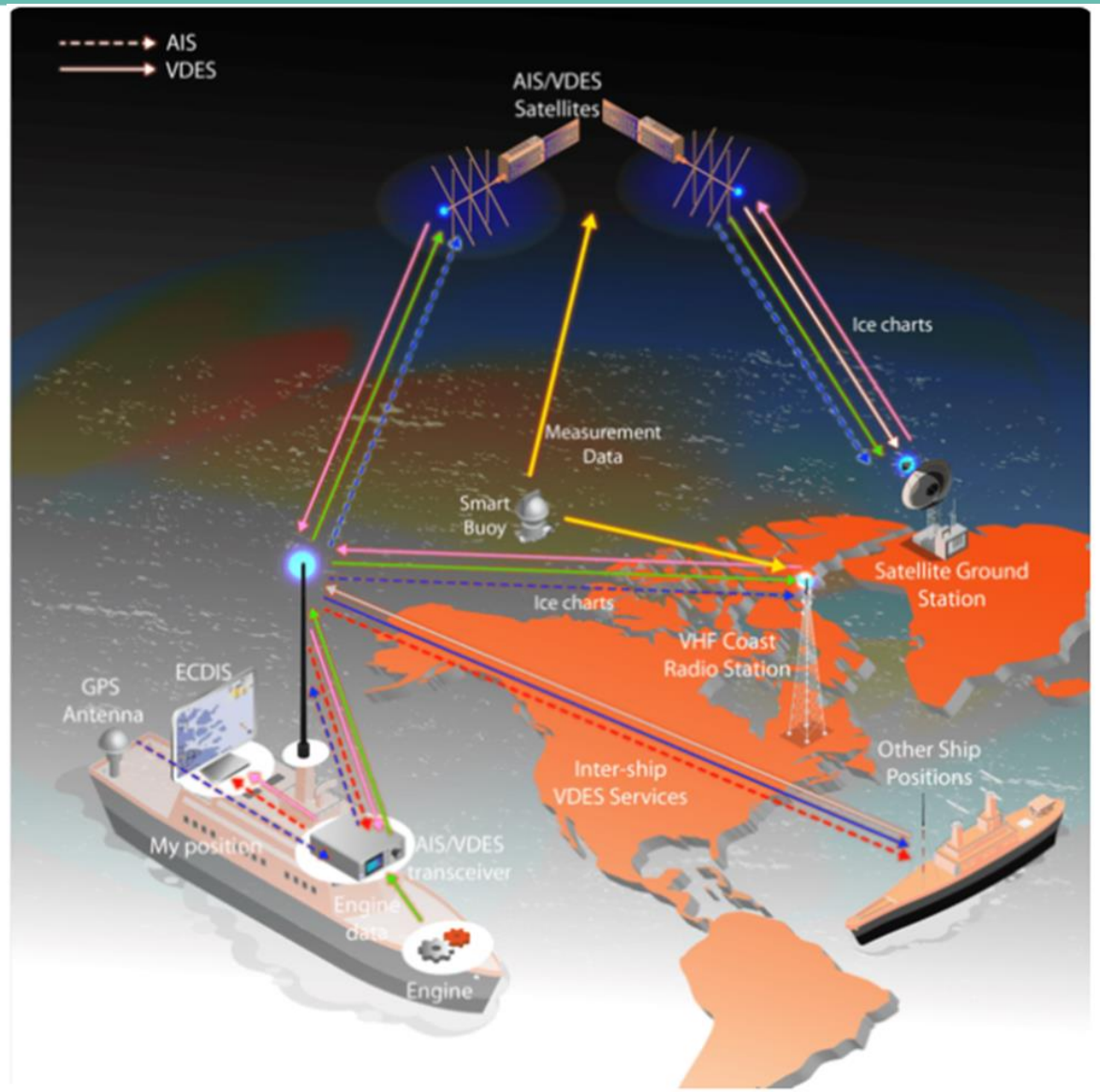

Needs for more digitalization

Over the past decade, the maritime industry and authorities have identified needs for more digitalization. This has been captured in the IMO e-Navigation strategy.

VDES is the new communication solution to implement the e-Navigation strategy. VDES is an extension to AIS, adding two-way data channels over VHF. By using special satellite channels (up and down), every ship with a VHF antenna is able to communicate globally. This figure illustrates a few VDES services such as “Ice charts”, “Engine monitoring”, and “Environmental monitoring” using smart buoys.

The VDES system consists of these two sub-systems working together:

- VDE-TER: The terrestrial sub-system (ship-to-ship and shore-to-ship)
- VDE-SAT: The satellite sub-system (satellite-to-ship)

GUIDELINE

G1117

VHF DATA EXCHANGE SYSTEM (VDES) OVERVIEW

Edition 2.0
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VDES Facts:

- VDES will provide a global coverage through a two-way satellite communication link part of the new standard.
- Can support approximately 80% of E-Navigation Services IMO are developing.
- Adds 14 channels to the existing AIS channels. Uses Higher levels of modulation, enabling 30 times the bit rates of todays AIS. Additional bandwidth for new services. Connects ships-ships, ships to coastal stations, adds satellite component to expand to global coverage. Satellite can route the signal to anywhere in the world.
- Utilises inherent AIS hardware providing a cost effective digital communications solution to industry whilst maintaining AIS requirements.
- Maritime safety information using end to end encryption via Maritime Connectivity Platforms (MCP) to enable specific digital data retrieval. (Information dissemination based on geographical, subscription, and/or regional requirements).
- Provides point-to-point, two-way, satellite VHF communication with usable bandwidth for medium to large packet data transfer.

What is VDES (VHF Data Exchange System)

VDES (VHF Data Exchange System) is the second generation of the popular AIS technology used for vessel tracking and other navigational and safety-related purposes by more than 200,000 vessels globally. As illustrated, AIS allows ships to broadcast their position (along with id, course, and speed). This is picked up by other ships, by coastal VHF radio networks, and today also by satellites.

Benefits of AIS 2.0

Operational efficiency

- Automation and digitalization
- Savings and simplifications

Increased safety at sea

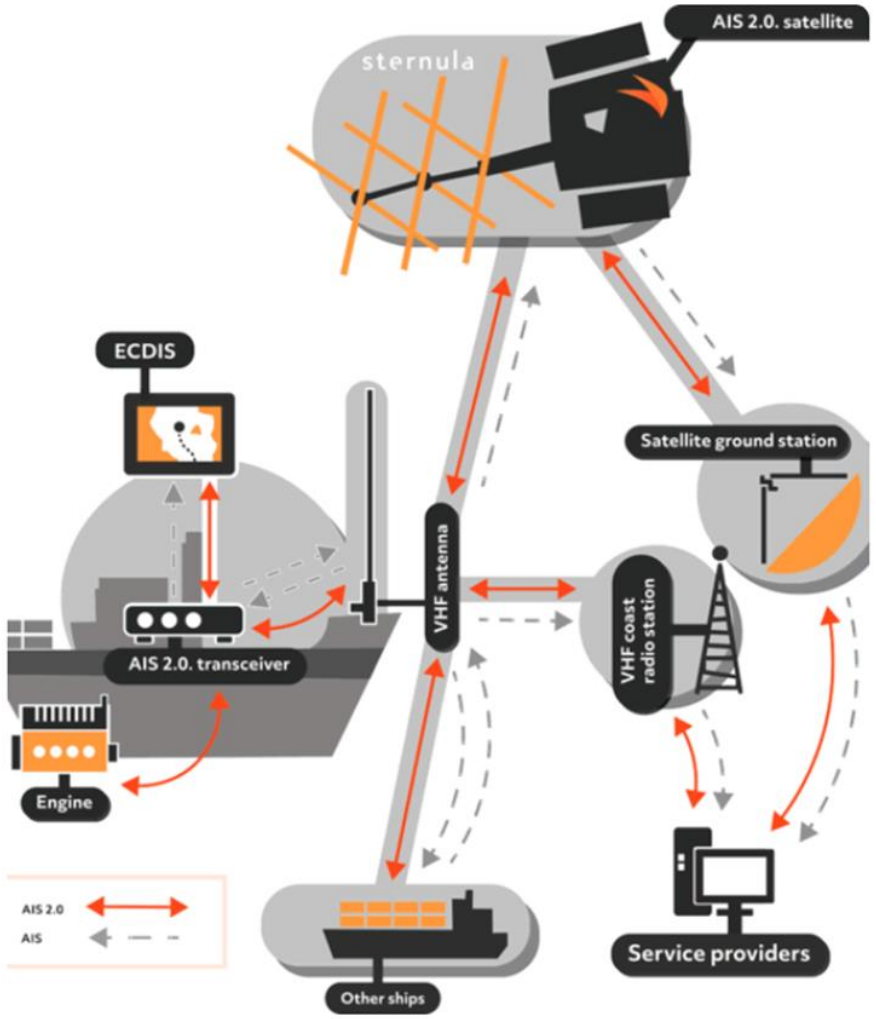
- Better safety & protection solutions
- Enable e-Navigation service
- Better situational awareness

Standardization

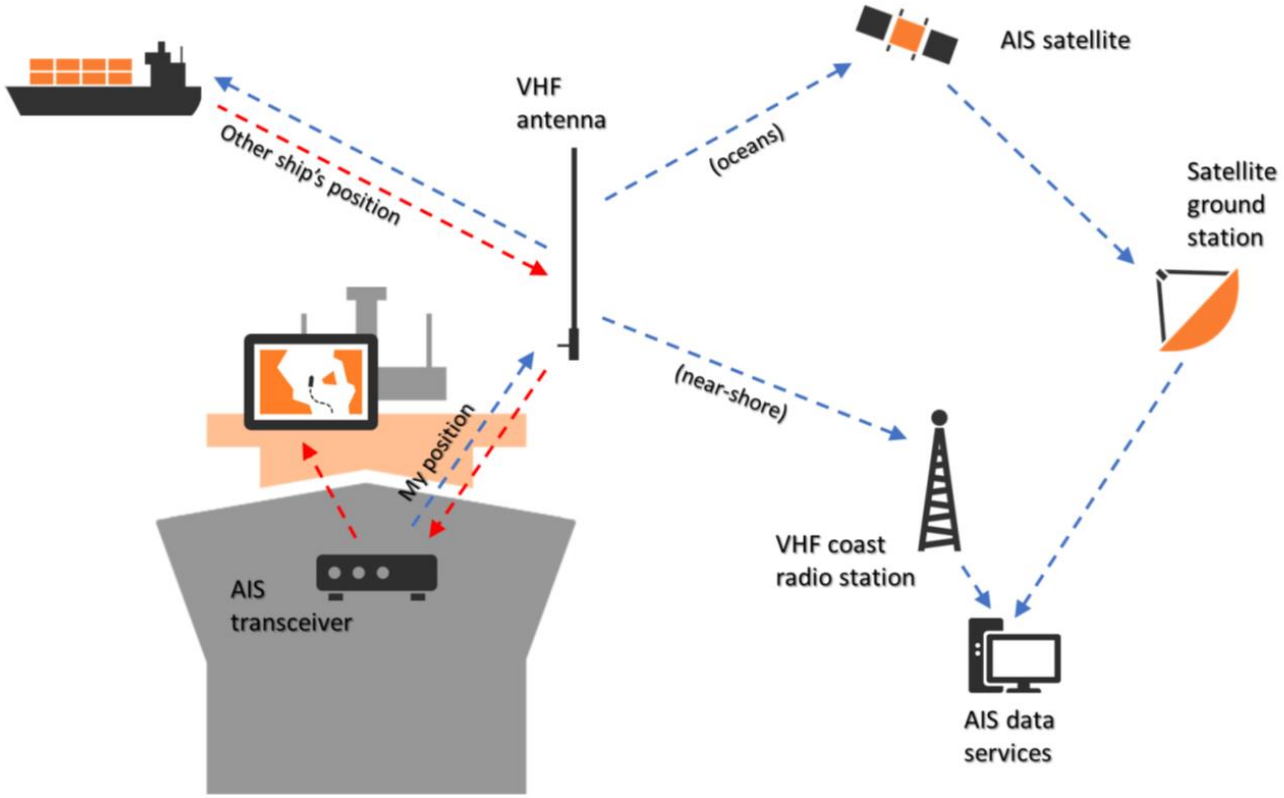
- ITU recommendation (ITU-R M.2092)
- Becoming an IMO requirement (SOLAS IV+V)

Available anywhere

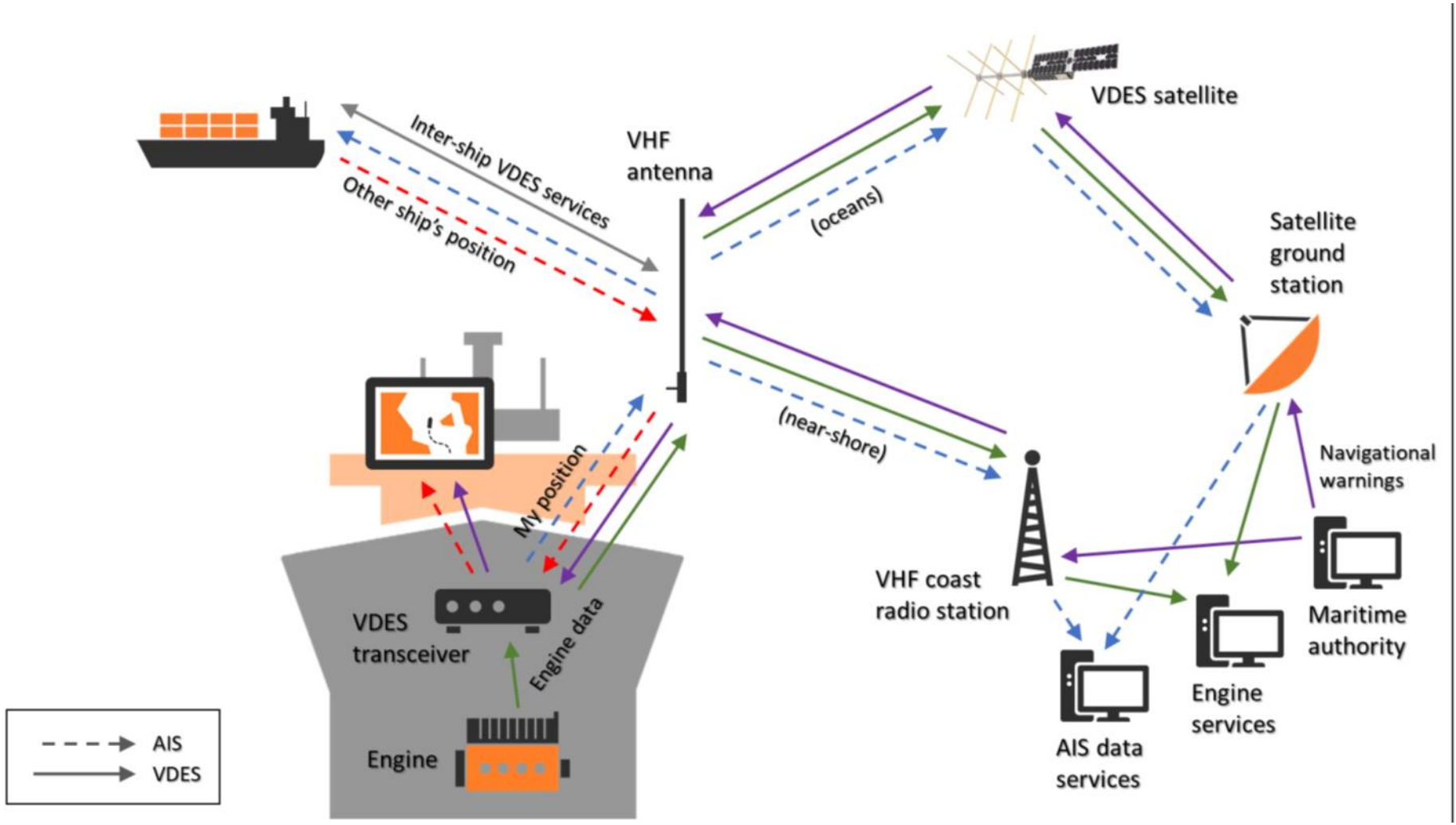
- Affordable ship equipment
- Global coverage via satellite
- Extremely simple and robust



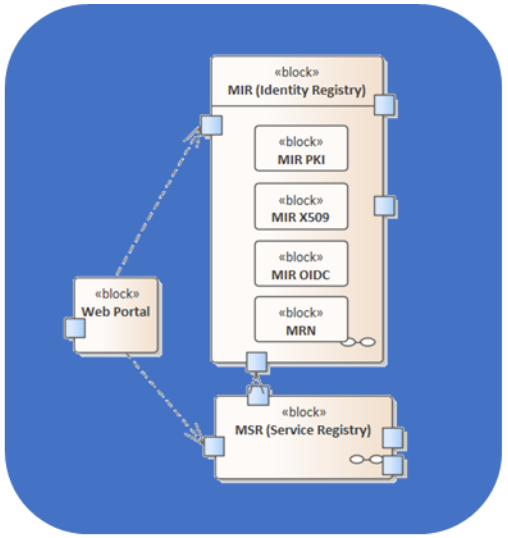
AIS Today…..


AIS satellite
VHF
antenna
Other ship's position
(oceans)
Satellite
ground
station
(near-shore)
My position
VHF coast
radio station
AIS
transceiver
AIS data
services

AIS 2.0 (VDES)


VDES satellite
Inter-ship VDES services
Other ship's position
VHF antenna
(oceans)
Satellite ground station
(near-shore)
My position
Navigational warnings
VHF coast radio station
Maritime authority
VDES transceiver
Engine data
Engine services
AIS data services
Engine
AIS
VDES

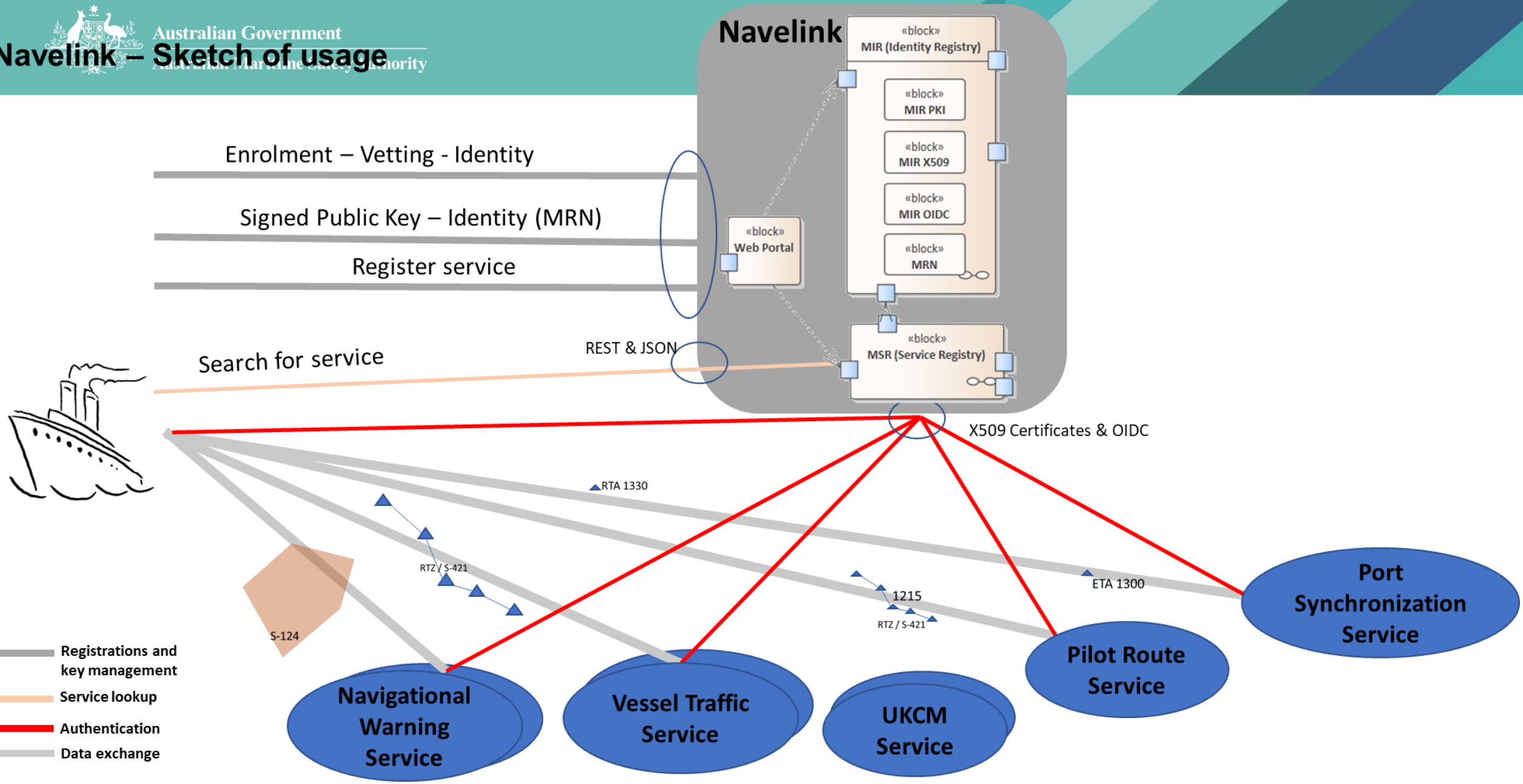
An MCP is the ‘Enabler.’

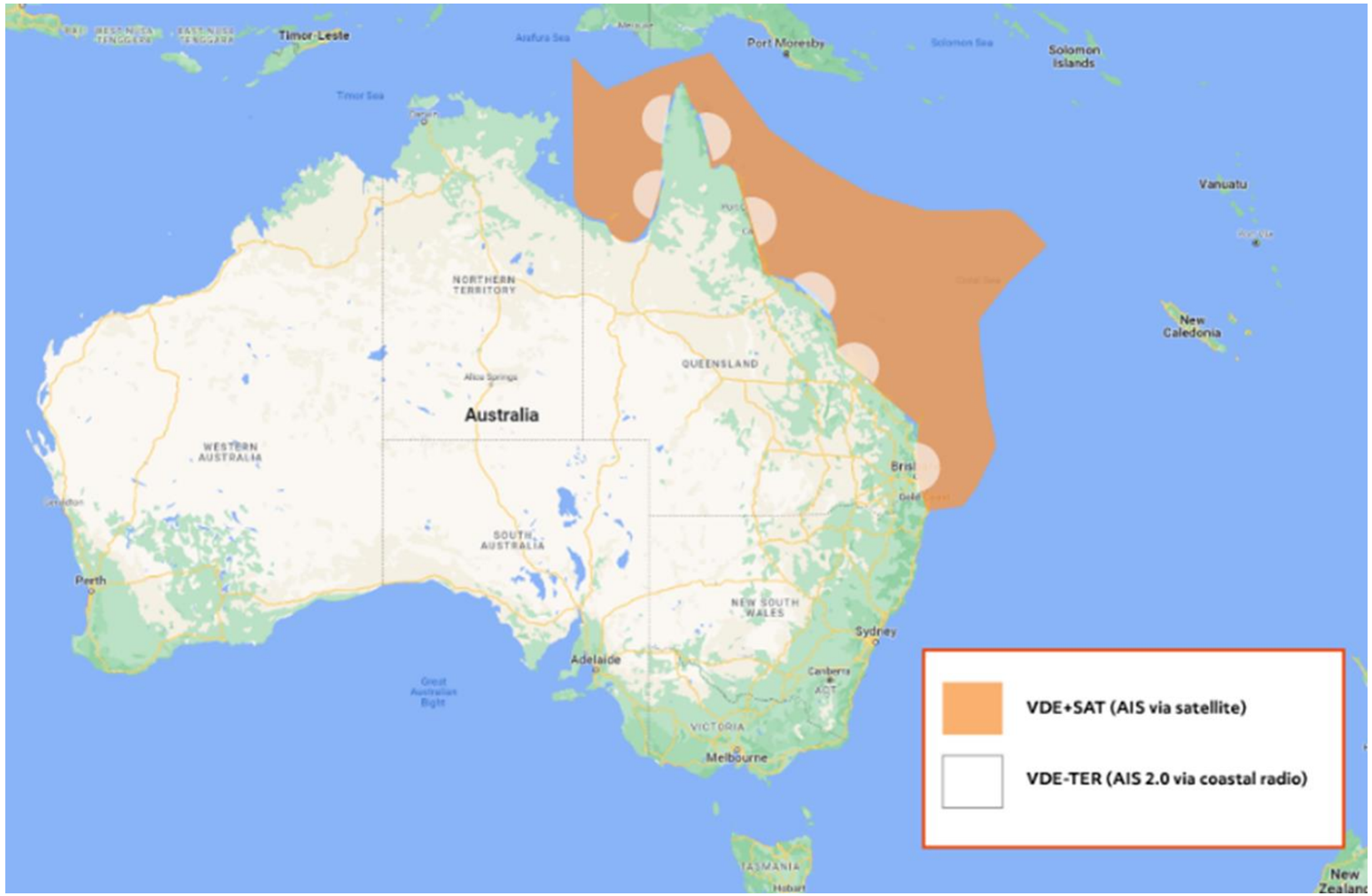


MCP and Navelink is “just” the enabler for the maritime actors to find each other digitally, and to securely exchange digital information.

Navelink is an operational instance of MCP, but remember, also live testbeds need to protect the communications and users.

Navelink – Sketch of usage





Pilot objectives:

- Demonstrate transmission of digital maritime services via satellite AIS 2.0 VDES/VDE-SAT
- Demonstrate transmission of digital maritime services via terrestrial VDES
- Integrate digital maritime services provided by the Maritime Connectivity Platform provider, 'Navelink.'
- Transmit S100 data sets via VDE-SAT/TER including but not limited to the following:
  - S124 – Navigation Warnings
  - S129 – Under Keel Clearance Management (UKMC)
  - S125 – Virtual AtoNs
  - S201 – AtoN Information
  - S400 – Weather