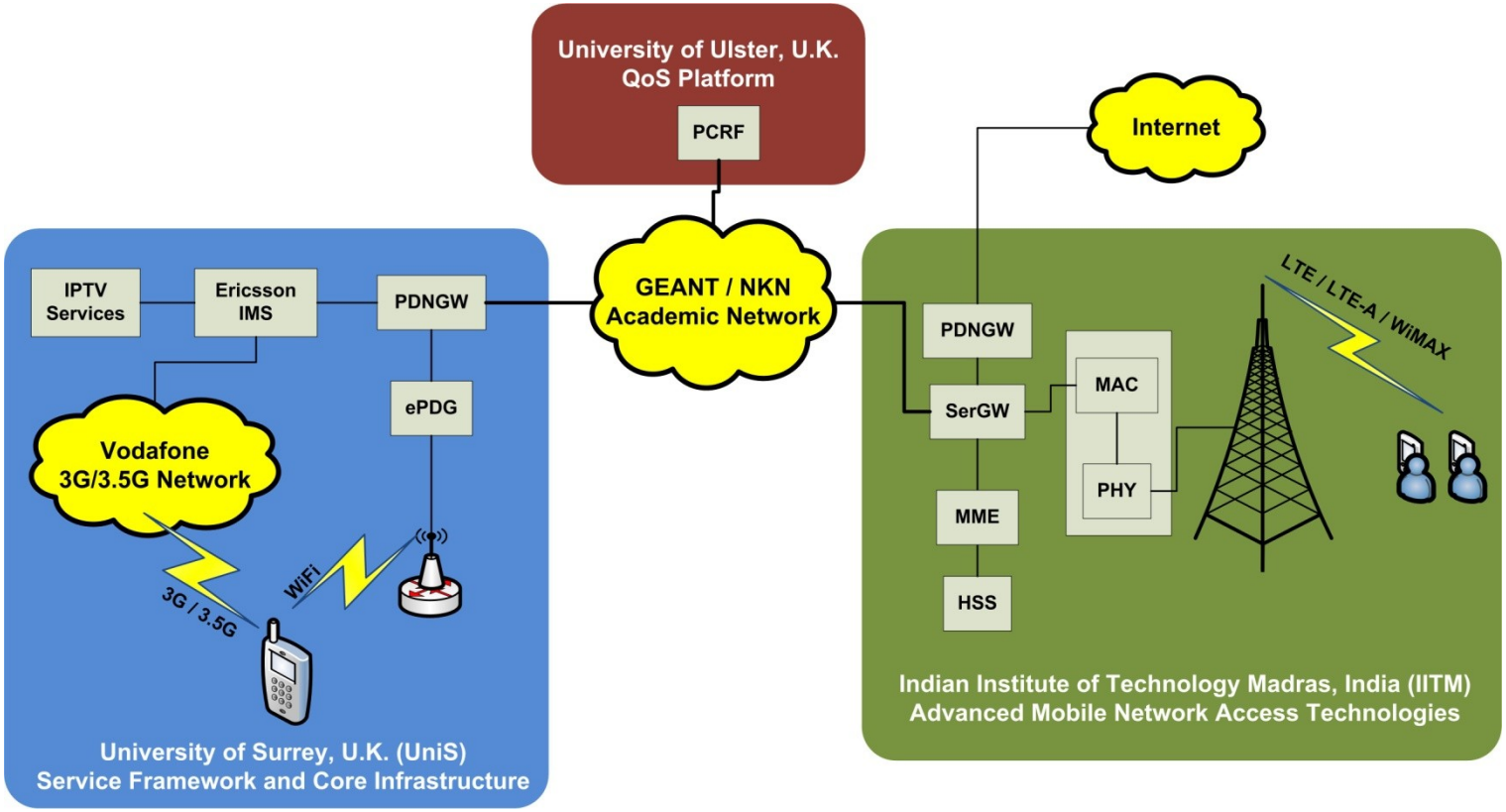
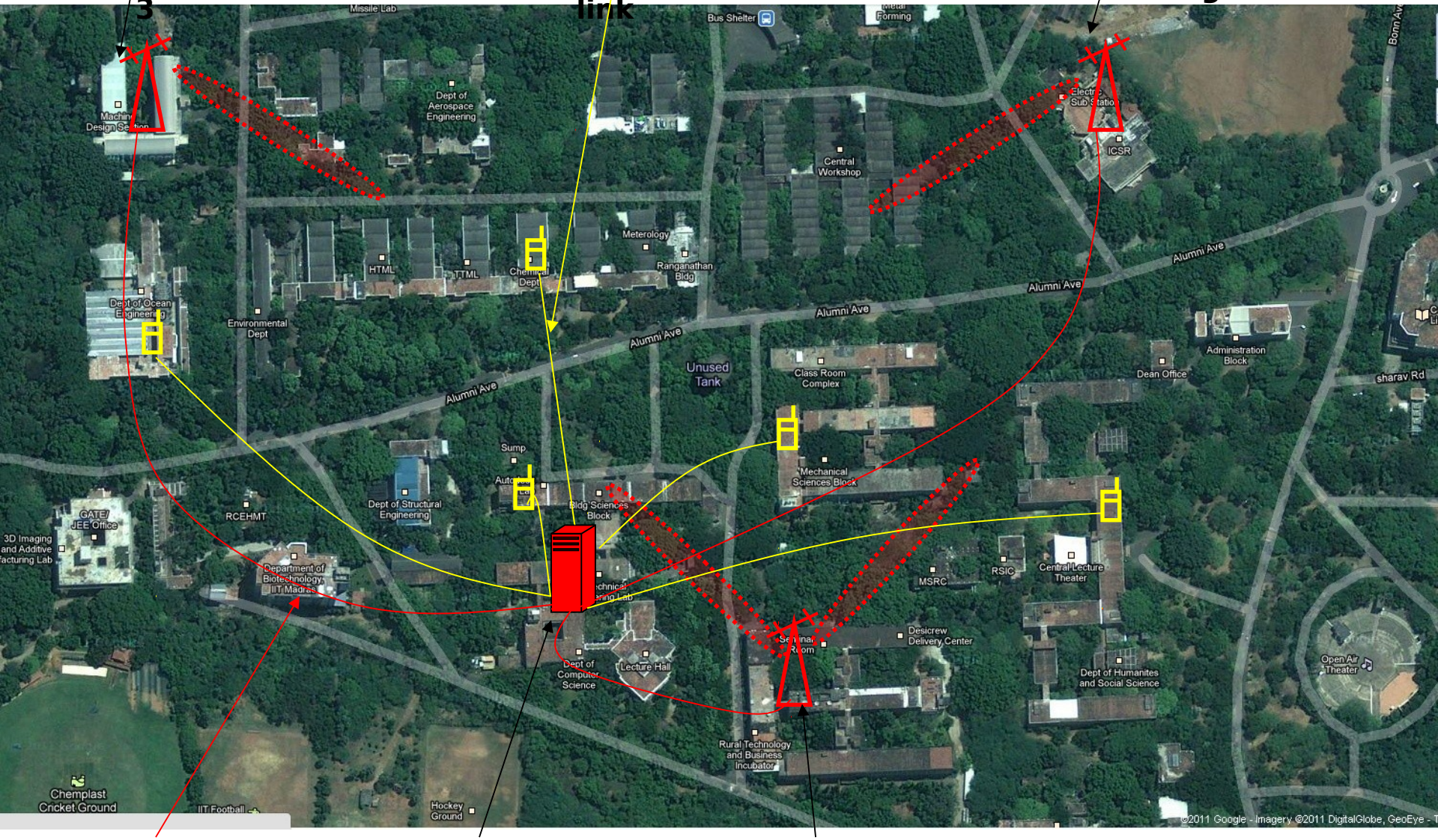
Overview of the Testbed

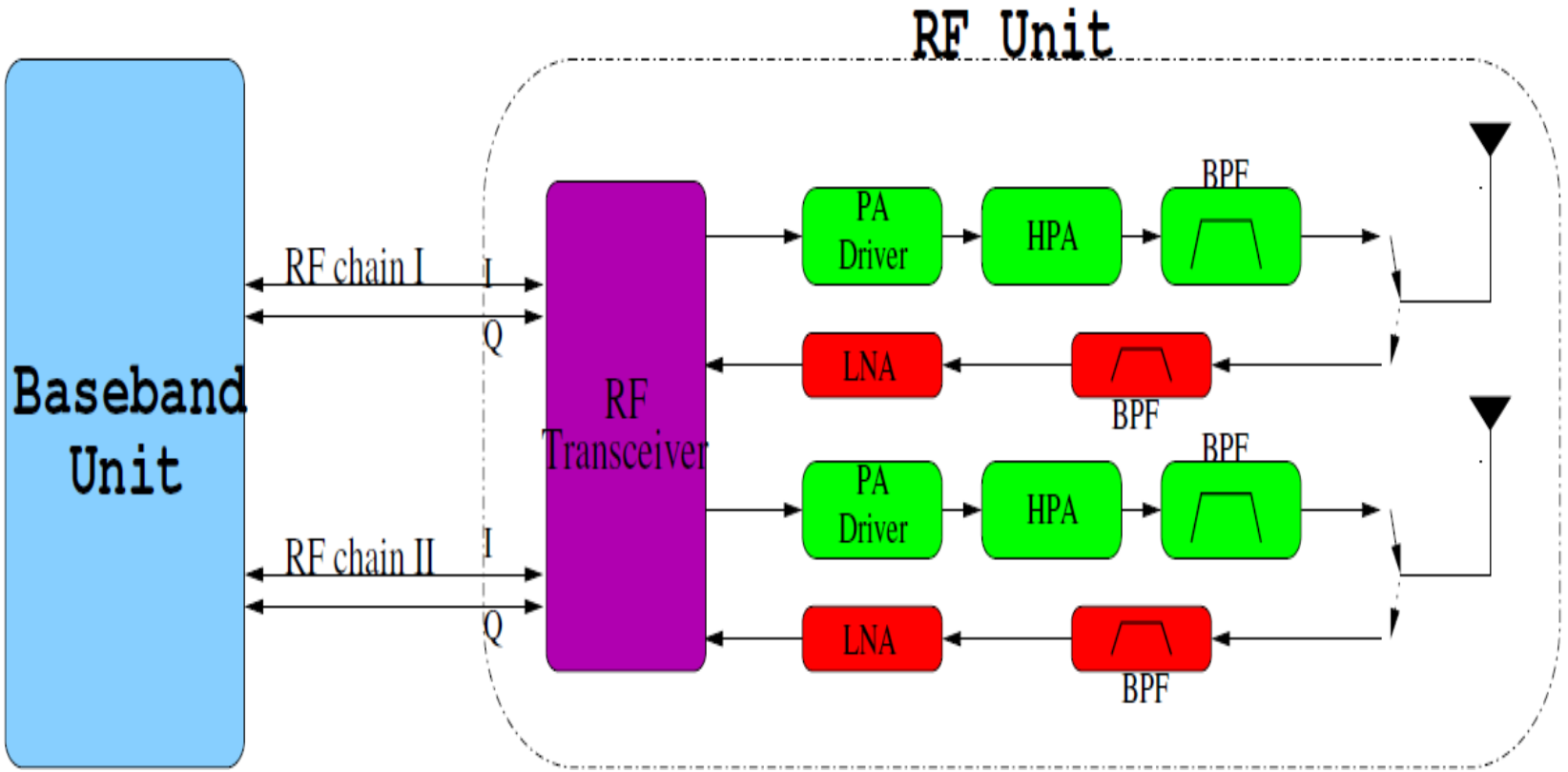


Footprint of the IITM Access N/W Testbed

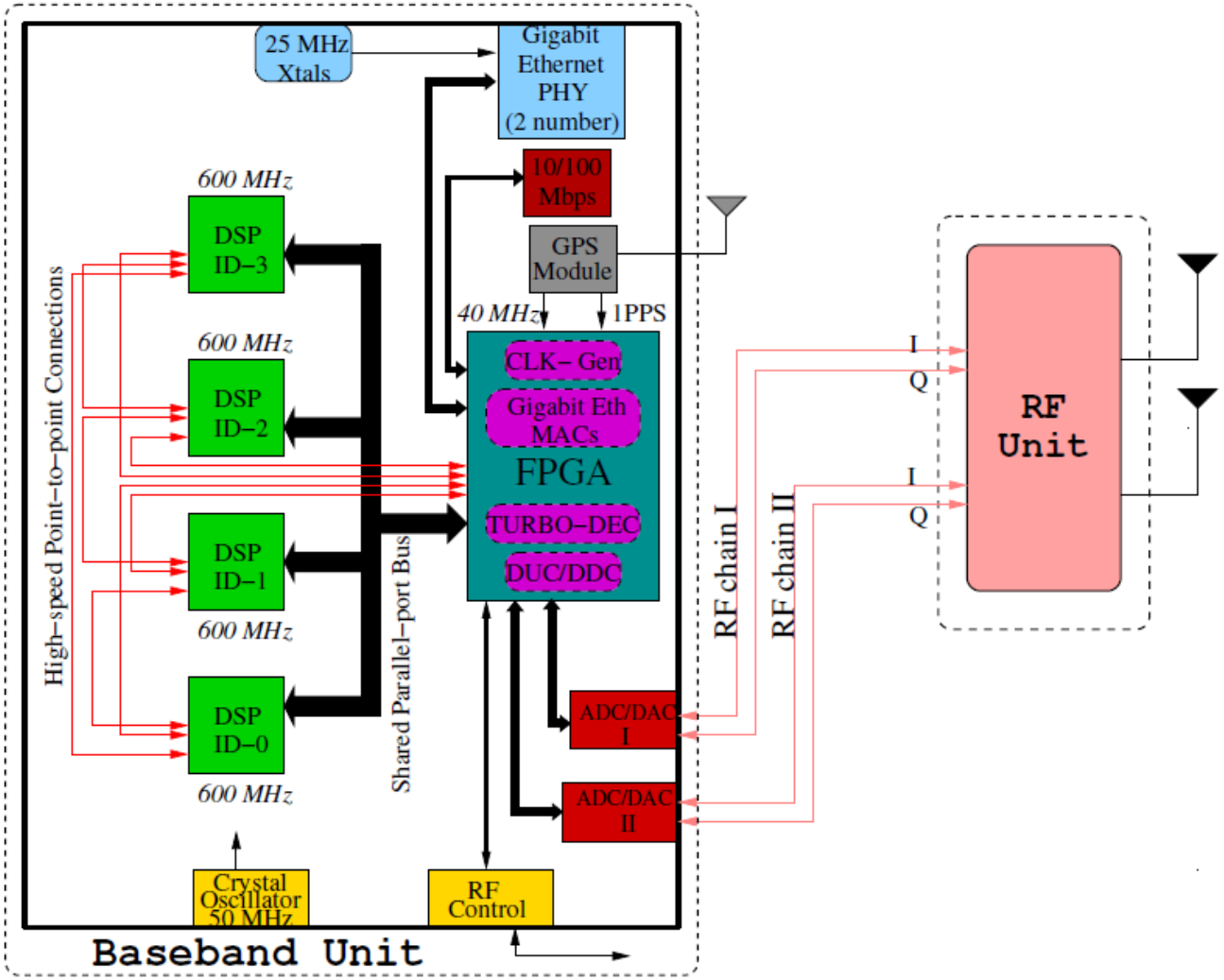
CEWiT INDIA



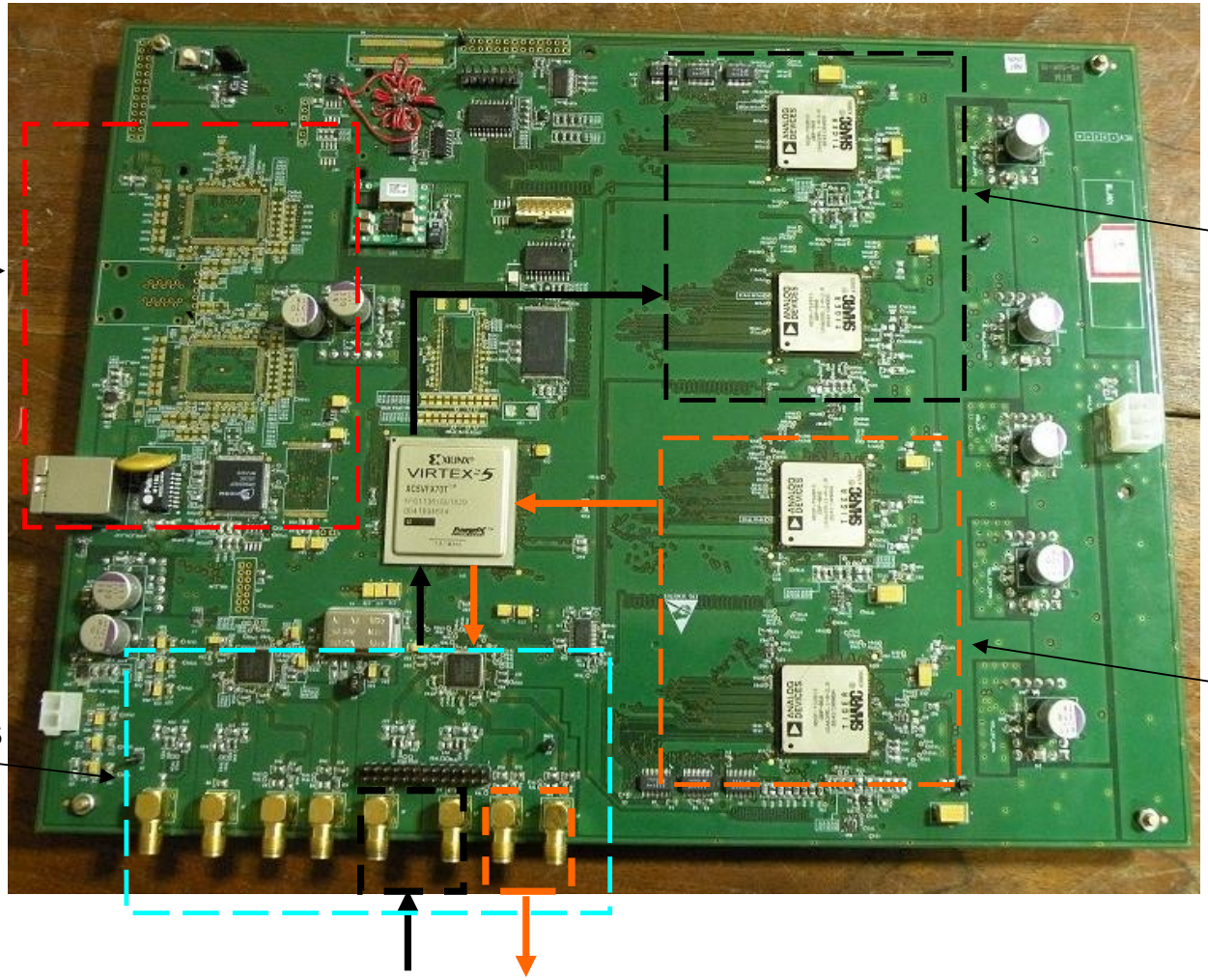
Testbed hardware architecture



Testbed hardware architecture (contd)



Snapshot of the Baseband Platform



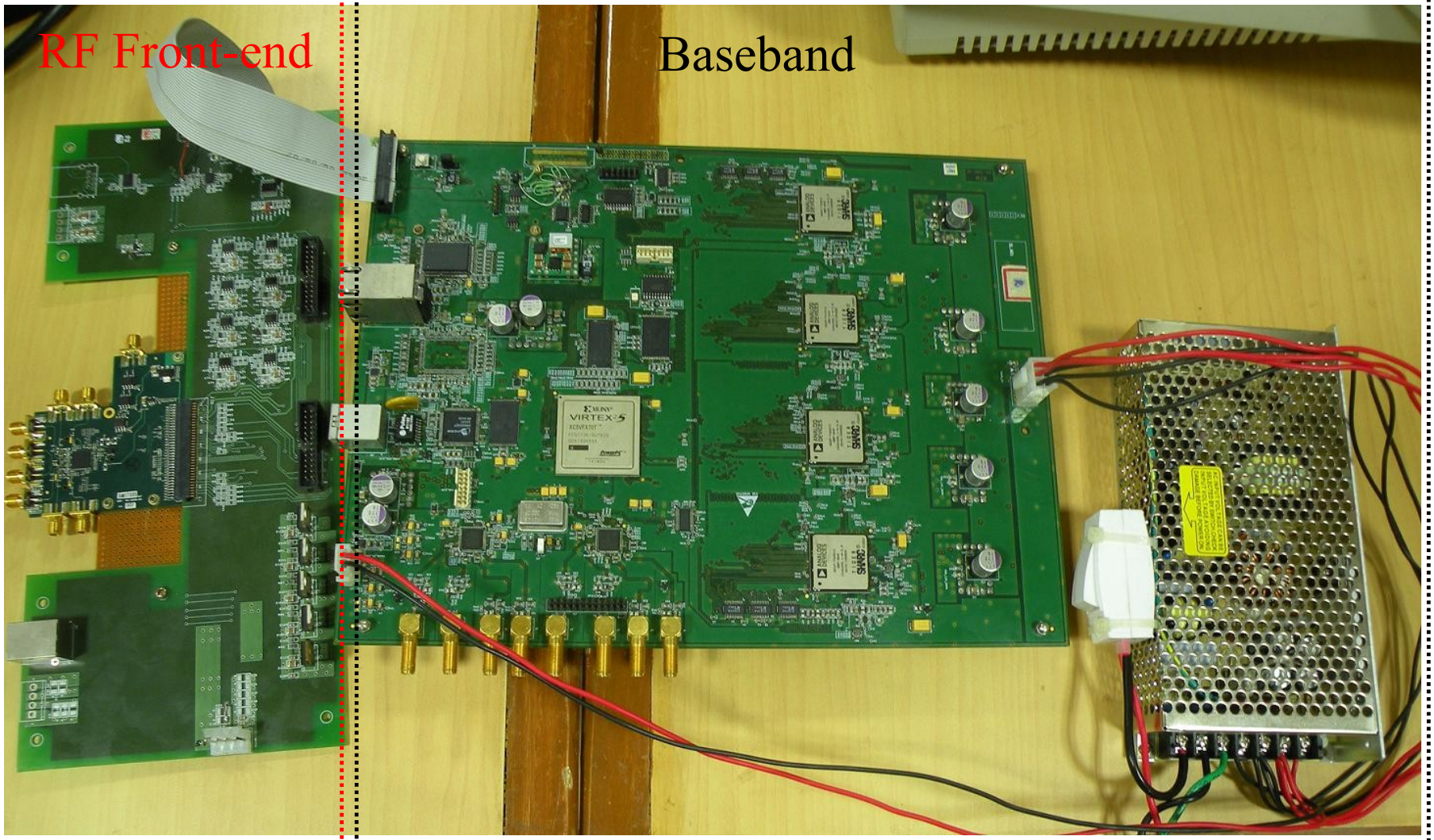
Features of the Baseband platform

- Supports 20 MHz bandwidth
- Capable of operating in both FDD & TDD mode
- One board supports 2x2 MIMO
  - Board design is such that 2 boards can be used for 4x4 MIMO
- DSP bank for embedded processing
  - 4DSPs: TigerSharc TS201
    - 32-bit floating-point processor; 24 Mb on-chip memory
- FPGA: Xilinx Virtex-5
  - One embedded RISC processor: PowerPC 440x5 32-bit from IBM
- On-board 16Mbit x 16 DDR SDRAM interfaced to PowerPC
- Two GigE & one Fast Ethernet interface
- GPS connectivity
- Multi-Gigabit intra-DSP & DSP-FPGA interfaces

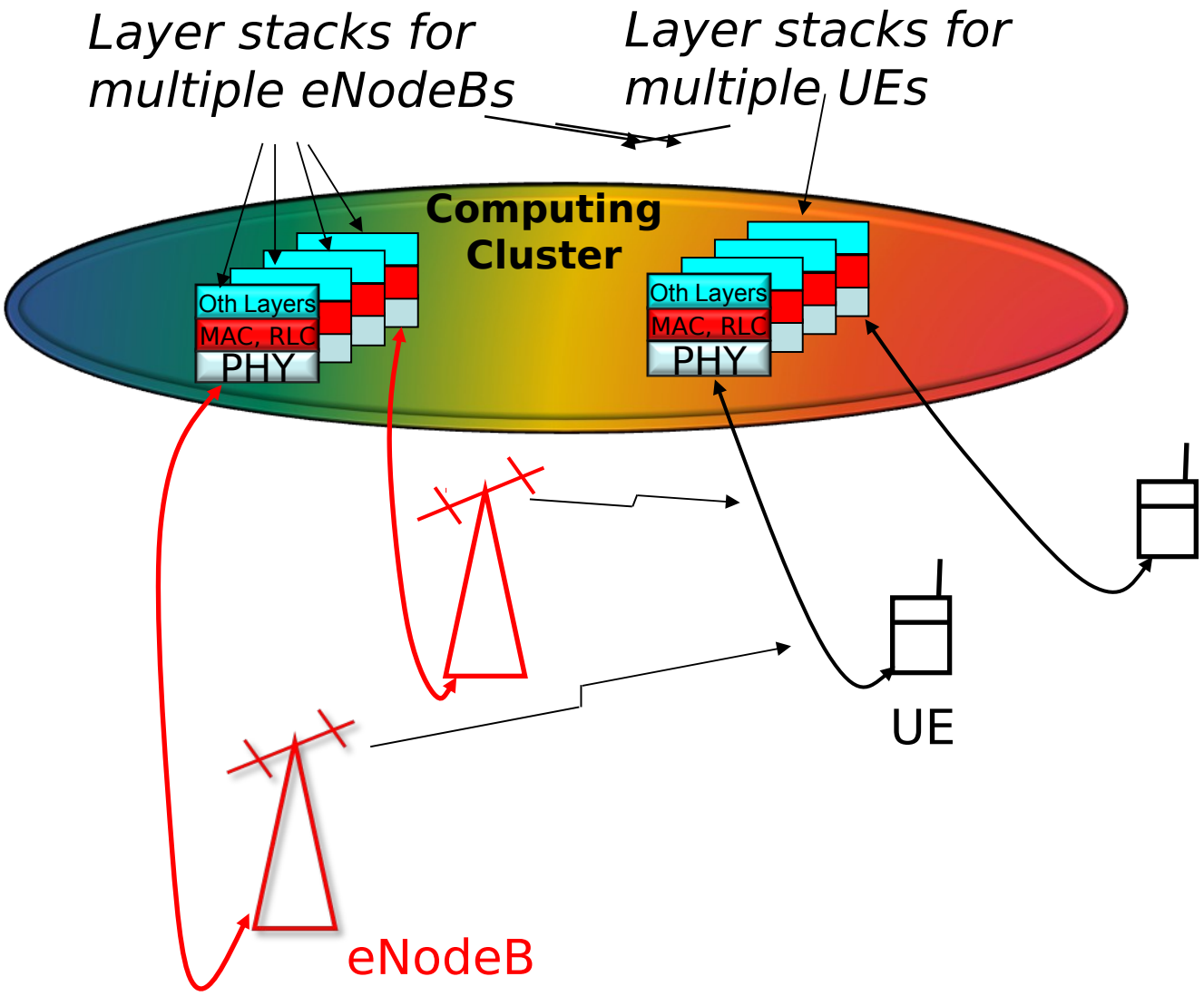
System parameters of the Access N/W Testbed

Parameters	Value
Number of BSs	4
Number of UEs	12
Number of sectors	4
Transmission bandwidth	20 MHz
BS transmit power	5 W
UE transmit power	250 mW
BS antenna radiation pattern	Sector (90^0 beamwidth)
MS antenna radiation pattern	Omni
BS antenna configuration	4x4
UE antenna configuration	2x2
Antenna polarization	Cross
DAC/ ADC resolution	12 bits

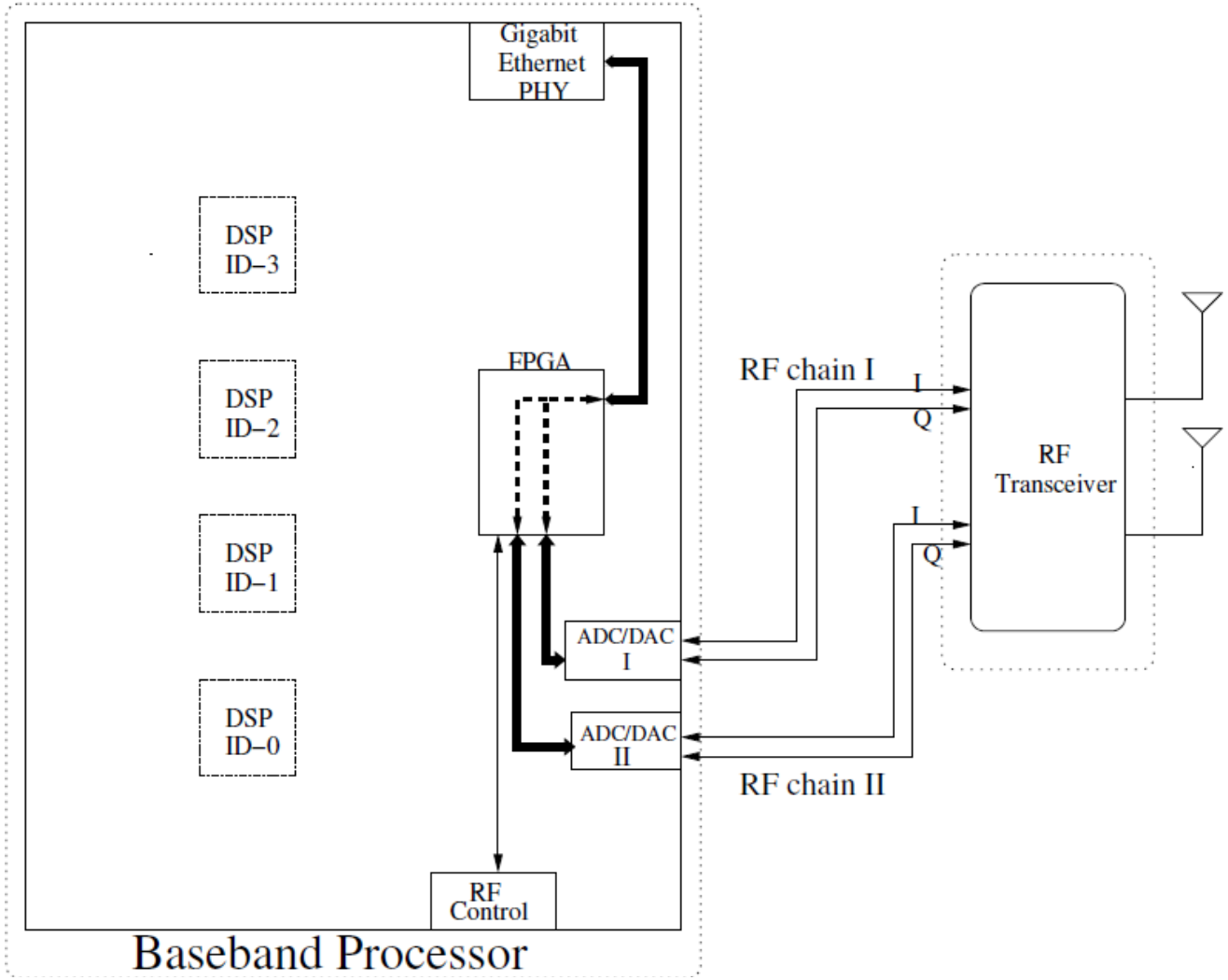
Snapshot of Baseband with RF



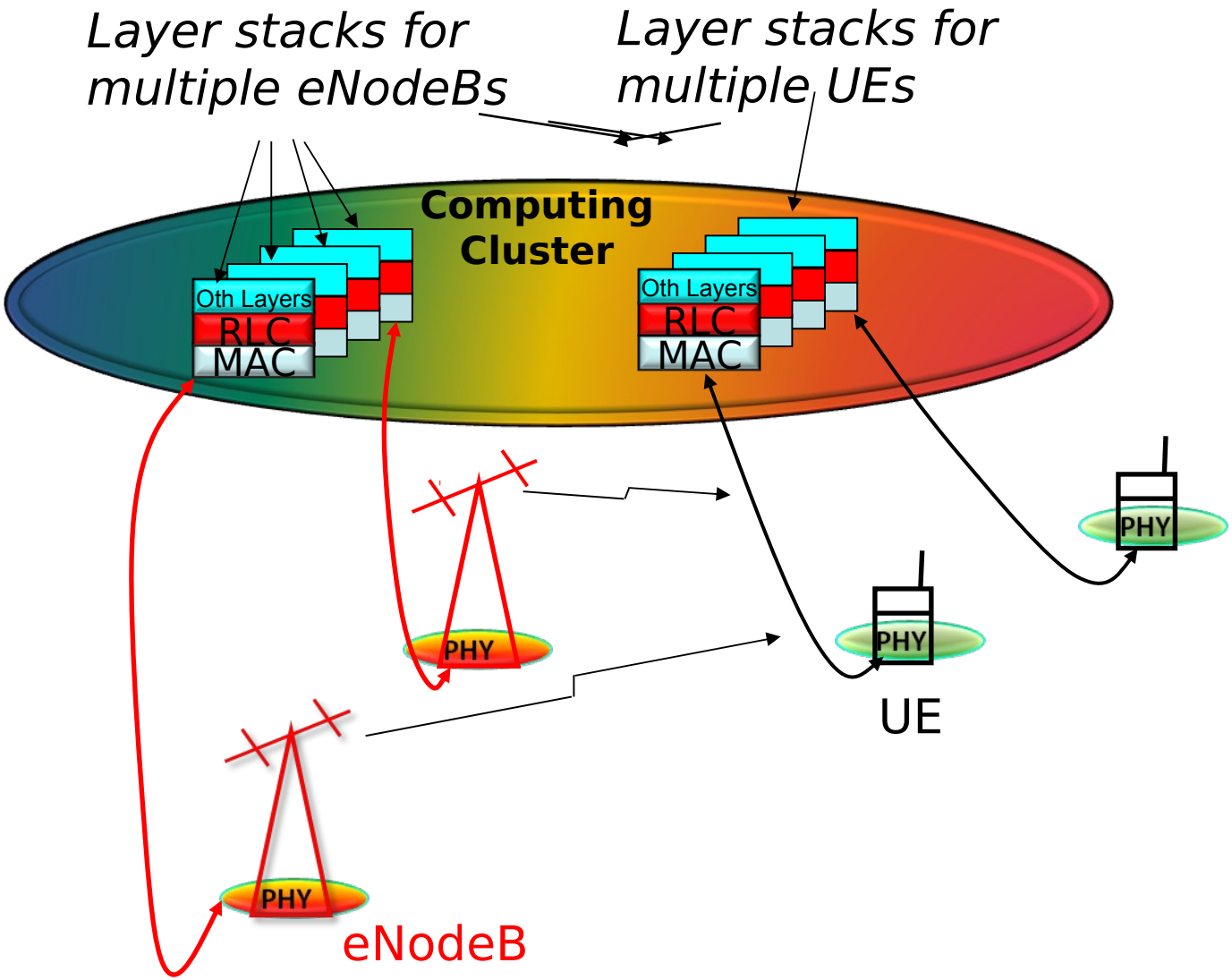
Software flow-diagram for SDR mode



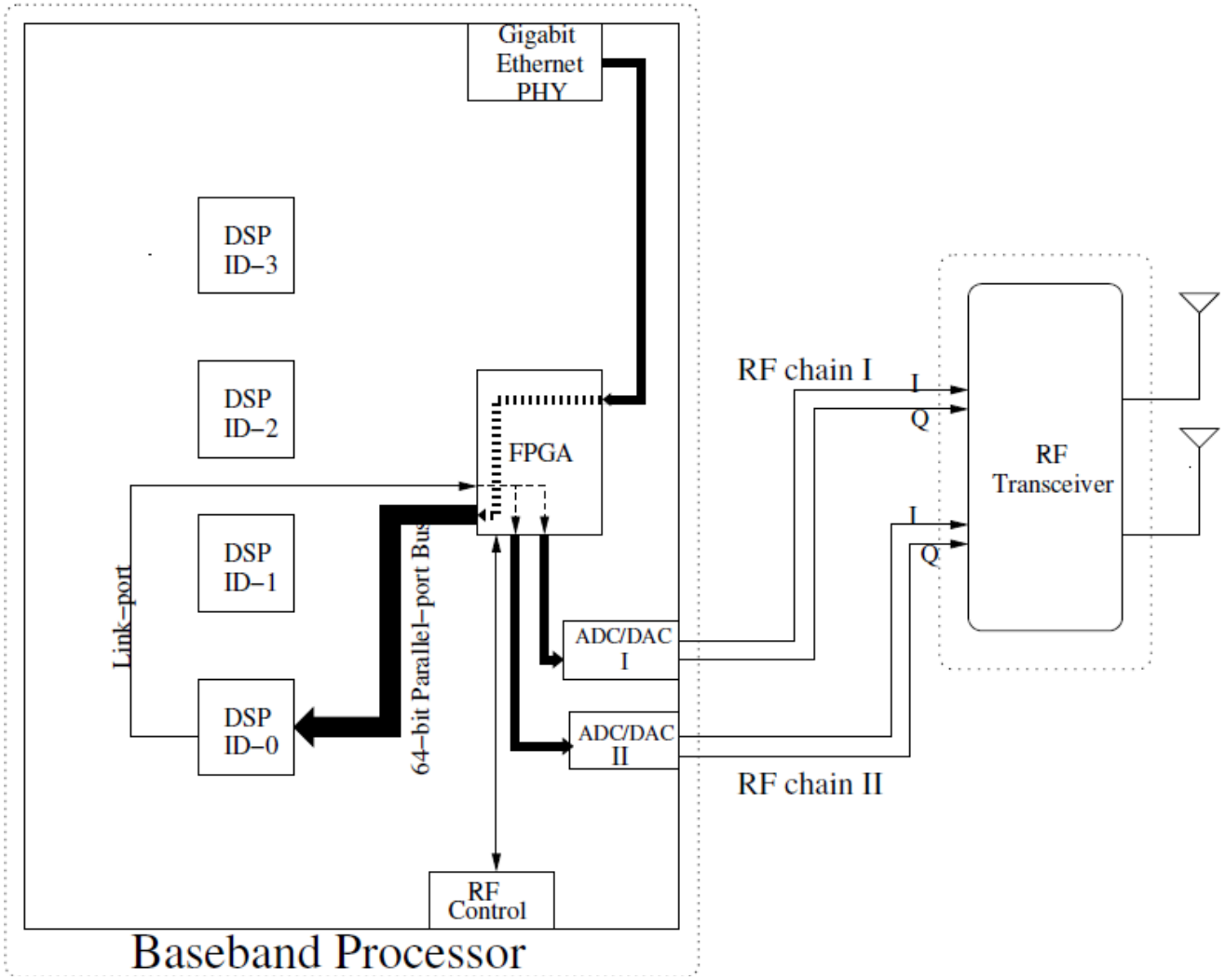
Data flow for SDR mode



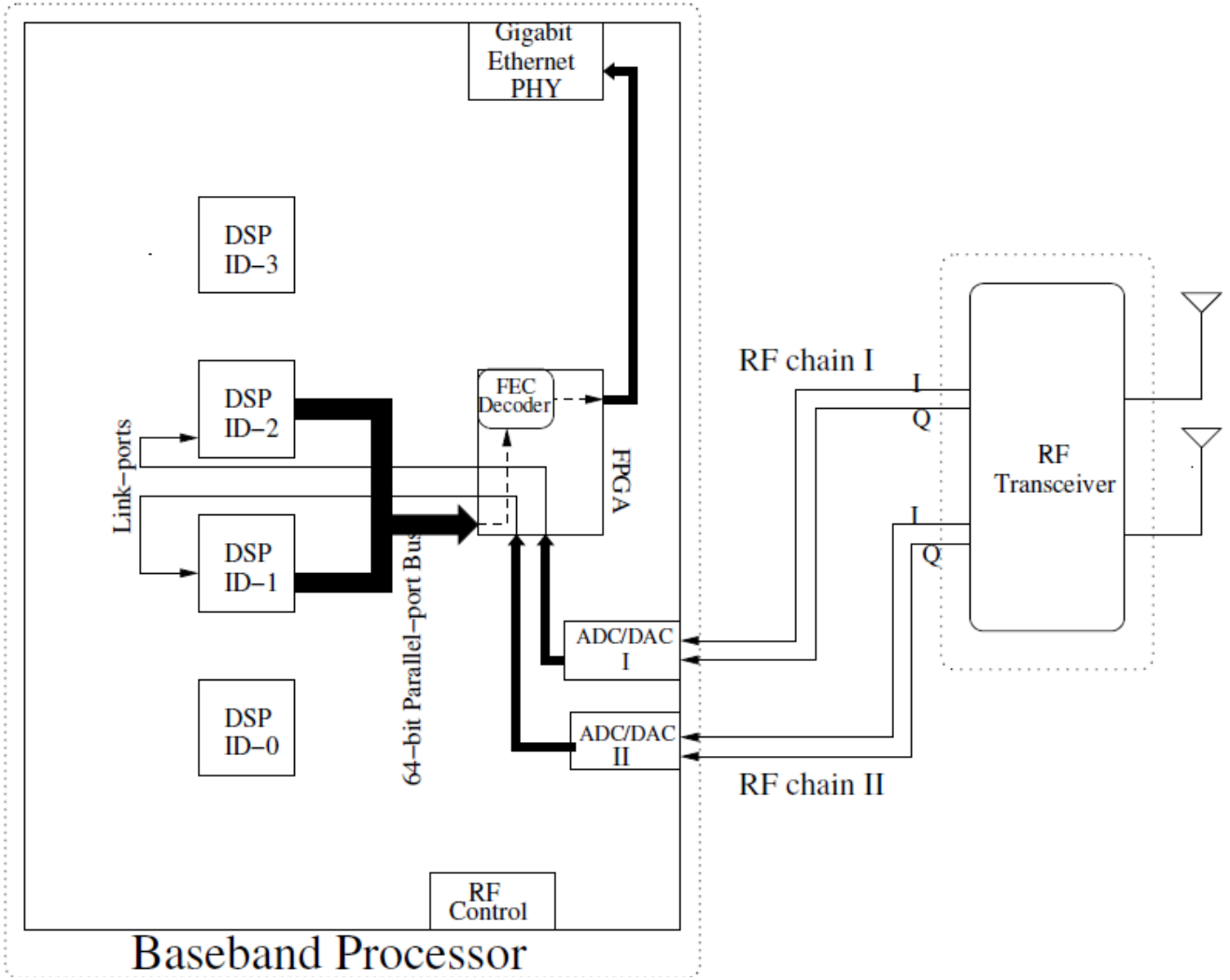
Software flow-diagram for real-time mode



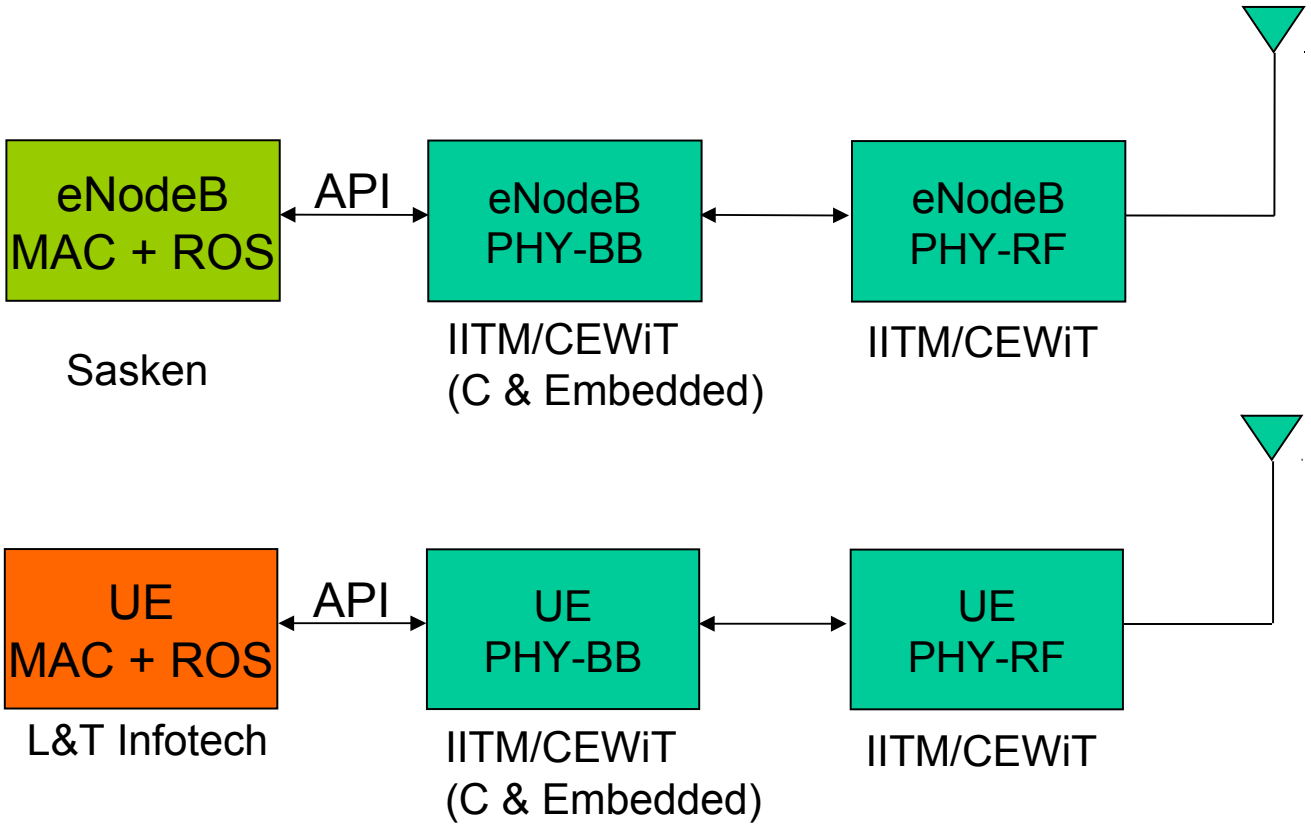
Transmit data flow for real-time mode



Receiver data flow for real-time mode



Testbed software schematics



ROS: Rest Of the Stack

MAC-PHY Integration set-up of the Testbed

Physical Layer design

- 3GPP Release 8 compliant
- PHY functionality of eNodeB and UE
- Support for TDD and FDD mode
- Support for various MIMO modes
- Scalable bandwidth up to 20 MHz
- PHY functions developed in C/C++, MATLAB and Assembly
- APIs defined to interface with higher layers
- PHY layer being integrated with higher layers from other organizations

Project Partners