SSAP: A pilot project in Japan for standardized data collection onboard and shore, and its harmonization to e-navigation

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Smart Ship Application Platform Project
JSMEA (Japan Ship Machinery and Equipment Association)

IMO NCSR-1
June 30, 2014

Outline

1. Introduction
2. Scope of SSAP
3. Implementation and onboard trials
4. Ship – shore system concept
5. Standard proposal
6. Summary

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Background

- Onboard and shore-based application services, which rely on ship onboard equipment data, have become prevalent
  - Weather routing
  - Optimum trim
  - Ship Performance monitoring
  - Engine performance monitoring
  - Power plant energy management
  - Condition monitoring
  - Remote maintenance

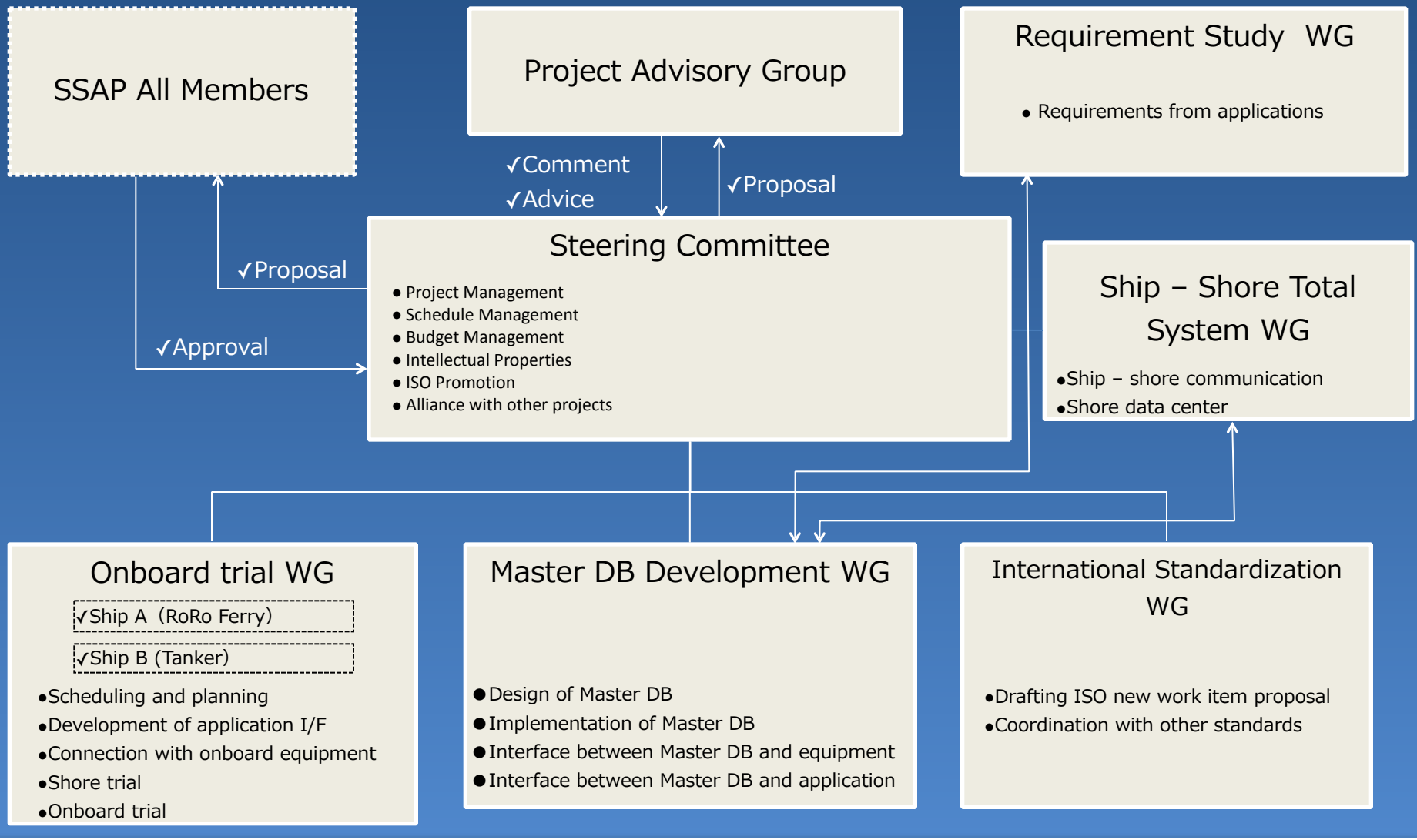
- The concept of “Smart Ship” is to utilize such application services to optimize ship operations in terms of safety and energy efficiency

- The target of “Smart Ship Application Platform (SSAP)” project is to provide open platform to access ship equipment data for such application services

SSAP Project

- Smart Ship Application Platform Project (SSAP)
- Participants
  - Members: 26 organizations
  - Observers: 9 organizations
- Joint Industry Project (JIP) organized by JSMEA
- Project schedule
  - Dec 2012 – March 2015 (will move to the next phase after the period)
- Budget
  - Approx. 1.2 Million USD
  - Class NK funding + participant fees from members
- Registered as e-navigation test bed in May 2014

SSAP project organization

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JSTRA

SNJ THE SHIPBUILDERS' ASSOCIATION OF JAPAN

JSMEA Japan Ship Machinery and Equipment Association

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Scope of SSAP

1. To develop standardized and open platform for safety and energy-efficiency applications to access shipboard equipment data onboard and shore

2. To propose ISO standards regarding
   1) ship data server
   2) data dictionary and format

3. To harmonize with e-navigation and other IMO/ISO/ IEC standards

Image of application services installation (now)

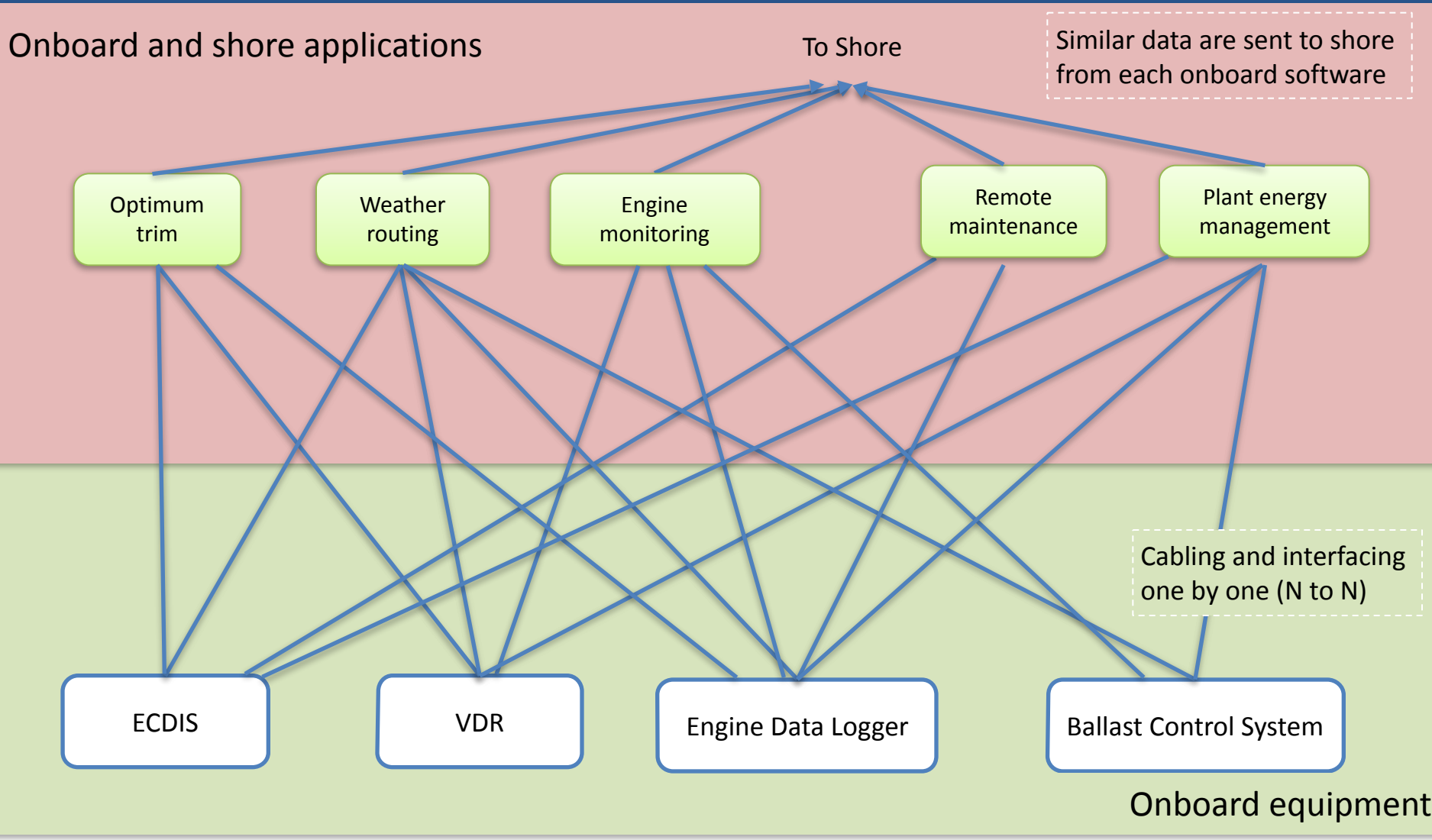
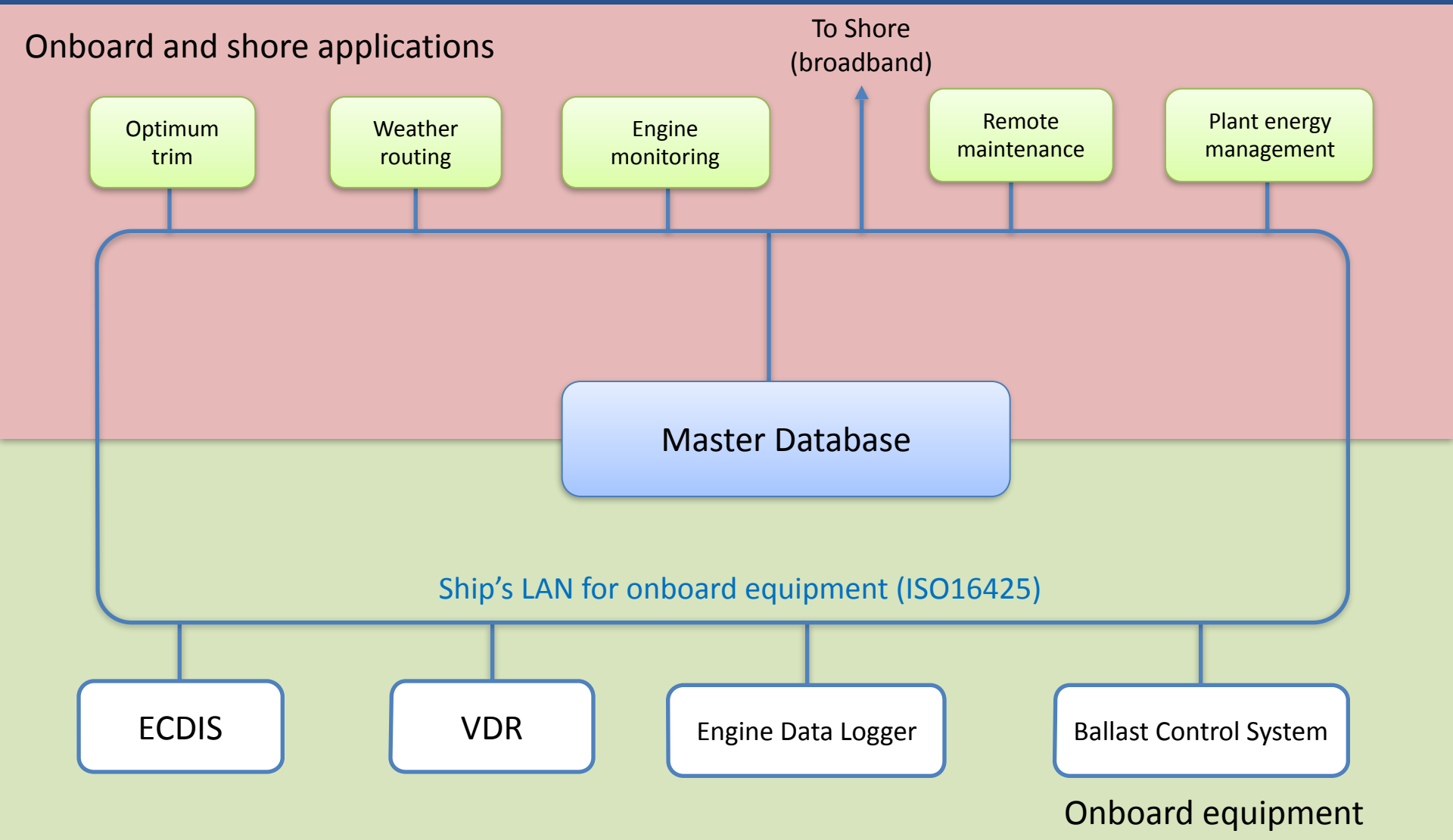


Image of application services installation (future)



Main action items of SSAP

1. Study requirements from existing safety and energy efficiency application services
2. Design Master DB and interfaces
3. Implementation of Master DB and interfaces
4. Onboard trials of the implemented system
5. Design specifications for ship – shore information system
6. Implementation of ship – shore system and its trial
7. Review the design of Master DB, interfaces and ship-shore system based on lessons learned from the trials
8. Develop proposal for ISO

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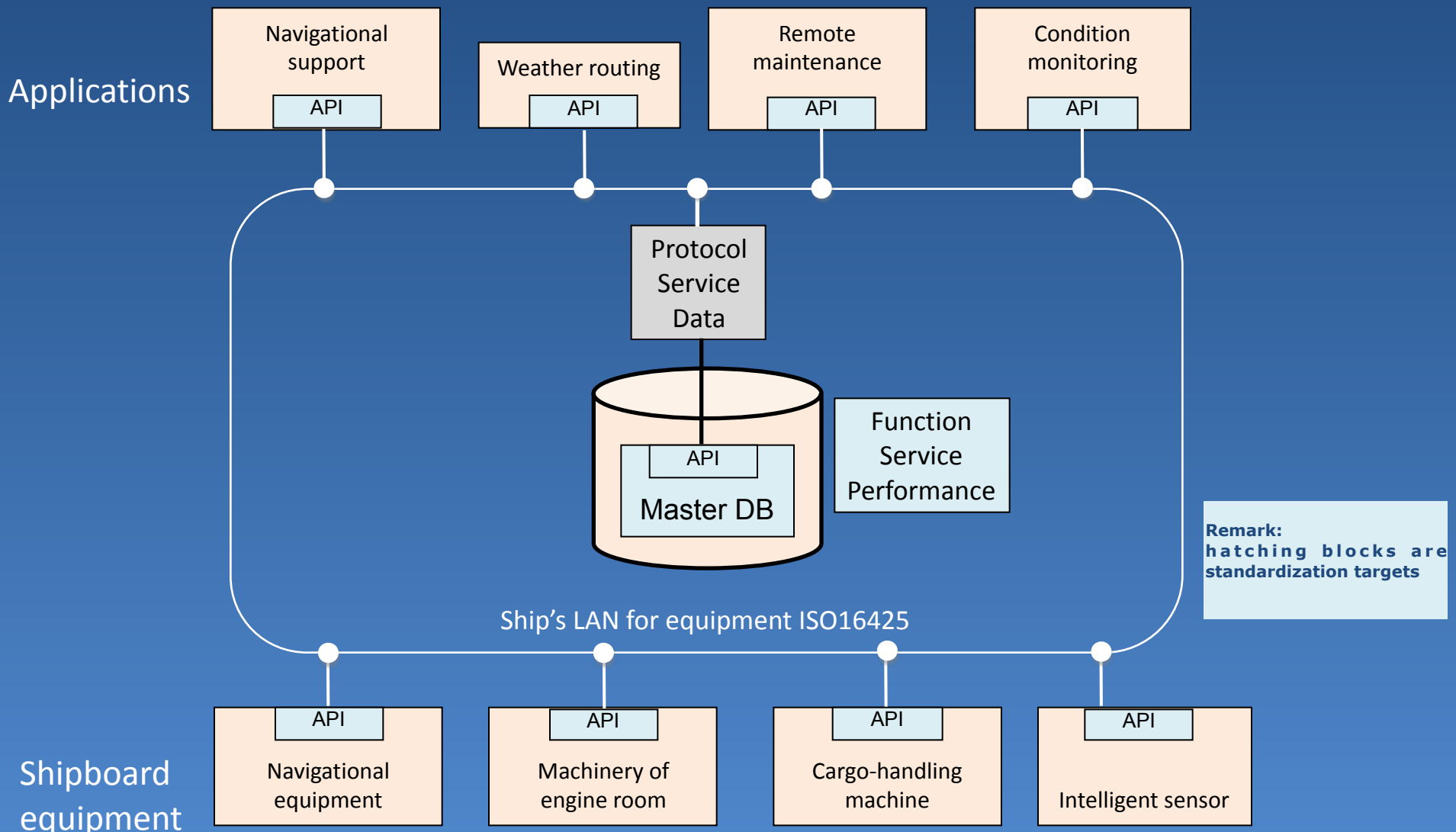
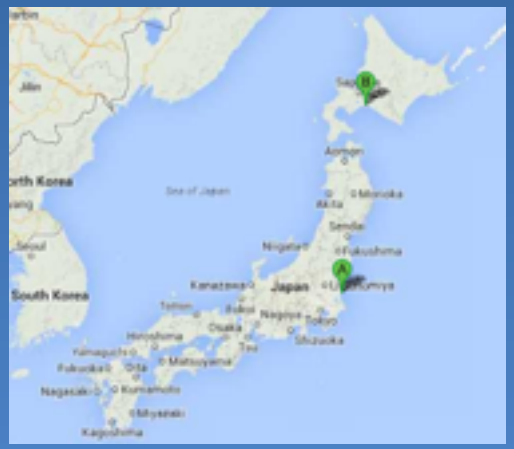
Image of Master Database



API: Application Program Interface

Onboard trial - ship (A)

- RoRo Ferry “Sunflower Shiretoko” (retro-fit)
- Gross ton ：11,400 MT Speed :25Knot
- L :190m B :26.4m
- Trial since Jan 2014



Data and information flow image – Ship (A)

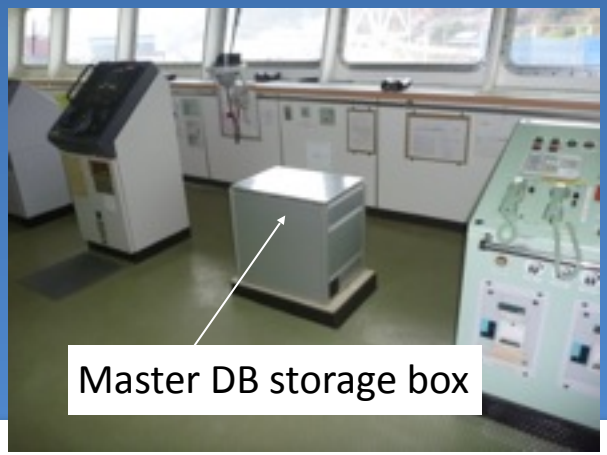
Onboard equipment

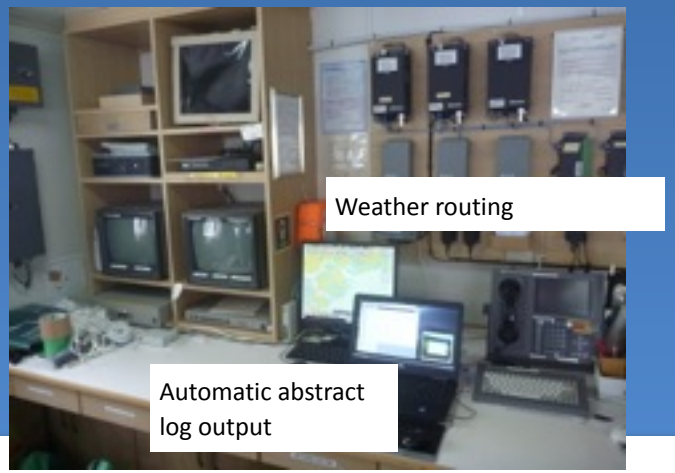
- GPS
- Anemometer
- Echo Sounder
- Auto Pilot
- Roll/Pitch sensor
- Engine Data Logger
- M/E remote control
- CPP remote control
- Shaft power meter

Master DB

Application

- Weather routing
- Automatic abstract log output





Onboard trial - ship (B)

- Crude-oil Carrier “SHINKYOKUTO MARU” (new building)
- Deadweight ：5,500 MT　　L :105m　　B :16m
- Trial since April 2014

Data and information flow image – Ship (B)

Onboard equipment

- GPS
- Anemometer
- EM log
- Gyro pilot
- Radar
- AIS
- NAVTEX
- Doppler sonar
- Cargo control system
- Engine Data Logger

Master DB

Application

- Weather routing
- Engine monitor

Master DB storage box

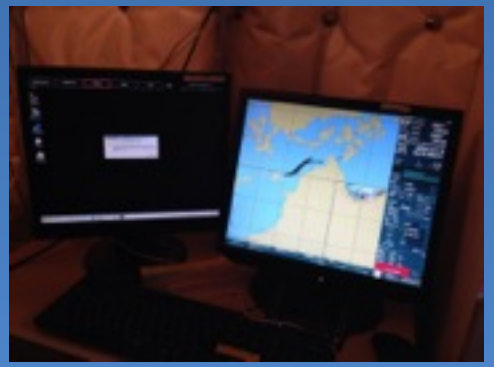


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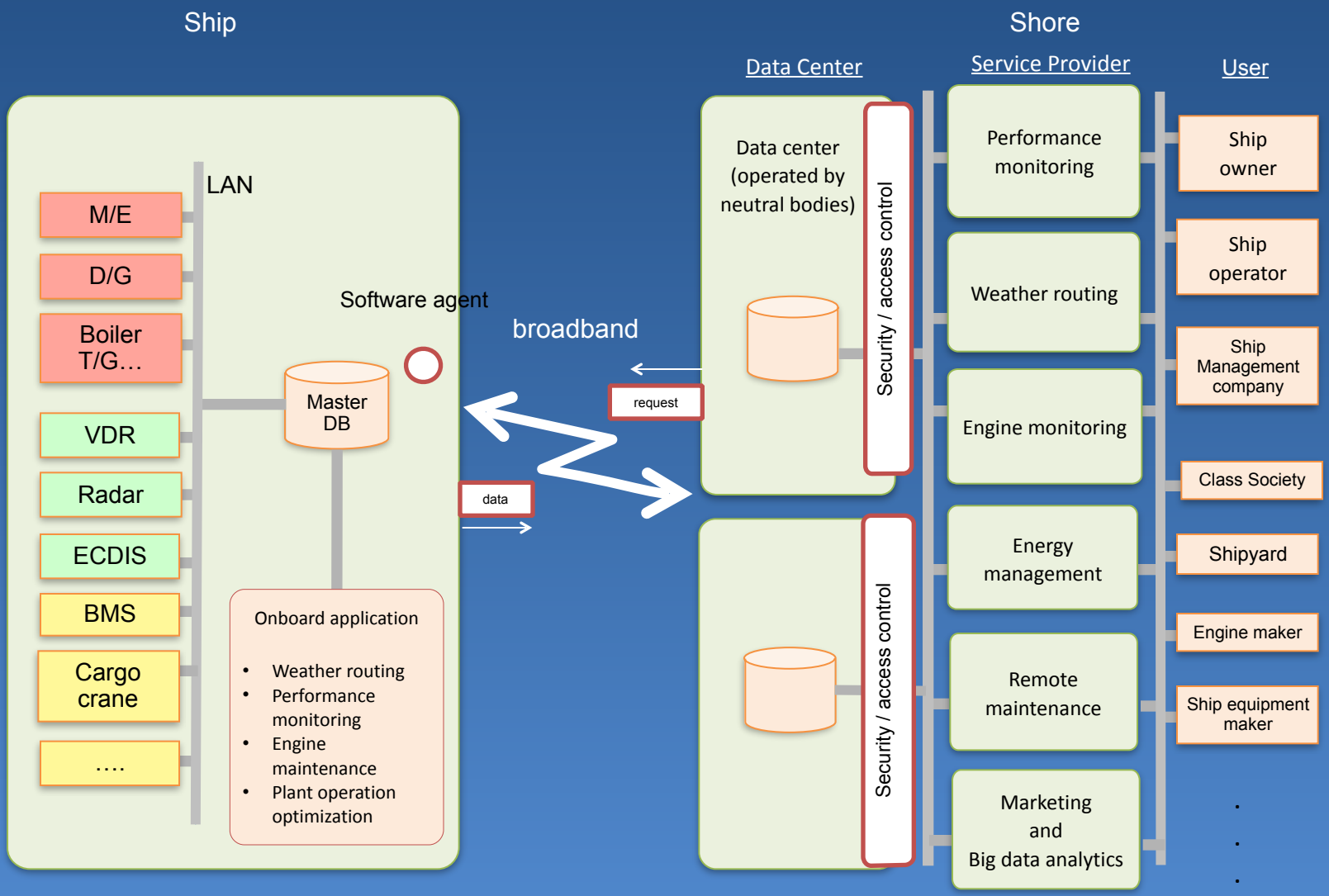
Image of ship – shore open platform



What are the benefits of such platform ?

- ✓ Safety and energy-efficiency application service providers can concentrate on providing software function, quality and usability without spending resources for data collection
- ✓ Equipment manufacturers can develop their remote maintenance services by using the standardized platform
- ✓ Ship owners investment cost (CAPEX and OPEX) for onboard applications and shore services will be reduced
- ✓ Ship owners can use robust and reliable data center services to access ship operation data
- ✓ Shipyards and equipment manufactures can collect data from running equipment to improve service levels of their products

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Scope of standardization (1)
- Shipboard data server -

- System model
- System security
- Communication specification
- Data specification
- Data server requirement
- API requirement on equipment, application and data server

Scope of standardization (2)
- data dictionary and format -

- Data dictionary
  - Machinery, hull and cargo
- Specification of data format (Informative annex)
  - Data structure, character of data etc.

Policy of standardization

- Corroborate and harmonize with
  - Existing standards
    - IEC61162-450 (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-100 series
    - IEC BAM(Bridge alert management – Operational and performance requirements, methods of testing and required test results)
  - Associated projects / Organization
    - e-Navigation
    - IEC
    - etc.

Schedule for ISO/IMO

ISO

- Oct 2013 … Preliminary notice in ISO/TC8 annual committee in Singapore
- Oct 2014 … Presentation in ISO/TC8 annual committee in Panama
- Mar 2015 … New work item proposal to ISO/TC8/SC6

IMO

- SSAP will report the result according to the e-navigation test bed guideline

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Summary

- JSMEA, Class NK and 26 members are working on SSAP project, which is registered as a test bed of e-navigation
- SSAP aims at providing standardized way of accessing ship equipment data for safety and energy efficiency applications onboard and ashore
- SSAP will harmonize its proposal with e-navigation and other IMO/ISO/IEC standards

Thank you very much for your attention

For further information, please contact

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JSMEA, Japan Ship Machinery and Equipment Association

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