WAN Manager Survey 2022

Nearly three years out from the start of the pandemic, enterprise networking is starting to stabilize. The extended impact of COVID-related remote work has impacted WAN trends such as migration to the cloud, SD-WAN adoption, and exploring Network-as-a-Service. The MPLS decline has slowed and some enterprises are building their own private backbones between data centers and core sites. Sourcing strategies are converging for MPLS and DIA while broadband is split mainly between carriers and ISPs. With new technologies and tools materializing, network managers will likely still be rethinking their configurations in the coming years.

This year our survey focused on three key topics:

1. Like in all previous versions, we asked questions about how networks are currently configured. This included the prominence of MPLS versus other underlay technologies, the distribution of various bandwidths for these underlay products, and product sourcing strategies.

2. We asked about SD-WAN adoption including types of vendors, factors for adoption, and management levels.

3. We asked a few questions on cloud connection methods, cloud providers, and NaaS adoption.

This executive summary presents some key findings on some of these questions.

Key Findings

*   MPLS usage paused its decline, flattening after several years of decreasing.

*   DIA and MPLS usage rates are not far from converging—only 3 percentage points away from one another.

*   Middle and upper bandwidth ranges are most popular for DIA and broadband while MPLS is still the dominant product at port sizes 50 Mbps and smaller.

*   SD-WAN installation rates are lower than expected, only growing 4% since 2020, which is largely due to longer rollout periods.

*   While respondents regard most of the factors for adopting SD-WAN we listed as important, more respondents are beginning to consider security a critical feature than in years past.

- More respondents are selecting unmanaged and co-managed SD-WAN services than in our last update. This year, unmanaged services overtook co-managed plans by 3%.

- All 2022 respondents reported at least one IaaS provider and nearly 80% had more than one. Cloud adoption is clearly fairly ubiquitous at this point and multi-cloud is a strong majority.

- NaaS solutions are starting to gain interest from network managers, although adoption rates are low.

Network Configuration

Network underlays have been in transition as more enterprises install SD-WAN services and attempt to meet the increase in cloud traffic. Companies are looking to lower costs and increase connectivity while maintaining secure networks. All of these changes have led to a decrease in MPLS usage, but has the decline in MPLS stalled?

FIGURE 1
What is the average product mix of your WAN sites? (2022)
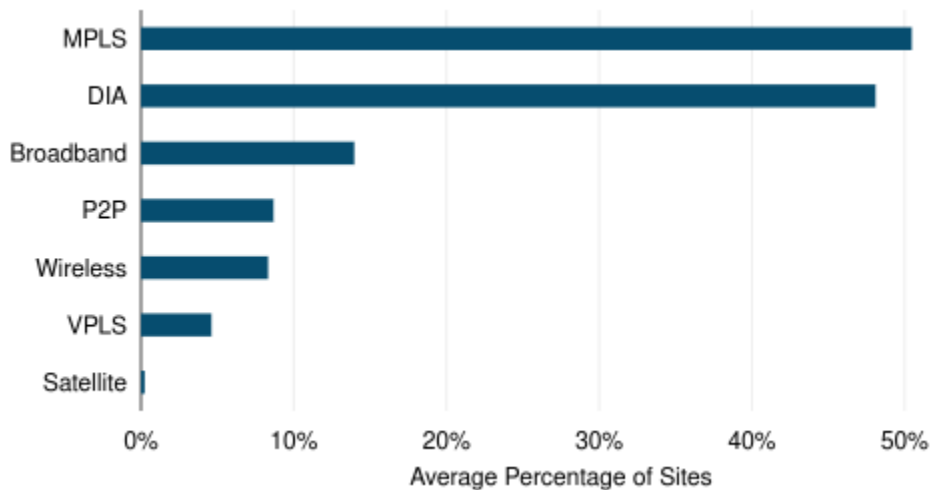
Notes: Each bar represents the average percentage of WAN sites using the listed products across all respondents from 2022.

Source: TeleGeography   © 2023 TeleGeography

- This is the first year that MPLS usage has seen some stability after the past several years of downward trends. It increased 5 percentage points from last year, from 46% up to 51%.

- There is a near convergence of the average number of sites running MPLS and DIA this year, with MPLS at 51% of sites and DIA at 48%.

- Broadband still appeared in 3rd place behind MPLS and DIA, but dropped 9 percentage points since 2021. The service is now only present at 14% of sites.

- Point-to-point/International Private Line (P2P/IPL) was present in 9% of sites, mostly for connections between data centers and disaster recovery sites.

Wireless, while more popular than satellite, was a relatively unpopular choice for WAN connectivity still in 2022. Of course, some respondents had considerably more sites on wireless, but on average it was only used at 8% of sites. One respondent we interviewed from a company with thousands of small points of sale(often well outside major metros) had transitioned many such locations to LTE-enabled tablets, moving away from basic broadband. As they said: "Cellular on a mediocre day is

better than DSL." As 5G internet access plans become more available, especially with broadband-like usage terms, we expect to see wireless usage rise in the coming years.

Network Services Time Series

To examine product trends over time, we compared the change in percentage points between 2022 and previous years. Individual network configurations do not change rapidly due to contract length and the time it takes to go from RFI/RFP to installed network, but our time series clearly indicates that WAN configurations are undergoing a shift.

FIGURE 2

What is the average product mix of your WAN sites? (2018-22)
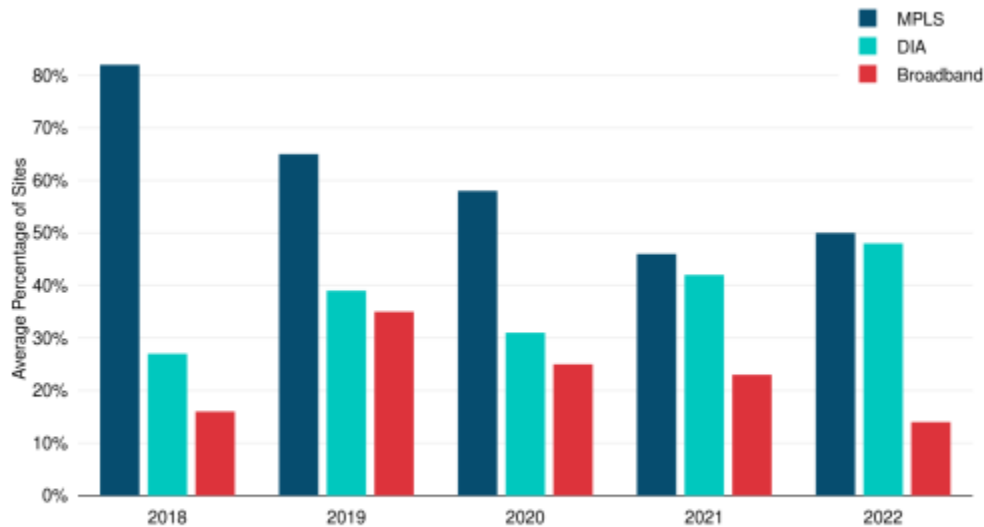
Notes: Each bar represents the average percentage of WAN sites using the listed products across all respondents in each listed year.

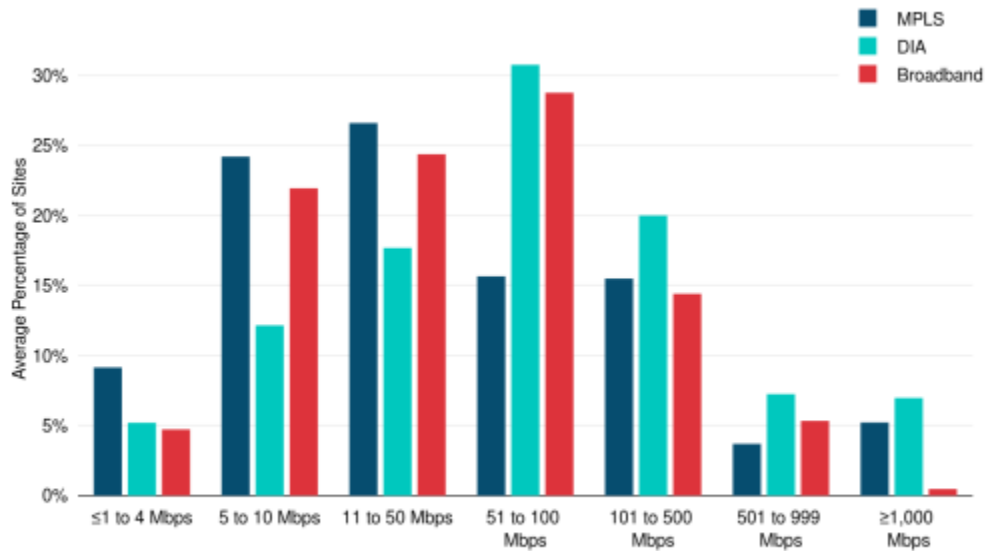Source: TeleGeography   © 2023 TeleGeography

- There is a clear downward trend in MPLS usage, as the product decreased by 32 percentage points since 2018.

- DIA usage mirrored this trend in reverse, as it increased from 27% in 2018 to 48% in 2022.

- Broadband trends have fluctuated from a rapid 19-point increase between 2018 and 2019 to fall back to 14% by 2022.

Bandwidth Distribution by Product

Especially post-pandemic, offices have been under constant bandwidth pressure. With the evolution of SD-WAN, WAN managers have begun to shrink port sizes for MPLS while increasing DIA and business broadband bandwidths. Altering these port sizes often lowers the total cost of ownership, making it a compelling data point to measure.

## What percentage of your global ports fall within each port size/ bandwidth range? (2022)

Notes: Each bar represents the average percent across all respondents from 2022 of each bandwidth range for each respondent's global MPLS, DIA, or business broadband sites.

Source: TeleGeography   © 2023 TeleGeography

- In 2022, MPLS usage peaked at 11-50 Mbps with 27% of sites.

- DIA was a more common product in the top four bandwidth ranges, peaking at 31% for the 51-100 Mbps range.

- Business broadband also peaked at 29% in the 51-100 Mbps range before steeply dropping to 14% in the following range.

FIGURE 4
Difference in Percentage of Sites (2018-2022)
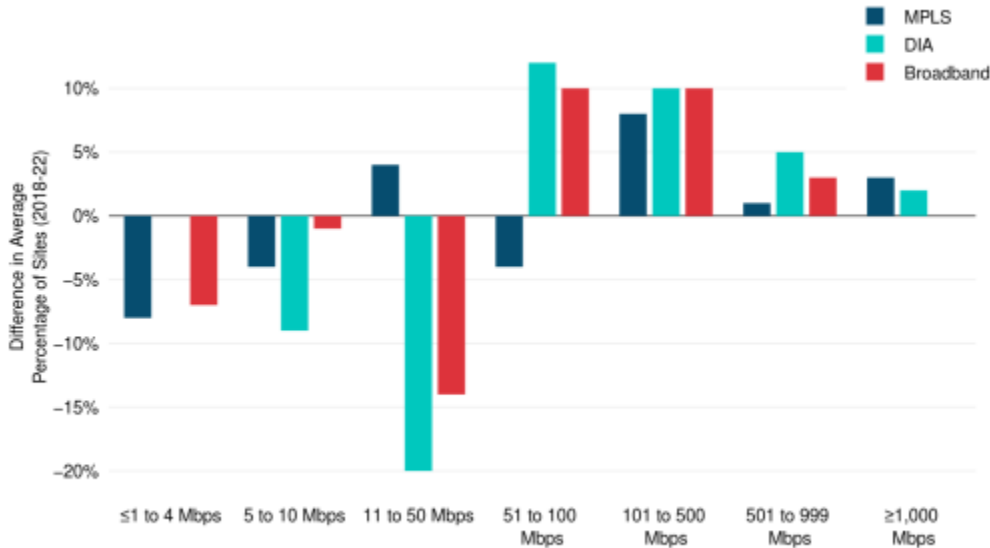
Notes: Each bar represents the difference in percentage points in average bandwidth range usage for each product between 2018 and 2022.

Source: TeleGeography   © 2023 TeleGeography

- Since 2018, MPLS port sizes have shrunk at all port sizes of 50 Mbps and below, most notably 7 percentage points at the ≤1-4 Mbps range.

- DIA saw increases in all port sizes above 50 Mbps, with the largest increase of 12 points in the 51-100 Mbps range.

- Another major shift at the 51-100 Mbps range, business broadband increased 10 points over the past 4 years.

SD-WAN Trends

Approaching a decade since SD-WAN emerged as a networking technology, it is safe to say nearly all corporate network managers have at least heard of SD-WAN. The COVID-19 pandemic forced IT infrastructure teams to accommodate remote work and accelerated the shift to cloud services. These changes in the underlay shifted the cybersecurity threat landscape and drove SD-WAN vendors and customers to focus more on security than ever before. SD-WAN is becoming more complex, integrating SASE architectures and improving services to meet the needs of the WAN world.

When we first asked about SD-WAN in 2018, interest was high but few respondents had installed the technology or begun the rollout process. Over the past four years, early adopters who finished their deployments are beginning to assess the impact, and more enterprises than ever are in the rollout stage. Every two years we've looked at the enterprise SD-WAN market to see what has changed and solidified.
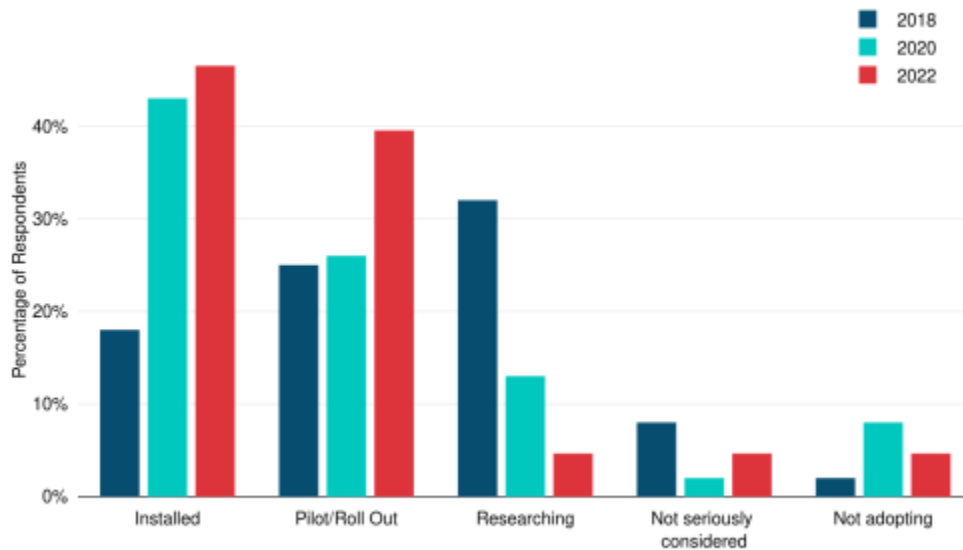
SD-WAN Adoption

We expected relatively fast growth for SD-WAN over the past several years, and if anything, thought COVID would mostly increase demand–which it certainly has. However, while the number

of enterprises deploying SD-WAN has increased since 2020, installation percentages are lower than expected due to long rollout phases. This year, 47% of respondents have installed SD-WAN while 86% are in some stage of adopting the technology. In the past two survey editions, we made note that many of our survey takers might have been more proactive or forward-thinking WAN managers compared to the universe of enterprises. We'd like to emphasize this again, although we do believe this to be reflective of where the rest of the market is heading.

The time series figure below notes key shifts of where respondents were in the process of researching and adopting SD-WAN in 2018, 2020, and 2022.

Stage of Adoption of SD-WAN (2018 vs. 2020 vs. 2022)

Notes: Each bar demonstrates the percentage of all valid respondents in 2022, 2020, and 2018 who are in each stage of SD-WAN adoption.

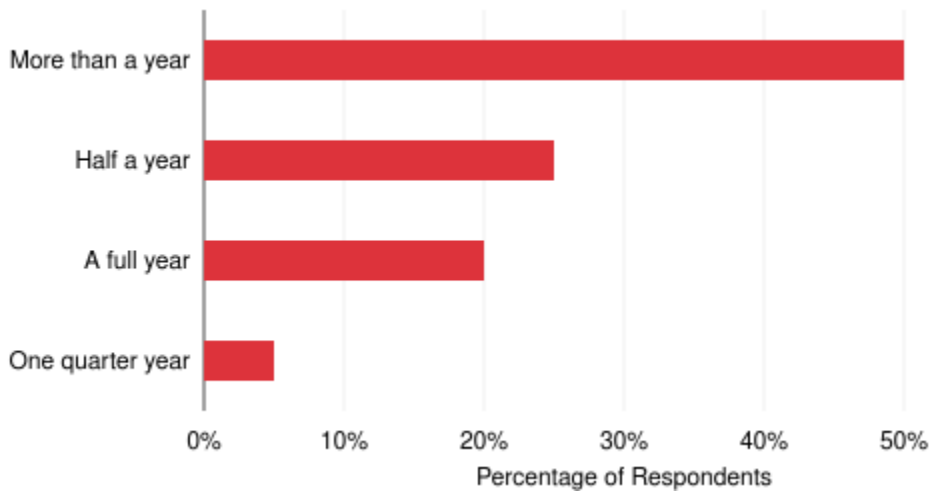Source: TeleGeography   © 2023 TeleGeography

- This year, the SD-WAN installation rate is at 47% of respondents versus 43% in 2020 and 18% in 2018. This marks almost a 30-point increase since our first survey. Within the 'Installed' category, we included any company that had SD-WAN on at least part of their network.

- The percentage of respondents in the Pilot/Roll Out phase has increased by 14% indicating more enterprises in the researching phase have decided to adopt and are now in the process of rolling the service out.

- A minority of respondents–only 5%– indicated they were not adopting SD-WAN. One WAN manager in the Business Services industry said they were not adopting SD-WAN because they already have their own VNF setup.

It has become clear that rolling out SD-WAN is not as fast and easy as it once appeared.

FIGURE 6

What best describes the amount of time it took you to fully deploy SD-WAN on your network? (2022)

Notes: Each bar demonstrates the percentage of respondents who indicated it took that amount of time to fully deploy SD-WAN on their network in 2022.

Source: TeleGeography   © 2023 TeleGeography

- Almost three-quarters of respondents reported their SD-WAN rollout took at least a year, of which, 50% said deployment took more than a year.

The initial marketing for SD-WAN surrounded the ability to cut network spending "in half." For some, that promise remains attractive, but the ability to create a more agile, flexible, optimized network without increasing costs has emerged as a powerful motivator for adopting SD-WAN. We asked respondents to rank the factors in considering or adopting SD-WAN on a scale from one to five, where one is not at all important and five is extremely important.

FIGURE 7
Reasons for Adopting SD-WAN (2022)
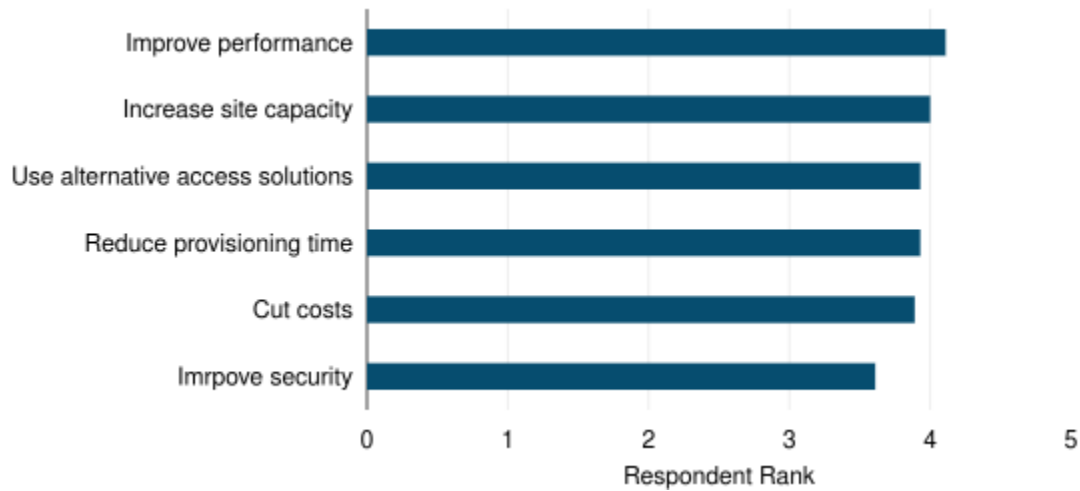
Notes: Each bar demonstrates the average rank respondents from 2022 who are at least considering SD-WAN up to have already installed it assigned to the given factor in terms of importance in making their decision to adopt the technology.

Source: TeleGeography   © 2023 TeleGeography

- The factor with the highest average rank was to improve performance and not far behind was to increase site capacity.

- This year, all factors we provided as options were on average ranked at least three and a half out of five.

SD-WAN Management Levels

The spectrum of carrier involvement in a managed SD-WAN service differs by the service provider and the package chosen. It can range from a carrier-provided unmanaged SD-WAN overlay (similar to what you would get directly from an SD-WAN vendor) to a fully managed carrier service where a provider handles installation, ongoing support of deployment, and policy implementation. In the middle, you find co-managed SD-WAN services where a provider handles deployment and management, but an enterprise can view network analytics, add applications, and establish policies through their customer portal.

FIGURE 8

Level of SD-WAN Management Selected/Plan to Select (2022)
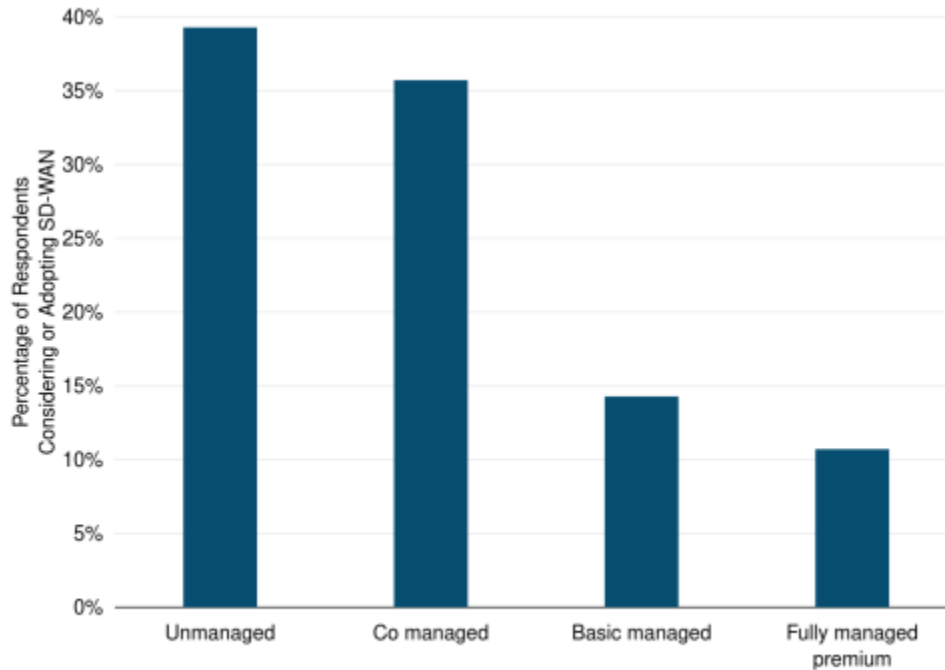
Notes: Each bar represents the percentage of respondents who are considering or adopting SD-WAN what their planned or chosen management plan is in 2022.

Source: TeleGeography   © 2023 TeleGeography

• Unmanaged plans were the most popular configuration amongst our respondents (39%), followed closely by co-managed plans (36%), then basic managed or fully managed.

The trends of SD-WAN management plans have shifted and we expect they will continue to as more enterprises research and adopt SD-WAN. Co-managed options are popular especially with enterprises that might have a smaller IT infrastructure team that needs to outsource some capabilities, but has the skill and desire to maintain some control.

Cloud and NaaS Trends

As cloud adoption becomes increasingly necessary for multinational enterprises, backend networks are becoming more complex. The introduction of X-as-a-service products and the need for multi-cloud environments has pushed WAN managers to make changes to their current ecosystems and adopt new technologies.

In this section of the 2022 WAN Manager Survey, we look at how network professionals are integrating the cloud and Networking-as-a-Service (NaaS) into their enterprise networks. We analyze survey results on Infrastructure-as-a-service (IaaS) adoption, IaaS partner choices, data center landscapes, where companies are connecting to their cloud service providers (CSPs), and NaaS adoption.

Infrastructure-as-a-Service

This year, when we asked about IaaS providers, all survey participants responded that they used at least one IaaS provider. WAN managers have a plethora of IaaS providers to choose from, including Amazon Web Services, Azure, Google, and others. AWS had the first-to-market advantage in IaaS services. This year, however, we found that WAN managers most frequently chose Microsoft Azure as an IaaS provider (97%).

FIGURE 9
IaaS Providers used with Enterprise WANs (2022)
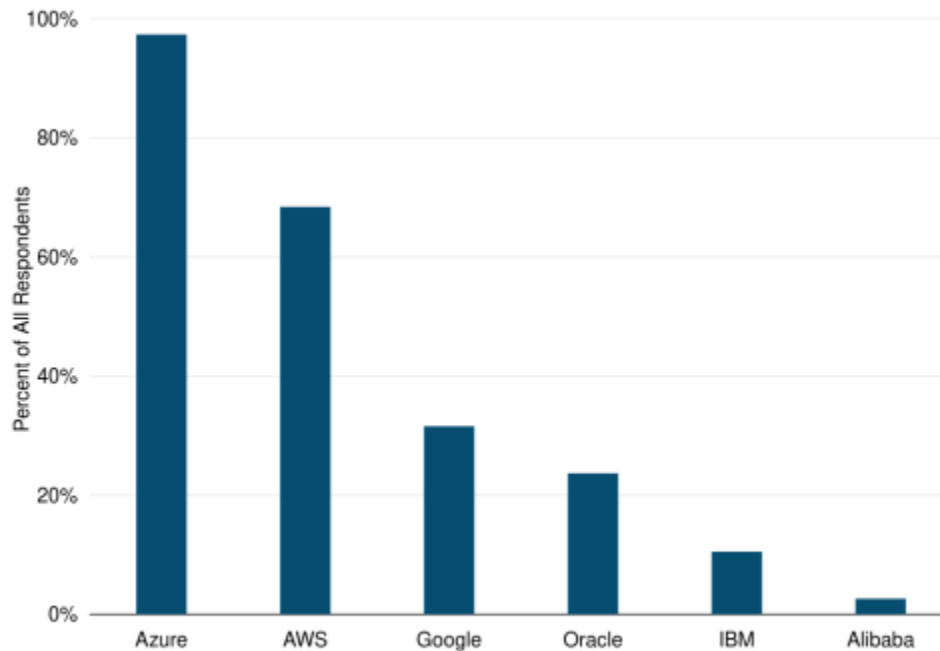
Notes: Each bar represents the percentage of all respondents in 2022 that indicated they are using the listed IaaS partners.

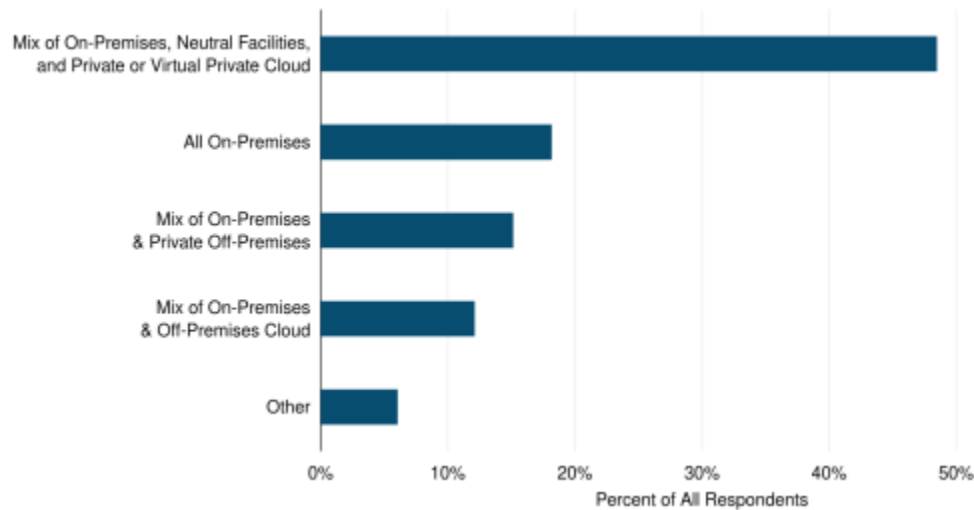Source: TeleGeography   © 2023 TeleGeography

- Following Azure, Amazon Web Services (AWS) made up 68% of respondents. A third of respondents chose Google while 24% chose Oracle as their provider.

IaaS Connection Methods

While the public internet is often considered the default method for reaching the cloud, companies have many options depending on their capacity, performance, or security requirements. We asked WAN managers to select all the ways that they connected to cloud service providers. We took our definitions for various cloud connectivity services from TeleGeography's *Cloud and WAN Infrastructure* report.

FIGURE 10
Where are your data centers located? (2022)

Notes: Each bar represents the average percentage across all respondents in 2022 using the listed mix of data center locations.

Source: TeleGeography   © 2023 TeleGeography

- Almost half of our respondents said their data centers were located at a mix of on-premises, neutral facilities, and private or virtual private cloud environments.

- Respondents who reported using all on-premise data centers jumped from 11% in 2019 to 18% in 2022.

- Nearly a third of respondents were using either private or off-premise cloud servers with some mix of on-premise servers.

Networking-as-a-Service

This is the first year we asked about enterprises' familiarity and approach to Network-as-a-Service (NaaS). NaaS allows enterprises to consume network infrastructure through a subscription model like cloud services to meet business needs and optimize network performance on an on-demand basis. The central idea of NaaS is that enterprises can consume network services as needed rather than through a long-term contractual agreement. Key to this are portals where enterprises can log on and allocate network connections down to even an hourly basis in some cases. Rather than weeks or months to spin up this service, it is generally available immediately upon ordering.

This is inherently limited to the core network and data center traffic, as bandwidth-on-demand would rarely be available down to a local corporate site. Backbone networks are over provisioned sufficiently to accommodate just-in-time networks, but this is very rarely going to be the case for last mile connections. So NaaS is mostly a service to connect things like data centers, large call centers, disaster recovery sites, and other resources located where fiber assets are widely available–not to spin up service to permanent branch offices or local corporate sites. However, as last mile solutions like FTTx and 5G service become more available there are potential use cases for NaaS at locations such as pop-up events or even temporary sites.

This year, we found that while NaaS products are available on the market, few enterprises have purchased them, with some still in the research phase but most being unfamiliar with these products.

FIGURE 11

NaaS Stage of Adoption (2022)
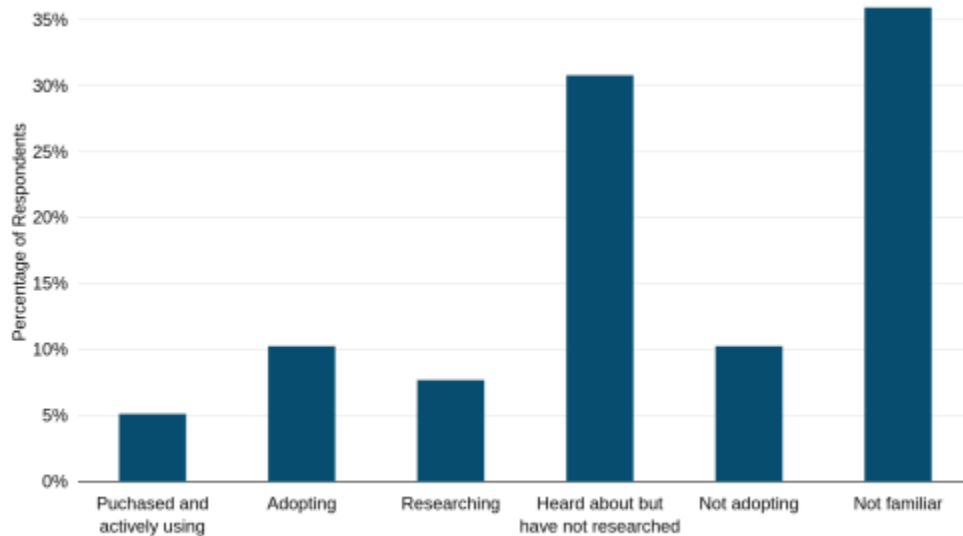
Notes: Each bar demonstrates the percentage of all valid respondents in 2022 who are in each stage NaaS/middle mile solutions adoption.

Source: TeleGeography   © 2023 TeleGeography

- A minority of respondents–only 5%– have purchased and are actively using NaaS solutions.

- Three in ten respondents have heard of NaaS/middle mile but have yet to research them while almost 40% of respondents were not familiar with these solutions at all.

- One in ten respondents has researched NaaS/middle mile and decided not to use them.

In the coming years, we expect to see an uptick in the adoption of NaaS as the next major development in the WAN market. This is especially true as enterprises continue to move away from on-prem data centers and putting more business and workloads in the cloud. Being able to shift around resources on an as-needed basis rather than vastly over provisioning for uneven workloads is key to digital transformation.

About the Survey

The 2022 report is comprised of 62 survey responses from network managers at distinct companies. We also conducted in-depth interviews with eight respondents to contextualize survey answers. Participants came from a number of industries, ranging in size from medium sized enterprises to Fortune 500 enterprises. Participating companies had a median annual 2021 revenue of about $11 billion and most were multinational in scope.