Building the Internet of Things @ Sea
Creating affordable solutions for all
First results from Horten-Moss IoT @ Sea
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Making maritime things talk beyond navigation

Bastø-Fosen AS
2014 stats:
5 ferries
Horten-Moss strait Oslo Fjord
3.4M pax, 1.8M veh
31,722 voyages = 179,849 nm
97.76% operational
KEY TOPICS

Horten – Moss IoT @ Sea

Sea Traffic Management services

The Internet of Things @ Sea
## TRENDS IN SILICON VALLEY

<table>
<thead>
<tr>
<th>Now: Open</th>
<th>Before: Closed</th>
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<tbody>
<tr>
<td><strong>Interoperable Platform &amp; Ecosystem</strong></td>
<td>Vendor lock-in &amp; instrument focus</td>
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<tr>
<td><strong>Open Source, Open Standards, Open Architecture</strong></td>
<td>Proprietary &amp; Closed</td>
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<td>Front end &amp; back end independence = Future-Proof solutions</td>
<td>Integrated HW &amp; SW stand-alone instruments</td>
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<td>Collaborate on low value add</td>
<td>Do everything in-house behind closed doors</td>
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<td>Reduced costs due to use of OSS</td>
<td>Expensive products due to proprietary solutions</td>
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<tr>
<td>User driven innovation</td>
<td>Internal R&amp;D projects</td>
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Innovation platform enabling System Wide Information sharing (seaSWIM) - data & information exchange:

**OBP** – Open Bridge Platform

**OSP** – Open Shore Platform

**REX** – Route Exchange app:
Real-time sharing and exchange of intended routes
Dynamic ETA updated in real-time
Sharing of weather data between ships
Advanced collision avoidance mechanism
MARSEC SYSTEM ARCHITECTURE

Maritime Cloud

Services
- Maritime Identity Registry
- Distributed Messaging Servers
- Open Source
- Maritime Service Portfolio Registry
- Contextual Geolocated Information

Stakeholders
- YTS
- Customs
- Ports Operations
- Service Providers

Navigation
Paperwork
Communication
Messages
Registration
Reporting
• Most trafficked strait in Norway
• Cost savings & environment: Up to 15% fuel savings expected
• Increased safety & efficiency – dynamic ETA
WHAT IS THE IOT?

The IoT refers to uniquely identifiable objects and their virtual representation in an internet-like structure.

More objects are becoming embedded with sensors and gaining the ability to communicate. The resulting information networks promise to create new business models, improve processes and reduce costs and risks.
In the IoT, sensors and actuators embedded in physical objects are linked through wired and wireless networks, often using the same Internet Protocol (IP) that connects the Internet.

When objects can both sense the environment and communicate, they become tools for understanding complexity and responding to it swiftly. They can work without human intervention.
The widespread adoption of IoT will take time but it’s speeded up by wireless technologies, Open Source Software, standardization, data collection (Big data!), cloud & edge computing.

A first step toward the IoT is converting networks on proprietary protocols to IP-based networks. When objects can sense and communicate, it changes how and where decisions are made and who makes them.
STM IoT applications in the Horten-Moss strait:

1. Information & Analysis:
   - Tracking behavior
   - Enhanced situational awareness
   - Sensor-driven decision analytics

2. Automation & Control:
   - Process optimization
   - Optimized resource consumption
   - Complex autonomous systems – next step
IP protocol & Open Standards:
• Data & Information Sharing and Exchange

Open Source:
• MARSSA – Open Reference System Architecture
• OBP & OSP based on MARSSA & Maritime Cloud communication framework

User Driven Innovation – DDU3
THANK YOU

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