



Creating new telco opportunities with open RAN

Unlocking a new world of possibilities

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INTRODUCTION

UNLOCKING A NEW WORLD OF POSSIBILITIES

SUPPORTERS SPEAK

“This approach [Open RAN] offers numerous benefits, including increased choice, enhanced energy efficiency, higher network capacity and improved performance for customers.”

– Santiago Tenorio, Vodafone’s Director of Network Architecture

“The projects we’re backing today with £88 million in government research and development investment will use innovative Open RAN solutions to make our mobile networks more adaptable and resilient, with future-proofed technology to support bringing lightning-fast connections across the country for many years to come.”

– Sir John Whittingdale, UK Minister for Data and Digital Infrastructure

“Beyond the flexibility it will bring, Open RAN will evolve the vendor ecosystem and revolutionize the current 5G industry in the medium to long term. And we are convinced that this is good for our customers and for society, so we are making it happen.”

– Enrique Blanco, Global CTIO, Telefónica SA

The open radio access network (RAN) is finally gathering momentum now with several major communications service providers (CSPs) making significant investments and committing to adopting the technology.

Late last year, U.S. service provider AT&T awarded a mega \$14 billion open RAN deal to Ericsson, providing a much-needed impetus to open RAN technology. Meanwhile, the UK’s Vodafone Group is targeting to move 30% of its base stations in Europe to open RAN by 2030. Deutsche Telekom, Orange and Telefonica are some of the other CSPs that have committed to the development of the open RAN ecosystem. These initiatives follow greenfield deployments by U.S. operator Dish Network and Japan’s Rakuten.

An innovative approach, open RAN is designed to improve network flexibility, foster innovation, bring down capital and operational expenses and allow CSPs to work with a diverse set of vendors. It promotes the use of open and interoperable interfaces, which enable service providers to use components from different vendors.

The open RAN approach nurtures a more diverse

vendor ecosystem, thus encouraging innovation in contrast to the traditional walled garden approach.

Setting the stage

Open RAN offers multiple benefits to operators, including more easily exposing network application programming interfaces (APIs) to developers. This sets the stage for network monetization since developers can deliver new applications that operators may sell to enterprise customers or even to consumers.

In addition, by disaggregating hardware and software, open RAN allows operators to use automation to manage network elements with less operational complexity than a traditional network. One example could be using automation to power down radios when not in use, which enables energy efficiency.

The movement towards open RAN has been in the works for several years now. However, the lack of mature standards and commitment from the service providers meant that there were very few deployments initially.

Now the market forces are aligned in favor of open RAN. In addition, the success of early adopters like

Japan's Rakuten, which launched commercial 4G and 5G services based on open RAN, has provided a much-needed reference point to the industry.

Support for open RAN

Apart from the investment from service providers, the support from several governments also adds to the momentum. Earlier this year, the U.S. National Telecommunications and Information Administration (NTIA) announced \$420 million in funding to promote open RAN as part of its \$1.5 billion Wireless Innovation Fund, a 10-year program designed to jumpstart new ways to build open and interoperable wireless networks. In addition, the UK government earmarked £88 million for research and development of open RAN solutions.

In this report, we'll cover the key benefits and opportunities offered by open RAN as the industry moves from initial hesitation to more robust adoption. In addition, our report includes perspectives from both the service providers as well as vendors on the challenges in transitioning from traditional to open RAN-based networks.

This report is written by Fierce Network Research's team: Gagandeep Kaur, Consulting Analyst, and edited by Martha de Grasse, Consulting Editor, and Elizabeth Coyne, Editor in Chief.



Open RAN, O-RAN and open RAN

The distinction between “Open RAN” and “open RAN” lies primarily in the use of capitalization and its implication within the communications industry. “Open RAN” or “O-RAN” typically refers to the O-RAN Alliance, a group of telecom operators, vendors and research bodies that collaborate to promote the development and deployment of open, interoperable and software-based RAN technologies. The O-RAN Alliance is highly focused on creating a multi-vendor ecosystem where equipment from different manufacturers can work together seamlessly, fostering competition, innovation, and cost reduction in the telecom industry.

On the other hand, “open RAN” (lowercase “open”) refers more broadly to the concept or philosophy of using open, interoperable standards in RAN infrastructure. This approach aims to move away from traditional RAN architectures that rely on proprietary hardware and software from a single vendor. By using open standards, operators have the flexibility to mix and match components from different vendors, enabling more innovation and driving down costs. Open RAN as a concept is not confined to the efforts of any one organization but is supported by various entities, including telecom operators and global standard bodies like the O-RAN Alliance.

Both O-RAN and open RAN focus on disaggregating traditional RAN infrastructure, but the distinction in terminology is key for understanding whether the reference is to a specific organizational effort or a broader industry concept.



Open RAN benefits

Growing support from several prominent global CSPs coupled with demonstrable benefits is driving the global growth of open RAN.

Significant cost savings: Unlike a traditional RAN setup, open RAN allows CSPs to use network components from different vendors, which offers cost advantages and avoids vendor lock-in. Vendor diversity brings bargaining power and boosts competition. With open standards, the use of commercial off-the-shelf servers (COTS) also helps reduce capex, while network automation reduces opex. According to a 2022 report by Analysys Mason, open RAN could deliver up to 30% savings in total cost of ownership (TCO) for operators with the right platform strategy and skill sets.

Energy efficiency: Open RAN implementations offer an opportunity to enhance energy efficiency compared

with traditional RAN. With the use of artificial intelligence (AI) and automation, open RAN enables flexible power management and lower energy consumption.

Rapid innovation: Proprietary RAN systems can be slow to evolve, as innovation is driven by the roadmap of the few dominant vendors. On the other hand, open RAN allows a greater number of vendors and developers to create solutions, thus ensuring more innovation. The presence of several vendors in the system promotes collaboration and the development of new features and services.

Reduced time-to-market for new services: A traditional RAN system often requires more time to issue network updates because of hardware changes. On the other hand, software-defined flexibility in open RAN makes it easier for telcos to roll out new features or services. While traditional RAN vendors do have the ability to quickly add new features and capabilities, they are not necessarily open. Open RAN allows CSPs to skip lengthy hardware development and deployment cycles and accelerate innovation, leading to faster introduction of new services to the market.

Cloud-native operations: The option for cloud-native operations allows the telcos to scale the network up and down as required. This is crucial as it enables them to cost-effectively meet the growing consumer demand without investing in new infrastructure.



An open RAN timeline

In 2016, CSPs that had been suffering for years because of vendor lock-in turned their focus to developing open interfaces to reduce costs, boost innovation and bring down their dependency on a few traditional RAN vendors. This timeline showcases the milestones of their efforts.

2016	2018	2019	2020	2021	2022	2023	2024
Facebook formed Telecom Infra Project (TIP) to accelerate adoption of open interfaces in networks	AT&T, Deutsche Telekom, China Mobile, NTT DOCOMO and Orange formed O-RAN Alliance	Japan's Rakuten built the world's first virtualized open RAN greenfield 4G network	Open RAN Policy Coalition launched to expedite policy development GSMA and O-RAN Alliance joined to fast-track the adoption of open RAN Nokia and Samsung announced the availability of open RAN products	Ericsson announced the availability of open RAN products	The U.S. \$280B CHIPS and Science Act allocated \$1.5B for open and interoperable wireless networks Dish Network launched U.S. commercial services using open RAN Vodafone said 30% of its European network to run on open RAN by 2030	AT&T and Ericsson ink 5-year open RAN deal	U.S. earmarked \$42 million for development of 5G open RAN ecosystem

Even though there is a growing recognition of the vast benefits offered by open RAN, the journey has not been without obstacles. For the movement to be a success, CSPs still need to address several challenges, including network complexity and security issues.

Security

The involvement of multiple vendors potentially leads to diminished security of the systems. According to [Strand Consult](#), open RAN presents significant new risks because of the introduction of multiple vendors, components and interfaces, each with different grades of security, quality and product development.

The [European Union](#) also flagged risks in open RAN related to the introduction of new vendors, interfaces and components, loss of control for network operators and lack of maturity of technical specifications and products.

"It's going to sound silly, but keeping your equipment updated and upgraded to the latest and greatest in terms of security is crucial. Because quite frankly, we see a lot of customers, who put something in and it just sits there for years," said Rimma Iontel, chief architect, Global Telco Team, Red Hat.

Ensuring accountability

With the presence of multiple vendors in the system, CSPs are likely to face the challenge of identifying and rectifying

issues in case of a network-related problem. It is easier for vendors to pass off the blame to other vendors for interoperability issues in open RAN, whereas in a traditional RAN, operators often have one vendor to hold accountable.

"Interoperability and trying to figure out in operations which vendor owns the root cause analysis and which vendor is responsible for that particular software patch or fixing the issue actually becomes paramount," Vikram Prasad, head of program and client solutions at Amdocs, told Fierce Network Research. "This is the biggest challenge that we have seen on the services side when it comes to putting the open RAN systems in place."

"Interoperability and figuring out which vendor owns the root cause analysis and which vendor is responsible for that particular software patch or fixing the issue becomes paramount."

– Vikram Prasad, Head of Program and Client Solutions at Amdocs

Integration

Because an open RAN system depends on components from various vendors for hardware and software, integration between the equipment can be a challenge. A lot of new open RAN vendors are entering the market. It is argued that there will be an increase in interoperability testing of their solutions to ensure the same level of reliability that is seen with traditional RAN systems.

"The same thing that makes open RAN good for service providers also makes it challenging because you have so many choices and you have to make sure everything is interoperable," Iontel said.

Network monitoring and management

The involvement of multiple vendors and network disaggregation can increase operational complexity, making network monitoring difficult.

"Major manufacturers remain conservative about introducing open RAN-based interfaces to legacy RAN equipment," Minsoo Na, director and head of 6G R&D at SK Telecom, said. "This necessitates the development of a separate management server [EMS] to manage network equipment [DU, RU] from multiple manufacturers simultaneously. This could complicate management and operation in comparison to using equipment from a single manufacturer."

It is widely accepted in the industry that the deployment of open RAN in a brownfield network scenario is more challenging than in a greenfield network.

Greenfield vs. brownfield

While greenfield projects are perfect for leveraging the complete potential of open RAN, brownfield deployments offer a chance for operators to modernize their networks while improving flexibility, network economics and energy efficiency. In addition, it enables them to have more intelligent operations and paves the way for easy evolution to 6G.

“Considering cost and compatibility, deploying open RAN in a brownfield is more complex compared to a greenfield,” said Minsoo. “In the case of a brownfield, open RAN is deployed alongside 5G legacy RAN equipment. Thus, any legacy RAN equipment known to be incompatible with open RAN would need to be replaced. Given the costs associated with replacement and deployment, numerous practical difficulties are expected.”

Minsoo added, “Moreover, incumbent vendors are hesitant about opening interfaces based on open RAN for legacy RAN equipment due to the low-profit margins compared to the cost. However, these manufacturers remain positive about deploying Open RAN in new markets.”

Brownfield challenges

The challenge of open RAN deployments in brownfield networks primarily stems from the fact that the open RAN components from different vendors would need to work seamlessly with the existing legacy network infrastructure. This presents interoperability challenges as well as rigorous testing and validation requirements to ensure efficient functioning between the traditional and open RAN systems.

“It is expected that initial multi-vendor Open RAN networks may not yet have performance or security parity compared to conventional network deployments. The gap to a single vendor network will reduce over time as profiles and testing mature but is unlikely to reach parity instantly due to vendor readiness,” [noted a GCC Open RAN Consortium Whitepaper on Open RAN for Brownfield Operators Challenges and Opportunities.](#)

Integration of testing and maintaining dual networks can lead to higher-than-expected costs and extended timelines. It can also lead to operational complexity as well as security challenges. Several telecom operators, such as Vodafone, Orange and AT&T, are exploring brownfield open RAN deployment cautiously for these and other reasons. In transitioning to open RAN from traditional RAN, consistent network performance and service reliability are crucial since any disruption could affect user experience.

Operating and maintaining open RAN networks will also require new skills and training for the workforce. Network engineers will need IT skills in addition to RF skills.

Telco perspective: SK Telecom



Minsoo Na, Director and Head of 6G R&D at SK Telecom

In August 2019, SK Telecom began using open RAN, based on its standards, in the commercial 5G network specifically for in-building networks. SK Telecom defined the fronthaul interface specifications between the digital unit (DU) and the layer splitter, a DU-radio unit (RU) fronthaul multiplexer, provided by the third-party vendor to ensure interoperability, regardless of the manufacturers.

Through the development of the layer splitter based on SK Telecom’s standard and through interoperability and verification tests, the operator succeeded in the commercialization of 5G in-building solutions with the incumbent DU and the third-party RU.

Even before the establishment of the O-RAN Alliance’s fronthaul standard, SK Telecom managed to introduce RU from third-party manufacturers into the already

SECTION 3: DEPLOYING OPEN RAN

deployed RAN system, which did not support inter-vendor interoperability, according to Minsoo Na, director and head of 6G R&D at SK Telecom.

Enabling the selection of third-party RUs suitable for deployment in various site environments can lead to the creation of a cost-effective network and quicker equipment procurement. It can also act as a catalyst for changes in the telecommunications equipment ecosystem, which is currently dominated by a few major equipment manufacturers.

Open RAN shortcomings

Regarding shortcomings, “the current open RAN does not support beamforming, a core 5G technology,” he noted. This results in lower performance levels compared to previously deployed RAN equipment. In addition, major manufacturers remain conservative about introducing open RAN-based interfaces to legacy RAN equipment. This necessitates the development of a separate management server to manage network equipment (DU, RU) from multiple manufacturers simultaneously, which could complicate management and operation in comparison to using equipment from a single manufacturer.

SK Telecom’s plans

SK Telecom has already completed the establishment of outdoor and in-building coverage within its 5G commercial network using legacy RAN equipment. New deployments for expanded coverage are occurring on a relatively small scale,

“We anticipate that there will be limited large-scale deployment of open RAN in the short term.”

– Minsoo Na, Director and Head of 6G R&D at SK Telecom

he told Fierce Network Research. “We anticipate that there will be limited large-scale deployment of open RAN in the short term,” he added.

Since the fundamental architecture in the future should take the form of an open RAN, SK Telecom is conducting various research and development to define an open RAN architecture that is optimal for our future business environment. Furthermore, SK Telecom is planning to make open RAN a mandatory requirement in the 6G network, Minsoo said.

Open RAN standardization

The standardization of open RAN has made considerable progress, with several operators currently undergoing commercialization trials, he said, adding, “However, we still believe additional standardization processes to be necessary.”



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SINGLE-VENDOR OPEN RAN

While the core purpose of moving away from vendor lock-in and reducing dependency on single vendors is defeated with single-vendor open RAN systems, telecom operators may initially want to deploy open networks without involving multiple players.

Unlike traditional RAN setups, a single-vendor open RAN deal doesn't mean that a single vendor will own and control the network. The same will be the leading network solutions provider and will hold the responsibility of integrating some vendor partners selected by telcos. For example, in the case of the AT&T-Ericsson deal, while Ericsson is the dominant vendor, AT&T **has said it will work with** several other players, including Fujitsu, Corning, Intel and Dell.

A single, main vendor strategy assumes significance given that open RAN is still in its early stages and the standardization is not mature. The strategy of single-vendor open RAN provides a safe and predictable path for telcos to experiment with the technology without going for full-blown open RAN deployments.

"Open RAN is here to stay as a concept," Neil Coleman, product line manager of open RAN automation at Amdocs, noted. "A number of big announcements have validated the open RAN approach. Over the next few years, there will be a strong focus on single-vendor open RAN," he said. "I



think that's going to be because operators will see that as a way of managing the change. So instead of being fully open from day one, they will be partially open."

However, single-vendor open RAN beats the purpose of fostering innovation by encouraging healthy competition between the vendors. In addition, vendor diversity, which has the potential to accelerate innovation, will remain

elusive as single-vendor open RAN continues to focus on a few suppliers.

Initially, operators may prefer single vendor open RAN systems to reduce risk, ease integration and ensure stable, predictable performance. But as the open RAN ecosystem matures and operator confidence grows, more and more operators may transition toward multi-vendor strategies.

CONCLUSION

Despite several security and integration challenges, there is little doubt that open RAN has a promising future in the industry. With investment predicted to grow at a CAGR of 24%, according to Counterpoint Research, the next few years will witness the growing adoption of open RAN as well as a transition from single-vendor open RAN to multi-vendor open RAN deployments.

Open RAN investment by 2030

- Accelerated open RAN growth is expected from 2025 onwards after stagnation in 2023 and 2024.
- Open RAN network investments to grow at a CAGR of 24% during the forecast period.
- Asia-Pacific and North America will remain the largest open RAN markets in the forecast period.
- Europe is expected to record the fastest growth with a CAGR of 108% during 2023-2030.

Source: Counterpoint Research



“Maturing standards and correspondingly maturing products will translate into broader adoption of open RAN in the next few years,” Iontel said. “Many service providers have gone through rounds of lab evaluations and that feedback has been absorbed by the ORAN vendors making sure their products are going to meet deployment models, performance, and scale requirements necessary to go into production.”

The adoption of open RAN promises to alter the communications networks forever. CSPs will need to focus on vendor diversity, security, interoperability and standardization to unlock the full benefit of open RAN. In addition, collaboration between the CSPs, vendors and standardization organizations will facilitate a smooth migration to open RAN, thus paving the way for an overall more open and innovative telecom ecosystem.

**Rimma Iontel**

Chief Architect, Global Telco Team
Red Hat

Rimma Iontel is responsible for supporting Red Hat's global ecosystem of customers and partners in the telecommunications industry. Since joining Red Hat in 2014, she's been assisting customers and partners in their network transformation journey, helping them leverage Red Hat open-source solutions to build telecommunication networks capable of providing modern, advanced services to consumers in an efficient, cost-effective way.

“
Open RAN is finally
ready for prime time.
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—Rimma Iontel, Chief Architect, Global Telco Team, Red Hat

What are the major trends in open RAN today?

The major trend is that open RAN is finally ready for prime time. It's not a new concept. O-RAN Alliance has been around since 2018, and the standards have been worked on for the past six years. The problem has been that they were not mature enough for actual production networks. Finally, now we are seeing deployments with customers using something that's based on open RAN.

Even though it's open RAN compliant, the service providers are not necessarily mixing and matching the way they envisioned to be doing once it's full-blown open RAN deployments. So, essentially, they are still sticking with one vendor. All the components come from that one vendor and maybe one component from another vendor, but essentially, they are being very safe about it.

What are the key challenges faced by service providers in implementing open RAN?

The flexibility has both pros and cons. The same thing that makes open RAN good for service providers also makes it challenging because you have so many choices and you have to make sure everything is interoperable. Even though you have a standard, there are always optional components to the standards, and you never know what one vendor decided to choose out of those options. And then you need

to make sure they all work together. And also, there are more points where things can break. And then, security. A lot more is exposed, so there are more points of attack.

In addition, monitoring the data from implementing observability across the entire network. A service provider now gets in a lot more data than they used to. So a telco has to make decisions where it never used to have to make a decision. Do I monitor that point? Do I keep that data? How long do I keep that data? How do I analyze that data? We've seen customers drowning in the amount of monitoring information. So it's very difficult to decide what's relevant and what's not. We are hoping AI will help address this problem. But right now, it's not very mature. The traditional tools are not sufficient to address something like an open RAN with all the disaggregated points.

What do you think the telcos can do to address these challenges? What are the steps they can take or strategies they can adopt to address these problems?

Regarding interoperability, we are all working on better-defined standards – for instance, having a plugfest where different providers, application and equipment providers have an opportunity to test products together before they go into the customer network.

And then, each service provider has to do due diligence and do its interop testing. Every time they have new equipment, they have to do interop and regression testing as well. Apart from that, security is always a tough question. Putting sophisticated, modern security mechanisms built into the network and making sure the vendors that you're working with are following that DevSecOps type of development cycle where security is addressed very early on. It's not an afterthought. It's going to sound silly, but keeping your equipment updated and upgraded to the latest and greatest in terms of security is crucial. Quite frankly, we see a lot of customers who put something in and it just sits there for years.

How is your open RAN approach different from others, and how is it helping service providers implement open RAN easily?

Red Hat is all about open source. From an open-source point of view, we advocate for horizontal platforms. And we provide platforms that can fulfill that requirement. So basically, one platform can run any type of service that a service provider is planning to deploy in their network.

This gives a very uniform operational approach. And through that uniform approach, they have a uniform way of observability, of implementing security.

Because open RAN itself is so complex, you want things that open RAN is running on to be simple. So our approach is to take the upstream, take an open source implementation and harden it for service providers and for other industries as well – because our products work across different industries.

How is the open RAN space likely to evolve over the next two to three years?

I am anticipating that maturing standards and correspondingly maturing products will translate into broader adoption of open RAN in the next few years. Many service providers have gone through rounds of lab evaluations and that feedback has been absorbed by the O-RAN vendors making sure their products are going to meet deployment models, performance and scale requirements necessary to go into production. It's not going to be an overnight revolution, but I expect small expanding islands of deployments to support new services or to replace aging legacy infrastructure.

The original expectation was that we would see full O-RAN stack deployment, but it appears that instead, it might be a more gradual adoption.

Also, the expectation was for a mix-and-match approach, but that doesn't seem to be the current direction; we are seeing distributed unit/centralized unit (DU/CU) or radio unit (RU/DU/CU) combos coming from one vendor, and that's how it is probably going to be deployed.



At first glance, O-RAN deployments in the short term might not look dramatically different from traditional cloud RAN, but the interfaces and the modularity will already be baked in, along with the understanding of the architecture and skills necessary to run O-RAN, setting the stage for future growth with 5G and then transition to 6G.

**Vikram Prasad**

Head of Program and
Client Solutions, Amdocs

Vikram Prasad is head of program and client solutions, responsible for mobile technical solutions and services for Amdocs Mobile Network. He is also responsible for the incubation of emerging technologies such as 5G, O-RAN and private networks while enhancing the customer lifecycle, value and end-user experience.

**Neil Coleman**

Product Line Manager Open RAN
Automation, Amdocs

Neil Coleman is the product line manager for Amdocs Open RAN software automation, delivering solutions that combine Amdocs' deep RF domain knowledge with machine learning and supporting efforts to mature the software ecosystem through involvement in key open RAN initiatives.

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The moment a CSP transitions from a closed system to an open system with multiple actors in the stack, it leads to the problem of testing the stack together.

– Vikram Prasad, Head of Program and Client Solutions, Amdocs

There's a lot of scratching of heads in operator organizations today about how they can operationalize open RAN and still make it sit comfortably with what they're doing with the traditional RAN.

– Neil Coleman, Product Line Manager Open RAN Automation, Amdocs

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What are the major trends that you have observed in open RAN?

Coleman: There has been a big shift in the last year as open RAN has transitioned from a disruptive concept to a mainstream technology. All the operators that we work with have made significant statements about their desire to embrace open RAN technologies. It has changed the mood and perception of open RAN in the industry. Additionally, they [operators] are saying they will be using capital expenditure in the next round for open RAN rather than v-RAN [virtual RAN], which is a big shift.

What are the key challenges faced by your customers in implementing open RAN?

Prasad: Since we started working on open RAN in 2020-21, the major challenge has been interoperability. The moment a CSP transitions from a closed system to an open system with multiple actors in the stack, it leads to the problem of testing the stack together. And after testing, when it goes into production, [if] you start experiencing problems in production, then it is not clear who is responsible for the issues. I believe that interoperability and trying to figure out in operations which vendor owns the root cause analysis and which vendor is responsible for that particular software patch or fixing the issue becomes paramount. This is the biggest challenge that we have seen on the services side when it comes to putting the open RAN systems in place.

Coleman: On the software side, it is pushing operators to look at their old automation and management platforms that they had deployed that have been managing their traditional RAN and trying to understand how they can adapt them to the new open RAN world. Over the last year, we have seen several operators going through an exercise of tool refresh to try to use systems installed at the time of LTE to manage LTE and 5G networks and realizing that they are no longer fit for the purpose. How do we move forward and get new platforms in place so that when these new virtualized and open technologies come into place, we can manage them? So there's a lot of scratching of heads in operator organizations today about how they can operationalize open RAN and still make it sit comfortably with what they're doing with the traditional RAN.

What steps can the telcos take to address these challenges?

Prasad: When you have multiple vendors in the ecosystem, having or choosing a specific vendor within that particular ecosystem of components may not be the right approach. And sometimes, telcos tend to do this themselves, and they face several challenges. For one, they sometimes lack the scalability. They also lack the skill sets because now they are not just focused on the radio but also need to have expertise on the COTS, the underlying, let's say, the L1 acceleration cards, then someone needs to have expertise in the software stack. They also need to go through all

of those different skill sets to start managing and have expertise in those different components, which sometimes the operators don't have. So if you give it to one of the vendors in that ecosystem, then they are at the mercy of that particular vendor and that becomes another challenge.

In all these cases, we advise telcos to choose an unbiased system integrator who does not have any bias towards a certain component or OEM in the stack and comes in with the expertise and scalability and integrates right from day zero.

How is your open RAN approach different from other players in the market? How is your approach helping your customers in maximizing the benefits of open RAN?

Coleman: We consider ourselves one of the largest vendor-neutral kind of brand systems integrations and automation providers. So, we have the scale, experience, and flexibility to take operators on the open RAN journey, either at a systems integration level or at a software level.

We have built this scale over the last 20 years, where we've been operating in a multi-vendor environment, delivering hundreds of projects within operators around services to integrate their networks and services to automate their networks. Matching that scale with a lot of experience in tackling multi-vendor helps us provide our customers a

migration path from how they're managing their networks today through to this new world without a rip-and-replace approach and a way to avoid fragmentation challenges they'll see as they introduce a new network technology.

On the software side, operators are looking to understand how they can have an automation and orchestration layer that is ready and fit for open RAN. We are already a trusted supplier of the software capabilities that they use today, and those software capabilities are already multi-vendor because we're already providing that overlay layer on top of their existing vendor. So they trust us to navigate this new, multi-vendor world.

Can you share an example of an open RAN project that led to greater efficiencies for the customer?

Prasad: I would share our first open RAN project in Latin America with a multi-vendor ecosystem. For this customer, we were responsible as SI [systems integrator], from the design and integration of the stack deployment as well as operations. The whole idea was to provide rural broadband in different areas in this particular country in Latin America. And the operator initially used one of the big three and then they went with this open RAN OEM. With us, what they gained was, first of all, a reduced TCO [total cost of ownership], significantly lower than the traditional OEMs.

The second operator experienced a significant reduction in energy because the [open RAN] stack was consuming much less energy than the traditional OEM. There was also parity in feature sets from their current OEM to a certain extent. So, they were getting similar benefits with much more reduced energy and much more reduced cost for service in the rural areas.

Another customer here in North America is the first greenfield service provider and cloud-native. They experienced a multitude of benefits. Not only did they have ease of deployment, but also much lesser TCO.

How do you think open RAN is likely to evolve over the next two to three years?

Coleman: I think open RAN is here to stay as a concept. Several big announcements have validated the approach. Over the next few years, there will be a strong focus on single-vendor open RAN. I think that's going to be because operators will see that as a way of managing the change. So instead of being fully open from day one, they will be partially open.

But now those stacks that they are buying, they're mandating they have to be more open. They have to be disaggregated. And what we'll see over the next couple of years is the emergence of pure multi-vendor from day one open RAN.

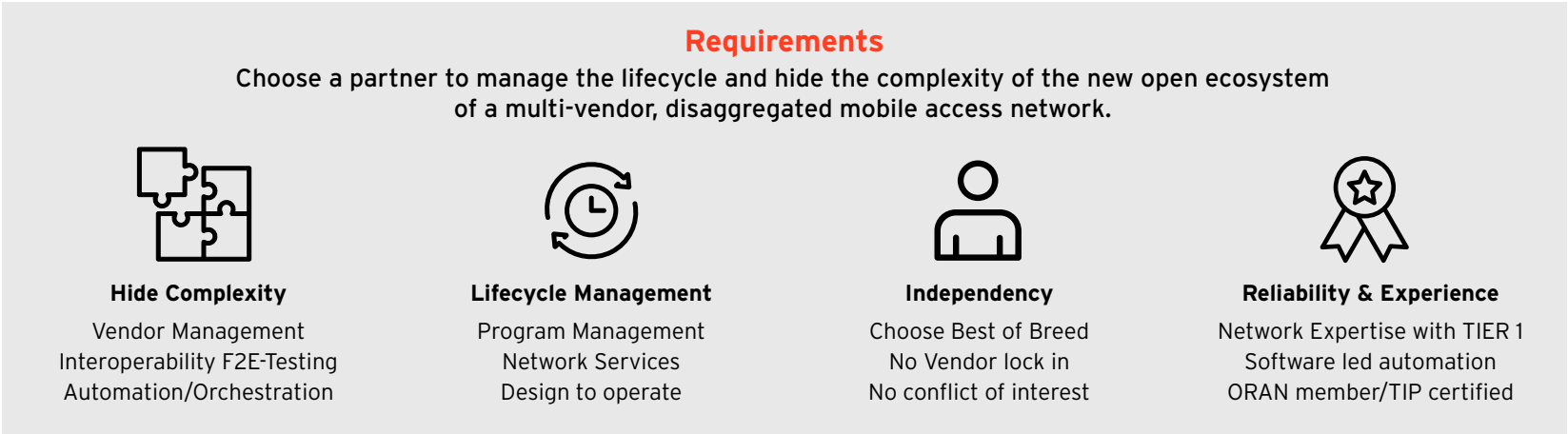
We'll also see single-vendor open RAN approaches morphing into more multi-vendor kinds of environments. And I think that's the important thing that the industry needs to work towards. So when they make decisions about who helps them with a service or helps integrate or what software stack they use to automate it, they need to be aware that the end goal isn't a single-vendor open RAN with a bit of automation on the top. The end goal in five years is to have a true multi-vendor, open RAN environment.

New 5G use cases, the agility of network resource deployment and newer network OEMs are fueling a new vendor ecosystem that embraces open-standard, cloud-native networks. Yet for service providers, whose success depends on the ability to monetize the technology, this presents a host of challenges: meeting unprecedented capacity demands, increasing network coverage, leveraging technology to drive innovation and reducing the total cost of ownership (TCO) – all while ensuring a great connection.

Open radio access network (Open RAN) technology is key to addressing these challenges. It provides speed to deploy services fast, openness to drive innovation, intelligence to efficiently orchestrate a dynamic network and agility to capture every revenue opportunity.

The challenge of disaggregated, virtualized solutions

To thrive in the next-generation economy, adopting disaggregated, virtualized solutions is key. But this requires adapting your radio access networks to become more software-driven, using a variety of software and hardware from multiple vendors. This too brings challenges: for example, how do you ensure interoperability between



the various components? And how do you optimize deployment scenarios where every service provider's network architecture is unique?

To answer these questions, we need to look at the role of systems integrators - those who bring the capabilities to accelerate consumption and adoption of Open RAN architectures and unlock the benefits they afford.

Amdocs Open RAN solution

Amdocs Open RAN solution's comprehensive set of open network products and services minimizes risk during your transition to an Open RAN network. It's the culmination of a

careful evaluation of product technologies, as well as hardware & software vendors from throughout the entire ecosystem.

Amdocs Open RAN solution includes:

- **System integration services:** validates and benchmarks vendor combinations to deliver flexible and innovative technologies to the network including:
 - Lab services:
 - Automated testing and validation of use cases
 - Vendor and change management

- Automation of CI/CD pipelines
- Life cycle management of software packages
- Benchmarking vendors
- Co-ordination and governance

- **Open RAN deployment and operations services:**

- Network planning and design to support coverage and capacity needs
- Automated pre-staging of servers as per configuration
- Accelerated and cost-efficient network deployments for launching new services or network assets
- Streamlining operations through automation to reduce costs and improve efficiencies

- **Open RAN automation:** Optimize network performance and capacity with flexible automation delivered through an open Non-RT RIC and machine learning powered xApps and rApps.

- **Service management and orchestration (SMO):** provides a hybrid architecture to alleviate operational complexity and manage both existing 4G/5G and OpenRAN network elements

Why Amdocs

As a preferred partner for tier-1 and tier-2 service providers across the globe, our vast network of rollout and acceptance services provides scalable, fast and reliable network rollouts - enabled by our software-led approach and bolstered by our automation and resource flexibility to support process acceleration. With our flexible Open RAN solution, you enjoy the freedom to move rapidly, adapt easily, automate operations and streamline innovation, without being held back by proprietary, monolithic network systems.

For more information, contact
networkmarketing@amdcs.com