

Independent market research and competitive analysis of next-generation business and technology solutions for service providers and vendors

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PAPER**

5G Orchestration and Service Assurance: 2024 Heavy Reading Survey

A Heavy Reading white paper produced for Amdocs and Cisco



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EXECUTIVE SUMMARY

Mobile service providers are continuing the journey to monetize their 5G investment as the implementation pace of their standalone (SA) core ramps up. The successful monetization of the core will, in many respects, hinge on service providers' ability to address several unique 5G service-related requirements:

- Software and hardware disaggregation should enable services to run seamlessly at the edge or in a public or private cloud.
- The SA core should support cloud native services through an API exposure model that emulates public cloud services.
- Service speed must achieve ultra-low latency performance targets to support mission-critical 5G services. This is particularly true of 5G sliced-based services that utilize software to allocate dedicated network bandwidth and resources on shared 5G and cloud infrastructure to ensure low latency performance instead of simply adopting a "best effort" approach.

To meet these new requirements, service providers must be able to support the complex and multi-domain interworking model that such services employ.

It is a significant challenge to manage and orchestrate the lifecycle of disaggregated services that operate in multiple domains with low latency budgets. To address this, 5G networks are now adopting an "end-to-end" orchestration model that utilizes automation to provide essential insight into individual service performance and lifecycle.

Similarly, the industry is also examining how automation and programmable software policies can augment existing service assurance capabilities. The goal is to ensure that network monitoring can implement closed-loop feedback to respond dynamically and in real time to changes in network performance levels that could degrade the performance of sliced- and non-slice-based services.

To understand the impacts and document the steps service providers are taking to implement end-to-end orchestration and evolve their service assurance platforms, Heavy Reading partnered with **Amdocs** and **Cisco** to develop a 20-question web-based survey that was fielded in March 2024. This white paper presents the key findings and detailed data trends for each question.

Each question was filtered based on the annual revenue of the companies for which the survey respondents worked to assess data sensitivity trends on a more granular basis. Two filter groups were utilized:

- **Tier 1 service providers:** Those with at least \$1bn USD in annual revenue (n=61).
- **Tier 2/3 service providers:** Those with between \$1m and \$999m USD in annual revenue (n=63).

KEY FINDINGS

The following are the key findings from this study.

End-to-end orchestration – executive key findings

- 93% of service providers believe that end-to-end orchestration is either a “very important” (49%) or “important” (44%) component for monetizing 5G or cloud services.
- Less than a third of service providers believe their current end-to-end orchestration platforms support 5G or cloud end-to-end use cases.
- Many service providers believe these platform limitations are temporary and that non-supported functions will move to the supported column in the next 12–18 months. Aggregating the 12–18 months score and “supported now” scores translates into approximately 6 out of 10 service providers that believe their orchestration platforms will be ready to support these use cases soon.
- Service providers consider multiple attributes in making end-to-end orchestration platform decisions. Similar to service assurance platform input, based on “extremely important” responses, the top two ranked attributes were reliability and resilience (52%) and scalability (41%).

End-to-end orchestration – key findings

- Only 38% of service providers are “ready now” to support end-to-end orchestration. Unsurprisingly, “ready now” input related to end-to-end orchestration for more complex 5G sliced-based services drops to 22%. Instead, most service providers assess themselves as “making progress but not ready yet” to support end-to-end orchestration. The split here is 61% for 5G sliced-based services and 53% for non-sliced 5G or cloud-based services.
- While many service providers lag in end-to-end orchestration support, they still believe in its value and are focused on supporting complex service use cases, including 5G slicing. In terms of current priorities, cloud orchestration leads the way (67%), followed by 5G sliced-based services (58%) and network as a service (NaaS; 57%). Heavy Reading interprets this first-place ranking of cloud orchestration as a clear indicator that service providers are focused on addressing multicloud and edge domain service complexity.
- Based on “major barrier” input (and similar to the service assurance barrier input above), the top three perceived end-to-end orchestration implementation barriers were a lack of documented or consistent processes (28%), a skills gap (27%), and a limited budget to purchase end-to-end capabilities (26%).
- Service providers think that end-to-end orchestration will deliver operational benefits. Out of five options, optimization (76%) and orchestration (68%) were the two leading benefits.
- There is strong support for integrating artificial intelligence (AI) tools into end-to-end orchestration platforms. The top ranking perceived benefit was operational efficiency (74%), followed by a second tier of closely ranked benefits spanning dynamic optimization (61%) to customer-centric assurance (58%) and flexible orchestration (57%).

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- Service providers consider a wide range of benefits in making end-to-end orchestration purchasing decisions. These benefits include optimizing total cost of ownership (TCO), reducing time to market, improving customer experience, enabling revenue generation, and supporting new business models. The revenue generation/business model benefit attained the highest ranking score (363).

The evolution of service assurance – executive key findings

- 86% of service providers believe that automation is either a “very important component” (36%) or an “important component” (50%) for monetizing 5G or cloud-based services.
- 78% of service providers will likely automate network processes in the next 12 months. Of these, 19% are “implementing now,” while 59% believe it is “extremely likely” they will start the process in the next 12 months.
- Service providers consider numerous factors when selecting an automated service assurance solution. Based on “extremely important” inputs, the top two standouts are reliability and resilience (50%) and scalability (43%).
- Intent-based assurance is the future. 81% of service providers have already implemented or plan to implement intent-based networking that utilizes business intent to respond automatically to changes in network performance.

The evolution of service assurance – key findings

- A myriad of goals/objectives are driving service providers’ network automation strategies. Of these, the leader by a narrow margin was “improving network operation efficiency” (59%). “Improving customer experience and reducing churn” attained a second-place ranking (53%).
- The top two investment priorities for automation in the next three years are performance visualization, insights, and analytics (520) and service orchestration (506).
- Service providers have already started to implement automated assurance tools. The clear leaders in the “already implemented” category are automated fault and event management tools (43%).
- Still, less than a third of the service providers (27%) are either ready to or have already started to support automated assurance of 5G slice-based services. In contrast, the largest group by a wide margin (62%) believes they are making progress but are not ready to support automated assurance for these services. A logical conclusion here is that service providers’ delay in monetizing 5G slice-based services is in part due to a lack of an automated service assurance solution.
- The top three obstacles to purchasing automated assurance tools in order are a limited budget to purchase automated tools (29%), a skills gap (26%), and limited trust in these tools (23%).
- The top three benefits service providers expect from an automated assurance solution are monitoring and guaranteeing service-level agreements (SLAs; 482), automatic assurance issue resolution based on rules or actions (455), and analysis and alerts based on specific criteria (437).

END-TO-END ORCHESTRATION

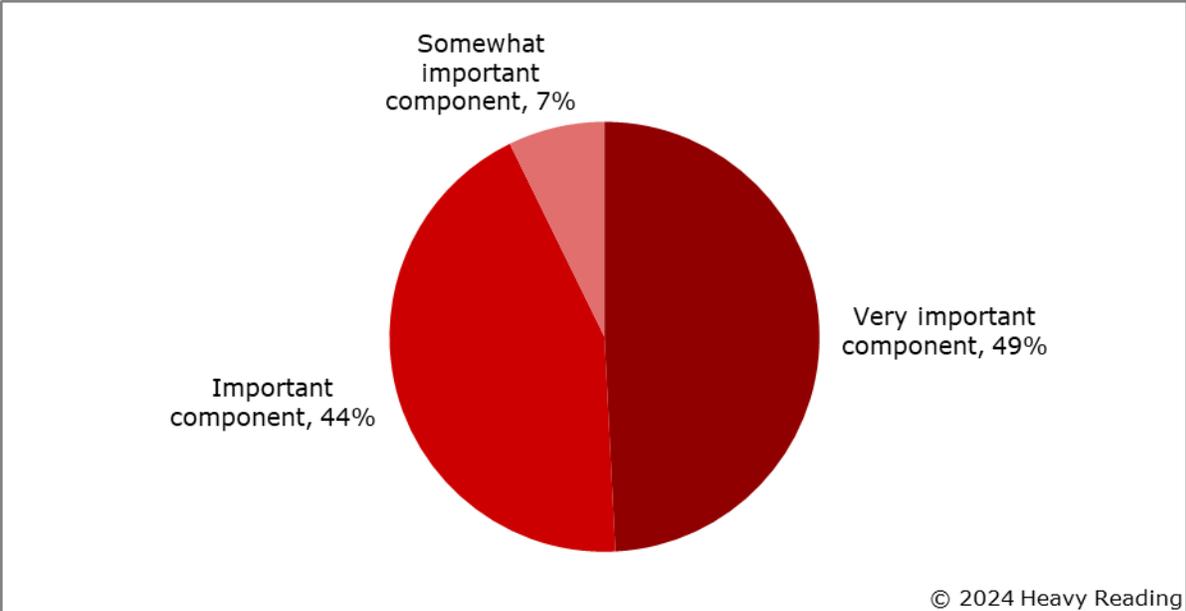
Service execution is more complex in a hybrid cloud and legacy environment. This is particularly true for mobile service providers that are managing 5G, 4G, and potentially even 2G or 3G networks, as well as cloud and edge services. In this hybrid environment, end-to-end orchestration is essential since it supports dynamic and automated tools and policies to manage both slice and non-sliced services on an end-to-end basis.

The initial question in this section of the survey explored the relative importance that service providers attach to end-to-end orchestration.

As shown in **Figure 1**, end-to-end orchestration falls into a strategic imperative territory, with nearly half (49%) of respondents assessing it as a "very important component" for monetizing 5G or cloud services and 44% as an "important component." This leaves only a very small group of respondents (7%) that believe it is only a "somewhat important component."

The data trends among the two filter groups are similar in that 10% or less of both groups assess end-to-end orchestration as only a "somewhat important" monetization component. Tier 1 survey respondents recorded a significantly greater percentage of "very important" responses compared to their Tier 2/3 colleagues (Tier 1 = 59%, Tier 2/3 = 40%) (see **Appendix B**).

Figure 1: How important is end-to-end orchestration for monetizing 5G or cloud-based services?



(n=124)

Source: Heavy Reading

Note: Numbers in figures throughout this report may not total 100 due to rounding.

Once Heavy Reading documented that service providers rank end-to-end orchestration highly, the logical next step was to determine their readiness to support it.

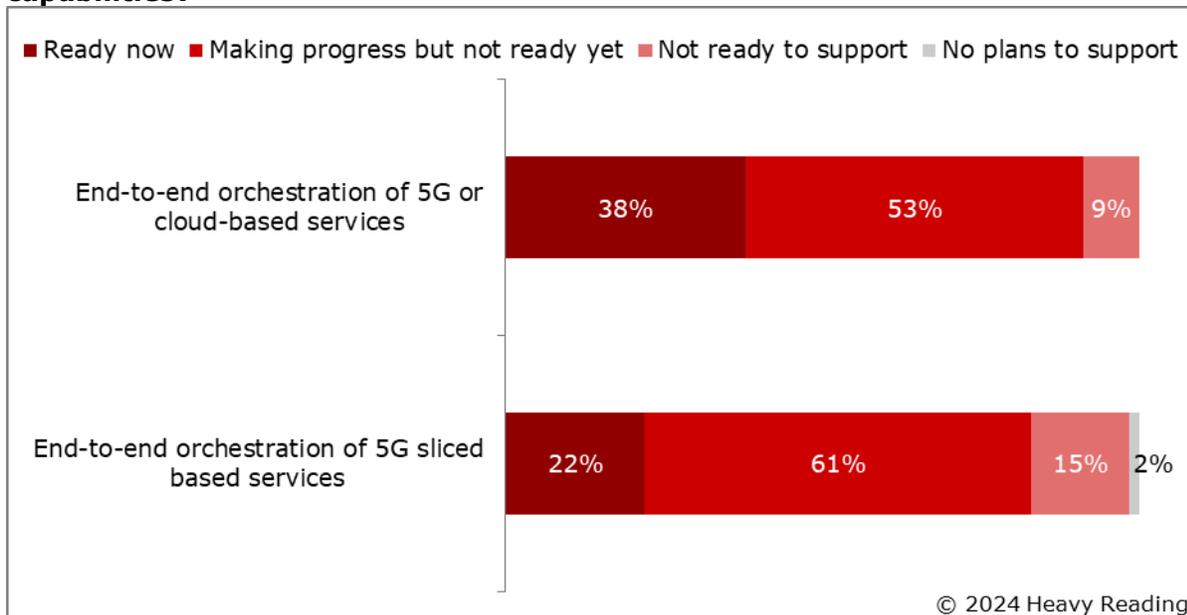
According to **Figure 2**, only 38% of service providers are “ready now” to support the end-to-end orchestration of 5G or cloud-based services. Unsurprisingly, “ready now” input related to end-to-end orchestration for more complex 5G sliced-based services drops to 22%.

This leaves a significant number of respondents that assess themselves as “making progress but not ready yet” to support end-to-end orchestration. The split here is 61% for 5G sliced-based services and 53% for non-sliced 5G or cloud-based services.

Another related and important data point is that a very small group (17%) of service providers assess themselves as “not ready to support” (15%) or have “no plans to support” (2%) end-to-end orchestration for 5G sliced-based services. The numbers are even lower (9%) for 5G or cloud-based services (“not ready to support” = 9%, “no plans to support” = 0%).

Tier 1 survey respondents led their Tier 2/3 colleagues in terms of “ready now” support for 5G or cloud-based services (Tier 1 = 43%, Tier 2/3 = 33%) and 5G sliced-based services (Tier 1 = 32%, Tier 2/3 = 13%) (see **Appendix B**).

Figure 2: Which statement best describes your readiness to support the following capabilities?



(n=124)

Source: Heavy Reading

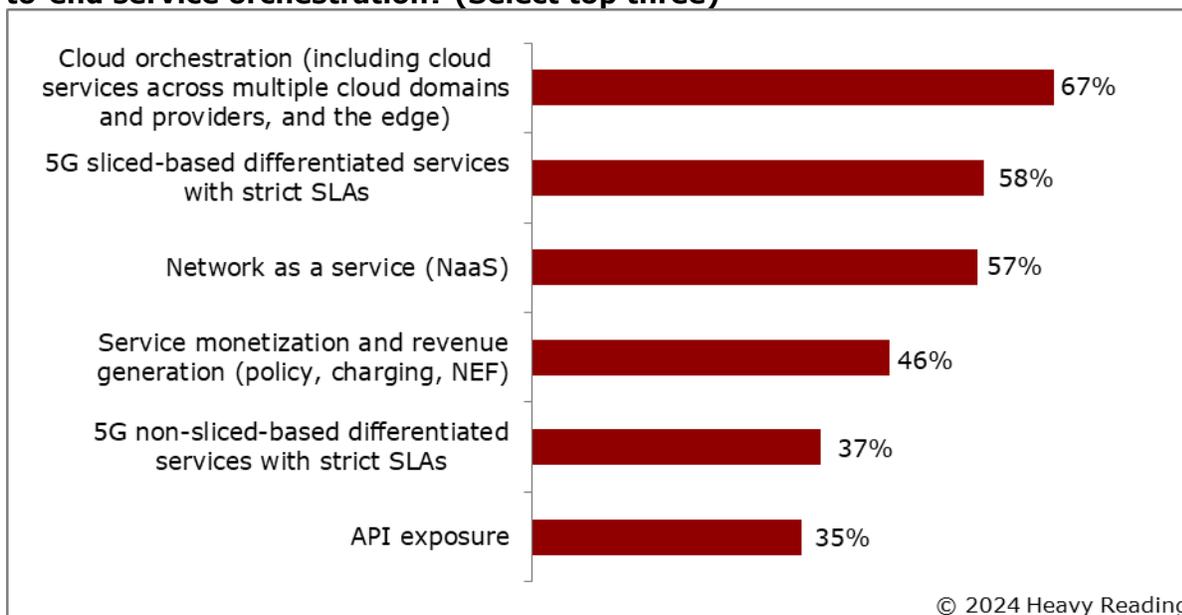
As documented above in **Figure 1**, end-to-end orchestration is a key component in monetizing 5G or cloud services. On a more granular basis, the question is which service use cases are driving implementation and revenue growth.

When asked to rank specific service-based use cases that are driving their implementation strategy, as shown in **Figure 3**, service providers placed cloud orchestration (67%) in first place, followed by 5G sliced-based services (58%) and NaaS (57%).

Rounding out the rankings in fourth place was service monetization and revenue generation (from a policy, charging, and network exposure perspective; 46%), followed by 5G non-sliced-based services (37%) and API exposure (35%).

Priorities among the two filter groups are similar, with both groups ranking cloud orchestration as the highest priority (Tier 1 = 62%, Tier 2/3 = 71%) (see **Appendix B**).

Figure 3: Which service-based use cases are driving your implementation of end-to-end service orchestration? (Select top three)



(n=124)

Source: Heavy Reading

The next question in the survey examined the relationship between service-based use cases and end-to-end orchestration platform readiness.

According to **Figure 4**, less than a third of service providers believe their current platforms support these use cases.

In a tightly packed field, cloud orchestration and API exposure (both 31%) attained slightly higher scores than 5G non-sliced-based services (30%), NaaS, and service monetization and revenue generation capabilities (both 28%).

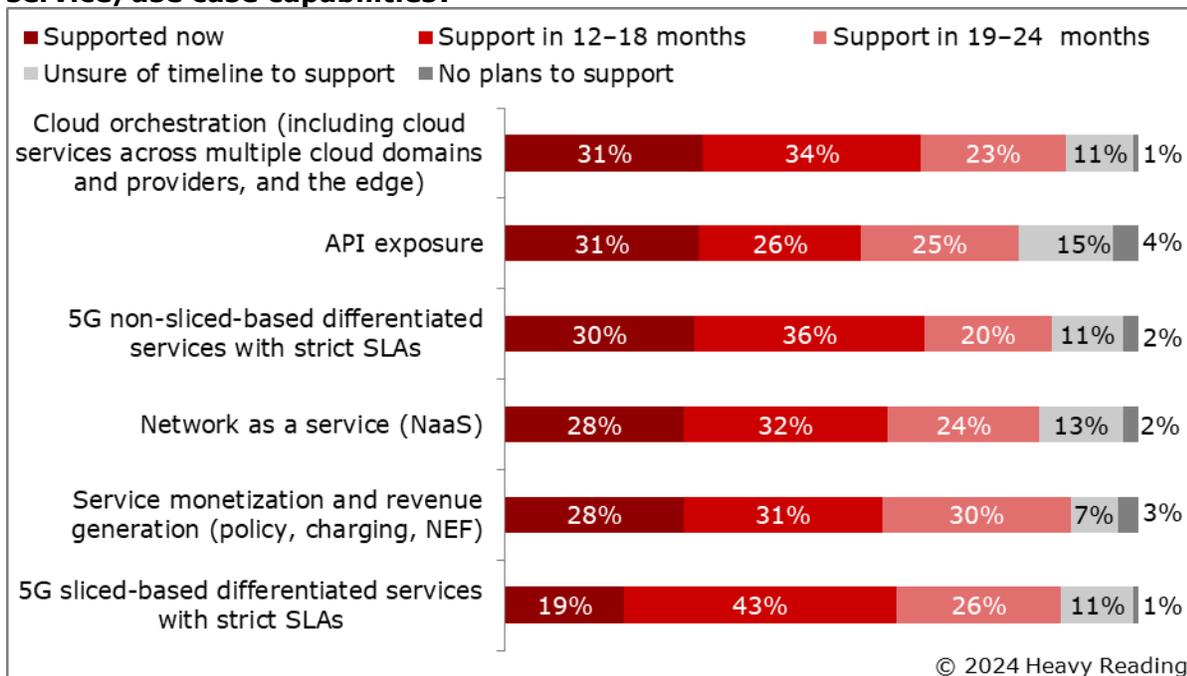
In contrast, 5G slice-based services achieved the lowest “supported now” score (19%). However, they did attain the highest “support in 12–18 months” score (43%), which confirms that service providers believe current platform limitations are one reason more progress is needed to support end-to-end orchestration for 5G slicing (see **Figure 2**).

A greater proportion of Tier 1 survey respondents believe that their current orchestration system supports a broad range of service/use case capabilities now (Tier 1 range = 39–23%, Tier 2/3 range = 30–15%) (see **Appendix B**).

Although service providers believe that their orchestration platforms are currently limited, this is a temporary issue since many of these limitations are forecast to be supported in the next 12–18 months.

Aggregating the “support in 12–18 months” and “supported now” scores translates into approximately 6 out of 10 service providers believing their orchestration platforms will be ready to support these use cases (e.g., NaaS: 28% for “supported now” + 32% for “support in 12–18 months” = 60%).

Figure 4: When will your current orchestration system support the following service/use case capabilities?



(n=124)

Source: Heavy Reading

In addition to services-based use cases, the survey also examined the operational use cases driving end-to-end orchestration adoption. The survey questions utilized five operational categories with the following explanatory text:

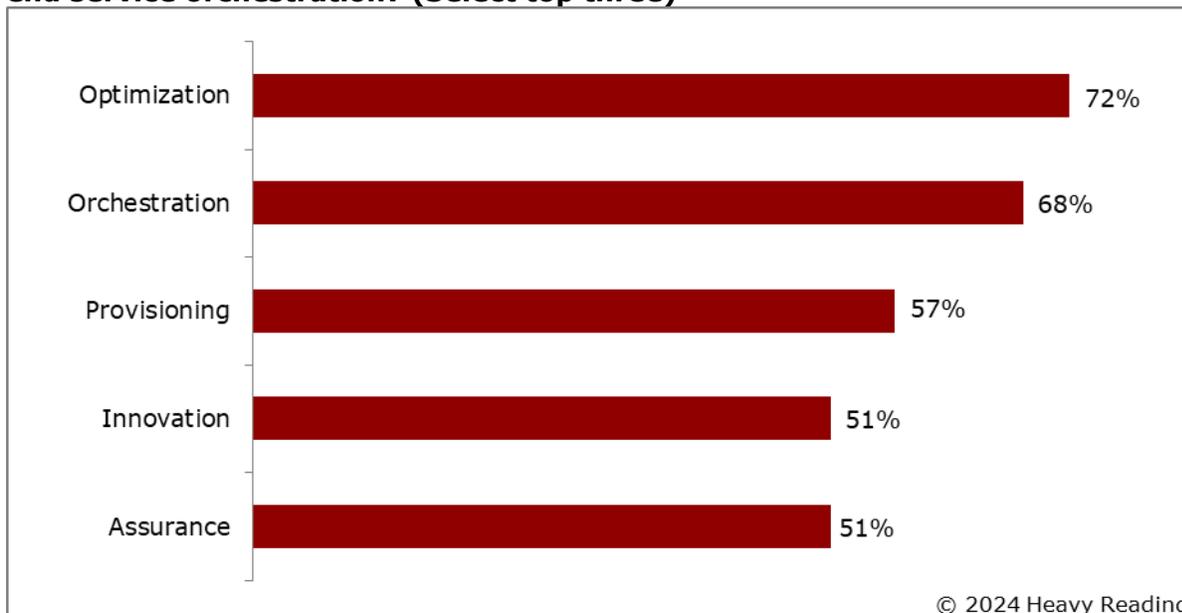
- **Innovation:** *Intent-driven automation and agile service creation and assurance enable the development and deployment of innovative network technologies and services.*
- **Provisioning:** *Smooth and efficient service fulfillment and activation across multiple networks and domains.*
- **Optimization:** *Peak network efficiency by dynamically adjusting resources leveraging model-driven automation via AI/[machine learning]ML closed-loop systems.*
- **Orchestration:** *Coordinates and manages network components to work in seamless alignment.*
- **Assurance:** *Optimal performance of both services and underlying network resources within agreed-upon SLAs.*

As shown in **Figure 5**, while all categories had significant levels of support, two stood out: optimization (72%) and orchestration (68%). These results confirm that service providers' initial focus in an end-to-end orchestration context centers around managing components and achieving peak network efficiency.

Nonetheless, the significant support for other use cases, including provisioning (57%) and innovation and assurance (both 51%), confirms that end-to-end orchestration is vital to support a multi-use case operational model.

The Tier 1 and Tier 2/3 survey respondent groups had similar views here. They rank optimization (Tier 1 = 73%, Tier 2/3 = 71%) and orchestration (Tier 1 = 70%, Tier 2/3 = 67%) as the top two operational use cases driving end-to-end service orchestration (see **Appendix B**).

Figure 5: Which operational use cases are driving your implementation of end-to-end service orchestration? (Select top three)



(n=123)

Source: Heavy Reading

There is little, if any, doubt that AI-based tools and automated policies will play a significant role in end-to-end orchestration support. What is uncertain is the immediate benefits that service providers expect from integrating AI tools and policies into an end-to-end orchestration system.

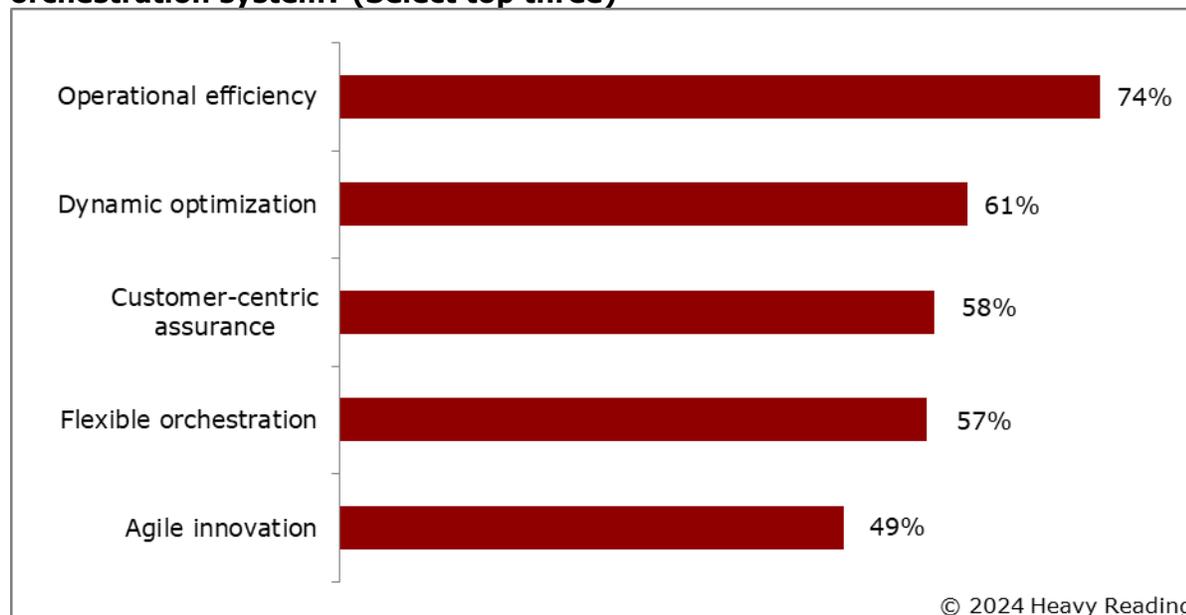
Similar to the format of the previous question, five benefit categories were utilized with the following explanatory text:

- **Dynamic optimization:** Adjust network resources, ensuring peak efficiency and performance.
- **Customer-centric assurance:** Enhance quality and reliability by using advanced analytics.
- **Agile innovation:** Enables intent-based automation and service creation, quickly developing and deploying services.
- **Flexible orchestration:** Service orchestration across diverse and complex networks. Model-driven automation and accurate representation of services and resources.
- **Operational efficiency:** Streamline network resources across multiple vendors and technologies.

Looking at benefits, as shown in **Figure 6**, the top ranking perceived benefit is operation efficiency (74%), followed by a second tier of closely ranked benefits spanning from dynamic optimization (61%) to customer-centric assurance (58%) and flexible orchestration (57%). Agile innovation achieved the lowest ranking (49%).

Both the Tier 1 and Tier 2/3 survey respondent groups ranked operational efficiency as the leading benefit of integrating AI into an end-to-end orchestration system (Tier 1 = 74%, Tier 2/3 = 75%) (see **Appendix B**).

Figure 6: What are the leading benefits of integrating AI into an end-to-end orchestration system? (Select top three)



(n=124)

Source: Heavy Reading

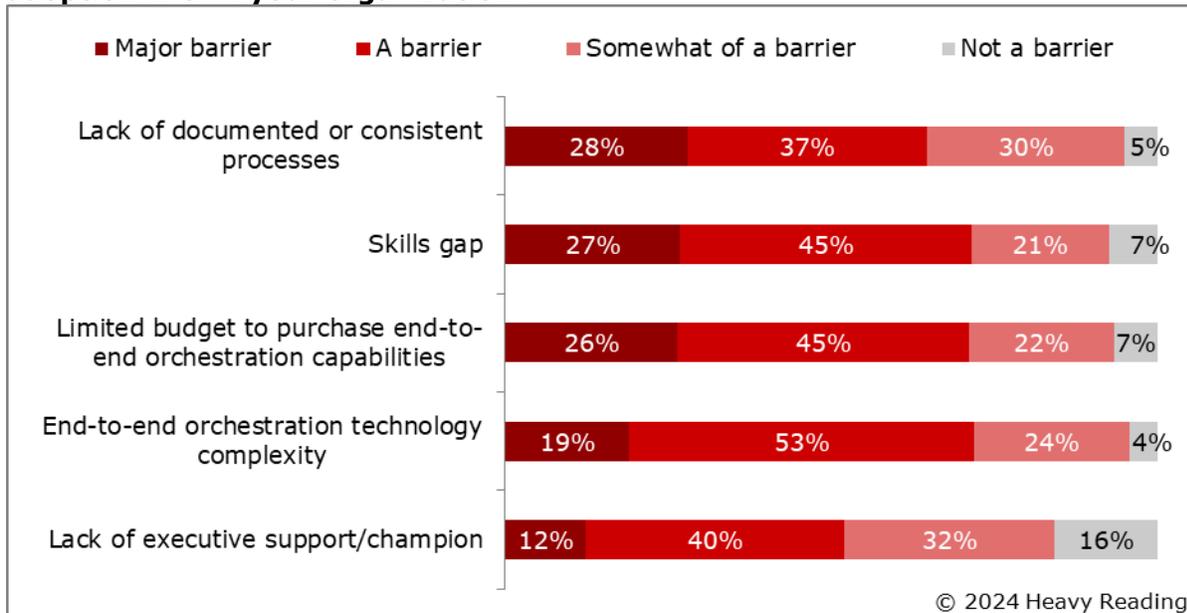
The survey also addressed understanding the barriers to implementing end-to-end orchestration. Four categories were utilized: "major barrier," "barrier," "somewhat of a barrier," and "not a barrier."

Based on "major barrier" input, as shown in **Figure 7**, the top three perceived barriers were lack of documented or consistent processes (28%), skills gap (27%), and limited budget to purchase end-to-end capabilities (26%). On a positive note, only 19% and 12% of service providers view end-to-end complexity and lack of an executive champion, respectively, as major barriers.

Overall, based on trends from previous research, Heavy Reading believes that having all these "major barrier" inputs under the 30% threshold is a positive trend. This threshold is lower than those for other technology introductions we have tracked over the years.

Nevertheless, like any technology adoption, there are implementation issues. In this case, these translate to a "barrier" input range from 37% (lack of documented or consistent processes) to end-to-end orchestration complexity (53%).

Figure 7: To what extent are the following barriers to end-to-end orchestration adoption within your organization?



(n=124)

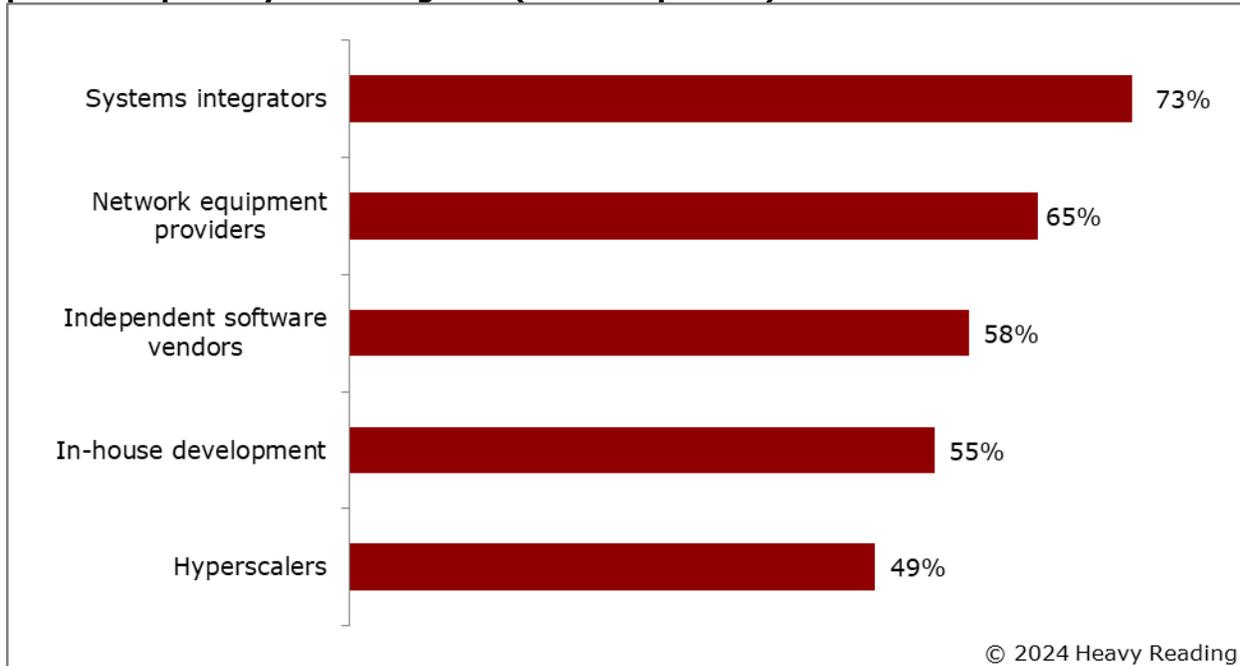
Source: Heavy Reading

The survey also considered which partner service providers preferred to work with to implement end-to-end orchestration.

Based on the rankings shown in **Figure 8**, the top two preferences are systems integrators (73%) and network equipment providers (NEPs; 65%). The bottom three, independent software vendors (58%), in-house development (55%), and hyperscalers (49%), also achieved respectable scores, which confirms they are relevant options.

Among the filter groups, Tier 1 survey respondents' top three partner preferences are NEPs (75%), systems integrators (74%), and performing the work in-house (52%). Tier 2/3 respondents' preferences are systems integrators (73%), independent software vendors (68%), and in-house development (57%) (see **Appendix B**).

Figure 8: For your end-to-end service orchestration solution, which type of partnerships are you looking for? (Select top three)



(n=124)

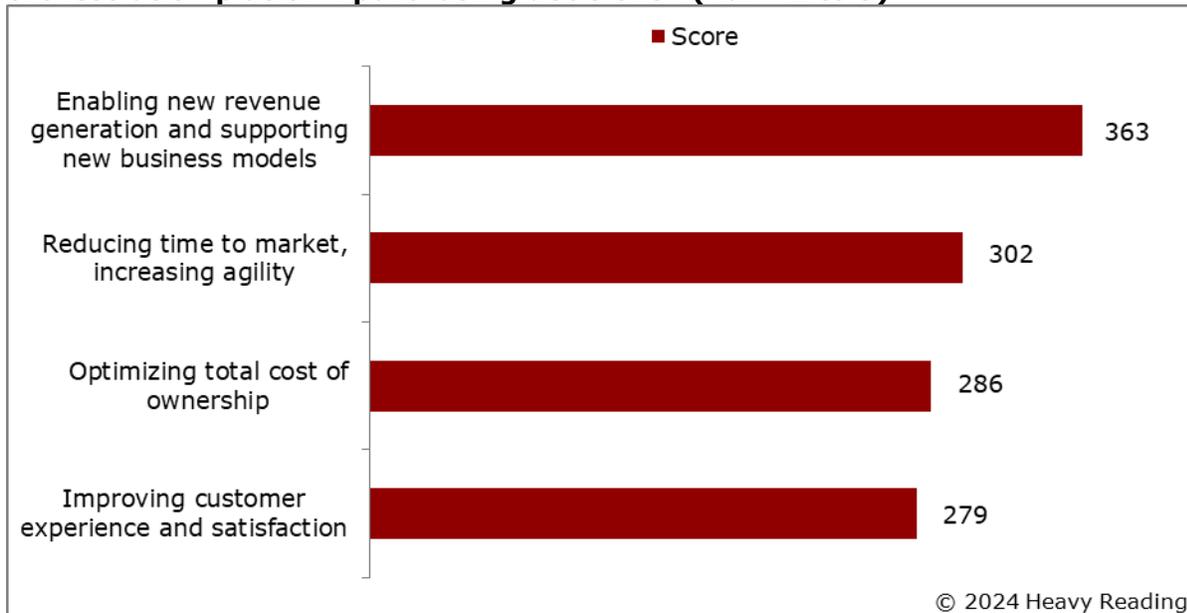
Source: Heavy Reading

The final two questions in this end-to-end orchestration section of the survey explored the capabilities considered in making end-to-end orchestration platform decisions, as well as the expected benefits such a system would provide.

Starting with the latter, the leading perceived benefit, as illustrated in **Figure 9**, was enabling new revenue generation and supporting new business models (363). The remaining four rankings were much closer and impacted by differences between Tier 1 and Tier 2/3 respondent input (see **Appendix B**).

Heavy Reading interprets this data as validating that while revenue and business models are the leading considerations in purchasing decisions, other factors, including TCO and customer experience, are also influential.

Figure 9: How important are the following benefits when making end-to-end orchestration platform purchasing decisions? (Rank 1 to 5)



(n=124)

Source: Heavy Reading

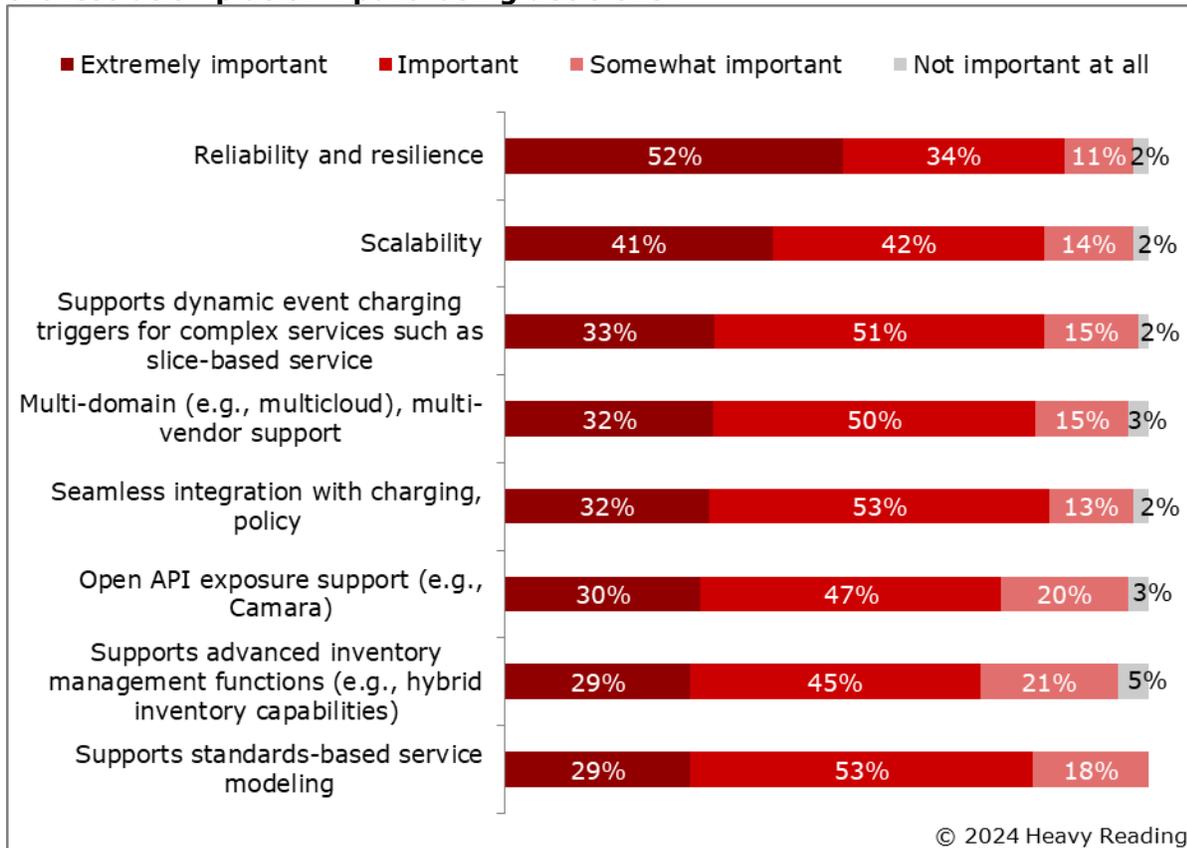
The final question in this section ranked the capabilities that service providers believe are most important when purchasing end-to-end orchestration platforms.

Based on “extremely important” input, as shown in **Figure 10**, the clear leader was reliability and resilience (52%), with scalability achieving a second-place ranking (41%).

The remaining six capabilities were tightly ranked (29–33%), indicating that while viewed as secondary factors, each is subject to due diligence in the purchasing phase.

The Tier 1 and Tier 2/3 respondent groups both ranked reliability/resilience and scalability as the top two considerations when making end-to-end orchestration purchasing decisions (reliability/resilience, Tier 1 = 66%, Tier 2/3 = 44%; scalability, Tier 1 = 45%, Tier 2/3 = 38%) (see **Appendix B**).

Figure 10: How important are the following capabilities when making end-to-end orchestration platform purchasing decisions?



(n=124)

Source: Heavy Reading

THE EVOLUTION OF SERVICE ASSURANCE

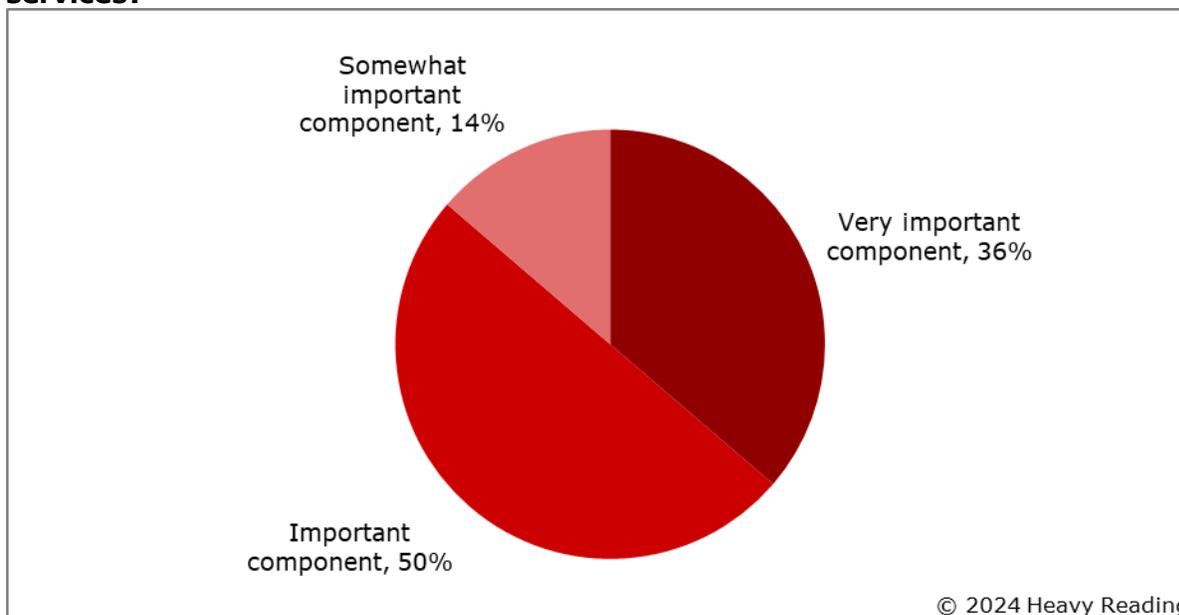
The same requirements to provide seamless service delivery in hybrid networks that are fueling end-to-end orchestration adoption are also influencing the evolution of service assurance. This is because, without new automated capabilities, service assurance is unable to monitor and intervene when network performance limitations degrade service performance.

In this new world order, service assurance must be informed and capable of utilizing automation to capture data and ultimately implement intent-based policies in real time before service performance degradation occurs.

The initial question investigated the importance that service providers attach to automation in a monetization context. According to **Figure 11**, they hold automation in high regard; 86% believe that it is either a “very important component” (36%) or an “important component” (50%), leaving only 14% that felt it was just a “somewhat important component.”

The breakdown of “very important component” differed significantly among the filter groups. While about half of Tier 1 survey respondents (49%) consider network automation a “very important component” for monetizing 5G or cloud-based services, only about a quarter of Tier 2/3 respondents do (24%) (see **Appendix B**).

Figure 11: How important is network automation for monetizing 5G or cloud-based services?



(n=124)

Source: Heavy Reading

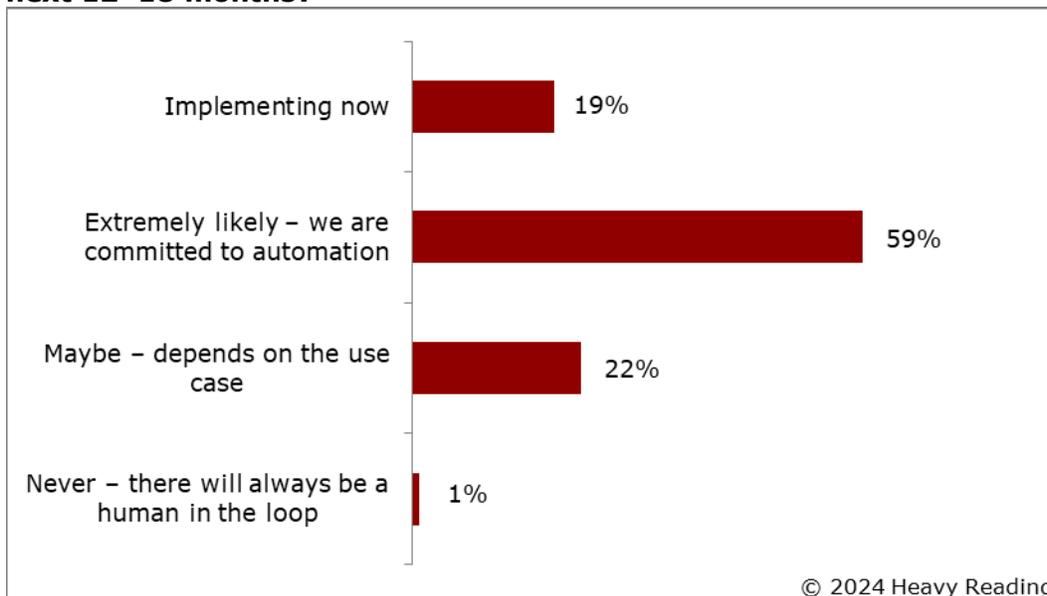
Understanding service providers’ timelines to implement automated processes was also a key focus area.

As depicted in **Figure 12**, 78% of service providers are likely to automate network processes in the next 12 months. Of these, 19% are “implementing now,” while 59% believe it is “extremely likely” they will start the process. This leaves 22% of survey respondents with a “maybe” depending on the right use case and a very telling only 1% that will never automate.

Like the previous figure, Tier 1 survey respondents also lead their Tier 2/3 colleagues in the “implementing now” category (Tier 1 = 28%, Tier 2/3 = 10%). Both groups had very similar “extremely likely – we are committed to automation” (Tier 1 = 61%, Tier 2/3 = 57%) inputs.

Heavy Reading interprets this data as validating that while Tier 1 respondents may be ahead in the implementation journey of automating network operational processes, both groups comprehend the value proposition (see **Appendix B**).

Figure 12: How likely are you to automate operational network processes in the next 12–18 months?



(n=124)

Source: Heavy Reading

Service providers must have a well-defined view of the goals automation can deliver to effectively exploit its value.

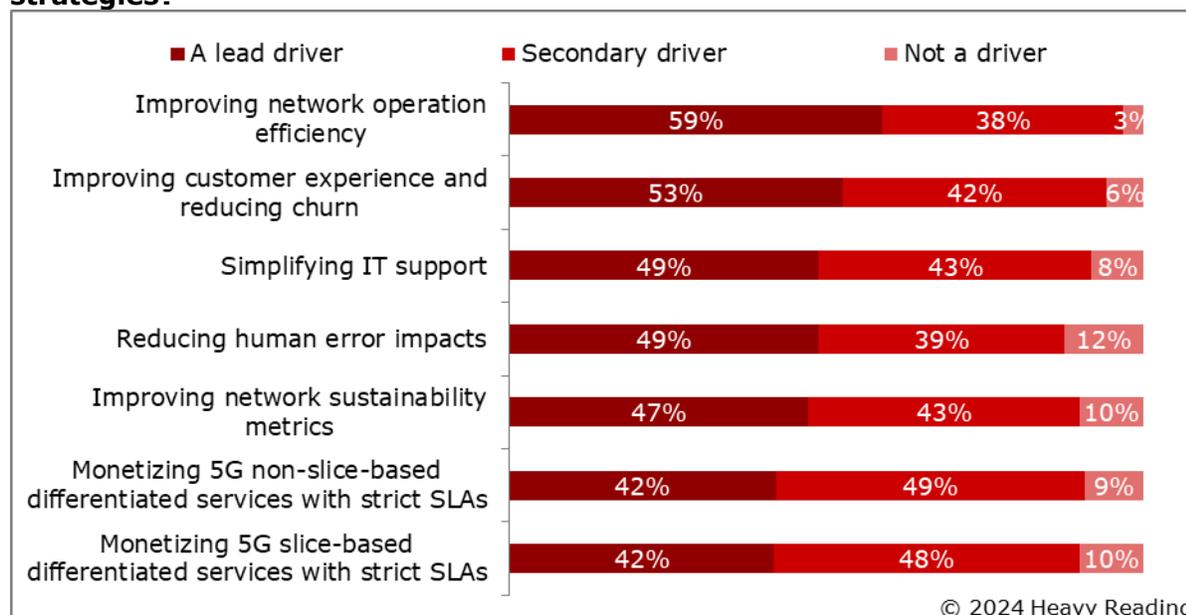
Based on “lead driver” input, as shown in **Figure 13**, the front-runner by a narrow margin was “improving network operation efficiency” (59%). Improving customer experience and reducing churn attained a second-place ranking (53%).

The remaining five were closely ranked: simplifying IT support and reducing human error impact (both 49%), improving network sustainability metrics (47%), monetizing 5G non-sliced-based differentiated services, and monetizing 5G slice-based differentiated services (both 42%).

It is also worth noting that the slicing-differentiated services-strict SLA option attained the second highest “secondary driver” scores (49%). This result reinforces Heavy Reading’s view that slice service monetization will take place gradually once other lead goals are achieved (see **Figure 16**).

Both filter groups assigned the highest lead driver score to “improving network operation efficiency” (Tier 1 = 61%, Tier 2/3 = 57%). Tier 1 survey respondents’ second-place choice was “improving customer experience and customer churn” (56%), while Tier 2/3 respondents’ second-place choice was “simplifying IT support” (52%) (see **Appendix B**).

Figure 13: Which goals/objectives are driving your network automation strategies?



(n=124)

Source: Heavy Reading

The next step in gathering automation data was to determine where service providers would invest soon, in this case, three years.

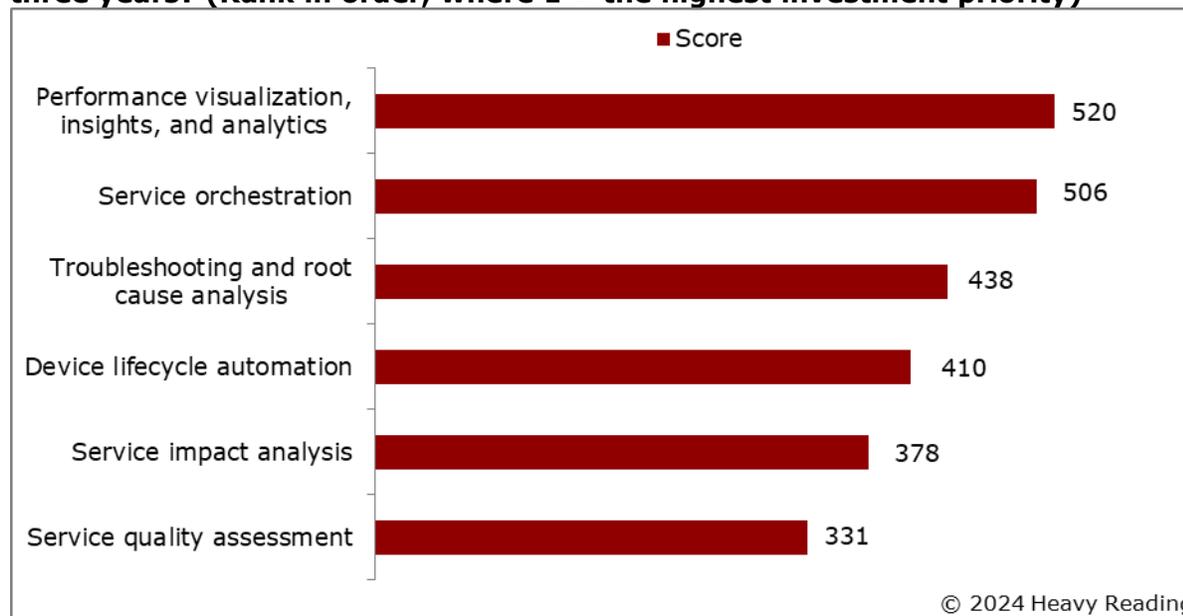
The data presented in **Figure 14** indicates that the top two investment priorities in the next three years are performance visualization, insights, and analytics (520) and service orchestration (506).

In third place was troubleshooting and root cause analysis (438), followed by device lifecycle automation (410), service impact analysis (378), and service quality assessment (331).

The Tier 1 and Tier 2/3 survey respondent groups flipped their top two rankings, with Tier 1 respondents selecting performance visualization (268) and then service orchestration (248). In contrast, Tier 2/3 respondents selected service orchestration (258) first, followed by performance visualization (252) (see **Appendix B**).

Heavy Reading interprets these data trends as confirming that initially, service providers are focusing on investing in automation projects that will increase network performance and visibility and help them simplify service orchestration (see the **End-to-end orchestration** section of the report).

Figure 14: What are your network automation investment priorities in the next three years? (Rank in order, where 1 = the highest investment priority)



(n=124)

Source: Heavy Reading

The next survey question shifted the discussion from automation investment priorities to the anticipated benefits of making this investment into an automated assurance solution.

When asked to rank a range of specific benefits, as shown in **Figure 15**, the top three perceived benefits included monitoring and guaranteeing SLAs (482), automatic assurance issue resolution based on rules or actions (455), and analysis and alerts based on specific criteria (437).

Both filter groups ranked monitoring and guaranteeing network and SLAs as the top benefit (Tier 1 =249 – Tier 2/3 = 233) (see **Appendix B**).

Heavy Reading believes the ranking of these top benefits is significant since all three are foundation capabilities that will enable assurance solutions to become automated and rules-based intent assurance systems.

Figure 15: What are the outcomes/benefits you expect from an automated assurance solution? (Rank in order, where 1 = the greatest benefit)



(n=124)

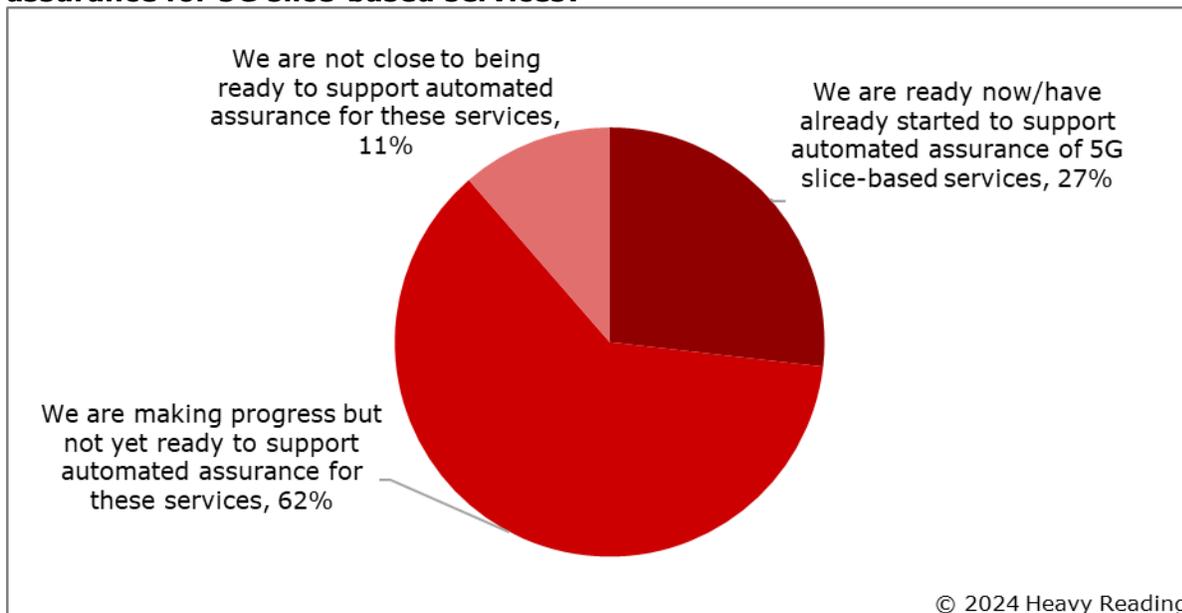
Source: Heavy Reading

The input from **Figure 13** indicates that the automation and monetization of 5G slice-based services is typically considered a secondary implementation driver. The data below in **Figure 16** provides insight into why this is the case. A key consideration is the limited support for automated assurance for 5G-sliced-based services. In this case, less than a third of the service providers (27%) are either ready to or have already begun to support automated assurance of 5G slice-based services.

In contrast, the largest group of respondents by a large margin (62%) believe they are making progress but are not ready to provide automated assurance for these services. On a positive note, only 11% indicated they are not close to being ready to support.

The logical conclusion here is that service providers' delay in monetizing 5G slice-based services is in part due to a lack of an automated service assurance solution.

Figure 16: Which statement best describes your readiness to support automated assurance for 5G slice-based services?



(n=123)

Source: Heavy Reading

Most service providers must make further progress to support the automated assurance of advanced capabilities such as 5G slicing. However, as shown in **Figure 17**, numerous specific automated tools that comprise automated assurance solutions have already been implemented or will be implemented in the next 12–18 months.

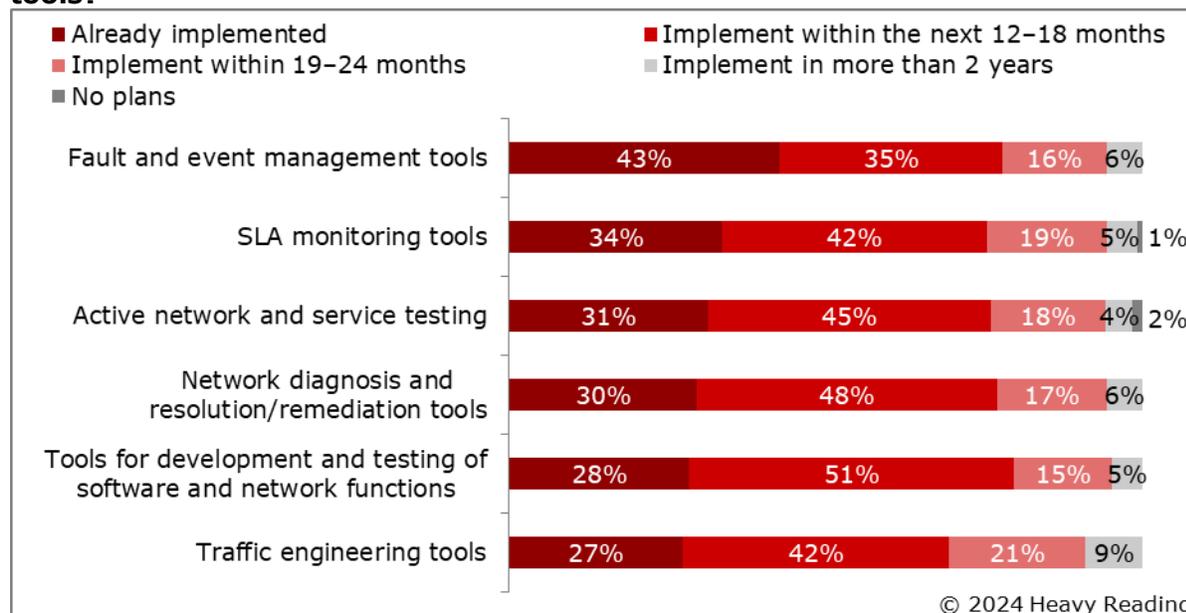
The clear leader in the “already implemented” category is automated fault and event management tools (43%). In second through sixth place are several closely ranked capabilities:

- SLA monitoring tools (34%)
- Active network and service testing (31%)
- Network diagnostics and resolution/remediation tools (30%)
- Tools for development and testing of software and network functions (28%)
- Traffic engineering tools (27%)

A similar number of Tier 1 and Tier 2/3 survey respondents have “already implemented” automated fault and event management tools (Tier 1 = 46%, Tier 2/3 = 40%). Yet, Tier 1 respondents have a considerable lead in the other capabilities (see **Appendix B**).

The data also reveals that most service providers that do not yet support these capabilities plan to implement them in the next 12–18 months. The top two priorities are tools for the development and testing of software and network functions (51%) and network diagnosis and resolution/remediation tools (48%).

Figure 17: When will you implement the following automation and assurance tools?



(n=123)

Source: Heavy Reading

This section of the survey also included an implementation barrier question. Although not identical to the end-to-end orchestration barrier question (see **Figure 7**), it included several common selection choices: lack of detailed processes, skill set challenges, lack of executive champion, and limited budget.

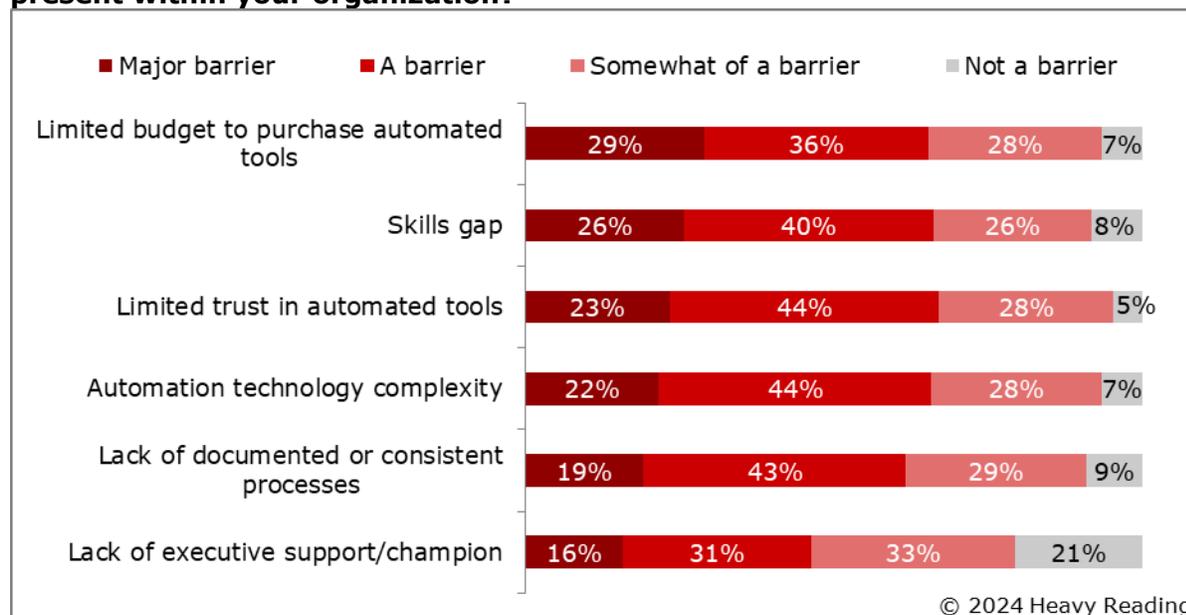
As shown in **Figure 18**, based on “major barrier” inputs, two of these attained the highest scores: limited budget to purchase automated tools (29%) and skills gap (26%).

The skills gap also attained second-place ranking in the end-to-end orchestration barrier question (27%), which positions it as an endemic concern. Encouragingly, lack of executive support/champion was the lowest ranked “major barrier” concern in both sections (end-to-end orchestration = 12% and automation adoption = 16%).

Heavy Reading is also encouraged that the number of “major barrier” responses for the remaining four of the six obstacles was less than 25%. That is not to say there are no challenges, but rather, they tend to fall into the “barrier” category, which is not uncommon in the rollout of a generational technology.

Both filter groups agreed that the two leading perceived “major barriers” were a limited budget to purchase automated tools (Tier 1 = 32%, Tier 2/3 = 26%) and a skills gap (Tier 1 = 29%, Tier 2/3 = 23%) (see **Appendix B**).

Figure 18: To what extent are the following barriers to automation adoption present within your organization?



(n=124)

Source: Heavy Reading

The second to last question in this section ranked the capabilities that service providers believe are essential when purchasing an integrated network automation and service solution.

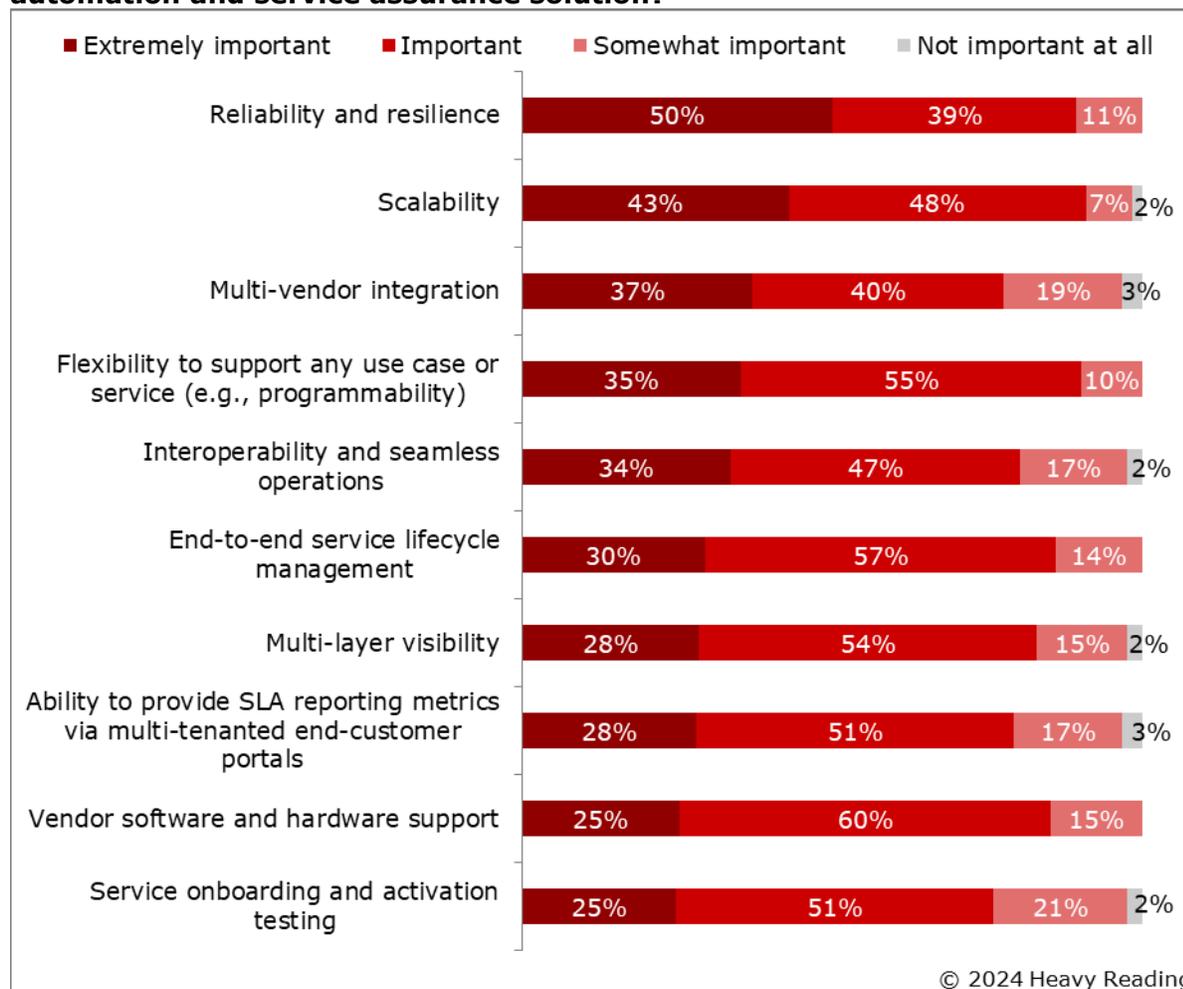
As shown in **Figure 19**, service providers consider a variety of factors when selecting an integrated network automation and service assurance solution based on “extremely important” inputs. But the two standouts are reliability and resilience (50%) and scalability (43%).

After that, the multi-factor impact is observed, with the remaining attributes falling into the 25–35% range. Of note is the fact that one attribute that fell into this range—vendor software and hardware support—attained the highest “important” score (60%).

Both the Tier 1 and Tier 2/3 survey respondent groups ranked reliability and resilience as the leading “extremely important” considerations when selecting an integrated network automation and service assurance solution (Tier 1 = 49%, Tier 2/3 = 51%) (see **Appendix B**).

Interestingly, these attributes also attained the highest rankings for purchasing *end-to-end orchestration systems*. In Heavy Reading’s view, this finding reinforces the fact that while service providers consider a range of factors, foundational capabilities such as reliability and scale are at the top of their “any” platform list (see **Figure 10**).

Figure 19: How important are the following when selecting an integrated network automation and service assurance solution?



(n=123)

Source: Heavy Reading

As observed, automation will play a prominent role in the evolution of service assurance solutions. One tangible outcome has been the emergence of intent-based assurance, which unifies business service intent and network monitoring to ensure SLAs are met through specific network action.

To ensure clarity, the following detailed definition was included in the survey:

One outcome of automating assurance functions is the creation of an intent-based assurance system. In this model, the user, or customer order, specifies the business intent of a "service" (e.g., L3 VPN from London to Paris with 1Gbps bandwidth and a latency [service-level objective] SLO of 2ms). KPIs and alerts are derived from users' intent and used to validate the intended state. When SLA/SLO violations are detected, assurance notifies the higher layers that the "intent" of the service is at risk, which then enables "action" to be taken.

The first two key observations in **Figure 20** are that intent-based assurance will positively impact customer experience (86%), and it represents the logical evolution of linking assurance to intent-based networking (85%).

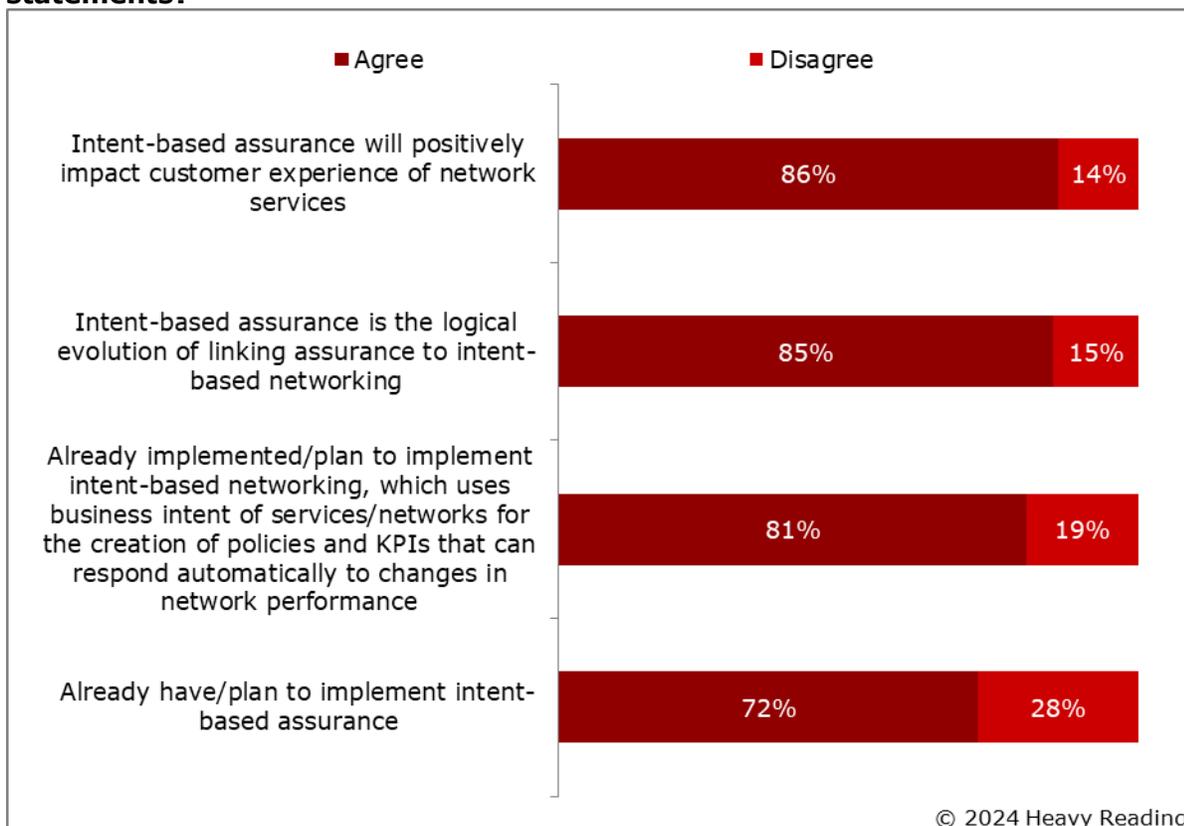
Consequently, 81% of service providers have already implemented or plan to implement intent-based networking that utilizes business intent to respond automatically to changes in network performance. Moreover, 72% have either implemented or plan to implement intent-based assurance.

Tier 1 and Tier 2/3 service providers are closely aligned on the benefits of intent-based assurance. Tier 1 survey respondents were further ahead in the intent-based assurance planning/implementation phase (Tier 1 = 80%, Tier 2/3 = 65%) (see **Appendix B**).

Based on these definitive data points, it is clear that service providers of all sizes believe their assurance evolution paths will depend heavily on the implementation of intent-based assurance.

One final thought: While Heavy Reading used a single definition in the survey for clarity purposes, it is important to note that intent-based assurance is not limited to this particular use case. Rather, it is well-suited to any complex 5G and cloud service, including 5G slice-based services, which Heavy Reading believes will fuel future service innovation.

Figure 20: Do you agree or disagree with the following intent-based related statements?



(n=124)

Source: Heavy Reading

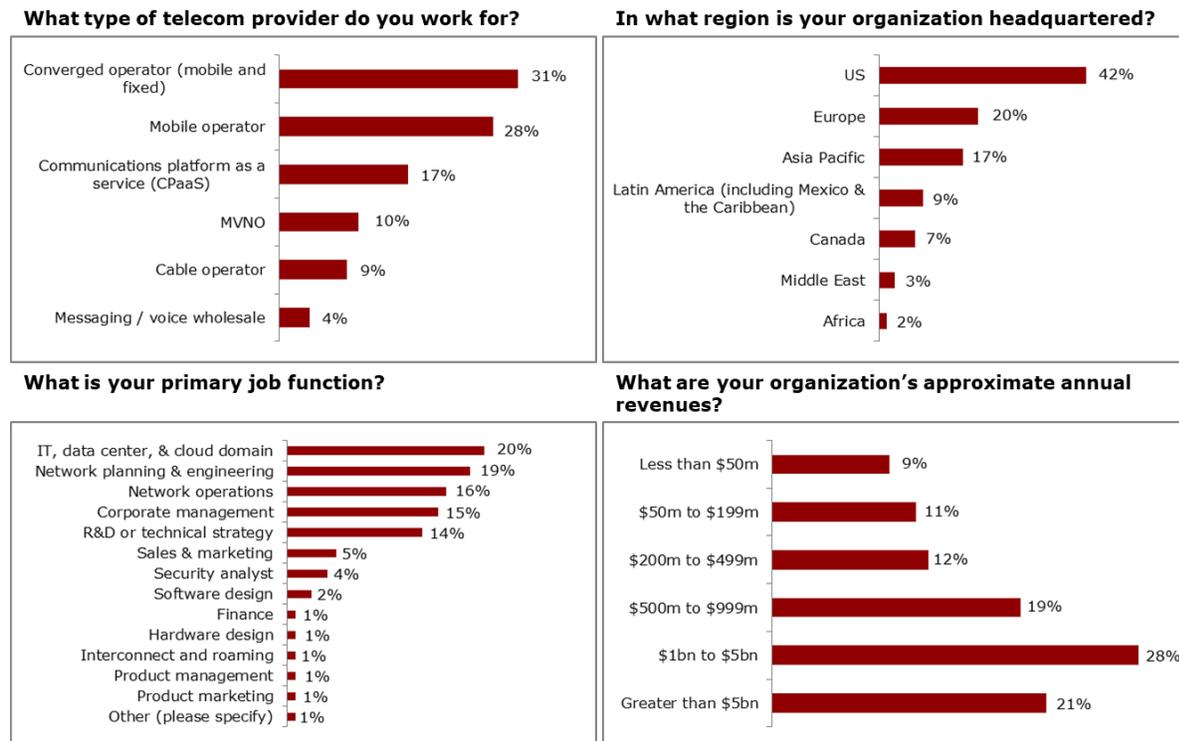
APPENDIX A: SURVEY DEMOGRAPHICS

This Heavy Reading white paper is based on a web-based global survey of service providers conducted in March 2024.

Respondents were drawn from the service provider 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, 124 qualified responses remained.

Figure A1: Survey demographics



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(n=124)

Source: Heavy Reading

APPENDIX B: FILTER GROUP RESULTS

This section of the report contains the results of each survey question using the following three filter groups.

- **Tier 1:** Service providers with at least \$1bn USD in annual revenue (n=61).
- **Tier 2/3:** Service providers with between \$1m and \$999m USD in annual revenue (n=63).

Question: How important is end-to-end orchestration for monetizing 5G or cloud-based services?

Tier 1 (n=61)

| Responses | Proportion of respondents |
|------------------------------|---------------------------|
| Very important component | 59% |
| Important component | 36% |
| Somewhat important component | 5% |

Tier 2/3 (n=63)

| Responses | Proportion of respondents |
|------------------------------|---------------------------|
| Very important component | 40% |
| Important component | 51% |
| Somewhat important component | 10% |

Source: Heavy Reading

Conclusion

The data trends are similar in that 10% or less of both groups assess end-to-end orchestration as only a “somewhat important” monetization component. However, Tier 1 survey respondents recorded a significantly greater percentage of “very important” responses (Tier 1 = 59%, Tier 2/3 = 40%).

Question: Which statement best describes your readiness to support the following capabilities?

Tier 1 (n=61)

| Responses | Ready now | Making progress but not ready yet | Not ready to support | No plans to support |
|--|-----------|-----------------------------------|----------------------|---------------------|
| End-to-end orchestration of 5G or cloud-based services | 43% | 49% | 8% | 0% |
| End-to-end orchestration of 5G sliced-based services | 32% | 55% | 10% | 3% |

Tier 2/3 (n=63)

| Responses | Ready now | Making progress but not ready yet | Not ready to support | No plans to support |
|--|-----------|-----------------------------------|----------------------|---------------------|
| End-to-end orchestration of 5G or cloud-based services | 33% | 57% | 10% | 0% |
| End-to-end orchestration of 5G sliced-based services | 13% | 67% | 21% | 0% |

Source: Heavy Reading

Conclusion

Both the Tier 1 and Tier 2/3 survey respondent groups are more advanced in their “ready now” support for 5G or cloud-based services (Tier 1 = 43%, Tier 2/3 = 33%) than for 5G sliced-based services (Tier 1 = 32%, Tier 2/3 = 13%).

Question: Which service-based use cases are driving your implementation of end-to-end service orchestration? (Select top three)

Tier 1 (n=61)

| Responses | Proportion of respondents |
|---|---------------------------|
| Cloud orchestration (including cloud services across multiple cloud domains and providers and the edge) | 62% |
| 5G sliced-based differentiated services with strict SLAs | 59% |
| Network as a service (NaaS) | 57% |
| Service monetization and revenue generation (policy, charging, NEF) | 49% |
| 5G non-sliced-based differentiated services with strict SLAs | 44% |
| API exposure | 28% |

Tier 2/3 (n=63)

| Responses | Proportion of respondents |
|---|---------------------------|
| Cloud orchestration (including cloud services across multiple cloud domains and providers and the edge) | 71% |
| 5G sliced-based differentiated services with strict SLAs | 57% |
| Network as a service (NaaS) | 57% |
| Service monetization and revenue generation (policy, charging, NEF) | 43% |
| 5G non-sliced-based differentiated services with strict SLAs | 30% |
| API exposure | 41% |

Source: Heavy Reading

Conclusion

Priorities among the two filter groups are similar, with both groups ranking cloud orchestration as the top priority (Tier 1 = 62% = Tier 2/3 = 71%). Scoring was also similar concerning 5G slice-based differentiated services (Tier 1 = 59%, Tier 2/3 = 57%) and NaaS (Tier 1 = 57%, Tier 2/3 = 57%).

Question: When will your current orchestration system support the following service/use case capabilities?

Tier 1 (n=61)

| Responses | Supported now | Support in 12-18 months | Support in 19-24 months | Unsure of timeline to support | No plans to support |
|---|---------------|-------------------------|-------------------------|-------------------------------|---------------------|
| Cloud orchestration (including cloud services across multiple cloud domains and providers and the edge) | 32% | 37% | 17% | 14% | 0% |
| API exposure | 39% | 22% | 24% | 14% | 2% |
| 5G non-sliced-based differentiated services with strict SLAs | 33% | 34% | 18% | 11% | 3% |
| Network as a service (NaaS) | 34% | 29% | 22% | 15% | 0% |
| Service monetization and revenue generation (policy, charging, NEF) | 36% | 34% | 22% | 7% | 2% |
| 5G sliced-based differentiated services with strict SLAs | 23% | 41% | 25% | 11% | 0% |

Tier 2/3 (n=63)

| Responses | Supported now | Support in 12-18 months | Support in 19-24 months | Unsure of timeline to support | No plans to support |
|---|---------------|-------------------------|-------------------------|-------------------------------|---------------------|
| Cloud orchestration (including cloud services across multiple cloud domains and providers and the edge) | 30% | 32% | 29% | 8% | 2% |
| API exposure | 23% | 29% | 26% | 16% | 6% |
| 5G non-sliced-based differentiated services with strict SLAs | 27% | 38% | 22% | 11% | 2% |
| Network as a service (NaaS) | 23% | 35% | 26% | 11% | 5% |
| Service monetization and revenue generation (policy, charging, NEF) | 21% | 29% | 37% | 8% | 5% |
| 5G sliced-based differentiated services with strict SLAs | 15% | 45% | 27% | 11% | 2% |

Source: Heavy Reading

Conclusion

A greater percentage of Tier 1 survey respondents believe that their current orchestration system supports a broad range of service/use case capabilities now (Tier 1 range = 39–23%, Tier 2/3 range = 30–15%).

Of note is the greater percentage of Tier 1 respondents (39%) that believe their current orchestration system supports API exposure compared to Tier 2/3 respondents (23%). Both groups ranked 5G-sliced-based differentiated services with strict SLAs as the least likely capability to be supported now (Tier 1 = 23%, Tier 2/3 = 15%).

Question: Which operational use cases are driving your implementation of end-to-end service orchestration? (Select top three)

Tier 1 (n=61)

| Responses | Proportion of respondents |
|---------------|---------------------------|
| Optimization | 73% |
| Orchestration | 70% |
| Provisioning | 60% |
| Innovation | 48% |
| Assurance | 48% |

Tier 2/3 (n=63)

| Responses | Proportion of respondents |
|---------------|---------------------------|
| Optimization | 71% |
| Orchestration | 67% |
| Provisioning | 54% |
| Innovation | 54% |
| Assurance | 54% |

Source: Heavy Reading

Conclusion

Tier 1 and Tier 2/3 survey respondents have similar views here. They ranked optimization (Tier 1 = 73%, Tier 2/3 = 71%) and orchestration (Tier 1 = 70%, Tier 2/3 = 67%) as the top two operational use cases driving end-to-end service orchestration.

Question: What are the leading benefits of integrating AI into an end-to-end orchestration system? (Select top three)

Tier 1 (n=61)

| Responses | Proportion of respondents |
|----------------------------|---------------------------|
| Operational efficiency | 74% |
| Dynamic optimization | 61% |
| Customer-centric assurance | 59% |
| Flexible orchestration | 62% |
| Agile innovation | 44% |

Tier 2/3 (n=63)

| Responses | Proportion of respondents |
|----------------------------|---------------------------|
| Operational efficiency | 75% |
| Dynamic optimization | 62% |
| Customer-centric assurance | 57% |
| Flexible orchestration | 52% |
| Agile innovation | 54% |

Source: Heavy Reading

Conclusion

Both the Tier 1 and Tier 2/3 survey respondent groups ranked operational efficiency as the leading benefit of integrating AI into an end-to-end orchestration system (Tier 1 = 74%, Tier 2/3 = 75%). While other scores and rankings were similar, Tier 1 respondents ranked flexible orchestration in second place (62%) and dynamic optimization (61%) in third place. Tier 2/3 respondents scored dynamic optimization in second place (62%).

Question: To what extent are the following barriers to end-to-end orchestration adoption within your organization?

Tier 1 (n=61)

| Responses | Major barrier | A barrier | Somewhat of a barrier | Not a barrier |
|--|---------------|-----------|-----------------------|---------------|
| Lack of documented or consistent processes | 30% | 38% | 23% | 8% |
| Skills gap | 30% | 43% | 23% | 3% |
| Limited budget to purchase end-to-end orchestration capabilities | 27% | 43% | 22% | 8% |
| End-to-end orchestration technology complexity | 22% | 57% | 20% | 2% |
| Lack of executive support/champion | 12% | 38% | 35% | 15% |

Tier 2/3 (n=63)

| Responses | Major barrier | A barrier | Somewhat of a barrier | Not a barrier |
|--|---------------|-----------|-----------------------|---------------|
| Lack of documented or consistent processes | 26% | 35% | 37% | 2% |
| Skills gap | 24% | 46% | 19% | 11% |
| Limited budget to purchase end-to-end orchestration capabilities | 26% | 46% | 23% | 5% |
| End-to-end orchestration technology complexity | 16% | 49% | 28% | 7% |
| Lack of executive support/champion | 13% | 41% | 30% | 16% |

Source: Heavy Reading

Conclusion

The differences between “major barrier” data trends among the filter groups are minimal. Lack of documented or consistent processes, skills gap, and limited budget all attained first-place scores for both groups.

Question: For your end-to-end service orchestration solution, which type of partnerships are you looking for? (Select top three)

Tier 1 (n=61)

| Responses | Proportion of respondents |
|------------------------------|---------------------------|
| Systems integrators | 74% |
| Network equipment providers | 75% |
| Independent software vendors | 48% |
| In-house development | 52% |
| Hyperscalers | 51% |

Tier 2/3 (n=63)

| Responses | Proportion of respondents |
|------------------------------|---------------------------|
| Systems integrators | 73% |
| Network equipment providers | 54% |
| Independent software vendors | 68% |
| In-house development | 57% |
| Hyperscalers | 48% |

Source: Heavy Reading

Conclusion

Tier 1 survey respondents' top three partners in order are NEPs (75%), systems integrators (74%), and performing the work in-house (52%). Tier 2/3 respondents' preferences are systems integrators (73%), independent software vendors (68%), and in-house development (57%).

A few other notable differences include NEPs attaining the second lowest ranking (54%) among Tier 2/3 respondents vs. the top ranking among Tier 1 respondents. Similarly, while Tier 2/3 respondents ranked independent software vendors highly as their second choice (68%), Tier 1 respondents ranked them in last place (48%).

Hyperscalers achieved last or second-last metrics, but their overall scores are not prohibitively low (Tier 1 = 51%, Tier 2/3 = 48%). Heavy Reading believes these scores confirm that hyperscalers continue to make progress in achieving their goal of becoming a well-established ecosystem partner.

Question: How important are the following benefits when making end-to-end orchestration platform purchasing decisions? (Rank in order, where 1 = the highest importance)

Tier 1 (n=61)

| Responses | Score | Rank |
|--|-------|------|
| Enabling new revenue generation and supporting new business models | 188 | 1 |
| Reducing time to market, increasing agility | 139 | 4 |
| Optimizing total cost of ownership | 140 | 3 |
| Improving customer experience and satisfaction | 143 | 2 |

Tier 2/3 (n=63)

| Responses | Score | Rank |
|--|-------|------|
| Enabling new revenue generation and supporting new business models | 175 | 1 |
| Reducing time to market, increasing agility | 163 | 2 |
| Optimizing total cost of ownership | 146 | 3 |
| Improving customer experience and satisfaction | 136 | 4 |

Source: Heavy Reading

Conclusion

Both groups scored enabling new revenue growth as the top benefit (Tier 1 = 188, Tier 2/3 = 175). Similarly, optimizing TCO was ranked third by both groups (Tier 1 = 140, Tier 2/3 = 146).

Among the Tier 1 survey respondents, second- and fourth-place rankings were improving customer satisfaction (143) and reducing time to market, increasing agility (139). Tier 2/3 respondents ranked reducing time to market, increasing agility higher in second place (163), and improving customer satisfaction in fourth place (136).

Question: How important are the following capabilities when making end-to-end orchestration platform purchasing decisions?

Tier 1 (n=61)

| Responses | Extremely important | Important | Somewhat important | Not important at all |
|---|---------------------|-----------|--------------------|----------------------|
| Reliability and resilience | 61% | 31% | 7% | 2% |
| Scalability | 45% | 40% | 13% | 2% |
| Supports dynamic event charging triggers for complex services such as slice-based service | 35% | 50% | 13% | 2% |
| Multi-domain (e.g., multcloud) – multi-vendor support | 39% | 46% | 10% | 5% |
| Seamless integration with charging, policy | 40% | 48% | 8% | 3% |
| Open API exposure support (e.g., Camara) | 39% | 47% | 12% | 2% |
| Supports advanced inventory management functions (e.g., hybrid inventory capabilities) | 32% | 47% | 15% | 5% |
| Supports standards-based service modeling | 32% | 53% | 15% | 0% |

Tier 2/3 (n=63)

| Responses | Extremely important | Important | Somewhat important | Not important at all |
|---|---------------------|-----------|--------------------|----------------------|
| Reliability and resilience | 44% | 38% | 14% | 3% |
| Scalability | 38% | 44% | 14% | 3% |
| Supports dynamic event charging triggers for complex services such as slice-based service | 30% | 52% | 16% | 2% |
| Multi-domain (e.g., multcloud) – multi-vendor support | 25% | 54% | 19% | 2% |
| Seamless integration with charging, policy | 24% | 57% | 17% | 2% |
| Open API exposure support (e.g., Camara) | 22% | 46% | 27% | 5% |
| Supports advanced inventory management functions (e.g., hybrid inventory capabilities) | 25% | 43% | 27% | 5% |
| Supports standards-based service modeling | 25% | 54% | 21% | 0% |

Source: Heavy Reading

Conclusion

Both the Tier 1 and Tier 2/3 groups ranked reliability/resilience and scalability as the top two considerations when making end-to-end orchestration purchasing decisions (reliability/resilience, Tier 1 = 61%, Tier 2/3 = 44%; scalability, Tier 1 = 45%, Tier 2/3 = 38%). Also of note is the fact that Tier 1 respondents ranked open API exposure much higher (tied for third) than Tier 2/3 respondents, which ranked this in last place (Tier 1 = 39%, Tier 2/3 = 22%).

Question: How important is network automation for monetizing 5G or cloud-based services?

Tier 1 (n=61)

| Responses | Proportion of respondents |
|------------------------------|---------------------------|
| Very important component | 49% |
| Important component | 39% |
| Somewhat important component | 11% |

Tier 2/3 (n=63)

| Responses | Proportion of respondents |
|------------------------------|---------------------------|
| Very important component | 24% |
| Important component | 60% |
| Somewhat important component | 16% |

Source: Heavy Reading

Conclusion

While about half of Tier 1 survey respondents consider network automation as a “very important component” for monetizing 5G or cloud-based services (49%), only about a quarter of Tier 2/3 respondents do (24%). Instead, the majority of Tier 2/3 respondents (60%) view automation as an “important component” of the monetization process. Heavy Reading interprets this input as confirming that automation is important for all service providers, but even more so for the largest group.

Question: How likely are you to automate operational network processes in the next 12–18 months?

Tier 1 (n=61)

| Responses | Proportion of respondents |
|---|---------------------------|
| Implementing now | 28% |
| Extremely likely – we are committed to automation | 61% |
| Maybe – depends on the use case | 11% |
| Never – there will always be a human in the loop | 0% |

Tier 2/3 (n=63)

| Responses | Proportion of respondents |
|---|---------------------------|
| Implementing now | 10% |
| Extremely likely – we are committed to automation | 57% |
| Maybe – depends on the use case | 32% |
| Never – there will always be a human in the loop | 2% |

Source: Heavy Reading

Conclusion

Consistent with the input that a greater percentage of Tier 1 survey respondents view automation as an important monetization component, a greater percentage of Tier 1 respondents also lead their Tier 2/3 colleagues in the “implementing now” category (Tier 1 = 28%, Tier 2/3 = 10%).

Both groups had very similar “extremely likely – we are committed to automation” (Tier 1 = 61%, Tier 2/3 = 57%) inputs. Heavy Reading interprets this result as confirming that while Tier 1 respondents may be ahead in the implementation journey of automating network operational processes, both groups recognize the value proposition. The only caveat for Tier 2/3 respondents is the requirement to link automation benefits to specific use cases (Tier 1 = 11%, Tier 2/3 = 32%).

Question: Which goals/objectives are driving your network automation strategies?

Tier 1 (n=61)

| Responses | A lead driver | Secondary driver | Not a driver |
|--|---------------|------------------|--------------|
| Improving network operation efficiency | 61% | 36% | 3% |
| Improving customer experience and reducing churn | 56% | 37% | 7% |
| Simplifying IT support | 45% | 42% | 13% |
| Reducing human error impacts | 51% | 37% | 12% |
| Improving network sustainability metrics | 47% | 46% | 7% |
| Monetizing 5G non-slice-based differentiated services with strict SLAs | 47% | 44% | 8% |
| Monetizing 5G slice-based differentiated services with strict SLAs | 39% | 58% | 3% |

Tier 2/3 (n=63)

| Responses | A lead driver | Secondary driver | Not a driver |
|--|---------------|------------------|--------------|
| Improving network operation efficiency | 57% | 40% | 3% |
| Improving customer experience and reducing churn | 49% | 46% | 5% |
| Simplifying IT support | 52% | 44% | 3% |
| Reducing human error impacts | 47% | 40% | 13% |
| Improving network sustainability metrics | 47% | 40% | 13% |
| Monetizing 5G non-slice-based differentiated services with strict SLAs | 37% | 53% | 10% |
| Monetizing 5G slice-based differentiated services with strict SLAs | 44% | 39% | 16% |

Source: Heavy Reading

Conclusion

Both groups assigned the highest lead driver scores to “improving network operation efficiency” (Tier 1 = 61%, Tier 2/3 = 57%). Tier 1 survey respondents’ second-place choice was “improving customer experience and customer churn” (56%), while Tier 2/3 respondents’ second-place choice was “simplifying IT support” (52%).

Both groups were also aligned in their grouping of the remaining goals/objectives together in the low to high 30–40% ranges for their third- to seventh-place lead driver rankings.

Question: What are your network automation investment priorities in the next three years? (Rank in order, where 1 = the highest investment priority)

Tier 1 (n=61)

| Responses | Score | Rank |
|--|-------|------|
| Performance visualization, insights, and analytics | 268 | 1 |
| Service orchestration | 248 | 2 |
| Troubleshooting and root cause analysis | 228 | 3 |
| Device lifecycle automation | 195 | 4 |
| Service impact analysis | 184 | 5 |
| Service quality assessment | 158 | 6 |

Tier 2/3 (n=63)

| Responses | Score | Rank |
|--|-------|------|
| Performance visualization, insights, and analytics | 252 | 2 |
| Service orchestration | 258 | 1 |
| Troubleshooting and root cause analysis | 210 | 4 |
| Device lifecycle automation | 215 | 3 |
| Service impact analysis | 194 | 5 |
| Service quality assessment | 173 | 6 |

Source: Heavy Reading

Conclusion

While inputs were similar in terms of general trends, Tier 1 and Tier 2/3 survey respondents flipped their top two rankings. Tier 1 respondents selected (in order) performance visualization (268) and then service orchestration (248). In contrast, Tier 2/3 respondents ranked service orchestration first (258), followed by performance visualization (252).

Question: What are the outcomes/benefits you expect from an automated assurance solution? (Rank in order, where 1 = the greatest benefit)

Tier 1 (n=61)

| Responses | Score | Rank |
|---|-------|------|
| Monitoring and guaranteeing network and SLAs | 249 | 1 |
| Try and automatically resolve assurance issues based on rules or actions | 231 | 2 |
| Perform analysis and alert me if certain criteria are met | 219 | 3 |
| Flag any anomalous behavior for me | 218 | 4 |
| Predict when issues will start to impact customer quality of experience | 200 | 5 |
| Tell me when capacity is expected to be exhausted on a given link or network path | 164 | 6 |

Tier 2/3 (n=63)

| Responses | Score | Rank |
|---|-------|------|
| Monitoring and guaranteeing network and SLAs | 233 | 1 |
| Try and automatically resolve assurance issues based on rules or actions | 224 | 2 |
| Perform analysis and alert me if certain criteria are met | 218 | 3 |
| Flag any anomalous behavior for me | 211 | 5 |
| Predict when issues will start to impact customer quality of experience | 214 | 4 |
| Tell me when capacity is expected to be exhausted on a given link or network path | 202 | 6 |

Source: Heavy Reading

Conclusion

Both filter groups ranked monitoring and guaranteeing SLAs, automatically resolve assurance issues, and perform analysis and alert based on criteria in first, second, and third place, respectively. (Tier 1 = 249, 231, 219; Tier 2/3 = 233, 224, 218). Tier 1 survey respondents' next rankings were flagging anomalous behavior in fourth place and predicting when issues would start to impact quality experience in fifth compared to Tier 2/3 respondents, which flipped them in order.

Both filter groups also assigned a sixth-place ranking to the link or network path exhaust warning (Tier 1 = 164 – Tier 2/3 = 202)

Question: Which statement best describes your readiness to support automated assurance for 5G slice-based services?

Tier 1 (n=61)

| Responses | Proportion of respondents |
|---|---------------------------|
| We are ready now/have already started to support automated assurance of 5G slice-based services | 25% |
| We are making progress but not yet ready to support automated assurance for these services | 66% |
| We are not close to being ready to support automated assurance for these services | 10% |

Tier 2/3 (n=63)

| Responses | Proportion of respondents |
|---|---------------------------|
| We are ready now/have already started to support automated assurance of 5G slice-based services | 29% |
| We are making progress but not yet ready to support automated assurance for these services | 58% |
| We are not close to being ready to support automated assurance for these services | 13% |

Source: Heavy Reading

Conclusion

The overall trends were very similar, with (surprisingly) a marginally larger group of Tier 2/3 survey respondents (29%) selecting the ready now/already started option (Tier 1 = 25%).

Question: When will you implement the following automation and assurance tools?

Tier 1 (n=61)

| Responses | Already implemented | Implement within the next 12–18 months | Implement within 19–24 months | Implement in more than 2 years | No plans |
|---|---------------------|--|-------------------------------|--------------------------------|----------|
| Fault and event management tools | 46% | 39% | 12% | 3% | 0% |
| SLA monitoring tools | 41% | 41% | 15% | 3% | 0% |
| Active network and service testing | 36% | 49% | 8% | 5% | 2% |
| Network diagnosis and resolution/remediation tools | 31% | 54% | 10% | 5% | 0% |
| Tools for development and testing of software and network functions | 35% | 43% | 13% | 8% | 0% |
| Traffic engineering tools | 34% | 34% | 19% | 14% | 0% |

Tier 2/3 (n=63)

| Responses | Already implemented | Implement within the next 12–18 months | Implement within 19–24 months | Implement in more than 2 years | No plans |
|---|---------------------|--|-------------------------------|--------------------------------|----------|
| Fault and event management tools | 40% | 32% | 21% | 8% | 0% |
| SLA monitoring tools | 27% | 43% | 22% | 6% | 2% |
| Active network and service testing | 27% | 40% | 27% | 3% | 2% |
| Network diagnosis and resolution/remediation tools | 29% | 41% | 24% | 6% | 0% |
| Tools for development and testing of software and network functions | 22% | 59% | 17% | 2% | 0% |
| Traffic engineering tools | 21% | 50% | 24% | 5% | 0% |

Source: Heavy Reading

Conclusion

Although a similar number of Tier 1 and Tier 2/3 survey respondents have “already implemented” automated fault and event management tools (Tier 1 = 46%, Tier 2/3 = 40%), Tier 1 respondents have a considerable lead in the other capabilities (Tier 1 = second- to fifth-place range = 34–41%, Tier 2/3 = 21–27%).

Implementation within the next 12–18 months garnered a similar result (Tier 1 = 34–54%, Tier 2/3 = 32–59%). Not surprisingly, though, a greater number of Tier 2/3 respondents expect to implement within a 19–24 month window (Tier 1 range = 8–19%, Tier 2/3 = 17–27%).

Question: To what extent are the following barriers to automation adoption present within your organization?

Tier 1 (n=61)

| Responses | Major barrier | A barrier | Somewhat of a barrier | Not a barrier |
|--|---------------|-----------|-----------------------|---------------|
| Limited budget to purchase automated tools | 32% | 37% | 20% | 10% |
| Skills gap | 29% | 42% | 24% | 5% |
| Limited trust in automated tools | 28% | 43% | 26% | 3% |
| Automation technology complexity | 22% | 46% | 27% | 5% |
| Lack of documented or consistent processes | 21% | 45% | 26% | 9% |
| Lack of executive support/champion | 14% | 38% | 29% | 19% |

Tier 2/3 (n=63)

| Responses | Major barrier | A barrier | Somewhat of a barrier | Not a barrier |
|--|---------------|-----------|-----------------------|---------------|
| Limited budget to purchase automated tools | 26% | 35% | 35% | 3% |
| Skills gap | 23% | 39% | 27% | 11% |
| Limited trust in automated tools | 19% | 44% | 30% | 6% |
| Automation technology complexity | 21% | 43% | 28% | 8% |
| Lack of documented or consistent processes | 18% | 40% | 32% | 10% |
| Lack of executive support/champion | 17% | 24% | 37% | 22% |

Source: Heavy Reading

Conclusion

In both cases, the two leading perceived “major barriers” were a limited budget to purchase automated tools (Tier 1 = 32%, Tier 2/3 = 26%) and a skills gap (Tier 1 = 29%, Tier 2/3 = 23%). The range of inputs for “barrier” responses was also similar, especially concerning percentage inputs for automation complexity (Tier 1 = 46%, Tier 2/3 = 43%), limited trust in automated tools (Tier 1 = 43%, Tier 2/3 = 44), and lack of documented or consistent processes (Tier 1 = 45%, Tier 2/3 = 40%).

Moreover, Tier 1 and Tier 2/3 survey respondents ranked a lack of executive support/ champion as the lowest concern in their “major barrier” and “barrier” assessments (Tier 1 = 14% and 38%, Tier 2/3 = 17% and 24%).

Question: How important are the following when selecting an integrated network automation and service assurance solution?

Tier 1 (n=61)

| Responses | Extremely important | Important | Somewhat important | Not important at all |
|--|---------------------|-----------|--------------------|----------------------|
| Reliability and resilience | 49% | 34% | 17% | 0% |
| Scalability | 39% | 58% | 3% | 0% |
| Multi-vendor integration | 36% | 48% | 12% | 3% |
| Flexibility to support any use case or service (e.g., programmability) | 42% | 53% | 5% | 0% |
| Interoperability and seamless operations | 37% | 46% | 17% | 0% |
| End-to-end service lifecycle management | 35% | 55% | 10% | 0% |
| Multi-layer visibility | 28% | 58% | 13% | 0% |
| Ability to provide SLA reporting metrics via multi-tenanted end-customer portals | 29% | 52% | 17% | 2% |
| Vendor software and hardware support | 25% | 66% | 8% | 0% |
| Service onboarding and activation testing | 27% | 49% | 22% | 2% |

Tier 2/3 (n=63)

| Responses | Extremely important | Important | Somewhat important | Not important at all |
|--|---------------------|-----------|--------------------|----------------------|
| Reliability and resilience | 51% | 44% | 5% | 0% |
| Scalability | 47% | 39% | 11% | 3% |
| Multi-vendor integration | 38% | 33% | 25% | 3% |
| Flexibility to support any use case or service (e.g., programmability) | 29% | 57% | 14% | 0% |
| Interoperability and seamless operations | 30% | 48% | 17% | 5% |
| End-to-end service lifecycle management | 24% | 58% | 18% | 0% |
| Multi-layer visibility | 29% | 51% | 16% | 5% |
| Ability to provide SLA reporting metrics via multi-tenanted end-customer portals | 27% | 51% | 17% | 5% |
| Vendor software and hardware support | 25% | 54% | 21% | 0% |
| Service onboarding and activation testing | 23% | 53% | 21% | 3% |

Source: Heavy Reading

Conclusion

Both groups ranked reliability and resilience as the leading “extremely important” considerations when selecting an integrated network automation and service assurance solution (Tier 1 = 49%, Tier 2/3 = 51%). Tier 2/3 survey respondents ranked scalability in second place in “extremely important” scoring (47%), while Tier 1 respondents ranked it in third place (39%).

Flexibility to support any use case service attained a second-place “extremely important” ranking (42%) among Tier 1 respondents, while Tier 2/3 respondents assigned it a fifth-place ranking (29%).

Question: Do you agree or disagree with the following intent-based related statements?

Tier 1 (n=61)

| Responses | Agree | Disagree |
|---|-------|----------|
| Intent-based assurance will positively impact customer experience of network services | 85% | 15% |
| Intent-based assurance is the logical evolution of linking assurance to intent-based networking | 87% | 13% |
| Already implemented/plan to implement intent-based networking, which uses business intent of services/networks for the creation of policies and KPIs that can respond automatically to changes in network performance | 84% | 16% |
| Already have/plan to implement intent-based assurance | 80% | 20% |

Tier 2/3 (n=63)

| Responses | Agree | Disagree |
|---|-------|----------|
| Intent-based assurance will positively impact customer experience of network services | 87% | 13% |
| Intent-based assurance is the logical evolution of linking assurance to intent-based networking | 84% | 16% |
| Already implemented/plan to implement intent-based networking, which uses business intent of services/networks for the creation of policies and KPIs that can respond automatically to changes in network performance | 78% | 22% |
| Already have/plan to implement intent-based assurance | 65% | 35% |

Source: Heavy Reading

Conclusion

Tier 1 and Tier 2/3 survey respondents are closely aligned on the benefits of intent-based assurance. Both groups agreed that intent-based assurance would positively impact customer experience (Tier 1 = 85%, Tier 2/3 = 87%) and that intent-based assurance represented the logical evolution of linking assurance to intent-based networking (Tier 1 = 87%, Tier 2/3 = 84%). Tier 1 respondents were somewhat ahead in the intent-based assurance planning/implementation phase (Tier 1 = 80%, Tier 2/3 = 65%).