CISE Standardisation at ETSI and IoT Interoperability

Presented by:

Hugo Pinto (Inovaworks, CEO)
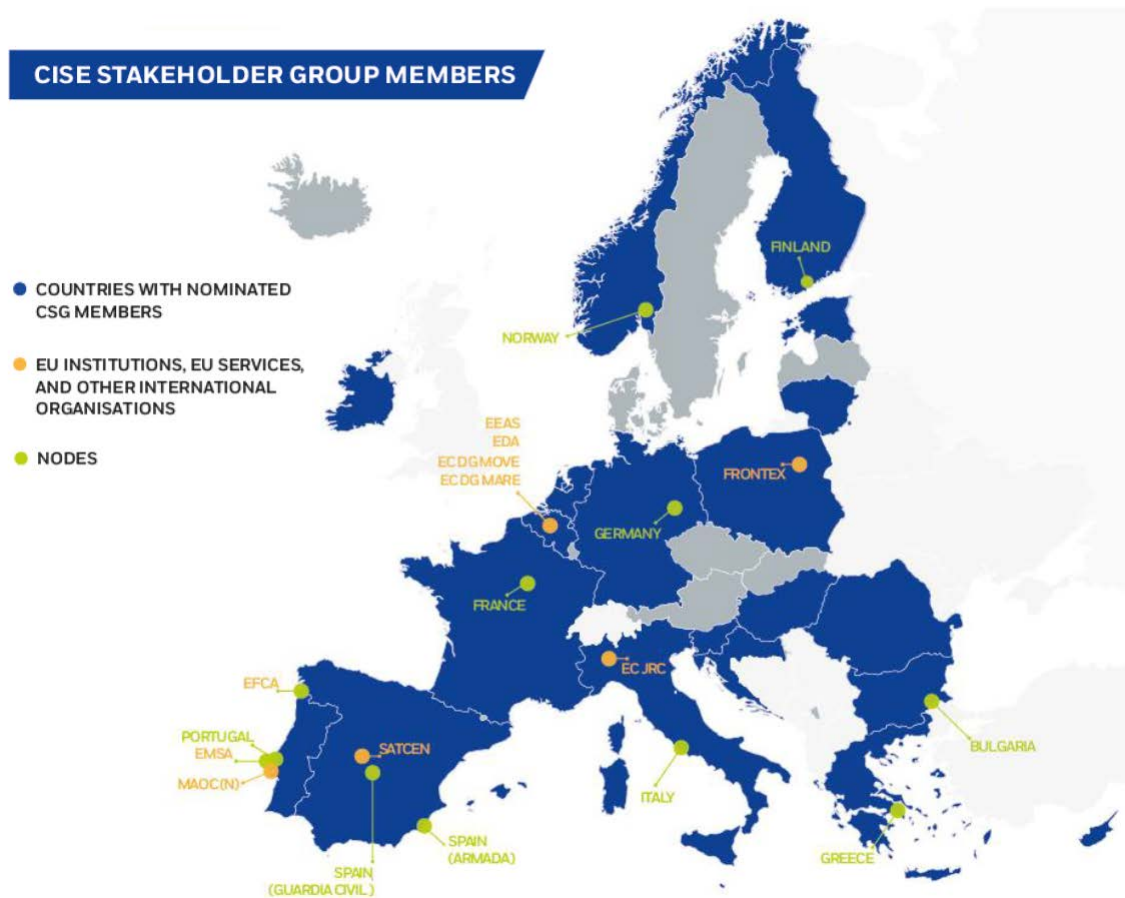
ETSI IoT Conference

4-5-6 July 2023

Agenda

- CISE Standardisation - History and Methodology

- ISG CDM Part 1; 2019-2021: Standardising CISE Data and Service Model

- ISG CDM Part 2; 2021-2023: Update and domain extension

- ISG CDM Current State of Play

- CISE-TP – Test and Validation environment

- CISE Standardisation – way ahead?

2

CISE in Europe

- The Common Information Sharing Environment CISE was initiated by the Commission as a vision to enable cross-sectoral and cross-border information exchange amongst all European authorities with competences at sea in order to improve overall maritime situational awareness across European waters to ensure safer, more secure and cleaner seas, and thus to promote the European Blue Economy.
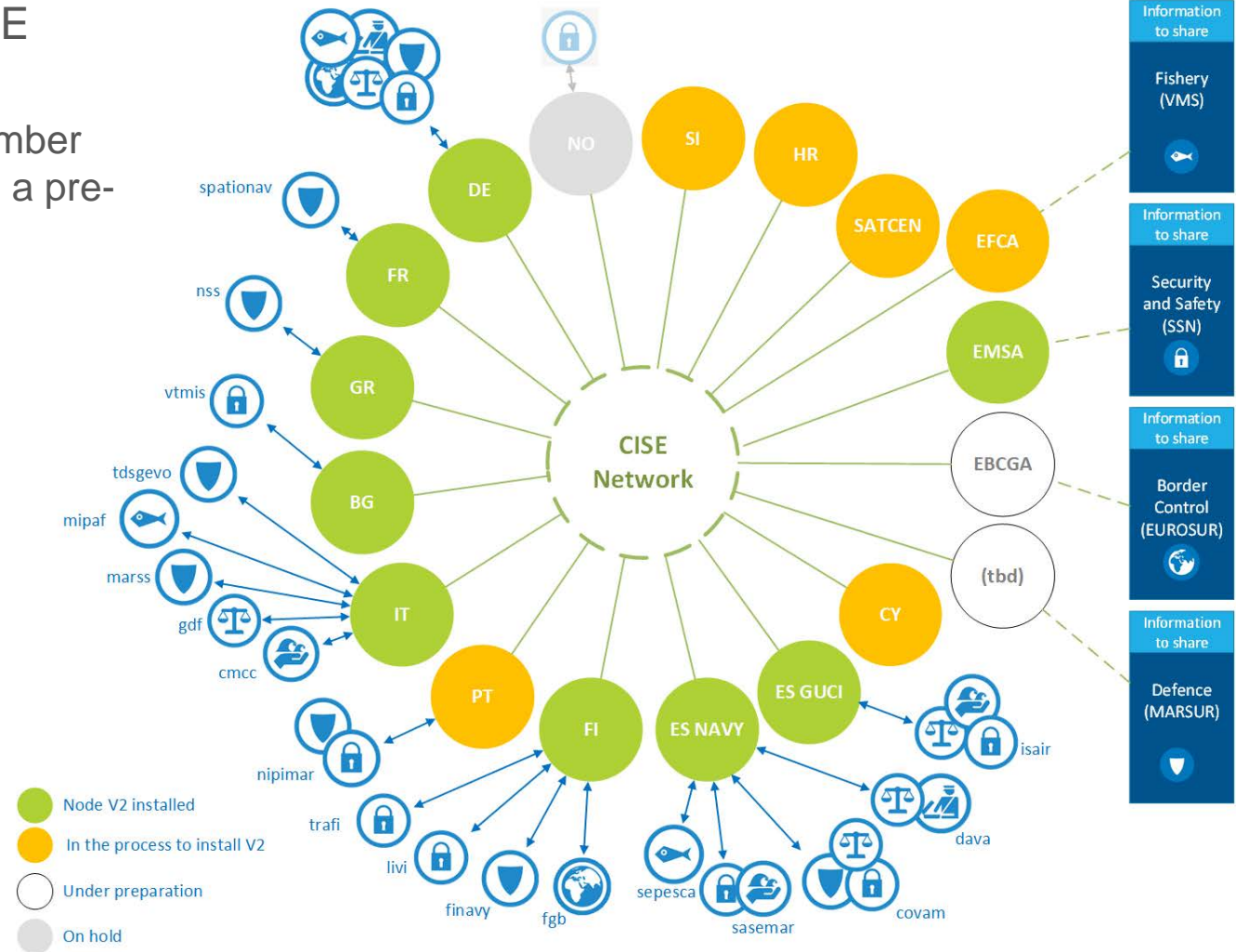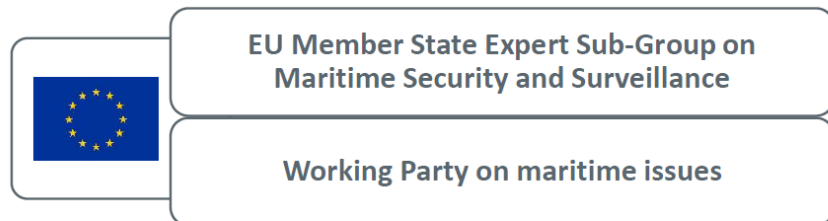
Transitional Phase

- After EUCISE 2020, Transitional Phase to turn CISE operational:
  - At the time being 25 legacy systems from 12 Member States and EU agencies have been connected in a pre-operational CISE network implementation.

Set up by the **European Commission** (DG MARE) → Coordinated by **EMSA** → Executed by the **CISE Stakeholder Group**

Legal and policy framework (Council conclusion 22/7/21)

EU Member State Expert Sub-Group on Maritime Security and Surveillance

Working Party on maritime issues

Legend:
- Node V2 installed
- In the process to install V2
- Under preparation
- On hold

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CSG – State of Play (Sept 2022)

ETSI initiative: the ISG CDM

2017-19

- 2017: EUCISE2020 WP 10 Task: Technical Standardisation Proposal for CISE exploitation
  - «Define new technical standards for the components of CISE, including the protocol stack, the semantic and data model specifications, the core and common services»

April 2019: Terms of Reference (ToR) for ETSI ISG CDM approved by ETSI Director-General (following ETSI Board consultation).

ISG CDM Members:
1) Leonardo SpA;
2) Federal Ministry of Economic Affairs and Energy;
3) Consorzio Nazionale Interuniversitario per le Telecomunicazioni;
4) Finnish Transport and Communications Agency;
5) Italian Ministry of Economic Development;
6) IBM Germany.

ISG CDM Participants
1) Inovaworks Command & Control;
2) Satways Ltd.;
3) LAUREA University.

ISG CDM Counsellors
1) European Joint Research Center;
2) European Maritime Safety Agency.

5

ETSI CDM Scope of Work Items

- **GR CDM001 Use Cases**
  - Describes use cases of interest as the basis for system requirement definition (9 use cases EUCISE2020, 4 use cases ANDROMEDA)
- **GS CDM002 System Requirements**
  - Defines requirements for system architecture, infrastructure (core services), interface (common services) and system performance
- **GS CDM003 Architecture**
  - Defines the infrastructure (network and secure communication, application security, auditing, administration user interface, collaboration tools) and interface (consumer, provider)
- **GS CDM004 Protocol incl. Service Model**
  - Defines a set of semantics to allow end user communication (service model)
- **GS CDM005 Data Model**
  - Describes the data model

ETSI ISG CDM (second term, 2021/23)

- ISG CDM extended (in 2021) for 2 years in order to complete the following tasks:

  - Update the CDM specifications based on the developments of the CISE Transition Phase (Node V2)

  - Include other user communities, e.g. Border Control areas to demonstrate CISE solution capability to be applied outside the maritime domain

  - Request for STF (Specialist Task Force) to support CDM to align standards with CISE Transition Phase and allow for testing (as envisaged by EC Standardization Rolling Plan 2021)
    - Funded and kicked off in December 2022

ISG Standardisation Achievements

Status of the IDG CDM Work Items (and Deliverables)

|	
GR CDM 001 Use Cases Definition - Published	GR CDM 001 Use Cases, Release 2, approved
GS CDM 002 System Requirements – Published	GS CDM 002 System Requirements, Release 2, final draft
GS CDM 003 Architecture – Published	GS CDM 003 Architecture, Release 2, early draft
GS CDM 004 Service Model – Published	GS CDM 004 Service Model, Release 2, early draft
GS CDM 005 Data Model – Published	GS CDM 005 Data Model, Release 2, early draft
GS CDM 006 Test Suite Specs Analysis – Published	GS CDM 007 Test Suite, ongoing

https://www.etsi.org/committee/1584-cdm

The CISE data and Service Model

CISE Data Model

- Designed in the Cooperation Project (2012-2013), maintained by the JRC

- Design principles:
  - Oriented to cross-sector information exchange
  - Independent from sectorial business processes
  - Flexible
  - Extensible

- Interlinked entities with their attributes
  - Vessel, Operational assets, Cargo, Movement, Location, Action, I Anomaly, Risk, Person, Organization, Document, METOC

http://emsa.europa.eu/cise-documentation/cise-data-model-1.5.3/
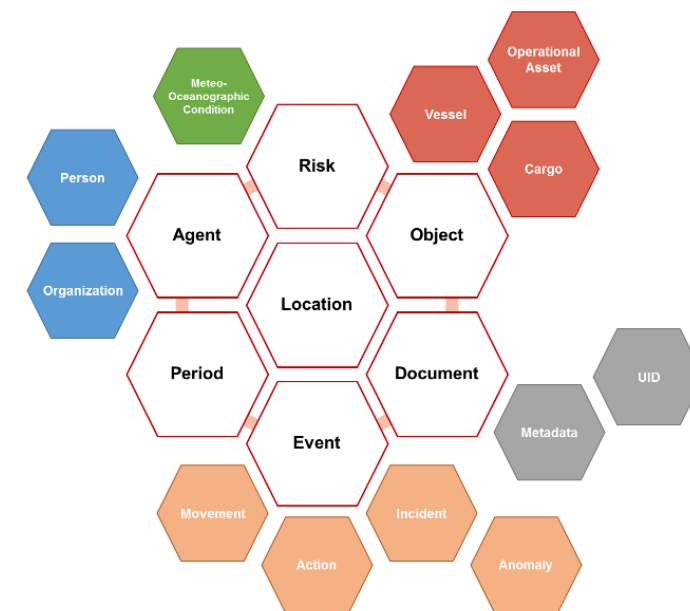
CISE Service Model

- Describes the possible semantics CISE participants can use to exchange data
- Based on 5 Asynchronous RESTful communication patterns
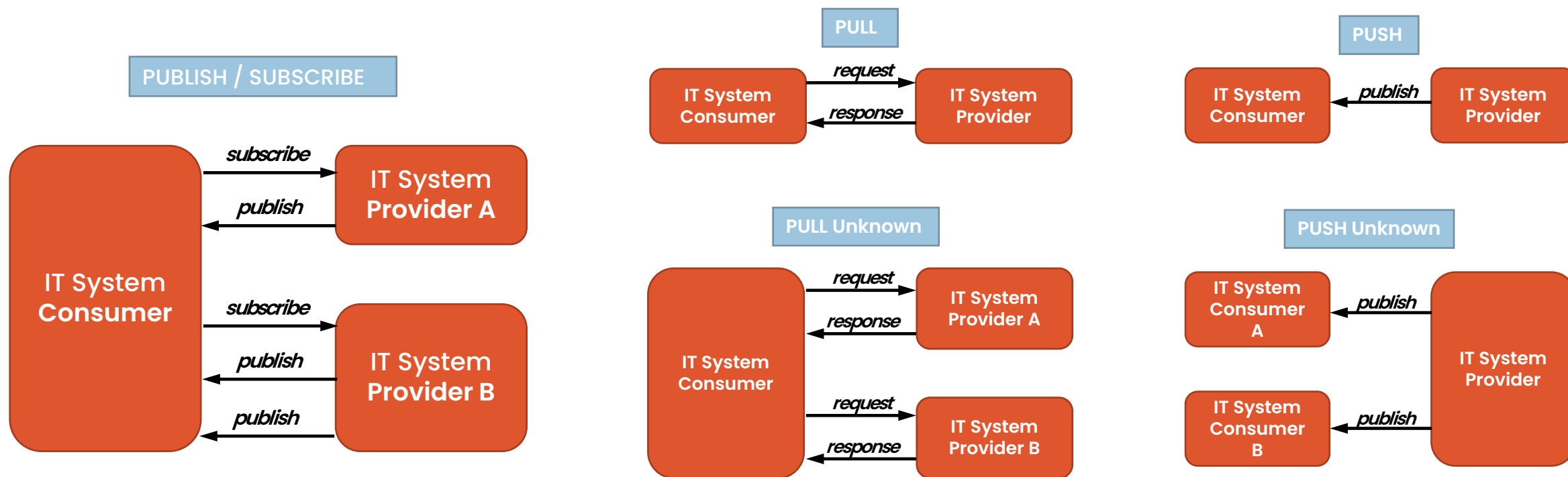
CISE-TP scope and methodology

- Need of a standardized qualification process for nodes and adaptors implementing the standards and developed by industries independently one from another;
- Reference Testing Platform;
- Improving standards:
  - incomplete or omitted specs; requirements not expressly specified; conflicting requirements; incorrect semantics; requirements that cannot be achieved practically.
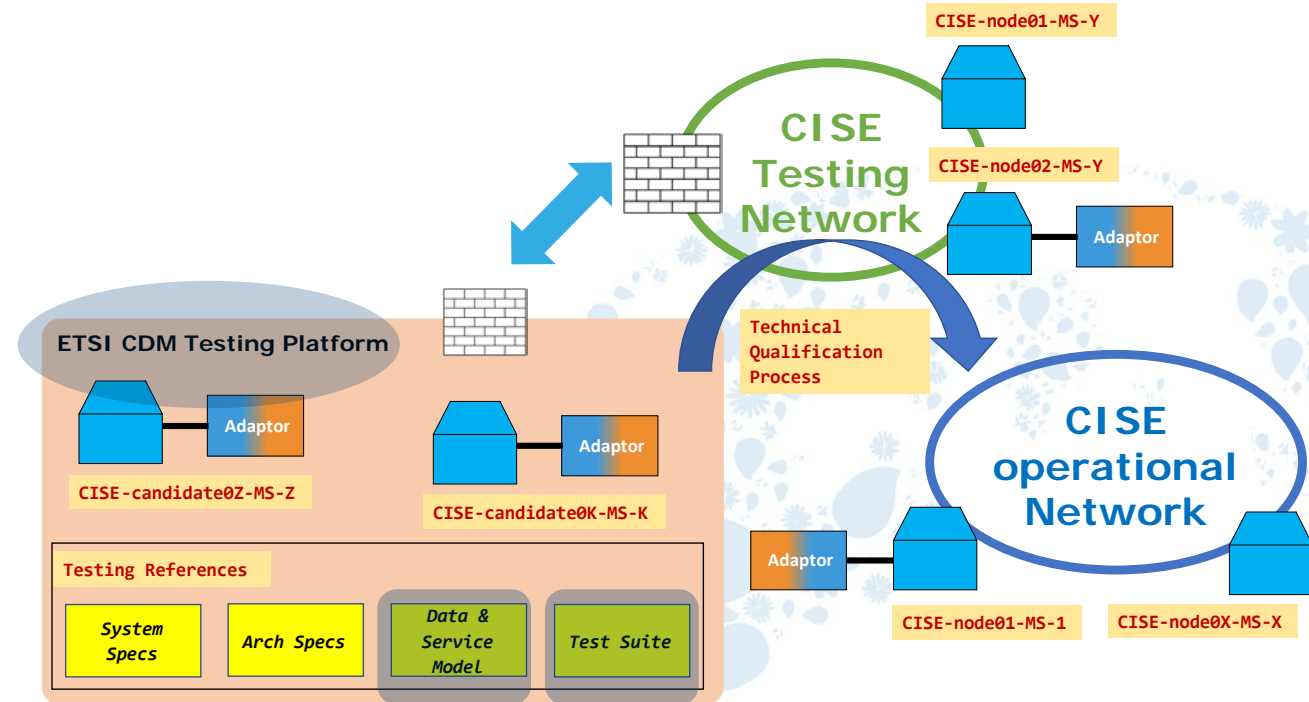
CISE interoperability across applications?

- The CISE Data Model is intrinsically non-finite ("snow-flake pattern") with the ability to represent a graph of directly-correlated entities in a single call, which may pose a problem while integrating with intrinsically tabular/relational data models

- The CISE Data Model encompasses a snapshot of a given sub-graph of the exchanged data's domain, and does not necessarily guarantee nor Consistency, nor Completeness, nor even Processability of the data at the destination participant

- The CISE Service Model is modelled to facilitate orchestration between loosely-coupled parties, and does not focus on near—real-time, fast data scenarios

- STILL…. CISE already provides invaluable, extensible domain knowledge on Maritime Situation Awareness that can, and should, be leveraged in different applications!

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Thank you for your attention

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