中国移动
China Mobile

C-RAN system based on OpenAirInterface : Achievements and Prospects

BUPT and China Mobile Research Institute
Joint Projects

Introduction

Background

- Achievements
  - TDD 20M LTE CRAN testbench
  - Cross-layer video streaming demo
- Prospects
  - CU/DU splitting scheme
  - CU use-case

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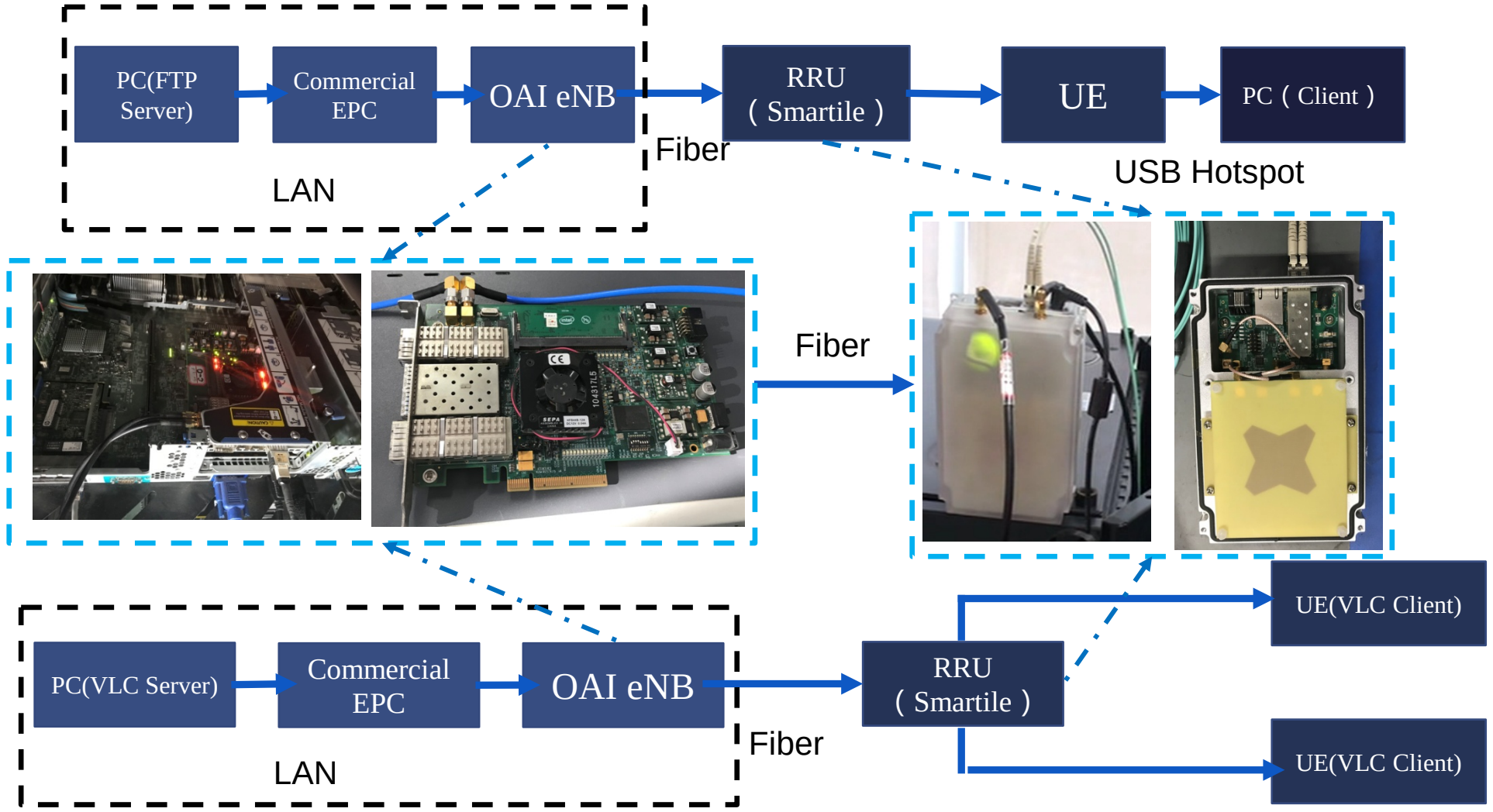
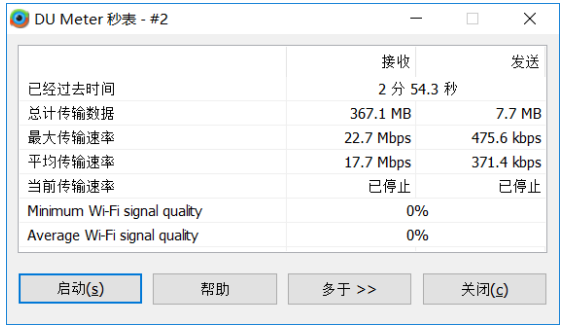
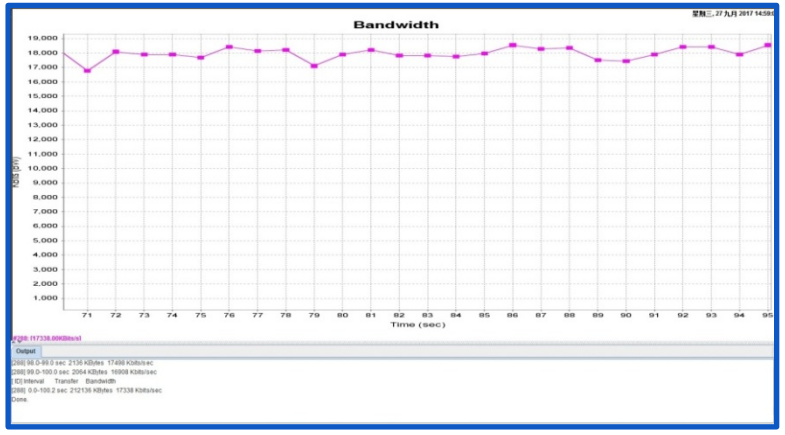
- Introduction of the testbench
- Cross-layer bandwidth estimation
- CU/DU splitting scheme
- CU use case design

Introduction of the testbench



Performance and Demo





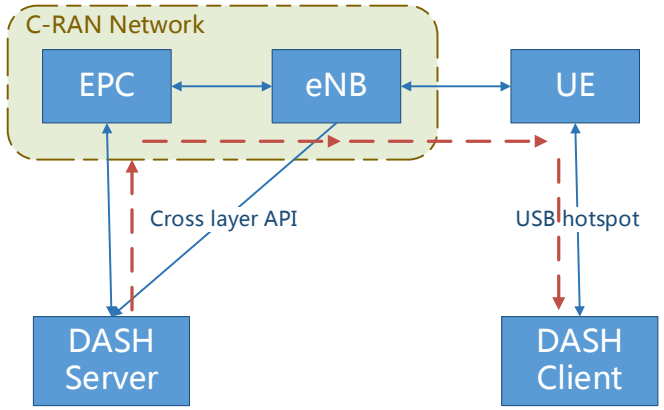
Performance

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

VLC video streaming demo

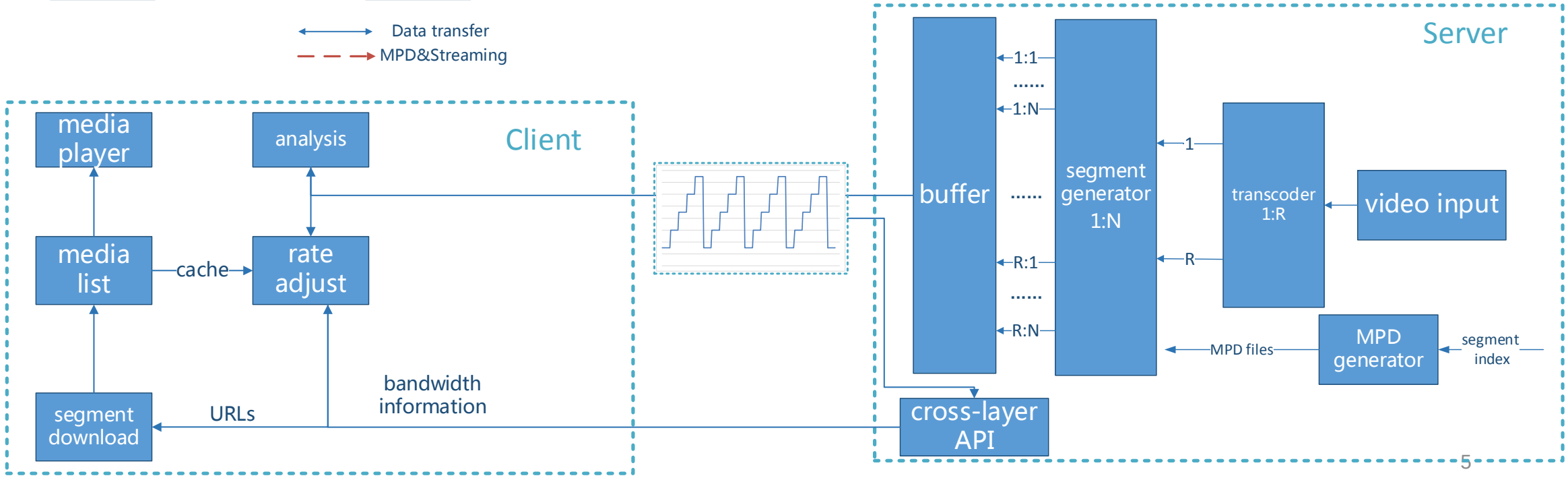
- 2 UE 720p video streaming
- Multipath radio scenario

Cross layer bandwidth estimation

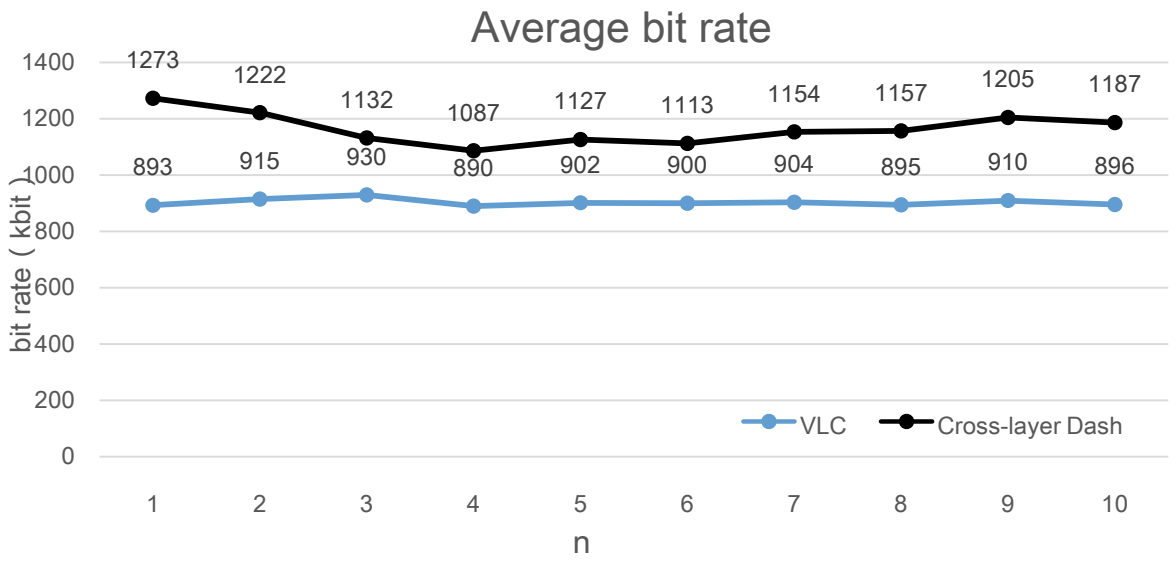


Cross layer video streaming design

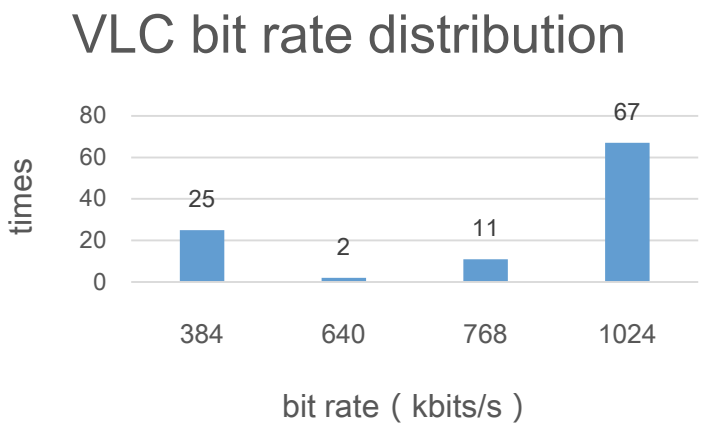
- DASH server: generate segments of the video; analyze the bandwidth information
- DASH client: adjust the bitrates according to the cache and bandwidth information
- Cross layer API: get the baseband information and send to the dash server

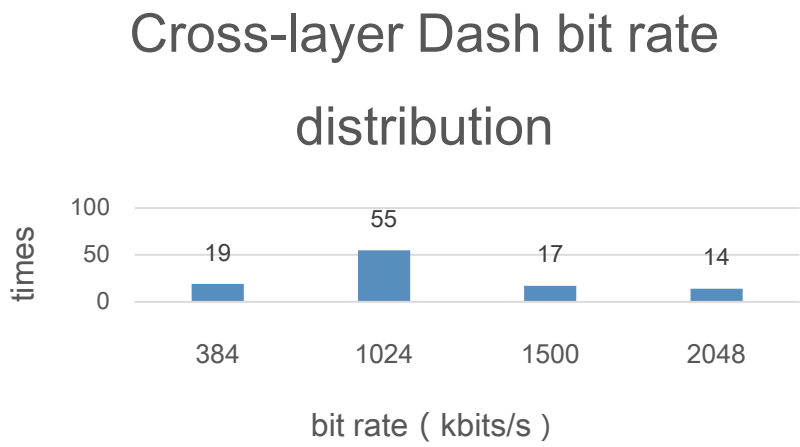


Performance analysis (vs. VLC)



	average bit rate (kbit)
VLC	904
Cross-layer Dash	1158

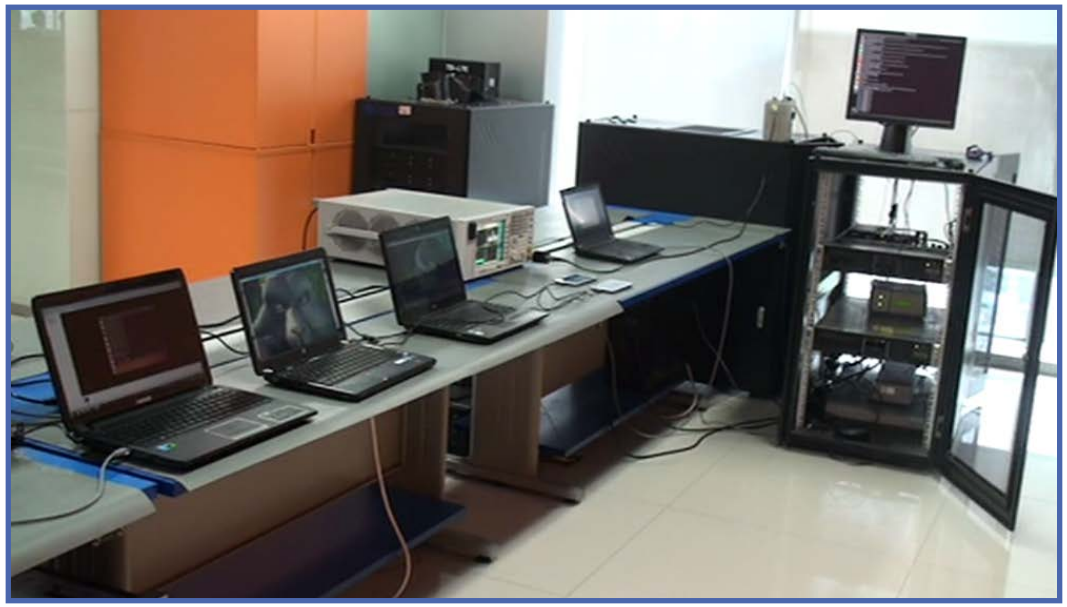




For details:

A Novel Bandwidth Estimation Algorithm of TCP Westwood in Typical LTE Scenarios

Cross-layer demo



Smartile

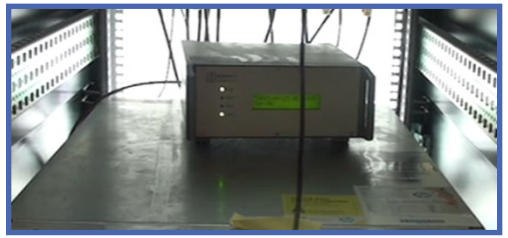
cable

Spectrometer

radio

Cell phone

fiber

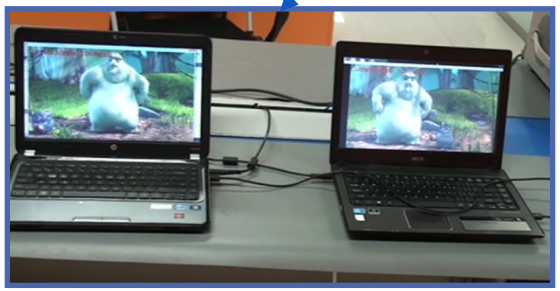


Rubidium clock

clock

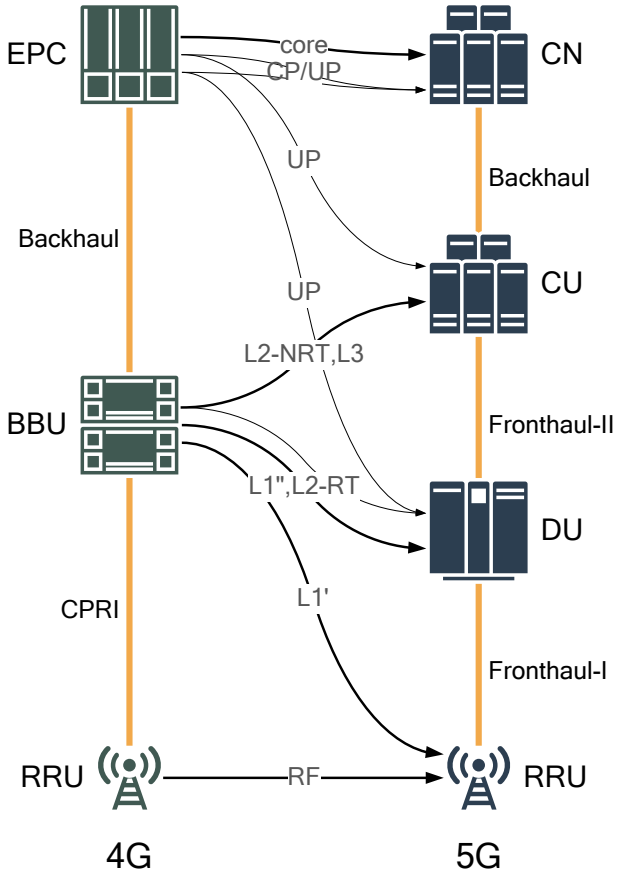
FPGA card

USB hotspot

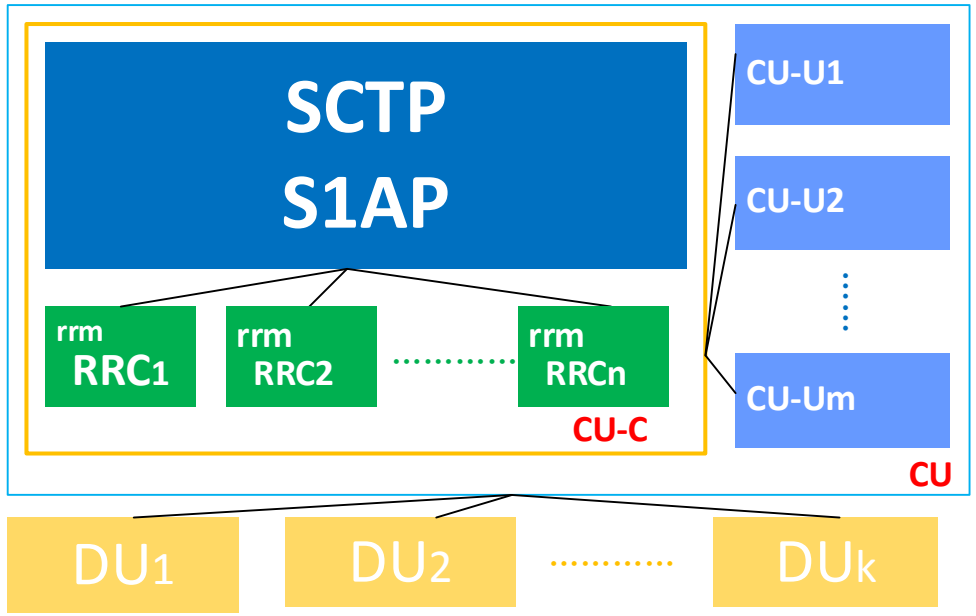


Dash client and VLC client

CU/DU splitting scheme

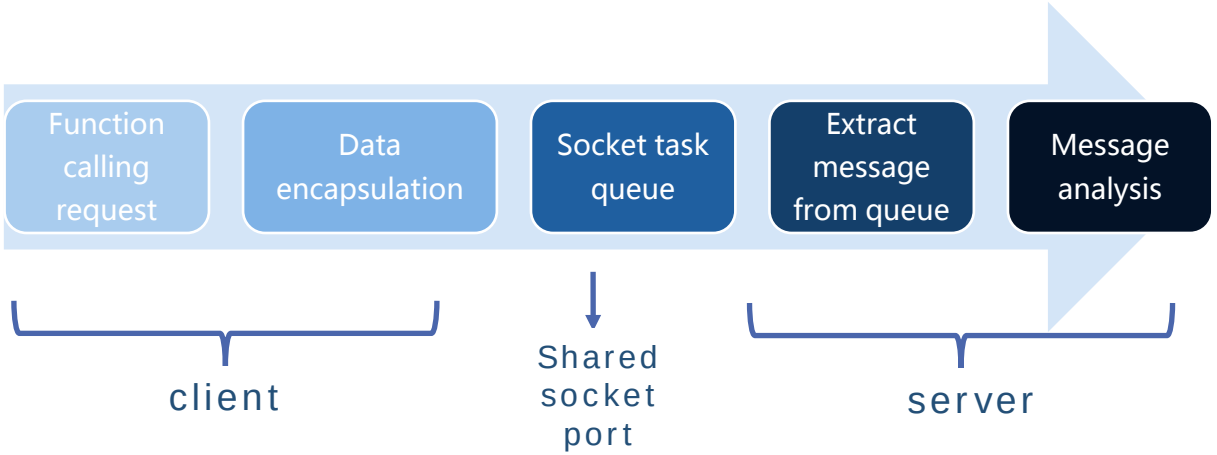


4G to 5G
BBU to CU/DU

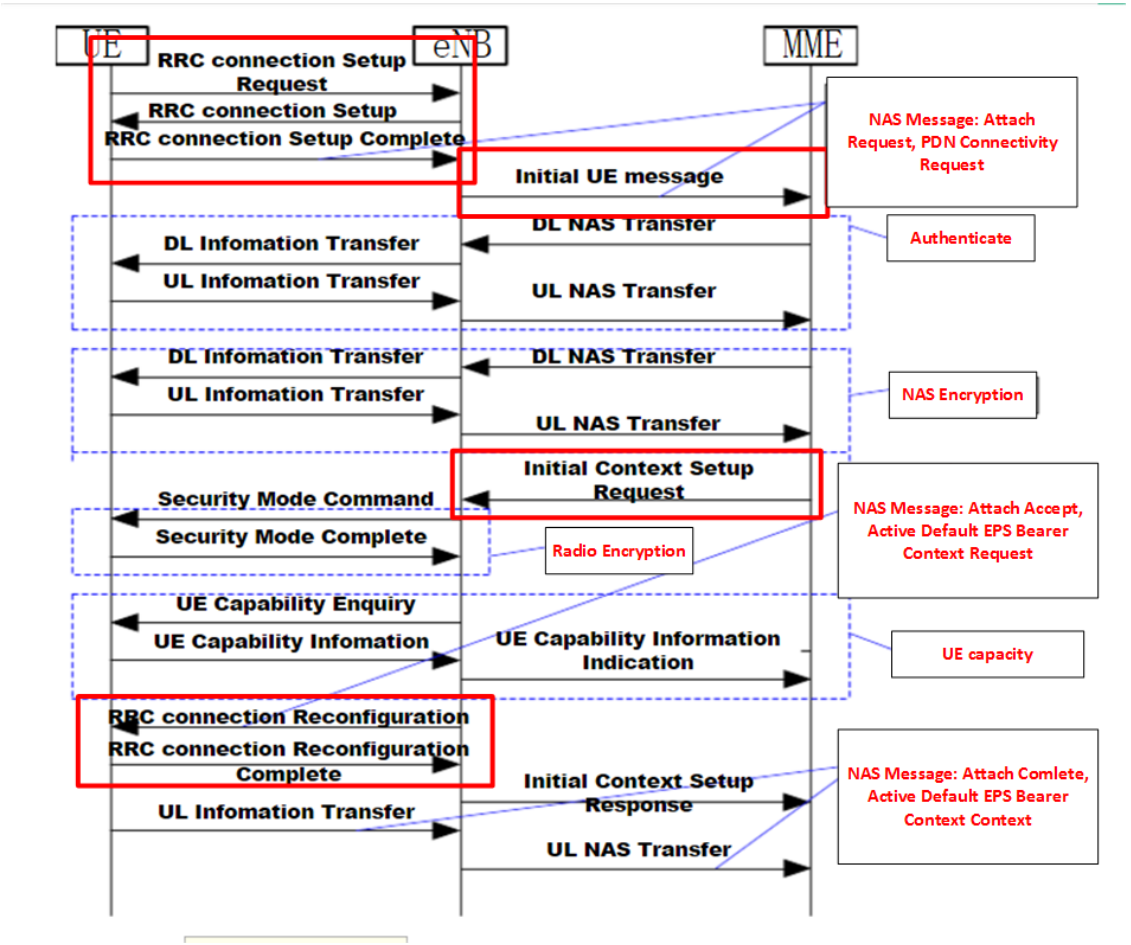


- S1AP →n CU-Cs
- CU/C → m CU-Us
- CU → k DUs

- OAI functions adjustment



CU use-case design



Splitting structure:

- PDCP RLC buffer design

Controlling signals test:

- RRC connection setup
- Initial UE message
- Initial context setup request
- RRC connection reconfiguration

Data streaming test:

- Traffic loads
- Packets delay
- PDCP-RLC rate matching

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Thank you !