



SatNav & IoT - added value to long distance wireless communication

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KNL Networks in brief

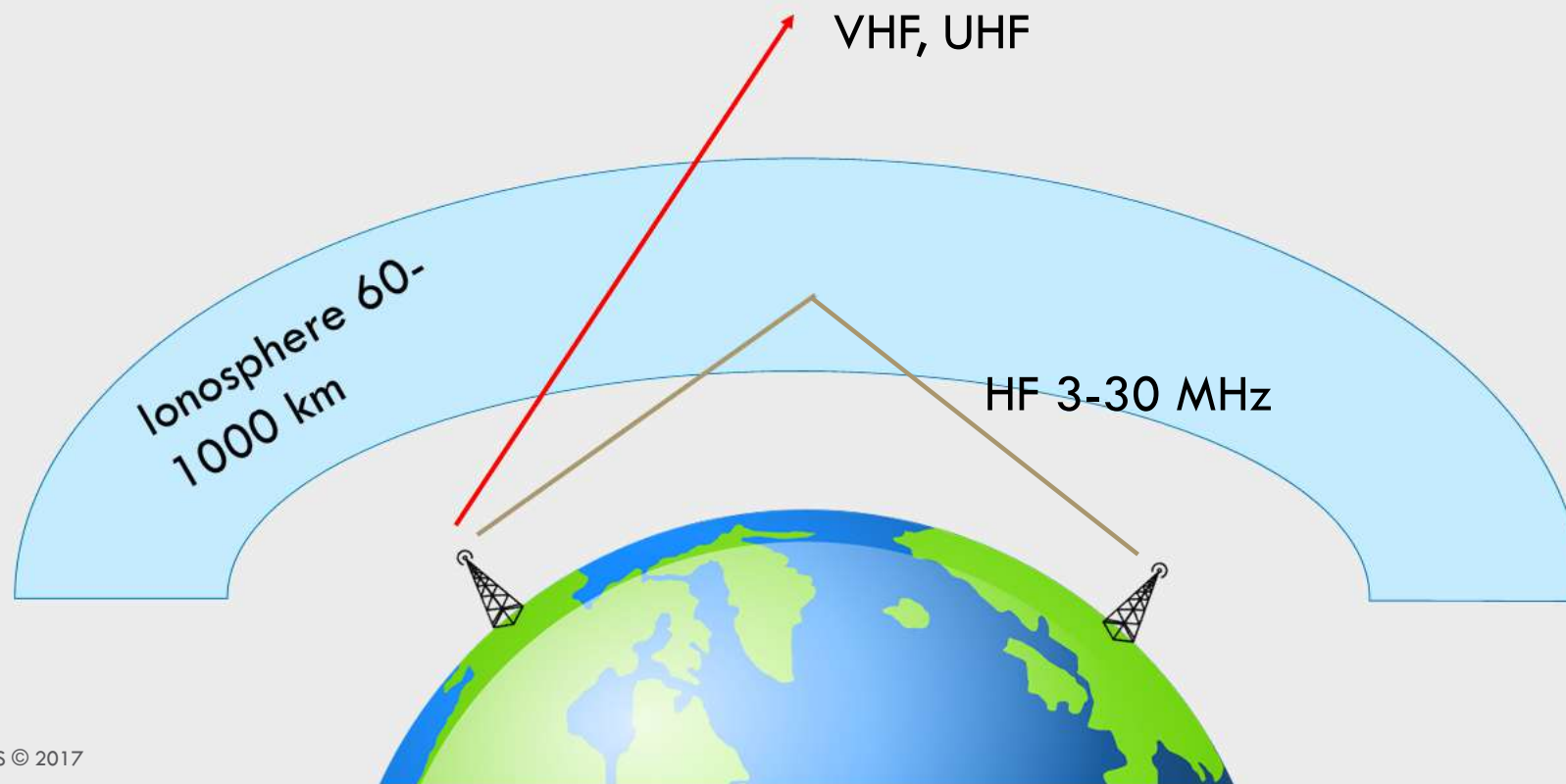
- Founded 2011 as Kyynel Oy
- Spin-off from the University of Oulu (CWC)
- Headcount 28
- Offices in Oulu and Helsinki
- Sales in Norway, UK and Singapore
- Two investment rounds in 2014 and 2016
- Develops and operates independent global cognitive HF radio network
- Maritime as primary market

THE "RADIO": JUST SWITCH IT ON TO OPERATE

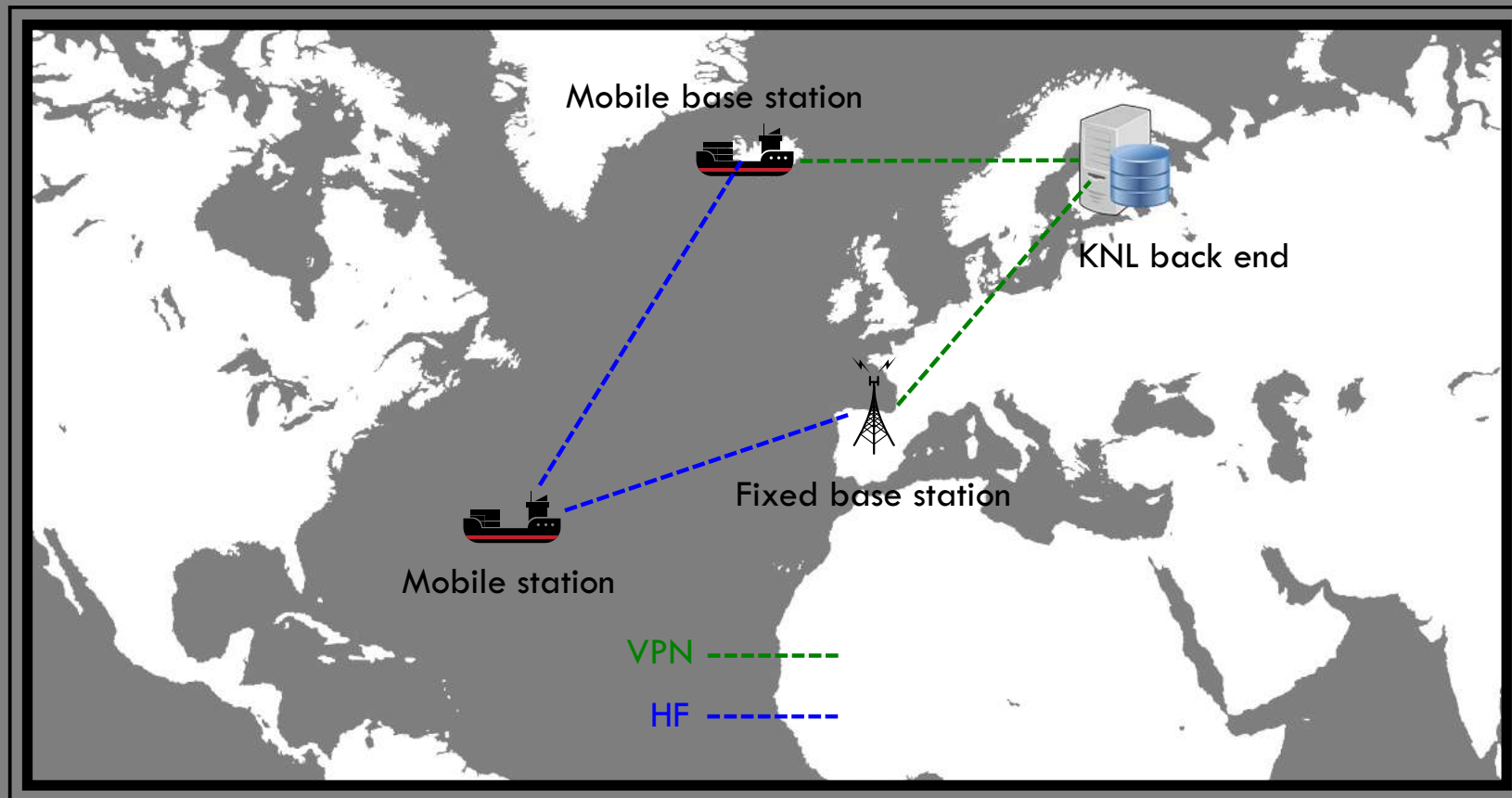


- The novel solution combines the traditional high frequency (HF) terrestrial radio system with the latest cognitive and software radio technologies
- Selects automatically the best channel and parameters.
- Terminal can act also as a base station, while connected to internet via cellular modem.
- 2 LAN connectors
- GNSS receiver
- 3G modem

Long distance space wave communication without satellite



KNL Global network



IoT at sea – industry taking first but big steps

– Ship operation

- Fuel consumption optimization
- Predictive maintenance
- Emission control

– Asset tracking

- Container sensors (temp, humidity)
- Location tracking

– Autonomous shipping

- KNL is participant in DIMECC Design for Value project, exploiting the opportunities of digital disruption in maritime logistics value chains.

“The maritime industry lags behind alternative transport industries in terms of its use of information and communications technology.”

-Ericsson 2015

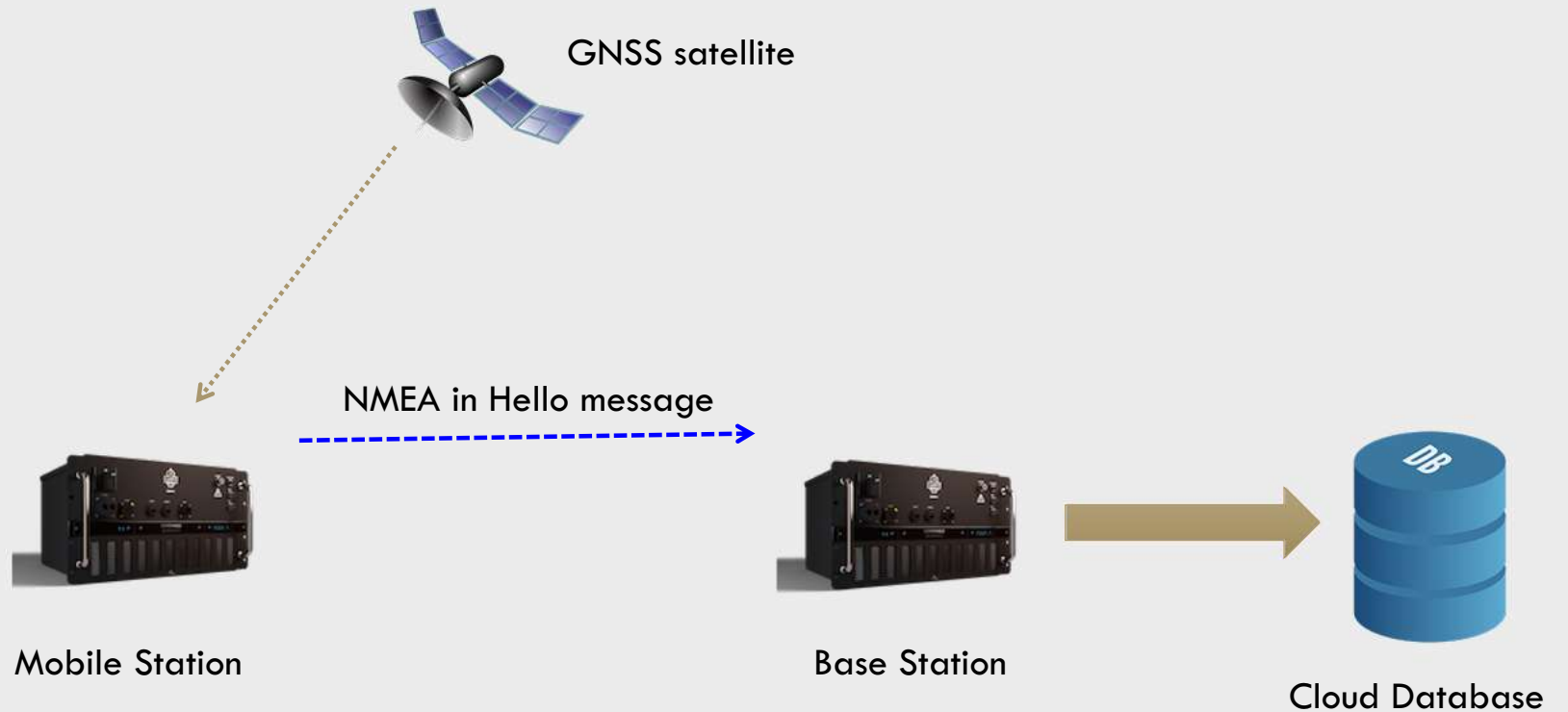
“Autonomous shipping is the future of the maritime industry. As disruptive as the smartphone, the smart ship will revolutionise the landscape of ship design and operations”

-Rolls-Royce 2016

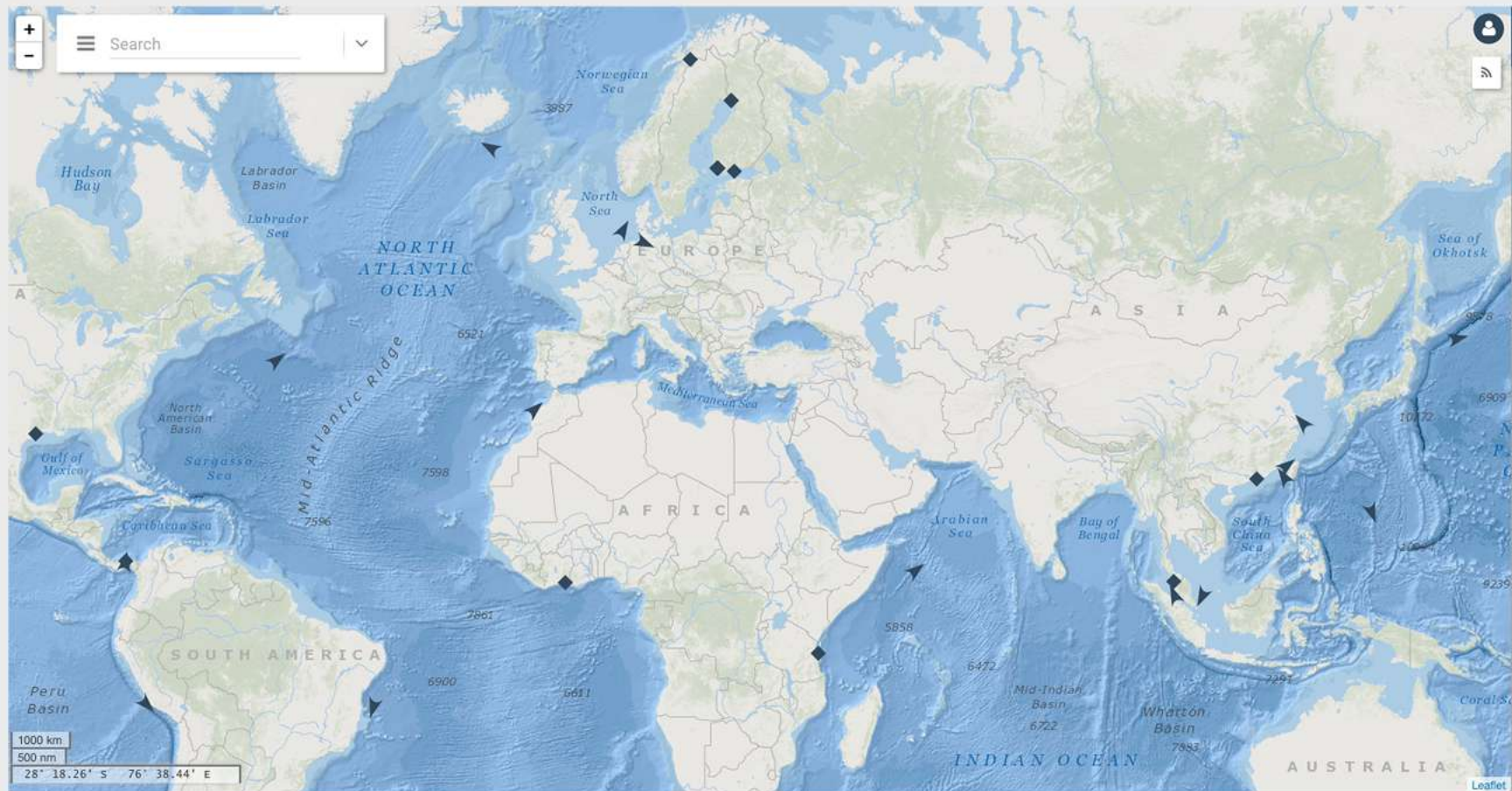
“These services are based on capturing digitalised data streams from every engine, after which this data is analysed by specialists. This allows real-time optimisation of the equipment whilst predicting operational and maintenance demands.”

-Wärtsilä 2017

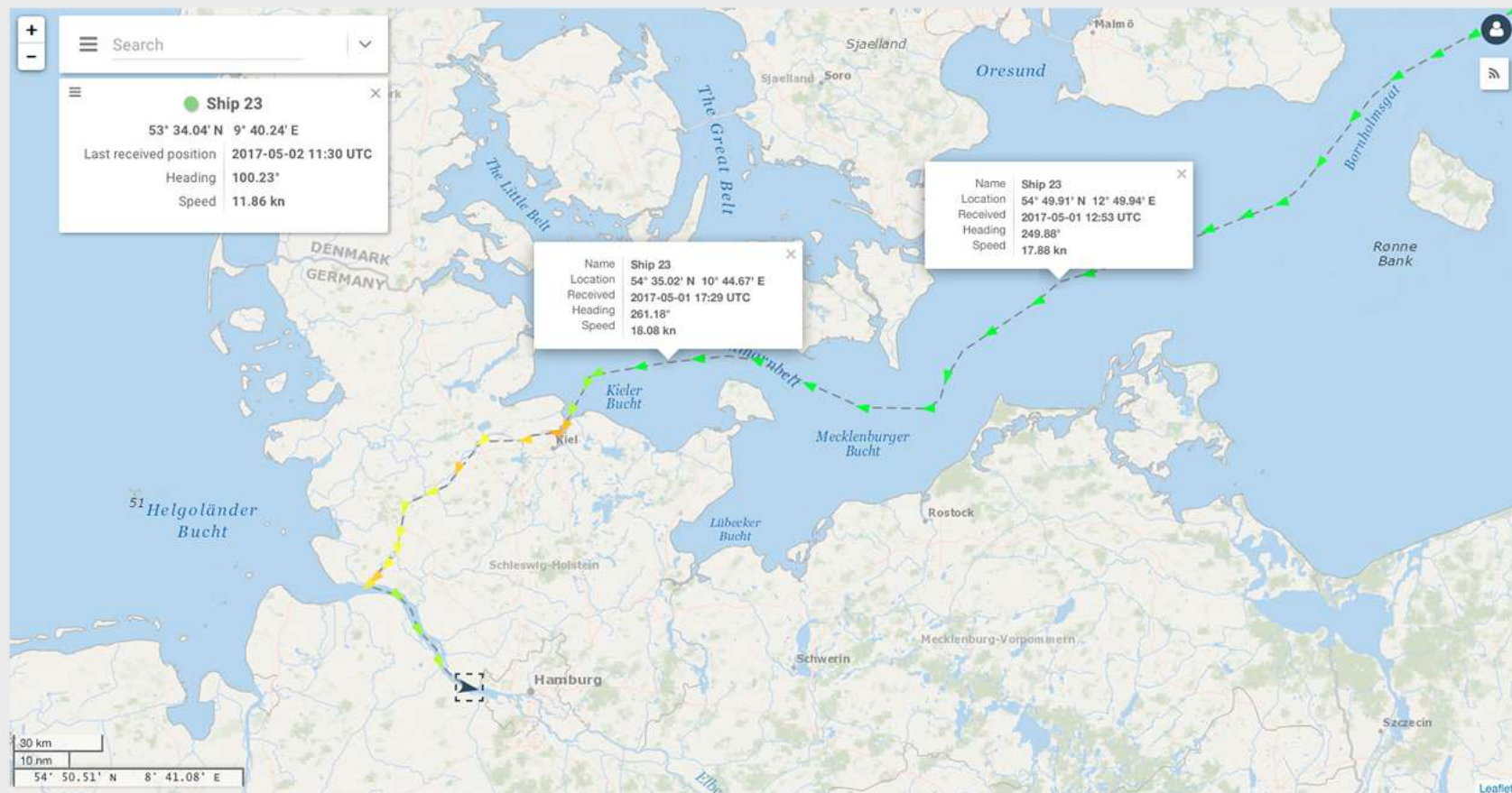
GNSS Location as added value service



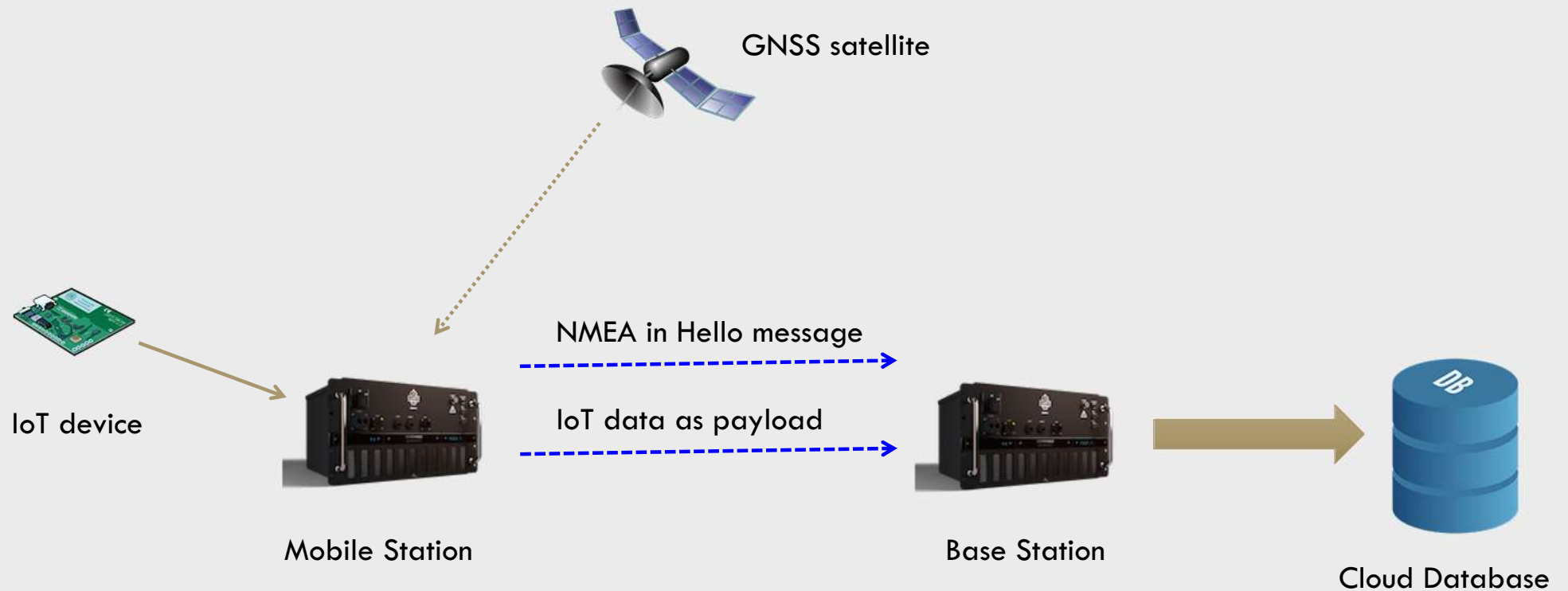
Global real time location service



Location history in database



Combine IoT Data and GNSS Location



Add IoT data: What, Where, When





Thank You Questions?