



IEC report of IHO S-100 related items

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INTERNATIONAL
ELECTROTECHNICAL
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IEC report of IHO S-100 related items

Topics:

- IEC 63173
S-421: Route Plan based on S-100
- IEC 63173-2
Secure Communication (SECOM)

IEC 63173

S-421: Route Plan based on S-100

- Current work is focused on the use cases
- More government organizations have joined with their specific use cases.
- The object model of the Route Plan reflects the needs of the use cases
- Current list of uses cases:
 1. **Route cross check:** Ship sends route for check by shore, for example by VTS
 2. **Flow management:** Shore, for example VTS, organizes the schedules of ships for fluent sailing
 3. **Enhanced monitoring:** Shore, for example VTS, monitors sailing of the ship against the route plan
 4. **Ice navigation:** Traffic management for ice covered areas provides routes for ships

IEC 63173

S-421: Route Plan based on S-100

Current list of uses cases:

5. **Under keel clearance management:** This operates together with S-129
6. **Fleet route planning:** A tool for shipowner to manage fleet
7. **Chart management:** Chart seller provides charts based on the route plan
8. **Route optimization:** Ship uses 3rd party service to optimize route plan
9. **Port call synchronization:** Ship participates in port call optimization or just in time arrival scheme
10. **Reference route:** Shore provide reference route to sail for example from a pilot point to port
11. **Search and rescue:** MRCC instruct ships about SAR sailing patterns

IEC 63173

S-421: Route Plan based on S-100

- The planned target of publishing was Apr 2021, but the process is behind the schedule. The forecasted publishing is **second half of 2021**
- Latest version available is a Committee Draft (CD), IEC TC80/948/CD
- Next meeting of the related IEC workgroup (IEC TC80/WG17) is 23rd – 26th June 2020

IEC 63173-2 SECOM

- Background is the e-Navigation testbed “**STM validation project**”
 - about 400 real ships and multiple VTS/Ports.
- SECOM is intended to be a gap-filler to provide standardized communication infrastructure between shore and ships for transfer of files related to the e-Navigation
 - Majority of such files will be based on IHO S-100
 - Infrastructure is in principle capable to transfer any anonymous file
 - Excluded is services which need data streaming and which cannot be converted as a series of separate data files

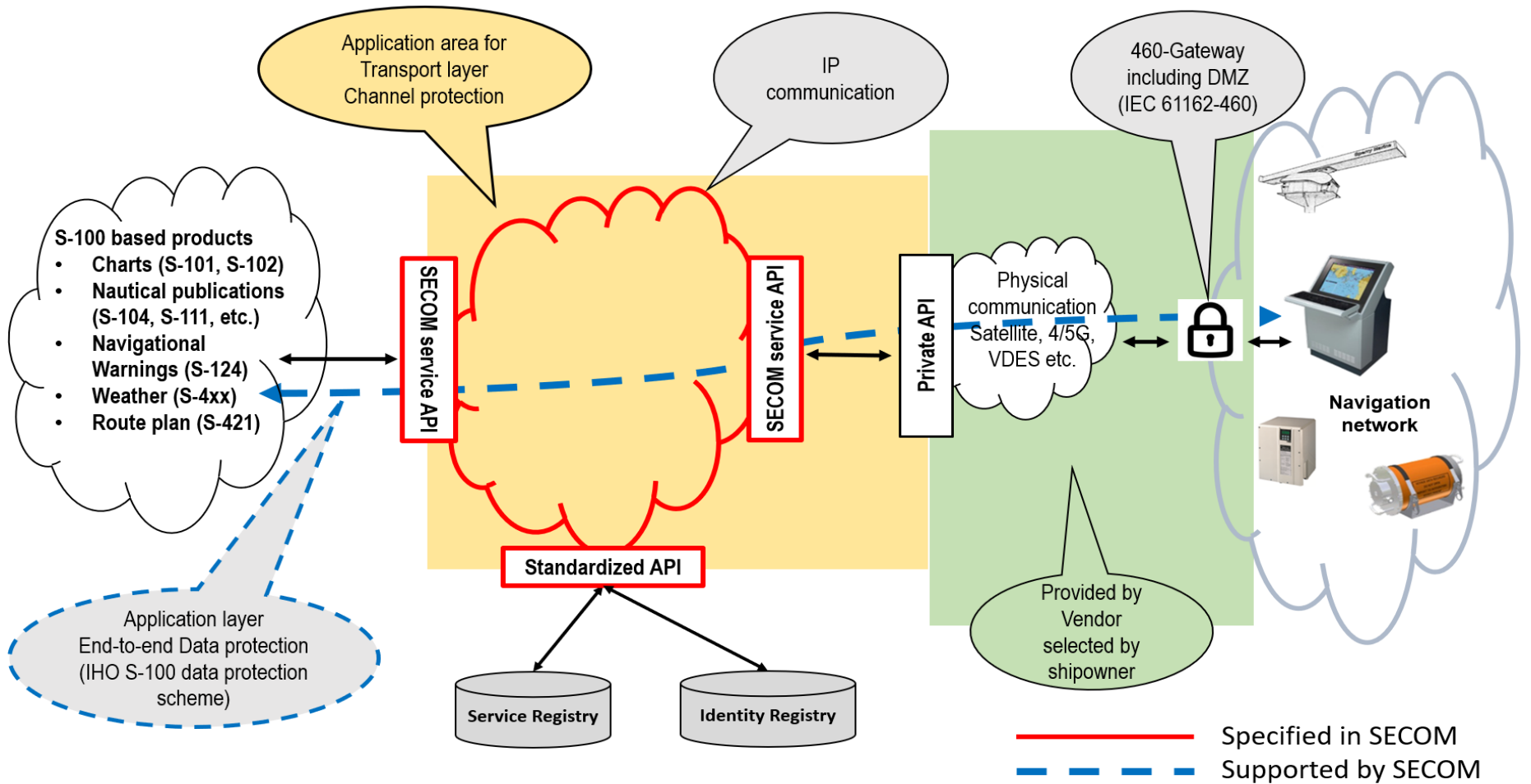
IEC 63173-2 SECOM

- Latest version available is a Committee Draft (CD), IEC TC80/956/CD
- Planned publication as international standard is summer of 2022

IEC 63173-2 SECOM

- Cyber security
 - **Authentication & Integrity check**
 - **End-to-end principle** (from original source end user)
 - **Digital signature** based on IHO S-100 Part 15
 - SECOM facilitates “**key management = SECOM PKI**” for actors like a ship, a VTS centre, etc. which cannot use the “IHO private key” to create the digital signature
 - **Confidentiality** (encryption)
 - If applicable, priority on IHO S-100 Part 15
 - **Alternative standardized method** for those who cannot use IHO S-100 Part 15 method
 - Standardized encryption & decryption algorithm
 - “encryption key management” facilitated by SECOM (Diffie-Hellman exchange principle using SECOM PKI)
 - **Transport layer protection** used for enhanced cyber security for the **internal messages within SECOM** (for example key management)

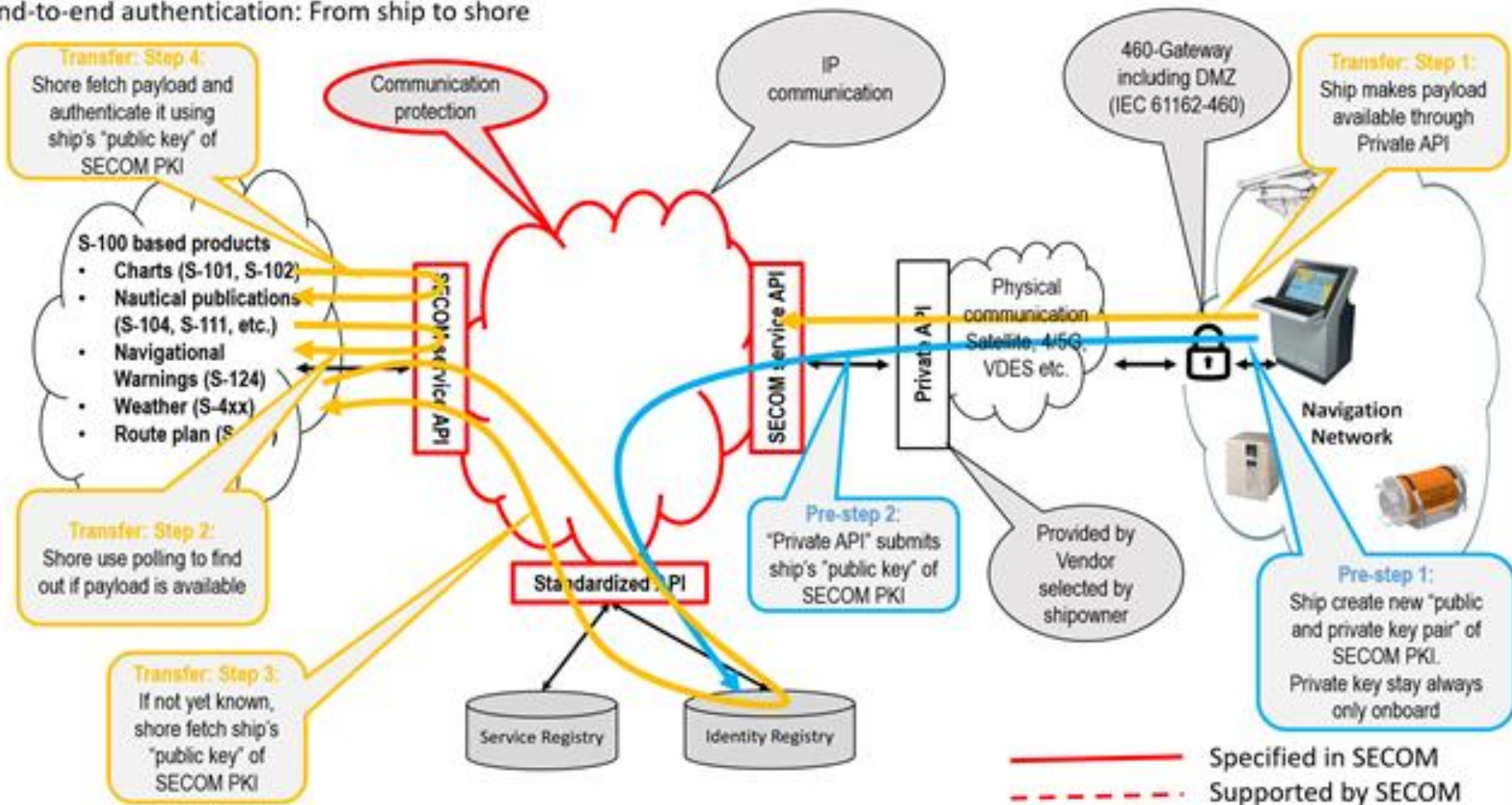
IEC 63173-2 SECOM



High level description of IEC 63173-2

IEC 63173-2 SECOM

End-to-end authentication: From ship to shore



Example of transfer from ship to shore



Thank you

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