Geophysical Research Abstracts,
Vol. 11, EGU2009-9073, 2009
EGU General Assembly 2009

Modern Technologies aspects for Oceanographic Data Management and Dissemination : The HNODC Implementation

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The development of new technologies for the aim of enhancing Web Applications with Dynamically data access was the starting point for Geospatial Web Applications to developed at the same time as well. By the means of these technologies the Web Applications embed the capability of presenting Geographical representations of the Geo Information.
The induction in nowadays, of the state of the art technologies known as Web Services, enforce the Web Applications to have interoperability among them i.e. to be able to process requests from each other via a network. In particular throughout the Oceanographic Community, modern Geographical Information systems based on Geospatial Web Services are now developed or will be developed shortly in the near future, with capabilities of managing the information itself fully through Web Based Geographical Interfaces.
The exploitation of HNODC Data Base, through a Web Based Application enhanced with Web Services by the use of open source tolls may be consider as an ideal case of such implementation.
Hellenic National Oceanographic Data Center (HNODC) as a National Public Oceanographic Data provider and at the same time a member of the International Net of Oceanographic Data Centers(IOC/IODE), owns a very big volume of Data and Relevant information about the Marine Ecosystem. For the efficient management and exploitation of these Data, a relational Data Base has been constructed with a storage of over 300.000 station data concerning, physical, chemical and biological Oceanographic information.
The development of a modern Web Application for the End User worldwide to be able to explore and navigate throughout HNODC data via the use of an interface with the capability of presenting Geographical representations of the Geo Information, is today a fact.
The application is constituted with State of the art software components and tools such as:
• Geospatial and no Spatial Web Services mechanisms
• Geospatial open source tools for the creation of Dynamic Geographical Representations.
• Communication protocols (messaging mechanisms) in all Layers such as XML and GML together with SOAP protocol via Apache/Axis.
At the same time the application may interact with any other SOA application either in sending or receiving Geospatial Data through Geographical Layers, since it inherits the big advantage of interoperability between Web Services systems.
Roughly the Architecture can denoted as follows:
• At the back End Open source PostgreSQL DBMS stands as the data storage mechanism with more than one Data Base Schemas cause of the separation of the Geospatial Data and the non Geospatial Data.
• UMN Map Server and Geoserver are the mechanisms for: Represent Geospatial Data via Web Map Service (WMS)
Querying and Navigating in Geospatial and Meta Data Information via Web Feature Service (WFS)
oAnd in the near future Transacting and processing new or existing Geospatial Data via Web Processing Service (WPS)
• Map Bender, a geospatial portal site management software for OGC and OWS architectures acts as the integration module between the Geospatial Mechanisms. Mapbender comes with an embedded data model capable to manage interfaces for displaying, navigating and querying OGC compliant web map and feature services (WMS and

transactional WFS).
• Apache and Tomcat stand again as the Web Service middle Layers
• Apache Axis with it's embedded implementation of the SOAP protocol ("Simple Object Access Protocol") acts as the No spatial data Mechanism of Web Services. These modules of the platform are still under development but their implementation will be fulfilled in the near future.
• And a new Web user Interface for the end user based on enhanced and customized version of a MapBender GUI, a powerful Web Services client.

For HNODC the interoperability of Web Services is the big advantage of the developed platform since it is capable to act in the future as provider and consumer of Web Services in both ways:
• Either as data products provider for external SOA platforms.
• Or as consumer of data products from external SOA platforms for new applications to be developed or for existing applications to be enhanced.

A great paradigm of Data Managenet integration and dissemination via the use of such technologies is the European's Union Research Project Seadatanet, with the main objective to develop a standardized distributed system for managing and disseminating the large and diverse data sets
and to enhance the currently existing infrastructures with Web Services

Further more and when the technology of Web Processing Service (WPS), will be mature enough and applicable for development, the derived data products will be able to have any kind of GIS functionality for consumers across the network.

From this point of view HNODC, joins the global scientific community by providing and consuming application Independent data products.