to more than 25 countries. It has more than 2,000 full-time employees with strong experience in network and services delivery, supported by a team of consulting/industry specialist advisors.
- **Juniper** has a wide portfolio of hardware and software solutions that can address nearly all the SDN requirements of enterprises. It often adopts automated, open and standards-based approaches. Products such as Contrail, NorthStar, NFX series and WANDL IP/MPLS tend to be an open interface and can be interchangeable at strategic points as per clients' requirements.
- **Orange Business Services** delivers via its Flexible SD-WAN solution that can be combined with managed security, WAN optimization and application visibility services These services are provided either on appliance or VNF and through various levels of service management. Multi-sourcing integration (MSI), which is offered as a service, takes care of multi-vendor and multi-network type integration and management.
- **VMware** SD-WAN by VeloCloud™ is VMware's flagship SD-WAN solution (acquired VeloCloud™ in December 2017). It is delivered in cloud, hybrid cloud and on-premise versions. Its primary solutions are SD-WAN Gateway, SD-WAN Edge and SD-WAN Orchestrator.
- **Rising Star Apcela** is continuing its impressive transformation into an enterprise-centric provider of deterministic networking services, aligning enterprise application and network performance requirements. The firm has network as a service (NaaS)-oriented products that are based on its AppHUB platform. It also offers low latency with high frequency SD-WAN as a service based on its modular Alpha platform.

CISCO

Overview

Cisco is a global company with its headquarters in San Jose, California. It offers a broad array of infrastructure hardware and software, including switches, routers, network optimization support (NOS), SD-WAN, Intelligent WAN (IWAN), WAN hardware and software, and the requisite control, management and automation capabilities for them. It also offers consulting/advisory services related to these activities and to general business areas related to current and future technology for a wide range of industry verticals. Cisco is relevant in nearly all verticals and geographies globally.

Strengths

Vast portfolio coverage: Cisco's portfolio includes IWAN, Meraki SD-WAN and branch technologies and solutions, as well as Cisco SD-WAN (Viptela) product and service range. The firm also offers a full portfolio of SD-WAN hardware (ASR/ISR 1000, ISR 4000, routers, vEdge routers, etc.), management systems such as vManage, and cloud enablement such as Cisco Cloud onRamp for co-location. It can demonstrate numerous U.S. and global installations among end-user organizations, service providers and carriers.

Tiered usage pricing plans: Cisco provides SD-WAN solutions to enterprises and offers usage subscription in three tier levels with 1,3 and 5-year plans.

Key supplier status in most implementations: Most of the enterprises and carriers in the enterprise network service provisioning market consider Cisco as one of the key equipment providers in the SDN/SD-WAN space and as one of their partner/supply companies.

Caution

Cisco appears to be present in all supply areas of the market and sometimes faces direct competition with key (partner) clients within the same RFI/RFQ/bids. It is sometimes involved in procurement proposal situations, where its equipment is represented in all offers. Although commercially enviable in the short term, vendors have historically found this to be a risky situation.

2019 ISG Provider Lens™ Leader

Cisco is a strong leader in the market for SD WAN equipment and services.

DELL EMC

Overview

Dell EMC is a large privately held company headquartered in Hopkinton, Massachusetts, providing a broad range of IT products and services to enterprises and service providers. The company develops, delivers and supports information infrastructure and virtual infrastructure technologies, solutions and services. It is traditionally known for server and data center equipment and services but has been rapidly gaining prominence in the SDN space following its acquisition of a majority stake in VMware/VeloCloud.

Strengths

Extensive new range: Dell EMC has rolled out new edge, network and customer premises equipment (CPE) last year, all of which have proved popular. The strategic acquisition of VMware/VeloCloud has given the company significant capabilities in the SD-WAN equipment and services market.

Ready, out of the box: The firm's new open universal customer premises equipment (uCPE) and the Virtual Edge Platform (VEP) family are pre-tested and configured to work seamlessly with Silver Peak Systems, VeloCloud Networks and Versa Networks. This expands its reach to enterprises, service providers and carriers.

Caution

Many enterprises still consider Dell EMC as a supplier of only servers and technologies and do not acknowledge the networking element of its business. The firm should demonstrate its abilities in the SDN space by leveraging its partners (VMWare, VeloCloud, Versa, Silver Peak Systems).

2019 ISG Provider Lens™ Leader

Dell EMC is aggressively competing in this space with its range of high-quality solutions, especially when combined with its strategic partners offerings.

HCL

Overview

HCL has 124,000 employees spread across 41 countries and generated around $8 billion in revenue in 2018. The company is continuing to invest in building industry-leading, differentiated tools for optimized network automation and management. Some of these include NetBOT (automated network management), HCL Sensus (software-defined networks), HCL TIS (SD-WAN), HCL Nucleus (automated wireless management) and HCL Rendezvous (AI-enabled collaboration). The company has an enviable list of reference clients and high visibility projects worldwide within its general and software-defined portfolio.

Strengths

Knowledge and execution: HCL has deep in-house knowledge and capabilities in all areas of networking and transformation. It also has significant expertise in consulting and scalable implementations based on a wide platform of technology. The company has proven its ability to deliver POCs and pilots and scale them into global enterprise-wide or divisional deployments.

Strong ecosystem: HCL has an impressive pantheon of partners, co-invested partners and acquired companies. Each of them brings specific expertise to the overall HCL and SDN family of offerings and capabilities.

Industry scope: HCL is active in a wide array of industries and specific industry sub-sectors. It also has impressive references of client success.

Caution

Maintaining a smooth functioning collaborative ecosystem of internal resources and partner companies is a challenging task. Although HCL seems to be capable in this respect, it should exercise caution in future activities with a focus on this vital area.

2019 ISG Provider Lens™ Leader

HCL delivers innovative and scalable enterprise network-level solutions in the SDN space.

IBM

Overview

IBM has been at the forefront of enterprise network and digital transformation for some time. Its SDN offerings are led by IBM Global Technology Services (GTS), with additional focus from its telecom and media and entertainment industry divisions. With an extremely strong portfolio of its own solutions and a vast partner ecosystem of leading players in SDN and SD-WAN, IBM is able to deliver comprehensive, provider-agnostic solutions for enterprises.

Strengths

Strong portfolio of offerings: IBM has an exceptionally strong portfolio of its own solutions and a partner ecosystem of leading players in the SD-WAN and networking products markets. This enables the firm to deliver comprehensive, innovative and low-risk solutions for enterprises.

Multiple-solution options: Solutions may be full-enterprise SD-WAN, partial or branch SD-WAN/intelligent edge, hybrid private/public cloud enabled, involve data centers and IT infrastructure, fully/highly secure, or an MPLS replacement. SD-WAN migration services can be delivered as part of the overall engagement by utilizing IBM's consulting resources.

Unrivaled global coverage, portfolio and innovation: IBM has an almost unrivaled global footprint and is a well-established provider of network and technology infrastructure, integration and operation services globally. The firm was one of the first suppliers to offer a NaaS delivery and pricing model and it continues to innovate in this area.

Caution

IBM appears to be positioned strongly in the large to high-end mid-market enterprise segments. The adoption of NaaS could turn the entire mid-sized enterprise segment into a potential client base. The firm should carefully assess its sales and delivery costs to achieve this and gain a competitive edge.

2019 ISG Provider Lens™ Leader

IBM is a world-leading provider of vendor-agnostic SDN/SD-WAN offerings with innovative pricing options.

INFOSYS

Overview

As of 2017, Infosys is the second-largest Indian IT company and the 596th largest public firm in the world based on revenue. On September 28, 2018, its market capitalisation was $44.32 billion. Infosys has a deep background in technology and networks engineering. It has long-standing engagements with carriers, service providers, and enterprises in the migration and transformation areas. The firm has recently shifted its focus to SDN and NFV. It has introduced innovative AI, robotics and advanced toolsets in the networking space, while retaining its core consulting and engineering competencies.

Strengths

NaaS model SD deployments: Infosys enables SDx-focused enterprise network transformation and employs a "consumption made easy" approach to supply to more than 25 countries. It has over 2,000 employees with extensive experience in network and services delivery, supported by a strong team of consulting/industry specialist advisors. Its experience in migration and transition can be applied to enterprise network transitions to de-risk the process.

Wide software-defined solution set: Infosys offers core SD-WAN, NaaS and network transformation services, ROBO (remote office, branch office), and service design network. Its portfolio also includes ServiceNow toolsets for delivery and management of customer services, with a WIFI-first current structure but 5G on the roadmap.

AI and robotics-driven developments and optimization: The Nia platform (formerly MANA) converges data analytics (potentially from Infosys Information Platform [IIP]), machine learning, knowledge management and cognitive automation capabilities. It enables a wide set of industry and function-specific solutions as part of the new SD network business delivery.

Caution

Many enterprises regard Infosys as supplier of only technologies. The firm should focus more on demonstrating its abilities in the SDN space.

2019 ISG Provider Lens™ Leader

With its innovative processes, toolsets and methods, Infosys is positioned as a world-class provider of SD-WAN for enterprises.

JUNIPER

Overview

Headquartered in Sunnyvale California, Juniper is a well-known provider that caters to carriers, larger service providers, and selected enterprises globally. It has a strong science-grounded approach to SDN/SD-WAN and has a large ecosystem of supportive partners in the carrier and delivery areas. It has an extensive portfolio of hardware and software solutions that can address nearly all SDN requirements of enterprises and often employs automated, open and standards-based approaches. Products such as Contrail, NorthStar, NFX series and WANDL IP/MPLS tend to be an open interface and are interchangeable at strategic points as per clients' requirements.

Strengths

Positioned to deliver to carrier or enterprise: Juniper is well positioned to provider partial or complete network solutions and replacements to carriers and enterprises on a global basis.

Productized off the shelf solutions: Contrail SD-WAN solutions, which can be bought or licensed, cover end-to-end SD delivery from CPE to the cloud or service provider. They offer full orchestration and in-built security and also cover MPLS, broadband internet and 4G/LTE transport paths.

Future safe: Contrail is scalable and highly secure for a multi-cloud environment. It has an open interface that is designed to be highly evolvable.

Caution

Juniper appeals strongly to large and larger mid-sized enterprises as well as carriers. However, other enterprises may not be aware of its capabilities apart from being an equipment provider to large-scale customers. This must be rectified if the company wants to increase its presence in the smaller end of the mid-sized enterprise market.

2019 ISG Provider Lens™ Leader

Juniper is a well-respected mature provider with deep technical understanding of the SDN/SD-WAN market and strong delivery capabilities.

ORANGE BUSINESS SERVICES

Overview

Orange Business Services covers a wide range of network services such as SD-WAN, (Flexible SD-WAN) and internet services, which can be integrated or combined with managed security, WAN optimization and application visibility services. These services can be provided either on appliance or on VNF and with various levels of service management. Its MSI service takes care of multi-vendor and multi-network type integration and management. Orange Business Services is highly focused on providing consulting services to ensure that client requirements are met.

Strengths

Excellent capabilities and partnership delivery: Orange Business Services has large coverage through its core network and partnerships. It offers full compatibility with Flexible SD-WAN through virtual SD-WAN gateways, allowing easy migration from traditional WAN to SD-WAN.

Out-of-the-box solution coupled with ease and customization: Flexible SD-WAN is an automated, intelligent, global solution with on-demand virtualized services. It is centrally orchestrated for end-to-end performance and control. It ensures reliable performance, improved security and support for multiple connection types, cost control and high-quality end-user experience for business-critical applications.

Consultative from POC to commercial roll-out: Orange Business Services follows a highly collaborative, open and consultative approach. The company demonstrates its trusted advisor capabilities to guide the client from POCs to commercial rollouts.

Caution

Many small systems integrators and advisory companies in specific geographies will compete directly for aggressive price points in this market segment. Orange Business Services must remain highly competitive in this regard while delivering a superlative service.

2019 ISG Provider Lens™ Leader

Orange Business Services has highly flexible products that can address client needs in the SD-WAN space. It also offers world-class, consulting-led transitional programs.

VMWARE

Overview

VMware is a publicly traded company based in Palo Alto, California and has Dell EMC as a majority shareholder. Founded in 1998, it is a well-respected provider that has thousands of patents, high intellectual property of its own, and an ecosystem of more than 75,000 partners. The company launched VMware NSX®, an SDN network virtualization and security platform, following the acquisition of Nicira in 2012. With the acquisition of VeloCloud™ in December 2017, VMware SD-WAN by VeloCloud™ became VMware's flagship SD-WAN solution that is delivered in cloud, hybrid cloud and on-premise versions. Its primary solutions are SD-WAN Gateway, SD-WAN Edge and SD-WAN Orchestrator.

Strengths

Reliable and powerful solution for large enterprises and SMEs: SD-WAN by VeloCloud™ delivers hybrid WAN with high performance, reliability, transport and provider flexibility to assure optimal performance even for demanding applications such as voice and video. Primarily targeted at SMEs and large enterprises, it enables seamless insertion and chaining of virtualized services, both on-premises and in the cloud,

Ease of deployment and management: VMware offers centralized monitoring, visibility and cloud control to enable zero-touch branch deployment. It also delivers automatic business policy and firmware updates, link performance and capacity measurements.

Ease of branch deployments: SD-WAN Edge activation by cloud can enable branch deployment within minutes. Automatic WAN circuit discovery and monitoring eliminates link-by-link and branch-by-branch configuration.

Caution

VMware's offerings are in the higher end of the overall supply prices, which should be addressed as many lower cost providers are now maturing and delivering in the SD-WAN marketplace.

The company may need more certified professionals and implementation consultants to ensure high customer satisfaction in the expanding market.

2019 ISG Provider Lens™ Leader

VMWare has high-quality solutions and extensive expertise, making it an attractive choice for secure SD-WAN offerings.

RISING STAR: APCELA

Overview

Apcela is continuing its impressive transition into an enterprise-centric provider of deterministic networking services, aligning enterprise application and network performance requirements. The company has NaaS-oriented products based on the AppHUB platform as well as low latency with high-frequency SD-WAN as a service based on the modular Alpha platform. It has an impressive private network ability, operating in 185 markets in 43 countries, with more than 70 cloud hubs. Apcela has hybrid private/public offerings along with strong partnering capabilities with many other providers and gateways to efficiently deliver its managed SD-WAN solutions and platform and hub solutions to enterprise to allow DIY.

Strengths

Expanding products and service range: Apcela has expanded its range of offerings and services during over the year to include managed SD-WAN services, network analytics platform, application acceleration for Office 365, and distributed security. These are supported by its AppHub platform, global network services and professional services practices.

Impressive growth and coverage: Apcela has a smaller revenue share compared to many leaders in the SDN transformation services space. However, its enterprise business units are growing rapidly at a 35 percent CAGR, accounting for over 60 percent of all revenues with 35 percent YoY growth in new enterprise clients. This has led to new practices and many new clients for DIY being added in new global locations.

Caution

Apcela must further demonstrate new SD reference cases to a wider audience in order to increase market awareness of its excellent SD-WAN and managed SD-WAN offerings.

2019 ISG Provider Lens™ Rising Star

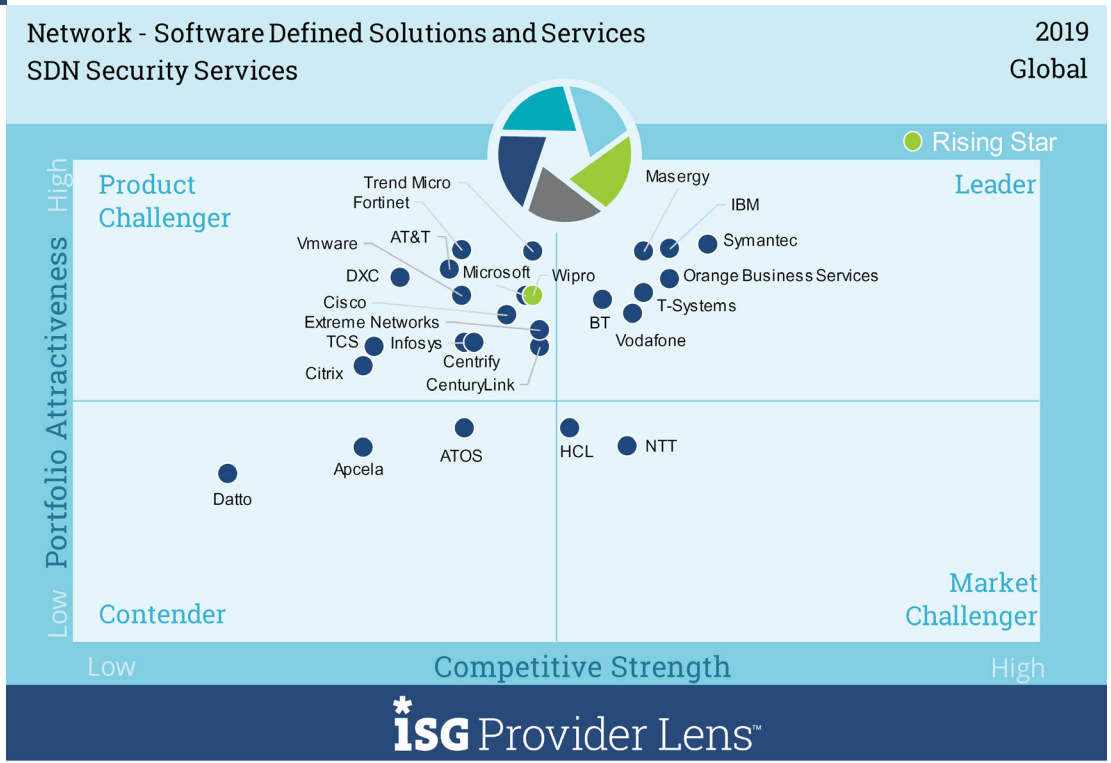
Apcela is rapidly gaining prominence for the supply of innovative DIY solutions to enterprises in the SD networking space.

SDN SECURITY SERVICES

Definition

An SD-WAN is a logical overlay network that encompasses any WAN transport — public, private, even LTE/4G or 5G, and is independent of any single carrier or service provider. The overlay occurs between any two SD-WAN nodes, called edges, which can be deployed at the branches and/or data centers. A cloud- delivered variation extends the overlay to any cloud point-of-presence (PoP) or data center. A key value in security services for the network is that SD-WAN unifies secure connectivity over all transports while supporting transport independence. There is no need to use or provide a different security mechanism for different transport types or to depend on the transport provider for their secure network. The network overlay can support a wide variety of security capabilities and can be enhanced in its inherent security capabilities by the addition of advanced security systems that are added as discrete overlays, services, or applications and can be managed both automatically and at central as well as local levels.

Generally, the top requirements that should be mandatory within every SD-WAN security regime are:



Source: ISG Research 2019

SDN SECURITY SERVICES

Definition (cont.)

Secure connectivity

SD-WAN provides end-to-end encryption across any network type, including the internet with full and secure authentication. It has massively scalable key exchange capabilities with automatic management. It also enables secure communication among branches and data centers, as well as communication to the cloud via gateways. All devices and components are fully authenticated in the network and all traffic across that network is encrypted.

Segmentation and micro segmentation

Many enterprises require segmentation to isolate different types of traffic for regulatory reasons or to give different business groups like finance, marketing and HR their own network segments. Enterprises typically address these needs by using either virtual LANs (VLANs) or virtual routing and forwarding (VRF). SD-WAN allows segmentation in a much more secure manner compared to MPLS (which doesn't encrypt the traffic) as SD-WAN automatically encrypts all traffic.

Secure services insertion

An SD-WAN will have built-in foundational security capabilities (such as a Layer 7 firewall) in the edge devices, but SD-WAN alone may not be a best-of-breed security solution for all enterprise requirements. Additional security services can be inserted at various locations (for e.g. at the branch, in the cloud, and on-premise at the data center or within headquarters) to provide enhanced security capabilities to meet enterprise needs. SD-WAN service insertion brings functions, such as virus scanning and data loss prevention, close to the appropriate traffic as much as possible. SD-WAN can perform deep application recognition, allowing granular control over routing of specific traffic to flow through specific and targeted security services.

Secure deployment

SD-WAN allows the enterprise to ship an edge device to a branch or for the branch to be acquired from a local supplier based on a provider list. The box can be installed in a plug-and-play manner by local non-IT/technical/engineer staff. The headquarter network staff centrally creates a configuration, typically using a group profile, that can be pulled down by the box following the authentication of a unique activation key or be pushed to the box from a cloud redirector after the box pings. A branch can be onboarded to the enterprise system or add resources within hours.

SDN SECURITY SERVICES

Definition (cont.)

There is no risk of losing shipped equipment or compromising the overall security of the enterprise system as it does not contain network security keys or encryption tokens.

Visibility and compliance

A significant attribute of SD-WAN that extends to the cloud is its ability to recognize thousands of different applications. This can be combined with analytics, monitoring and metrics that an orchestrator and controller can collect from each of the edge and gateway devices. The operation allows the enterprise to perform critical activities such as looking for anomalies in application usage, screening for unsanctioned applications and dropping the packets of unwanted applications. The enterprise can also apply policies around specific applications such as routing them through a specific additional security service if required. Traffic steering and segmentation in this manner can also assist in meeting regulatory or internal compliance requirements.

Additional overlay security and infringement tracking services

With the emergence of SD security, multi-layer security can be more easily integrated into an SD-WAN solution via software, which isn't possible with a standalone appliance-based approach. The benefits for providers and enterprise IT teams alike are a much simpler insertion of security into the branch to protect internet access, far more timely service deployment and upgrades, and greatly reduced chances of one standalone network or security component breaking another.

SDN SECURITY SERVICES

Eligibility Criteria

- Product/service portfolio coverage/focus, completeness and scope
- Understanding of overall security and SDN/SD-WAN and additional focus areas
- Scope of partnerships and offerings, management capability for the needed orchestration to deliver integrated product
- Completeness and pro-activeness of customer support and advisory post delivery
- Third-party accreditation of solution/test results and confidence delivery
- Stability and roadmap planning of the provider
- Reference customer/solutions in post pilot/commercial deployment
- Competitiveness of offering and types of commercial terms

Observations

- **BT** has a risk-based methodology, working with customers to understand their current exposure and therefore avoiding overinvestment in one area while leaving gaps in another. Its depth of understanding of both networks and overall security helps protect customers from design flaws and places security controls when there is exposure in their SDN.
- **IBM's** current roadmaps and plans is based on the philosophy that philosophy that security is network integrated, software defined, critical to SD-WAN and will programmable. The firm also believes that networks are becoming highly secure environments.
- **Masergy** added a new option to its SD-WAN service in 2017 called SD-WAN Go, which includes embedded firewalls, zero-touch provisioning from the Masergy portal and WAN optimization. Other aspects of its security portfolio include Masergy Unified Enterprise Security™ (UES), security operations, (with centers around the globe) and managed security services coupled with professional services.
- **Orange Business Services** covers a large range of network security services such as managed security options based on both cloud security and SD-WAN security. Cloud security is based on

SDN SECURITY SERVICES

Observations (cont.)

its own products together with its strategic partner Zscaler. Secure by Orange SD-WAN service is also available.

- **Symantec** has a wide and deep coverage in terms of network and enterprise security as well as security within SDN environments. Its portfolio covers network forensics (security analytics, endpoint detection and response) and content and malware analysis (integrated with Symantec Proxy, ASG, WSS, endpoint protection, ATP platform, secure message gateway, CASB, email security service and WAF).
- **T-Systems** mainly cover security services and products and is specifically focused on SD security from the Magenta Security. This division covers embedded security, SAP security, classified security, cloud security, consulting, bespoke solutions, on-premise security services, building security and automotive security operations centers.
- **Vodafone** provides security within all areas of its services range, both built-in and as additional or value-added service (VAS) products, including within its SD-WAN, internet access and cloud connect ranges. The Secure Network Gateway (SNG) proposition introduced the web security add-on and the internet and SD-WAN proposition (Zscaler). There is also a new tiered proposition that covers firewall sourcing, deployment, management and monitoring (BAE Systems).
- **Wipro's** SD network services portfolio is part of its connected future practice. This covers data center networks, WAN, SD-WAN and SDN/NFV areas that utilize Swift SDN and #WANFreedom together with SDX Security. Security is considered an integral part of Wipro's overall deliveries. The firm has subject matter experts for each technology and process area, as well as in industry verticals, to bring in the required knowledge to consulting-led delivery teams.

BT

Overview

BT is a longstanding provider of security services in the networking and cloud areas. It has many certified and compliant security solutions and monitoring centers running on a global basis. The firm has recently been applying these security solutions to the SDN area. BT's SDN security approach is to provide a global offering that combines network and security into one solution, instead of treating them as separate entities. The firm has adopted a risk-based methodology, working with customers to understand their current exposure and therefore preventing overinvestment in one area while leaving gaps in another. Its depth of understanding of both networks and overall security helps protect customers from design flaws and places security controls when their SDN faces exposure.

Strengths

End-to-end portfolio: BT has a strong end-to-end portfolio and a global reach, protecting customers and their businesses in 180 countries. BT Security can monitor, track and react to threats across the network and has an integrated internal and commercial security team. The firm has highly experienced business and solution consultants as well as technology practitioners to advise and formulate delivery for client-specific projects.

Portfolio flexibility: BT has a mix of its own and partner solutions to deliver highly capable managed security solutions to different client sizes.

Assuring existing investments are safeguarded: BT ensures that its customers' existing security controls are deployed effectively, patched and fine-tuned accordingly. This centralized management is provided globally from 15 SOCs to ensure that the latest threats are covered and taken care of in near real time.

Caution

BT has a large portfolio and certified solutions. However, its marketing and PR on a global level, specifically on SDN security, is not that aggressive or reaching the coverage levels of many of its competitors. This should be rectified with a new market approach campaign.

Many global enterprises believe that firm is (erroneously) is more focused on the U.S. and EMEA instead of being a truly global player.

2019 ISG Provider Lens™ Leader

BT is a strong global provider of managed security solutions within the SDN space and has strong monitoring capabilities.

IBM

Overview

IBM Global Technology Services (GTS), together with the telecom and media and entertainment divisions, has a strong portfolio of its own solutions along with a vast partner ecosystem of leading players. IBM's current roadmaps and plans are based on the philosophy that security is network integrated, software defined, critical to SD-WAN and will programmable. The firm also finds that networks are becoming highly secure environments. IBM's paradigm "Security-Enabled with cloud, AI and orchestration, driven by collaboration" underpins all its SD initiatives and forms a basis for its discrete security-focused practice for services within the firm.

Strengths

Highly secure core-to-edge network: IBM has a strong visionary approach towards SDN and SD-WAN and its associated security. With the provisioning of SDN services and built-in/add-on security, the firm offers a core-to-edge high security innovative network.

Global portfolio: IBM has an almost unrivaled global footprint and is an established provider of network and technology infrastructure as well as integration and operation services. It was one of the first to offer a network as a service (NaaS) delivery/pricing model and is continuing to innovate in this area.

Excellent solution ecosystem: IBM has a strong portfolio of its own security solutions but is also expanding its world-class partner ecosystem in the SDN, SD-WAN and security space. These assets, together with IBM's consulting and project management abilities and deep industry vertical expertise, allow it to deliver comprehensive built-in or add-on solutions.

Caution

IBM may not be taking advantage of the SME marketplace and is instead concentrating on larger clients. It may not be emphasizing its security enough as an add-on service to attract players in this segment.

2019 ISG Provider Lens™ Leader

IBM has a strong security built-in philosophy that supports the on-going transformation from traditional WAN to SD-WAN in enterprises.

MASERGY

Overview

Masergy delivers secure hybrid networking, cybersecurity and cloud communications to global enterprise clients in industries such as manufacturing, healthcare, entertainment, finance and broadcasting. Its cloud services include network and application management, global cloud communications and hosted remote access. Its managed services focus on disaster recovery and security. In 2017, Masergy added a new option to its SD-WAN service called SD-WAN Go, which includes embedded firewalls, zero-touch provisioning from the Masergy portal and WAN optimization. Other aspects of its security portfolio include Masergy Unified Enterprise Security™ (UES), security operations (with centers around the globe) and managed security services coupled with professional services.

Strengths

Ability and maturity: Masergy has a comprehensive and wide-reaching set of its own developments. It also has decades of experience in the security areas of networking and enterprise protection.

Strong global coverage for managed services: Masergy has an extensive global coverage with 24/7 operations centers to protect its clients' networks and businesses.

Consultative and practitioner advisory: Masergy's team of professional service experts have extensive security expertise and industry knowledge to detail the needs and possibilities during their engagements with enterprise clients.

Caution

Masergy may not be visible to the SME marketplace as it primarily perceived as a supplier for large enterprises in many regions. Due to the product and service range on offer, this may be a wasted opportunity for the company.

2019 ISG Provider Lens™ Leader

Masergy offers a highly capable portfolio of security services in the SDN space for enterprises globally.

ORANGE BUSINESS SERVICES

Overview

Orange Business Services covers a large range of network security services such as managed security options based on both cloud security and SD-WAN security. Cloud security is based on its own products together with its strategic partner Zscaler (where joint development and deployment plans exist) and includes control of internet usage, clean-up of browsing traffic and secure remote access, security as a virtual function, uCPE or SDN Pop and Orange uCPE as an enabler. SD-WAN appliance with advanced security (due in second half of 2019). Secure by Orange SD-WAN service utilizes Secure SD-WAN management platform in hosting zones across multiple global locations. Orange has 1,300 cyber defense experts around the globe, 30 years in securing critical infrastructures, 4 cyber security operations center (SOCs) and 9 SOCs, 3 scrubbing centers and 720 multinational customers.

Strengths

Global reach and competence: Orange Business Services offers large coverage through its hosting zones and cyber defense experts. It has a strategic partnership with Zscaler along with joint development roadmaps.

Multiple routes to meet requirements: The firm offers flexible security solutions and managed security services for most scales and types of enterprise deployments.

Consulting services for commercial roll-out: Orange Business Services provides a highly collaborative, open and consultative approach, guiding the customer through the decision-making process beginning with the proofs of concept (POCs) till commercial rollouts.

Caution

Larger enterprises do not always understand the level and scope of security services offered by Orange Business Services. To address this concern, the firm should provide a comparative chart and use cases that demonstrate which products are suitable based on the type and scale of deployment.

2019 ISG Provider Lens™ Leader

Orange Business Services offers high-quality and flexible security products for most enterprise types and scales.

SYMANTEC

Overview

Symantec is a leading provider of cybersecurity software and services and operates one of the world's biggest cyber intelligence networks. Founded 36 years ago, the firm employs 13,000 people in more than 35 countries and has over 2,000 global patents. Its software and services are used by corporations, government agencies and individuals. It has deep coverage on network and enterprise security as well as security within SDN environments. Its portfolio covers network forensics (security analytics, endpoint detection and response) and content and malware analysis (integrated with Symantec Proxy, ASG, WSS, endpoint protection, ATP platform, secure message gateway, CASB, email security service and WAF).

Strengths

Mature and capable provider: With four decades of experience, Symantec offers a comprehensive range of security solutions and has deep knowledge in the security areas of networking and enterprise protection.

Consultative practitioners: Symantec has a large pool of advisors who work exclusively in the enterprise and government security areas to support client-specific engagements and deliveries.

Global reach, local knowledge: Symantec is focused on global businesses and clients, while also retaining its ability to consult and deliver locally in numerous countries.

Caution

Symantec is erroneously perceived in some enterprises as a technical solution/ upgrade choice rather than a business partner or full-service provider. It has both the expertise and products to deliver complete corporate-level network solutions to large enterprises and SMEs. The firm should continue to demonstrate these capabilities to its customers.

2019 ISG Provider Lens™ Leader

Symantec is a highly capable service provider with innovative and strong security products along with full security coverage capabilities for enterprises in the SDN space.

T-SYSTEMS

Overview

T-Systems provides high-quality services throughout Europe and many other international markets in SDN and SD security. The firm covers security services and products and is specifically focused on its SD security offerings from Magenta Security. This division covers embedded security, SAP security, classified security, cloud security, consulting, bespoke solutions, on-premise security services, building security and automotive SOC. To keep up with the market trends, T-Systems has recently expanded its coverage areas with enhanced security consulting services for SDN/SDN-WAN (consulting, assessments, testing), managed next-generation firewall @ AWS/Azure, continuation of IBM QRadar SOC/SIEM services, DDoS backbone and cloud protection, APT Protect Pro and Protect Pro for email (available as cloud).

Strengths

Strong existing and expanding portfolio: T-Systems is expanding its existing portfolio of products and services this year in areas such as network security services from cloud, (IDS/IPS from the cloud, web application firewalling, customer dedicated web security) cloud access security broker 2.0, and automated service provisioning and operation.

On-track planning: The company's security portfolio is clearly structured, and its coverage and initiatives are well defined and funded. Portfolio upgrades are strategically planned and executed, and the roadmap is shared with industry observers.

Ability and stability: T-Systems has a comprehensive and wide-reaching set of developments with deep knowledge in the security areas of networking and enterprise protection, based on several decades of knowledge.

Caution

T-Systems has a larger portfolio than many of its competitors. However, it should clearly define its offering to the SME market with specific use cases from its vast reference base.

2019 ISG Provider Lens™ Leader

T-Systems provides a broad and extensive portfolio of security services and products. It also caters to some industry vertical-specific cases.

VODAFONE

Overview

Vodafone provides security within all areas of its services range, both built-in and as additional or VAS products, including within its SD-WAN, internet access and cloud connect ranges. Its security offerings include Cisco MSX orchestrated SD-WAN, Cisco security (ASAv), cloud security (Zscaler), advanced live action analytics, cloud connect (managed security services: NAT service for public peering, WAN optimization), internet access (web security, DDoS protection and BGP route hijack security support) and SD-WAN overlay onto internet.

The group has introduced web security add-on with the recent proposition of secure network gateway (SNG). It also has an SD-WAN proposition (Zscaler) to ensure secure internet access. A new tiered proposition covers firewall sourcing, deployment, management and monitoring (BAE Systems).

Strengths

Flexible applications and security offerings: Vodafone applies different models to ensure that specific enterprise needs are met with both inherent and optional VAS security deployments.

Differing vendor-agnostic delivery models: The firm also offers solution products from BAE systems, Cisco and Zscaler to ensure neutrality with a choice of an optimum delivery method to suit client requirements.

Caution

Use cases for specific instances and applicability of different solutions on offer could be improved to assist enterprises in making critical decisions.

2019 ISG Provider Lens™ Leader

Vodafone offers a strong portfolio of security products with SDN at the highest standard.

RISING STAR: WIPRO

Overview

Wipro's SD network services portfolio is part of its connected future practice. This covers data center networks, WAN, SD-WAN and SDN/NFV areas and utilize Swift SDN and #WANFreedom together with SDX Security. Security is considered an integral part of Wipro's overall deliveries. The firm has subject matter experts in each technology and process area, as well as industry verticals to bring the overall range of required knowledge together within consulting-led delivery teams. Wipro offers both off-the-shelf solutions and highly tailored client-specific solutions. Some of these include NetFactory, ServiceNXT, governance via Wipro SmartView, Cloud Trust Security framework, Wipro Holmes RPA/AI methods and toolsets as well as partner solutions and products from many companies.

Strengths

Productized offerings are advanced and flexible: SDX Security, an end-to-end highly secure SDN/SD-WAN security system, is productized and can be fully tailored to meet individual enterprise requirements.

Addressing rolling out to in-operation phases: Wipro provides a plethora of advanced tools and methods for commercially rolling out and managing SD network security implementations, including the use of AI and single-pane-of glass management systems.

Caution

The need to focus on industry-specific solution areas, such as FSI, manufacturing and energy, medical and chemical production, may push Wipro to undertake a significant recruitment program to maintain a consistent level of expertise.

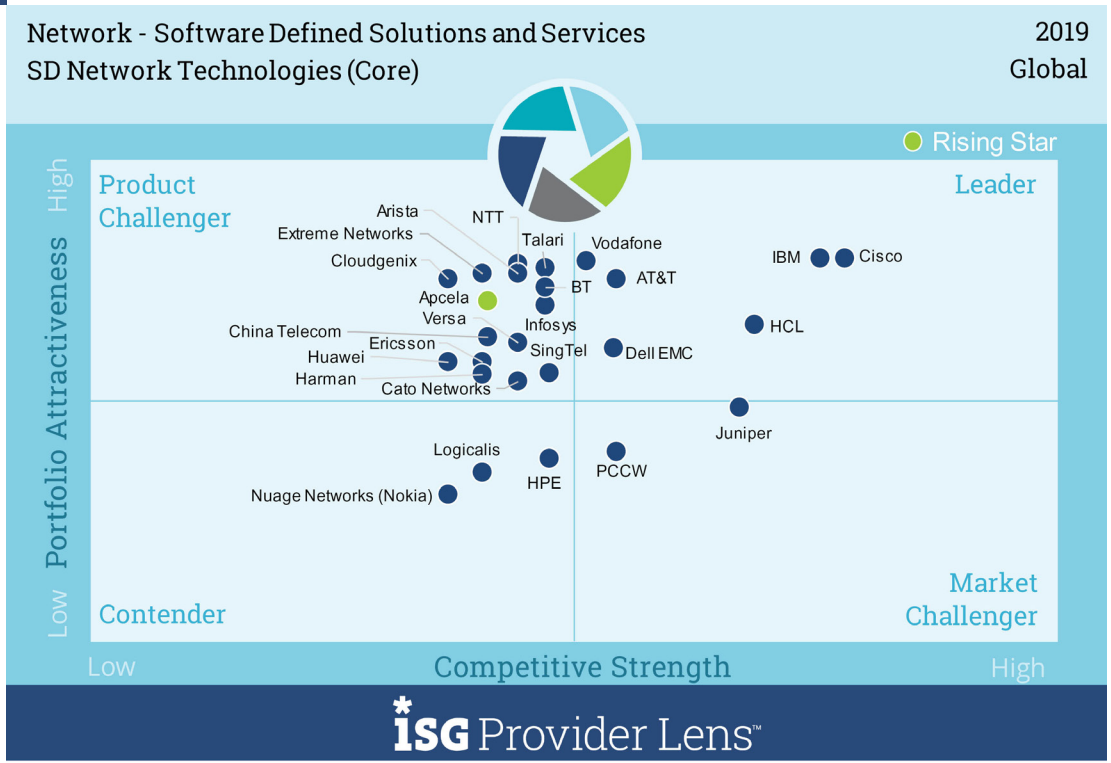
2019 ISG Provider Lens™ Rising Star

Wipro is an important provider of advanced security packages within SDN on a global level.

SD NETWORK TECHNOLOGIES (CORE)

Definition

Software-defined networking (SDN) technology is an approach to networking that eliminates the complex and static nature of legacy distributed network architectures by utilizing a standards-based software abstraction between the network control plane and underlying data forwarding plane in both physical and virtual devices. It is fundamentally different from NFV in terms of end results and ability, although both approaches are mutually supportive. A network virtualization program eliminates the conventional shortcomings and provisioning tasks related to legacy network segmentation technologies, such as switched VLANs, routed subnets, and firewall access lists (ACLs). An SDN-based network virtualization application supports arbitrary assignment of IP/MAC addressing schemes, automates network configuration tasks and enforces expected network segmentation. Data plane abstraction provides a standards-based approach to dynamically provision the network fabric from a centralized (or distributed) software-based controller or multiple controllers.



Source: ISG Research 2019

SD NETWORK TECHNOLOGIES (CORE)

Definition (cont.)

SDN technologies enable improvements in network agility and automation, while substantially reducing the cost of network operations compared to traditional network deployments. An industry-standard data plane abstraction protocol (such as OpenFlow) allows the use of any type and brand of data plane devices, since all the underlying network hardware is addressable through a common abstraction protocol. Such a protocol allows for the dynamic and automatic provisioning of virtual network segments and virtual routing services on both physical and virtual networking devices. Security policies can be automatically provisioned via a cloud orchestration platform, such as OpenStack, or through workloads assigned according to attributes like MAC, subnet, VLAN and IP protocol in an automated manner.

The utilization of an SDN protocol additionally facilitates the use of bare metal switches from any mix of vendors, allowing full freedom within the supplier selection and the provisioning phases of a network. SDN controllers also allow API interaction (north and southbound), enabling the use of a wide range of off-the-shelf and custom-built network applications. This was previously unavailable in traditional networks.

The OpenFlow protocol is managed by the Open Networking Foundation (ONF) — a non-profit user-governed consortium that includes some of the world's largest users such as Google, Facebook, Yahoo!, Deutsche Telekom, Verizon and Goldman Sachs. Given the explicitly user-driven governance model of the ONF, it is not subject to conventional vendor influence which is common with other vendor-sponsored industry standards bodies.

The main companies covered in this segment are vendors of SDN and NFV equipment and core services that are purchased either directly by enterprises or service providers for specific enterprise projects.

SD NETWORK TECHNOLOGIES (CORE)

Eligibility Criteria

- Product portfolio coverage, focus areas, completeness of broader solutions
- Ability to deliver equipment and service to customer, inclusive of prerequisite training
- Understanding of overall market area, technology environment and evolutions and contributions to that area
- Scope of partnerships and offerings, management capability for the needed orchestration within a customer project
- Openness of offering to avoid vendor lock-in
- Completeness of customer support and assistance post delivery
- Stability and roadmap planning of the provider
- Reference customer/solutions in post pilot/commercial deployment
- Competitiveness of offering and types of commercial terms

Observations

- **AT&T** is positioned to supply partial or complete network solutions and replacements, upgrades/hybrids to existing networks, hybrid MPLS (existing)/private data net solutions, private IP VPN, cloud-based networking, application acceleration and mobile applications utilizing SD network functionality, and innovative core technology solutions.
- **Cisco** offers a broad array of infrastructure hardware and software, including core SD network technologies, switches, routers, network optimization support (NOS), SD-WAN, Intelligent WAN (IWAN), WAN hardware and software and the requisite control, management and automation capability. It also supplies consulting/advisory services related to these activities.
- **Dell EMC** develops, delivers and supports information infrastructure and virtual infrastructure technologies, solutions and services. It is traditionally well known for server and data center equipment and services but is rapidly gaining prominence in the networking and SD networking core technologies space.

SD NETWORK TECHNOLOGIES (CORE)

Observations (cont.)

- **HCL** is continuing to invest in building industry-leading, differentiated tools for optimized network automation and management. It has an enviable list of reference clients and high visibility projects worldwide within its general and software-defined core technologies and services portfolio.
- **IBM** has put significant focus on network engineering, integration and innovation services from its Global Technology Services (GTS) division over the last two years. The firm has a strong portfolio of its own core technology along with a vast partner ecosystem of leading players and best-of-breed solutions in SD networks, enabling it to provide true vendor-agnostic solutions for enterprises.
- **Vodafone** has made significant investments in its own developments. Its packaging of solutions, support and consulting services on those service-wrapped items are its focus of delivery in this area. Its core technology and service deliveries, which include Vodafone SD-WAN, Cisco Viptela and Cisco Meraki products, sets it supplies together with edge items such as vCPE.
- Rising Star **Apcela** has NaaS-oriented products that are based on its AppHUB platform. It also offers low latency with high frequency SD-WAN as a service based on its modular Alpha Platform. The company has an impressive private network ability, operating in 185 markets across 43 countries. It has more than 70 cloud hubs, partnering capabilities with many other providers, gateways and hybrid private/public offerings.

AT&T

Overview

AT&T has long had a vast array of business and technology streams in the networking space. It was early to realize the potential benefits of SDN and SD-WAN, with internal and external proofs of concept (POCs) taking place ahead of most of the other suppliers. This activity has evolved over time to form a distinct focus and provisioning areas in SDN, SD-WAN and access, with core technologies becoming one of the AT&T trademarks. The company is continuing to implement SDN with NFV and SD-WAN across its own network and business centers.

Strengths

Strong capabilities: Through its business and government units, AT&T is positioned to supply partial or complete network solutions and replacements, upgrades/hybrids to existing networks, hybrid MPLS (existing)/private data net solutions, private IP VPN, cloud-based networking, application acceleration and mobile applications utilizing SD network functionality, and innovative core technology solutions.

Influence and standards contributions: AT&T is involved in most industry groups related to SDN and is a significant contributor to the overall roadmap of core technologies globally.

Portfolio scale, depth and breadth: The company has a large internally developed portfolio of products and services that are suitable for many enterprise requirements. It also offers best-of-breed products and services from its extensive partner ecosystem.

Caution

Many regions see AT&T as a supplier for only large enterprises. The company must make significant efforts to change its image in order to penetrate the SME marketplace effectively.

2019 ISG Provider Lens™ Leader

AT&T has a vast portfolio of SD core technologies and associated services, coupled with strong consulting support globally.

CISCO

Overview

Cisco offers a broad array of infrastructure hardware and software, including core SD network technologies, switches, routers, NOS, SD-WAN, IWAN, WAN hardware and software, along with the requisite control, management and automation capability. It also supplies consulting/advisory services related to these activities.

Caution

Cisco appears to be working in all supply areas of the market, sometimes in direct competition with key (partner) clients within the same RFI/RFQ/bids. This is historically a dangerous situation for vendors.

Strengths

Extensive portfolio: Cisco has a successful portfolio of SD-WAN hardware (ASR/ISR 1000, ISR 4000, routers, vEdge routers, etc.) and management systems (such as vManage), coupled with cloud enablement such as Cisco Cloud onRamp for co-location. It can demonstrate numerous global installations among end-user organizations, service providers and carriers.

Ubiquitous positioning in offers: Most enterprises and many carriers in the enterprise network service provisioning market consider Cisco as one of the main equipment providers in the SDN/SD-WAN area and as one of their partner/supply companies.

Mature and innovative offerings: Cisco was one of the first companies to produce core technology for the SDN and SD-WAN market and has been maintaining an edge over other providers ever since.

2019 ISG Provider Lens™ Leader

Cisco is in an enviable position regarding core technology supply to the SDN marketplace globally.

DELL EMC

Overview

Dell EMC is a large privately held company headquartered in Hopkinton, Massachusetts. It provides a broad range of IT products and services to enterprises and service providers. The firm develops, delivers and supports information infrastructure and virtual infrastructure technologies, solutions and services. It is well known for providing server and data center equipment and services and has been rapidly gaining prominence in the networking and SDN space following its acquisition of a majority stake in VMware/VeloCloud.

Strengths

Extensive new range: Dell EMC has rolled out new edge, network and customer premises equipment (CPE) last year, all of which have proved popular. The strategic acquisition of VMware/VeloCloud has given the company significant capabilities in the SD-WAN equipment and services market.

Ready, out of the box: The firm's new open universal customer premises equipment (uCPE) and the Virtual Edge Platform (VEP) family are pre-tested and configured to work seamlessly with Silver Peak Systems, VeloCloud Networks and Versa Networks. This expands its reach to enterprises, service providers and carriers.

Caution

Many analyst/business information companies do not acknowledge the core and networking element of DELL EMC's business, considering it as a rack or DC supplier. The firm should demonstrate its abilities in the networking technologies and SD space to change this image and offset any shortcomings.

2019 ISG Provider Lens™ Leader

Dell EMC is a highly credible competitor in this space, providing high-quality equipment and solutions from its new product range.

HCL

Overview

HCL is continuing to invest in building industry-leading, differentiated tools for optimized network automation and management. These include HCL Sensus (software-defined networks), HCL TIS (SD-WAN) and HCL Nucleus (automated wireless management). The firm has an enviable list of reference clients and high visibility projects worldwide within its general and software-defined core technologies and services portfolio.

Strengths

Capabilities and execution: HCL has strong in-house knowledge and capabilities as well as products and services in the core technologies area. It also has expertise in consulting and scalable implementations across a wide spectrum of platforms.

Broad base of partners: The company has an impressive pantheon of partners, co-invested partners and acquired companies. Each of them brings specific expertise to HCL's core technology offerings.

Industry scope: HCL is active in a wide array of industries and specific industry sub-sectors. It also has impressive references of client success.

Caution

Maintaining a smooth functioning collaborative ecosystem of internal resources and partner companies is a challenging task. Though HCL appears to deliver well in this respect, it must exercise caution in future growth and execution capabilities with a focus on this vital area.

2019 ISG Provider Lens™ Leader

HCL delivers advanced and effective core technologies and services in the SDN space globally.

IBM

Overview

IBM has been at the forefront of enterprise network and digital transformation for some time and is further strengthened by its software-defined network offerings from its IBM Global Technology Services (GTS) division. The firm has put significant focus on its network engineering, integration and innovation services offered through GTS over the last two years. IBM has a strong portfolio of its own core technology along with a vast partner ecosystem of leading players and best-of-breed solutions in SD networks. The firm is thus positioned to provide true vendor-agnostic solutions for enterprises.

Strengths

Strong portfolio: IBM has an exceptionally strong portfolio of its own solutions and a partner ecosystem of leading players in the SD-WAN and networking products markets, enabling the firm to deliver a comprehensive solutions portfolio.

Technology supply or implementation services: IBM can provide upgrade/update or solution migration services as part of the overall engagement by utilizing its consulting resources.

Unrivaled global coverage and local presence: The firm has an almost unrivaled global footprint and is a well-established provider of network and technology infrastructure, integration and operation services globally with local delivery and support capabilities.

Caution

IBM appears to be positioned strongly in the large to high-end mid-market enterprise segments. However, it is being challenged by new entrants that are focused exclusively in the SME market.

2019 ISG Provider Lens™ Leader

IBM is a highly competitive global company with a strong portfolio of SD core technologies and services.

VODAFONE

Overview

The Vodafone Global Enterprise division provides telecommunications and IT services to corporate clients in 182 countries with its own PoPs in 74. It is a strong proponent of NFV/SDN and SDN and supplies extensive enterprise-focused services in those areas together with mobile and value-added service (VAS) mobile products and services. Though Vodafone has made significant investments in developing its own core technologies and services, the packaging of solutions, support and consulting around service-wrapped items are its main delivery in this area. Core technology and service deliveries include Vodafone SD-WAN, Cisco Viptela and Cisco Meraki products as well as edge items such as vCPE.

Strengths

Expert practitioner-led customized solutions: Vodafone can identify the most suitable components of solutions for clients. It advises them on the core areas that need coverage and which package is most suitable for their needs.

Vendor agnostic with different delivery models: The firm can choose among many differing technology leaders to ensure neutrality, with a choice of an optimum delivery method to suit the client.

Caution

Vodafone has a significant and advanced portfolio of core solutions with service wraps. However, its use cases may not be specific enough for some enterprises. This pushes the need for consultative sales intervention, which may be time consuming.

The company still lacks coverage (25 cities covered and partnership extensions) and visibility in the critical North American region.

2019 ISG Provider Lens™ Leader

Vodafone provides a comprehensive portfolio of core technologies and services, coupled with interesting service wraps and offers.

RISING STAR: APCELA

Overview

Apcela has NaaS-oriented products that are based on its AppHUB platform as well as low latency with high frequency SD-WAN as a service based on its modular Alpha Platform. It has an impressive private network ability, operating in 185 markets in 43 countries. It has more than 70 cloud hubs, strong partnering capabilities with many other providers, gateways and hybrid private/public offerings, which allow for the efficient delivery of its managed SD-WAN solutions and technology in the core areas to enterprise.

Strengths

Expanding products and service range: Apcela has expanded its range of offerings and services over the year to include managed SD-WAN services, network analytics platform, application acceleration for Office 365 and distributed security, while maintaining its AppHub platform, global network services and professional services practices.

Heritage leveraged: Apcela has a highly reputable heritage in the financial services and trading markets and an enviable track-record of delivering managed trading platforms and SD-WAN in this critical and secure industry. The company has effectively utilized and leveraged this into new industry verticals and new markets, which in turn have delivered excellent references.

Caution

Apcela's core equipment areas of the platform and Hub solutions are not as well understood by enterprises compared to the overall managed solutions portfolio. The company should provide more visibility in this area to drive further growth.

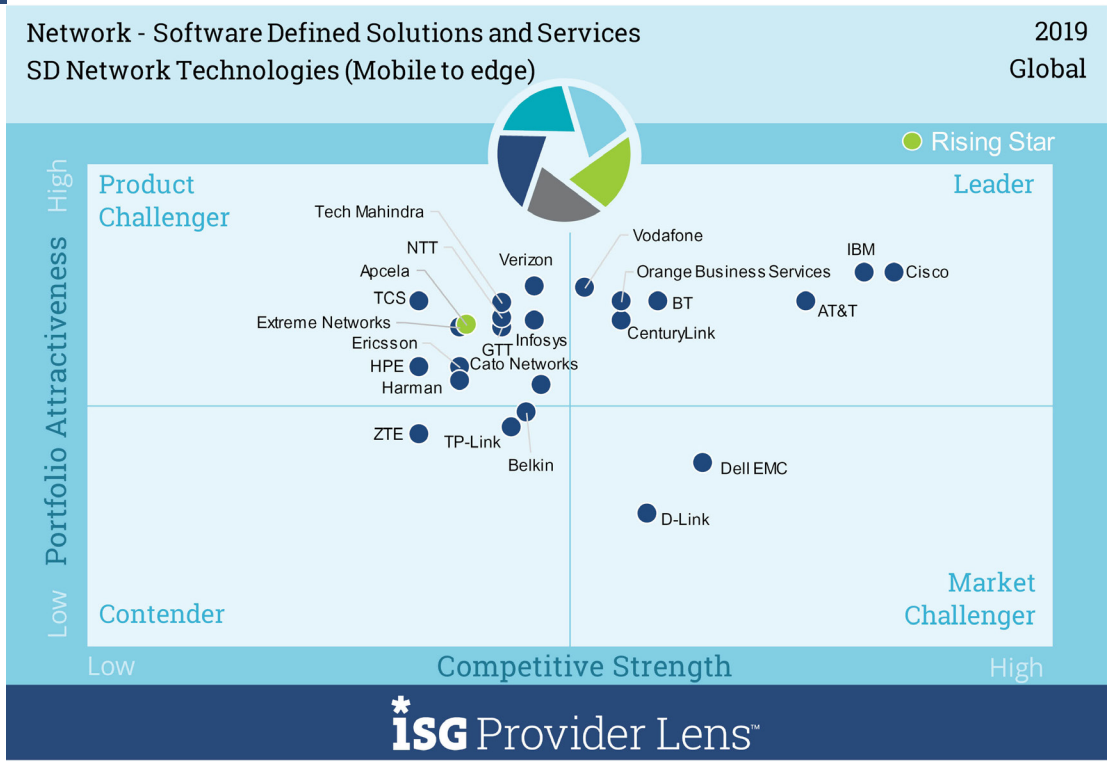
2019 ISG Provider Lens™ Rising Star

Apcela is a prominent provider of innovative platforms, hubs and technologies in the SDN space.

SD NETWORK TECHNOLOGIES (MOBILE TO EDGE)

Definition

SDN technologies enable improvements in network agility and automation, while substantially reducing the cost of network operations compared to traditional network deployments. Deploying an industry-standard data plane abstraction protocol (such as OpenFlow) allows the use of any type and brand of data plane devices as all the underlying network hardware is addressable through a common abstraction protocol. Such a protocol allows for a dynamic and automatic provisioning of virtual network segments and virtual routing services on both physical and virtual networking devices. Additionally, with SD access in branch/edge, including all customer premises equipment (CPE, referenced as virtual CPE or vCPE in SDN terms) and associated WiFi networks, access points (APs), software-defined mobile network (SDMN), software-defined local area network (SD-LAN), which includes both wireless (SD-WLAN) or mobile (SD-WMLAN), the management protocol can be further improved.



Source: ISG Research 2019

SD NETWORK TECHNOLOGIES (MOBILE TO EDGE)

Definition (cont.)

vCPE

The traditional CPE deployment model, which requires multiple specialized devices at customer premises with each involving complex installation and possibly pre-installation of enterprise-specific codes or software, is extinct. vCPE is replacing multiple hardware appliances with a generic CPE that is vendor independent and based purely on performance points, utilizing SDN and/or SD-LAN and delivery capabilities rather than branding. This enables enterprises to provide services on-demand with the required flexibility to rapidly scale up/down services at high reliability and quality levels without the need for trained technical or support staff.

SDMN

SDMN is relatively new and stems from the complexity of network management in 5G mobile networks and beyond, driven by the growing mobile traffic demand, heterogeneous wireless environments, and diverse service requirements. This environment has driven a perceived need to introduce new radio network architecture by taking advantage of software-oriented design, the separation of the data and control planes, and network virtualization to manage complexity and offer flexibility in 5G networks. SDN in mobile networks is fundamentally different from SDN for the internet. Mobile networks deal with the wireless access problem in complex radio environments, while the internet mainly addresses the packet-forwarding problem. Specific requirements in mobile networks shape the development of SDMN. As the proposed micro networks and enterprise-specific networks within 5G move towards reality and piloting, SDMNs (as part of the enterprise managed portfolio) are gaining prominence.

SD NETWORK TECHNOLOGIES (MOBILE TO EDGE)

Definition (cont.)

SD-LAN

SD-LAN is an emerging solution built on the principles of software-defined networking. However, there are key differences in topology, network security, application visibility and control, management and quality of service compared to a wider reaching SDN or SD-WAN system. SD-LAN is similar in concept to cloud managed LAN systems. It decouples control management and data planes to enable a policy-driven architecture for wired and wireless LANs. SD-LANs are characterized by their use of a cloud management system and wireless connectivity without the presence of a physical controller. They may be found both in more traditional network environments with cloud management services, or as part of overreaching SDN/SD-WAN deployments and strategies.

SD-LAN builds an application and policy-driven wired and wireless access architecture, offering self-organizing and centrally managed networks that are simpler to operate, integrate and scale. It can prioritize and change the behavior of the network based on application requirements and policies of what can be accessed by users, clients and IoT. Typically, it has self-optimizing, self-healing and self-organizing wireless access points and access switches and is cloud managed. It has fully open APIs that allow tight integration of network and applications infrastructures that are not vendor dependant.

This segment will look at all main vendors and service providers (such as telcos) in the SD-LAN space, including vCPE, SDMN and SD-LAN specific vendors.

SD NETWORK TECHNOLOGIES (MOBILE TO EDGE)

Eligibility Criteria

- Product portfolio coverage, focus areas, completeness of broader solutions
- Ability to deliver equipment and service to customer, inclusive of prerequisite training
- Understanding of overall market area, technology environment and evolutions and contributions to that area
- Scope of partnerships and offerings, management capability for the needed orchestration within a customer project
- Openness of offering to avoid vendor lock-in
- Completeness of customer support and assistance post delivery
- Stability and roadmap planning of the provider
- Reference customer/solutions in post pilot/commercial deployment
- Competitiveness of offering and types of commercial terms

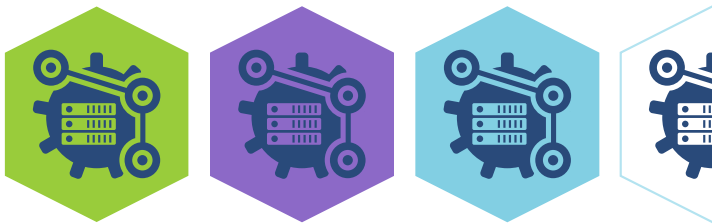
Observations

- **AT&T** FlexWare℠ covers the SD-WAN area and is responsible for core-to-edge functions. AT&T vCPE services under FlexWare℠ shifts control intelligence from CPE or edge devices into a centralized software-based controller.
- **BT** has set up its Connected Edge platform that is based on open technology (x.86 devices with future-proofed solutions utilizing established providers, with global logistics capability and migration path for existing Cisco infrastructure).
- **Cisco** solutions, which are based on Meraki, are innovative for SME business on a larger scale than Viptela SD-WAN offerings. Both invoke and utilize intelligent edge functionality, control and capabilities.
- **CenturyLink** offers adaptive networking solutions, SD-WAN as a service, and application and performance-aware routing with full flexibility in appliance deployments based on uCPE.
- **IBM** has put significant focus on its network engineering, integration and innovation services within GTS over the last two years. It also offers SD-LAN, intelligent edge and u/vCPE devices and virtualized devices at the edge. The firm has a strong portfolio of its own technology and solutions together with those from a vast partner ecosystem.

SD NETWORK TECHNOLOGIES (MOBILE TO EDGE)

Observations (cont.)

- **Orange Business Services** uCPE is a key enabler for flexible SD-WAN and covers VNF primary functional areas (VNF vRouter, VNF SD-WAN, VNF Security, VNF WAN Op), orchestration (deployment and chaining of VNF, Ciena, BluePlanet), middleware (operating system supporting virtualized functions) (Cisco, Juniper) and hardware, x86 platform, uCPE vendor platform (Cisco ENCS, Juniper NFX) or whitebox.
- **Vodafone** has made significant investments in edge technologies and services and has many developments of its own. The packaging of solutions, support and consulting services on those service-wrapped items are its focus of delivery. It relies on key partners to deliver the individual VNF and edge/branch product and technology sets.
- Rising Star **Apcela** has a strong base in high-performance/low-latency networks, hybrid networks and multi-cloud and SD networking. It is particularly known for allowing smooth and accelerated application use and delivery. It has gained recognition in this segment by utilizing its in-house development to create a range of important NaaS-oriented products.



AT&T

Overview

AT&T has a vast array of business and technology streams in the networking space and was early to realize the potential benefits of SDN and SD-WAN, with internal and external POCs taking place ahead of most of the other suppliers. This has evolved to form a distinct focus and provisioning areas in SDN, SD-WAN and access, with AT&T FlexWare℠ covering the SD-WAN area and becoming responsible for core to edge functions. AT&T vCPE services under FlexWare℠ shifts control intelligence from CPE or edge devices into a centralized software-based controller.

Strengths

Strong capabilities: Through its business units, AT&T is positioned to supply intelligent edge vCPE products and branch control, utilizing FlexWare℠ to manage provisioning and deployment of CPE functions.

Portfolio scale, depth and breadth: AT&T has a vast internally developed portfolio of products and services that can address many enterprise requirements. It also has best-of-breed products and services from its extensive partner ecosystem.

Vendor agnostic: FlexWare℠ uses open interface control to enable the installation of CPE and vCPE elements from multiple vendors.

Caution

AT&T is seen as a supplier for only large enterprises in many regions. It must make significant efforts to change this image in order to attract the SME marketplace in all regions.

2019 ISG Provider Lens™ Leader

AT&T has an innovative edge roadmap and ability built around its FlexWare℠ capabilities.

BT

Overview

BT is a longstanding leader in network services. It provides consulting, managed services, cloud, network and enterprise improvement services and technology to its vast enterprise customer base. Most of these services are offered under the Global Services banner. The company has an extensive partner constellation as well as its own products and services, often in integrated ecosystems of delivery. In the SD-WAN and edge areas, BT has set up its Connected Edge platform based on open technology (x.86 devices with future-proofed solutions utilizing established providers with global logistics capability and migration path for existing Cisco infrastructure). Current versions are running on Cisco 5000 Series EENCS. This is in conjunction with virtualized network functions (VNFs), which are equivalent to BT's managed solutions.

Strengths

Client requested focus on intelligent edge: BT has taken customer feedback to enable and develop its edge strategy, leading to a customer take-up.

Model simplicity: BT is focused on the simplicity of its x.86 hardware for most of its clients' deployments. It offers easy-to-understand service wrappers that use the same service offerings in SD-WAN.

Caution

BT has an advanced SD-WAN proposition with intelligent edge. However, it should provide more clarity to clients on the available offerings as well as future developments.

2019 ISG Provider Lens™ Leader

BT is a well-performing company with excellent intelligent edge products that are offered with managed service wrappers.

CISCO

Overview

Cisco offers a broad array of infrastructure hardware and software, including core SD network technologies. It provides switches, routers, network optimization support (NOS), SD-WAN, Intelligent WAN (IWAN), WAN hardware and software, and the requisite control, management and automation capability covering core technology to CPE edge. Its Meraki-branded solutions are innovative for SME business. On a larger scale, its SD-WAN offerings (based on Cisco Viptela) are highly scalable. Both invoke and utilize intelligent edge capabilities.

Strengths

Extensive portfolio: Cisco has a full portfolio of SD-WAN hardware (ASR/ISR 1000, ISR 4000, routers, vEdge routers), management systems (such as vManage), and Cisco SD-WAN (Viptela and Meraki) solutions. It has strong references for vCPE and intelligent edge deployments at enterprises.

Mature and innovative offerings: Cisco was one of the first companies to produce edge and vCPE/vManage technologies and services for the SDN and SD-WAN market, giving it a leading edge over other providers.

Caution

Cisco appears to be working in all supply areas of the market, sometimes in direct competition to key (partner) clients within the same RFI/RFQ/bids. This is historically a dangerous situation for vendors.

2019 ISG Provider Lens™ Leader

Cisco is a key supplier of SD-WAN and intelligent edge hardware and services globally.

CENTURYLINK

Overview

CenturyLink has been ranked consistently as one of the most dynamic and delivery-oriented WAN and SD-WAN companies with an impressive portfolio of its own assets. It has recently made various announcements on ethernet-LAN, SD-WAN, uCPE, internet applications, including access extensions and management that are highly relevant to edge. CenturyLink offers adaptive networking solutions, SD-WAN as a service, and application and performance-aware routing with full flexibility in appliance deployments based on uCPE". The company can host multiple virtual network functions (VNF) with a virtual appliance that can consolidate multiple functions on a single device, thus bringing immense operational and cost efficiencies to the enterprise WAN edge.

Strengths

uCPE edge with managed capabilities in SD-WAN: CenturyLink offers SD-WAN as a service to cover both core and edge, including uCPE functionality and control.

Client and end-customer centric: The firm has implemented a slew of new tools and methods to improve customer experience, both for its clients and end users. It incorporates AI, fault and engineering fix information, order and remedial management as well as billing and usage systems, making edge or branch accounting simple.

Caution

CenturyLink has a strong foothold in Europe and the Americas but lacks a deep presence in APAC and Africa.

The company is well known for its managed service delivery as opposed to providing solutions, which may deter those wanting non-managed solutions.

2019 ISG Provider Lens™ Leader

CenturyLink is a highly capable global provider of uCPE and branch offerings.

IBM

Overview

IBM has been at the forefront of enterprise network and digital transformation for some time. Its software-defined network offerings are led by its IBM Global Technology Services (GTS) division. IBM has put significant focus on its network engineering, integration and innovation services in GTS over the last two years. It is also focused on offering SD-LAN and intelligent edge as well as u/vCPE and virtualized devices at the edge. IBM has a strong portfolio of its own core technologies along with a vast partner ecosystem of leading players and best-of-breed solutions for SD networks and edge management.

Strengths

Strong portfolio: IBM has a strong portfolio of edge technology and management services for SD-WAN, along with a partner ecosystem of leading players in the networking products market. This enables the firm to deliver a comprehensive solution portfolio.

Unrivaled global coverage and local presence: IBM has an almost unrivaled global footprint and is a well-established provider of network and technology infrastructure, integration and operation services globally with local delivery and support capabilities.

Caution

IBM has not published a compelling portfolio of use cases regarding SD-LAN or intelligent edge this time. It is expected to make announcements related to this over the course of the year.

2019 ISG Provider Lens™ Leader

IBM has global credibility in delivering advanced intelligent edge and SD-LAN solutions that are enterprise ready.

ORANGE BUSINESS SERVICES

Overview

Orange Business Services covers a large range of network services, including SD-WAN (flexible SD-WAN) and uCPE services, which can be provided either on appliance or on VNF. Orange uCPE is a key enabler for Flexible SD-WAN and includes VNF primary functional areas (VNF vRouter, VNF SD-WAN, VNF Security), VNF WAN Operations Orchestration (deployment and chaining of VNF, Ciena, BluePlanet), middleware (operating system supporting virtualized functions; Cisco, Juniper), hardware, x86 platform, uCPE vendor platform (Cisco ENCS, Juniper NFX) or whitebox. Orange Business Services offers extensive consulting capabilities to ensure that client requirements are fully met.

Strengths

Excellent capabilities and partnerships: Orange Business Services offers wide coverage through its own capabilities and partnerships. Its uCPE services are fully compatibility with Flexible SD-WAN through virtual gateways and universal management, allowing easy migration from traditional LAN to intelligent edge.

Out-of-the-box ease: Flexible SD-WAN is an automated, intelligent global solution with on-demand virtualized services. It is centrally orchestrated for end-to-end performance and control via uCPE of edge functionality and inventory.

Consultative services covering POC to commercial roll-out: Orange Business Services provides a highly collaborative, open and consultative approach, together with a network of labs and innovation centers to allow for rapid PoC developments.

Caution

Intelligent edge advantages must be clearly marketed as separate use cases and examples, even if they are part of the Flexible SD-WAN offering, in order to bring clarity to enterprises.

2019 ISG Provider Lens™ Leader

Orange Business Services has excellent edge capabilities for addressing clients' needs. It also has a strong consulting-led implementation program.

VODAFONE

Overview

Vodafone Global Enterprise is a strong proponent of SDN and intelligent edge solutions. Vodafone extensively supplies enterprise-focused services in those areas as well as SD-WAN products and services to enterprises. The firm has made significant investments in developing its own edge technologies and services. However, it is mainly focused on the packaging of solutions, support and consulting around those service-wrapped items, relying on its key partners to deliver the individual VNF and edge/branch product and technology sets required. Edge technology and service deliveries are part of the Vodafone SD-WAN, Cisco Viptela and Cisco Meraki product sets, together with edge items such as vCPE.

Strengths

Expert practitioner-led customized solutions: Vodafone can identify the most suitable components of solutions for clients. It advises them on the SD-LAN and intelligent edge areas that need coverage and which package or components of packages are most suitable for their needs.

Vendor agnostic with different delivery models: The firm can choose among different technology leaders to ensure neutrality, with a choice of an optimum delivery method to suit the client.

Caution

Vodafone relies primarily on service-wrapped edge technologies and solutions from other providers. Many of Vodafone's competitors use the same approach and this may blur its differentiation for clients.

2019 ISG Provider Lens™ Leader

Vodafone provides a comprehensive edge technologies and services delivery with high-quality service wrappers.

RISING STAR: APCELA

Overview

Apcela has a strong basis in high performance/low latency networks, hybrid networks and multi-cloud and SD networking. It is particularly known for allowing smooth and accelerated application use and delivery. It has gained recognition in this segment by utilizing its in-house development capabilities to create a range of important NaaS-oriented products that are based on its AppHUB platform, as well as low latency with high frequency SD-WAN as a service based on its modular Alpha platform. Apcela's strong partnering capabilities with many other providers and gateways enable it to efficiently deliver its managed SD-WAN solutions and technology in the mobile and edge space.

Strengths

Expanding products and service range: Apcela has expanded its range of offerings and services over the year to include managed SD-WAN services, network analytics platform, application acceleration for Office 365 and distributed security, while retaining its secure trading and mobile acceleration offerings.

Heritage leveraged: Apcela has a highly reputable heritage in the financial services and trading markets. It also has an enviable track record of delivering managed trading platforms and mobile-focused solutions in this critical and secure industry. The firm has effectively utilized and leveraged this into new industry verticals and new markets.

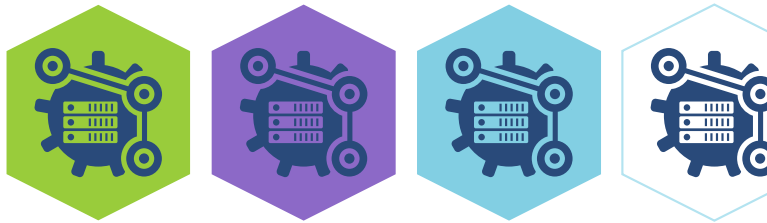
Caution

Compared to the overall managed solutions portfolio, Apcela's mobile and edge solutions are not well understood by enterprises. The firm should address this concern in order to drive further growth in this area.

2019 ISG Provider Lens™ Rising Star

Apcela is a prominent company known for its innovative solutions for mobile application acceleration and mobile-to-edge solutions delivery.

Methodology



METHODOLOGY

The ISG Provider Lens™ 2019 – "Network - Software Defined Solutions and Services" research study analyses the relevant software vendors and service providers in the Global market, based on a multi-phased research and analysis process, and positions these providers based on the ISG Research methodology.

The study was divided into the following steps:

1. Definition of Network - Software Defined Solutions and Services
2. Use of questionnaire-based surveys of service providers/vendor across all trend topics
3. Interactive discussions with service providers/vendors on capabilities & use cases
4. Leverage ISG's internal databases & advisor knowledge & experience (wherever applicable)
5. Detailed analysis & evaluation of services & service documentation based on the facts & figures received from providers & other sources.
6. Use of the following key evaluation criteria:
   - Strategy & vision
   - Innovation
   - Brand awareness and presence in the market
   - Sales and partner landscape
   - Breadth and depth of portfolio of services offered
   - Technology advancements

Authors and Editors

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Kenn is a thought leader and practitioner in networks, smart infrastructure and services and application of advanced technologies globally. Authoring and lead analyst of Software Defined Networking and Digital Transformation IPLs, as well as authoring multiple ISG Insights. He supports clients with customer engagement activities and events on SDN, Future Networks, ICT Network Services, IoT, Smart Cities and Infrastructure, Mobile Enterprise client strategies, Digital Transformation, market development and trends. Kenn is a known expert in these fields in many countries internationally, with over 40 years of experience in the ICT sector.

Jan Erik Aase, Editor

Director

Jan Erik Aase is a director and principal analyst for ISG. He has more than 35 years of collective experience as an enterprise client, a services provider, an ISG advisor and analyst. Jan Erik has overall accountability for the ISG Provider Lens™ reports, including both the buyer-centric archetype reports and the worldwide quadrant reports focused on provider strengths and portfolio attractiveness. He sets the research agenda and ensures the quality and consistency of the Provider Lens™ team.

ISG Provider Lens™ | Quadrant Report
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