ISG Provider Lens™

Network - Software Defined Solutions and Services

SDN Transformation Services (Consulting & Implementation)

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.

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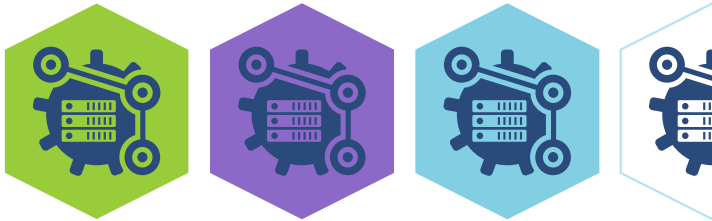
It must be noted that significant volatility exists in the constellation of market providers, partly due to the multitude of mergers and acquisitions that occurred during the last 18 months. This trend is set to continue and may even increase during the remainder of 2019 as SDN becomes mainstream.



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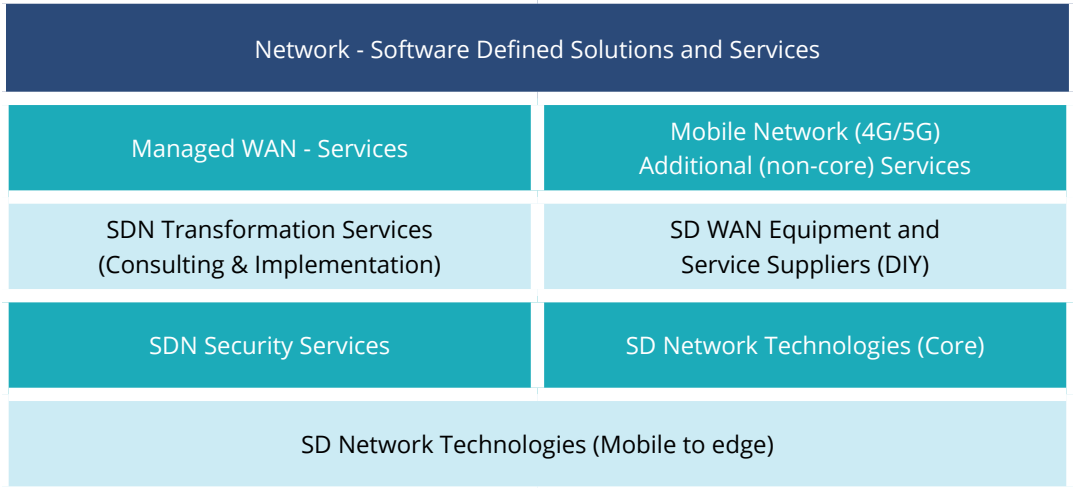
Introduction

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

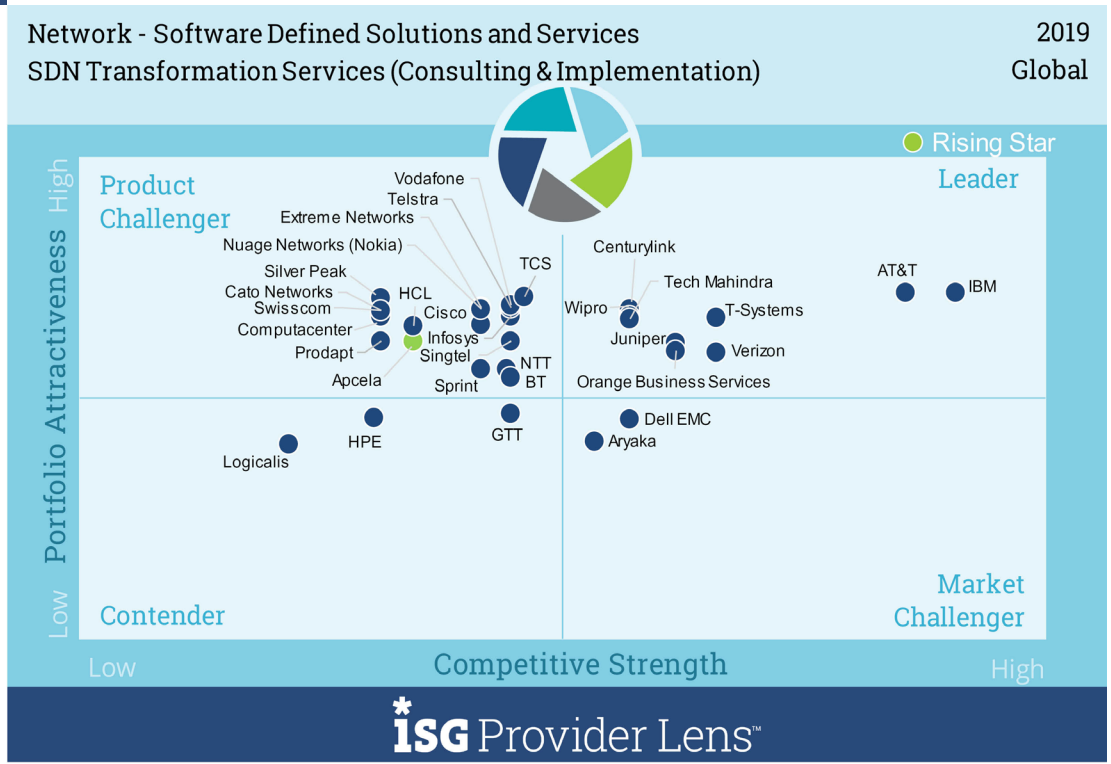
Network - Software Defined Solutions and Services Quadrants

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.

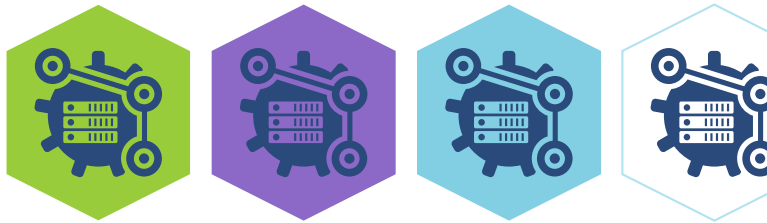
Caution

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.

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

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