

---

# Improving QoE using O-RAN compliant nearRT-RIC, KPM and RC SMs in an online multi-player game

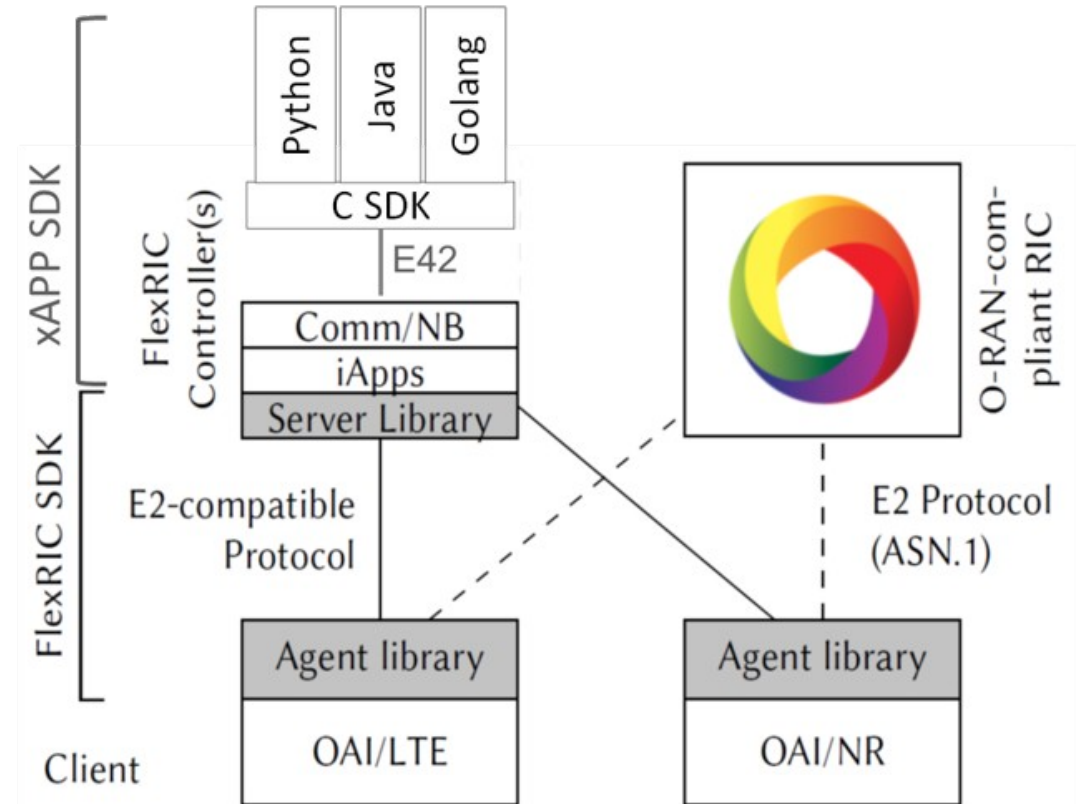
20/06/2023

- Mikel Irazabal
- **Robert Schmidt**
- Teodora Vladic



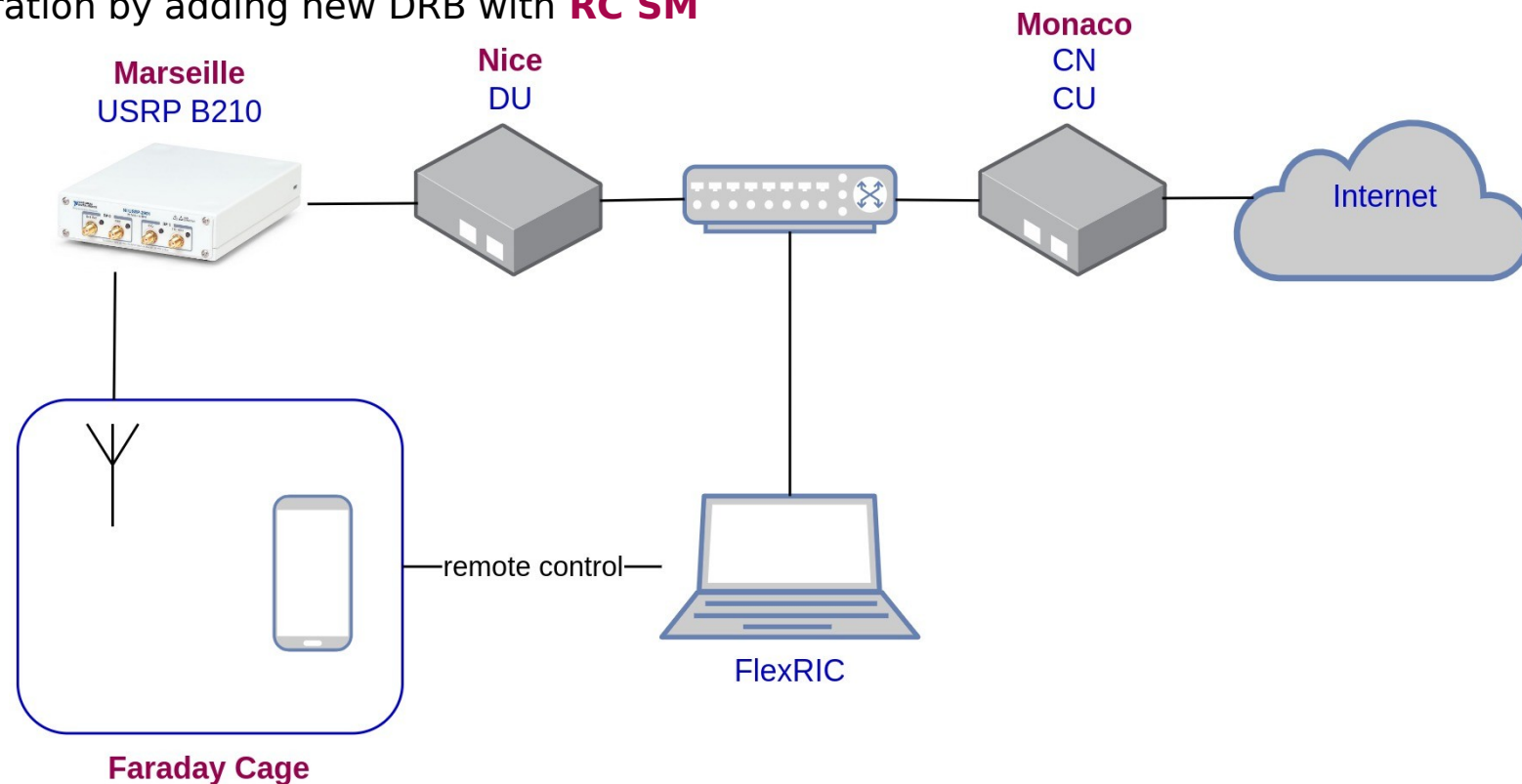
# FlexRIC is a nearRT-RIC

- ✓ FlexRIC is an O-RAN-compliant E2 Agent, near-RT RIC, and xApp SDK
- ✓ Provides a number of service models
  - E2SM-KPM and E2SM-RC (E2SM-CCC to follow)
  - Custom: E2SM-RRC, E2SM-PDCP, E2SM-RLC, E2SM-MAC, E2SM-GTP, E2SM-SC and E2SM-TC
- ✓ Designed to be customizable and ultra-lean (highly efficient for resource-restricted UC)
- ✓ Allows varying message encoding



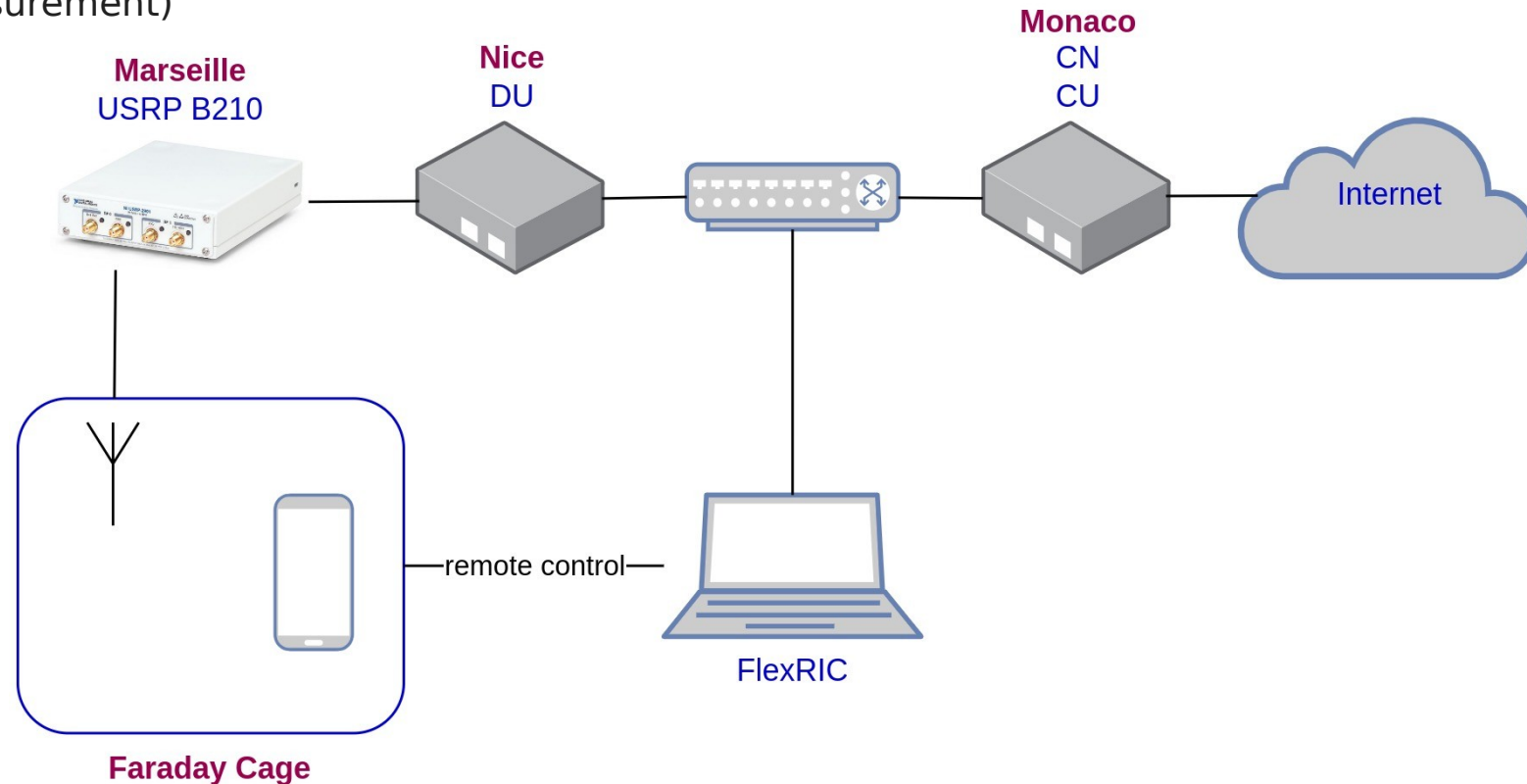
# Demo description

- ✓ **xApp** monitors and controls QoE of user with latency-sensitive application
- ✓ FlexRIC near-RT RIC
- ✓ In OAI-DU: monitor UE performance via **KPM SM**
- ✓ In OAI-CU: modification of RAN configuration by adding new DRB with **RC SM**

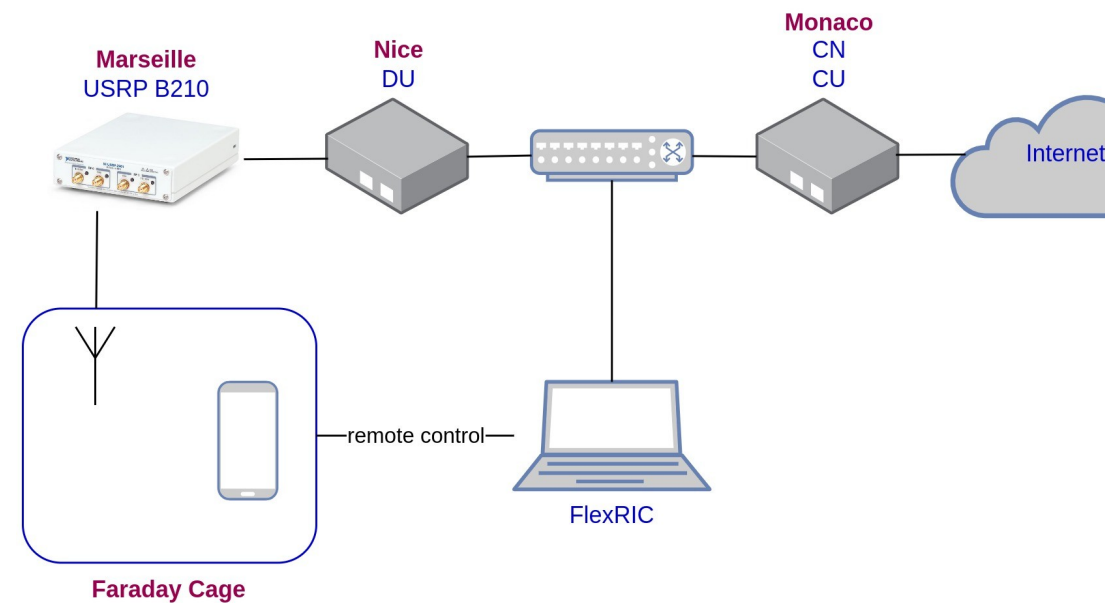
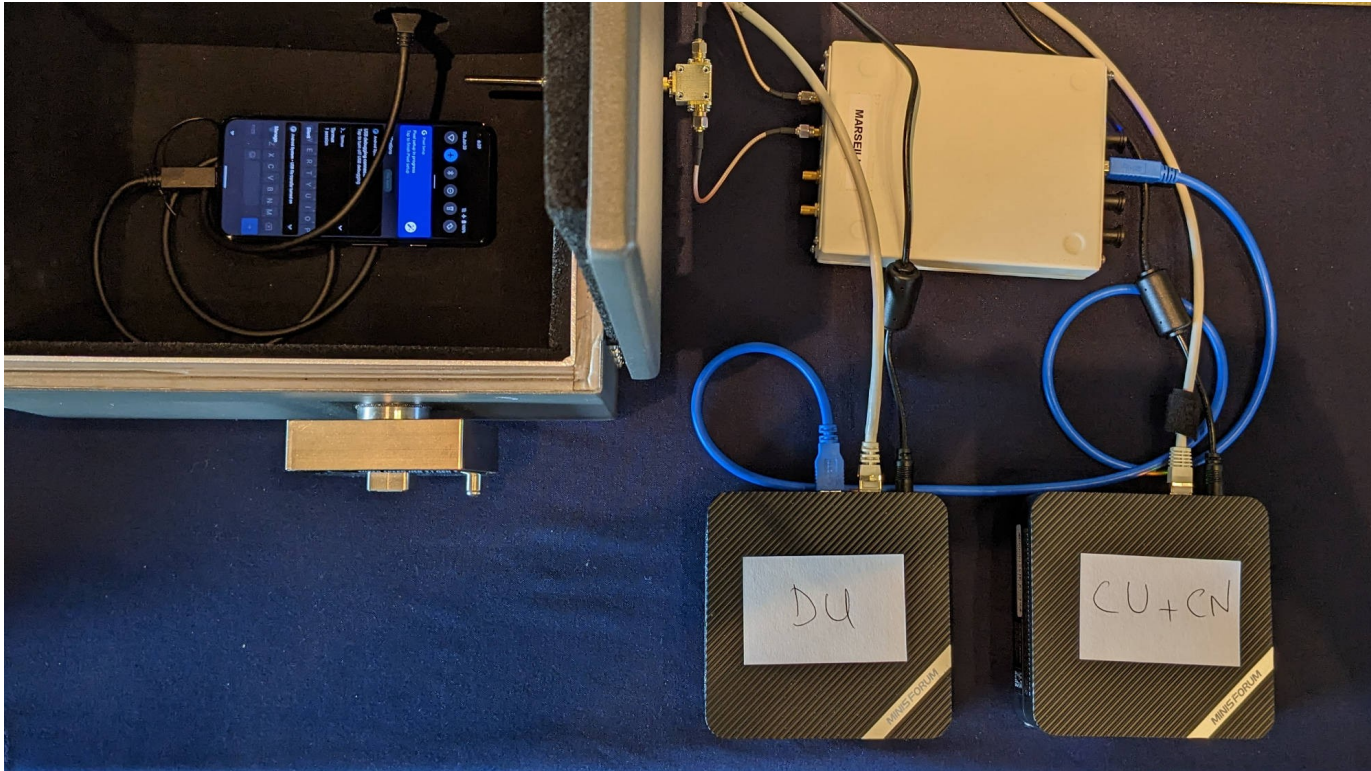


# Demo components

- ✓ Full **OAI RAN** open source stack (DU, CU, CN)
- ✓ **FlexRIC**, O-RAN compliant nearRT-RIC and xApp open source stack
- ✓ O-RAN Service Models:
  - **KPM v03.00** (Key Performance Measurement)
  - **RC v01.03** (RAN Control)
- ✓ **COTS UE** (Google Pixel 5)



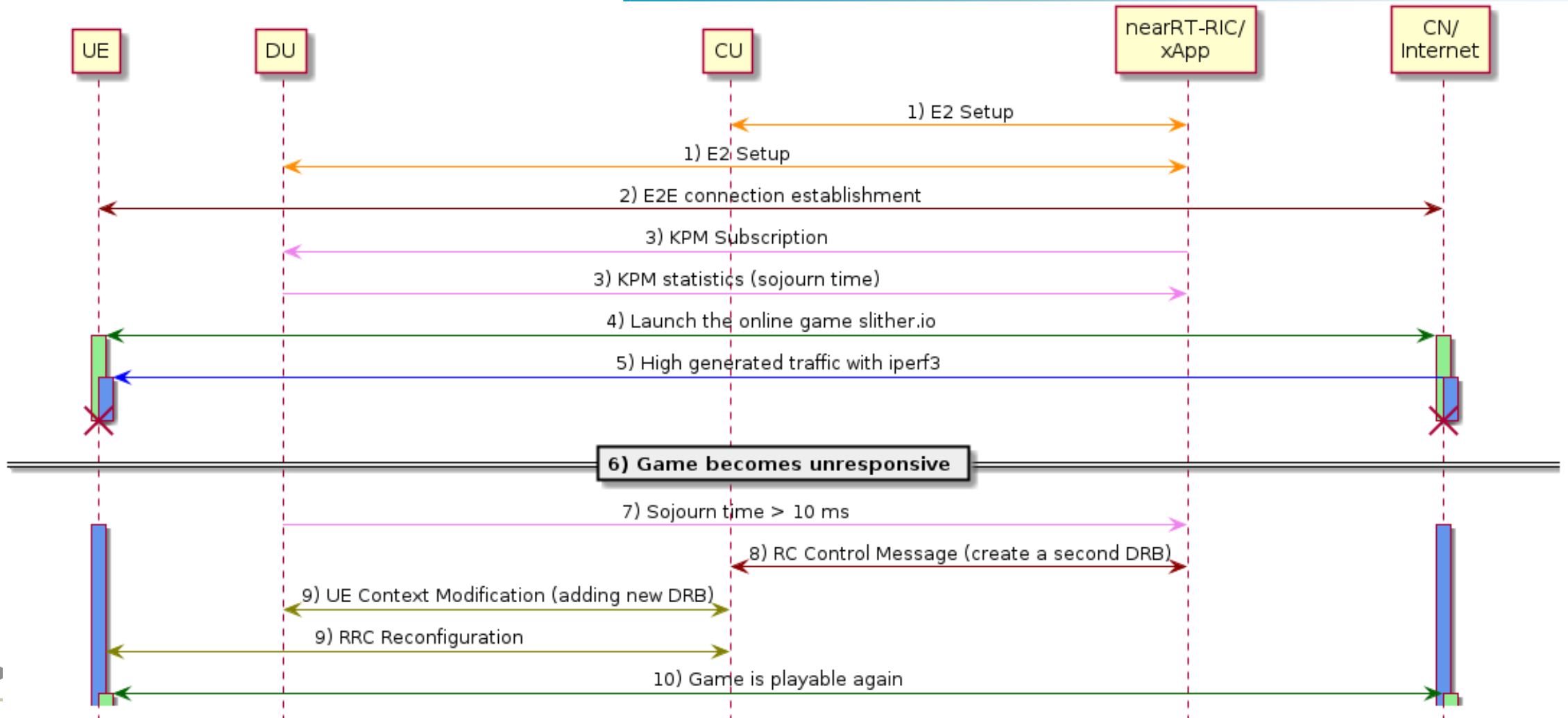
# Demo setup



# Demo video



# Demo details – Message Flow



# Conclusion

- ✓ Enhance user's QoE of delay sensitive application while allowing high traffic
- ✓ Demonstrate end-to-end near real-time RIC monitoring and control features
  - Use latest O-RAN Service Models: KPM v03.00 and RC v01.03
- ✓ Performance: 95Mbps DL (cell max) while satisfying the latency requirements
- ✓ Pure OAI implementation (CN & RAN stacks, FlexRIC)