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)
- T-Systems (D)

Integration
- Fujitsu Laboratories of Europe (UK)
- Pallas GmbH (D)
- Project Coordinator

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URL: http://www.eurogrid.org
European Testbed for GRID Applications

**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 brokering
  - ASP services
  - Application coupling
  - Interactive access

**CAE GRID**
- Accommodate coupled CAE simulations from the aerospace field
- Create an HPC portals for engineering users at EADS, Daimler-Chrysler and partners
- Prototype an ASP service on top of EUROGRID

**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, ...

**Operate a GRID for biomolecular simulations**

**Develop interfaces to existing biological and chemical codes**

**Develop a relocatable version of DWD’s weather prediction model**

**Goal: ‘Weather prediction-on-demand’ as an ASP solution**

**Demonstrate a European HPC GRID testbed**

**Develop new GRID applications**

**Enable sharing of competence and know-how**

**Agree on security standards, certification, access policies, ...**

**Accommodate coupled CAE simulations from the aerospace field**

**Create an HPC portals for engineering users at EADS, Daimler-Chrysler and partners**

**Prototype an ASP service on top of EUROGRID**
Interactive Access
- Interactive control and steering of jobs
- Accommodate interactive applications and application steering
- Provide interactive command execution
- Implement a general mechanism for transmitting graphics output

Efficient Data Transfer
- Accommodate third-party data transfer mechanisms
- Provide fail-safe data transfer and optional encryption
- Overlap transfer and processing of data
- Handle latency-critical burst transfers, and bulk transfers which utilise available bandwidth

Application Coupling
- Integrate communication middleware for weakly coupled applications
- Develop techniques for strongly coupled applications
- Develop interfaces to schedulers for co-scheduling

UNICORE Client

Resource Brokering
- Dynamically identify available resources
- Automatically match resource requirements to available resources
- Select execution resources based on quality of service criteria (turnaround time, cost, ...)

Application Specific Plugins
- PDB Search

Testbed

Domain Specific Plugins
- Meteo GRID

ASPS Services
- Building block for application service provision (ASP)
- Provide accounting and billing of computing and license costs
- Generate reliable cost prediction
- Interface to standard accounting mechanisms
UNICORE Grid System: Software Base of the EUROGRID Project

Uniform Interface to Computing Resources
- Provides a science and engineering GRID combining distributed resources of supercomputer centers and makes 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
- Source code: http://www.unicore.org/downloads.htm

UNICORE Architecture
- Client: Interacts with the user and provides functions to construct, submit and control the execution of computational jobs
- Gateway: Acts as point–of–entry into the protected domain of the HPC centers
- Server: Schedules and runs the jobs on the HPC platform that it controls
- 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

PDB Search Interface

Weather Forecast Interface