

# Magic Quadrant for Network Services, Global

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Enterprises need greater agility from global network services to support cloud IT delivery and IoT. I&O leaders sourcing global network services must include new services, like managed SD-WAN, NFV and network on demand, in vendor evaluations to ensure the desired business outcomes are achieved.

## Market Definition/Description

The market for global network services continues its rapid evolution. In response to enterprise demand for WANs that can support cloud IT delivery and achieve much higher levels of agility, network service providers (NSPs) have been deploying a range of new software-based networking services. They are also changing their business models to allow for more flexible sourcing. This Magic Quadrant focuses on these transformational technologies and/or approaches that deliver on the future needs of the enterprise, rather than simply concentrating on legacy services. However, delivering a consistent set of service features and user experiences across all these elements on a global basis remains a challenge that requires scale and operational maturity.

Gartner defines the network service global market as the delivery of fixed corporate networking services with worldwide coverage. Services that are evaluated in this Magic Quadrant include both established and emerging global network service categories, such as:

- **WAN transport services, used to form hybrid WANs and underpin managed software-defined WAN (SD-WAN) services** — These include MPLS, Ethernet services and internet services, including dedicated internet access (DIA), broadband and cellular.
- **Carrier-based cloud interconnect** — This refers to direct MPLS, internet and/or Ethernet connections to leading providers of cloud services, including infrastructure as a service (IaaS), platform as a service (PaaS) and software as a Service (SaaS). These services improve the performance, availability and security of connectivity to critical cloud services, compared with generic public internet access. The option to insert network functions, such as firewalling and WAN optimization (which are often virtualized), into these connections is increasingly common.
- **Managed software-defined WAN (SD-WAN) services** — While some enterprises are renewing their existing MPLS or hybrid WANs, virtually all new managed global network deployments seen by Gartner in 2018 were managed SD-WAN networks, a trend we expect to see continue through 2019 and beyond. These services are based on edge devices with zero-touch

configuration, able to dynamically route traffic over different links based on policies under central policy management control (see “Technology Insight for Software-Defined WAN [SD-WAN]”). SD-WAN improves WAN agility by allowing easier and faster deployment of new sites, flexibility in the link types used, and simplified addition of new applications to the network. In addition, SD-WAN services typically provide significantly enhanced levels of application visibility compared to traditional managed router services.

- **Network on-demand services** — Network on-demand services from NSPs enable enterprises to make real-time changes to access/port bandwidth, change the WAN service types delivered over a network port and, in some cases, even add and remove endpoints, such as connections to cloud providers all under software control. They are controlled by the enterprise, via the provider’s web portal or APIs. Many providers are using software-defined networking (SDN) to deliver this functionality.
- **Network function virtualization (NFV) services** — This functionality is the replacement for purpose-built hardware devices, such as routers, security devices or WAN optimizers, with software running on industry-standard hardware equipment (see “Network Function Virtualization Will Enable Greater WAN Agility and Flexibility”). It can be run in virtual customer premises equipment (vCPE), which consists of on-site x86-based servers, supporting multiple virtualized network functions. Alternatively, some functions can run NFV service nodes, located in the provider’s network; although, in this case, some form of on-premises device will still be needed. NFV allows network functions to be activated on demand and consumed on an “as a service” basis, seeking to improve both the agility and cost-effectiveness of the enterprise WAN.
- **vCPE** — vCPE is the use of industry-standard, x86-based servers, rather than function-specific appliances, at enterprise premises to deliver enterprise network edge functions, such as WAN edge routers, including SD-WAN, WAN optimization controllers (WOCs), and security functions such as firewalls. (See “Innovation Insight for Virtual CPE.”)

## What’s Changed?

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In the past 12 months, Gartner has observed continued evolution of enterprise requirements and buying criteria for global networks. Enterprises are focusing on increasing the agility of their networks and on services that can enable their adoption of cloud IT delivery and eventual adoption of the Internet of Things (IoT). This is leading to most new global networks being based on SD-WAN and making greater use of the internet as a primary WAN transport.

Additionally, enterprises are more willing to utilize smaller providers and innovative services consumed on an as-a-service basis. This places less emphasis on larger providers, network scale and the availability of large numbers of provider staff to deliver customized capabilities to address site- or application-specific requirements.

Both enterprises and network service providers are taking advantage of the marketplace created by colocation hubs, such as Equinix and Digital Realty, to allow them to source access that is distance-insensitive at the national or even regional level. This simplifies the overall design and reduces the need for the deployment of large numbers of network points of presence (POPs; see “Five Key Factors to Prepare Your WAN for Multicloud Connectivity”). However, coverage for at least the

country level is still important, both to reduce costs and to improve performance when accessing cloud services and network-based virtual functions. The trend of moving away from customized solutions toward standard off-the-shelf managed services continues, with more and more services consumed on an as-a-service basis. Although uptake of NFV and vCPE has been slower than expected due to relatively high prices and technological limitations of some early implementations, the momentum behind these services is increasing, as enterprises see the value of the increased agility they can bring. (For example, in the 2018 iteration of this Magic Quadrant, less than 50% of providers offered these services. In this 2019 edition, that number is almost 90%.)

Network on-demand services are gaining in popularity, not to reduce costs by varying WAN bandwidth over the course of the day or week, but rather to dynamically adjust the capacity of different network services (e.g., Shrink MPLS and grow internet access as SD-WAN is rolled out). This allows enterprises to accommodate new applications and even create connections to new destinations, such as additional cloud providers, on demand, potentially allowing for dynamic load balancing of cloud providers and cloud performance optimization. However, these offerings are in their infancy in terms of functionality and coverage.

While delivering against a strong technological roadmap is important, it must be combined with good operational performance to deliver and sustain these services. Some service providers have been struggling to deliver the new capabilities they are offering with the levels of quality enterprises require.

To strengthen the focus of this research on these key trends and capabilities, we are no longer evaluating SIP trunk services, managed LANs or wireless LANs (WLANs). SIP trunk services will be covered in a separate Market Guide.

The inclusion and exclusion criteria for this year's Magic Quadrant, although similar to prior years, have been adjusted to reflect these trends.

# Magic Quadrant

Figure 1. Magic Quadrant for Network Services, Global



Source: Gartner (February 2019)

## Vendor Strengths and Cautions

### AT&T

Based in Dallas, Texas, AT&T is a major U.S. provider of fixed and mobile network services and has completed the acquisition of media and entertainment company Time Warner.

AT&T has an extensive global MPLS and Ethernet network, with broad reach. Its internet backbone, although high-capacity, has much less coverage than its other services. Its NetBond carrier-based cloud interconnect offer connects to 12 cloud providers in 24 cities.

AT&T was an early adopter of NFV and vCPE with its FlexWare offering. It was a little later in adopting managed SD-WAN, but now has a differentiated network-based SD-WAN capability and is launching additional offers based on multiple vendors. This rapid rollout has come, however, at the expense of some platform fragmentation.

In the past 12 months, AT&T has become more willing to pursue opportunities that do not necessarily have a substantial U.S. component.

Global enterprises of all sizes should evaluate AT&T for global networking services.

### Strengths

- AT&T's FlexWare is a leading NFV/vCPE suite with a range of deployment options including vCPE edge devices and 160 NFV service nodes. It supports multiple virtual network functions (VNFs) including routing SD-WAN, security and WAN optimization (although some of these VNFs are only available on an unmanaged basis).
- AT&T offers SD-WAN services based on VMware (formerly VeloCloud), with POP-based gateways to improve performance and scalability and to simplify migration. SD-WAN based on 128 Technology was also launched in 2018, and Cisco SD-WAN (Viptela) is planned for 2019.
- 2018 saw a significant expansion of AT&T's Ethernet footprint, which now allows for reach to 41 countries, with up to 100 Gbps access available.

### Cautions

- AT&T's additional SD-WAN offerings, from Cisco and AudioCodes/128 Technology, are based on separate NFV platforms from its primary FlexWare offering, limiting enterprises' ability to take advantage of the full suite of FlexWare capabilities.
- AT&T's own global internet service (AT&T Dedicated Internet Global [ADIG]) has limited coverage compared to the other leading providers in this Magic Quadrant. As a result, AT&T relies more heavily on dedicated internet access services from other providers when building hybrid or SD-WAN networks.
- Some Gartner clients are reporting increased levels of dissatisfaction with the quality of the vendor's service delivery and support.

### BT

Headquartered in London, BT is a major provider of fixed-line, mobile and broadband services in the U.K. Its Global Services division offers global networking and IT services to enterprise and public-sector customers.

BT has an extensive global network, with especially strong coverage in Europe and Latin America. BT has stated that it plans to move to a more “asset light” approach to its global network. As a result, Gartner expects that it will dispose of some of its in-country network assets; although BT expects to retain access to this infrastructure through commercial agreements.

In the past 12 months, BT has significantly enhanced its enterprise network portfolio, rolling out additional managed SD-WAN services and an NFV/vCPE offer, in addition to its existing proven hybrid WAN capabilities and carrier-based cloud interconnect offer.

In 2018, BT Global Services announced that it intends to focus on its largest 800 enterprise clients.

Large global enterprises should consider BT for global networking services.

### Strengths

- BT offers managed SD-WAN globally with multiple offers based on Nuage Networks from Nokia, Cisco SD-WAN (Viptela), Cisco SD-WAN (Meraki), Infovista and Riverbed.
- BT has a comprehensive NFV/vCPE offer with multiple virtual network functions in routing, SD-WAN, security, visibility, and WAN optimization, and a bring-your-own VNF capability, deployable from vCPE devices and 12 NFV service nodes.
- The vendor has a strong carrier-based cloud interconnect offer with eight cloud services and 16 cities supported globally. These support the insertion of virtualized network services, such as firewalling and WAN optimization, into the connections.

### Cautions

- BT has indicated that it is no longer focusing on directly pursuing business from smaller multinationals, including some of the more than 4,400 that are currently its clients. However, it will continue to serve these customers via regional sales teams, desk-based sales and indirect partners.
- BT’s plans for network on-demand services are limited to bandwidth on-demand for single services, with no announced plans for the dynamic addition of multiple services and new endpoints.
- In the U.S. market, BT’s network and sales coverage is not as strong as that of its U.S.-headquartered competitors.

### CenturyLink

CenturyLink is a major U.S. network service provider based out of Louisiana, with extensive global networking capabilities largely arising from its 2017 acquisition of Level 3 Communications.

CenturyLink’s global network includes Ethernet, MPLS and internet services, and is strongest in the U.S., Europe and Latin America.

CenturyLink's managed service offerings, especially SD-WAN and NFV/vCPE, are more limited than those of its leading competitors.

Global enterprises with geographic requirements focused on some or all of the U.S., Latin America and Europe should consider CenturyLink.

### Strengths

- CenturyLink has a strong network on-demand offering supporting Ethernet, MPLS and internet, and allowing connection to cloud endpoints.
- The vendor's carrier-based cloud interconnect offering supports connection to six major cloud providers in 40 cities globally, with support for dynamic capacity and connections.
- CenturyLink's network coverage in North America and South America is especially strong.

### Cautions

- Compared to other providers in this Magic Quadrant, CenturyLink's SD-WAN offering is limited, with its Versa Networks-based offering only available in 37 countries globally and its Cisco SD-WAN (Meraki and Viptela) offerings available in the U.S. only. However, CenturyLink plans to expand coverage of Versa Networks' offering to more than 60 countries and expand its Cisco SD-WAN (Viptela)-based offer internationally in 2019.
- CenturyLink's current NFV offering is very basic, with a single VNF each for routing, SD-WAN and security available in on-premises vCPE devices, and security and routing VNFs available in a small number of NFV service nodes. However CenturyLink has plans to expand both the VNFs supported and number of service nodes during 2019.
- CenturyLink has limited coverage of the Asia/Pacific region, although this has been improving, and very limited coverage in Africa and the Middle East.

### Global Cloud Xchange

Global Cloud Xchange (GCX) is the global networking arm of Reliance Communications, a large Indian network service provider.

GCX has rolled out MPLS and Ethernet POPs, with a focus on proximity to its extensive undersea cable infrastructure that connects India, China, the Asia/Pacific region, and the Middle East to the U.S. and Europe. GCX also has cloud gateways in 15 cities, connected to five global cloud providers.

GCX's internet network is significantly smaller than its MPLS footprint, limiting its ability to control internet quality in SD-WAN deployments, although it does have extensive capabilities at managing third-party ISPs.

GCX was one of the first providers to offer managed hybrid WANs and has enhanced this offering to provide managed SD-WAN based on a large number of vendors. However, its NFV/vCPE capabilities are currently limited.

GCX is best-suited for global networks that are primarily focused on linking sites spread across Asia/Pacific, the Middle East, the U.S. and Europe, or for enterprises requiring very-high-bandwidth services between major global hubs.

### Strengths

- GCX offers managed SD-WAN services based on Juniper Networks, Cisco SD-WAN (Meraki), Silver Peak and Riverbed, with additional vendors in test, although solutions from leaders VMware and Cisco SD-WAN (Viptela) are yet not supported.
- GCX has a more extensive global cable network than most providers, which allows it to address high-bandwidth needs between major global hub locations with good price performance.
- GCX has a strong track record of delivering hybrid WANs, including the management of a wide range of access providers and customer-provided access.

### Cautions

- GCX does not currently operate any NFV-based service nodes, but vCPE services are planned for 1Q19.
- GCX has limited network on-demand services that allow bandwidth adjustment for internet and MPLS services, but not Ethernet services; and it does not allow the addition of new services or endpoints.
- GCX's own network coverage in Eastern Europe, Latin America and Africa is not as extensive as that of leading providers in this Magic Quadrant. Instead, the vendor relies on partners for depth of coverage in these regions.

### GTT

GTT is a provider of global enterprise networking services based in McLean, Virginia. GTT has grown rapidly through acquisitions, with its largest acquisition to date being European network service provider Interoute, which closed on 31 May 2018.

GTT offers a broad set of network services, including fiber, Ethernet, MPLS, internet and managed network services, throughout North America and Western Europe, with more limited coverage in other regions. Its carrier-based cloud interconnect connects to 10 cloud providers in 14 cities.

Through the acquisition of network aggregator Global Capacity in 2017, GTT gained an extensive in-house access provider management capability.

GTT offers managed SD-WAN from two vendors, and NFV/vCPE from both vCPE devices and NFV service nodes in 16 cities.



GTT should be evaluated for global networks, particularly those requiring strong coverage in North America and Europe.

### Strengths

- GTT offers a managed SD-WAN solution based on Silver Peak and VMware (VeloCloud).
- The vendor delivers NFV in vCPE devices and NFV service nodes in 16 cities, with multiple SD-WAN, security and WAN optimization VNFs.
- GTT operates one of the largest internet backbones in the world, which enables it to deliver a high level of internet performance around the globe.

### Cautions

- GTT currently lacks a network on-demand capability.
- The vendor will have to manage integration of the large number of companies it has acquired, creating a degree of operational risk.
- GTT lacks network coverage in Latin America, the Asia/Pacific region and Africa, compared to leading providers in this Magic Quadrant. Instead, the provider relies on partners for depth of coverage in these regions.

### Masergy

Masergy is a privately held network service provider based in Plano, Texas, and owned by Berkshire Partners. While it is the smallest of the providers in this research, based on size and revenue, Masergy remains successful in its efforts to target global enterprises seeking customized network services that leverage a software-defined platform.

Masergy's network offers MPLS, Ethernet and internet services from a software-defined backbone with a network on-demand capability allowing services and capacity to be changed on demand.

Masergy leverages both proprietary and third-party hardware (including from Fortinet and Silver Peak) to deliver managed SD-WAN services. For several years, Masergy has delivered NFV services as its standard approach to delivering network edge functions, supporting both vCPE devices and NFV service nodes.

Organizations should evaluate Masergy if they require network services in the major global economies.

### Strengths

- Masergy provides a mature global NFV and vCPE platform offering with a wide range of VNFs, including SD-WAN, router, firewall, WAN optimization, session border controller, and encryption on vCPE appliances or from 54 NFV service nodes.

- Gartner clients report a very high level of satisfaction with Masergy's services.
- Masergy's network services are delivered from a network on-demand service platform that allows enterprises to dynamically adjust capacity and service types on each access line.

### Cautions

- Masergy does not publicly disclose the VNF vendors it uses on its NFV platform, which can discourage enterprises looking for specific vendor solutions (e.g., a specific firewall vendor).
- While growing, Masergy's network infrastructure in Europe, the Asia/Pacific region and Latin America is limited when compared to the Leaders in this Magic Quadrant. In addition, it does not have points of presence in Africa or the Middle East, although it does serve customer locations in those regions.
- Masergy has limited experience in supporting very large global networks (i.e., 1,000-plus locations).

### NTT

NTT, headquartered in Japan, is the leading network service provider in Japan, and its NTT Communications arm provides global network services to enterprises. NTT's ownership of Dimension Data, which has now been combined with NTT Communications, gives it an extensive managed and professional services capability as well as additional sales reach.

Outside of the Asia/Pacific region, where the vendor is especially strong, NTT continues to expand its infrastructure and is adding MPLS POPs in central Europe and North America. Through its ownership of Dimension Data and its Internet Solutions subsidiary, NTT also has strong coverage in the African region. Its carrier-based cloud interconnect offer has connections to a wide range of cloud providers in a large number of cities.

NTT offers managed SD-WAN globally, with multiple vendors as standard and an even larger number of vendors supported on a custom basis.

The provider has comprehensive NFV/vCPE and network on-demand offerings.

NTT should be evaluated by enterprises with global WAN needs, particularly by enterprises requiring extensive coverage in the Asia/Pacific region and/or Africa.

### Strengths

- NTT offers managed SD-WAN services globally, based on Cisco SD-WAN (Viptela), Silver Peak, Riverbed and Versa Networks as standard with a large number of other vendors available on a custom basis.
- The vendor offers NFV solutions based on vCPE appliances and 76 NFV service nodes, with a large number of VNFs including multiple routing, SD-WAN, security and WAN optimization.

- NTT has a strong network-on-demand offering, with Ethernet, internet and MPLS services, and dynamically configurable bandwidth, as well as the ability to add additional cloud endpoints.

### Cautions

- NTT's global network coverage is limited compared to other leading providers in this Magic Quadrant, particularly in Latin America, the Middle East and Eastern Europe.
- The vendor's brand awareness outside of the Asia/Pacific region is still limited, meaning it does not get considered for many opportunities for which it might be suitable.
- NTT's positioning of NTT Communications, Dimension Data and NTT DATA is confusing, with multiple overlapping offers, although NTT has plans to improve this via the integration of several NTT Group companies.

### Orange Business Services

Orange Business Services is the enterprise service unit of Orange, a global communications service provider headquartered in France.

Orange Business Services continues to offer the broadest global coverage of any provider in terms of POPs, including all emerging regions. Orange has a comprehensive carrier-based cloud interconnect offer called VPN Galerie, with connectivity to 10 cloud providers in 14 cities, which also provides virtualized WAN optimization and network security.

In 2018, Orange significantly expanded its range of SD-WAN offerings, with its Flexible SD-WAN offer including support for five vendors and POP-based SD-WAN gateways for some vendors.

Orange also expanded the rollout of its NFV/vCPE offerings, both on-premises and network-based; however, its plans for network-on-demand services are very limited.

Orange should be evaluated by enterprises with requirements for managed global networks across all regions.

### Strengths

- Orange has SD-WAN offers based on Cisco SD-WAN (Viptela), Riverbed, Infovista, Juniper Networks and Cisco SD-WAN (Meraki), including POP-based SD-WAN gateways for some offers.
- Orange has a comprehensive NFV/vCPE service offer with multiple VNFs for routing, SD-WAN, security and WAN optimization, available in on-premises devices and 20 NFV service nodes.
- The vendor has the broadest network coverage in terms of countries connected to its own network, with strong coverage in all the major emerging regions.

## Cautions

- Orange's network-on-demand services are currently limited to bandwidth on demand for Ethernet services in Europe; although, it has plans to expand this globally and add cloud connectivity features in 2019.
- Orange prefers to offer managed network services. It does not typically pursue unmanaged, bandwidth-only network opportunities, making it a poor fit for multinational corporations seeking a transport-only WAN.
- The vendor's coverage of the U.S. market is more limited than its U.S.-based competitors, although it has improved its U.S. access options with additional Ethernet and broadband partners.

## Sprint

Sprint is a U.S.-based fixed and wireless service provider based in Kansas City, Missouri, that is majority-owned by SoftBank of Japan. Subject to regulatory approval, Sprint is in the process of merging with T-Mobile USA (a majority-owned subsidiary of Deutsche Telekom of Germany), a deal that is expected to close in the first half of 2019. It is not clear what impact, if any, this would have on Sprint's network services outside of the U.S., given that Deutsche Telekom also offers international network services via T-Systems.

While Sprint has an extensive network in North America, it has lighter network coverage in other regions. It provides carrier-based cloud interconnect to Amazon Web Services (AWS) and Microsoft in 15 cities around the world and to additional cloud providers via Equinix Cloud Exchange.

Sprint offers a managed SD-WAN solution based on VMware (VeloCloud) with coverage in 38 countries and plans to launch additional solutions based on Cisco SD-WAN (Meraki), Cisco SD-WAN (Viptela) and Fortinet in 2019.

Sprint should be considered by organizations with global requirements that are predominantly in North America and limited requirements in other regions.

## Strengths

- Gartner clients report that Sprint is easy to do business with, providing a good portal, flexible contracting terms and a good account management experience.
- Sprint has significantly enhanced its U.S. network with more POPs and very extensive Ethernet access for Ethernet and MPLS service.
- Sprint offers the option of usage-based pricing for its MPLS service, allowing clients to burst up to their full access line speed if needed.

## Cautions

- Sprint's managed SD-WAN service is currently available in only 38 countries worldwide, significantly fewer than leading providers in this Magic Quadrant.

- Sprint currently has no vCPE and NFV services, although premises-based vCPE is planned for launch in 32 countries 2019.
- The vendor lacks a network-on-demand offer and does not currently have any plans to develop such a capability.

## Tata Communications

Part of the Tata Group, a multinational conglomerate holding company, Mumbai- and Singapore-headquartered Tata Communications is a global provider of digital infrastructure services.

Tata Communications continues to expand its global network reach with new POPs in Africa and the Middle East, and in several airports around the world. Its network coverage is particularly strong across the Asia/Pacific region, the Middle East and Africa, but it also has good coverage in Europe and the U.S. Tata Communications offers carrier-based cloud interconnect from 18 cities to eight leading cloud services.

The vendor has placed a strong focus on developing its global internet WAN service, extending its own large internet backbone with selected ISP partners to create its unique IZO Internet WAN offering.

Tata Communications has multiple managed SD-WAN offerings, with support for an additional vendor planned.

In 2018, Tata Communications rolled out a global NFV/vCPE service with on-premises vCPE and NFV-service-node-based delivery of multiple virtual functions.

Tata Communications is suitable for all enterprise global WAN needs, has good experience in large distributed networks and is particularly strong for those requiring extensive coverage in Africa, the Middle East and the Asia/Pacific region.

## Strengths

- Tata Communications' SD-WAN offerings include a Versa Networks-based solution, a Tata Communications-developed SD-WAN capability for traditional Cisco Integrated Services Routers (ISRs) and SD-WAN termination in its cloud gateways, with support for Cisco SD-WAN (Viptela) planned for 2019.
- Tata Communications has an NFV/vCPE offer with multiple VNFs including routing, SD-WAN, security and WAN optimization delivered using on-premises vCPE devices and from 30 NFV service nodes.
- Tata Communications' IZO Internet WAN offers a unique alternative to MPLS, with comparable SLAs and with availability in more than 122 countries.

## Cautions

- The vendor does not support network on-demand services, although bandwidth on demand for Ethernet services is planned for the first half of 2019.
- Tata Communications has limited global networking sales coverage compared to some of the other leading providers in this Magic Quadrant, resulting in it sometimes not being considered for opportunities for which it might be suitable.
- The vendor's network coverage in Latin America and Eastern Europe is weaker than that of other leading providers in this Magic Quadrant.

## Telefonica

Telefonica, headquartered in Madrid, delivers fixed and mobile telecommunications services globally through its own international, local and partner networks.

Telefonica's global network builds upon Telefonica's extensive national networks in Spain, Germany, the U.K., Argentina, Brazil, Chile, Colombia, Ecuador, Mexico and Peru, but is weaker in other regions.

Telefonica's network on-demand services allow bandwidth on demand for MPLS, internet, Ethernet and carrier-based cloud interconnect. Its carrier-based cloud interconnect offering connects to four cloud providers in nine cities globally.

Telefonica offers managed SD-WAN services from two vendors, but its NFV/vCPE offer is currently limited compared with leading providers in this Magic Quadrant.

Telefonica is especially well-suited to enterprises with global networks that require strong coverage requirements in Latin America and/or Europe.

## Strengths

- Telefonica offers managed SD-WAN services globally, based on Cisco SD-WAN (Viptela) and Nokia Nuage.
- Telefonica has a network-on-demand capability that allows for bandwidth on demand for MPLS, internet, Ethernet and carrier-based cloud interconnect.
- Telefonica has very strong network coverage in Europe and Latin America.

## Cautions

- Telefonica's global network has limited coverage in the U.S., and very limited coverage in the Asia/Pacific region, the Middle East and Africa.
- Telefonica's NFV/vCPE offering is limited to a single VNF for each of the following functions: SD-WAN (Nokia Nuage), security (Fortinet) and WAN optimization (Infovista Ipanema), although these are available both on vCPE devices and from 17 NFV service nodes.

- Telefonica's carrier-based cloud interconnect offer is limited to Amazon, Microsoft, Google and IBM in nine cities worldwide.

## Telstra

Headquartered in Melbourne, Australia, Telstra is a major network service provider in the Asia/Pacific region, with global networking capabilities.

Telstra's product evolution maintains a high focus on cable and network infrastructure across the Asia/Pacific region; but the vendor is also incrementally enhancing its MPLS capabilities in both Europe and the U.S.

Telstra offers bandwidth on-demand connectivity via 36 Telstra Programmable Network (TPN) POPs across 11 countries. However, these POPs are predominantly in the Asia/Pacific region and are separate from Telstra's MPLS network. Telstra offers carrier-based cloud interconnect to 12 cloud providers in 8 cities.

The TPN network offers NFV services from seven POPs (four in the Asia/Pacific region, one in the U.K. and two in the U.S.). It offers 23 VNFs from 10 vendors, including routing, SD-WAN, security, WAN optimization and application delivery controllers (ADCs), with open-source options for some functions. It has two additional TPN POPs planned for 2019. However, Telstra lacks an on-premises NFV/vCPE offering.

Telstra is best-suited for organizations requiring strong network coverage in the Asia/Pacific region, but with less extensive requirements in other regions.

## Strengths

- Telstra offers managed SD-WAN services based on VMware (VeloCloud), Cisco SD-WAN (Viptela) and Cisco SD-WAN (Meraki).
- The vendor owns extensive submarine cable infrastructure and large numbers of network POPs in the Asia/Pacific region, with good connectivity to Europe and North America.
- Telstra has a unique joint venture in China, giving it particular strength in delivering services to this important market.

## Cautions

- Telstra's NFV/vCPE services are behind those of the Leaders in this Magic Quadrant.
- Telstra's network coverage is weaker outside the Asia/Pacific region than that of leading providers in this Magic Quadrant, particularly in North America, Latin America, Africa and the Middle East.
- The vendor has limited experience in supporting very large global networks (e.g., 1,000-plus locations).

## T-Systems

T-Systems is a division of Deutsche Telekom, a major European fixed and mobile service provider and U.S. mobile operator. Headquartered in Frankfurt, Germany, T-Systems is responsible for delivering IT services and global enterprise networking.

T-Systems global network offers MPLS and Ethernet services, with a much more limited internet footprint, and its carrier-based cloud interconnect offer is extremely limited.

T-Systems founded the Next Generation Enterprise Network Alliance (ngena), a separate company, to deliver SD-WAN, NFV/vCPE and network on-demand services globally, in combination with regional alliance partners. However, it has not yet gained significant traction in the market.

T-Systems also resells SD-WAN services from Aryaka, in which Deutsche Telekom Capital Partners has a minority investment.

T-Systems is best-suited for enterprises with global networks that are heavily weighted toward Europe.

### Strengths

- T-Systems network has strong coverage in Europe, especially central Europe.
- T-Systems has a strong hybrid WAN offer, including cellular for rapid deployment backup.
- The ngena platform offers SD-WAN based on Cisco SD-WAN (Viptela) on an NFV basis, with SD-WAN, security and WAN optimization VNFs, although currently only from Cisco.

### Cautions

- Managed SD-WAN services, network on demand and NFV/vCPE are currently only delivered via the ngena alliance (or for SD-WAN from Aryaka), not over T-Systems' existing networks. This makes migrations and hybrid deployments more difficult, although T-Systems plans to launch its own SD-WAN services in early 2019.
- T-Systems' carrier-based cloud interconnect is limited to Amazon and Microsoft in two European cities, fewer than any other provider in this Magic Quadrant.
- T-Systems' network coverage of Latin America, the Middle East and Africa is much weaker than that of the Leaders in this Magic Quadrant.

## Verizon

U.S. telecommunications provider Verizon is one of the world's largest providers by revenue of fixed and mobile network services.

Verizon has an extensive global network, including national and metropolitan fiber infrastructure in the U.S., European and Asia/Pacific markets, with a broad portfolio of data, voice and managed network services. During 2018, the vendor significantly increased secure interconnectivity between



MPLS and the internet, as well as expanding its carrier-based cloud interconnect service to 29 cities, providing interconnection to eight cloud providers.

Verizon offers a network on-demand capability with bandwidth on demand for Ethernet and MPLS services.

The vendor has a very comprehensive NFV/vCPE offer with many different types of VNFs, multiple vendors for many VNFs using multiple deployment options, in-service nodes, public cloud or a wide range of on-premises devices.

Verizon offers managed SD-WAN from three vendors using four delivery approaches: as a dedicated SD-WAN appliance; or as software on either a vCPE-based device, a Verizon NFV service node or hosted on AWS.

Global enterprises of all sizes should evaluate Verizon for both managed and unmanaged network requirements.

### Strengths

- Verizon offers managed SD-WAN services based on Versa, Cisco SD-WAN (Viptela) and Cisco SD-WAN (Meraki), available as a fully managed, partially managed or self-managed service.
- Verizon offers a very comprehensive range of NFV/vCPE services with multiple routing, SD-WAN, security, visibility, WAN optimization, session border controller, software-defined perimeter and WLAN controller VNFs, on a wide range of on-premises devices and from 43 NFV service nodes.
- The vendor supports one of the world's largest internet backbones with direct Ethernet connectivity up to 100 Gbps, as well as LTE.

### Cautions

- Verizon's MPLS network coverage of the Middle East and Africa is not as extensive as some of its competitors.
- Although Verizon has its own strong global internet backbone, it needs to improve its local internet partnering and peering for better geographical reach and faster deployment.
- Some Gartner clients have expressed a need for improvement in Verizon's presales and postsales support, which does not match that of some of its peers evaluated in this Magic Quadrant.

### Vodafone

Newbury, U.K.-headquartered Vodafone is a provider of fixed and network services in multiple countries in Europe, Africa and the Asia/Pacific region. Vodafone Business is the unit responsible for providing global enterprise networks.

Vodafone's extensive national networks in multiple countries give it especially strong coverage of Europe, Africa and the Asia/Pacific region; reasonable coverage of the U.S. and the Middle East; but weaker coverage of Latin America. The vendor's carrier-based cloud interconnect supports 13 cities, but currently only connects to Microsoft, Amazon and Alibaba.

Vodafone offers managed SD-WAN services from two vendors, and NFV/vCPE services from on-premises devices and 13 NFV service nodes. Vodafone has a network on-demand service that supports bandwidth on demand for Ethernet and MPLS services.

Vodafone has emphasized automation, from quoting to service assurance, and has plans to use artificial intelligence (AI) to further enhance its operational capabilities during 2019.

Enterprises with global networks that require strong coverage in any or all of Europe, Africa or the Asia/Pacific region should consider Vodafone.

### Strengths

- Vodafone offers managed SD-WAN based on Juniper Networks and Cisco SD-WAN (Viptela), with Cisco SD-WAN (Meraki) available in local markets only.
- Vodafone's network coverage is especially strong in Europe, the Asia/Pacific region and Africa.
- Vodafone's NFV/vCPE service supports routing, SD-WAN, security and WAN optimization VNFs delivered from on-premises devices or 13 NFV service nodes.

### Cautions

- Vodafone's coverage of Latin America is very limited, and its coverage of the U.S. is lighter than that of U.S.-based providers.
- Vodafone's carrier-based cloud interconnect offering supports only Microsoft, Amazon and Alibaba, although four more providers and additional cities are planned for 2019.
- Vodafone is primarily focused on its top 1,435 global accounts and does not always bid on other opportunities.

### Vendors Added and Dropped

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We review and adjust our inclusion criteria for Magic Quadrants as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant may change over time. A vendor's appearance in a Magic Quadrant one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. It may be a reflection of a change in the market and, therefore, changed evaluation criteria, or of a change of focus by that vendor.

### Added

No vendors were added to the Magic Quadrant.

## Dropped

Interoute was dropped; in May 2018, it was acquired by GTT, which is included in this research.

## Inclusion and Exclusion Criteria

To qualify for inclusion, providers need to:

- Provide global WAN services to enterprise customers, with a minimum of five POPs in each of the following regions: Asia/Pacific, North America and Europe.
- Have contracts signed to provide global enterprise network services in three geographic regions out of the following five: North America, South America, Europe, Africa and Asia/Pacific, within the past 12 months.
- Provide their own global network services, not simply resell the services of other global or regional network providers.

## Evaluation Criteria

### Ability to Execute

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Gartner evaluates providers on the quality and efficacy of the processes, systems, methods or procedures that enable IT provider performance to be competitive, efficient and effective; and to positively impact revenue, retention and reputation within Gartner's view of the market. Our emphasis is on a vendor's service quality, pricing and track record. These elements are particularly important for global networks because the issues of infrastructure, language and culture are more challenging than if applicable to only one country.

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product or Service	High
Overall Viability	Medium
Sales Execution/Pricing	High
Market Responsiveness/Record	High
Marketing Execution	Medium
Customer Experience	High
Operations	Low

Source: Gartner (February 2019)

### Completeness of Vision

Gartner evaluates providers on their ability to convincingly articulate logical statements. This includes current and future market direction, innovation, customer needs and competitive forces, and how well they map to Gartner’s view of the market. Visionary providers should have a clearly articulated strategy in evolving areas of enterprise networking, including, but not limited to, networking for cloud services, SD-WAN, SDN, NFV and vCPE. The portfolio should be broad enough to satisfy the evolving requirements of most enterprises, not just a specific vertical industry or customer size.

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	Medium
Marketing Strategy	Medium
Sales Strategy	Low
Offering (Product) Strategy	High
Business Model	Low
Vertical/Industry Strategy	Low
Innovation	High
Geographic Strategy	Medium

Source: Gartner (February 2019)

## Quadrant Descriptions

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### Leaders

Providers in the Leaders quadrant are performing well today and maintain a stable organization with a clear vision of market direction. They deliver comprehensive portfolios of good-quality network services across broad geographies. They address the global networking needs of a broad range of enterprises in terms of size, geographic distribution and vertical industry. Leaders shape the direction of the market by extending their coverage, developing new class-leading capabilities and new commercial models, and deploying these at scale.

### Challengers

Challengers are strong in execution, but narrower than Leaders in their vision for taking market leadership. Their focus is more on established network services and geographies, and they are typically followers of the market innovations created by Leaders and Visionaries.

### Visionaries

Visionaries have market-leading plans for the future in terms of geographic and/or network service innovation. However, their current capabilities are not class-leading in terms of scope and/or quality.

## Niche Players

Providers in the Niche Players quadrant may focus on a particular segment of the market, as defined by characteristics such as size, vertical sector, geographic coverage or technology, and may be strong providers for those requirements. However, they lack the current capabilities to address the needs of the broader range of enterprises or the vision to significantly alter their position in the market.

## Context

In an era of increased digital business and carrier-based cloud interconnect, enterprise demand for bandwidth and network access has never been stronger. This demand is heightened by enterprise requirements for video and the IoT, and by the fact that organizations frequently struggle with application performance challenges when moving applications and computing/storage to the public cloud. Additionally, new workloads and new digital business initiatives require agile and scalable networks that can provide greater accessibility and reliability without exponentially increasing costs.

These factors are contributing to the sustained bandwidth growth in the global network service market, which currently averages between 30% and 40% per annum. However, enterprises are continually looking to optimize their IT spend, including their WAN spend. In this context, new network architectures, most notably SD-WAN, are increasingly being rolled out by global providers. These providers are presenting SD-WAN as a way to grow bandwidth while simultaneously allowing enterprises to set policies designed to boost application performance, improve management and reduce hardware footprint. Thus, as demand for cloud-supported computing and applications grows, enterprises must redesign their networks and implement new options that better service these requirements.

Fortunately, enterprises can choose from a wide selection of solution providers, most operating across multiple geographies. This breadth is allowing enterprises to choose between one, two or many providers to find the best solution for their specific needs. These decisions will be based on geographic requirements, end-user support, price sensitivity and management propensity (i.e., the enterprise's desire to manage multiple networks from multiple providers). Additionally, the intense competition continues to drive down unit prices for global networking services. However, in a market where there are no meaningful price lists, enterprises will still need to utilize competitive procurement practices and strong negotiations to obtain the best prices.

## Market Overview

Gartner forecasts that the market for enterprise data networking services in 2019 will be \$156 billion, broadly unchanged from 2018 (see "Forecast: Enterprise Communications Services, Worldwide, 2016-2022, 4Q18 Update"). The number of global network service providers included in this research has shrunk slightly due to the acquisition of Interoute by GTT Communications. However, competitive intensity remains high as enterprises are increasingly willing to consider smaller providers, including managed service providers who have little or no network infrastructure of their own (such as those featured in the "Market Guide for Managed SD-WAN Services").

Alternatively, enterprises may choose a combination of multiple regional providers — such as those featured in the regional use cases in Gartner’s Critical Capabilities for Network Services, and the “Market Guide for Network Services, Fixed and Mobile, Pan-African” and “Market Guide for Network Services, Fixed and Mobile, Pan-Latin American.”

## Sourcing Trends

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The global network service market continues to move toward a more software-driven, as-a-service model, with increasing levels of visibility and self-service via portals and APIs available to enterprise customers. However, this means that providers are increasingly reluctant to allow any deviation from the standard offering, as it will require the deployment of a fully custom solution at a much higher cost. In addition, such solutions will be in danger of rapidly becoming obsolete in this fast-moving market.

Providers are however increasingly focused on providing the managed service platform (e.g., SD-WAN and NFV/vCPE) and are increasingly open to “bring your own access” and other sourcing approaches for the network transport components.

## Operational Trends

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The adoption of SD-WANs is moving the network buying discussion away from technologies toward outcomes and service levels. Providers continue to improve their SLAs with more realistic objectives and more meaningful penalties for failing to meet those objectives, increasingly including the right to cancel the service in the event of chronic breach. Installation lead times — a pain point for many enterprises with global networks — are now starting to be covered by standard SLAs, and providers are making considerable efforts to improve delivery times, although, they remain frustrated by third-party/local access providers. The ever-increasing speeds of cellular services are making this technology more useful as a rapid deployment (interim) solution, as well as providing a truly diverse backup option.

Electronic quoting and ordering are increasingly widespread, with electronic bonding between the global providers and their local access providers. Self-service provisioning and increased visibility of the service being delivered via portals continue to gain momentum.

However, global networks are also becoming more complex because transport becomes a hybrid of MPLS, internet and Ethernet, cloud endpoints are added, and SD-WAN and NFV technology are added. In addition, internet, especially using broadband or cellular access, is an inherently less predictable service than MPLS. Enterprise networking organizations face continual pressure to improve the agility with which they can respond to the needs of the business.

As a result, despite the continual investment in improving the customer experience, the majority of providers have struggled to achieve high levels of customer satisfaction.

## Network Architectures

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Enterprises' adoption of cloud IT service delivery remains key to driving transformation of their WAN architectures. Fortunately for the enterprise, the global network service providers have deployed a range of capabilities to address enterprises' cloud connectivity needs (see "Five Key Factors to Prepare Your WAN for Multicloud Connectivity"). All providers offer carrier-based cloud interconnect from their MPLS and Ethernet networks to leading cloud service providers such as Amazon and Microsoft — with the key differentiators being the specific cloud providers and cities connected. Additionally, leading providers have enabled virtualized security and WAN optimization services to be added to these connections, backed by standard SLAs. Provider-managed SD-WAN services also offer the option of direct internet access from every site, with options for security either on-site or as a cloud-based service. Enhanced internet backbone services may be available to improve the performance of cloud service access over the internet.

New global network proposals are predominantly for managed SD-WAN services based on a hybrid mix of internet and MPLS transport, with different applications using the most appropriate link type, and typically with direct internet access from every site, including corresponding security solutions.

Ethernet WAN services (virtual private line and virtual private LAN services) remain more niche in use and are principally used for data center interconnection or for geographically restricted scenarios (i.e., Metro Ethernet) as a cost-efficient solution for high-bandwidth scenarios. Different combinations of each of these services can be used to obtain different service levels appropriate to each enterprise location.

## Access Options

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WAN access is evolving, with traditional leased-line access, such as T1 or E1 lines, no longer proposed in new deals, except when no other form of access is available, such as in rural locations, some emerging markets or where fiber is extremely limited. These traditional access lines have been replaced by optical Ethernet access at 10 Mbps, 100 Mbps, 1 Gbps or even 10 Gbps. The scale economics of Ethernet access are very good with each tenfold increase in speed, typically only increasing cost by two to three times. As a result, in developed markets, enterprises now tend to purchase access lines with much higher speeds than they currently require, with the port capacity limited to their current needs. This allows them to easily and quickly upgrade capacity in response to changing requirements.

Some providers are delivering network-on-demand services allowing self-service alteration of bandwidth (up to the access speed) via a portal or APIs. In some cases, it is possible to change the service types delivered over the access line (e.g., adding internet services to a line that initially delivered MPLS) and to add additional endpoints, such as cloud services.

For smaller, less critical or remote locations, broadband (increasingly, "superfast broadband" such as VDSL, cable modem or passive optical network [PON]) is the access technology of choice, despite having either no SLAs or poorer SLAs than Ethernet or traditional leased-line access. When enterprises require large numbers of broadband connections, they can find that they are able to get better pricing than that offered by global service providers by looking to aggregators as an alternative. In response to this, in addition to their own access aggregation services, many providers



now support “bring your own broadband.” This refers to where the service provider delivers managed services over broadband sourced by the enterprise, which purchases its broadband either directly or from a broadband service aggregator.

Finally, cellular connectivity, including 4G where available, is increasingly being used for backup, rapid deployment or temporary locations, although it does not include SLAs. As with broadband, enterprises may be able to get attractive deals for data-only mobile services themselves, which will then be managed by their global provider.

## Managed and Virtualized Services

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The vast majority of global WANs are delivered on a managed service basis, with the on-site devices, such as routers, security appliances and WAN optimizers, provided and managed by the service provider. Although, U.S.-headquartered multinationals are more likely to manage their networks in-house. Providers are now offering alternative ways to deliver this functionality. In particular, this applies to NFV, where these capabilities are delivered as software on x86-based servers, either on-site vCPE or for some functions in the provider’s POPs (although in this some form of on-premises device will still be needed). NFV can be delivered either on top of existing transport networks, such as MPLS or hybrid WANs, or as a feature of a software-defined network. These offerings promise to greatly improve the agility of enterprise networks, with the potential for the rapid deployment of new sites, as well as on-demand capacity upgrades and the addition of incremental services. Although Gartner expects significant uptake of these services over the next 12 to 18 months, they are still at the early stages of their deployment and no two providers have the same roadmap, let alone rollout timetable.

An increasing number of global WANs incorporate managed application visibility and/or WAN optimization, with some providers now offering application-level visibility by default. SD-WAN services, which operate based on application-level policies, also typically offer inherently higher levels of application visibility.

## Pricing Trends

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Downward pressure on global network service prices is relentless (e.g., global MPLS services see unit price declines averaging 10% per year, although with strong regional variance). Gartner has produced research summarizing and predicting pricing trends for different services and geographies (see “Network Service Price Trends: What You Need to Know to Save Money on Your Next Contract Negotiation”). The response from providers varies, with some focusing on extending their own networks, while others are relying heavily on network-to-network interface (NNI) connections to partners to improve their regional coverage. Most providers are increasingly using carrier-neutral communications hubs, such as those operated by Equinix, to allow them to cost-effectively interconnect with multiple access, backbone and cloud providers. These hubs, particularly when combined with NFV and/or SD-WAN, have dramatically reduced the level of investment required to be competitive in the global network service market. This has allowed smaller providers, including some of the more recent entrants to this Magic Quadrant, to offer solutions competitive with those of the largest providers. However, maintaining a consistent set of service features and user experiences across all these different elements remains a challenge.

## Gartner Recommended Reading

*Some documents may not be available as part of your current Gartner subscription.*

“Market Guide for Network Services, Fixed and Mobile, Pan-African”

“Market Guide for Network Services, Fixed and Mobile, Pan-Latin American”

“Market Guide for Managed SD-WAN Services”

“Network Service Price Trends: What You Need to Know to Save Money on Your Next Contract Negotiation”

“How to Choose the Right Level of Agility for Your Next Global Enterprise WAN”

“2018 Strategic Roadmap for Enterprise Networking”

“Five Key Factors to Prepare Your WAN for Multicloud Connectivity”

“How Markets and Vendors Are Evaluated in Gartner Magic Quadrants”

### Evaluation Criteria Definitions

#### Ability to Execute

**Product/Service:** Core goods and services offered by the vendor for the defined market. This includes current product/service capabilities, quality, feature sets, skills and so on, whether offered natively or through OEM agreements/partnerships as defined in the market definition and detailed in the subcriteria.

**Overall Viability:** Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood that the individual business unit will continue investing in the product, will continue offering the product and will advance the state of the art within the organization's portfolio of products.

**Sales Execution/Pricing:** The vendor's capabilities in all presales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel.

**Market Responsiveness/Record:** Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.

**Marketing Execution:** The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification

with the product/brand and organization in the minds of buyers. This "mind share" can be driven by a combination of publicity, promotional initiatives, thought leadership, word of mouth and sales activities.

**Customer Experience:** Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, service-level agreements and so on.

**Operations:** The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.

#### Completeness of Vision

**Market Understanding:** Ability of the vendor to understand buyers' wants and needs and to translate those into products and services. Vendors that show the highest degree of vision listen to and understand buyers' wants and needs, and can shape or enhance those with their added vision.

**Marketing Strategy:** A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the website, advertising, customer programs and positioning statements.

**Sales Strategy:** The strategy for selling products that uses the appropriate network of direct and indirect sales, marketing, service, and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

**Offering (Product) Strategy:** The vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature sets as they map to current and future requirements.

**Business Model:** The soundness and logic of the vendor's underlying business proposition.

**Vertical/Industry Strategy:** The vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets.

**Innovation:** Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.

**Geographic Strategy:** The vendor's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either

directly or through partners, channels and subsidiaries as appropriate for that geography and market.

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