
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.

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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.

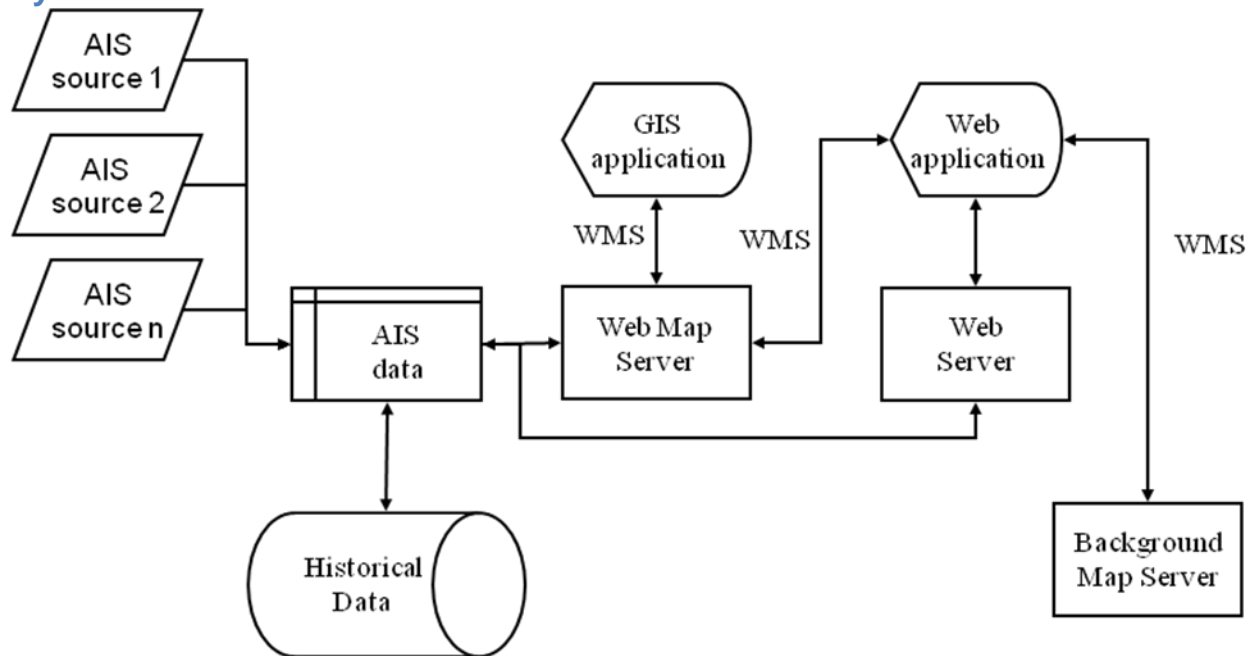
Relevant authorities / member states in the regional Information Management Center has access to the web application. Coordinated form the North Atlantic IMC.

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

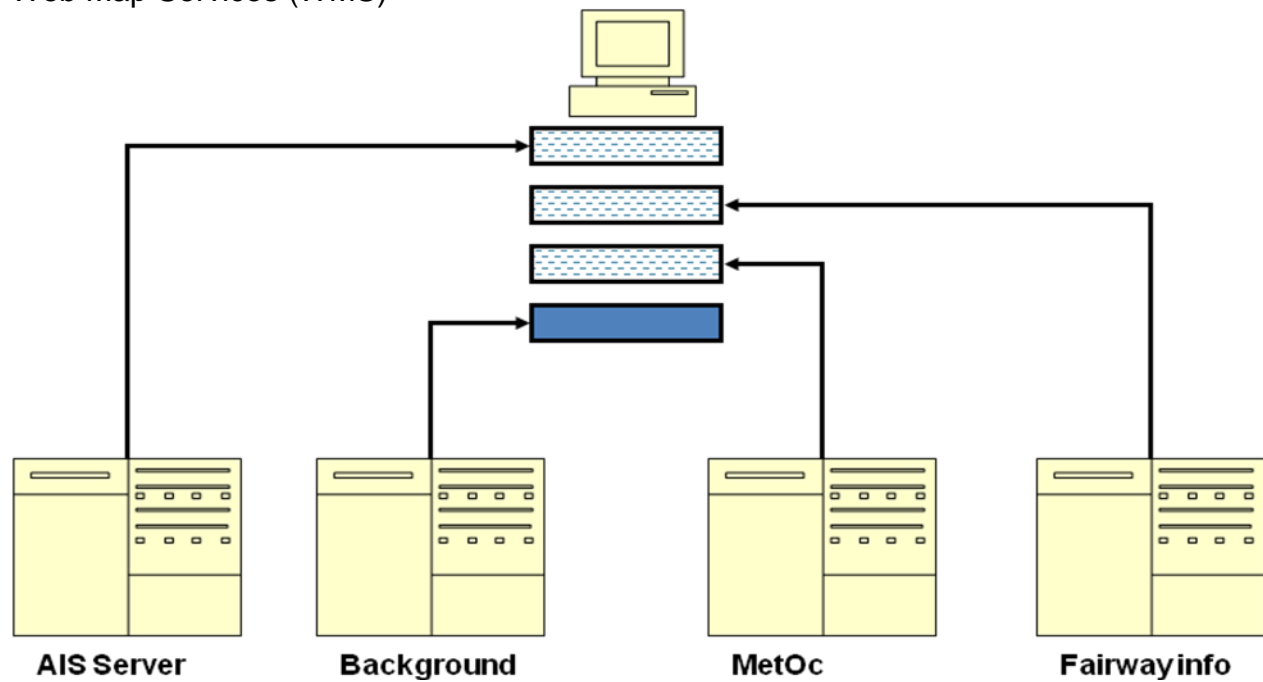


Features

- 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”)

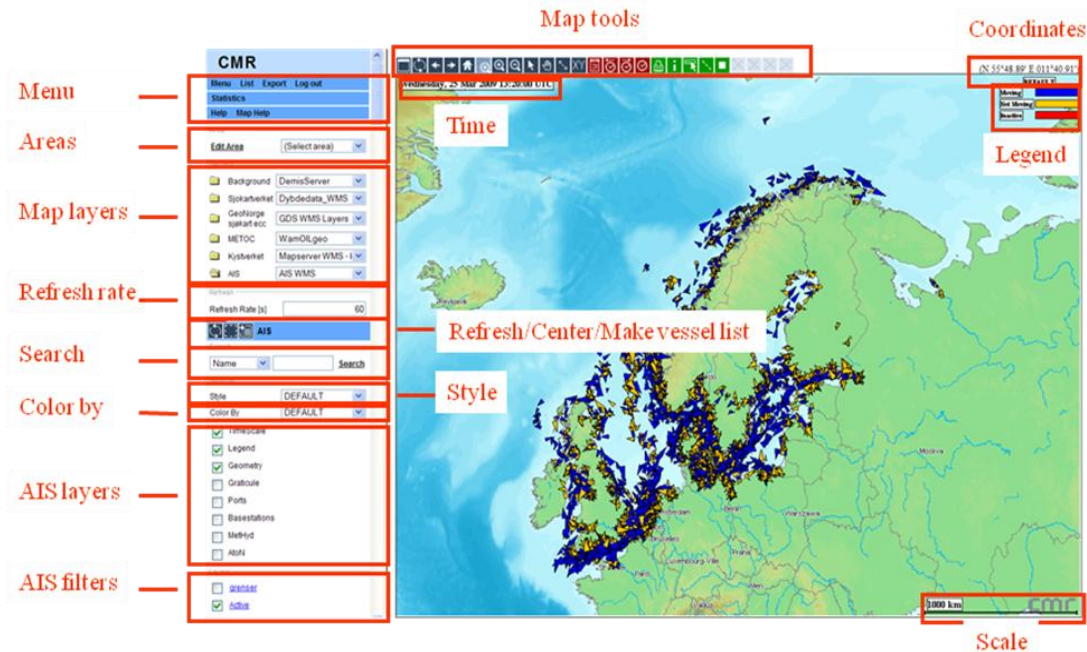
- Export data to other applications
- “Smart links” to other web applications
- Manage user access to data through use of “hidden filters”

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



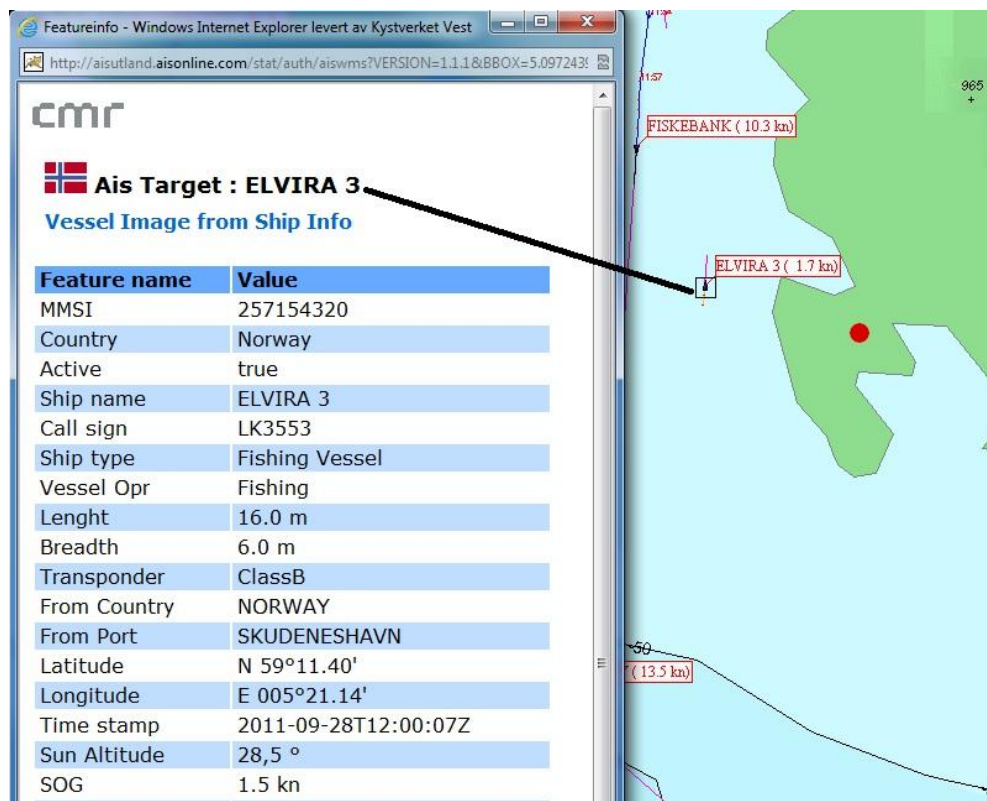
Map tools for various use

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.

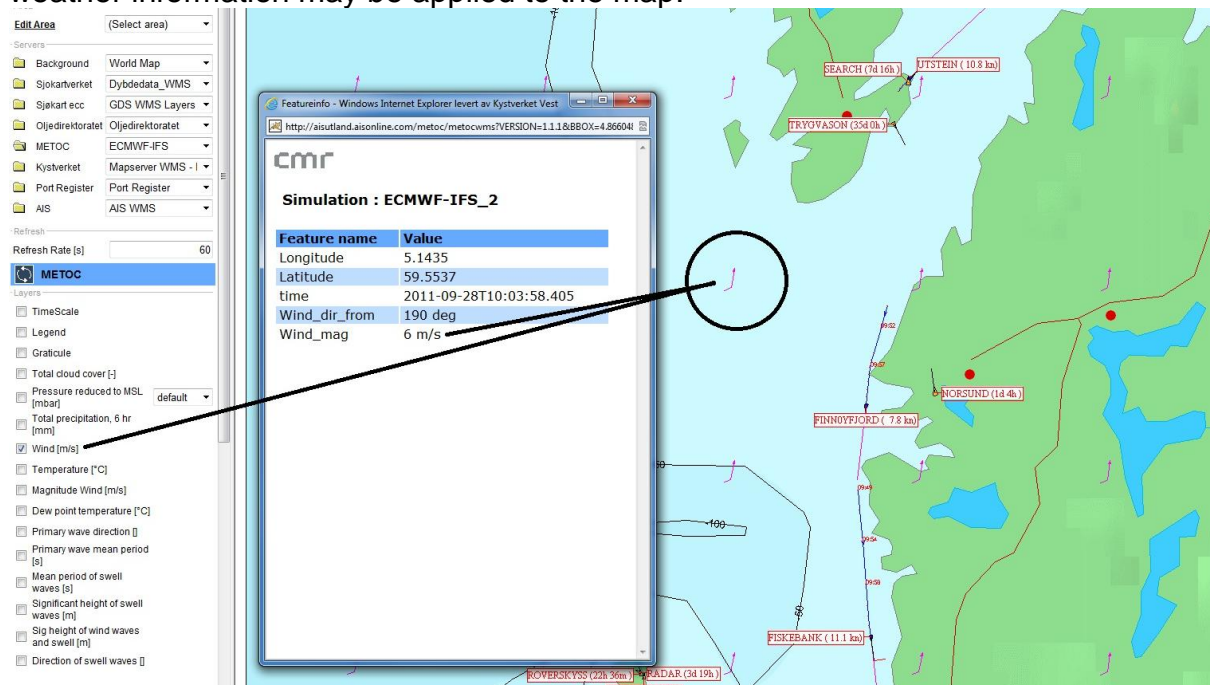


Weather Information

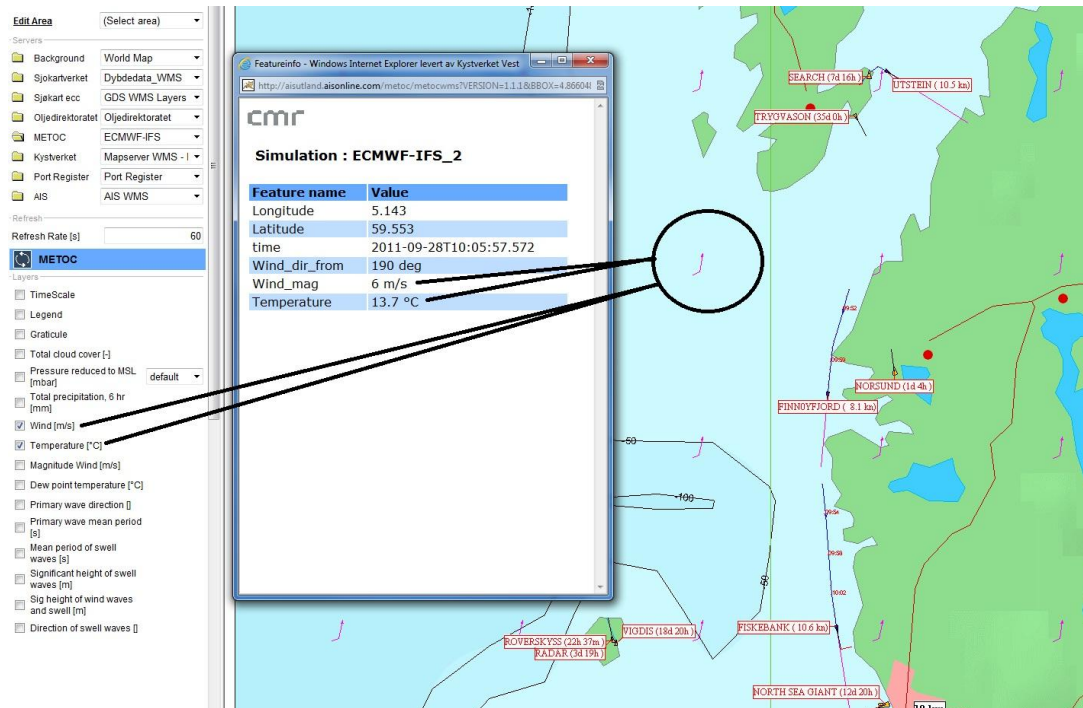
Map tools for weather data



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



This is wind + temperature

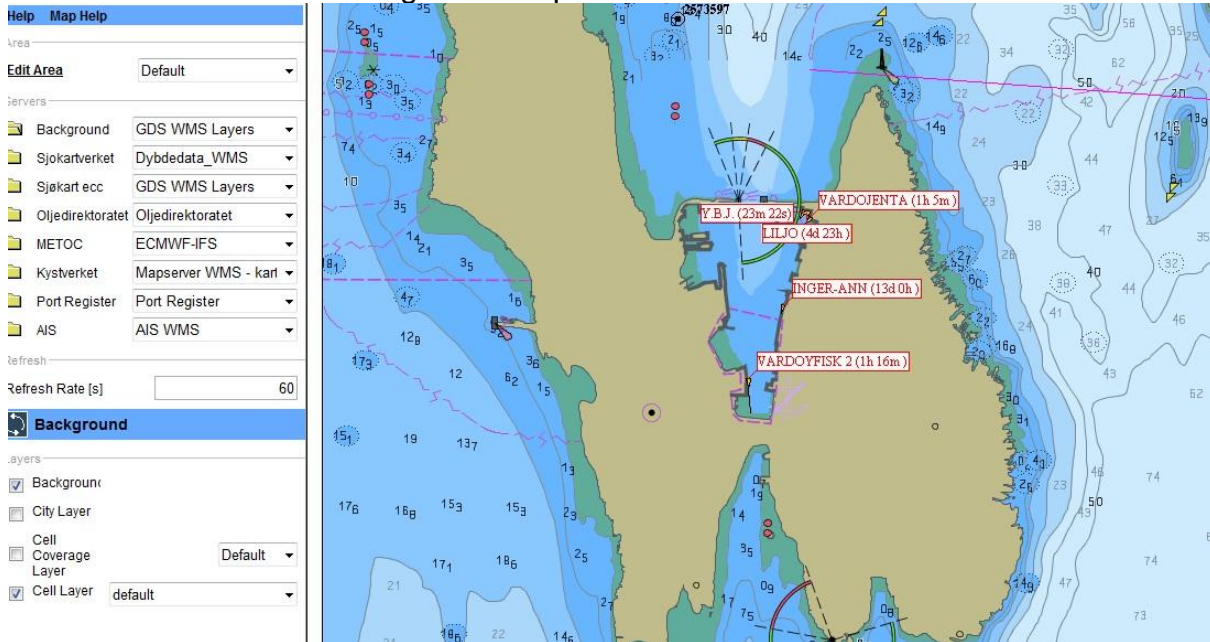
Search for vessels

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

The screenshot shows a search interface for vessels. It includes a dropdown menu for search criteria (Name, IMO number, Call sign, MMSI number, Destination, Country, ToPortName, InPortName, FromPortName) and input fields for the search term and zoom level. The 'Name' option is selected in the dropdown. The search term is entered in the 'Search' field, and the zoom level is set to 'DEFAULT' in the 'Zoom To' field.

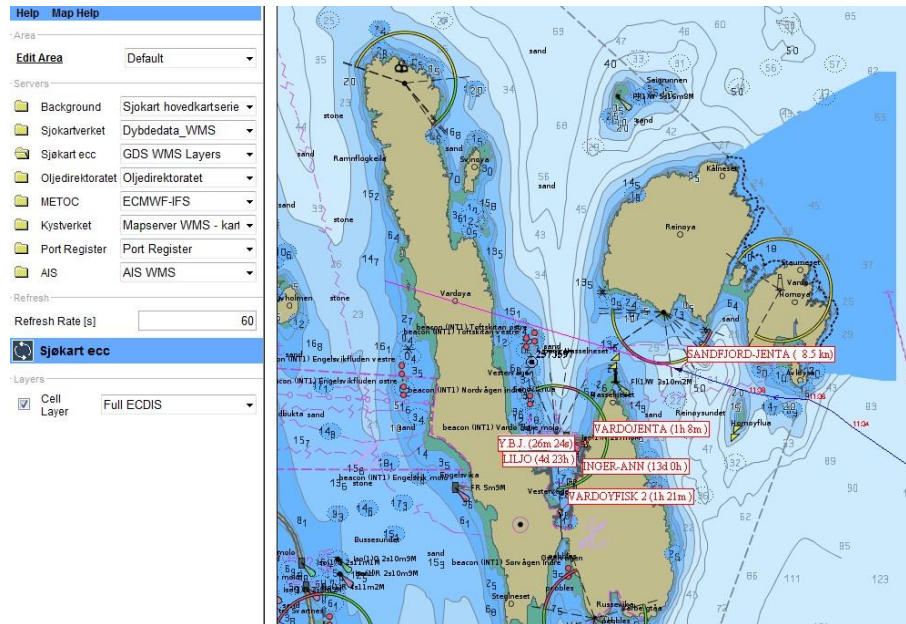
Different maps as background

The users can choose background maps.

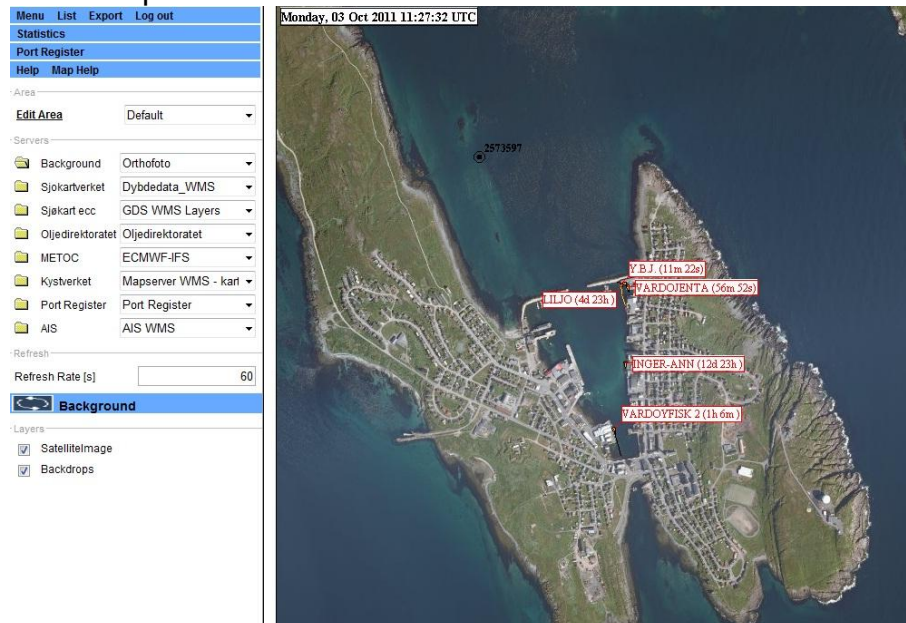


The screenshot displays the BLAST web application interface. On the left, there is a sidebar with various settings. The 'Background' section is highlighted, showing a list of available background maps: GDS WMS Layers, Dybdedata_WMS, GDS WMS Layers, Oljedirektoratet, ECMWF-IFS, Mapserv WMS - kart, Port Register, and AIS WMS. The 'Background' map is selected. Below this, there are checkboxes for 'Background', 'City Layer', 'Cell', 'Coverage Layer', and 'Cell Layer'. The 'Coverage Layer' is set to 'Default', and the 'Cell Layer' is set to 'default'. The 'Refresh Rate [s]' is set to 60. The main map area shows a nautical chart of a coastal region with various depth contours and labels. Labels include 'Y B J (23m 22s)', 'VARDOJENTA (1h 5m)', 'LILJO (4d 23h)', 'INGER-ANN (13d 0h)', and 'VARDOYFISK 2 (1h 16m)'. The map also shows depth contours and various navigational markers.

S57 charts



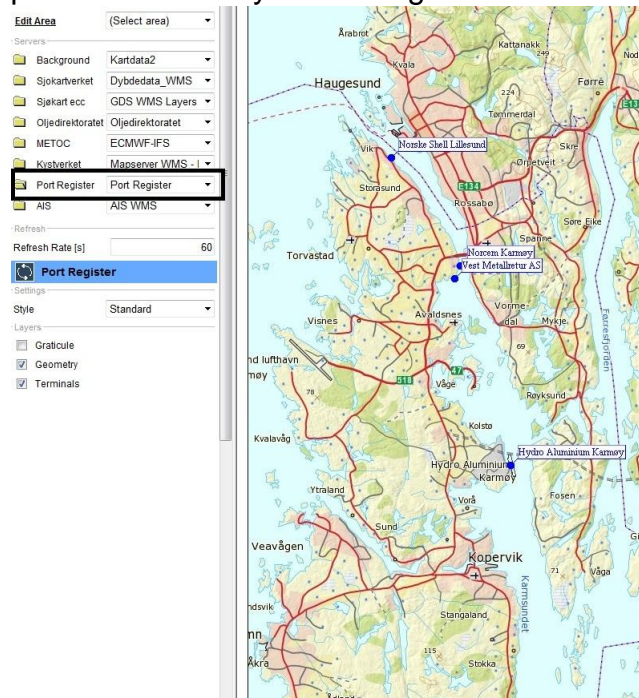
Ecdis maps



Satellite maps (NASA) as background

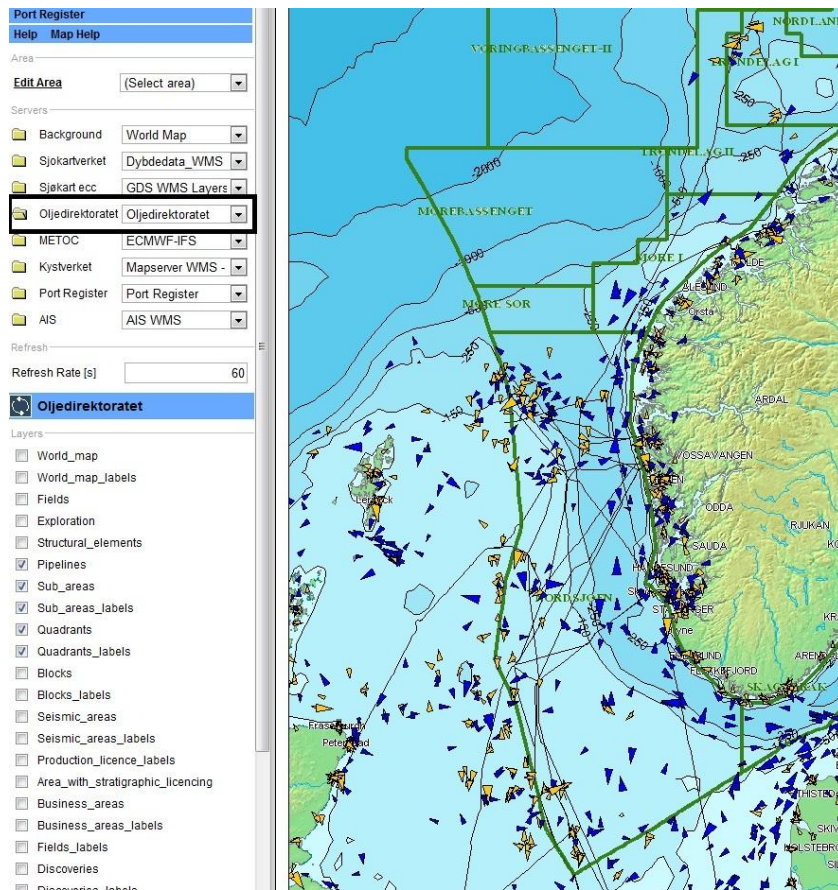
Port register

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.



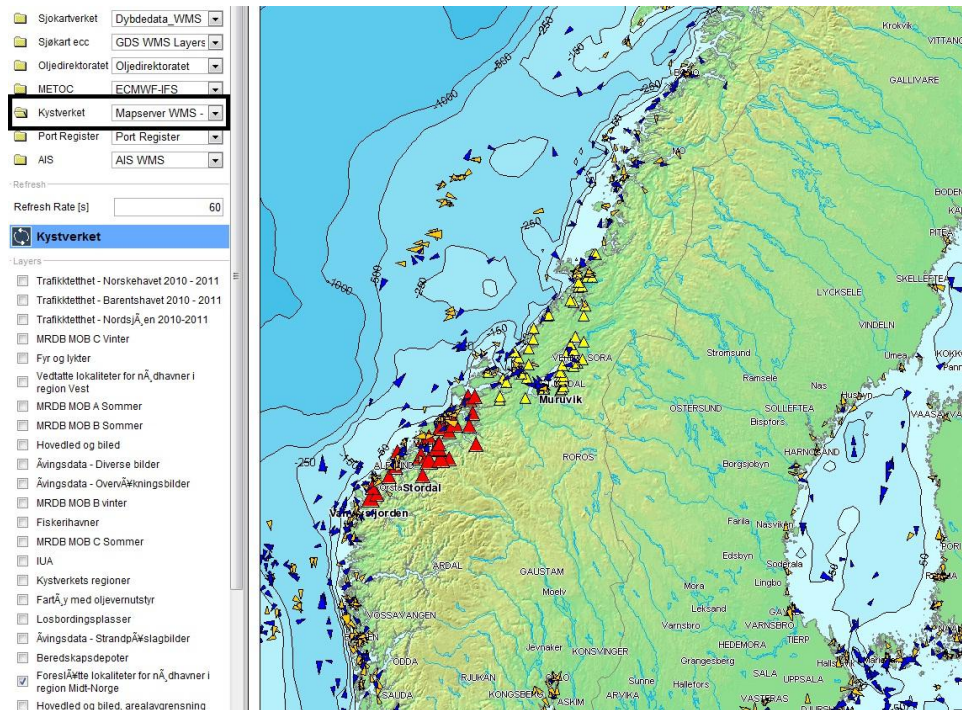
Oljedirektoratet (The Norwegian Oil Directorate)

Here one finds an overview of the different oilfields in the North Sea. The user can choose what areas he wants to display.



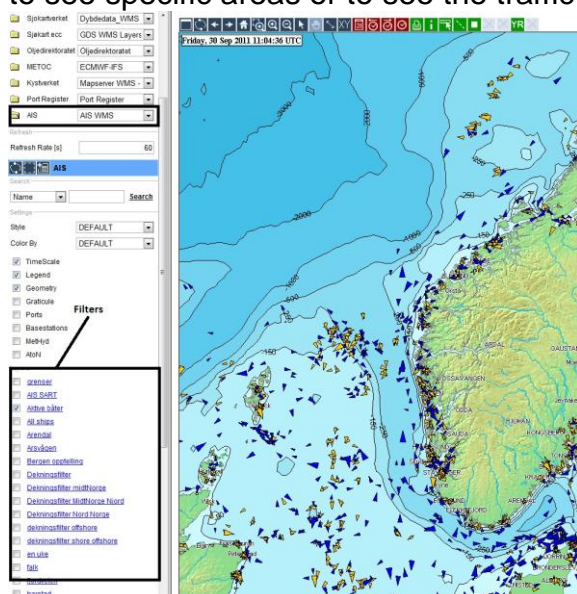
Kystverket. (The Norwegian Coastal Administration.)

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:

Name of filter

Operation between constraints

Remember to save filter before leaving this page !

Attribute	Description	Operation	Value	Unit	Action
Ship type	Accept vessels with vessel type	=	Tanker	-	Delete
Latitude	Accept vessels with latitude	>	67.5	decimal degrees	Delete
Polyline	Draw Polyline (long 1, lat 1, ,, long n, lat n : name)	draw name	12 mil line	decimal degrees	Delete Draw

Attribute

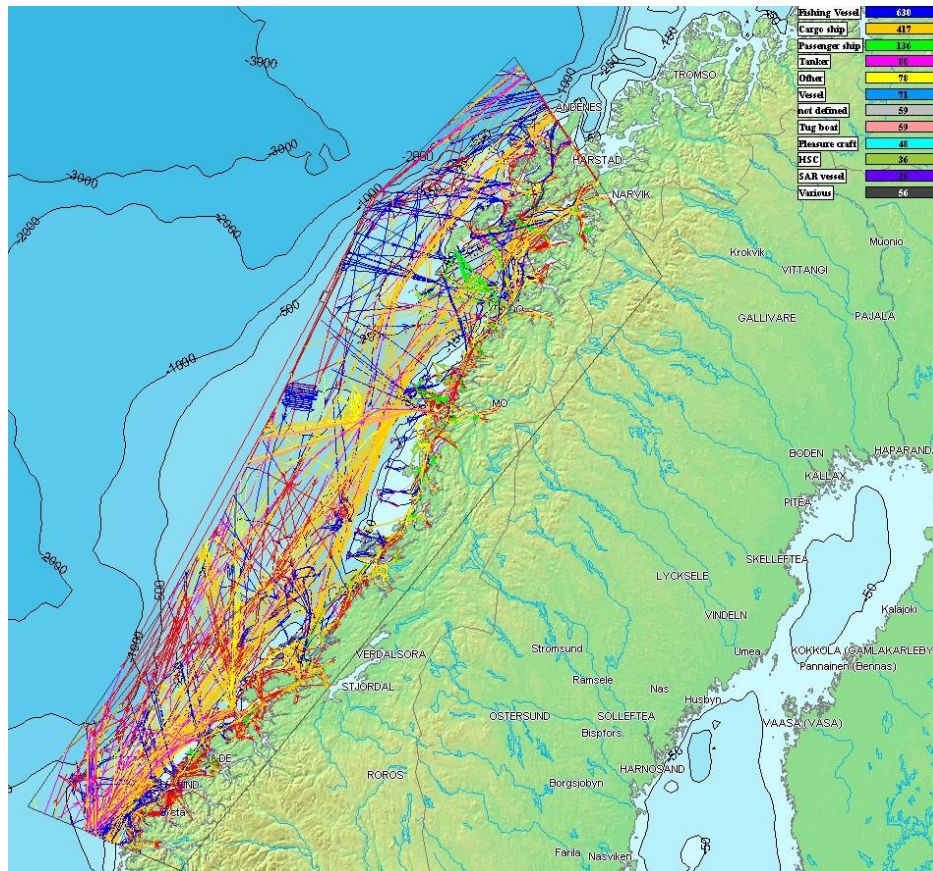
Operation

Value

Unit

Delete Draw

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



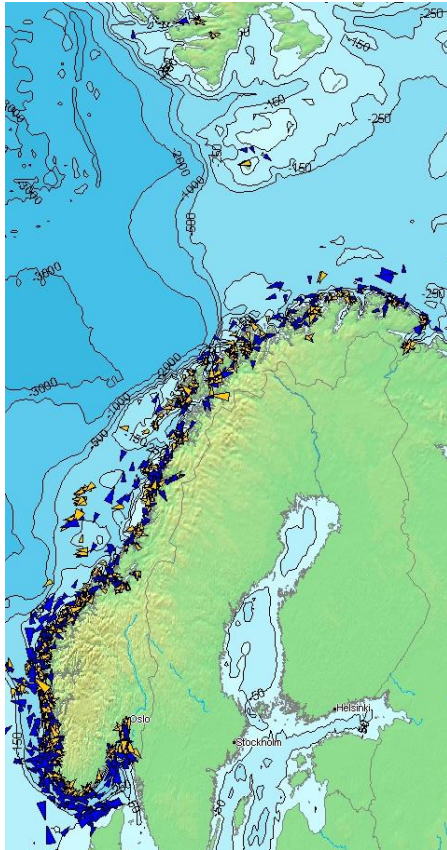
BLAST

Bringing Land and Sea Together

European Union

**The Interreg IVB
North Sea Region
Programme**

Investing in the future by working together
for a sustainable and competitive region



Member states AIS coverage



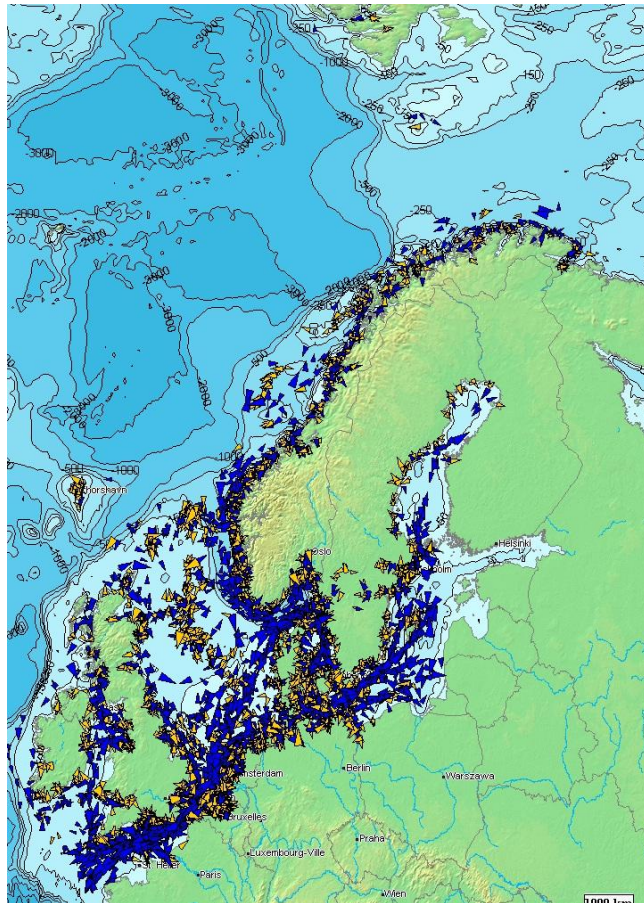
BLAST

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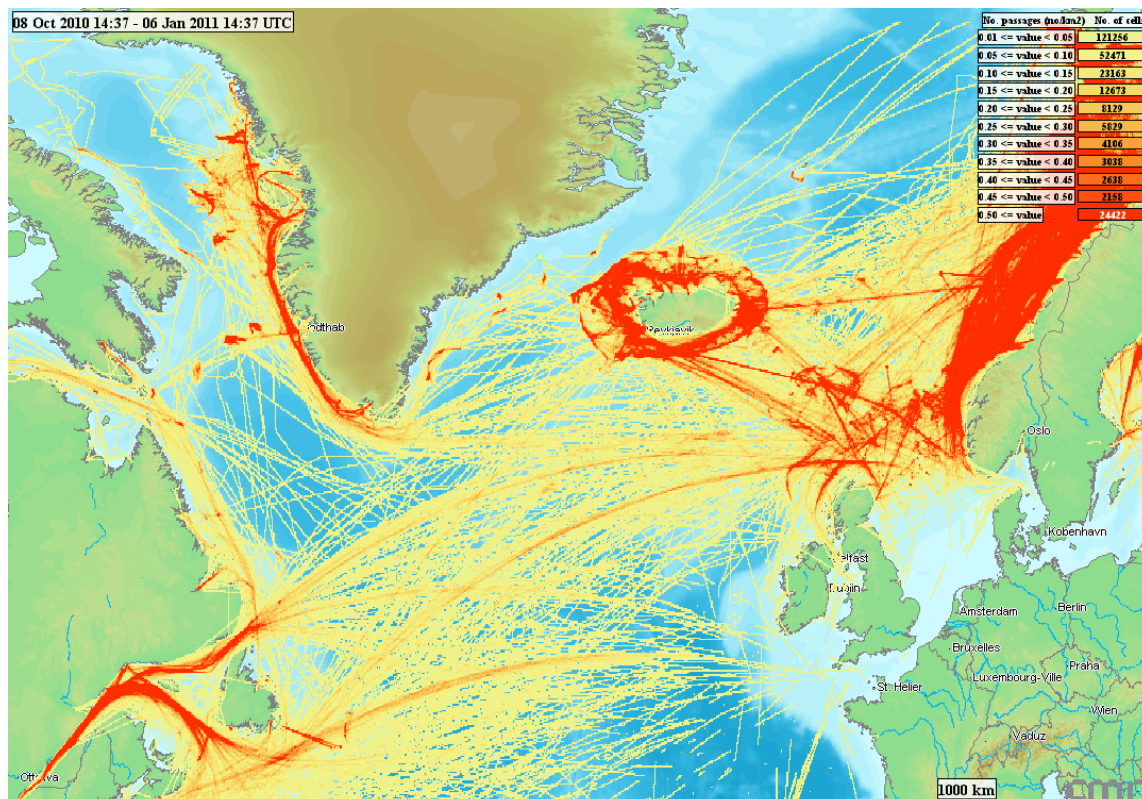
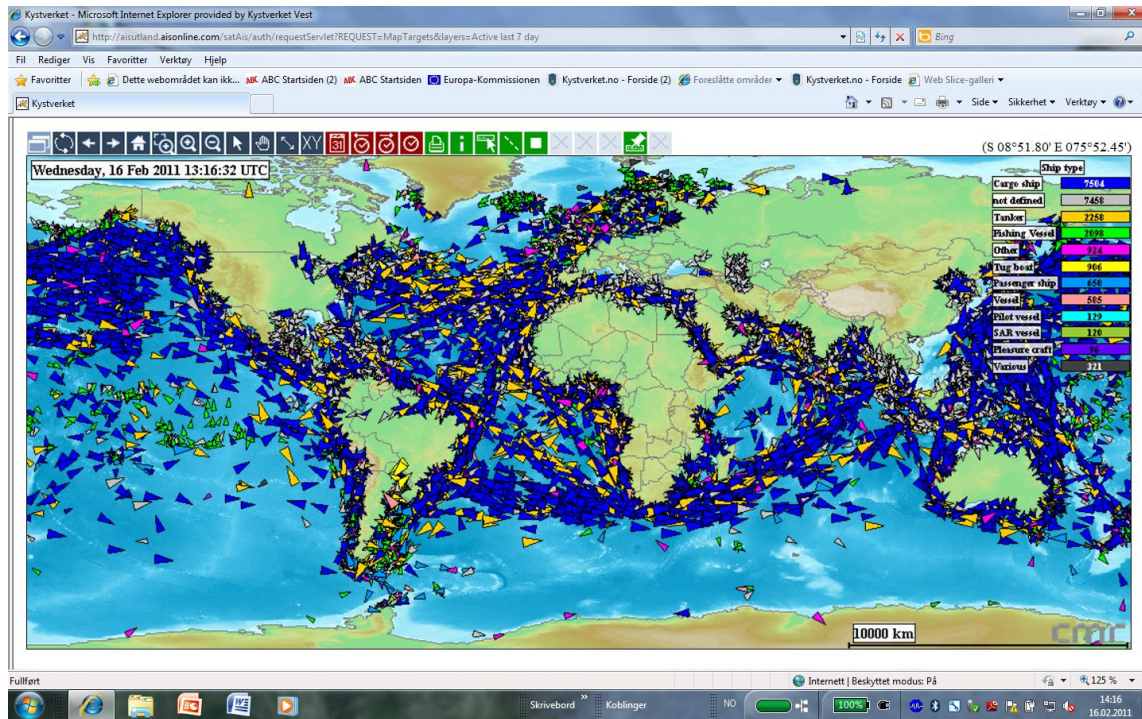
European Union

**The Interreg IVB
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AIS from satellite

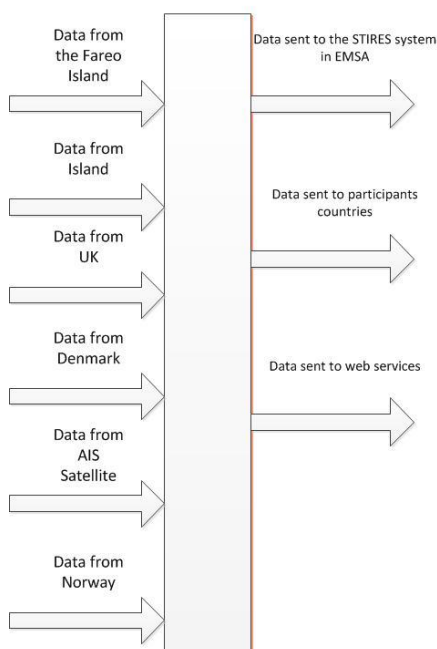


System for exchanging and distributing AIS data

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.

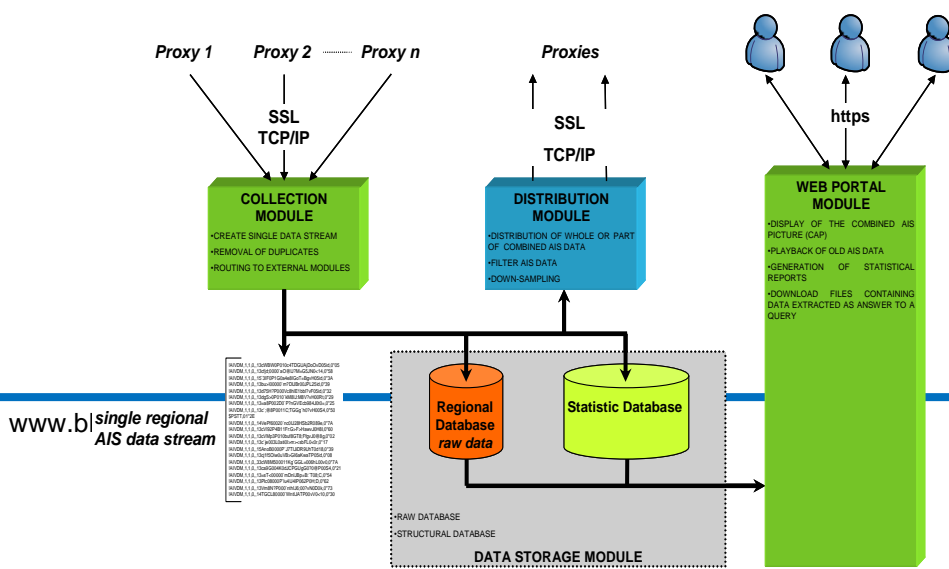
Service for collecting and storing AIS data

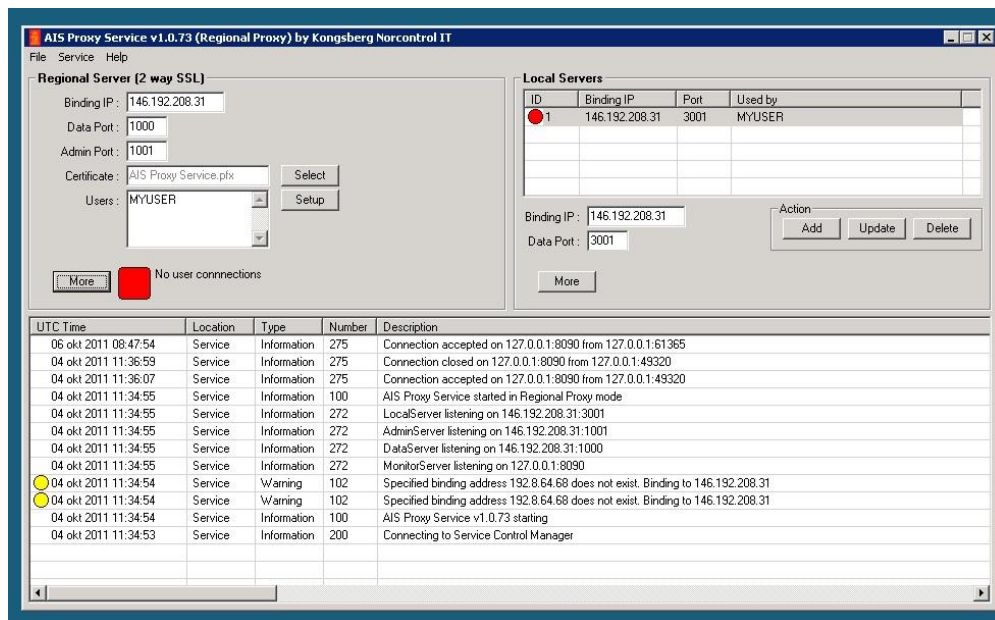


The AIS distribution system

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



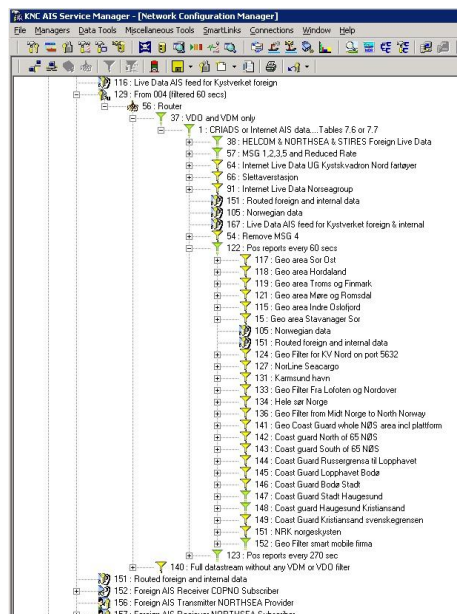


This proxy system communicates with all member states through 2 way SSL.

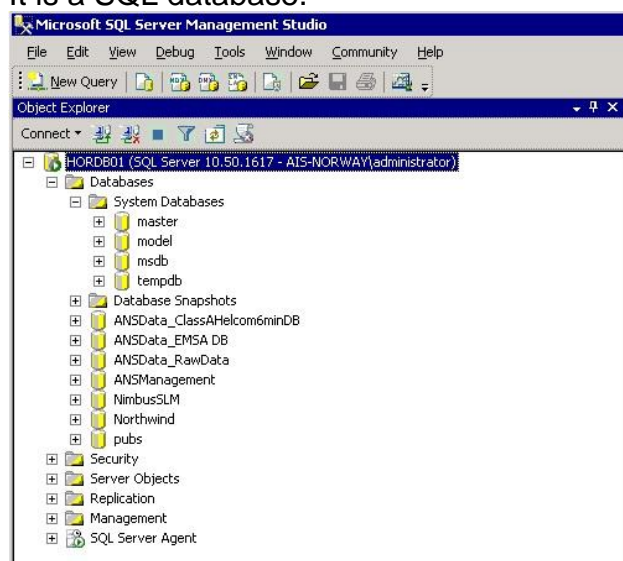
AIS storage

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 pr day that includes all AIS data collected every day. This is from May 2011.

Navn	Dato endret	Type	Størrelse
 ANSDData_RawData 01 May 2011 ML39640	02.05.2011 03:44	DAT-fil	909 453 kB
 ANSDData_RawData 02 May 2011 ML39641	03.05.2011 03:36	DAT-fil	863 754 kB
 ANSDData_RawData 03 May 2011 ML39642	04.05.2011 03:40	DAT-fil	827 810 kB
 ANSDData_RawData 04 May 2011 ML39643	05.05.2011 03:36	DAT-fil	849 496 kB
 ANSDData_RawData 05 May 2011 ML39644	06.05.2011 03:41	DAT-fil	853 769 kB
 ANSDData_RawData 06 May 2011 ML39645	07.05.2011 03:40	DAT-fil	881 109 kB
 ANSDData_RawData 07 May 2011 ML39646	08.05.2011 03:54	DAT-fil	914 819 kB
 ANSDData_RawData 08 May 2011 ML39647	09.05.2011 03:43	DAT-fil	899 610 kB
 ANSDData_RawData 09 May 2011 ML39648	10.05.2011 03:41	DAT-fil	882 023 kB
 ANSDData_RawData 10 May 2011 ML39649	11.05.2011 03:44	DAT-fil	905 848 kB
 ANSDData_RawData 11 May 2011 ML39650	12.05.2011 03:44	DAT-fil	926 992 kB
 ANSDData_RawData 12 May 2011 ML39651	13.05.2011 03:40	DAT-fil	906 904 kB
 ANSDData_RawData 13 May 2011 ML39652	14.05.2011 03:57	DAT-fil	902 783 kB
 ANSDData_RawData 14 May 2011 ML39653	15.05.2011 03:43	DAT-fil	848 716 kB
 ANSDData_RawData 15 May 2011 ML39654	16.05.2011 03:45	DAT-fil	831 667 kB
 ANSDData_RawData 16 May 2011 ML39655	17.05.2011 03:44	DAT-fil	861 475 kB
 ANSDData_RawData 17 May 2011 ML39656	18.05.2011 03:40	DAT-fil	799 476 kB
 ANSDData_RawData 18 May 2011 ML39657	19.05.2011 03:33	DAT-fil	857 154 kB
 ANSDData_RawData 19 May 2011 ML39658	20.05.2011 03:51	DAT-fil	865 768 kB
 ANSDData_RawData 20 May 2011 ML39659	21.05.2011 07:17	DAT-fil	888 221 kB
 ANSDData_RawData 21 May 2011 ML39660	22.05.2011 07:07	DAT-fil	881 455 kB
 ANSDData_RawData 22 May 2011 ML39661	23.05.2011 05:40	DAT-fil	863 362 kB
 ANSDData_RawData 23 May 2011 ML39662	24.05.2011 06:15	DAT-fil	880 666 kB
 ANSDData_RawData 24 May 2011 ML39663	25.05.2011 09:00	DAT-fil	860 323 kB
 ANSDData_RawData 25 May 2011 ML39664	26.05.2011 05:52	DAT-fil	886 358 kB
 ANSDData_RawData 26 May 2011 ML39665	27.05.2011 06:32	DAT-fil	896 492 kB
 ANSDData_RawData 27 May 2011 ML39666	28.05.2011 05:51	DAT-fil	854 346 kB
 ANSDData_RawData 28 May 2011 ML39667	29.05.2011 05:52	DAT-fil	832 302 kB
 ANSDData_RawData 29 May 2011 ML39668	30.05.2011 03:44	DAT-fil	838 649 kB
 ANSDData_RawData 30 May 2011 ML39669	31.05.2011 07:11	DAT-fil	916 462 kB
 ANSDData_RawData 31 May 2011 ML39670	01.06.2011 09:09	DAT-fil	924 626 kB

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



Danish Ministry of the Environment
National Survey and Cadastre



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