Geophysical Research Abstracts
Vol. 14, EGU2012-12363, 2012
EGU General Assembly 2012
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Earth Observation oriented teaching materials development based on OGC Web services and Bashyt generated reports

T. Stefanut (1), D. Gorgan (1), G. Giuliani (2), and P Cau (3)

(1) Technical University of Cluj-Napoca, Romania (teodor.stefanut@cs.utcluj.ro, dorian.gorgan@cs.utcluj.ro), (2) University of Geneva, Geneva, Switzerland (giuliani@grid.unep.ch), (3) Center for Advanced Studies, Research and Development in Sardinia, Italy (pierluigi.cau@gmail.com)

Creating e-Learning materials in the Earth Observation domain is a difficult task especially for non-technical specialists who have to deal with distributed repositories, large amounts of information and intensive processing requirements. Furthermore, due to the lack of specialized applications for developing teaching resources, technical knowledge is required also for defining data presentation structures or in the development and customization of user interaction techniques for better teaching results.

As a response to these issues during the GiSHEO FP7 project [1] and later in the EnviroGRIDS FP7 [2] project, we have developed the eGLE e-Learning Platform [3], a tool based application that provides dedicated functionalities to the Earth Observation specialists for developing teaching materials. The proposed architecture is built around a client-server design that provides the core functionalities (e.g. user management, tools integration, teaching materials settings, etc.) and has been extended with a distributed component implemented through the tools that are integrated into the platform, as described further.

Our approach in dealing with multiple transfer protocol types, heterogeneous data formats or various user interaction techniques involve the development and integration of very specialized elements (tools) that can be customized by the trainers in a visual manner through simple user interfaces. In our concept each tool is dedicated to a specific data type, implementing optimized mechanisms for searching, retrieving, visualizing and interacting with it. At the same time, in each learning resource can be integrated any number of tools, through drag-and-drop interaction, allowing the teacher to retrieve pieces of data of various types (e.g. images, charts, tables, text, videos etc.) from different sources (e.g. OGC web services, charts created through Bashyt application, etc.) through different protocols (ex. WMS, BASHYT API, FTP, HTTP etc.) and to display them all together in a unitary manner using the same visual structure [4].

Addressing the High Power Computation requirements that are met while processing environmental data, our platform can be easily extended through tools that connect to GRID infrastructures, WCS web services, Bashyt API (for creating specialized hydrological reports) or any other specialized services (ex. graphics cluster visualization) that can be reached over the Internet. At run time, on the trainee's computer each tool is launched in an asynchronous running mode and connects to the data source that has been established by the teacher, retrieving and displaying the information to the user. The data transfer is accomplished directly between the trainee's computer and the corresponding services (e.g. OGC, Bashyt API, etc.) without passing through the core server platform. In this manner, the eGLE application can provide better and more responsive connections to a large number of users.

References:

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