



Enabling Grids for E-science

# Technical Overview

## EGEE-II's achievements over two years

*Erwin Laure*  
*EGEE Technical Director, CERN*

*EGEE-II Final EU Review (CERN)*  
*8-9 July 2008*

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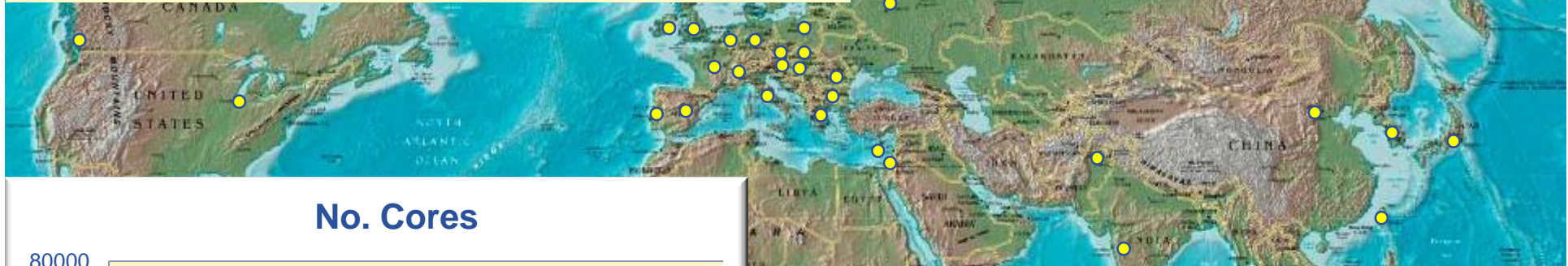




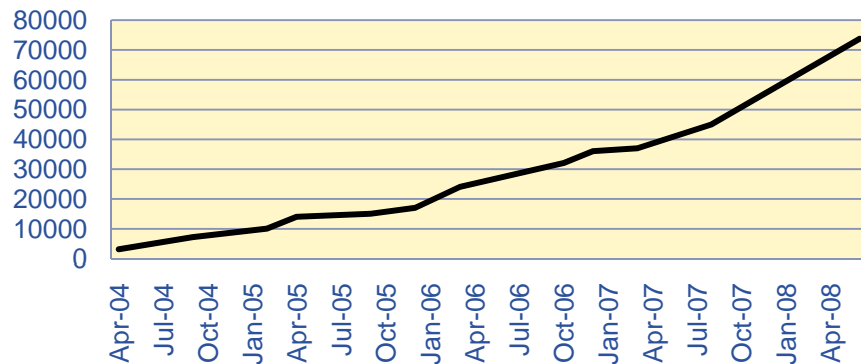
# Highlights of EGEE-II - Infrastructure

## EGEE Production Grid Infrastructure

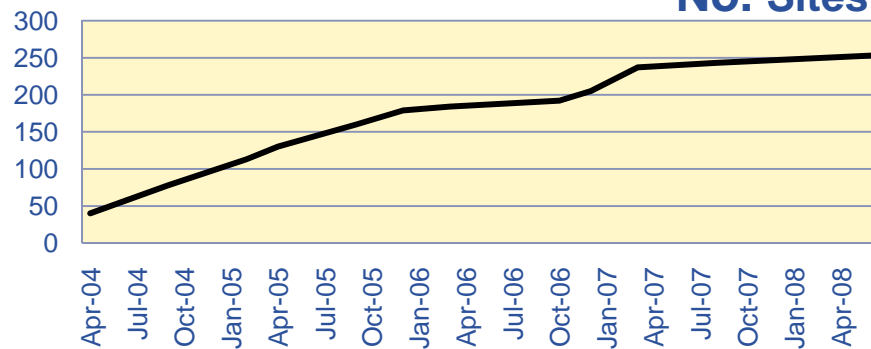
Steady growth over the lifetime of the project  
Improved reliability



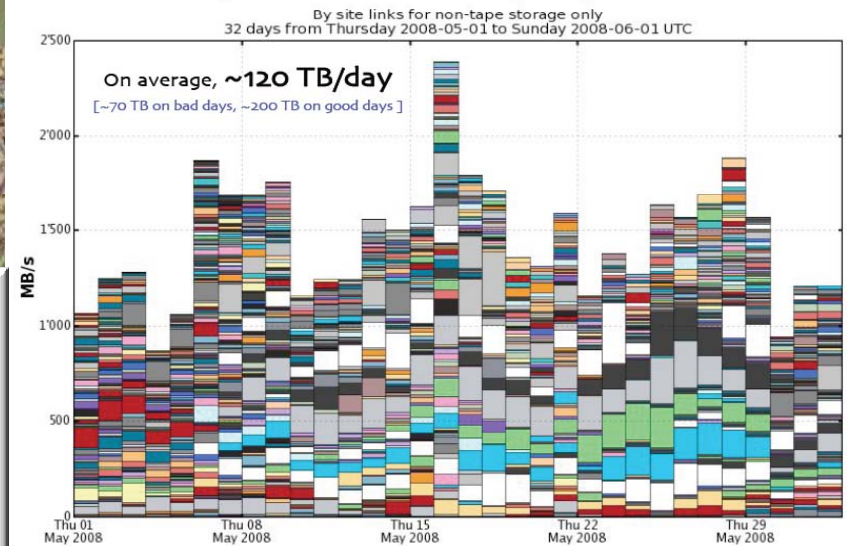
### No. Cores



### No. Sites

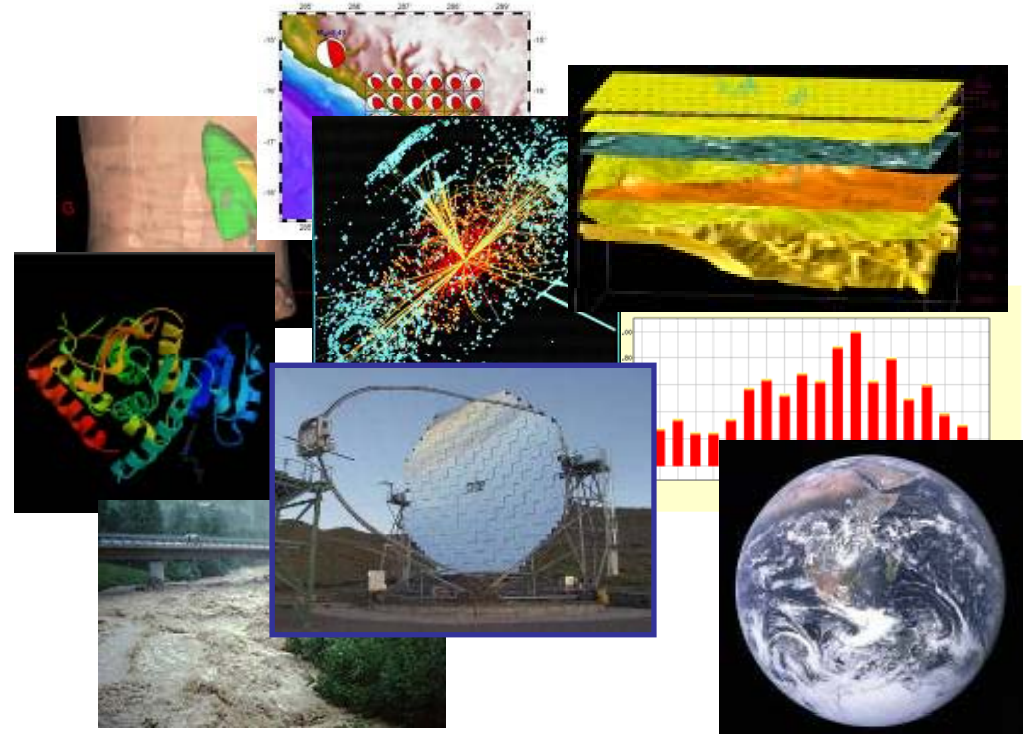


### Daily CMS PhEDEx transfer rate, Debug + Production



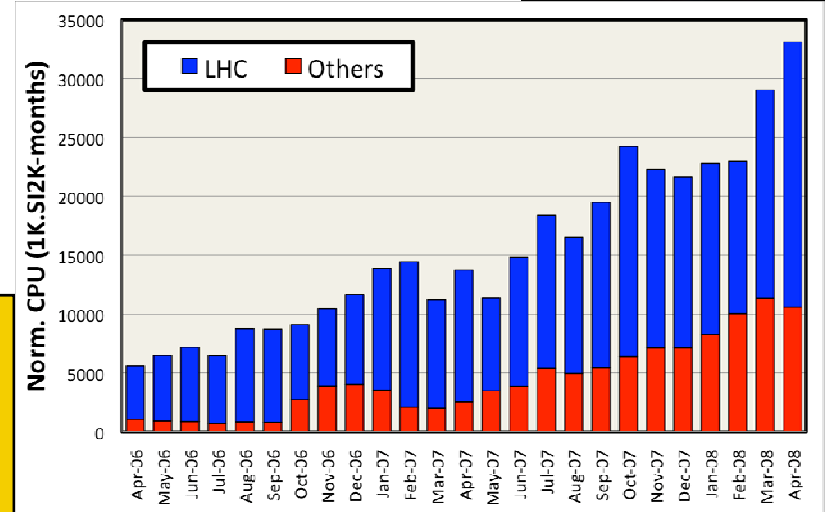


- **>270 VOs from several scientific domains**
  - Astronomy & Astrophysics
  - Civil Protection
  - Computational Chemistry
  - Comp. Fluid Dynamics
  - Computer Science/Tools
  - Condensed Matter Physics
  - Earth Sciences
  - Fusion
  - High Energy Physics
  - Life Sciences
- **Further applications under evaluation**

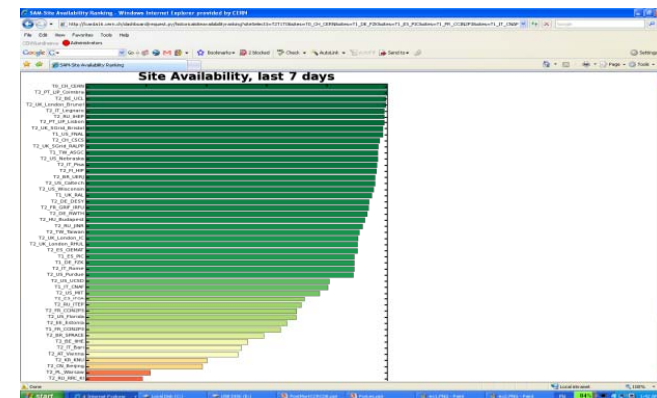
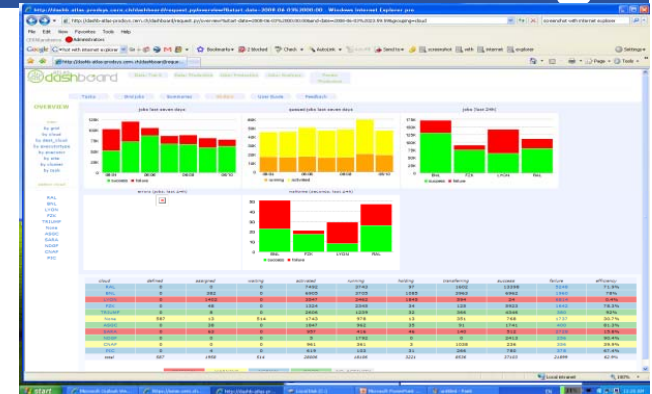


**Applications have moved from testing to routine and daily usage**

**~80-95% efficiency**



- **SAM allows to plug in VO-specific test**
  - Only responsive sites taken into account for scheduling
- **Experiment dashboards**
  - Better understand reason for failures
  - Extensively used by the LHC community
  - VL MED VO (biomed) using the dashboard for a year now, others interested
- **Evolution similar to operations grid monitoring:**
  - Feed VO monitoring results to the sites
  - Common mechanism



- **Many communities already achieve new scientific results thanks to EGEE**
  - Earth Science
  - Fusion
  - Drug Discovery (WISDOM)
  - HEP (hopefully after LHC start)
- **Not only thanks to the availability of computing and data infrastructure but also thanks to the collaborative and community building aspects of EGEE**

- **Maintained and improved the gLite middleware distribution**
  - Some 40 updates during PY2
- **“gLite restructuring”**
  - Critical review of gLite distribution to ease further evolution
  - Full adoption of ETICS as build system
    - Essential for porting activities
  - Code and dependencies clean-up
    - >50% reduction of rpms on clients (~20% size)
  - Full support for SL4, clients and several services 64bit compliant
  - Porting activities (Debian, CentOS 4 and 5, SuSe 9, Solaris, Ubuntu, etc) now being integrated in standard release process



- **gLite being adopted outside EGEE**

- Regional projects: BalticGrid-II, SEE-GRID-SCI, EELA-2
- Several components being used by EUIndiaGrid, EUChinaGrid, EUMedGrid, OSG (via VDT)
- Focused infrastructures: Health-e-Child, D4Science, BEinGRID (CGGVeritas)
- Many local and regional installations
- Uptake from Industry: Philips Research, Imense Ltd; support companies are appearing (e.g. Constellation Technologies Ltd)





- **Incubator for new Grid efforts world-wide**

- Infrastructure and application efforts
- Collaborating Project Office to keep close links

- **Leading role in building world-wide Grids through interoperation efforts**

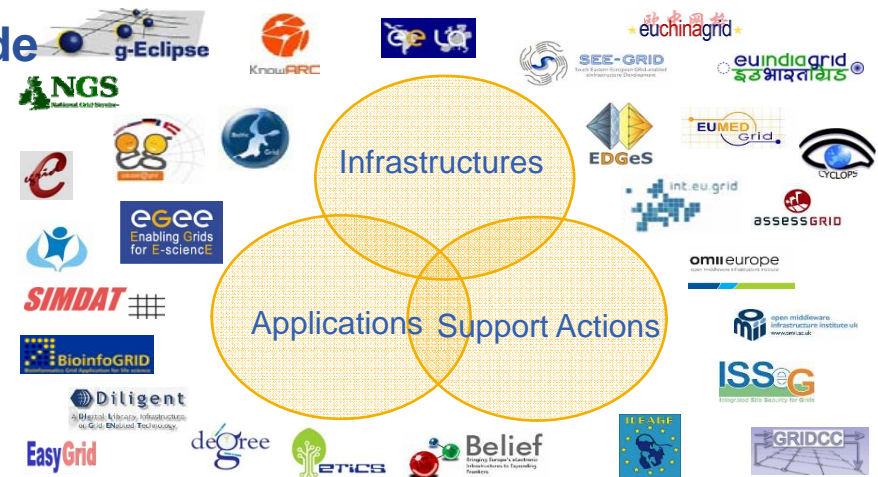
- Bilateral: EGEE/OSG, EGEE/NDGF, EGEE/NAREGI, EGEE/Unicore/DEISA
- Multilateral: Grid Interoperation Now (GIN)
- **New:** e-Infrastructure policy group created (DEISA, EGEE, Naregi, OSG, TeraGrid)
- Trust infrastructure: IGTF, EUGridPMA; MWSG

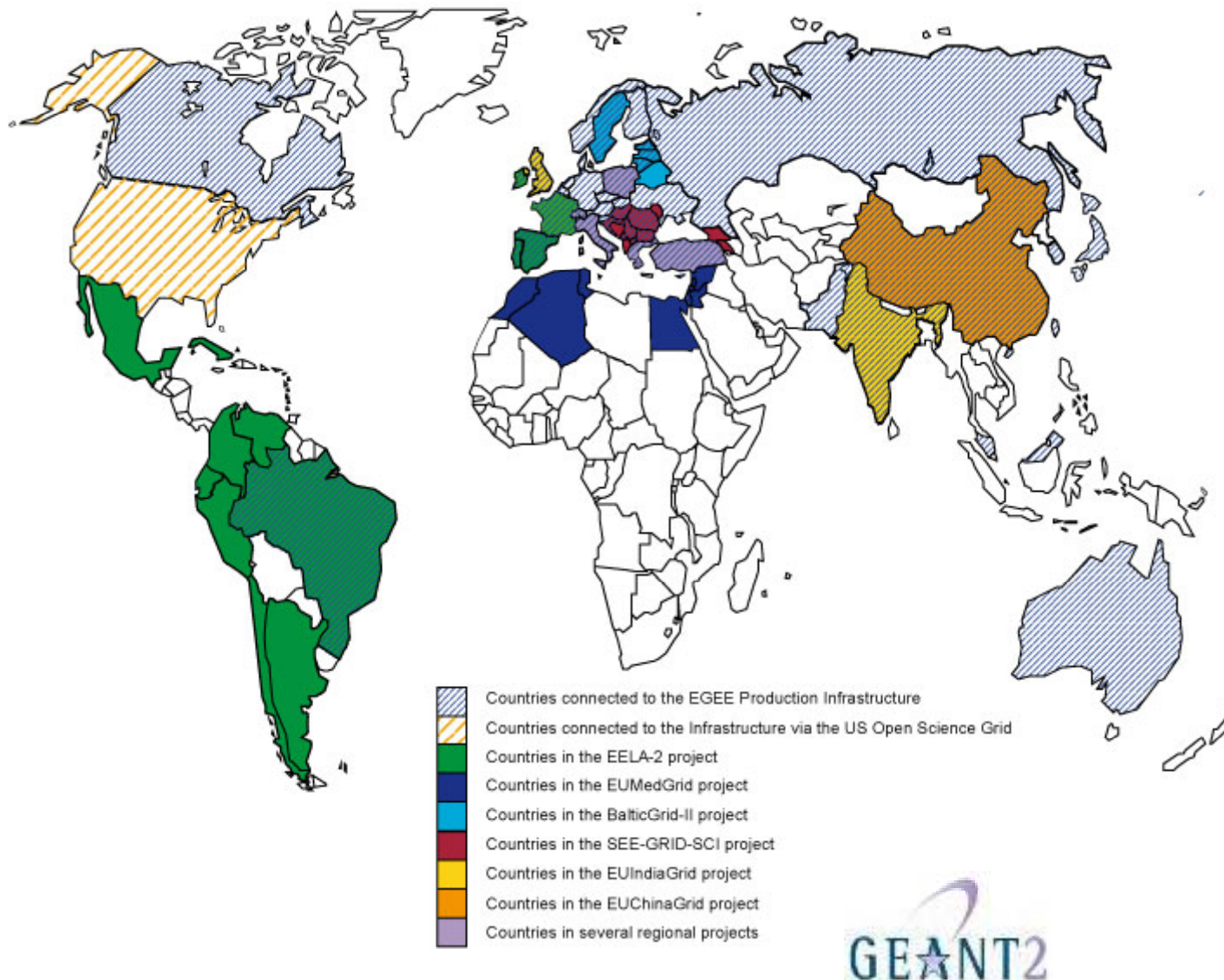
- **Experiences and requirements fed back into standardization process (OGF)**

- Many EGEE members are area directors, WG chairs, WG members

- **Contacts with industry strengthened**

- Industry Days, Industry Task Force, Business Associates Programme





# Worldwide Grid Infrastructures



APAC  
DEISA  
EGEE  
Naregi  
NDGF  
NGS  
OSG  
Pragma  
Teragrid





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# Coordination

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- Coordinates PoW of technical activities
  - Managed the workplans of JRA1 and SA3
  - Managed the gLite restructuring plan
- Assessed application and operations requirements
  - ~120 requirements - ~50 resolved; many others close to resolution
- Working Groups on specific topics

- **MPI**
  - Provided site configuration and middleware fixes to enable MPI jobs on EGEE
- **Short deadline jobs**
  - Provided site configuration and middleware fixes to enable short deadline jobs
- **Job priorities**
  - Prototyped several solutions for implementing job priorities; short term solution adopted, longer term strategy being worked on
- **Medical Data Management**
  - Assessment of the secure data management components in gLite
- **Portals**
  - Best practices on how to use portals on EGEE
- **VO Management**
  - Test of how set up and closure of a VO works in practice; feedback to operations and SA3
- **Worker Node**
  - Analysis how to deal with different worker node environments; interoperability
- **Database access**
  - Best practices to access databases
- **In many cases with participation from other projects (int.eu.grid, Diligent, ...)**

- **Security Coordination Group**
  - Coordination of project wide (and inter-project) security issues
    - Security Policies (Joint Security Policy Group)
    - Operational Security (Operational Security Coordination Team)
    - Trust Anchor (EUGridPMA, IGTF)
    - Middleware Security (gLite security tasks and Middleware Security Group)
    - Vulnerabilities (Grid Security Vulnerability Group)
  
- **Operations Advisory Group (OAG)**
  - Platform for negotiating VO resource allocation and operational support (running of services etc)
  
- **User Information Group (UIG)**
  - Make user documentation easily accessible
  
- **Quality Group**
  - Define and monitor the quality status of the project

- **Majority of resources accessible via EGEE are owned by High Energy Physics – need to encourage contributions from other disciplines**
  - Hindered by availability of gLite on different platforms
    - Improved in the second year of the project (also thanks to the gLite restructuring process)
    - Important component of the EGEE-III Program of Work
  - Applications need to assess the infrastructure prior to connecting their own resources
    - Some possibility via GILDA in EGEE-II
    - EGEE-III foresees dedicated “seed” resources for this purpose
      - *Usage is time-limited!*
  - Encourage applications to bring in their own resources in the VO registration process
  - Operations Advisory Group (OAG) restructured and process reinforced in EGEE-III
  - Interface EGEE to Cloud (HaaS) offerings



- **Sustainability requires further de-centralization**
  - Efforts to de-centralize operations started in EGEE-II and will be continued and reinforced in EGEE-III
    - E.g. automation task in EGEE-III
- **Build the basis for the European Grid Infrastructure/National Grid Infrastructure (EGI/NGI) model**



- **EGEE is the largest multi-disciplinary, managed production Grid infrastructure in the world supporting more than 270 VOs from many different domains**
- **Continued improvements:**
  - reliability, fault-tolerance, deployability, usability
- **EGEE is working towards a sustainable world-wide Grid infrastructure through international collaborations, standardization, and industry**