

Activities of Smart Ship Application Platform 2 (SSAP2) Project

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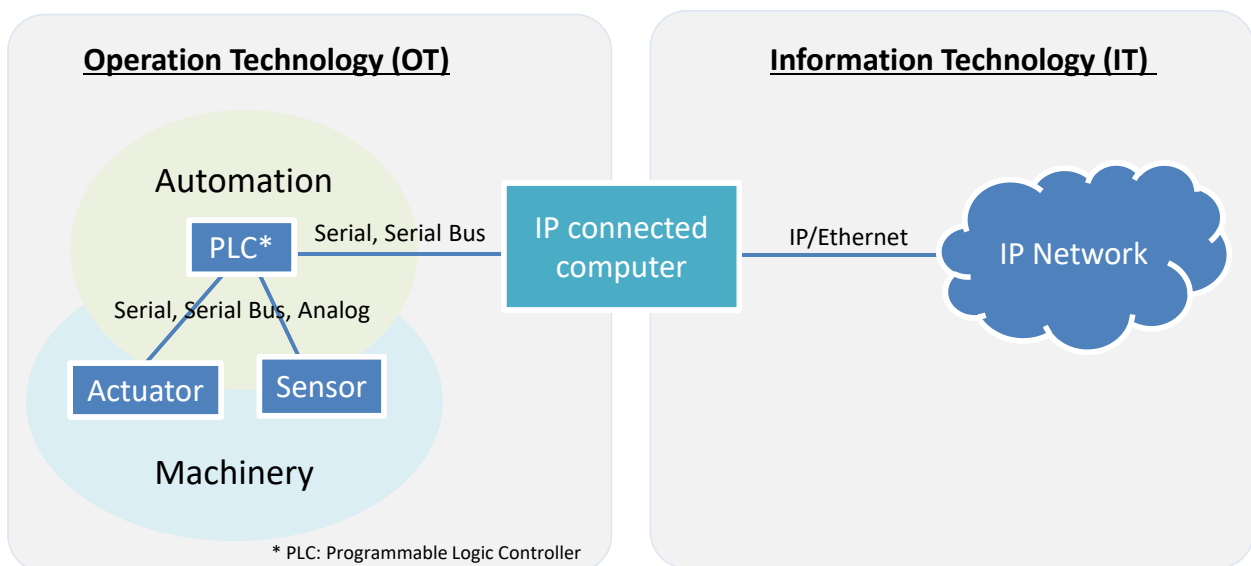
Background

- ❖ Onboard and ashore IoT application services, which relies on ship onboard equipment data, have become prevalent.
 - ❖ Weather routing
 - ❖ Optimum trim
 - ❖ Performance monitoring
 - ❖ Engine monitoring
 - ❖ Condition monitoring
 - ❖ Power plant energy management
 - ❖ Remote maintenance

Smart Ship and SSAP

- ❖ The concept of Smart Ship is to utilize IoT application services to achieve optimum ship operation in terms of safety and energy efficiency
- ❖ The target of SSAP (SSAP & SSAP2) project is to support these IoT application services to access ship equipment data easily and enhance more application services development

IoT (Internet of Things)



“Operation Technology (OT)” and “Information Technology (IT)” are to be bridged.
The era of “transparency” where user can access field data.

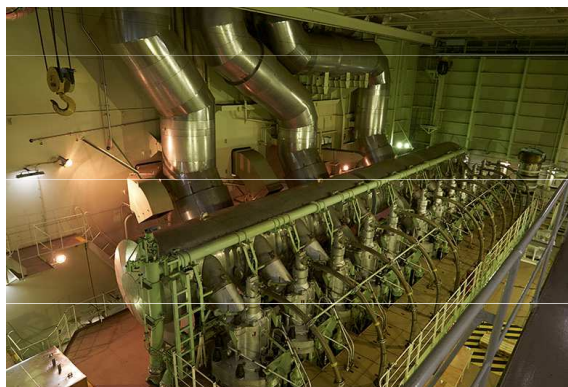
Coming IoT applications in marine industry

Target

- Prevent unpredicted downtime
- Reduce maintenance cost
- Energy efficiency in operation

Measure

- Condition monitoring
- Big data analysis
- Support service engineer
- Intelligent machinery
 - Self diagnostics



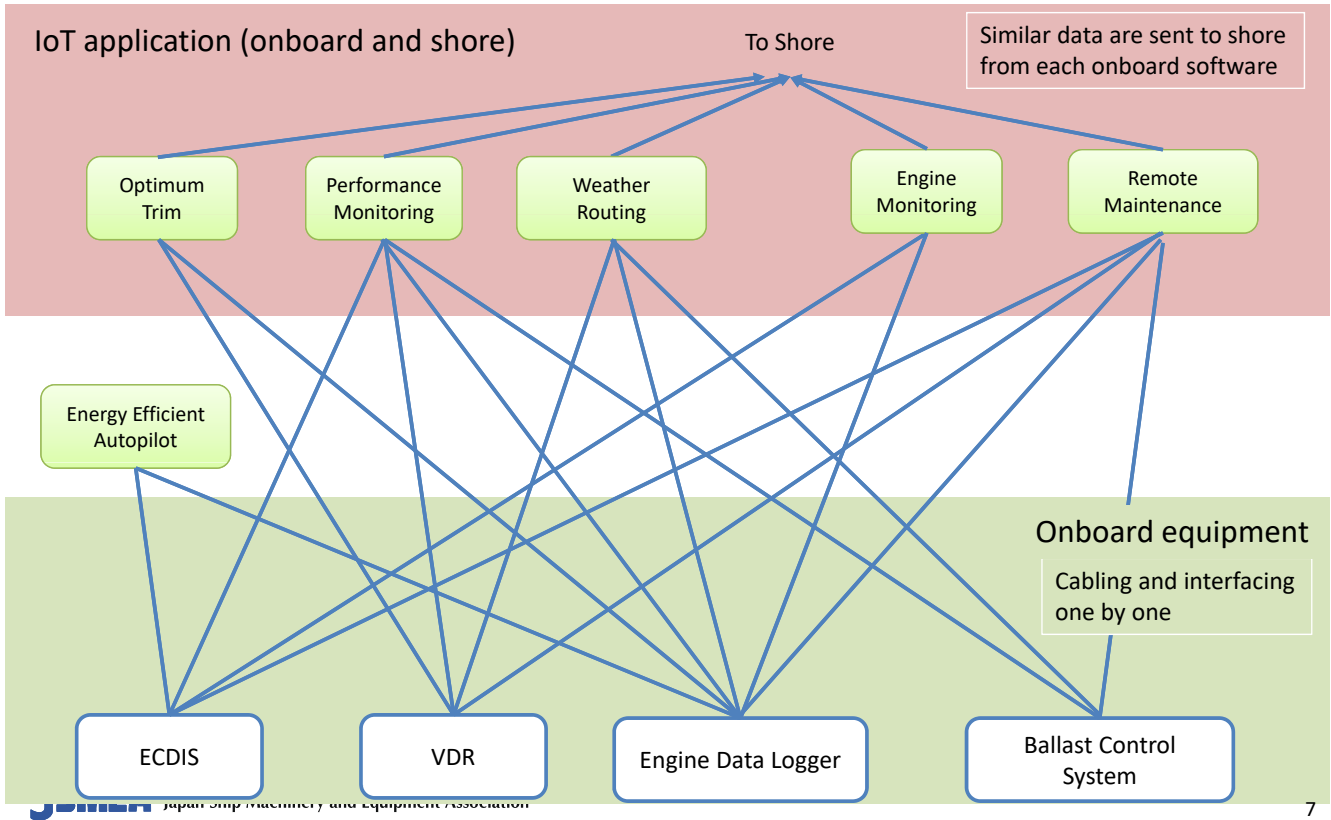
Working style will be changed

IoT and Big data applications

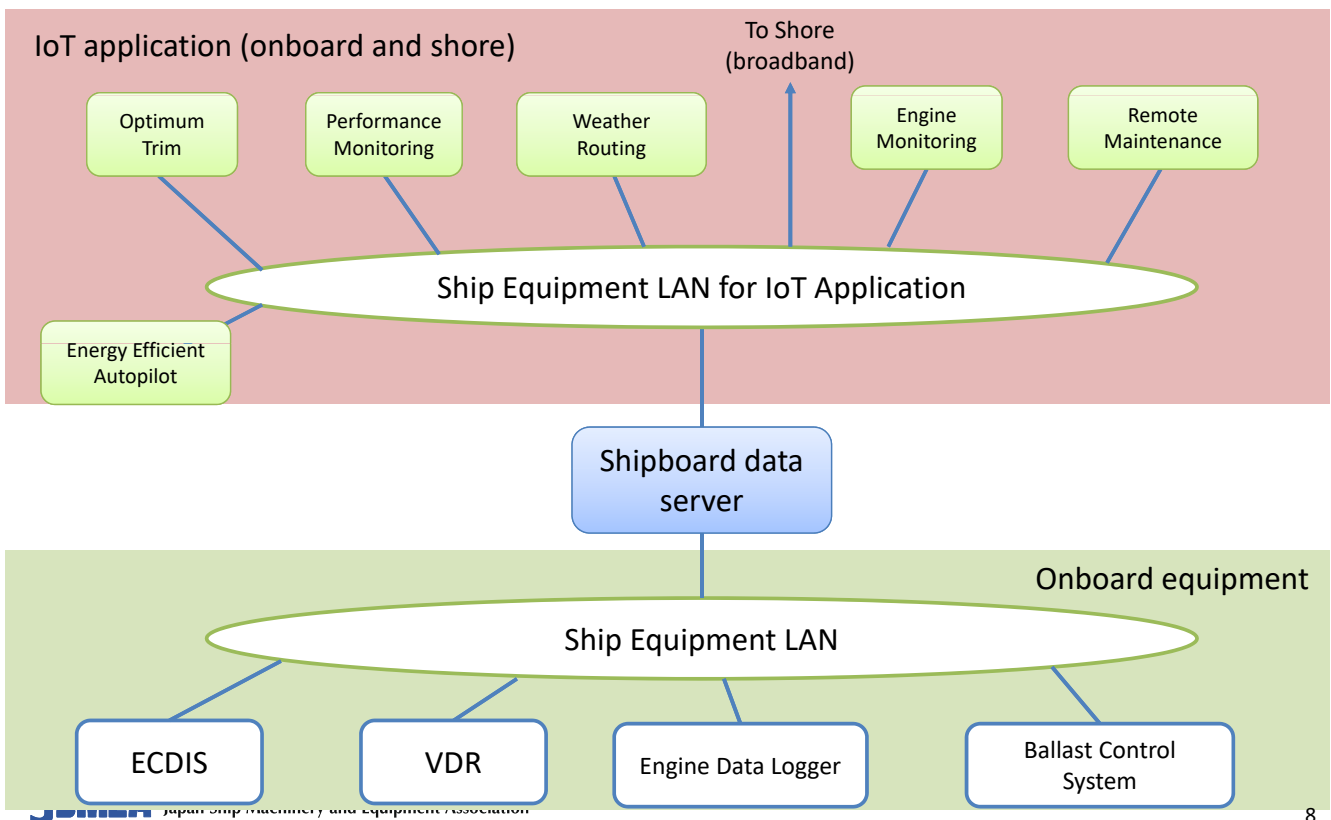
Role	Function	Example of IoT and Big data application
Ship owner	Technical management	<ul style="list-style-type: none"> • Safety operation • Condition monitoring & maintenance • Environmental regulation compliance • Hull & propeller cleaning • Retrofit & modification
	New building	<ul style="list-style-type: none"> • Design optimization
Ship operator	Operation	<ul style="list-style-type: none"> • Energy saving operation • Safe operation • Schedule management
	Fleet planning	<ul style="list-style-type: none"> • Fleet allocation • Service planning • Chartering

Other partners in value chains, such as cargo owners, shipyards, manufacturers, class societies, have also interests in ship Big data. With acceptance of IoT data owner, normally ship owner, Ship IoT will become prevalent.

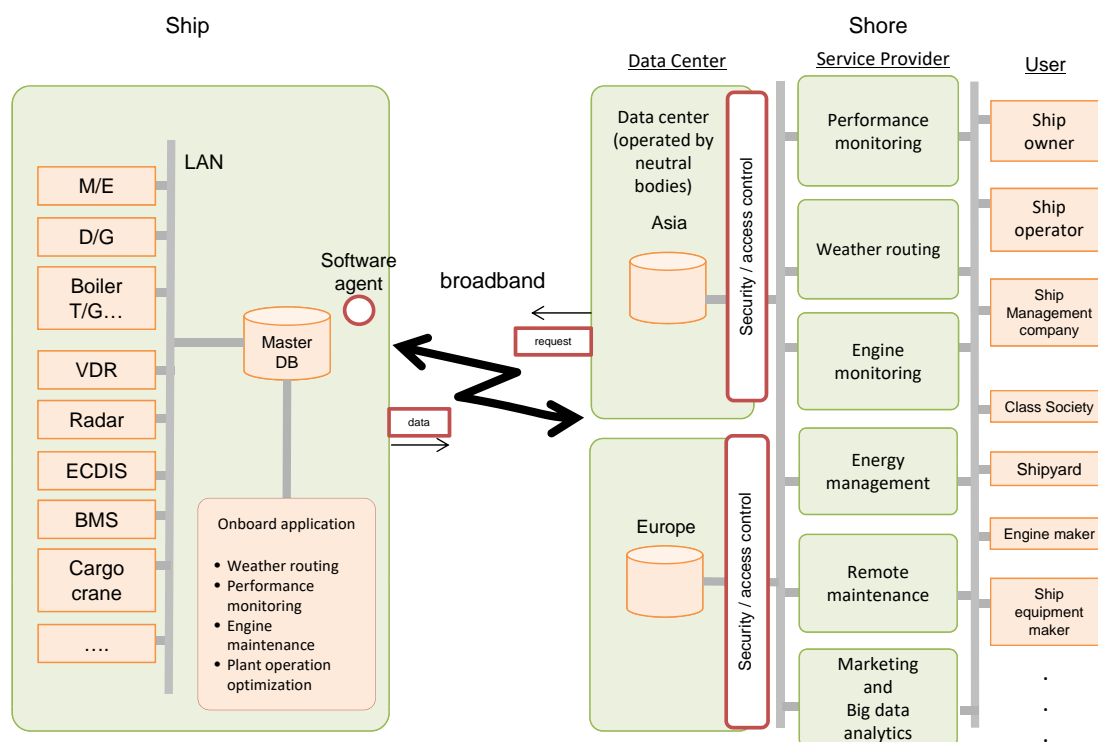
IoT application installation (now)



IoT application installation (future - SSAP2 target)



Concept of Ship - Shore Open Platform



What are the benefits of such platform ?

- ✓ Application providers can easily provide onboard and shore application software / services
- ✓ Equipment manufacturers can easily provide their services, such as remote maintenance -> Ship owners can get remote maintenance supports directly from manufacturers
- ✓ Ship owners investment cost (CAPEX and OPEX) for onboard applications and shore services will be lower -> more big data applications will be used
- ✓ Shipyards and equipment manufactures can collect data from running equipment -> better understanding for service performances
- ✓ Ship owners can manage/control ship data transmission to shore
- ✓ Standardized format and protocol will enhance application development

SSAP Project (Dec 2012 – Mar 2015)

- Participants
 - Members: 27 organizations
 - Observers: 9 organizations
- Joint Industry Project (JIP) supported by JSMEA + Class NK
- Achievements
 - Design specification of shipboard data server
 - Implementation of shipboard data server and trials on 2 domestic vessels
 - Ship – shore open platform design for ship IoT
 - Proposed 2 ISO NPs (ISO NP19847 / ISO NP19848)

Onboard trials in SSAP (2014)

RORO Ferry
SUNFLOWER SHIRETOKO



Crude-Oil Tanker
SHINKYOKUTO MARU

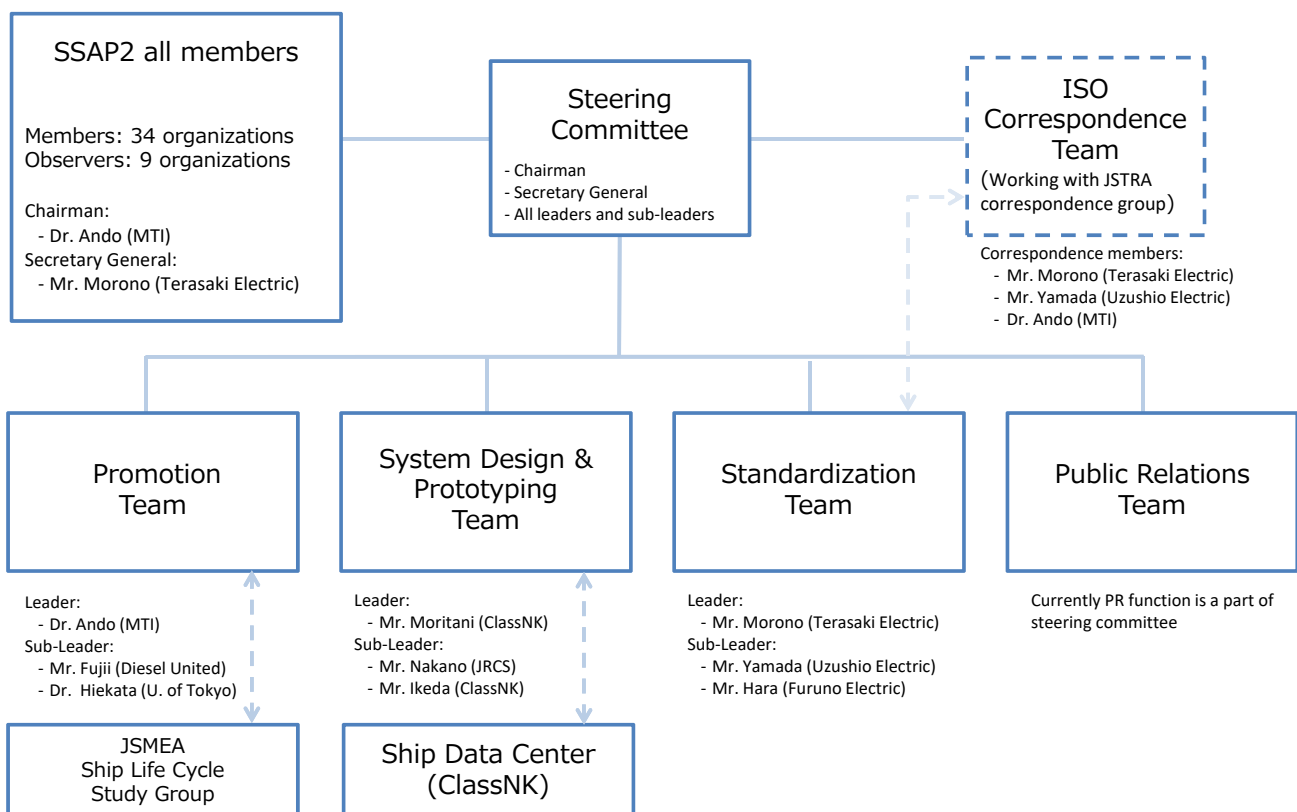


SSAP2 Project

(Smart Ship Application Platform 2 Project)

- Participants
 - 34 members + 9 observers
- Schedule
 - Aug. 2015 – Oct. 2017
- Action items
 1. Promotion of SSAP2 concept
 2. System design and prototyping of SSAP2
 3. Standardization – ISO CD19847/CD19848
 4. Public relations

Organization of SSAP2 Project

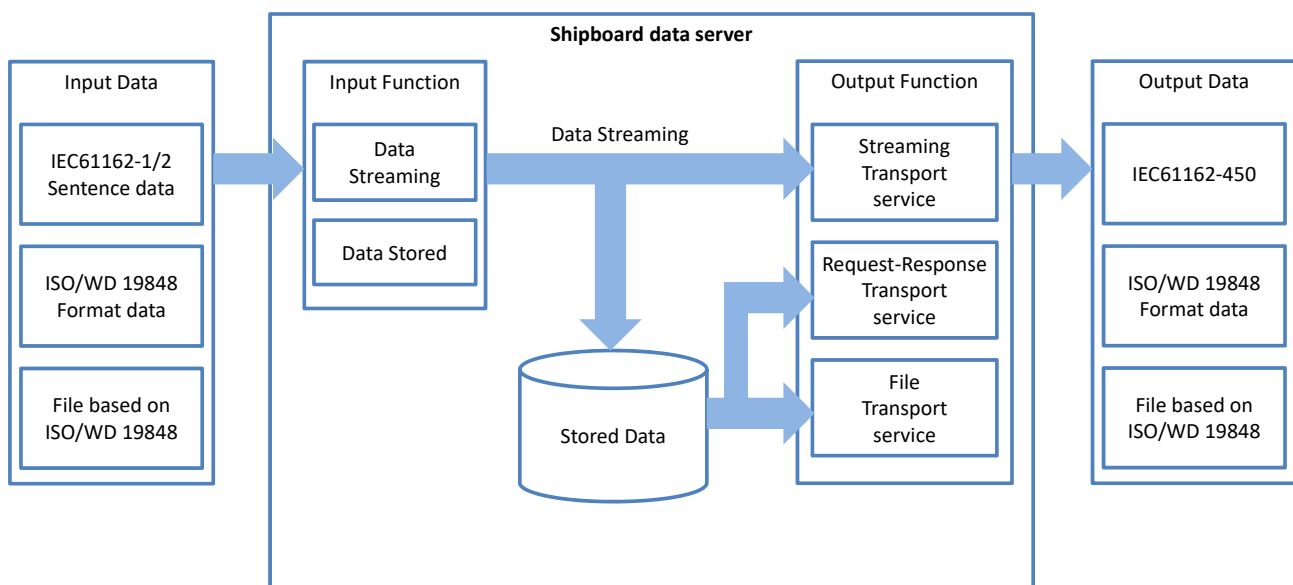




ISO CD 19847

Shipboard data servers to share field data on the sea

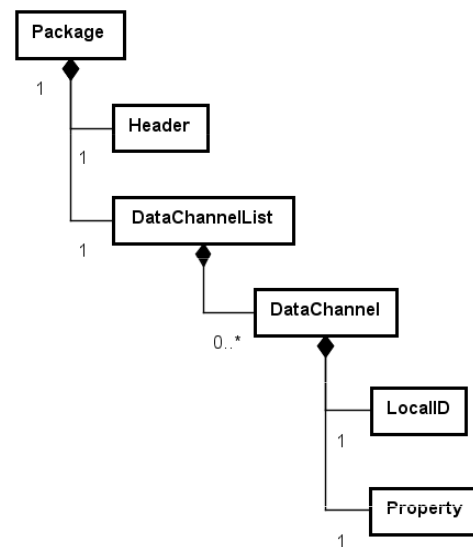
- Requirements for shipboard data server



ISO CD 19848

Standard data for shipboard machinery and equipment

- Data channel
 - Data channel ID
 - Data channel property
- Time series data
- Data structure
 - Structure of data channel list
 - Structure of time series data

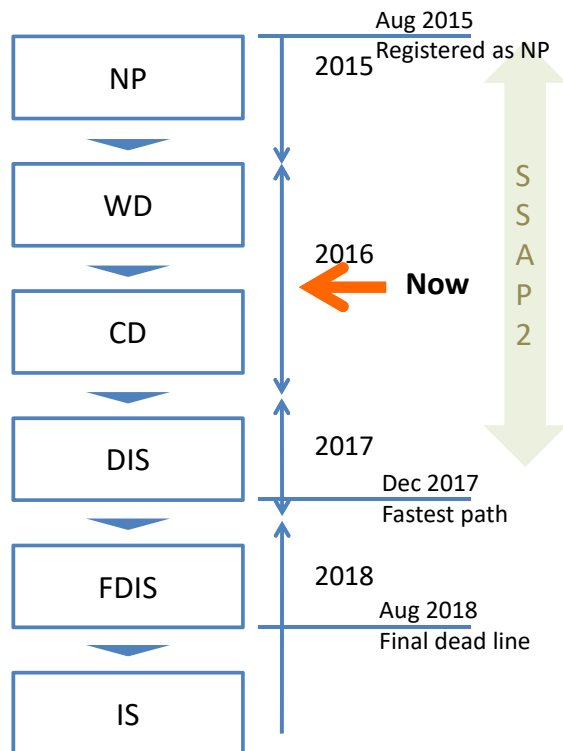


Model of data channel list

Policy of standardization

- ❖ Corroborate and harmonize with
 - Existing standards
 - IEC61162-450/460(Digital Interface – Part 450 Multiple taker and multiple listeners – Ethernet interconnection)
 - ISO16425 (Guidelines for the installation of ship communication networks for shipboard equipment and systems)
 - New proposed standards
 - IHO S-100series
 - IEC BAM(Bridge alert management – Operational and performance requirements, methods of testing and required test results)
 - Associated projects / Organization
 - e-Navigation(IALA)
 - SMART-Navigation(Korea)
 - IEC etc.,
 - Cyber security discussions

Process for ISO (ISO CD19847, ISO CD19848) *

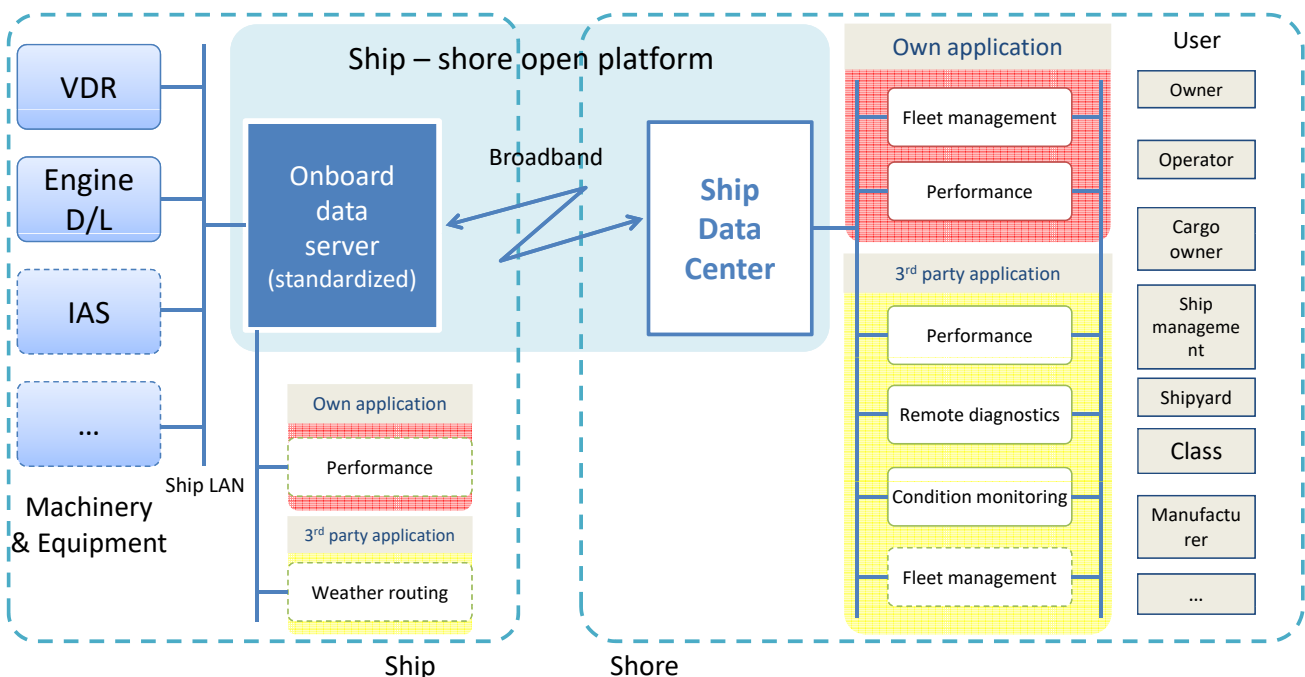


- ISO PWI 19847/19848 were accepted as NP in Aug 2015
- The first ISO/TC8/SC6/WG16 meeting was held in June 2016 in Tokyo
- 2 CDs will be distributed for comment and voting soon to the P-members of ISO/TC8/SC6

• NP: New work item Proposal, WD: Working Draft
 • CD: Committee Draft, DIS: Draft International Standard
 • FDIS: Final Draft International Standard, IS: International Standard

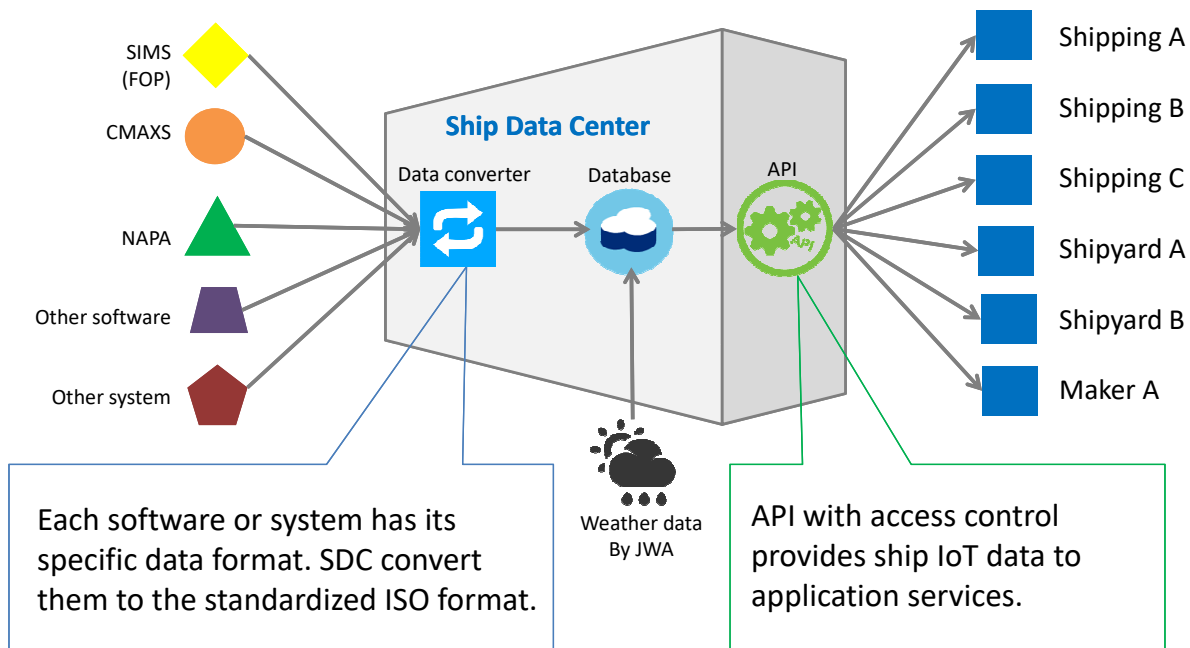
Ship–shore open platform for Ship IoT

Ship-shore open platform provides good security and access control to enhance cooperation with industry partners for utilizing Ship IoT data.

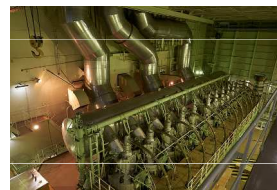


Ship Data Center at Shore

Ship data center provides a platform to access ship IoT data safely, easily and reasonably. With the platform, utilizations of ship IoT data at shore will become much easier and it will enhance development and operation of ship IoT application services.



Use Case Scenarios of Ship Data Center



Shipping

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

Shipyard

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

Maker

- Remote condition monitoring
- Remote diagnostics
- After service support

Class Society

- Utilization in class inspection

Software vendor

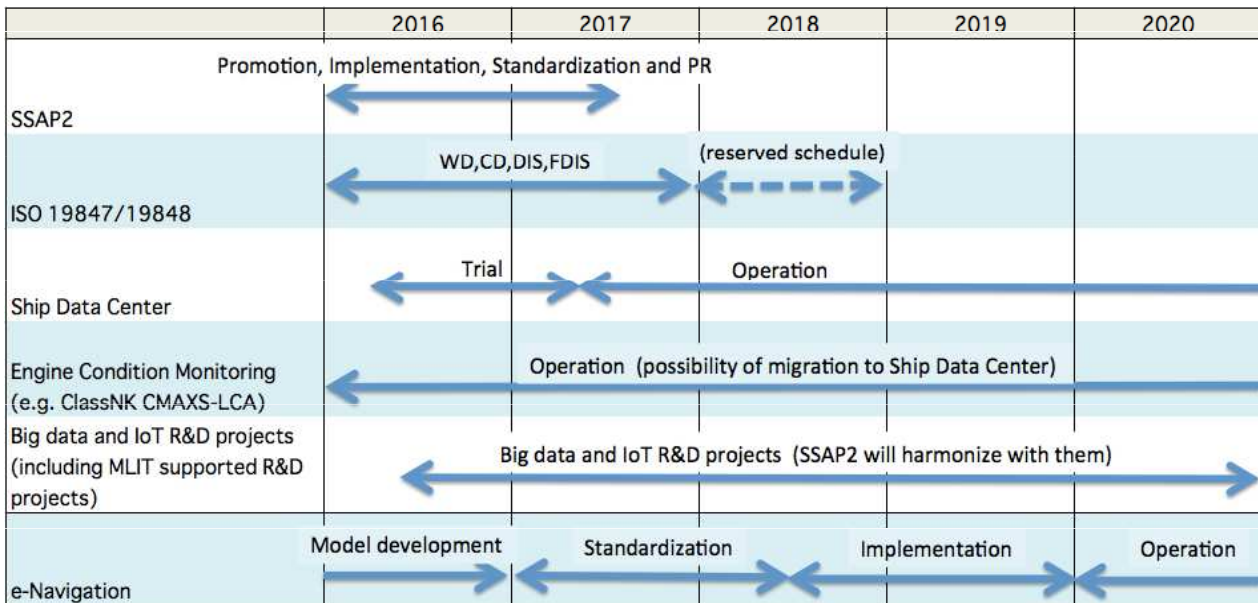
- Application services

Insurance/Bank

- New services

Ship Data Center

Schedule (estimation)



Summary

- JSMEA, Class NK, 34 member organizations and 9 observers are working together for SSAP2 (Smart Ship Application Platform 2) Project
- The aim of SSAP2 Project is to design and to implement an open platform for supporting Ship IoT service development and operation
- SSAP2 follows up ISO CD 19847/CD 19848 standardization process
- Ship Data Center is a platform for shore side Ship IoT applications. SSAP2 work closely with Ship Data Center to achieve the open platform concept.



Thank you very much for your attention

For further information, please contact

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JSMEA, Japan Ship Machinery and Equipment Association