

5G ITALY

The Global Meeting in Rome

3^a Edizione

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1-2-3
DIC 2020

- Mid-size historical port:
 - passengers and freight;
 - multipurpose(containers, break/dry/liquid bulk);
 - freight village, car stocking (25,000 cars capacity);
 - along TEN-T SCANMED corridor (core node);
 - door of Tuscany;
 - minor ports (Piombino, Elba) under the same organization.

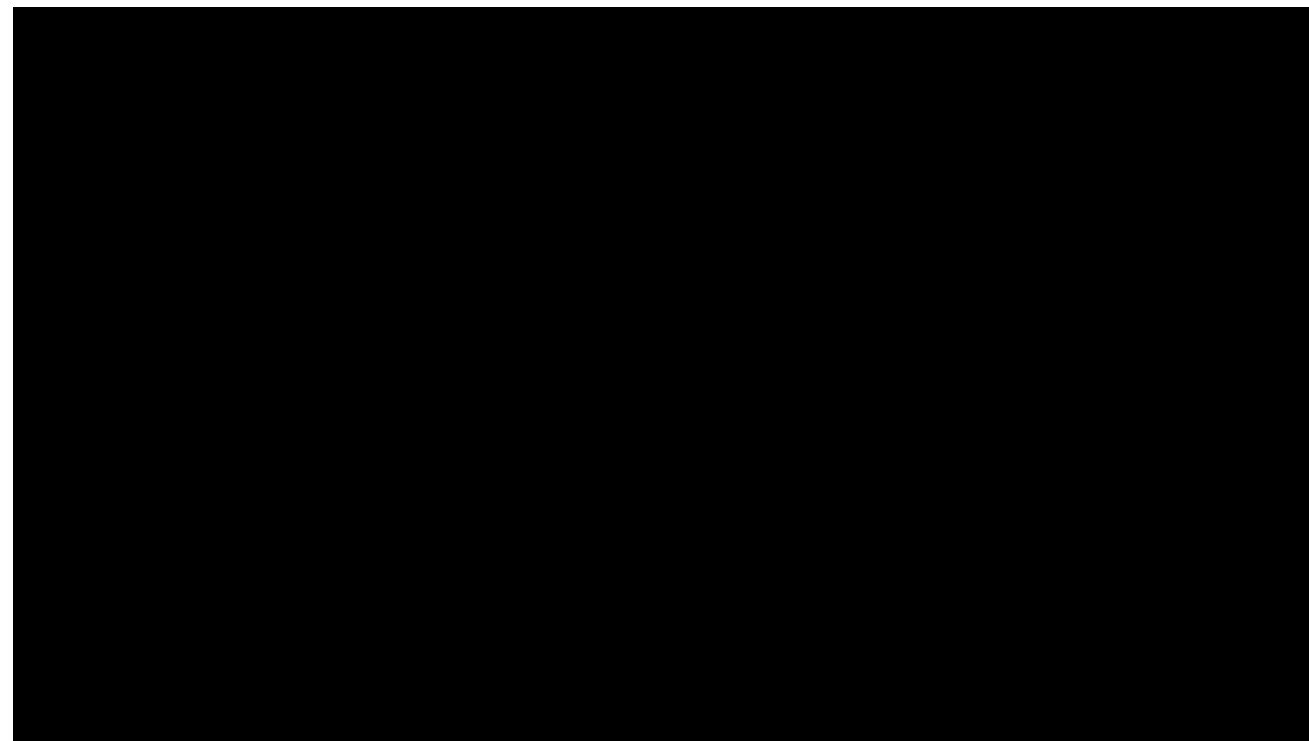


Started in 2013 aimed at:

- Adopting a standardized cloud architecture;
- Supporting the continuous process of gathering application-layer requirements;
- Integrating added-value services as ICT prototypes;
- Extending the scope of the services provided by the Port Authority to the landside (i.e. the TEN-T corridor) and through the sea.



JLAB – R&D Activities Overview





Stable partnership with:

- technology providers, stakeholders, other ports;
- outstanding associations (ESPO, Corridor Forum, ERTICO).

2016

- **July** – Most innovative public body (SMAU 2016)
- **November** – Plugtests, EU Connected Vehicle



2017

- **June** – ITS EU congress, «Ports and 5G»
- **July** – Rai SuperQuark, «Port of the future»



2018

- **June** – Swedish Ministry of Post & Telco, «Ports and 5G»
- **September** – ITS World Congress, «Port of the future towards automation in the 5G era»
- **October** – Autopilot italian pilot site for Autonomous Driving



2019

- **March** – ETSI First C-ITS port in EU
- **September** – Global solution Forum, «5G and sustainability»
- **October** – ITS World Congress, «5G and port of the future»



2020

- **July** – Hannover Messe Digital Days, «Industrial Energy Efficiency Award»



Sea ports in 2030:

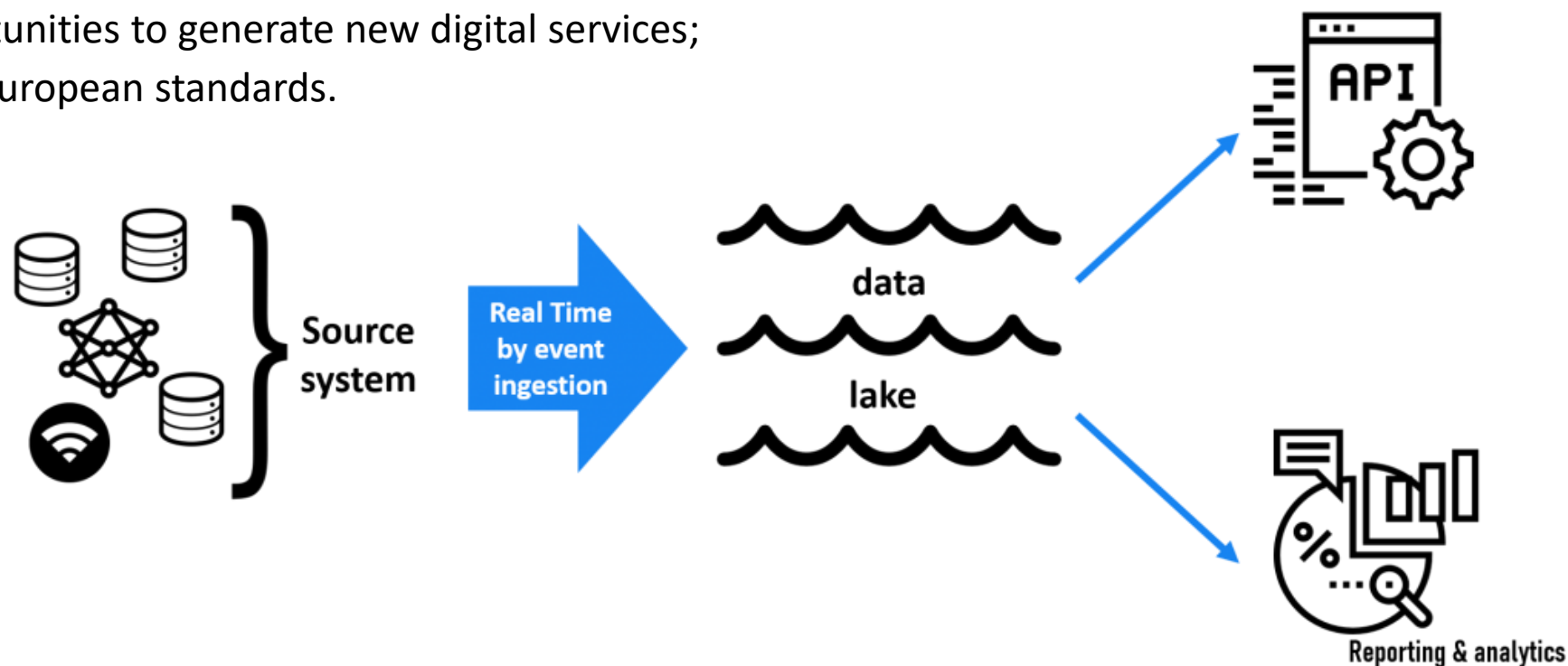
- high capacity and efficiency,
- highly integrated with inland transport and logistic nodes,
- capable of sustainable growth without further infrastructure investments.
- following the European models:
 - for the circular economy;
 - to reduce the environmental footprint (more renewable, less pollutants);
 - to improve the navigability of port channels, operational efficiency, optimize the capacity of docks yards, and flows;
 - transform the port into a local and national innovation hub.

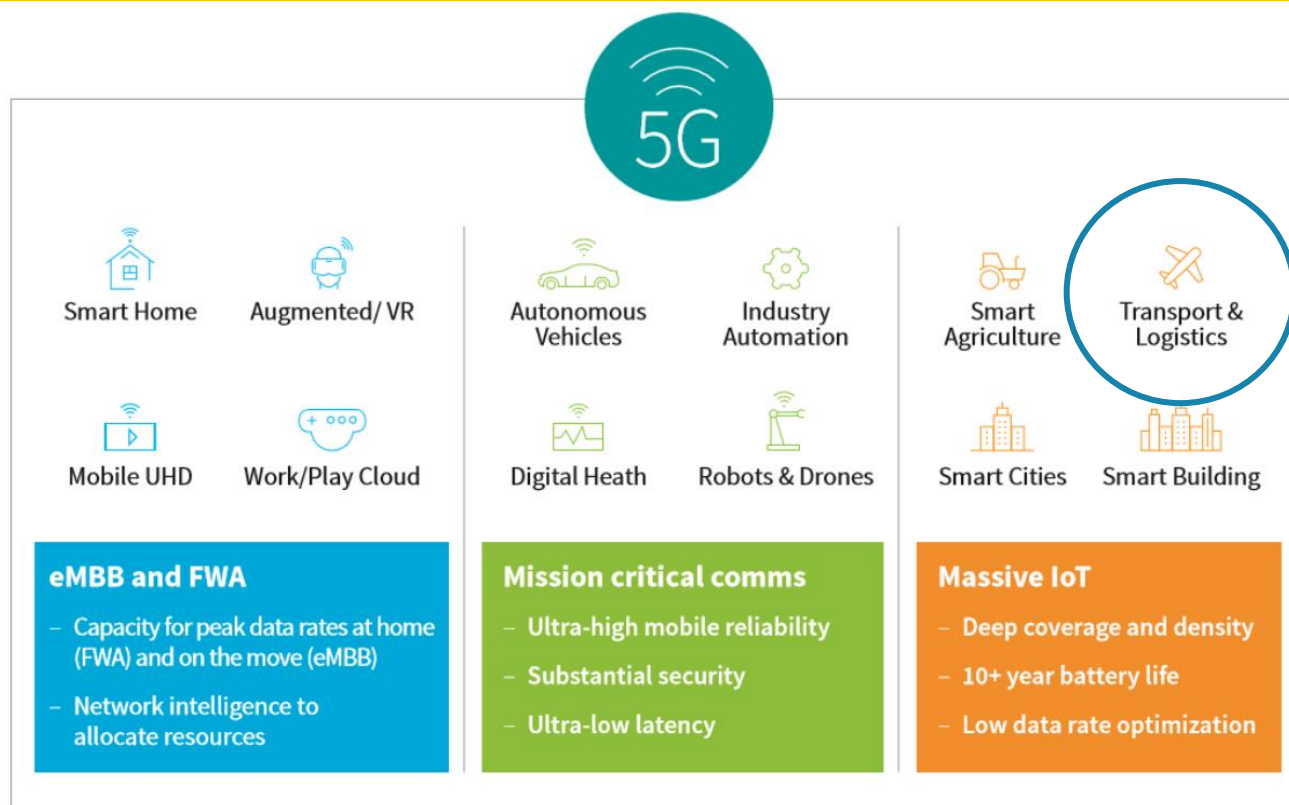


Image – Port of the Future Serious Game (C) Deltares

Beyond digitalization:

- Regain data ownership and consider the port as a Digital Hub;
- Invest in data availability, accuracy and trust;
- Structuring the process involving the port in port information systems;
- Opening up market opportunities to generate new digital services;
- Enforce compliance with European standards.

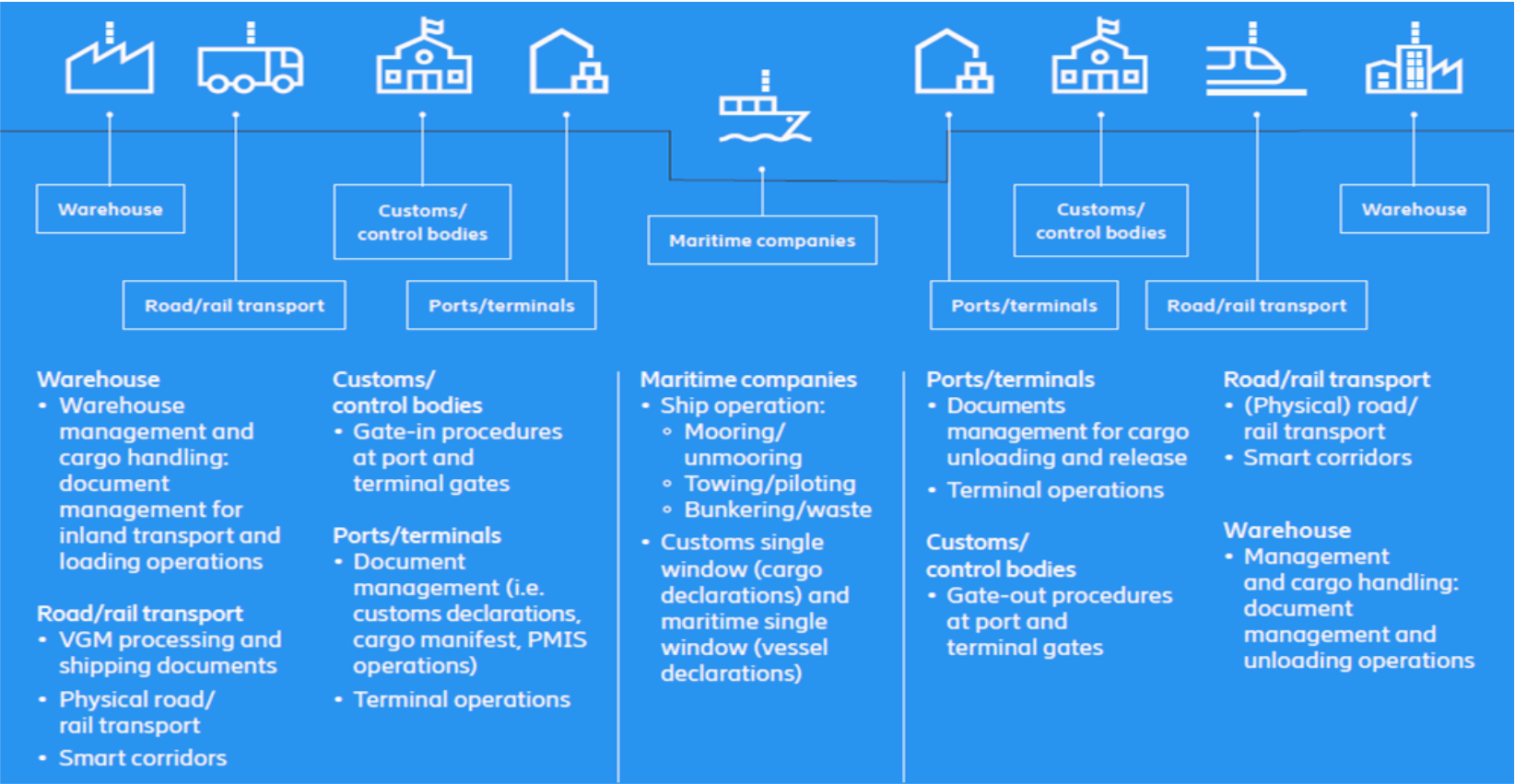




5G will create an ecosystem for technical and business innovation involving vertical markets such as automotive, energy, food and agriculture, city management, government, healthcare, manufacturing, public transportation, and many more. It will serve a larger portfolio of applications with a corresponding multiplicity of requirements ranging from high reliability to ultra-low latency going through high bandwidth and mobility.

5G & Port of The Future

One of the greatest challenges that ports face today is how they can evolve and adapt to become more efficient, competitive and sustainable. With its low latency, high capacity, and enhanced flexibility, 5G stands to bring unprecedented value to the optimization of ports, delivering a new level of process and operational efficiency that can significantly reduce costs, lower environmental impact, and boost economic value.



<https://www.ericsson.com/en/blog/2020/7/5g-port-of-the-future-jul-14-20202>

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Port of Hamburg



Port of Rotterdam



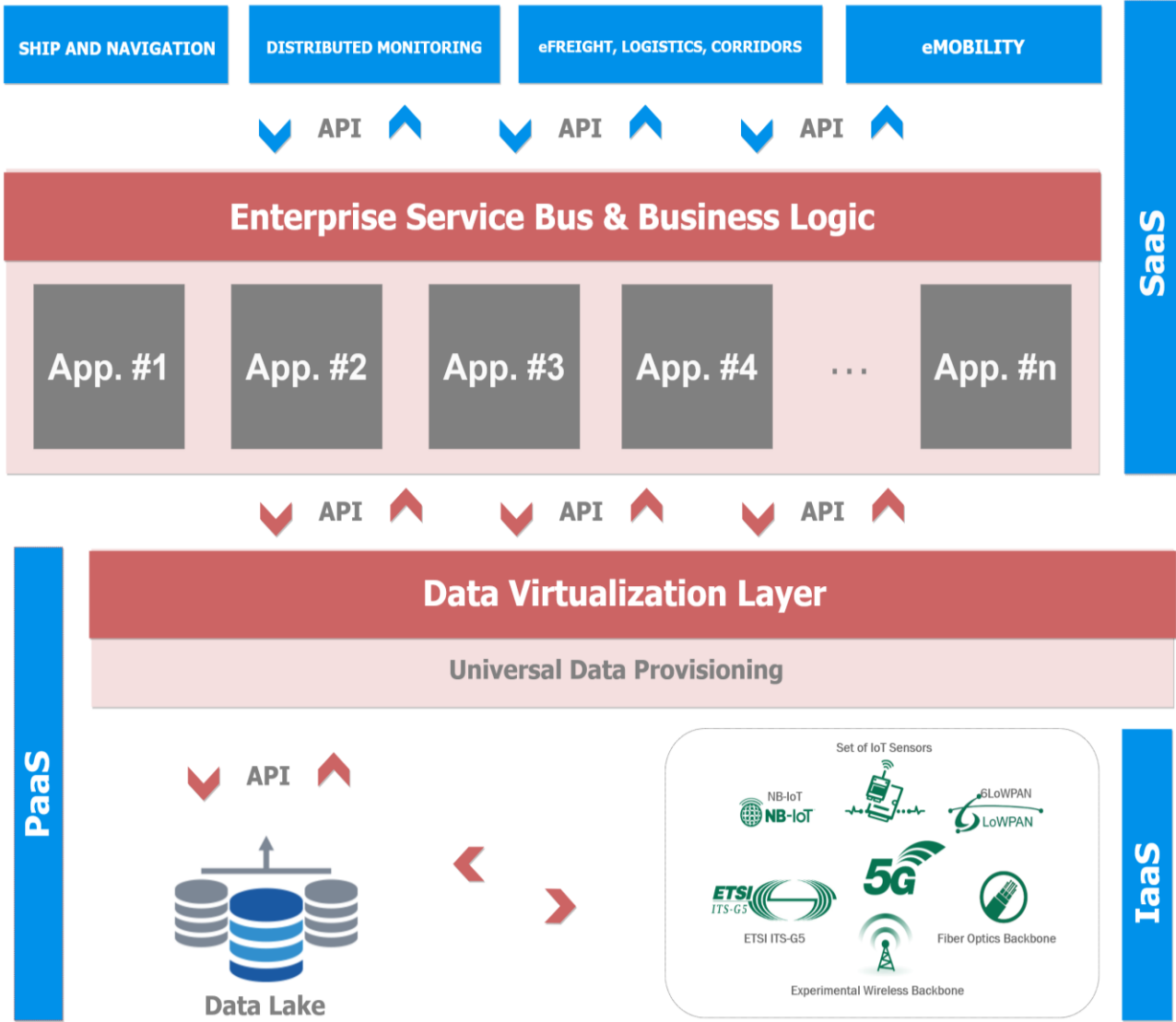
Port of Livorno

Ports are complex systems involving a wide number of stakeholders:



Heterogeneous ICT systems.

Ports are therefore becoming increasingly interested in smart solutions to help optimize and improve their operational efficiency and reduce logistics costs, moving towards the concept of sustainability.



μService-oriented architecture:

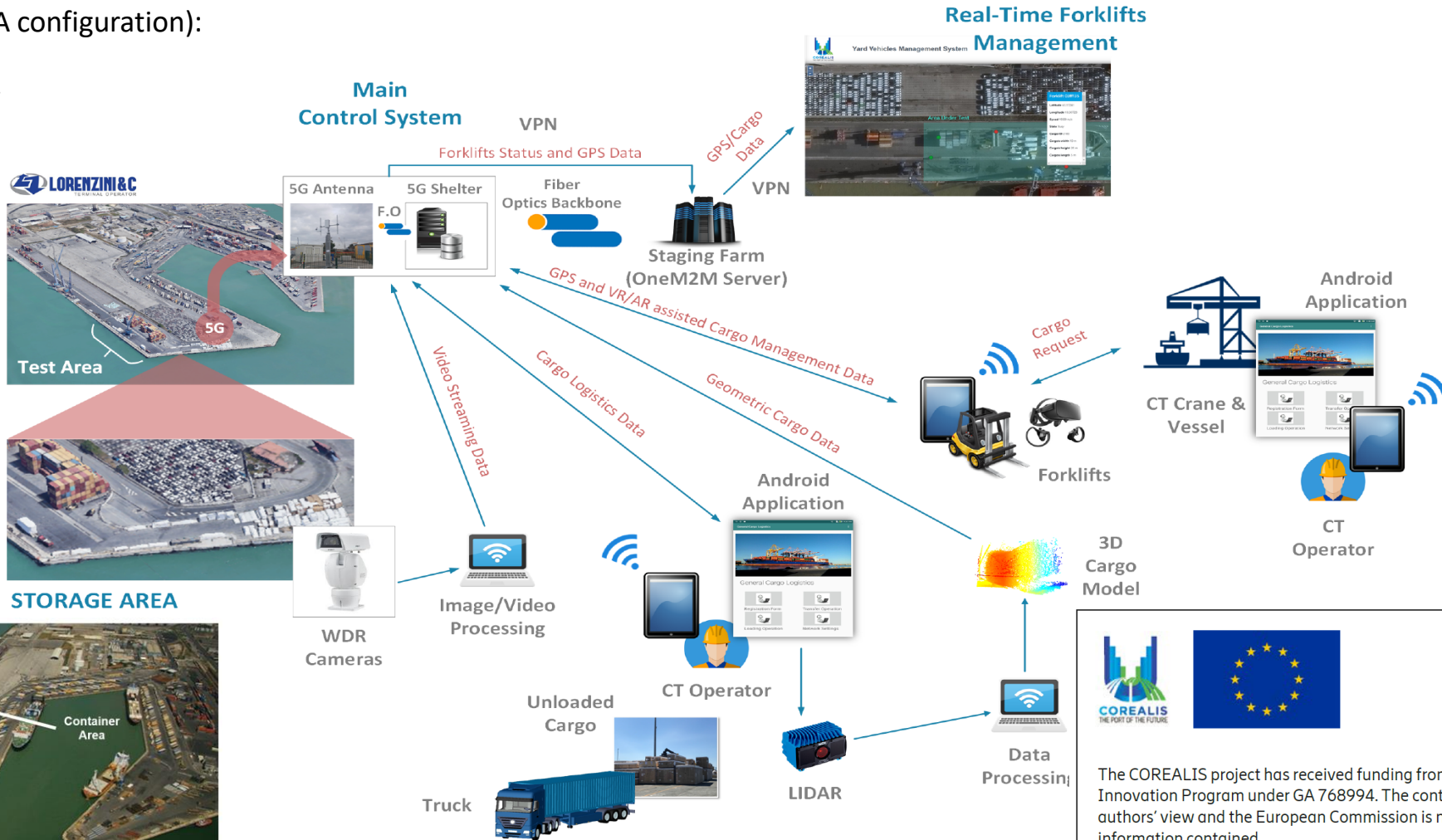
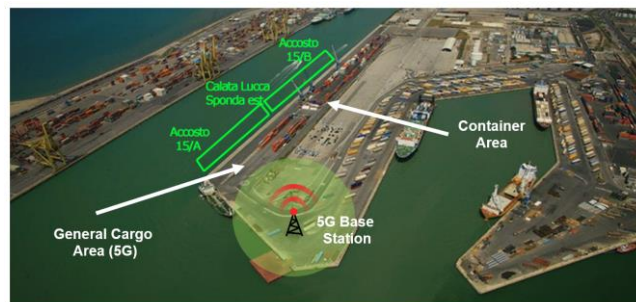
- Cloud solution;
- Full support for IoT devices;
- New security policies;
- New infrastructural elements: ESB & DVL;
- Integration with Legacy IT systems;
- High scalability/flexibility;
- Decoupling between the application level and the data level;
- Easy development/integration of new services;
- Redundancy/clustering.



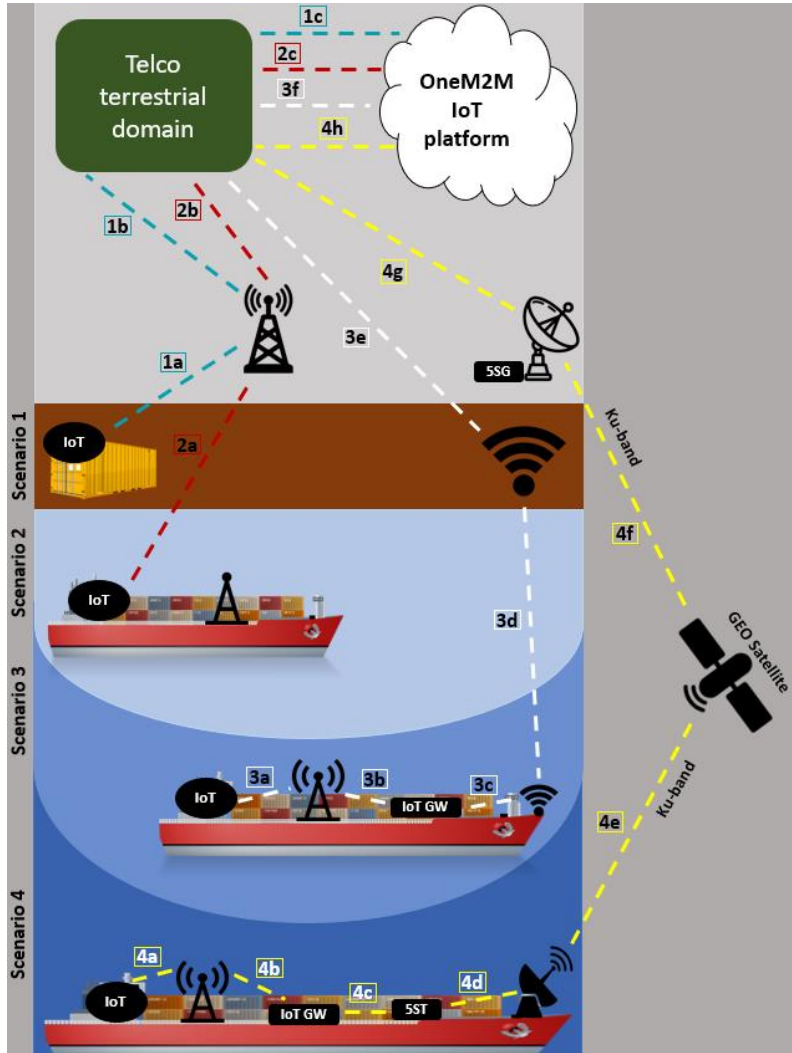
Port of Livorno – 5G Trial (intra terminal operations)

Private 5G network (NSA configuration):

- ❑ Coverage: 250x50 m²
- ❑ Frequency: 3.7GHz
- ❑ E2E Latency: < 10ms
- ❑ Reability: > 99%
- ❑ Availability: 99.999%

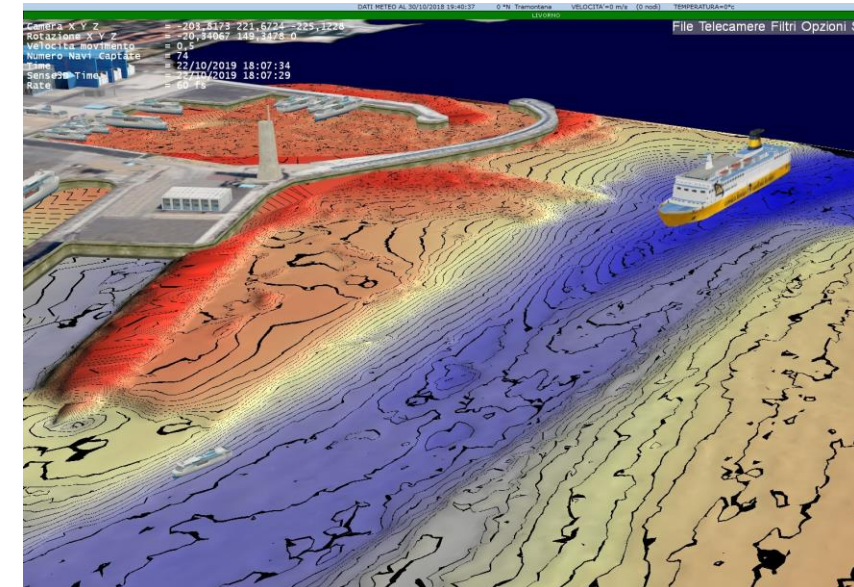


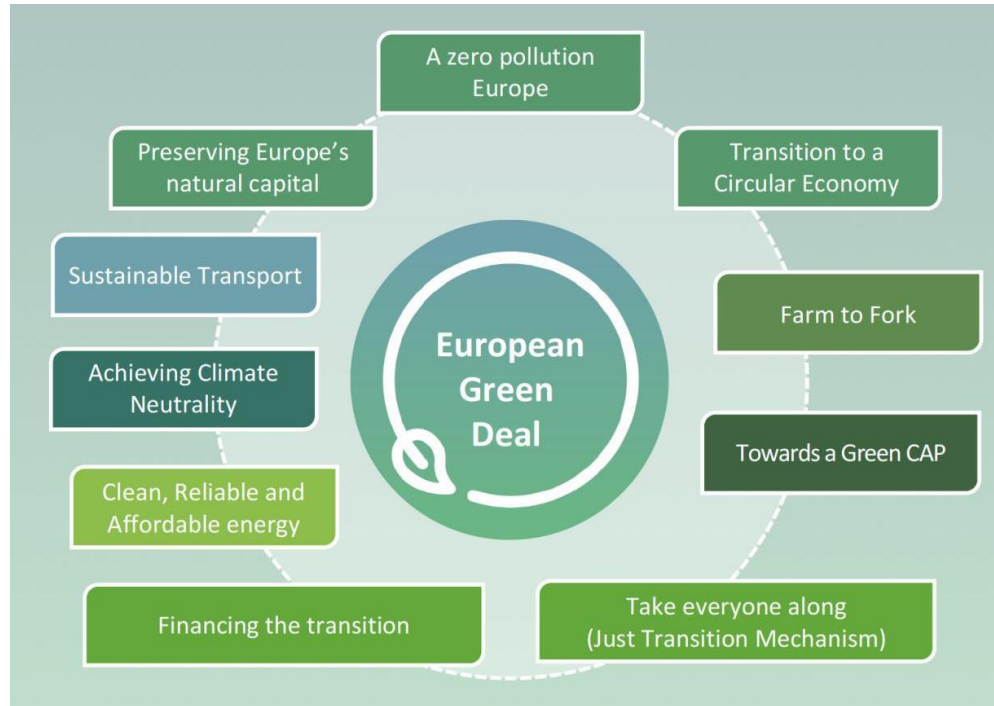
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Connected Vessel

- ❑ Continuous update of bathymetric data, proper sea bed modeling accessed via GIS platform;
- ❑ Real-time support for navigation (especially for maneuvering);
- ❑ Integration of terrestrial and satellite components for container tracking and remote control in ports and in deep sea sailing;
- ❑ Valuable data sets: e.g. HD cameras, meteo stations, HR coherent radars.





Evaluation of 5G benefits against UN SDGs:

- ❑ presented at Columbia University (**Global Solutions Forum**) in the context of the Climate Week 2019 in NYC;
- ❑ awarded for industrial energy efficiency at **Hannover Messe Digital Days 2020**;
- ❑ Estimated environmental **8,2% of CO2 saving per year** (roughly equal to 150,000 kg of CO2), to be validated through field measurements.



8 DECENT WORK AND ECONOMIC GROWTH



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



THANK YOU FOR YOUR ATTENTION



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