Demo: End-to-End 5G Demo featuring Lookaside Acceleration of LDPC Encode/Decode and O-RAN F1 and 7.2 Splits

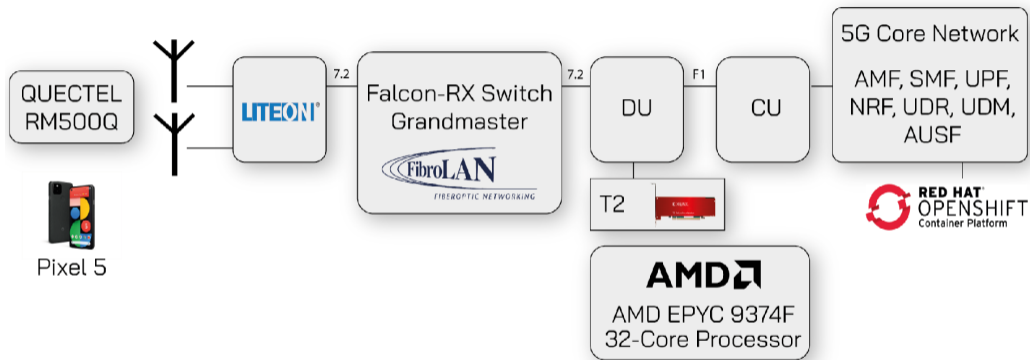Robert Schmidt (OpenAirInterface)

October 19, 2023

Demo description

- ▶ ORAN 7.2 fronthaul split using OSC fronthaul interface library (FHI, E release)
- ▶ 3GPP F1 midhaul split between OAI O-CU/O-DU
- ▶ "Optionally": AMD T2 Lookaside Accelerator card
- ▶ LITEON O-RU at n78 (3.7 GHz), 100MHz BW, TDD 2.5ms DDDSU/DDSUU
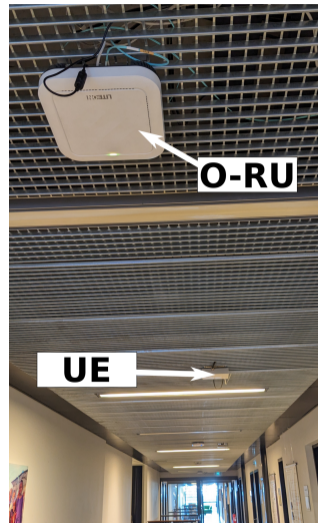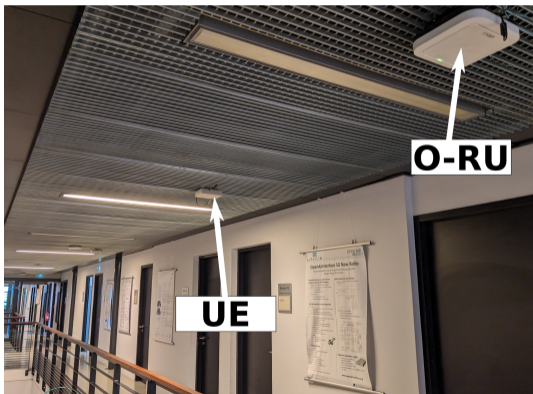
Architecture

Setup

- ► CN deployed in OpenShift Cluster
- ► O-CU deployed in Openshift Cluster
- ► O-DU on dedicated server (in server room)
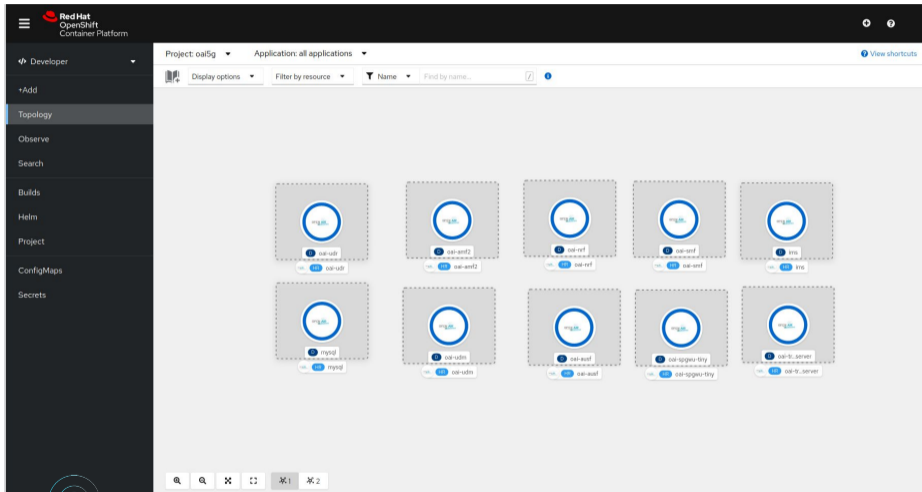- ► O-DU server has integrated T2 card

Setup

▶ O-RU and UE in hallway at EURECOM

Local Cloud Deployment of 5G Core Network

Demo: E2E 5G Demo with Lookaside Acceleration, and F1 and 7.2 splits – Robert Schmidt

Hardware Details (DU machine)

```
Architecture:            x86_64                          $ ethtool -i enp193s0f1
  CPU op-mode(s):         32-bit, 64-bit                  driver: ice
  Address sizes:         52 bits physical, 57 bits virtual  version: 5.15.0-1038-realtime
  Byte Order:            Little Endian                   firmware-version: 4.00 0x8001184e 1.3236.0
CPU(s):                  32                              expansion-rom-version:
  On-line CPU(s):        0-31                            bus-info: 0000:c1:00.1
Vendor ID:               AuthenticAMD                    supports-statistics: yes
  Model name:            AMD EPYC 9374F 32-Core Processor  supports-test: yes
    CPU family:          25                              supports-eeprom-access: yes
    Model:               17                              supports-register-dump: yes
    Thread(s)/core:      1                               supports-priv-flags: yes
    Core(s)/socket:      32
    Socket(s):           1
    Stepping:            1
    Frequency boost:     enabled
    CPU max MHz:         4304.9312
    CPU min MHz:         1500.0000
    BogoMIPS:            7688.24
```

Demo Video: Software LDPC, DDDSU

Demo Video: T2-Offload LDPC, DDDSU

Conclusion

- ▶ AMD T2 Lookaside Accelerator card
  - ▶ Average CPU utilization 15.2% $\to$ 12.5%
- ▶ O-RAN 7.2 split through OSC FHI library
- ▶ 3GPP F1 split
  - ▶ O-DU/O-CU physically separate