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Open RAN

Opportunities are emerging but what about the challenges?

Open Ran and Hybrid Networks - migration is coming, but it will be a long journey. There are key operational issues that must be considered and a harmonised approach to assurance will be essential. Why? *By Kirsi Valtari, Executive Vice President Automation & CMO, Elisa Polystar.*

Standards have enabled the interoperability of mobile networks and the delivery of consistent service experience to their users. However, many of the solutions from which these networks have been built have been implemented with proprietary technologies. As a result, while operators have long sought to deploy solutions from multiple vendors, in practice, many have actually chosen single suppliers for key domains – and this has been particularly true for arguably the most important of these – the RAN.

Building a RAN is costly, requiring intensive effort and widespread deployment of physical infrastructure. And, the deployed infrastructure needs to meet stringent SLAs. For this and other reasons, most operators have deployed RAN from a single vendor – in other words, today's RAN is homogeneous, at least within each generation of mobile technology.

5G could change this situation, for technical and strategic reasons. One is the advent of Open RAN. 5G is CAPEX intensive, as it requires a larger number of cells to achieve the required performance and coverage targets. While it brings many benefits – in terms of the number of devices that can be connected within a given area, for instance – it's likely to lead to a significant increase in CAPEX. Analysys Mason, for example, predicts an increase of 23% between 2018 and 2025.

Open RAN is seen as a key tool to help control CAPEX, as it is expected to enable a more diverse vendor ecosystem – and, potentially, cost savings for operators. However, although Open RAN brings many benefits – which have been widely discussed - it also brings challenges.

What are these challenges and what do operators need to consider?

Open RAN - creating hybrid networks

Open RAN has, rightly, attracted considerable attention. Some forecasts suggest that it could capture as much as 75% market share by 2030 (e.g., ABI Research). That's significant and, potentially hugely disruptive if it leads to the more diverse vendor ecosystem promised.

As many will know, Open RAN is based on a new, standardised reference design and architecture for RAN solutions. This is achieved through the disaggregation of the RAN system into functional elements, splitting hardware from software. Some of these have been implemented as components, allowing the whole to be assembled more easily than if starting from a blank canvas. Vendors can build complete solutions, or they can contribute with elements that can, in turn, be used by others.

None of this changes the air interfaces used by mobile User Equipment (UEs), as this is defined and specified by 3GPP, among other standards development organisations. But, Open RAN will introduce new solutions that will likely have their own specific implementations of different procedures and reporting processes. So, despite the shift to non-proprietary solutions, proprietary variations will persist.

This is likely to occur at the level of different procedures that are necessary for the operation of Open RAN solutions, particularly at a micro level.

That's the first challenge. But, there are others. It will take time for Open RAN to take off.

Operators are deploying networks today and will not wait for widespread availability of new Open RAN products. So, existing solutions will continue to be deployed, with Open RAN complementing and augmenting current coverage rollout plans. Initial use cases for the technology suggest that it will find a role in areas that might not be reached by current RAN solutions – for new small cell coverage, for example, or within dedicated private infrastructure.

Third, traditional RAN solutions aren't going to disappear overnight. In fact, quite the opposite – the deployed RAN infrastructure is likely to remain in place for many years.

Indeed, we can confidently predict that typical classic and Open RAN solutions will co-exist. This complicates matters.

It is therefore essential to ensure full interoperability between current RAN deployments and new O-RAN solutions.

Harmonisation is key for effective service assurance

This will be key at the edges of different cells – a critical zone, given handover and mobility tracking between, say, an O-RAN domain and a traditional RAN domain.

All of which means that operators must consider how they will monitor and assure current and planned RAN solutions, together with Open RAN deployments in increasingly heterogeneous networks. They must also think how they can automate the processes by which theydo so – so that observed events and historic records can trigger actions to optimise performance and maintain customer experiences (for people and devices) before any service impact canbe detected by the UEs and services they access.

Of course, operators are familiar with the problems that can result from their existing RAN solutions, but the introduction of this heterogeneous vendor landscape with a new architecture introduces the potential for a host of new possible network issues (that we don't yet understand – or have yet to even define).

So, the success of Open RAN is also dependent on the ability to extend assurance and management systems to these platforms, while handling existing solutions, and with the automation required to reduce the burden on operational teams and to ensure compatibility with cloud-native core networks that are also being deployed to support 5G SA.

This represents quite a challenge. Certainly, Open RAN offers significant potential benefits. If it can help reduce operator CAPEX, that's a huge win. But, if the introduction merely introduces new operational problems, shifting costs into OPEX, that's going to be a serious problem.

Open RAN is exciting. It could deliver significant benefits and help operators save costs, even while they are transforming their networks and extending full 5G SA capabilities.

But, its introduction must be accompanied by a comprehensive approach to service monitoring and assurance. It cannot lead to the deployment of new assurance silos that are dedicated to Open RAN. Operators need a single solution that can extend to this new technology while supporting their existing and ongoing RAN investments – but this challenge must be solved, so that the promise of Open RAN can be secured. A harmonised approach is essential, to cover all investment options.