



(Image courtesy of Keysight)

THREE CATEGORIES OF OPEN RAN TESTLAB DRIVING DEPLOYMENT

KEYSIGHT UPDATES ON OPEN RAN INNOVATIONS AND THE TESTING PROCESSES BEHIND THEM

Open RAN contains multitudes. It's an ideological movement grounded in the belief that a diverse radio supplier ecosystem begets competitions which begets advantageous economics which begets more and faster innovation. It's an ongoing and collaborative process of standardizing interfaces between different

parts of a radio system. And it's also very much an exercise in performance and interoperability testing that lets an operator stitch together different pieces of hardware and software, then confidently deploy in a commercial network.

Keysight's Eng Wei Koo, director of technology for O-RAN solutions, defined three categories of testing environments that are facilitating the slow march toward scaled Open RAN commercialization. These descriptions are also encapsulated in an Open RAN handbook co-published by Keysight and Vodafone.

The category one lab, he explained, supports functional end-to-end testing for gNodeBs, and is best suited for small cells and non-massive MIMO radios. "The category one test lab would typically be

focusing...end-to-end test together with a set of tools that allows them to be able to look at troubleshooting," Koo said. This also includes monitoring and analytics capabilities for specific interfaces and all the interfaces making up a particular RAN configuration. Test staff would be able to perform wraparound RAN testing and isolate pieces of the system to dig into functional performance.

Category two test labs support 3GPP and O-RAN Alliance conformance and interoperability testing, including radio and distributed units, base stations and massive MIMO beamforming radios. Koo called out the ability to do sub-system testing "whereby you do O-RU testing in isolation, you do CU testing in isolation," he said. This also includes infrastructure testing for transport and cloud in isolation,



as well as performance of xApps, rApps and service management and orchestration capabilities.

The most elaborate setups are in category three test labs and support testing for “deployment readiness,” according to the

co-published handbook, including features like “energy efficiency, performance, scalability, security, stability, robustness, and resiliency, under real-world operating conditions.” As Koo put it, “You can replicate field issues in the lab...[which] accelerates the lab to live deployments...This will need to definitely get into a CI/CD/CT testing model so you can actually accelerate your field deployments through lab testing throughout the entire lifecycle.”

As for the point of this three-category approach to continuous testing of Open RAN systems, Koo said it supports innovations related to standardization, cloudification and network intelligence. To the standards point, it’s imperative “to look at the multi-vendor interoperability between modular components. That includes the radio access network, the

cloud, the transport, management and orchestration.”

He continued: “And the second pillar of innovation [is] focused on the cloudification aspects. So as we know today until Open RAN came along, typically we see radio access networks being delivered on vertically integrated solutions; that includes the inclusion of servers within the radio access network solution. With open cloudification, operators will be able to deploy the cloud infrastructure separately as compared to the virtual and cloud network functions.”

The network intelligence piece covers the functionality of the non-real-time and near-real-time RAN Intelligent Controllers, along with xApps and rApps that run on the platform, and SMO capabilities.