HEAVY READING

WHITE PAPER

5G Orchestration and Service Assurance:
A 2023 Heavy Reading Survey

A Heavy Reading white paper produced for Juniper Networks and RADCOM

JUNIPER NETWORKS®   **RADCOM**

AUTHOR: JIM HODGES, RESEARCH DIRECTOR, HEAVY READING

EXECUTIVE SUMMARY

Today, mobile service providers are ramping up the deployment of 5G standalone (SA) core networks. This commercialization phase is a vital step in monetizing their 5G investments and driving future service innovation. The 5G core is foundational for the delivery of cloud native services, some of which can be deployed utilizing network slicing to guarantee a defined level of multi-domain end-to-end service performance.

To support these advanced services, service providers must also develop and execute orchestration and assurance platform strategies. By doing so, they can orchestrate, provision, and charge for these 5G services on an end-to-end basis as they traverse multiple domains such as the radio access network (RAN), transport, edge, core, and cloud networks.

This Heavy Reading white paper presents the key findings and supporting data points from a web-based global service provider survey designed to provide granular insights into service provider orchestration and assurance strategies. Heavy Reading partnered with **Juniper Networks** and **RADCOM** in the development of the 20-question survey fielded in March 2023. (See ***Appendix A*** for additional survey demographic information.)

To document data sensitivity trends, each of the survey questions was filtered based on the annual revenue of the companies for which the survey respondents worked. Two filter groups were utilized:

- **Tier 1 service providers:** Those with at least $1bn USD in annual revenue (n=51).
- **Tier 2/3 service providers:** Those with less than $1bn USD in annual revenue (n=57).

END-TO-END ORCHESTRATION KEY FINDINGS

Deployment and monetization strategies

Although service providers anticipate numerous **benefits from implementing end-to-end orchestration*, the lead driver is service monetization.**

Service monetization will execute in several distinct service domains. The leading orchestration-centric services include service-level agreement (SLA)-based network slices (34%). This result was followed closely by multi-tenant dedicated enterprise services integrated into the public network (31%), dedicated enterprise services as standalone mobile private networks (29%), and edge-based applications and services (26%).

Service providers are split on when to support end-to-end orchestration for public and private network services. 42% and 40% plan to support all domains at commercial launch for public and private services, respectively. However, a little more than half plan to implement a phased domain approach for these same public (51%) and private (54%) services.

Platform design attributes

The majority of service providers (64%) are either "very confident" (20%) or "confident" (44%) that their current networks are up to the task of supporting end-to-end orchestration. That leaves more than a third of service providers (35%) that are either only "somewhat confident" (28%) or "not confident" at all (7%).

This general state of confidence does not mean that service providers believe their orchestration platforms are fully up to the task of managing the complexity associated with the end-to-end orchestration of 5G services. Less than a third of the respondents (24–31%) indicated their systems can currently manage end-to-end orchestration for certain 5G services.

This means that system upgrades or platform replacement will be necessary to meet the orchestration requirements these capabilities will introduce. The largest sample of service providers plans to take action within the next 12 months to support multi-domain orchestration (37%) and network functions virtualization orchestrator (NFVO) services (36%).

Most service providers (58%) favor a new platform to support end-to-end orchestration. Among this group, 21% plan to purchase a new *open* orchestration platform from their incumbent vendor, while a second group (18%) also plans to purchase from their incumbent vendor but are willing to accept a *proprietary* platform. This leaves two other groups that plan to move on from their current vendors and either build a new muti-vendor solution in-house (13%) or purchase a new open orchestration platform from a new single vendor (6%). **The remaining 42% plan to evolve their current orchestration platform.**

Regardless of which vendor partner they select, service providers expect that a new orchestration platform will be open. Based on "extremely important" input, 37% of respondents selected open standards-based APIs as the lead design attribute. Close behind were other open attributes, such as the ability to integrate specialized third-party domain orchestrators (33%) and the ability to evolve even existing current RAN, core, and transport functions to open and standards-based APIs (29%). Flexible resource management (30%), cloud native architecture (33%), and automated SLA management (33%) are also important.

Deploying and monetizing slices

The value of network slicing is that it can be applied to many unique service types, including enterprise services and even internal network operations. Of these opportunities, **the top use case is to utilize slicing to support business-to-business (B2B) services that encompass private network services (81%),** followed by support of business-to-business-to-everything (B2B2X) services (52%) and then internal network operations (49%).

Slicing monetization and charging will rely on several flexible options. The preferred approach by a narrow margin is to charge based on the scale of a slice and the resources consumed (e.g., the number of network functions and data centers utilized) (56%). This was followed by the others in a very tight grouping: slice type and SLA (54%) and then lifecycle duration and number of slices (both 41%).

Service providers plan to deploy slices gradually. In 2023, the largest group of respondents (43%) forecasts they will deploy only 0–10 slices commercially. By 2025, 67% forecast they will still deploy 1,000 or fewer slices (14%: 0–10; 21%: 11–100; and 32%: 101–1,000).

5G SERVICE ASSURANCE KEY FINDINGS

Service assurance platform requirements

More than half of service providers (54%) support replacing existing assurance platforms to support 5G services. 21% plan to replace within 12 months, and 33% plan the same within 24 months. This leaves 34% of respondents who plan to evolve their existing assurance platform and 11% who do not know what approach their company plans to adopt. Further survey data inputs point to automation as a leading driver for platform replacement.

Assurance business priorities

The 5G assurance team's business priority is to improve service quality and customer experience (51%). In second and third place, respectively, were automation of network operations (31%) and preventing churn (18%). The top ranking of service quality and customer experience was not unexpected since every new generation of mobile technology must deliver improved service and customer experience compared to the previous one to be monetizable.

Service providers' top priority in improving customer experience is focused on a basic need—to boost service quality (64%). Other objectives garnered lower levels of support, including delivering personal experiences (16%), offering self-help applications (12%), and improving customer care teams (8%).

Automating assurance and customer experience

Automation of network operations and service quality are not mutually exclusive. Many of these same survey respondents believe that network automation is a complementary capability that will improve 5G service quality the most (31%), ahead of service quality management (22%), predictive analytics (19%), and monitoring key performance/quality indicators (KPIs/KQIs) (17%).

Artificial intelligence (AI) will play a vital role in several 5G assurance use cases. Of these, based on "extremely important" inputs, the top three use cases are enhancing the customer experience (49%), improving service quality (44%), and automatic detection of network anomalies (41%). Automating root cause analysis to support edge and public and private cloud orchestration (39%) was not far behind.

5G service providers anticipate that automated assurance will deliver a broad range of benefits. These range from optimizing network issues (68%), cost savings (62%), and SLA compliance validation (55%) to revenue generation (52%).

To support automated assurance, a 5G assurance platform will need to implement some form of integrated containerization support. More than 7 out of 10 service providers surveyed believe it is either "very important" (31%) or "important" (43%) that an automated assurance platform supports Kubernetes (K8s) integration.

Real-time data

Service providers will rely on various types of assurance usage data to support their 5G service and networks. Among these various sources, the top priority by a considerable margin was session/packet analysis (36%). This result was followed by three tightly coupled datasets: monitoring services from the lab to commercial launch (20%), subscriber onboarding (19%), and evaluating new network equipment (18%).

In the real-time cloud native world of 5G service delivery, the assumption is that assurance must also pivot to a *real-time data insight assurance model* to be able to capture the impact of these real-time services on overall service quality. **The survey data confirms this, as more than 8 out of 10 (86%) of survey respondents ranked real-time data insight as either "extremely important" (36%) or "important" (50%) for 5G assurance.**

This focus on 5G real-time data and services also has monitoring implications. Based on "extremely important" input, the top areas of focus include monitoring the core network (51%), improving service quality (48%), and monitoring the RAN and edge (both 44%). Other secondary but still important monitoring areas encompass monitoring network slices (36%) and handover between cells (33%).
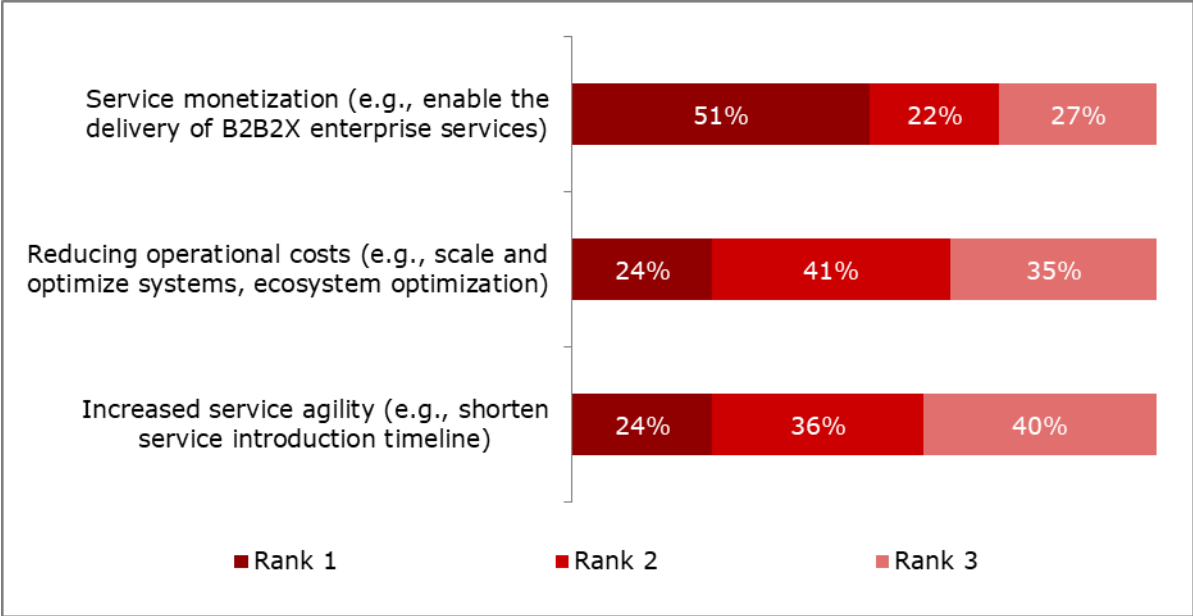
END-TO-END ORCHESTRATION

The first question in the orchestration section of the survey addressed the primary drivers for implementing end-to-end orchestration. As **Figure 1** illustrates, when asked to rank three fundamental drivers, the top-of-mind consideration among the survey respondents based on the highest "rank 1" inputs was service monetization (51%) related. This encompasses a broad range of capabilities, including the delivery of B2B2X services in the enterprise.

The two other "rank 1" scores were much lower at 24% each. These drivers were reducing operational costs, which includes scaling and optimizing systems and the ecosystem, and increased service agility associated with improvements in the service introduction timeline.

Tier 1 and Tier 2/3 service providers have similar views of the importance of service monetization based on "rank 1" inputs (Tier 1 = 45% vs. Tier 2/3 = 56%).

Figure 1: What are the primary drivers for implementing end-to-end orchestration? (Rank in order, where 1 = most important)

Note: Numbers in figures throughout this report may not total 100 due to rounding. (n=108)
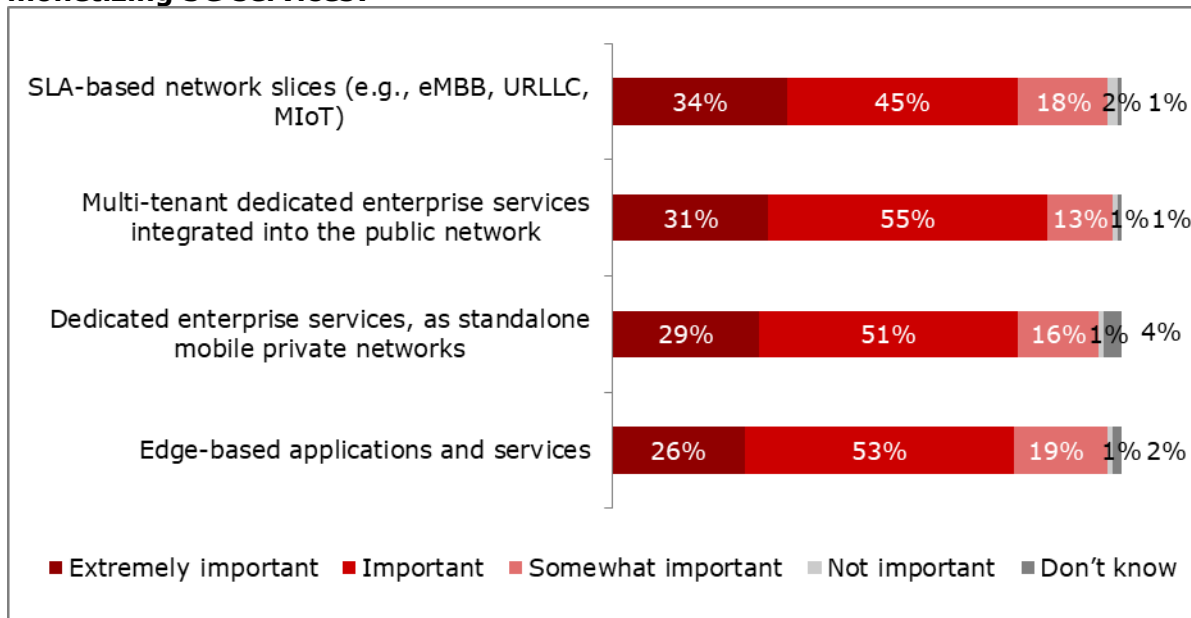*Source: Heavy Reading*

One of the key value propositions of end-to-end orchestration is that it can be applied to many distinct 5G service types. This is particularly important since 5G mobile service providers now find themselves facing competition from numerous players. These include hyperscalers at the network edge, in the public cloud, and even in the enterprise—in part due to the focus on utilizing 5G to support private networks.

When asked about the importance of selling and orchestrating a range of 5G services, as illustrated in **Figure 2**, the survey respondents ranked all four options closely based on "extremely important" responses. SLA-based network slices led the way (34%), followed closely by multi-tenant dedicated enterprise services integrated into the public network (31%), dedicated enterprise services as standalone mobile private networks (29%), and edge-based applications and services (26%).

Based on these same "extremely important" inputs, the priorities for Tier 1 mobile service providers were SLA-based network slices (41%), edge-based applications (39%), and dedicated enterprise services as standalone mobile private networks (33%). The priorities of the Tier 2/3 service providers were multi-tenant dedicated enterprise services integrated into the public network (30%), SLA-based network slices (28%), and dedicated enterprise services as standalone mobile private networks (25%).

Heavy Reading views this data as confirming that selling and orchestrating slice-based services remains a priority, especially for Tier 1 service providers.

Figure 2: How important are selling and orchestrating the following capabilities for monetizing 5G services?
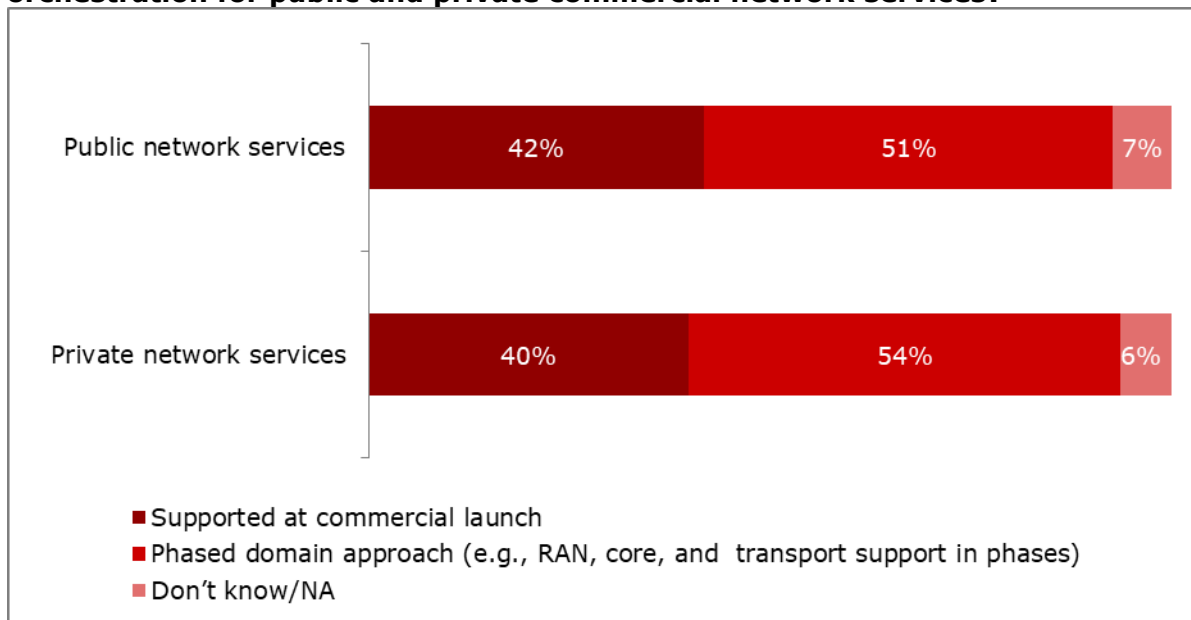

n=108
Source: Heavy Reading

This leads to an important decision point: Should service providers implement end-to-end orchestration in the strictest sense to support all network domains (e.g., core, RAN, and transport) at commercial launch or follow a gradual phased domain approach?

To provide a more granular context, Heavy Reading asked the survey respondents this very question split into two categories: public network services and private network services.

As illustrated in **Figure 3**, service providers are split on which deployment approach to support both public and private network services. While 42% and 40% plan to support all domains at commercial launch for public and private services, respectively, a little more than half plan to implement a phased domain approach for these same public (51%) and private (54%) services.

Tier 1 service providers are equally split for both private and public network services (commercial launch, 45% and 47%; phased domain, 45% and 45%). In contrast, Tier 2/3 service providers favor a phased domain approach for private (61%) and public (56%) networks versus the commercial launch option (35% and 37%, respectively).

Figure 3: What deployment strategy will you utilize to deliver end-to-end network orchestration for public and private commercial network services?
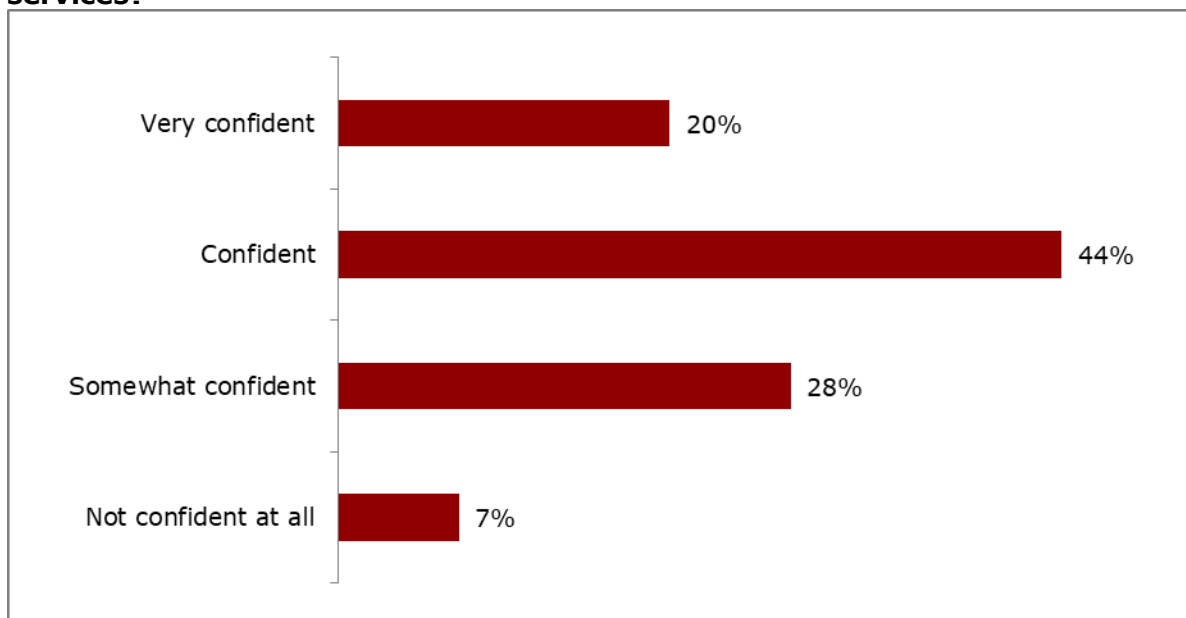

n=108
Source: Heavy Reading

The previous figure confirms that service providers believe end-to-end orchestration is vital to monetizing 5G services. The next logical question in the sequence is: How confident are these same service providers that their current network can support this capability to monetize 5G services, slice-based or otherwise? Overall, confidence levels are high.

As shown in **Figure 4**, 64% of service providers are either "very confident" (20%) or "confident" (44%) that their current networks are up to the task. That leaves more than a third of service providers (35%) that are either only "somewhat confident" (28%) or "not confident at all" (7%).

A greater portion of Tier 1 service providers aligned with "very confident" compared to their Tier 2/3 counterparts (Tier 1 = 29% vs. Tier 2/3 = 12%). Conversely, a greater portion of Tier 2/3 service providers characterized their state as "confident" (Tier 1 = 41% vs. Tier 2/3 = 47%).

Figure 4: How confident are you that your current network supports the necessary end-to-end orchestration functions to monetize 5G services, including slice-based services?
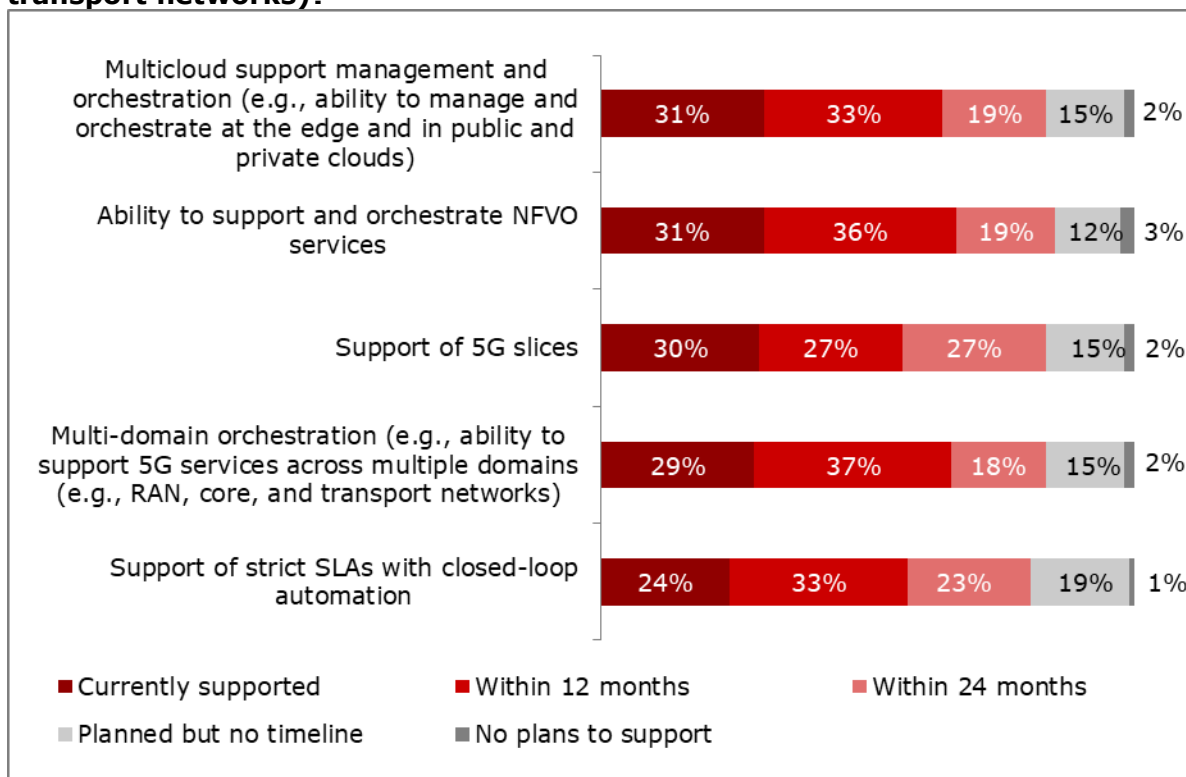

n=108
Source: Heavy Reading

To understand the impacts of end-to-end orchestration, the survey asked respondents to assess the readiness of their existing orchestration system to support a range of functions for NFVO services, multicloud, multi-domain, slices, and even SLA closed-loop automated services.

Overall, as shown in **Figure 5A**, less than a third of the respondents (24–31%) indicated their systems can currently manage end-to-end orchestration for these capabilities. This means that system upgrades or outright replacement will be necessary to meet the orchestration requirements these capabilities will introduce. In response, the largest sample of service providers plans to take action within the next 12 months to support these functions. The leading two priorities (by a narrow margin) were multi-domain orchestration (37%) and NFVO services (36%).

The remaining survey respondents plan to support end-to-end orchestration for the listed capabilities within 24 months (18–27%) or within no defined timeline (12–19%). While implementation will be then gradual, the fact that 3% or less of the survey respondents indicated they would not support orchestration confirms that more than 9 out of 10 service providers are committed to end-to-end orchestration.

Figure 5A: To what extent can your current network orchestration system support the following capabilities on an end-to-end basis (e.g., in the core, RAN, and transport networks)?
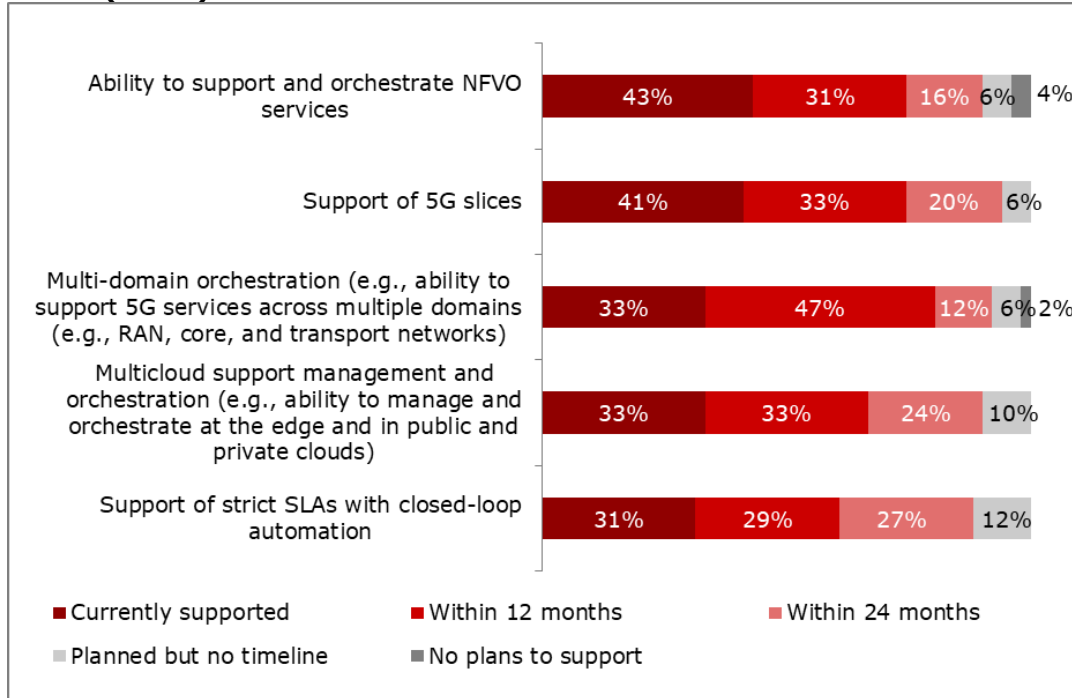

n=108
Source: Heavy Reading

As previously documented, a greater proportion of Tier 1 service providers prefer to support end-to-end orchestration from commercial launch, while a greater proportion of Tier 2/3 service providers favor a phased approach. Given these strategies, it is not surprising that, as illustrated in **Figure 5B,** Tier 1 service providers are considerably ahead in terms of currently supported functions.

For example, many Tier 1 service providers currently possess the ability to support and orchestrate NFV-based services (43%) and even 5G slices (41%)—more than double the results of their Tier 2/3 service provider counterparts (both 19%).
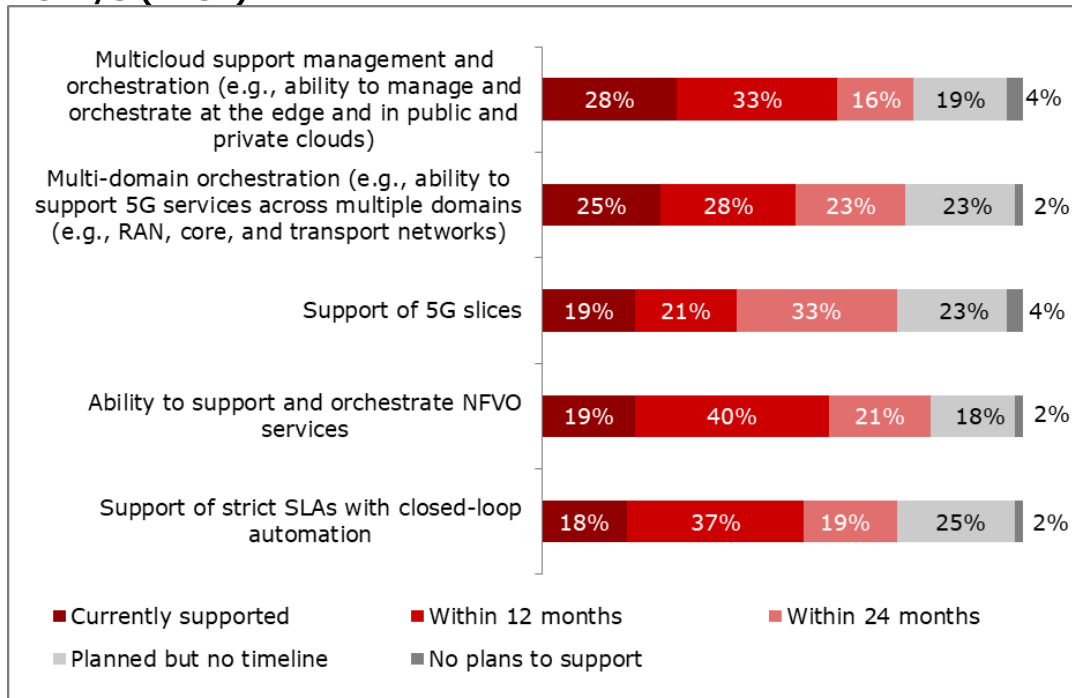
Another reinforcing marker is the fact that more Tier 2/3 service providers (18–25%) have yet to even define a timeline for compliance compared to Tier 1 service providers (6–12%). But both groups are aligned on the value of orchestration, as input on "no plans to support" from both Tier 1 and Tier 2/3 service providers falls within the 0–4% range.

Figure 5B: To what extent can your current network orchestration system support the following capabilities on an end-to-end basis (e.g., in the core, RAN, and transport networks)? Tier 1 vs. Tier 2/3

Tier 1 (n=51)

	Currently supported	Within 12 months	Within 24 months	Planned but no timeline	No plans to support
Ability to support and orchestrate NFVO services	43%	31%	16%	6%	4%
Support of 5G slices	41%	33%	20%	6%	
Multi-domain orchestration (e.g., ability to support 5G services across multiple domains (e.g., RAN, core, and transport networks)	33%	47%	12%	6%	2%
Multicloud support management and orchestration (e.g., ability to manage and orchestrate at the edge and in public and private clouds)	33%	33%	24%	10%	
Support of strict SLAs with closed-loop automation	31%	29%	27%	12%	

■ Currently supported   ■ Within 12 months   ■ Within 24 months
□ Planned but no timeline   ■ No plans to support

Tier 2/3 (n=57)

	Currently supported	Within 12 months	Within 24 months	Planned but no timeline	No plans to support
Multicloud support management and orchestration (e.g., ability to manage and orchestrate at the edge and in public and private clouds)	28%	33%	16%	19%	4%
Multi-domain orchestration (e.g., ability to support 5G services across multiple domains (e.g., RAN, core, and transport networks)	25%	28%	23%	23%	2%
Support of 5G slices	19%	21%	33%	23%	4%
Ability to support and orchestrate NFVO services	19%	40%	21%	18%	2%
Support of strict SLAs with closed-loop automation	18%	37%	19%	25%	2%

■ Currently supported   ■ Within 12 months   ■ Within 24 months
□ Planned but no timeline   ■ No plans to support

Source: Heavy Reading

The end-to-end orchestration requirements to support the capabilities in the previous figure are complex, which will lead many service providers to evaluate their 5G orchestration platform strategies. There are only two viable approaches: evolve existing platforms or deploy a new 5G orchestration platform.

The results captured in **Figure 6A** document that both strategies are in play. While the largest single data group (42%) plans to evolve its existing platform, the aggregate majority (58%) plans to deploy a new 5G orchestration platform following a different path. The first group from this majority (21%) plans to purchase a new orchestration platform from their incumbent vendor.

The second group (18%) also plans to purchase from their incumbent vendor but is willing to accept a proprietary platform. This leaves two other groups that plan to move on from their current vendors and either build in-house a new muti-vendor solution (13%) or purchase a new open orchestration platform from a new single vendor (6%).

Figure 6A: Which best describes your 5G orchestration platform strategy?
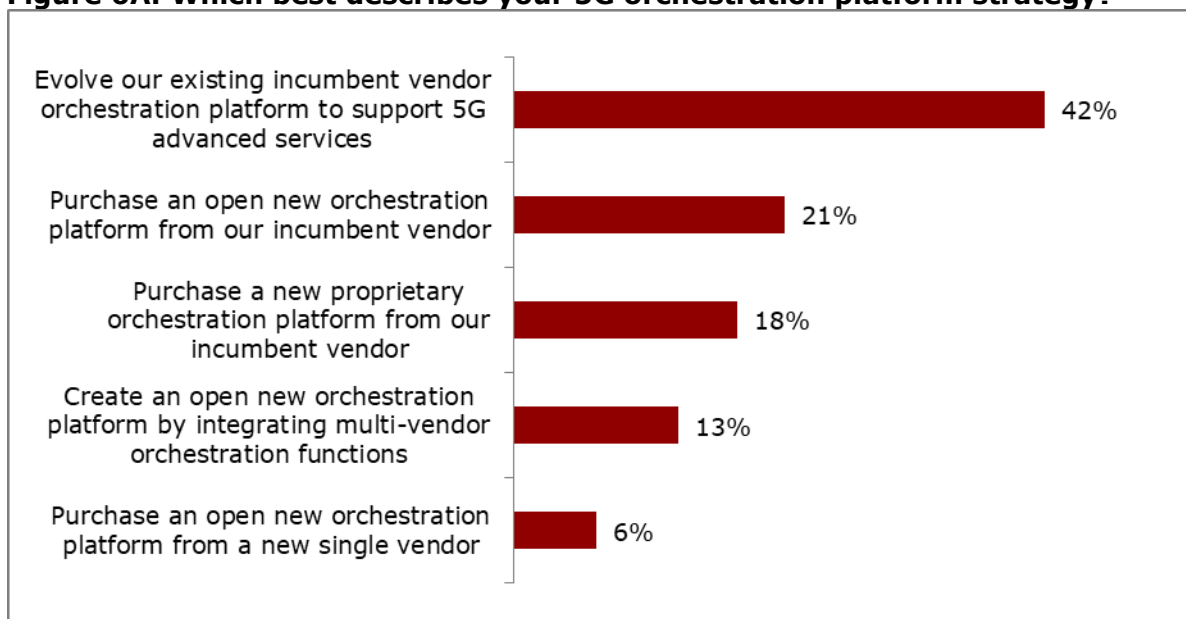

n=108
Source: Heavy Reading

Investigating the data trends of the two filter groups shown in **Figure 6B** reveals that a greater percentage of Tier 1 service providers (51%) support the current platform evolution strategy compared to Tier 2/3 service providers (33%). However, in both groups, one of the preferred approaches is to purchase a new open platform from the incumbent vendor (Tier 1 = 22% vs. Tier 2/3 = 21%). Also noteworthy is the fact that a smaller group of Tier 1 service providers are less likely to purchase a new proprietary platform from their current vendor (Tier 1 = 14% vs. Tier 2/3 = 21%).
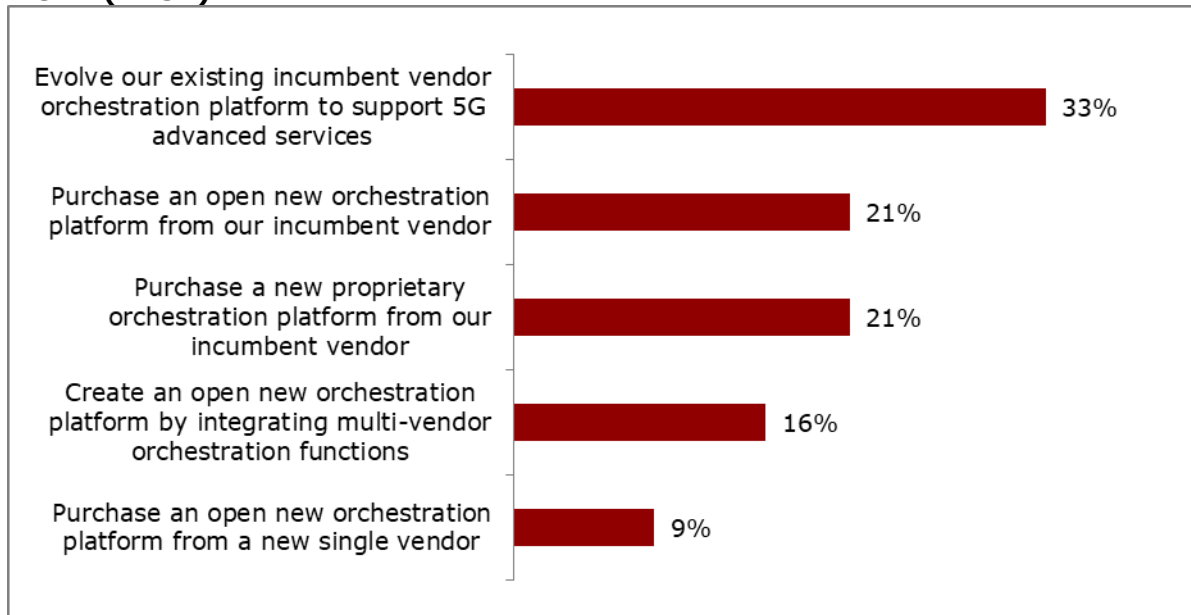
**Figure 6B: Which best describes your 5G orchestration platform strategy?
Tier 1 vs. Tier 2/3**

Tier 1 (n=51)
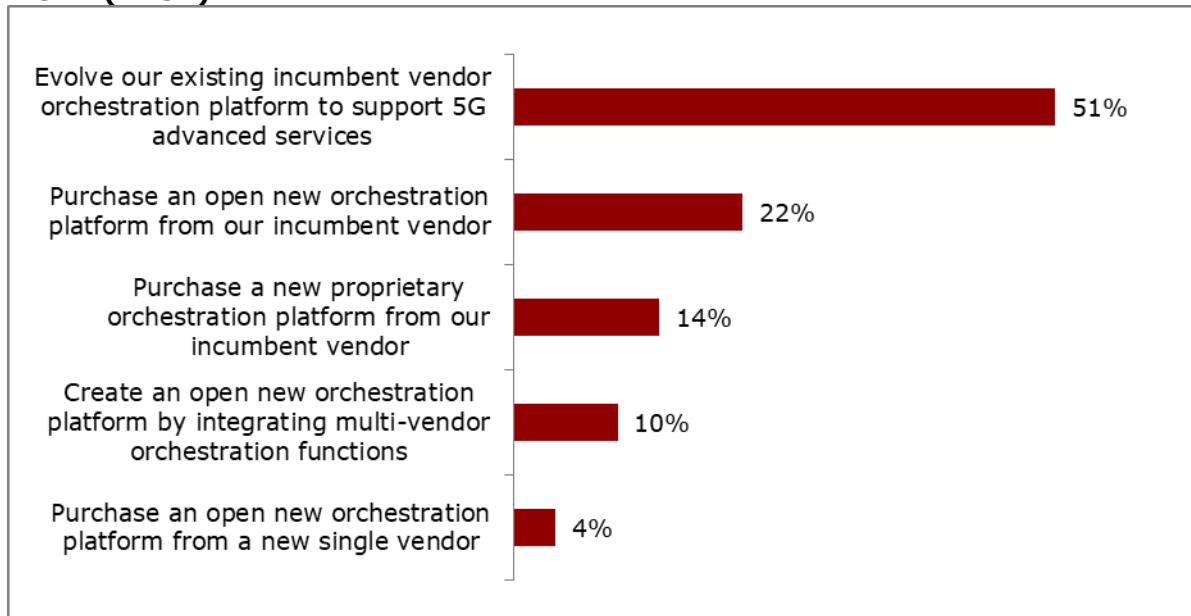
Source: Heavy Reading

Tier 2 (n=57)

Source: Heavy Reading

The shift from proprietary orchestration platforms was also endorsed in the next question of the survey, which asked survey respondents to rank orchestration platform design attributes.

As shown in **Figure 7**, based on "extremely important" input, 37% of respondents selected open standards-based APIs as the leading consideration. Close behind were other open attributes, such as the ability to integrate specialized third-party domain orchestrators (33%) and the ability to evolve existing current RAN, core, and transport functions to open and standards-based APIs (29%).

Other functions, such as flexible resource management (30%), cloud native architecture (33%), and automated SLA management (33%), are also important.

Platform openness was important for both Tier 1 and Tier 2/3 service providers. Yet, based on "extremely important" inputs, Tier 1 service providers seem to assess attributes such as open standards-based APIs higher than Tier 2/3 service providers (Tier 1 = 45% vs. Tier 2/3 = 30%)

The only plausible takeaway from these inputs is that service providers expect new orchestration platforms to be open, scalable, cloud native, automation-ready, and capable of supporting flexible integration scenarios.

Figure 7: How important are the following design attributes when purchasing a new orchestration platform?
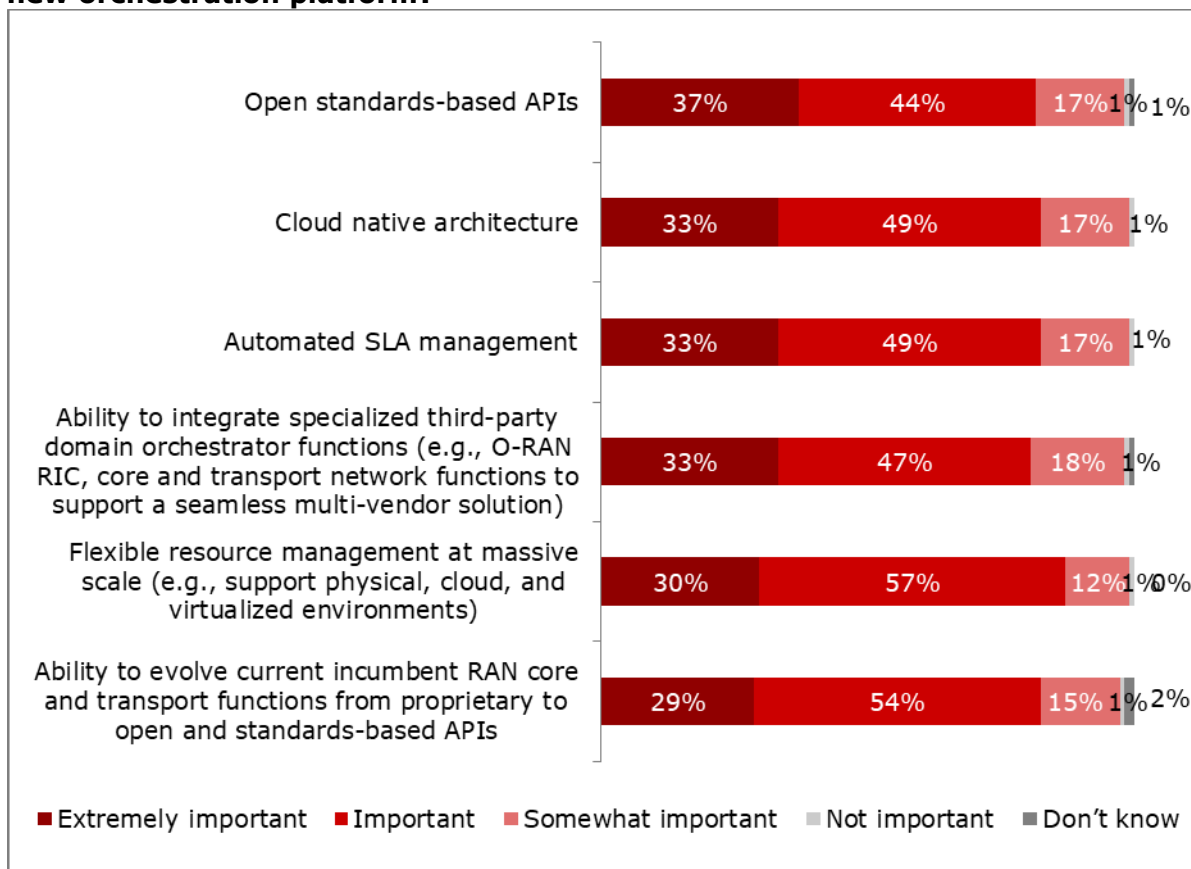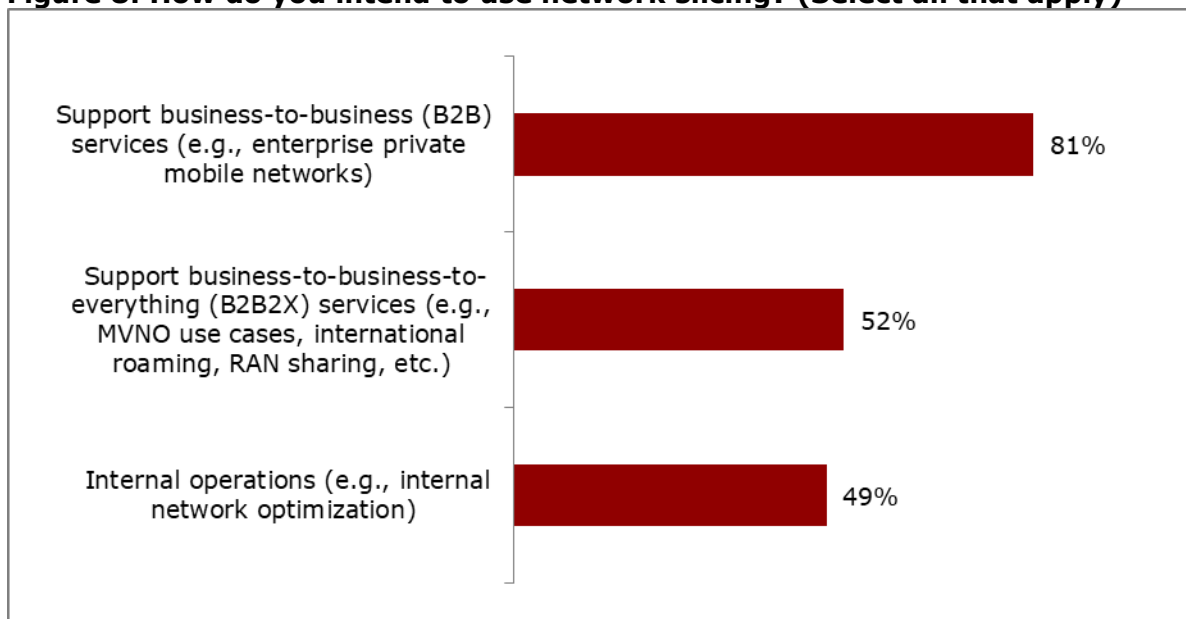

n=108
Source: Heavy Reading

The value of network slicing is that it can be applied on multiple levels for enterprise services or even for internal network operations. Of these opportunities, the top use case is to utilize slicing to support B2B services that encompass private network services (81%), followed by support B2B2X services (52%) and then internal network operations (49%).

Tier 1 and Tier 2/3 service providers' input was very similar:

- Tier 1 B2B = 76% vs. Tier 2/3 = 86%

- Tier 1 B2B2X = 55% vs. Tier 2/3 = 49%

- Tier 1 internal operations = 49% vs. Tier 2/3 = 49%

Based on this input, it is clear that service providers of all sizes are looking to gain additional flexibility to further monetize enterprise B2B business channels.

Figure 8: How do you intend to use network slicing? (Select all that apply)

n=108
Source: Heavy Reading

Having a flexible and viable strategy for charging for 5G slices will be crucial to monetizing 5G services. **Figure 9** provides some valuable insight into how service providers plan to accomplish this. Given that slicing can be utilized for a broad spectrum of use cases, service providers are keeping their options open.

As captured in this figure, the options can be broken down into four categories: resources consumed, slice type and SLA, lifecycle duration, or simply the number of slices deployed.

The preferred approach by a narrow margin is to charge based on the scale of a slice and the resources consumed (e.g., number of network functions and data centers utilized) (56%), followed by the other options in a very tight ranking pattern. These include charging based on slice type and SLA (54%), followed by lifecycle duration and the number of slices (both 41%).

The data also provide additional feedback on the use of slicing for internal operations only. While the service providers plan to use slicing to gain internal operational insights to optimize their networks (see **Figure 8**), only 5% of service providers plan to utilize slicing for internal purposes *only*. In other words, slices will be monetized and charged utilizing several options, with internal operations benefits viewed as a residual advantage.

Tier 1 and Tier 2/3 service providers share similar views. The top two preferred approaches for Tier 1 service providers are charging based on resources consumed (63%) and charging based on slice type (47%). For Tier 2/3 service providers, the preferences are slice type (60%) and resources consumed (49%). Additionally, both groups believe the non-monetized internal standalone slicing option is a non-starter (Tier 1 = 4% vs. Tier 2/3 = 5%).

Figure 9: Which approach will you utilize to charge/monetize network slices? (Select all that apply)
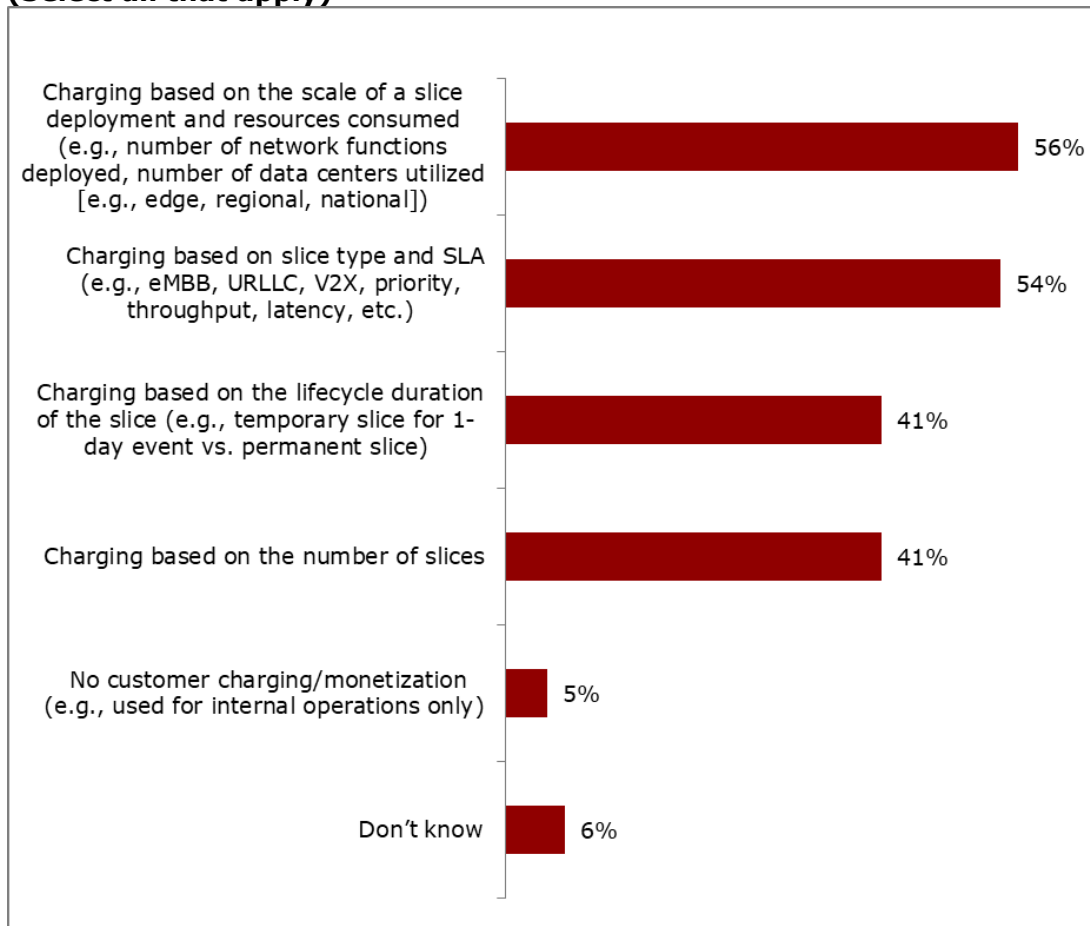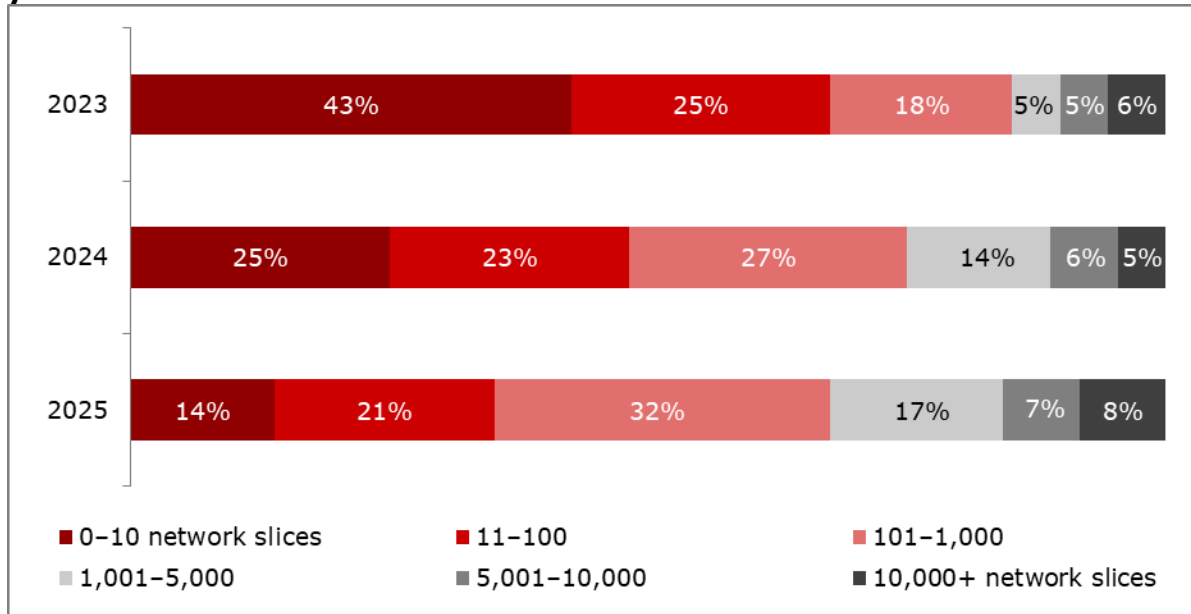

n=108
Source: Heavy Reading

While service providers will adopt a flexible approach to how they bill for slices, deployment will be gradual. In 2023, the largest group of respondents (43%) is forecast to deploy only 0–10 slices commercially. As shown in **Figure 10A**, by 2025, 67% of these same respondents forecast they will still deploy 1,000 or fewer slices (14%: 0–10, 21%: 11–100, and 32%: 101–1,000).

Figure 10A: How many commercial 5G network slices do you expect to deploy per year?

n=108
Source: Heavy Reading

As anticipated, there are differences between Tier 1 and Tier 2/3 service providers' commercial network slice support strategies. **Figure 10B** shows that Tier 1 service providers are planning to support a greater number of slices in the 5,000+ range over the next two years, culminating in 28% (16% + 12%) compared to 5% (0% + 5%) for Tier 2/3 service providers in 2025.

Figure 10B: How many commercial 5G network slices do you expect to deploy per year? Tier 1 vs. Tier 2/3

Tier 1 (n=51)

Tier 1 responses	0–10	11–100	101–1,000	1,001–5,000	5,001–10,000	10,000+
2023	39%	20%	16%	6%	8%	12%
2024	20%	24%	20%	16%	12%	10%
2025	10%	22%	22%	20%	16%	12%

Tier 2/3 (n=57)

Tier 2/3 responses	0–10	11–100	101–1,000	1,001–5,000	5,001–10,000	10,000+
2023	46%	30%	19%	4%	2%	0%
2024	30%	23%	33%	12%	2%	0%
2025	18%	21%	42%	14%	0%	5%

Source: Heavy Reading

5G SERVICE ASSURANCE

Successful 5G services monetization will hinge on not only the ability to orchestrate services, but also the capability to monitor, bill, and deliver a high quality customer experience.

Therefore, the initial decision that mobile service providers must make in their 5G assurance strategy is to finalize their platform strategy. The fundamental platform decision here is identical to the orchestration decision: either evolve the existing assurance platform or purchase a new assurance platform to support 5G services.

In this case, as shown in **Figure 11**, similar to the orchestration decision trends, 54% support the replacement strategy (replace within 12 months [21%] or replace within 24 months [33%]). This leaves 34% of respondents that plan to evolve their existing assurance platform and 11% who do not know what approach their company plans to adopt. Heavy Reading believes several factors are fueling the replacement decision, including the later data points from this section that highlight the need to utilize AI and automated assurance to meet stringent 5G service requirements.

Tier 1 and Tier 2/3 service providers are following a similar path. While 25% of Tier 1 service providers plan to replace their existing service assurance platform in the next 12 months, 18% of Tier 2/3 service providers advocate the same timeline.

Similarly, 35% of Tier 1 service providers support the 24-month replacement timeline compared to 32% of Tier 2/3 service providers. Surprisingly, a smaller percentage of Tier 1 service providers plan to evolve their existing assurance platform (27%) versus their Tier 2/3 counterparts (40%).

Figure 11: Are you planning on replacing your service assurance solution to support 5G services?

Yes, in the next 12 months — 21%
Yes, in the next 24 months — 33%
No, we will evolve our existing assurance platform — 34%
Don't know — 11%
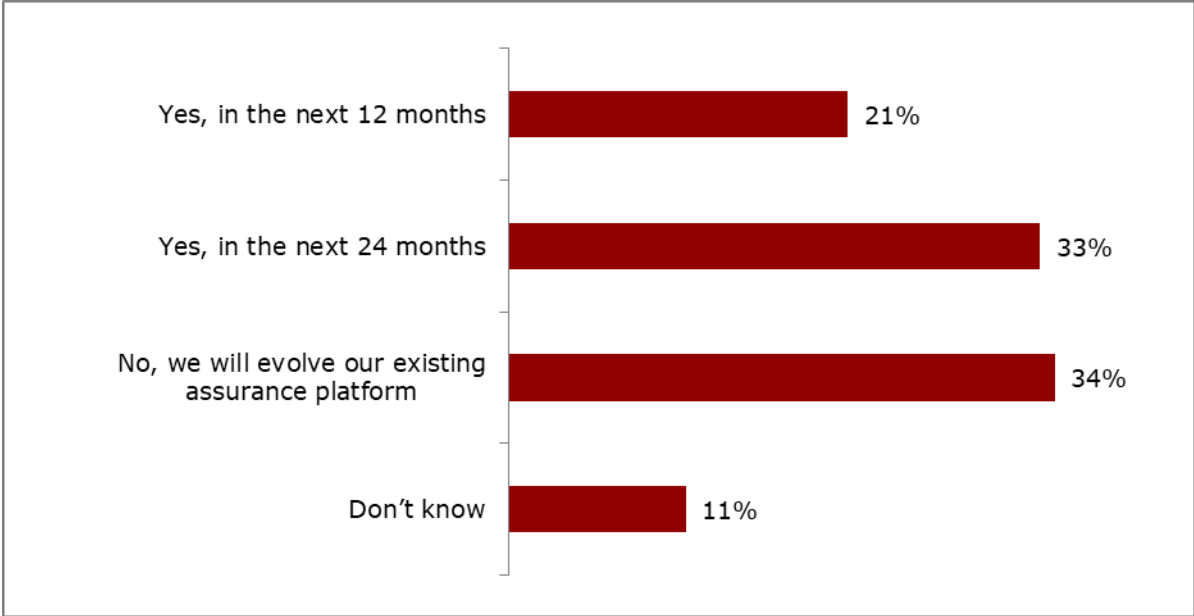
n=108
Source: Heavy Reading

As with any new technology introduction, service provider assurance teams need to step back and reevaluate their business priorities in an assurance context to ensure current policies and strategies apply to 5G services.

As shown in **Figure 12**, the top assurance team business priority is to improve service quality and customer experience (51%), followed by automation of network operations (31%) and preventing churn (18%).

The top ranking of service quality and customer experience was not unexpected. Every new generation of mobile technology must deliver improved service and customer experience from the previous one to be monetizable.

Tier 1 and Tier 2/3 survey respondents provided very similar inputs, confirming that service quality and customer experience are the top business priority regardless of service provider size:

- Improve service quality and customer experience: Tier 1 = 47% vs. Tier 2/3 = 54%

- Automate network operations: Tier 1 = 31% vs. Tier 2/3 = 32%

- Preventing churn: Tier 1 = 22% vs. Tier 2/3 = 14%

Figure 12: What is the top business priority for your 5G network assurance team?
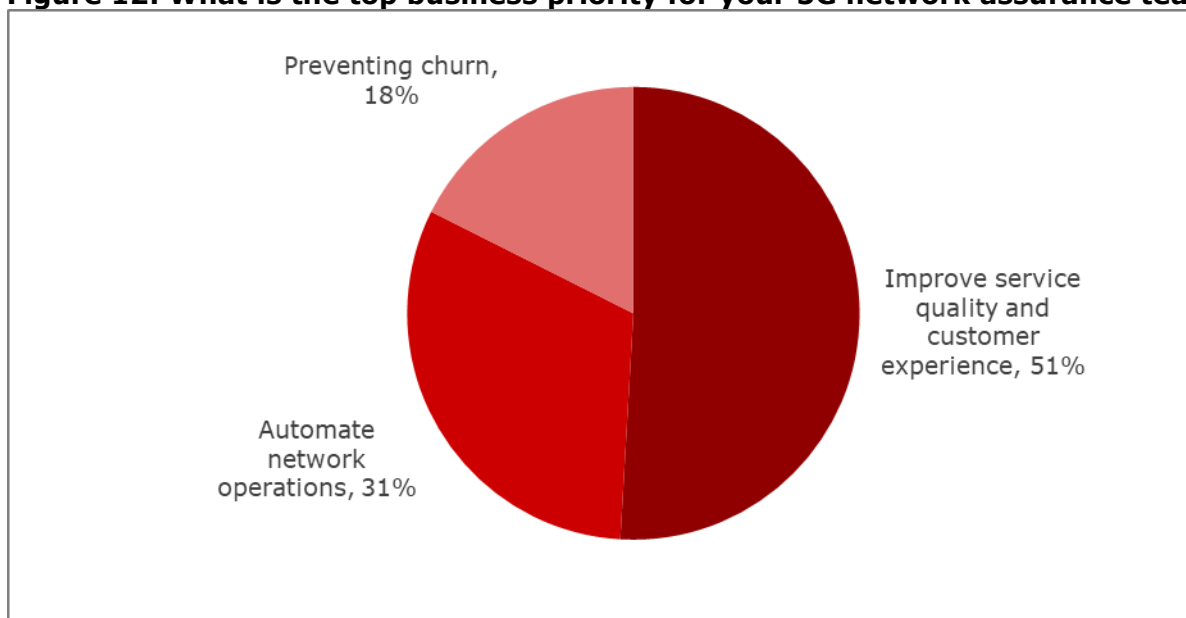

n=108
Source: Heavy Reading

As documented in the previous figure, the 5G assurance team's top two business priorities are improving service quality and customer experience, as well as network operations.

However, as illustrated in **Figure 13**, the two are not mutually exclusive. These same respondents believe that network automation is a complementary capability that will improve network automation the most (31%), ahead of service quality management (22%), predictive analytics (19%), and monitoring KPIs/KQIs (17%).

Tier 1 and Tier 2/3 service provider input followed very similar data trends, with network automation the top choice of both (Tier 1 = 32% vs. Tier 2/3 = 30%).

Figure 13: Which capability will improve 5G service quality the most?
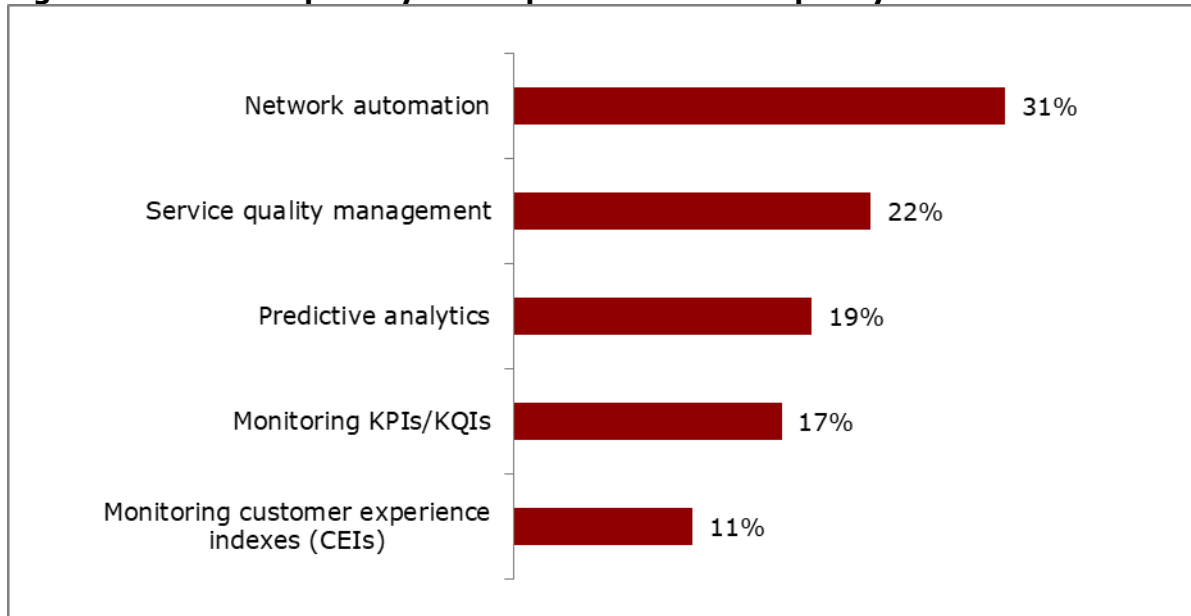

n=107
Source: Heavy Reading

Heavy Reading deems the second-place ranking of automating network operations in **Figure 12** as significant. Network operations automation was not a prominent business priority encountered in Heavy Reading research when 4G was rolled out in scale some eight-plus years ago.

And as captured in **Figure 14**, 5G service providers anticipate that automated assurance will deliver a broad range of benefits, ranging in order from optimizing network issues (68%), cost savings (62%), and SLA compliance validation (55%) to revenue generation (52%). Heavy Reading views these data trends as further validation that service providers believe automated assurance will provide value on several distinct levels.

Both filter groups ranked optimizing network issues (Tier 1 = 67% vs. Tier 2/3 = 68%) and cost savings (Tier 1 = 65% vs. Tier 2/3 = 60%) as the top two considerations.

Figure 14: What benefits do you expect from the introduction of 5G automated assurance? (Select all that apply)
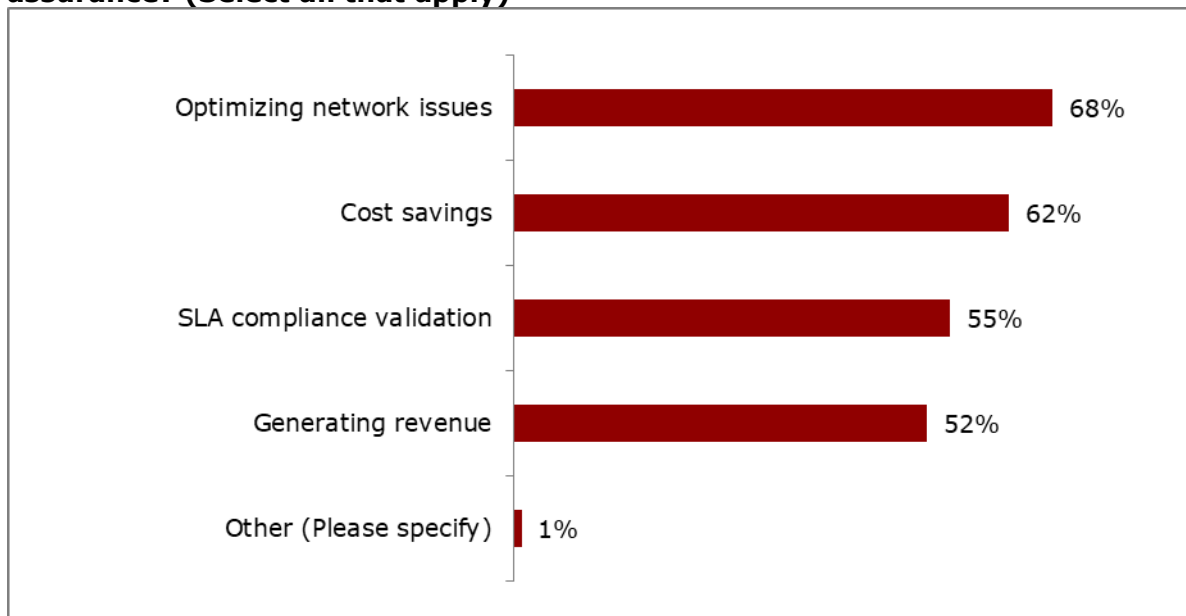
n=108
Source: Heavy Reading

To implement automated assurance, service providers will need to make the shift from manual processes to AI-based processes that are much better equipped than humans to react in real time.
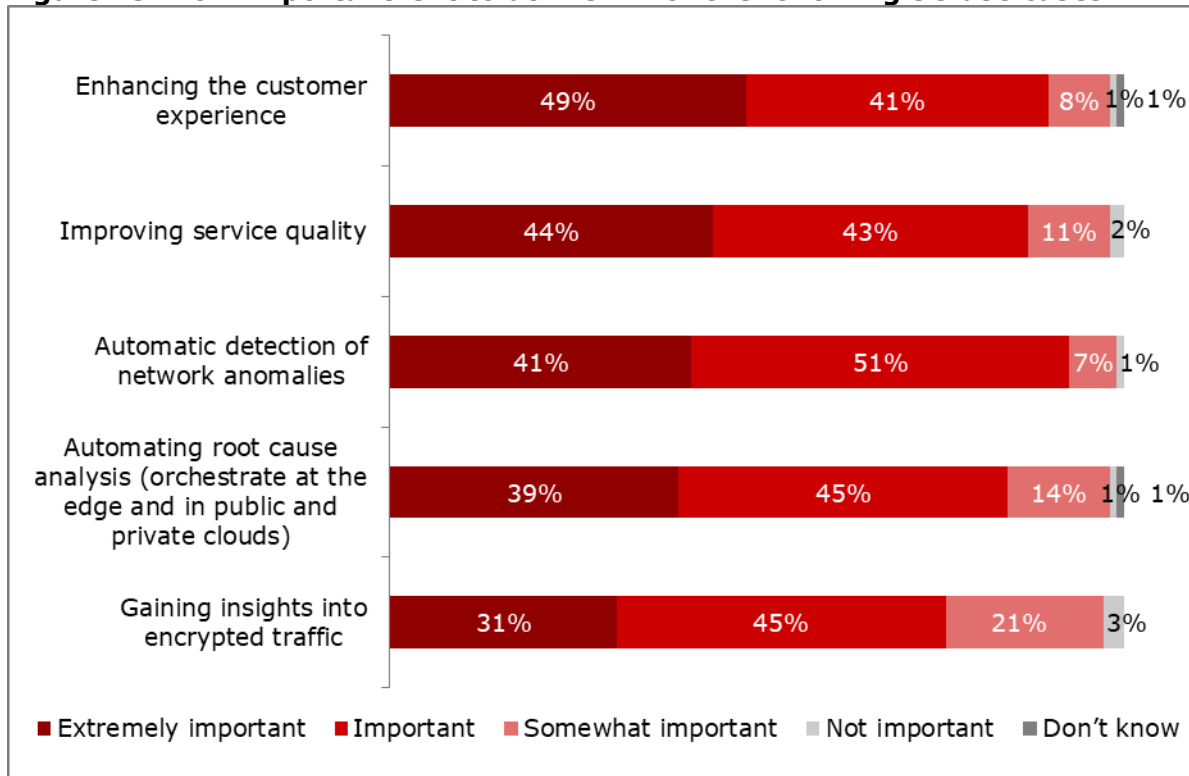
Figure 15 confirms service providers trust that AI will play a vital role in numerous 5G use cases. Of these, based on "extremely important" inputs, the top three use cases are enhancing the customer experience (49%), improving service quality (44%), and automatic detection of network anomalies (41%). Automating root cause analysis to support edge and public and private cloud orchestration (39%) is not far behind.

The top four uses cases for Tier 1 service providers based on the same "extremely important" input were enhancing customer experience and improving service quality (both 62%), automatic detection of network anomalies (54%), and automating root cause analysis to support edge and public and private cloud orchestration (52%).

Tier 2/3 inputs were similar in terms of use case priorities, but their percentage of "extremely important" inputs was considerably lower with a higher level of "important" responses. For these service providers, the top "extremely important" use cases were enhancing the customer experience (37%), automatic detection of network anomalies (30%), and automating root cause analysis and improving service quality (both 28%).

Taken together, these data points serve to reinforce that AI will play a key role in supporting automated assurance in the cloud, in the network, and at the edge. Such assurance will be crucial to the achieve the top overall use case priority, the familiar enhanced customer experience (see **Figure 12** and **Figure 17**).

Figure 15: How important is it to utilize AI for the following 5G use cases?

Enhancing the customer experience: Extremely important 49%, Important 41%, Somewhat important 8%, Not important 1%, Don't know 1%

Improving service quality: Extremely important 44%, Important 43%, Somewhat important 11%, Don't know 2%

Automatic detection of network anomalies: Extremely important 41%, Important 51%, Somewhat important 7%, Not important 1%

Automating root cause analysis (orchestrate at the edge and in public and private clouds): Extremely important 39%, Important 45%, Somewhat important 14%, Not important 1%, Don't know 1%

Gaining insights into encrypted traffic: Extremely important 31%, Important 45%, Somewhat important 21%, Not important 3%

Legend: Extremely important · Important · Somewhat important · Not important · Don't know
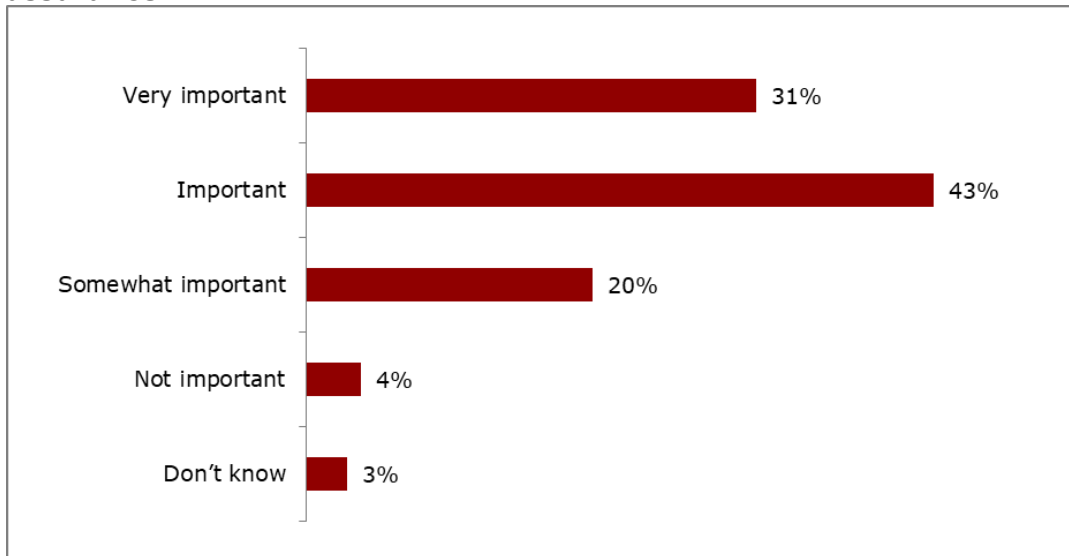
n=107
Source: Heavy Reading

To support automated assurance, a 5G assurance platform will need to implement some form of integrated containerization support.

As captured in **Figure 16**, more than 7 out of 10 service providers surveyed believe it is either "very important" (31%) or "important" (43%) that an automated assurance platform support K8s integration. Tier 1 service providers are more bullish on the need to support K8s integration (Tier 1 "very important" = 42% and "important" = 40%) compared to Tier 2/3 service providers ("very important" = 21% and "important" = 46%).

Heavy Reading believes this data confirms that service providers view K8s integration as a foundational component of their overall automated assurance platform strategy.

Figure 16: How important is integration into Kubernetes (K8s) for automating 5G assurance?

Very important — 31%
Important — 43%
Somewhat important — 20%
Not important — 4%
Don't know — 3%

n=107
Source: Heavy Reading

Understanding the assurance team's top customer experience priorities was also within the survey scope.

When asked to select a single top 5G customer experience priority, as shown in **Figure 17A**, the majority (64%) focused on the basic need to boost service quality. Other options garnered much lower levels of support, including delivering personalized experiences (16%), offering self-help applications (12%), and improving customer care teams (8%).

Figure 17A: What 5G customer experience objective is your organization's top priority?

Boosting service quality — 64%
Delivering personalized experiences — 16%
Offering self-help applications — 12%
Improving customer care teams — 8%

n=107
Source: Heavy Reading

Tier 1 and Tier 2/3 service providers both ranked boosting service quality as the top priority (Tier 1 = 66% vs. Tier 2/3 = 61%)

Figure 17B: What 5G customer experience objective is your organization's top priority? Tier 1 vs. Tier 2/3

Tier 1 (n=50)

Responses	Proportion of respondents
Boosting service quality	66%
Delivering personalized experiences	14%
Offering self-help applications	14%
Improving customer care teams	6%
Total	**100%**

Tier 2/3 (n=57)

| Responses	Proportion of respondents
Boosting service quality	61%
Delivering personalized experiences	18%
Offering self-help applications	11%
Improving customer care teams	11%
Total	**100%**

Source: Heavy Reading

Service providers will unquestionably rely on various types of assurance usage data to support their 5G service and networks. The question is: Which datasets are most important?

When this question was presented to the survey respondents, as shown in **Figure 18**, the top priority by a considerable margin was session/packet analysis (36%), followed by three tightly coupled datasets:

- Monitoring services from the lab to commercial launch (20%)
- Subscriber onboarding (19%)
- Evaluating new network equipment (18%)

Session/packet analysis was the top selection of both Tier 1 (34%) and Tier 2/3 (37%) respondents. Heavy Reading believes this focus on session/packet analysis is in part because service providers have well-established practices in place to collect and assess this data.

**Figure 18: Which assurance usage data is the most important for supporting 5G service and networks?**

Session/packet analysis — 36%
Monitoring services from the lab to commercial launch — 20%
Subscriber onboarding — 19%
Evaluating new network equipment — 18%
Monitoring cell handover — 7%
Other (please specify) — 1%
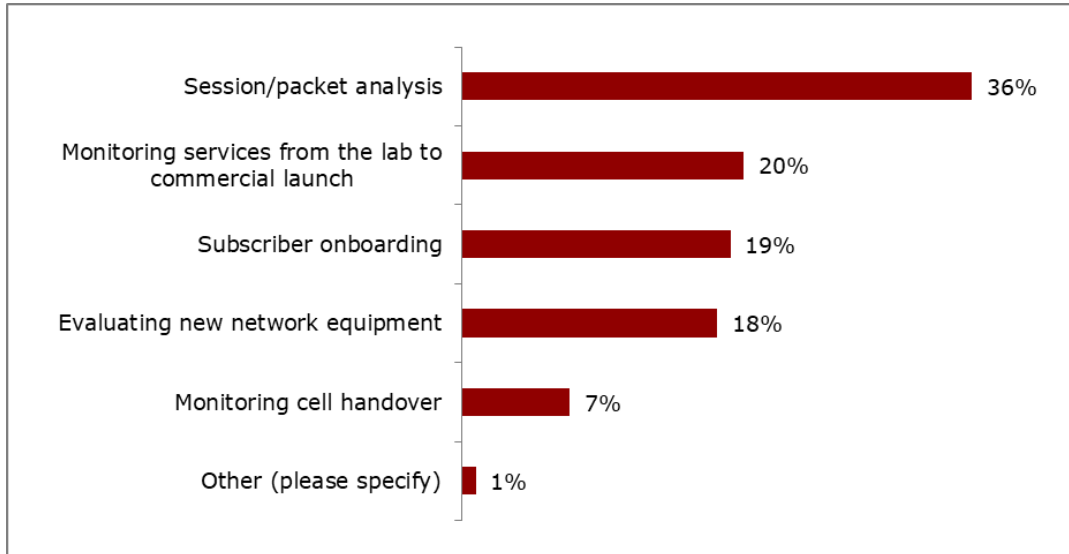
n=107
Source: Heavy Reading

In the real-time cloud native world of 5G service delivery, the assumption is that assurance must also pivot to a real-time data insight assurance model to be able to capture the impact of these real-time services on overall service quality. **Figure 19** data validates this is the case. More than 8 out of 10 (86%) of survey respondents ranked this capability as "extremely important" (36%) or "important" (50%).

Figure 19: How important are real-time data insights for 5G assurance?

Somewhat important, 13%
Extremely important, 36%
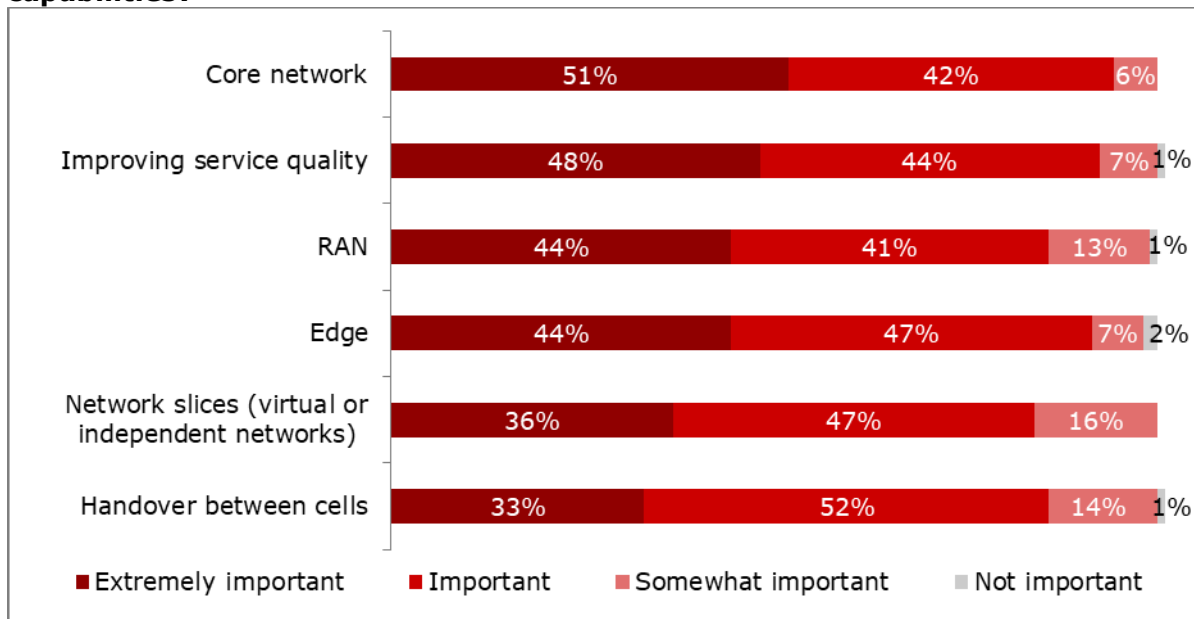Important, 50%
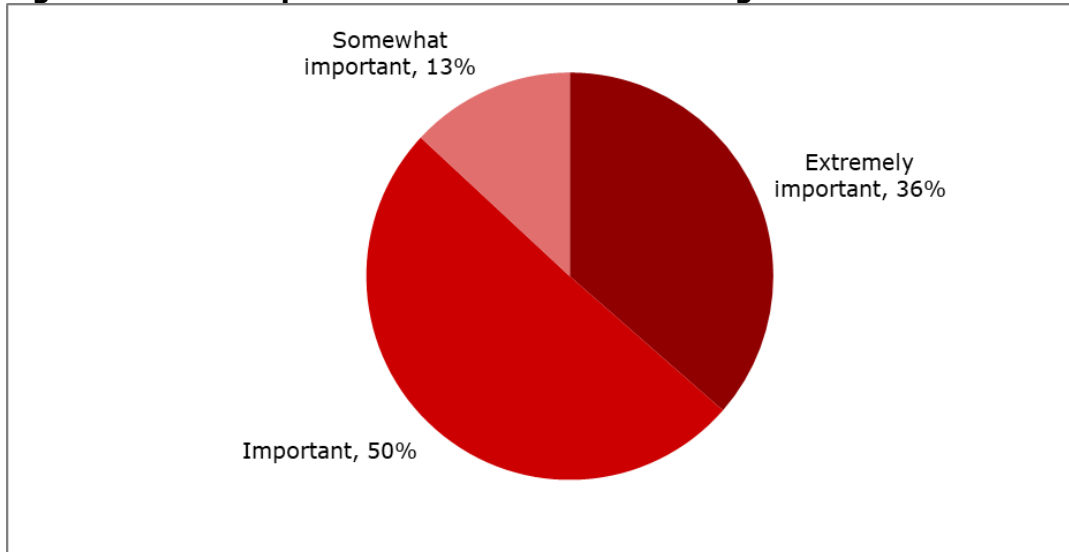
n=107
Source: Heavy Reading

Tier 1 and Tier 2/3 data trends are similar, with a larger sample of Tier 1 service providers selecting "extremely important" (Tier 1 = 44% vs. Tier 2/3 = 30%) and an almost identical proportion selecting the "important" option (Tier 1 = 50% vs. Tier 2/3 = 51%). A larger percentage of Tier 2/3 service providers (19%) selected the "somewhat important" option compared to their Tier 1 colleagues (6%).

In theory, increased reliance on real-time data means that network and service monitoring, such as end-to-end orchestration, must take into consideration all network domains to provide a true picture of customer experience. **Figure 20A** validates this theory.

Based on "extremely important" inputs, as captured in the figure, service providers believe there is a diverse range of network areas that must be monitored. Of these, the top areas of focus include monitoring the core network (51%) and improving service quality (48%), as well as monitoring the RAN and edge (both 44%).

Other secondary but still important monitoring areas encompass monitoring network slices (36%) and handover between cells (33%).

Figure 20A: How important is it to monitor the following 5G network areas/ capabilities?

n=107
Source: Heavy Reading

In looking at the two filter group inputs, while the core network attained the greatest level of "extremely important" input in both groups (Tier 1 = 64% vs. Tier 2/3 = 40%), there are several differences. The first is that the data range of "extremely important" inputs from Tier 1 service providers for all the capabilities shown in **Figure 20B** is much greater (42–64%) compared to the data range of 21–40% for Tier 2/3 service providers, which tended to relate to the "important" category (46–65%) for these same capabilities. The second difference is that the edge is a lower priority for Tier 2/3 service providers ("extremely important": Tier 1 = 60% vs. Tier 2/3 = 30%).

Figure 20B: How important is it to monitor the following 5G network areas/ capabilities? Tier 1 vs. Tier2/3

Tier 1 (n=50)

Responses	Extremely important	Important	Somewhat important	Not important
Core network	64%	34%	2%	0%
Edge	60%	38%	2%	0%
Handover between cells	46%	38%	14%	2%
Improving service quality	60%	34%	6%	0%
Network slices (virtual or independent networks)	42%	44%	14%	0%
RAN	58%	36%	6%	0%

Tier 2/3 (n=57)

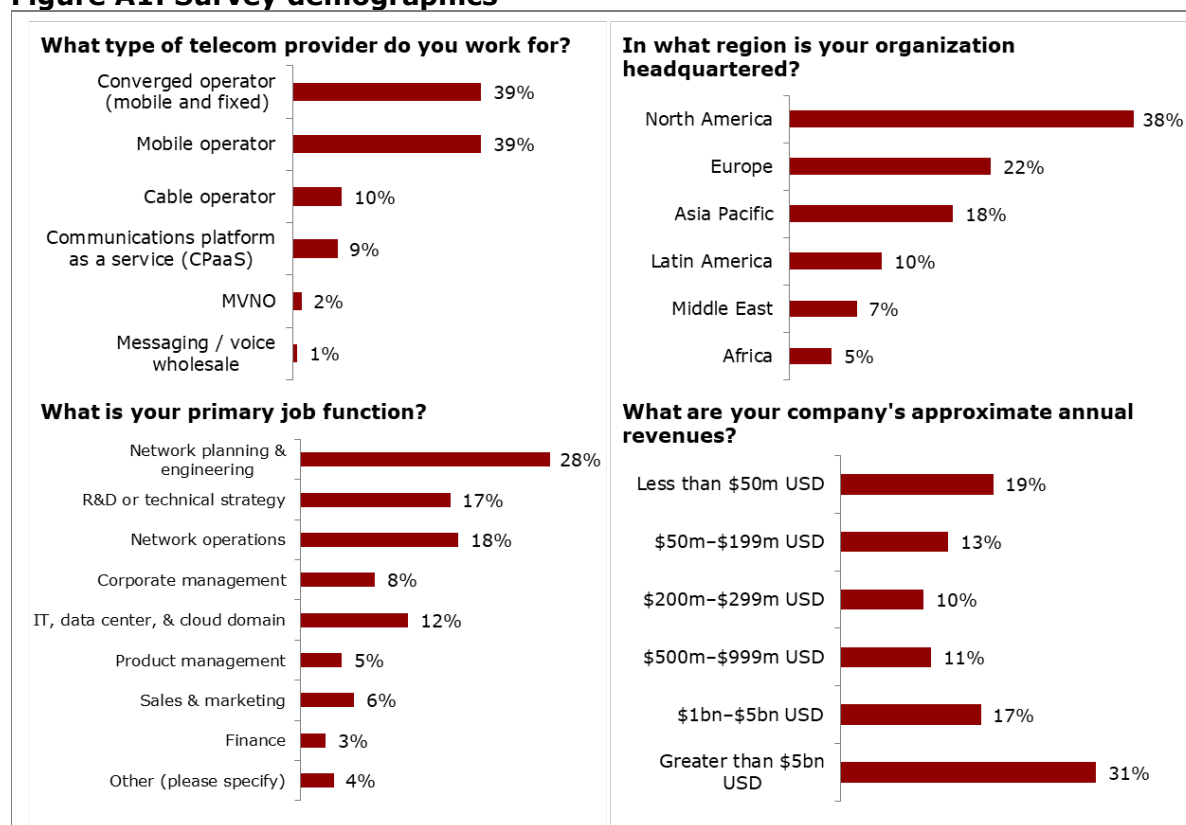| Responses	Extremely important	Important	Somewhat important	Not important
Core network	40%	49%	9%	0%
Edge	30%	54%	11%	4%
Handover between cells	21%	65%	14%	0%
Improving service quality	37%	53%	9%	2%
Network slices (virtual or independent networks)	32%	49%	18%	0%
RAN	32%	46%	19%	2%

Source: Heavy Reading

APPENDIX A: SURVEY DEMOGRAPHICS

This Heavy Reading white paper is based on a web-based global survey of service providers conducted in March 2023.

Respondents were drawn from the network operator list of the Light Reading readership database. All responses are confidential and are only ever presented in aggregate form. Heavy Reading does not share individual names or company names from the survey.

After reviewing and removing incomplete responses, 108 qualified responses remained.

Figure A1: Survey demographics

n=108
Source: Heavy Reading