

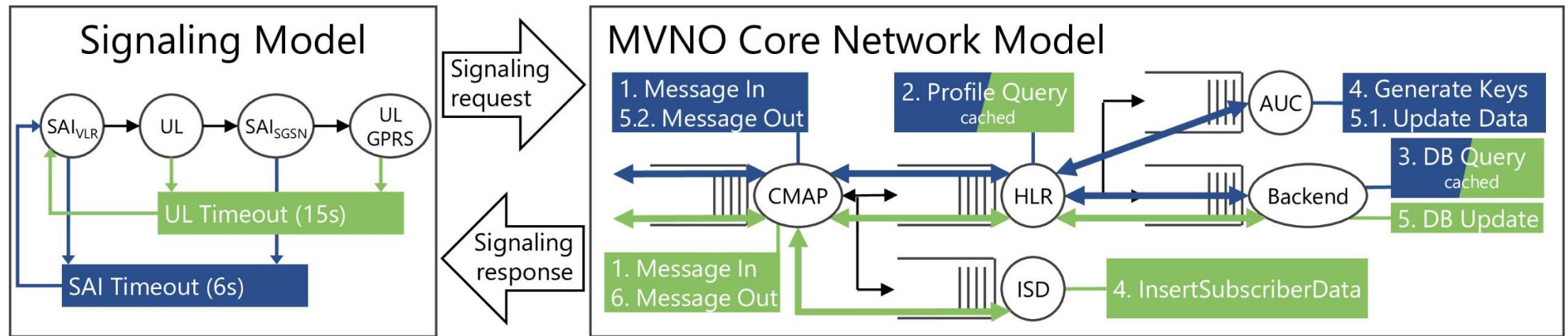


Towards Understanding the Signaling Traffic in 5G Core Networks

Simon Raffeck, Stefan Geißler, Tobias Hoßfeld

info3.org

2G/3G MVNO Core Model



- ▶ Signaling model for a global 2G/3G core network
- ▶ Each component has equivalent in 5G core
- ▶ Interactions of 5G network functions are more complex

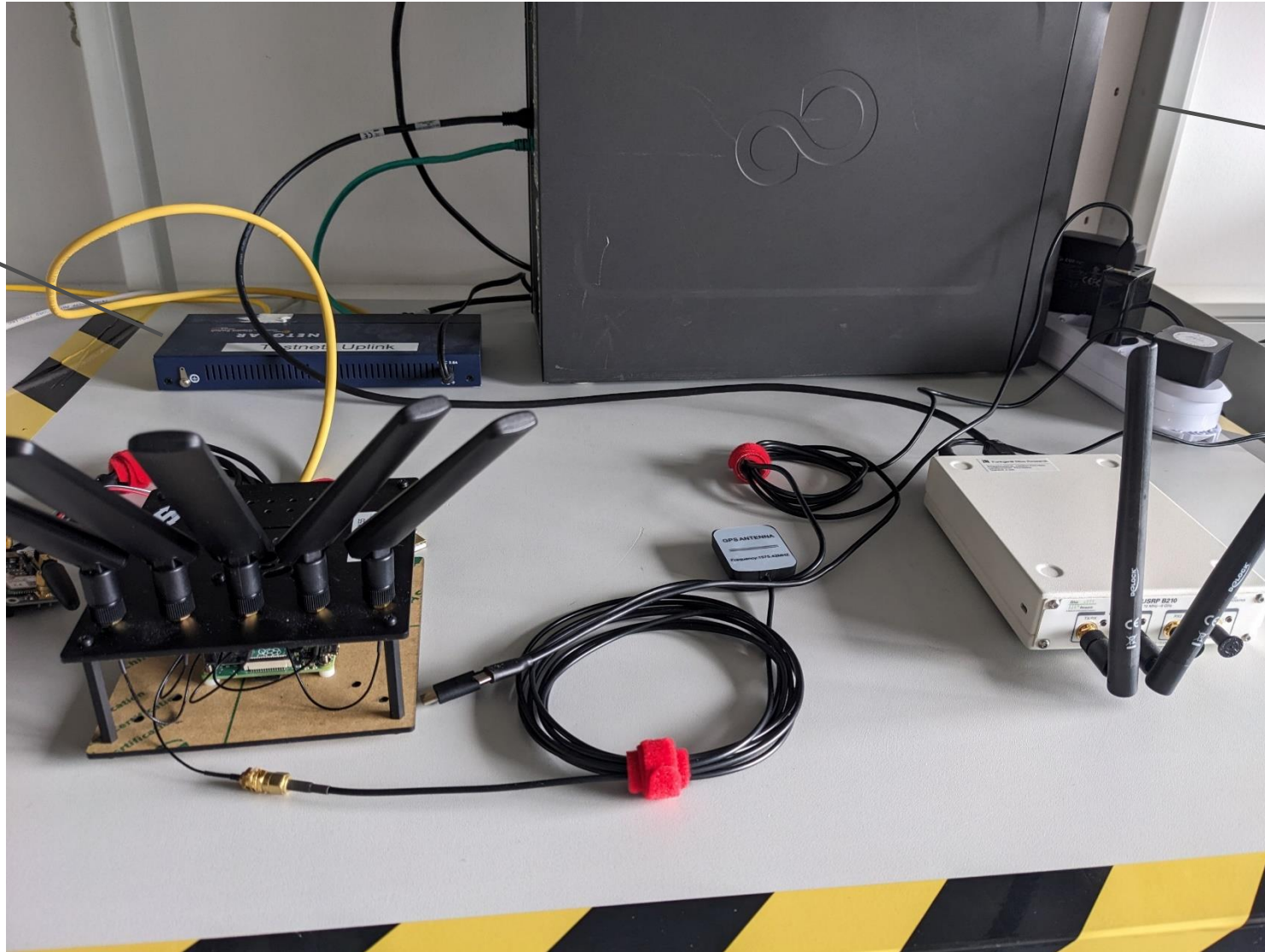
➔ First step: Obtaining as much information from the core as possible

S. Geißler, F. Wamser, W. Bauer, S. Gebert, S. Kounev and T. Hoßfeld, "MVNOCoreSim: A Digital Twin for Virtualized IoT-centric Mobile Core Networks," in *IEEE Internet of Things Journal*, doi: 10.1109/JIOT.2023.3263258.

5G Campus Network

Core in the cloud

Snapdragon UE

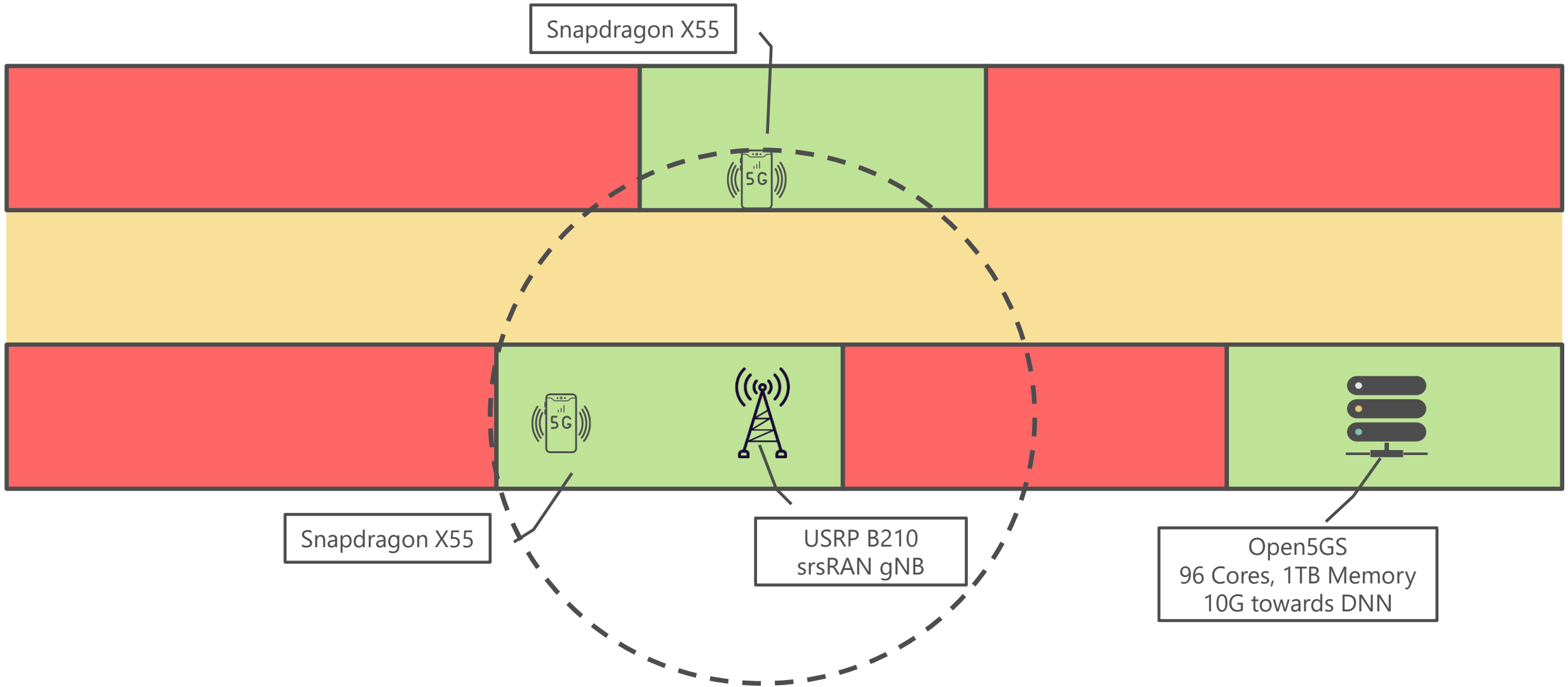


gNB

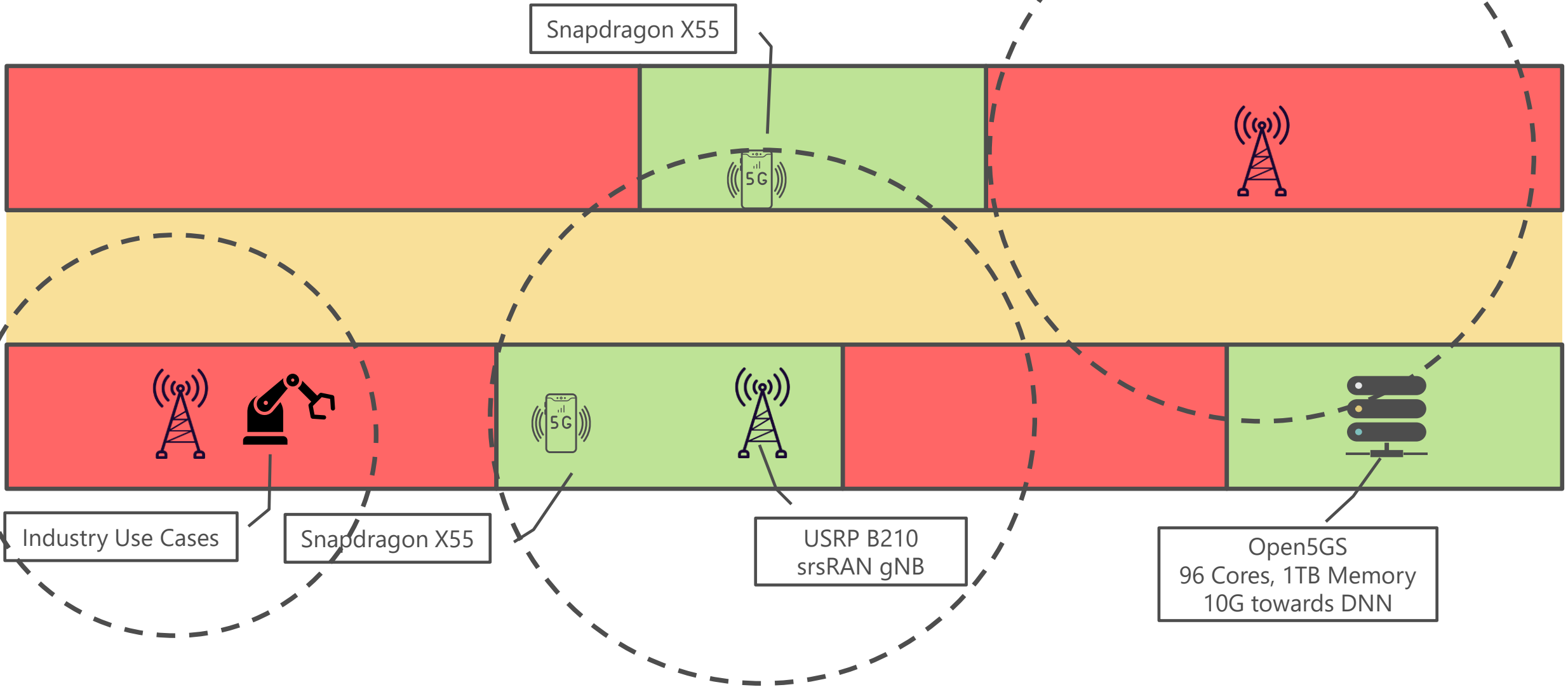
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gNB

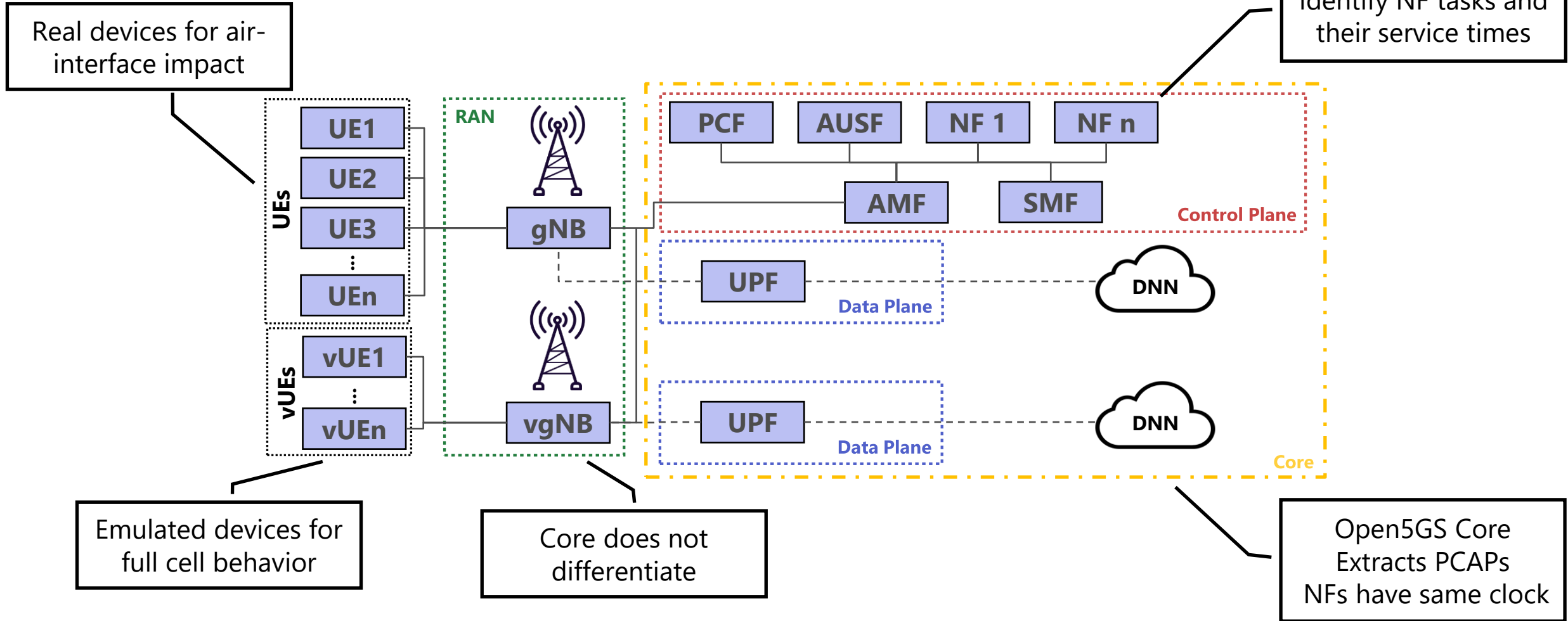
LS3 5G Campus Network Layout



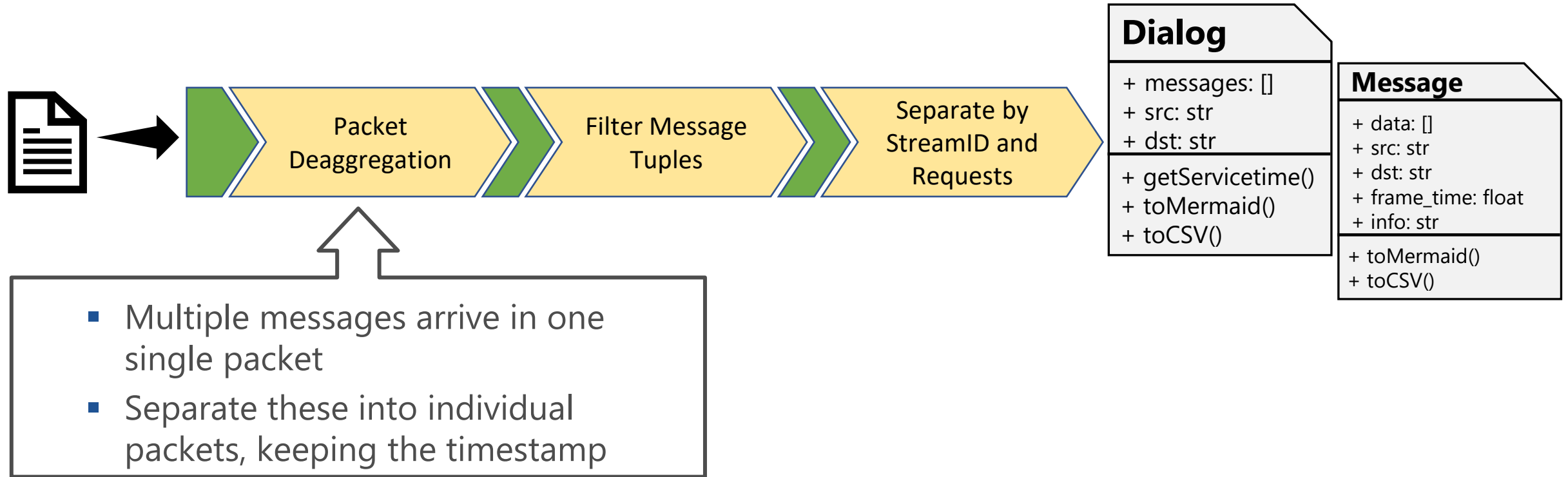
LS3 5G Campus Network Layout



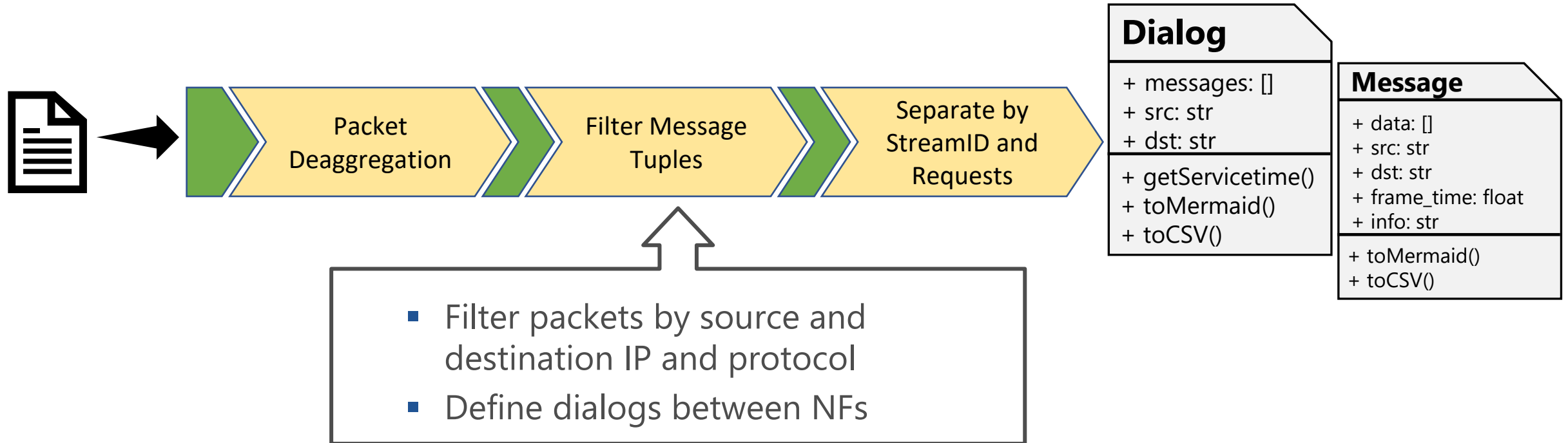
5G Campus Network



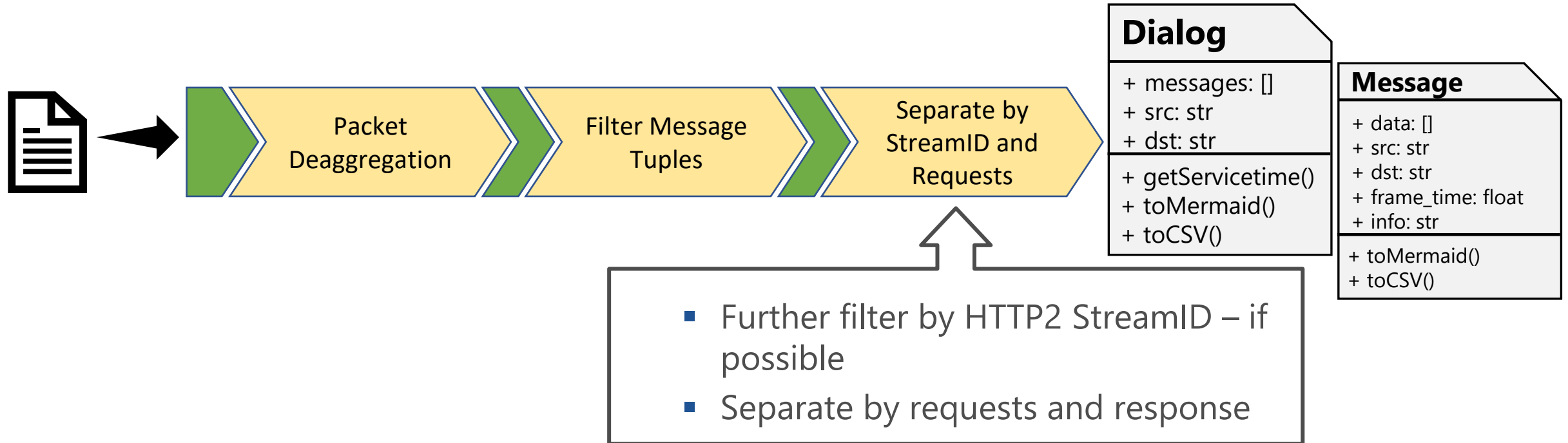
5G Traffic Parser



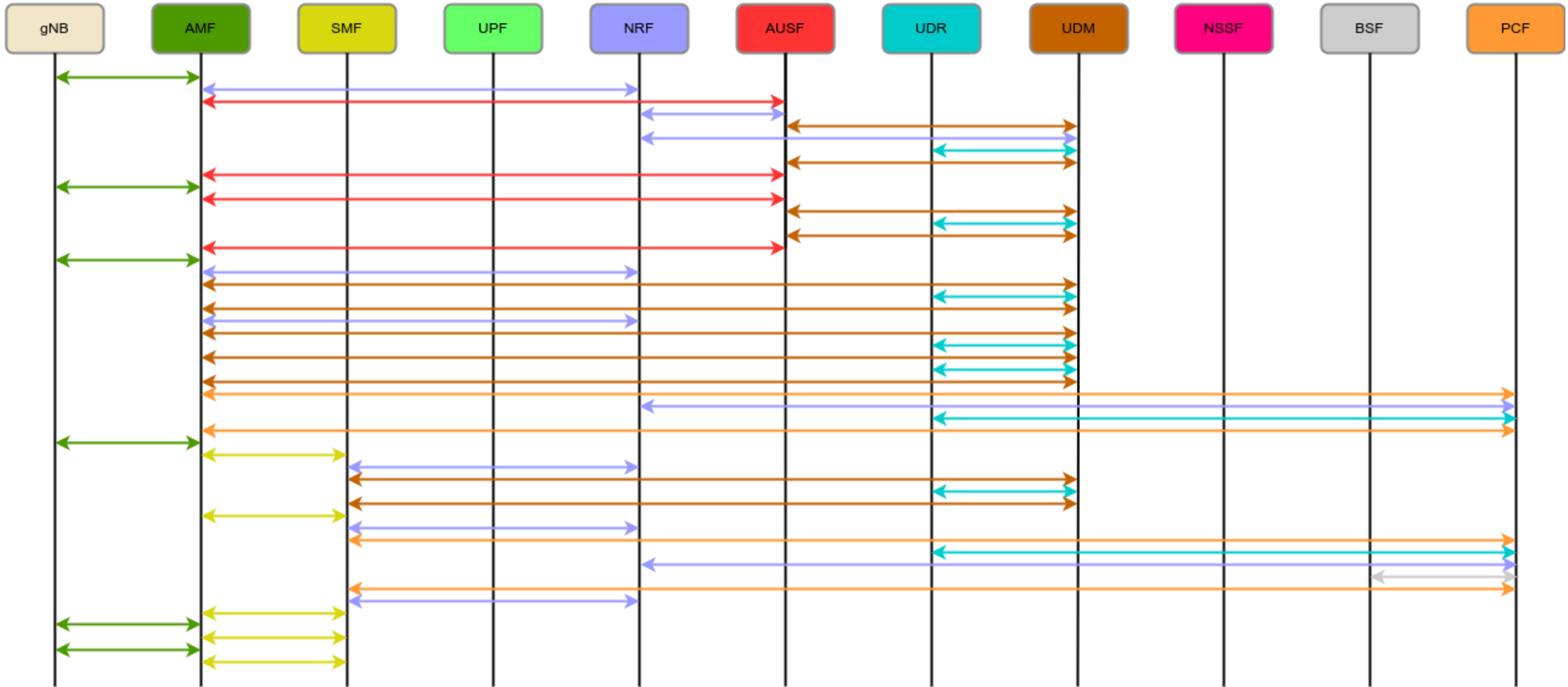
5G Traffic Parser



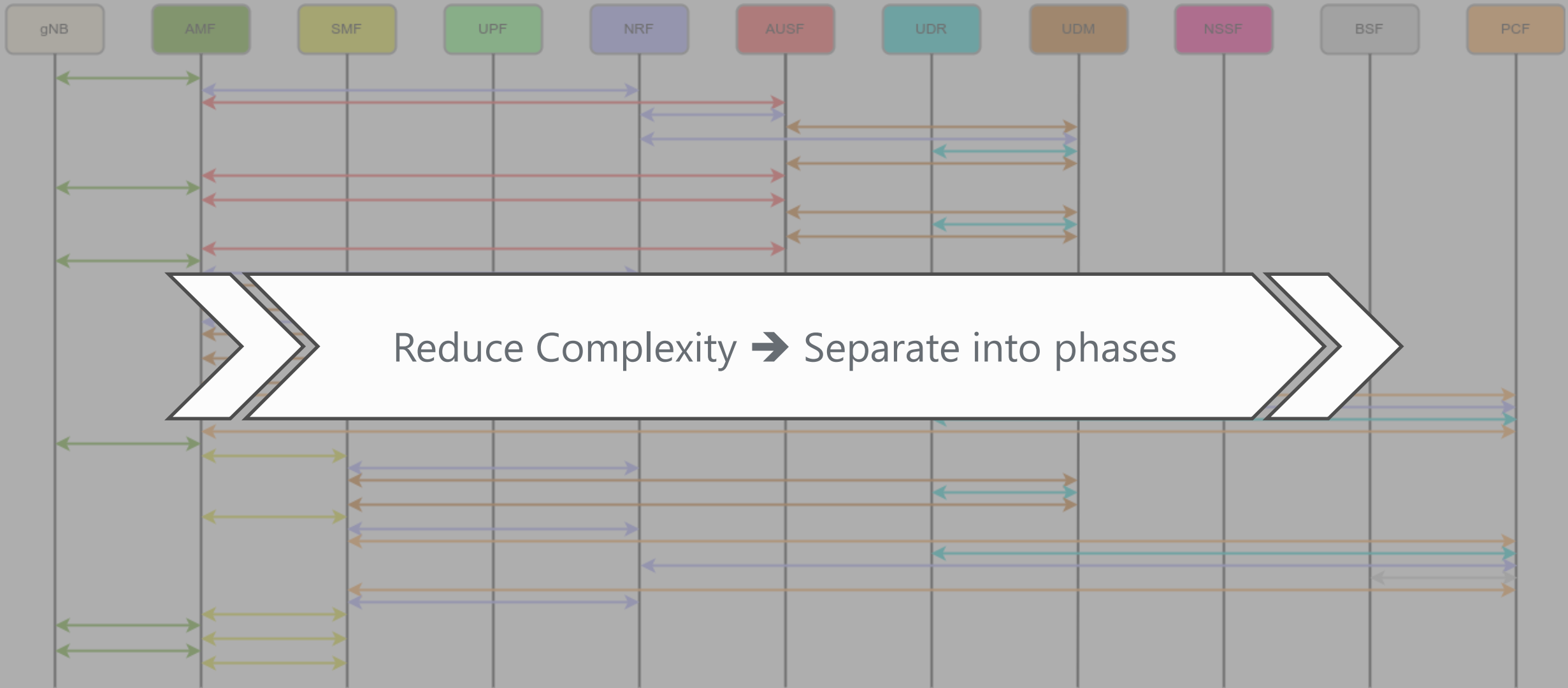
5G Traffic Parser



Understanding 5G Signaling Traffic

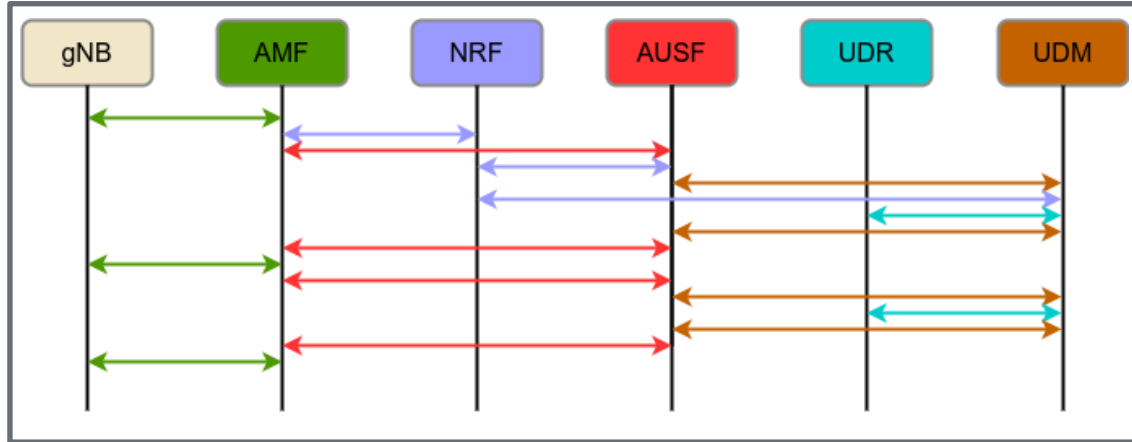


Understanding 5G Signaling Traffic

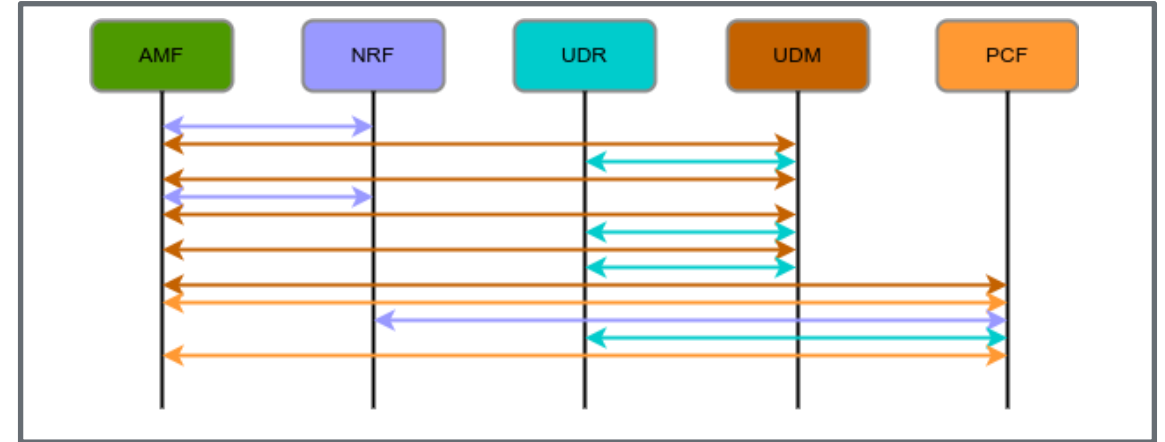


Understanding 5G Signaling Traffic

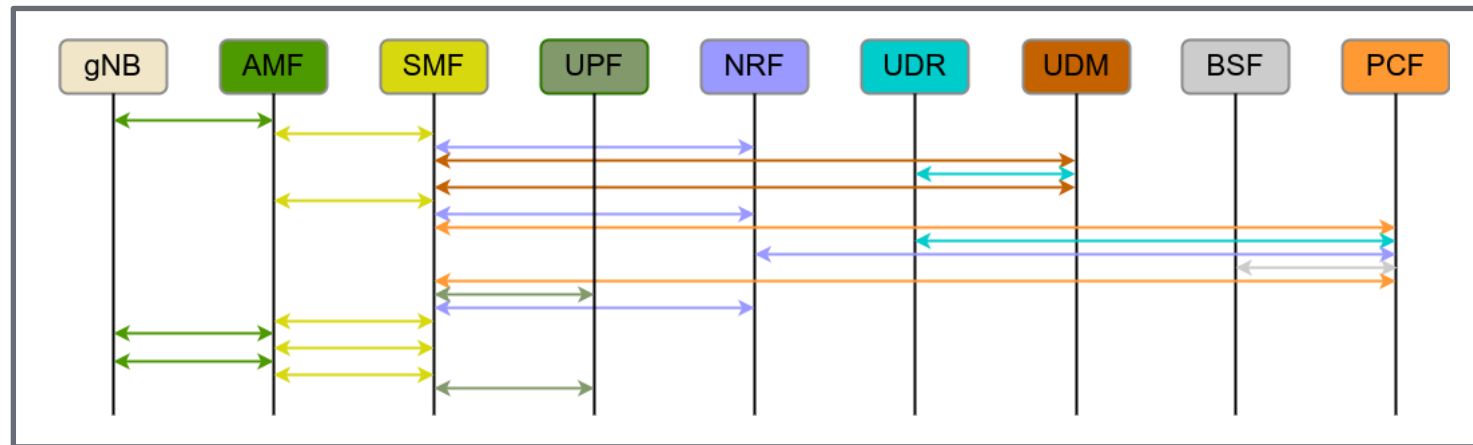
Authentication Phase



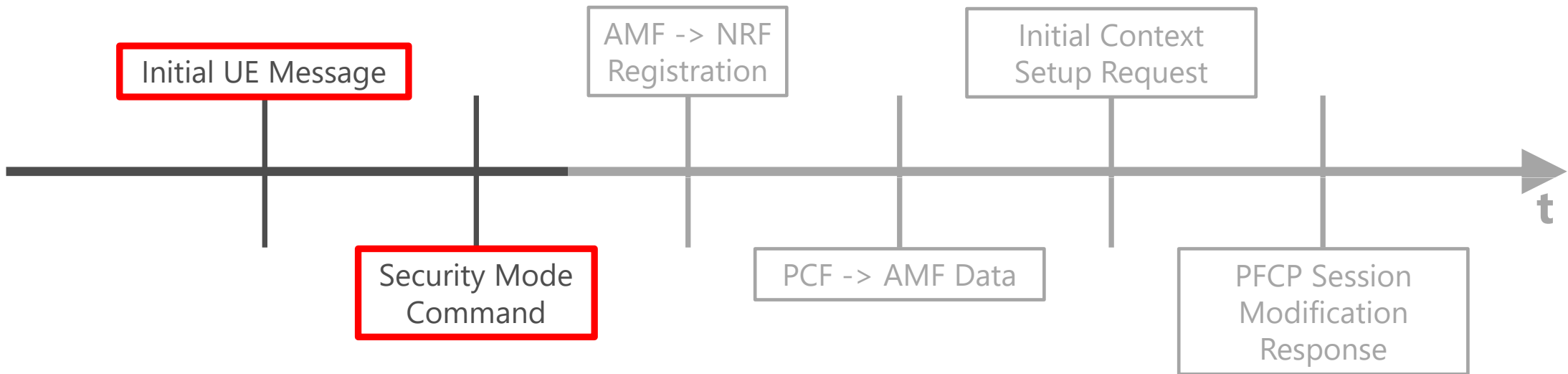
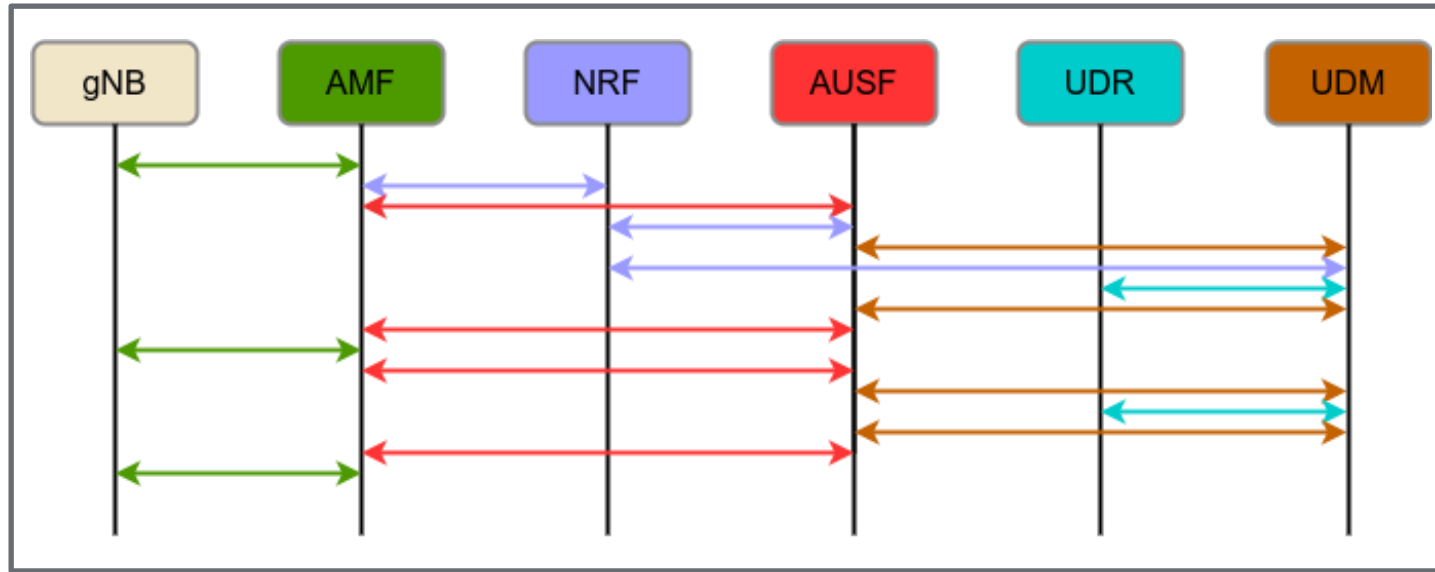
Mobility Phase



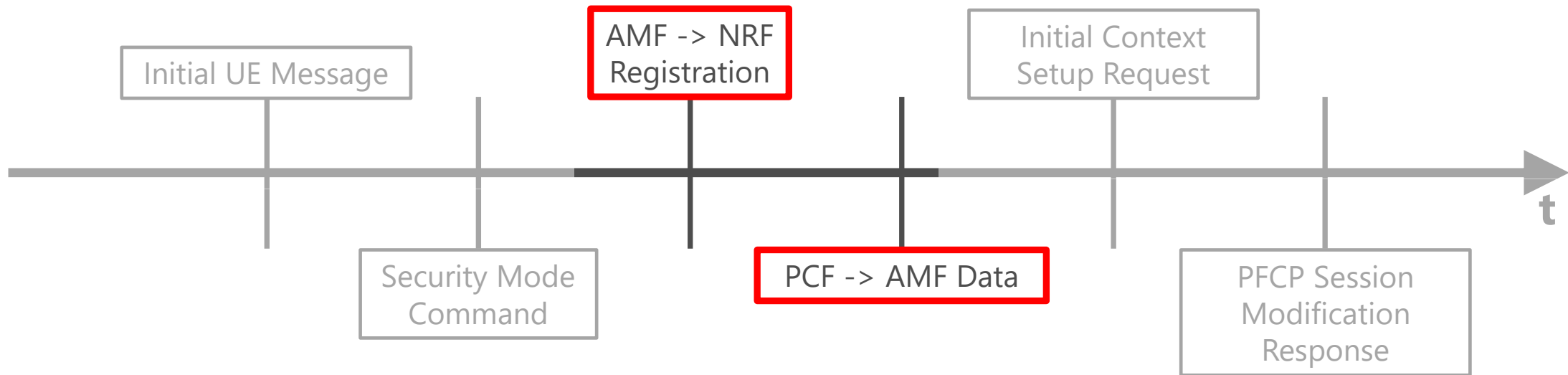
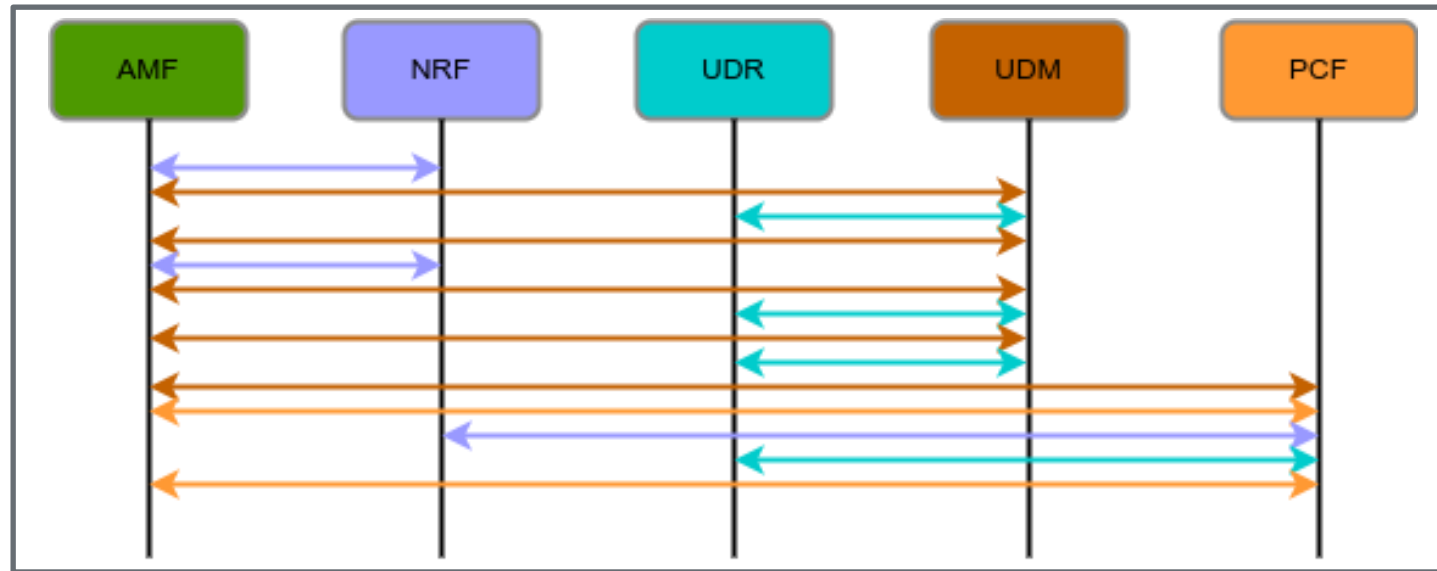
PDU Establishment Phase



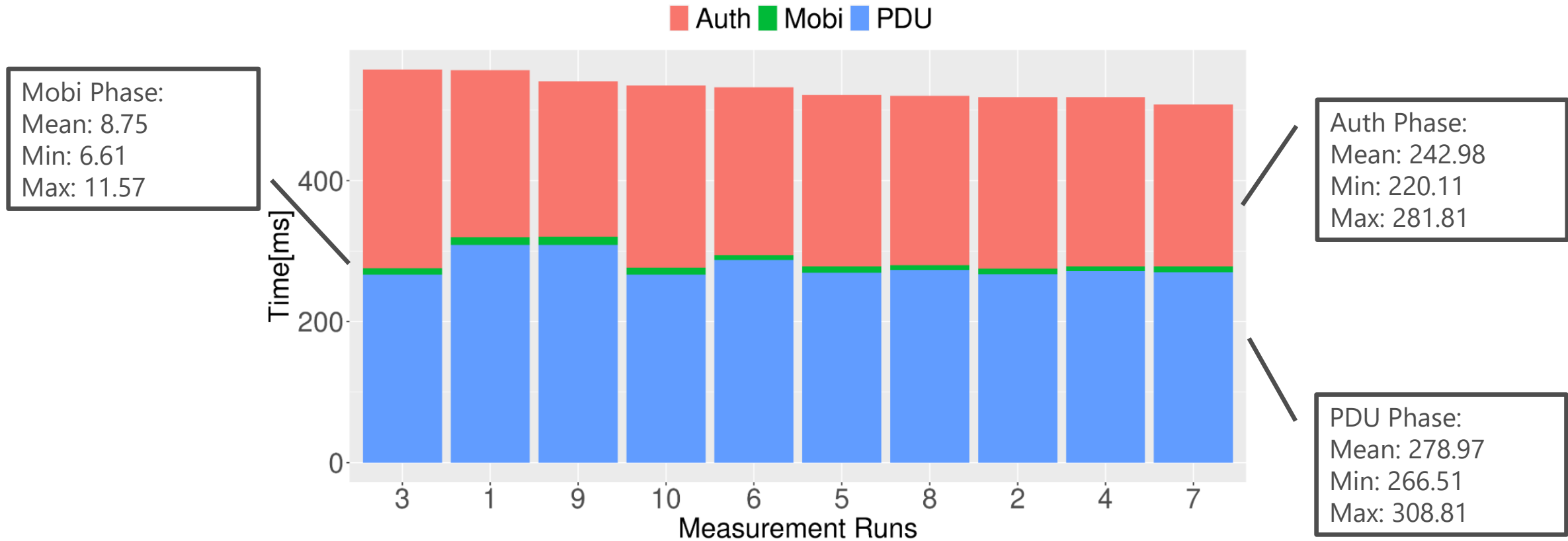
Authentication Phase



Mobility Phase



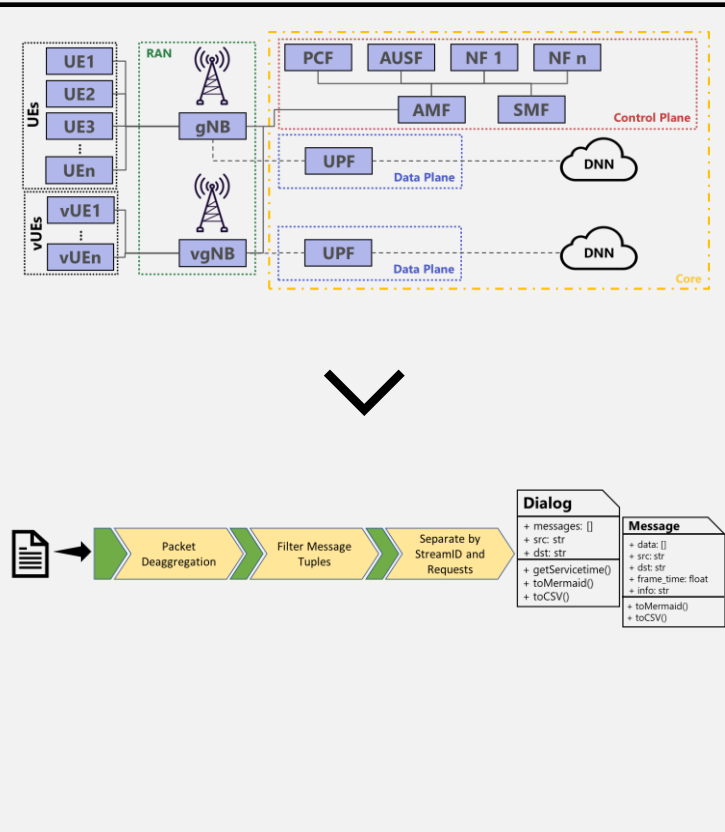
Preliminary Results



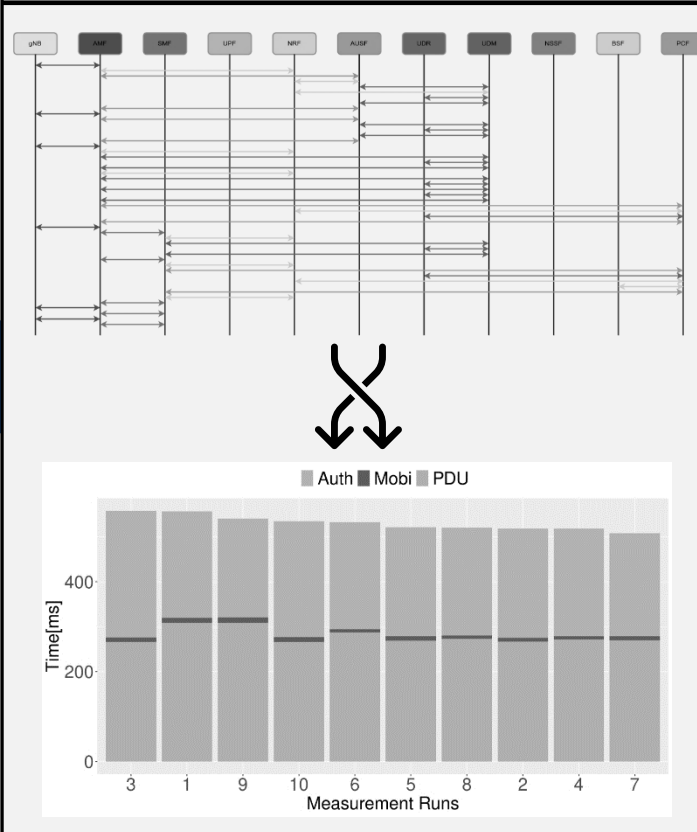
- ▶ Mobility phase does not interact with UE → shortest service time
- ▶ Higher variance in Authentication and PDU Session phase
- Air-interface introduces longer service times and variance

Conclusion

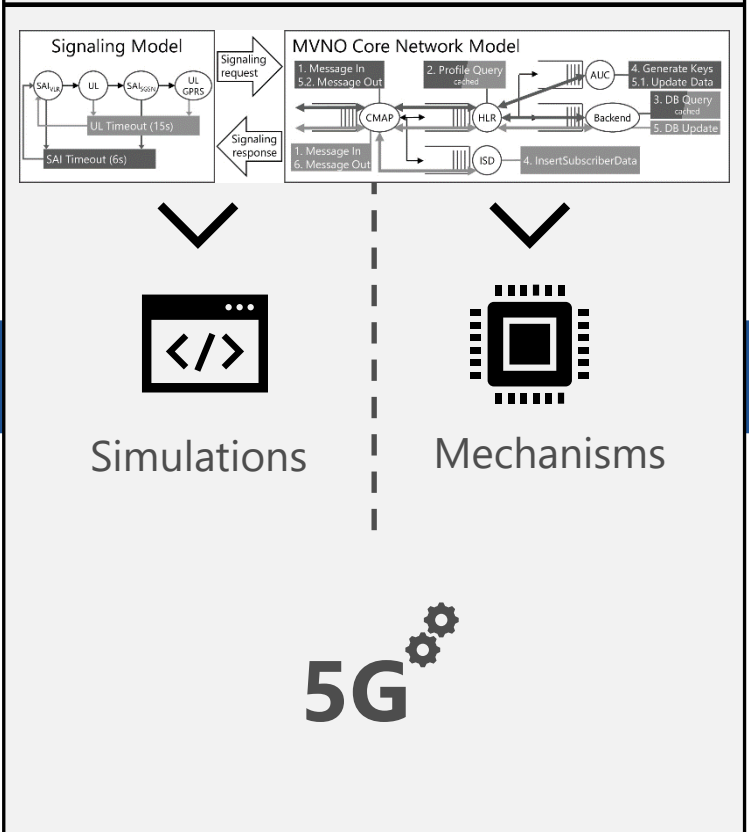
Traffic Analysis



Modelling 5G

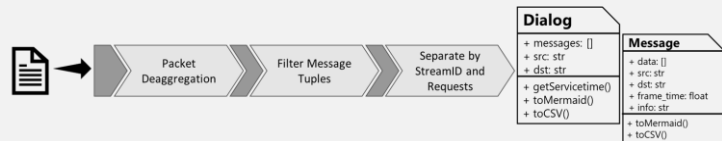
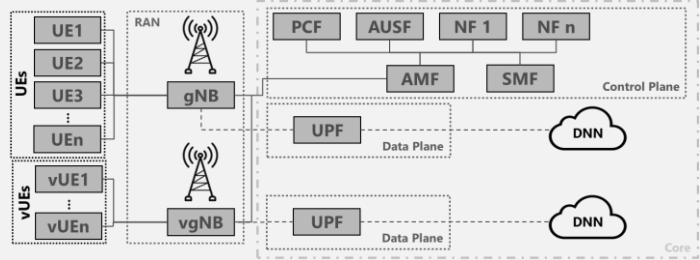


Future Work

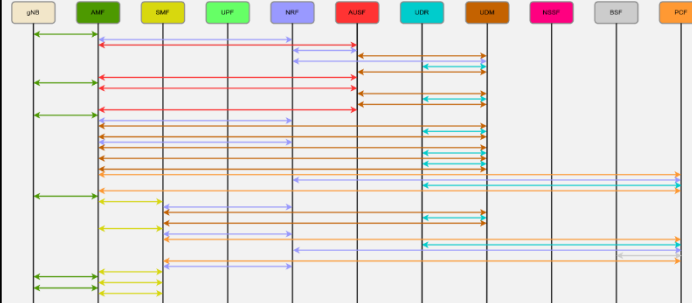


Conclusion

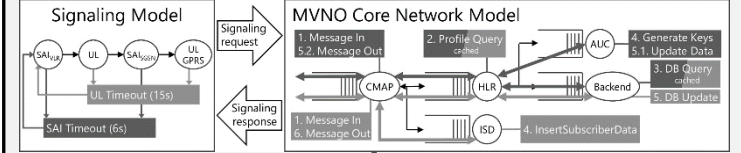
Traffic Analysis



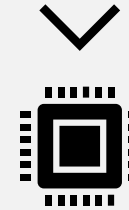
Modelling 5G



Future Work



Simulations



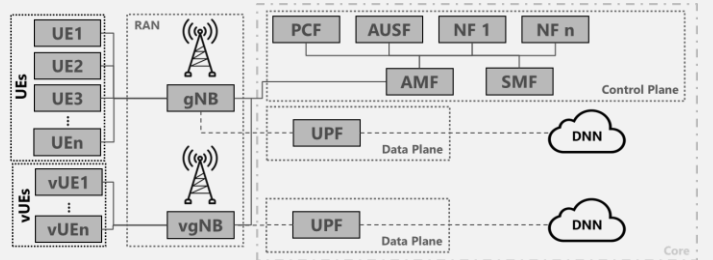
Mechanisms

5G

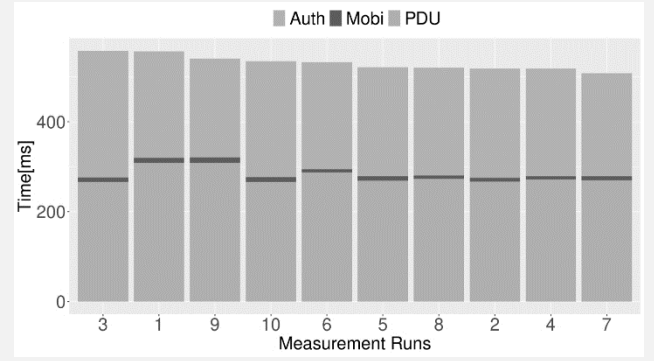
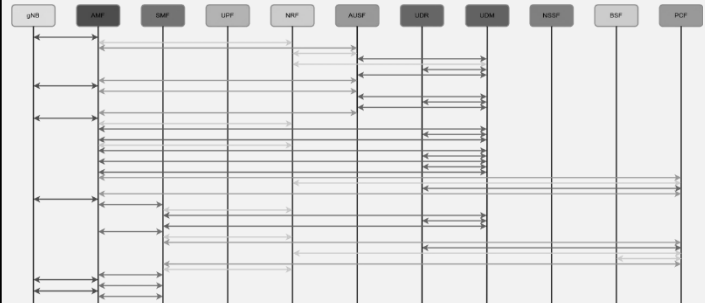


Conclusion

Traffic Analysis



Modelling 5G



Future Work

