Jakota
Cruise Systems

Operating TENs while optimizing changing modes of transportation at sea terminals

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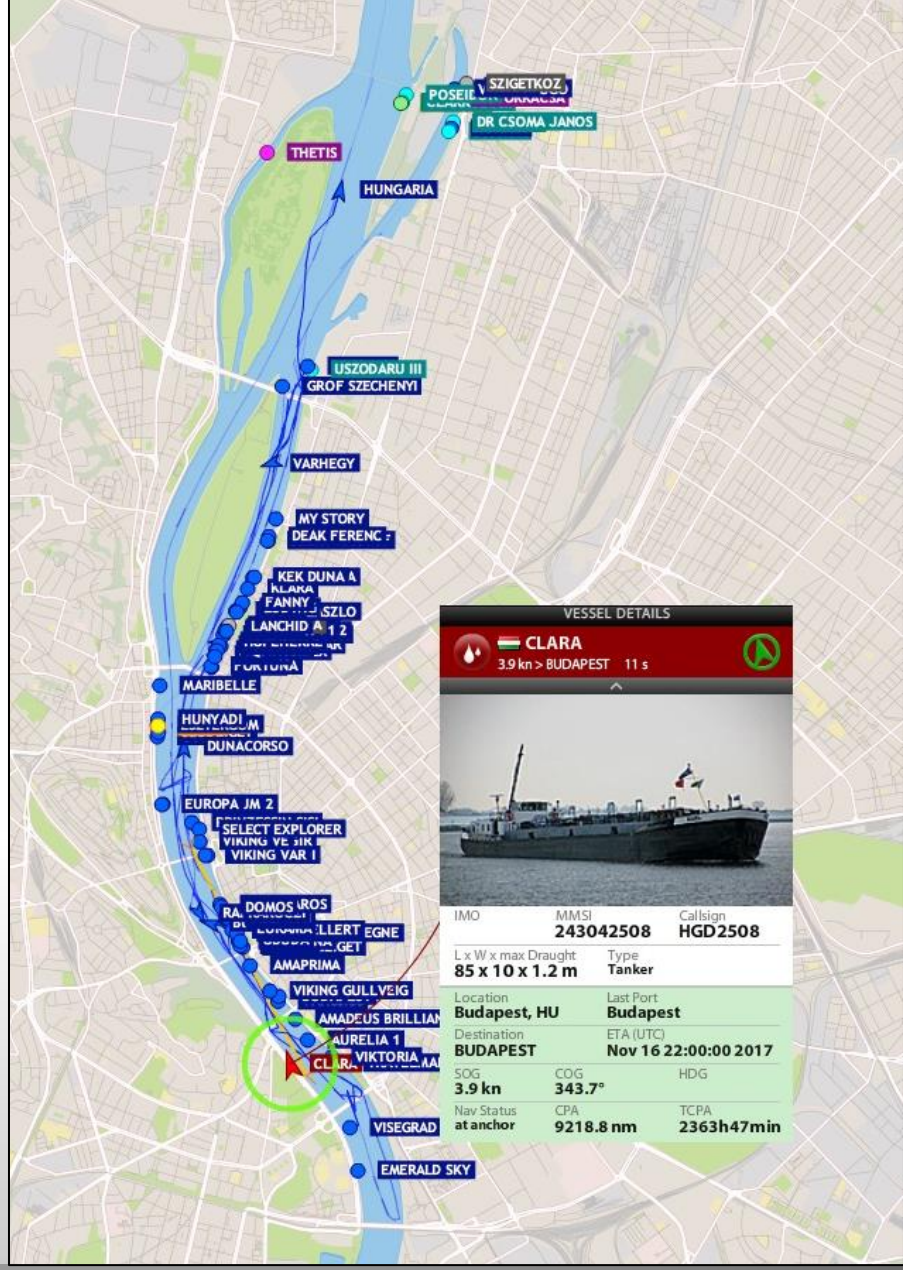
Agenda:

- Objective & Motivation
- Approach and Database
- Functionality
- Optimization

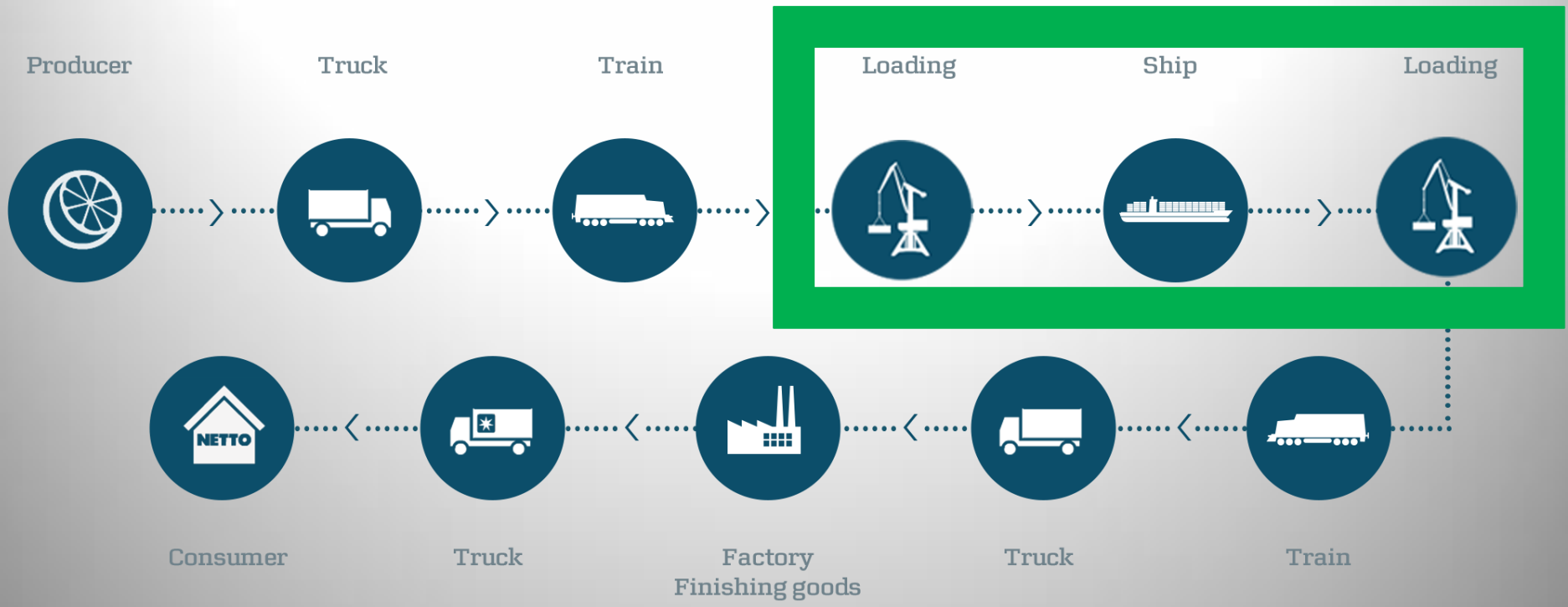


FleetMon:

- One of world's leading companies in field of work
- Coverage of global maritime commodity flows
- Based on Automatic Identification System (AIS)
- Reception with thousands of stations and satellites
- Handling of >300.000.000 messages per day
- Actual paying customers from 164 countries
- Marine, customs, coast guard, SAR, Greenpeace, DNV-GL, Daimler or Microsoft

Objective:

- 94 seaports assigned in network corridors
- Aim is optimizing in change of transport

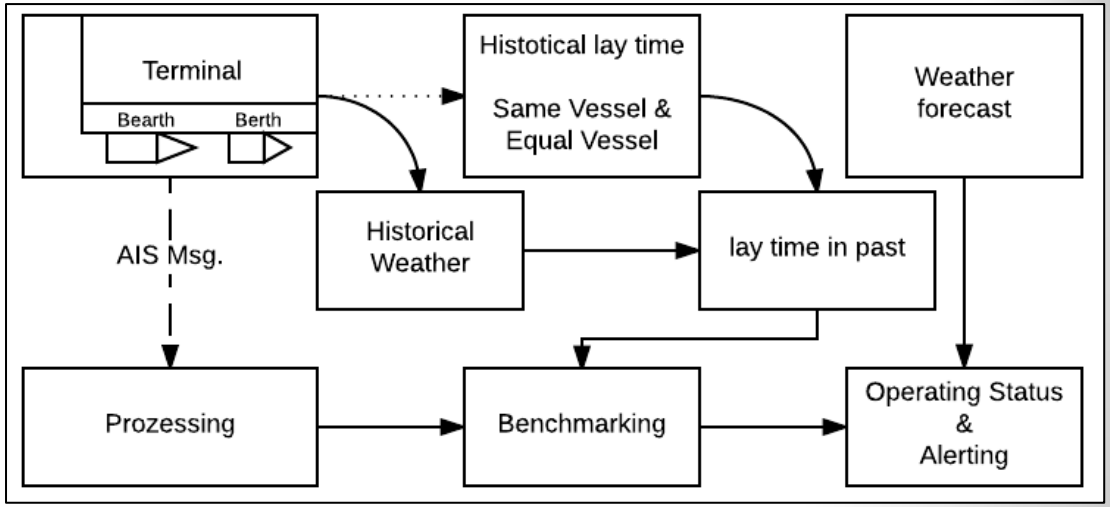


Motivation:

- 3,8 billion tons of goods are handled 2014 in EU-28 ports
- 80 million containers are handled per year in EU-28
- Multiple reasons why the ship is out of schedule (weather, technical breakdowns, customs, strikes…)
- Assumption: 8.000 TEU ship, 10% cargo handling, modal split 3:1 (truck : train) – time delay
- 300 trucks and 2 block trains have to wait

Approach:

- Only the crew, ship operator and port are informed about problems



- Information about the vessel to the clients: duration of actual laytime, previous lay time of the vessel, lay time of comparable ships, forecast and identification of correlations in weather
- Awareness → contacting the cargo operator

Database & Technology:

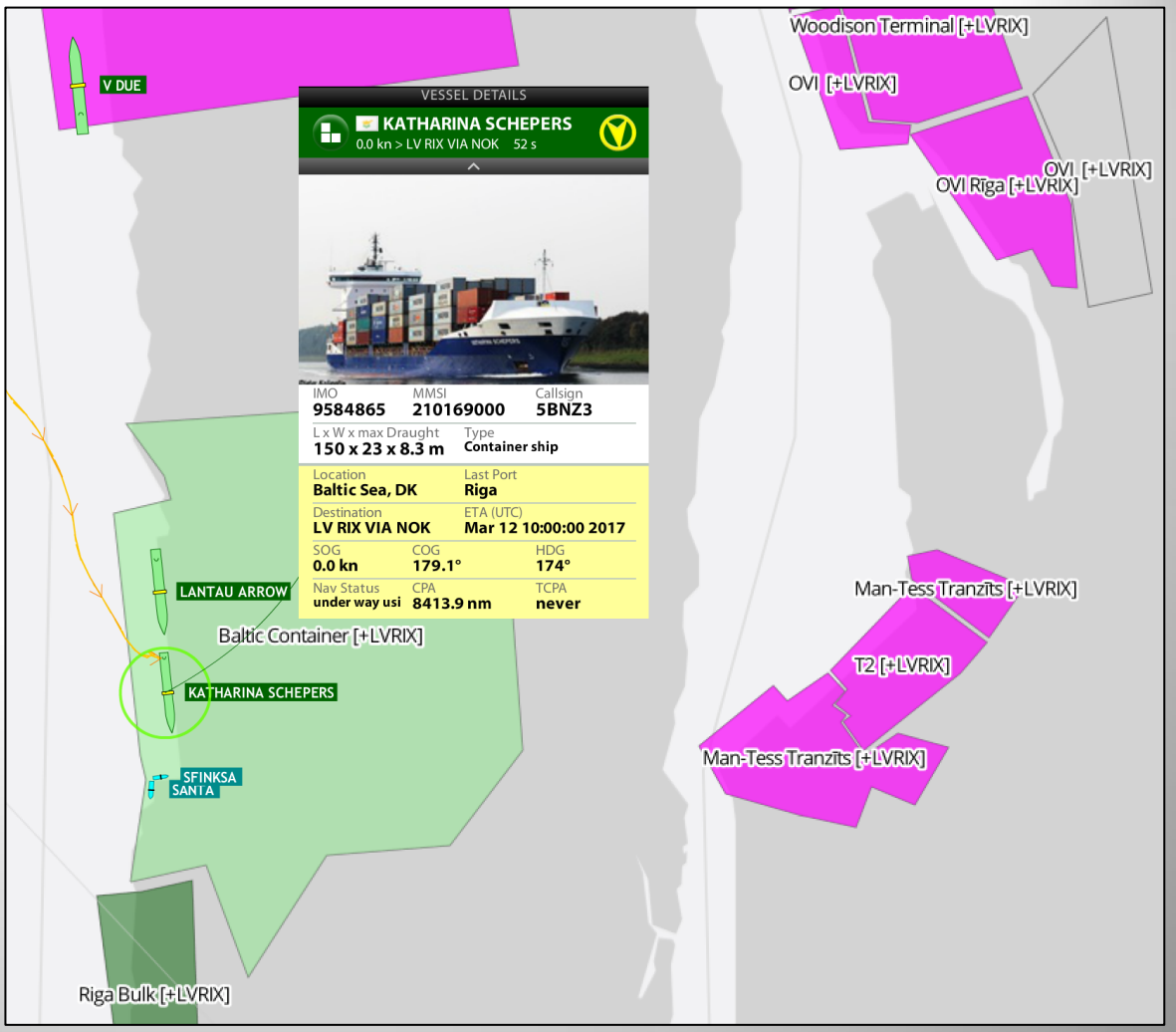
- All ships on international (or commercial) voyage use the Automatic Identification System (AIS)
- Initiated 2005 by International Maritime Organization
- Reason was improvement of collision avoidance
- Contains static and dynamic information
- Like: position, speed, course, rate of turn, heading, navigation status, draft, length or ship type…
- Every 2sec until 3min (depending on navigation status)

Reliability of Data:

- Normally AIS has a range of 20 nm (nautical miles)
- With signal transduction 50 nm
- Automatic data are reliable (position, speed)
- The information from nautical officers are not trustable (navigation status)
- Problem: “moored” navigation status on terminal

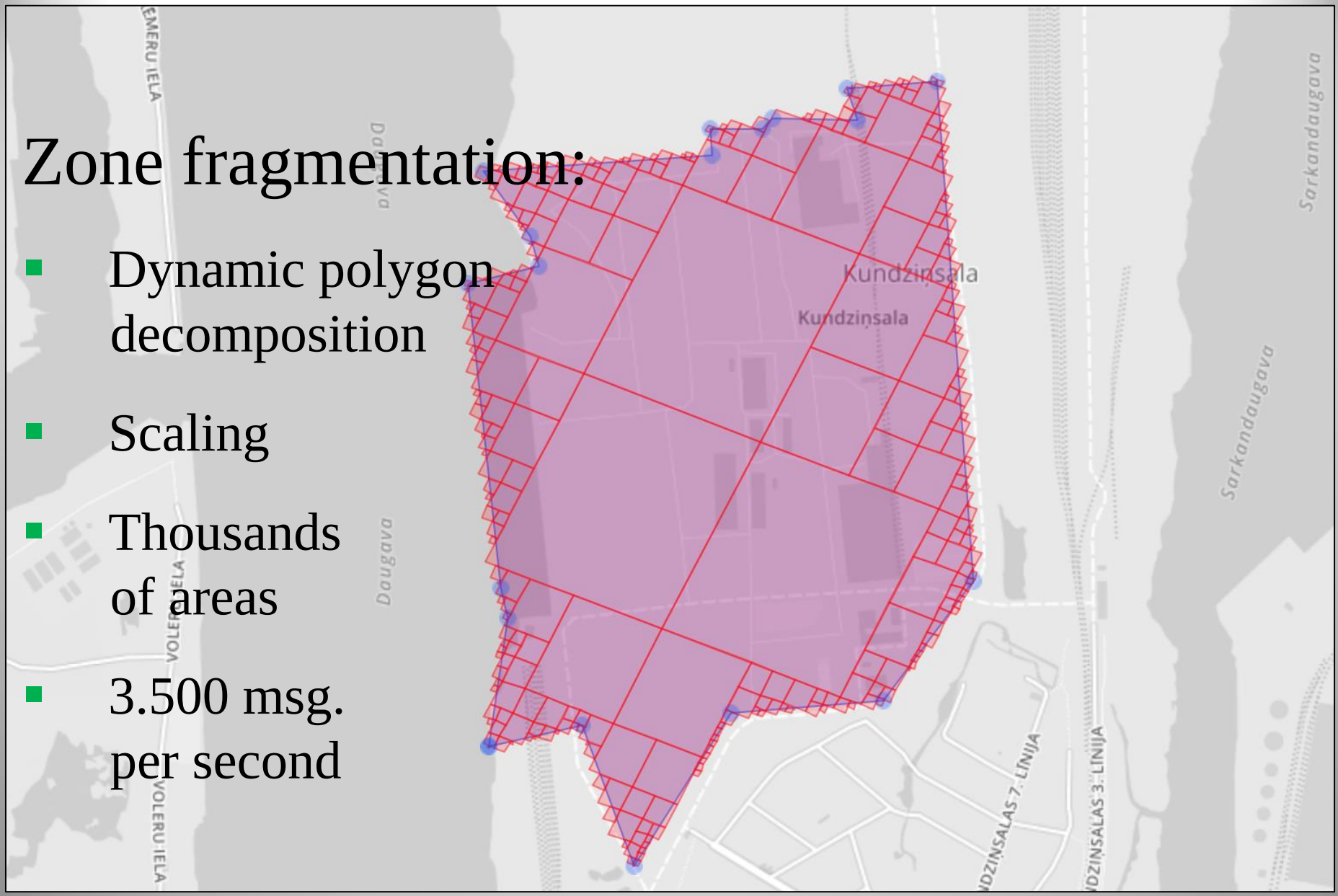
Geo-Fancing:

- Baltic container terminal Riga
- Exact capture of all zones
- In & out + stop events



Zone fragmentation:

- Dynamic polygon decomposition
- Scaling
- Thousands of areas
- 3.500 msg. per second



Laytime prediction:

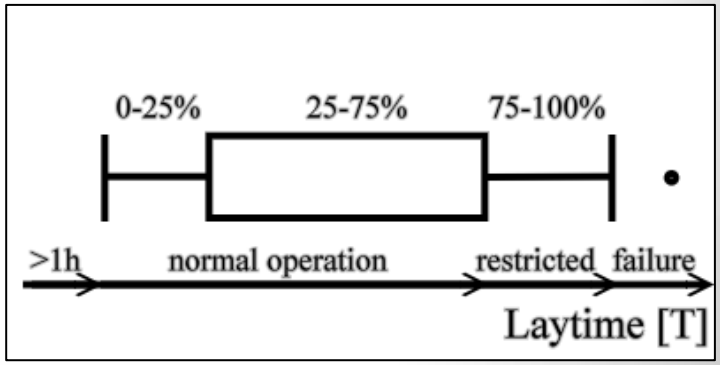
- Based on the laytime of the same ship in the past
- And the laytime of equal vessels (length, cargo type)

$$TL_{pr} = \frac{\frac{1}{n_{sa}} \sum_{i=1}^{n_{sa}} TL_{sa}}{2} + \frac{TL_{eq}\left(\frac{n_{eq}}{2}\right)}{2}$$

TL_{pr} = Laytime predicted
TL_{sa} = Laytime same ship
TL_{eq} = Laytime equal vessel

Terminal Status:

- Based on predicted laytime of equal vessels on terminal
- Laytime over prediction
  → information to client



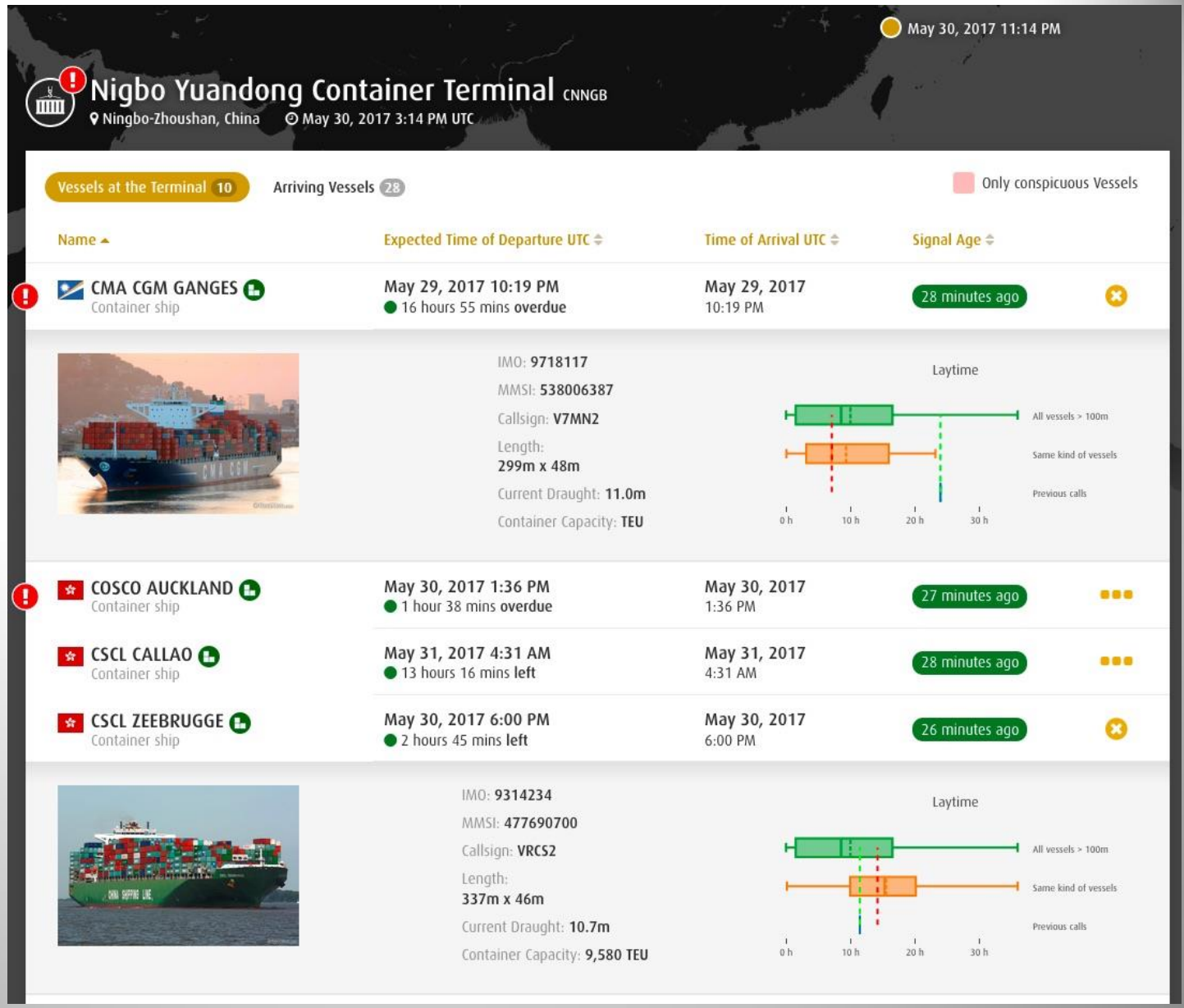
- Laytime longer than 75% of all equal ships
  → terminal status: restricted
- Ongoing laytime more than three times standard deviation of all lay times = outlier
  → alert to client: vessel or terminal failure

Nigbo Yuandong Container Terminal

China

Front-end

Nigbo Yuandong Container Terminal (China)



Conclusion:

- Involved parties will be informed
- Trucks could wait in stopping areas outside the port
- Improved ETA and ETD for trucks and trains
- System is usable for RoRo or bulk cargo too

We are very interested to work together with you on EU research projects / H2020

FleetMon
Tracking the Seven Seas

Thank you for your attention

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