



**NAVELINK**

# Developer forum

24-11-2022

[Navelink.org](https://navelink.org)

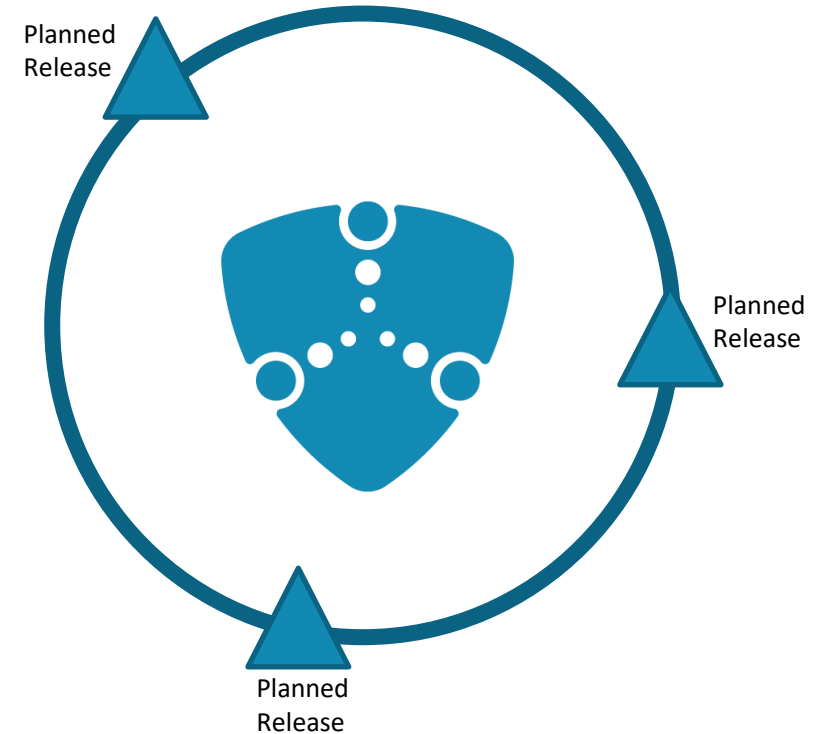
# Agenda

- 1) Navelink Platform status & update
- 2) Navelink Roadmap (Head of concept Navelink)
- 3) Service development discussions & information
  - a) Forum service developers – G1128 & MRN pattern (Each developer)
  - b) Forum security and interoperability (Each developer)
  - c) Ongoing work within the STM-community (Trello) (Each developer)
- 4) Overview of Navelink usage
- 5) Q&A
  - a) New questions (All)
- 6) Digital Incubator Thomas Christensen (MCC)
- 7) Presentation on VDES & MMS 14:30-15:00 Stefan Pielmeier (Sternula)
- 8) Closing remarks

# 1) Navelink Platform status & update

- Upgrade of MSR to .NET 6
- Implementation of G1128 schemas to DEV and TEST planned on Monday 28/11 at 13:00
- Many certificates needs renewing
  - Demo on how to renew your certificates by Mikael

## Received questions



# 2) Navelink Roadmap



Upgrade to latest G1128

Increase SECOM Compliance

Increase Traceability

Add more Service Specifications and Designs

Refine Permissions Management

Add MMS support

Increase VDES support

Add Service Ledger support

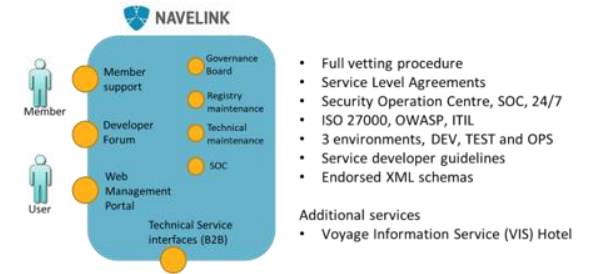
Enable subscription on Navelink technical notes

Enhance functionality to host payload formats

Add SECOM Hotel

Add support for Geocasting

Add support for Service Payment



# 3) Service development discussions & information

- Forum service developers
  - G1128
  - Discussion on future changes of MRN pattern
- Forum Security and interoperability
  - Common discussions
- Ongoing work within the STM-community (Trello)
  - Trello check
  - Common standardization work: S-124, S-421, SECOM, General STM news



# G1128 schema

The G1128 XML schemas is used primarily to describe and register a service in Maritime Service Registry (MSR). Based on the content in the XML, the MSR extracts some data and stores it specifically in the database. The content of this database is later returned as JSON fields. The original XML is also returned.

## Current version (early 1.0)

### Service Specification

- + Mainly references any data model

### Service Design

### Service Instance

<URL>https://....</URL>

## Present version (1.3)

### Service Specification

- + Can reference a S100 Feature Catalogue or Product (examples ongoing)
- + Can still reference any data model by name
- Removed definitionsAsXSD

### Service Design

No changes identified

### Service Instance

- + Field "URL" changed to "endpoint"

<endpoint>https://....</endpoint>

# Breaking change

# G1128 schemas

## Consequences of changed field name URL in Service Instance

- When retrieving and searching for service the response contains both the service in JSON format and also the original XML file. The JSON is unchanged, but the XML retrieved will be in the format decided by the registrator, as long as the schema is accepted by Navelink. By accepting both versions of the schema (and more in future...), everyone using the XML part in the response will have to accept all versions of the schema allowed in Navelink.

### Example (simplified)

```
{  
  "name": "<name>",  
  "instanceId": "<mrn>"  
  "InstanceAsXml": "xmlns="" .... <URL>https://</URL>",  
  "endpointUri": https://,  
  "endpointType": null  
}
```

```
{  
  "name": "<name>",  
  "instanceId": "<mrn>"  
  "InstanceAsXml": "xmlns="" .... <endpoint>https://</endpoint>",  
  "endpointUri": https://,  
  "endpointType": null  
}
```

[xmlns="http://efficiensea2.org/maritime-cloud/service-registry/v1/ServiceInstanceSchema.xsd"](http://efficiensea2.org/maritime-cloud/service-registry/v1/ServiceInstanceSchema.xsd)

[xmlns="http://iala-aism.org/g1128/v1.3/ServiceInstanceSchema.xsd"](http://iala-aism.org/g1128/v1.3/ServiceInstanceSchema.xsd)

# Different solutions

- Accept all approved versions of the IALA G1128 schema when registering services in Navelink
- Accept that "asXML" content in responses are according to one of the approved versions of the G1128 schema
- Be careful to use the content in the asXML (G1128 XML) when retrieving essential fields, such as URL, and use the MCP/Navelink fields instead in the JSON.
- Should we add versioning on Search Instance REST operations where the service consumer selects the format returned? (Shall Navelink convert between the formats?)

The most reasonable solution seems to be that the JSON part is kept **VERY** stable, and if using the XML part, the schema stated in the XML must be accepted and interpreted, hence everyone need to implement the G1128 schema, if using the XML.

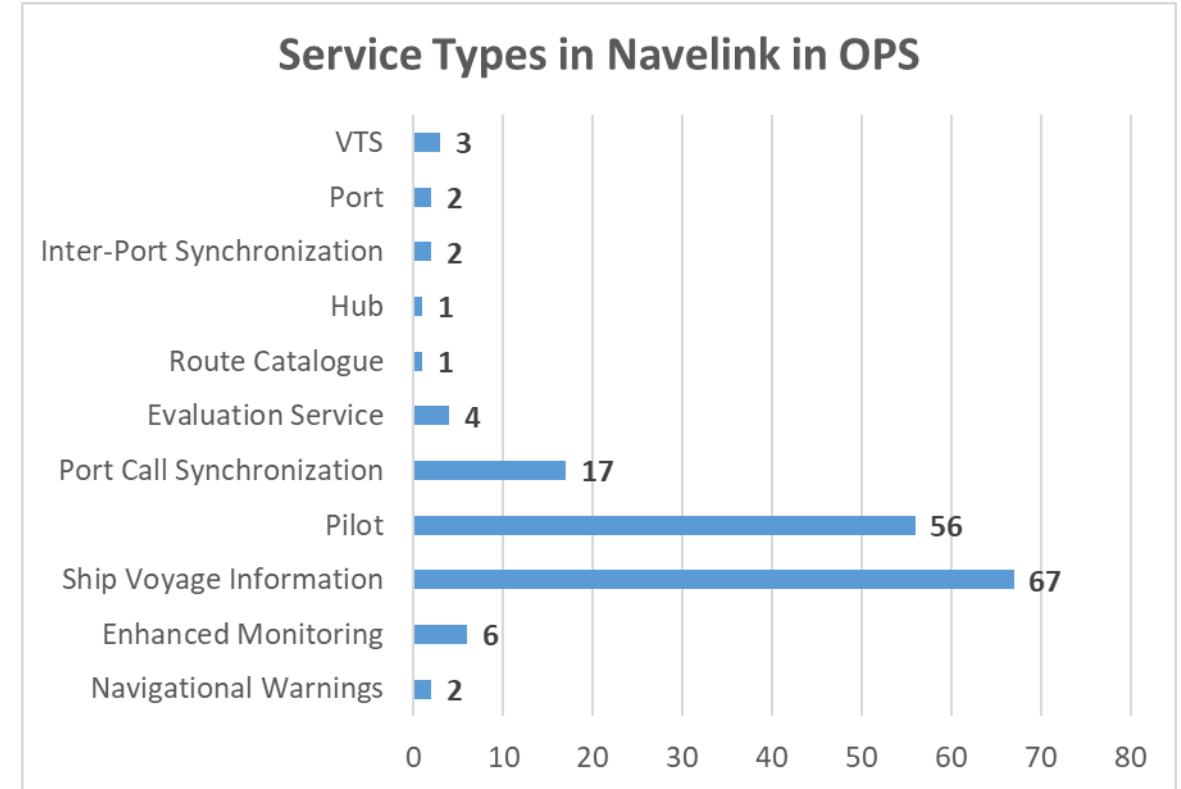
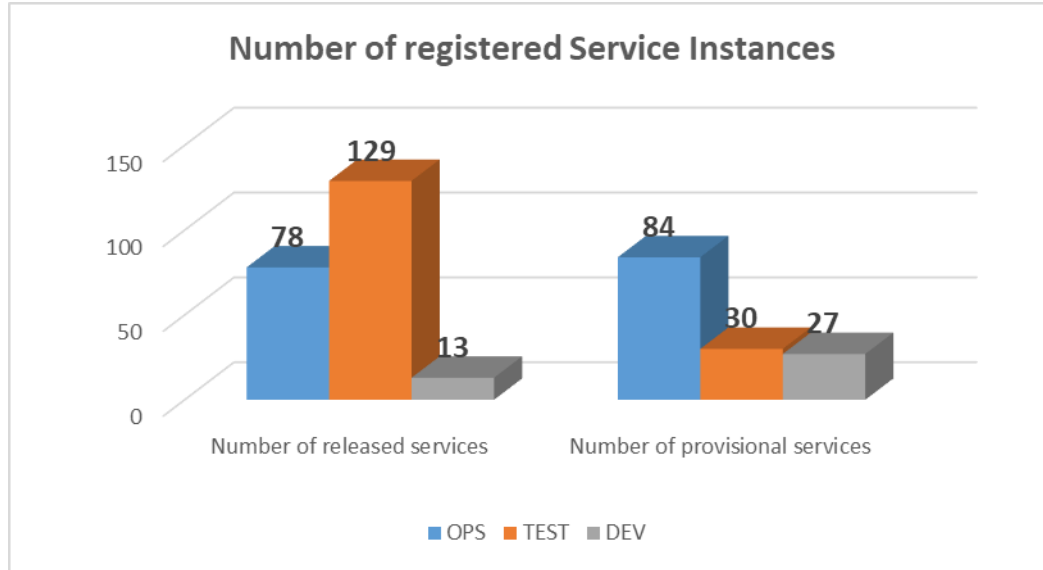
Recommendation: Use primarily the JSON fields in the response. Treat the asXML content as extra information more for presentation.

Search includes today also the XML content, hence new fields in the XML is also possible to search on in free text search.



# 4) Overview on Navelink usage

2022-11-23

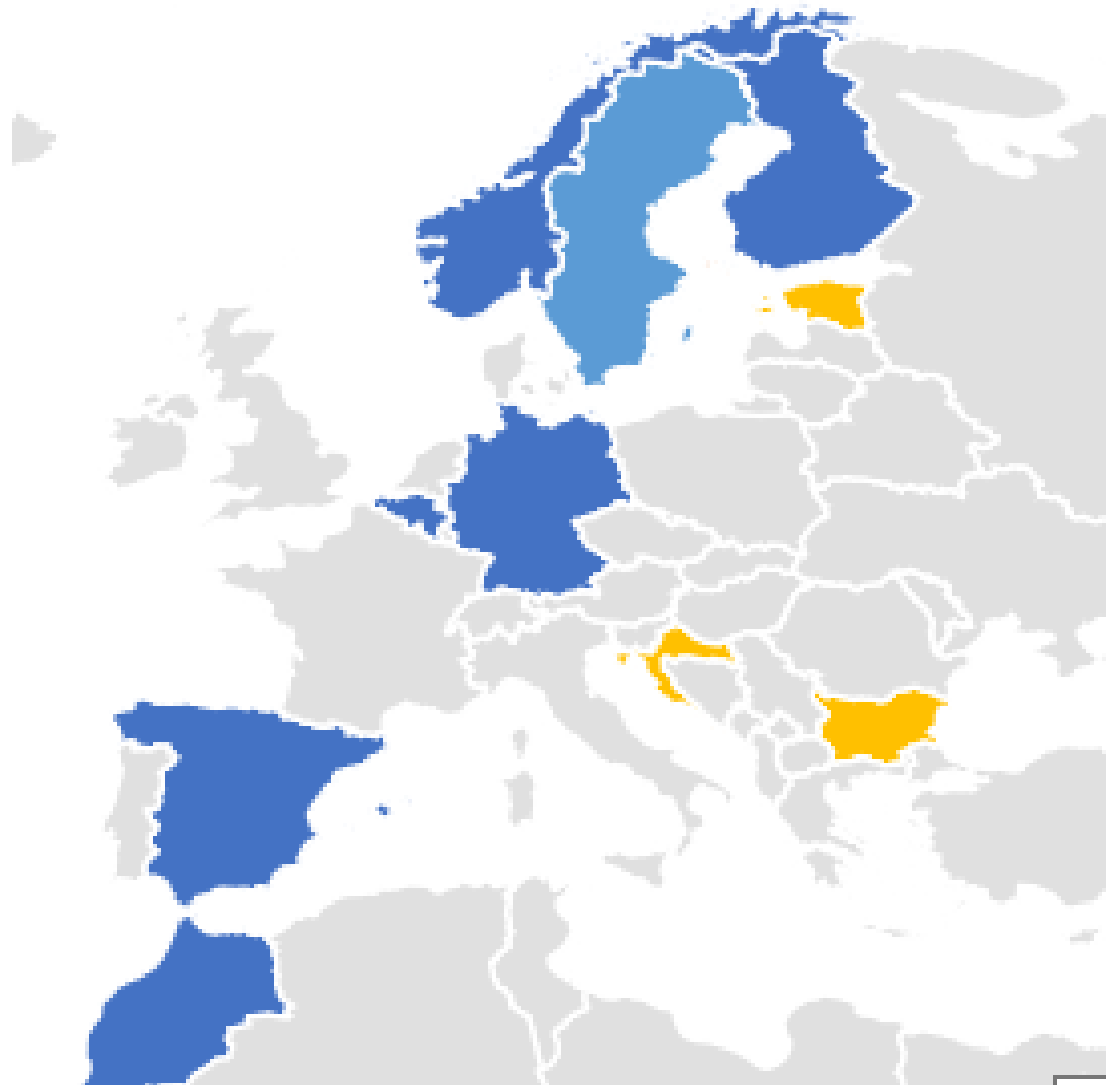


## Events since last Dev Forum:

Created in OPS

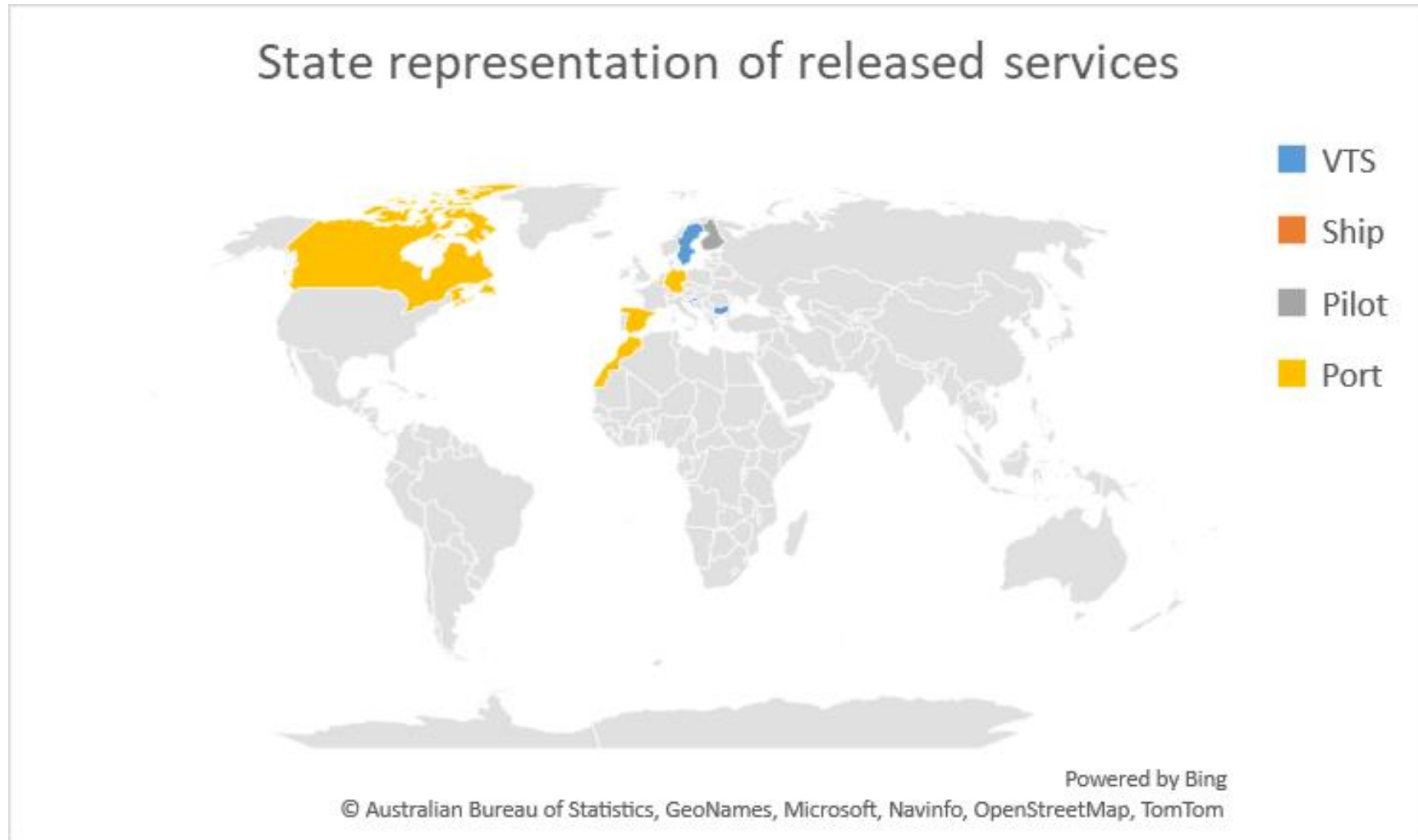
- Wartsila NaviPort of KRBNP Port Call Synchronization (provisional)

# Geographical representation in Europa for services in Navelink



- Verification
- Ship
- Hub
- VTS
- Port
- Evaluation
- Pilot

# Geographical representation of release services in Navelink



# Graphical presence of Navelink services including ongoing development

## State representation of services registered



Powered by Bing

© Australian Bureau of Statistics, GeoNames, Microsoft, Navinfo, OpenStreetMap, TomTom

## 5) Q&A

- Any Questions? The floor is open.

## 6) Digital Incubator

- Presentation on Digital Incubator by Thomas Christensen (MCC)

[Digital Incubator – Maritime Connectivity Platform](#)



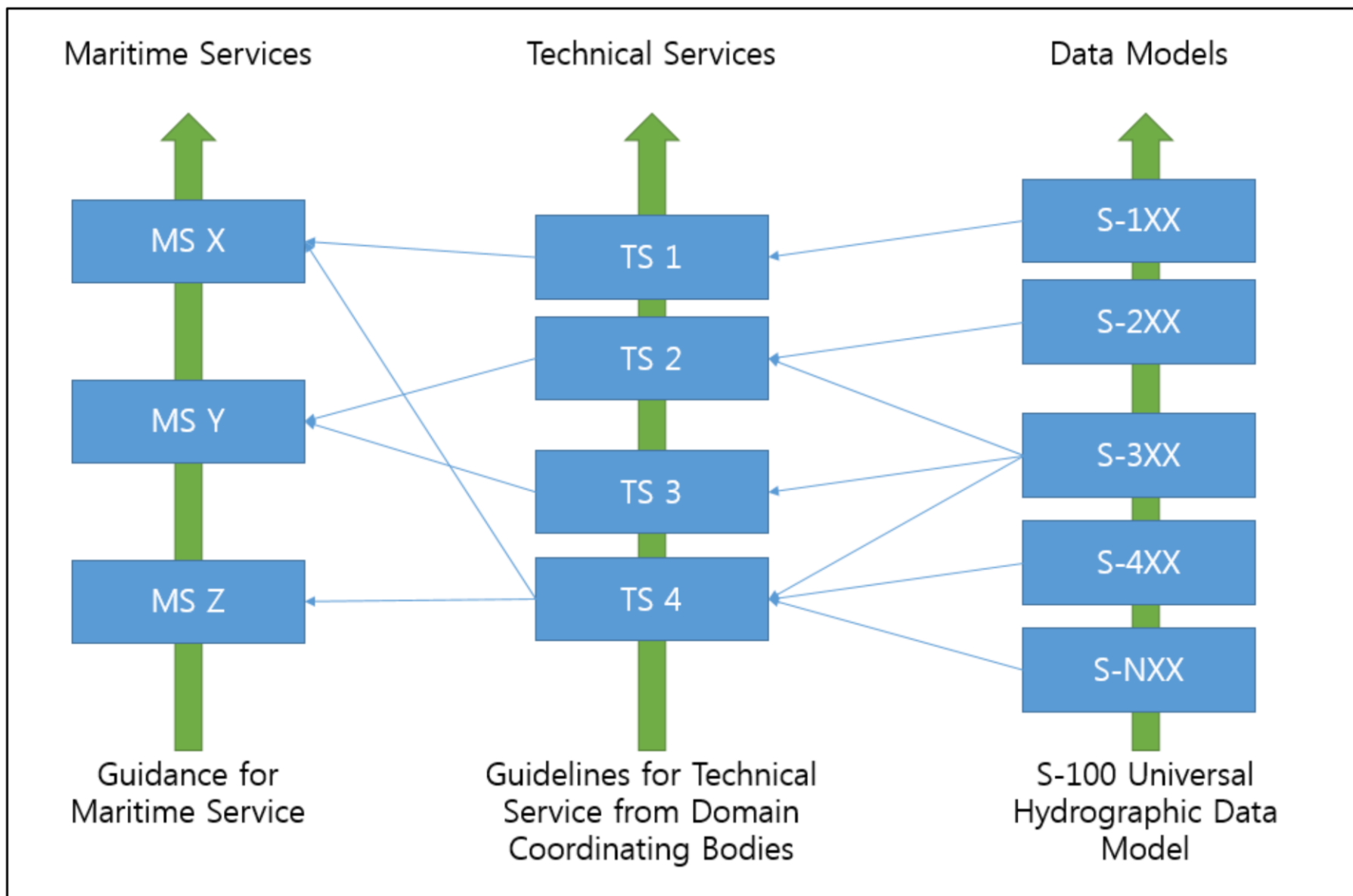
ARM October 2022



## The Open Digital Incubator Initiative

Thomas Christensen  
Secretary General  
Maritime Connectivity Platform Consortium







## The HARMONISED (technical services)

IALA is developing technical services for provisioning of

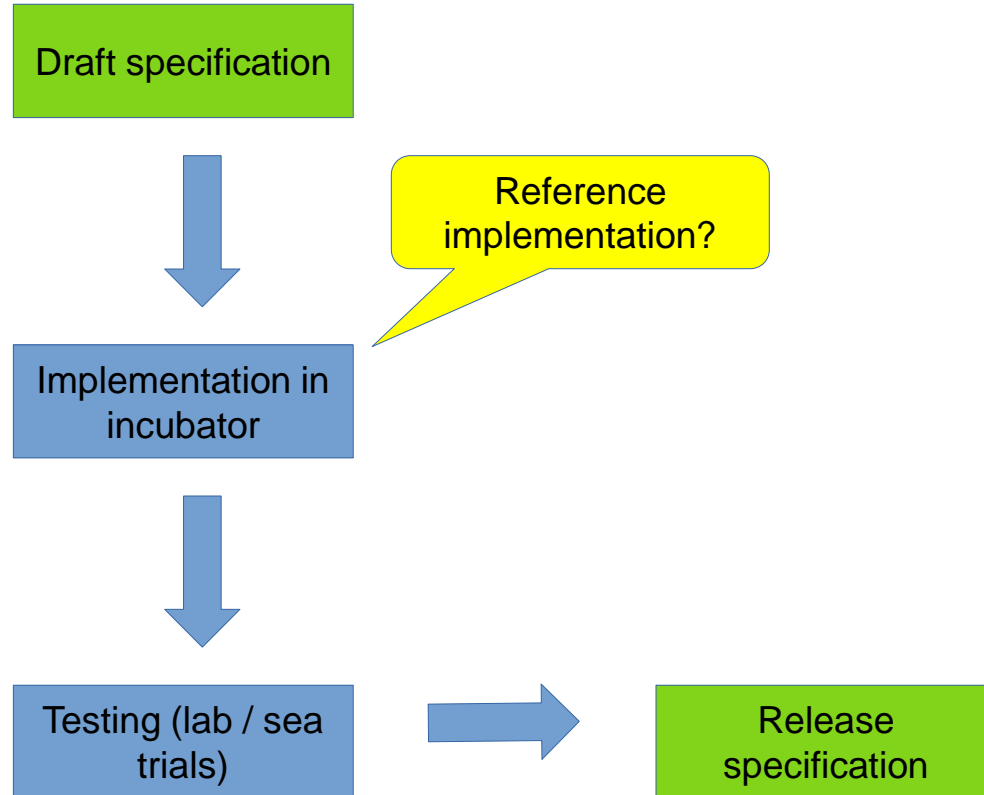
Aids to navigation information (ARM/ENAV)  
Vessel Traffic Service information (VTS/ENAV)

IHO is developing technical services for provisioning of

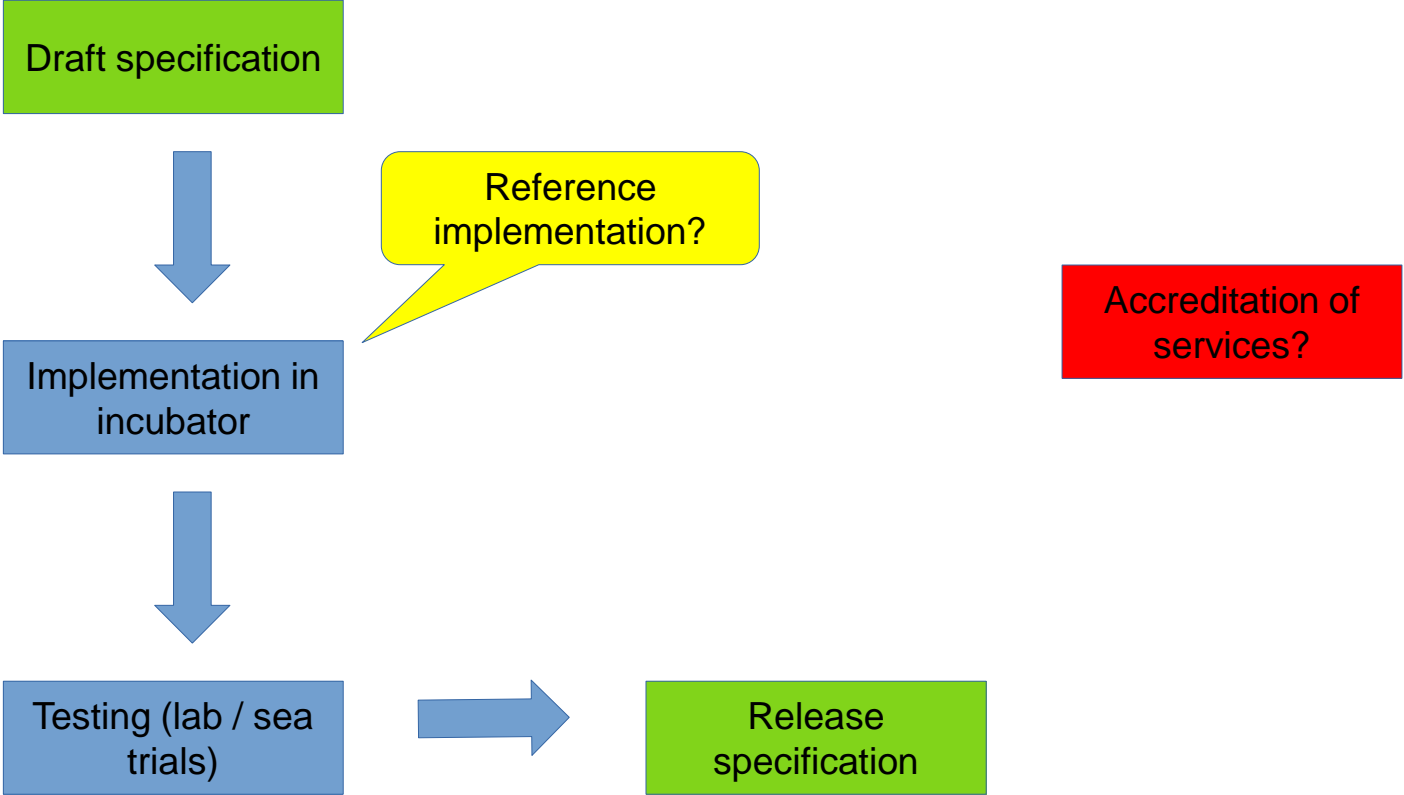
Navigational Warnings

More to come... (including MASS!!!)

# Testing and validation



# Testing and validation



## Key principles

Permanent initiative with dynamic content

Different services will be tested at different times  
requiring different components for testing

Mainly software - which all should be open source

Testing may be done with organisations hosting solutions  
or by requiring open source components

Will be lab tests - and possibly sea trials (GMDRT project)

Results will be submitted to relevant organisations (IALA)

# Open Digital Incubator Initiative

## Partners and current components



General Lighthouse Authorities  
of the United Kingdom and Ireland  
Research and Development

Njord  
Open source application for provisioning  
AtoN services  
and MCP demonstrator

Canadian  
Coast  
Guard



Njord  
Open source application for provisioning  
Navigational Warnings



**Fintraffic**

Develop VTS services  
Platform TBD

# Open Digital Incubator Initiative

## Partners and current components



German Aerospace Center

EPD (Enavigation Prototype Display)  
Bridge system that will be able to consume  
various services being developed



Korean Research Institute of  
Ships and Ocean Engineering

MCP demonstrator  
GMDRT (Global Maritime Digital Route  
Transition) coordinator

Web page with

Information

Results

Link to open source

[digitalincubator.maritimeconnectivity.net](https://digitalincubator.maritimeconnectivity.net)

[di.maritimeconnectivity.net](https://di.maritimeconnectivity.net)

YOU ARE WELCOME TO JOIN



## 7) Presentation on VDES & MMS

- Presentation on VDES & MMS by Stefan Pielmeier (Sternula)
- (PDF with slides can be found after the last Navelink presentation slide)

## 8) Closing remarks

- Next Developer Forum we will discuss:
  - How can VDES be used together with existing services in Navelink?
- Remember to renew your certificates!
- Next Developer Forum at 15/12-2022

# Meeting notes

- The participants were asked to check their certificates and see if they need to renew any
- If you have any feedback about how to handle the two G1128 formats, please send it to us at [info@navelink.org](mailto:info@navelink.org)
- If any of you have any feedback about the MRN pattern changes, please send it to us at [info@navelink.org](mailto:info@navelink.org)
  - A proposal was lifted regarding doing a proper specification on the "device type" if that is the reason for the change
  - A document with the reasoning of the change will be released by MCC
- Thomas Christiansen (MCC) gave a presentation on digital incubation
  - The services during test is primarily registered in MCP service registry
  - Digital incubator is working on implementing the services
  - Testbed/test framework to experiment with these services
- Stefan Pielmeier (Sternula) gave a presentation on VDES and MMS
  - VDES Alliance, [VDES Alliance – Making VDES Happen \(vdes-alliance.org\)](http://vdes-alliance.org)
  - AIS2.0 -- VDES is:
    - Described by IALA G1117 (new version in December 2022)
    - Expected to be included into IMO SOLAS IV and V during the next 24 months
  - It is not just any technology but something that will probably be on every ship in about 10-20 years as it can be used to reach every ship, even those without internet (which is the purpose it was intentionally created for)
  - First Sternula satellite scheduled to be active to use in 2023 with plan to have 5 in 2025, 10 in 2027 and 70-120 in 2029
- Next developer forum at 15/12-2022



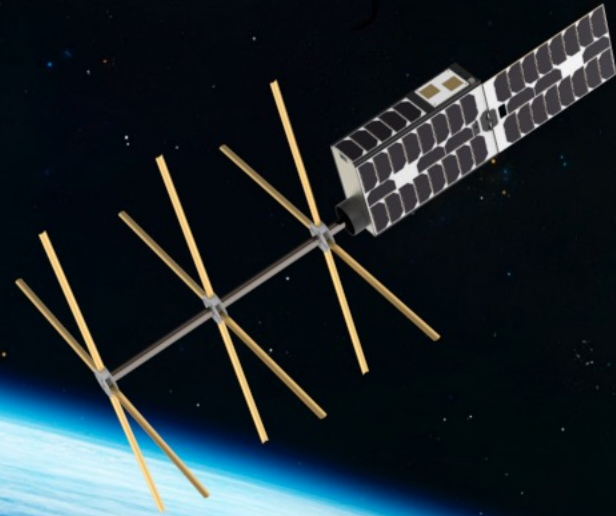
**NAVELINK**

[Navelink.org](https://navelink.org)



# sternula

Connecting the Oceans



providing

# worldwide AIS 2.0

Stefan Pielmeier, [stefan@sternula.com](mailto:stefan@sternula.com)



# About Sternula

## World leader in AIS 2.0

- **Stefan Pielmeier** is CTO and
  - VDES workgroup chairman at IALA
  - Chairman of the VDES Alliance
  - Representing DK at IEC, ITU, IMO
  - having a team of 8 in R&D/operations
- **Lars Moltzen** is CEO and
  - experienced founder of SMVs
  - finding funding and customers
  - having a team of 4 in Sales/Marketing



# AIS2.0 = user\_friendly(VDES)

Where VDES is including (see ITU-R M.2092-1):

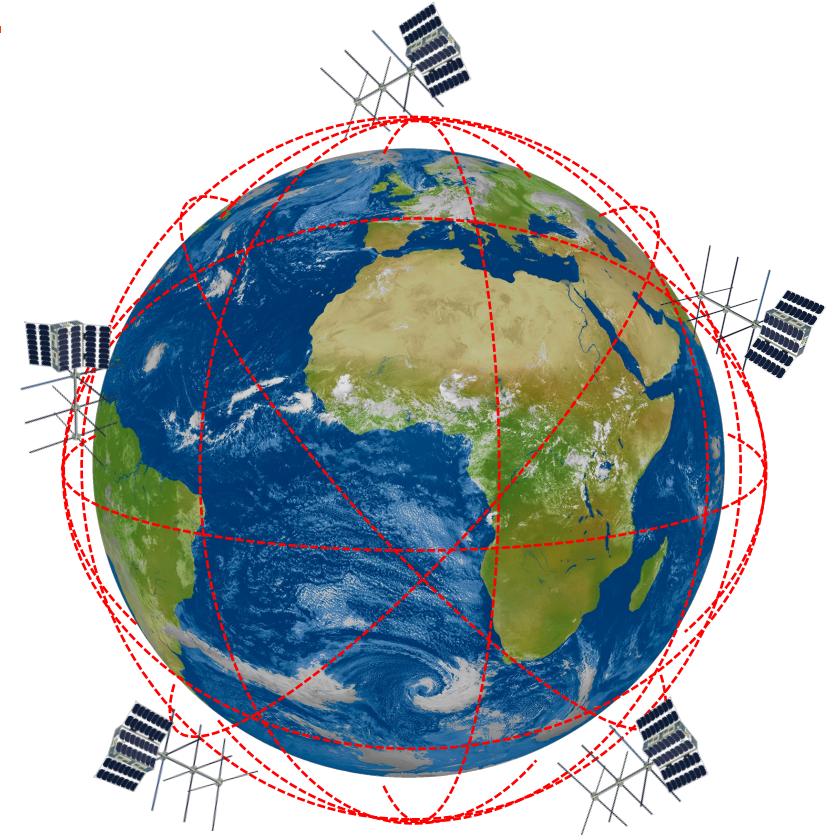
- AIS (1.0 the good old, according to ITU-R M.1371)
- ASM (2 new channels, 19200 bit/s): for small messages, terrestrial and Sat. UL only
- VDE-TER (terrestrial VDE, 200kHz bandwidth): ship-ship, ship-shore, shore-ship
- VDE-SAT (satellite VDE, 100kHz exclusive, 300kHz total): ship-sat, sat-ship

# Our VDE-SAT network

## AIS 2.0 (VDES) is

- described by IALA G1117
- recommended by ITU-R M.2092-1
- expected to be included into IMO SOLAS IV and V during next 24 months\*
- getting a test standard at IEC
- seamless integrated SAT, TER, Adhoc

\*: see IMO MSC105&106 reports at docs.imo.org



\*\* : rounded datarates for one satellite covered area; UL and DL for all aggregated users; from 'net' bitrates in ITU-R M.2092-1 Tables 9-11

\*\*\* : latitudes arctic/equatorial



# Digital Services over VDE-SAT

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Sternula solution:

- using (VDE-TER and) VDE-SAT for transport of
- S100 over MMTP (NCSR9:S-100 in ECDIS 2026-2029)
- signed/authenticated by MIR certificates
- optionally encrypted by MIR public keys
- discovered by MSR

VDE-SAT will only deliver selected services:

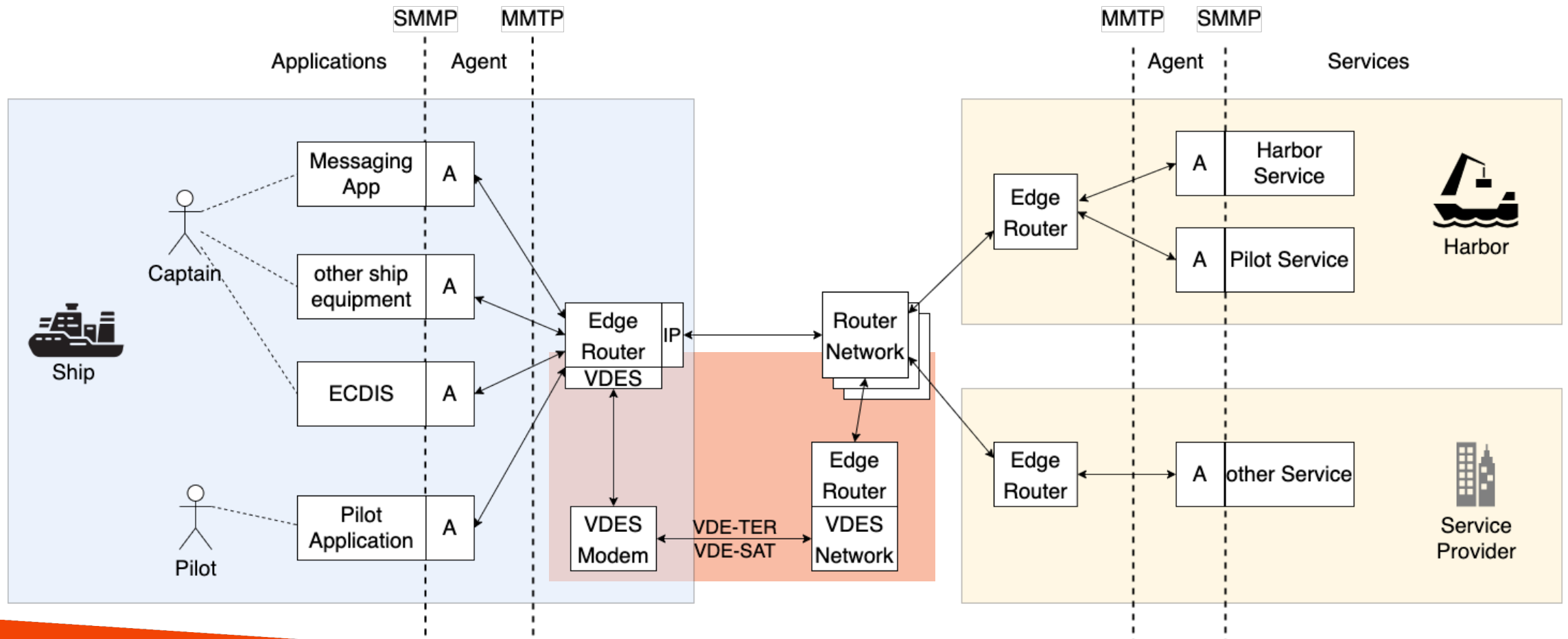
- communicated to the MMS Edge Routers (subset of MSR)

# MMS Strategy

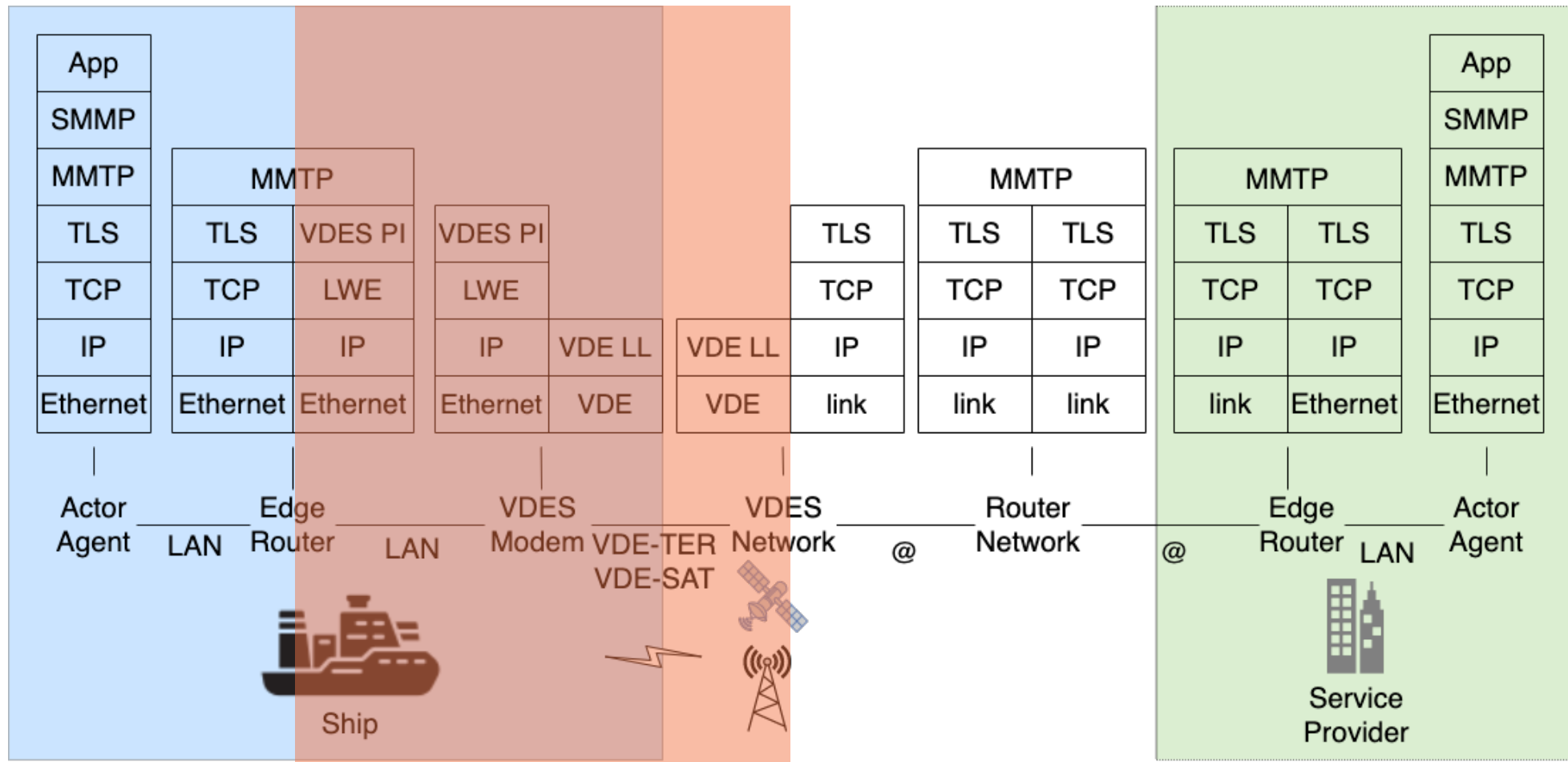
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- 2023 Developed at MCC:MMS working group
- 2024 adopted by RTCM (Stefan is chair for the activity)
- 2024/5 to be recognized by SOLAS
- 2024/5 to be referred to by the IEC:ECDIS standards
- as an alternative to SECOM, or better:
- to be referred or integrated into the IEC:SECOM standard as an alternative method of transport

# MMS/VDES



# MMS/VDES

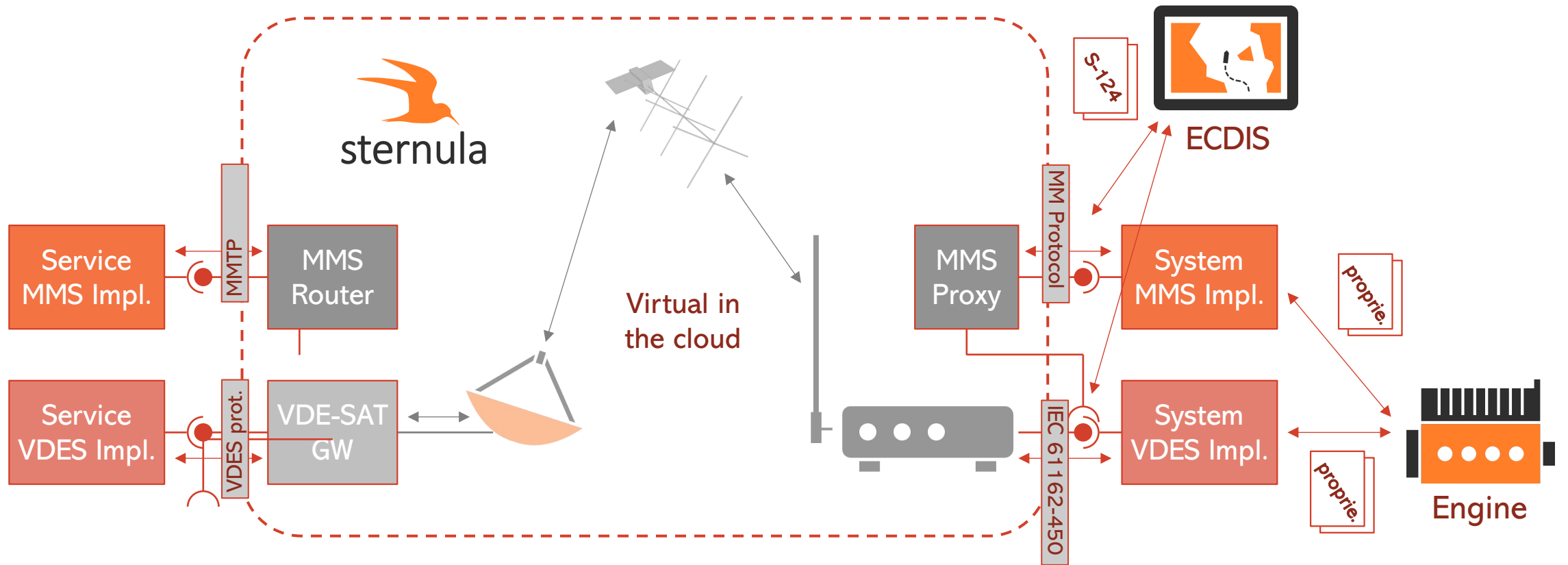


# Market introduction

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- Now: virtual test platform
- 2022-12-18: Launch of Sternula-1 satellite
- 2022-02-18: LEOP finished, VDE-SAT operational
  - with SAAB R6 ship terminal (UL up to 40kbps/terminal, DL: 95kbps total cell DL)
  - with MMS Edge Router (“Sternula MMS Proxy”)
  - with PC as user terminal
    - Ice charts
    - Weather bulletin
    - Weather on route (on demand service)
    - GREENPOS reporting (4 times a day)
    - virtual AtoN with SAAB R6
- 2022-03-01: worldwide AIS2.0 demo starts with ~30 vessels worldwide to receive and transmit to Sternula-1
- => commercial AIS 2.0 available

# Virtual Test Platform



Service provider

Sternula VDE-SAT Network

Onboard the ship

Order at <https://www.sternula.com/index.php/product-vdes-testplatform>