NEWSLETTER

OAI WINTER EDITION

With winter behind us and brighter days ahead, now is the perfect time to spotlight the progress achieved across the OpenAirInterface community in recent months. This Winter Newsletter brings together updates from the OAI RAN, Core Network, and OAM components, along with highlights from recent events and a look ahead to what's coming next.

First OAI Foundation U.S. Hands-on Workshop

From 17–19 November 2025, the OpenAirInterface (OAI) Foundation held its first U.S. Hands-on Workshop at the University of Texas at Austin. The event is part of OAI's ongoing mission to provide open–source–based reference implementations for 5G and 6G technologies and to support the training of engineers for the cellular wireless industry.

The workshop opened with a full day of presentations, including keynotes, panel discussions, technical talks, and live demonstrations of recent OAI developments. The following two days were dedicated to hands-on training sessions, where participants worked with OAI technical leaders to deploy and configure software components and explore practical use cases.

SAVE THE DATE

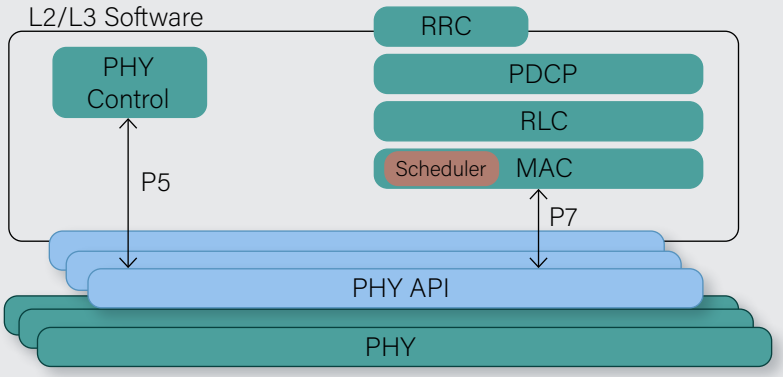
- SUMMER OAI WORKSHOP IN PORTO (PORTUGAL): JUNE 22–23
- FALL U.S. HANDS-ON WORKSHOP AT NCSU (NC): OCTOBER 13–14
- NEXT OAI WEBINAR, ISAC EXPERIMENTATION WITH OAI: MARCH 24

OPEN AIR interface

OAI RAN

FAPI transport via WLS

As part of the effort to integrate the OAI PNF with O-RAN SC O-DU, the WLS library was integrated into OAI and chosen as the library for FAPI message transport between the OAI PNF and the O-RAN SC O-DU (VNF). Stemming from that integration, the OAI VNF was also adapted to support this as a transport mechanism to the PNF, which can now be used in the OAI VNF-PNF split, adding to the usage of sockets as the available transport mechanisms between the two components. The WLS library leverages DPDK and hugepages to transport the messages, and must be installed following the steps described here. To use WLS, the nr-softmodem must be compiled with the option '-t WLS'. The PNF, upon startup, creates the WLS instance and makes it available for the VNF to connect to and begin the message exchange.



UL Heavy TDD

OAI recently introduced support for uplink-heavy TDD patterns, i.e., configurations that include as many or more uplink (UL) slots than downlink (DL) slots. A typical example is the DSUUU pattern. These configurations are particularly suitable for scenarios where uplink traffic dominates, and reduced downlink capacity is acceptable.

To support these patterns, the scheduler has been reworked to better track uplink slots, and several improvements have been made to uplink scheduling. Particular attention has been given to enabling SRS transmission in all uplink slots, ensuring that UEs can still operate with two uplink layers in these configurations.

As part of this effort, continuous integration tests have been added with both OAI L1 and Nvidia Aerial. Depending on bandwidth and radio channel conditions, uplink throughput exceeding 300 Mbps can be achieved.

vrtsim: A New RF Simulator Alternative

OpenAirInterface introduces vrtsim, a real-time or fixed-timescale RF simulator designed to more closely reflect development on physical RF hardware.
To support different testing environments, vrtsim operates in two modes:

- **Real-Time Execution –** Emulates hardware timing so the OAI stack behaves as if connected to a live radio.
- **Fixed-Time Execution –** Provides a deterministic environment where the simulation clock is coupled to the wall clock but slowed down, enabling testing on slower CPUs or when repeatable results are required.

vrtsim also allows the use of an external channel model. The model is provided as an array of baseband-sampled channel impulse response vectors through a new API. Example implementations are available in a dedicated repository. The simulator also remains compatible with the channel models used in rfsimulator. At this stage, vrtsim supports 1 gNB-to-1 UE connection. Support for additional UEs is under development.

What's New in RRC

Several changes address long-standing issues in the RRC layer, particularly in CU/DU split architectures. The handling of CellGroupConfig has been corrected to ensure full transparency, with DU-encoded configurations now forwarded unchanged by the CU, as required by 3GPP specifications.
Security procedures during N2 handover and RRC re-establishment, with or without DRB integrity protection, have also been significantly strengthened. These improvements resolve integrity failures previously caused by incorrect ciphering and key transitions. The RRC now correctly applies Next Hop chaining and master key updates in line with 3GPP TS 33.501, ensuring consistent security behavior across the CU-CP, CU-UP, and UE.
Beyond these fixes, the RRC layer has been extended with completed bearer management and PDU Session Release support in the CU, enabling correct and consistent end-to-end bearer lifecycle handling.

Looking ahead, several major RRC initiatives are currently under active review. These include a new multi-cell handling architecture, NR Paging support on the CU, and the finalization of the multi-QoS framework, enabling multiple QoS flows per DRB along with complete PDU Session Modify procedures in the CU. Together, these developments prepare OAI for more scalable multi-cell deployments and more advanced QoS-driven services in future releases.

OAI CN

Release of OAI CN Version 2.2.0

We are excited to announce the release of OAI CN Version 2.2.0, which significantly improves the overall quality and performance of our 5G Core Network and introduces new features. Key highlights include:

Enhanced Stability and Reliability:

We have focused on improving the stability of core network functions and enhancing the quality of the codebase. This release also incorporates numerous bug fixes reported by end users, making the OAI CN more stable and compatible with a wider range of COTS UEs. This ongoing work is vital for supporting future developments in 5G Advanced and 6G.

New Features:

This release introduces several critical new features, including:

- Quality of Service (QoS) support for both the control and data planes;
- Ethernet PDU session support (for Time-Sensitive Networking (TSN) applications);
- Support for framed routing;
- Support for the Transport Layer Security (TLS) protocol;

Enhanced Interoperability with Other CN Solutions:

AMF, SMF, and UPF can seamlessly function with other components from open-source CN solutions. It provides users with the flexibility to create a customized CN by mixing components from various providers.

3GPP Release Alignment:
Updating the Service-Based Interface (SBI) to conform with 3GPP Release 17 specifications, with plans for a future update to Release 18.

New Performance:
We are introducing enhancements to the User Plane Function (UPF), which leverages eBPF/XDP to boost user-plane performance.

Enhanced User Experience:
We have made improvements aimed at making the OAI CN more intuitive and user-friendly.

Stay tuned for these upcoming features:

- Support for the Elliptic Curve Integrated Encryption Scheme (ECIES) Profile A (to enable the Subscription Concealed Identifier (SUCI));
- Support for Usage Reporting Rules (URR)

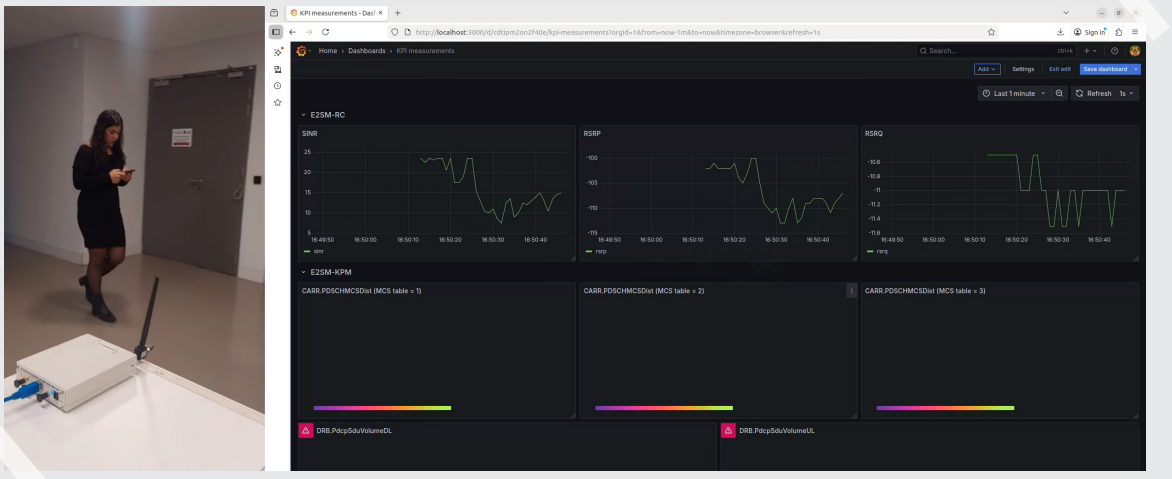
OAI OAM

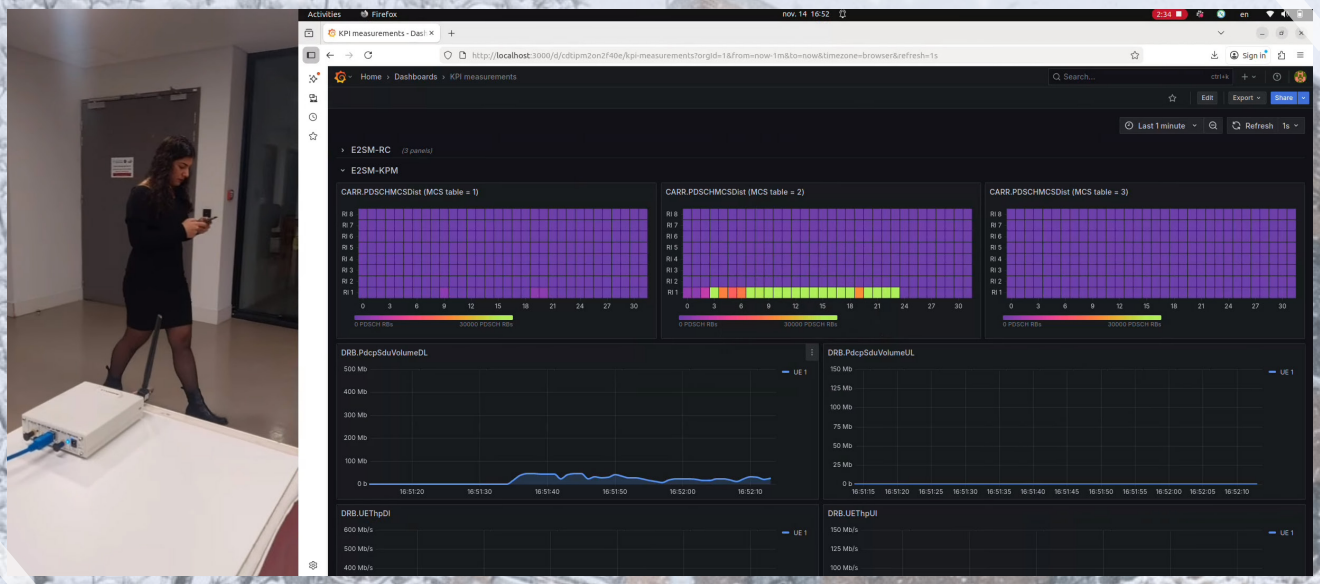
Update on FlexRIC

1. Grafana support for O-RAN Service Models

We have expanded our E2SM-KPM support to include cell-level measurements, specifically the PDSCH MCS distribution. Previously limited to UE-level measurements, our implementation now exports both UE- and cell-level metrics to a SQLite database. In addition, support has been introduced for exporting UE channel quality measurements collected via E2SM-RC.

These enhancements enable the visualization of resource consumption for each UE connected to the data network, as well as the overall MCS distribution across all UEs. Furthermore, channel quality indicators (RSRP, RSRQ, SINR) can be visualized for individual UEs, providing an approximate indication of UE location.

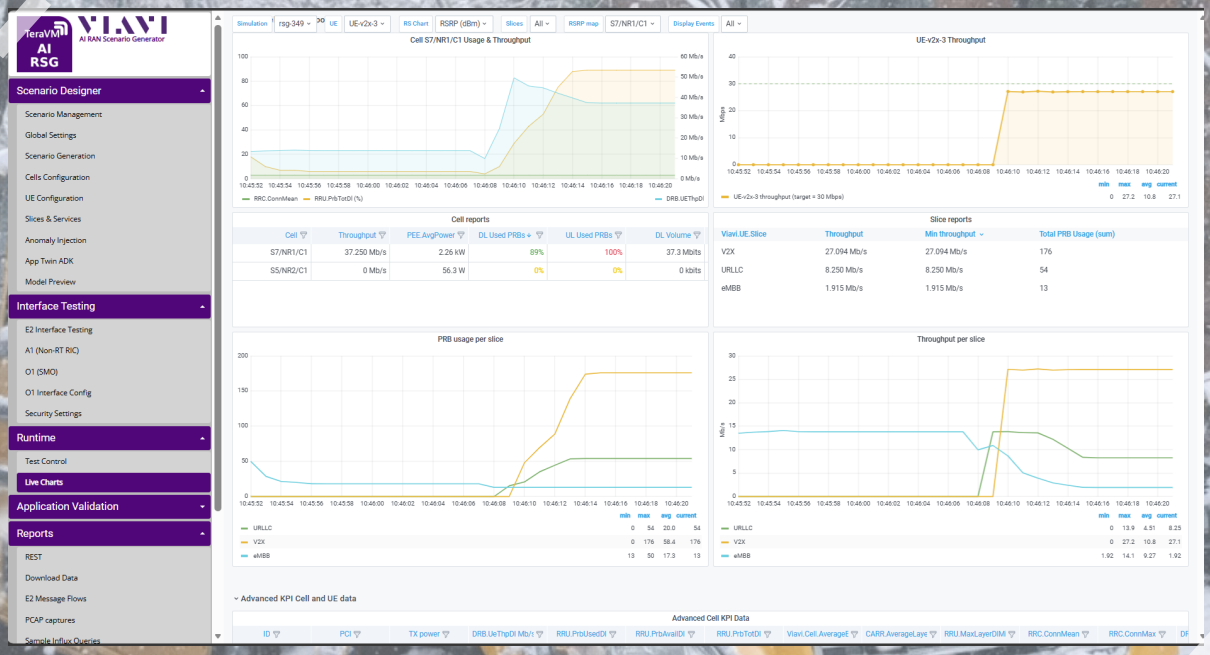




2. Interoperability between OAI FlexRIC and VIAVI AI RSG

OAI FlexRIC has been successfully integrated with the VIAVI AI RSG over the E2 interface. This integration was demonstrated through a resource allocation use case in a single-cell setup with three network slices—eMBB, URLLC, and V2X—operating under a proportional fair scheduler. Using E2SM-KPM, we retrieved per-slice PRB utilization and per-UE throughput metrics for UEs belonging to different slices.

Based on these measurements, slice resources were dynamically reconfigured to 5/20/75% for eMBB/URLLC/V2X via E2SM-RC. The gNB adapted PRB allocation in real time, as observed through visualizations available in the VIAVI UI.



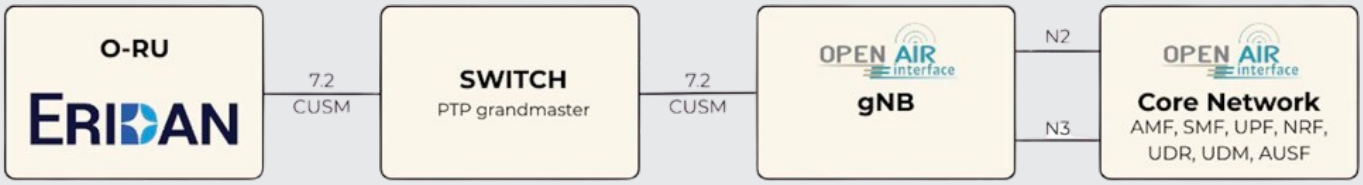
Energy Saving RF Channel Reconfiguration Use Case

We are pleased to announce that Orange Innovation Egypt has successfully implemented E2SM-CCC in FlexRIC, enabling support for the Energy Saving RF Channel Reconfiguration use case. The code and an accompanying tutorial for this implementation are currently being prepared and will be available soon.

OAI EVENTS

O-RAN Alliance Global PlugFest Fall 2025

During the O-RAN Alliance Global PlugFest Fall 2025, as part of the Joint European Venue, OpenAirInterface showcased the configuration and partial fault management capabilities of the Eridan O-RU using the OAI 7.2 M-plane. Through the NETCONF protocol, the OAI gNB connected to the O-RU, retrieved its capabilities, subscribed to notifications, and carried out CU-plane configuration. With the O-RAN SC fronthaul library populated from the O-RU data, the system completed the setup seamlessly, without activating carriers since the focus was on M-plane operations. To further verify fault-handling behavior, a controlled timing disruption was introduced by temporarily interrupting the PTP signal on the switch and subsequently restoring it. These results verified that the OAI gNB successfully configured the Eridan O-RU via the M-plane without manual intervention and correctly retrieved its alarm notifications.



OAI Hands-on Tutorial in Japan

An OAI Hands-on Tutorial was held on September 26 at the Telecom Center Station (Japan). This event was organized by the Tokyo Metropolitan Industrial Technology Research Institute (TIRI), co-organized by the IEICE Smart Radio (SR) Technical Committee, and supported by iDAQS Co., Ltd., under the direction of Hidehiko Tobe. The program combined expert lectures with a practical 5G hands-on session in a shielded environment. It was held as part of the Young Talent Development and Research Promotion Project, aiming to support early-career engineers and researchers.

Program highlights:

- **Lecture:** "Exploring Extension Implementations for Mobility Support in OpenAirInterface". Speaker: Jin Nakazato (Tokyo University of Science). The talk addressed current limitations of fixed deployments in OAI and explored approaches for mobility support, including the use of digital twin technologies and perspectives for future development.
- **Hands-on session:** "Building a RAN Using OpenAirInterface Open Source". Speaker: Hidehiko Tobe (iDAQS Co., Ltd.). Participants installed OAI on their own Ubuntu laptops and set up a 5G RAN using USRP B210 radios. Thirty-two participants successfully connected an iPhone 16e UE to a gNB running on their PCs and validated end-to-end connectivity. SIM cards created during the session were offered to participants for continued use.
- **5G technical briefings** during the hands-on session, with contributions from: Hidehiko Tobe (iDAQS), Michitaka Kawano (NI), Tetsuya Iye (Kozo Keikaku Engineering, Inc.), and Akemi Tanaka (Sanperion).

OpenAirInterface at the ETSI SNS4SNS Workshop

OpenAirInterface participated in the ETSI SNS4SNS “Software & Standards for Smart Networks & Services” event, held from February 2–5, 2026, at ETSI in Sophia Antipolis.

As part of the program, Raymond Knopp, President of the OpenAirInterface Software Alliance, presented a talk titled “OpenAirInterface: The open source for sustained European leadership in wireless innovation.” The presentation took place during the session “6G Innovation with Open APIs and Edge-Aware Exposure Frameworks.”

LF Networking Launches Duranta to Advance Open RAN with OpenAirInterface

At OSS Europe, LF Networking announced progress toward further integrating Open RAN technologies into the broader open networking ecosystem through collaboration with the OpenAirInterface Software Alliance. This collaboration led to the launch of Duranta, a new LF Networking incubation project built on the OpenAirInterface software stack.

Duranta aims to advance research and innovation in the Radio Access Network (RAN) by providing an open, research-grade reference stack that includes RAN components such as CU and DU, as well as a user equipment (UE) software stack. The project also focuses on improving tooling, documentation, testing, and integration assets to make open RAN experimentation more reproducible and easier to validate in research and trial environments.

Hosted under LF Networking, the initiative provides neutral governance and a broader collaboration framework, bringing together industry, academia, and the open source community to accelerate the development of end-to-end open telecom systems. More information about Duranta here.

OAI Webinar on the Collaborative Standards Software License (CSSL)

In November, OAI hosted a webinar introducing the Collaborative Standards Software License (CSSL), an evolution of the OAI Public License V1.1. This development accompanies the launch of Duranta, a joint initiative between OpenAirInterface and LF Networking, aimed at advancing open-source innovation in the RAN ecosystem.

The session reviewed the foundations of the OAI Public License V1.1 and explained the motivations behind evolving it into the CSSL. Speakers also discussed the relationship between the launch of Duranta and the adoption of CSSL, as well as the practical aspects of transitioning the OAI codebase to the new license framework.

Recording of the webinar is available here.