



IMIS Global Limited

www.imisglobal.com

May 2014

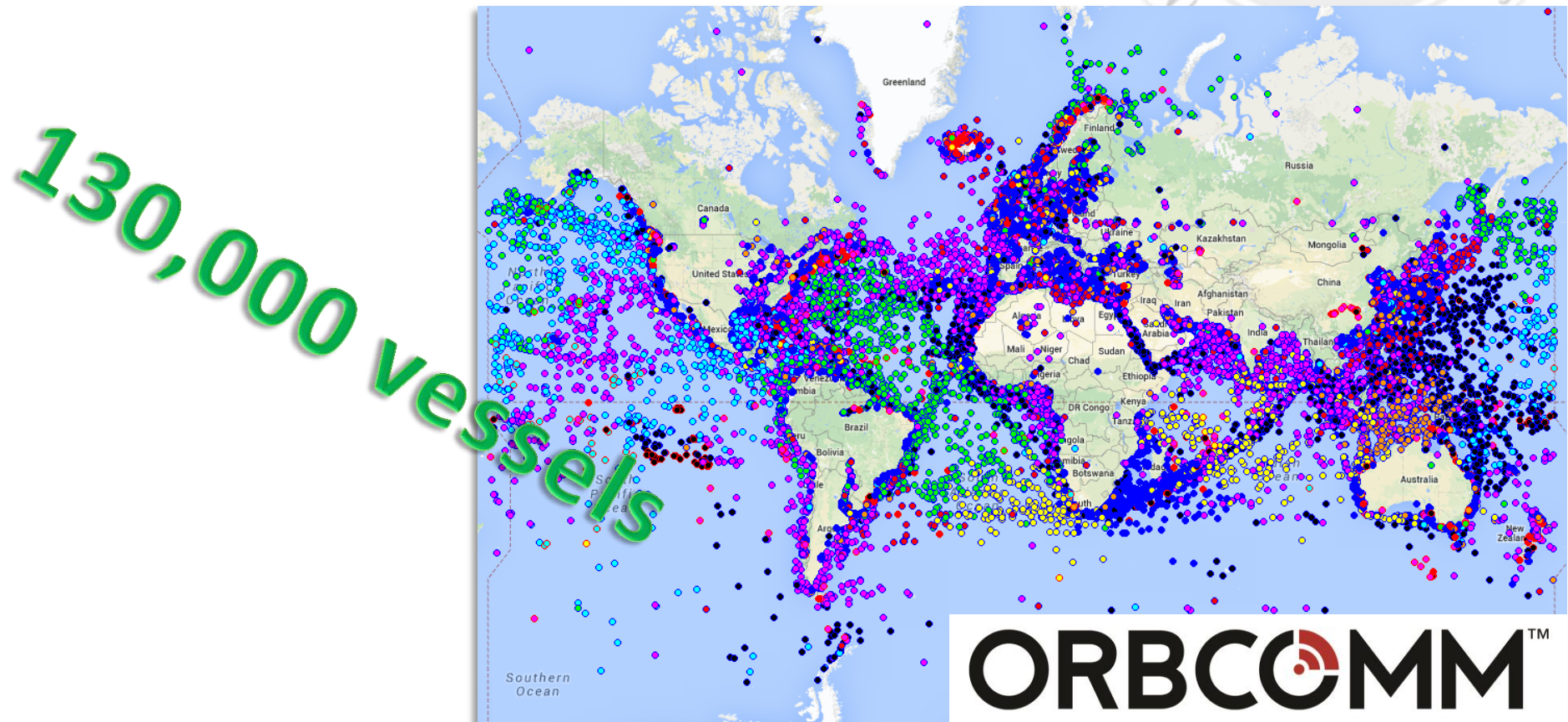
So you think you have accurate AIS data?

- ❖ 90% of all goods moved around the world is by sea
- ❖ Maritime risks include :

- Safety
- Security
- Economic
- Environmental

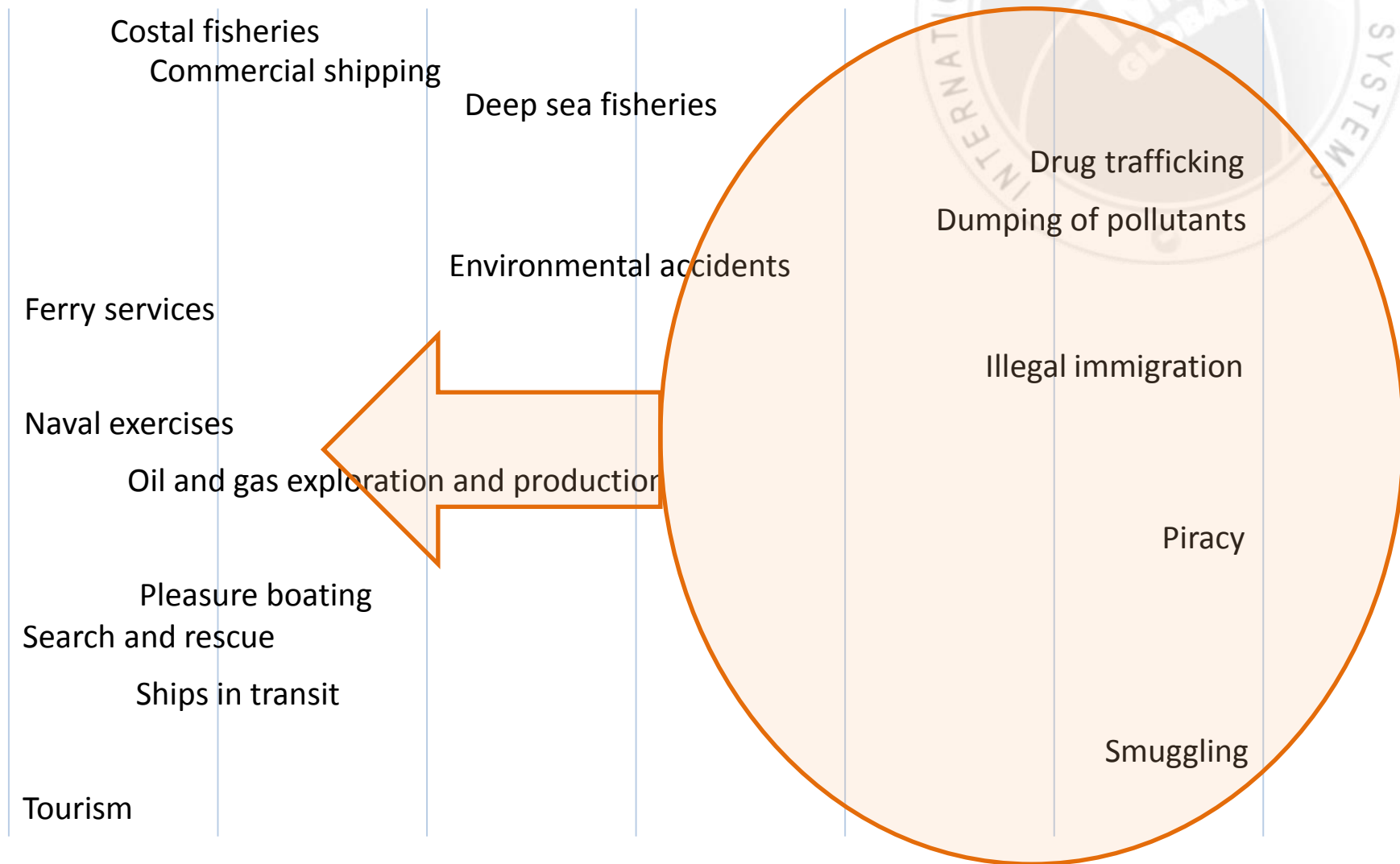


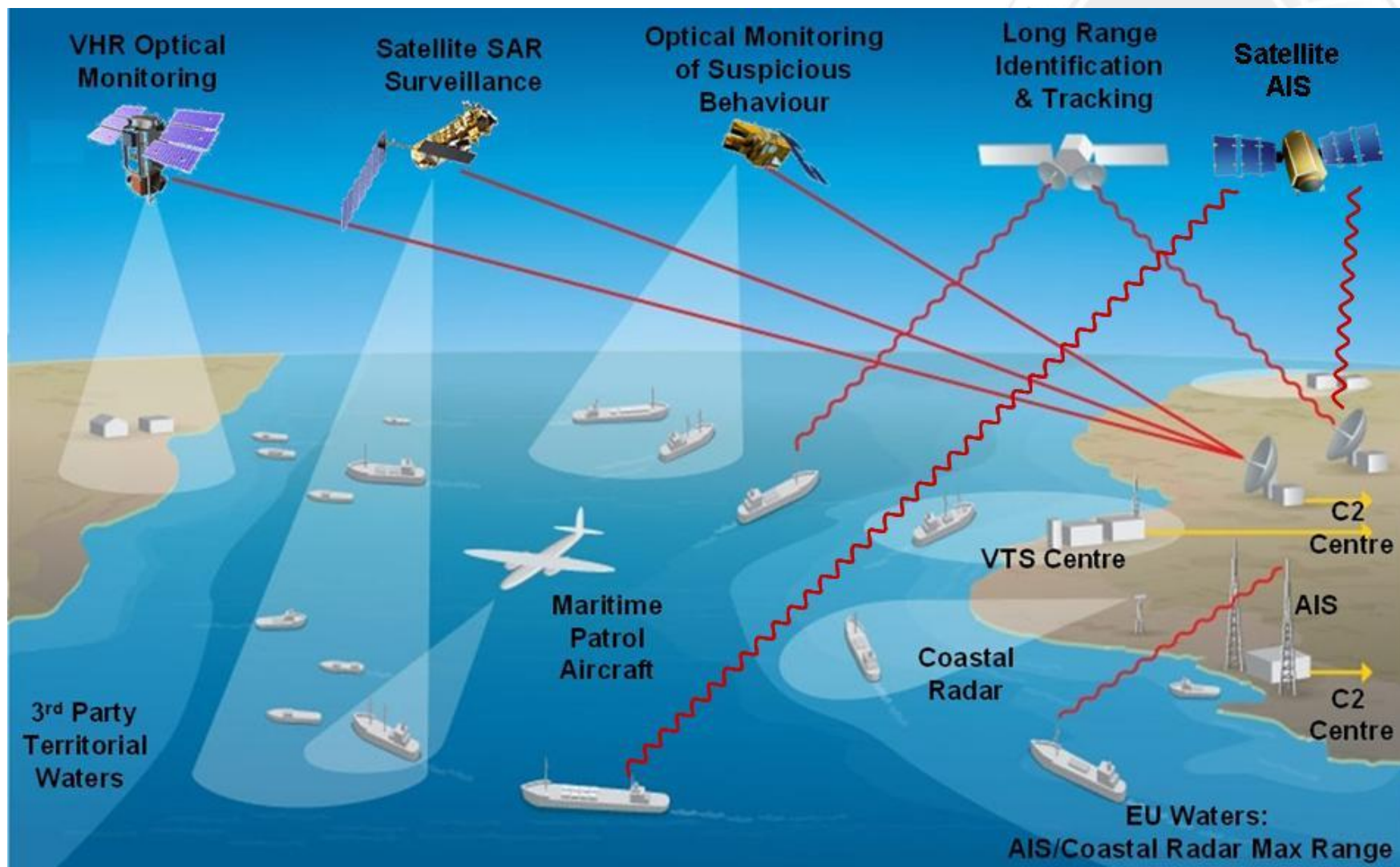
- ❖ Since 2004 all SOLAS vessels have to carry AIS
- ❖ Since 2004, AIS is tracked from space (ORBCOMM) providing Navigational, Identity and Voyage data
- ❖ Since 2010 all inland waterway vessels in the EU had to fit AIS
- ❖ Next Gen AIS (VHF Data Exchange System (VDES)) planned for 2017



Cooperative activities

Non-cooperative activities





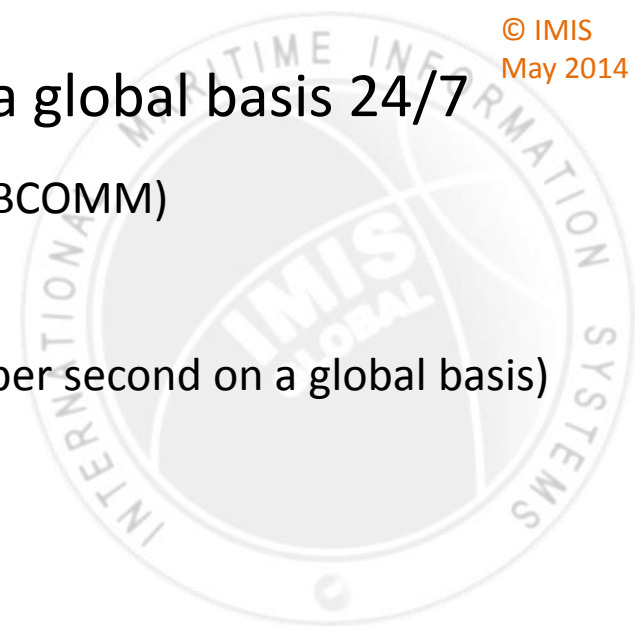
- ❖ AIS with +/-10,000 AIS messages per sec. on a global basis 24/7
- ❖ Satellite AIS (S-AIS) with >100,000 targets (ORBCOMM)
- ❖ RADARSAT images (pre-arranged)
- ❖ LRIT (INMARSAT C) (One report every 6 hours +/-2.5 per second on a global basis)
- ❖ Optical (pre-arranged)

DATA FUSION

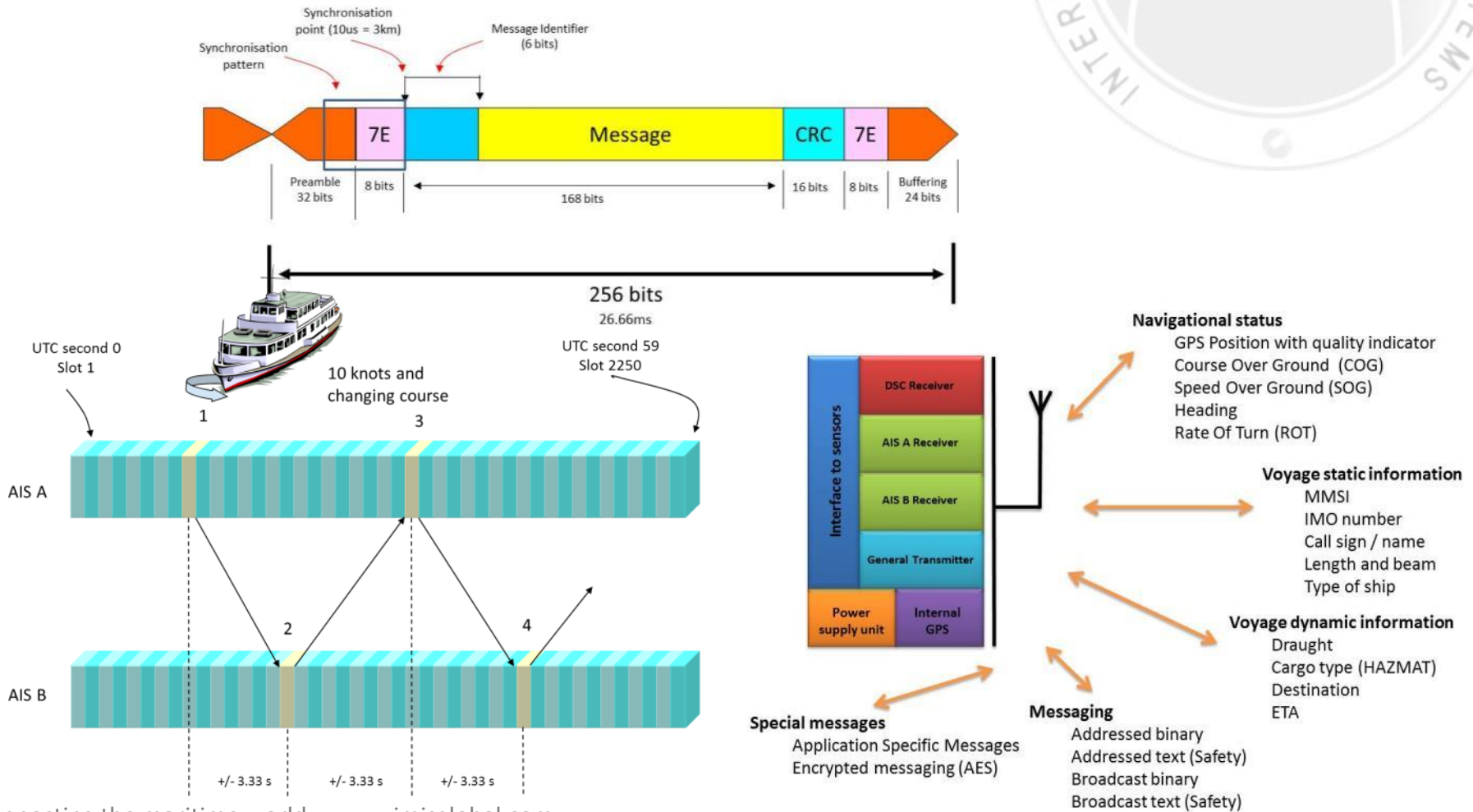
IS THE KEY

S-AIS and RADARSAT

½ meter resolution by GEOEYE



- ❖ AIS data accuracy and detail
- ❖ AIS data is temporally accurate to $\pm 10\mu\text{s}$
- ❖ Class A AIS data contains many different data values
- ❖ AIS data can be corrupted (no FEC)





❖ Vessel side:

Faulty / badly designed equipment	Incorrect installation and configuration	Deliberate tampering / spoofing tools
Wrong default values	Wrong MMSI, Call sign, Name, IMO number	
Errors in MMSI on a regular basis	Wrong connections to Gyro Compass (COG wrong)	
Errors in Latitude on a regular basis	GPS antenna position wrongly entered (A + B + C + D)	
Errors in Longitude on a regular basis	High noise floor on vessel leading to RX issues	
Faulty navigational status (Furuno)		



❖ Shore side:

Wrong equipment	Incorrect installation	Deliberate tampering / spoofing tools
AIS receiver with wrong feature set	High electrical noise floor	
Focus on sensitivity rather than system design	Single omnidirectional antenna system	
Low capacity data links	Focus on range rather than on capacity	
Simple systems (receiver and antenna)	No onsite data storage and 'data catch up'	
No GPS timing at site		



Ship trackers 'vulnerable to hacking', experts warn

Dave Lee Technology reporter, BBC News

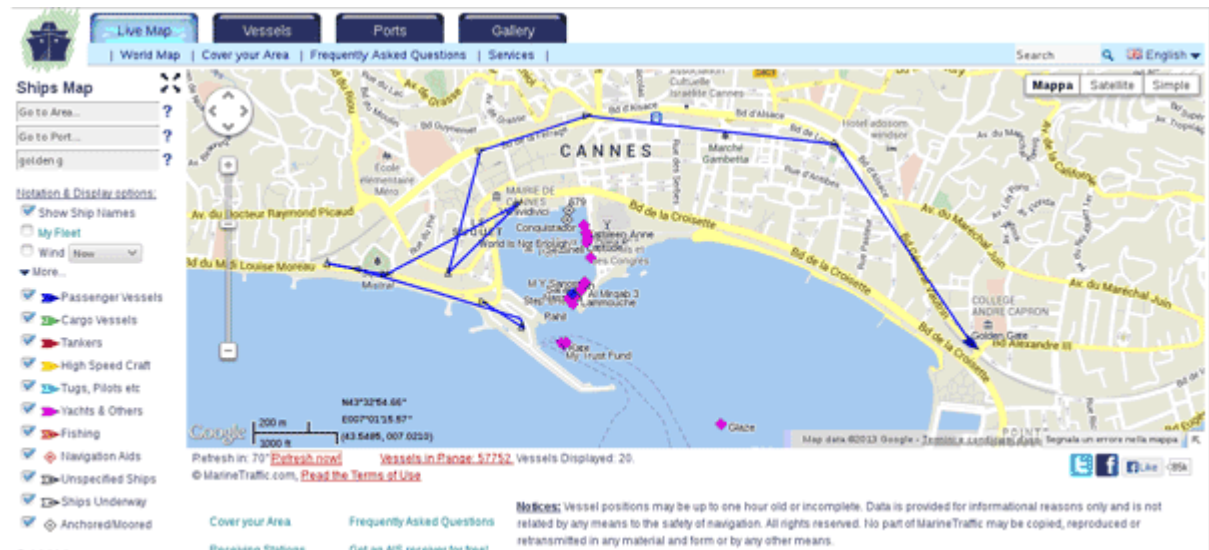
... the MMSI number of the Hamoda K and the Ramtin (Volga) match.

Name	Type	IMO	MMSI	Flag	Manager	Owner
Ramtin (Volga)	Crude Oil Tanker	9003237	671291000	Togo	Tabuk Maritime	Tabuk Maritime
Hamoda K	Oil/ Chemical Tanker	6510722	671291000	Togo	Zad Fuel Co	Zad Fuel Co

Rob Almeida
October 25, 2013

Vulnerabilities Discovered in Global Vessel Tracking Systems

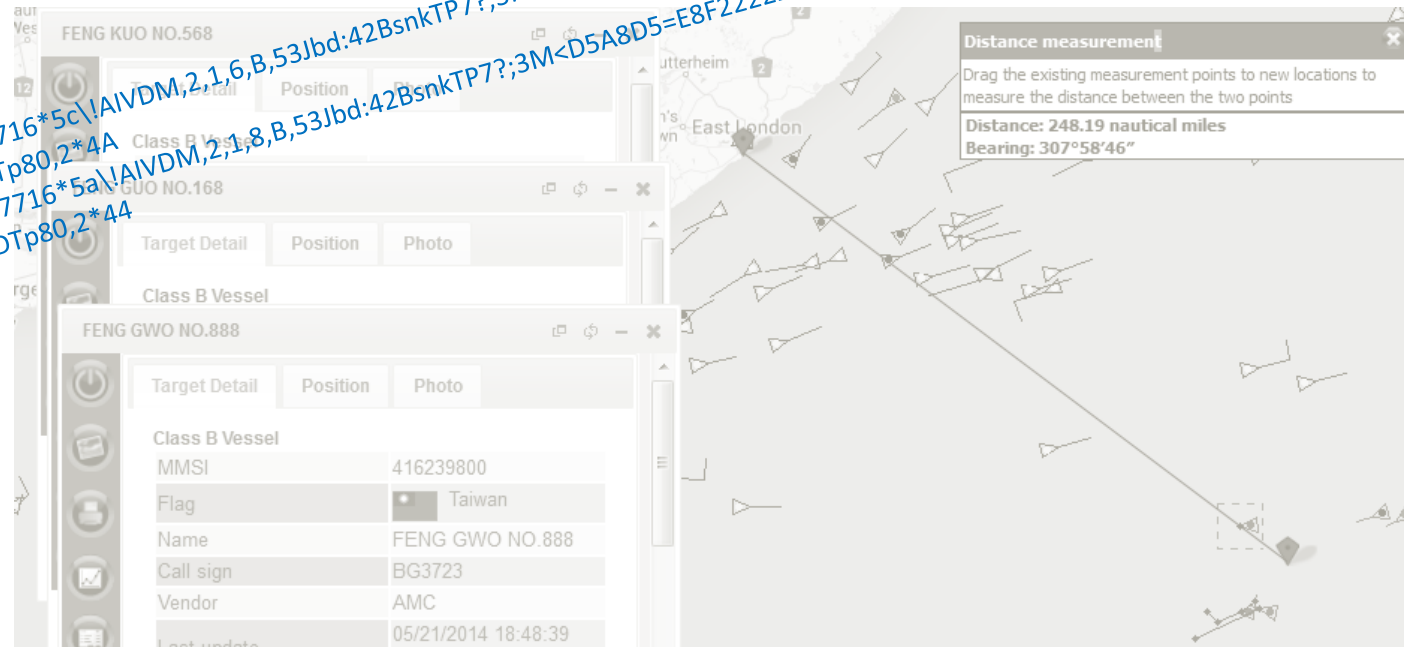
Kyle Wilhoit and Marco Balduzzi
(Senior Threat Researcher)



Improve the quality of the AIS data 1

Quality \neq Range

Quality \neq Amount of data



Protect your AIS data 1

Obtain data from multiple overlapping terrestrial sources

Obtain data from reputable satellite AIS service providers

Manage the local AIS data environment using AIS base stations

Use standards compliant AIS network software systems

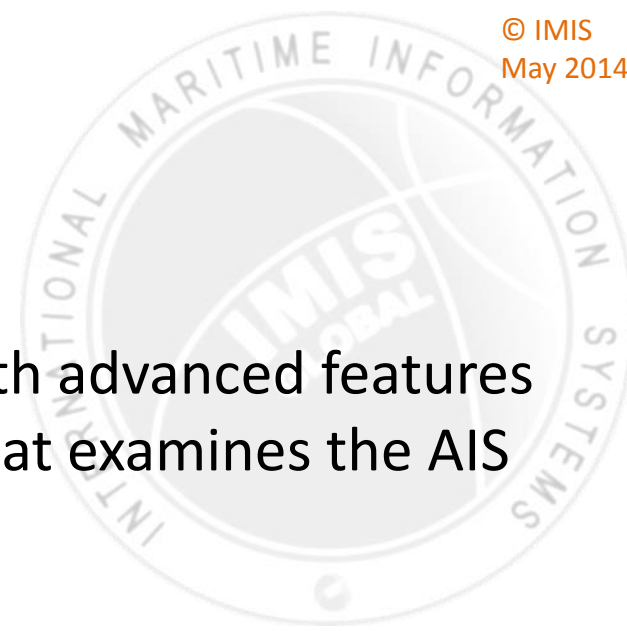


Protect your AIS data 2

Implement a tried and tested AIS network with advanced features including an AIS data firewall with features that examines the AIS data and could include:

1. Source
2. Content
3. Time
4. Location
5. Other data sources

Implement these checks in near real time on all incoming AIS data.





IMIS Global Limited develops high end AIS network solutions in South Africa that:

Have had the combined technical and operational inputs from many different, well funded maritime safety and security authorities.

Have been exhaustively tested by these authorities under test and real operational conditions over many years.

Have significant additional capacity (>150,000 targets) and security features (world leading) to deal with all of the threat scenarios to which it has been exposed thus far.



IMIS Global has offices in Pretoria that:

Has a reputation for the design, supply and support of high performance, web enabled, AIS networks compliant to all AIS standards to maritime safety and security authorities on a global basis (+/- 200 man years of development and testing)

Supplies AIS firewalls that tag suspect AIS data and AIS targets in near real-time

Supplies AIS reporting systems that allows examination of AIS data ranging from a single vessel to an global environment

>99.99% uptime



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Thank you for your valuable time