# Reference design of CU Test Case based on OAI 4G eNB

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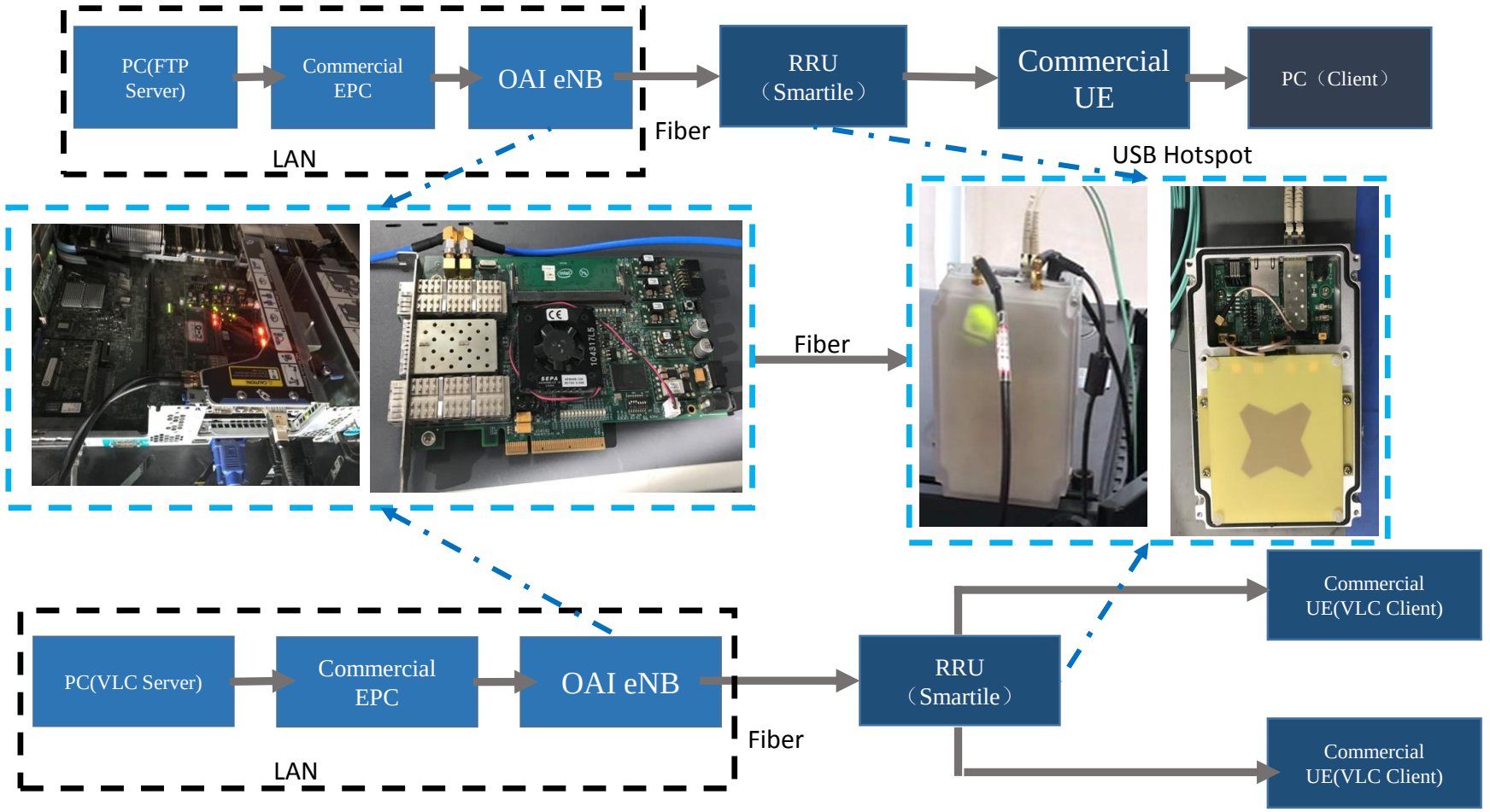
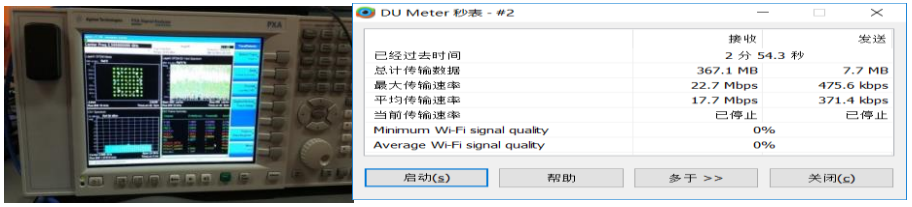
# Introduction of C-RAN PoC




**LTE TDD**
**Config 1 and 3**

**Performance**

- iPerf TCP testing mode: 18Mbps downloading bitrates
- FTP downloading bitrates: 2.0MBytes/s



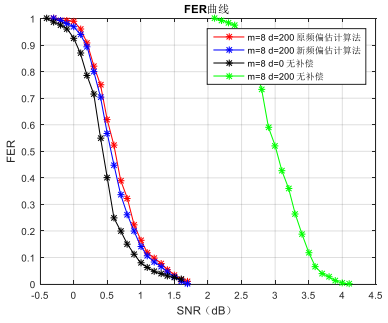

VLC video streaming demo

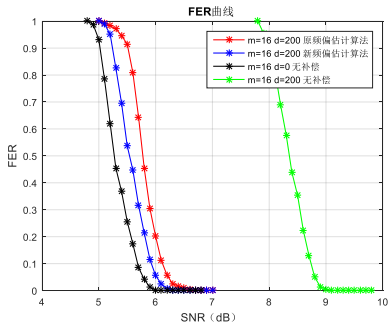
- 2 UE 720p video streaming
- Multipath radio scenario

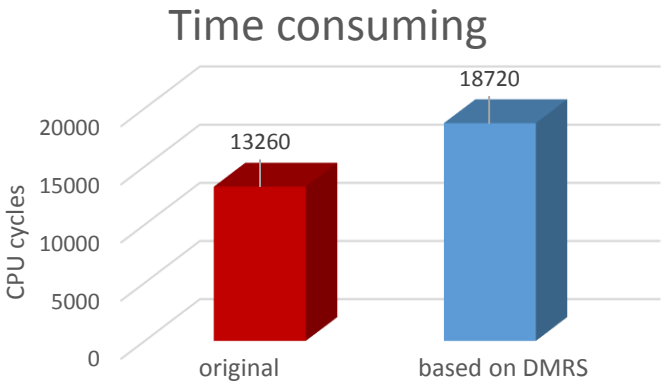
# Optimization of algorithms in uplink receiver

## Frequency Offset Estimation

d means frequency offset(Hz)
m means MCS

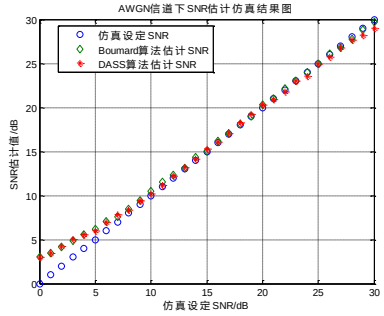


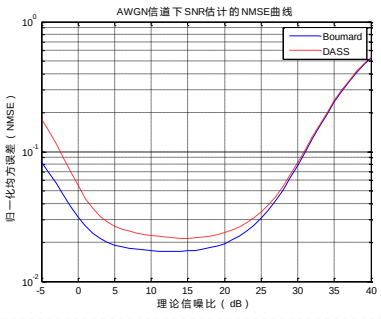



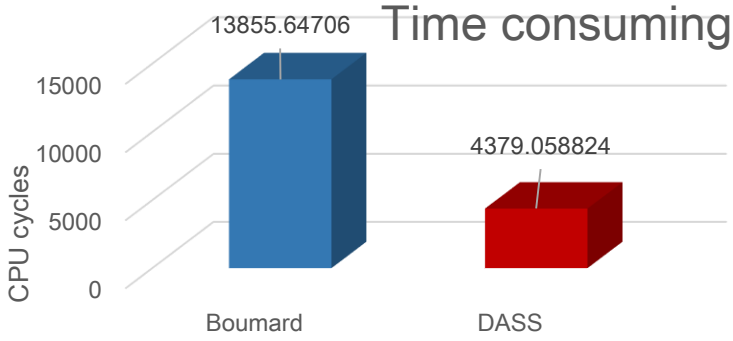




## Noise Estimation

m means MCS

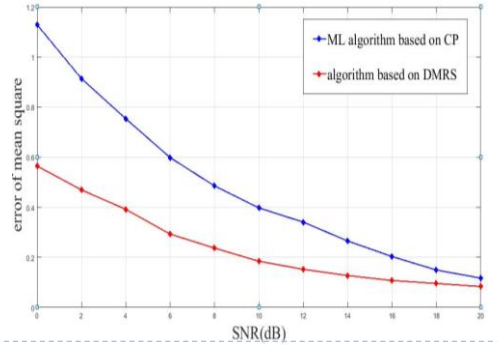


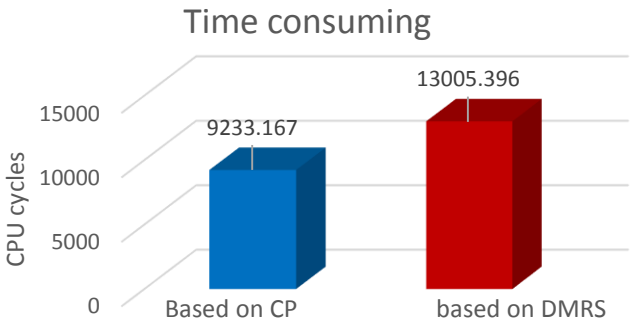




## Timing Offset Estimation

RB=100, delay=20 samples

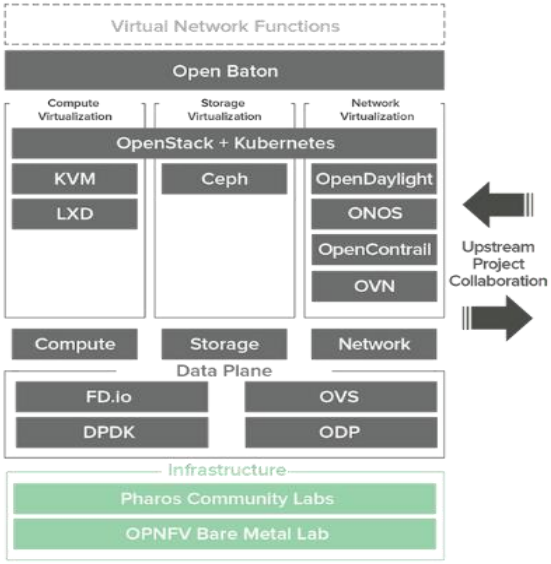


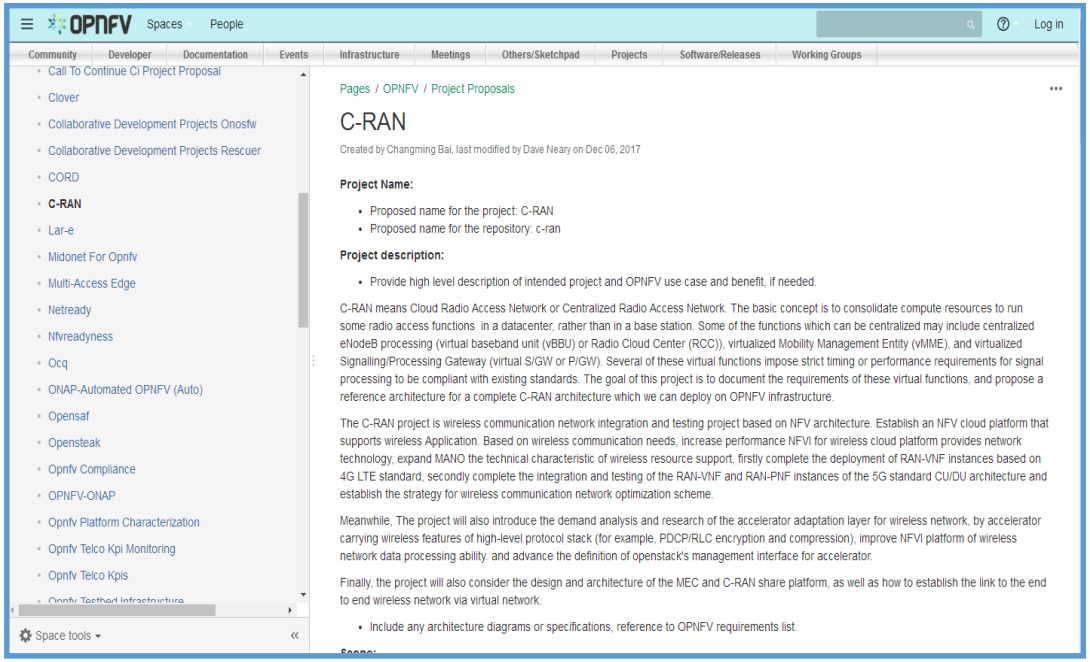



# C-RAN project in OPNFV

## What is OPNFV

- An open source community.
- Focus on NFV platform and integration testing.
- Adapt the code from other communities to make them work together.
- Support various requirements of applications.



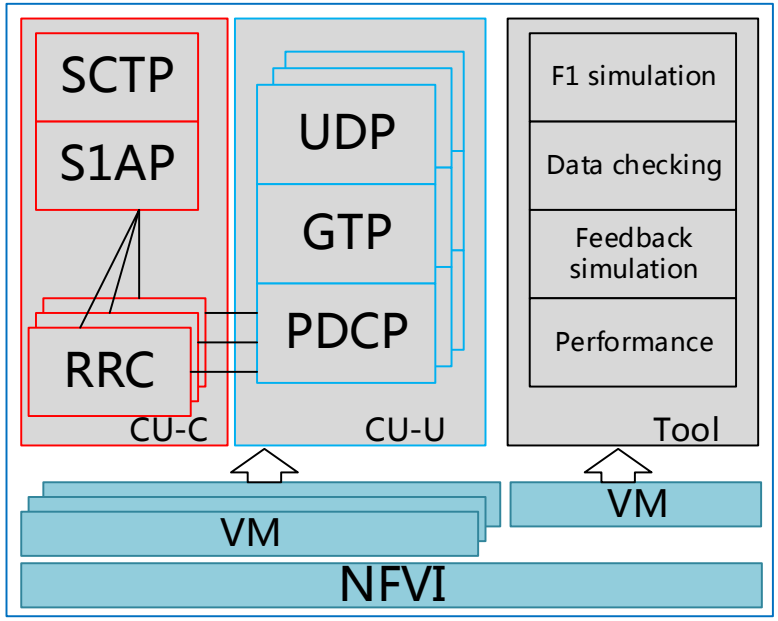

## C-RAN project in OPNFV

- C-RAN project proposal has been established this year.
- Integration of RAN functions and NFVI.
- Goal is to document the requirements and propose a reference architecture of the RAN functions(such as CU) so that we can deploy them on NFVI.
- Help to make CU open source.

# CU test case based on 4G eNB

## Instruction of CU test case

- The picture is the final structure of CU based on LTE.
- A tool is introduced to test CU.
- CU and the tool will be deployed on VMs with CentOS.
- This test case is used to test whether the NFVI can meet the requirement about throughput and delay of CU.
- The split code is an independent file, so it will be easy to be merged into develop branch.




## Progress of CU test case

- The CU/DU is split based on LTE with TDD1 20M bandwidth.
- The interface between CU and DU is designed based on the master branch of OAI in 2014.
- The protocol is used to encapsulate data as the protocol-split branch does.
- CU and DU have been split completely and they can run on two servers. CU is server and DU is client and they exchange messages through socket without TNL.

## Ongoing work

- CU will be split into CU-C and CU-U. DU will be replaced by the tool.
- Migrate the test case from Ubuntu to CentOS.

# Summary and rough plan

- CU test case based on 4G eNB
  - DU waits for subframe indication from hardware.
  - CU and DU run asynchronously.
  - Two commercial UEs can make random access and achieve ping package through EPC at the same time.
- Rough plan
  - The interface between CU and DU is private. F1 interface will be used when NR CU completed.
  - The work about CU/DU splitting will be continue and we hope the NR CU will be tested in C-RAN project.

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# Thank you!

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