EFFICIENSEA
2.0 GETTING CONNECTED

Final Conference

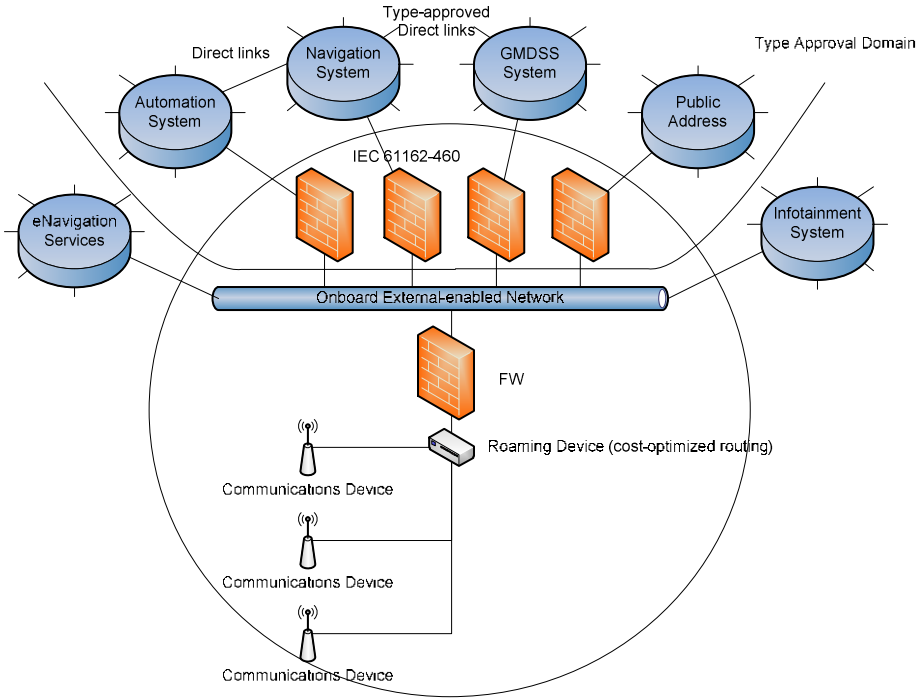
T2.4 Shipboard System Integration, Onboard networks

This project has received funding from The European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement no. 636329

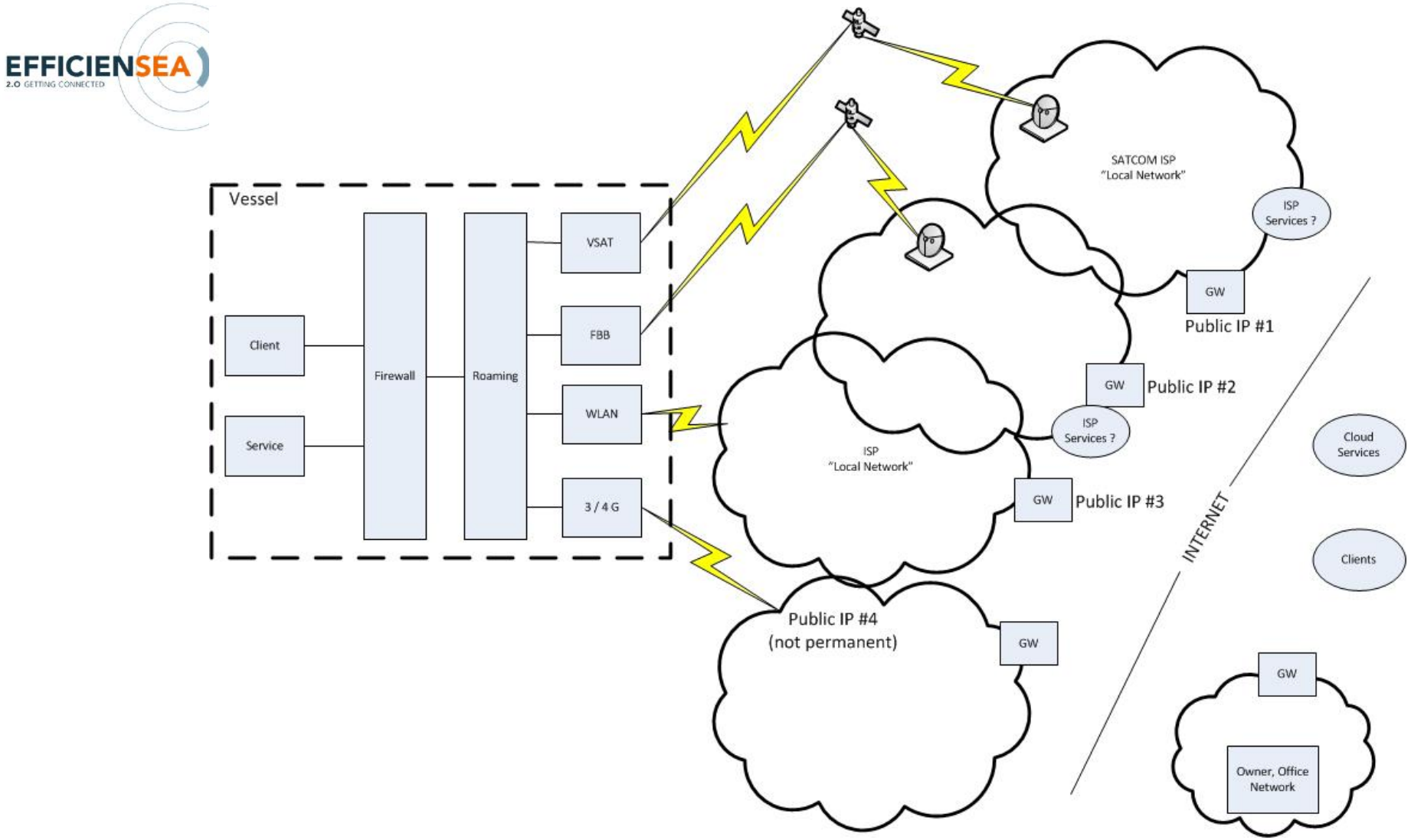
Contents

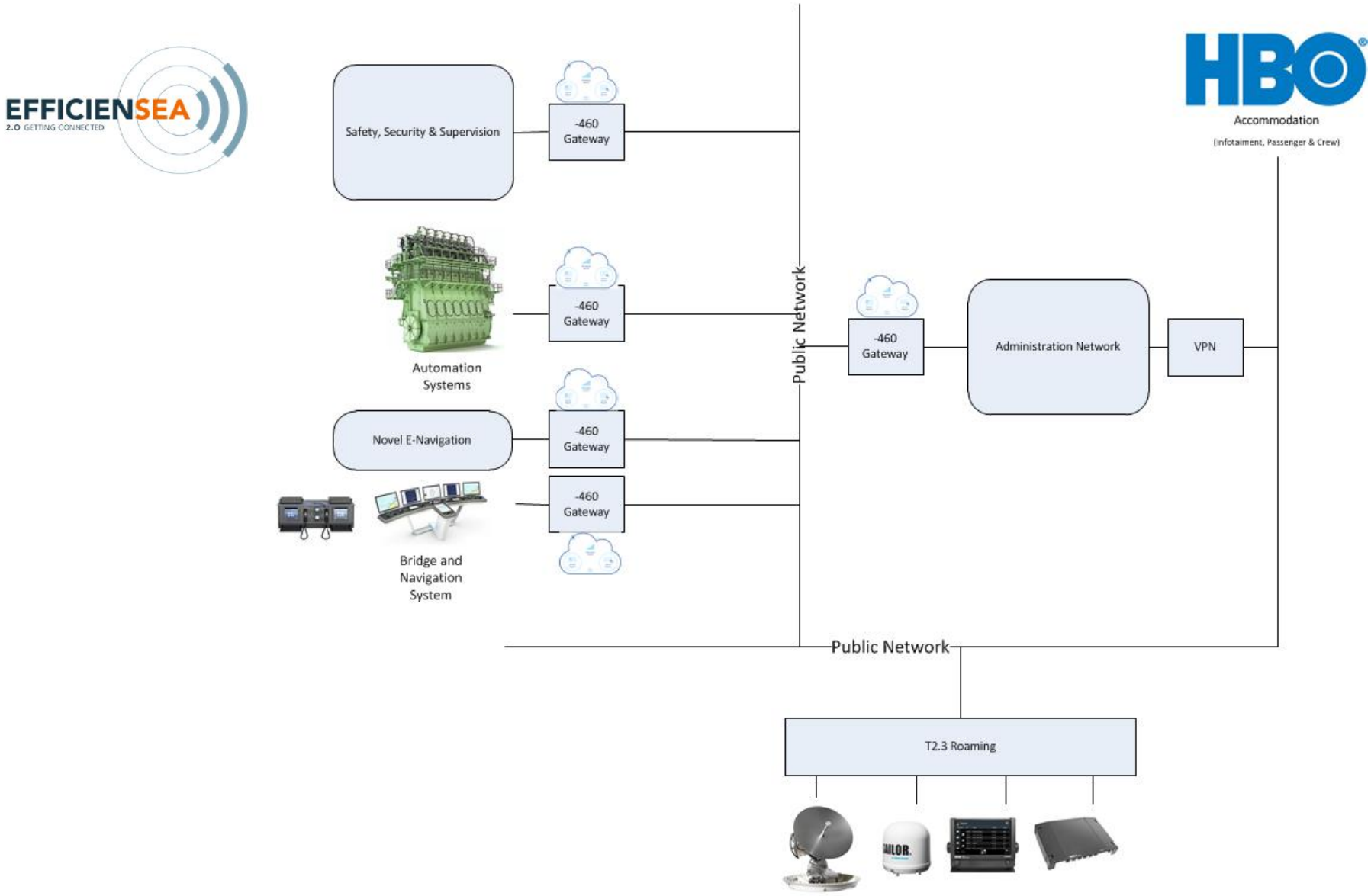
- WP2 Task 2.4 Scope
- Summary of work so far
- Presentation of Prototype setup
- Learnings from prototype setup so far

Scope

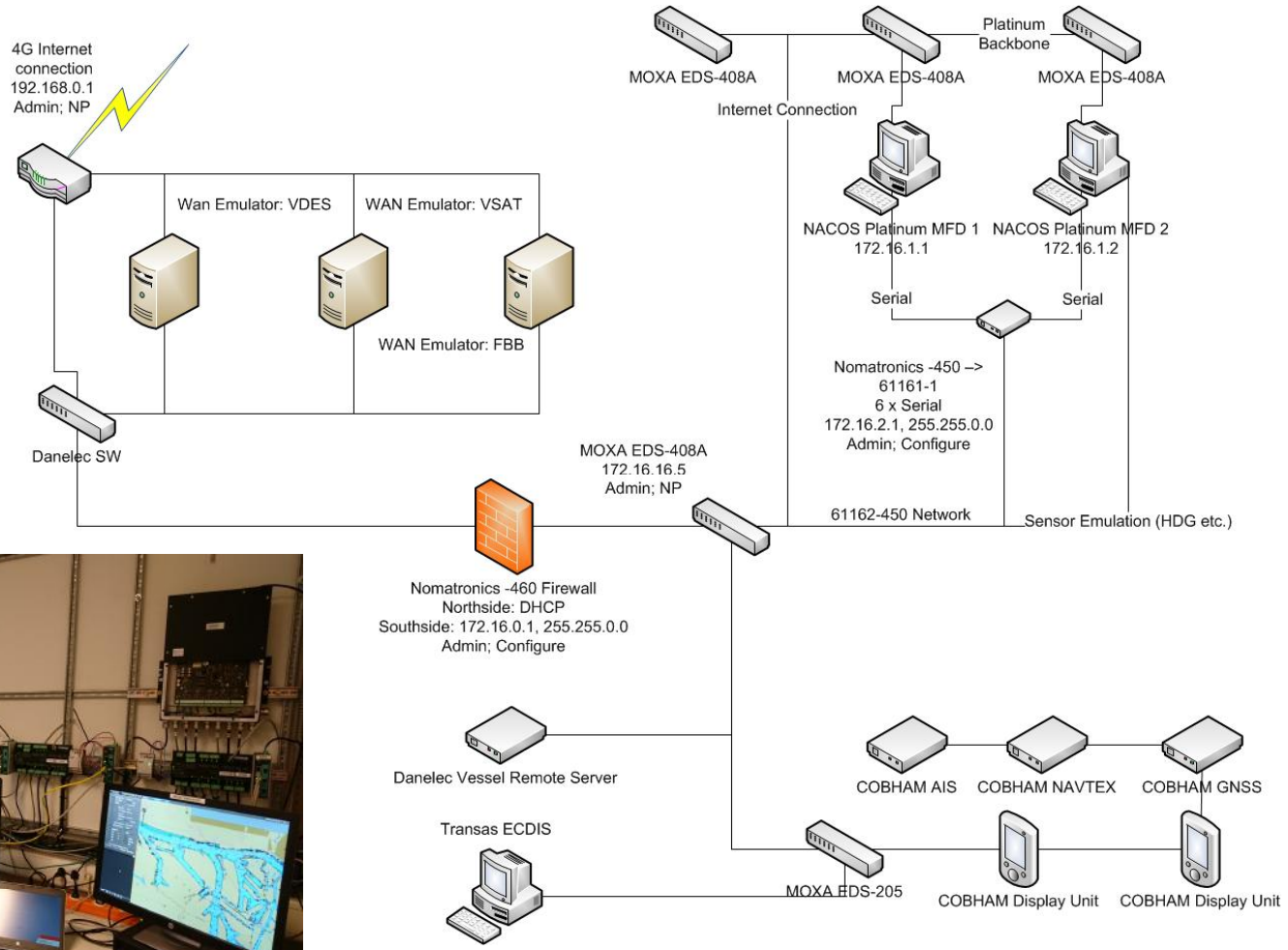


- Develop On-Board System Architecture
  - Low impact Integration with existing infrastructure and architecture
  - Requirement of an “open” and harmonized architecture
  - Cyber Security Considerations
- Vessel<->Shore communication protocols
- Prototype Demonstration & Potential Standardization


EFFICIENSEA
2.0 GETTING CONNECTED
Vessel
Client
Service
Firewall
Roaming
VSAT
FBB
WLAN
3 / 4 G
SATCOM ISP
"Local Network"
ISP
Services ?
GW
Public IP #1
GW
Public IP #2
ISP
Services ?
ISP
"Local Network"
GW
Public IP #3
Public IP #4
(not permanent)
GW
INTERNET
Cloud
Services
Clients
GW
Owner, Office
Network

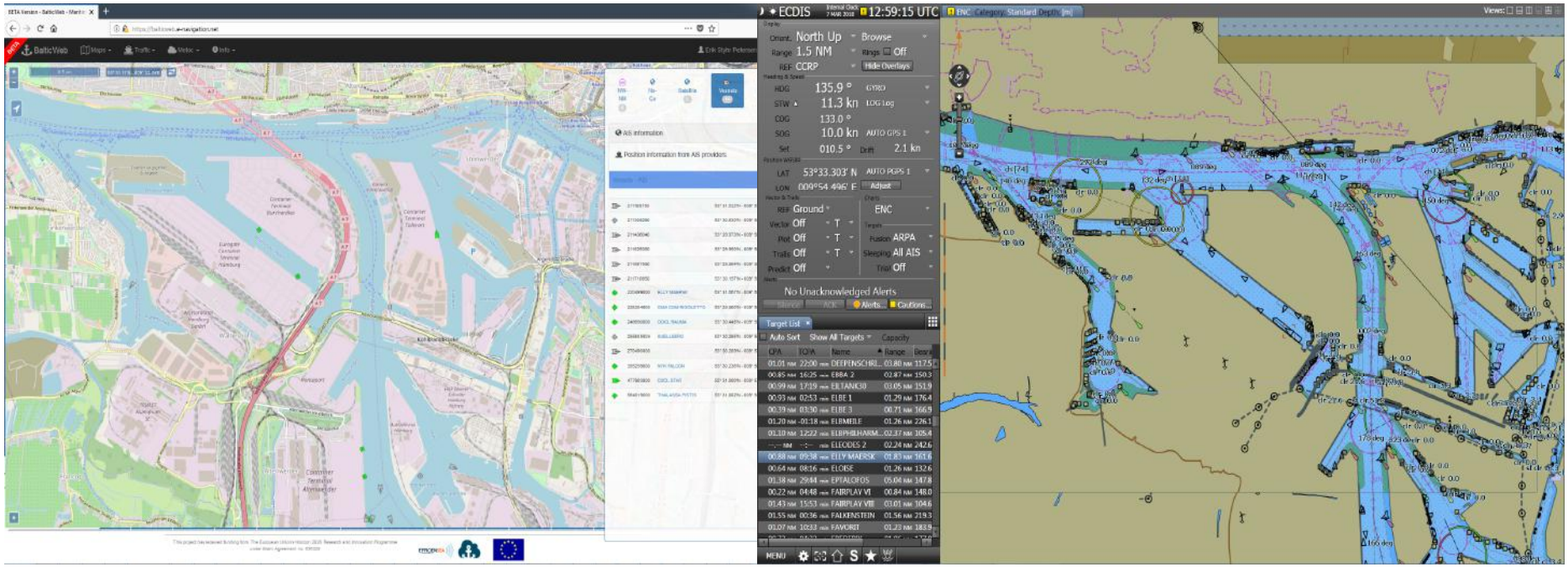

EFFICIENSEA
2.0 GETTING CONNECTED
Safety, Security & Supervision
-460 Gateway
-460 Gateway
Automation Systems
Novel E-Navigation
-460 Gateway
-460 Gateway
Bridge and Navigation System
Public Network
-460 Gateway
Administration Network
VPN
HBO
Accommodation
(Infotaiment, Passenger & Crew)
Public Network
T2.3 Roaming

Prototype Setup at Wärtsilä, Hamburg



EFFICIENSEA 2.0 GETTING CONNECTED

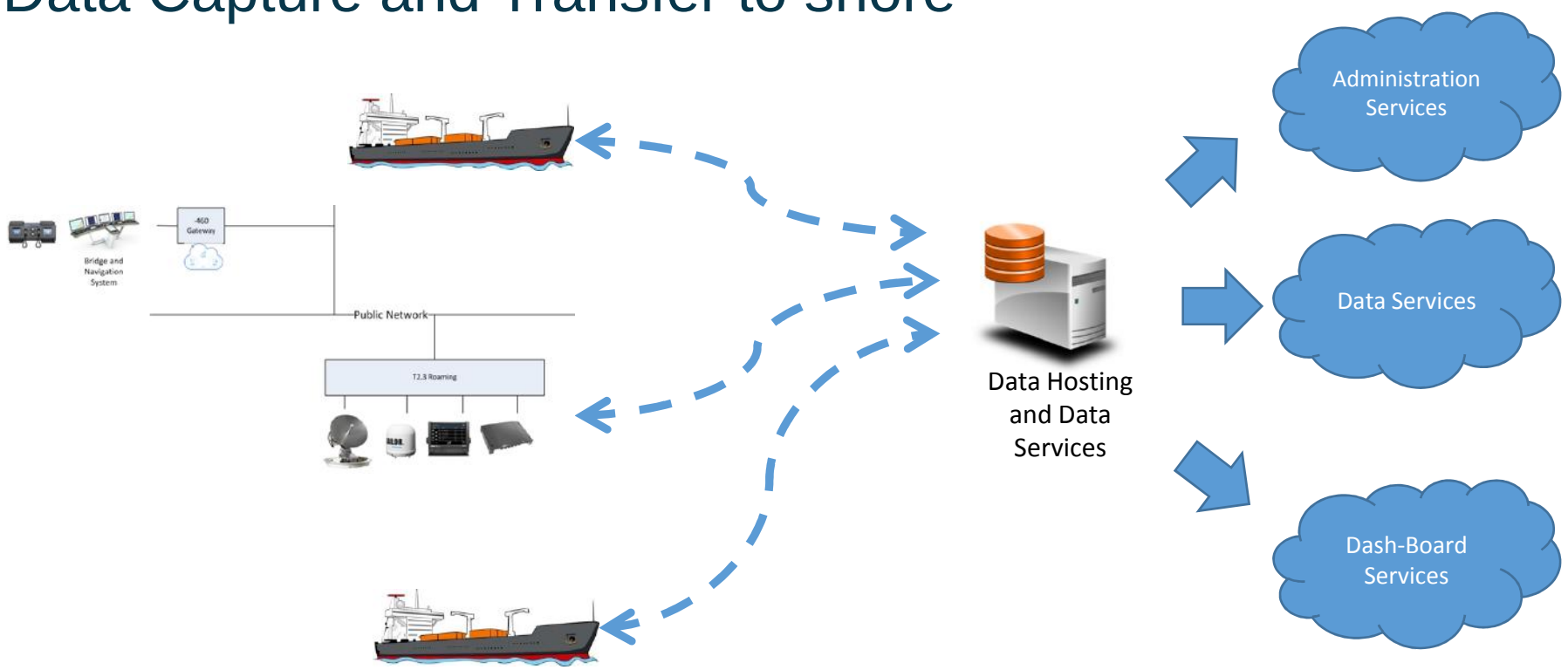
Wärtsilä



The final test: Connected!!!
ECDIS & BalticWeb, side-by-side

Danelec

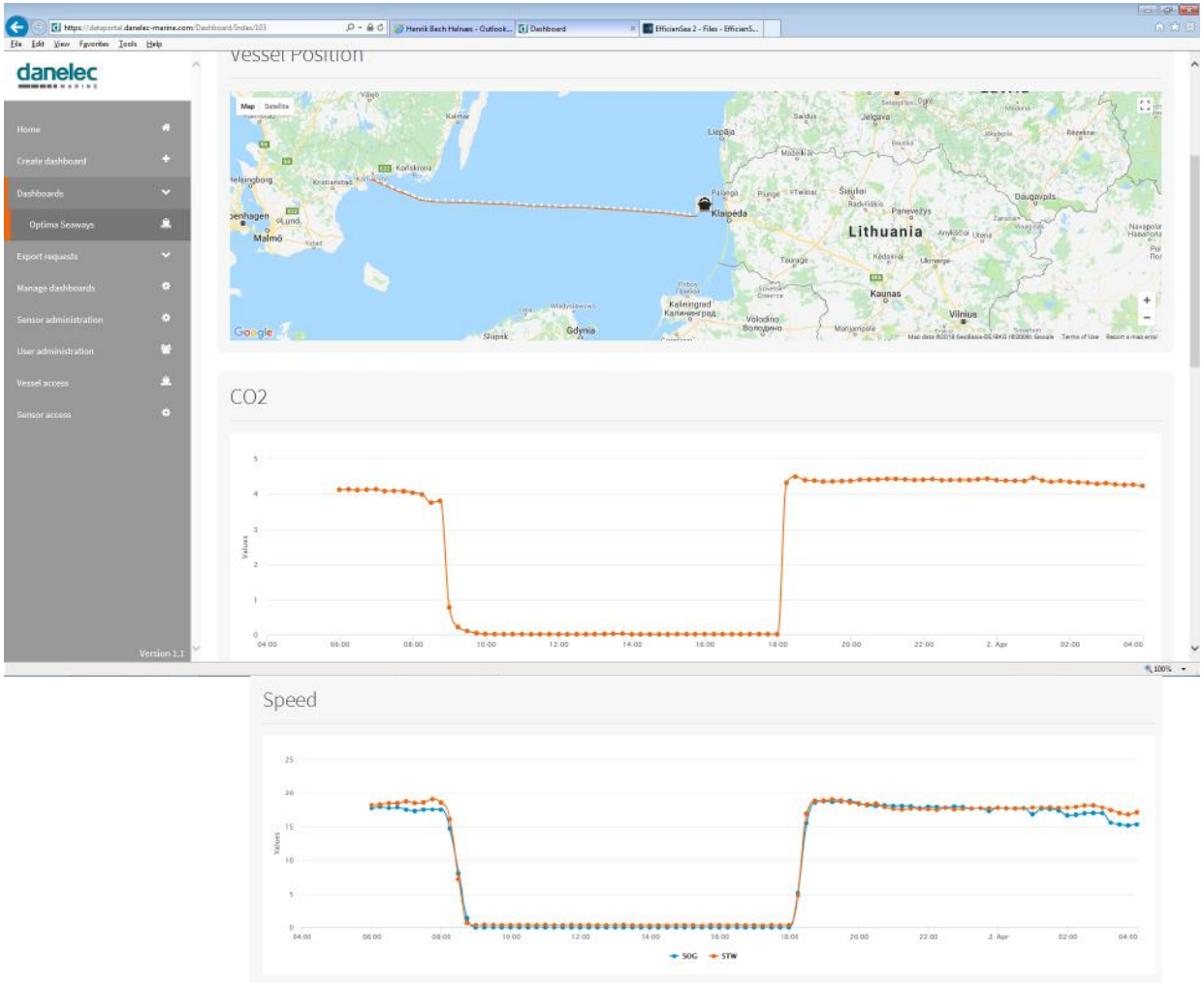
Data Capture and Transfer to shore



Danelec

Learnings:

- Works in architecture
- Reliable Communication Protocols at low bandwidth
- Interoperability
- MCP Ready



Cobham

- Goals:
  - Are providing sensors to provide data for the 450 network.
  - Show interoperability with other equipment on 450 network and In the architecture
  - Remote monitoring of performance of Cobham equipment through the architecture and the lower QoS situations

Transas: Summary of work

Commercial ECDIS software with the following additional functionality:

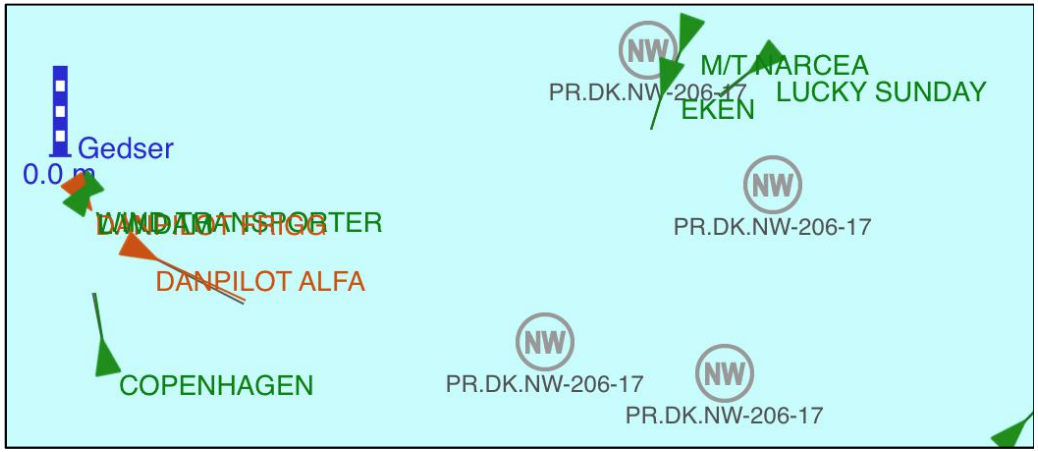
- **MCP**: Support of MSI service (S-124 format version 0.0.7)
- **MCP**: Support of Route Optimization service
- **MCP**: Support of Route exchange using RTZ format
- **MCP / STM-SeaSWIM**: Search of registered services. Ship Service book
- Supplementary: Weather and Satellite ice imaginary in GeoTIFF format

Prototype of new ECDIS generation:

- S101 charts: Waiting for Standard

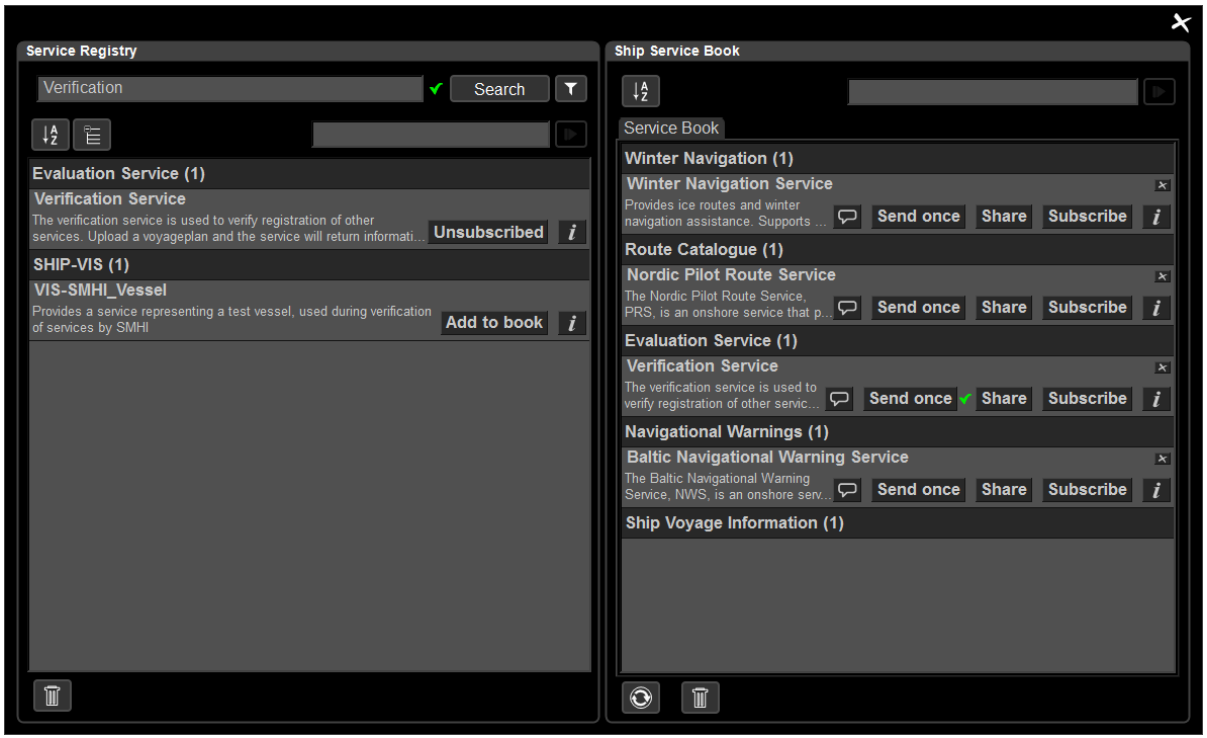
New Pilots e-Nav PPU:

- RTZ Routes
- S-124 NW (MSI & NM)



Transas: Learnings

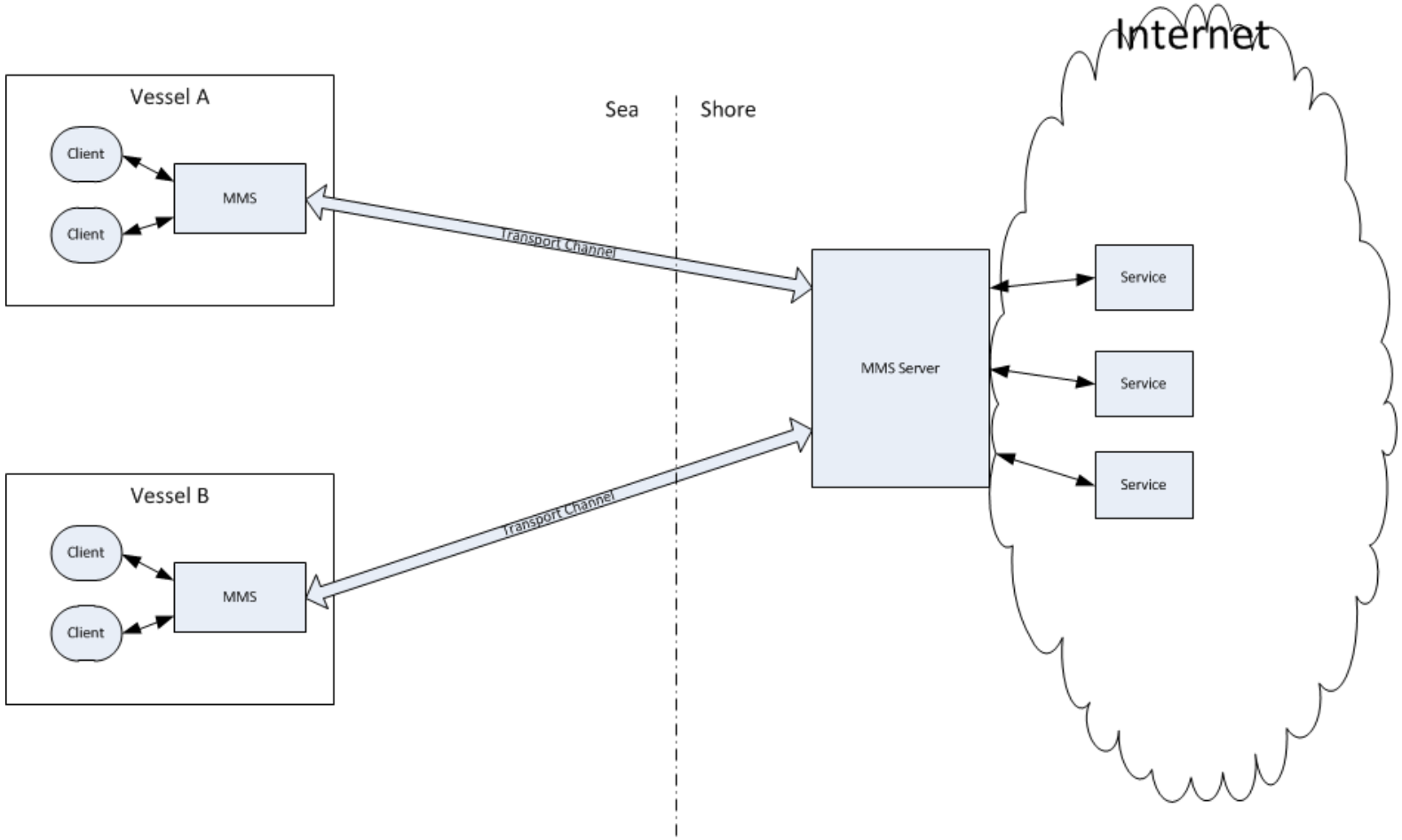
- **MCP & STM** services are accessible and operational
- Looking forward to the New **Era** of Non-SOLAS e-NAV tools
- **How to handle C**yber **S**ecurity
- Next e-Navigation trends and **needs**
- Future **commercialization**
- IHO **S-1xx** Standards



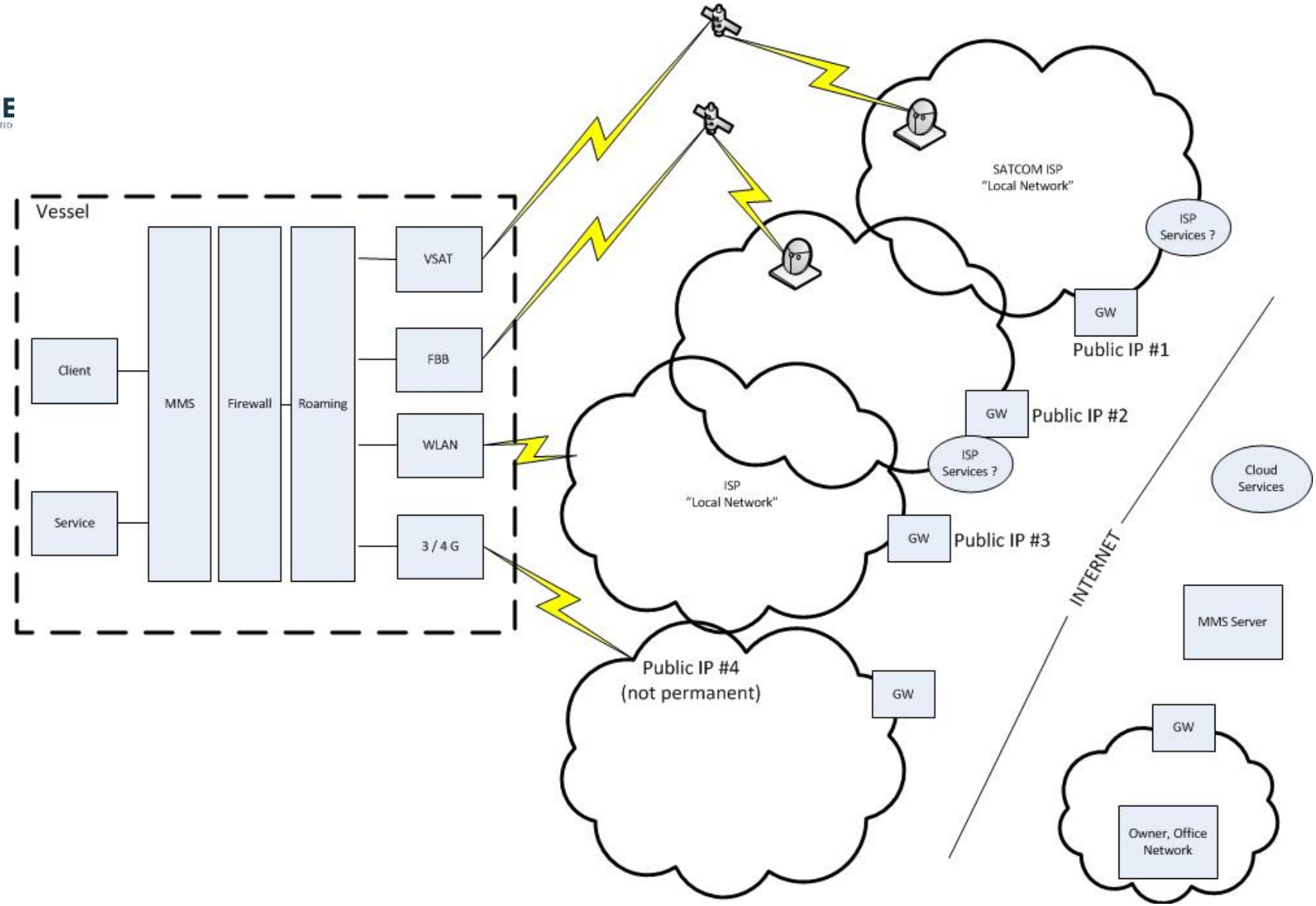
Fleet Operation Solutions, STC Solutions, Pilots PPU

Backup

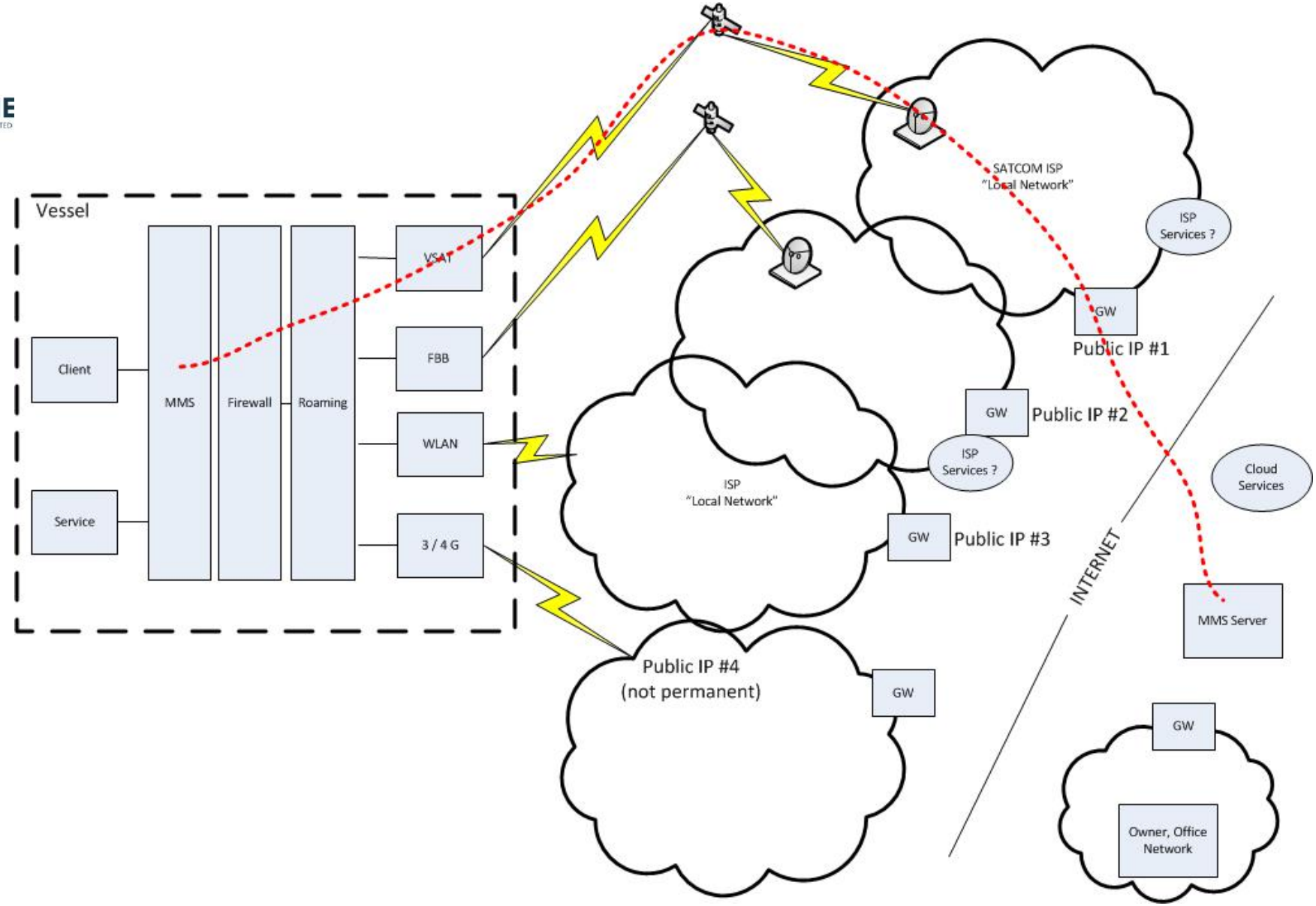
Maritime Messaging Service (MMS)



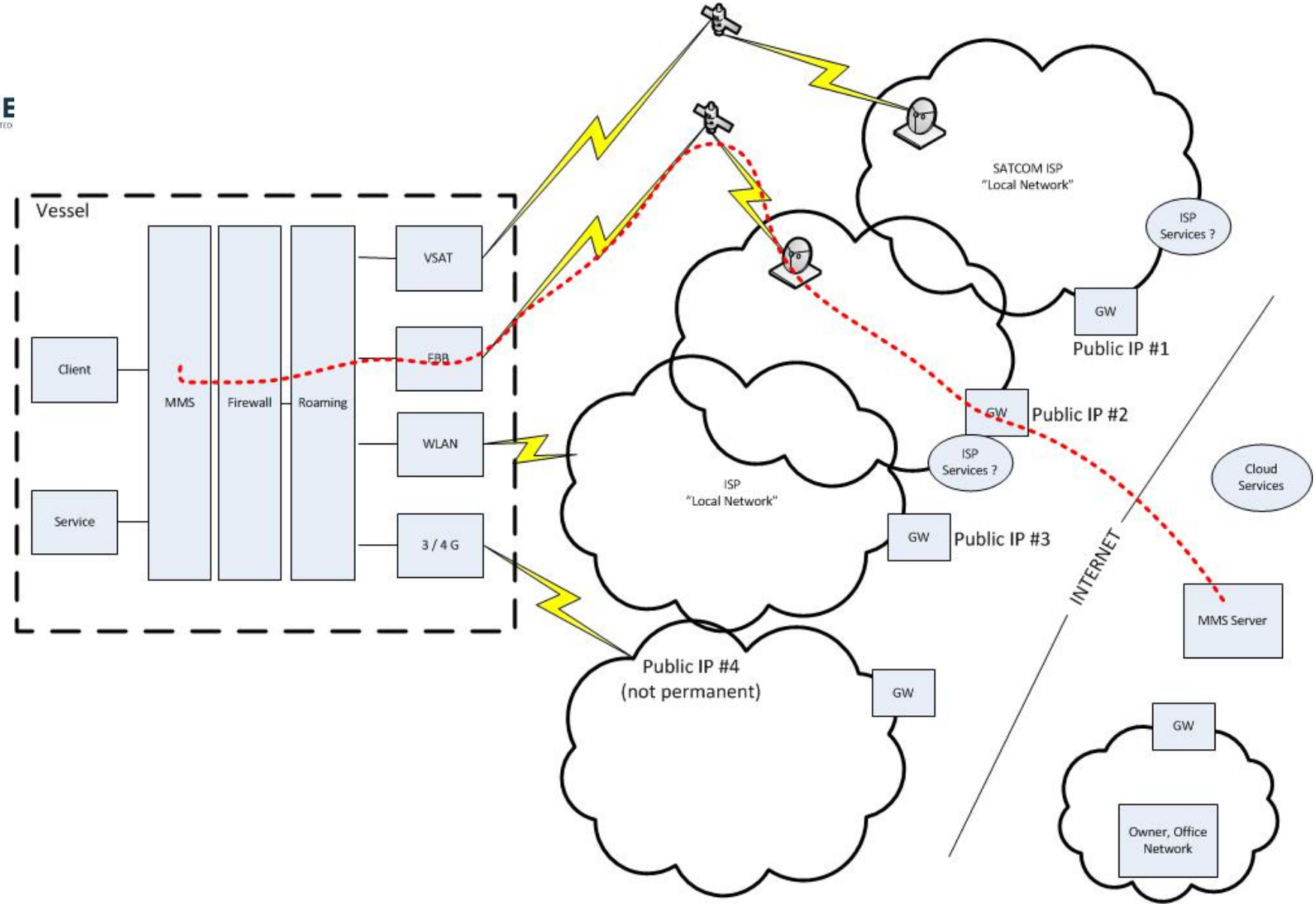
EFFICIE
2.0 GETTING CONNECTED

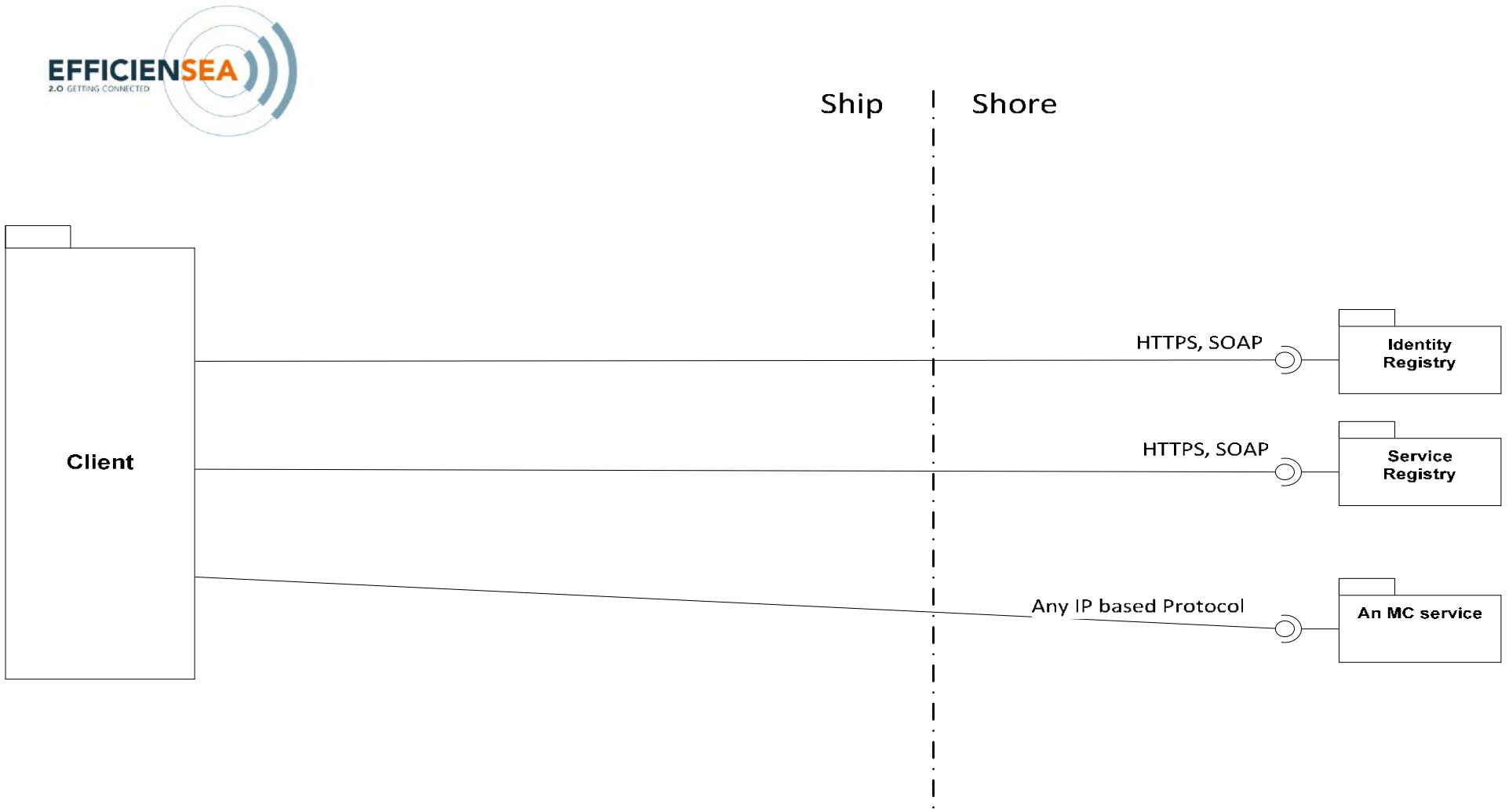


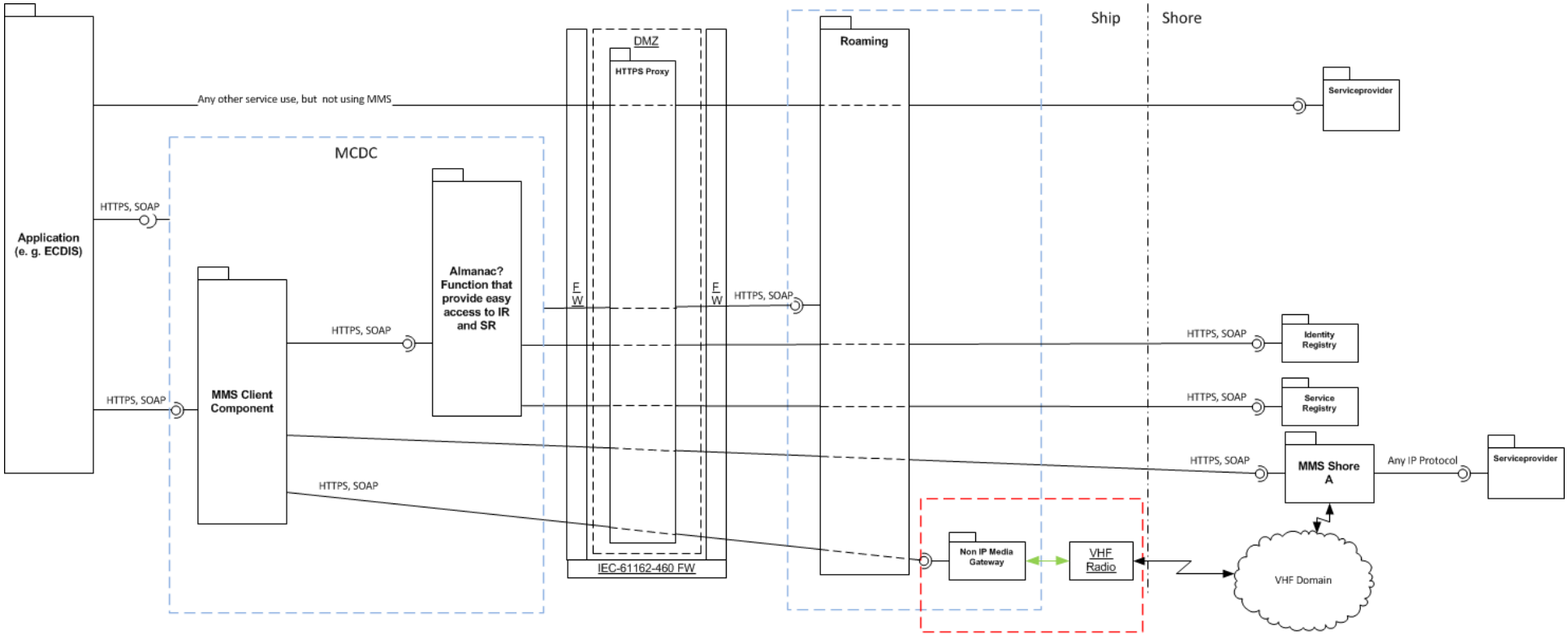
EFFICIE
2.0 GETTING CONNECTED



EFFICIE
2.0 GETTING CONNECTED




Ship
Shore
Client
HTTPS, SOAP
Identity Registry
HTTPS, SOAP
Service Registry
Any IP based Protocol
An MC service


Ship
Shore
DMZ
HTTPS Proxy
Roaming
Any other service use, but not using MMS
Serviceprovider
MCDC
Application (e. g. ECDIS)
HTTPS, SOAP
Almanac? Function that provide easy access to IR and SR
MMS Client Component
F W
F W
HTTPS, SOAP
Identity Registry
Service Registry
MMS Shore A
Any IP Protocol
Serviceprovider
Non IP Media Gateway
VHF Radio
VHF Domain
IEC-61162-460 FW