

FOOTPRINT@work, A COMPUTING FRAMEWORK FOR LARGE SCALE PARAMETRIC SIMULATIONS: APPLICATION TO PESTICIDE RISK ASSESSMENT AND MANAGEMENT

Friday 11 May 2007 09:20 (20 minutes)

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).

FOOTPRINT is an EU-funded FP6 project which aims at developing risk assessment and management tools for different end-user communities in Europe to limit the contamination of water resources by pesticides. The project is relevant to everyone involved in pesticide management and use (researchers, policy-makers, ministries, local authorities, water managers, farmers). It relies on the definition of a large number of agro-environmental scenarios and their modeling using validated pesticide fate models.

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.

Based on the principles of the PEST/SENSAN package which is widely used in hydrology for model calibration and sensitivity/uncertainty analyses, a set of tools have been developed to mimic its principal functionalities and to handle inputs and outputs of large parametric simulations. Although the pesticide fate models used for pesticide registration are typically locked, access to the code of the MACRO model has been granted as part of FOOTPRINT, which allows its porting under various OS, including Linux. Windows-based pesticide fate models have already been deployed on BRGM PCs running Linux using dedicated emulators. A parameter to the success of the deployment of MACRO onto the EGEE infrastructure would be the availability/development of a parametric jobs manager although alternatives can be used to avoid this aspect.

With a forward look to future evolution, discuss the issues you have encountered (or that you expect) in using the EGEE infrastructure. Wherever possible, point out the experience limitations (both in terms of existing services or missing functionality)

We have not made use of the EGEE infrastructure at this stage. From a prospective point of view, capacities and limitations with regard to storage resources on the EGEE architecture will be of particular interest. Also, swift and rapid access to the modelling results is essential.

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

Results from the very numerous (1-10,000,000 runs, several Petabytes of data) precomputed runs will be used to build a series of meta-models. The huge requirement for computing power has already led to collaboration with a national grid initiative (IGGI) and more than 500 desktop PCs of BRGM's internal grid will be used during their idle period for the modeling. The pesticide community has praised FOOTPRINT for its innovative and ground-breaking approach and numerous proposals for improvement of the methodology used have been expressed, resulting in demands for computing power far exceeding the capabilities of desktop PCs. Hence, the success of this European research project clearly calls for the use of high performance computing facilities such as those offered by the EGEE infrastructure. Key individuals in research institutes, registration authorities, consultancy and the agrochemical industry have already expressed their support to see the FOOTPRINT concept developed further.

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