Plinius Conference Abstracts,
Vol. 11, Plinius11-158, 2009
11th Plinius Conference on Mediterranean Storms

WRF4G: enabling ensemble operational weather forecasting on the GRID

J Fernández (1), V Fernández-Quiruelas (1), AS Cofino (1), L Fita (1), and JM Gutierrez (2)

(1) University of Cantabria, Applied Maths and Computing Sciences, Santander, Spain (fernandej@unican.es), (2) Instituto de Física de Cantabria CSIC-UC, Santander, Spain

The GRID provides transparent access to geographically distributed computational and storage resources. Several applications areas as high energy physics or bio-applications have been proven to benefit from this computational paradigm. Applications from the Earth Science community are starting to take advantage of this technology (see e.g. www.eu-degree.eu). The port of already existing Earth Science applications and, in particular, a numerical atmospheric model to the GRID poses a challenge in terms of the CPU and storage requirements. These applications are organized around communities known as virtual organizations (VO).

The limited area models require a large amount of input data to build the boundary conditions. Currently the heterogenous GRID infrastructure is subject to common failures and intermittent availability of resources the numerical weather models are not prepared for. For those reasons, in this contribution we present a new execution framework providing a software wrapper for a numerical prediction model. A wrapper for the WRF Modeling System has been developed to enable limited area model simulations on the GRID. This WRF for the GRID wrapper (WRF4G) is "gridifying" a complex workflow application as the WRF System.

The WRF4G framework has been adapted for the middleware developed in the leading european project on GRID computing known as EGEE (http://eu-egee.org/), also used in other GRID european projects (EELA2, ...) and National GRID Initiatives (NGI) like the Spanish NGI (ES-NGI). This GRID environment provides a High Productive Computing allowing to run multiple independent jobs with no high demanding on CPU and memory resources.

As an application of the WRF4G framework we present a multi-physics ensemble experiment of precipitation forecast over Spain, which is run daily at a 10km resolution by the Santander Meteorology Group (www.meteo.unican.es). Two parameterizations of the ensemble are run in the local cluster, whereas 15 additional simulations are sent to geographically distributed GRID resources.