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Life Sciences Applications on a Computing Grid Infrastructure

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Grids open exciting perspectives to address many of the challenges faced by biomedical research in terms of large scale computing and data management. The e-science group at LPC Clermont-Ferrand (http://clrwww.in2p3.fr/PCSV) focuses on deploying applications and developing services relevant to life sciences and healthcare in grid environments. The group is actively involved in the deployment of large scale distributed applications on the EGEE II grid infrastructure. This European project aims at federating distributed resources sharing data and providing a continuity of service using grid technology. As well, the group studies the development of bioinformatics services for complex data management and service discovery, and an efficient telemedicine application to share medical data in a secure way by using grid potentialities. Those applications use web services within the framework of EGEE, EUMed Grid, EELA, EUCHINA Grid and the EMBRACE European network of excellence.

Within the framework of the EGEE II project, the team studies the impact of grids for reducing computing time on the GATE Monte-Carlo simulation platform for radiotherapy and brachytherapy applications and on a wide in silico docking application on malaria (WISDOM project). Both applications are distributed in several small jobs which are then deployed on the computing grid. Jobs are submitted by using convivial and secure web portal interfaces. On both applications, the EGEE infrastructure allows to reach very significant acceleration in computing time, up to a factor 300 for Monte Carlo simulations and up to a factor of 2000 for the WISDOM application by reducing the calculations to 90 days instead of the 412 years by using one CPU. In a near future, a web portal will make it possible for a physician or a bioinformatician to reach the grid resources using an internet connection.
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