

SDR in ORBIT: LTE-U

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What is OpenAirInterface (OAI)?

- OpenAirInterface is open-source based experimental research
- Allows to simulate the digital communication environments, such as LTE (Long Term Evolution)
 - Real-world testbed: OAI Software + OAI Hardware or USRP (Universal Software Radio Peripheral) B210/X300
 - OAI Evolved Packet Core (EPC) + OAI Evolved Node B (eNB) <--> Commercial off-the-shelf (COTS) UE
 - Commercial/3rd party EPC + OAI eNB <--> COTS UE
 - OAI EPC + Commercial/3rd party eNB <--> COTS UE
 - **OAI eNB <--> OAI UE**
 - OAI + Signal generator/spectrum analyzer

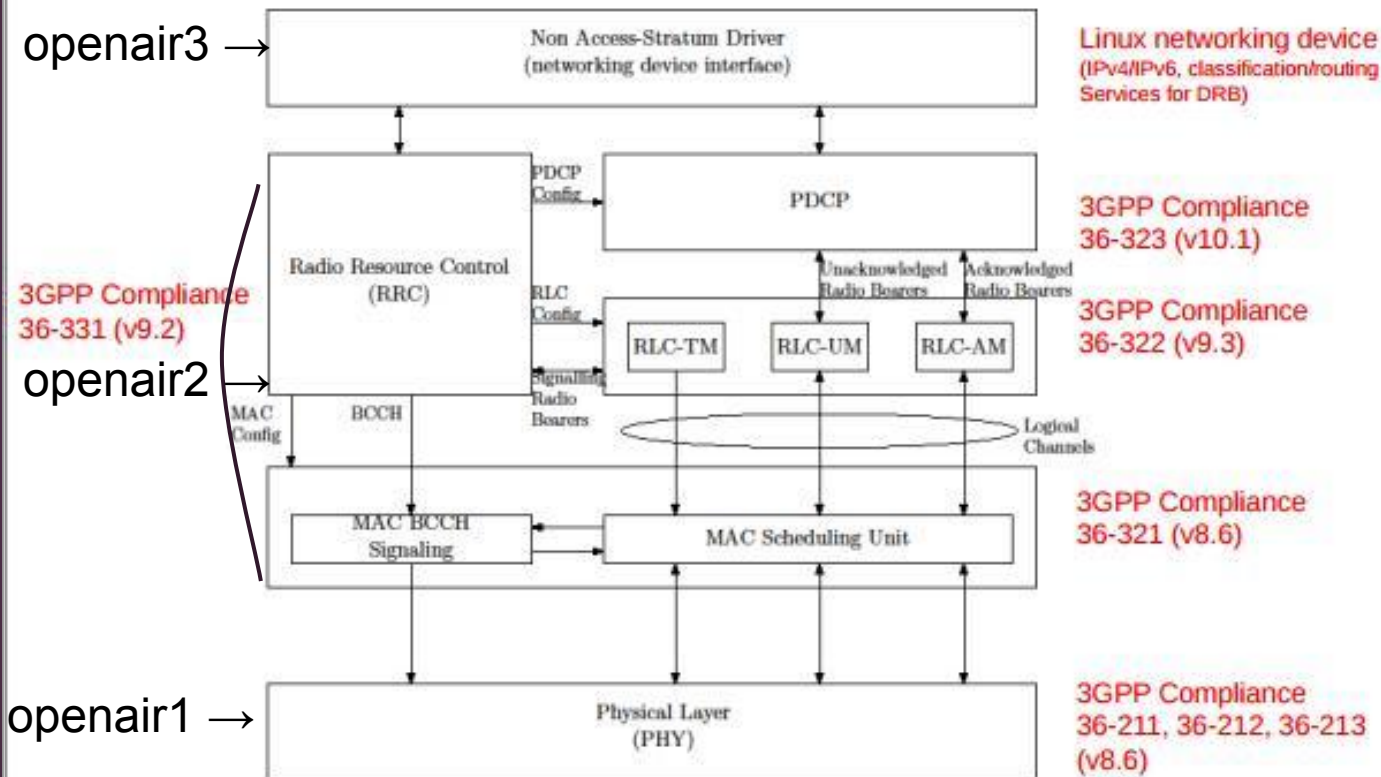
Source Code

- Organized into 6 main repositories for different use cases.
 - openair1, openair2, openair3, openairo, openair-cn, targets
- Each repository focuses on a different data communication layer or focus of 3rd Generation Partnership Project (3GPP) implementation
- Each containing its own detailed README file.

Reference: www.twiki.eurecom.fr

[fr/twiki/bin/view/OpenAirInterface/OpenAirDocumentation](http://www.twiki.eurecom.fr/bin/view/OpenAirInterface/OpenAirDocumentation)

OpenAirLTE PHY/MAC Protocol Stack



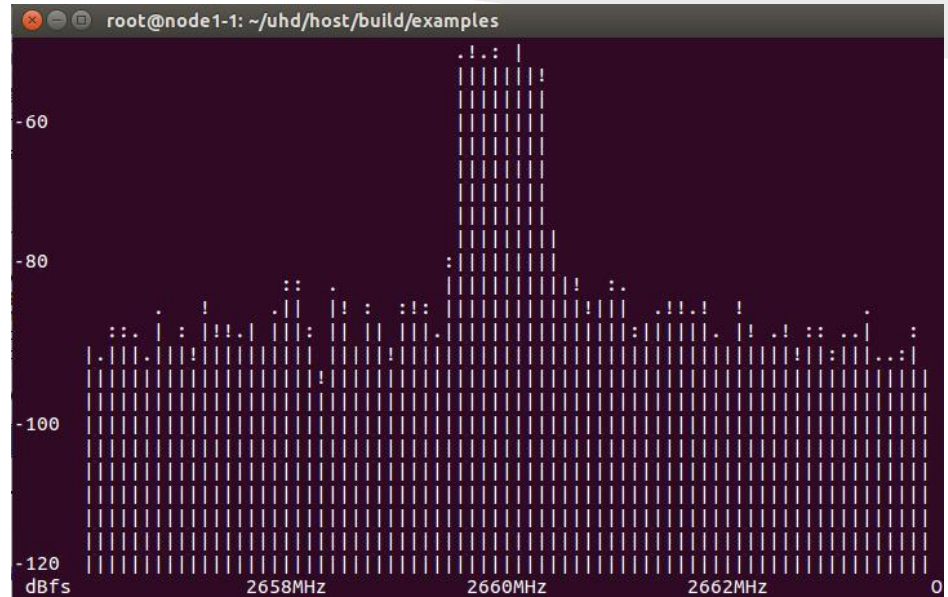
openair1 PHY (Physical layer)

openair4G - Revision 7698: /trunk/openair1/PHY

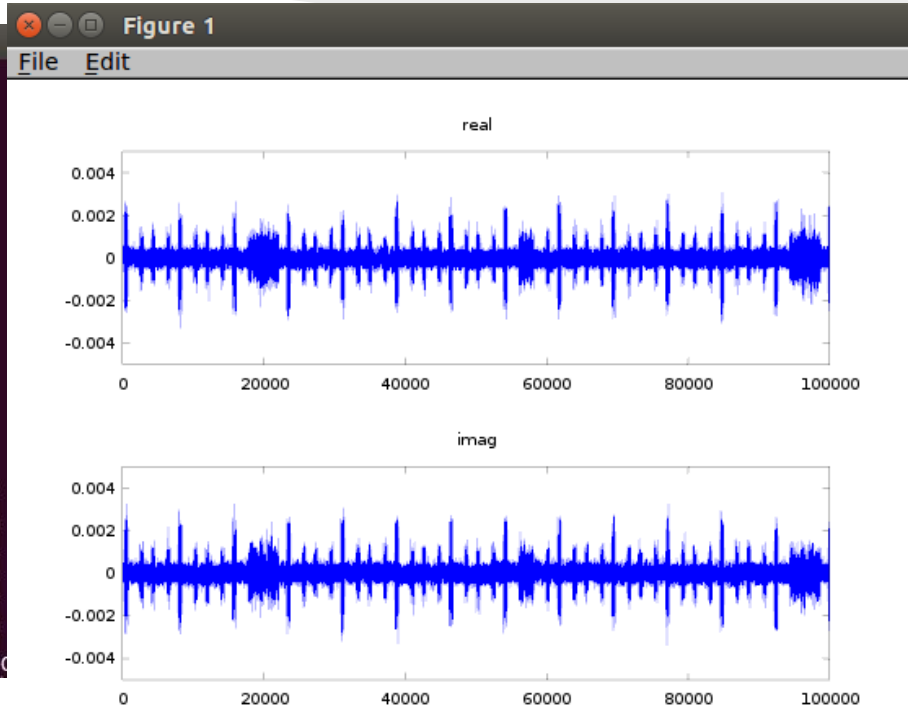
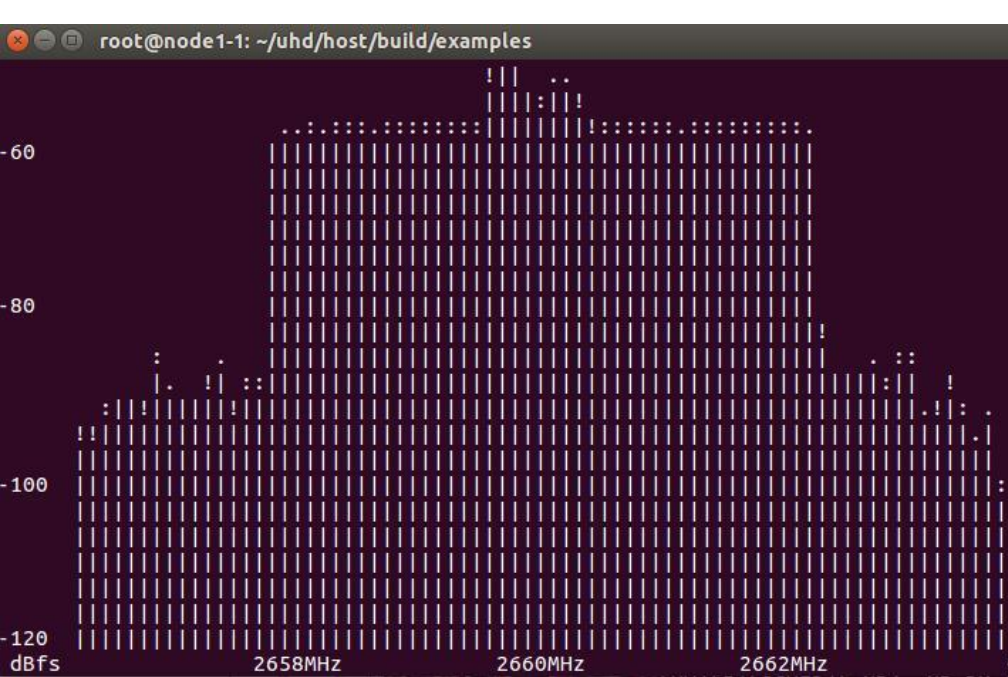
- [..](#)
- [CODING/](#)
- [COPYING](#)
- [INIT/](#)
- [LTE_ESTIMATION/](#)
- [LTE_REFSIG/](#)
- [LTE_TRANSPORT/](#)
- [MODULATION/](#)
- [Makefile.inc](#)
- [TOOLS/](#)
- [defs.h](#)
- [extern.h](#)
- [impl_defs_lte.h](#)
- [impl_defs_top.h](#)
- [spec_defs.h](#)
- [spec_defs_top.h](#)
- [sse_intrin.h](#)
- [types.h](#)
- [vars.h](#)

Experimentation on ORBIT

- Received LTE signal and I/Q samples from USRP Hardware Drivers (UHD) using OAI software



Experimentation on ORBIT



Next Week

- Fix issues with results on ORBIT (use spectrum analyzer)
- Learn and comprehend the components of LTE communication in openair1 repository (physical layer) in OAI