Demo: Showcasing Fronthaul 7.2 and Lookaside Hardware Acceleration of 5G OAI gNB Stack using AMD T2-Telco Card

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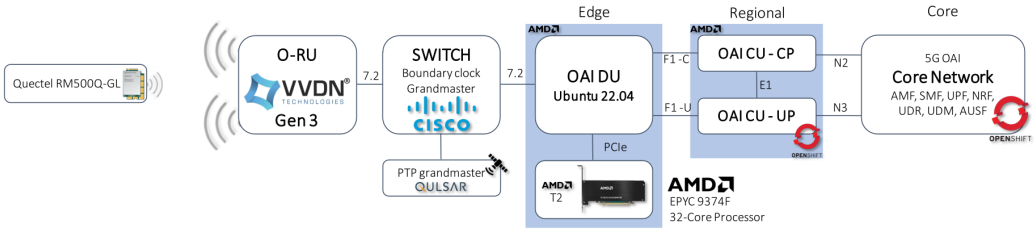
Demo description

- ORAN 7.2 fronthaul split using OSC fronthaul interface library (FHI, E release)
- 3GPP F1 and E1 midhaul splits between OAI O-CU-CP/O-CU-UP/O-DU
- “Optionally”: AMD T2 Lookaside Accelerator card
- Integration with O-RUs:
  - Benetel 550/650
  - VVDN Gen 3
  - LITEON O-RU
- Latest OAI release (v2.1)

Architecture

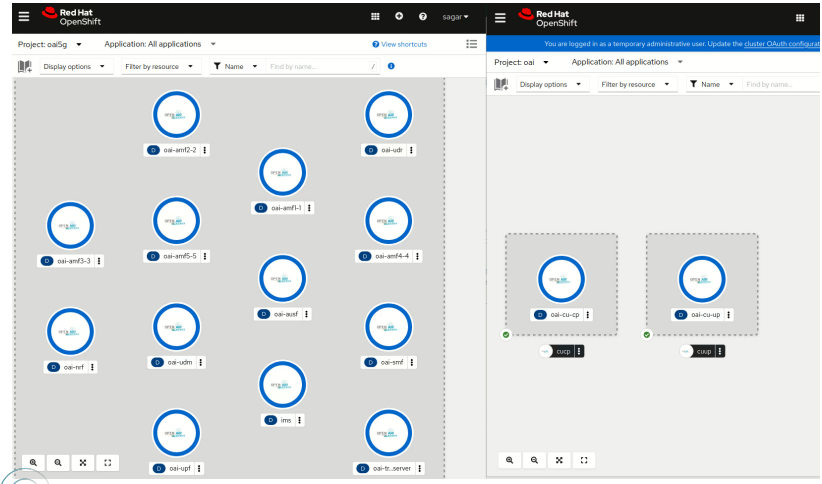
- TDD Configuration: 2.5ms DDSUU, 100 MHz BW
- Center Frequency 3999 MHz (N77)



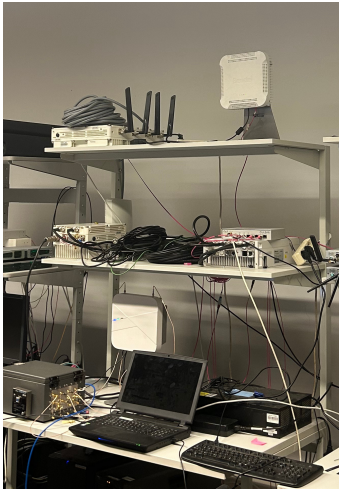
Setup

- Core network on OpenShift cluster (Core Cluster)
- CU-CP, CU-UP on another OpenShift cluster (Regional cluster)
- DU on Edge cluster (Ubuntu 22.04 Canonical)

Cloud Deployment of 5G Core/CU-CP/CU-UP



Setup



T2 Telco Card

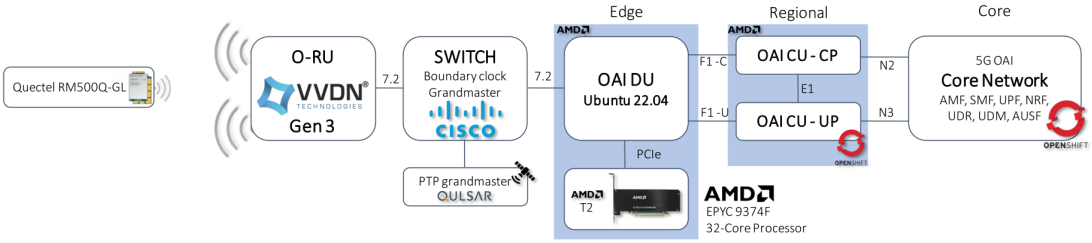
- High bandwidth look-aside (selected function) 5G NR LDPC accelerator
- O-RAN standards compliant DPDK/BBDev API
- Supports virtualization and orchestration

PCIe	2x Gen 4x8
Offload bandwidth	200 Gbps
Profile	HHHL
LDPC FEC throughput	33G Enc/14G Dec
Power	less than 55W

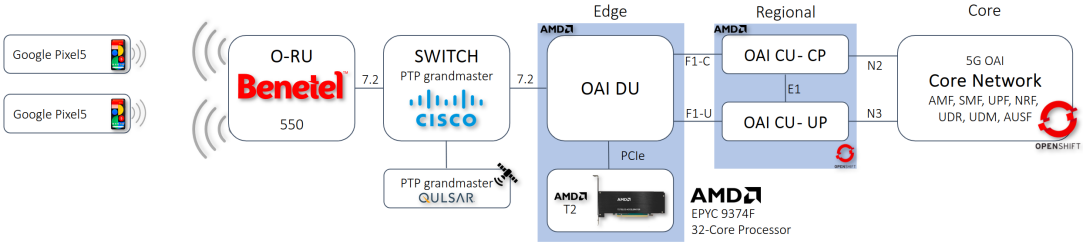
Hardware Details (DU machine)

```
Architecture:            x86_64
  CPU op-mode(s):        32-bit, 64-bit
  Address sizes:         52 bits physical, 57 bits virtual
  Byte Order:            Little Endian
CPU(s):                  32
  On-line CPU(s) list:   0-31
Vendor ID:               AuthenticAMD
  Model name:            AMD EPYC 9374F 32-Core Processor
    CPU family:          25
    Model:               17
    Thread(s) per core:  1
    Core(s) per socket:  32
    Socket(s):           1
    Stepping:            1
    Frequency boost:     enabled
    CPU max MHz:         4304.9312
    CPU min MHz:         1500.0000
```

Demo Videos: Comparison CPU load



Demo Video: Benetel 550



Conclusion

- AMD T2 Lookaside Accelerator card
  - Usage optional
  - Gains in performance/Reduced CPU load
- O-RAN 7.2 split through OSC FHI library
  - Multiple O-RUs tested
- 3GPP F1+E1 splits
  - O-DU/O-CU-CP/O-CU-UP physically separate