



Grid enabled Service Support Environment - SSE Grid

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The SSEGrid project is an ESA/ESRIN project which started in 2009 and is executed by two Belgian companies, Spacebel and VITO, and one Dutch company, Dutch Space. The main project objectives are the introduction of a Grid-based processing on demand infrastructure at the Image Processing Centre for earth observation products at VITO and the inclusion of Grid processing services in the Service Support Environment (SSE) at ESRIN.

The Grid-based processing on demand infrastructure is meant to

- support a Grid processing on demand model for Principal Investigators (PI) and
- allow the design and execution of multi-sensor applications with geographically spread data while minimising the transfer of huge volumes of data.

In the first scenario, 'support a Grid processing on demand model for Principal Investigators', we aim to provide processing power close to the EO-data at the processing and archiving centres. We will allow a PI (non-Grid expert user) to upload his own algorithm, as a process, and his own auxiliary data from the SSE Portal and use them in an earth observation workflow on the SSEGrid Infrastructure. The PI can design and submit workflows using his own processes, processes made available by VITO/ESRIN and possibly processes from other users that are available on the Grid. These activities must be user-friendly and not requiring detailed knowledge about the underlying Grid middleware.

In the second scenario we aim to design, implement and demonstrate a methodology to set up an earth observation processing facility, which uses large volumes of data from various geographically spread sensors. The aim is to provide solutions for problems that we face today, like wasting bandwidth by copying large volumes of data to one location. We will avoid this by processing the data where they are. The multi-mission Grid-based processing on demand infrastructure will allow developing and executing complex and massive multi-sensor data (re-)processing applications more efficiently. A workflow can be built and submitted for execution on multiple loosely coupled Grids (e.g. at VITO and at ESRIN). It is ensured that the data are processed where they are located. For this purpose the project aims to upgrade the Service Support Environment (SSE) to integrate multi-Grid processing services to be used by the PI for the systematic processing or reprocessing of EO data.

For both scenarios described above, two processing modes will be available. In near real-time (NRT), or "subscription mode", processing, the execution of a workflow is started but suspended a certain step where the workflow waits until certain data are present on the Grid. As soon as the data become available from the sensors, the execution is resumed automatically. In "historical mode" it is assumed that the data are already present.

An other main objective of the SSEGrid project is to propose new or amended versions of "Web Processing Service" protocols that may be able to bridge geo-spatial Service Oriented Architectures and Open Grid Services Architectures. In this context we will propose the Grid Web Processing Service as an extension of the OGC WPS service to allow for the dynamic deployment of user processes (workflows or Grid processes) and auxiliary data, for the discovery of user auxiliary data, for the query of process status and process audit (execution trace, log file) and for the notification of process completion or failure.