

B A  S H E E

Architectures for operational hybridized GNSS with Alternate PNT systems

LBS demonstration
November 16th 2022 9:30 - 13:00 CEST



Alternate PNT?

GNSS dominates location business → Outdoor only

What if GNSS fails?

LEO PNT satellites

Land-based systems could also be used

Wi-Fi (Fingerprinting, state-of-the-art)

Wi-Fi ranging

UWB ranging

Bluetooth (ranging, localization)

Magnetic field (Fingerprinting)



PNT systems require infrastructure

Even opportunistic systems (Wi-Fi fingerprinting) require infrastructure

At least:

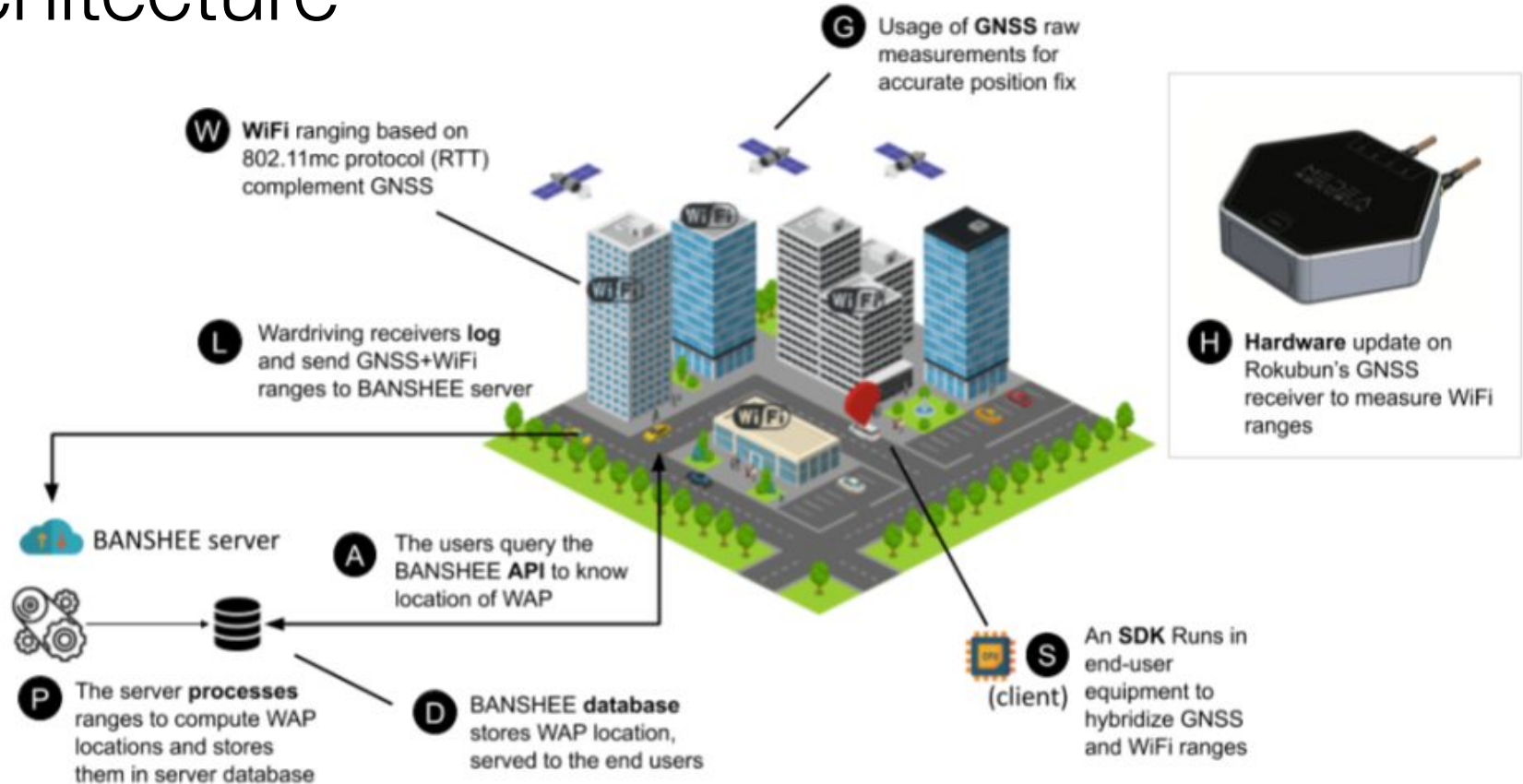
Positioning algorithms (i.e. **clients**)

Provision of node positions / reference maps (i.e. **server**)

Server - client interface (i.e. **API**)

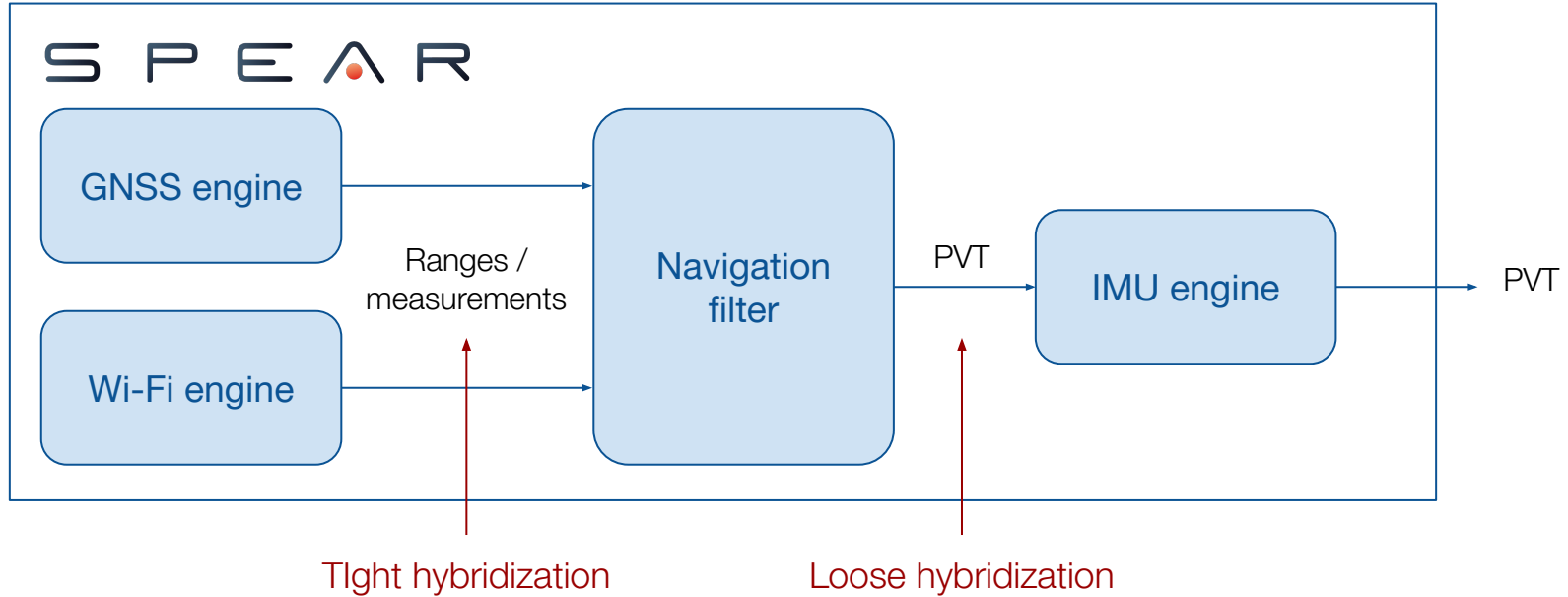


Architecture



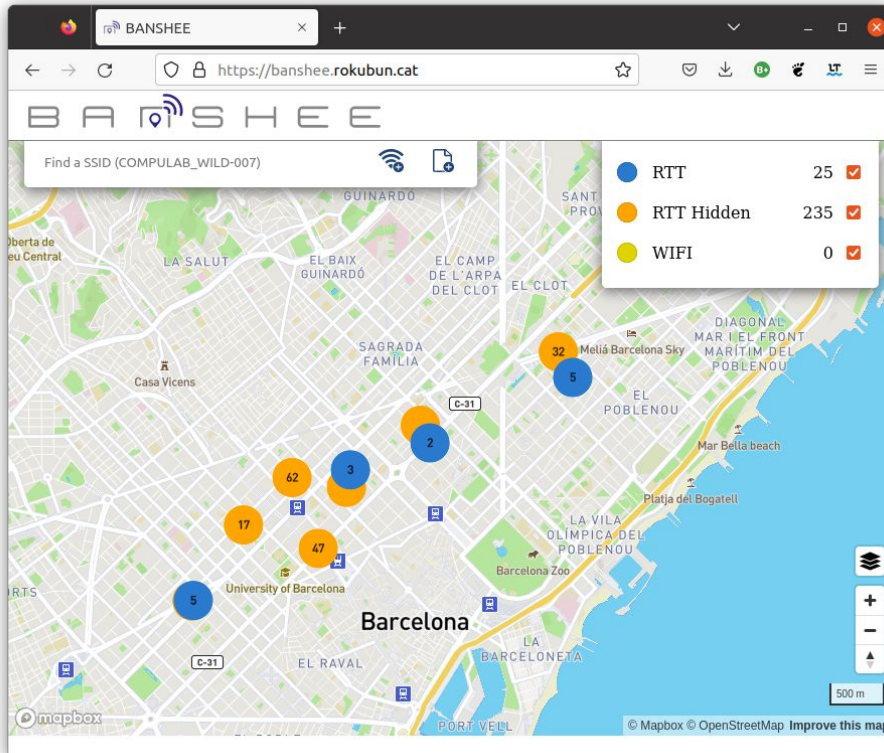


Client: Hybridized location





Server: Node products

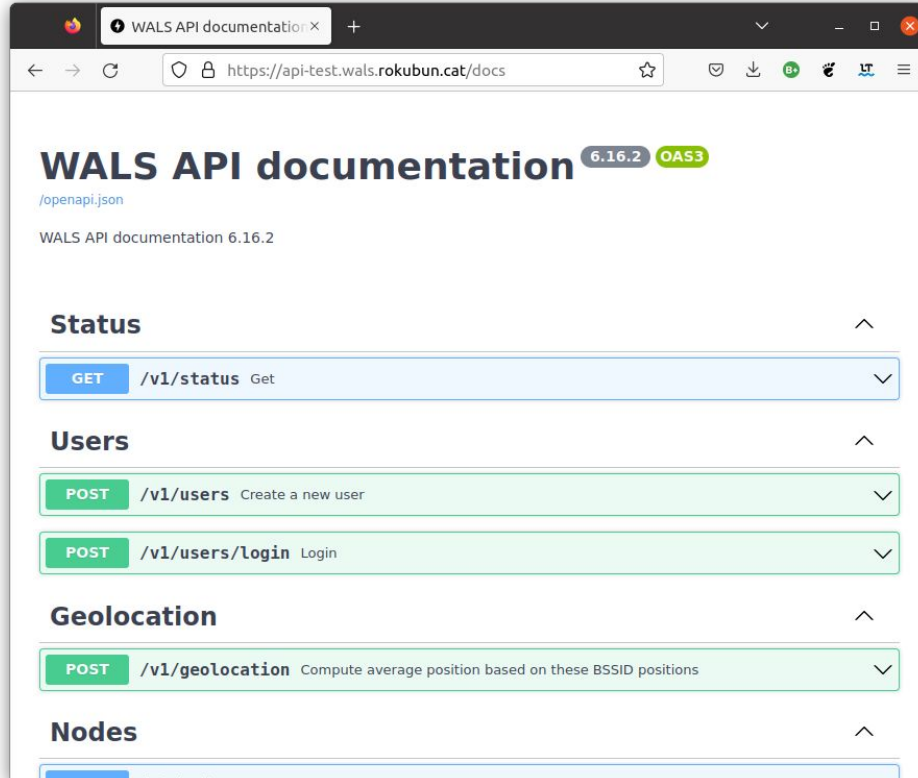


In the same way as we need GNSS orbits and clocks (“ephemeris”), we also require the **positions**, biases and other potential ancillary information from Alternate PNT **nodes** (in this case Wi-Fi routers)

<https://banshee.rokubun.cat/>



API: The glue between server and client



API provides a homogeneous interface between server and client

Receives geotagged RTT measurements to locate Wi-Fi nodes (WAPs)

Provides node (WAP) positions and other products to clients (to compute navigation solutions)



Some takeaways

BANSHEE proposed an architecture to use Wi-Fi RTT as alternate or complementary PNT system to GNSS

Based on hybridize ranging technology: Could be easily **extended** to other technologies

5G, UWB tags, Bluetooth beacons, ...

The final goal is to provide with an **integral navigation solution**, that provides a seamless **indoor/outdoor** navigation solution **regardless the target device**