



5G HEART

5GHEART.ORG

5GRONINGEN TESTBED

Iñaki Martin Soroa (TNO)

5G-HEART WP2

4 November 2021



5G HEALTH AQUACULTURE AND TRANSPORT VALIDATION TRIALS

5Groningen - Overview

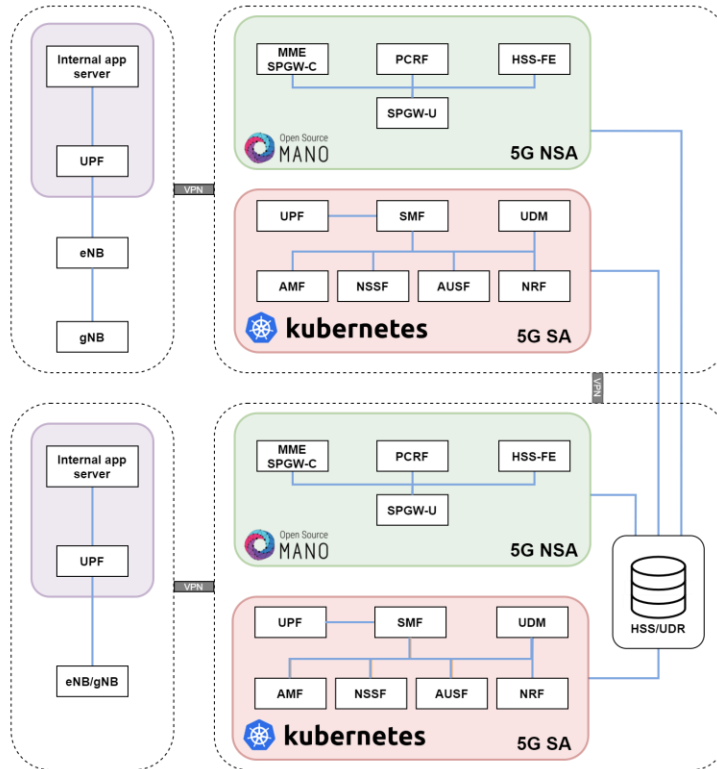
- 5Groningen is a 4G, 5G NSA and **5G SA** testbed
- Spanning 4 locations
 - Groningen: Core
 - Hoogeveen: Edge
 - Den Haag: Core/Database
 - Helmond: Edge
- Supports:
 - MEC
 - Slicing



5Groningen - Network

Location: **Hoogezaand**

Location: **Groningen**



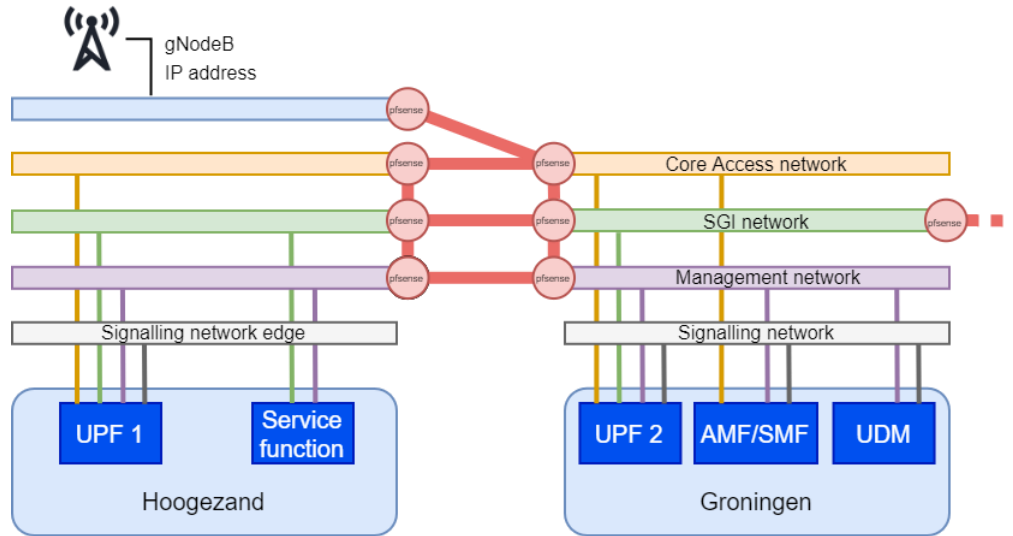
- 2 pairs of locations (Core and Edge)
 - Groningen – Hoogezaand
 - Den Haag – Helmond
- Single unified database in Den Haag
- Groningen – Hoogezaand
 - Single cloud
 - Single Kubernetes cluster
- Den Haag – Helmond
 - Separate clouds
 - Single Kubernetes cluster

Location: **Helmond**
5GHEART.ORG

Location: **Den Haag**

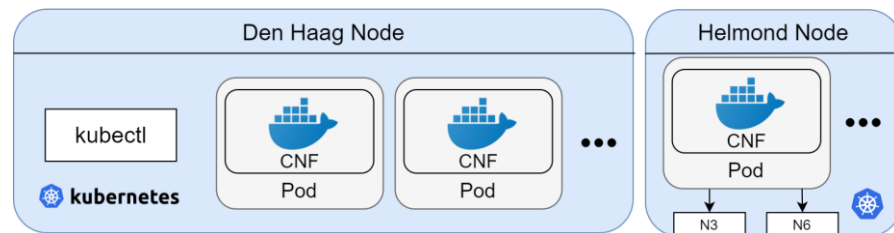
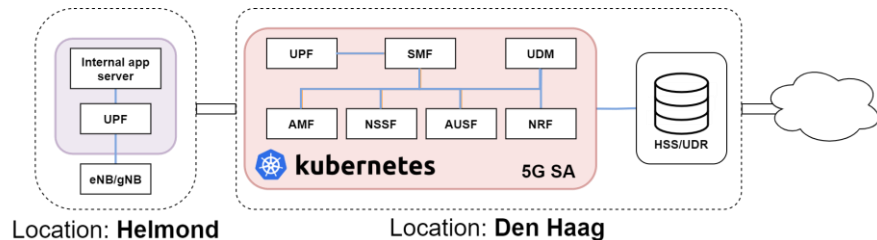
Servers interconnection: Groningen/Hoogezand

- The setup in Hoogezand-Groningen



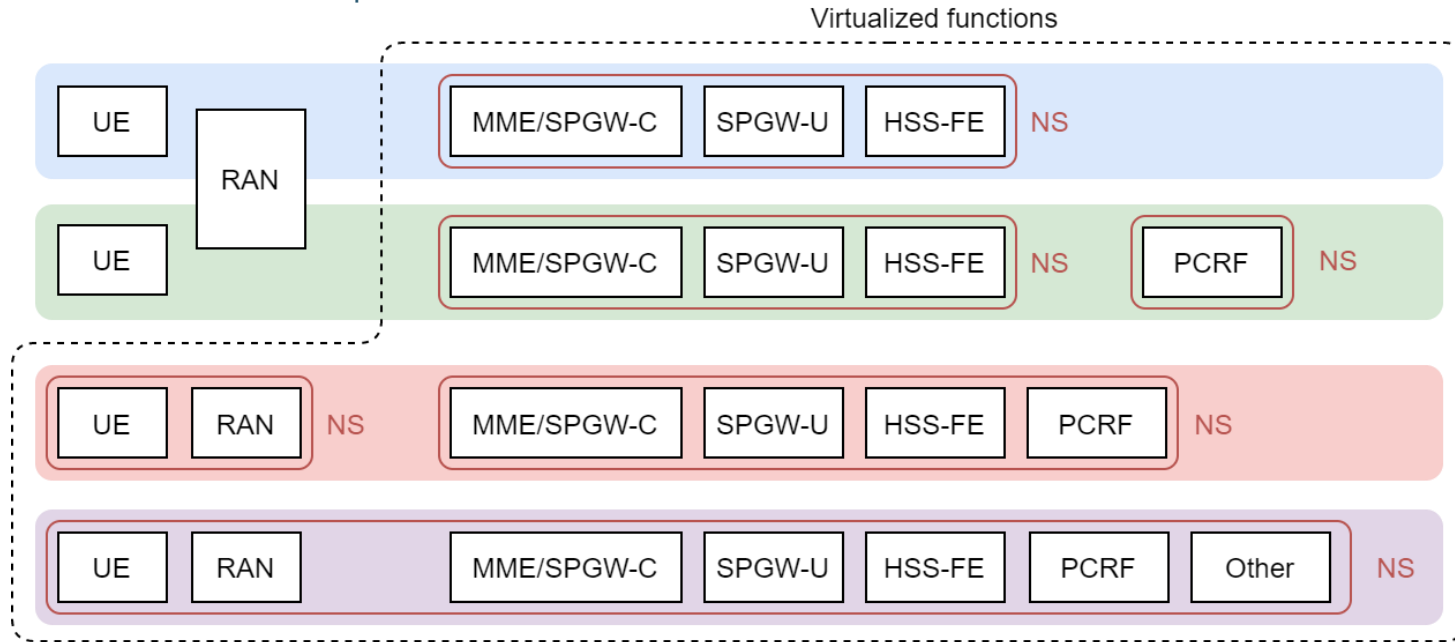
Orchestration in 5G SA

- Orchestration using Kubernetes clusters
 - 1 cluster in Groningen/Hoogezaand
 - 1 cluster in Den Haag/Helmond (spanning multiple clouds)
- Secondary interfaces for:
 - N2: AMF to gNB
 - N3: UPF to gNB
 - N6: UPF to DN
- Simple customization and deployment
- User friendly interface with 5GSP



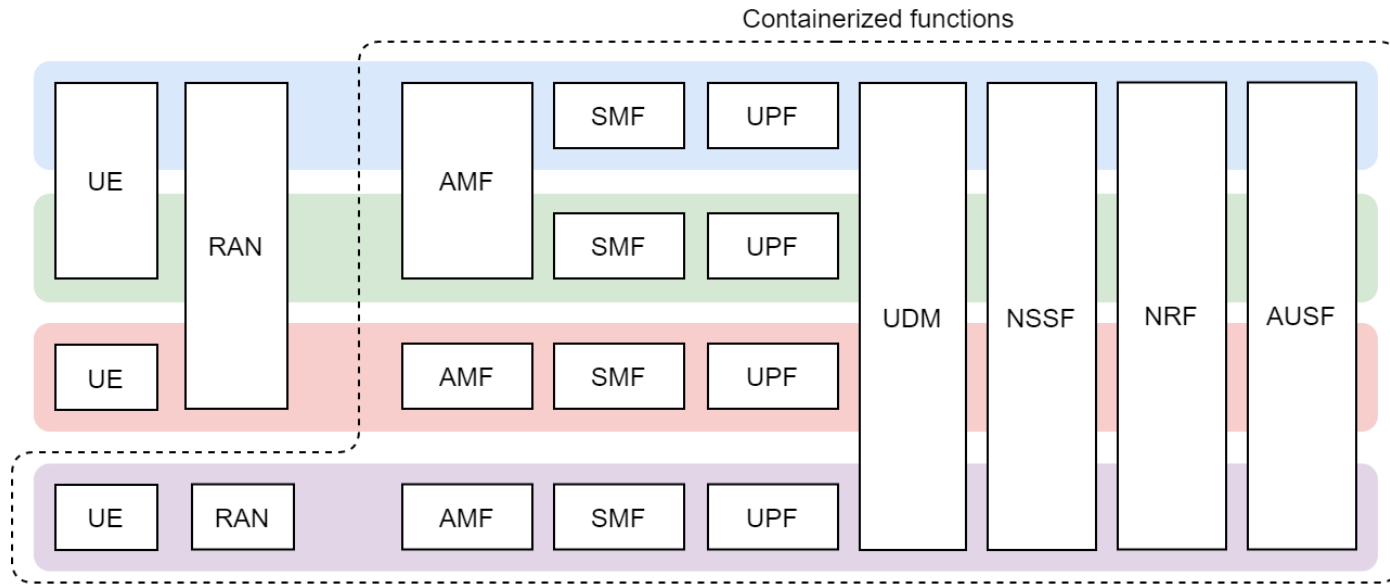
5G NSA slicing approach

- Using dedicated core networks
- Slice selection options: APN



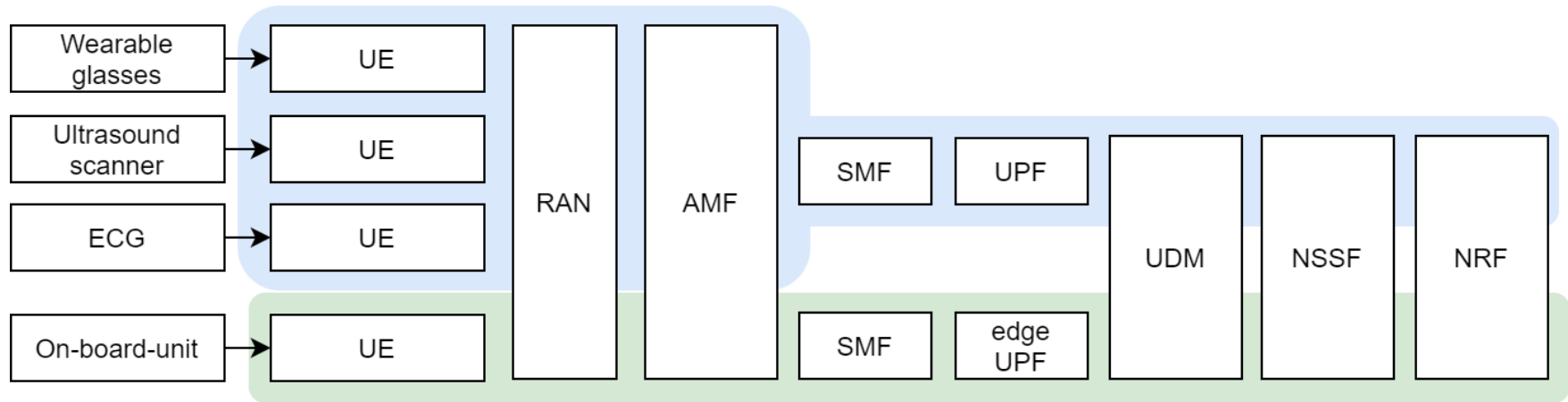
5G SA slicing approach

- Different slices, different SMF-UPF pairs
- Slice selection options: SST, SST+SD, TAI or DNN



Use cases

- Combined Healthcare and Traffic use case
- URLLC slice for traffic and eMBB slice for healthcare



THANK YOU FOR YOUR ATTENTION

5GHEART.ORG



This project received funding from the European Union's Horizon2020 research and innovation programme under grant agreement No 857034
