Third OAI General Workshop
Status and Objectives for 2017-2018
7th April 2017, Orange Gardens, Paris, France
Overview

- Status and objectives for openairinterface5g (Raymond)
- Status and objectives for openairCN (Lionel)
openair5G RAN

- **Main achievements since last workshop**
  - Architecture for 5G lower-layer functional splits: merged to develop branch
    - RU/L1
    - L1/L2 (FAPI/nFAPI)
  - Configuration module: merged to develop
  - Paging: merge requested
  - RRCConnectionReestabishment: merge requested
  - E-RAB Release: merge requested
  - X2-handover: merge to come
  - open-nFAPI: merge to come
  - Multi-core support for eNB: more merges to come

- **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
Current vRAN Roadmap in OAI

OAI Functional Splits

OSS/BSS/MEC

LTE/NR/NB PDCP

LTE RRC

NR RRC

NB-IoT RRC

LTE MAC-RLC

LTE-L1

LTE MODEM

LTE-L1

LTE MODEM

NR MAC-RLC

NR-L1

NR MODEM

NR-L1

NR MODEM

NB-IoT L1/MODEM

Radio-Cloud Center (RCC)

Radio-Access Unit (RAU)

Remote Radio-Unit (RRU)

Modularization of OAI
openair5G RAN : Objectives for next period

- **MAC Architecture revision**
  - Modularization of scheduling (preprocessor) entity
  - Configuration/management interfaces

- **MAC implementation**
  - Rewrite of DL and UL schedulers => 10s to 100s of connected UEs
  - Improve RA stability

- **MAC documentation**
  - Developer manual: scheduler implementation, L1 interface description, CU interface description

- **PHY documentation**
  - Developer manual: Real-time Threading architecture and MODEM procedures

- **Architectural revision for**
  - Higher-layer Functional split (3GPP CU-DU)
    - Follow current 3GPP standardization for NR + 4G retrofit
    - Modularization of RRC/PDCP-C and PDCP-U entities
  - Management interfaces and configuration in RAN (NETCONF?)
  - Precoding and centralized management of large numbers of RRU

- **CI Testing framework**
  - Implement a testing framework for scalability/stability of MACRLC, RRC/PDCP-C, PDCP-U without radio
  - Find a viable solution/partner for scalability testing with radio
    - No TM500 at EURECOM
openair5G RAN : Objectives for next period

- **Simulation / Emulation target (ex-oaisim)**
  - Complete integration into new fronthaul/midhaul architecture
  - Simulated UEs + behavioural modelling (channel) integrated with
    - L1 IF5
    - L1 IF4
    - L2 NFAPI
    - L2 F1 (later)
  - Same executables as real-time target and separate processes for RAN and UEs (same or different machines)
  - OAISIM elements to be reintegrated
    - Mobility
    - Channel modeling
    - L1 abstraction
New MACRLC entity
openair5G RAN: Objectives in next period

- **Features**
  - TM3/4/8: Finish testing of TM3 and start TM4
  - PUCCH2 CSI: add L1 component, L2 is done
  - NB-IoT L1/L2: interoperability testing and integration in development
  - eMTC: interoperability testing, RRC from private branch
  - 256 QAM: nice to have
  - 2 DL Carrier Aggregation (TDD Band 38/42-43 on Eurecom test network)
  - Subset of Rel-15 NR specifications in support of TCL 5G UE
    - down to 250us TTI / 80 MHz numerologies
    - Channel coding subsystem (LDPC+ rate matching)
  - Sidelink/ProSe/V2X procedures
  - MulteFire
OPENAIR CN STATUS
openairCN status

- **Done since last workshop**
  - Shift to GITHUB
  - 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) : to be merged
  - MME
    - Integration of FB/Radisys contributions from last 12 months into current develop branch
  - SPGW
    - Nothing particular during period
openairCN Objectives for the period

**Basic features 4G EPC**
- Many basic bugfixes to MME from FB still to come
- Multiple PDN : FB contribution to come
- Datapath (support of OVS) : FB contribution to come
  - Reintegration of dedicated bearer support
  - Integration of paging procedures
- Support of Release 14 IEs (e.g. for NB-IoT)
- Support X2 Handover : B-COM contribution to come
- Additional test cases / tools for S1AP testing

**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 given yesterday