Comcores
Radio over Ethernet Gateway for Future Fronthaul Networks

FG IMT-2020 Workshop and Demo Day

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Agenda

- About Comcores
- Motivation for Ethernet Based Fronthaul
- Comcores Overview on next generation fronthaul networks
- Demo setup
- Demo results

Comcores Headquarter

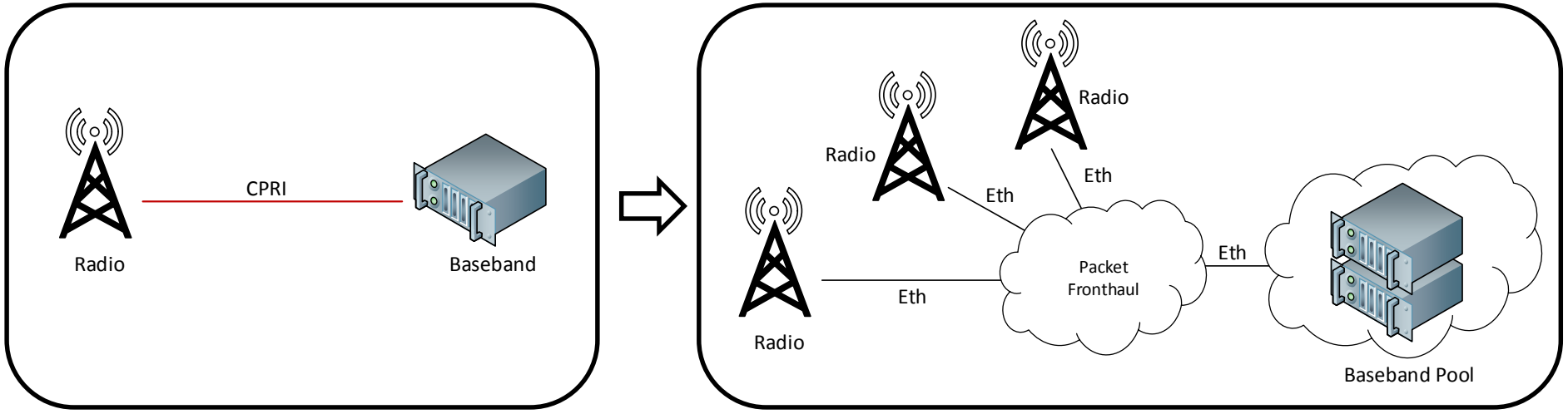
About Comcores

- Established in 2014
- Globally oriented high-tech company, headquartered in Scion DTU Science Park, 20 min outside Copenhagen, Denmark
- IP cores and design services for communication systems
- Specialized in digital radio systems

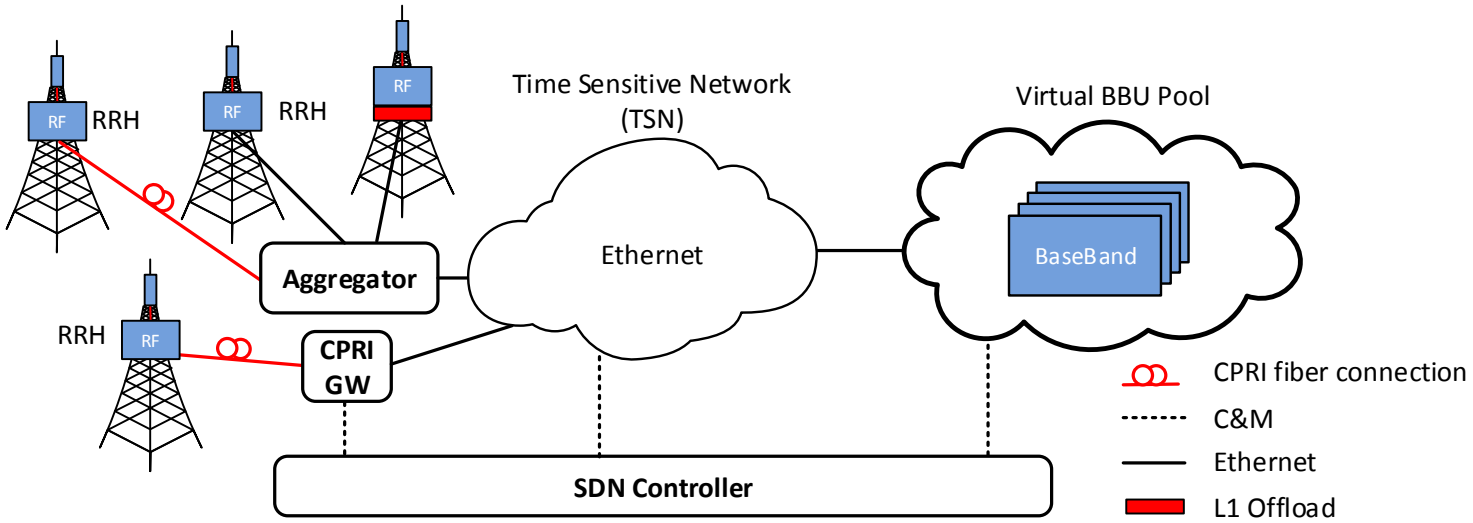
Comcores Headquarter

Motivation for Ethernet Based Fronthaul

- New fronthaul interface technologies are required to satisfy various RAN deployment and evolution requirements, and reduce fronthaul transmission costs
- Current dedicated point-to-point connection between BBUs and RRUs (such as CPRI/OBSAI) will evolve to many-to-many fronthaul mainstream switch networks (such as Ethernet) due to cost, availability and flexibility
- Fronthaul architecture is migrating from traditional RAN where single BBU connects to single/few RRUs to architectures where multiple centralized BBUs connect to multiple RRUs making a packet switched technology ideal
- Ethernet is a widely adopted & nearly ubiquitous standard technology

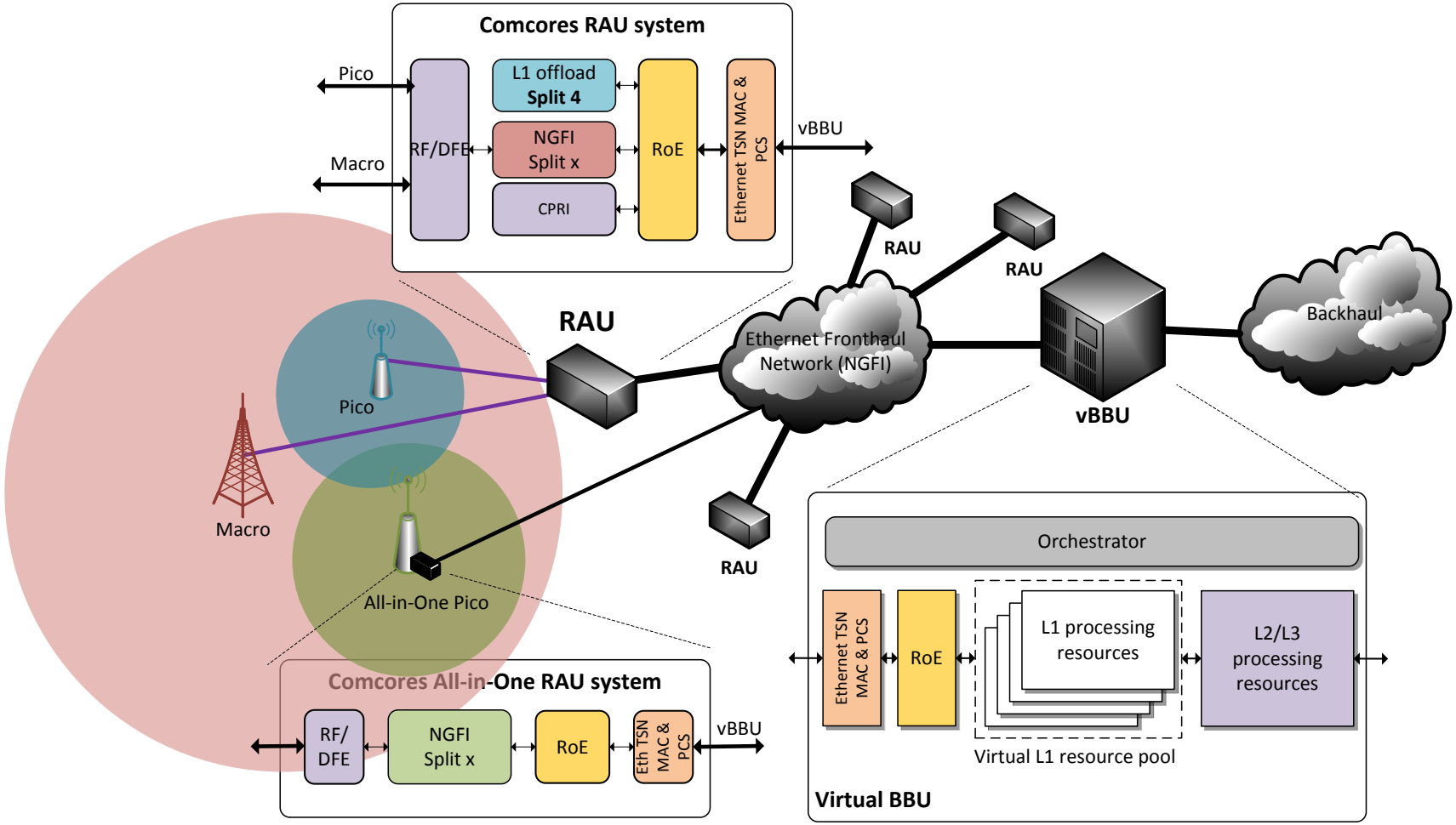


Comcores Overview on next generation fronthaul networks



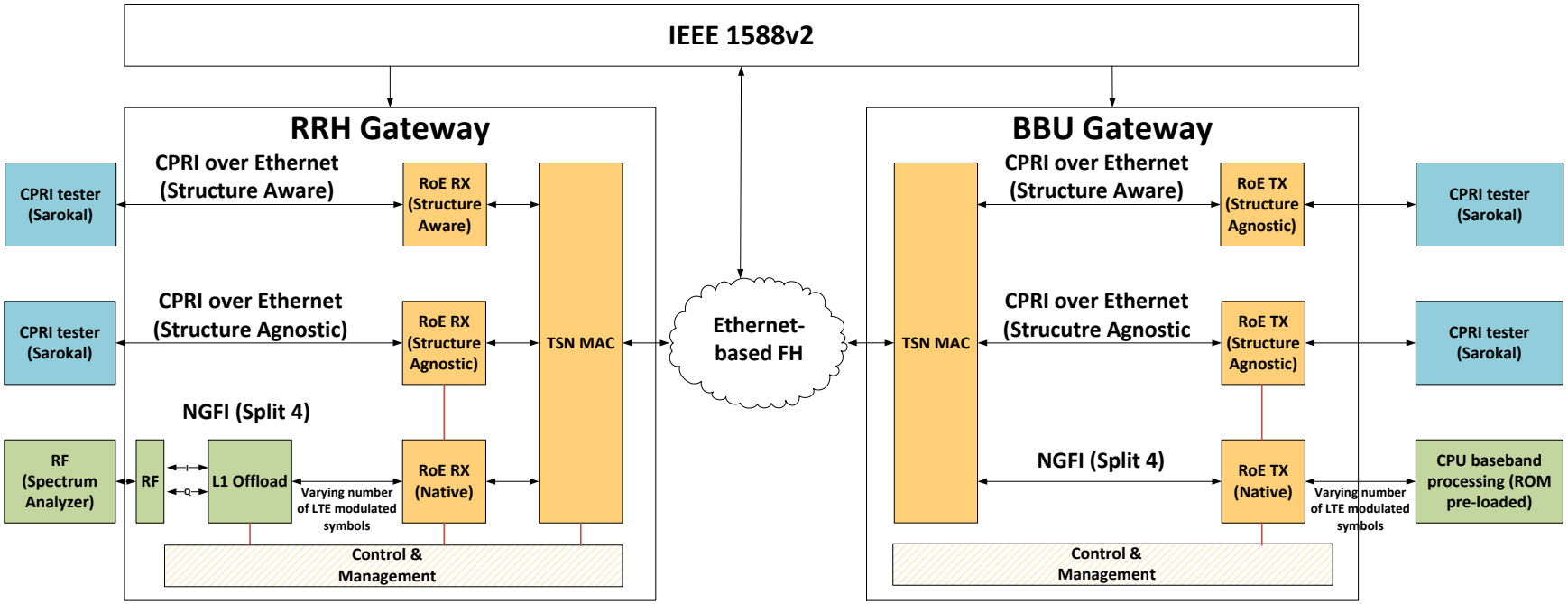
Comcores gateway

- Fits on both radio and base band side
- support of CPRI, new radio interface and high speed Ethernet

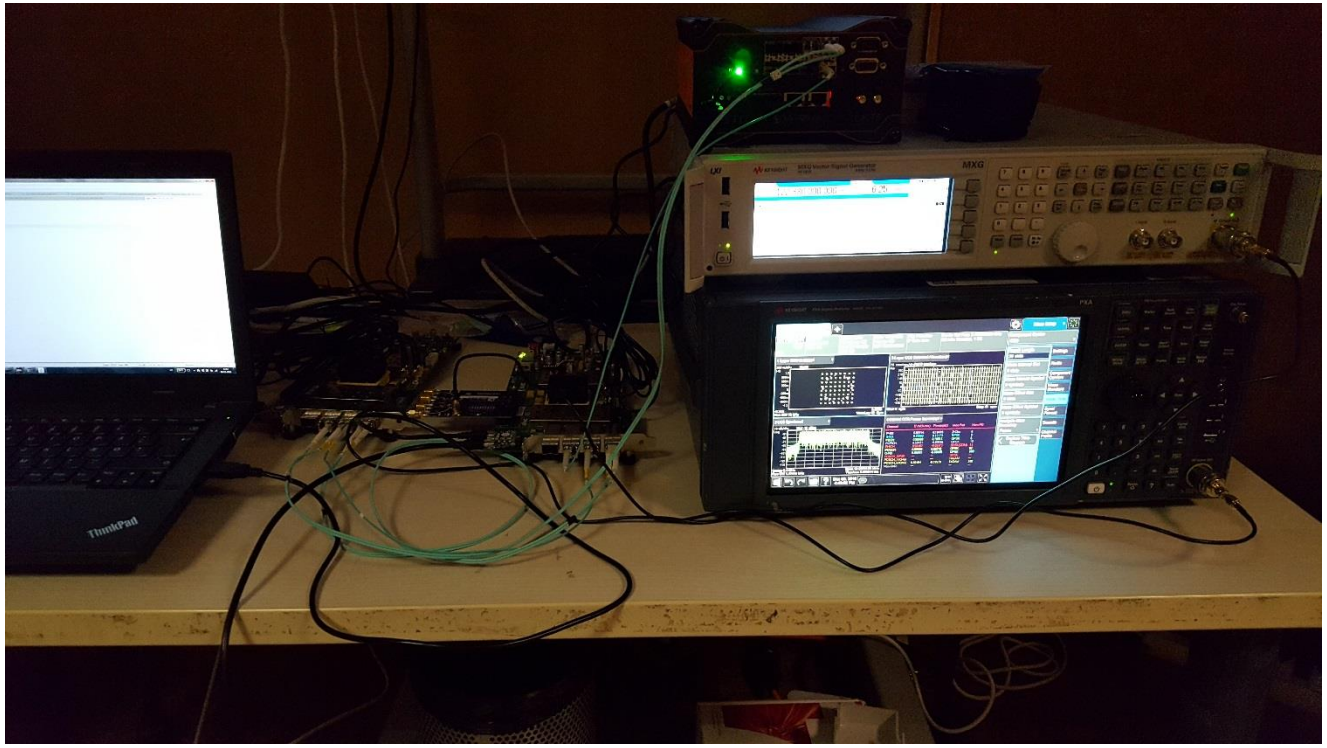


Demo setup

- IEEE P1914.3 - CPRI over Ethernet mapper/de-mapper
- IEEE P1914.1 - Next Generation Fronthaul Interface
- IEEE 802.3 - Time Sensitive Network features
- IEEE 1588v2 – time stamp



Lab setup



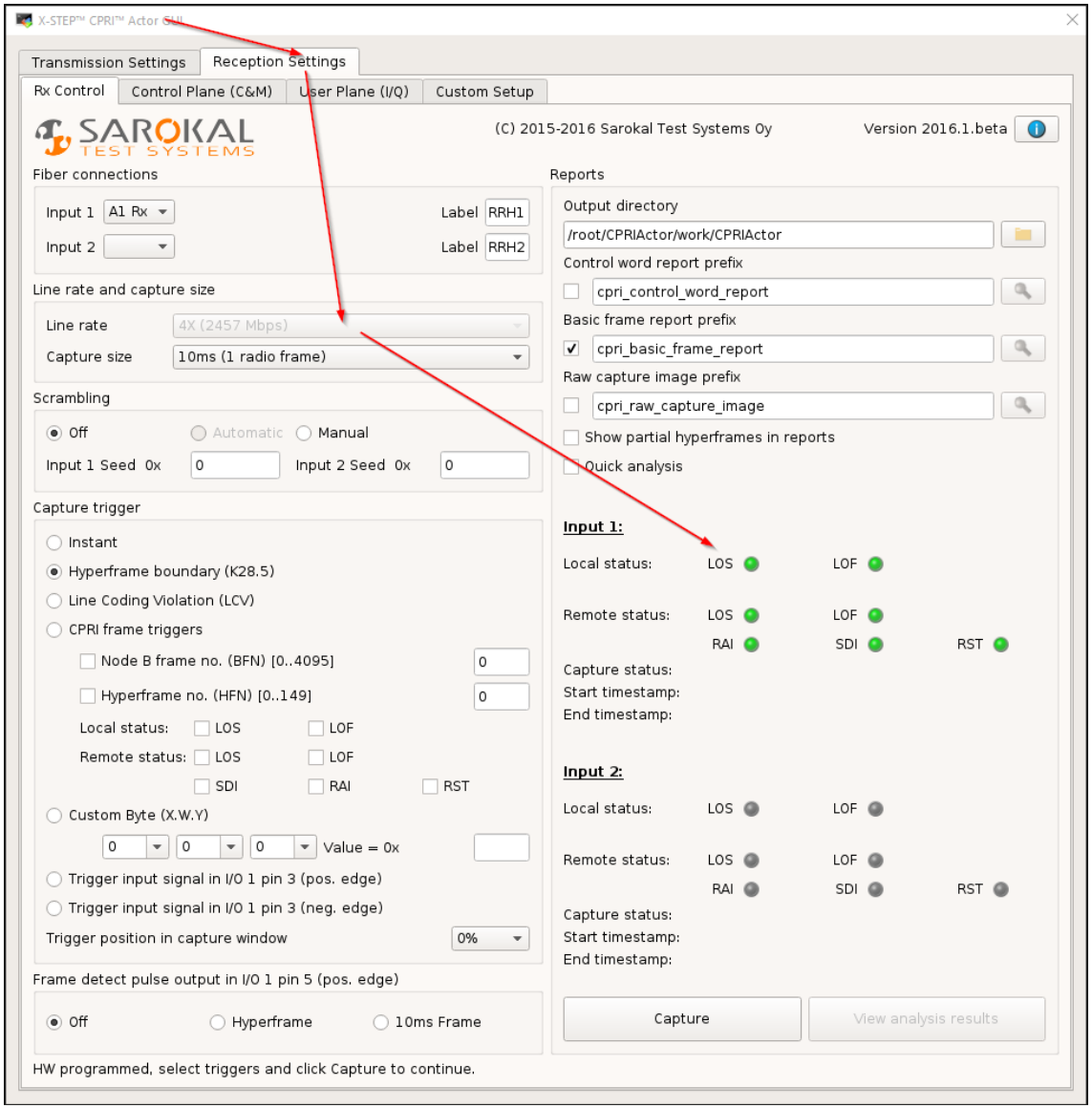
- Xilinx VC709 FPGA demonstration platform
- CPRI verification by Sarokal X-STEP tester
- LTE demondulation verification by Keysight PXA spectrum analyzer

CPRI over Ethernet - motivation

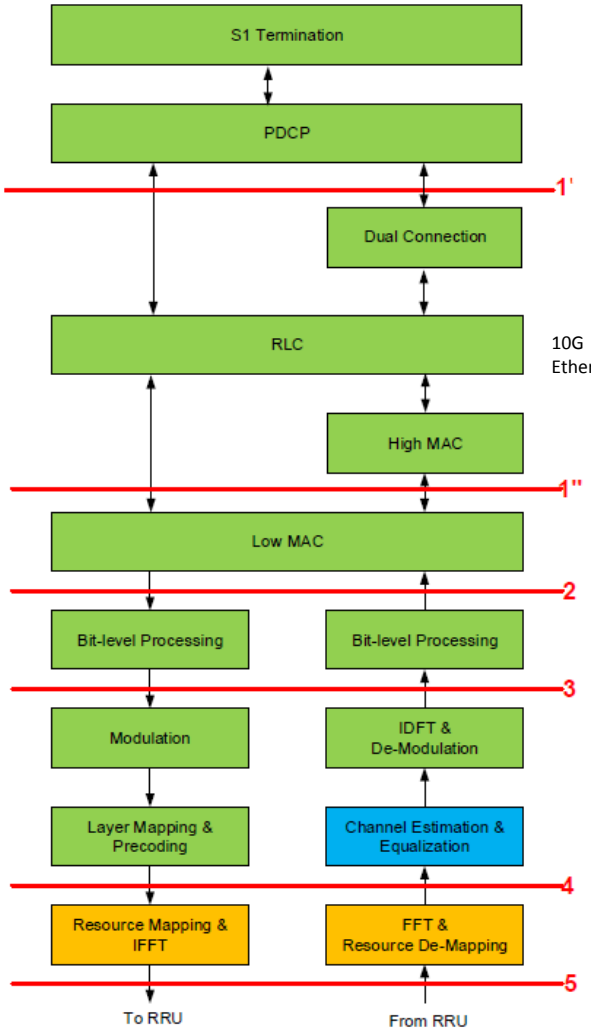
- C-RAN
- Bridge to carry current CPRI flows in future Ethernet based fronthaul networks

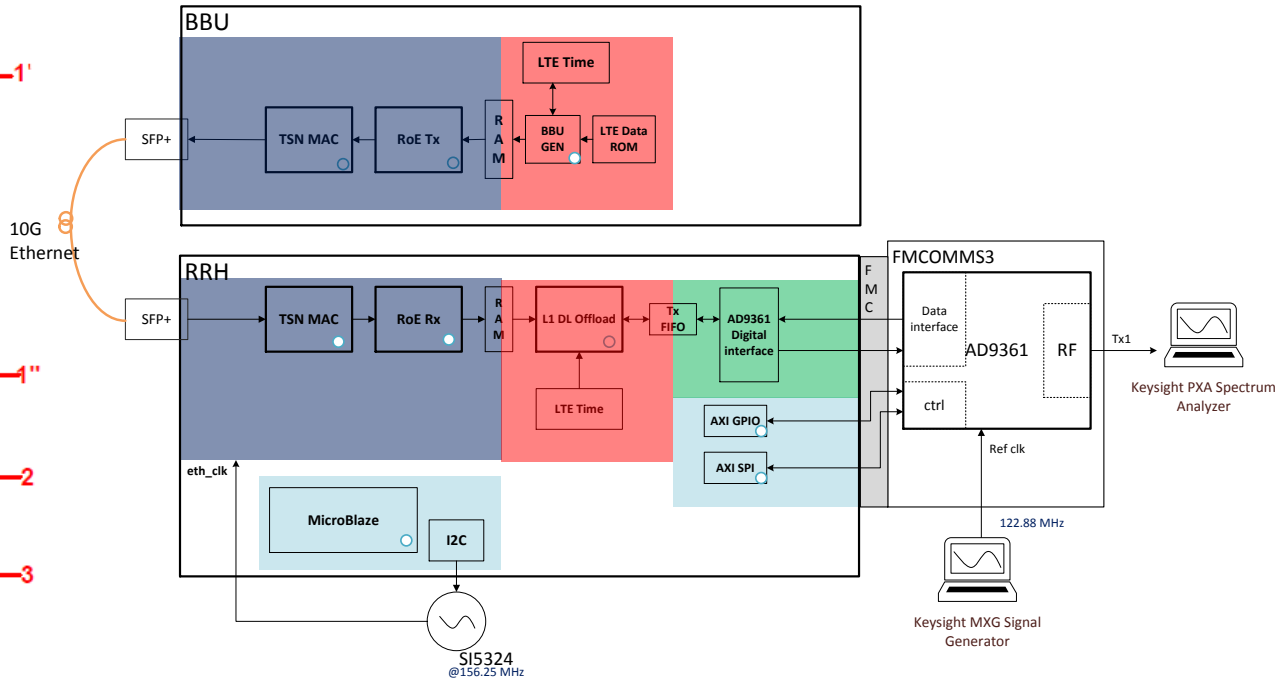
CPRI over Ethernet - result

- Synchronous traffic over asynchronous networks
- Lossless transmission based on the clock recovery and delay control schemes



Intra-PHY Split Proof of Concept

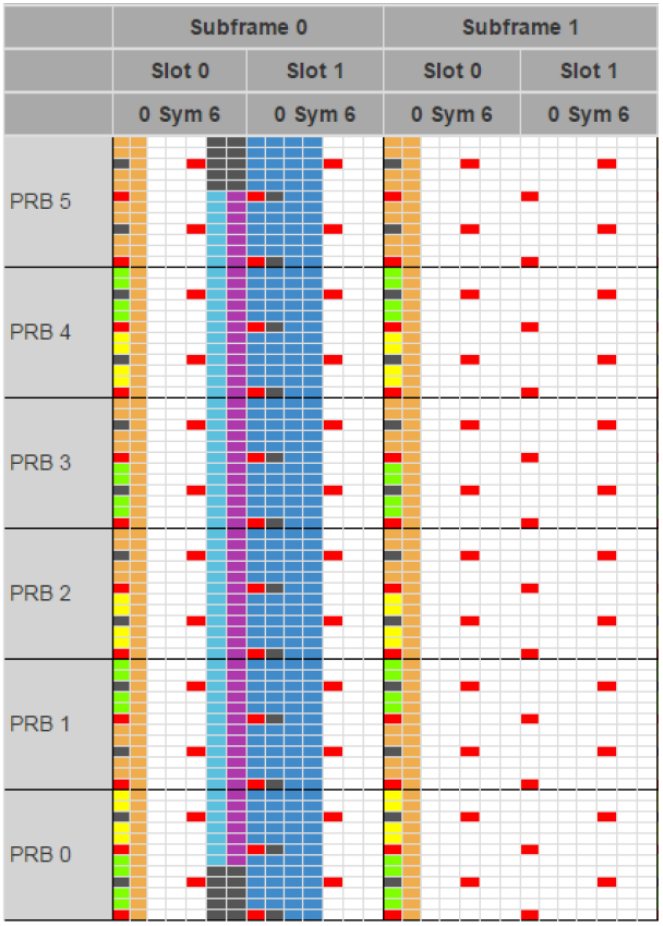


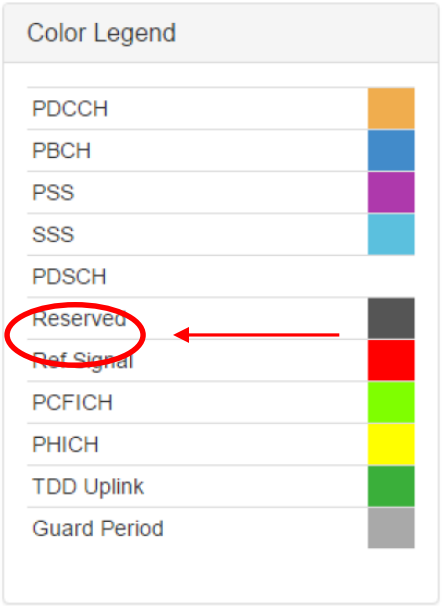


Source: ”White Paper of Next Generation Fronthaul Interface”

PDSCH cell load

- PDSCH cell load is dependent on the real traffic for Intra-PHY splits

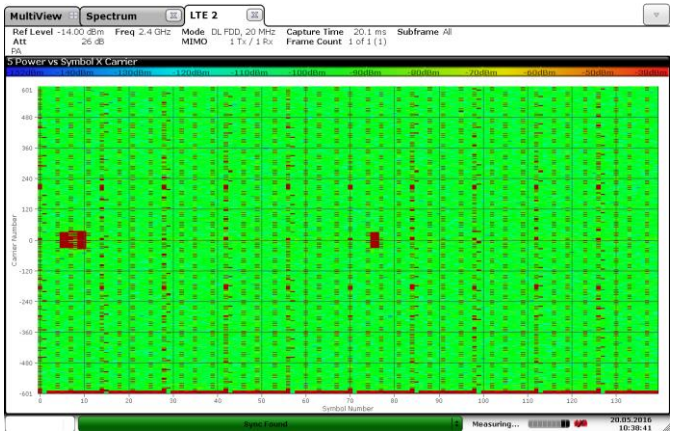


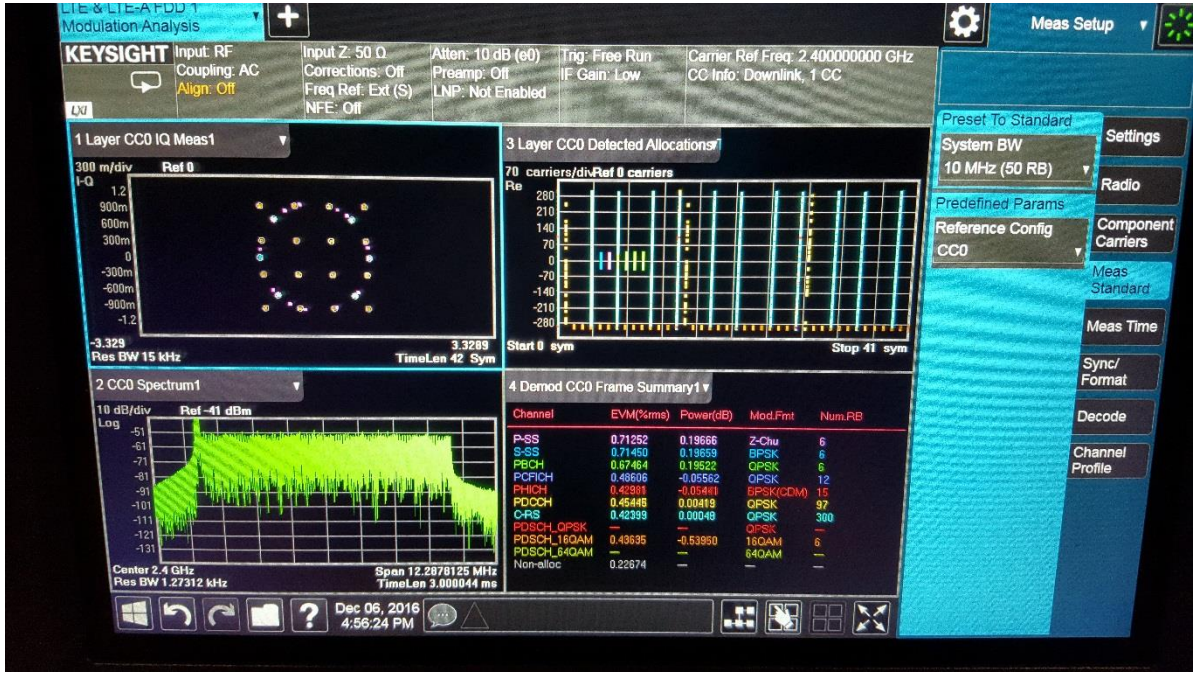


Downlink shared channel for user data

Low load in a 10 MHz cell

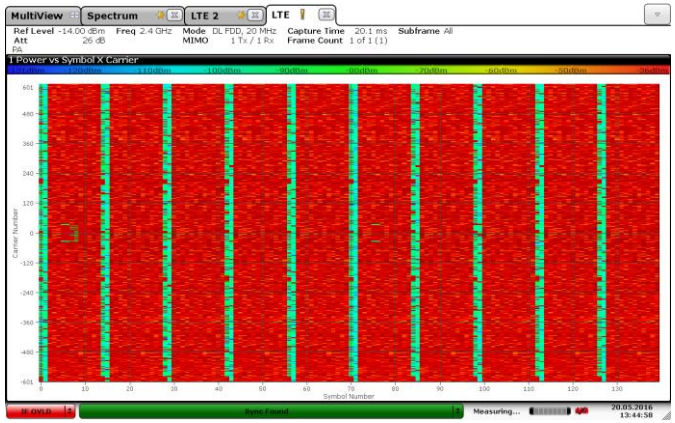
- Succesful cell synchronization
- 1 user allocated 1 RB (bottom)
- Autodetection of cell configuration
- Autodetection of user allocation





Peak load in a 10 MHz cell

- Full allocation of user data (PDSCH)
- < 1 % EVM
- ~160 Mbps load on Ethernet link
- 1:4 reduction compared to CPRI



Acknowledgement