

OAI 5G RADIO ACCESS NETWORK (RAN) PROJECT GROUP - CHARTER

Abstract: This OpenAirInterface (OAI) community project group named the **OAI 5G RAN PROJECT GROUP** has been set up at the OpenAirInterface Software Alliance (OSA) with the goal of developing a 3GPP compatible 5G gNB Radio Access Network (RAN) stack as open source software for the OAI community. The project will be developed and distributed under the OAI Public License V1.1. The OAI 5G RAN software will provide software functions implementing all the layers including PHY, MAC, RRC, RLC, and PDCP of the 5G RAN stack specified by 3GPP. Both the gNB as well as the UE stack will be implemented for the benefit of the community. Interfaces to the outside functions like RAN Intelligent Controller (RIC) allowing RAN programmability are also part of the goals of the PROJECT GROUP.

The stack will support the following:

- Non Stand-Alone gNB software stack
- Stand-Alone gNB software stack
- 5G UE software stack
- RIC interfaces
- CI/CD framework allowing for testing and data-center deployment of the 5G split architecture

Output of the PROJECT GROUP: The PROJECT GROUP has been designed to give the Alliance the means to accelerate 5G developments in the interest of the OAI community. The motivation of the donors to the PROJECT GROUP, who are also as members of the OSA, is to maintain and enhance the impact that the OSA has as open source community in the area of 5G telecoms.

Project Duration: The project will run over an initial period of two years starting from 15th of November 2020.

Participating Members: The project will be open for software contributions from all members of the OAI community.

Donation and Human Resource Contributions: Given the significant volume and coverage of developments of OAI 5G RAN as well as the aggressive timeframe envisioned, the project group seeks support of donors through monetary donations as well as providing engineering support to the OSA in order to enable the OSA Alliance to staff and manage the project. Donors of the Project Group come from among the Strategic Members of the Alliance. The donations are to be paid in 2 equal annual installments (see “Donation Levels” and “Voting Rights” below) given that the minimum duration of the project is two years. Any extension to the project scope that could eventually induce the donors to wish to extend their donation will be proposed by the Steering Committee (see “Governance Structure” below) and validated by the OSA Board of Directors (“Conseil d’administration”).

Management of the Project: The project group day to day progress will be managed by the staff of the OpenAirInterface Software Alliance that will regularly report to a **Steering Committee**. This Committee will be composed of representatives from EURECOM, the founding member of the OSA, as well as the Strategic Members of OSA who donors to the OAI are 5G RAN PROJECT GROUP.

The Steering Committee will have the role of defining the technical orientations of the project, setting goals and objectives, and monitoring the progress of the project. Decisions on the Steering Committee will be taken through voting. Financial and staff resources decisions will be made according to the OAI statutes and bylaws, under the sole authority of the Board of Directors of the OSA Endowment Fund (“Conseil d’administration du fond de dotation OAI”) in conformity with the OSA Board of Directors decisions.

Steering Committee and its Working: The Committee will consist of individuals representing their respective organizations including EURECOM, the founding member of OSA, as well as donors of the OAI 5G RAN PROJECT GROUP. Each individual person will thus be a Member of the Steering Committee (SC).

The President of the OpenAirInterface Software Alliance, also a representative of EURECOM, the founding member of OSA, will be an *ex-officio* member of and will preside over the Steering Committee.

The Steering Committee will meet on a quarterly basis when called by the President of the Steering Committee to address any matters regarding the technical orientation as well as the status of developments in the project. The quarterly meeting will be the appropriate forum to discuss and take decisions on the topics that will be distributed as agenda to the Committee members fifteen days prior to the date of the meeting. The President of the Committee will propose an initial agenda to which any member could request addition of any other items.

Technical Oversight Committee: The development of the 5G RAN architecture and software developments will be overseen by a Technical Oversight Committee (TOC) that will be appointed by the members of Steering Committee (SC). Each donor as well as EURECOM and the OSA will appoint one engineering delegate each to the TOC. The TOC will meet as and when required over the course of a regular set of meetings at its own initiative to closely follow the day to day technical evolution of the project as per the roadmap and will be responsible for ensuring the respect of the project timelines agreed with the Steering Committee. The TOC will submit regular progress reports to the SC.

Donation Levels: There are three categories among which donor organizations involved in the OAI 5G RAN PROJECT GROUP are classified:

- **Gold Donors:** Organizations in this category donate **200,000€** per annum in monetary contribution to OSA.
- **Silver Donors:** Organizations in this category donate **100,000€** per annum in monetary contribution to OSA.
- **Bronze Donors:** Organizations in this category donate **50,000€** per annum in monetary contribution to OSA.

Voting Rights: As previously noted, individual persons representing their respective organizations from among the Strategic Members who are also donors to the OAI 5G RAN PROJECT GROUP will each have a seat at the Steering Committee. As Steering Committee Members, individual persons will have the following voting rights.

- **Gold Donors:** Three (3) votes
- **Silver Donors:** Two (2) votes
- **Bronze Donors:** One (1) vote
- **EURECOM (the Founding Member of the OSA):** Three (3) votes

Decisions at the SC will be taken through a vote. Resolutions will be adopted by two thirds majority.

Utilization and Allocation of the Donations: The main purpose of the collected donations is to accelerate the technical developments of the 5G RAN project in order to have them available sooner to the whole OAI community (for example by appointing temporarily staff within the development team), as well as procuring any testing tools allowing for acceleration of the development process. The project will also be supported by the DevOps and Documentation team from the OSA in order to help with the CI and CD tooling and quality management of the software stack. Web presence as well as Press and Media exposure is expected to carry some additional costs. Some of the budget may also be used for exposure at industry events.

External Communications regarding the OAI 5G RAN PROJECT GROUP activities:

Any external communication including communications through the website and press releases will be proposed by the Steering Committee and will be validated by the Board of Directors of the OSA Endowment Fund (“Conseil d’administration du fonds de dotation OAI”).

DONOR’S SIGNATURE:

Donation Category

Signed name

Title

Print name

Company Name

Email address

Date

Annex 1: Technical Specs and Development Path

As previously stated, the scope of the OAI 5G RAN project is to build the 5G protocol stack for both gNB and UE allowing for end to end deployment of a 5G network.

The first target is to develop and provide the 5G Non-Stand Alone (NSA) RAN software and enable connection and traffic flow with a NSA-capable 5G commercial UE. In the NSA setting the gNB is supplemented by the LTE eNB that carries the control plane of the 5G signaling while the data bearer is set up on the gNB. A NSA capable 3GPP Rel-15 4G evolved packet core network (EPC) is connected through the S1 interface to eNB and X2-C interface enables connection between the eNB and gNB for routing and managing the flow of IP traffic. The NSA mode is also referred to as the EN-DC mode and is shown here in Fig. 1.

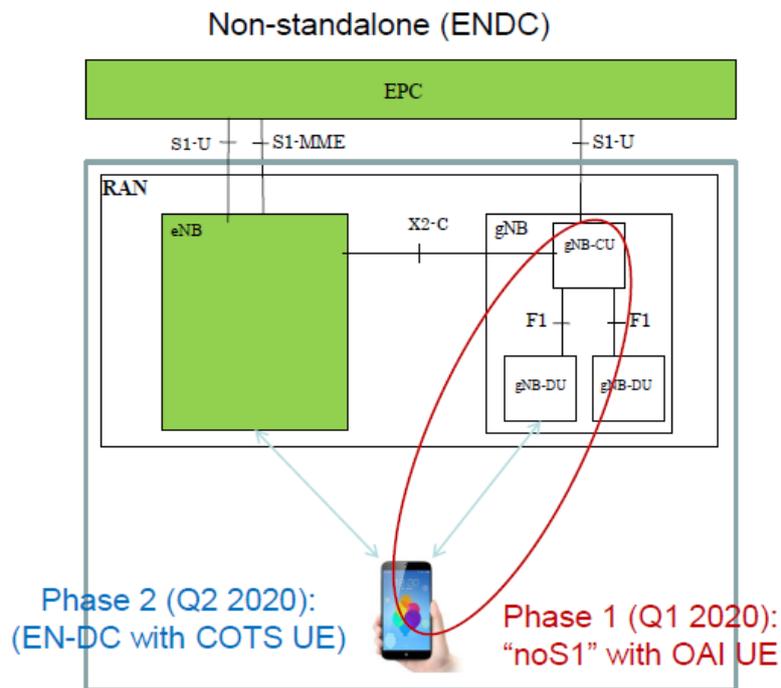


Figure 1. NSA mode of 5G RAN.

The two phases of development consist of a Phase-1 (no-S1 mode) which is an intermediate phase already having been implemented with preconfigured eNB and UE and configured to work without the existence of the core network, and Phase-2 which is the full NSA solution under architecture 3.x with the EPC as the core network.

The second target is the development of the 5G Stand-alone (SA) RAN software. The packet network is the 5G SA core with AMF, SMF and UPF as the main components of the 5G SA core¹ to which the 5G gNB is connected through the Next Generation (NG) control (C-) and user (U-) plane interfaces. Fig. 2 shows this mode of operation which is referred to here as Phase-3 as per internal roadmap of the OAI 5G RAN project. The target date for the availability of the gNB supporting SA functionality is end of Q4 2020.

¹ OAI also provides the 5G SA core

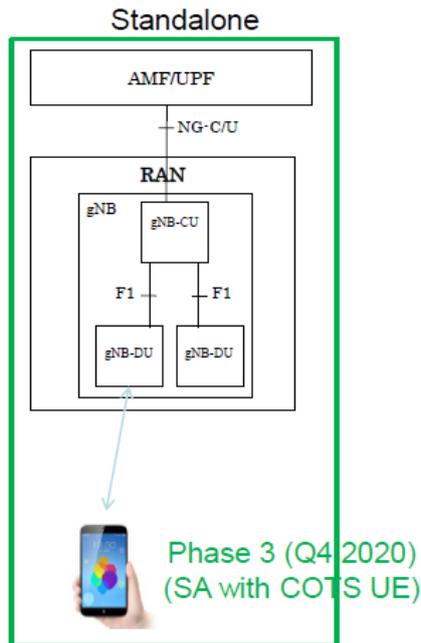


Figure 2. SA mode of 5G operation.

The Roadmap of 5G NR developments: The following chart give the status of current 5G implementations in the OAI codebase and the roadmap of future implementations.

Current developments cover NSA, i.e., phase 2 of the project according to figure 1 above.

OAI 5G RAN Project

Timeline

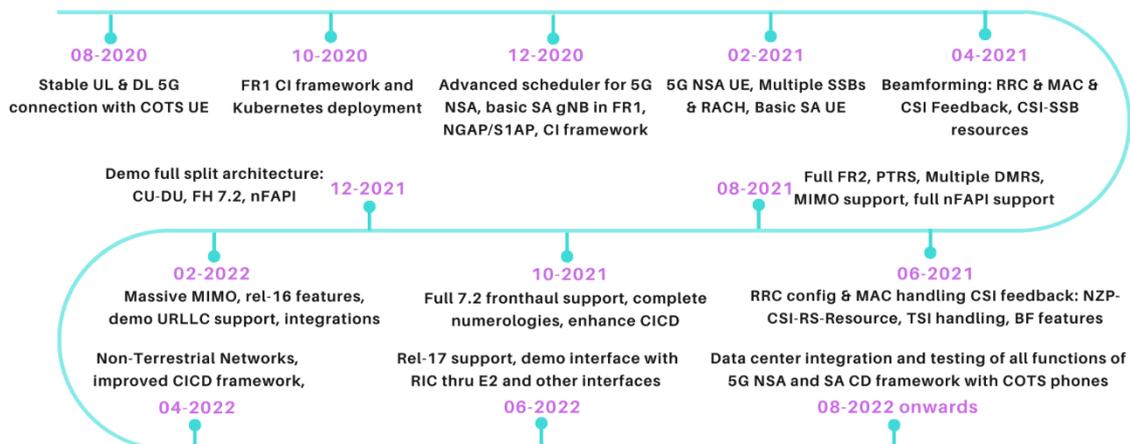


Figure 3. A global roadmap of the OAI 5G RAN Project Group.

Phase 3: Stand-Alone (SA) eNB and UE:

The OSA and EURECOM technical teams are currently focused on developing and testing the 5G NSA functionality. 5G SA project will only meet the timelines noted hereunder if enough engineering effort can be allocated as assumed in the chart above. The purpose of the OAI 5G RAN PG is to allocate this effort to the OAI 5G project.

Continuous Integration and Data Center Deployment:

The OAI Engineering team will support the 5G testing and Continuous Integration (CI) effort as well as data-center deployment of the RAN components. A Continuous Deployment (CD) framework is also under design that will leverage the 5G site at EURECOM.

RAN Programmability and RAN Splits:

Although not mentioned explicitly in the development plan, RAN Intelligent Control (RIC) and split architecture for the RAN are important architectural functions of the OAI 5G RAN PG roadmap. We shall work closely with other industry initiatives developing specifications in this area to include them in the OAI 5G RAN stack.