BLAST WP 5
Task 5.4: Central Database

Task 5.5: Web interface.

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Description of Web services, collecting and storing data from the AIS distribution system

This document will describe the web service as an interface for the users and the system in background for managing the AIS data.

Content

Webservices ........................................................................................................... 4
System architecture .............................................................................................. 5
Map screen ............................................................................................................. 6
AIS info of ships ..................................................................................................... 7
Weather Information .............................................................................................. 9
Search for vessels ................................................................................................ 10
Different maps as background .............................................................................. 11
Port register .......................................................................................................... 13
Oljedirektoratet .................................................................................................. 13
Kystverket .......................................................................................................... 14
AIS ....................................................................................................................... 15
Filters .................................................................................................................. 16
Different services ................................................................................................. 17
System for exchanging and distributing AIS data .............................................. 21
AIS Exchange .................................................................................................... 21
AIS storing .......................................................................................................... 21
Background

WP5 will support requirements given in directives:
- directives 2002/59/EC (Monitoring)
- directives 2000/59/EC (Waste)
- New Port State Directive

WP5 could also be a test bed for new functionality in SafeSeaNet if needed.

The Objectives for this work package are:
- Design and develop a regional maritime traffic monitoring platform beneficial for all Member States in the North Sea region.
- Harmonize maritime traffic information formats in the North Sea region and add new formats where needed.
- Harmonize regional maritime traffic information flow with SafeSeaNet and propose new functionality

Establish a network and server platform for development and demonstration.

Webservices

The center is running a web service that is using the WMS (Web Map Service) which is the standard protocol for serving georeference map images over the Internet. The application is develop in accordance to user needs from relevant stakeholders. Relevant authorities / member states in the regional Information Management Center has access to the web application. Coordinated form the North Atlantic IMC.

Several services have been included in the solution. Some integrated and some as layers.
- Map screen
- AIS info of ships
- Weather information
- Different maps as background
- Offshore information, infrastructure, blocks and so on
- Port register
- Filters regarding tracking, operational alarms and historical data.
- AIS exchange
- AIS monitor IMC
- Display of the combined picture (CAP);
- Playback of old AIS data;
- Generation of statistical reports; and
- Downloading of files containing data extracted in response and as the answer to a query

**System architecture**

- **AIS source 1**
- **AIS source 2**
- **AIS source n**

- AIS data
- Web Map Server
- GIS application
- Web application

- Historical Data
- Background Map Server

**Features**

- Show AIS data as a table or a map
- Configurable background maps from different servers
- Supports WMS foreground layers from different servers
- Search vessel using name, call-sign, IMO number etc.
- List vessels and zoom to vessel
- Target tracking with CPA calculations
- Integrated database with historical data
- Integrated port database
- User defined layers/filters and areas ("bookmarks")
- Export data to other applications
- “Smart links” to other web applications
- Manage user access to data through use of “hidden filters”

Web Map Services (WMS)

**Map screen**
The map screen includes tools to collect information for different kind of use.
Map tools for navigation in the map

Map tools for time

Map tools for various use

AIS info of ships
In the system there are three colors used, blue (moving), yellow (not moving) and red (inactive). The ship is colored blue if it is not moored (yellow). Red if it is out of VHF/AIS range from a base station or in another way not registered, maybe the AIS transponder is turned off.
Information from the ships is collected and displayed.
Weather Information

Map tools for weather data

The data from YR.no has been merged into the system. Layers with different kind of weather information may be applied to the map.

This is wind information
Search for vessels
In the map the user can search for vessels by name, IMO nr, MMSI and different other options also.

This is wind + temperature
Different maps as background
The users can choose background maps.

S57 charts
Ecdis maps

Satellite maps (NASA) as background
Port register
All ports are registered in the system. This makes it easy to make queries based on the port name. The system can generate an e-mail if a ship approaches a specific port.

Oljedirektoratet (The Norwegian Oil Directorate)
Here one finds an overview of the different oilfields in the North Sea. The user can choose what areas he wants to display.
Kystverket. (The Norwegian Coastal Administration.)
This is information concerning the Norwegian Coastal Administration; this example is place of refuges:
AIS
One is able to see the online AIS picture as one likes, and may make customized filters to see specific areas or to see the traffic pattern through specific areas.
Filters
It is easy to make filters if there are any special ships one wants to have monitored:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
<th>Operation</th>
<th>Value</th>
<th>Unit</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship type</td>
<td>Accept vessels with vessel type</td>
<td>=</td>
<td>Tanker</td>
<td></td>
<td>Delete</td>
</tr>
<tr>
<td>Latitude</td>
<td>Accept vessels with latitude</td>
<td>&gt;</td>
<td>67.5</td>
<td>decimal</td>
<td>Delete</td>
</tr>
<tr>
<td>Elevation</td>
<td>Draw Polyline (long, lat 1, long n, lat n)</td>
<td>&gt;</td>
<td>12 n mile</td>
<td>decimal</td>
<td>Delete</td>
</tr>
</tbody>
</table>

This filter will show a tanker monitored south of 67.5 and inside 12 mile line close to shore.
This filter is a week traffic and displays the categories of ships which have been in the defined area.

**Different services**
The web service is the end product of the exchange of data. Different kinds of access levels have been developed.
Norway including offshore installations
Member states AIS coverage
AIS from satellite
System for exchanging and distributing AIS data

AIS Exchange
Norway has a system for exchange and distribution of AIS data. This system gives the web service the AIS feed with which it generates the WMS layers. Norway has agreements with several countries.

Service for collecting and storing AIS data

The AIS distribution system
The communication between the different systems is a two ways secure communication with the member states. The data received is sent through the STIRES system (EMSA), data is sent back to the member states and the data is sent to web service which generates the WMS layers.
AIS Proxy system – IMC
This proxy system communicates with all member states through 2 way SSL.

**AIS storage**
The data is stored in a database in the Norwegian AIS system. The database store 2 years data at all time. Data older than that is stored as raw AIS data in an archive system.
The database communicates with ASM (AIS Service Management) – system. The ASM system is the management system for the AIS flow, user access, filters etc.
It is a SQL database.

As a backup the system generates a file per day that includes all AIS data collected every day. This is from May 2011.
The websystem also store data for 2 years.

This server receives AIS data from: Helcom.

Time scope: Tuesday, 06 Oct 2009 08:55:00 UTC to Thursday, 06 Oct 2011 08:41:42 UTC