Grids in Biomed Community

NA4 Biomed

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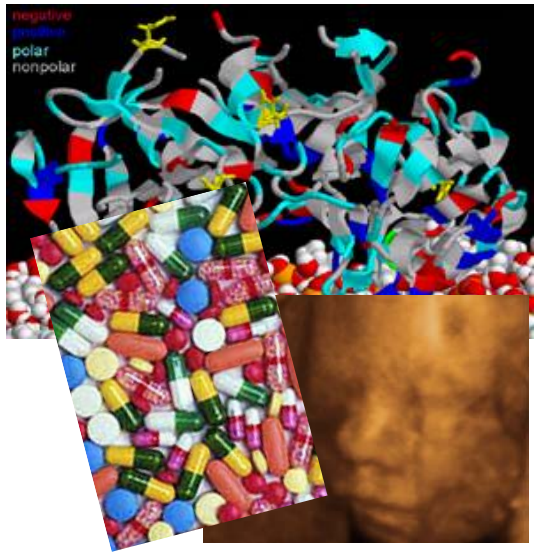
Information Society

Main Issues of Grid for Biomed



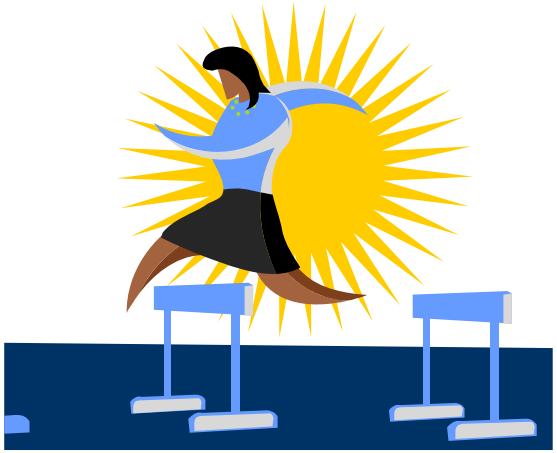
- **The Grid is Currently Used in Biomed to Solve the Problems of Both Large Computational Needs and Large Scale Data Management.**
- **The Grid is Being Applied in Different Areas:**
  - Biocomputation, for the Simulation of Biomolecular Physics and the Analysis of Genomics (GPS@, CaBIG, WISDOM, BioGRID, INFOGENMED, GenoGrid,…).
  - Medical Imaging, for the Creation of Distributed Virtual Repositories of Radiology Information and Processing Tools (MAMMOGRID, BIRN, MEDIGRID, TRENCADIS, GPTM3D, IXI,…)
  - Epidemiology, for the Consolidation and Processing of Large Population Databases and the Extraction of Knowledge (eDIAMOND, DATAMINING-grid).
  - Biomedical Simulation, for the Computation of Large Complex Physiological Models (GEMSS, GATE, gCAMAEC, CROSSGRID).
- **The Users are:**
  - Researchers: Clinics (BIRN, MAMMOGRID, GATE, GEMSS, GPTM3D,…) and Biologists (GPS@, CaBIG, WISDOM,…),
  - Industry: Pharmaceutical Companies (Not in an Open Grid, e.g. NOVARTIS).

Main Benefits and Opportunities of the EGEE Infrastructure

- **Benefits for Biomed:**
  - For Clinical / Biologist Researchers
    - Not Autonomous in Computational Power (Pharmacokinetics, GPS@, GPTM3D, XMIPP,…)
    - Set-up of Large Shared Distributed Repositories (SRM-DICOM, MAMMOGRID,…)
    - Speed-up Obtaining Research Results and Larger Tests (WISDOM,…).
  - For the Industry
    - Proof of Concept for Application to be Deployed on Corporate Grids.
  - For IT Researchers
    - Test Multi-domain Difficulties.
    - Develop Applications on Top of a Working Infrastructure.
    - Run, Test and Evaluate Performance.
- **Opportunities for EGEE / Biomed:**
  - Biobanks and Screening Programs.
  - Convergence of Bio-computing and Medical Informatics.
  - Novel Applications Emergence.
  - The Consolidation of Standards CEN/TC 252, VITAL, EN13606, DICOM, HL7, ICD, SNOMED,...

Barriers of Grids in the Biomed Community

- **Grid Technology Barriers**
  - Reliability (Prevents from Daily Practice and Makes Users Reluctant)
    - Used to Reliability in Resources and 24x7 Activity.
    - Still Single Points of Failure or Non-Automatic Reconfiguration.
  - Privacy
    - Conflicting International Regulations on Patient Data.
    - IPRs for Data.
  - Provenance
    - Repeatability and Data and Process Provenance.
  - Interfaces and Configuration
    - LCG / gLite are Wide-Spectrum Grids. Balance Customisation, Performance and Development Efficiency.
- **Biomedical Technology Barriers**
  - Standards
    - Incompatibilities Among Standards and Coding in Progress.
  - Involvement of Hospitals and Medical Research Centres
- **Industry Barriers**
  - The Grid Business Model
  - Reluctance on Sharing.



Sources / References

Enabling Grids for E-sciencE

- **HealthGrid Association (www.healthgrid.org)**
  - White Paper on HealthGrids.
  - SHARE Technical Annex.
  - HEALTHGRID Proceedings 2003 / 2004 / 2005.
- **Pharmagrid - PRISM Forum (www.pharmagrid.com)**
- **EGEE Applications (http://egee-na4.ct.infn.it/biomed/index.php).**
- **Project Specific Information (BIRN, MEDIGRID, GRID-IT, GEMSS, DATAGRID, INFOBIOMED, INFOGENMED, …)**
- **Other Documents:**
  - White Paper “Synergy between Medical Informatics and Bioinformatics: Facilitating Genomic Medicine for Future Healthcare”.
  - Information Society Technologies (IST) Work Programme 2005-06.
  - Action Plan for a European e-Health Area.
  - Bulletin of the World Health Organization 2000.