

# EUROGRID

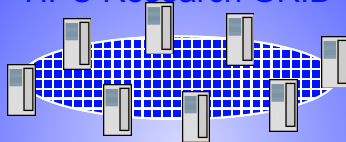
## European Testbed for GRID Applications

### Bio GRID



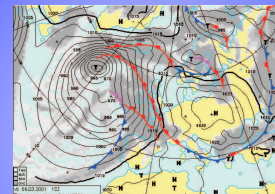
- ◆ Operate a GRID for biomolecular simulations
- ◆ Develop interfaces to existing biological and chemical codes

### 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, ...

### 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



- ◆ 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

**paralab**  
**sgt** SGI O2000(128 PE)  
**sgt** SGI Onyx2 (4 PE)

**CRAY** CRAY T3E - 1200 (128 PE)  
**FUJITSU** FUJITSU VPP 300 (8 PE)  
**sgt** SGI O3000 (512 PE)  
**sgt** SGI O2000 (128 PE)



**CRAY** CRAY T3E - 1200 (512 PE)  
**CRAY** CRAY T3E - 600 (512 PE)  
**intel** Linux Intel Cluster (36 PE)



**CRAY** CRAY T3E - 900 (32 PE)  
**NEC** NEC SX4B/2A  
**COMPAQ** Compaq Alpha Linux (4 PE)



**IBM** IBM SP3 (8 PE)  
**NEC** NEC SX5 (40 PE)  
**IBM** IBM Power4 (256 PE)  
**COMPAQ** Compaq Alpha Linux (24 PE)



**NEC** NEC SX5 (10 PE)

### HPC Centers

- Forschungszentrum Jülich (D)
- Paralab - 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:  
 T-Systems (D)

### Integration

- Pallas GmbH (D)  
Project Coordinator
- Assistant Partner:  
 Fujitsu European Centre for Information Technology (UK)



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URL: <http://www.eurogrid.org>

# EUROGRID

European Testbed for GRID Applications

## Technology Development Enhancements of the UNICORE GRID System

### Technology Development

- ◆ Satisfy requirements generated by domain-specific grids
- ◆ Improve EUROGRID take-up and exploitation in both science and industry



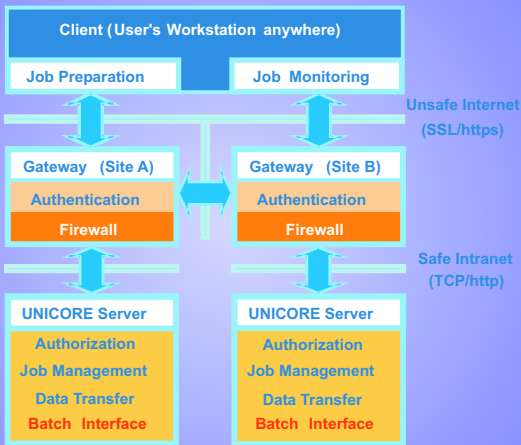
### Resource Brokering

- ◆ Dynamic identification of available resources in a GRID
- ◆ Broker automatically matches resource requirements of job to available resources
- ◆ Selection of possible matches based on various criteria, such as turnaround time, cost, etc.

### Efficient Data Transfer

- ◆ Fail-safe and encrypted transfer
- ◆ Overlap of transfer and processing
- ◆ Handle latency-critical burst transfers, and bulk transfers which utilise available bandwidth
- ◆ Exploit Quality-of-Service aware networks where available

### UNICORE Architecture



### ASP Services

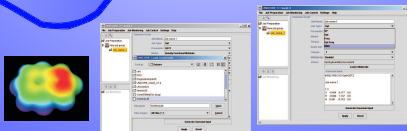
- ◆ Infrastructure for Application Service Providers (ASPs)
- ◆ Provide precise accounting and license billing
- ◆ Also provide up-front cost predictions
- ◆ Will interface to basic UNIX accounting mechanisms

### Application Coupling

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

### Application Specific Plugins

#### Gaussian



### Interactive Access

- ◆ Interactive control and steering of jobs
- ◆ Allow use of interactive applications
- ◆ Provision of interactive shell
- ◆ Provision of general-purpose interactive graphical interface