SDR in ORBIT: LTE-U OpenAir Interface
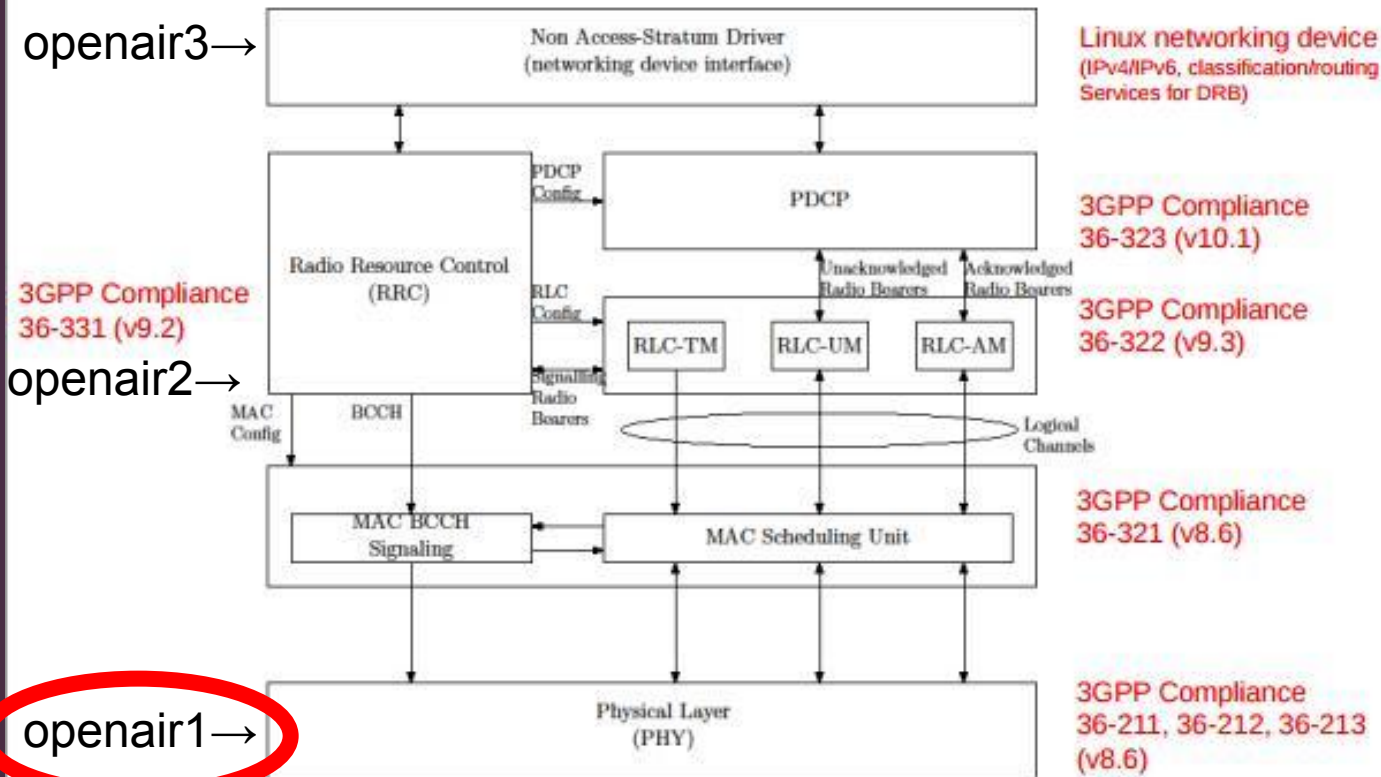
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August 12, 2015

OpenAirLTE PHY/MAC Protocol Stack
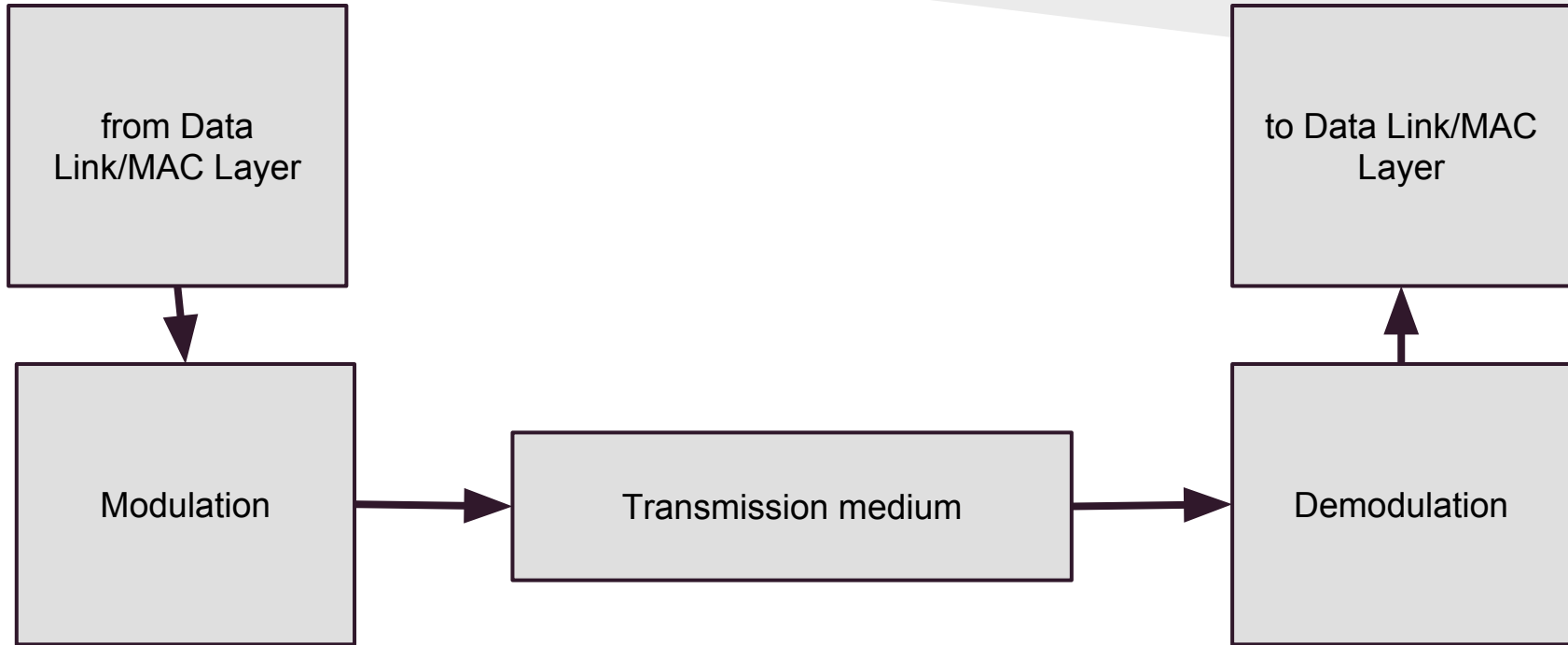
openair3→ | Non Access-Stratum Driver (networking device interface) | Linux networking device (IPv4/IPv6, classification/routing Services for DRB)

PDCP Config

PDCP — 3GPP Compliance 36-323 (v10.1)

Radio Resource Control (RRC)

RLC Config

Unacknowledged Radio Bearers | Acknowledged Radio Bearers

RLC-TM | RLC-UM | RLC-AM — 3GPP Compliance 36-322 (v9.3)

3GPP Compliance 36-331 (v9.2)

openair2→

Signalling Radio Bearers

MAC Config | BCCH

Logical Channels

MAC BCCH Signaling | MAC Scheduling Unit — 3GPP Compliance 36-321 (v8.6)

openair1→ | Physical Layer (PHY) | 3GPP Compliance 36-211, 36-212, 36-213 (v8.6)

OpenAir1 and Physical Layer

openair4G - Revision 7773: /releases/rel_0.1_26.10.2014/openair1

- ..
- ARCH/
- COPYING
- DOCS/
- EMOS/
- LAUNCH_SCRIPTS/
- MAC_INTERFACE/
- Makefile
- PHY/
- README.TXT
- SCHED/
- SIMULATION/
- USERSPACE_TOOLS/

PHY Layer Transmission

from Data Link/MAC Layer

Modulation

Transmission medium

Demodulation

to Data Link/MAC Layer

OpenAir1 Directories

- PHY/ - code to handle signal processing of physical layer (LTE transport, Modulation, LTE reference signals)

- SCHED/ - schedules all PHY layer functions to run (Cell search, Downlink timing, Channel reference signal, scheduling request [SR])

- MAC_INTERACE/ - communicate with MAC layer, link with OpenAir2

Software ⟷ Hardware

- SIMULATION/ - Runs tests with PHY layer

- USERSPACE_TOOLS/ - tools in user space (user window for visuals, device driver interaction)

- ARCH/ - contains code for managing and running the CardBus MIMO 1 software radio

- Makefile- gives instructions to compile files