Flexible Infrastructure for the Development and Integration of Access / Fronthauling Solutions in Future Wireless Systems

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Acknowledgments

Bibliography

Conclusions and Future Work

The C-RAN Concept

✓ Promotes the aggregation of a pool of remote radio-heads (RRHs) for centralized processing in a baseband unit (BBU).

✓ We consider the existence of a soft boundary between indoor (in-lab) and outdoor (in-campus) deployments, enabled by an RF path extension based on analog RoF.

✓ The use of in-house and commercially ready hardware are separately addressed as complementary solutions for coexisting testbeds.

Future work includes the development of a virtualization layer for the physical testbed, with the aim to provide remote users with seamless access to the research infrastructure.

The ORCIP Deployment Plan

✓ Includes a set of radio heads deployed within the University of Aveiro Campus and connected through optical fiber to a central laboratory.

✓ Provides support to more research-oriented developments in the physical layer, such as new compression algorithms and waveforms, new transport protocols.

✓ Longer time for test and development but higher flexibility.

A C-RAN Implementation Example

First Demonstrator Architecture using OAI and CPRI MFH: http://www.openairinterface.org/?page_id=1638

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Currently Operating Setups

✓ USRP B210 + BBU + EPC, with 10G optical interface (SFP+) and 10 MHz LTE support.

✓ USRP 2953R + BBU + EPC, with split 7.1 and 5 MHz LTE support.

✓ USRP 2953R + BBU + EPC, with split 7.1 and 5 MHz LTE support.

✓ Shorter time for test and development but lower flexibility.

USRP-based Testbed

✓ For faster assessment of commercially ready solutions.

✓ Uses only commercial off-the-shelf equipment.

✓ Shorter time for test and development but lower flexibility.

FPGA-based Testbed

✓ Provide support for more research-oriented developments in the physical layer, such as new compression algorithms and waveforms, new transport protocols.

✓ Longer time for test and development but higher flexibility.

Conclusions and Future Work

✓ Our proposed architectures fit the concept of a local C-RAN, where RRHs are deployed within the campus and linked through a fronthaul to a central unit located in a laboratory.

✓ We consider the existence of a soft boundary between indoor (in-lab) and outdoor (in-campus) deployments, enabled by an RF path extension based on analog RoF.

✓ The use of in-house and commercially ready hardware are separately addressed as complementary solutions for coexisting testbeds.

✓ Future work includes the development of a virtualization layer for the physical testbed, with the aim to provide remote users with seamless access to the research infrastructure.

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Bibliography
