



# {open} :hack

tmforum | connecting digital ecosystems

TM Forum {open}:hack, Nice France, May 14-16.

## Port-o-matic

Joe Appleton (Southampton Solent University @joeappleton18)  
Jergus Lejko (Southampton Solent University)  
Michael Sevenpiper (Southampton Solent University)  
Marcin Wisniewski (Southampton Solent University)  
Dr Craig Gallen (Open NMS UK cgallen@opennms)



Southampton  
**SOLENT**  
University





# Southampton Port-o-matic Smart Port Platform



- Southampton Port is the second largest in the UK
  - **52,000** ships a year
  - The UK's number one cruise port, which welcomes 1.7m passengers
  - Each cruise ship up to **6,000** passenger and crew
  - Contributes **£1.23 billion** to the UK economy
- Port-o-matic
  - Is a platform bringing together shipping companies and ports
- API's provided by:



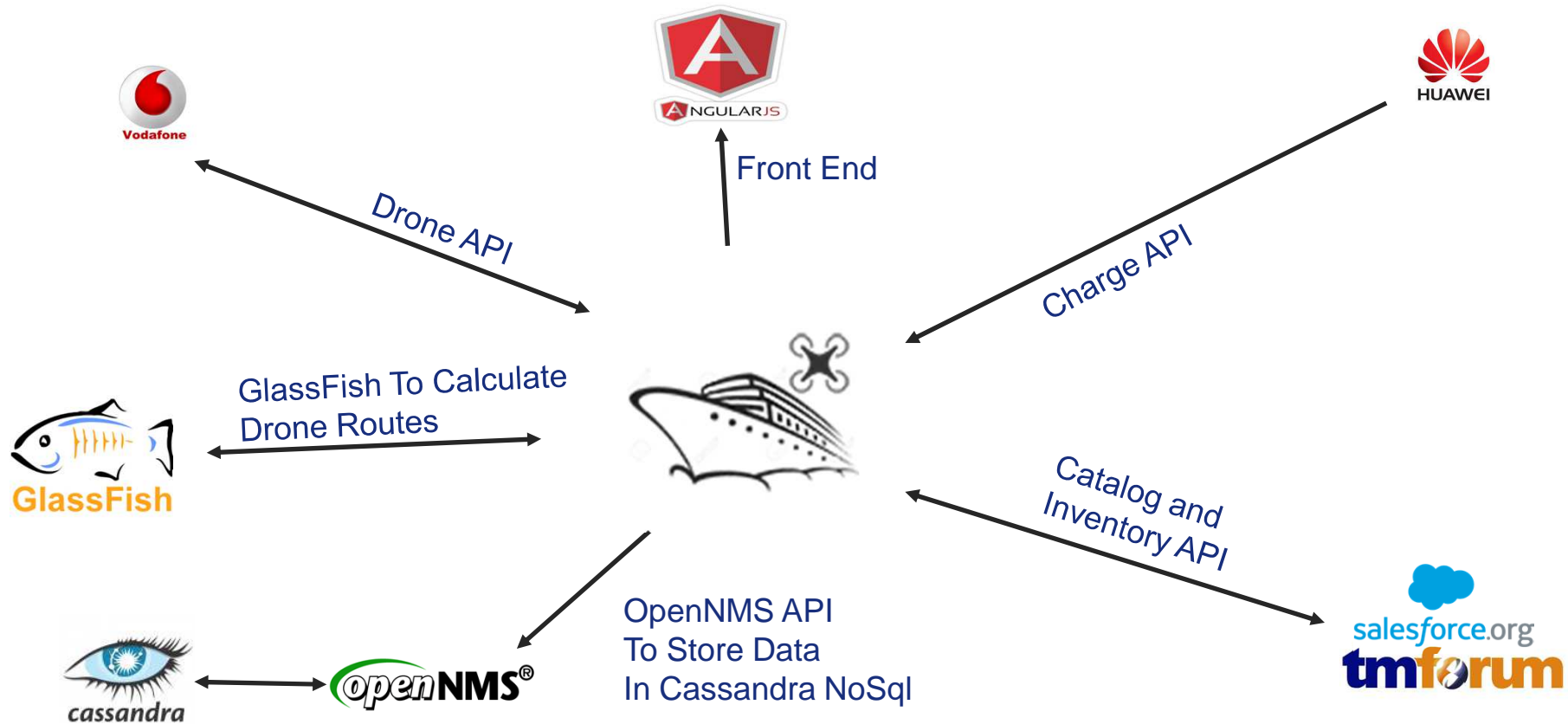
# Our Platform Solution



## *Single point for ordering and accessing port services*

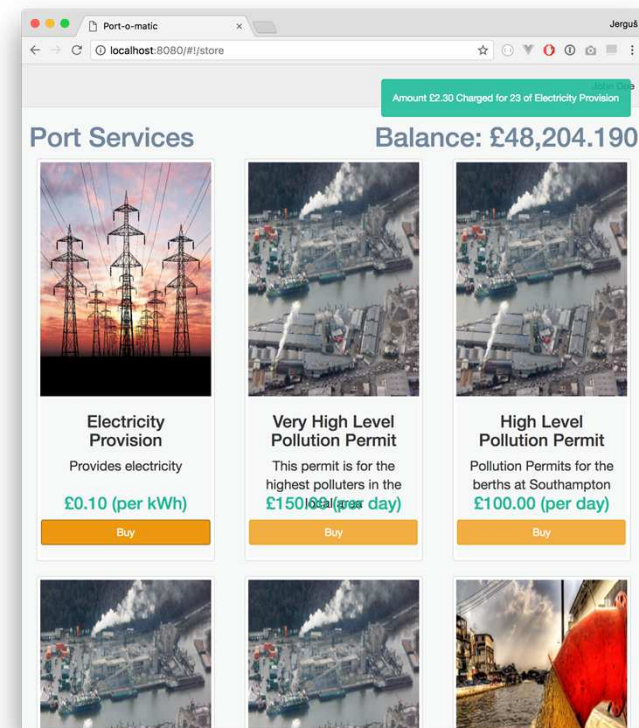
- Service Catalogue
  - Easily discoverable services
  - Aggregation of 3<sup>rd</sup> part offers
  - Port services (Docking charges, Water, Electricity, Waste Water and Data Communications etc.)
  - Pollution charging (for running generators in port)
- Measurements
  - Ship Side IoT devices Measuring Water, Electricity, Waste Water and Data consumption
  - Flying Drones measuring smoke emissions for pollution charging
- Presentation
  - User Web Application to view, order and access services

# System Architecture



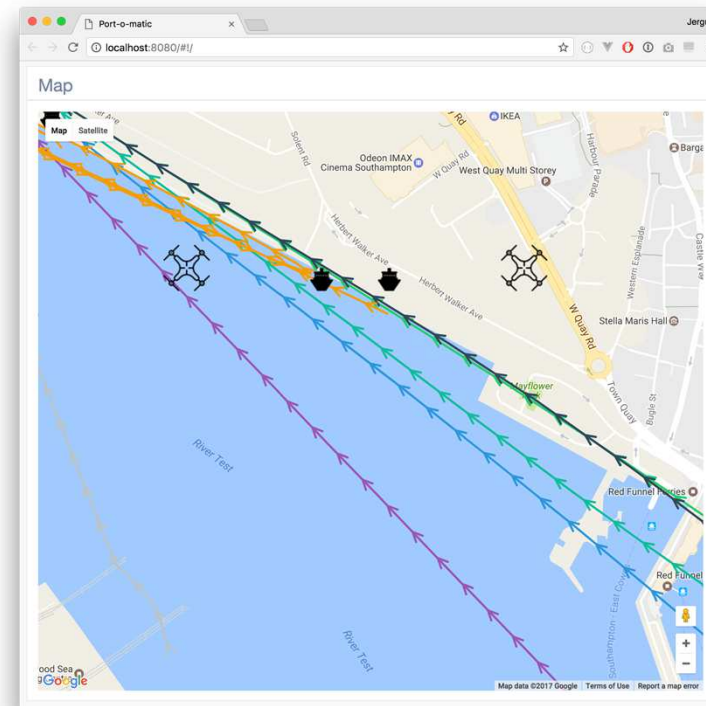


- SalesForce Catalog
  - ❑ Pulled services
  - ❑ Their data/pricing
- Huawei Charging & Balance API
  - ❑ Used to charge for services



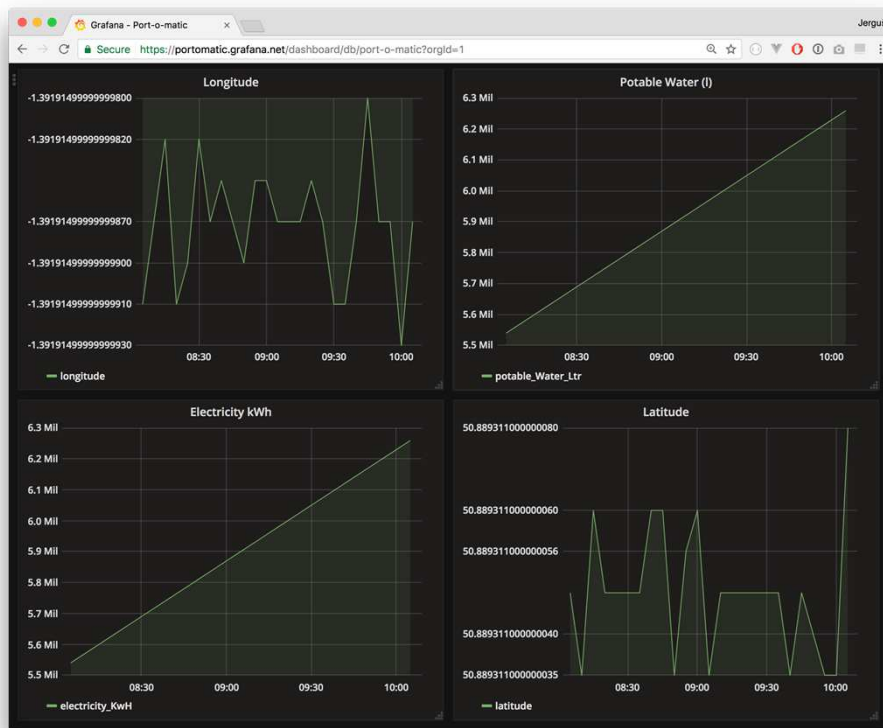
# Vodafone Drone API integration

- Real-time data mapping
  - Position, direction
- API's
  - TMForum Address API
  - Vodafone Drone API
- Flight Control Algorithm
  - Automatic mission handling



# Grafana

## Display of real time data from drones and metering devices



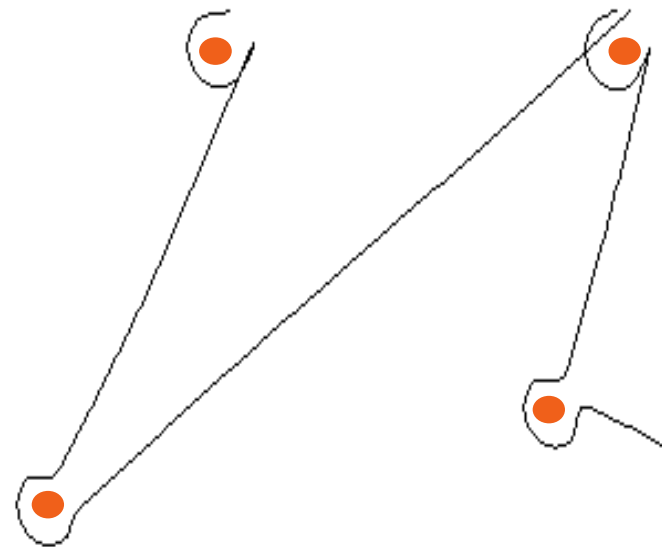
## Grafana Measurements API



# Calculating Measurements

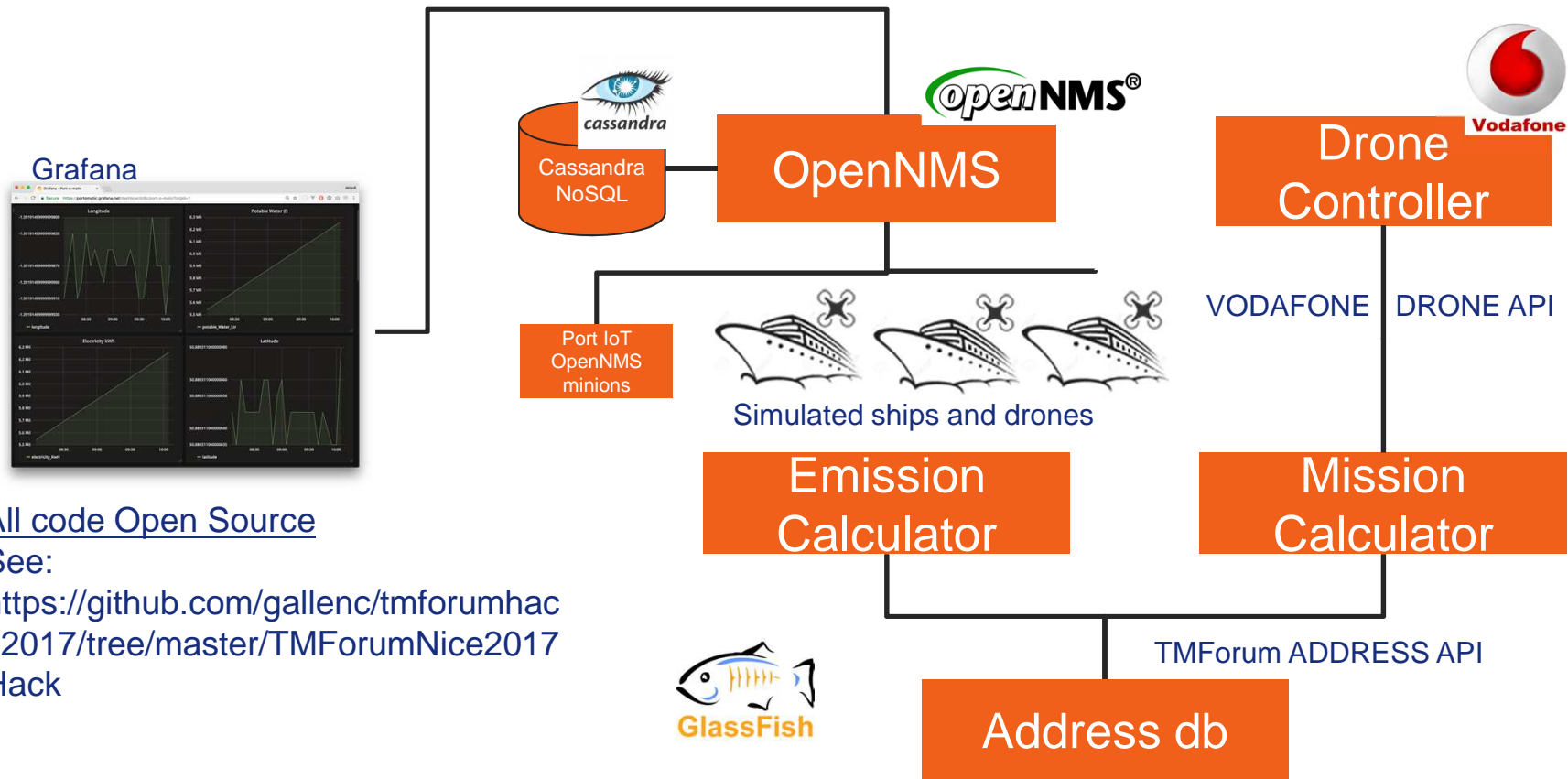
- double measuredCy; is the total measured concentration ( $\mu\text{g}/\text{m}^3$ ) at distance Dy;
- double distanceDz; // Dz is the distance from the ship (m) at which concentrations are to be predicted;
- **double predictionCz = ((measuredCy) / (2.7171)) \* (-0.5476 \* Math.log(distanceDz)+2.7171);**

calculated drone path





# Architecture



All code Open Source

See:

<https://github.com/gallenc/tmforumhack2017/tree/master/TMForumNice2017Hack>



# {open} :hack

tmforum | connecting digital ecosystems

TM Forum {open}:hack, Nice France, May 14-16.

## THANK YOU QUESTIONS?



Southampton  
**SOLENT**  
University

© 2017 TM Forum | 10

