



# PLASMA / A-STAR Project Overview

February 2014



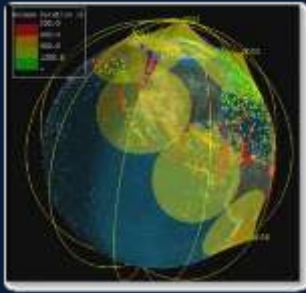
# Contractual Background

- ***'Platform for Advanced SAT-AIS Maritime Applications'*** (PLASMA) is a co-funded ESA ARTES 21 2C SAT-AIS applications demonstration project
- Objective is to support and promote the UK's Space Strategy by providing a long-term UK-based SAT-AIS data centre, which will:
  - provide services delivering SAT-AIS data and value-added AIS-derived information to eEE's EMEA customers
  - support third-party development of maritime applications and services.
- PLASMA started in Nov 2013 and will run until ~ May 2015.
- The ***'Advanced Ship Tracking and Reporting'*** (A-STAR) project is a contract extension to PLASMA. It started in Oct 2014 and will run until Dec 2015.



# eE SAT-AIS System Overview

Satellites



Earth stations



DPC

## A highly secure system

- Data is encrypted at all phases of transmission from satellite reception to user delivery
- Data center is in a secure facility
- System security will be constantly monitored
- Licensed by Cdn gov't under RSSSA – provides oversight of data distribution to authorised users

## A very simple system

- Satellites receive existing vessel AIS transmissions
- Does not require special AIS transmissions or any new ship-borne equipment
- AIS signals routed by satellites to earth stations and then to Data Processing Center(DPC) where AIS messages are stored
- From DPC filtered data sets are streamed directly to government customers

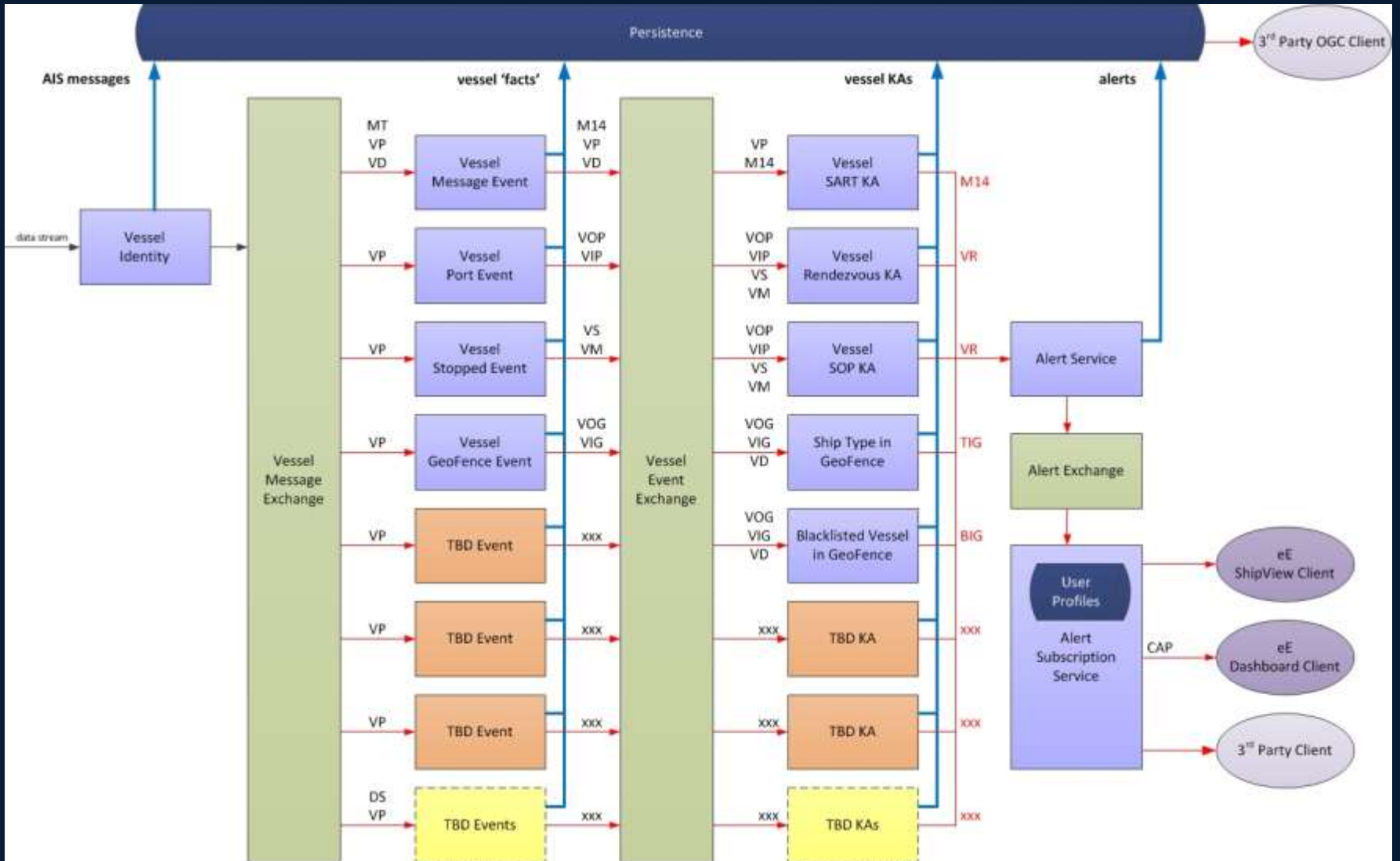


Ship emits AIS signal



Customers

# PLASMA SOA



# PLASMA KAs

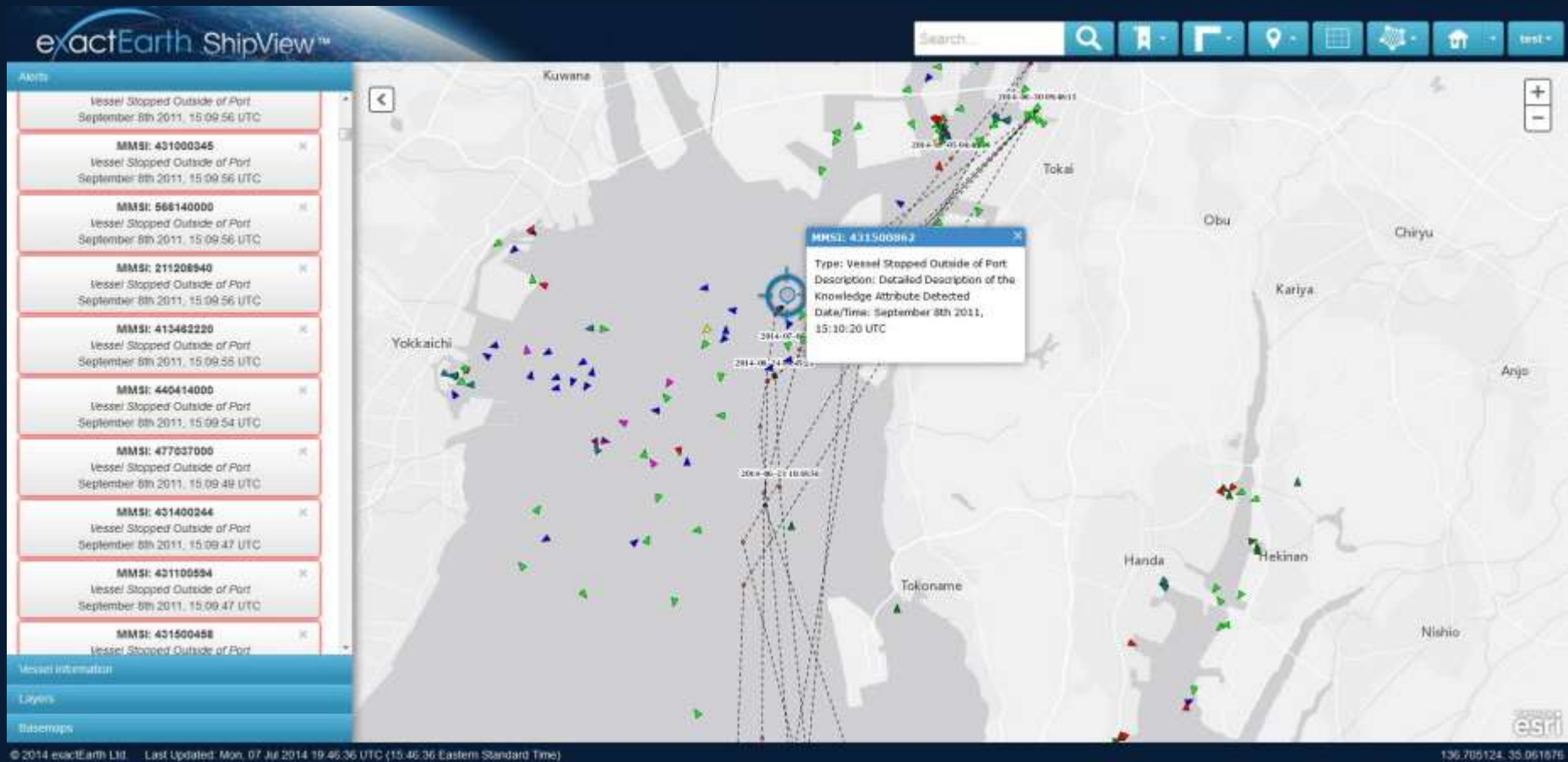
- Essentially ‘pointers’ into the data for alerting customers to look at specific potential events in a constant and highly voluminous incoming data stream.
- A suite of ‘Event Detectors’ analyses the incoming AIS message stream and creates ‘facts’ (e.g. vessel in port, vessel stopped, vessel in geofence, etc.). These ‘facts’ are then combined to create a particular KA (e.g. vessel stopped outside of port)
- Made available via PLASMA’s geospatial web services:
  - alerts sent directly to our CAP-compliant ‘dashboard’ service or M2M subscriber services
  - M2M retrieval via our OGC-compliant web feature/map server
  - browsed via our interactive web viewer ‘ShipView’.
- All facts/events and KAs/alerts are persisted in a database:
  - therefore over time we will build up an increasingly detailed pattern of life for every ship we detect, e.g. what ports it visits, where/when it stops, where/when it speeds up/travels slowly, which ships its has rendezvoused with etc., etc.



# Initial KAs

- Demo Release 1:
  - Ship Stopped Outside Port
  - Single Hulled Tanker Entering AoI
  - Blacklisted Ship Entering AoI
  - Message 14 Transmitted with Nearby Vessels
- Demo Release 2:
  - Ship Rendezvous
  - Ships Leaving Ports in Sierra Leone, Guinea and Liberia declaring a UK destination
  - Any vessel declaring a destination matching a port of interest; also returns independently calculated ETA

# Alert / KA Access via ShipView



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136.705124, 35.061676



# Alert Service via CAP

exactEarth Dashboard

vessel-stopped-outside-port  
October 20th 2014, 20:20:50 UTC

**Alert Sender:** plasma@exactearth.com  
**Alert Status:** Actual  
**Alert Type:** Alert  
**Area Description:** [-29.768935 31.229691666666668]  
**Latitude:** -29.768935  
**Longitude:** 31.229691666666668  
**Event Category:** Safety  
**Event Description:** Vessel with mmsi '226333000' has stopped but is not in port  
**Event Time:** October 20th 2014, 20:20:50 UTC  
**Certainty:**  
**Severity:** Moderate  
**Urgency:** Immediate

vessel-stopped-outside-port  
October 20th 2014, 20:21:05 UTC

vessel-stopped-outside-port  
October 20th 2014, 20:22:07 UTC

vessel-stopped-outside-port  
October 20th 2014, 20:22:28 UTC

vessel-stopped-outside-port  
October 20th 2014, 20:23:37 UTC

vessel-stopped-outside-port  
October 20th 2014, 20:24:19 UTC

© 2014 exactEarth Ltd. Last Updated: Mon, 01 Dec 2014 15:20:49 UTC (15:20:49 GMT+0000 GMT Standard Time) 30.895547, -29.942116

# PLASMA Demonstration End Users

- European Maritime Safety Agency (EMSA):
  - under the ESA-EMSA SAT-AIS Initiative PLASMA is supplying SAT-AIS data to EMSA for use in its SAT-AIS demonstration service roll out to EC member states
- South Africa Maritime Safety Authority (SAMSA)
- Globavista
- Each of these:
  - provides input into the services' specifications (i.e. user requirements)
  - uses the implemented pre-operational services, evaluates and provides feedback

# A-STAR Extensions

- Continue supply of eE SAT-AIS data to EMSA, but now also include eE Doppler data
- Provide 'positional verification' (PV) services
- Provide 'behaviour analysis' services, courtesy of Roke Manor
- Include global sea-state and weather forecast data for additional KA generation, courtesy of TeamSurv
- With additional Danish and Irish partners (Gatehouse and National Space Centre Ireland) widen our demonstration end users to include the Danish and Irish Navies, MIK Belgium, as well as NMIC and DSTL in the UK.

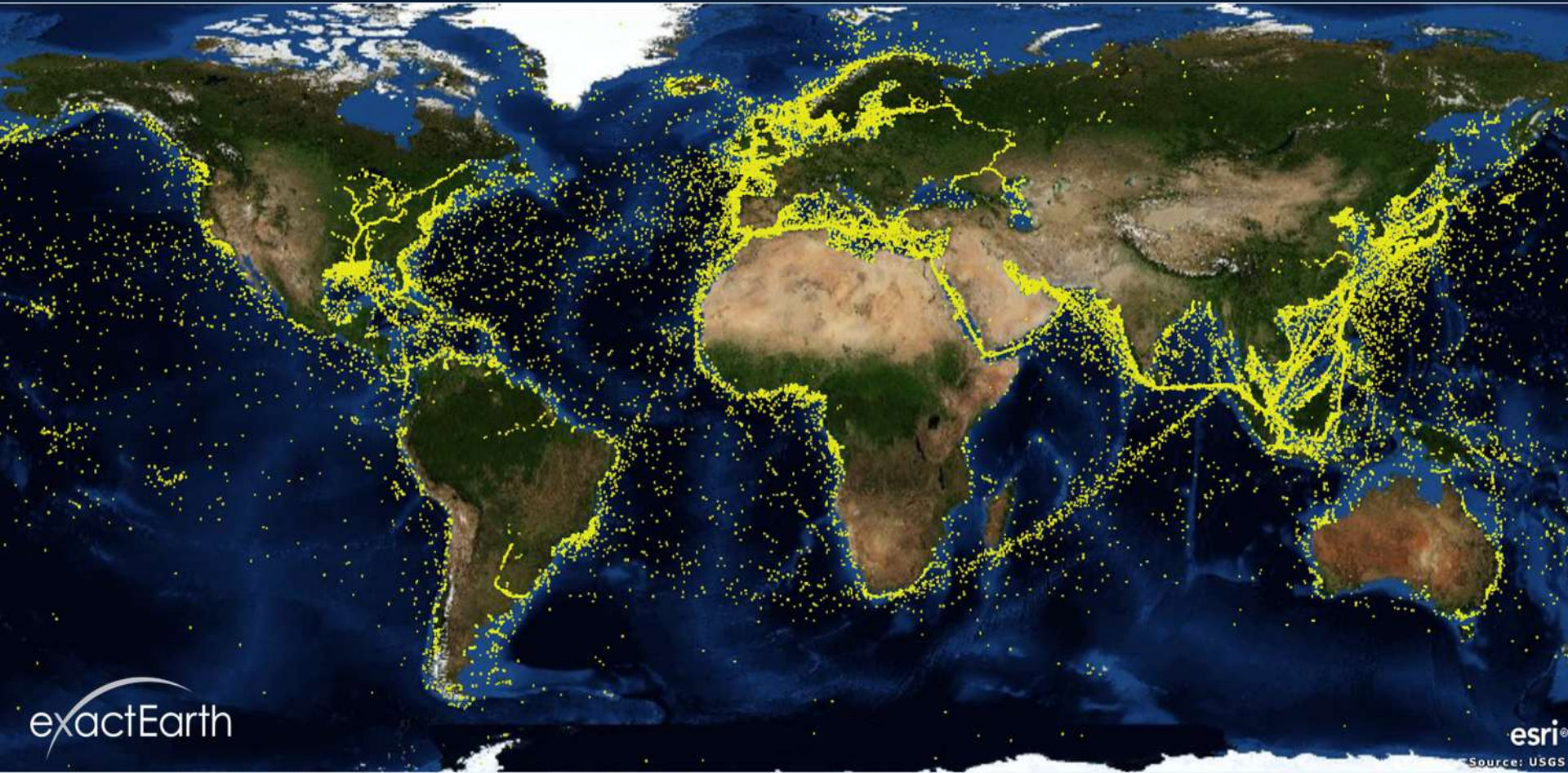




# Thank You!

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