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Heavy Reading's 5G Network Slicing Operator Survey

*A Heavy Reading white paper produced for
Amdocs, Ericsson, and Sandvine*



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INTRODUCTION AND KEY FINDINGS

This report presents the results of the Heavy Reading **5G Network Slicing Operator Survey** conducted in the summer of 2022. The survey was open to employees of communications service providers (CSPs) only.

At the start of the survey, respondents were presented with the following definition:

This survey asks for network operator views on 5G network slicing. The focus is on network slicing, as specified by 3GPP, in the wide-area public network. All responses are confidential. Data is only presented in aggregate form.

Network slicing in the 5G architecture offers a mechanism to build and manage separate end-to-end logical networks tailored to specific requirements of different customer use cases. Network slice instances can be created, changed, and removed by management and orchestration functions.

The high level 3GPP definition (in Technical Specification 28.530) is as follows: “Network slicing is a paradigm where logical networks/partitions are created, with appropriate isolation, resources, and optimized topology, to serve a purpose or service category (e.g., use case/traffic category, or for [mobile network operator] MNO internal reasons) or customers (logical system created ‘on demand’).”

Network slicing is a service capability that makes 5G better than 4G and is used as an exemplar of why 5G itself is useful and valuable. As a result, it is part of the “5G hype” industry narrative, used to support extravagant claims for the technology. At the same time, it is castigated by contrarians. This public profile inevitably influences survey respondents’ perceptions.

The Heavy Reading **5G Network Slicing Operator Survey** is intended to help industry participants better understand the status of this technology and provide insight into how operators are thinking about using slicing capabilities to offer commercial services. The survey was conducted in June and July 2022, and this analysis was written in August and September 2022.

Key findings: Promising signs, but early days for 5G network slicing

The primary motivation to pursue network slicing is to offer enterprise services.

Approaching half (46%) of respondents believe the main reason to invest in network slicing is for enterprise use cases, ahead of consumer services at 28%, and to optimize network performance with 19%. The survey indicates that for high value, strategic enterprise services, operators will seek to use slicing to enable their own brand commercial network as a service (NaaS) offers. For consumer services, rather than go direct to market with a slice service, operators will be more likely to offer slicing capability to enable other digital service providers via a partnership model or through application programming interfaces (APIs).

Operator professionals are positive on network slicing and think it will contribute to the success of 5G; however, there is also an element of caution in the data.

To get an alternative view of operator sentiment, the survey asked about respondents’ personal views of 5G network slicing. The intent was to give respondents an opportunity to directly express a view that is less filtered through the lens of their employer. If this reveals

a negative sentiment, then that is important to know. In the event, 44% say slicing is “a critical part of the 5G system that is vital to 5G service growth,” and 45% say it is “a useful tool with important commercial applications.” There is a strong regional difference, with US respondents more enthusiastic, 59% of whom said slicing is “vital to 5G service growth” versus 29% in the rest of the world (RoW).

It is imperative that operators, and the wider technology industry, work harder to demonstrate the value of network slicing to potential enterprise customers. In the survey, just 30% of respondents say, “most customers understand the concept and see value in it.” At face value, this is encouraging; however, it probably paints an overly optimistic picture, given survey takers are often naturally optimistic. It also means that 70% do not think the market has a good understanding of how this technology will benefit them. Similarly, the biggest planning and engineering challenge to network slicing is, according to respondents, “identifying service requirements of enterprise customers.” More dialogue with customers about network slicing is critical.

There are encouraging signs that operators will commercialize network slicing over the next two years. However, the majority are still in the early phases of implementation. The largest group (34%) is still “trying to understand what network slicing means for us.” The next largest group, the 33% that is “conducting trials and gaining experience,” is more committed; these operators are already engaged in working out the mechanics of how such a service may work. There is also a cohort that is more advanced. The “defined architecture” (18%), “approved business case” (5%), and “started implementation” (8%) group accounts for a combined 31% of the respondent base. Even accounting for some overenthusiasm, this demonstrates positive momentum.

Operators expect to only offer 10s of slice types in the early phase of commercial operation. The largest group (44%) expects to offer fewer than 10 slice types, and among the respondents that are in technical strategy and network engineering roles (i.e., those that best understand how to provision and manage slices), a full 66% expect fewer than 10. Operators will be careful about how they introduce slice-based services and will focus on a few key verticals or customers in the first phases of commercialization. This is a pragmatic approach that reflects the maturity of customer communications and of network slice implementation and management.

A solid 40% of respondents “plan to use network slices to deliver and monetize high volume OTT services,” ahead of a more equivocal 31% that may do so, depending on the business case. Given that operators have been largely unsuccessful in directly charging internet companies for network access, it is tempting to ascribe this 40% result to wishful thinking by telecommunications company (telco) respondents. However, so-called over-the-top (OTT) companies already work closely with operators, and there is a basis to deepen and extend this collaboration. An alternative analysis is that what is normal in terms of telco and OTT working relationships today will not necessarily stay that way. As application performance requirements become more stringent, as customer expectations increase, and as new services emerge, there will be a need to rethink and re-architect how telcos and internet companies interact and how regulation evolves.

In terms of operational challenges, respondents are split almost evenly between “cross-domain coordination, design, and solutioning” (34%) and the “need to transform network operations” (33%). Both indicate an early-stage technology. The low score for “assuring and reporting SLAs” (8%) also reflects the fact that network slicing is still developing. In time, it is likely that service-level agreement (SLA) reporting will come to be seen as more challenging. There are also some interesting demographics splits in the response. For R&D roles, the number that identifies “cross-domain coordination, design, and solutioning” as most challenging jumps to 67%, whereas among network engineering and operations roles, the “need to transform network operations” comes first, with 50%. For the 16 management roles, “organizational and people readiness” is the biggest challenge with 50% (versus 21% for the survey as a whole). Naturally, each group thinks it has the hardest job!

Asked when their organization would invest in new orchestration solutions to meet the requirements of 5G network slicing, 40% of respondents expect this to happen “within one year.” This perhaps gives an over-bullish picture of the overall industry timeline, but it nevertheless indicates that investment activity is underway or imminent among market leaders. Also, it is clear that investment in these technologies and systems should start one to two years ahead of service launch. This result is, therefore, representative of early-adopter and fast-follower investment plans.

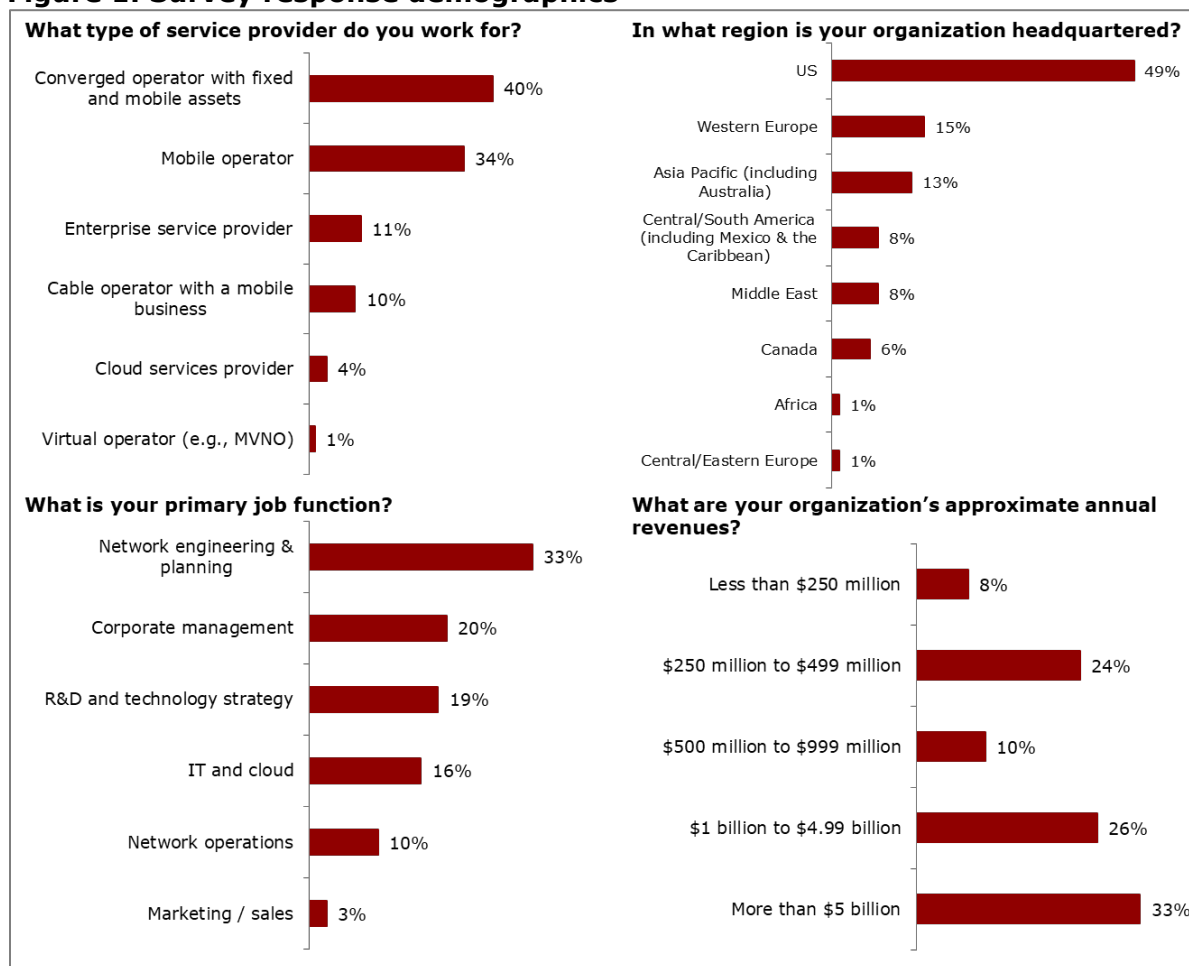
SURVEY DEMOGRAPHICS

The Heavy Reading **5G Network Slicing Operator Survey** is based on a questionnaire written by Heavy Reading, with input from study sponsors Amdocs, Ericsson, and Sandvine. The online survey was promoted by email to Light Reading’s service provider databases. The survey garnered 80 qualified responses from individuals working at CSPs that own and operate mobile networks.

Respondents were asked to self-assess their knowledge of their company’s 5G network and service strategy. Those that reported “no direct knowledge,” only “a little knowledge,” and “some general knowledge” were excluded from the survey, and their responses are not considered in this analysis. Only those respondents that claim to have “in-detail” knowledge or to be “well informed” of their company’s strategy were included.

Respondent demographics are shown in **Figure 1**. The 80 individual responses were from professionals working at 56 different operators. (Individual operating companies in different national markets are counted separately.)

Figure 1: Survey response demographics



n=80

Source: Heavy Reading

The response is led by mobile operators (34%) and converged operators with mobile businesses (40%), for a combined 74% of the total. Respondents are generally from developed economies, with the majority working for operators reporting more than \$1bn in annual revenue. Network engineering & planning (33%), corporate management (20%), and R&D/technical strategy (19%) are the main job roles represented, accounting for a combined 72% of respondents. With 49% of the response, the US is the largest region represented; however, there is good representation from the RoW. This analysis shows how responses vary according to demographic filters (e.g., the US vs. RoW). Where this is the case, it is noted in the text.

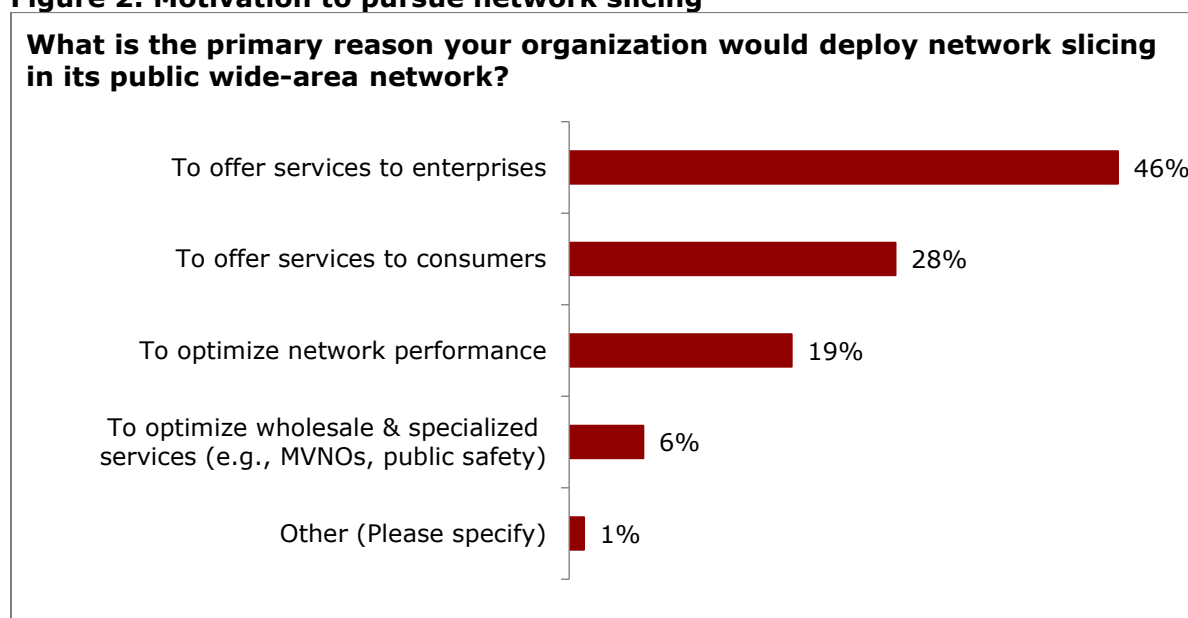
MOTIVATION FOR NETWORK SLICING

In this section, operators are asked about demand for network slicing, including their motivations, how close they are to commercial service introduction, and their priority use cases.

The primary motivation to use network slicing, as shown in **Figure 2**, is to offer enterprise services. With 46% of the response, enterprise is ahead of consumer services at 28% and network performance at 19%. This result is not surprising, given that slicing is most frequently discussed in relation to business services. In this context, the relatively strong score for consumer services is notable. Consumer also scores more strongly for the 27 pure-play mobile operator respondents, neck and neck with enterprise at 37% each.

Later in the survey (**Figure 9**), the response indicates that operators are less likely to offer direct-to-consumer “slice services” than to offer slicing capability to other digital service providers (gaming being the canonical example). In the enterprise market, however, using slicing to enable direct-to-the-customer NaaS offers scores highly (see **Figure 8**).

Figure 2: Motivation to pursue network slicing

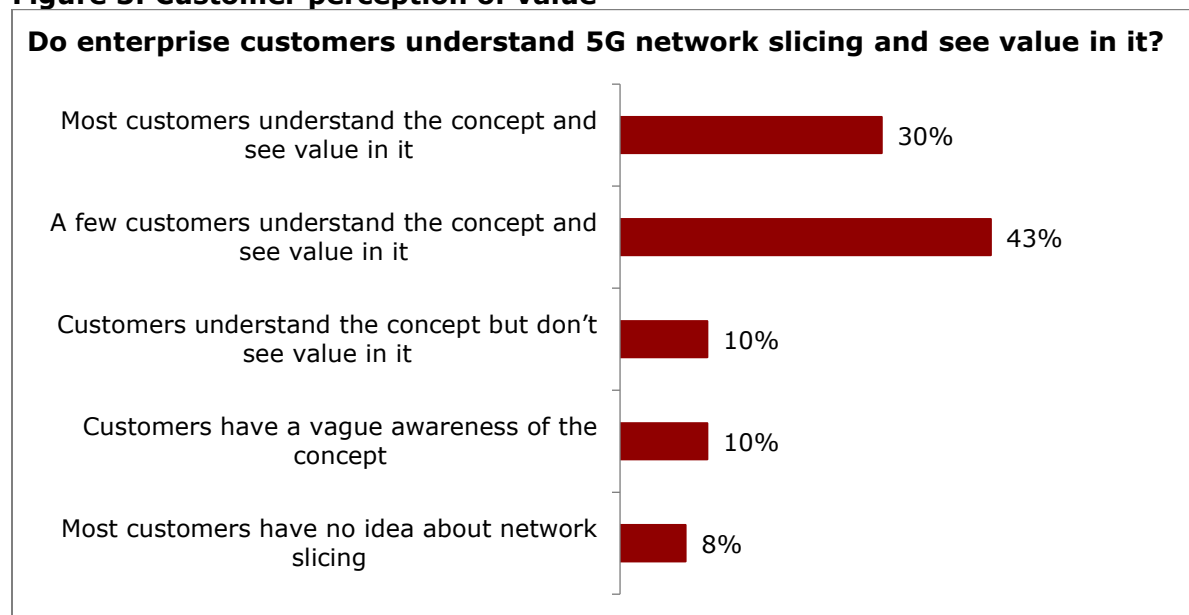


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Source: Heavy Reading

Figure 3 shows that operators, and the wider technology industry, have work to do to explain and demonstrate the value of network slicing to potential enterprise customers. A full 30% say “most customers understand the concept and see value in it,” which at face value is encouraging for the technology. However, this also means 70% do not think the market has a good understanding of how slicing will benefit customers. If we apply a discount to the original 30% (because survey takers in this type of study are generally overly optimistic by nature), the message becomes even clearer: operators, and their vendor partners, will need to invest in customer education to demonstrate the value of network slicing.

Figure 3: Customer perception of value



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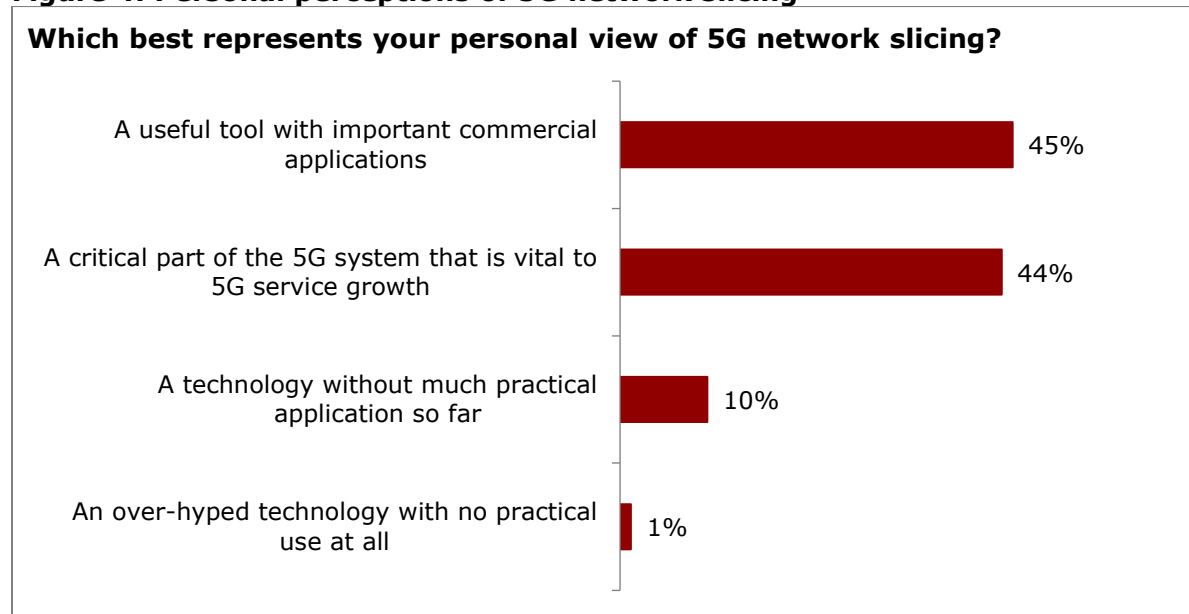
Source: Heavy Reading

As noted in the introduction, network slicing has a high profile in the mobile networking industry, with loud supporters and detractors. To get a broader idea of operator sentiment, the survey asked about respondents' personal views of 5G network slicing. The question specifically asked for a personal view rather than the wider organizational view to give respondents an opportunity to directly express a sentiment (negatively, perhaps) that is less filtered through the lens of their employer.

Figure 4 shows that from a personal perspective, the operator professionals represented by the survey are enthusiastic and positive, with 44% saying slicing is "a critical part of the 5G system that is vital to 5G service growth." Although this is a strong positive signal for network slicing, there is a note of caution. Just as many (45%) say it is "a useful tool with important commercial applications." In other words, they are positively disposed, they like the technology, and they think it will contribute to the success of 5G—but there is also some equivocation in this response that it would be wrong to ignore.

There is also a strong regional difference in the response. US operators are much more enthusiastic, with 59% saying slicing is “vital to 5G service growth” versus 29% in RoW. There are two major ways to interpret this. First, Americans are consistently more bullish and enthusiastic by nature, and this is reflected in surveys. And second, US operators are investing more heavily in 5G network infrastructure than many RoW counterparts and subsequently may be more bullish on the opportunities to monetize 5G.

Figure 4: Personal perceptions of 5G network slicing



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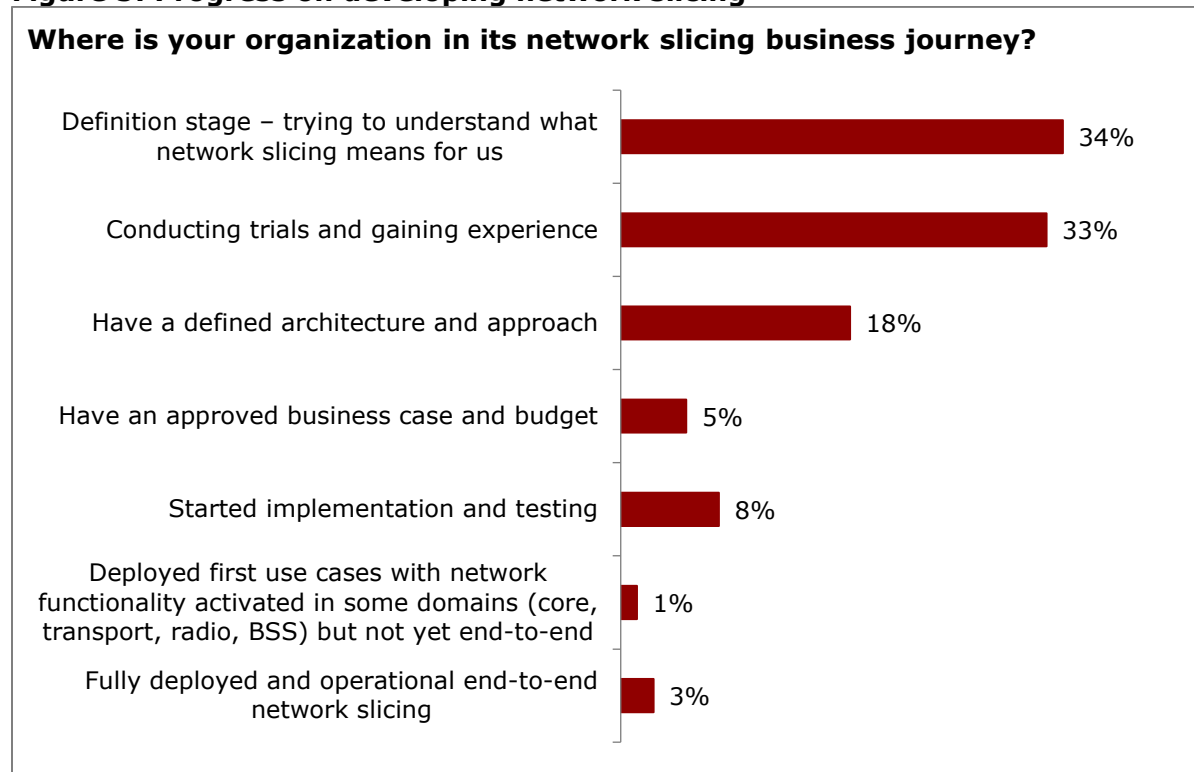
Source: Heavy Reading

Timing when to invest in new technologies and deciding how to judge technology maturity and market demand are notoriously difficult. Network slicing impacts the end-to-end application path from device OS through to the cloud host, which makes it complex to design a capable network platform and introduces many dependencies to the commercialization timeline. The survey asked how mature operators’ plans are for this technology and how close they are to offering commercial services.

Figure 5 shows the large majority are still in the early phases. The largest group (34%) is still “trying to understand what network slicing means for us,” which indicates that there are large segments of the market tentatively watching to see how the pioneers evolve the technology and how customer demand develops. The next largest group, the 33% “conducting trials and gaining experience,” is more committed, and these operators are engaged in working out the mechanics of how such a service may work. It is encouraging that a third of the base is active in technology development. However, some caution is warranted because the term “conducting trials” covers a lot of ground, from small-scale lab trials to field trials in live networks.

There is also a cohort that is more advanced. The “defined architecture” (18%), “approved business case” (5%), and “started implementation” (8%) group accounts for a combined 31% of the respondent base. This does not mean 31% of all operators worldwide, but rather, that of those individuals represented in the survey, 31% believe their company is in a more active stage of network slice development. Even accounting for some overenthusiasm, this demonstrates positive momentum and indicates that commercial services will follow in due course. This aligns with the first precommercial services starting to emerge at small scale at a handful of operators worldwide.

Figure 5: Progress on developing network slicing



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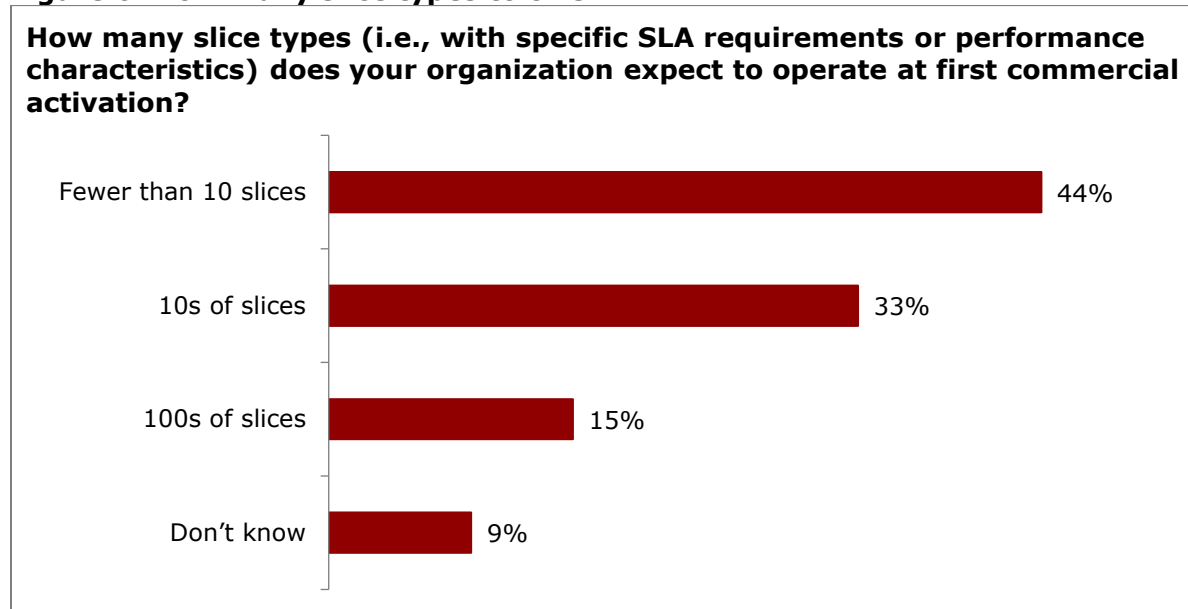
Source: Heavy Reading

COMMERCIALIZING NETWORK SLICING

This section covers questions about network slice service offerings, how operators may commercialize this technology, and favored go-to-market models.

One of the key questions for operators is: How many slices should they offer? Or more precisely, how many slice types? The difference is that a single slice type (e.g., to support cellular Internet of Things [IoT]) could be sold to multiple customers. A greater number of slice types is potentially harder to provision and manage (although automation may address this) and explain to customers. **Figure 6** shows that most operators expect to only offer 10s of slice types at first commercial activation (i.e., in the early phase of commercial operation). The largest group (44%) expects to offer fewer than 10 slices, and among the 44 respondents that are in technical strategy and network engineering roles (i.e., those that best understand how to provision and manage slices), a full 66% expect fewer than 10. This indicates that operators will be careful and pragmatic about how they introduce slice-based services and will focus on a few key verticals or customers in the first phases of commercialization.

Figure 6: How many slice types to offer



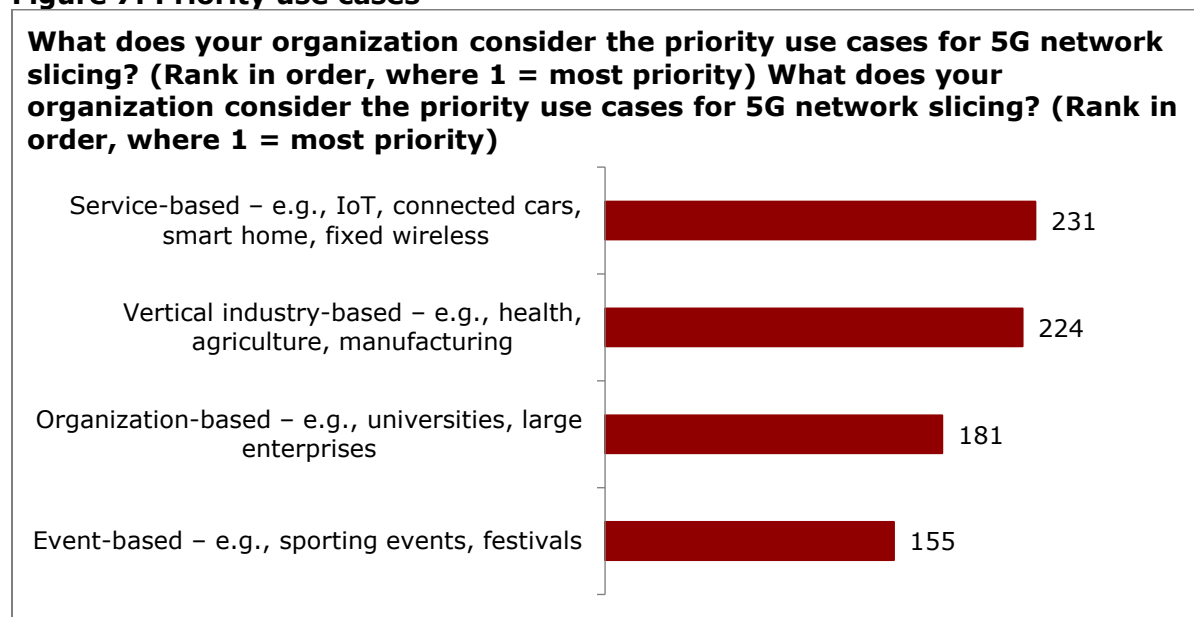
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Source: Heavy Reading

Operators' priority use cases for network slicing are shown in **Figure 7**. Serviced-based use cases rank the highest, followed by vertical industry-based slicing. This is logical in that network slices are often discussed in the context of, for example, connected cars or IoT, or are associated with a vertical sector such as utilities. Within the corporate management and sales and marketing job functions (18 respondents), vertical industry-based slicing use cases rank highest out of all categories surveyed. Organization-based (e.g., for large enterprises and universities) ranked third overall. A complication with any such analysis is the potential for crossover among sector, service, and organization. For example, a water company that requires a remote meter-reading solution covers all three.

The lowest priority use case was for event-based slicing. There is, on paper, a strong case for slicing in this scenario, such as providing broadcasters or stadium operators with better service during a sporting event. The relatively lower prioritization in this survey may reflect the challenges with addressing demand that is short term/transient in nature with a relatively immature technology stack. Short term, network slice instances will have greater requirements on automation. Perhaps as slice management technology matures, this use case will rise higher on operator priority lists.

Figure 7: Priority use cases



n=80

Source: Heavy Reading

Focusing on specific services enabled by slicing, the survey asked operators to select from a list of preselected options to determine which services would be most attractive commercially. **Figure 8** shows how respondents ranked these options. The first analysis is that with an average of 2.75 selections per respondent, the large majority took the opportunity to select three different options, indicating broad-based interest.

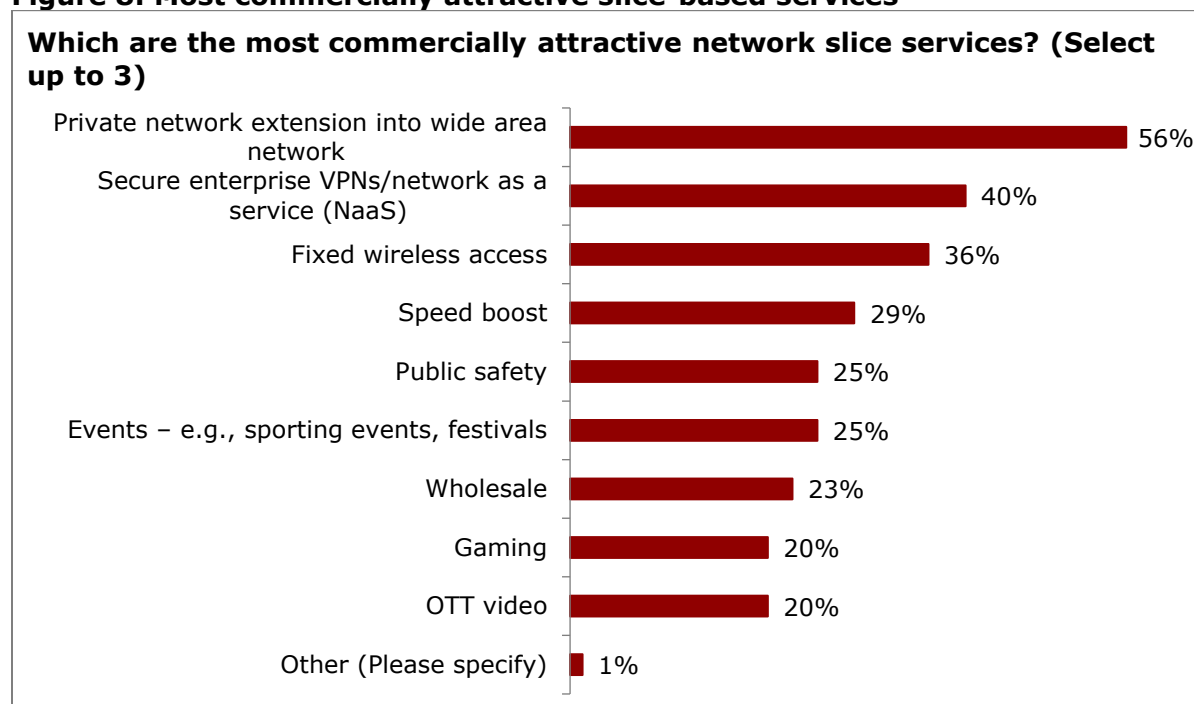
The clear leader with 56% is “private network extension into wide-area network.” This answer makes good sense in so far as private mobile networks are in vogue, and linking these networks using slicing to create a virtual private network solution in the wide area is a service that operators are uniquely positioned to provide. This, on paper, is a terrific use of slicing that may prove to be commercially important. One concern might be that it depends on the widespread deployment of private 5G networks (yes, this market looks positive, but right now, it is mostly trials and test beds). Also, even when private networks are established, will there be strong demand for mobility between private networks and the wide-area public network? In other words, this result is logical, but there are some concerns, primarily as relates to the timeline.

Another interpretation could be to link network slicing to virtual private networks on the public network. Heavy Reading is aware of operators discussing this approach with customers by, for example, offering the organization priority access and dedicated policy control when its users are in the campus area covered by the public network. This model is currently in development but remains fairly early stage.

The second-place “secure enterprise VPNs,” with 40%, might be a nearer-term commercial option. There is an established market for VPN-style mobile enterprise services, particularly for higher end customers. Given there are reasons why enterprises may want traffic isolation (e.g., privacy, security, custom policies, and bring-you-own-device), this may be a good opportunity to use network slicing technology to create a new type of NaaS model for enterprise mobility. Recent announcements by leading handset OS companies and network equipment vendors reference this service type.

In third place is fixed wireless access, with 36%. This is an example of using slicing to manage traffic on a network built for both mobility and residential broadband access. For example, these customers may need different handling in the network core or may compete for radio resources in the access network at a busy hour. Segmenting them into discrete slices may be a good way to manage these different needs, although there are other methods available. The sustained growth of fixed wireless access customers over the past few years also helps explain this third-place result.

Figure 8: Most commercially attractive slice-based services



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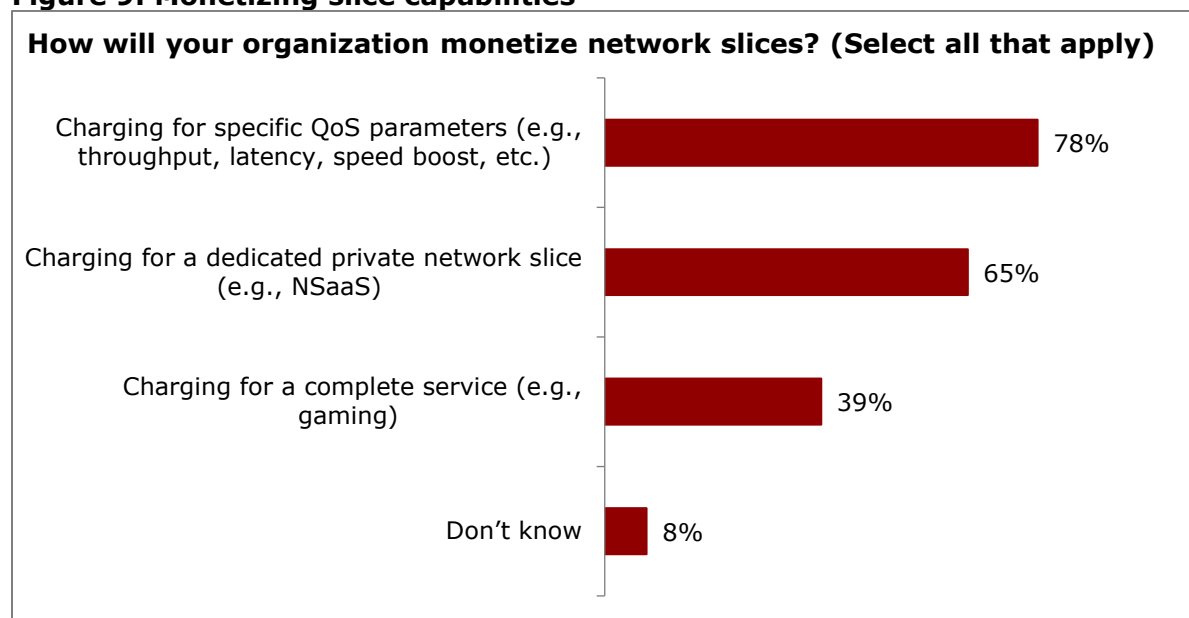
Source: Heavy Reading

The questionnaire asked if offering network slice services direct to customers is the best way to monetize this technology. Or should operators charge for the underlying network service and associated performance? **Figure 9** shows that the answer is not clear cut and that a mix of monetization approaches is under consideration. The question generated an

average of 1.9 selections per respondent, with the top two answers being relatively close. There is, however, a large variance between “charging for specific QoS parameters” (78%) and “charging for a complete service” (39%). The relative difference of about 40% suggests that operators are primarily thinking about using network slicing to enable services that partners can integrate into their offerings, rather than as part of a direct-to-the-customer service directly under their own brand.

The dedicated private network slice option (similar to the secure VPN service discussed above) also scores highly at 65%. This confirms interest in this service model already identified in **Figure 7** and also indicates that for high value, strategic enterprise services, operators will seek to use slicing in their own brand commercial offer. It appears that secure enterprise wide-area services are likely to be a mainstay service of operator slicing strategies.

Figure 9: Monetizing slice capabilities



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Source: Heavy Reading

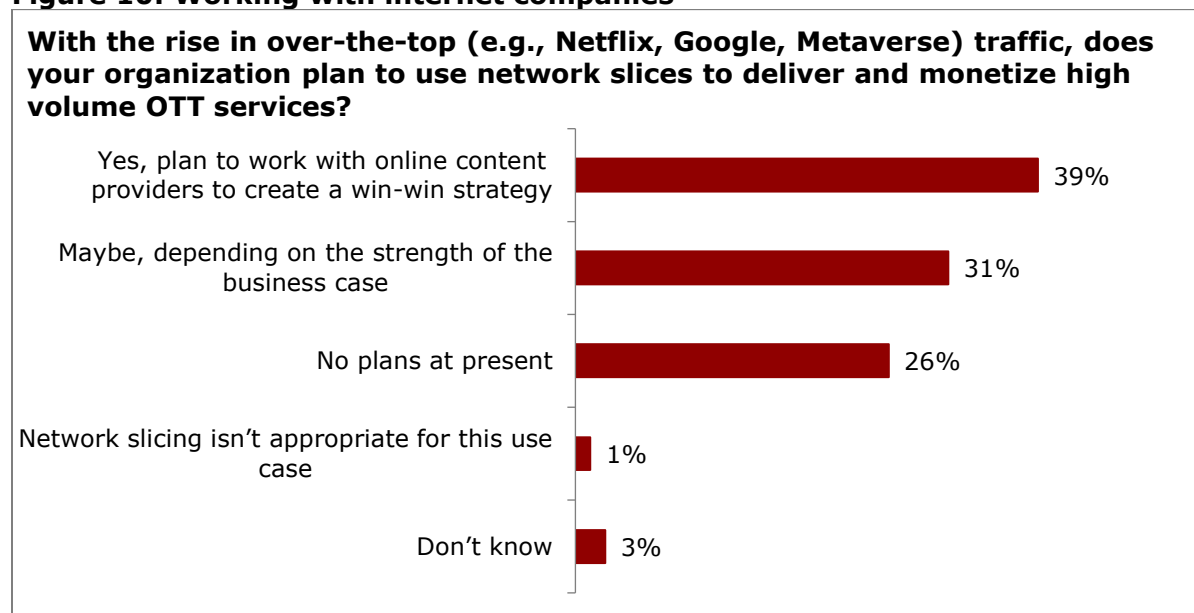
Most of the traffic on broadband networks is generated by customer demand for services from internet companies (so-called OTT traffic). Approximately 56% of global network traffic is generated by six companies, according to Sandvine. In mobile networks, it is logical to consider how network slicing may be able to improve the performance, efficiency, and user experience of the most in-demand services or enable new service experiences offered by these types of providers (e.g., virtual reality gaming, metaverse meetings, or similar). This is, however, a thorny topic, given issues related to net neutrality and because, in some markets, some telecoms are actively lobbying regulators to levy charges on OTT internet companies to carry traffic.

Asked if they anticipate working with internet companies “to use network slices to deliver and monetize high volume OTT services,” **Figure 10** shows a solid 40% say their company plans to do this, ahead of a more equivocal 31% that may do so, depending on the business case. There are several ways to analyze this result.

A telecommunications firm planning to work with an OTT does not necessarily mean the OTT will be receptive, and it could simply be the case that some respondents think they can/should work closely with these companies and potentially derive some revenue from them. Presumably, the thinking is that network slicing will provide a capability that improves the service, and the operator can somehow charge the OTT provider for this or monetize the customer via a revenue share. In this analysis, it is tempting to ascribe this 40% result to wishful thinking by telecom respondents.

However, internet companies do already work closely with telecom operators to optimize services, even if telcos do not directly monetize this work. An alternative analysis, therefore, is to be aware that what is normal in terms of telco and OTT working relationships today will not necessarily stay that way. As application performance requirements become more stringent, as customer expectations increase, and as new services emerge, there will be a need to rethink and re-architect how telcos and internet companies interact. In mobile networks, 5G network slicing will potentially allow a closer working relationship that benefits customers.

Figure 10: Working with internet companies



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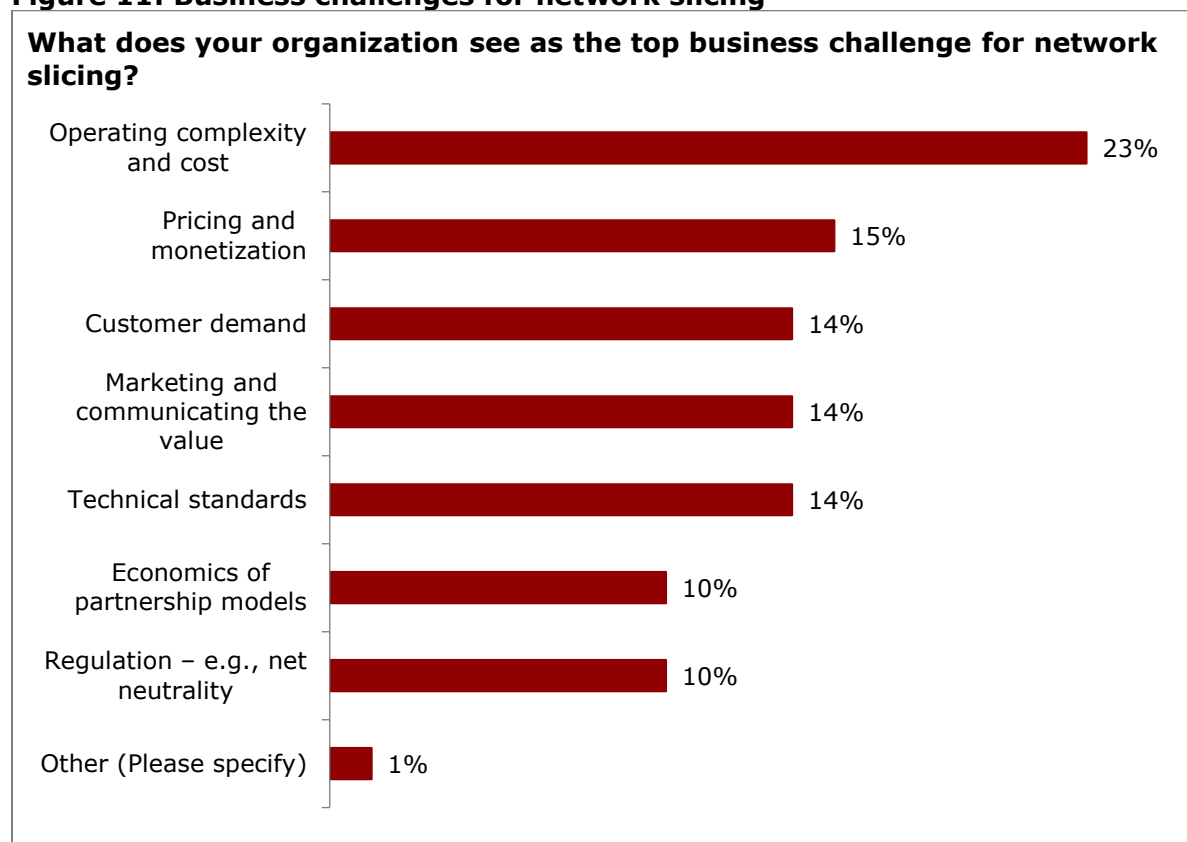
Source: Heavy Reading

TECHNICAL AND BUSINESS CHALLENGES

A 5G network slice, in principle, operates end-to-end across the network path. This, by definition, makes the implementation and operation of slices technically complex. And because slicing capabilities are not well known to customers, partners, investors, and regulators, there are also likely to be business challenges.

The top business challenges are ranked in **Figure 11**. “Operating complexity and cost” comes out on top with 23%. However, the primary observation is that, with only one response per respondent allowed in this question, all the options are well represented. There is no single standout “top business challenge,” but rather, a broad mix of issues that need to be addressed. It may be that this reflects the early stage of network slicing and that as operators move toward commercialization, one or two challenges will emerge as greater than others. That, however, is speculation. For now, respondents identify a broad set of challenges with only “operating complexity” jumping out.

Figure 11: Business challenges for network slicing

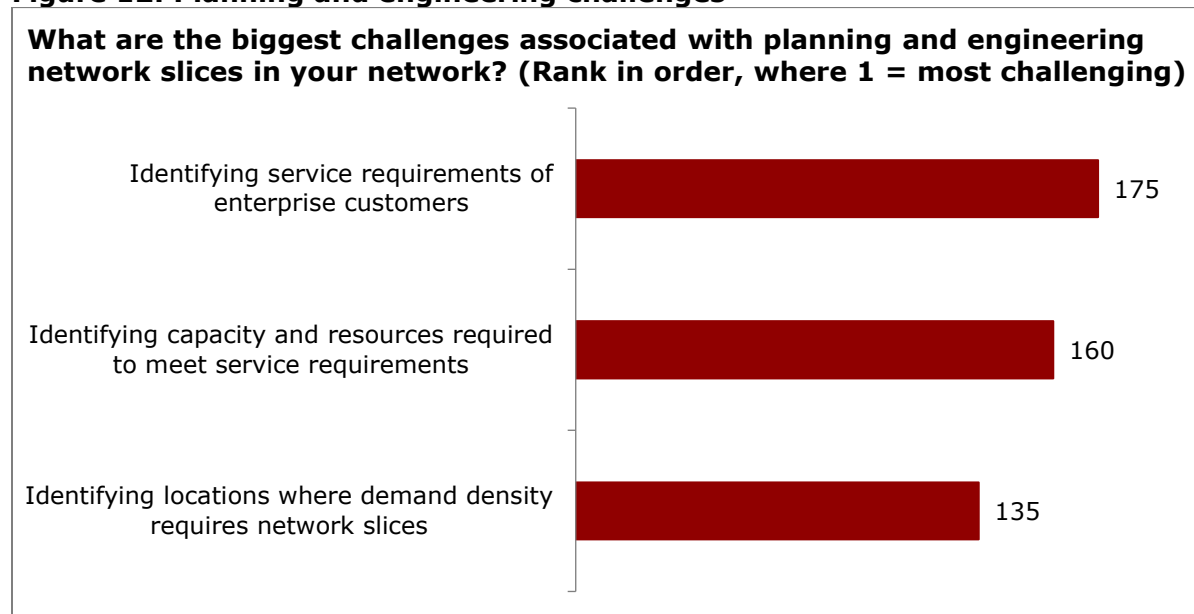


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Source: Heavy Reading

In terms of the network planning and engineering challenges, **Figure 12** shows how respondents rank three options presented to them, using a weighted average score to show “most” to “least” challenging. “Identifying service requirements of enterprise customers” ranks as most challenging overall. As consistently identified in the survey, more dialogue with customers about network slicing would be useful to address this gap (e.g., see **Figure 3**). The 62 respondents in technical job roles rank this as an even bigger challenge, whereas the corporate management and marketing roles (18 respondents) are more likely to rank “identifying capacity and resources required to meet service requirements” in first place. This different assessment of the planning and engineering challenges by technical and commercial roles shows that each demographic group feels more confident in the areas with which it is familiar.

Figure 12: Planning and engineering challenges



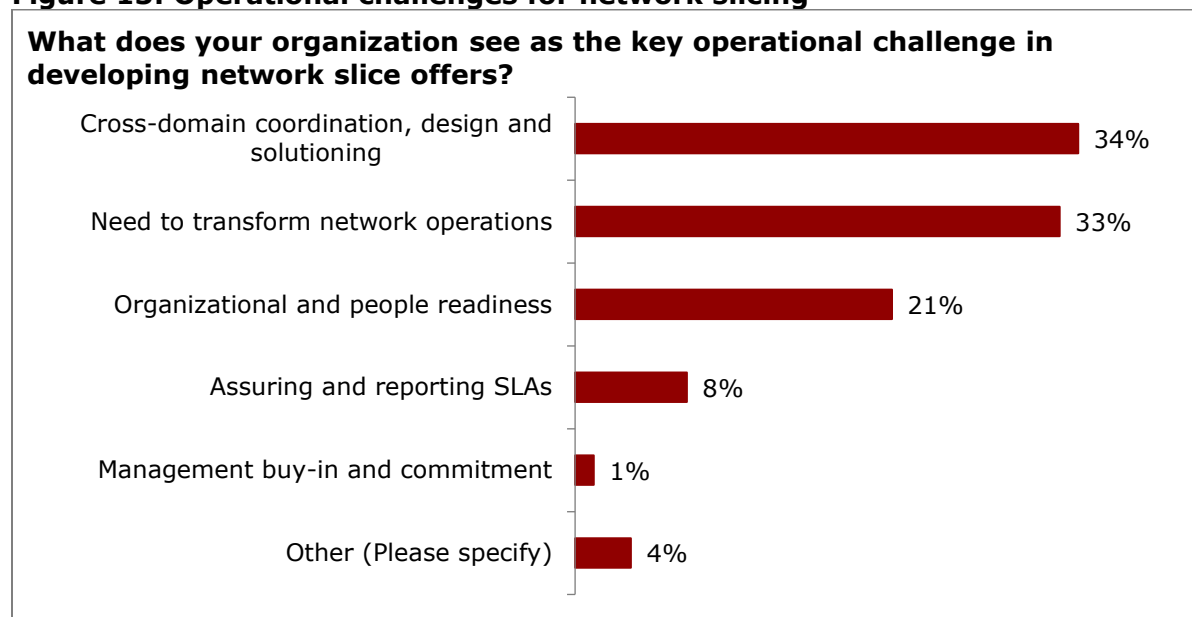
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Source: Heavy Reading

In terms of operational challenges, **Figure 13** shows respondents are split evenly between “cross-domain coordination, design, and solutioning” (34%) and the “need to transform network operations” (33%). Both scores are indicative of an early-stage technology. The low score for “assuring and reporting SLAs” (8%) is also a reflection of the fact that network slicing is still in development. As these services are deployed, it is likely that SLA reporting will come to be seen as more challenging.

There are some interesting demographics splits in the response. For R&D roles (16 respondents), the number that identifies “cross-domain coordination, design, and solutioning” as most challenging jumps to 67%, while among the 26 roles in network engineering and operations, the “need to transform network operations” comes first with 50%. For the 16 management roles, “organizational and people readiness” is the biggest challenge with 50% (versus 21% for the survey as a whole). Of course, each group thinks it has the hardest job!

Figure 13: Operational challenges for network slicing



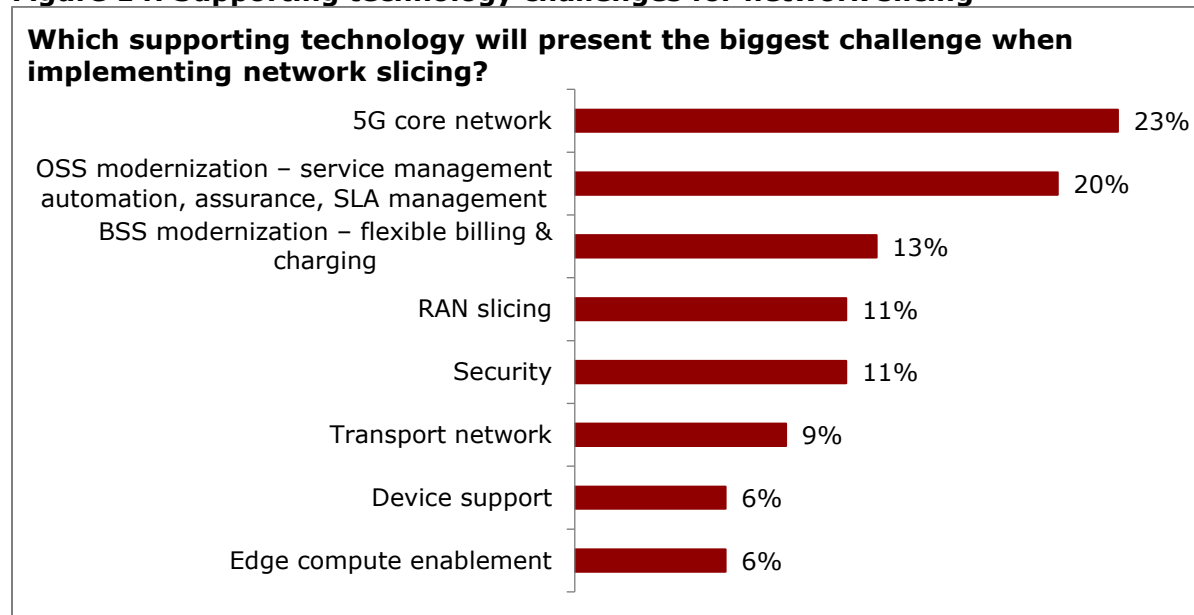
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Source: Heavy Reading

Figure 14 asks respondents, “which supporting technology will present the biggest challenge when implementing network slicing?” This question draws a spread of opinion, which reflects that network slicing spans several organizational domains. The lead challenge is “5G core” with 23%. This result was influenced by corporate management respondents, 56% of whom call this the biggest challenge. Slicing depends on a 5G core and can only be deployed in a standalone (SA) network. And given that only a few operators worldwide are live with a 5G core and that it is a major investment that is technically challenging, it is logical that it scores highest in this question.

"OSS modernization" is second with 20%, followed by "BSS modernization" (13%), "RAN slicing" (11%), "security" (11%), "transport network" (9%), "device support" (6%), and "edge compute enablement" (6%). It is perhaps surprising that "RAN slicing" did not score higher as the "biggest challenge," given that an end-to-end slice requires sufficient 5G radio coverage and deep enough capacity that operators can afford to allocate resources to the slice. One possible explanation is that an operator already needs an excellent 5G RAN to operate in SA mode. Or maybe this will emerge as a greater problem in later surveys once operators have more experience?

Figure 14: Supporting technology challenges for network slicing



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Source: Heavy Reading

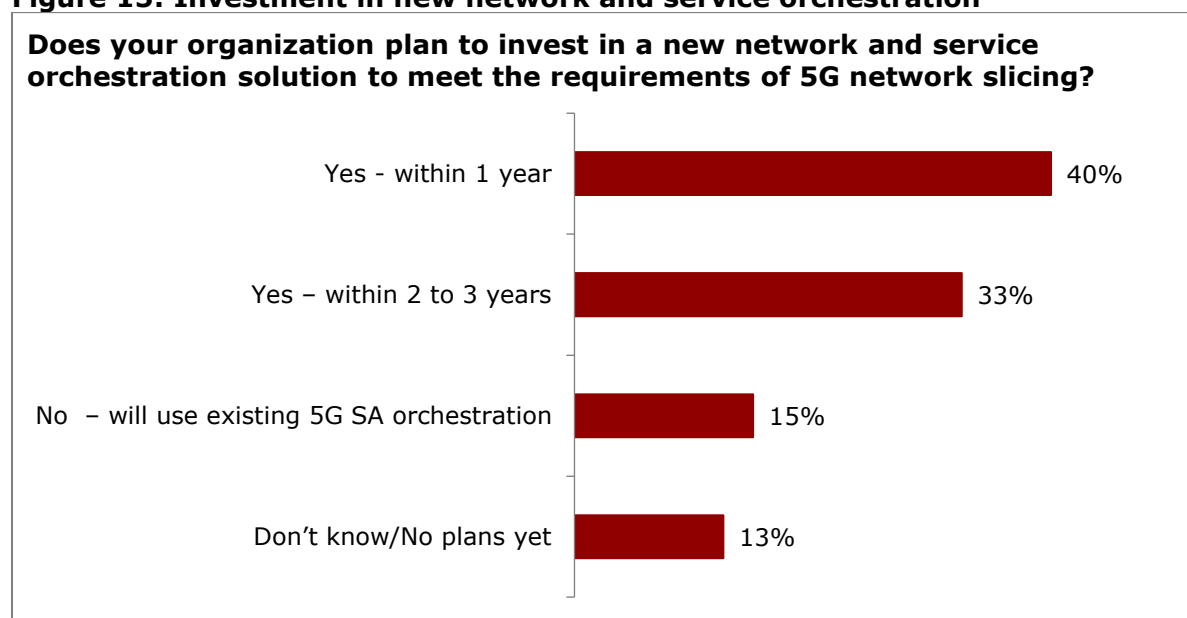
ORCHESTRATION AND AUTOMATION

Investment in network and service orchestration, network analytics, and service assurance is a key enabler for 5G network slicing.

Asked when their organization would invest in a new orchestration solution, **Figure 15** shows that 40% of respondents expect this to happen “within 1 year.” This perhaps gives an overly bullish picture of the overall industry timeline but nevertheless indicates that investment activity will start in the near term. It is clear that investment in these technologies and systems needs to start one to two years ahead of service launch. The result, therefore, stands as indicative of early-adopter and fast-follower investment plans.

A smaller percentage believe they “will use existing 5G SA orchestration” (15%). In hindsight, this was perhaps poorly worded because, for many operators, orchestration for the 5G core is itself a major new investment. The key observation in this question, then, is that almost three-quarters (73%) of respondents believe investment will be needed in a new network and service orchestration solution over the next few years.

Figure 15: Investment in new network and service orchestration

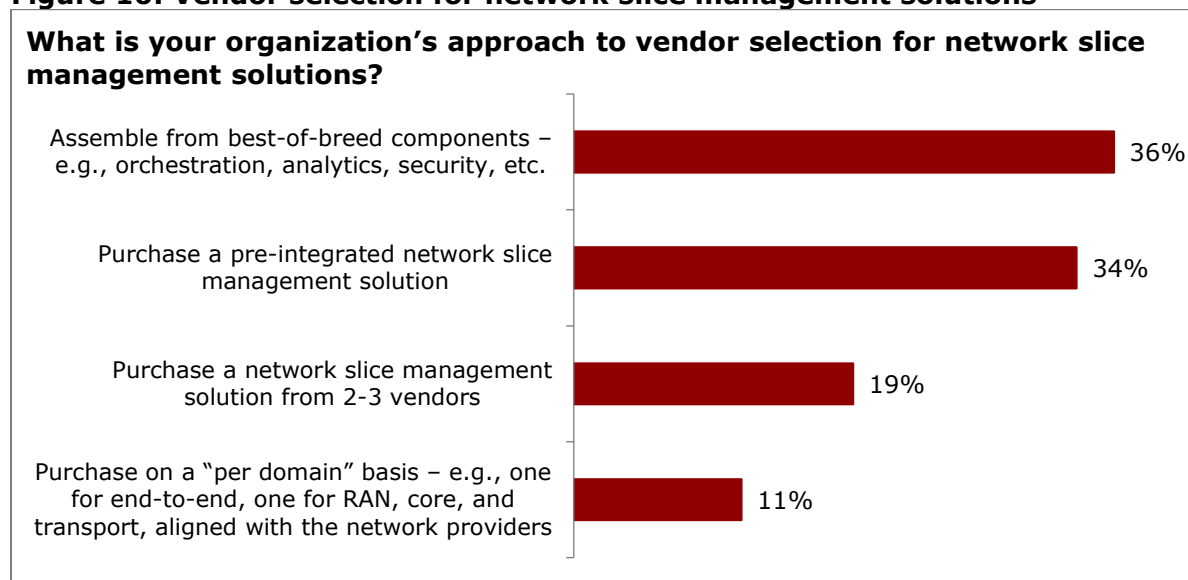


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Source: Heavy Reading

In terms of which type of vendor operators are likely to work with to source network slice management solutions, **Figure 16** shows the response is split between assembling a best-of-breed solution from multiple vendors (36%) and purchasing a pre-integrated management solution (34%). It is a surprise that only 11% selected a “per domain” vendor selection strategy because RAN, core, and transport have unique demands that are often best met by specialist domain vendors. It is possible that some of this vote instead selected the “best-of-breed” option.

Figure 16: Vendor selection for network slice management solutions

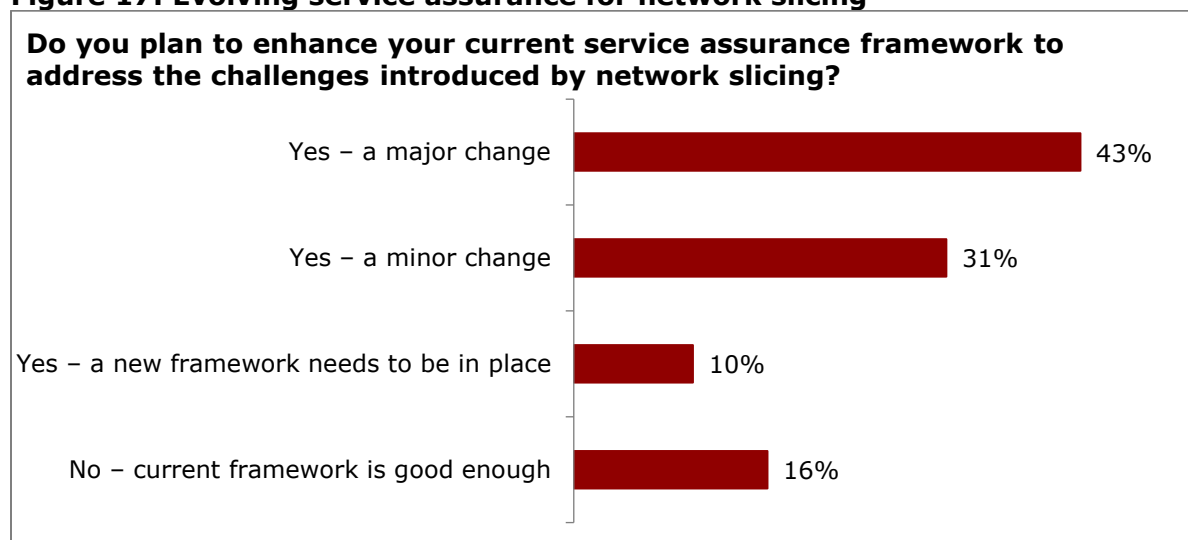


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Source: Heavy Reading

Figure 17 shows respondents' views on evolving service assurance for network slicing. The result indicates operators will upgrade and modify their existing service assurance process rather than introduce a new framework altogether (just 10%). However, the vote is split on how much change is required: 43% say it will involve “a major change” compared to 31% “only minor change.” This may reflect how much progress the operator has already made or differing views of how challenging this evolution actually is. Either way, the overall majority view is that service assurance needs to evolve. The 16% that say the “current framework is good enough” should not be discounted because operators have a long history of making do with repurposed service assurance solutions.

Figure 17: Evolving service assurance for network slicing



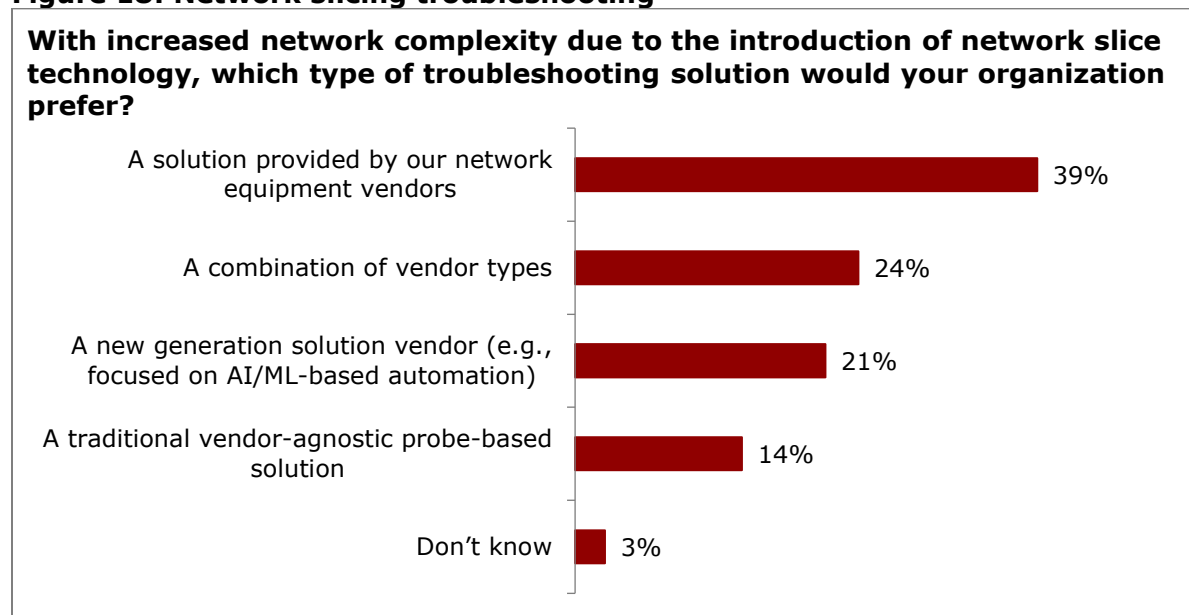
n=80

Source: Heavy Reading

Service assurance is used, in part, for troubleshooting and to identify where and why performance is not at the expected level. This is particularly important for network slicing because these services will often be sold with an associated SLA with regular reporting to the customer. This means the service provider needs a way to quickly investigate and resolve issues. A common vendor view is that current service assurance tools will struggle to support SLA-based service delivery and monetization.

To investigate this, respondents were asked, “Which type of troubleshooting solution would your organization prefer?” **Figure 18** shows the top choice is one provided by “network equipment vendors” (39%) followed by “combination of vendors” (24%) and “a new generation solution vendor (e.g., focused on AI/ML based automation)” (21%). Selecting an equipment vendor solution is perhaps explained by a desire to address the high complexity of troubleshooting and monitoring in cloud native environments. Moreover, vendors now often provide inline monitoring as part of the Cloud Native Function (CNF) itself. By contrast, traditional probing becomes significantly more difficult for dynamic microservice network functions in comparison to the classical devices with static interface polling. Nevertheless, many operators take a “belt and braces” approach to network monitoring and troubleshooting, and, in practice, it is likely many will use both vendor-provided and external troubleshooting tools.

Figure 18: Network slicing troubleshooting

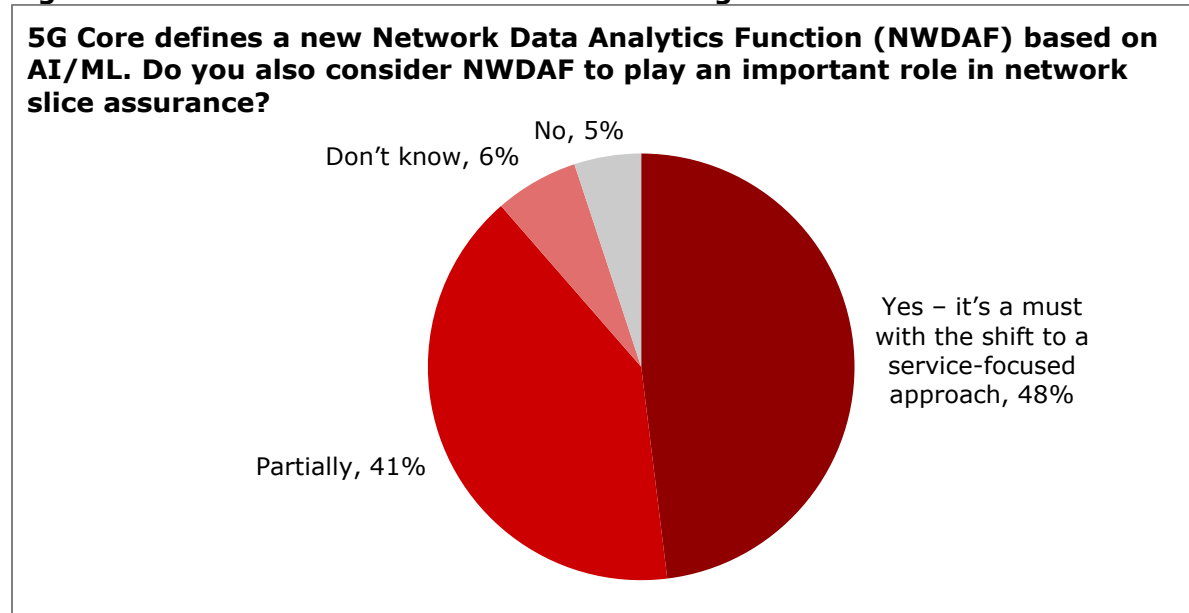


n=80

Source: Heavy Reading

The Network Data Analytics Function (NWDAF) is a new node in the 5G system architecture that is not present in 4G. **Figure 19** considers the NWDAF and its role in network slice assurance. When analyzing the responses by job role, the majority (77%) of “IT and cloud” job functions believe that, yes, NWDAF will play an important role. In contrast, when results from every other role are considered, there is a more even split between “yes” and “partially”. The result suggests an important role for the NWDAF, tempered by some uncertainty around the maturity of NWDAF and artificial intelligence/machine learning (AI/ML) technology in slice assurance.

Figure 19: The role of NWDAF in network slicing



n=80

Source: Heavy Reading

ABOUT THIS STUDY

The Heavy Reading **5G Network Slicing Operator Survey** is intended to help industry participants better understand the status of this technology and gain insight into how operators are thinking about using slicing capabilities to offer commercial end-user services. The survey was conducted in June and July 2022, and this analysis was written in August and September 2022.

The questionnaire was written by Heavy Reading, with input from study sponsors Amdocs, Ericsson, and Sandvine. The online survey was promoted by email to Light Reading's service provider databases. The survey garnered 80 qualified responses from individuals working at communication service providers that own and operate mobile networks.

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