# S-100 Data Services with IEC 63173-2 (SECOM)

IHO S-100 WG8

Julius Moeller

Maritime Services

- ## Public…
  - Vessel Traffic Services
  - Navigational Warnings
  - Meteorological information
  - Search and Rescue
  - …

- ## … and commercial services
  - Voyage Planning
  - Nautical Charts Delivery
 - Fleet Monitoring
  - Port Services (e. g. tug planning)
  - …

https://commons.wikimedia.org/wiki/File:Just_in_Time_(27689036171).jpg
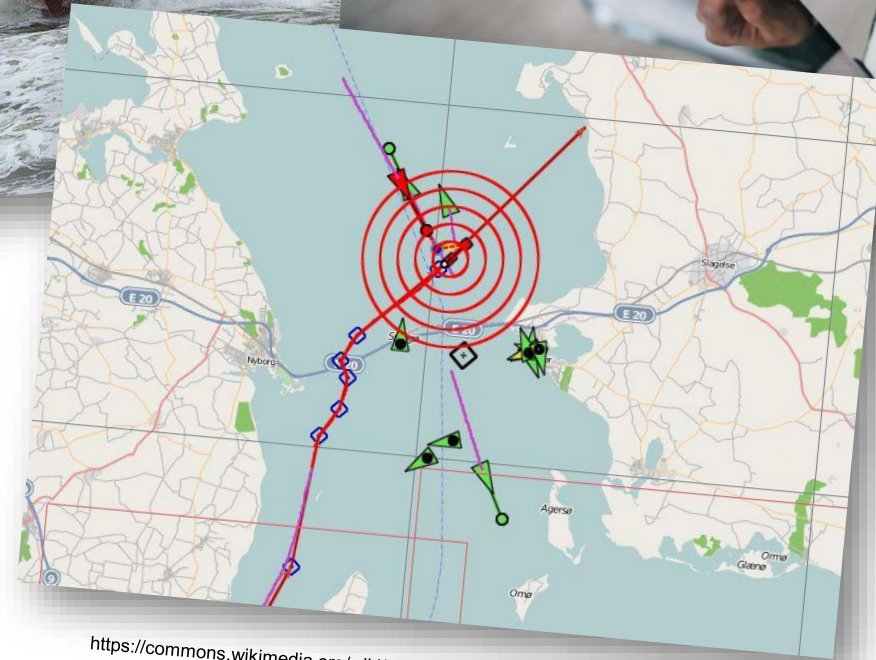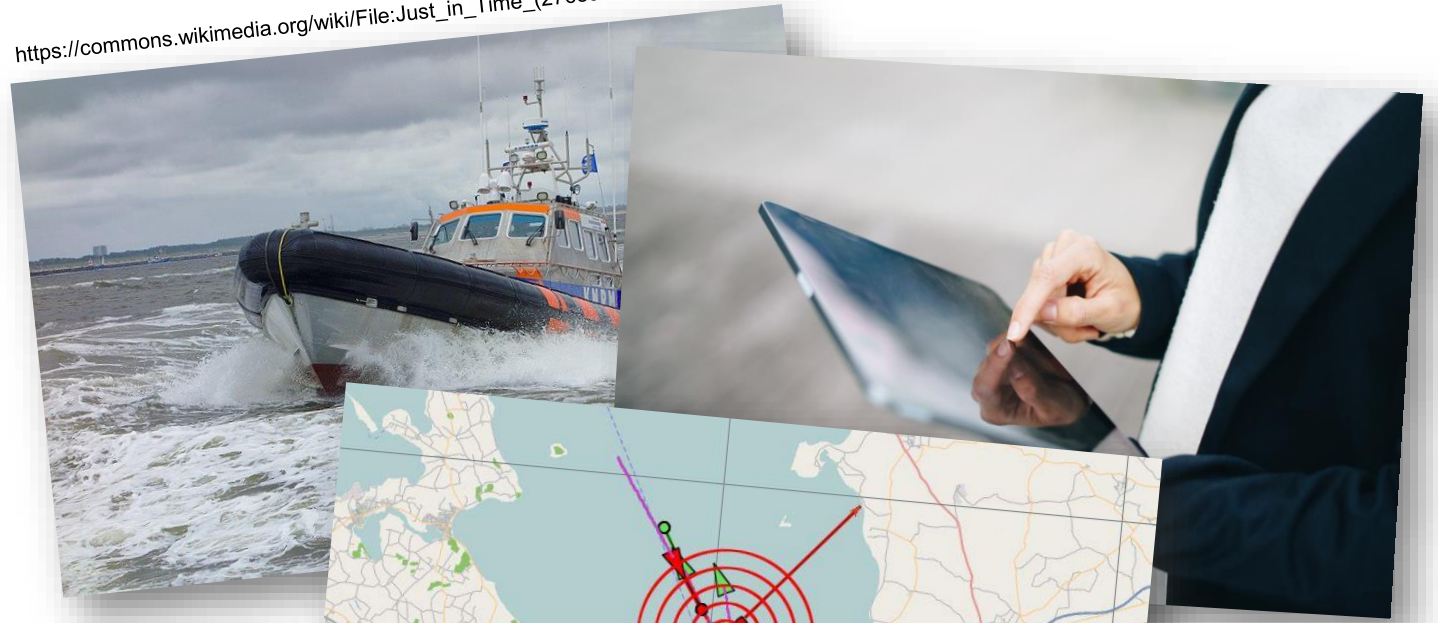
https://commons.wikimedia.org/wiki/File:AIS_targets_(OpenCPN).JPG

Maritime Service Levels

Coordination of services in three levels:

- **Maritime Services**: Define purpose, operational approach, user needs, provided information and relation to other services.

- **Technical Services**: Describe set of technical solutions including data model and communications means to provide a Maritime Service.

- **Data Models**: Harmonise the representation of information in data.

> **Data production is the first step, but we also need next-generation digital services for the provision of the data!**
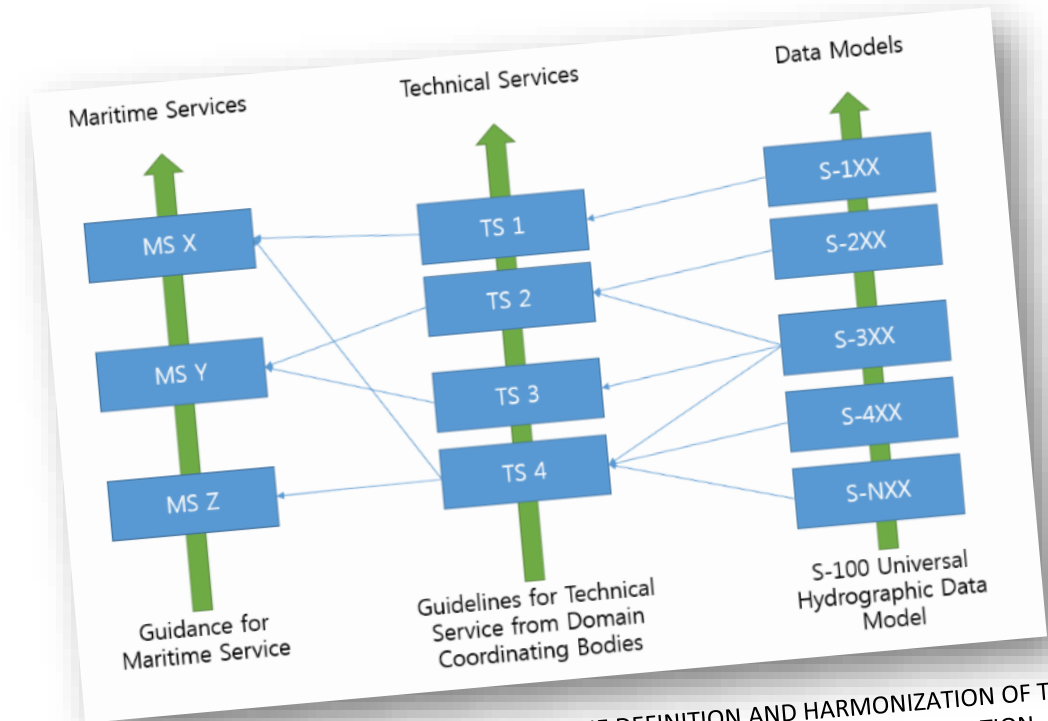
From: IMO MSC.467(101) - GUIDANCE ON THE DEFINITION AND HARMONIZATION OF THE FORMAT AND STRUCTURE OF MARITIME SERVICES IN THE CONTEXT OF E-NAVIGATION

IMO's ECDIS performance standard

At NCSR 10, the following amendment to IMO's ECDIS performance standard was proposed:
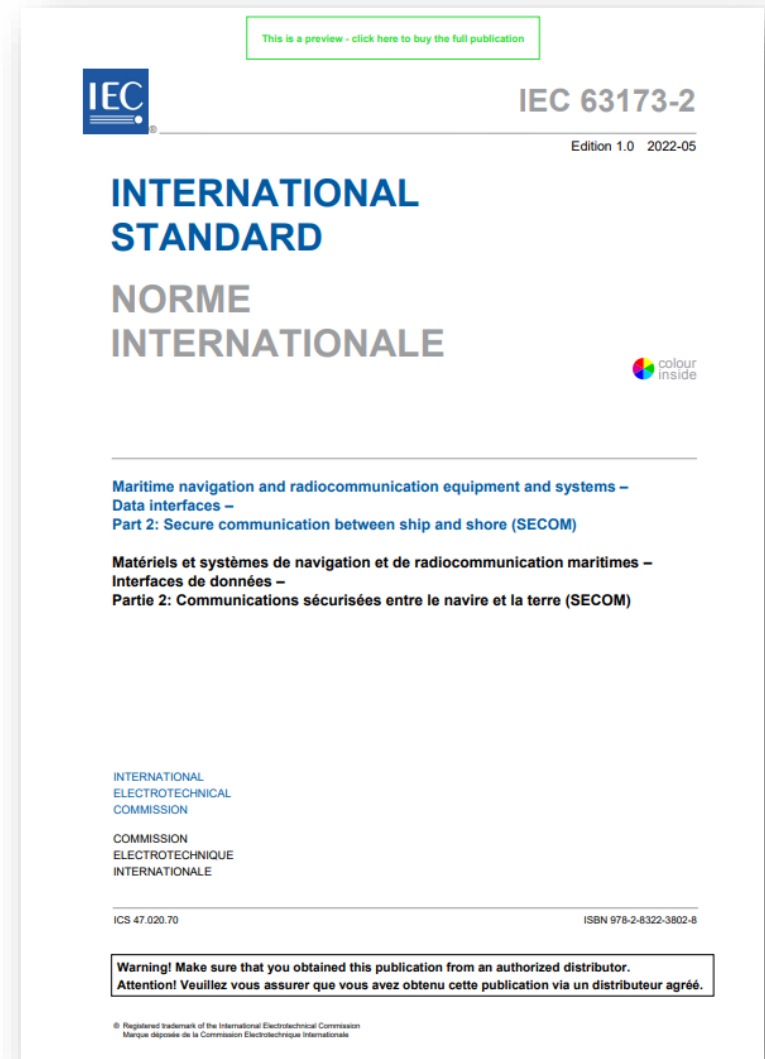
*"11.3.4 It should be possible to exchange, send and receive, both selected and alternative route plans with shore-based maritime service providers. The exchange should be in accordance with standard formats for route plan exchange[8] **and should use standard service interfaces including information security protection[9]** to allow for secure machine-machine communication."*
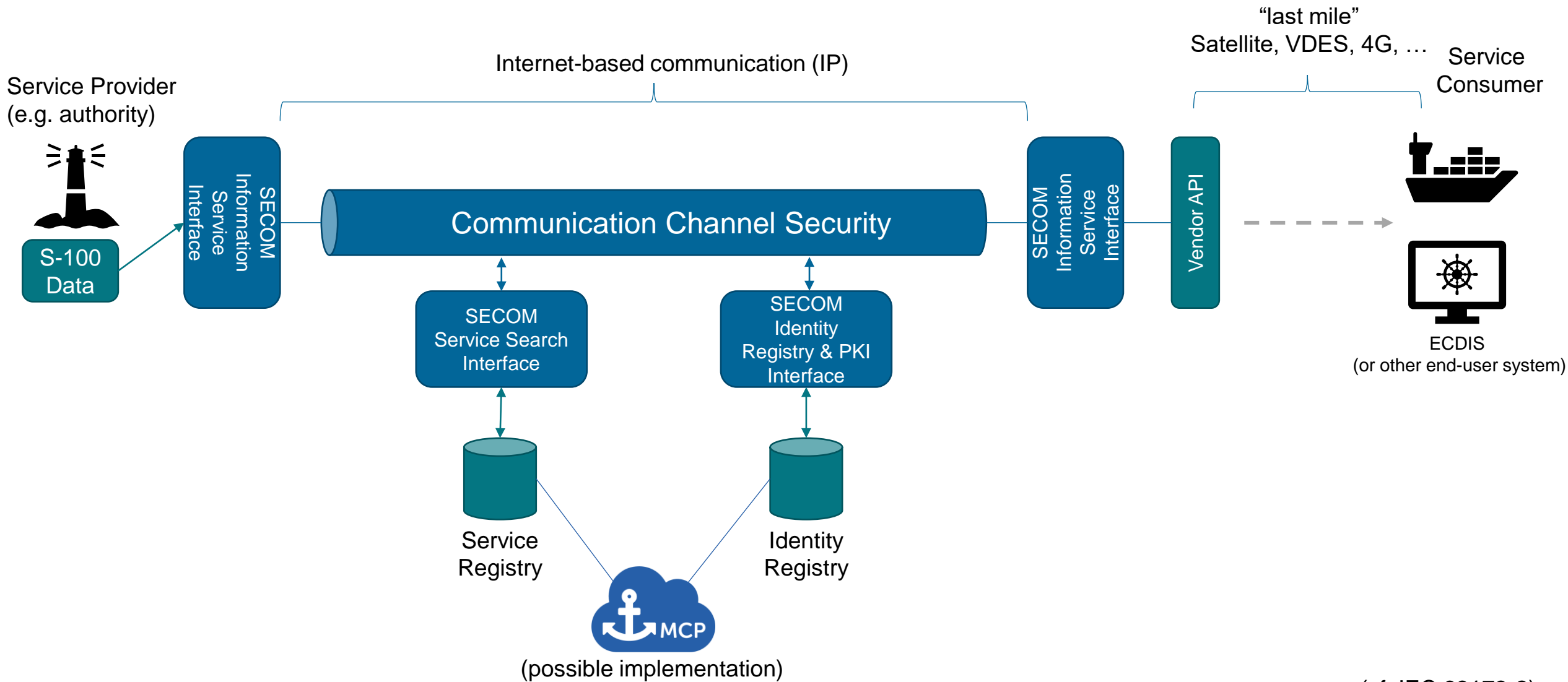
[8] IEC 61174/IEC 63173-1.

[9] IEC 63173-2 (Maritime navigation and radiocommunication equipment and systems - Data interfaces - Part 2: Secure communication between ship and shore (SECOM))

What is SECOM (IEC 63173-2)?

- SECOM provides standards for secure data exchange with technical services.

- It contains a technical service interface design that is in accordance with guidelines and templates from IALA and partly included in S-100.

- This includes data protection measures, formal API specifications, and interfaces for service discoverability.

- It supports all S-100 based data models (not only route exchange).

- The goal is to facilitate interoperability and reduce the need to support many different service designs.

- Interfaces for digital identity management is also implemented with the help of a Public-Key Infrastructure (SECOM PKI)
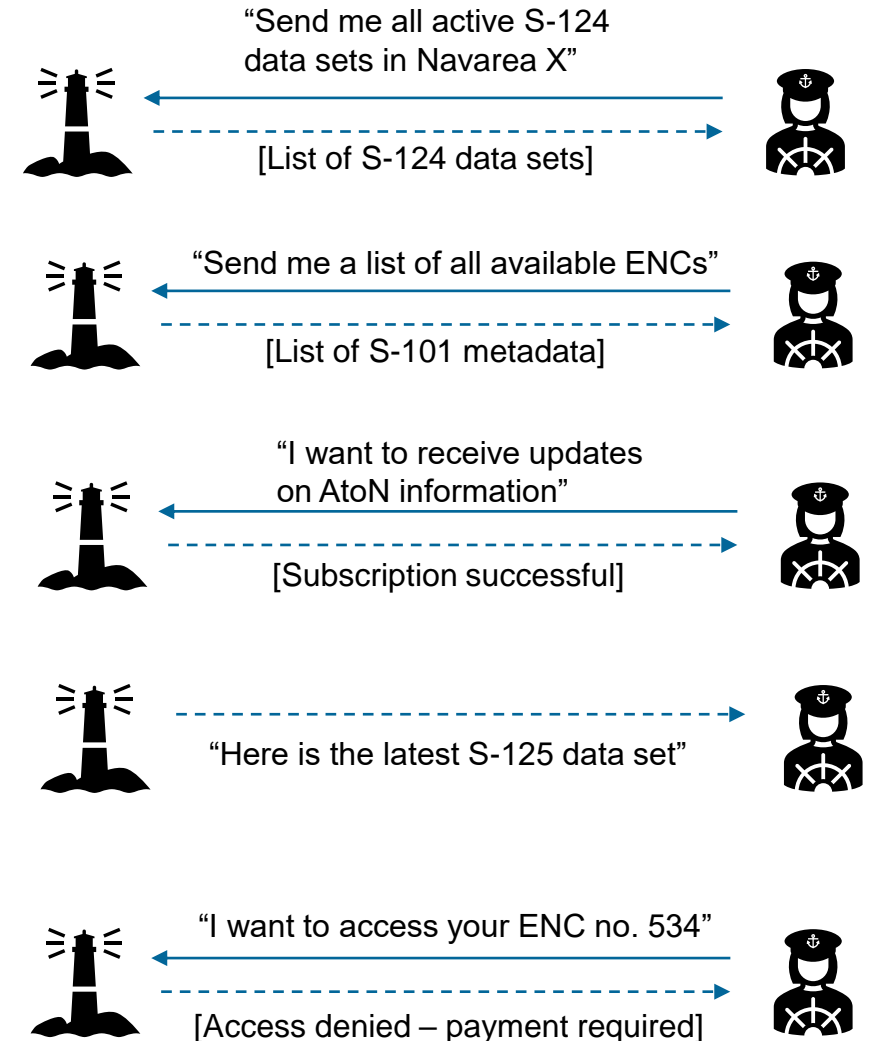

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IEC 63173-2

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Maritime navigation and radiocommunication equipment and systems –
Data interfaces –
Part 2: Secure communication between ship and shore (SECOM)

Matériels et systèmes de navigation et de radiocommunication maritimes –
Interfaces de données –
Partie 2: Communications sécurisées entre le navire et la terre (SECOM)

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SECOM Architecture

Service Provider
(e.g. authority)

S-100 Data

SECOM Information Service Interface

Internet-based communication (IP)

Communication Channel Security

SECOM Service Search Interface

SECOM Identity Registry & PKI Interface

Service Registry

Identity Registry

MCP

(possible implementation)

SECOM Information Service Interface

Vendor API

"last mile"
Satellite, VDES, 4G, …

Service Consumer

ECDIS
(or other end-user system)

(cf. IEC 63173-2)

SECOM Communication Patterns

- **Get** – Returns S-100 data based on filter criteria (such as geometry, validity period or identifier)

- **Get summary** – Returns a list of available S-100 data sets provided by a Service

- **Subscribe** – Creates a subscription to receive updates of S-100 data products (based on filter criteria)

- **Upload** – Can be used to push information to a SECOM entity.

- **Access management** – Used to provide data services only to authorised service consumer (e.g., after payment)

"Send me all active S-124 data sets in Navarea X"

[List of S-124 data sets]

"Send me a list of all available ENCs"

[List of S-101 metadata]

"I want to receive updates on AtoN information"

[Subscription successful]

"Here is the latest S-125 data set"

"I want to access your ENC no. 534"

[Access denied – payment required]

# Service Specification (Example for S-124)

Excerpts from the technical service specification for the NW-service, based on G1128, G1157 and IEC SECOM.

Benefits

- Secure and efficient way of delivering S-XXX data products directly to the ECDIS.

- Automates the download and import of new data (normally done manually by the mariner).

- Enables the ECDIS to implement real-time data services through subscription.

- Global interoperability: A SECOM-compliant ECDIS can automatically find and query necessary data sets (from various authorities or service providers) along an international route.

- Based on common web-technologies: Data services can be integrated into other applications easily (e.g., web apps, mobile apps, PPUs, etc.)
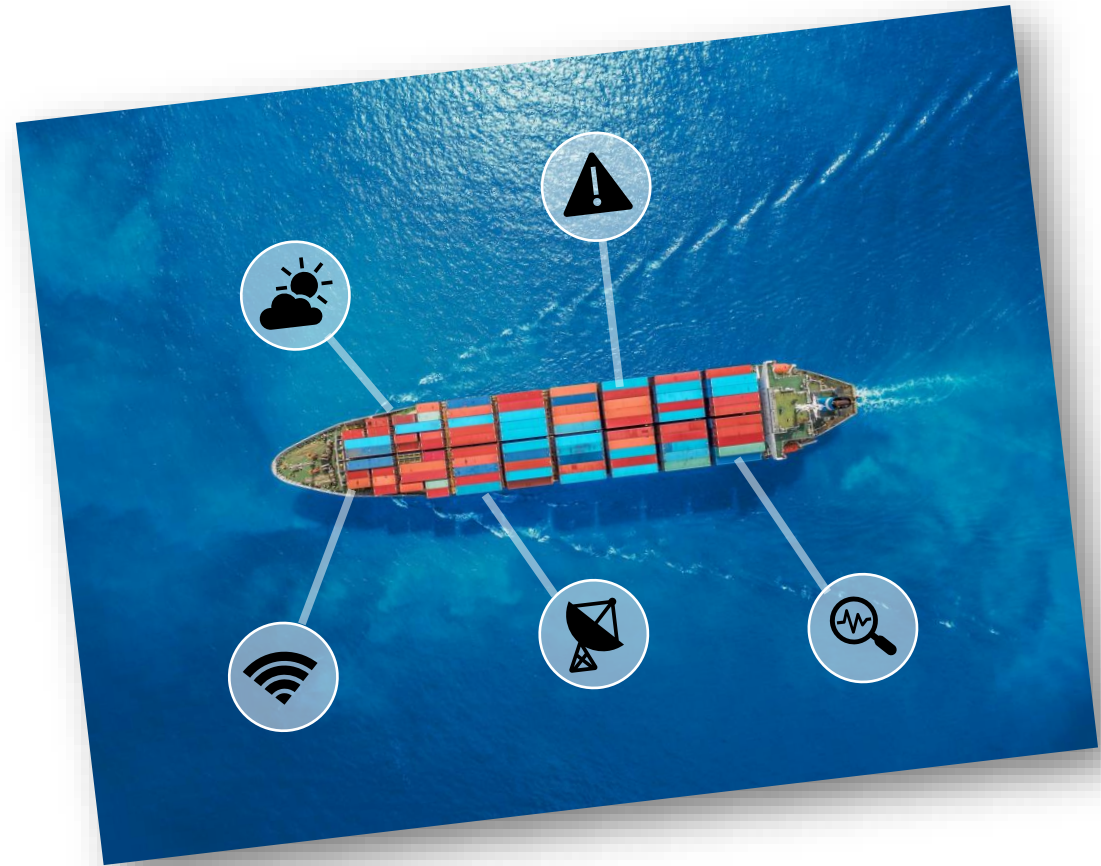
Implementation and Testing of SECOM

- Open-Source Implementation [available](#) (Java) provided by General Lighthouse Authorities (UK/Ireland)

- Implementation of a SECOM trial service for S-124 Navigational Warnings in Australia

- Other authorities have started to trial SECOM services as well.

- [Open Digital Incubator Initiative](#) discusses/coordinates the implementation and development of technical service specifications for maritime services in the context of e-Navigation.

Insights:

- Proper implementation of SECOM service requires an Identity Registry and Service Registry (as provided by the Maritime Connectivity Platform)

- Implementation is straight forward and easy to test (due to the utilisation of well-established web-technologies)

- In theory, SECOM services might be compatible with other communication technologies, such as VDES. However, work needs to be done to achieve interoperability.

Demonstration

Thank you for your attention!

Questions?

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