



5th OAI General Workshop
Status and Objectives for 2018-2019
21st June 2018, BUPT, Beijing, China



Overview

- **Status and objectives for openairinterface5g**
- **Status and objectives for openairCN**

Key Development Activities Today

- **5G NR**
 - Driven by TCL 5G Labs (UE) and EURECOM (gNodeB)
 - Growing interest, demo at MWC 2018
- **IoT**
 - LTE-M, EURECOM/Orange Labs/Nokia Bell Labs(soon)
 - NB-IoT, B-COM/EURECOM/NTUST/Nokia Bell Labs
- **Functional Splitting / Data-Center Deployments**
 - Many partner institutions and projects and traffic on mailing list
 - OAI architecture driven by EURECOM/Nokia Bell Labs
 - CU/DU split (Eurecom, China Mobile, BUPT)
 - NF-API (Initially Cisco ,others lately)
 - Fronthaul component (EURECOM,Nokia,many others)
- **5G Core**
 - Architecture exploration EURECOM/BUPT/B-COM/Blackned/U. Edinburgh
 - Evolution of openairCN components
 - Some interest in USA in M-Cord ecosystem
- **Stabilization of RAN/CN components**
 - openairCN : driven by Facebook for OpenCellular, git/jenkins CI @ Facebook, EURECOM, B-COM
 - openairinterface5g: driven by Fujitsu, CI being setup at EURECOM, Fujitsu and Nokia Bell Labs
 - eNodeB MAC layer redesign
- **D2D for ProSE and LTE-V2X**
 - Driven by Vencore Labs and EURECOM (NIST PSIAP)
 - Orange/EURECOM (LTE-V2X)
- **FeMBMS**
 - Driven by IRT (Munich) and EURECOM for now

openair5G RAN

■ Main achievements since last workshop

- Technical Board in place
- CI Framework in place (full operation Summer 2018)
- New RAN architecture in place
- FAPI/open-nFAPI merged
- NR : Initial demo, Rel15 implementation (public) underway
- New Simulators merged
- LTE-M : merge to come (Summer 2018), public branch tested in community
- NB-IoT: merge to come
- Multi-core support for eNB
- Sidelink (ProSe) : merge to come
- STTI (HRLLC) :

■ Buggy/Missing/Incomplete Essential Features

- RLC AM mode : buggy
- Multi-UE/RA scheduling : buggy
- TM3/4/8/9/10 : incomplete
- PUCCH2 : incomplete
- TDD configurations:
- Measurement gap handling : missing
- DRX handling : missing
- Carrier Aggregation : incomplete
- X2-handover: assessment of status (Summer 2018)

Regular Meetings

- **Strategic Board Webex**
 - Every 2 weeks
 - Overview of recent activity
 - Discussion on
 - strategic objectives
 - Legal matters
 - Links with other organizations (e.g. standardization)

- **Technical Board Webex**
 - Tbd (see next slide)

- **Weekly developer Webex**
 - Tuesday Mornings (general)
 - Friday Mornings (NR, every two weeks with Europe/Asia)
 - Friday Afternoons (NR, every two weeks with Europe/Americas)

Technical board

- **Creation of technical board to oversee**
 - Roadmap implementation
 - Architecture evolution
 - Review merge requests
 - Code quality
 - Adherence to architecture
- **Members: OSA, Orange, Nokia, Fujitsu, TCL, EURECOM, BCOM, Fraunhofer IIS, OpenCells**
- **Meetings**
 - Slack channel currently setup for Technical Board day-to-day interactions
 - Regular Meetings to be setup

openair5G RAN : Objectives for next period

- **MAC Architecture revision**
 - **Modularization** of scheduling (preprocessor) entity
 - Configuration/management interfaces
- **MAC implementation**
 - Debugging to allow 10s to 100s of connected UEs
- **PHY documentation**
 - Developer manual : Real-time Threading architecture and MODEM procedures
- **Architectural revision for**
 - **Higher-layer Functional split** (3GPP CU-DU)
 - Integration + VCO OPNFV Demo
 - **Management interfaces** and configuration in RAN
- **CI Testing framework**
 - EURECOM testbed online for community (Summer 2018)
 - 16 Cat-6 UEs (TDD/FDD), 1 Cat-M1 UE, 1 Cat-NB UE

openair5G RAN : Objectives in next period

■ PHY Implementation

- Multi RU/eNB EURECOM test network
- NR NS procedures
 - PDCCH,PDSCH,PRACH,PUSCH (more in NR presentation tomorrow)
 - Real-time demo by Fall 2018
- Sidelink
 - on-network/relaying
 - Integration of V2X signaling modes
- Basic L1/L2
 - TM3/4/8: Finish testing of TM3 and start TM4 in CI
 - 256 QAM : integration of community development
 - 2 DL Carrier Aggregation (TDD Band 38/42-43 on Eurecom test network)
 - PUCCH2 CSI: add L1 component + test procedures
- NB-IoT L1/L2
 - interoperability testing and integration in develop
- eMTC
 - More realistic scheduling procedures (integration of higher-order repetition modes)
 - Testing with more modules
- eMBMS/FeMBMS
 - Integration of Fraunhofer IIS eMBMS UE procedures
 - Development of Rel14 eMBMS waveforms (1.5/7.5 SCS numerologies)
- STTI (HRLLC)
 - Integration of Fraunhofer IIS developments

OPENAIRCN STATUS

openairCN status

- **Done since last workshop**
 - CI Framework for openairCN ongoing
 - Automatic generation of tests from merge requests
 - ☞ S1AP tester (FB + EURECOM)
 - ☞ Commercial eNB + TM500 (FB)
 - HSS
 - Rel14 contribution from Sprint (USA) : integrated
 - MME
 - Integration of Blackned contributions
 - ☞ Handover procedures
 - ☞ Paging
 - ☞ Multiple PDN
 - Integrations of BCOM contributions
 - ☞ X2 handover support
 - SPGW
 - Paging + OVS support

openairCN Objectives for the period

■ Basic features 4G EPC

- Many basic bugfixes to MME from FB still to come
 - Reintegration of dedicated bearer support (Blackned)
- Support of Release 14 IEs (e.g. for NB-IoT)
- Additional test cases / tools for S1AP testing / NG4T integration

■ 5G Core

- Evolution towards new network entities (AMF, SMF, UPF, UDM, AUSF)
 - Split of OAI MME in to AMF/SMF
 - HSS to inherit Rel14 version from openairCN
- CI framework from the beginning (like S1AP tester for 4G)
- Presentations in sessions