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Earth Science applications of the ES Virtual Research Community

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Earth Science is an all-embracing term for sciences related to the planet earth covering a large user community from academy, industry and organizations. To provide a scientific basis for addressing societal issues is more and more computing resources are neededboth for real and remote time applications. In the framework of the European Grid Initiative, EGI, the ES VRC gathers the partners of 9 Virtual Organizations located in 23 European or associated countries and is linked to EELA2, EUAsia and African partners. Overview of applications and tools are presented.

Detailed analysis

The applications already ported on EGEE are from different ES disciplines like atmospheric chemistry, biodiversity, climatology, hydrology, meteorology, pollution, seismology domains. Atmospheric chemists and meteorologists use these applications to model ozone or pollution, or predict regional weather patterns. Solid earth physicists within this community use applications to study earthquakes. A number of hydrology applications focus on predicting floods. Several climate applications deal with access and distribution of climate model outputs for further studies like model inter-comparisons, downscaling or impact of the climate change on agriculture, water resources⋯. The forecasting and monitoring of natural risks such as flood and fire have driven the use of OGC (Open Geospatial Consortium) components implemented on top of Grid middleware. The number of applications and tools developed is very impressive. However the interface between the ES environment and Grid middleware is not simple for many applications and developments. There persist significant gaps due to complex computing protocols in ES that will be addressed by the ES VRC.

Conclusions and Future Work

Demonstration of the interest of Grid technology in ES domain is done through this large panel of applications and tools. Then the next step is to expand and support Grid uptake within ESFRI, as well as other related community scientific projects and propose them collaboration to use the Grid. In order not to discourage the new user the ES Grid community needs to continue providing user-friendly tools and helping the porting of applications. For projects a gateway customerized to the needs and requirements of the concerned community will be proposed.

Impact

Success stories are always a good way to attract new applications and projects. Forecasting or monitoring of risk and weather are applications running regularly on a medium or long term basis following the scientific and technological evolution. The use of the Grid in the other applications lasts when results are obtained and published in international journal and/or in PhD dissertations. The ES VRC is expecting to bring new applications and projects. The increase of new applications will permit to create collaboration among people working in the same field and then to develop more common tools, and/or among people having applications based on the same requirements concerning input or output data, or numerical approach. An important

point is that the use of Grid technology is addressed in several infrastructure EU projects related to the ES community and in the Climate field.

Keywords

Earth Science Applications

URL for further information

www.EUEarthScienceGrid.org

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