Key results of EUCISE2020

(EUropean test bed for the maritime Common Information Sharing Environment)

C. Matarazzi, ASI, EUCISE2020 Coordinator

VIP Day Italia, Roma, 12/03/2019

EUCISE2020 received funding from the European Union's seventh framework programme under grant agreement no: 608385

EUCISE 2020 project

- Challenges
- Mission, roadmap and principles
- Common architecture, access rights and development plan
- Transition phase to operational CISE
- Gap analysis and expected user value
- Implementation status
- Validation campaign

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EUCISE2020

- develops the reference implementation of the European CISE for cross-border and cross-sector information exchange between the European maritime authorities, according to COM (2010) 584
- is included among the actions of the EUMSS (European Maritime Security Strategy) implementation plan; the results of the project are relevant for the security of the European seas.

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CISE Challenges

- CISE was born to overcome the obstacles of a lack of information sharing between the European maritime administrations.
- The challenging objective is to realize on a voluntary basis a cross-sector and cross-border exchange of information to face the risks of maritime activities in the European seas.
- A fundamental purpose is to **overcome the sectoral information silos**
- The main objective is to achieve interoperability between existing maritime surveillance systems
- CISE is not a new system or a system of systems: it is a voluntary information cooperation based on the principle of responsibility-to-share between the existing systems of the European maritime authorities of various sectors: defense, fishing, border control, environment, safety and security, custom, ...

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Context analysis

- Gap analysis of user needs performed by the TAG (Technical Advisory Group)in the CISE User Communities
- Survey to detect the services requested by users performed by Gartner Group

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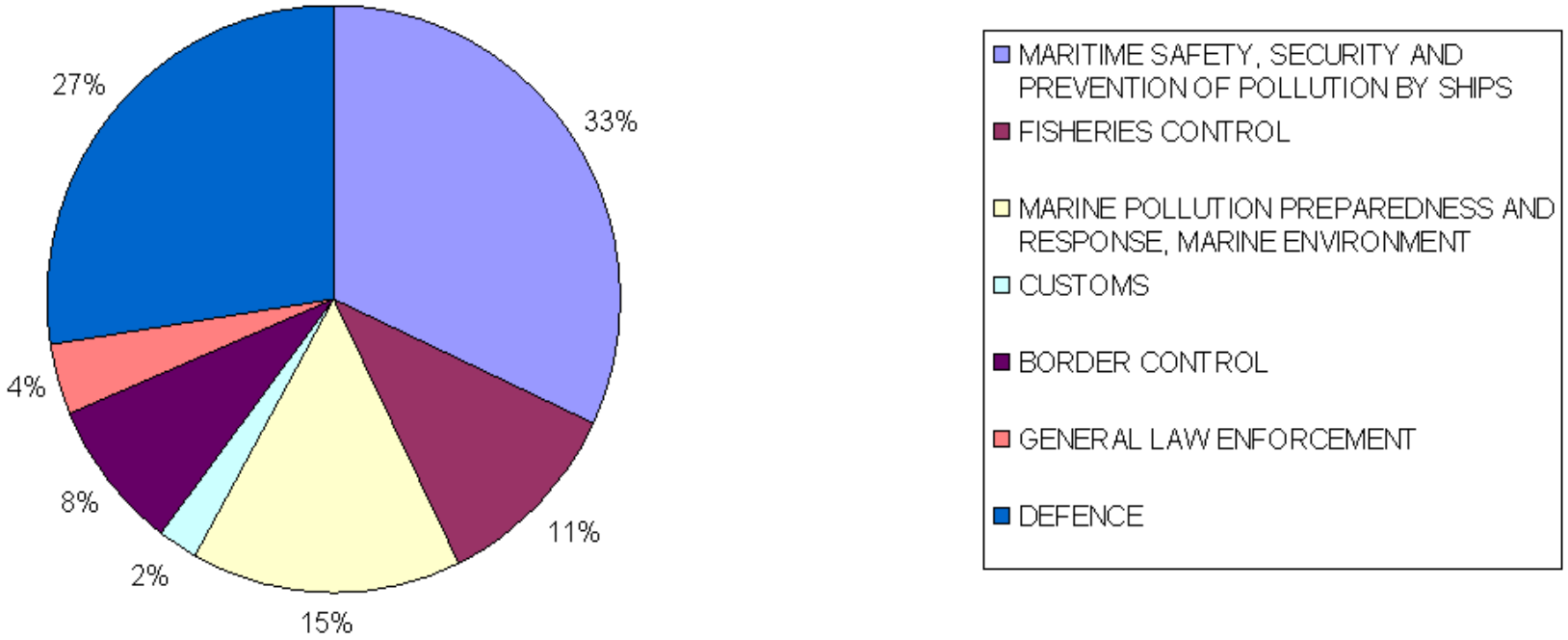
Gap analysis: Data Ownership

Current ownership per User Community



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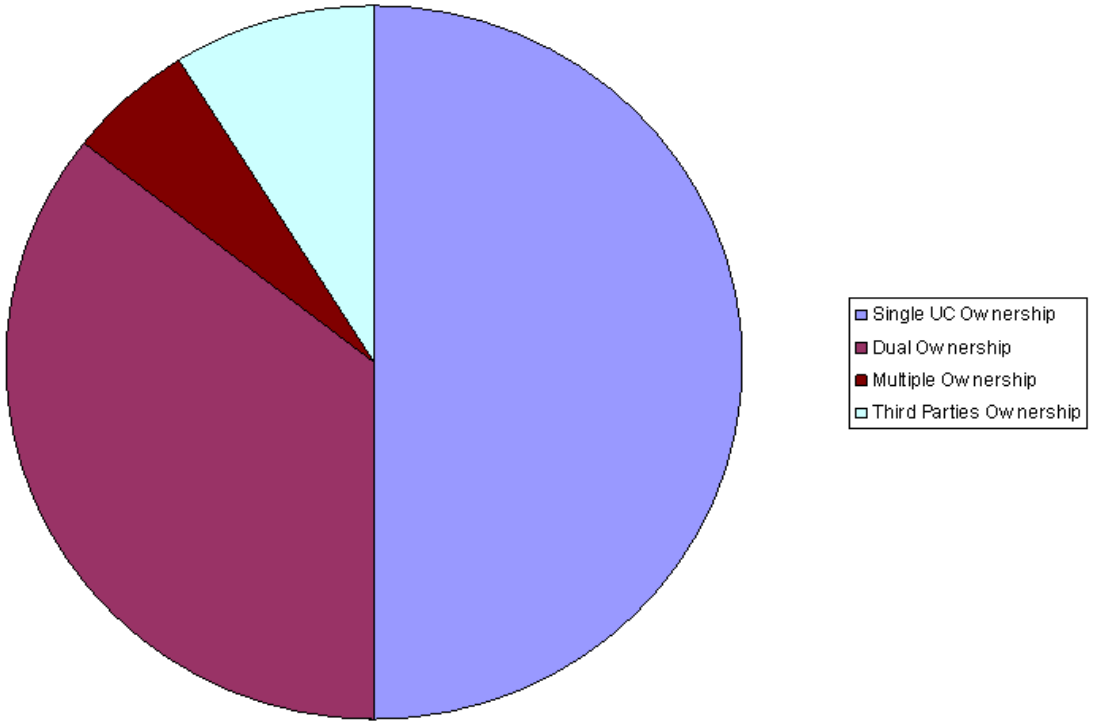
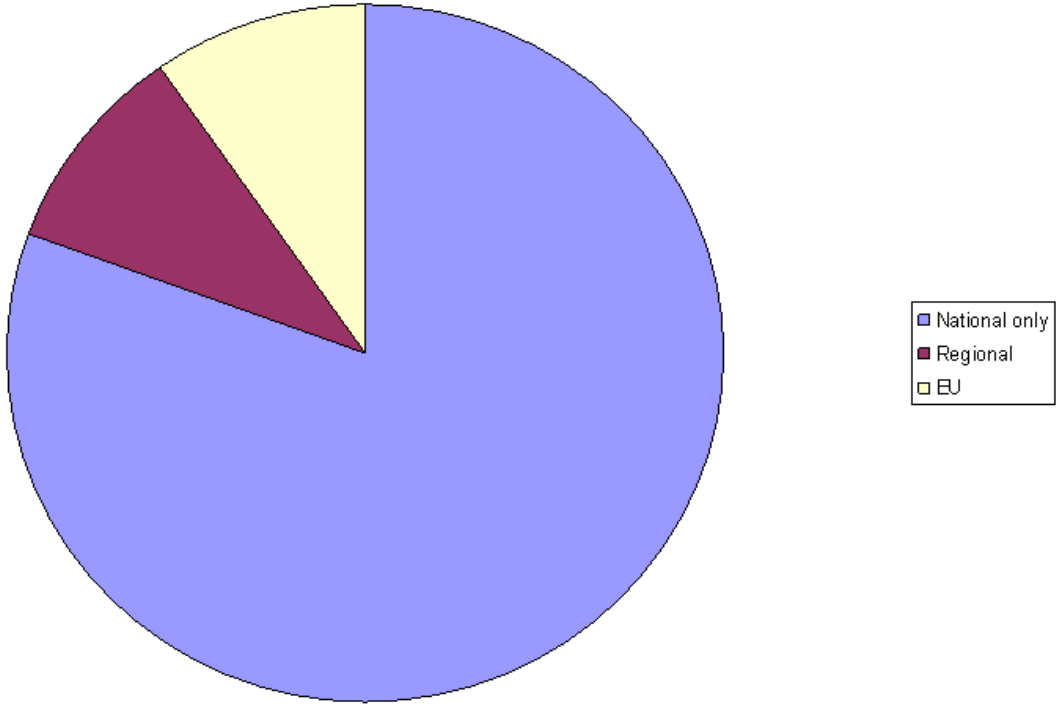
Gap analysis: Data Ownership

Multiple Ownership is frequent



National Ownership is by far predominant



45% of the Data is collected by more than one UC

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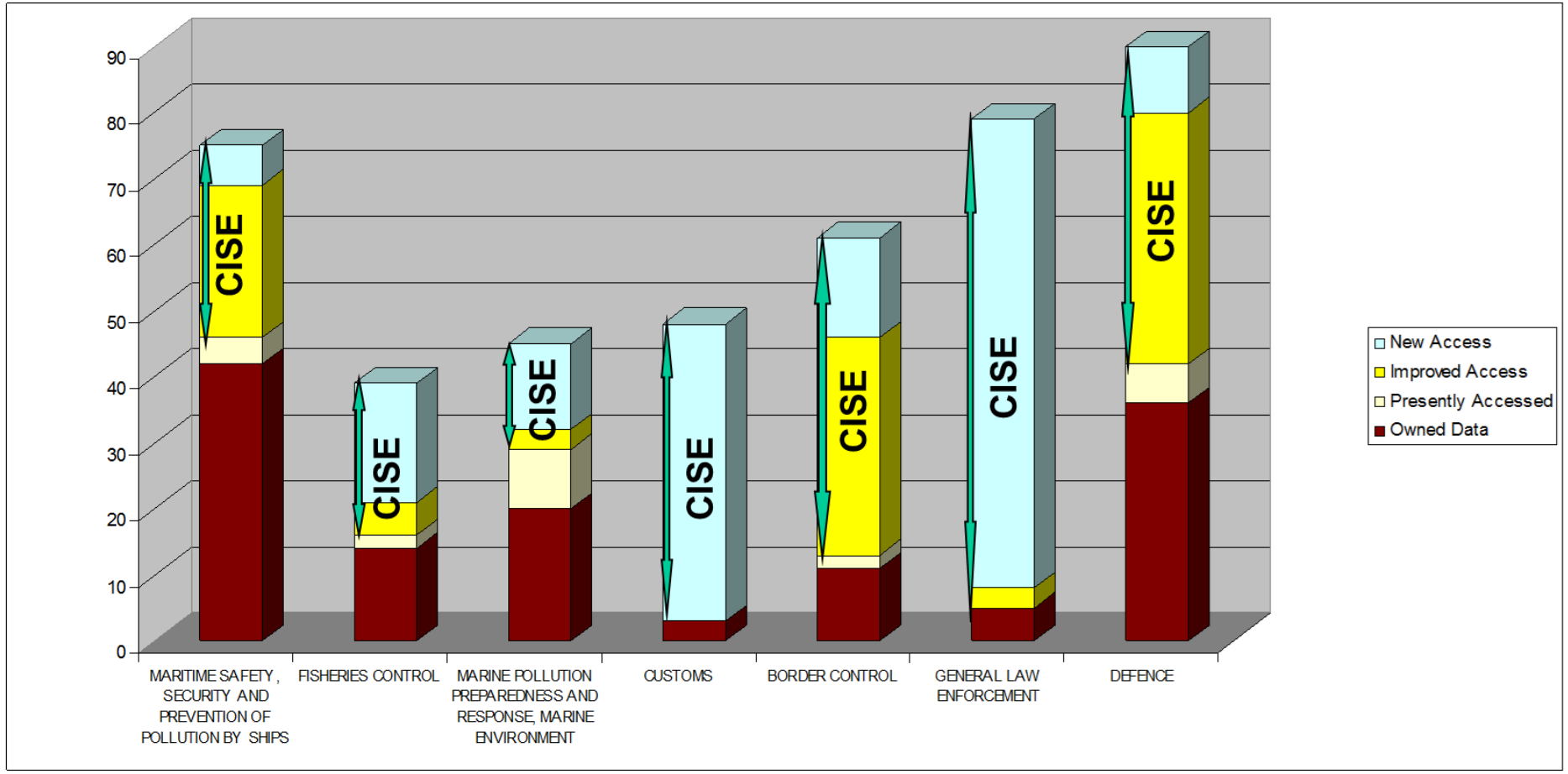
Gap analysis: More complete datasets required

CISE required to enable between 40% and 90% of expected data access



Demand to access further data might be on a fairly occasional situation, rather than on a daily basis.

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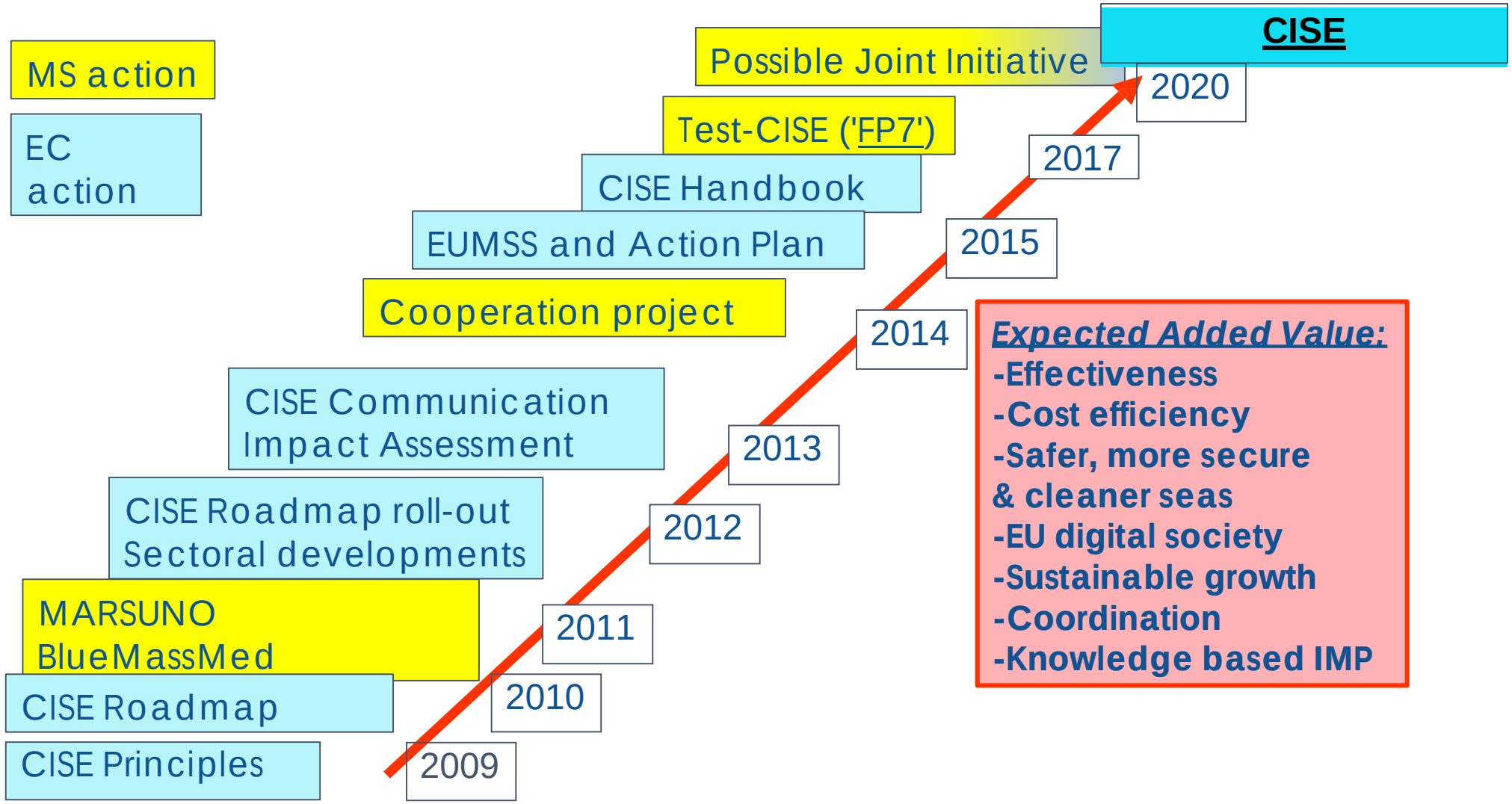
CISE: Common Information Sharing Environment
Cross – Sector and Cross-Border interoperability for better "Maritime Governance"



EUCISE2020 Coverage

EUCISE2020 Partners

- 38 Partners
- 15 EU/EEA maritime Countries
- Open to new partners and to collaborations with EU Agencies

- Maritime Authorities
- Experts
- Research Institutions

Partner observers participating in national nodes:

1. Ministry of Fishery – Spain
2. Ministry of Interior – Italy
3. Ministry of Fishery - Italy

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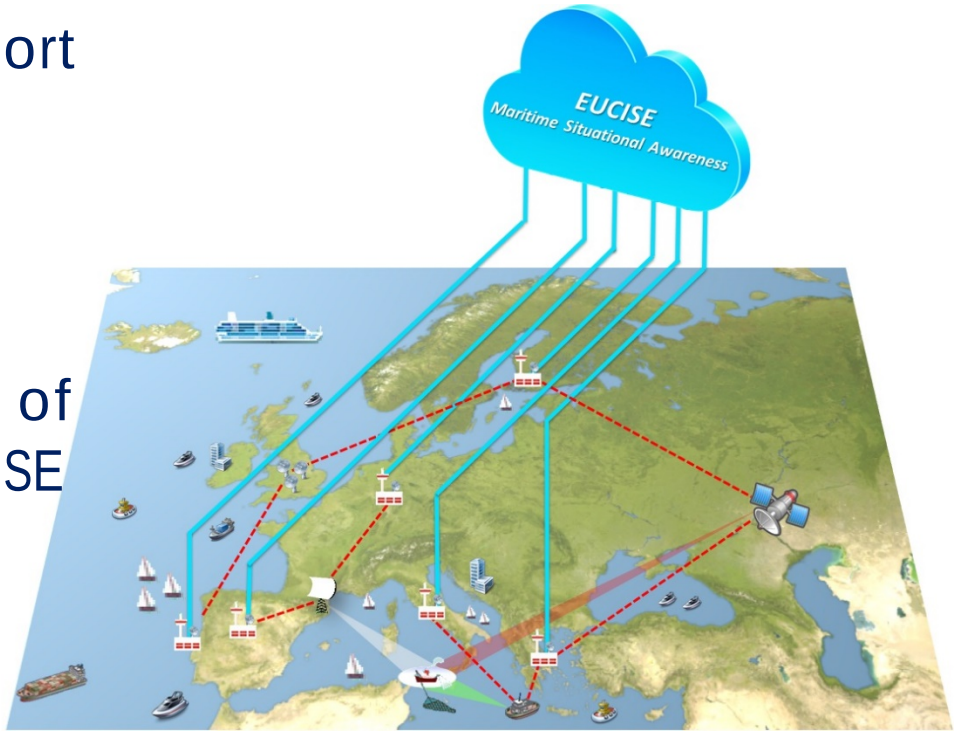
Operational Concept

Primary mission of EUCISE2020 is to support the EU Maritime Situational Awareness capability by means of an **Information Sharing Environment** implementing adequate security measures to ensure confidentiality, integrity and availability of data required and transmitted in the CISE community.

EUCISE2020 does not affect the functionalities of the operational information systems belonging to the participating Public Authorities or of the existing European sectorial information systems.



Blue lines depict flows of information within the CISE community, while the red dashed lines depict flows of information within the legacy systems belonging to single Public Authorities.

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EUCISE2020 Principles

- Complete decentralization according to CISE Hybrid Architecture: no central system, no central database
- Military/civilian cooperation;
- Independence from any system and sensor
- Independence from any national or European architecture
- Common technical architecture
- Management of EU RESTRICTED information through a special channel
- Firm adherence to standards and open source software
  - Adherence to the CISE data and service models
  - Promotion of standardization groups inside the EU bodies (ETSI); an ISG - Industry Specification Group in ETSI established as early as 2017; the group includes maritime authorities and industries
  - IPR management and sharing
- Open to new partners and to European Agencies

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Expected impacts

- The result of the project is a validated technical and operational reference framework
- Enhanced maritime awareness will help ensuring more secure, safer and cleaner seas
- Clear evidence of the cost/effectiveness of the approach will be provided
- The consolidation of requirements and joint procurement will lead to reduced procurement and maintenance costs
- Participants will verify and optimize their technological choices
- The results will create important market opportunities worldwide for the European industry

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NETWORK TOPOLOGY

The network topology of EUCISE2020 is based on the CISE hybrid vision concept. Each Member State and Community can adopt one of the following paradigms:

- Single-way approach: All Public Authorities of a Member State are connected to the EUCISE2020 Network through a single access point
- Multiple-way approach: Public Authorities of a Member State are connected to the EUCISE2020 Network through different access points

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Common EUCISE2020 system configurations include the following components:

- **CISE Adaptor** allows a Legacy System (LS) to connect to a CISE Gateway. It translates the LS data into the common CISE Data Model
- **CISE Gateway** (GW) implements the common CISE specifications and implements the CISE messaging protocol to exchange with the CISE adaptor or with the other CISE Gateways
- **CISE Node** (NODE) is an enhanced gateway, capable of performing advanced business functions like fusion and storing of information (EUCISE Advanced Services).

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Common architecture

Three different configurations of the EUCISE2020 network architecture are implemented:

- **Configuration A**: single Public Authority belonging to a single Member State will connect to EUCISE2020 contributing with a single Legacy System
- **Configuration B**: each Public Authority of the same Member State taking part in the EUCISE2020 information exchange connects its own Legacy System to a dedicated Adaptor; several Adaptors connect to a EUCISE2020 Gateway type B that will access the EUCISE2020 Network.
- **Configuration C**: Public Authorities belonging to the same Member State connect their Legacy Systems to the EUCISE2020 Network through a single EUCISE2020 Node type C

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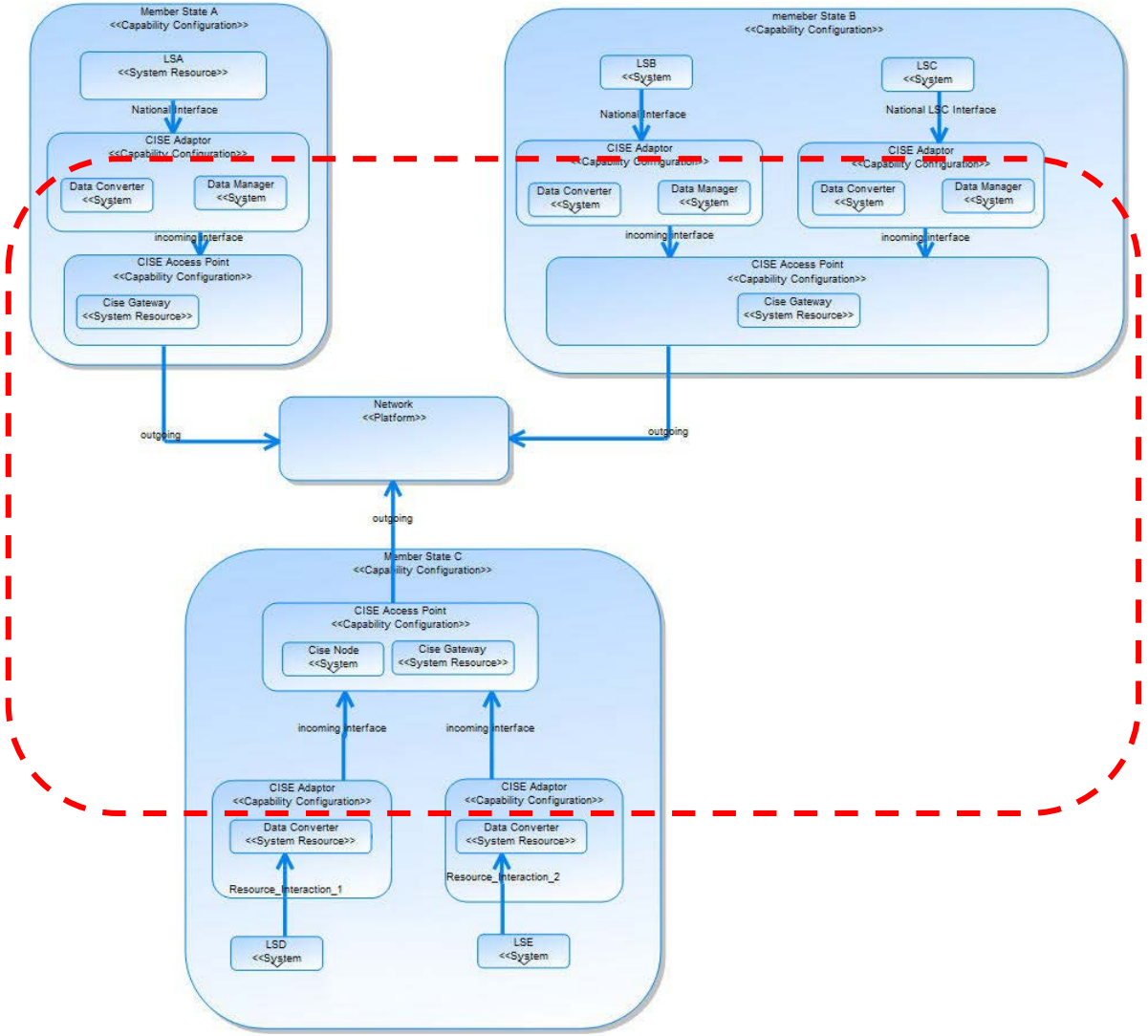
Common architecture

Logical Architecture of EUCISE2020 Configurations A, B and C:

- Inside the red line components developed through the joint European tender
- Outside the red line interfaces with the national legacy systems developed through the national procurements



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Guidelines for the Access Rights

The Access Rights Matrices are managed by the partners who supply the information.

Data categories made available on the EUCISE2020 network:

- Open Data: Data free and available to all partners on a voluntary base; at least data publicly available on the Internet
- Open Data Sensitive: available to User Communities. Data made available to specific User Communities on a voluntary base independently by bilateral or multilateral agreements
- Restricted Unclassified Data available to specific partners of each User Community based on existing bilateral or multilateral agreements
- EU Restricted Data available to specific partners of each User Community through the EU Restricted channel.

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Transition to CISE Implementation

Different levels to consider: technical, operational and strategic.

- From a **technical point of view**, the path is clear; the project has an open policy to share solutions; the standardization process already started though the establishment of an ISG Industry Specification Group in ETSI; the group includes maritime authorities and industries; the **conceptual integrity of the design shall be safeguarded** because the process of extension and engineering is long; the life cycle of the solutions can reach 7 -10 years.
- From an **operational point of view**,; the current challenge is to reach the operators of national legacy systems and **enable them to make extensive use of the functionalities implemented**. An intense training program in the national sites dedicated to system operators is planned. A further challenge is the sharing of common operating procedures and the release of additional data and information; for this purpose, it is planned an **Independent Audit Function** to verify the implementation of the Responsibility-to-Share principle.
- **Strategic support** comes from the EUMSS action plan, the DG MARE coordination action and involvement of maritime authorities. The EUCISE2020 community is very cohesive and wide.

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Transition to CISE Implementation

Urgent need to start the transition to CISE Implementation to have CISE operational by 2020.

Major points to address:

- Maintain operational the information exchange infrastructure between the 10 national nodes participating in the pre-operational CISE after the end of project
- Define infrastructure governance criteria to implement
- Manage the intellectual property of the partners, according to IPR policy and existing constraints
- Follow the CISE principles to which EUCISE2020 conformed; in particular:
  - Cross-sector and cross-border exchanges of information
  - Inclusion of all user communities
  - Civilian/military cooperation
  - Fully decentralized architecture without centralized databases
  - Full adherence to functional and technological standards
  - System to system interoperability

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Governance model proposed by DG MARE

Transition Phase

- DG MARE
- EMSA
- Member States represented in the Stakeholder Group (SG)
- European Agencies in SG
- Stakeholder Group takes by consesus the strategic decisions
- MSEsG in case of disagreement

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Validation Campaign

- Expected and Observed benefits
- Implementation status
- Preliminary results of information sharing
- Benefits of Satellite Monitoring
  - Satellite Ship and Oil Detection (CSK)
  - Meeting at sea detected using satellite acquisition

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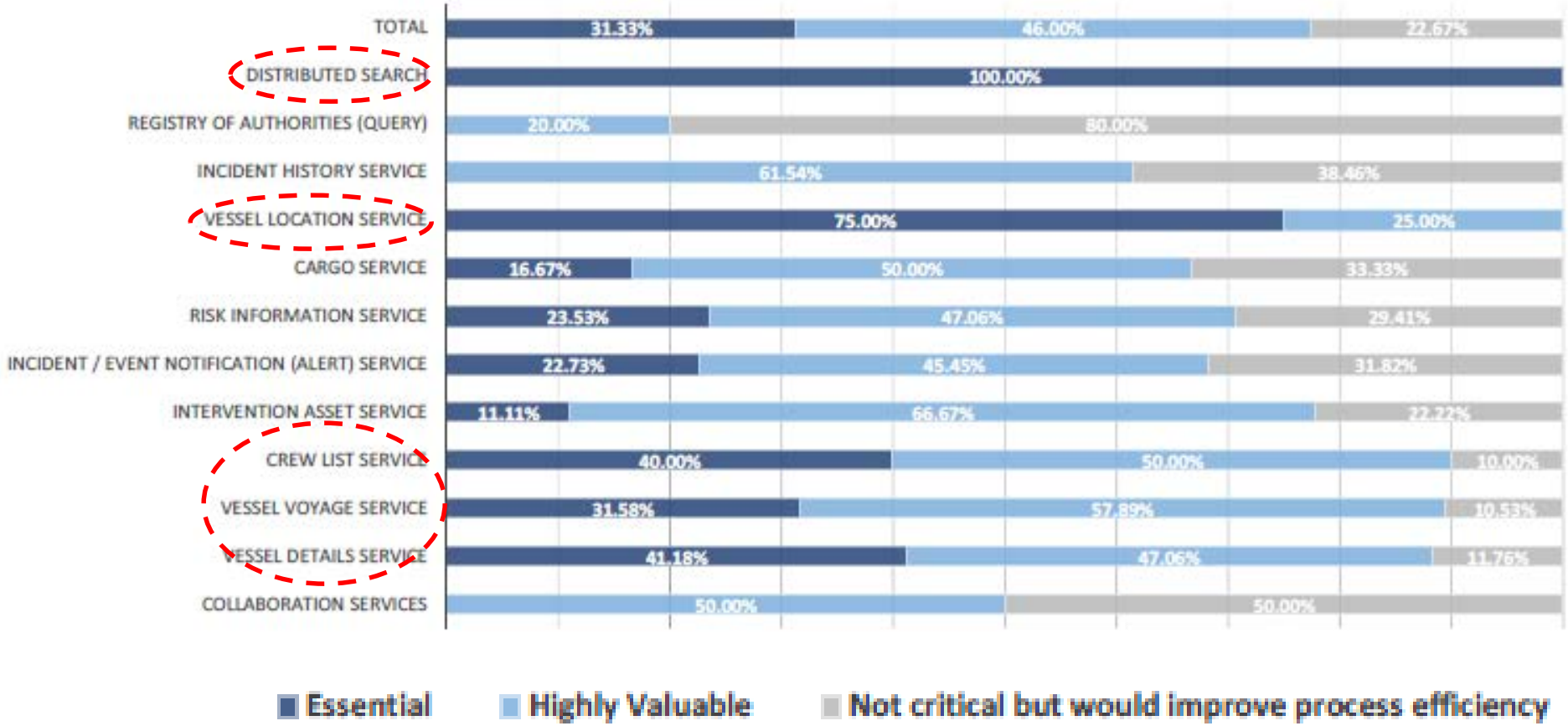
Expected befefits : CISE Benchmarking User Value

For 77% of Authorities, the 12 identified CISE services are either essential or highly valuable to support their operational processes; by implementing these services, CISE contributes directly to his objective of *"improving the daily work of operations for Maritime Authorities."*

Operational criticality of the CISE services



A registry of Authorities, Incident History and Collaboration are less mission critical for most Authorities but provide significant operational efficiency benefits

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Observed Benefits

Coordinator of Validation: Two main areas of benefits observed during the validation

infrastructure

EUCISE2020 network provides a complete, flexible and expandable support for maritime authorities to generate, acquire, handle and built new information of interest.

The ICT infrastructure already deployed allows continuous operation and direct communication between and among operators.

New services can be introduced by authorities' agreements and/or new services commissioning, avoiding new creation of complex interfaces and ICT infrastructures. During this validation period we have used services in use but new ones have been introduced over the period and we have got immediate access.

information sharing/exchanging

Information sharing and exchanging during this period have proved the unquestionable advantages of EUCISE2020 network in terms of process automation, continuity, awareness of available information or access to new valuable information. Process automation avoids manual data interchange, this improves current operation firstly, shortening timelines and secondly, providing a common model of information understood by all the operators and easily handled by all the legacy systems in EUCISE2020. During this phase, processes involving data exchange previously carried out manually have been validated, such as assets deployments or anomalies. Services discovered within this phase have proved useful for daily operation, identification of ships in incidents can be one example. In all the cases, it is important to remark that the information can be used immediately.

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Implementation status

Period of Execution of validation campaign: 17 January 2019 – 14 February 2019

1. 10 national nodes; 2 European nodes
2. 18 legacy systems connected
3. Almost all partners are using the EUCISE2020 network
4. Partners are increasing the volume of information exchanged
5. Partners are extending the type of services
6. Service provided are mainly Vessel Services.

Statistics	17 Jan - 14 Feb
Provided Services	785489
Service Types	6
Active Partners	90%

Provided Services	17 Jan - 14 Feb (n)	17 Jan - 14 Feb (%)
Action	860	< 1%
Aircraft	3	< 1%
Anomaly	8438	1%
Document	5849	1%
Incident	708	< 1%
Vessel	769631	97%

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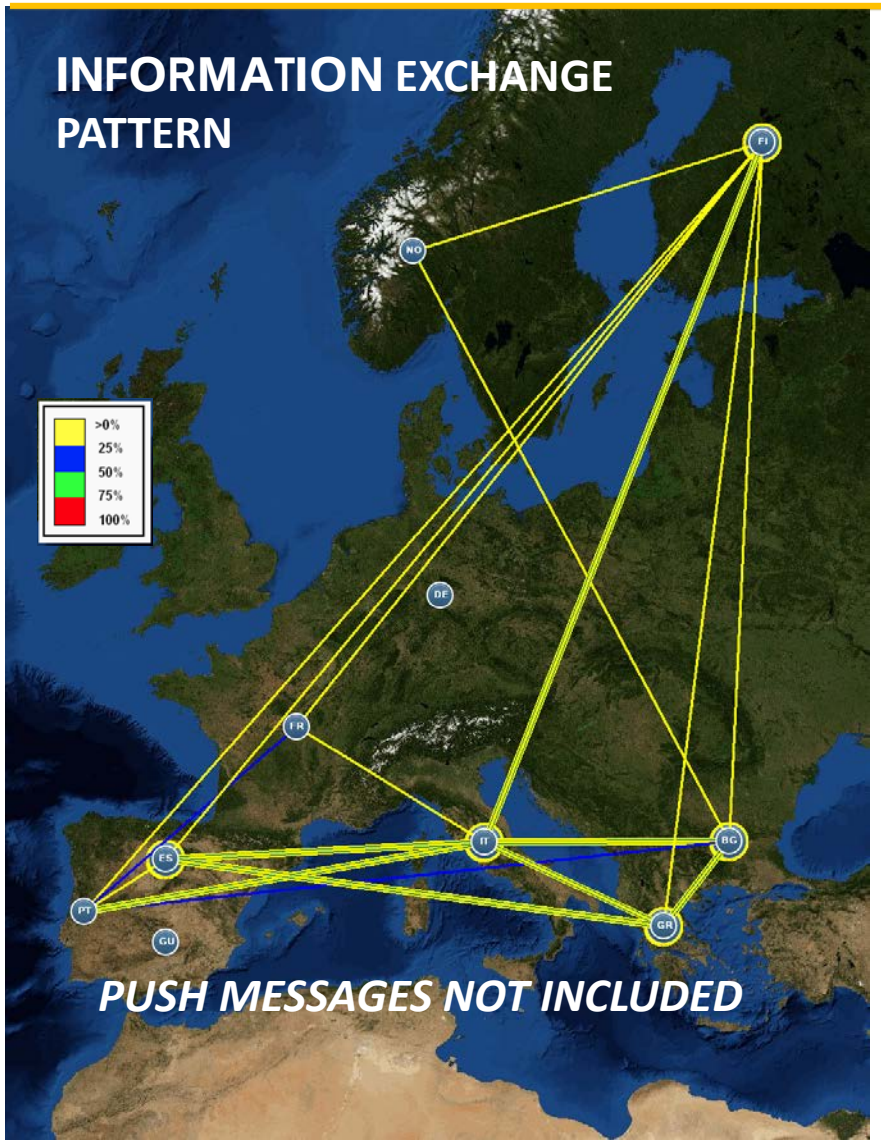
Validation Campaign Preliminary Results

(17 January 2019 – 14 February 2019)



- **Number of provided services:** 8733
- **Type of provided services:** 4 (vessel, anomaly, location document, action)

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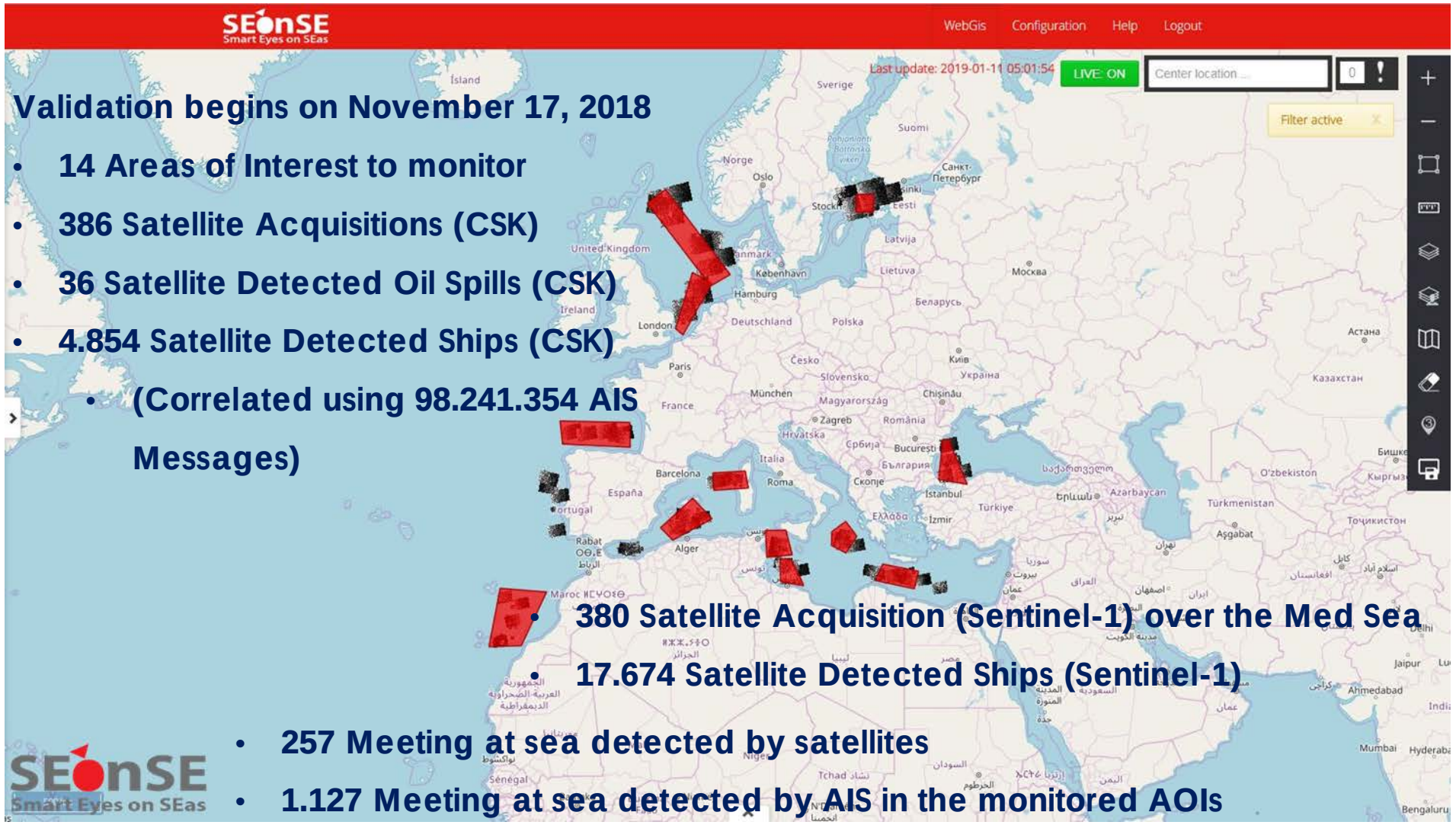
Benefits of Satellite Monitoring



Validation begins on November 17, 2018

- **14 Areas of Interest to monitor**
- **386 Satellite Acquisitions (CSK)**
- **36 Satellite Detected Oil Spills (CSK)**
- **4.854 Satellite Detected Ships (CSK)**
  - **(Correlated using 98.241.354 AIS Messages)**
- **380 Satellite Acquisition (Sentinel-1) over the Med Sea**
- **17.674 Satellite Detected Ships (Sentinel-1)**
- **257 Meeting at sea detected by satellites**
- **1.127 Meeting at sea detected by AIS in the monitored AOIs**

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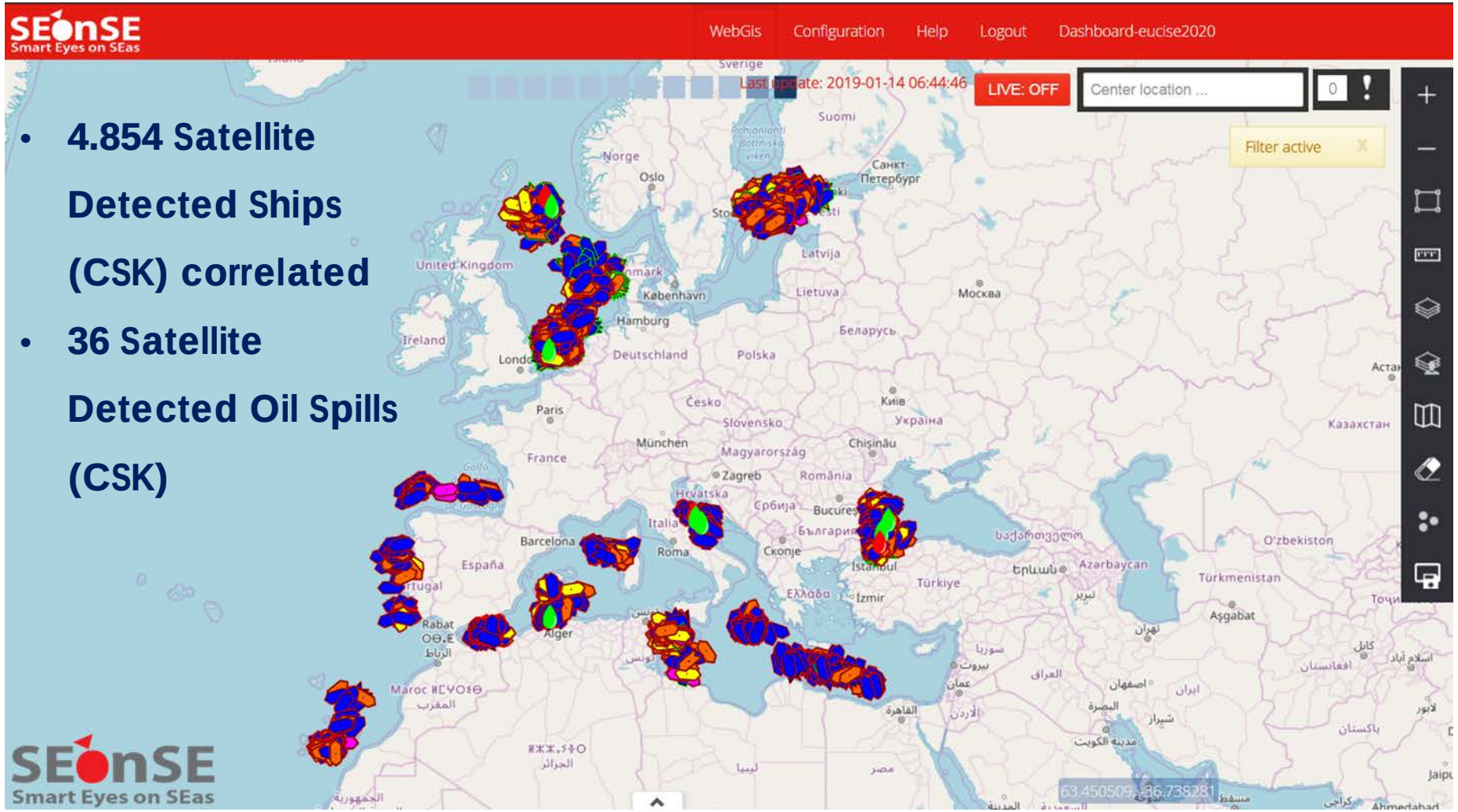
Satellite Ship and Oil Detection (CSK)

Distribution of the satellite ship detection over the monitored areas

- **4.854 Satellite Detected Ships (CSK) correlated**
- **36 Satellite Detected Oil Spills (CSK)**



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Meeting at sea detected using satellite acquisition

- **Satellite Ship Detection – Rendezvous**
- **257 Meeting at sea detected by satellites**

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