EUROGRID

European Testbed for GRID Applications

Demonstration of distributed applications

- Bio-Grid: biomolecular simulations
- Meteo-Grid: weather prediction
- CAE-Grid: coupled computer aided engineering simulations
- HPC-Grid: large scale scientific codes

Development of Grid software based on UNICORE

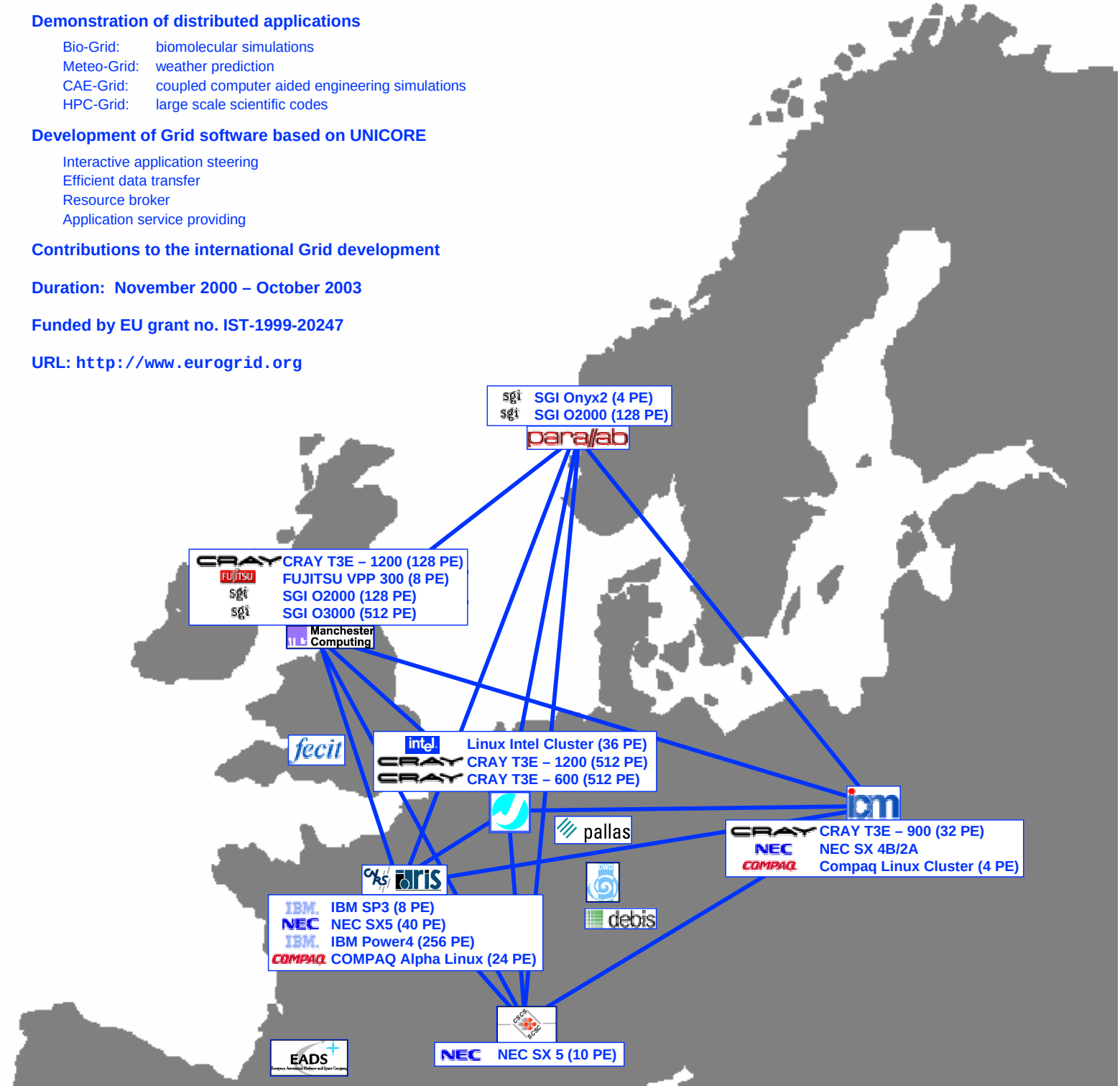
- Interactive application steering
- Efficient data transfer
- Resource broker
- Application service providing

Contributions to the international Grid development

Duration: November 2000 – October 2003

Funded by EU grant no. IST-1999-20247

URL: `http://www.eurogrid.org`



HPC Centers

- Forschungszentrum Jülich (D)
- Parallab – University of Bergen (N)
- CNRS – IDRIS (F)
- Warsaw University (PL)
- Victoria University of Manchester (UK)
- ETH Zürich – SCSC Manno (CH)

Users

- Deutscher Wetterdienst (D)
- GIE EADS CCR (F)

Assistant Partner:

- debis Systemhaus (D)

Integration

- Pallas GmbH (D)

Assistant Partner:

- Fujitsu European Centre for Information Technology (UK)

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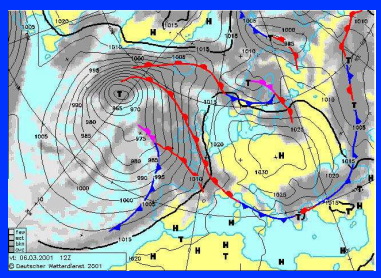
Bio GRID

- Operate a GRID for biomolecular simulations
- Develop interfaces to existing biological and chemical codes

Meteo GRID



- Develop a relocatable version of DWD's weather prediction model
- Goal: 'Weather prediction-on-demand' as an ASP solution

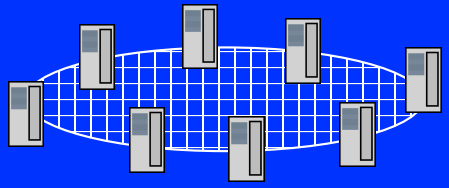
Technology Development

- Build on the functionality of UNICORE
- Extend UNICORE to provide the middleware necessary for the Domain specific GRIDs
  - Efficient data transfer
  - Resource brokerage
  - ASP services
  - Application coupling
  - Interactive access

CAE GRID

- Coupled simulations of aircrafts
- HPC portals for EADS engineers and for engineers at Daimler-Chrysler and partners
- Develop GRID technology for computing cost estimates and billing

HPC Research GRID



- Demonstrate a European HPC GRID testbed
- Develop new GRID applications
- Enable sharing of competence and know-how
- Agree on security standards, certification, access policies, ...

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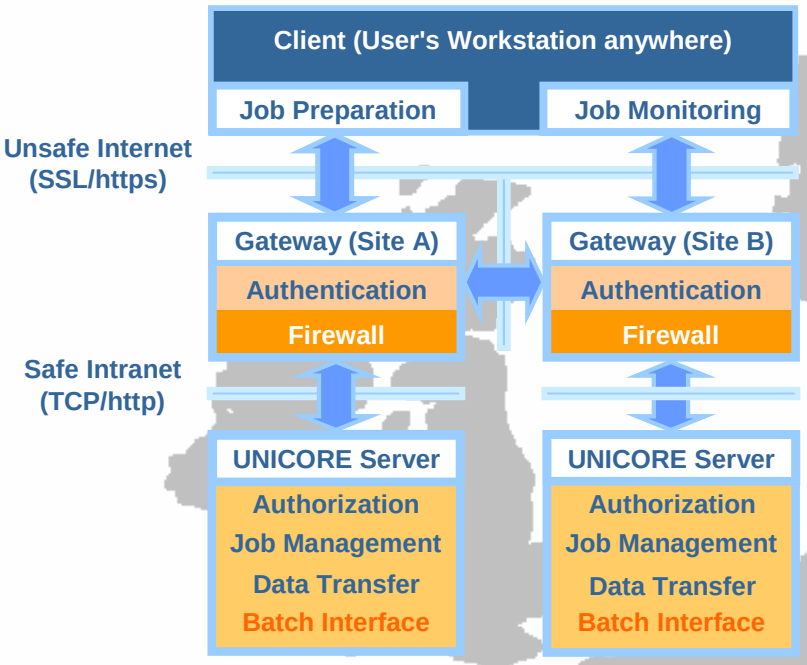
UNICORE Grid System: Software Base of the EUROGRID Project

UNICORE Uniform Interface to Computing Resources

- Provides a science and engineering GRID combining distributed resources of supercomputer centers and making them available through the Internet
- Performs strong authentication in a consistent and transparent manner
- Hides differences between platforms from the user
- Creates a seamless HPC portal for accessing supercomputers, compiling and running applications, and transferring data
- URL: `http://www.unicore.de`
- UNICORE Test Grid: `http://www.fz-juelich.de/unicore-test`



UNICORE System Architecture

Clients: Interacting with the user and providing functions to construct, submit and control the execution of computational jobs

Gateways: Acting as point–of–entry into the protected domains of the HPC centers

Servers: Schedule and run the jobs on the HPC platforms that they control

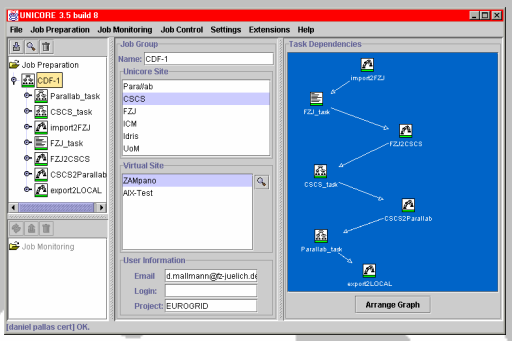
- Components written in Java
- Protocols between the components defined using Java mechanisms

Functions

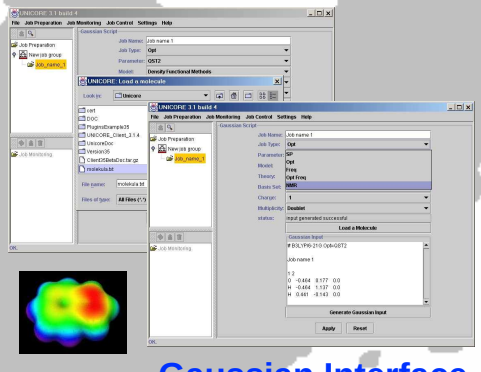
- Interactive creation of batch jobs
- Submission to different platforms at different locations
- Interdependent multi-application and multi-site jobs
- Automatic control of job flow
- Automatic staging of data
- Secure access to remote data
- Reuse of existing jobs
- Authentication of users through x.509 certificates
- Single sign-on to the EUROGRID Testbed
- Mapping to existing user identification at target site
- Authorization of users at target site

Client

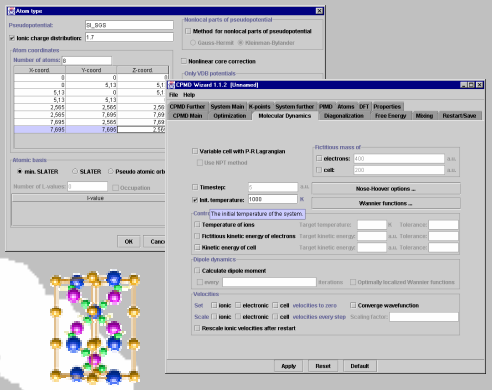
- Prepare and modify structured jobs
- Show resources
- Submit jobs on the Internet
  - execution of scripts
  - data transfer directives
  - application specific interfaces
- Monitor and control of jobs
- Fetch output



Client



Gaussian Interface



CPMD Interface

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