A GRID-BASED e-INFRASTRUCTURE FOR DATA ARCHIVING/COMMUNICATION AND COMPUTATIONALLY INTENSIVE APPLICATIONS IN THE MEDICAL SCIENCES

Autori: Alberto Redolfi – IRCCS FBF – Consorzio NeuGrid - Brescia

Abstract

The neuroimaging community is making increasing use of statistical and mathematical tools to extract information out of images of biological tissues. Actually, computational neuroanatomic tools are intensively used and shortly the increasing availability of image datasets will lead to the need of increasing resources. *neuGRID* project aims to collect and archive large amounts of imaging data paired with Grid-based computationally intensive analyses of these data. The *neuGRID* project will establish a distributed e-Infrastructure interconnecting hospitals all over the Europe and will supply clinical neuroscientists and researchers with the most advanced information and communication technologies to overcome Alzheimer's pathology.

In order to make feasible the project is clear that two main services are needed: the first is represented by a uniform and very large bandwidth between the core labs of the grid allowing the transfer of the large amount of data. With respect to the centre IRCCS-FBF it was made possible with the invaluable help of GARR consortium getting in this first year a connection of 10 Mbps which will be increased by the end of the project to 100 Mbps and to 1 Gbps in the next future. The second key point is represented by the computing power needed to reduce the processing time of the algorithms classically used by the neuroimaging community. The power of the *neuGRID* processing will be characterized by efficient nodes equipped with supercomputer/grid-cluster capabilities and resources of more than one hundred and fifty processor cores, 150 GB of RAM memory and up to 10 TB of physical space each. In this talk will be given a real time demo of the *neuGRID* web based platform took in place to date displaying the portal service, the dataset used to archive, retrieve and share data, and the grid architecture used in this project. Finally new perspectives and potentialities for the study of the neurodegenerative disorders will be highlighted using the powerful technology here depicted.