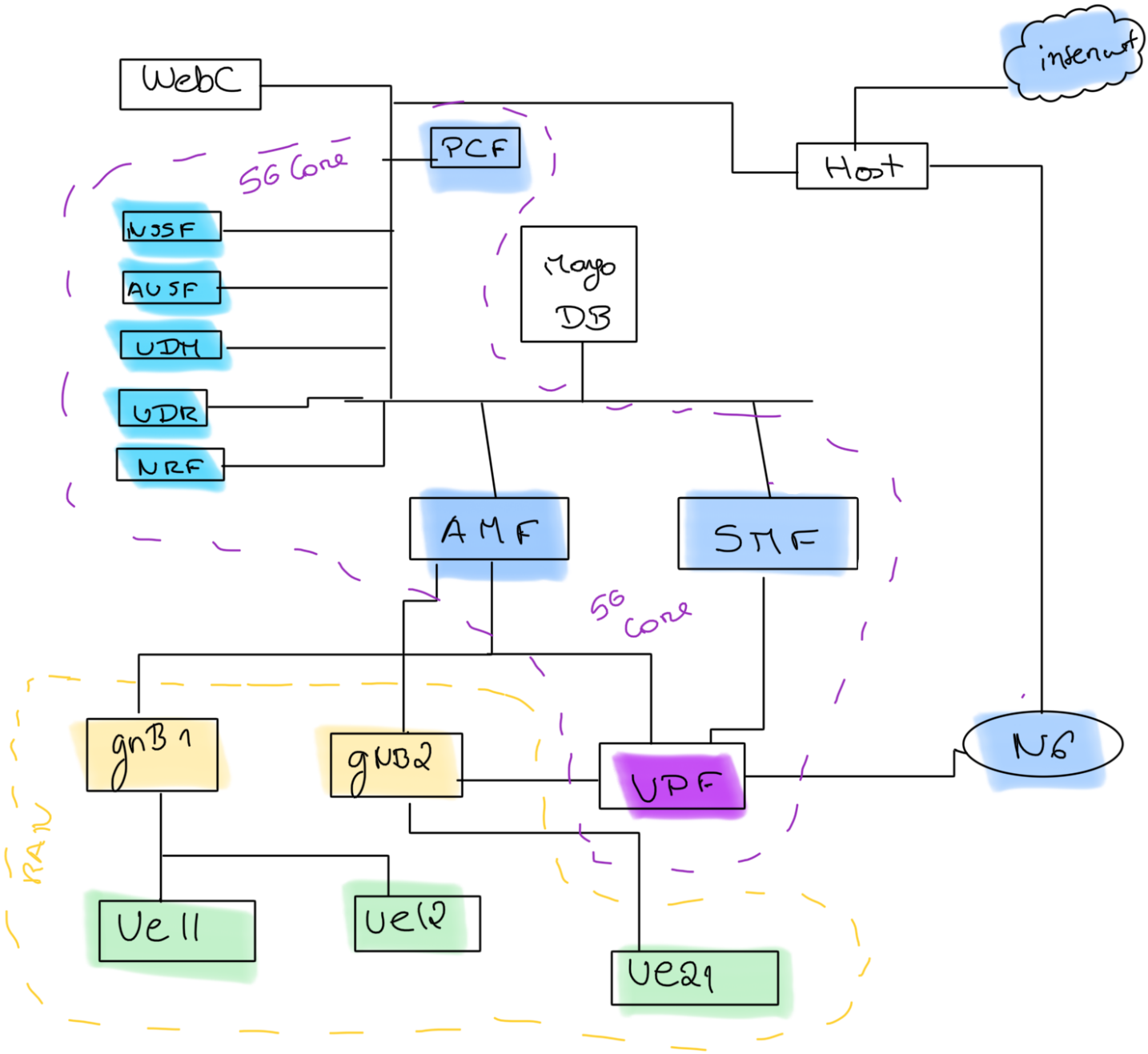
→ 5G

Fasten data speeds, low latency. Suited for IoT, high-speed mobile broadband, enhanced mobile broadband, VR, Edge computing, drones, massive machine type communications.

↳ Network topology



RAN → Radio Area Network

RAN

UE → user equipment (tipo telemóvel)

gNB → Base station que suporta 5G. Responsible for radio-related functions. (tipo antena, station)

5G Core

UPF → User plane function → does all the work to connect all the data coming from the RAN to the internet. (routing, forwarding, etc.)

SMF → Session Management function manages the user session including establishment, modification, release of sessions.

AMF → Access and Mobility Management Function. Receives all connection and session info and is responsible for handling connection and mobility management tasks.

NRF → Network repository function works as a centralized repository for all the 5G network functions (NFs) in the Operator's network.

UDR → Unified data repository, used to store data by 5G Network Functions

functions.

UDM → Unified data management, responsible for generating credentials used during authentication, authorizes access based on user subscription, which it retrieves from UDR and sends to other NFs.

AUSF → Authentication Server Function performs authentication with UE. Connects with UDM and AMF.

NSSF → Network slicing Selection Function is a solution to select the optimal network slice available for the service requested by the user in the 5G environment where various services are provided.

PCF → Policy control function supports the unified policy framework that governs the network behaviour

↳ 5G Non-stand alone (NSA)

NSA: Uses 4G as an anchor for radio access, uses the 4G core to control services, brings more speed and less latency.

SA (stand alone): Works without 4G, dedicated core, new services with slicing and edge computing
(> 2023)

↳ 5G Procedures
- Connection, registration and mobility management
- Session management (PDU session establishment, modification and release, session continuity)
- Handover Procedures
- Procedures for trusted / non-trusted 3GPP access.

3GPP: international standardization organization for cellular telecommunications, based on a model where different technical specs are grouped into different phases or 'releases'. (2G, 3G, 4G, 5G)

↳ Distributed cloud : Edge computing and 5G
- 5G provides native support for Multi-access Edge computing (MEC).
- Edge computing: placement of components (servers, data storage) closer to edge of network, closer to the source of data.
- Edge computing and 5G allows low latency services and more reliability (cloud resources and services are closer to end-users)

↳ 5G slicing

- Creation of distinct logical networks.
- Each device supports connecting to up to 8 slices.
- 5G support end-to-end slicing.

End to end slice: logical network capabilities and network characteristics in order to serve a defined business purpose of a customer.