

## Performance Analysis of Atmosphere and Ocean Model on EU-IndiaGrid Infrastructure

Thursday 10 May 2007 09:30 (15 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).**

C-DAC, India and ICTP, Italy are collaborating in EUIndia Grid project -an interoperable Grid infrastructure for the European and Indian Scientific Community. In this project, earth and atmospheric Science has been identified as a pilot grid application. In this presentation we give a brief overview of the EU-India Grid Infrastructure and the performance of an atmospheric model RegCM3 (Regional Climate Model Version 3) and an Ocean Model ROMS (Regional Ocean Modeling System) on it.

**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.**

At the moment the ReGCM Code is running in parallel on the GARUDA Indian GRID and we are currently porting and evaluating and comparing performance of the code on both the infrastructures. The code is a parallel code and it therefore fundamental to have an efficient MPI implementation above the grid easily usable. Another key issue about Earth and Atmospheric simulation is the handling of I/O requirements: beside the size of the output generated there could be also privacy and security issues associated with them.

**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)**

The first attempt to use the grid revealed as main issue the Information System. As a matter of fact the IS provided by EGEE infrastructure seems a little bit weak in this respect not indicating with enough details the computational resource MPI-enabled on the GRID. It is for instance not easy to spot out which are the cluster and/or the MPI resource that are based on high speed network (like for instance Myrinet and/or Infiniband cards).

**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**

RegCM3 is a regional climate model developed at International Center for Theoretical Physics (ICTP) and is used widely for downscaling the climate scenarios generated by Global climate models. The code is parallelized using MPI and is scalable on a cluster of computers. The ocean model ROMS has been developed by Rutgers University and UCLA and is widely used for simulating the ocean conditions. Under the EU-IndiaGrid initiatives it is planned to develop a coupled ocean atmosphere regional

model for generating realistic climate scenarios which will help the International community have a better understanding of the effects of various green house gases on the climate. We discuss the design of computational workflow and the performance of the RegCM3 and ROMS model on the EUIndia grid resources.

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**Session Classification:** Experience with application domains