



Contribution ID: 149

Type: Poster

Interactive Air Pollution Simulation

Describe the scientific/technical community and the scientific/technical activity using (planning to use) the EGEE infrastructure. A high-level description is needed (neither a detailed specialist report nor a list of references).

The radioactive air pollution simulation is a computational core of the commercial IMS Model Suite - a software system for environmental pollution assessment and prediction of consequences of nuclear accident or radiological emergence. It provides the target audience (scientists, emergency response authorities, etc.) with the ability to predict the spread of radioactive air pollutants given the pollutant release data (location, amount) and the meteorological conditions in the area.

Report on the experience (or the proposed activity). It would be very important to mention key services which are essential for the success of your activity on the EGEE infrastructure.

The simulation will require the operational grid with standard services like CE, SE, resource broker. The interactivity requires the usage of the Migrating Desktop UI which is used for job submission, monitoring and as a container of application specific plug-in handling the data flowing to/from the interactive channel. For the setup of the interactive channel the ability to execute the gLogin tool is required.

Describe the added value of the Grid for the scientific/technical activity you (plan to) do on the Grid. This should include the scale of the activity and of the potential user community and the relevance for other scientific or business applications

The application core simulates a number (thousands) of particles that have been released into the atmosphere using the Lagrangian trajectory model. The computational requirements increase with added number of particles, which are necessary for increased precision of the simulation. There was a clear need for using parallel computation to decrease the computational time. As the individual particles are independent of each other, a very efficient parallelization is achieved. Using the clusters from the grid and the special interactivity feature enables the users to perform the simulation faster and with the ability to monitor and steer the simulation as it proceeds. Even several clusters might be used to run it in a parameter study-like scenario.

Abstracts for online demonstrations must provide a summary of the demo content. Places for demos are limited and this summary will be used as part of the selection procedure. Please include the visual impact of the demo and highlight any specific requirements (e.g. network connection). In general, a successful demo is expected to have some supporting material (poster) and be capable of running on a single screen or projector.

The demo presents an interactive steering of a simulation running on the grid. The Migrating Desktop UI is used as a platform for submitting the application to the grid and launching application specific interaction plug-in.

In the demo, the user submits the application using the predefined parameters stored as an icon on the desktop. Then he monitors the status of the job in the job monitoring dialog. When the job enters running state the user starts the application plug-in, which connects via interactive channel to the application. As the computation proceeds, images showing map with the particles are sent to the user for each hour of simulation time (i.e. every few seconds). Images are buffered locally for the sake of viewing past images and for playing simple animation. Each simulation step, the user can send a command to split particles, thus doubling particle count simulated. There is also a command for terminating the simulation correctly instead of aborting it the usual way.

Author: Mr SIMO, Branislav (Institute of Informatics, Slovak Academy of Sciences)

Presenter: Mr SIMO, Branislav (Institute of Informatics, Slovak Academy of Sciences)

Track Classification: Demo and Poster session