



Enabling Grids for  
E-science in Europe

[www.eu-egee.org](http://www.eu-egee.org)

*Cern School of Computing, Aug 30 – Sep 10 2004*

# The EGEE Infrastructure The GILDA Testbed

**Erwin Laure**  
EGEE Deputy Middleware Manager

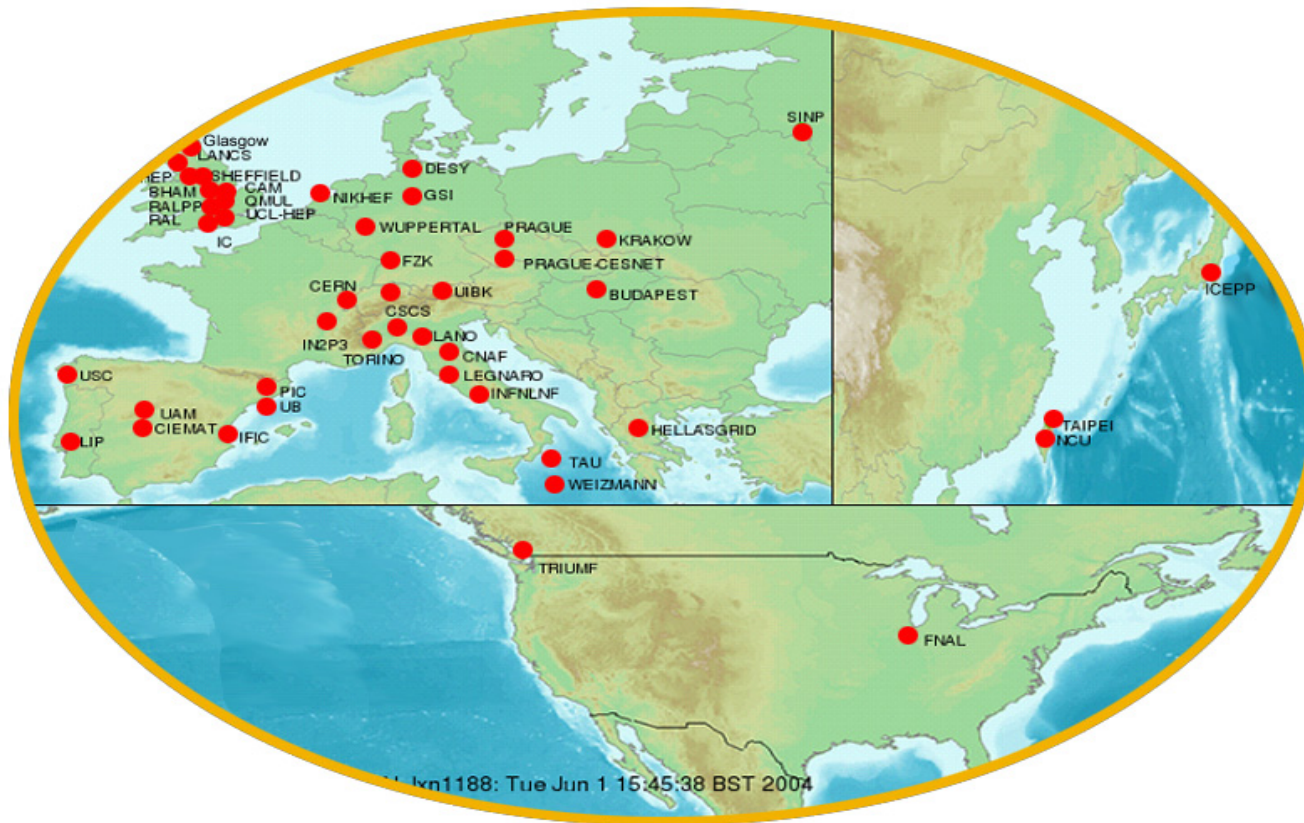


- Users
  - People with **computing-intensive task** who want to use grid resources to accomplish it.
- Virtual Organization (VO)
  - Group of people with common interests and which **controls access** to certain resources.
- Site Administrators
  - People who **manage** computing resources and who are ultimately **responsible for usage** of those resources.
- Outside Authorities
  - People or organizations with a **financial, legal, etc. interest** in grid's resources or operation. (e.g. Police, funding agencies, ...)



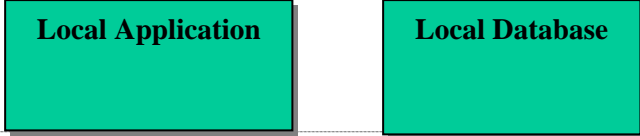
# LCG-2/EGEE-0 (I)

- Based on HEP-LCG testbed: more than 60 sites worldwide (+ few non-HEP); over 6.000 CPUs



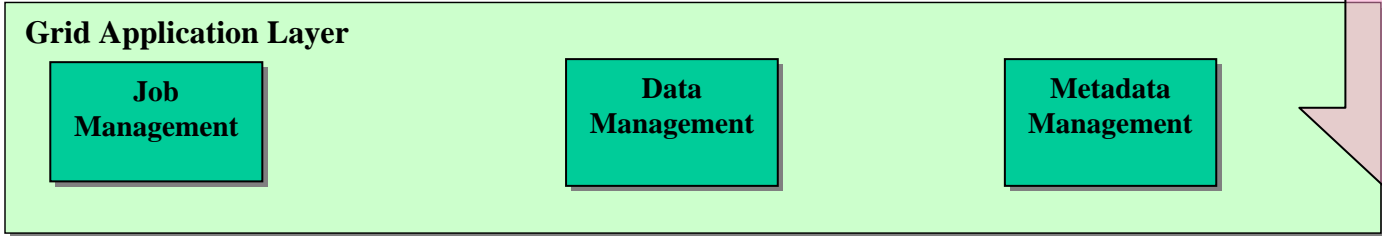
# From Fabrics to Grids

Local Computing

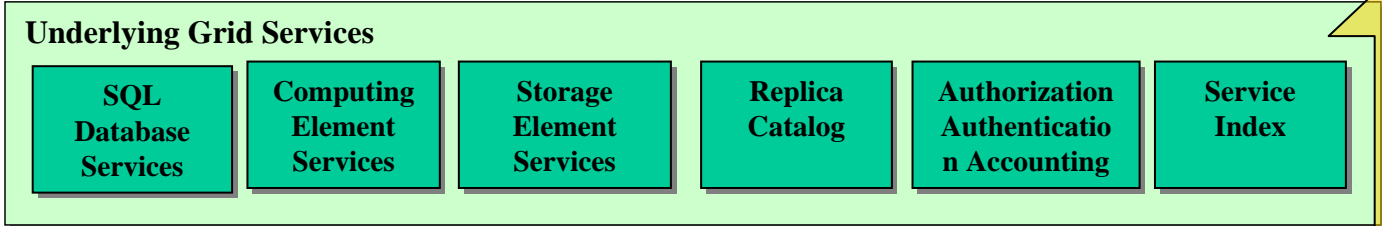


APPLICATIONS

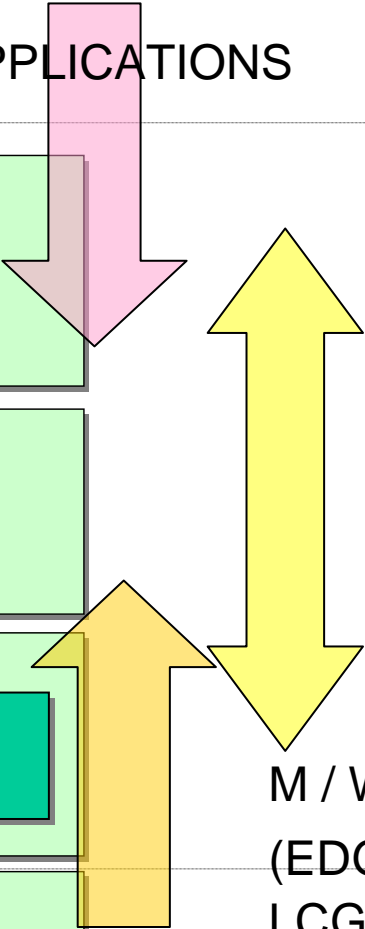
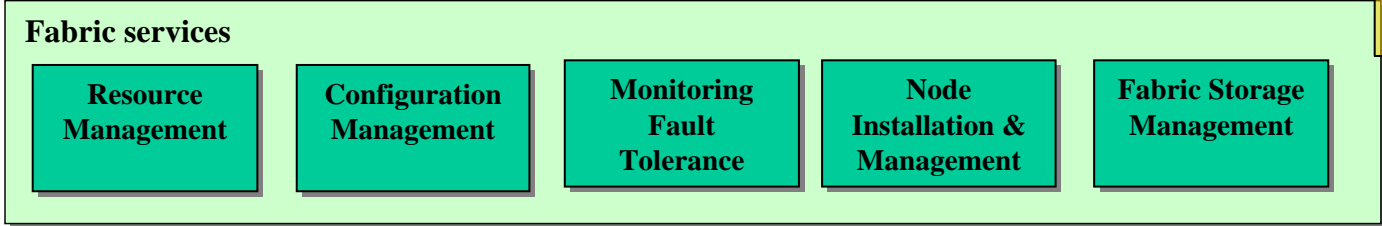
Grid



Grid




Fabric



M / W  
(EDG  
LCG  
others)

VDT  
(globus,  
Condor)

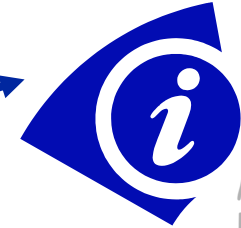
- 
- Workload Management
    - Reliable Job Submission
    - Matchmaking
    - Logging & Bookkeeping
  - Data Management
    - Replica Management
    - Metadata Management
  - Resources
    - Gatekeeper (batch interface)
    - Storage (disk, tape, etc.)
    - Database (SQL, ...)
    - Network
  - Information System
    - Service Discovery
    - Service State Information
  - Security
    - Authentication
    - Authorization

# LCG-2 Architecture

User Interface



Information System

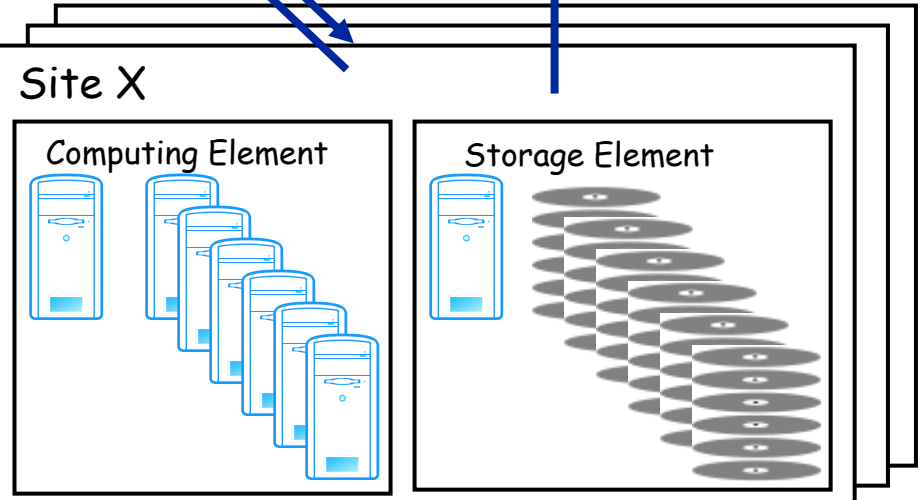


MDS  
Idap

Resource Broker



Replica Location  
Service



update  
credential

submit  
retrieve

query

query

submit  
retrieve

publish  
state

VOMS/VO Idap

- User Interface (UI) & Worker Nodes (WN)
  - **Deployment: User/Site, many.**
  - Contain client software to access EDG services.
  - Lightweight and easy to install on existing systems.
  - Neither is really part of the grid, but provide access to it.
- Gatekeeper (CE)
  - **Deployment: Site, one per batch system.**
  - Grid interface to LRMS (PBS, LSF, Condor).
- Storage Element (SE)
  - **Deployment: Site, one per MSS type.**
  - Grid interface to storage (disk, tape, etc.).

# Machine Types (cont'd)

- Monitoring Node (MON)
  - Deployment: Site, one per site.
  - Site R-GMA server; site's interface to accounting system.
- Information Catalog (IC)
  - Deployment: one per grid.
  - Registry of all R-GMA producers & consumers on grid.
- Replica Location Service (RLS)
  - Deployment: VO, one per VO.
  - LRC and RMC servers.

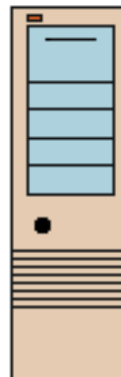
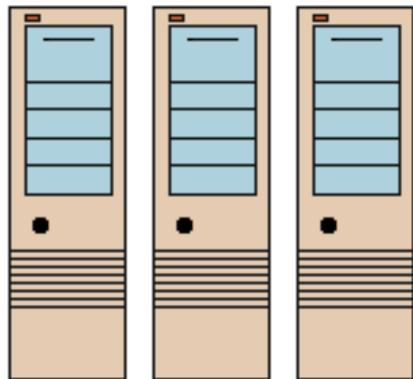


# Machine Types (cont'd)

- Virtual Organization Membership Service (VOMS) or VO Idap server
  - Deployment: VO, one per VO.
  - Contains VO's membership and authorization information.
- Resource Broker (RB)
  - Deployment: VO?, few per grid.
  - Contains matchmaking service.
  - Reliable job submission service (CondorG).
  - Logging & Bookkeeping for job state information.
  - Information Index (II) as cache for information system
  - Cache for job input and output “sandboxes”.

# Typical Testbed Site

Mass Storage System (0+)

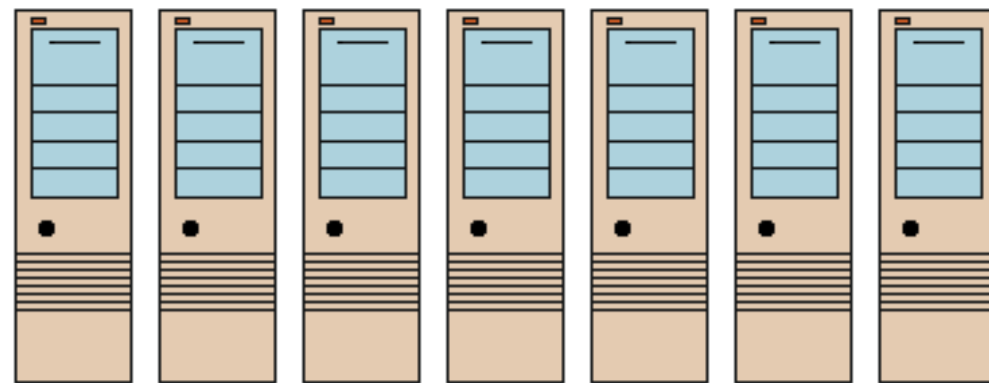


Gatekeeper (1+)

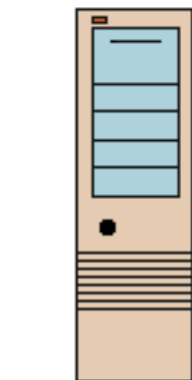


Storage Element (1+)

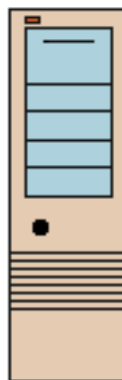
LRMS (PBS, LSF, Condor)



Worker Nodes (0+)



LCFGng (1)



"MON" (1)

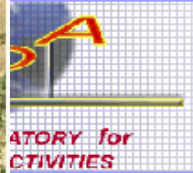
# GILDA

(<http://gilda.ct.infn.it/>)



**GRID INFN LABORATORY for  
DISSEMINATION ACTIVITIES**

- GRID DEMONSTRATOR
- 1) CERTIFICATION AUTHORITY
- 2) VIRTUAL ORGANIZATION
- 3) GRID TUTOR
- MONITORING
- CONTACTS



**GridICE**  
the eyes of the Grid



Geo view    Gris view    Help    about

Select **Site**  and/or **Role**

	Computing Resources					Storage Resources					
	Slot#	SlotFree	SlotLoad	RunJob	WaitJob	Power	CPU#	CPUload	Available	Total	%
ct.infn.it	12	12	0%	0	0	2792	2	0%	13.7 Gb	15.3 Gb	10%
grid.cnr.it	42	42	0%	0	1	14418	18	0%	1.8 Tb	2.0 Tb	10%
europa.com	6	6	0%	0	2	1730	1	0%	15.8 Gb	17.4 Gb	9%
pd.infn.it	3	3	0%	0	0	-	-	-	67.4 Gb	69.1 Gb	2%
tilab.com	12	12	0%	0	0	3984	4	100%	499.0 Gb	499.3 Gb	0%
	6	6	0%	0	0	3186	2	0%	32.7 Gb	34.3 Gb	5%
<b>TOTAL</b>	<b>81</b>	<b>81</b>	<b>0%</b>	<b>0</b>	<b>3</b>	<b>26110</b>	<b>27</b>	<b>20%</b>	<b>2.4 Tb</b>	<b>2.6 Tb</b>	<b>6%</b>

20 Jul 2004 16:39:46 +0200

[GridICE Homepage](#)

# More Information

- SA1 homepage
  - <http://egee-sa1.web.cern.ch/egee-sa1>
- Information on
  - Current status
  - How to join (as site and user): <http://egee-sa1.web.cern.ch/egee-sa1/Participate.htm>
  - Software
  - Users and installation guides