

Open RAN: driving maturity in systems integration

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Systems integration (SI) is one of the major barriers to large-scale adoption of open RAN. There are several reasons for this including the added complexity of hardware and software integration that comes with multi-vendor RAN deployments; the need for post-integration support; an underdeveloped SI channel and the need for accountability within a complicated supply chain. All this can add to the cost and time to deploy a RAN, compared to a single-vendor network.

Open RAN adds complexity to systems integration, in terms of both technology and partner strategy

A range of factors make open RAN challenging to deploy, and even more challenging for integrators than traditional RAN, which was largely tested and implemented by the equipment vendor. The introduction of virtualisation, open interfaces and multiple vendors all add different layers of complexity to the integration process.

Even in single vendor systems, virtualisation and open interfaces create new requirements for cloudification and security that need ongoing support from integrators. This challenge is exacerbated by the current lack of cross-domain skills in the industry, across both RAN and cloud technologies. However, it is multi-vendor deployments that create the biggest challenge for open RAN integration. Having multiple vendors in a single network requires complex testing and optimisation and significantly expands the role of the integrator, creating opportunities for vendor-neutral SIs but new challenges for operators.

These challenges relate to technical scope, but also vendor/operator communication, problem resolution and after-service support.

The new integration skillsets that are required in open RAN are in short supply, unsurprisingly given the technology's immaturity. In traditional RAN, vendors have handled the majority of operators' integration needs for their own proprietary systems. However, this is less feasible in open RAN because it could require one vendor to integrate products from its competitors, which would create a conflict of interest.

Stakeholders also need to consider that some vendor-integrators are adopting multi-vendor open RAN at a slow pace and have less incentive to drive vendor-neutral integration forwards. Furthermore, if operators rely too much on incumbent vendors for open RAN integration, we could see strategic lock-in by these same vendors at SI level. This would go against the fundamental goals of open RAN and would also be sub-optimal in terms of competition and vendor communication.

Therefore, operators need to adopt a new approach for open RAN system integration.

Neutral integrators offer an effective solution for open RAN integration, although they will take time to mature

Taking integration in-house will be an option for some operators, but for many others, neutral third-party integrators will be vital.

Operators have sometimes done their own SI in early open RAN deployments (for example, those of Rakuten or Vodafone UK). However, many operators lack the resources to do their own SI and in practice, in-house integrations have often relied on the resource and knowledge of one major network equipment provider (NEP). This simplifies the process, but relying too much on a single, large vendor, even if it is committed to open RAN, could create a de facto lock-in.

Neutral integration is important for a range of reasons.

- It helps to avoid bias and the potential strategic lock-in of large vendors at integration level.
- It can help in supporting effective communication between operators and vendors during multi-vendor deployments. Being neutral allows the integrator to act as an unbiased go-between that can facilitate confidentiality and information sharing.
- It can potentially provide an accountable party for operators, otherwise known as “a single throat to choke”. Many operators are fearful of taking on additional vendor relationships as required in open RAN, and the resulting difficulty of solving problems or holding any single party to account for problems.

However, in order to carry out these roles, the SI channel requires significant maturity, which is lacking in RAN due to the long-standing dominance of incumbent vendor-integrators. As a result, it will take time and effort from all open RAN stakeholders, not only to drive the required skills and knowledge within the SI segment, but also to ensure open RAN remains open and competitive at integration level.

Stakeholders should drive maturity in open RAN integration, while encouraging simplification, collaboration and openness

Stakeholders in open RAN must strive to simplify integration, at the same time as putting the building blocks in place to drive maturity in both neutral and in-house SI.

For vendors, this means focusing on simplicity by providing pre-integrated solutions, which reduce the overall complexity for SIs. Although this might be a compromise in full mix-and-match openness in the short term, it will improve time to market and help third-party SIs to achieve greater scale more quickly than having to integrate every network from scratch. Vendors should also be pre-optimising solutions as much as possible, while leveraging data and technology to improve the integration experience.

Operators can drive effective RAN SI forward by focusing on collaboration and by sharing learnings to drive maturity within the integration channel. They should use in-house skills where possible, while developing and supporting neutral integration partners. Some operators will want to undertake integration in-house; however, they should be cautious about relying too much on large vendors for integration support. Where possible, operators should also contribute their in-house integration experiences to open alliances or blueprints, which will help to support broader maturity in open RAN SI. Some operators have already done this, such as Rakuten via its Symphony solutions, and Docomo through its Open RAN Ecosystem.

In addition, system integrators themselves play a very important role. Analysys Mason is forecasting that new revenue for [SI and professional services in open RAN will surpass USD10 billion by 2026](#). This represents a significant opportunity, and new and existing integrators should invest in this to become key enablers in the open RAN market. This includes all types of integrator; vendor-integrators, operators and third-party integrators. However, all parties have to be conscious that there is a need for neutral integration in open RAN, otherwise we could witness further lock-in by larger vendor-integrators.

For more information on this topic, see Analysys Mason's [vRAN - Open RAN insights](#).