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Oceanotron server for marine in-situ observations : a thematic data model implementation as a basis for the extensibility

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Oceanotron (https://forge.ifremer.fr/plugins/mediawiki/wiki/oceanotron/index.php/Accueil) is an open-source data server dedicated to marine in-situ observation dissemination. For its extensibility it relies of an ocean business data model.

IFREMER hosts the CORIOLIS marine in-situ data centre (http://www.coriolis.eu.org) and, as French NODC (National Oceanographic Data Centre, http://www.ifremer.fr/sismer/index_UK.htm), some other in-situ observation databases. As such IFREMER participates to numerous ocean data management projects.
IFREMER wished to capitalize its thematic data management expertise in a dedicated data dissemination server called Oceanotron.

The development of the server coordinated by IFREMER has started in 2010.
Knowing the diversity of data repository formats (RDBMS, netCDF, ODV, MEDATLAS, ...) and the temperamental nature of the standard interoperability interface profiles (OGC/WMS, OGC/WFS, OGC/SOS, OpenDAP, . . .), the architecture of the software relies on an ocean business data model dedicated to marine in-situ observation features.
The ocean business data model relies on the CSML conceptual modelling (http://csml.badc.rl.ac.uk/) and UNIDATA Common Data Model (http://www.unidata.ucar.edu/software/netcdf-java/CDM/) works and focuses on the most common marine observation features which are : vertical profiles, point series, trajectories and point. The ocean business data model has been implemented in java and can be used as an API.

The oceanotron server orchestrates different types of modules handling the ocean business data model objects :
- StorageUnits : which read specific data repository formats (netCDF/OceanSites, netCDF/ARGO, ...).
- TransformationUnits : which apply useful ocean business related transformation to the features (for example conversion of vertical coordinates from pressure in dB to meters under sea surface).
- FrontDesks : which get external requests and send results for interoperable protocols (OpenDAP, WMS, ...).
These modules are chained back and forth to process user requests. They exchange requests and observation features formatted in the ocean business data model.

This inner-interoperability level enables to capitalize ocean business expertise in software development without being indentured to specific data formats or protocols. In addition, different development teams can work together on different modules, depending on their expertise. IFREMER/ALTRAN/EFFITIC has developed the core system, netCDF storageUnits and OpeNDAP frontDesk. University of Reading has developed the OGC/WMS frontdesk.

Oceanotron is the data dissemination server for MyOcean in-situ data providers. As such it is now deployed at 7 different places in Europe. The software will also be used as an interoperability server for data providers in SeaDataNet2 project.

The presentation will detail the achieved implementation of this ocean business data model and its usage in the oceanotron software. The perspectives will also be discussed.