The 3rd International Summer School on Grid Computing 2005

Khalid Tijani

Pietro Hiram Guzzi

Francisco Pinto

Group 7

Laura Antonelli

Gerardo Giordano

William Bacchi

William Bacchi Francisco Pinto	Code Development
Gerardo Giordano Khalid Tijani	Search Strategy
Pietro Hiram Guzzi Laura Antonelli	Presentation and Real World Application

GRID

…is bringing together:

- people

  expertise

  technologies enabling knowledge discovery

An ant can make little…

…an army of ants can make a lot!!!

Medical Imaging

Reconstruction of nuclear medicine Image:
Single Photon Emission Computed Tomography (SPECT)

Forward

***projection* process**

acquisition system provides a set of the *projections*

Backward

***reconstruction* problem**

reconstructing a set of slices of the scanned orgar

(by a numerical computation)

Reconstruction algorithm

Geographically distributed resources

Raw data

Raw data

Florence

Acquisition system and storage resource
Careggi Hospital

Genoa

Acquisition system and storage resource
S.Martino Hospital

Genoa & Naples

Grid Portal
DISI & ICAR-NA

Genoa

Computational resource
DISI

Naples

Computational resource
University of Naples

Naples

MDS Server ICAR-NA

Naples

Computational resource
ICAR-NA

Principal Issues

1. Distributed and Heterogeneous Data Sources
   1. 1 Geographically distributed laboratories and hospitals produce a lot of data
   1.2 Images can differs in format, schema, …

2. Data processing is incompatible with respect to diagnostic time
   2.1 Data acquisition process introduces noise on data
   2.2 Clinical diagnostic is not possible on corrupted data

Goals

- a high performance, freely accessible medical imaging environment that allows the medical doctor to:
  - archive
  - reconstruct
  - process
  - visualize
  - tomographic data from any geographic location with
  - Internet access

grid environment

Acquisition system and storage resources

Acquisition system and storage resources

Grid Portal

Computational resources

Grid solutions

- **Virtual Organization**
  - Globus Security Infrastructure (GSI) technologies to realize a Virtual Organization which joins people and resources and allow to share data and computational resources.
  - Virtual Organization Membership Service (VOMS) solve the problems of granting users authorization to access the resources at VO level, providing support for group membership, roles and capabilities.

- **Grid Portal to access resources and data**
  - OGSA-DAI for transparent access to heterogeneous data

Progressive Exercise

We developed the clients to interact with several technologies:
Java, web services and GT4

We have completed the exercises:

1.1- 1.2 - 1.3 Java Technology

2.1 - 2.2 - 2.3 Web Services

3.1 - 3.2 - 3.3 GT4

3.4 -3.5 GT4 Cone and Cuboid Services not available

Final Exercise: Pillar Search

The kind of problem to solve suggested us to use High Throughput Computing technologies.

We wanted also to use the Explorer developed during the progressive exercise,

We also to tried to organize all the groups to avoid searching all for the same pillars.

We managed to find a “GLOBUS” pillar.

Feedback

Discussion of papers was really Interesting

We Liked having lectures and practicals mixed up

Scheduled time to do Progressive Exercise, Team Work and Team building.

The final task should have been Known from the beginning.

The practical parts of technologies presentation should have been oriented to the construction of the solution of the final test.

The group evaluation is not objective and the certificate is personal, and there should be a personal evaluation.