Environment Oriented Applications in enviroGRIDS Portal

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The enviroGRIDS system resources and functionality are accessible to the large community of users through the portal that provides Web applications for data management, hydrologic models calibration and execution, satellite image processing, report generation and visualization, and virtual training center. EnviroGRIDS (Black Sea Catchment Observation and Assessment System supporting Sustainable Development) [1] is a 4-years FP7 Project aiming to address the subjects of ecologically unsustainable development and inadequate resource management for Black Sea Catchment region.

The portal publishes through the Web applications the geospatial functionality provided through Web technologies and the high power computation supported by the Grid technologies. There are five categories of users such as data providers, earth science specialists, decision makers, citizens, and system administrators.

The main user application categories provided by the portal are Data management – provide the user with spatial data management and operations. The user may enter data and metadata, visualize, modify, update, and remove spatial data from the data repositories; Hydrologic model management – provide the Earth Science specialists with hydrologic model configuration, scenario and model development, model calibration and scenario running. One of the water quality models that will be used is SWAT (Soil Water Assessment Tool) [2]. SWAT is a model designed to estimate impacts of land management practices on water quantity and quality in complex watersheds; Satellite data processing – the specialist may process satellite data and images in order to search for relevant information (e.g. land cover, vegetation, water, soil composition, etc); Data visualization and report – the specialists visualize various spatial data in different formats and views and compose environmental reports for decision makers and citizens; Decision maker and citizen application – provide the decision makers with the interactive and graphical tools to access the private environmental reports. The user may visualize data that make possible statistical analysis and predictions; Virtual Training Center – the specialists develop environment oriented presentations and execute spatial data processing over the Grid by using the enviroGRIDS resources.

EnviroGRIDS functionality gathers services provided by various technologies such as SWAT related modules, Collaborative Working Environment (CWE) [3], Uniform Resource Management (URM) [4], gProcess and ESIP Platforms [5], and experience on other research projects like GiSHEO, SEE-GRID-SCI, and EGEE. EnviroGRID system is developed on the gLite middleware available on EGEE, SEE-GRID and enviroGRIDS VO infrastructures.

The presentation mainly highlights the issues and the experiments on the enviroGRIDS portal development concerning with scientific, technical, and technological solutions.

Main references for further information:
[1] enviroGRIDS Project, http://www.envirogrids.net/
[2] Soil and Water Assessment Tool, Official SWAT Web site, http://www.brc.tamus.edu/swat/index.html
[3] Manca S., Soru C., Cau P., Meloni G., Fiori M., A multi model and multiscale, GIS oriented Web framework based on the SWAT model to face issues of water and soil resource vulnerability. Presentation at the 5th International SWAT Conference, August 3-7, 2009

[4] Karel Charvat, Stepan Kafka, Marek Splichal, Maris Alberts, Andra.Martinsone, Petr Horak, Martin Vlk, Peteris Bruins, URM Concept for Sharing Information Inside of Communities, WCCA 2008, Tokyo

[5] Gorgan D., Bacu B., Rodila D., Pop P., Petcu D., Experiments on ESIP - Environment Oriented Satellite Data Processing Platform, in Earth Science Informatics Journal, Springer, Vol.3/4, ISSN: 1865-0473, pp. 297-308, (2010).