Gartner.

Magic Quadrant for Network Services, Global

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Driven by cloud IT service adoption and accelerated by COVID-19, the market for global enterprise network services is undergoing a generational shift in technologies and provider landscape. I&O leaders must adapt their network sourcing approaches to reflect this transformation.

Strategic Planning Assumptions

By 2025, to enhance agility and support for cloud applications, 65% of enterprises will have implemented software-defined wide-area networks (SD-WANs), compared with about 30% in 2020.

By 2025, to deliver flexible, cost-effective scalable bandwidth, 40% of all enterprise locations will have only internet WAN transport, compared with approximately 15% in 2020.

By the end of 2024, 30% of enterprises will employ SDCI services to connect to public CSPs, up from less than 10% in 2020.

Through 2024, less than 30% of SD-WAN solutions will be delivered on universal customer premises equipment (uCPE), due to performance, price and complexity.

Market Definition/Description

Gartner defines the global network service market as the provision of fixed corporate networking services with worldwide coverage.

Current global network services required for evaluation in this Magic Quadrant and Critical Capabilities include:

- **WAN Transport Services** — Multiprotocol Label Switching (MPLS) and both broadband/DSL and dedicated internet access (DIA) services available globally. DIA should be offered as the provider's own service, which can be supplemented by DIA from partners. Broadband internet can be a resold solution, but must be generally available on a global basis.

- **Carrier-Based Cloud Interconnect (CBCI)** — This is a direct connection between a service provider's enterprise network services, such as MPLS and/or Ethernet services, and the private connection option of one or more cloud service providers (CSPs). CBCI must be established

directly between the network service provider (NSP) and the cloud provider. CBCI services are mandatory on a global basis.

- **Managed WAN Services** — These must include managed Software-Defined WAN (SD-WAN) and are required to be offered globally. Although a minority of enterprises are renewing their managed router networks, most new managed global network deployments are now based on managed SD-WAN networks, using a mix of MPLS and internet transport. This is a trend Gartner expects to continue. An option for managed SD-WAN services is for the provider to deploy network-based SD-WAN gateways to facilitate interconnection between SD-WAN and non-SD-WAN networks, improve scalability, and avoid the need for traffic to traverse long distances over the internet.

Emerging global network services that are evaluated, but which are not mandatory, include:

- **Network On Demand (NOD)** — NOD services from NSPs enable enterprises to make near-real-time changes to access/port bandwidth, change the WAN service types delivered over a network port and, in some cases, add and remove endpoints (for example, connections to cloud providers). This occurs under software control, via the provider's web portal or APIs.

- **Network Function Virtualization (NFV)** — NFV is an architecture to deliver multiple network functions, including routing, firewall, SD-WAN, WAN optimization, and visibility, as software, termed "virtual network functions" (VNFs). NFV enables enterprises to rapidly (in minutes) deploy network functionality to support locations where it is required. NFV can be implemented on universal customer premises equipment (uCPE), industry-standard x86 devices used in place of function-specific appliances or in NFV service nodes, located in the provider's network or in colocation facilities. NFV enables network functions to be activated on demand, deactivated when no longer required and consumed on an "as a service" basis. This can improve the agility and cost-effectiveness of the enterprise WAN.

- **4G/LTE and 5G Cellular WAN Access** — We see cellular connectivity gradually expanding in applicability for SD-WAN use cases, including rapid deployment of new locations, supporting temporary locations and providing diverse backup links. The enhanced performance of 5G will further broaden those opportunities.

In addition, it is highly desirable for providers to offer related network services, including managed WAN optimization, managed application visibility, and managed, network-related security services.

Integrators, virtual operators and carriers may be included, but only if they will bid for stand-alone WAN deals and provide and manage offerings that include WAN connectivity.

What's Changed

Gartner continues to observe changes in enterprise requirements and buying criteria for global networks. The COVID-19 pandemic has highlighted the true value of agility for enterprise

networks, as enterprises have had to rapidly change working practices, accelerate digital and cloud transformations, and cope with rapidly changing business circumstances. Organizations using flexible networking technologies and sourcing approaches have been much better able to support the rapid accommodation of new endpoints and new applications, including cloud services and IoT, and have done so while controlling their WAN expenditure. Enterprises are increasingly willing to consider smaller providers and innovative services, especially those that can be consumed on an as a service basis. This places less importance on supplier size and the availability of large numbers of provider staff to deliver customized capabilities.

The growing use of internet services for WAN transport is increasing the need for providers' own internet services and good partnering with local ISPs. This reduces the importance of MPLS network scale, as providers can exploit carrier hubs and internet access, to source access that is distance-insensitive at the national or even regional level. Points of presence are increasingly acting as gateways between access and backbone network services, cloud services and extranets, in addition to serving as locations where network services, such as security, can be applied.

Services like managed SD-WAN, network on-demand services, NFV and uCPE, which transform the enterprise networking market, are being rapidly deployed to help improve the agility of providers' network solutions. The inclusion and evaluation criteria for this Magic Quadrant and its companion Critical Capabilities research have been evolved to reflect these trends.

Using SD-WAN overlay services with an underlay of internet services allows enterprises the option to separately source their overlay from their underlay. However, the majority of enterprises still buy most of their underlay services from their overlay provider, especially when using a hybrid underlay, mixing MPLS and internet. This integrated sourcing approach is the primary focus of this Magic Quadrant. Enterprises focused specifically on enterprise network operations services can consider most providers in this report and also those in the Magic Quadrant for Managed Network Services, which focuses on network operations services.

Magic Quadrant

Figure 1: Magic Quadrant for Network Services, Global

Source: Gartner (March 2021)

Vendor Strengths and Cautions

AT&T

AT&T is a Leader in this Magic Quadrant. Based in Dallas, Texas, AT&T is a major provider of U.S. fixed and mobile network services and global enterprise network services.

AT&T's internet backbone has been expanded and now reaches 67 countries. Its NetBond cloud connectivity connects to 13 major cloud providers in 26 cities.

AT&T offers managed SD-WAN solutions from VMware, Silver Peak and Cisco Viptela, with 70 network-based gateways for its VMware offer, plus partner gateways.

AT&T's FlexWare NFV platform includes a broad range of VNFs, including edge compute options, available from both uCPE devices and 79 NFV service nodes.

AT&T should be considered for global networking requirements by enterprises of all sizes, regardless of home country.

Strengths

- AT&T has launched a Global SD-WAN SOHO offer, which enables support of residential sites for work from home use cases.

- AT&T has expanded its VNF ecosystem with additional vendors for security, visibility and edge compute.

- AT&T's Dedicated Internet, on-demand change orders, now supports port and access speed changes.

Cautions

- AT&T's SD-WAN and NFV/uCPE offerings remain fragmented, with network-based SD-WAN gateways limited to its VMware solution and Cisco Viptela software delivered on a separate hardware platform.

- AT&T's network on-demand service remains more limited than leading competitors in terms of feature set and geography.

- Gartner clients have expressed dissatisfaction with the "Day 2" AT&T experience, including network quality, time to respond, time to repair, customer support, and especially around the provider's use of third parties for SD-WAN support. However, there have been recent improvements in some KPIs.

BT

BT is a Leader in this Magic Quadrant. Headquartered in London, BT is a major provider of U.K. fixed and mobile network services and global enterprise network services.

BT has a large global network, maintaining its global POPs during its divestment of national networks in Europe and Latin America. To become "asset-light," BT is adding to its existing networking operating model, a new operating model based on DevOps methodologies for new services.

BT offers managed SD-WAN based on Nuage, Cisco Viptela, Cisco Meraki, VMware, Fortinet and Versa, with network-based SD-WAN gateways for Nuage and VMware. It offers cloud connectivity to eight major cloud providers in 74 cities.

Large global enterprises should consider BT for global networking services.

Strengths

- BT's network coverage is especially strong in Europe and Latin America.

- BT has a comprehensive NFV/uCPE offer with multiple VNFs in routing, SD-WAN, security, visibility, and WAN optimization, and a bring-your-own VNF capability, deployable from uCPE

devices and 33 NFV service nodes.

- BT offers nationwide domestic MPLS, IP VPN, SD-WAN and ISP services in China via its joint-venture entity, BT China Communications, improving its ability to serve this important market at lower price points and better service levels.

Cautions

- All of BT's current network services, including SD-WAN and NFV, are under the networking operating model. Enterprises should seek clarification regarding which services are or will be supported on the new IT stack of the digital model and what the balance of investment between these two approaches will be.

- BT lacks a full multiservice NOD, with dynamic service and endpoint addition, although it has long-term plans to develop such services.

- BT's own internet services have significantly less coverage than its MPLS services, leading to it using ISP partners to extend its reach.

China Telecom Global

China Telecom Global is a Niche Player in this Magic Quadrant. China Telecom Global (CTG) is a subsidiary of China Telecom, based in Hong Kong.

CTG has expanded its MPLS and Ethernet coverage of the APAC, North America, Western Europe, the Middle East and Africa regions; however, it has weaker coverage in Latin America and Eastern Europe. It offers cloud connect to seven major cloud providers in 15 cities.

CTG's internet coverage is more extensive than its MPLS coverage, across all regions.

Internationally, it offers SD-WAN based on Versa with 54 network-based SD-WAN gateways.

China Telecom Global should be considered for midsize networks focused on the APAC region, with less complex needs, especially for enterprises with extensive requirements in China.

Strengths

- CTG has strong network coverage in China and good APAC regional capabilities.

- It has launched a premium internet service in China and is expanding this across the APAC region.

- CTG has launched a customer self-services portal of all its global network services.

Cautions

- CTG has no NFV/uCPE platform and no specific plans to develop this capability.

- Compared with leading providers in this research, CTG has limited experience delivering large global networks.

- CTG's network coverage in Eastern Europe, Latin America, Africa and the Middle East is not as extensive as that of leading providers in this Magic Quadrant.

Colt

Colt is a Visionary in this Magic Quadrant. Headquartered in the U.K., Colt is a global NSP with an especially strong presence in Europe and major cities in the APAC region.

Colt offers SD-WAN based on Versa, with 10 network-based SD-WAN gateways. Colt offers cloud connect to nine major cloud providers in 40 cities.

Colt has historically focused on locations it could directly connect to its own fiber network, but it is now extending its offers, such as Colt On Demand, to locations connected via third-party access.

Colt should be considered by global organizations with most of their locations in Europe and/or the largest cities in Asia.

Strengths
- Colt has strong network coverage in Europe and some of the largest cities in Asia, including its dense metropolitan area fiber networks in many major cities.

- Colt offers an NOD service, called Colt On Demand, for Ethernet, internet and MPLS services, including cloud connectivity.

- Colt has specific networking offerings for the financial services sector.

Cautions
- Colt lacks its own network infrastructure in Latin America, the Middle East and Africa.

- Colt only supports a single SD-WAN vendor compared with leading providers on this quadrant that offer a portfolio of different SD-WAN vendors.

- Colt's NFV/uCPE offering is very limited compared with leading providers in this Magic Quadrant.

Deutsche Telekom

Deutsche Telekom is a Niche Player in this Magic Quadrant. Deutsche Telekom, a major European fixed and mobile service provider and U.S. mobile operator, has reorganized, transferring responsibility for global enterprise networking from its T-Systems unit to Deutsche Telekom itself.

Deutsche Telekom offers cloud connectivity to five major cloud providers in seven cities. The provider offers managed SD-WAN globally from Cisco Viptela, Juniper, Silver Peak and VMware, with additional vendors supported at local level, but does not have network-based SD-WAN gateways for any of its global offerings.

Deutsche Telekom should be considered by enterprises with global networks that are heavily weighted

toward Europe.

Strengths

- Deutsche Telekom's network has strong European coverage, especially in central Europe.

- Deutsche Telekom offers managed SD-WAN from four vendors globally and an additional five vendors in specific local markets.

- Deutsche Telekom has introduced a network on-demand offering for Etherent, MPLS and internet.

Cautions

- Deutsche Telekom's network coverage in North and South America, the Middle East and Africa is much less than that of leading providers in this Magic Quadrant.

- The provider offers cloud connectivity to fewer providers and in fewer cities than leading providers in this Magic Quadrant.

- Deutsche Telekom's NFV/uCPE offering is very limited, with a limited number of VNFs and no NFV service nodes.

GTT

GTT is a Niche Player in this Magic Quadrant. Based in McLean, Virginia, GTT is a provider of global enterprise networking services.

In October 2020, GTT announced the sale of its infrastructure unit — which includes city fiber networks in Europe, long-haul fiber in North America and its transatlantic cables — to I Squared Capital.

GTT offers managed SD-WAN from VMware, Silver Peak and Fortinet, all with network-based gateways. GTT offers NFV/vCPE services from both uCPE devices and NFV service nodes in 40 cities, with a limited range of VNF types. It offers cloud connectivity to 12 major cloud providers in 27 cities.

GTT should be considered by enterprises requiring global networks that need strong coverage in North America and Europe.

Strengths

- GTT's carrier-based cloud interconnect service supports a wide range of cloud providers from a good range of cities worldwide.

- The provider supports customer VNFs on its NFV platform, including from uCPE devices and from NFV service nodes in 40 cities worldwide.

- GTT operates one of the largest internet backbones in the world, which enables it to deliver good internet coverage and performance worldwide.

Cautions

- GTT lacks NOD capabilities, an increasingly common capability among others in this research.

- GTT has limited network coverage outside North America and Europe, compared with leading providers in this Magic Quadrant. Instead, the provider relies heavily on partners for depth of coverage in these regions.

- GTT has grown through a large number of acquisitions and, as a result, has suffered from sales inconsistency and lack of brand awareness in the global network marketplace.

Lumen

Lumen is a Leader in this Magic Quadrant. Lumen, formerly known as CenturyLink, headquartered in Monroe, Louisiana, is a major U.S. NSP, with extensive global networking capabilities.

Lumen's Cloud Connect offers interconnections to six major cloud providers in 59 cities.

Lumen offers managed SD-WAN services based on Versa, Cisco Viptela and Cisco Meraki, but currently lacks network-based SD-WAN gateways. Lumen's NFV/uCPE offering is available from uCPE devices and more than 600 NFV service nodes, though only 22 nodes support all VNFs.

Multinational enterprises should consider Lumen for managed and unmanaged global networking requirements.

Strengths

- Lumen has a strong NOD capability that supports dynamic configuration of Ethernet, MPLS, internet and cloud connectivity on-demand via a portal and APIs.

- Lumen's network coverage in North America and South America is especially strong.

- Lumen offers a strengthened integrated SD-WAN SLA, which includes SLA-based commitments to availability tiers, repair and change management.

Cautions

- Lumen does not currently offer network-based SD-WAN gateways, although these are planned.

- Lumen's NFV offering is not as strong as leading providers on this Magic Quadrant, offering a limited choice of VNFs for its on-premises uCPE devices and NFV service nodes.

- Lumen has very limited network coverage of Africa and the Middle East.

Masergy

Masergy is a Visionary in this Magic Quadrant. Owned by Berkshire Partners, Masergy is a privately held NSP based in Plano, Texas.

Masergy offers cloud connectivity to 11 major cloud providers in 42 cities as well as 200+ smaller cloud providers.

Masergy offers managed SD-WAN from Fortinet and Silver Peak with 169 network-based SD-WAN gateways for its Fortinet offer. Masergy delivers NFV services as its standard approach to delivering network edge functions supporting a limited range of VNFs from uCPE devices and 57 NFV service nodes.

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

Strengths

- Masergy has a mature global NFV and vCPE platform, offering a wide range of VNFs, including SD-WAN, router, firewall, WAN encryption, WAN optimization and session border controller, on vCPE appliances or from 57 NFV service nodes.

- Masergy's NOD service supports bandwidth on demand for Ethernet, MPLS and internet services on the same access line with portal and API control.

- Masergy's AIOps analyzes network and cloud application performance to the user level, predicts potential issues and shows mitigation steps in the customer portal as well as supporting shadow IT discovery.

Cautions

- Masergy's network coverage has not been growing, with little or no growth in the number of POPs in Europe, the APAC region or Latin America, and no POPs in Africa or the Middle East. However, it does serve customer locations in those regions via third parties.

- Masergy has limited experience in supporting large global networks (that is, 1,000-plus locations).

- Masergy pricing is often higher than other service providers in this Magic Quadrant, especially those with larger networks.

NTT

NTT is a Leader in this Magic Quadrant. NTT is the leading NSP headquartered in Japan and a provider of global network services via its NTT Ltd. unit, which has integrated several networking-related companies owned by NTT, including Dimension Data, a global system integrator.

NTT offers cloud connectivity to 10 major cloud providers in 50 cities.

NTT has a comprehensive NFV/vCPE offering a broad range of VNFs from both uCPE devices and 103 NFV service nodes.

NTT offers managed SD-WAN globally based on Cisco Viptela, Cisco Meraki, Silver Peak, Versa and VeloCloud, with 139 network-based SD-WAN gateways in 52 cities for all offers.

NTT should be considered by all enterprises with global WAN needs across all regions.

Strengths

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

- In addition to extensive MPLS coverage of the APAC, North America, Europe and Africa regions, NTT offers a global internet backbone with premium internet and a wide range of access providers.

- NTT has a strong managed SD-WAN offer, with a choice of five SD-WAN vendors, with all offers supported by a large number of network-based gateways.

Cautions

- NTT's network coverage in Latin America is more limited, compared with leading providers in this Magic Quadrant.

- The provider's brand awareness outside the APAC region is still limited, meaning it does not get considered for many opportunities for which it might be suitable.

- NTT's pricing for its own network transport services, such as MPLS, outside the APAC region can be higher than that of other leading providers, although its partner-based internet services are competitive.

Orange Business Services

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

Orange supports cloud connectivity to 10 major cloud providers in 20 cities worldwide.

Orange offers managed SD-WAN services based on Cisco Viptela, Fortinet and Cisco Meraki with 29 network-based Gateways for its Cisco Viptela offer. It offers NFV/uCPE with routing, SD-WAN, security, and WAN optimization VNFs available from uCPE devices and 30 NFV service nodes.

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

Strengths

- Orange has the broadest network coverage in terms of countries connected to its own network, with strong coverage in all the major emerging regions.

- Orange has a mature program to support co-management and third-party underlay networks, including "bring your own access."

- Orange offers a comprehensive portfolio of optional performance management and visibility tools for its network services.

Cautions

- Orange's global network on-demand services are limited to bandwidth on-demand for cloud connectivity only, although it has additional capabilities in France.

- The provider frequently proposes customized solutions that could create challenges for long-term support and migration.

- 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.

PCCW Global

PCCW Global is a Niche Player in this Magic Quadrant. PCCW Global is the international arm of the incumbent provider of Hong Kong, a strong provider in APAC, with growing global reach.

PCCW Global offers cloud connectivity in 27 cities, connecting to eight major cloud providers.

PCCW Global offers NFV and uCPE with a limited range of VNFs available from uCPE devices and 102 NFV service nodes.

It offers managed SD-WAN based on VMware and Cisco Viptela, with 14 network-based SD-WAN gateways.

PCCW Global should be considered by enterprises that need strong APAC and/or African regional coverage, with more limited needs in other regions.

Strengths

- PCCW Global has strong network capabilities in the APAC region, as well as above-average coverage in Africa and the Middle East.

- PCCW Global offers NOD services based on its Console Connect acquisition, with a comprehensive feature set but from a limited number of points of presence.

- PCCW Global offers NFV-based services for all of its MPLS POP locations, as well as managed uCPE across all regions.

Cautions

- PCCW Global's coverage in North America, Eastern Europe and Latin America is not as extensive as that of leading providers in this Magic Quadrant. Instead, the provider relies on

partners for depth of coverage in these regions.

- PCCW Global offers a very limited range of virtual network functions on its NFV platform.

- PCCW Global has limited experience with global managed network services, especially for larger, more complex networks.

Riedel Networks

Riedel Networks is a Niche Player in this Magic Quadrant. Riedel Networks is a privately held, global service provider based in Butzbach, Germany.

Riedel focuses on midsize multinationals and the media and events sector, where it has experience delivering networking for major events, such as Formula One motor racing.

It offers cloud connectivity to nine major cloud providers in 17 cities, although this is via cloud exchanges rather than direct connectivity.

Riedel offers managed SD-WAN services based on Cisco Viptela and Cisco Meraki, with 24 network-based gateways.

Riedel should be considered by midsize multinationals seeking global managed network services, especially those interested in Cisco-based solutions.

Strengths
- Riedel has a strong track record of delivering mission-critical services, with rapid deployment as demonstrated by its track record supporting major events.

- Riedel has specific offers for the events, retail and manufacturing sectors.

- Riedel's network and SD-WAN offer is 100% Cisco-based, allowing it to focus on service delivery rather than interoperability.

Cautions
- Riedel lacks a network-based NFV/offer, and its uCPE offer is limited to the Cisco ENCS platform.

- Riedel lacks a network on-demand offer, although it has plans to develop this capability within the next 18 months.

- Riedel lacks experience with the deployment of very large networks (100s to 1,000s of sites).

Singtel

Singtel is a Niche Player in this Magic Quadrant. Based in Singapore, Singtel is a leading NSP in the APAC region.

Singtel has good MPLS coverage in the APAC region but limited coverage in other regions. Cloud connectivity is available to six major cloud services from 36 cities.

Singtel has expanded its NFV/uCPE with a moderate range of VNFs offered from uCPE devices and 17 NFV service nodes.

Singtel offers managed SD-WAN based on Cisco Viptela, Fortinet, Cisco Meraki and VMware, with network-based SD-WAN gateways for Cisco Viptela, Cisco Meraki and VMware.

Singtel should be considered for most APAC region enterprise needs, including high-bandwidth services, where needs outside the APAC region are more limited.

Strengths

- Singtel has partnered with local ISPs globally to offer an enhanced internet backbone service with SLAs.

- It has a more extensive APAC region subsea cable network, as well as out-of-region cables, than most providers. This allows it to address high-bandwidth and low-latency services.

- Singtel has a broad range of managed SD-WAN services, with network-based gateways for three of its offers.

Cautions

- Singtel's own network coverage outside the APAC region is not as extensive as that of leading providers in this Magic Quadrant. Instead, the provider relies on partners for depth of coverage in these regions.

- Singtel's NOD offering is limited to MPLS and cloud connectivity, although it plans to add internet in 2021.

- Singtel has limited experience with larger, more complex global networks.

Tata Communications

Tata Communications is a Leader in this Magic Quadrant. Part of the Tata Group, Mumbai-headquartered Tata Communications is a global provider of enterprise network services.

Tata offers cloud connectivity to eight major cloud providers in 23 cities.

Tata offers managed SD-WAN based on Versa, Cisco Viptela and its own offer using Cisco routers, with 45 network-based SD-WAN gateways for its Versa offer.

Tata offers NFV/uCPE services with routing, SD-WAN, security and WAN optimization VNFs available from uCPE devices and 45 NFV service nodes.

Tata Communications should be considered for all enterprise global WAN needs, especially those requiring extensive coverage in Africa, the Middle East and the APAC region.

Strengths

- Tata Communications' IZO internet WAN offer provides an enhanced internet service with end-to-end SLAs based on the backbone of Tata, combined with access from local ISP partners in more than 125 countries.

- Tata Communications has strong coverage of the APAC region, Africa and the Middle East, combined with good coverage in Europe.

- Tata is working with its NetFoundry subsidiary to develop an application-aware, secure, zero-trust WAN offer.

Cautions

- Compared with others in this Magic Quadrant, Tata lacks a multiservice NOD capability.

- The provider's own network coverage in Latin America and Eastern Europe is weaker than that of other leading providers in this Magic Quadrant.

- Tata Communications has limited global networking sales coverage, compared with some of the other leading providers. As a result, it is sometimes not considered for opportunities for which it might be suitable.

Telefonica

Telefonica is a Challenger in this Magic Quadrant. Telefonica, headquartered in Madrid, is a major provider of fixed and mobile network services in Spain, the U.K., Germany and 10 Latin American countries, offering global network services to multinational enterprises.

Telefonica offers managed SD-WAN services from Cisco Viptela, Nuage, Cisco Meraki and Fortinet, and has 10 network-based SD-WAN gateways for Nuage and 26 for Cisco Viptela.

Telefonica offers NFV/uCPE supporting a limited range of VNFs from uCPE devices and 26 NFV service nodes. It offers cloud connectivity to five major cloud providers in eight cities.

Telefonica should be considered by enterprises with global networks that require strong coverage in Europe and Latin America.

Strengths

- Telefonica has a strong NOD capability that allows for bandwidth on demand for MPLS, internet and its carrier-based cloud interconnect.

- Telefonica proactively supports bring your own (BYO) access/underlay approaches.

- Telefonica has strong network coverage in Europe and Latin America.

Cautions

- Telefonica's global network has limited coverage in the U.S.; very limited coverage in the APAC region, the Middle East and Africa; and its long-term Latin American coverage and ownership remains uncertain.

- Telefonica's SD-WAN support remains fragmented, with 10 Nuage gateways limited to Spain and Latin America, while Cisco Viptela is delivered from a separate platform.

- Telefonica's carrier-based cloud interconnect offering is limited to five cloud providers in eight cities worldwide, with none in the APAC region.

Telia

Telia is a Niche Player in this Magic Quadrant. Headquartered in Sweden, Telia is the largest NSP in the Nordic region and offers global network services from its Telia Carrier division.

In 2020, Telia announced its intention to sell Telia Carrier to Polhem Infra, an investment company.

Telia offers managed SD-WAN based on Cisco Viptela with 36 network-based gateways and Nuage with 24 network-based gateways. It offers NFV and uCPE with a very limited range of VNFs from uCPE devices and 26 NFV service nodes. It offers cloud connectivity to five major cloud services in 25 cities worldwide.

Telia should be considered by enterprises with significant requirements across Europe and the U.S. and more limited needs in other regions.

Strengths
- Telia has one of the most extensive, high-capacity global internet backbones, with strong peering capabilities and port speeds up to 400 Gbps.

- Telia's internet and MPLS network has extensive coverage of Europe and North America.

- Telia uses AI and ML to enhance its customer service levels.

Cautions
- Telia's network coverage of Asia, Latin America, the Middle East and Africa is very limited.

- Telia lacks a true network on-demand offering with online changes to bandwidth and services, although it has an online portal to request service changes.

- Outside the Nordic region, Telia has less experience with access and CPE management than leading providers in this research.

Telstra

Telstra is a Niche Player in this Magic Quadrant. Headquartered in Melbourne, Australia, Telstra is a major NSP in the APAC region.

Its Telstra Programmable Network (TPN) offers NOD services, cloud connectivity and network-based NFV, and it is interconnected with Telstra's MPLS network. Telstra offers direct cloud connectivity to three major cloud providers in 31 cities.

Telstra offers managed SD-WAN services based on VMware, Cisco Viptela and Cisco Meraki, with SD-WAN gateways in the APAC region for VMware.

It offers NFV/uCPE services with a limited range of VNFs from eight NFV service nodes.

Telstra should be considered by organizations requiring strong network coverage in the APAC region, but with less extensive requirements in other regions.

Strengths

- The provider owns extensive subsea cable infrastructure and large numbers of network POPs in the APAC region.

- Telstra has a joint venture in China, giving it strength in delivering services to this important market.

- The Telstra Programmable network offers a rich set of NOD services, especially suitable for cloud connectivity.

Cautions

- Telstra's NFV/uCPE services are behind those of the leaders in this market, especially the lack of a standard uCPE capability and limited range of VNFs and NFV service nodes.

- Telstra's MPLS and internet coverage in regions outside the APAC region is well below average of the providers in this research.

- The provider has limited experience in supporting large global networks.

Verizon

Verizon is a Leader in this Magic Quadrant. Headquartered in New York City, Verizon is a major provider of U.S. fixed and mobile network services and global enterprise network services.

Verizon offers carrier-based cloud interconnect services to nine major cloud providers in 27 cities worldwide.

Verizon offers managed SD-WAN from Versa, Cisco Viptela, Cisco Meraki and Silver Peak, with 32 network-based SD-WAN gateways for the Cisco Viptela and Versa offers.

It offers NFV/uCPE services with a very broad portfolio of VNFs from a wide range of uCPE devices and 64 NFV service nodes.

All multinational enterprises should consider Verizon for managed and unmanaged network requirements.

Strengths

- Verizon offers a comprehensive range of NFV/vCPE services, including routing, SD-WAN, SD-Branch, security, SBC, WAN optimization and a Kubernetes Edge compute service.

- Verizon offers NOD capabilities, with bandwidth on-demand for Ethernet, MPLS, internet and cloud connectivity with portal and API-based control.

- Verizon supports one of the world's largest internet backbones with direct Ethernet connectivity up to Nx100 Gbps.

Cautions

- Verizon's MPLS and internet network coverage in the Middle East and Africa lags many of its key competitors.

- Although it now has network-based SD-WAN gateways, Verizon seldom proposes these.

- Verizon does not offer any enhanced internet backbone services across its extensive internet network.

Vodafone

Vodafone is a Leader in this Magic Quadrant. Newbury, U.K.-headquartered Vodafone is a provider of fixed and mobile network services in Europe, Africa and the APAC region. Vodafone Business is responsible for providing global enterprise networks.

Vodafone offers cloud connectivity to seven major cloud providers in 36 cities and has an NFV/uCPE offer with a good portfolio of VNFs, delivered from uCPE devices and 24 NFV service nodes.

Vodafone offers managed SD-WAN services based on Juniper, Cisco Viptela, Cisco Meraki and VMware, with 16 network-based gateways for Juniper and eight for VMware.

Vodafone should be considered by enterprises with global networks that require strong coverage in any or all of Europe, Africa or the APAC region.

Strengths

- Vodafone's network coverage is especially strong in Europe, the APAC region and Africa.

- Vodafone has achieved a high level of automation for its network services, from quoting to service assurance, and is using AI to further enhance its operational capabilities.

- Vodafone continues to take advantage of its strength in global mobility, to enhance its WAN portfolio.

Cautions

- Vodafone's coverage of Latin America is limited, and its coverage of the U.S. is lighter than that of U.S.-based providers.

- Vodafone currently lacks a full NOD service, although it plans to deliver this starting in 4Q21.

- Vodafone is primarily focused on its top 1,435 global accounts and the enterprises in the markets, where it has national and partner operations and does not always bid on other opportunities.

Vendors Added and Dropped

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

Riedel Networks met our revised inclusion criteria.

Dropped

Sprint (now T-Mobile) did not meet our revised inclusion criteria.

Global Cloud Xchange did not meet our revised inclusion criteria.

Two service products underwent a name change: CenturyLink has rebranded under the name of Lumen, and Deutsche Telekom reorganized, transferring responsibility for global enterprise networking from T-Systems to Deutsche Telekom.

Inclusion and Exclusion Criteria

To qualify for inclusion, service providers must:

- Sell MPLS and internet (both dedicated and broadband/DSL) services to enterprise customers. All services must be generally available and not offered on an individual customer (one-off) basis or only in limited markets. Broadband services can either be inherent to the provider's core network offering or offered in a resale model, but the broadband services must be available on a global basis.

- Have a minimum of five MPLS and internet POPs in each of the following: the APAC region, North America and the EMEA region.

- Connect to at least three cloud providers (CBCI) in each of the following: the APAC region, North America and the EMEA region.

- Have signed at least one contract for global enterprise network services, as a net new account, in the last 12 months, in each of the following geographic regions: APAC, North America and

Europe.

- Provide their own global network services, not simply resell the services of other global or regional network providers.

Evaluation Criteria

Ability to Execute

<div align="center">Table 1: Ability to Execute Evaluation Criteria</div>

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 (March 2021)

Completeness of Vision

<div align="center">Table 2: Completeness of Vision Evaluation Criteria</div>

Evaluation Criteria	Weighting
Market Understanding	Medium
Marketing Strategy	Medium
Sales Strategy	Low

Evaluation Criteria ↓	Weighting ↓
Offering (Product) Strategy	High
Business Model	Low
Vertical/Industry Strategy	Medium
Innovation	High
Geographic Strategy	Medium

Source: Gartner (March 2021)

Quadrant Descriptions

Leaders

Providers in the Leaders quadrant are performing well and maintaining a stable organization with a clear vision of market direction. They deliver comprehensive portfolios of 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 commercial models and deploying them at scale.

Challengers

Challengers are strong in execution but narrower than Leaders in their vision for taking market leadership. They focus more on established network services and geographies and 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 such characteristics as size, vertical sector, geographic coverage or technology, and they may be strong providers for those requirements. However, they lack the capabilities to address the needs of the broader range of enterprises or the vision to significantly alter their position in the market.

Context

The COVID-19 pandemic has highlighted the true value of agility for enterprise networks as enterprises have had to rapidly change working practices, accelerate digital and cloud transformations, and cope with rapidly changing business circumstances. Organizations using flexible technologies and sourcing approaches have been much better able to support the rapid accommodation of new endpoints, new applications and new network capabilities, while controlling their WAN expenditure.

Digital business initiatives are placing increasing demands on the enterprise network, increasing the needs for bandwidth (between 20% and 30% annually), reliability and performance. Video, both live and stored, is the main driver of increases in bandwidth, whereas IoT typically requires greater reliability.

A growing proportion of enterprise applications are being delivered as cloud services — infrastructure as a service (IaaS), platform as a service (PaaS) and SaaS. This requires incorporation of cloud endpoints into the network and a burgeoning need for user-to-cloud, data-center-to-cloud and even cloud-to-cloud connectivity.

To address these demands, service providers are deploying a range of new networking technologies. SD-WAN is now the default offering for new network deployments and major refreshes, while the virtualization of network edge functions, using NFV and uCPE, is gradually becoming more common. CBCI is also mainstream, complemented by emerging NOD services. Growing use of the internet as a network transport option, together with cloud endpoints, is resulting in performance uncertainty, and is driving significant demand for application visibility services.

Enterprises with global networking needs can choose from a wide selection of solution providers. This decision will be based on geographic requirements, the specific services required and the preferred sourcing approach. This will include managed or unmanaged network services with the growing option of sourcing the underlay of transport services separately from the overlay of SD-WAN and other services, such as security.

Competition continues to drive down unit prices for global networking services. However, in a market in which there are no meaningful price lists, enterprises still need to use competitive procurement practices and strong negotiations to obtain the best prices.

Market Overview

Gartner forecasts that the market for enterprise data networking services in 2021 will be $113 billion, an increase of approximately 3% from 2020 (see Forecast: Communications Services, Worldwide, 2018-2024, 4Q20 Update). The number of global NSPs included in this research has remained fairly constant, but some providers have left and others joined while many more are operating in the broader market and did not meet all of our inclusion criteria. In addition to large global providers, enterprises are increasingly willing to consider smaller providers, including

managed service providers, with little or no network infrastructure of their own, but who resell network services to their enterprise clients where needed.

Sourcing Trends

Providers are increasingly focused on providing the managed network service "overlay" platform (for example, managed SD-WAN, security and NFV/uCPE) while becoming more open to "bring your own access" and other flexible sourcing approaches for the "underlay" network transport components. However, the majority of enterprises still buy most of their underlay services from their overlay provider, especially when using a hybrid underlay, mixing MPLS and internet. This integrated sourcing approach is the primary focus of this Magic Quadrant. Enterprises focused specifically on enterprise network operations services can consider most providers in this report and also those in the Magic Quadrant for Managed Network Services.

Most global network service providers are continuing to move toward a more platform-based approach using a software-driven, as-a-service model, with increasing levels of visibility and self-service via portals and APIs available to enterprise customers. Providers pursuing this approach are reluctant to allow deviations from their standard offerings because that will require deployment of a custom solution at a higher cost that could rapidly become obsolete in this fast-moving market.

However, some providers are taking a different approach, closer to that of system integrators, assembling solutions per customer, using third-party networks and services. While providers pursuing this approach are able to support a wider variety of vendors and solutions designs, their solutions are typically less agile and automated.

Operational Trends

The network buying discussion is gradually moving 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 starting to be covered by standard SLAs. Global providers are also striving to improve their lead times, although they remain constrained by the lead times of third-party/local access providers. The increasing speeds of cellular services are making this technology more useful as a rapid deployment (interim) solution. In addition, it provides a truly diverse backup option. However, the hype around 5G cellular replacing fixed connectivity should be treated with caution, due to maturity issues — especially coverage limitations.

Electronic quoting and ordering are increasingly widespread, with electronic bonding between the global providers and their local access providers. Self-service ordering and/or provisioning as well as the increased visibility of the service being delivered via portals continue to gain momentum. This is blurring the lines between managed services and self-management to create a spectrum of co-management possibilities.

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 adding even more intrigue and complexity. In addition, the internet, especially using broadband or cellular access, is an inherently less predictable service than MPLS. Visibility capabilities, sometimes referred to as performance analytics, can help by enabling enterprises to see the actual performance of their applications. Thanks to the continual investment in enhancing the customer experience, customer satisfaction with global NSPs is improving.

Network Architectures

New global network proposals are predominantly for managed SD-WAN services based on a hybrid mix of MPLS and internet transport, with different applications using the most appropriate link type.

Most providers support a small portfolio of SD-WAN vendors because the market is more fragmented and differentiated than the router market it is replacing. Some providers offer network-based SD-WAN gateways, allowing for easier migration to SD-WAN and improved scalability. Most importantly, such gateways allow the network to use the internet for access and use the providers' higher-quality backbones for the long haul, greatly improving reliability and performance. This allows the design of so-called "internet only" global SD-WAN networks that, strictly speaking, are "internet as last mile" network designs. A similar outcome can be achieved by using stand-alone enhanced internet backbone services.

Enterprises' adoption of cloud IT service delivery remains key to transforming their WAN architectures. Fortunately for enterprises, global NSPs have deployed a range of capabilities to address enterprises' cloud connectivity needs (see Five Key Factors to Prepare Your WAN for Multicloud Connectivity). The providers in this research offer carrier-based cloud interconnect from their MPLS and Ethernet networks to leading cloud service providers, such as Amazon, Microsoft and Google. Most offer connection to additional cloud providers as well. The key differentiators are the specific cloud providers and the cities connected, and the ability to add virtualized services (such as security) into the cloud connection points.

Managed SD-WAN services typically offer the option of local internet access (split tunneling) from every site, which is especially useful for access to SaaS applications, such as Microsoft Office 365. Perimeter security can be provided on-site or as a cloud-based service and is increasingly integrated into the WAN design.

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.

Network functions, such as edge routing, SD-WAN, security, WAN optimization and visibility, can be delivered as on-site appliances. However, many providers prefer to offer these as VNFs, running in

NFV service nodes in their POPs or in uCPEs, which are essentially industry-standard servers, deployed at the customers locations, supporting one or more virtual functions. This makes it easy to rapidly change the functions deployed in the network and is also usually consumed on an as a service basis with a monthly subscription fee for each function. Some providers allow customers to run their own software on these platforms, including edge compute applications.

Many providers now offer NOD services, where bandwidth can be adjusted via a portal or APIs. Some of these services support multiple services (such as MPLS and internet) on a single access line and also allow dynamic control of cloud connectivity and or extranet connectivity including the ability to add additional network services and connections on demand.

Access Options

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 or some emerging markets. Pricing for these legacy service types is typically increasing, and, in many cases, the services are reaching the end of their life.

These legacy access lines have largely been replaced by optical Ethernet access at 10 Mbps, 100 Mbps, 1 Gbps or 10 Gbps. The scale economics of Ethernet access are very good, with each tenfold increase in speed typically increasing cost by only two to three times. As a result, in developed markets, enterprises now tend to purchase access lines with much higher speeds than they initially require, with the port capacity limited to their current needs. This allows them to easily and quickly upgrade capacity in response to changing requirements.

For smaller, less critical or remote locations, broadband (increasingly, "superfast broadband," such as very-high-speed DSL [VDSL], cable modem or passive optical network [PON]) is the access technology of choice, despite having no SLAs or poorer SLAs than Ethernet access. When enterprises require large numbers of broadband connections, they can sometimes find that they are able to get better pricing than that offered by global service providers by sourcing broadband access directly or from aggregators. Many providers now support "bring your own broadband." This refers to the service provider delivering managed services over broadband sourced by the enterprise.

Finally, cellular connectivity, 4G and emerging 5G, is increasingly being used for backup, rapid deployment or temporary locations, although it does not typically offer network performance or availability 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 Services

Most global WANs are delivered on a managed service basis, with the on-site devices, such as routers and security appliances provided and managed by the service provider. Transport links are usually sourced from the managed service provider but might also be sourced by the enterprise, which would then give the managed service provider operational responsibility for them. The U.S. is different, as a substantial fraction of U.S.-headquartered multinationals do use managed

network services, a significant number still manage their networks in-house and only source transport links from their global providers.

As more network functions, such as SD-WAN application policies or NOD bandwidth, are controllable via the providers' portals and APIs, networks are moving more to a co-managed reality. In this case, responsibilities for various network management functions are divided between the provider and the enterprise.

Pricing Trends

Downward pressure on global network service prices is relentless (for example, global MPLS services are still undergoing unit price declines averaging 8% per year, although with strong regional variance).

Gartner has produced research summarizing and predicting pricing trends for different services and geographies (see Use Gartner's Market Price Movement Data to Save Money on Your Next Contract Negotiation for Network Services). The response from providers varies, with some focusing on extending their own MPLS and internet networks, while others are relying heavily on MPLS and internet partnerships with local providers. 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 these different elements remains a challenge.

Evidence

Gartner developed this research based on the following sources of information:

- Gartner inquiry data on network services collected over a 12-month period. Inquiries with Gartner analysts about network services have increased every quarter by at least 5% for the last four quarters.

- Large number of enterprise inquiries on SD-WAN over the last 18 months.

- Analyst-reviewed Gartner Peer Insights data for this market.

- Provider responses to detailed questionnaires, as well as a video briefing specific to this Magic Quadrant research.

- Periodic provider briefings.

- Generally available information, news and data in financial and industry publications.

- Attendance at provider analyst conferences.

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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