Contribution ID: **134** Type: **Poster**

Workflow Management of the CAM Global Climate Model on the GRID

Tuesday, 3 March 2009 18:25 (5 minutes)

Recent trends in climate modeling find in GRID computing a powerful way to achieve results by sharing computing and data distributed resources. In this work, we present the successful port of an atmospheric Global Climate Model to the GRID by using existing middleware solutions plus newly developed tools (Grid Enabling Layer and Workflow Management Layer) to account for specific requirements posed by this application. In doing so, several weaknesses of current middleware were identified.

Conclusions and Future Work

The port of the CAM model has given us the opportunity of running it on grid in a user-friendly way, hidden to the users the complexity of the grid . Although the effort of developing an application in GRID is very high, the results are worth it. The next step in our work is porting the regional WRF model to the GRID and create a new application combining CAM and WRF.

Keywords

GRID computing; workflow; long term jobs; climate models; CAM model; El Niño phenomenon

Impact

Although we have shown that current GRID technology is immature and not completely well suited for the Earth Science community, there are some fields in earth science, including recent trends in ensemble forecasting or any other involving independent simulations, which could greatly benefit from the grid.
Regarding the computational part, this work shows how a complex application can be succesfully ported to grid if a good workflow management is used. This could encourage users of some other disciplines to migrate their applications to grid.

URL for further information

http://applications.eu-eela.eu/application_details.php?ID=5

Detailed analysis

Climate models are complicated computer programs which require large amounts of CPU power. Most of them are parallelized. However, the GRID cannot make the most of this kind of parallelism. Apart from computer parallelism, climate science is recently making use of a large number of simulations, referred to as "ensemble" . Ensemble prediction is based on the generation of multiple simulations from perturbed model conditions to sample the existing uncertainties. In this work, we present a GRID application consisting of a state-of-the-art climate model (CAM). The main goal of the application is providing a user-friendly platform to run ensemble-based predictions on the GRID. This requires managing a complex workflow involving long-term jobs and data management in a user-transparent way. In doing so, we identified the weaknesses of current GRID middleware tools and developed a robust workflow by merging the optimal existing applications with an underlying self-developed workflow

Primary author: Mrs FERNANDEZ, Valvanuz (Universidad de Cantabria)

Co-authors: Dr COFINO, Antonio (Universidad de Cantabria); Dr JOSE MANUEL, Gutierrez (Instituto de Física de Cantabria); Dr FERNANDEZ, Jesus (Universidad de Cantabria)

Presenter: Mrs FERNANDEZ, Valvanuz (Universidad de Cantabria)

Session Classification: Poster session

Track Classification: Experiences from application porting and deployment