



Implementation of geospatial services in Grid: the RISICO case study

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The CYCLOPS project is an FP6 Specific Support Action which aims to bring together two important Communities: GMES and Grid, focusing on the operative sector of European Civil Protection (CP).

Recently RISICO, an operative Italian Civil Protection application for wild fires risk assessment, has been ported to gLite by the CYCLOPS working group. RISICO presently runs in Grid accessing data stored using various proprietary formats in a gLite Storage Element. GLite is the Grid middleware developed by the EGEE European project (Enabling Grids for E-science).

As a further step we discuss which benefits could be granted to RISICO, realising an intermediate layer of geospatial web-services between the CP application and gLite. All the web-services implement standard interfaces specified by the Open Geospatial Consortium (OGC).

In this case the georeferenced data will be stored in standard formats (GRIB/NetCDF) and will be accessed through standard interfaces. The workflow will be as follows:

- The CP user selects an area in which the model should be run, selects the input data URIs and indicates an appropriate priority for the action.
- Our application, exposing the Web Processing Server (WPS) interface, receives the request, evaluates the input size and the priority, and then activates various independent data access services. These, implementing the Web Coverage

Service interface, are responsible of subsetting the original calibrated satellite data-sets and of the publishing of the results.

- When the various inputs have been set up, the WPS spawns and distributes an adequate number of jobs on the grid, which are responsible for the execution of the core algorithm.
- When all the jobs have successfully run, the WPS takes care of merging the results and publishes them to the CP user.

With this new approach, new use cases could be implemented with a limited effort:

1. In case of an emergency the CP could easily choose to increase the priority of the run, telling the WPS to submit the algorithm on a greater quantity of WN to get the results in a shorter time. Alternatively WPS could run the algorithm on a specific region with a better resolution.
2. The same algorithm could be run using data accessed through standard interfaces from different data providers on the same region for increased availability and for comparison purposes.
3. In future scenarios different algorithms accessible through the standard WPS interface could be run on the same data inputs for output comparison and integration.

A prototype of RISICO that makes use of the grid enabled WPS and WCS services is under development. This project is going to be part of the OGC-OGF interoperability initiative.