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# On demand Grid services for training in Earth Observation

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Current applications involving satellite data need huge computational power and storage capacities. Grid computing technologies that have evolved in the last decade promise to make feasible the creation of an environment, for these kinds of applications, which can handle hundreds of distributed databases, heterogeneous computing resources, and simultaneous users. In this context the recent Grid-based platform GiSHEO offers, for training purposes, satellite image processing services, workflow-based service composition, and user interaction combined with e-learning facilities.

## Detailed analysis

GiSHEO (On Demand Grid Services for Training and High Education in Earth Observation) addresess the issue of specialized services for training in Earth observation. Special solutions were proposed for data management, image processing service deployment, workflow-based service composition, and user interaction. A particular attention is given to the basic services for image processing that are reusing free image processing tools, like GDAL. The platform has distributed data repositories. A special feature is the connection with the ESA's GENESI-DR catalog. The physical platform is based on four clusters that are geographically distributed at four academic institutions. GiSHEO uses the Grid platform for near-real time applications for short-time data-intensive tasks. The data sets that are used for each application are of several tens of GBs, and the tasks are specific for image processing. In this particular case a scheme of instantiating a service where the data are located is required in order to obtain a response in near-real time.

A particular component is eGLE, the eLearning environment. It uses templates to allow teachers specialized in Earth observation to develop new lesson

## Conclusions and Future Work

The GiSHEO platform includes at this moment several basic services of the new training facility for Earth Observation. Advanced lessons and tutorials, that involve more than just remote sensing data, and related to disaster management and archeology, are planned to be developed in the next future.

## Impact

Grid-based platforms were recently build all over the world to satisfy the huge needs of computational power and storage capacities for Earth observation activities. Training activities in the field are not following these developing activities, resulting a big gap between the field request for specialists and the labor market offer. Currently there are only a few number of resources involved in educational activities in Earth Observation, one of the most complex one being EduSpace. Contrary to the current existing platforms that provides tutorials and training materials, GiSHEO intends to be a living platform where experimentation and extensibility are the key words. The feature of service composition support the creativity of the trainees.

## Keywords

Grid services, Earth observation, workflows

## URL for further information

http://gisheo.info.uvt.ro

## Justification for delivering demo and/or technical requirements (for demos)

The platform will be available for public use starting from 2010. Its impact on the community depends on the dissemination and the feedback. EGEE UF is an adequate forum to provide them.

**Author:** Prof. PETCU, Dana (West University of Timisoara)

**Co-authors:** Prof. ZAHARIE, Daniela (West University of Timisoara); Prof. GORGAN, Dorian (Technical University of Cluj Napoca); Mr FRINCU, Marc (West University of Timisoara); Mr NEAGUL, Marian (West University of Timisoara); Mr PANICA, Silviu (West University of Timisoara); Mr STEFANUT, Teodor (Technical University of Cluj-Napoca); Mr BACU, Victor (Technical University of Cluj-Napoca)

**Presenters:** Prof. PETCU, Dana (West University of Timisoara); Mr PANICA, Silviu (West University of Timisoara)

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