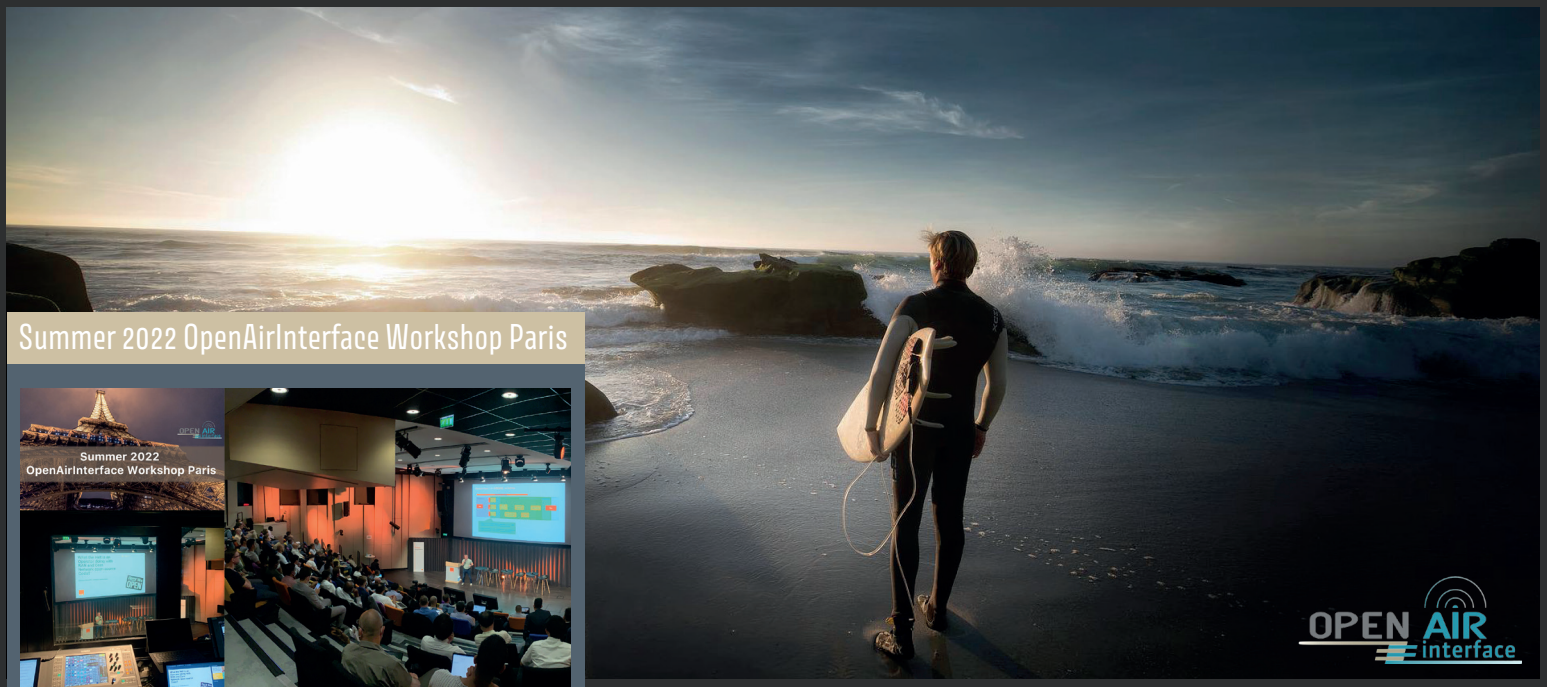
Newsletter

OAI 2022 SUMMER EDITION



Summer 2022 OpenAirInterface Workshop Paris

For the Summer OAI Workshop Paris, the team travelled to the prestigious location of Orange Gardens in Paris. During the event, Workshop participants all gathered around the different presentations, keynotes, panels and demos conducted by the OSA team and partners of the Alliance.

The goal of the Workshop was to show the different use cases of OAI through inspirational talks and innovative demos. We demonstrate how the OAI software has now become a complete and comprehensive solution for 5G, and we also addressed the latest complete tasks and ongoing works of the OAI RAN, Core and MOSAIC5G projects groups.

Welcome back to the OAI Newsletter! We are really enthusiastic about sharing our latest achievements and improvements with you.

During the first six months of the year, the OAI welcomed onboard new teammates, new Strategic Partners and Associate Partners. We participated in various international events, and the OAI RAN, Core as well as the MOSAIC5G projects groups have all grown in scope.

2022 is already a success, and we can not wait to show you what is next on the OpenAirInterface agenda.

3 new Software Engineers joined the OAI Team:

Dhanuja Elizabeth Tomas, OAI CI/CD
Somasekhar Kandukuri, OAI RAN Group
Franck Messaoudi, OAI CN Group

firecell · NI · NOKIA Bell Labs · FibroLAN · ZaiNar · wilab

With the arrival of Firecell, NI and Nokia Bell-Labs, 12 Strategic Partners are now sitting on the OAI Board of Directors.

FibroLAN, ZAINAR Tech, and Wilab joined the Alliance and we now count 20 Associated Partners.

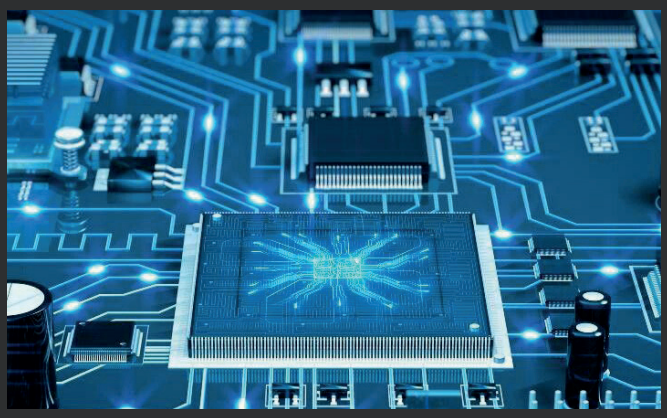
Upcoming Important Dates

- November: Next OAI Fall Workshop
- September: Next OAI Webinar
- August to November: O-RAN Plugfest at EURECOM

OAI 5G RAN

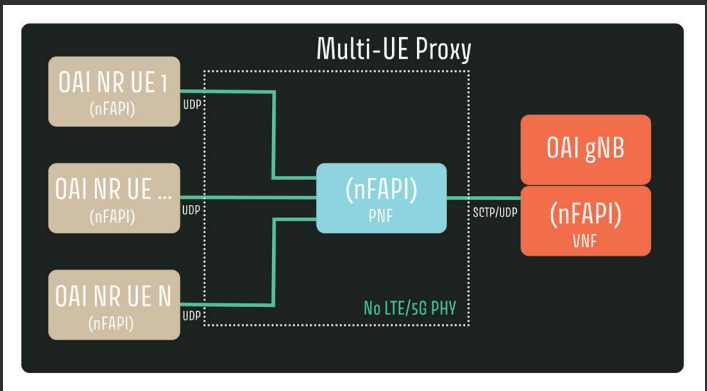
Creation of the first complete open-source software for private 5G

In June, Firecell, a Strategic Member of the Alliance, launched a new project that aims to create the 1st complete open-source software for Private 5G networks with OAI. The project will make use of the OAI software base as well as other open-source software to build a complete, cloud-native solution for Private 5G. The project covers the whole 5G software stack including a completely converged 4G/5G core and an O-RAN compatible RAN. Moreover, the stack fully conforms to 3GPP, O-RAN and Small Cell Forum specifications. As proof of quality, a dozen pilots interested in the project are in preparation with major industrial players within the automotive, aeronautics, railway, and smart-building sectors.



L2 simulator

EpiSci, EURECOM, and OSA are proud to announce the release world's first and only open-source, scalable 5G-NR Multi-UE Network Emulator with virtual L1 connection, also known as the «L2 simulator». It uses a networked version of FAPI (nFAPI) to exchange information between multiple gNBs and UEs over a central proxy, allowing to simulate a 5G network with a lower computational footprint while bypassing the resource-consuming physical layer (L1).



F1 interface: interoperability with commercial Accelleran gNB-CU and OAI gNB-DU

The F1 interface specified by 3GPP allows to split a gNB into a centralized unit (CU) for handling UE connections, and a distributed unit (DU) for handling the radio interface. Such base station «split» allows to mix-and-match equipment from different vendors. During the last months, the F1 interface has been integrated into OAI, and we performed interoperability tests with the commercial Accelleran gNB-CU and the OAI gNB-DU. The work on the F1 interface will continue to handle multiple DUs at a single OAI gNB-CU.

Allbesmart and OAI downlink throughput records

Since the beginning of the year, OAI and Allbesmart, an associate member of the OSA, had brilliantly worked together in order to release multiple downlink throughput records. In March, we were able to test a stable iPerf transmission between the OAI 5G Core Network, the OAI gNB, and a Quectel RM500Q UE modem reaching a throughput of 200 Mbps. One week after, we reached a downlink throughput higher than 250 Mbps with a single layer 80 MHz configuration. The OAI gNB was able to handle this new record on an x86_64-based CPU while communicating over-the-air through a 3GPP standard-compliant 5G NR link with a commercial device available on the market. The latest record was broken during the Summer 2022 OAI Workshop Paris, where the Allbesmart team showcased in their demo a downlink throughput of 479 Mbps working on their product based on OAI, the OAIBOX.

Launch of the first accessible & scalable 5G NR Multi-UE Network emulator

In March, the OpenAirInterface, EURECOM & EpiSci proudly announced the release of the world's first and only accessible, scalable 5G NR Multi-UE Network Emulator (5GEM) with virtual Layer-1 connections that fully support both 5G NR Standalone and Non-Standalone modes. Thanks to this collaboration, EpiSci further developed 5GEMANE, a customized version of 5GEM for EMANE. This tool is a game changer for accelerated development and deployment of new features such as AI/ML and Mobile Ad-hoc Networking for defence and public safety applications which can be used by government agencies, research institutions, and contractors. In addition to that, 5GEMANE is now available to US government agencies and defence contractors upon request.

EMANE: Extendable Mobile Ad-hoc Network Emulator

5G-NTN supports in OAI

The 3GPP standardisation of 5G is progressing rapidly, especially with the release 17 features supporting Non-Terrestrial Networks (i.e. satellites). This leads to the necessity of having an accessible 5G NTN protocol stack implementation which is only provided by OAI. With this collaboration, the 5G-GOA Eurescom project will be able to develop a gNB based gateway and a User Equipment compliant with the 5G NR standard of Release 17 for demonstrating the direct radio access connectivity in NTN. The goal is to reach the 5G GOA ambition, which is to facilitate the implementation of emerging satellite services in the context of full integration among satellite and terrestrial networks in 5G.

OAI 5G CORE NETWORK

OAI 5G Core Network released the v1.4.0 of all the 5G Network Functions

The OAI team has recently released v1.4.0 for OAI 5G CN. This version focuses on improving user experience in different aspects:

Core Network Functions

- Stabilizing 5G CN by providing various fixes for all NFs
- Supporting Network Slicing with NSSF and multiple AMFs (with AMF re-allocation procedure)

User Experience

- Improving the quality of tutorial/wiki e.g., new wiki page describing the variables in the configuration file of NFs, updating helm chart/helm chart tutorials
- Providing customized APIs to facilitate the User provisioning and configuring NFs

Docker Images

- Pushing official images produced by CI to OAISoftwareAlliance Docker-Hub, so that the users can download these images and deploy OAI 5G CN easily
- Reducing the image size, and CPU utilization footprint

We also continue to add more features/NFs into OAI 5G CN eco-system such as releasing NEF, supporting Ubuntu 20.04, and more.

Please refer to OAI 5G CN release v1.4.0 for more details

MOSAIC5G

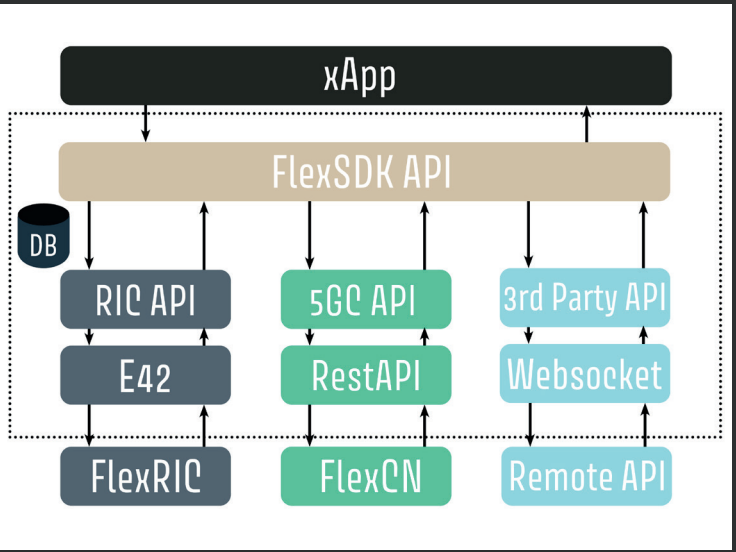
FlexSDK: Flexible xApp SDK framework for RAN and CN

FlexSDK is a Flexible xApp Software Development Kit, built to accelerate the development of a multi-vendor multi-language 4G/5G xApps. It is designed to be easy to use for both experts and non-experts developers allowing them to only focus on the observability, control, and coordination logics of the 4G/5G network. As shown in the figure below, FlexSDK currently supports three interfaces:

- **E42:** an extension of O-RAN E2 interface between xApps and a RIC allowing xApps to perform four RIC services including Report, Insert, Control, and Policy;
- **REST API:** A 3GPP compliant interface, NEF, Nxx, allowing FlexCN to interface with 5GC functions;
- **WebSocket APIs:** a generic interface to perform monitoring and control of a 3rd party 4G/5G RAN and CN.

From an xApp developer perspective, FlexSDK includes different level of Service APIs including xApp SDK, DB, Dashboard, Log, and xAppSim APIs.

FlexSDK Platform




```python
from sdk.sdk import xAppBase
from all_types import Ind, SRV_TYPE
class HWapp(xAppBase):
    def __init__(self, conf) -> None:
        super().__init__(save_db=True)
        self.ric_ids = self.connect(SRV_TYPE.RIC, conf)
        self.subscribe(SRV_TYPE.RIC, Ind.RIC_MAC, lambda x: print(x) ,
ric_id=self.ric_ids[0])
    def app_stop(self):
        self.unsubscribe(SRV_TYPE.RIC, Ind.RIC_MAC, ric_id=self.ric_ids[0])
conf = {"ip": "127.0.0.1"}
e = HWapp(conf)
e.run()
e.keep_run_until_c()
```

FlexSDK "HelloWorld" example for FlexRIC

FlexRIC new Service Models: E2SM-RRC, E2SM-PDCP, E2SM-RLC, E2SM-MAC & E2SM-KPM v2.0

FlexRIC currently includes multiple E2 service models for each layer of the 4G and 5G RAN stack including MAC, RLC, PDCP, and RRC. Newly released O-RAN E2SM-KPM v2.0 is under development and will be made available for the next release. All the service models are supported in both E2 agent and FlexRIC allowing a 3rd party to experiment or perform interoperability testing.

FlexCN new Service Models including 5GCN SMF and AMF

FlexCN currently supports 5GCN SMF and AMF network function monitoring including 3GPP standardized events such as PLMN or UE IP Address changed as well as extended monitoring information related to PDU session, QoS flows, SUPI/IMSI, and elements IP addresses. We are currently implementing the FlexCN slicing interface through AMF.

DB integration for FlexRIC and FlexCN Controllers

FlexSDK provides a generic DB API allowing to manage the RAN data efficiently across multivendor RAN and CN domains. In addition, it embeds a local SQLite DB to rapidly manage and manipulate the data by means of CRUD operations.

How to pariticipate in OAI meetings?

The OpenAirInterface runs different regular meetings related to OAI Project Groups and external developer meetings. Participating is ideal for those who wish to have precise information on the technical developments of the projects and who want to be actively involved in OAIs innovation.

• OAI Regular meetings:

If you wish to be part of one or more regular meetings (e.g., UE, or nFAPI), please contact contact@openairinterface.org

• External Developer Meetings:

We are holding weekly OAI Developer Calls open to all OAI community members. Two slots for this meeting have been created to better suit your timezone:

- Asia Time Zone on every odd weeks
- Americas Time Zone on every even weeks

Link to these meetings and downloadable calendar invitations are available here

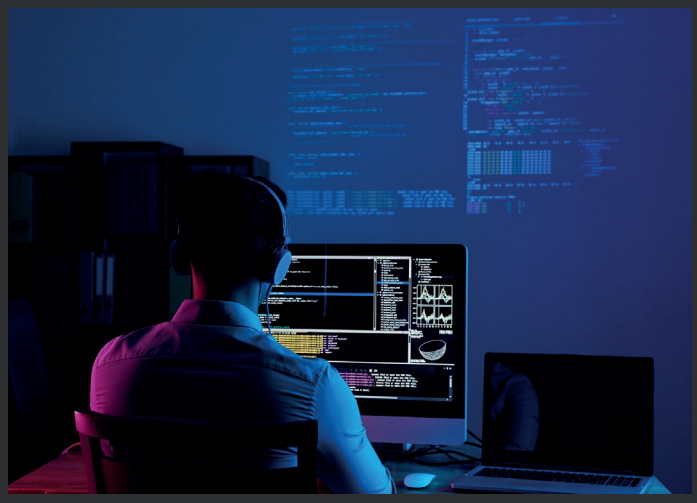
How to become a member?

Becoming a member is really easy. Different options are possible to allow you finding the best combination regarding how and when you want to engage.

The OpenAirInterface Software Alliance allows anyone who want to become a member to join us. Different types of membership exist in OAI: Strategic Members, Associate Members and Non-Profit Members.

Today Orange, Qualcomm, Fujitsu, PAWR, Meta Connectivity, Interdigital, AMD, Sequans Communications, NVIDIA, Firecell, National Instruments and Nokia Bell-Labs are sitting on the OAI Board of Directors.

You want to become a Member too? Please contact us via contact@openairinterface.org.



How to contribute to the OAI code?

One easy step: you need to sign an ICLA as an individual developer, or a CCLA if you would like to contribute as a company. Once done, please provide us with the document(s) via the contact@openairinterface.org email address.

Click here to download the document(s)

OAI EVENTS

2022 MWC Barcelona

From 28th February to 3rd March 2022 at the AMD Booth, the OSA team exhibited an End-to-End, Over-the-Air demonstration (OTA) of OpenAirInterface, an open source 5G stack with lookaside acceleration for the LDPC decoder. The setup leverages the AMD T1 Telco accelerator card which provides high performance, low latency, and power efficiency needed for the 5G O-DU deployments. This demo was a real achievement. In fact, more than being the only OTA setup of the whole MWC, the unique work of the team allowed the demo to run without any issue during the entirety of the congress.

OAI at the OMNI #7

In April, the seventh edition of Open Mobile Network Infra meetup, an event held in Japan between our Chinese and Japanese communities, put forward OAI as one of the main conference subjects.

« The development of open source-code software for Mobile Network Infrastructure is currently evolving fast to make them more accessible, less expensive, flexible, and scalable. Now companies, organizations, and individuals can build their own Mobile Network Infrastructure using the OAI eNB/gNB and the Core Network functionalities provided by OAI and free5GC; a project known for delivering mobile core functions.»

You want to be informed of the OSA news and events?

If you wish to be informed first of the latest OSA news, releases, achievements, and events, please contact comms@openairinterface.org saying that you would like to be added to our communication Mailing List. This is the best way to not miss anything and to meet the team in our biannual Workshops.

Follow the news here:

OAI & Firecell Seminar

In March, the Firecell team met the OAI team for a joint Seminar in our offices. During the two days of the event, we explored most of the OAI Core 4G/5G, OAI UE 4G/5G, OAI RAN and CI/CD subjects. Also, we went deeper in understanding the planned contributions of Firecell into OAI. Hosting the Firecell team was a pleasure and we are looking forward to strengthening the links we already have.

EURECOM's Hands-On Training on OAI

In June, EURECOM organized a Hands-On Training on OAI. The training was a two-day on-site event related to the 5G-OPERA project. On the first day, the team taught the participants how to set up a complete virtualized end-to-end 5G system based on OAI Core, RAN, and the RFsimulator. During the second day, a number of talks focused on individual technical aspects such as base station splits, Open RAN deployments, and 3GPP-related developments, and we helped participants to finalize their set-up in a debugging session to enable them to start developing code for OAI.