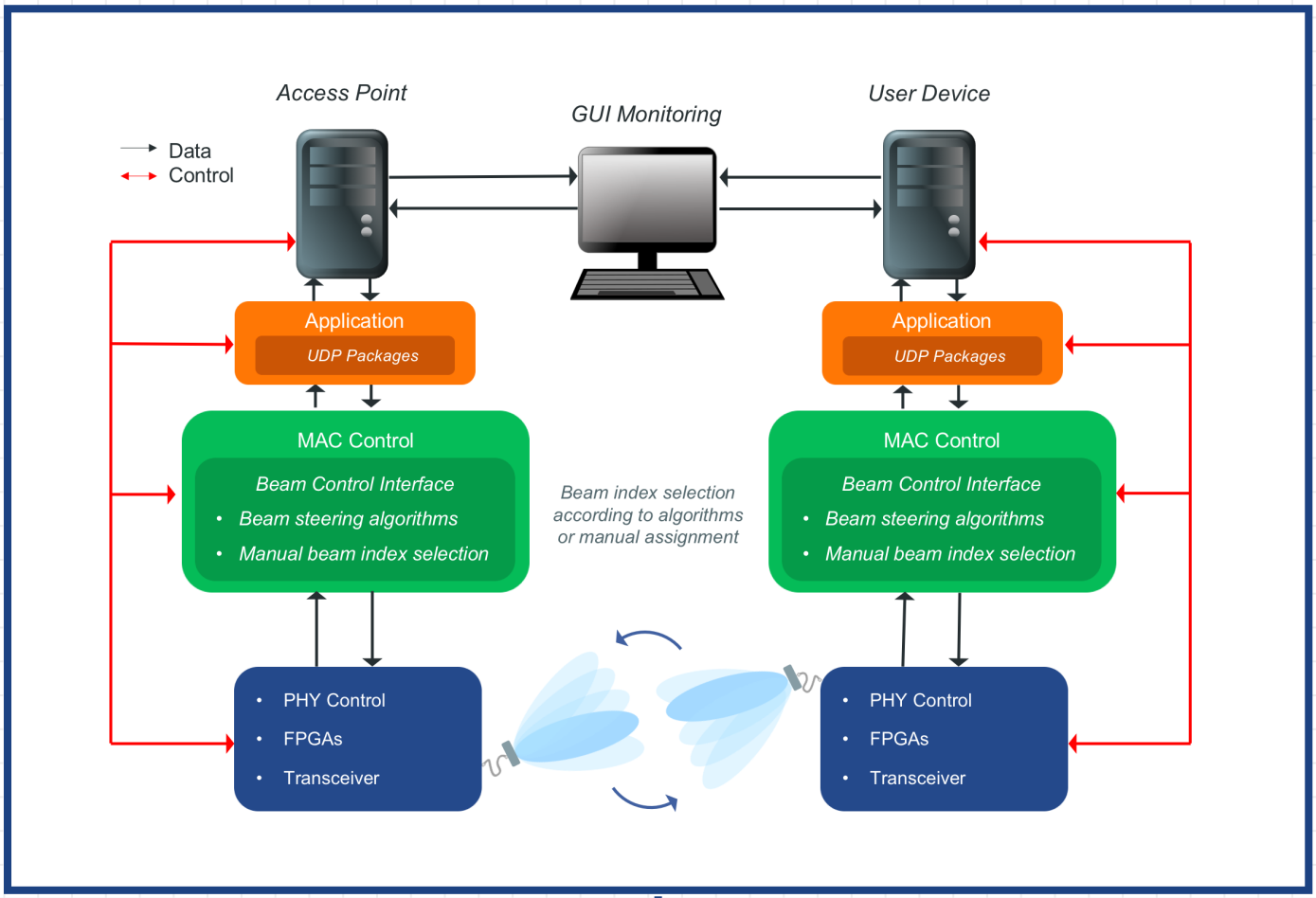
Orchestration and Reconfiguration Control Architecture

BASIC SDR CONTROL PLANE FUNCTIONALITY

Slice coordination

Automatic and manual beam steering functionality at MAC layer



- Evaluation of manual beam assignment and automatic beam steering functionalities.
- Development and test of new beam steering algorithm at MAC level.
- Mobility experiments for beam tracking.

BASIC SDR CONTROL PLANE FUNCTIONALITY

Slice coordination: Automatic and manual beam steering functionality at MAC layer

CONTEXT

mmWave systems experience much different channel conditions than regular systems below 6 GHz, e.g. higher path loss, higher attenuation by materials such as brick walls and more severe shadowing [1]. To mitigate these negative aspects, it is necessary to use directional antenna arrays. It means that the transmitter needs to send its signal through a specific direction, in which SNR is maximized at the receiver side.
Naturally, it is important to evaluate different beam steering algorithms under realistic channel conditions, in this manner it is possible to guarantee the desirable robustness and/or efficiency of the probing resources of the system in a given scenario.

UNIQUE SELLING POINT

Based on the imperative requirement of directional antenna arrays in mmWave systems, this ORCA facility provides a bidirectional link in the V-Band i.e. 57-66 GHz, in which it is possible to evaluate and design different beam steering algorithms as well as apply manual beam assignment under real channel conditions, including a mobility setup, which is described in Section 5.4.1 of deliverable 2.2.

OPPORTUNITIES

- Evaluation of manual beam assignment and automatic beam steering functionalities.
- Development and test of new beam steering algorithm at MAC level.
- Mobility experiments for beam tracking.

REFERENCES

The setup employs a Sibeam V band transceiver with integrated phase array antennas. At the base band processing level, the setup makes use of a PXI system from NI [2,3].

1 Y. Niu, Y. Li, D. Jin, L. Su, A. Vasilakos, "A Survey of Millimiter Wave Communications (mmWave) for 5G," in Wireless Networks, vol. 21, no. 8, pp. 2657-2676, 2015.

2 MiWaveS research project, "Heterogeneous Wireless Network with Millimetre Wave Small Cell Access and Backhauling", White Paper, http://www.miwaves.eu/MiWaveS_White%20Paper_June%202016.pdf, June 2016.

3 MiWaveS research project, "D6.5 - System measurements and presentation of the final joint demonstrator", Public Deliverable, submitted. http://www.miwaves.eu/MiWaveS_D6.3_D6.4_D6.5.pdf