REPORT

Industry survey on Open RAN adoption

aspire Perfecting Networks

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Executive Summary

The opening of the radio access network, often referred to as Open RAN, is the concept that software and hardware interfaces within cellular wireless networks can be open and interoperable. This is an area of interest for wireless operators because it offers many potential benefits in terms of network management, cost savings and helps foster innovation and differentiation in a multi-vendor ecosystem.

Although Open RAN presents new opportunities for operators, there are many different timelines and deployment models for the technology, which is still in its infancy. These differing timelines are due to a variety of factors – from how the networks are planned to operator business goals.

Mobile World Live together with Aspire Technology conducted an online survey of mobile network operators, mobile virtual network operators (MVNOs), hardware companies, software companies, system integrators and tower companies to understand the industry's views on deploying Open RAN reference architecture and some of the challenges to migrating to this new technology. This survey confirmed the industry's interest in Open RAN but also revealed that there are some concerns about the maturity of the technology and its readiness for deployment.

Key Findings

The industry wants more information on Open RAN: Nearly half (44%) of respondents say they are familiar with Open RAN but need to learn more about the technology. And another 23% say they are not familiar with Open RAN at all.

Industry players are divided on implementing Open RAN. While 40% of respondents said they plan to deploy Open RAN in the next 12 months to two years, another 40% said they have no plans to deploy the technology. Interestingly, when we looked solely at the survey response from network operators, we see that network operators are more bullish on open RAN implementation than the rest. 27% of our network operator respondents said that they plan to implement Open RAN in the next 12 months.

Capex and opex savings are considered key to Open RAN deployments. Savings in capital expenditures (capex) was rated the No. 1 consideration for adopting Open RAN followed by savings in operational expenses (opex).

Open RAN is considered significant to enterprise deployments and rural coverage. When asked to rank the main use cases for deploying Open RAN, respondents ranked enterprise No. 1 followed by rural coverage.

Open RAN viewed as not yet ready for large-scale deployment. Only 6% of respondents said that they believe Open RAN technology is currently ready for large-scale deployments. The majority (35%), said that they believe it will be ready in two to five years.

Integration and lack of maturity are two areas of concern with Open RAN. One of the benefits of Open RAN is that it offers the potential to use multiple vendors. However, this can be challenge when a problem arises because it may be difficult to isolate and identify the cause of the problem. System integration was identified by respondents as the biggest concern when deploying Open RAN followed by the technology not being mature enough for commercial deployment.

Specialized systems integrators will handle integration and support. Because of concerns about system integration, 33% of respondents said that they believe specialized systems integrators will be hired to handle integration issues. Another 26% said that global systems integrators will be hired to handle those integration challenges. However, when we looked only at the survey response from network operators, we found that 24% of operators believe that integration will be handled by operator technical staff and 30% of operators think it will be handled by specialized systems integrators. Similarly, when we looked at the response from operators about who will handle the support of Open RAN in the network, we found that 27% said that operator technical staff will handle support and 24% said they believed specialized systems integrators will handle support.

Survey Methodology

This report is based on responses from an online survey of 370 participants including mobile operators, fixed line operators, MVNOs, and hardware and software vendors conducted by *Mobile World Live* on behalf of Aspire Technology.

The largest group of respondents (29%) are in the "other" category. This group comprises a variety of mobile industry professionals in areas such as site acquisition, testing and consulting. Mobile operators made up the next largest group with 26% of survey participants. The mobile operator group was divided between mobile operators with revenues of more than US$10 billion (13%) and mobile operators with revenues of less than US$10 billion (13%). Hardware vendors made up 18% of survey participants followed by software vendors at 13%. System integrators accounted for 9% of respondents and MVNOs made up 3% of the group. The smallest category was the tower company/neutral host group with just 2% of results.

Geographically, the largest group of respondents (41%) were from companies with headquarters in Europe, followed by Asia (26%) and North America (21%). The rest of respondents were from the Middle East (5%), South America (4%) and Africa (3%).

Introduction

Mobile network operators have historically built wireless networks that rely upon highly specialized radio and networking equipment that is integrated with proprietary software. And while these types of deployments have worked well in the past, in the 5G era this network scenario is costly and constraining for operators, which is why many are considering shifting to a standards-based, software centric Open RAN network. And because 5G requires them to upgrade or switch out their existing RAN, many are using 5G as an opportunity to consider Open RAN.

But Open RAN deployments are still a rarity. According to consulting firm Deloitte, as of October 2020 there were only about 35 active Open RAN deployments around the world, many of which involved testing of Open RAN technology in greenfield, rural and emerging markets. However, the consulting firm also estimates that number could double this year and that Open RAN will accelerate rapidly in the next three to five years.

The reason many believe that Open RAN's momentum is growing is because many operators have talked publicly about Open RAN and signaled their interest in the technology. In addition, rising deployment costs have made migrating to an Open RAN architecture more appealing.

In fact, ABI Research expects Open RAN radio units for public outdoor macrocell networks will become a $69.5 billion market by 2030, with cumulative unit shipments reaching 15.7 million. ABI also predicts that the enterprise indoor small cell market for Open RAN will be large and reach $39.8 billion by 2030 with cumulative unit shipments topping 205.5 million.

This report assesses the level of interest mobile network operators have in Open RAN and also the perceived challenges and the expected timeline for deployment.

Open RAN deployment timelines vary

Open RAN is still a fairly new concept in the telecom world and that is likely the reason there is a large percentage of survey takers that said they have no plans to deploy the technology and also explains why those that are planning to deploy the technology are doing so on such different timelines.

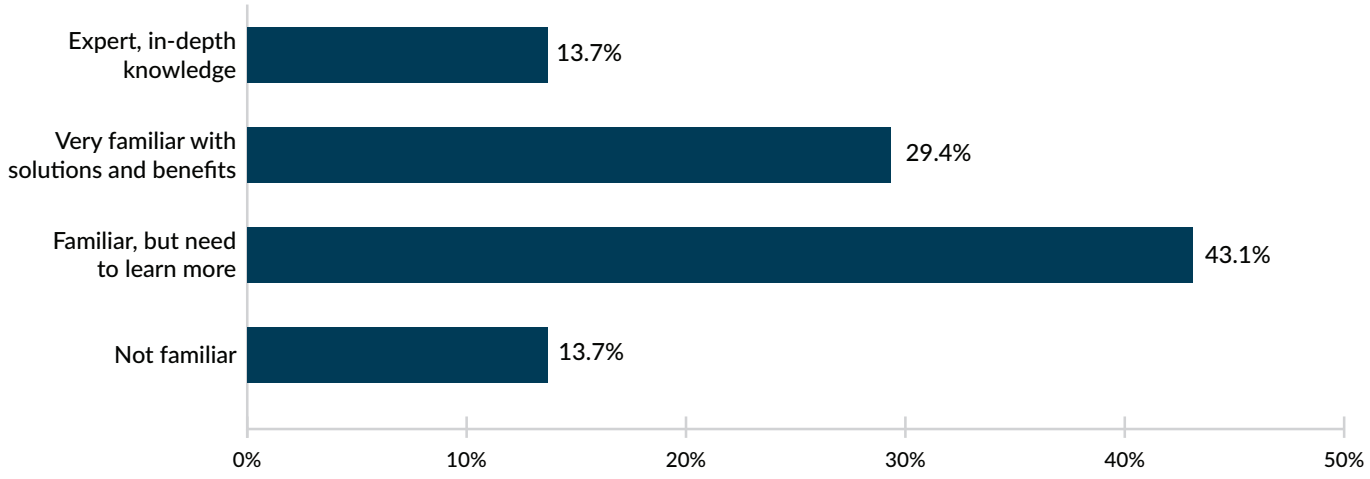
The Telecom Infra Project was launched in 2016 and the O-RAN Alliance was formed a few years later in 2018. Both these groups were created with the intention of bringing together a community of operators, vendors and others that would accelerate the development of Open RAN. However, it's clear that Open RAN is still a rather new concept for many in the telecom world and perhaps more education on the topic is necessary. The majority of survey respondents (44%) admitted that while they are familiar with Open RAN they need to learn more about the technology. Only 7% of survey respondents said that they had an in-depth knowledge of the subject and 25% said that they were very familiar with Open RAN solutions and benefits.

Thanks to the efforts of TIP and the O-RAN Alliance, there has been considerable progress with Open RAN, particularly among greenfield operators like Rakuten in Japan and in rural markets around the world. Nevertheless, the industry remains very divided on Open RAN. In fact, 40% of survey respondents said that they have no plans to implement Open RAN at this time.

But 18% of participants said they expect to deploy the technology in the next 12 months and another 22% said they will deploy Open RAN within the next 2 years.

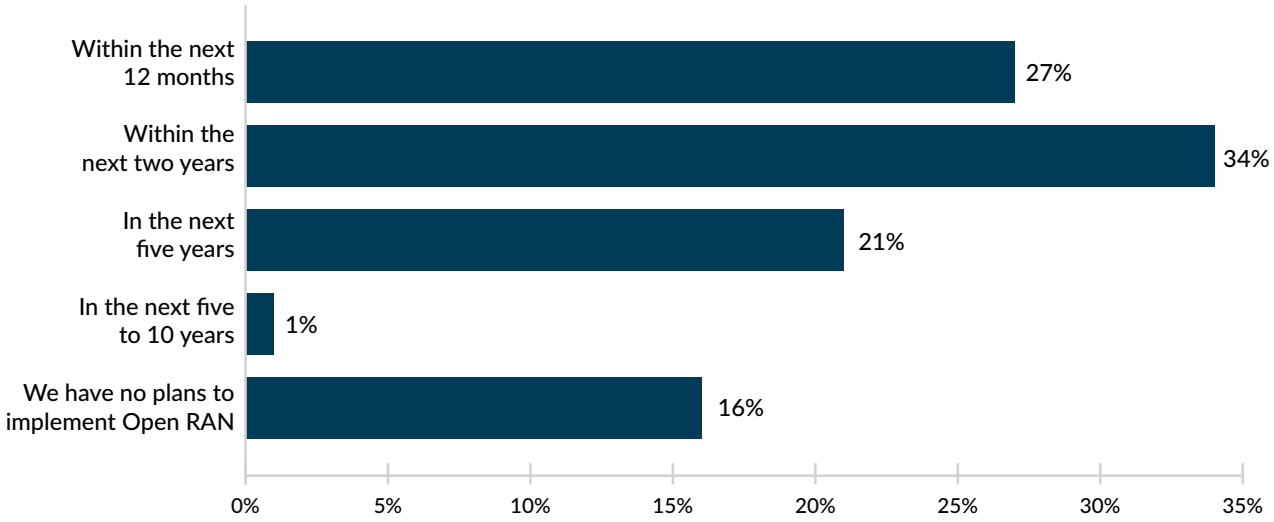
Operator View: When we looked at the results from just our operator respondents, we found a much more bullish outlook on Open RAN. 27% of our network operator respondents said that they plan to implement Open RAN in the next 12 months and 34% said they plan to implement Open RAN in the next two years. Only 16% of our operator respondents said they had no plans to deploy Open RAN.

Figure 1: How familiar are you with Open RAN?



Percentages based on Mobile Network Operator respondents only.

Figure 2: When do you plan to implement Open RAN?



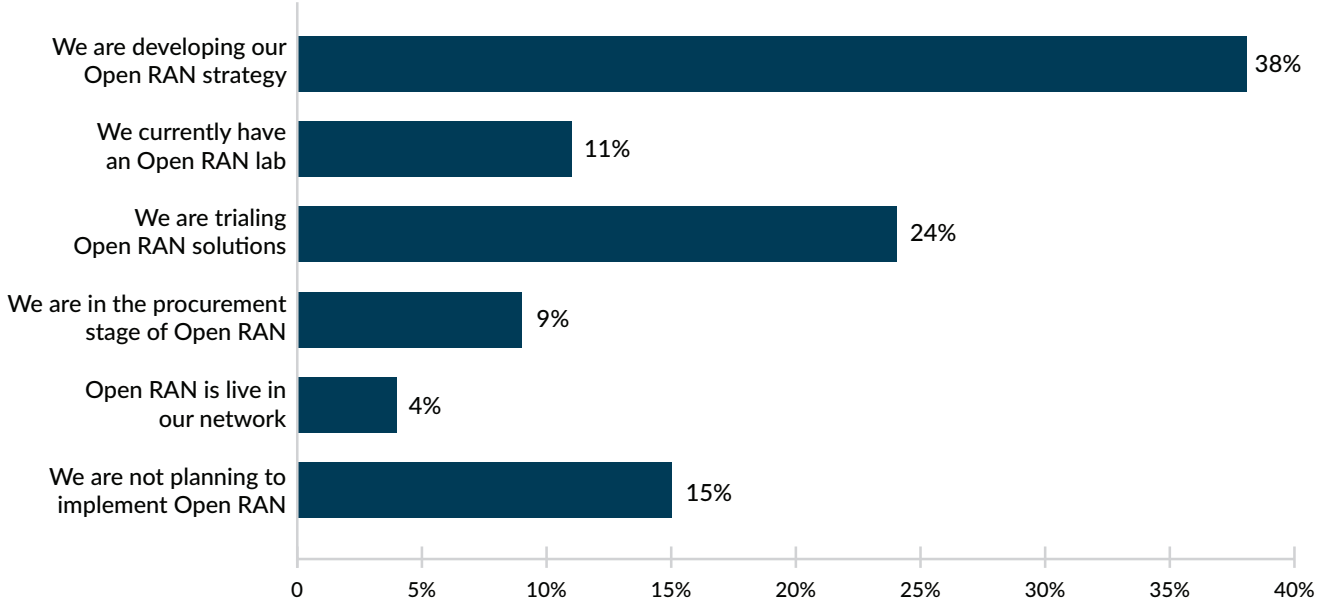
Percentages based on Mobile Network Operator respondents only.

The deployment timeline is further out for some survey participants. 15% said that they will deploy Open RAN in the next five years and 5% said that they will implement Open RAN in five to 10 years.

When asked about their company's Open RAN implementation plans, it is also important to note that 40% of respondents have no plans to deploy Open RAN (which is consistent with our findings in Figure 2).

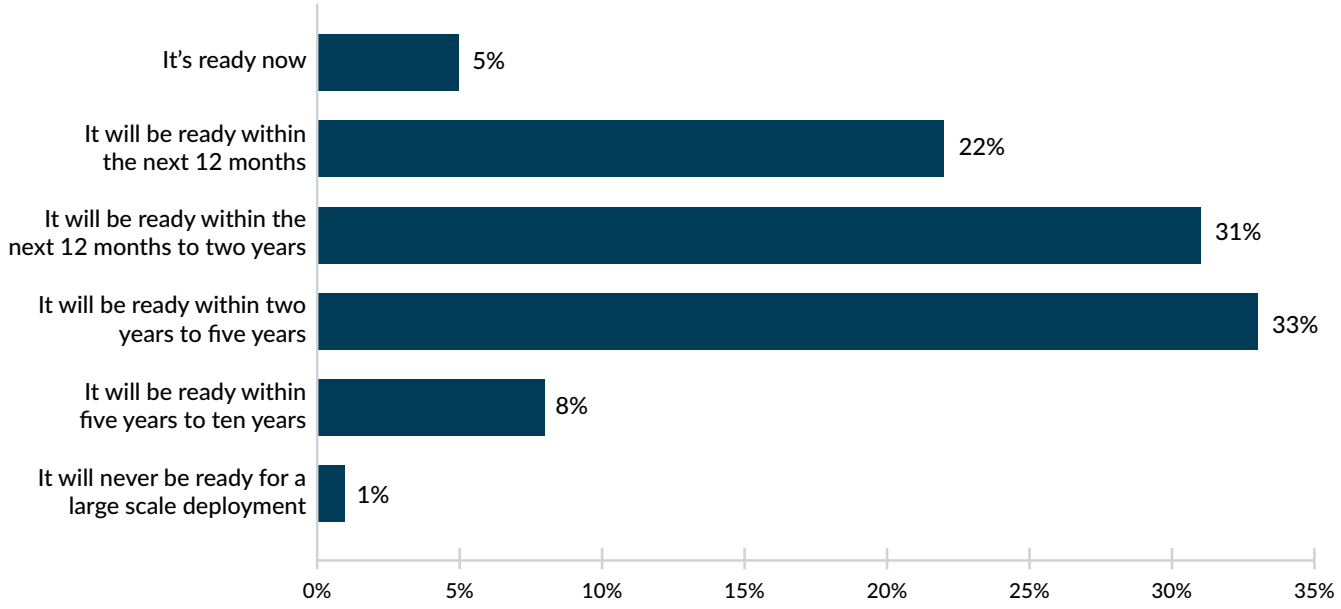
But of those that are planning to implement Open RAN, we learned that only 3% have Open RAN live in their network. However, 24% said that they are in the process of developing their Open RAN strategy and 19% said that they are involved in trials of the technology. Interestingly, 9% of respondents said that they currently have an Open RAN lab and 5% said that they are in the procurement stage of Open RAN.

Figure 3: How would you describe your company's stage in the Open RAN implementation?



Percentages based on Mobile Network Operator respondents only.

Figure 4: When do you think Open RAN technology will be ready for large-scale deployment?



Percentages based on Mobile Network Operator respondents only.

Most respondents to our study believe that Open RAN technology is still a work in progress when it comes to large-scale deployment of the technology. Two-thirds of respondents said that the technology will be ready in the future — 35% said that Open RAN will be ready within two years to five years and 31% said that it will be ready within the next 12 months to 2 years. Another 18% said that Open RAN will be ready in the next 12 months.

Only 6% believe Open RAN is ready for large-scale deployment today and 8% said it will be ready in five to 10 years. About 2% said it will never be ready for large-scale deployments.

Interestingly, one common theme throughout our survey is that participants have concerns about Open RAN's commercial readiness.

When asked what are the biggest concerns to deploying Open RAN, survey participants ranked system integration as the No. 1 issue and the No. 2 issue is that the technology is not mature or ready for commercial deployment.

Other top concerns revolve around costs. Survey participants said that No. 3 on their list is that the total cost of ownership is unclear and No. 4 is that the operational impact to the network is uncertain.

Survey respondents didn't seem as concerned about performance benefits of Open RAN, nor did they have issues with dealing with new suppliers or vendors.

Figure 5: What is your biggest concern when it comes to deploying Open RAN

1. System integration
2. Technology is not mature/ ready for commercial deployment
3. The total cost of ownership (TCO) is unclear
4. The operational impact to the network is uncertain
5. Too much complexity
6. The performance benefits are uncertain
7. We would have to deal with new vendors and suppliers

Drivers for Open RAN adoption

Open RAN standards have been championed for their ability to provide more competition in the market, improve network innovation and differentiation and reduce equipment costs. In our survey, we found that cost was a big factor when considering Open RAN. In fact, the top two reasons respondents gave for adopting Open RAN is that it offers cost savings – both in terms of capital expenditures and operating expenditures.

One of the downsides of sticking with traditional RAN deployment models is that a network operator is stuck with one RAN vendor's products and roadmap. Survey participants indicated that the Open RAN model, which allows for multiple vendors, is the third most important reason for moving to Open RAN because it allows them more flexibility in being able to select different equipment and software.

Using off-the-shelf hardware and virtualized network functions ranked in the middle at No. 4 in the list of reasons for moving to Open RAN. And driving innovation and offering new applications was No. 5. The least popular reason for considering Open RAN was to implement bespoke automation and artificial intelligence for network management.

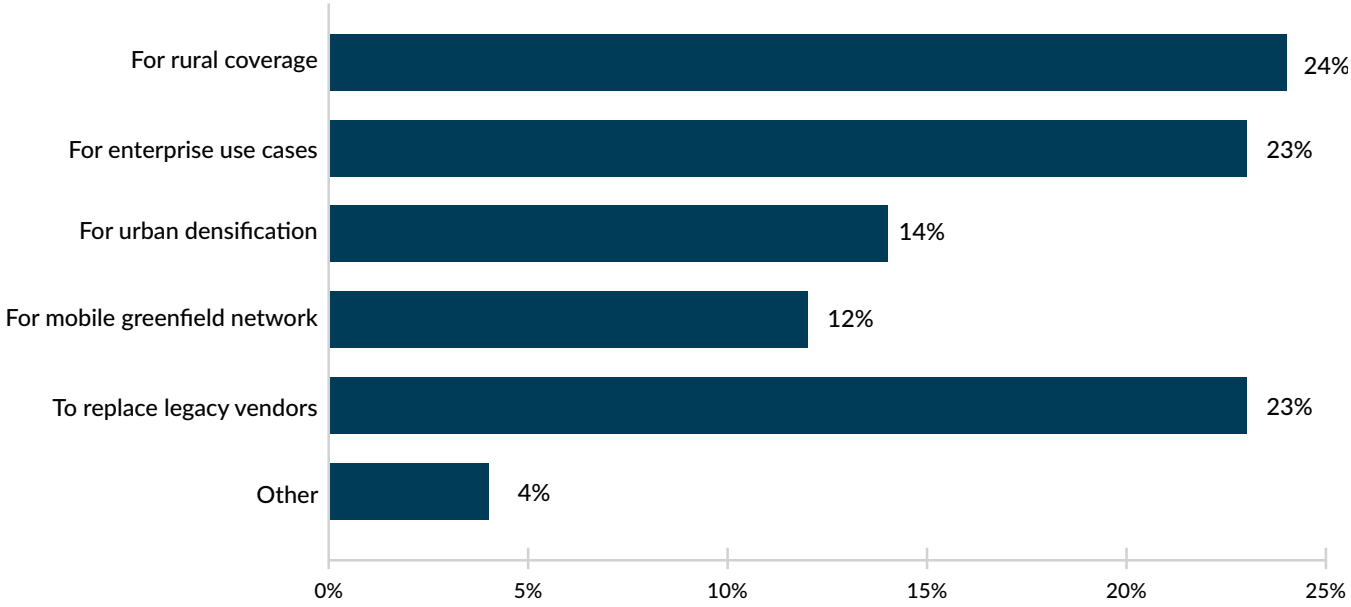
Figure 6: The most important considerations for adoption of Open RAN

1. To provide capex savings
2. To provide opex savings
3. To have flexibility in vendor selection for various RAN components
4. To use off-the-shelf hardware and virtualized network functions
5. To drive innovation and new applications/features
6. To implement bespoke automation and artificial intelligence for network management

Most survey respondents (26%) said that the No. 1 use case for Open RAN is in enterprise deployments, such as in-building or in an enterprise private wireless network. Rural markets are also considered a prime area for deploying Open RAN. Survey participants ranked rural coverage as the No. 2 use case (22%) because operators typically don't want to make large investments in markets where there is less usage because they are less profitable.

Replacing legacy vendors ranked No. 3 (21%), just slightly lower than rural coverage, indicating that survey respondents believe that some operators may move to Open RAN to replace their existing vendors. The two least popular use cases for Open RAN were to use it in a mobile greenfield network (16%) and for urban densification (11%).

Figure 7: What is the main use case for deploying Open RAN in your network?



Percentages based on Mobile Network Operator respondents only.

Interestingly, some survey participants wrote in other use cases that they believe are suitable for Open RAN including for resource sharing (i.e., network sharing) and in a neutral host deployment.

When asked to rank technologies that survey participants believe Open RAN must support, the No. 1 answer was 5G, followed by 4G. Not surprisingly, the least important technology to support, according to respondents, is 2G.

Figure 8: Which technologies are important for you to support for Open RAN?

	Most important				Least important
5G	49%	30%	4%	17%	0%
4G	24%	38%	34%	3%	0%
6G	13%	10%	29%	14%	33%
3G	1%	18%	14%	48%	19%
2G	12%	4%	18%	18%	48%

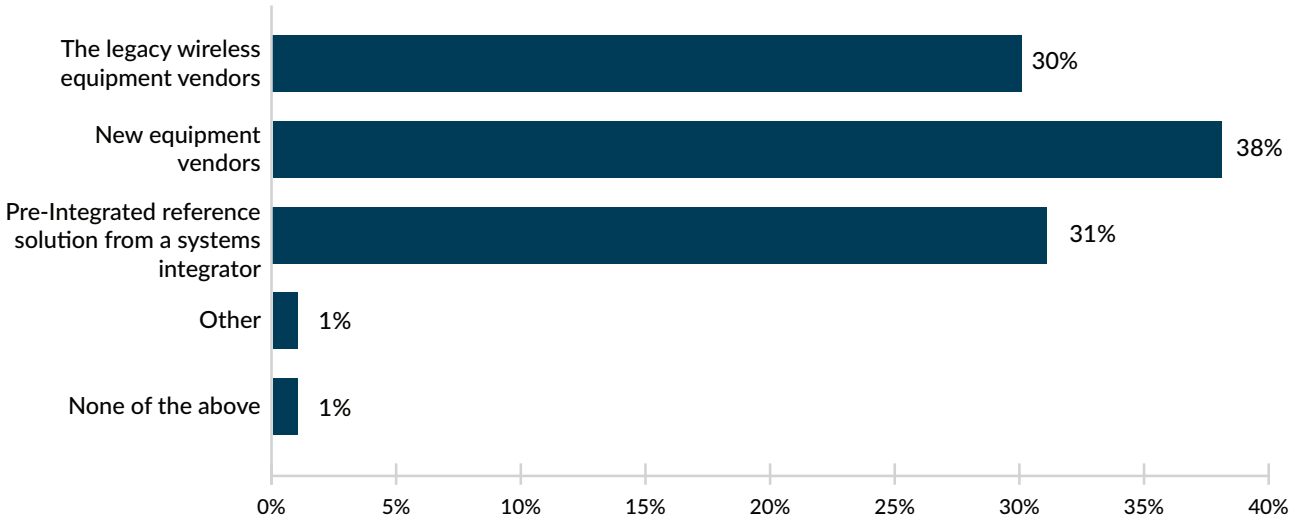
Percentages based on Mobile Network Operator respondents only.

Vendor selection is key

Because Open RAN embraces two new network concepts — virtualization and openness —it is viewed with some skepticism in the market. And that makes it particularly critical for operators to select the right vendors for their Open RAN deployments.

When asked what type of vendors survey participants will select to help them migrate to Open RAN, the No. 1 response was split between new equipment vendors (34%) and pre-integrated reference solution from a systems integrator (34%). However, a large percentage of respondents also said they would stick with legacy wireless equipment vendors (26%).

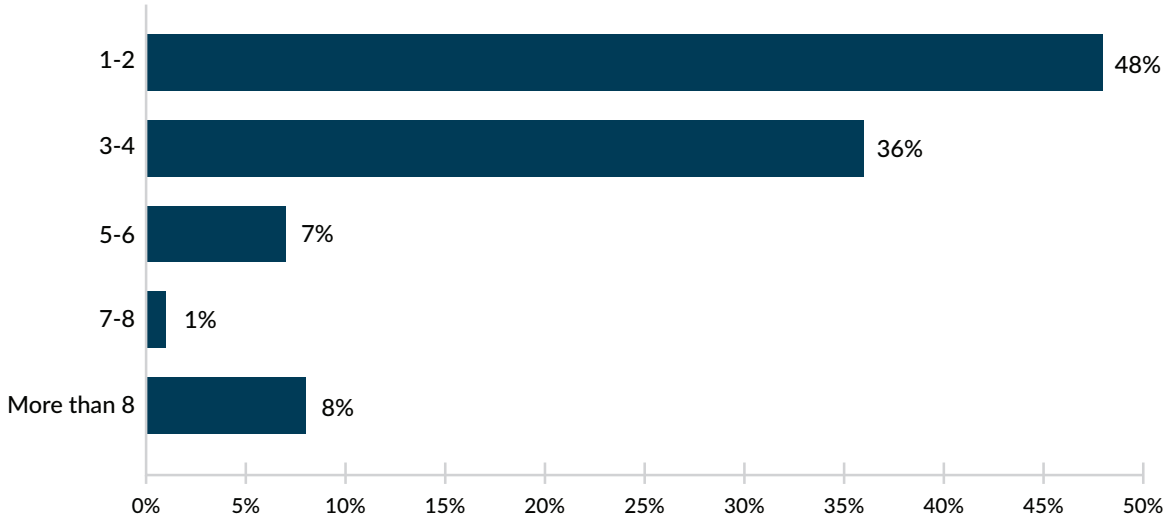
Figure 9: Which type of vendors do you plan to select to help you migrate to Open RAN technology?



Percentages based on Mobile Network Operator respondents only.

In the traditional RAN environment, most large operators typically select more than one RAN vendor for their network deployments. Although with Open RAN that tradition will likely continue, 87% respondents said that they will use four or fewer vendors for their deployment.

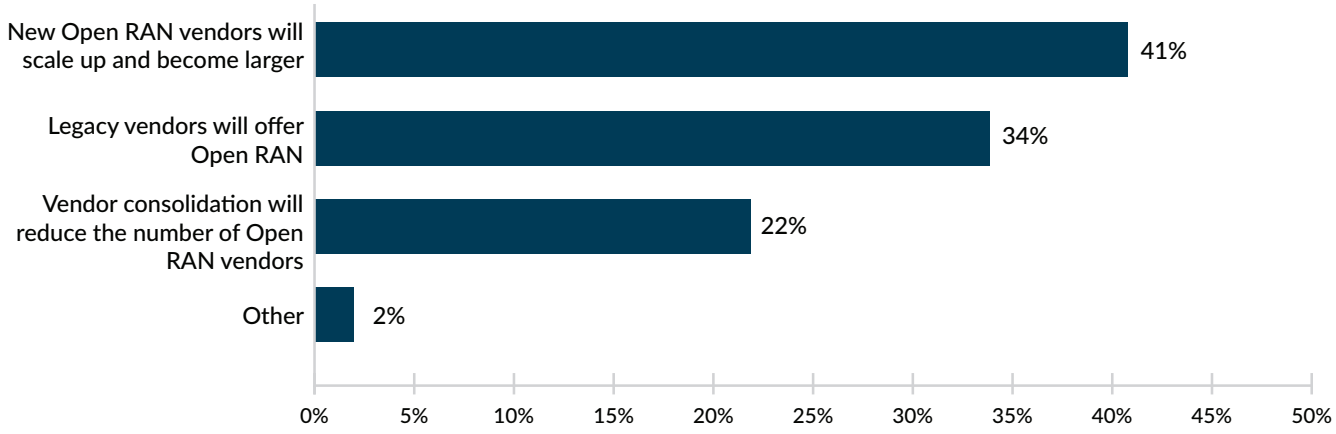
Figure 10: How many Open RAN vendors will you use in your deployment?



Percentages based on Mobile Network Operator respondents only.

Of those that responded to our question about what the Open RAN vendor landscape will look like in five years, 36% predicted that new Open RAN vendors will become larger while 32% said that legacy vendors will offer Open RAN and 30% predicted that vendor consolidation will reduce the number of Open RAN vendors.

Figure 11: What will the Open RAN vendor landscape look like in five years?



Percentages based on Mobile Network Operator respondents only.

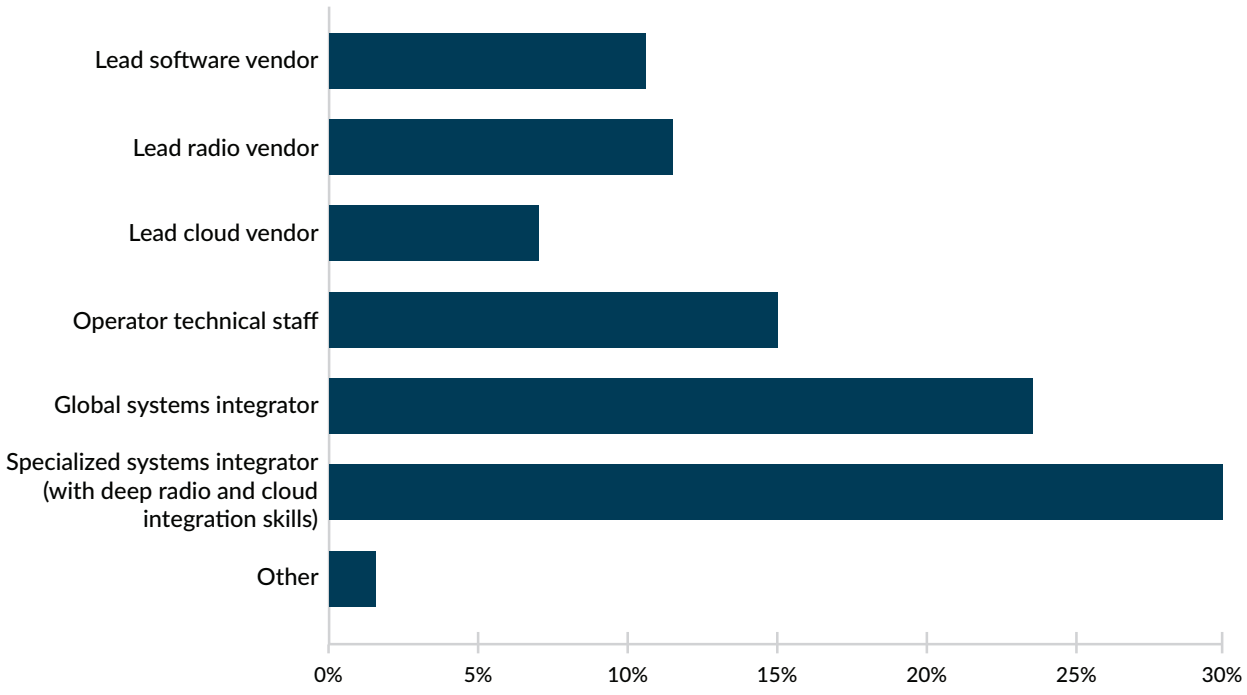
Specialized integrators will play a critical role

One potential challenge to deploying an Open RAN architecture while using software and hardware from different vendors is that it will be critical to ensure that those various components are interoperable and optimized. Many envision this task will fall to a systems integrator, making these types of companies a critical part of the move to Open RAN.

When asked who will handle the integration of Open RAN in the network, the majority of survey participants (33%) said that specialized systems integrators with deep radio and cloud integration skills will take on this task and another 26% said that the job will be handled by a global systems integrator. Only 12% of respondents said this job would be handled by the operator's technical team.

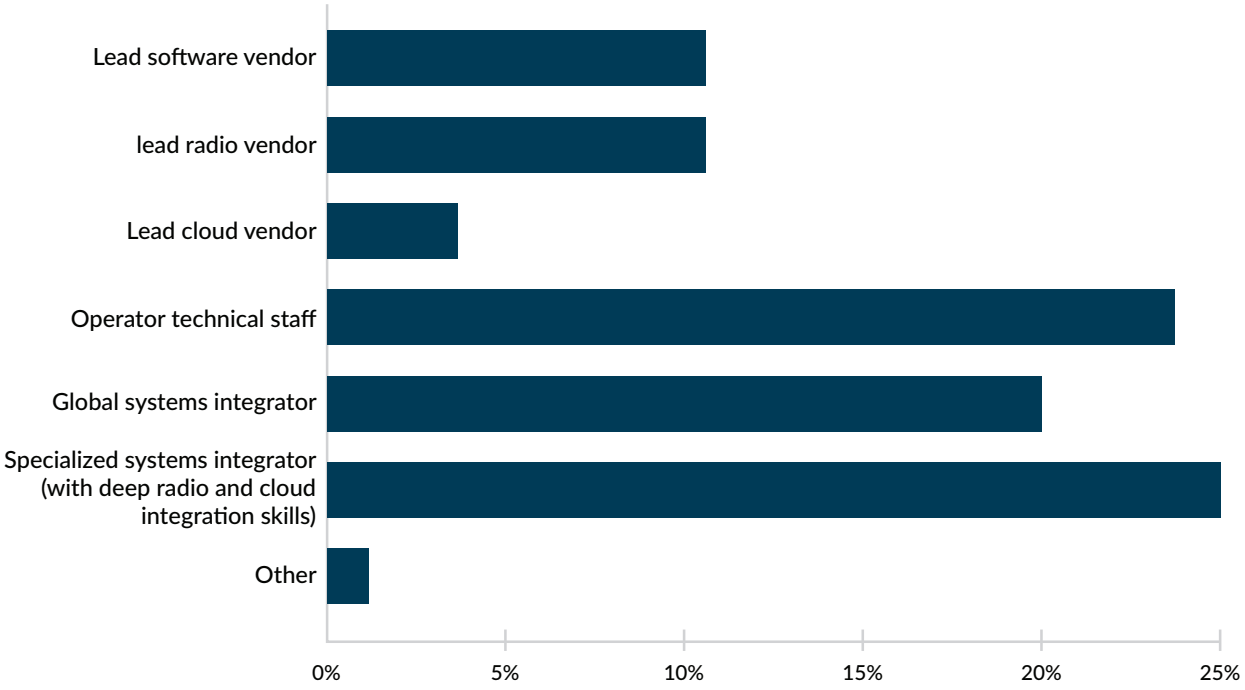
Operator View: When we looked solely at the results from our operator survey respondents we found that operators are much more confident in their technical team's ability to handle the integration of Open RAN. 24% of operator participants said that integration would be handled by the operator's technical team and 30% said integration will be handled by specialized system integrators. Only 9% of operators said that integration will be handled by global systems integrators.

Figure 12: Who will handle the integration of Open RAN in the network?



According to our survey, only 11% of respondents thought the lead radio vendor would handle integration tasks and only 10% thought that the lead software vendor would handle this. A mere 6% said that the lead cloud vendor would handle integration.

Figure 13: Who will handle the support of Open RAN in the network?



When asked who will handle support of the Open RAN in the network, the majority of respondents (25%) said that specialized systems integrators would handle the task. However, 24% thought that the operator's technical staff would perform that role, which is higher than the number who thought the operator's technical team (Figure 12) would help with integration. Another 21% said that they believed a global systems integrator would handle the Open RAN support.

It's likely that support of the Open RAN network will change as there will be more specialized vendors involved in Open RAN as compared to the past when a single vendor handled the integration and support of the RAN network. The role of specialized systems integrators and global system integrations is to provide a single interface for support for service providers and manage the service level agreements.

Operator View: Operator survey respondents were also more confident in their technical team's ability to handle the support of Open RAN in the network. When we looked solely at our operator responses to the survey questions, we found that 27% said that the operator technical teams will handle support for Open RAN, 24% said that it will be handled by specialized systems integrators with deep radio integration skills and 20% said it will be handled by the lead radio vendor. Only 9% said that support will be handled by global systems integrators.

Conclusion

Momentum around Open RAN is growing as operators realize the potential the technology offers in terms of cost savings, innovation, flexibility and time-to-market. While Open RAN is still relatively new, the ecosystem is coming together through experimentation, partnerships, trials and some early deployments.

Many service providers are developing their strategy for the adoption of this technology, however some still have doubts about Open RAN's current readiness for commercial deployment and the technology's ability to handle large-scale deployments.

Open RAN is viewed as having great potential for use in enterprise and private cellular networks, but also to replace existing networks because of the lower costs associated with the technology. 5G and 4G are the main technologies in focus due to network investment cycles; 2G and 3G are considered less important in the context of Open RAN as some of these networks are being phased out.

While Open RAN is praised for replacing proprietary interfaces with standards-based solutions and opening up the market to new and innovative suppliers, it also brings up questions about how various components of the network will work together seamlessly and who will the service provider call on if there are issues?

The role of network infrastructure vendors, system integrators and the service providers' technical staff is therefore key and changing with Open RAN. New Open RAN vendors are expected to become larger and legacy vendors will open interfaces and support Open RAN standards, but also service providers consider pre-integrated solutions as viable options to introduce the technology. Furthermore, Specialist System Integrators like Aspire with deep radio and cloud integration, testing, verification and network wide services skills are expected to take on a more prominent role in end-to-end integration and network support.

aspire Perfecting Networks

Aspire Technology is a leading Specialized System Integrator with a long history and experience in Mobile and Telco, and Open RAN since its early days.

Aspire is well established within the Open RAN ecosystem, with their Open RAN Lab services and projects for a wide range of Global Service Providers, network infrastructure vendors and Open RAN communities such as Telecom Infra Project, but also more recently with specialized integration, testing and verification services for Global Systems Integrators.

The Aspire Open RAN Lab enables technology partners and service providers to fast-track development, integration, benchmarking, testing and deployment of Open RAN based networks and solutions.

Aspire has been actively contributing to acceleration of time to market, reduction of deployment cost and improvement of multi-vendor interoperability and network performance. Aspire is also supporting service providers in transforming their traditional operational model and adopting open source frameworks such as TOGAF and platforms for orchestration, management, and automation of network and edge computing services such as Open Network Automation Platform (ONAP) and Service Management and Orchestration (SMO) solutions.

Open RAN is already making its mark on the wireless industry and the overall vendor eco-system, the next 12 months will be critical for the technology's widespread and overall success.

Find out more www.aspiretechnology.com

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