

Utel Open RAN Monitoring: Troubleshooting 5G Fronthaul and multi-vendor solutions

Utel's Open RAN monitoring solution enables the accelerated deployment of new Open RAN solutions for 5G fronthaul, minimising network-related errors and optimising performance. Utel's solution helps prove interoperability and supports vendor diversification strategies



Utel's **Open RAN network performance monitoring** solution is critical in the operator's pursuit of long-term commercial success, minimising network-related errors and optimising network performance.



Background

Open RAN technology presents mobile operators with problems of oversight and control that must be solved

Open RAN transforms Radio Access Network (RAN) technology. It does this by creating an environment where interoperability between different vendors over defined interfaces is possible, distinguishing it from the legacy mobile network ecosystem where RAN is proprietary, and a single vendor provides the radio hardware, software, and interfaces necessary to enable the mobile network to function.

Open RAN thus yields obvious advantages. It brings competition to the market in the form of lower-cost infrastructure providers. Mobile operators can benefit from having more choices in how they will meet performance requirements and they make those choices based on more competitive costs. Furthermore, Open RAN lowers the barriers to entry for new vendors meaning operators will be able to deploy network elements from a wider range of suppliers. This, in turn, will likely drive a broader skills base and lower-cost access to developer and lifecycle expertise. The arguments for the new technology are compelling.

In Open RAN the interface between the BBU and RRU / RRH, is "liberated". Opening it up allows any vendor's software to work on any open RRU / RRH. It's these Open interfaces that ensure the use of one supplier's radios work with another supplier's processors.

OpenRAN brings complications

While the Open RAN movement seeks to disaggregate telecoms hardware and software via open interfaces between the two the transition to its deployment isn't entirely straightforward. Open RAN technology presents mobile operators with problems of oversight and control that must be solved by finding a way to assure network performance both pre deployment and afterwards, through live monitoring. In this Use Case, we'll focus on the issue of troubleshooting Open RAN and its attendant, multi-vendor solutions.

Historically, the link between remote radios and base stations was, as already noted, based on proprietary implementations of the CPRI protocol. This meant that operators not only had to choose a single vendor for both entities, but they were also then locked in to their chosen suppliers and pricing models. This need no longer be the case.

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Open RAN thus seeks to define and build 5G RAN solutions based on generalised, vendor-neutral hardware and software-defined technology using open interfaces between all the components, across the operating board. It makes the Radio Access Network “open” within all aspects and components, with the interfaces and operating software separating the control plane from the user plane.

In short, the mobile operator can virtualise and disaggregate its radio access network, with the interfaces between components fully exposed.

The business challenges

Connecting the domain between the radio and the baseband unit is critical

With this scenario in mind, for Open RAN connecting the domain between the radio and the baseband unit –fronthaul- is critical. The fronthaul link is essential for meeting performance requirements – particularly those related to QoS and latency. Given 5G network evolution, which is driving ever increasing end-user latency needs that network operators must meet, managing the connection closely must be a priority.

However, implementation of Open RAN, compelling drivers or not, isn’t straightforward. That’s because disaggregating the radio from the base units requires a specific protocol be defined to enable interoperability between the solution of one vendor (e.g., for the radio – the Remote Radio Unit, RRU – basically, the antennae) and another (e.g., for the base units – Broadband Base Unit, or BBU). This protocol is central to replacing the proprietary, closed legacy RAN interfaces, thereby overcoming the traditional limitation operator’s face today. And that’s not all. Standardisation is also required to avoid one locked-in scenario simply being replaced by another of a different aspect. It’s an issue the industry will have to tackle.

This protocol question will most likely be answered by e-CPRI¹, an evolution of the Common Public Radio Interface. eCPRI recognises that 5G applications require flexible fronthaul configuration and it defines specifications connecting radio equipment (eRE) and radio equipment control (eREC) via the fronthaul transport network. Presently, it’s mainly used for 5G systems, LTE-Advanced and LTE-Advanced Pro. eCPRI is an entirely open interface, allowing carriers to work together in a more complimentary way, which should drive better connected and faster networks globally.

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1 - http://www.cpri.info/downloads/eCPRI_v_2.0_2019_05_10c.pdf

The Utel solution

Extensive interface support

To overcome the fronthaul and multi-vendor infrastructure challenges we've described, Utel has added Open RAN eCPRI monitoring to its established range of interfaces.

This enables validation of the connection between RRUs and BBUs from different vendors – in turn, assuring that new Open RAN deployments can proceed through evaluation stages to deployment. Monitoring can be continued in the live network, so that ongoing performance can be assured.

Utel's solutions support a wide range of interfaces, including:

- Mobile (2G/3G/4G/5G), IoT, TDM Networks
- A1/O1/E1/E2 interfaces
- RAN Intelligent Controller (RIC)
- O-RAN central unit (O-CU)
- O-RAN distributed unit (O-DU)
- O-RAN radio unit (O-RU)
- RNIB
- eCPRI interfaces
- eMBMS, MCx, network slicing components

Utel's Open RAN network performance monitoring solution is critical in the operator's pursuit of long-term commercial success, minimising network-related errors and optimising network performance.

As well as the specific eCPRI interface, functionality ranges from gathering data from both the range of relevant devices and the network Utel delivers the insights needed to:

- Monitor the health of all network devices
- Gain visibility in network traffic patterns
- Automate network change and configuration management
- Analyse and troubleshoot a range of specific element performance Issues

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Benefits

Visibility of a multi-vendor RAN environment

For the operator using different vendors to supply core components in an Open RAN environment, Utel ensures that products and solutions from multiple vendors can communicate with each other. The required monitoring validates eCPRI and oversees the various components involved, in the process analysing and decoding fronthaul protocol. In 5G cases in particular, oversight of the X2 interface – between two eNodeBs for 5G New Radio (NR) – is critical because many Operators enable the X2 interface to support intra-LTE active mode mobility.

While overcoming these (and other) issues mean Open RAN may take time to gain traction, early adopters driven by remote network coverage goals (as well as growing deployment of small cells and private networks) are already driving the market forward.

Leaders include Tier One operators, particularly in the APAC region where, for instance, one major Japanese operator with a global footprint and a growing business in private networks is leading the way, partnering with Utel, in validating the interoperability of its network components and troubleshooting both pre-deployment and, as it moves to live deployments, in-service Open RAN.

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Conclusion

Take advantage of Open RAN with Utel

Although presently still nascent, as we have seen Open RAN networks are already becoming increasingly popular due to the range of advantages they deliver. To leverage these, it is critical that operators quickly identify the right partner to enable and assure their Open RAN projects.

Those suppliers with first-mover experience fulfilling this vital role, like Utel, will likely play a key part in the proliferation of Open RAN networks in the coming years.

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