BASTA – Baltic Sea Rim Maritime and Seaport Connectivity

Project proposal, subject to contract

Challenge in maritime industry

- Lack of affordable state-of-the-art broadband connectivity affects businesses, operations, and passengers
  - Development of new services and infrastructure is hampered by lack of cost efficient wide area connectivity in open sea areas
  - Ships often rely on manually updated traffic, cargo, port, weather and safety information that is sent point-to-point rather than made available to all parties via a network

- Narrowband satellite networks cover sea area well enough but suffer from low bandwidth and high cost per data unit transferred

- Terrestrial cellular connectivity can provide cost efficient and low latency network service but at the moment the coverage area of the general frequency bands is limited to close to a shore line. LTE 450 MHz is an exception, as this low frequency signal can reach up to 100 km distances from the shoreline

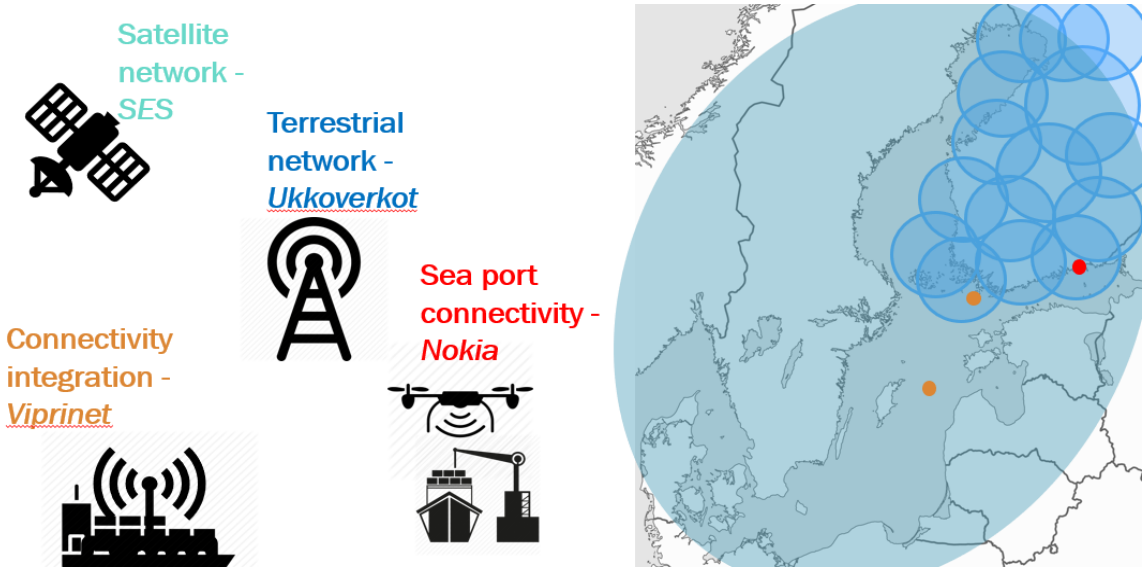
Need

- Growing traffic and passenger amounts are increasing the demand for new services and enhanced connectivity and requirements for data transfer capacity
  - A reliable high bandwidth network will enable data driven solutions used to manage fleets, monitor engines for predictive maintenance, remote sensing to optimize fuel consumption, oversee safe routes and navigation, and ensure the wellbeing of the crew
- In the Baltic Sea region, the maritime traffic is constantly increasing. Helsinki Port is becoming the busiest passenger ports in the world due to the heavy passenger traffic between Finland, Sweden, and Estonia

Solution and project concept

- This project will develop extensively scalable real-time broadband and IoT connectivity combining terrestrial and satellite network services and solutions for sea areas, seaports, airspace, and remote islands in the whole Baltic Sea area
  - Terrestrial network is based on low frequency and low latency LTE 450 MHz connectivity solutions for the open sea areas and high capacity private LTE/micro-operator solutions for seaports and certain high trafficked shipping routes
  - Low frequency LTE 450 MHz radio network will be supported with satellite connections, innovative cell towers further out from the coast line and capacity aggregating/bonding solution routers

- Results of this project support also the development of intelligent waterways, autonomous vessels and new, integrated satellite and terrestrial connectivity solutions for seaports enabling new end-to-end digital services

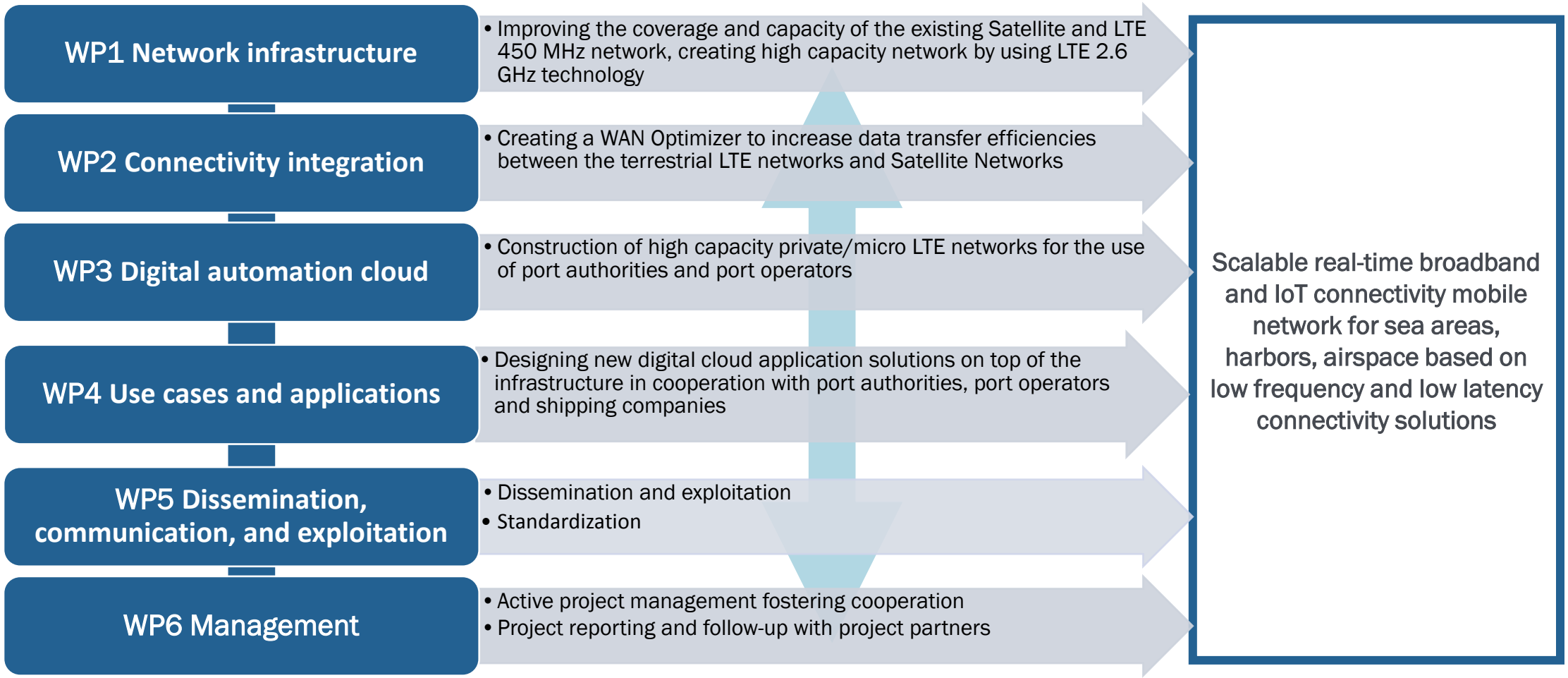


Project objectives

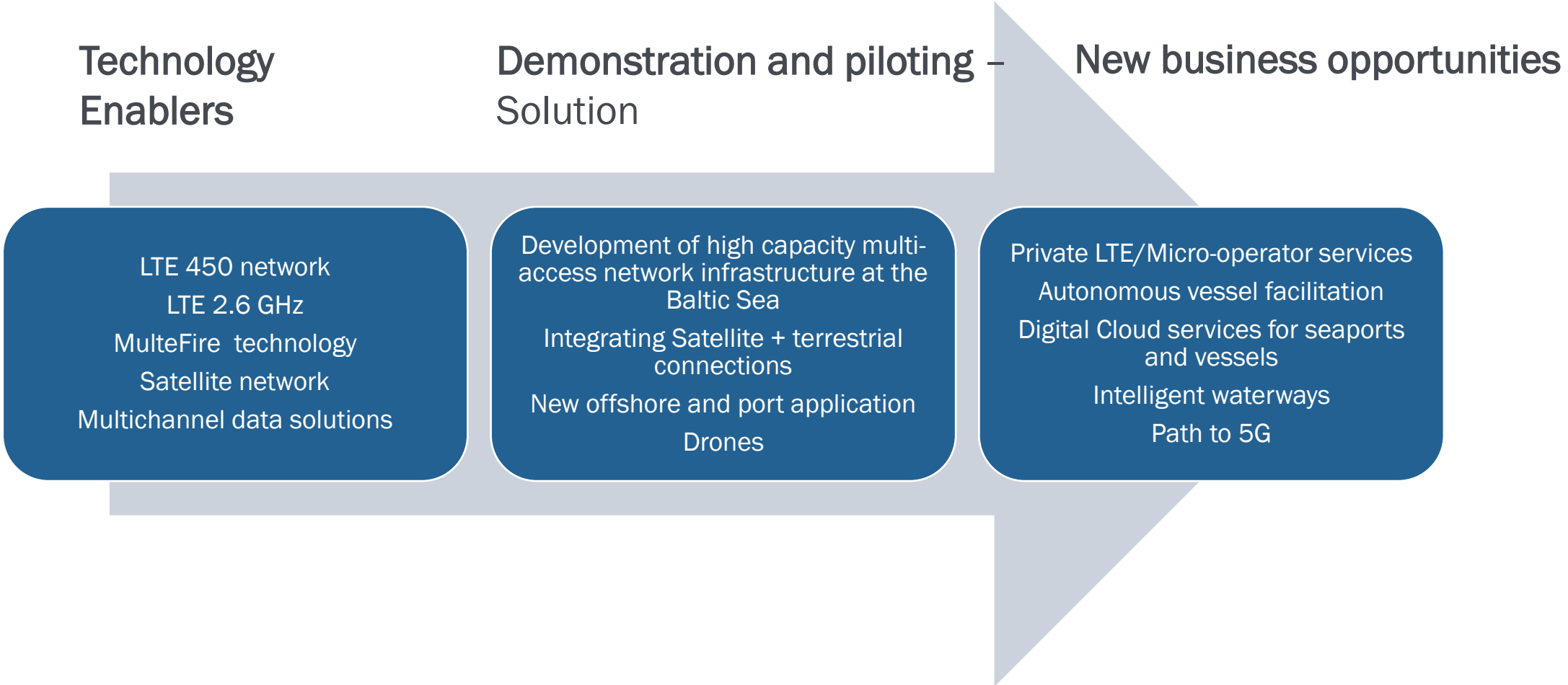
- Baltic Sea Rim Maritime and Seaport Connectivity project aims to develop the needed network infrastructure and solutions for smarter maritime logistics, ships, and seaports in the Baltic Sea region

- BASTA project will develop scalable real-time broadband and IoT connectivity mobile network for sea areas, seaports, and airspace based on low frequency and low latency connectivity solutions
  - Network development and testing (terrestrial and satellite networks)
  - Connectivity integration and optimization of multi-access connections between terrestrial and satellite connections
  - Development and deployment of end-to-end drone solutions for ports and private LTE networks for vessels

Project structure



From technology development and research to new business opportunities



Business potential and market opportunity

- For all partners, the project will result in new revenue streams from international maritime and seaport operations markets
  - The adoption of private IoT networks will grow substantially beyond the estimates for 4G/LTE with the introduction of 5G networks to 500+ million devices in 2022
  - The global market for satellite communications services for the maritime sector will double by 2026

Source: Harbour Research, NSR Research

The role of partners in the project

- **Ukkoverkot, Finland (SME, Project coordinator)**: The range of terrestrial of LTE 450 MHz and LTE 2.6 GHz network coverage is extended with innovative relay- and mesh network solutions and with tracking / beam-forming LTE terminals
- **SES, Luxembourg (Large Enterprise)**: Aggregating satellite network with LTE and providing a seamless network, backhauling capacity from ports, and multi casting data to ports and vessels with e.g. software updates. Testing and evolving 5G capabilities of the network and providing connectivity before towers are build
- **Nokia, Finland (Large Enterprise)**: Developing seaport connectivity solutions, e.g. drones, utilising unlicensed spectrum using MulteFire technology
- **Viprinet, Germany (SME)**: Providing integration of terrestrial and satellite connections for maritime industry use cases by multichannel VPN routers and system hubs that are bonding a variety of different WAN connections to a single virtual, fast, tap-proof and resilient dedicated line for stationary, portable and mobile use.

Contacts

Project manager

- Olli Tuohimaa, Ukkoverkot, Head of International Business Development
  - olli.tuohimaa@ukkoverkot.fi
  - +358 40 658 3122

Project coordination

- Pekka Torvinen, Spinverse, Consultant
  - pekka.Torvinen@spinverse.com
  - +358 50 3444 4322

BASTA

Baltic Sea Rim Maritime and Seaport Connectivity