Connectivity in maritime

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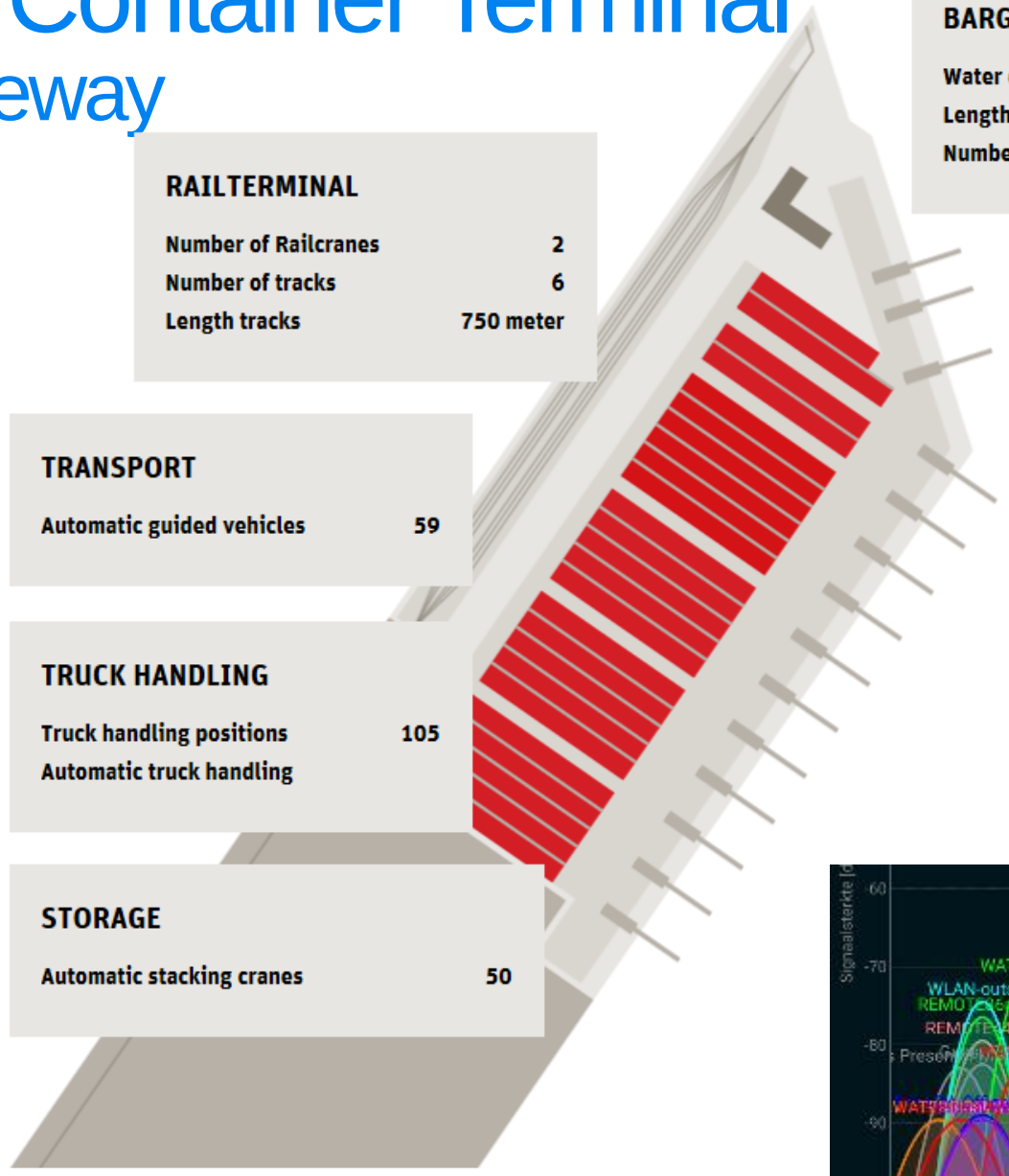
Container Terminal – Rotterdam Port Area
Rotterdam World Gateway (RWG)

Primary Process Container Terminal
Rotterdam World Gateway

- Containers arrive at Deepsea Quay
- Stored on Red marked stacks
- Further transport via:
  1. Water/Barges
  2. Rail/Train
  3. Road/Trucks

- Previous automation with WiFi signals:
- Too much outage



BARGE/FEEDERKADE

Water depth	11 meter
Length	550 meter
Number of quay cranes	3

RAILTERMINAL

Number of Railcranes	2
Number of tracks	6
Length tracks	750 meter

TRANSPORT

Automatic guided vehicles	59

TRUCK HANDLING

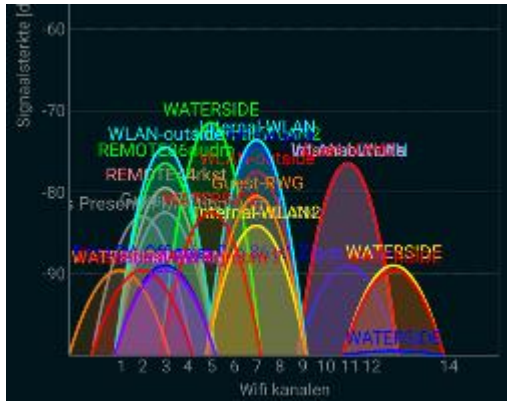
Truck handling positions	105
Automatic truck handling	

STORAGE

Automatic stacking cranes	50

DEEPSEA QUAY

Water depth	20 meter
Length	1.150 meter
Number of Deepsea quay cranes	11

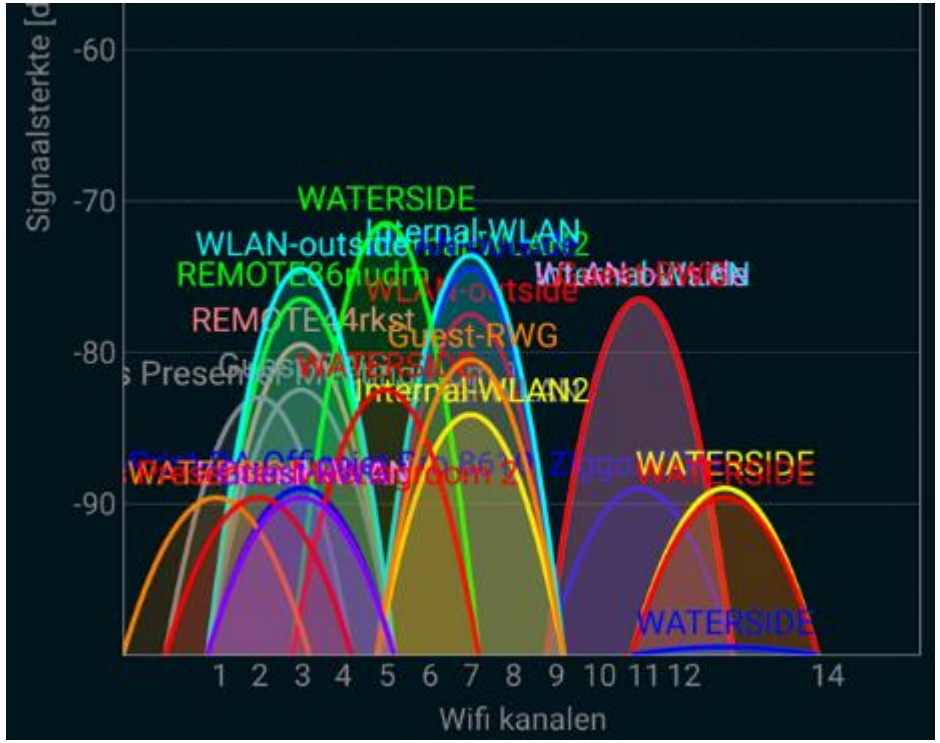


RWG needs

ISSUE:

WiFi for data communications in AGV’s, Trucks and Tablets unreliable and unpredictable

— Too many outages
— Multiple WiFi signals disturbing each other
— Varying performance in signal strength
— High OPEX due too extensive WiFi network (many hotspots)



RWG needs

SOLUTION:

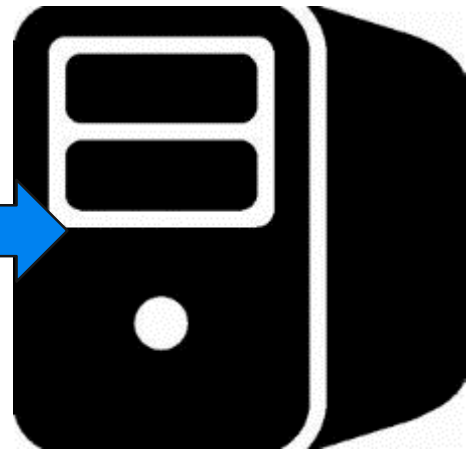
Fully redundant high available and secure Private LTE network delivered and managed by Ericsson

— Virtualized EPC
— Enterprise OSS
— Full Geo-redundant system

Data Modem

Radio / Antenna

Core Equipment

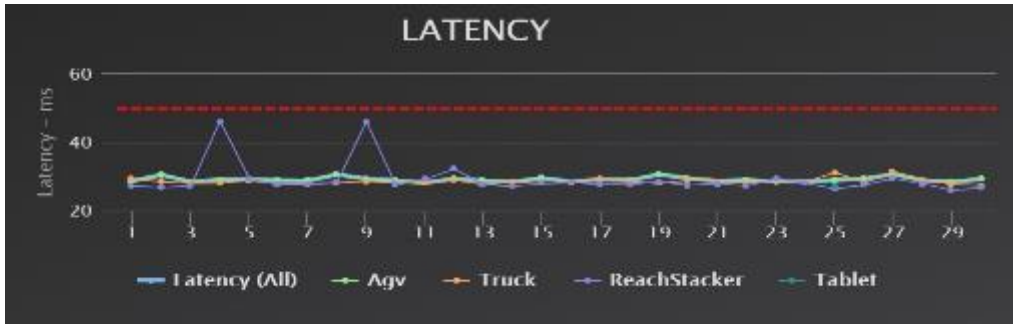


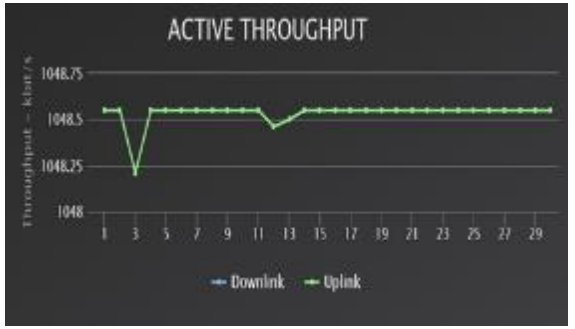
RWG Application Server

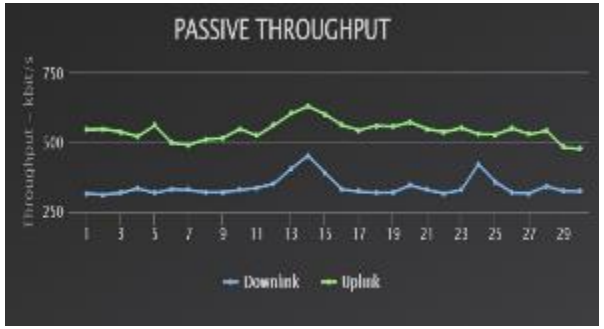
KPI / Performance

- Industry KPI's much more aggressive compared to consumer networks
- Downtime immediately affects operations causing high financial impact

- RWG requirements:
  - ultra high availability — 99.99% uptime
  - low latency — <50 ms
  - guaranteed throughput — >20Kbps per client







5G Automated Port

The challenge

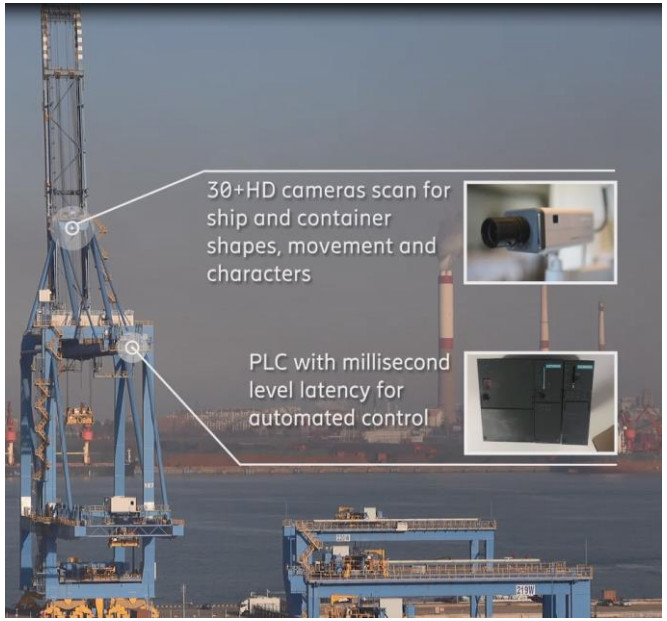
Automatic & remote operations are key to efficiency. Fiber is expensive and not flexible for moving cranes. Today WIFI and 4G cannot provide the needed bandwidth and latency features

Technology used

5G provides the needed low latency for PLC control and high bandwidth for video transmission from 30+ cameras on each crane. Fiber ruled out due to mobility restrictions.

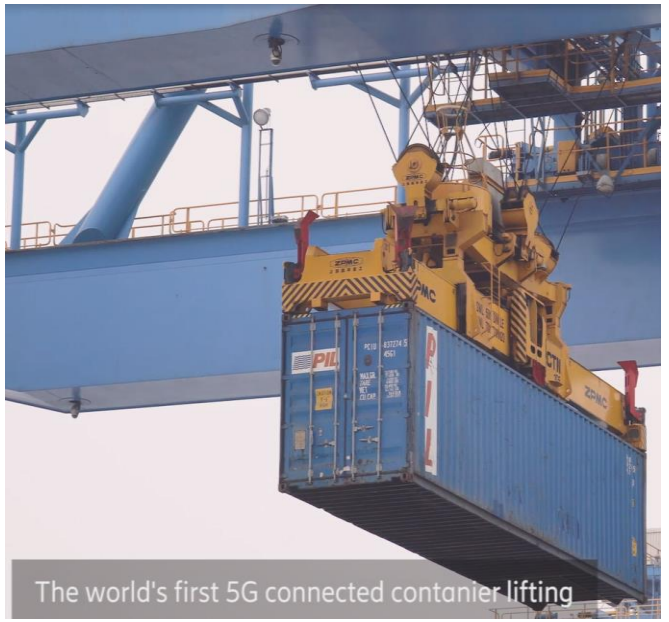
Results

STS crane successfully connected by Ericsson 5G and container lifting performed over 5G from remote operation room in production port. 70% savings in labor costs. World's first case. The vision is one 5G network to support all automatic port scenarios: STS crane, RTG crane, AGV, PTT, massive IoT, etc.



Hybrid transmission over 5G

- 30+ HD cameras in uplink
- PLC control traffic with <18ms low latency



The world's first container lifting supported by 5G in production port

Partners:

ERICSSON

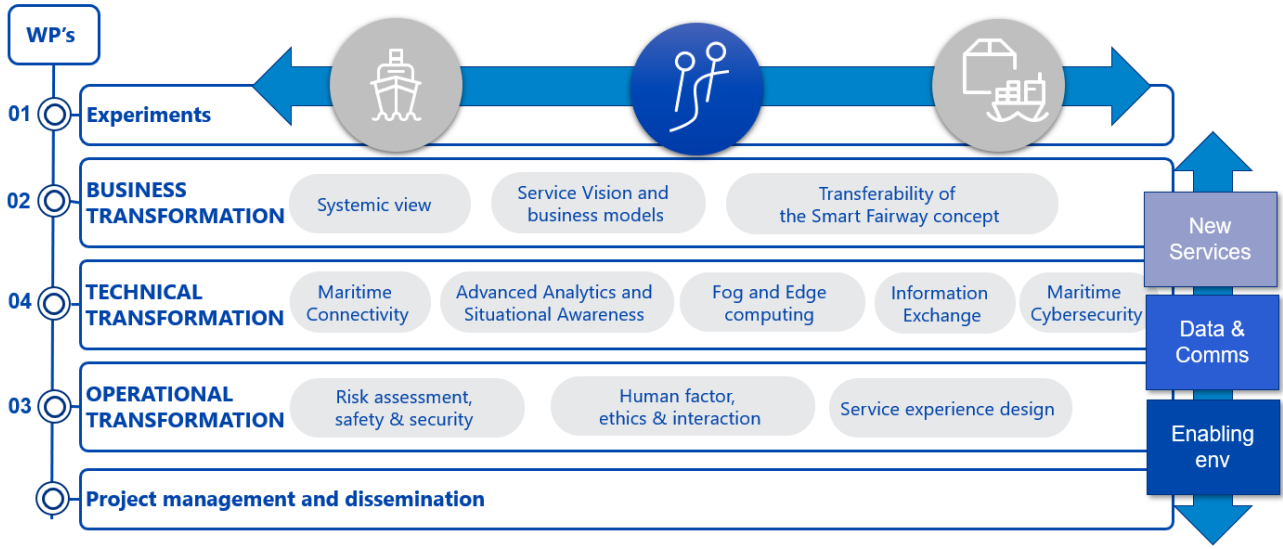
China unicom中国联通

ZPMC

青島港 PORT OF QINGDAO

Sea for Value – Fairway project

- Business Finland funded project
- Provide blueprints towards
  - Digitalisation
  - Service innovation
  - and information flows in maritime transport
- Preparing for advanced autonomous operations and navigation
- Smart fairway navigation experiments
- ePilotage working environment (on shore) and remote pilotage experiments



5G Momentum 27.9.2019 WS outcome

- 5G Merenkulussa project driven by Ericsson and Ålcom
- Utilizing the Ålcom 5G network for maritime trials
- Infrastructure installation to be finalized in the near future