Activity in Japan:
Smart Ship Application Platform (SSAP) Project and Realization of Ship-Shore Open Platform Concept

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(Chairman of Smart Ship Application Platform 2 (SSAP2) Project)

JSMEA Japan Ship Machinery and Equipment Association

SSAP Project (Dec 2012 – Mar 2015)
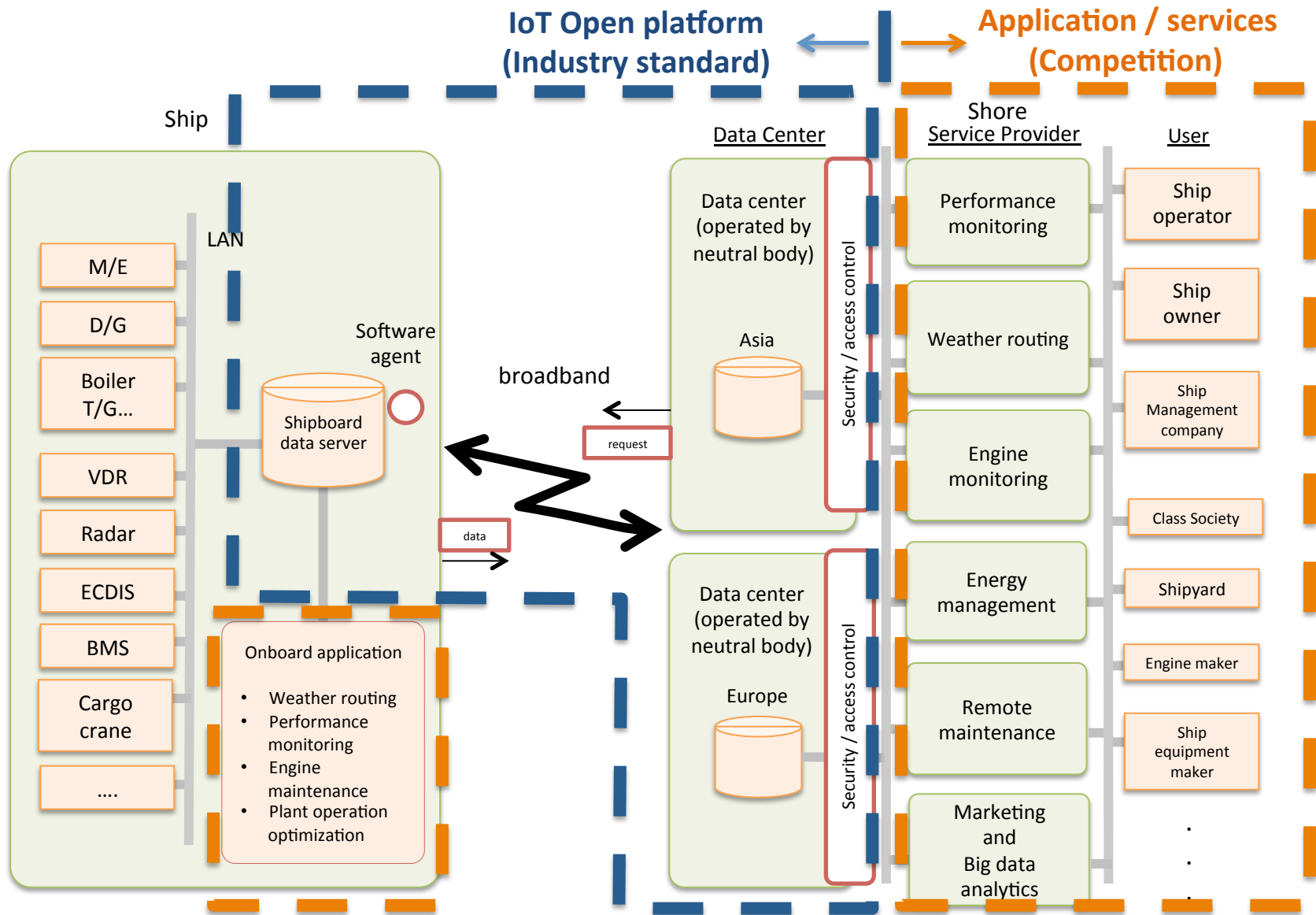## Smart Ship Application Platform (SSAP)

- Participants
  - Members: 27 organizations
  - Observers: 9 organizations

- Joint Industry Project (JIP)
  - JSMEA + ClassNK

- Achievements
  - Design specification of shipboard data server
  - Implementation of shipboard data server and conduct pilot trials
  - Ship – shore open platform design for ship IoT
  - Proposed 2 ISO NPs (ISO NP19847 / ISO NP19848)
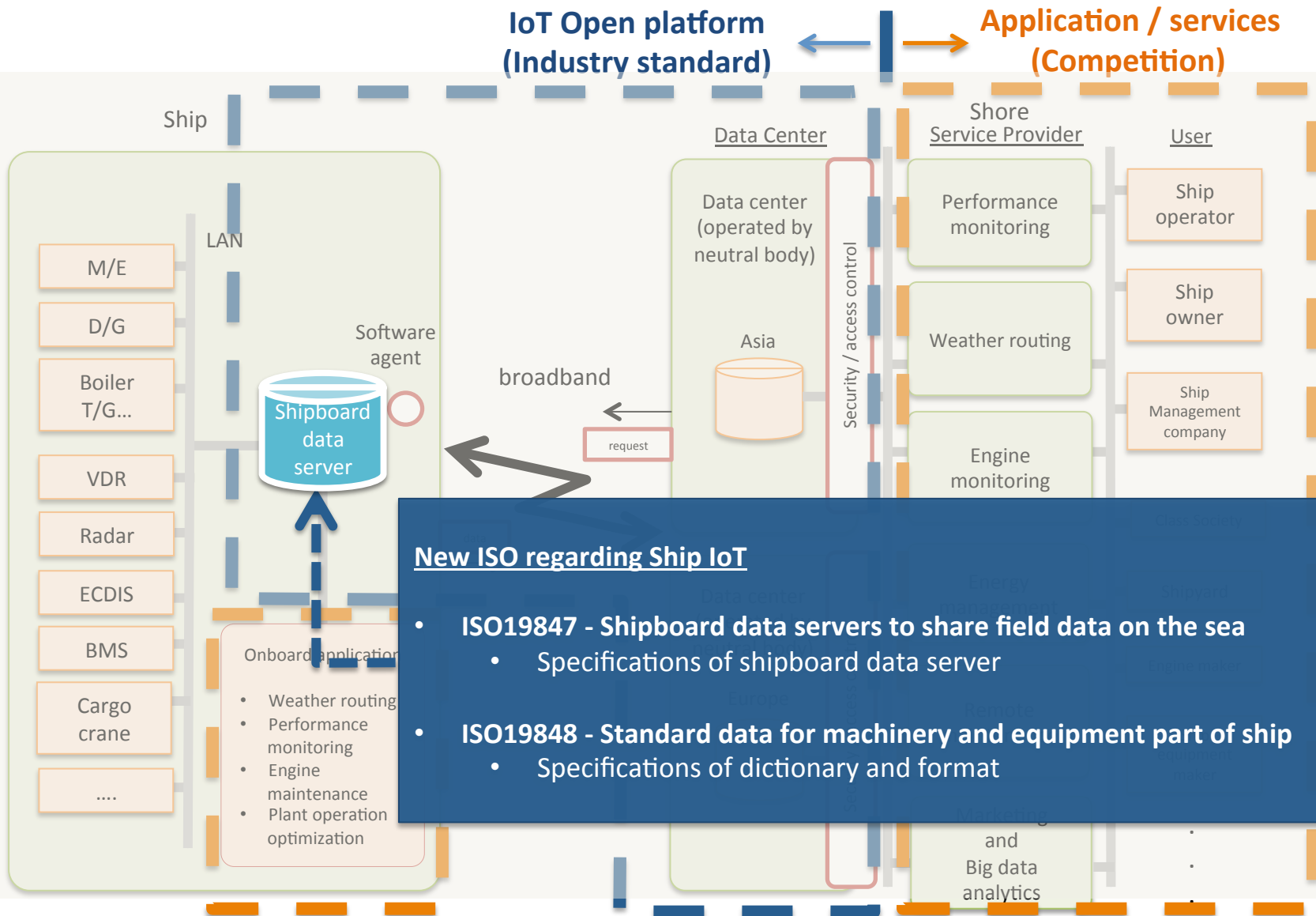
SSAP2 Project (Aug 2015 – Sep 2018)

- Participants
  - 38 members
  - 10 observers

- Joint Industry Project (JIP)
  - JSMEA + ClassNK

- Action items
  1. Marketing & promotion of the open platform concept
  2. System design and prototyping of open platform
  3. Standardization – ISO FDIS19847/FDIS19848
  4. Development of data catalogue
  5. Public relations

Open platform for data sharing in maritime industry

IoT Open platform
(Industry standard)

Application / services
(Competition)

Ship

LAN

- M/E
- D/G
- Boiler T/G...
- VDR
- Radar
- ECDIS
- BMS
- Cargo crane
- ....

Software agent

Shipboard data server

Onboard application

- Weather routing
- Performance monitoring
- Engine maintenance
- Plant operation optimization

broadband

request

data

Data Center

Data center (operated by neutral body)

Asia

Data center (operated by neutral body)

Europe

Security / access control

Security / access control

Shore Service Provider

- Performance monitoring
- Weather routing
- Engine monitoring
- Energy management
- Remote maintenance
- Marketing and Big data analytics

User

- Ship operator
- Ship owner
- Ship Management company
- Class Society
- Shipyard
- Engine maker
- Ship equipment maker
- . . .

Open platform for data sharing in maritime industry

IoT Open platform (Industry standard) ← | → **Application / services (Competition)**

Ship

LAN

M/E
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Radar
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....

Software agent

Shipboard data server

Onboard application
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broadband

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Data Center

Data center (operated by neutral body)

Asia

Security / access control

Shore Service Provider

Performance monitoring

Weather routing

Engine monitoring

User

Ship operator

Ship owner

Ship Management company

New ISO regarding Ship IoT

- **ISO19847 - Shipboard data servers to share field data on the sea**
  - Specifications of shipboard data server

- **ISO19848 - Standard data for machinery and equipment part of ship**
  - Specifications of dictionary and format

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ISO 19847
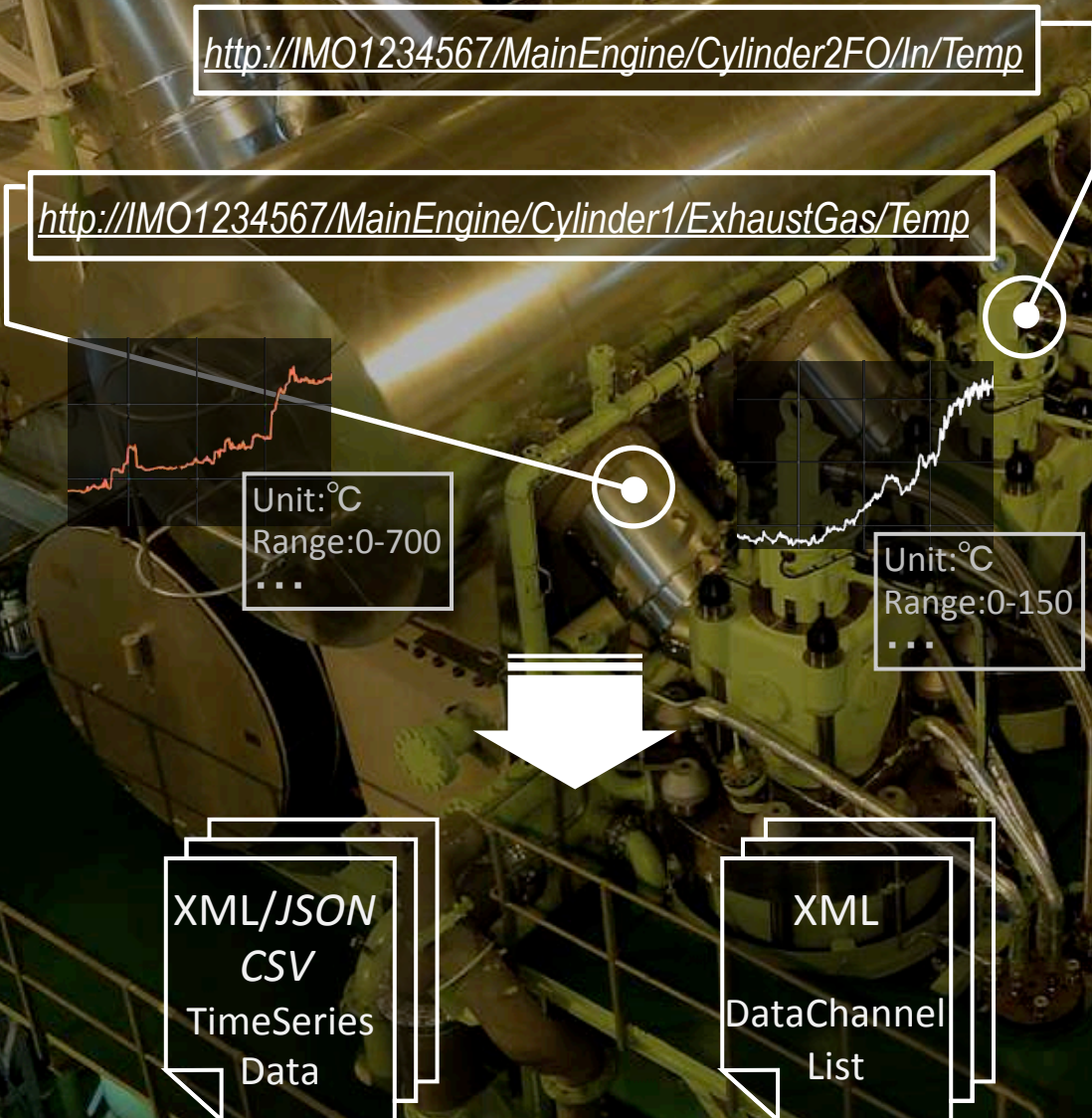## Shipboard data servers to share field data on the sea

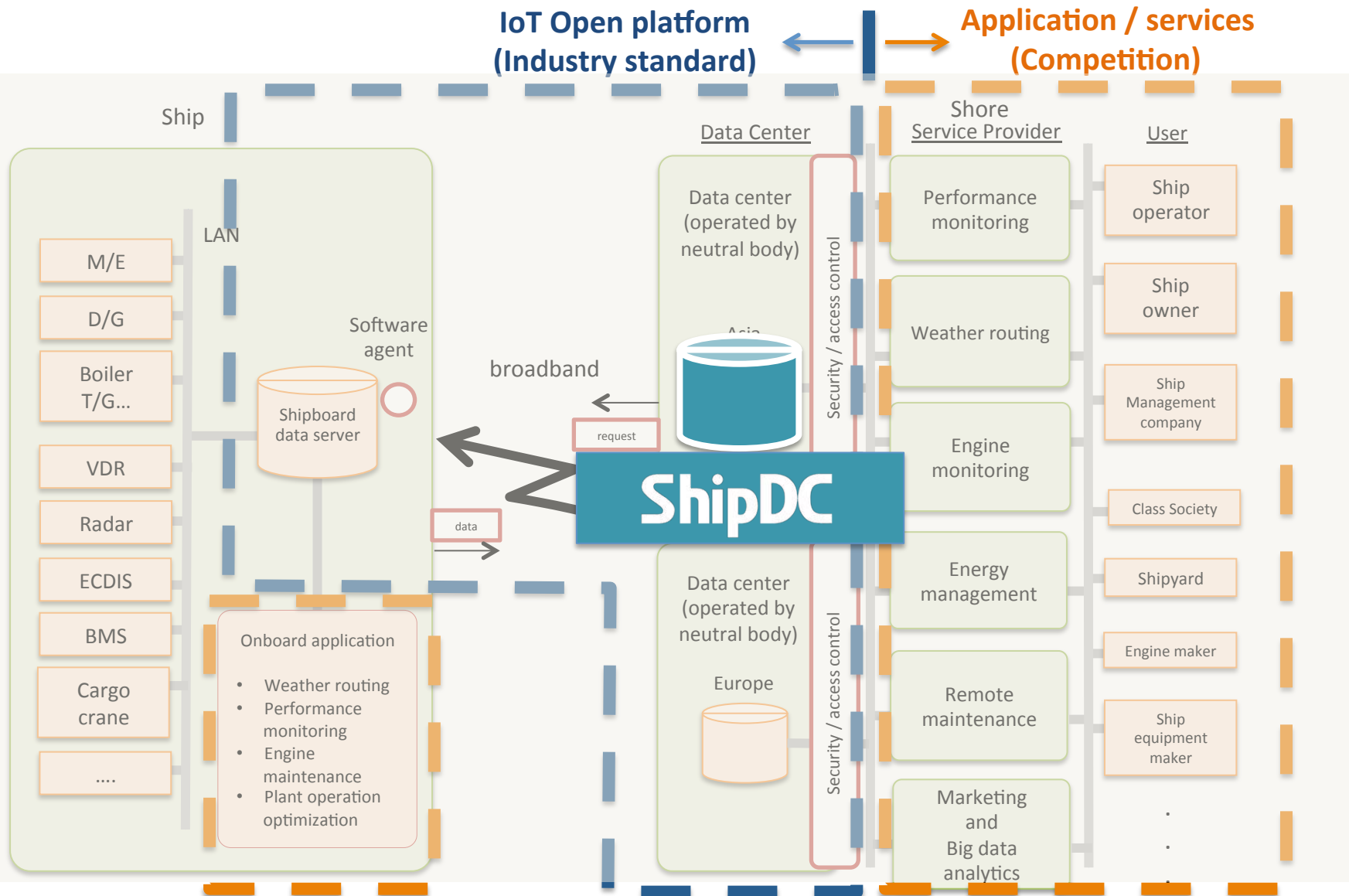- Requirements for shipboard data servers to collect and share field data
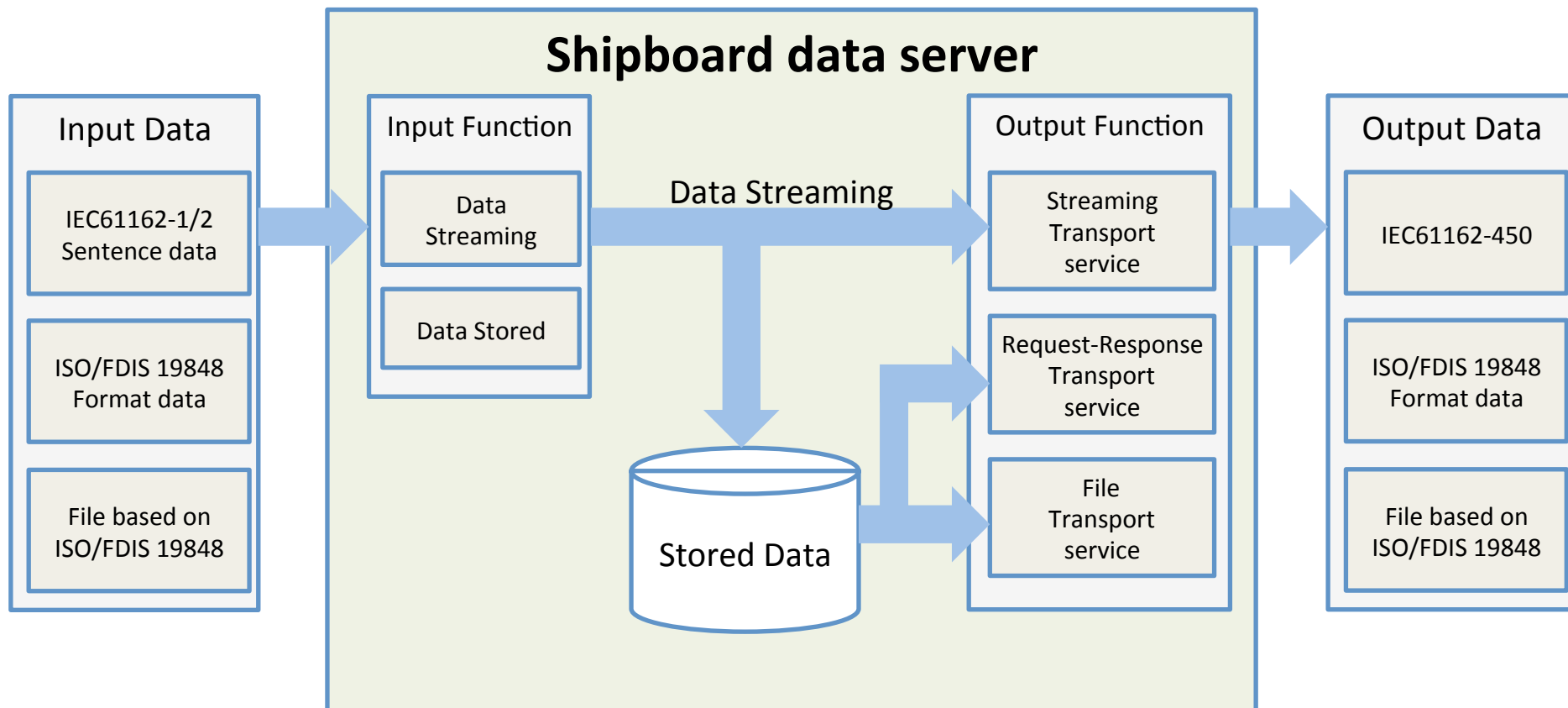
ISO 19848

- *Standardized ID of sensors, common data model & format*

- **ID of sensors**
  - **URL** compliant naming scheme
  - Dictionaries (*informative*)
    - JSMEA
    - DNV-GL

- **Data model**
  - Data channel list (meta data)
  - Time series data

- **Data format**
  - **XML** with schema definition
  - *JSON (informative)*
  - *CSV (informative)*

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http://IMO1234567/MainEngine/Cylinder2FO/In/Temp

http://IMO1234567/MainEngine/Cylinder1/ExhaustGas/Temp

Unit:°C
Range:0-700
…

Unit:°C
Range:0-150
…

XML/*JSON*
CSV
TimeSeries
Data

XML
DataChannel
List

JSMEA Japan Ship Machinery and Equipment Association

Open platform for data sharing in maritime industry

IoT Open platform (Industry standard) ← | → **Application / services (Competition)**

Ship

- M/E
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LAN

Software agent

Shipboard data server

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broadband

request

data

ShipDC

Data Center

Data center (operated by neutral body) — Asia

Data center (operated by neutral body) — Europe

Security / access control

Shore Service Provider

- Performance monitoring
- Weather routing
- Engine monitoring
- Energy management
- Remote maintenance
- Marketing and Big data analytics

User

- Ship operator
- Ship owner
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- Shipyard
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- Ship equipment maker

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Internet of Ships (IoS) Open Platform Consortium

Roles are defined and each player provides their expertise on the Internet of Ship(IoS) platform. Data governance and business rules had been built by IoS OP consortium under ShipDC.

Platform User (PU)

Ship owner

Operator

Ship management

Operator

PP
Platform Provider

Provider of onboard data collection equipment and services

ShipDC
Ship data center

Data collection, storage, standardization and provision

Data integration from other sources

SP
Solution Provider

Application service provider based on IoT data of ShipDC

Solution User (SU)

Ship owner

Operator

Ship management

Crew

IoS Open Platform

Data Buyer

Shipyard, manufacturer, weather service, insurance etc.

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Use Case Scenarios of ShipDC

Shipping
- Safety operation
- Vessel performance analysis
- Fleet operation optimization
- Weather routing

Shipyard
- In-service performance analysis of delivered ships
- Feedback to new ship design

Manufacturer
- Remote condition monitoring
- Remote diagnostics
- After service support

Class Society
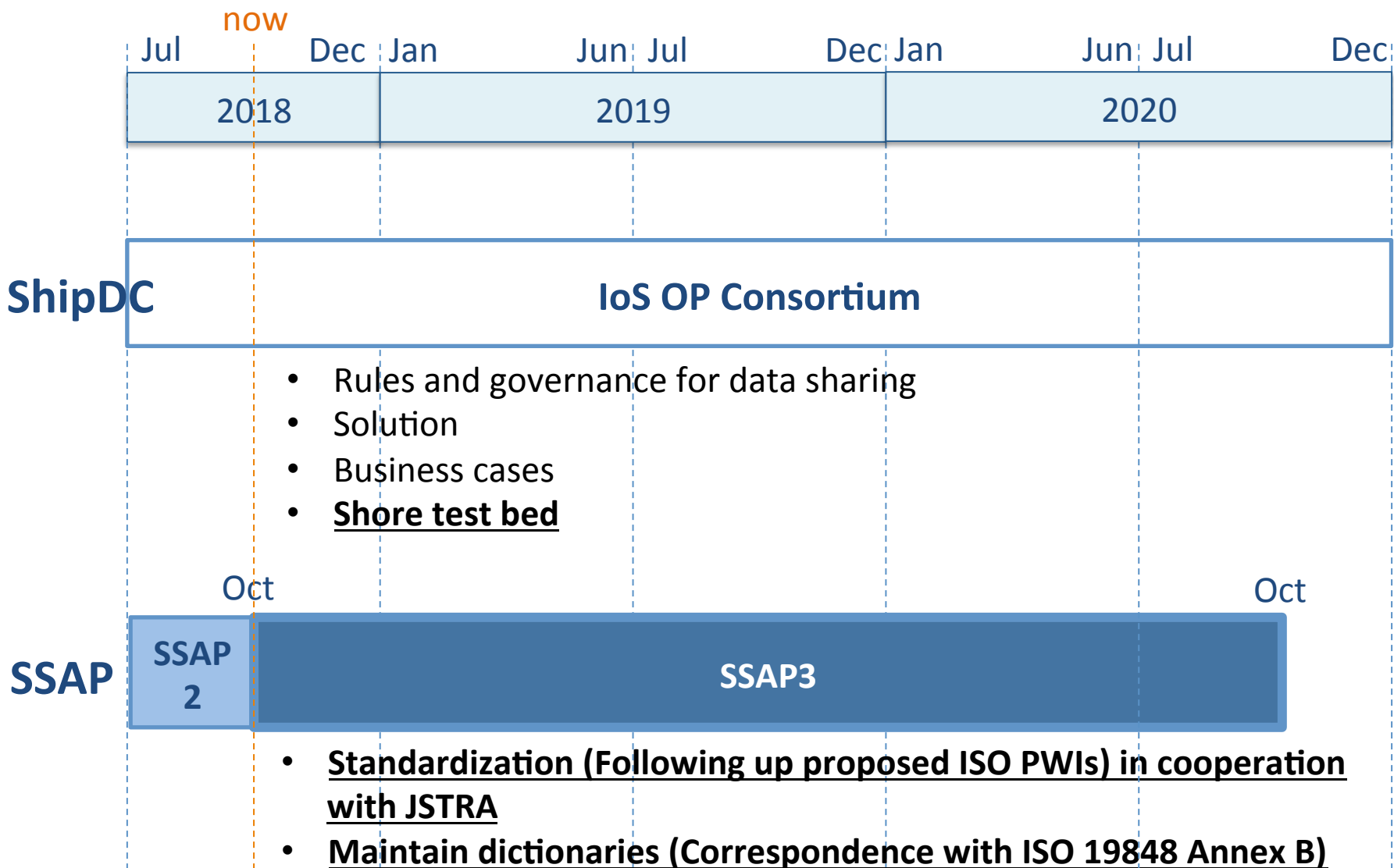- Utilization in class inspection

Insurance
- New services

Regulatory use
- Data reporting

ShipDC

Timeline of ShipDC and SSAP

now

Jul	Dec	Jan	Jun Jul	Dec Jan	Jun Jul	Dec
2018		2019		2020		

ShipDC

IoS OP Consortium

- Rules and governance for data sharing
- Solution
- Business cases
- **Shore test bed**

Oct   Oct

SSAP

SSAP 2   **SSAP3**

- **Standardization (Following up proposed ISO PWIs) in cooperation with JSTRA**
- **Maintain dictionaries (Correspondence with ISO 19848 Annex B)**

JSMEA Japan Ship Machinery and Equipment Association

Proposed PWIs
in ISO/TC8/WG10 − smart shipping

1. **Standard for test methods of ISO FDIS 19847 (ISO/TC8/SC6)**

2. **Revision of ISO 16425 (ISO/TC8/SC6)**

3. **Test & inspection methods of ISO 16425 (ISO/TC8/SC6)**

4. **Enhance cyber security of ISO FDIS 19847 (ISO/TC8/SC6)**

5. **Ship − shore data communication (ISO/TC8/WG10)**

Thank you very much for your attention