

An overview of the EGEE project

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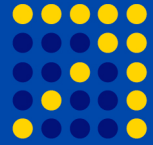
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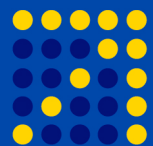




In this presentation an update on the status of the Grid in Europe (and in Italy), from the point of view of EGEE, will be given.

It will focus on the following subjects:

- The EGEE II project
- The related projects
- The EGEE infrastructure
 - The INFN production Grid
- The EGEE middleware (gLite 3.0)
- The GILDA testbed (the t-infrastructure)
- The applications
- The future
- Conclusions



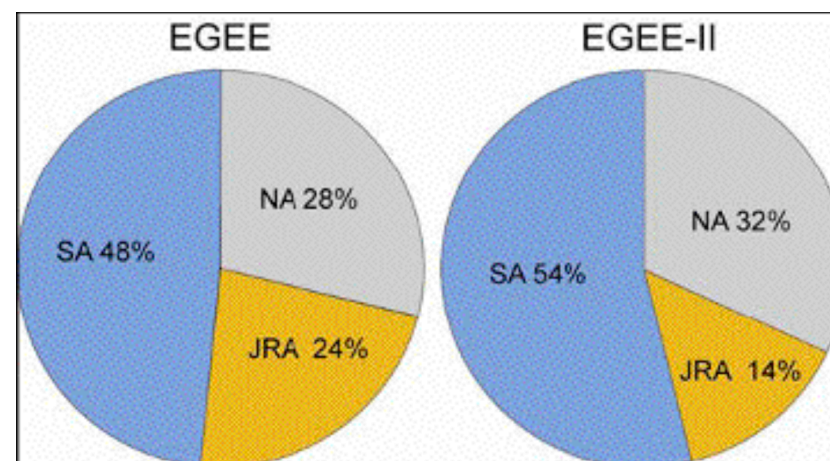
The EGEE project

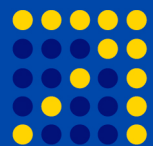
- EGEE
 - 1 April 2004 – 31 March 2006
 - 71 partners in 27 countries, federated in regional Grids

- EGEE-II
 - 1 April 2006 – 31 March 2008
 - Expanded consortium
 - 91 partners
 - 11 Joint Research Units (48 partners)
 - 13 Federation



- Exploitation of EGEE results
- Emphasis on providing production-level infrastructure
 - increased support for applications
 - interoperation with other Grid infrastructures
 - more involvement from Industry

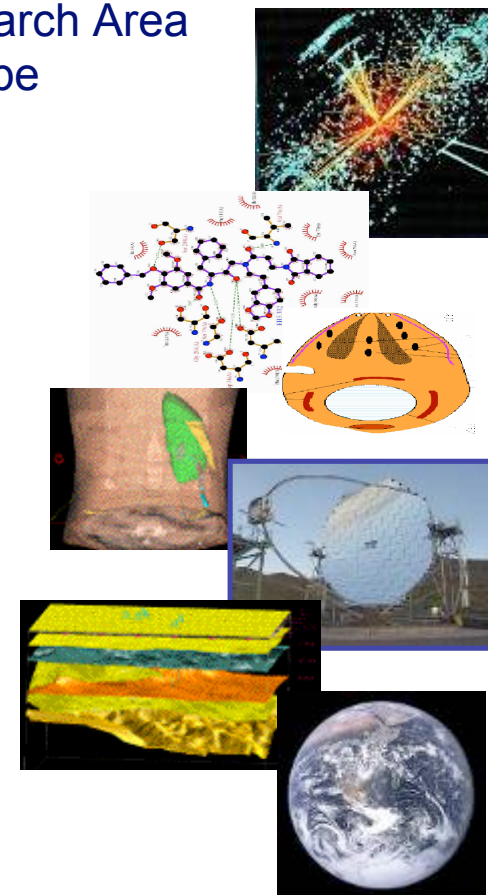


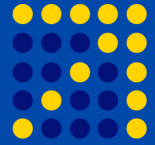


BioinfoGRID

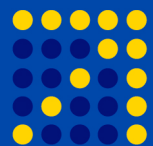
The EGEE II Mission

- Infrastructure
 - Manage and operate production Grid for European Research Area
 - Interoperate with e-Infrastructure projects around the globe
 - Contribute to Grid standardisation efforts
 - Support applications from diverse communities
 - Astrophysics
 - Biomedicine
 - Computational Chemistry
 - Earth Sciences
 - Finance
 - Fusion
 - Geophysics (incl. industrial application EGEODE)
 - High Energy Physics
 - Multimedia
 - ...
 - Industry
 - Reinforce links with the full spectrum of interested industrial partners
- + Disseminate knowledge about the Grid through training
- + Prepare for sustainable European Grid Infrastructure





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BioinfoGRID

Grids in Europe

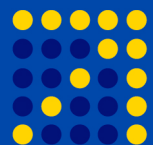
- EGEE is not alone.
- Great investment all over Europe in developing Grid technology:

- A Sample of National Grid projects:

- Austrian Grid Initiative
- Belgium: BEGrid
- DutchGrid
- France: e-Toile; ACI Grid
- Germany: D-Grid; Unicore
- Greece: HellasGrid
- Grid Ireland
- Italy: INFNGrid; GRID.IT
- NorduGrid
- UK e-Science: National Grid Service; OMII; GridPP



- EGEE provides framework for national, regional and thematic Grids

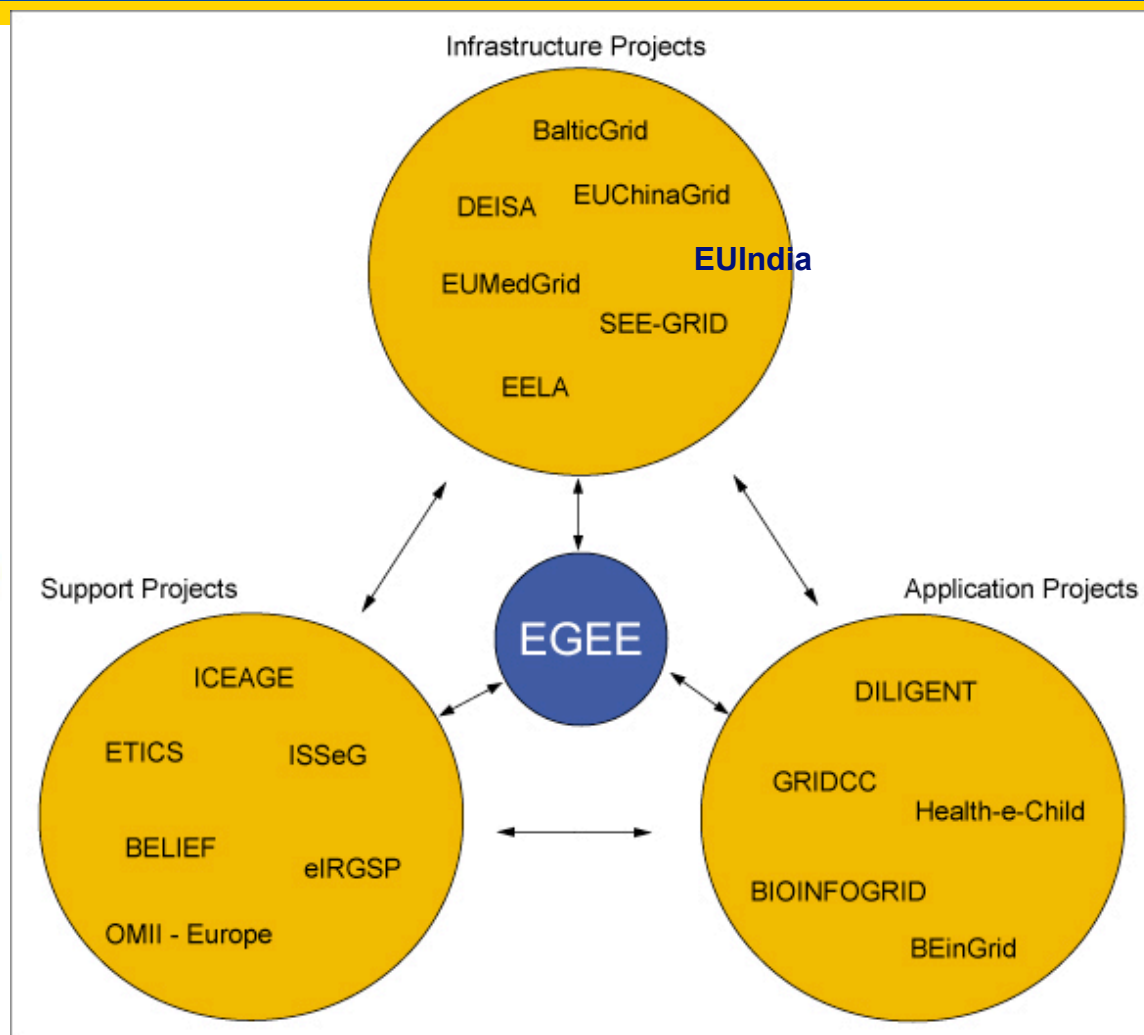


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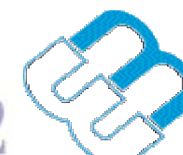
Related EU projects

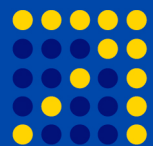


ISSeG



e-IRGSP



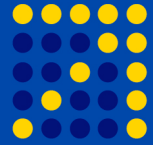


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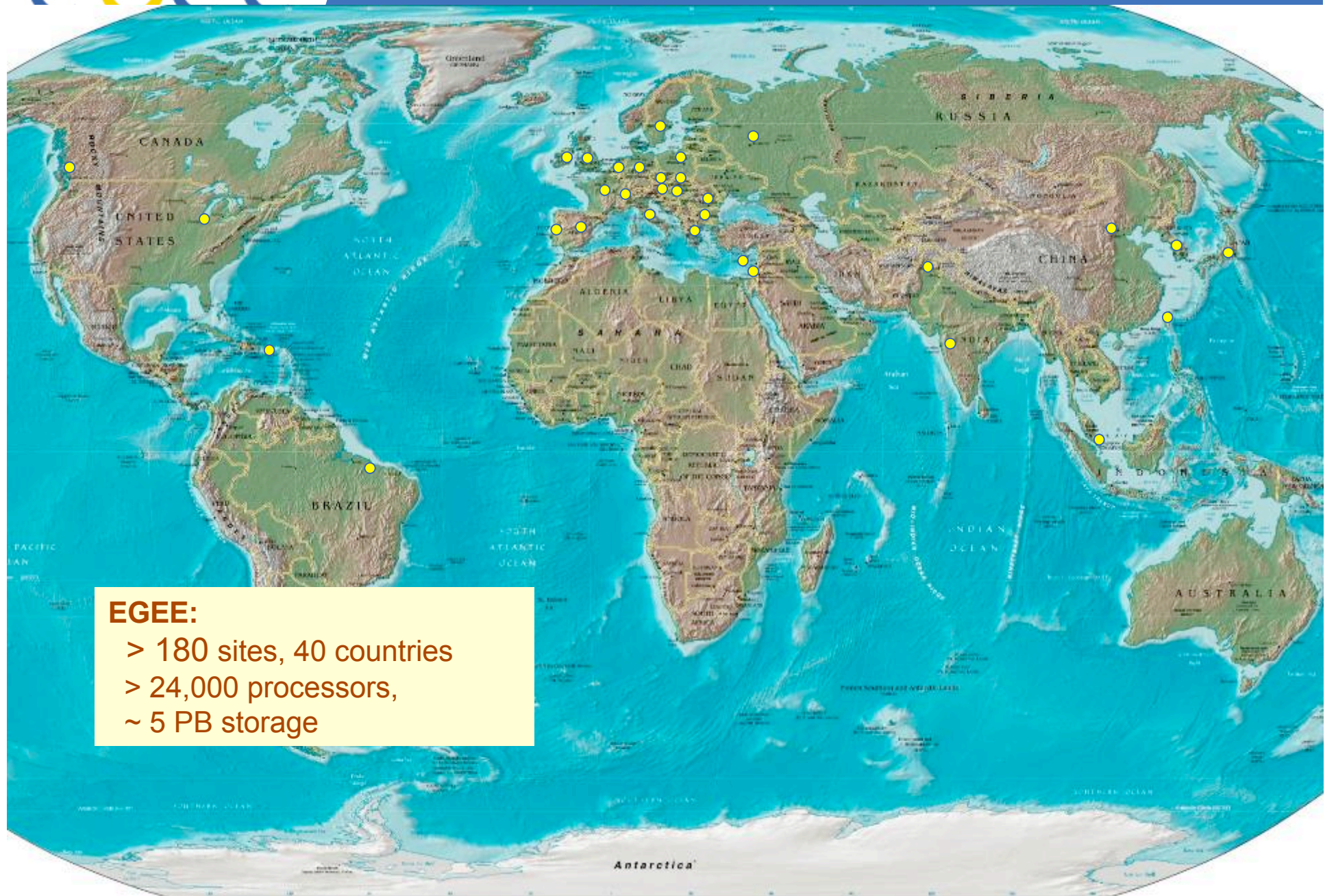
EGEE-II and Industry

- Industry Task Force
 - Group of industry partners in the project
 - Links related industry projects (NESSI, BEinGRID, ...)
 - Works with EGEE's Technical Coordination Group
- Collaboration with CERN openlab project
 - IT industry partnerships for hardware and software development
- EGEE Industry Forum
 - Led by Industry to improve Grid take-up in Industry
 - Organises industry events and disseminates grid information
 - Last event: EGEE Industry Day 12 July 2006, Ischia ,Italy
http://www.eu-egee.org/egee_events/industryday/IndustryDay_Ischia/
 - Next event: during fall in Catania
 - Further events across Europe are being planned





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EGEE:

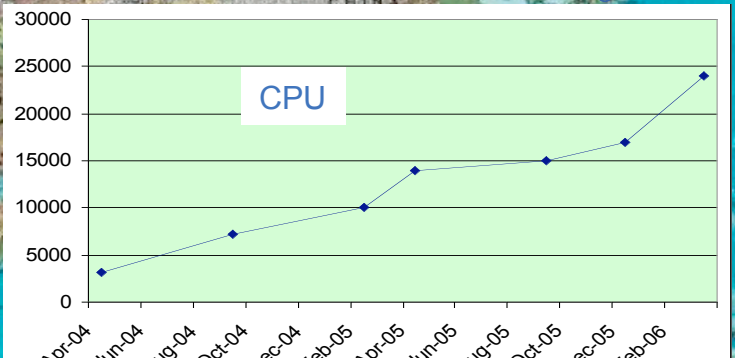
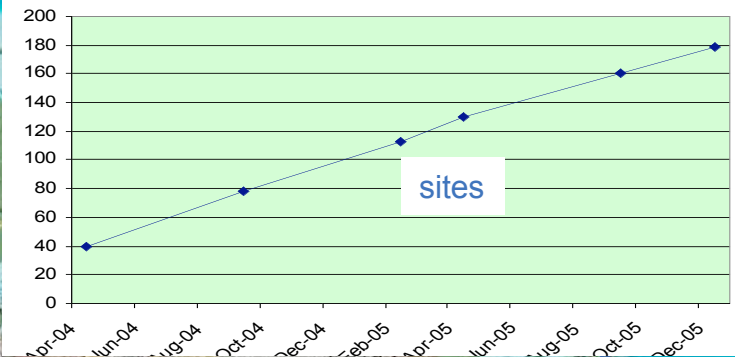
- > 180 sites, 40 countries
- > 24,000 processors,
- ~ 5 PB storage



EGEE Grid Sites : Q1 2006

EGEE:

Steady growth over the lifetime of the project



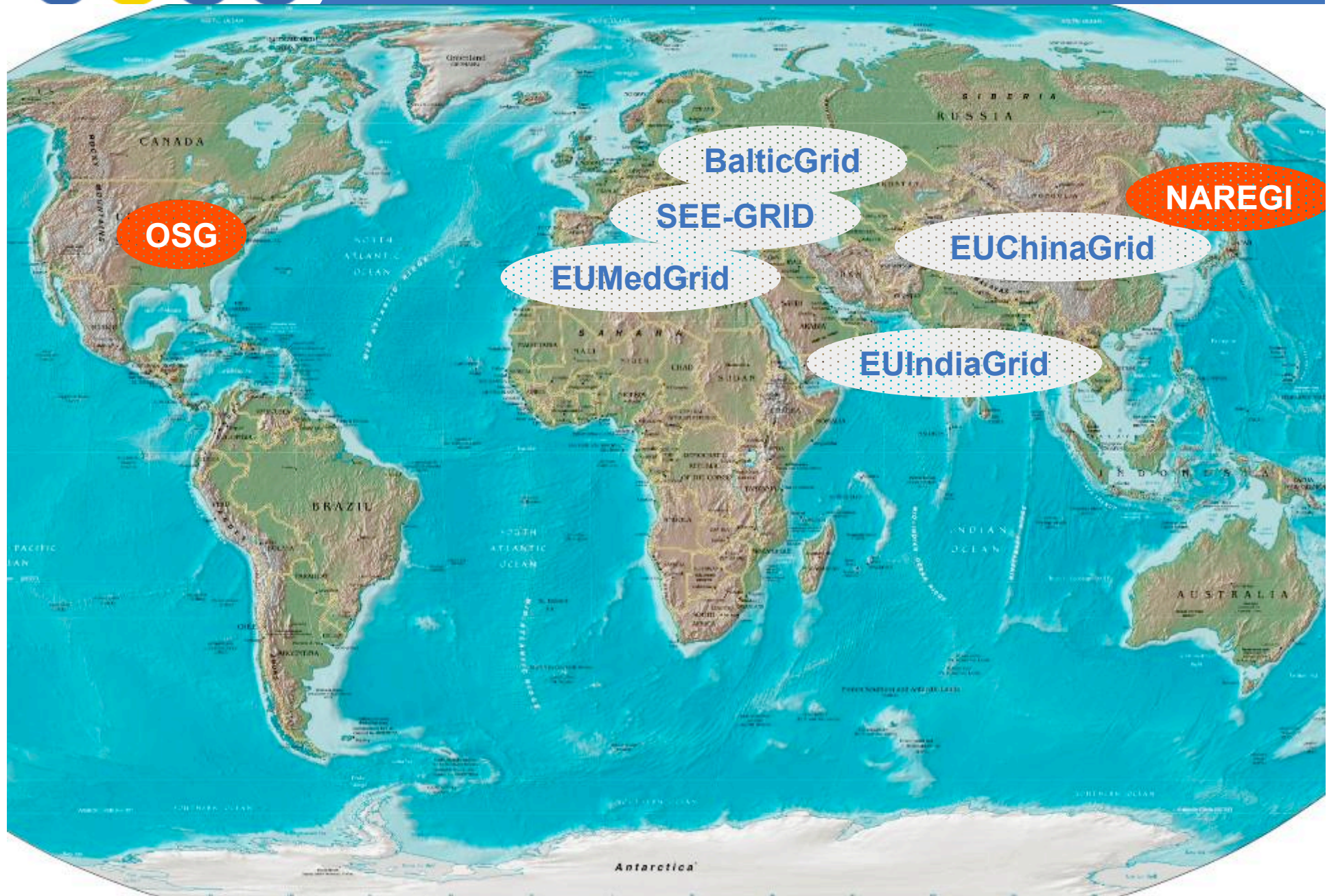
EGEE:

> 180 sites, 40 countries
> 24,000 processors,
~ 5 PB storage

country	sites	country	sites	country	sites
Austria	2	India	2	Russia	12
Belgium	3	Ireland	15	Serbia	1
Bulgaria	4	Israel	3	Singapore	1
Canada	7	Italy	25	Slovakia	4
China	3	Japan	1	Slovenia	1
Croatia	1	Korea	1	Spain	13
Cyprus	1	Netherlands	3	Sweden	4
Czech Republic	2	FYROM	1	Switzerland	1
Denmark	1	Pakistan	2	Taipei	4
France	8	Poland	5	Turkey	1
Germany	10	Portugal	1	UK	22
Greece	6	Puerto Rico	1	USA	4
Hungary	1	Romania	1	CERN	1



A global, federated e-Infrastructure



Related projects & collaborations are where the future expansion of resources will come from

Project	Anticipated resources (initial estimates)
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Related Infrastructure projects

SEE-grid	6 countries, 17 sites, 150 cpu
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EELA	5 countries, 8 sites, 300 cpu
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EUMedGrid	6 countries
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BalticGrid	3 countries, fewx100 cpu
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EUChinaGrid	TBC
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EUIndiaGrid	TBC
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Collaborations

OSG	30 sites, 10000 cpu
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ARC	15 sites, 5000 cpu
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DEISA	Supercomputing resources
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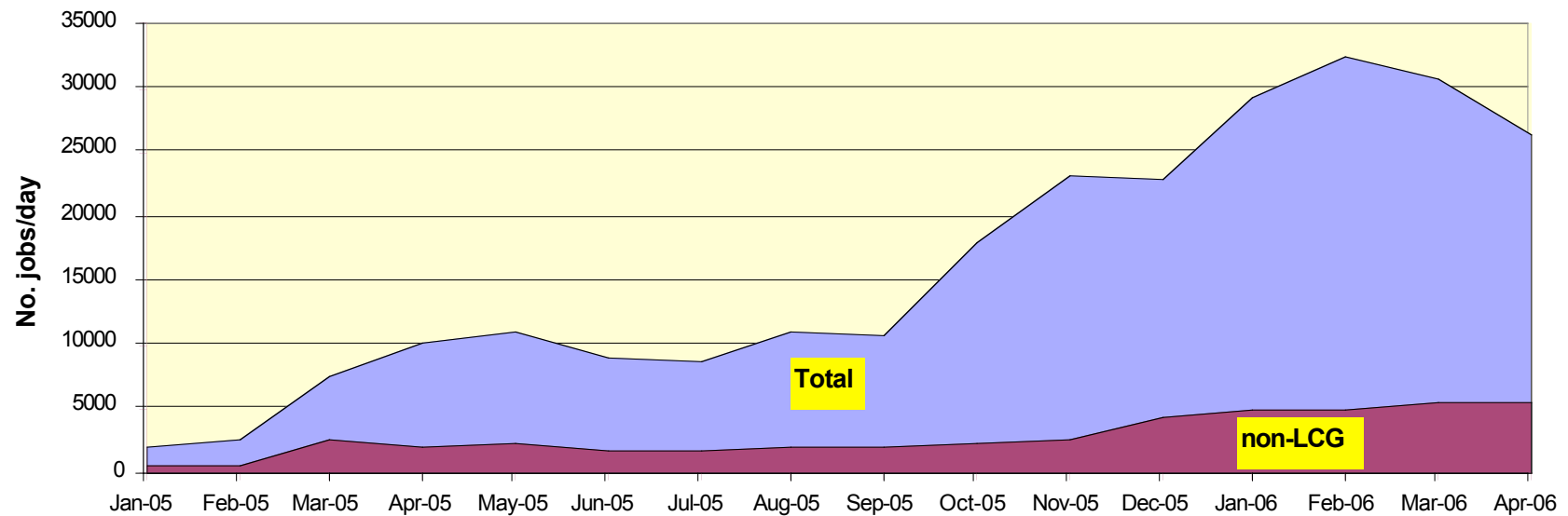
NAREGI

OSG

id

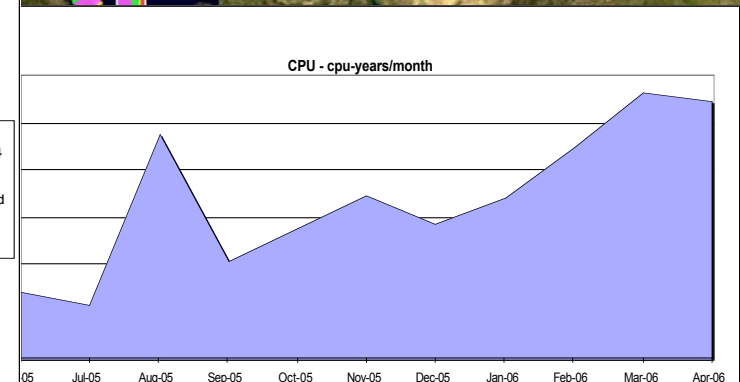
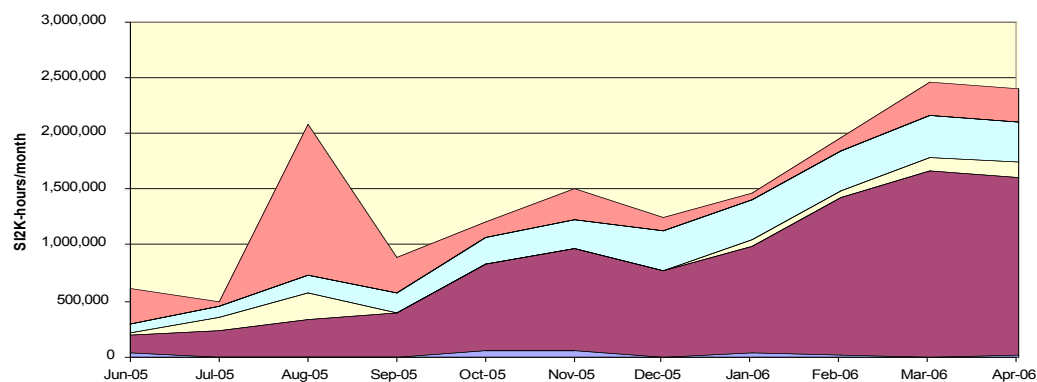
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ps per day
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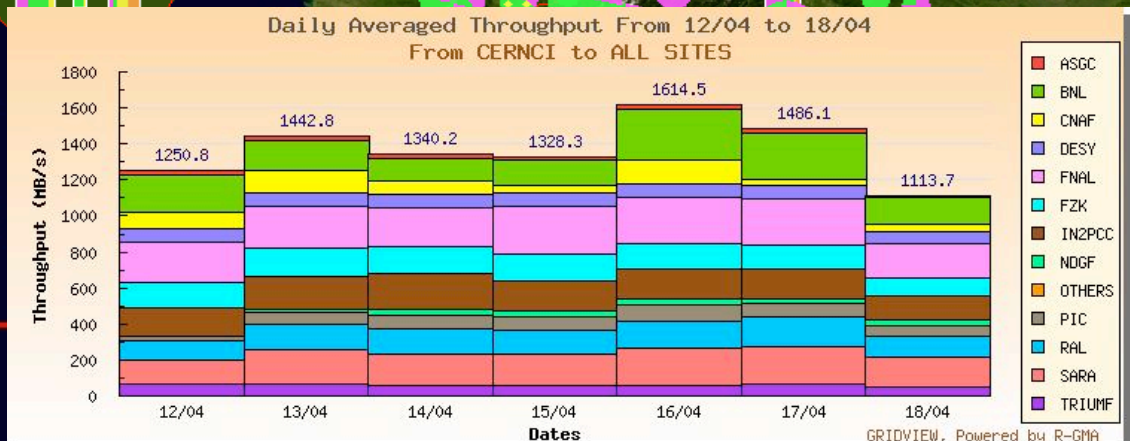
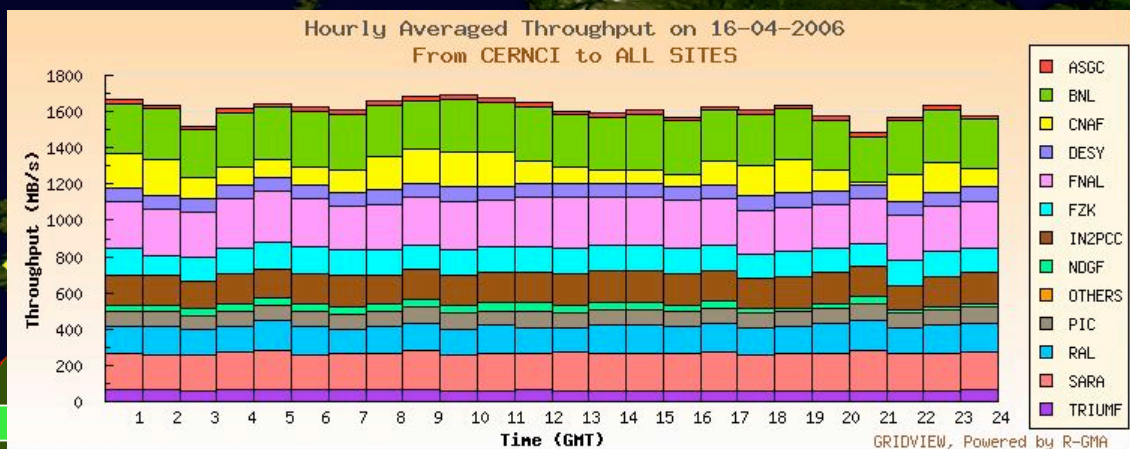


Sustained & regular workloads of >30K jobs/day

- spread across full infrastructure
- doubling/tripling in last 6 months - no effect on operations



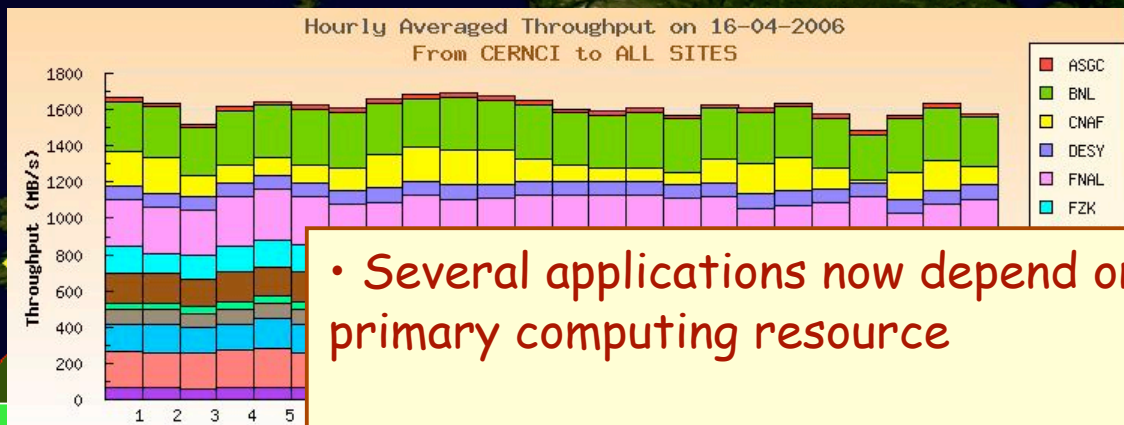
Massive data transfers > 1.5 GB/s



Waiting: 40
Ready: 750
Scheduled: 8840
Running: 11804
Done: 9347
Aborted: 4526
Cancelled: 141
Active Sites: 144 : 36826



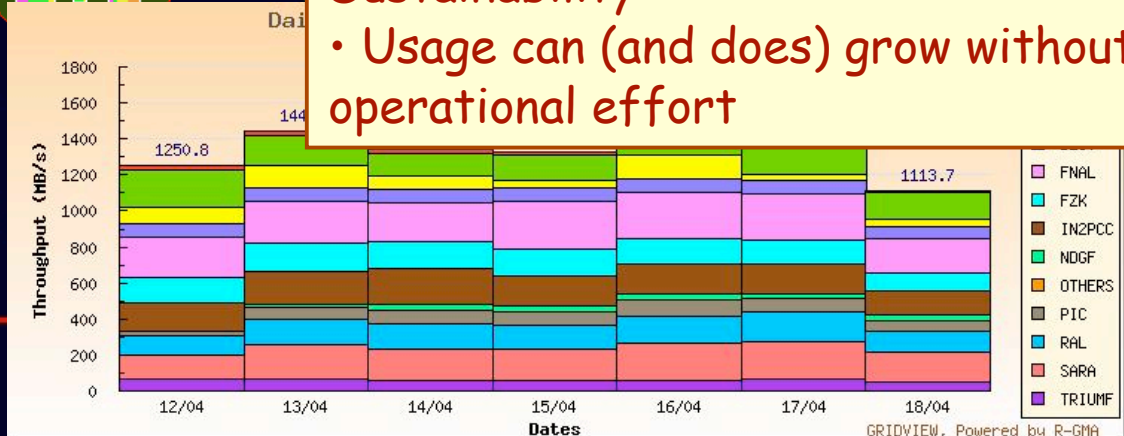
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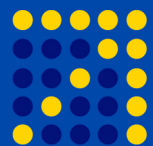
- Several applications now depend on EGEE as their primary computing resource

Sustainability:

- Usage can (and does) grow without need for additional operational effort



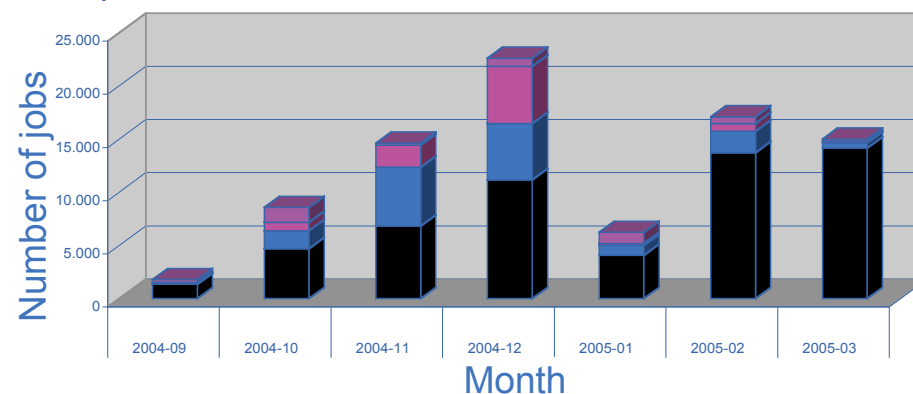
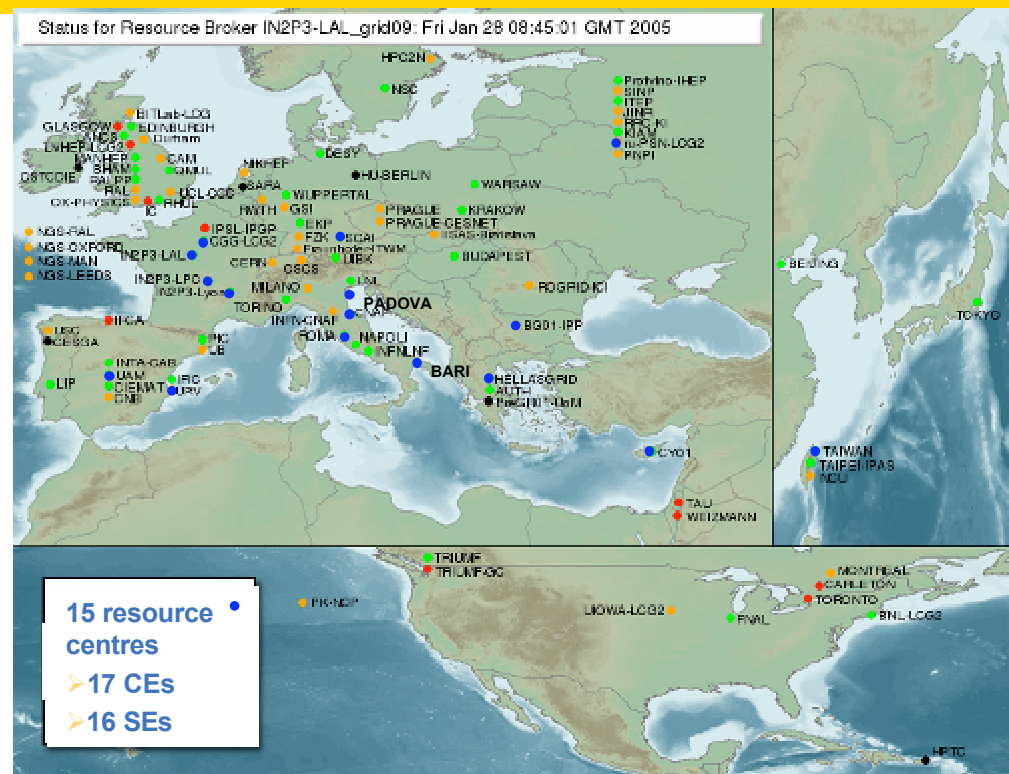
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BioinfoGRID

BioMed Overview

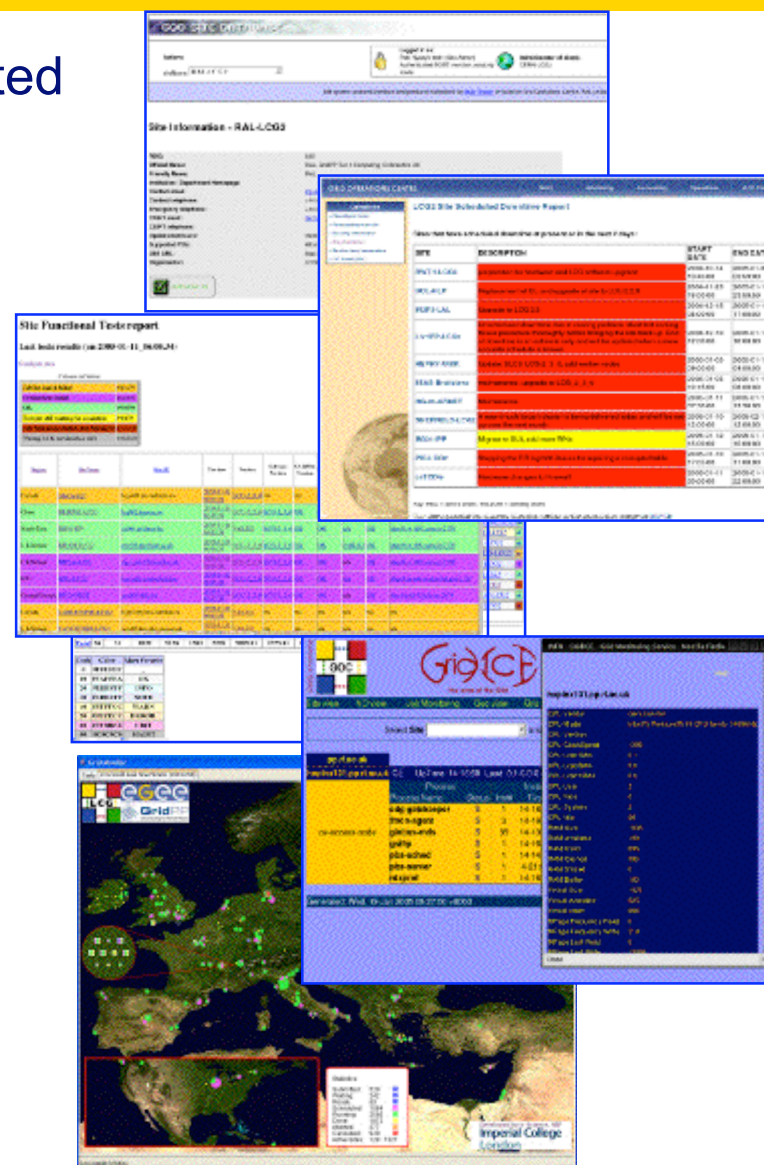
- Infrastructure
 - ~3.000 CPUs
 - ~12 TB of disk
 - in 9 countries
- >50 users in 7 countries working with 12 applications
- 18 research labs





BioinfoGRID

- However the resources need to be operated
- Grid operator on duty
 - 6 teams working in weekly rotation
 - CERN, IN2P3, INFN, UK/I, Ru, Taipei
 - Crucial in improving site stability and management
 - Expanding to all ROCs in EGEE-II
- Responsibility for operations is geographically distributed:
 - There is no “central” operation
 - **Operation Tools are developed/hosted at different sites:**
 - GOC DB (RAL), SFT (CERN), GStat (Taipei), CIC Portal (Lyon)
- but strong Operations coordination
 - Weekly operations meetings
 - Regular ROC managers meetings
 - Series of EGEE Operations Workshops



- **Terminology:**

- EGEE deploys a middleware distribution
 - Drawn from various middleware products, stacks, etc.
 - Do not confuse the *distribution* with development projects or with software packages
 - Count on 6 months from software developer “release” to production deployment
- The EGEE distribution:
 - Moving from version labelled: LCG-2.7.0
 - to version labelled: gLite-3.0



- **EGEE distribution contents:**

- ❖ **LCG-2.7.0:**

- VDT – packaging Globus 2.4, Condor, MyProxy
- EDG workload management
- LCG components:
 - BDII (info sys),
 - catalogue (LFC),
 - DPM, data management libraries and CLI tools
 - monitoring tools
- gLite: R-GMA, VOMS, FTS

moving

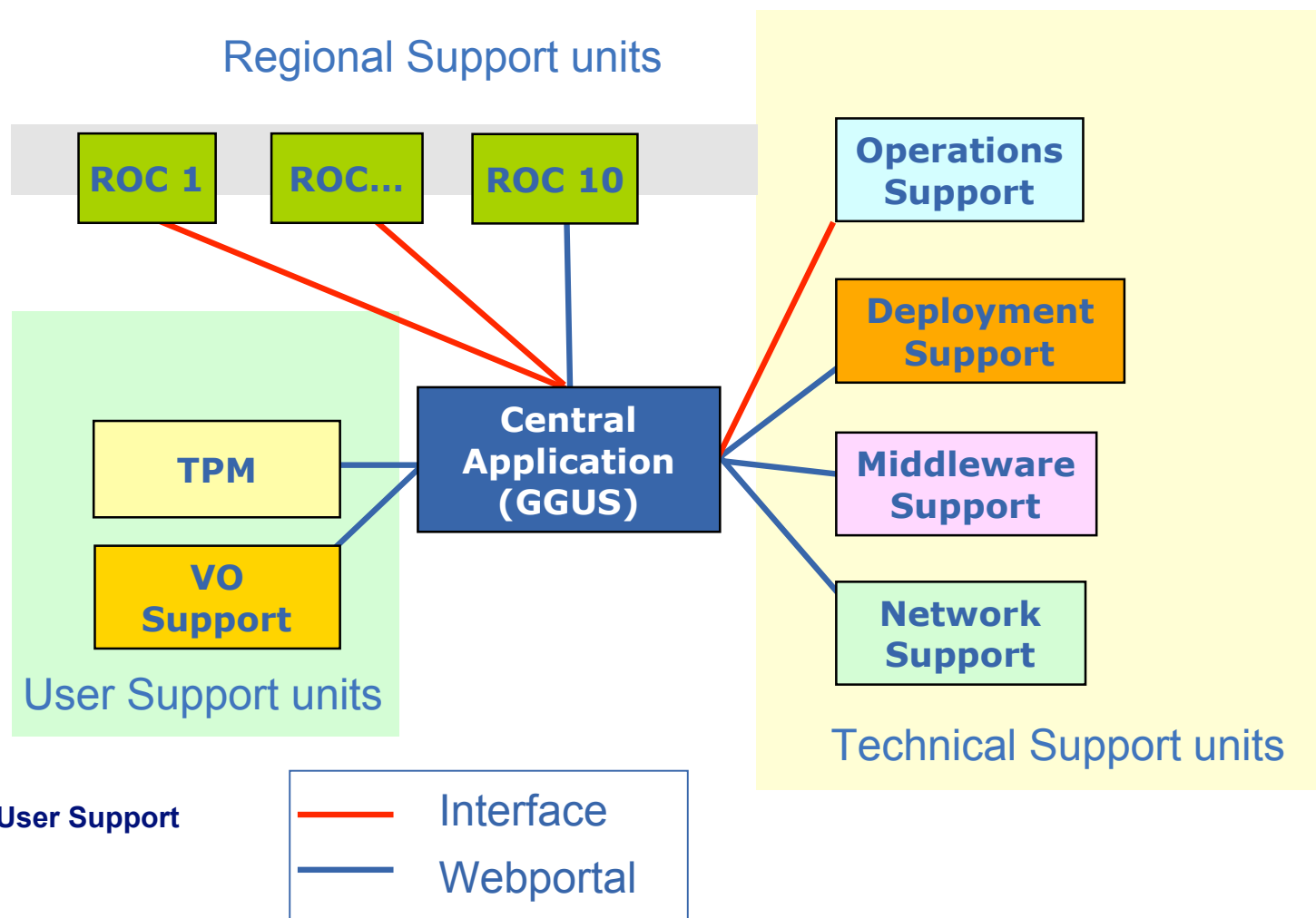
- ❖ **gLite-3.0, released on May 4, 2006:**

- Based on LCG-2.7.0, and
- gLite workload management
- Other gLite components (not in the distribution but provided as services):
 - AMGA, Hydra, Fireman
 - gLite-IO



"Regional Support with Central Coordination"

The ROCs, VOs and other project-wide groups such as the middleware groups ([JRA](#)), network groups ([NA](#)), service groups (SA) are connected via a central integration platform provided by GGUS.



"Regional Support with Central Coordination"

The ROCs, VOs

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by GGUS.

GGUS = Global Grid User Support

Regional Support units

• GGUS is now being used for all problem reporting:

• Operational, deployment and user support

• VOs are using it for their support system

• The use is growing steadily

Operations
Support

Deployment
Support

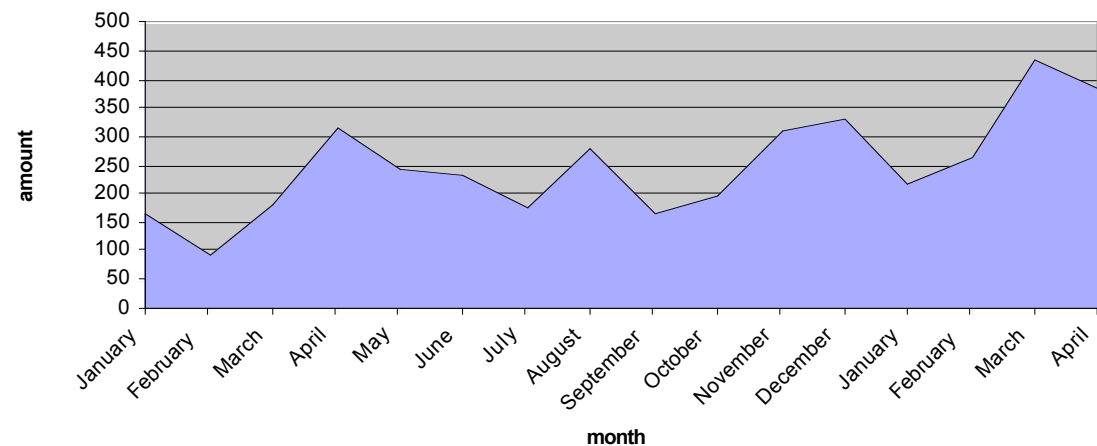
Central

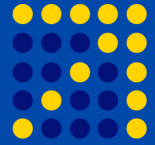
TPM

VO
Support

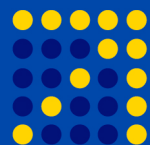
User Support u

Tickets per month

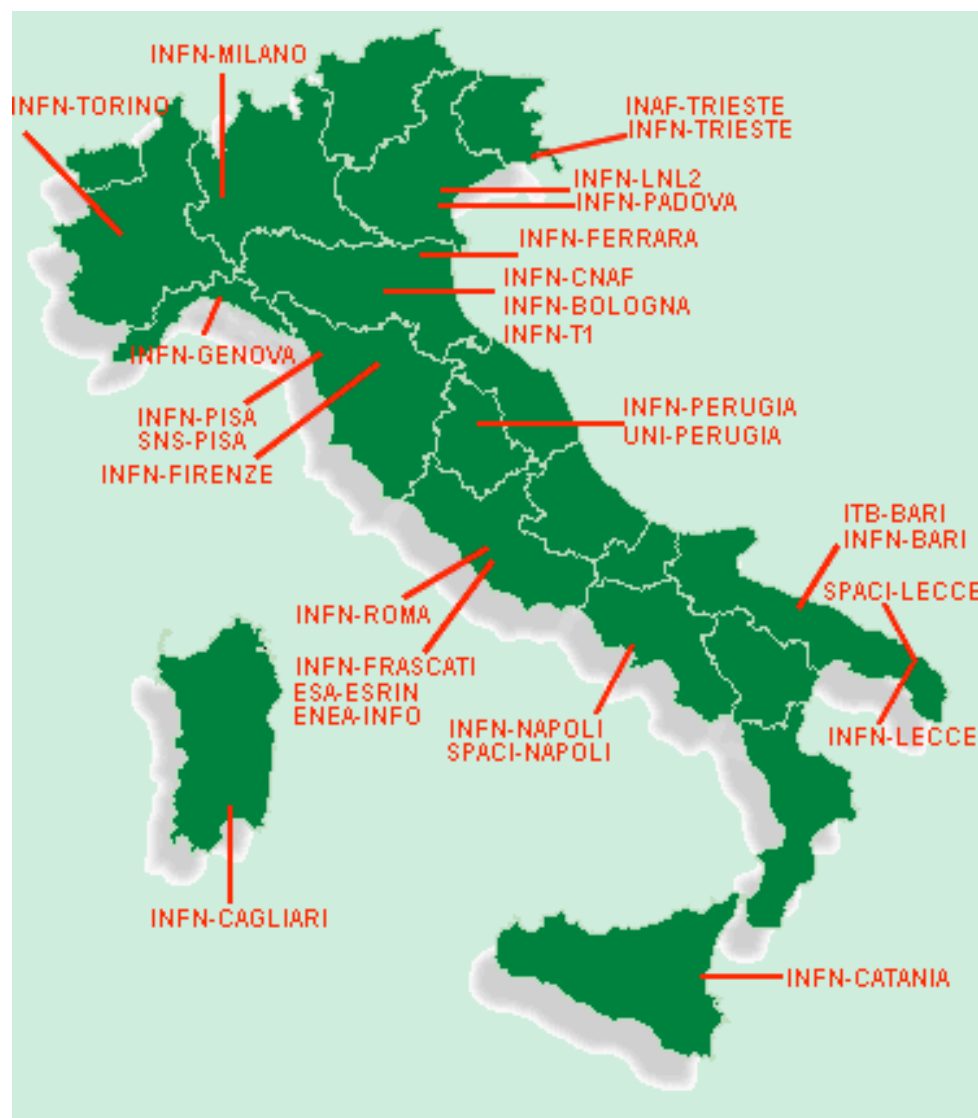




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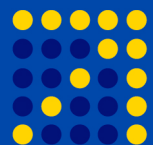
The INFN production Grid



37 'resource centers':

25 site also part of the
EGEE/LCG
registered
GOCDB

12 additional sites
reachable only from
inside Italy

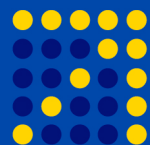


The INFN production Grid : the resources

Site ▼	Power	WN#	CPU#
CNR-ILC-PISA	18K	2	4
INAF-Trieste	35K	8	16
INFN-BARI	400K	38	76
INFN-BOLOGNA	98K	4	16
INFN-BOLOGNA-CMS	52K	7	14
INFN-CAGLIARI	92K	11	22
INFN-CATANIA	538K	43	104
INFN-CNAF	54K	6	11
INFN-FERRARA	91K	10	20
INFN-FIRENZE	379K	16	64
INFN-FRASCATI	34K	3	6
INFN-GENOVA	42K	4	8
INFN-LECCE	11K	2	4
INFN-LNL-2	776K	70	140
INFN-MILANO	264K	26	52
INFN-NAPOLI	229K	22	44
INFN-NAPOLI-ATLAS	-	-	-
INFN-NAPOLI-CMS	67K	7	14
INFN-NAPOLI-VIRGO	4K	1	2

INFN-PADOVA	531K	50	100
INFN-PERUGIA	200K	22	44
INFN-PISA	12K	2	4
INFN-PISA2	75K	13	23
INFN-ROMA1	253K	22	46
INFN-ROMA1-CMS	54K	5	12
INFN-ROMA1-VIRGO	31K	5	10
INFN-ROMA3	38K	4	8
INFN-T1	8269K	711	1422
INFN-TORINO	248K	24	48
INFN-TRIESTE	4K	1	2
ITB-BARI	294K	12	48
SNS-PISA	24K	3	6
SPACI-LECCE-IA64	15K	7	14
SPACI-NAPOLI	8K	3	3
SPACI-NAPOLI-IA64	29K	7	14
UNI-PERUGIA	-	-	-

2500 CPU's in total

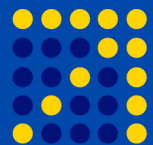


The INFN production Grid : the Supported VO's

<http://grid-it.cnaf.infn.it/index.php?voregister&type=1>

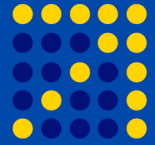
VO	Home page	LDAP/VOMS Server	Base DN/VOMS	Register (*)
alice	LHC Alice experiment	lcg-vo.cern.ch	ou=lcg1,o=alice,dc=eu-datagrid,dc=org	Click here!
atlas	LHC Atlas experiment	lcg-vo.cern.ch	ou=lcg1,o=atlas,dc=eu-datagrid,dc=org	Click here!
argo	INFN ARGO-YBJ experiment	voms.cnaf.infn.it	VOMS	Click here!
babar	Babar experiment	babar-vo.gridpp.ac.uk	ou=babar,dc=gridpp,dc=ac,dc=uk	Click here!
bio	Grid.it Biology group	voms.cnaf.infn.it	VOMS	Click here!
biomed	BIOMED	vo-biome.in2p3.fr	ou=lcg1,o=biomedical,dc=lcg,dc=org	Click here!
cms	LHC CMS experiment	lcg-vo.cern.ch	ou=lcg1,o=cms,dc=eu-datagrid,dc=org	Click here!
cdf	CDF experiment	voms.cnaf.infn.it	VOMS	Click here!
compchem	Dipartimento di Chimica-Universita' di Perugia	voms.cnaf.infn.it	VOMS	Click here!
dteam	LCG Deployment	lcg-vo.cern.ch	ou=lcg1,o=dteam,dc=lcg,dc=org	Click here!
egrid	EGRID experiment	voms.cnaf.infn.it	VOMS	Click here!
enea	ENEA	voms.cnaf.infn.it	VOMS	Click here!
esr	ESR Home	grid-vo.sara.nl	ou=lcgadmin,o=esr,dc=eu-egee,dc=org	Click here!
gridit	General Grid.it Project VO	voms.cnaf.infn.it	VOMS	Click here!
inaf	INAF	voms.cnaf.infn.it	VOMS	Click here!
infngrid	INFN-GRID project	voms.cnaf.infn.it	VOMS	Click here!
ingv	INGV Bologna	voms.cnaf.infn.it	VOMS	Click here!
lhcb	LHC LHCb experiment	lcg-vo.cern.ch	ou=lcg1,o=lhcb,dc=eu-datagrid,dc=org	Click here!
libi	NEW VO	voms.cnaf.infn.it	VOMS	Click here!
magic	MAGIC and grid	grid-vo.sara.nl	o=magic,dc=eu-egee,dc=org	
pamela	NEW VO	voms.cnaf.infn.it	VOMS	Click here!
planck	Planck Experiment	voms.cnaf.infn.it	VOMS	Click here!
theophys	INFN theoretical physics group	voms.cnaf.infn.it	VOMS	Click here!
virgo	INFN Virgo experiment	voms.cnaf.infn.it	VOMS	Click here!
zeus	ZEUS experiment	grid-vo.desy.de	ou=zeus,ou=vo,o=desy,c=de	Click here!

(*) Your personal certificate must be already installed in your browser.



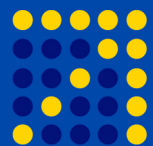
The INFN production Grid : the Central Management Team and the Regional Operation Center

- The CMT
 - The CMT is responsible of the certification: checking the functionalities of a site before to join the site to the production grid. In particular checks:
 - GUIS' information consistence
 - Local jobs submission (LRMS)
 - Grid submission with Globus (globus-job-run)
 - Grid submission with the ResourceBroker
 - ReplicaManager functionalities
- The ROC
 - First level support
 - Geographically based local front line support to Virtual Organization, Users and Resources Centres
 - Daily shift and Check list to be covered during the shift
 - Periodic (every 15 days) phone conference
 - ROC/CIC teams and site managers
 - Periodic reports to GDA
 - Second level support: CIC on Duty
 - Weekly shift
 - CIC tools use and development
 - Ticket system



This presentation will cover the following arguments:

- The EGEE II project
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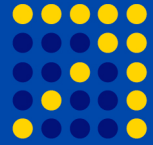
gLite 3.0 components

- Authentication
 - based on X.509 PKI infrastructure
 - uses (short lived) proxies
 - of the user certificates
- VO Membership Service: VOMS
 - Bare certificates are not enough for defining user capabilities on the Grid
 - Users belong to VO's, to groups inside a VO and may have special roles
 - VOMS provides a way to add attributes to a certificate proxy
 - The attributes are used to provide the user with additional capabilities according to the VO policies.

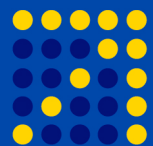
❖ gLite-3.0, released on May 4, 2006 :

– Based on components from

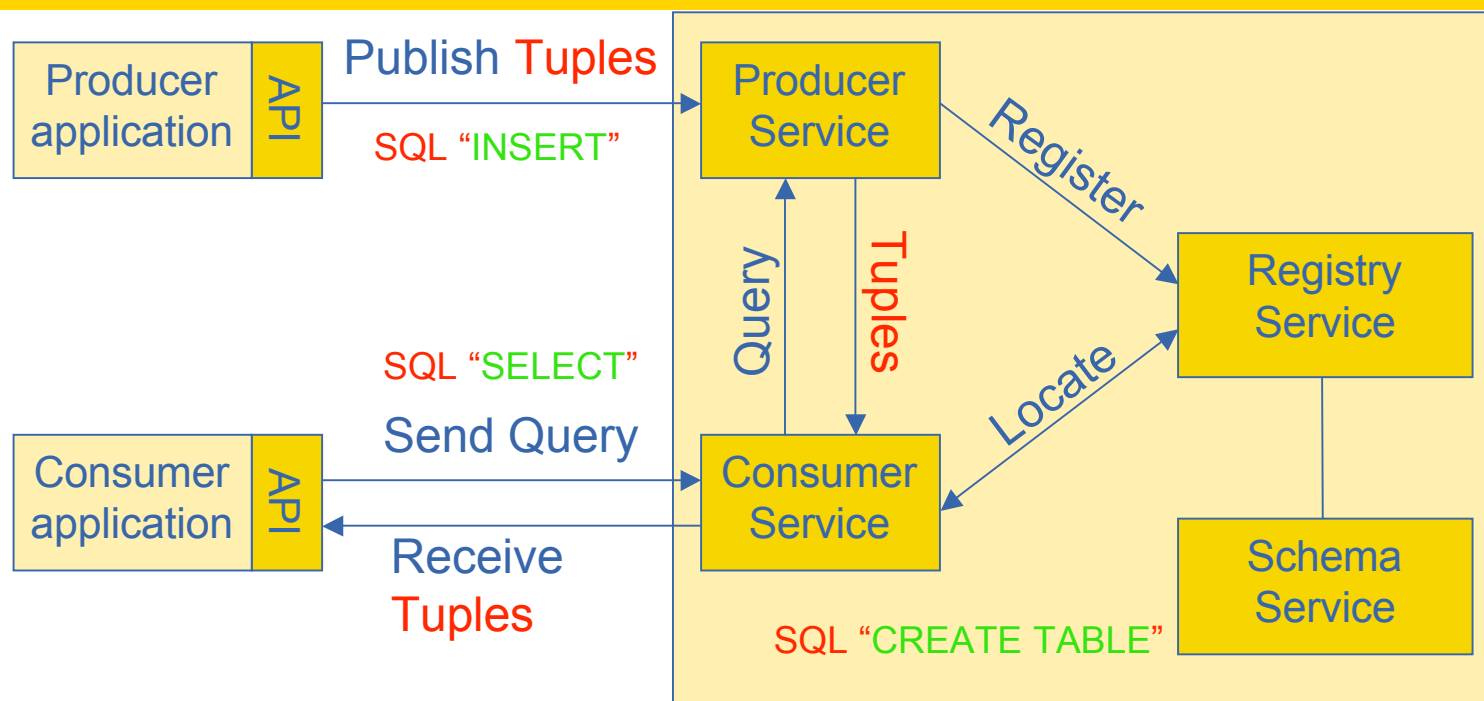




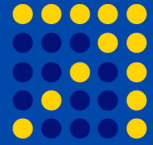
- Accounting - DGAS
 - DGAS: accumulates Grid accounting information
 - *User, JobId, user VO, VOMS FQAN(role,capabilities), SI2K, SF2K, system usage (cpuTime, wallTime...),...*
 - allows billing and scheduling policies
 - levels of granularity: from single jobs to VO or grid aggregations



gLite 3.0 components: R-GMA

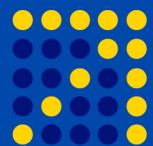


- The Relational Grid Monitoring Architecture (R-GMA) provides a uniform method to access and publish both information and monitoring data.
- From a user's perspective, an R-GMA installation currently appears similar to a single relational database.
- Relational implementation of the GGF's Grid Monitoring Architecture (GMA)



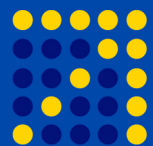
gLite 3.0 components: the Workload Management System

- Helps the user accessing computing resources
 - resource brokering
 - management of input and output
 - management of complex workflows
- Backward compatible with LCG-2
 - Capable of submitting to the LCG2.7 Computing Element
- Glite Computing Element
 - Condor-C GSI enabled
 - Uses CEMon to publish information (but also support provided for R-GMA and bdII)
 - and BLAH, Batch Local ASCII Helper, as Interface between the CE and the Local Resource Manager System

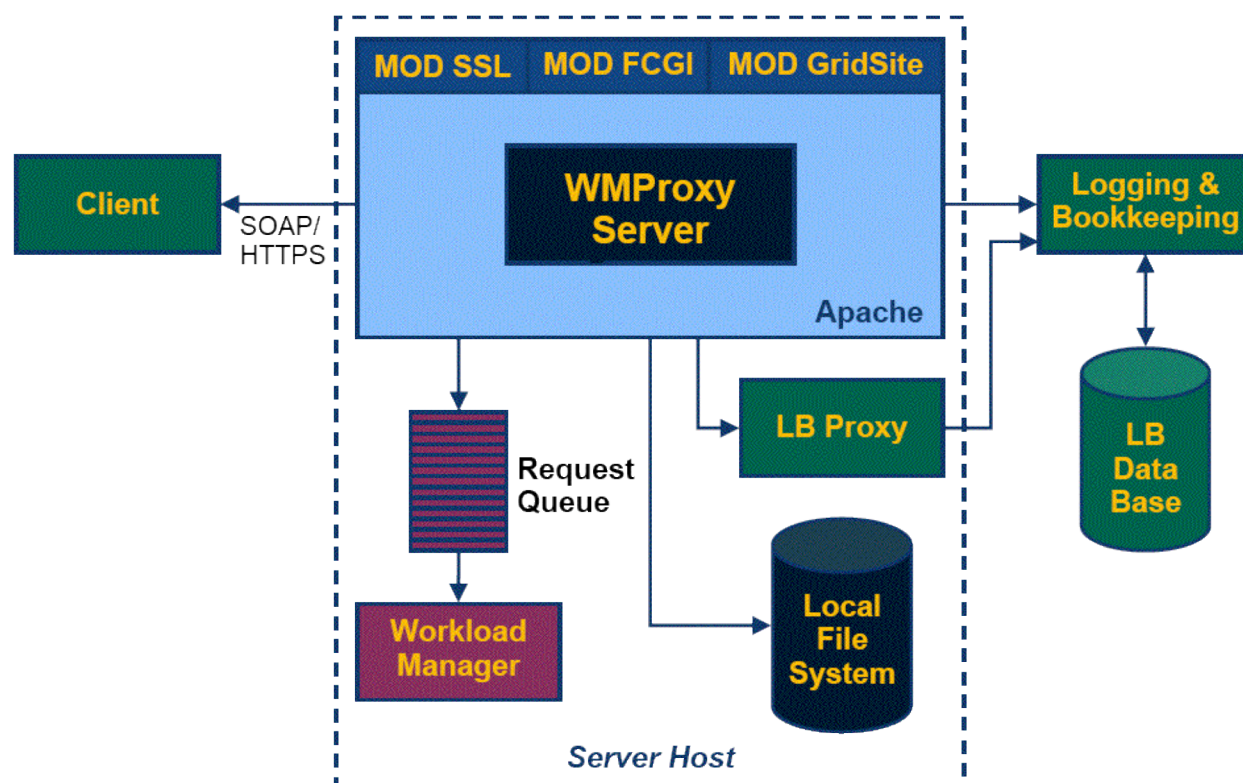


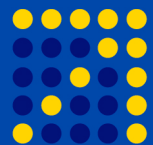
gLite 3.0 components: the Workload Management System

- Support provided for
 - *Bulk job submission*
 - *DAG job submission*
 - Support for execution of all DAG nodes within a single CE
 - chosen by user or by the WMS matchmaker
 - *deep or shallow resubmission*
 - Shallow Resubmission happens in case of failure only when the job didn't start
 - Deep Resubmission happens if the job didn't conclude all its operations
 - MPI jobs, even if the file system is not shared between CE and Worker Nodes (WN)
 - Push/pull mode job submission
 - collection of information from many sources
 - CEMon, bdII, R-GMA
 - Data management interfaces (DLI and StorageIndex)
 - file peeking during job execution (Job File Perusal)
 - for pilot job (initial support)
 - Pilot job which "prepare" the execution environment and then get and execute the actual user job



- WMPProxy is a SOAP Web service providing access to the Workload Management System (WMS)
- Job characteristics specified via JDL

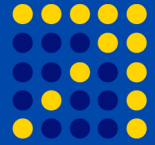




gLite 3.0 Data management components

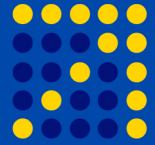
Data Management

- File and replica catalogues (LFC)
 - Central or local (not distributed)
 - Replication via Oracle, or squid caches tested by LCG
 - Secure
- File Transfer Service (FTS)
 - Reliable data transfer
 - Uses gridftp or srmcopy as transport
- Storage Elements based on SRM interface
 - DPM: implements Posix ACLs, VOMS roles/groups
 - Other available SEs: dCache, Castor
 - Deprecated: “Classic SE” – basically just gridftp
- Metadata catalogue:
 - AMGA
- Secure Keystore (data encryption) :
 - Hydra
- Utilities and IO libraries:
 - Lcg-utils
 - GFAL – this is the SRM client library
 - gLiteIO – expect functionality to be replaced

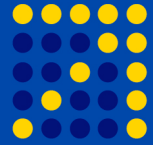


gLite: components under development

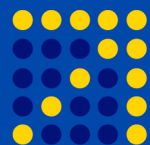
- Job Provenance
 - Long term job information storage
 - Useful for debugging, post-mortem analysis, comparison of job executions in different environments
 - Useful for statistical analysis
- CREAM: web service Computing Element
- ICE: Interface to Cream Environment
- GPBOX: Distributed VO policy management tool



- The EGEE II project
- The Grid related projects
- The EGEE infrastructure
 - The INFN production Grid
- The middleware (gLite 3.0)
- **The GILDA testbed (the t-infrastructure)**
- The applications
- The future
- Conclusions



- Why a training infrastructure?
 - e-Infrastructure for production
 - t-Infrastructure for training
- Easy entry point for new communities
- Need safe resources for installation training
- Need guaranteed response for tutorials
- Need limit the vulnerability of production systems
 - use training grid
 - have training CA
 - able to change middleware to prepare participants for future releases on production system



BioinfoGRID

The GILDA Project (<https://gilda.ct.infn.it>)

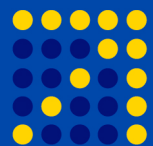
GILDA (Grid INFN Laboratory for Dissemination Activities)

is a virtual laboratory to demonstrate/disseminate the strong capabilities of grid computing.

GILDA consists of the following elements:

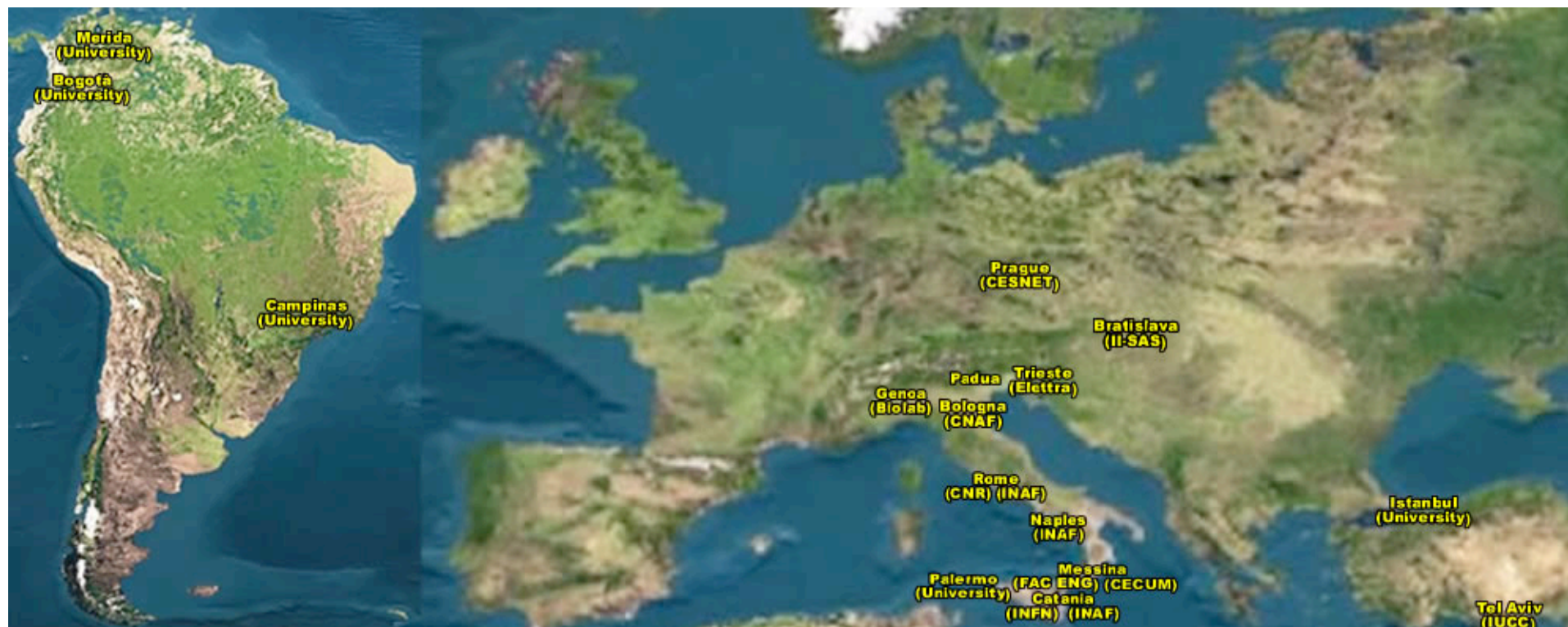
- [the GILDA Testbed](#): a series of sites and services (Resource Broker, Information Index, Data Managers, Monitoring tool, Computing Elements, and Storage Elements) spread all over Italy and the rest of the world on which the latest version of both the [INFN Grid](#) middle-ware (fully compatible with [LCG](#) middle-ware) and the [gLite](#) middle-ware are installed;
- [the Grid Demonstrator](#): a customized version of the full [GENIUS web portal](#), jointly developed by INFN and [NICE](#), from where **everybody** can submit a pre-defined set of applications to the GILDA Testbed;
- [the GILDA Certification Authority](#): a fully functional Certification Authority which issues 14-days X.509 certificates to everybody wanting to experience grid computing on the GILDA Testbed;
- [the GILDA Virtual Organization](#): a Virtual Organization gathering all people wanting to experience grid computing on the GILDA Testbed; the GILDA Virtual Organization is based on the Virtual Organization Membership Service (VOMS) developed by INFN;
- [the Grid Tutor](#): based on a full version of the [GENIUS web portal](#), to be used only during [grid tutorials](#);
- [the monitoring system](#): a versatile monitoring system completely based on [GridICE](#), the grid monitoring tool developed by INFN;
- [the GILDA mailing list](#): gilda@infn.it also archived on the web [here](#)

- Grid tutorials
- GILDA Posters
- Video tutorials
- Live User Interface
- User Interface PnP
- Virtual Services 
- Instructions for users
- Instructions for sites
- Useful links
- Sponsors
- Usage Statistics
- Old Usage Statistics

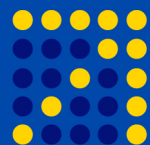


BioinfoGRID

The GILDA Test-bed (<https://gilda.ct.infn.it/testbed.html>)

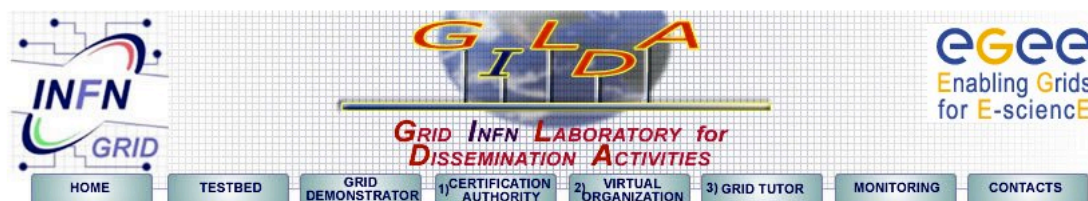
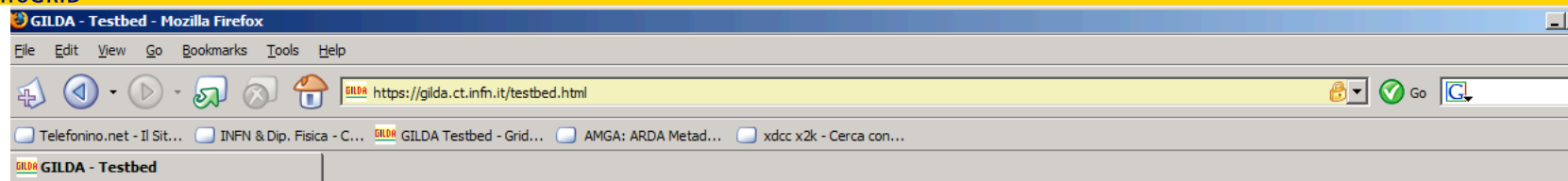


19 sites in 3 continents !



gLite and GILDA

BioinfoGRID



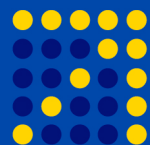
Grid services

This is a table of the general Grid Services available on GILDA.

SERVICE	HOST
LCG-2 Resource Broker (RB)	grid004.ct.infn.it
LCG-2 Resource Broker (RB)	grid013.ct.infn.it
LCG-2 Resource Broker (RB)	skurut2.cesnet.cz
LCG-2 Resource Broker (RB)	rb.be.itu.edu.tr
gLite Resource Broker (RB)	gltb-rb.ct.infn.it
gLite Resource Broker (RB)	gltb-rb2.ct.infn.it
Information Index (BDII)	grid004.ct.infn.it
Backup Information Index (BDII)	grid013.ct.infn.it
GILDA VOMS server	voms.ct.infn.it:8443/voms/gilda
GILDA gLite DGAS Price Authority	grid-demo1.ct.infn.it:56568
GILDA gLite DGAS HLR	grid-demo1.ct.infn.it:56567
GridICE Monitoring System	alifarm7.ct.infn.it:50080
LCG-2 File Catalog (LFC)	lfc-gilda.ct.infn.it
Backup LCG-2 File Catalog (LFC)	lfc-gilda.cern.ch
gLite FiReMan Catalog	grid017.ct.infn.it
gLite File Transfer/Placement Service	fts.ct.infn.it:8443
AMGA Metadata Catalog	amga.ct.infn.it:8822
gLite R-GMA server	rgma.nasrv.ct.infn.it:8443
MyProxy Server	grid001.ct.infn.it
Backup MyProxy Server	grid014.ct.infn.it

gLite Services

- Grid tutorials
- GILDA Poster
- Video tutorials
- Live User Interface
- User Interface PnP
- Instructions for users
- Instructions for sites
- Useful links
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- Usage Statistics
- Old Usage Statistics



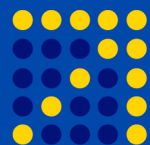
BioinfoGRID

The GILDA Certification Authority (<https://gilda.ct.infn.it/CA/>)

The screenshot shows a Mozilla browser window with the address bar set to <https://gilda.ct.infn.it/CA/>. The page title is "GILDA Certification Authority - Mozilla". The website content includes a logo for "GILDA GRID INFN LABORATORY for DISSEMINATION ACTIVITIES" and a navigation menu on the left with the following items:

- General information
- GILDA CA certificate
- Request a personal certificate
- Request an account
- Request a host certificate
- Renew a certificate
- Check a personal certificate
- Certificate Revocation List

The main content area features the heading "The GILDA Certification Authority" in large red text. Below this, it states: "The GILDA Certification Authority (GILDA CA) issues temporary (two weeks) personal public key certificates (compliant with the X.509 standard) in order to access the GILDA Testbed." It also notes: "Absolutely no identity check is going to be performed on the requester, so the personal certificates issued by the GILDA CA have absolutely no value on any real production Grid Infrastructure." The page lists the managing entity as Giuseppe Platania at INFN Catania, with contact details: Via S. Sofia, 64, I-95123 Catania, ITALY, e-mail: gilda-ca@ct.infn.it, Tel: +39 095 378 5469, and Fax: +39 095 378 5231. Instructions at the bottom guide users on how to inspect, request, or renew certificates based on their current status.



BioinfoGRID

The GILDA VOMS

The screenshot shows a Mozilla browser window titled "Virtual Organization Membership Service - Mozilla". The address bar displays the URL `https://cert-voms-01.cnaif.infn.it:8443/voms/gildav/`. The page features a blue header with the title "Virtual Organization Membership Service" and a logo of a lightbulb on a blue base. Below the header, there is a sidebar on the left with a menu structure:

- VOMS**
- FOR VO USERS**
 - [My membership details](#)
 - [New user registration](#)
 - [My requests](#)
- FOR VO MANAGERS**
 - [Administer the VO](#)
 - [Handle requests](#)
 - [Check audit data](#)
- CONFIGURATION**
 - [Configuration information](#)
 - [List all VOs on this server](#)

The main content area displays the heading "Welcome to VOMS!" followed by two paragraphs of text:

VOMS is the Virtual Organization Membership Service, a central database for VO membership information.

This is the VOMS administration interface providing VO membership-related services for VO users and VO managers.

Please select an item from the services listed on the left side of this page.

At the bottom of the sidebar, there is a footer section with the following text:

VOMS Admin 1.0.5
Release 1
© 2004 CERN, ELTE
on behalf of the EU EGEE Project

The browser's status bar at the bottom shows "Done" and various icons.

The GILDA Monitoring System (http://alifarm7.ct.infn.it:50080/gridice)

BioinfoGRID

GILDA - GridICE - Grid Monitoring Service - Mozilla

File Edit View Go Bookmarks Tools Window Help

http://alifarm7.ct.infn.it:50080/gridice/site.php

Home Bookmarks Webmail Tiscali Mail Missioni Offerte Ordini Mozilla.org

GILDA
GRID INFN LABORATORY for
DISSEMINATION ACTIVITIES

GridICE
the eyes of the Grid

Site view VO view Job Monitoring Geo view Gris view

Site view::ALL >> Summary

Site	GK#	CE#	RunJob	WaitJob	JobLoad	SlotLoad	Power	WN#	CPU#	CPUload	Available
be.itu.edu.tr	1	3	3	0	100%	100%	-	-	-	-	139.2 Gb
cesnet.cz	1	1	0	0	-	-	-	-	-	-	3 Tb
cnaf.infn.it	1	4	0	1	0%	0%	6K	1	2	0%	13.4 Gb
ct.astro.it	1	4	0	17	0%	0%	4K	1	1	0%	104.5 Gb
ct.infn.it	2	7	0	0	0%	0%	-	-	-	-	1.4 Tb
grid.unipg.it	1	3	0	0	0%	0%	20K	8	10	0%	7.3 Gb
na.astro.it	1	4	0	0	0%	0%	-	-	-	-	213.8 Gb
pd.infn.it	1	4	2	6	20%	0%	8K	2	4	5%	498.6 Gb
ui.savba.sk	1	4	0	0	0%	0%	19K	4	4	0%	68.5 Gb
TOTAL	10	34	5	24	15%	12%	56K	16	21	18%	5.4 Tb

Generated: Fri, 6 May 2005 12:28:49 +0200

VO view::gilda >> Core Services >> Computing Resources

Computing Resources

Computing Element ID	Site	Free Slots	Total Slots
cn01.be.itu.edu.tr:2119/jobmanager-lcglsf-infinite	be.itu.edu.tr	0	2
cn01.be.itu.edu.tr:2119/jobmanager-lcglsf-long	be.itu.edu.tr	0	2
cn01.be.itu.edu.tr:2119/jobmanager-lcglsf-short	be.itu.edu.tr	0	2
skurut1.cesnet.cz:2119/jobmanager-lcgpbs-gilda	cesnet.cz	0	0
grid011f.cnaf.infn.it:2119/jobmanager-lcgpbs-cert	cnaf.infn.it	2	2
grid011f.cnaf.infn.it:2119/jobmanager-lcgpbs-infinite	cnaf.infn.it	2	2
grid011f.cnaf.infn.it:2119/jobmanager-lcgpbs-long	cnaf.infn.it	2	2
grid011f.cnaf.infn.it:2119/jobmanager-lcgpbs-short	cnaf.infn.it	2	2
gildace.ct.astro.it:2119/jobmanager-lcgpbs-infinite	ct.astro.it	1	1
gildace.ct.astro.it:2119/jobmanager-lcgpbs-long	ct.astro.it	1	1
gildace.ct.astro.it:2119/jobmanager-lcgpbs-short	ct.astro.it	1	1
ce-test.ct.infn.it:2119/jobmanager-lcglsf-infinite	ct.infn.it	8	8
ce-test.ct.infn.it:2119/jobmanager-lcglsf-long	ct.infn.it	8	8
ce-test.ct.infn.it:2119/jobmanager-lcglsf-short	ct.infn.it	8	8
grid010.ct.infn.it:2119/jobmanager-lcgpbs-infinite	ct.infn.it	19	19
grid010.ct.infn.it:2119/jobmanager-lcgpbs-long	ct.infn.it	19	19
grid010.ct.infn.it:2119/jobmanager-lcgpbs-short	ct.infn.it	19	19
ce.grid.unipg.it:2119/jobmanager-lcgpbs-infinite	grid.unipg.it	16	16
ce.grid.unipg.it:2119/jobmanager-lcgpbs-long	grid.unipg.it	16	16
ce.grid.unipg.it:2119/jobmanager-lcgpbs-short	grid.unipg.it	16	16
grid4.na.astro.it:2119/jobmanager-lcgpbs-cert	na.astro.it	7	7
grid4.na.astro.it:2119/jobmanager-lcgpbs-infinite	na.astro.it	7	7
grid4.na.astro.it:2119/jobmanager-lcgpbs-long	na.astro.it	7	7
grid4.na.astro.it:2119/jobmanager-lcgpbs-short	na.astro.it	7	7
gilda-ce-01.pd.infn.it:2119/jobmanager-lcgpbs-infinite	pd.infn.it	2	2

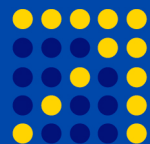
VO view::gilda >> Core Services >> Storage Resources

Storage Resources

Storage Element ID	Storage Space ID	Site	Available
cn02.be.itu.edu.tr	gilda:gilda	be.itu.edu.tr	139.22 Gb
testbed005.cnaf.infn.it	gilda:gilda	cnaf.infn.it	13.44 Gb
gildase.ct.astro.it	gilda:gilda	ct.astro.it	104.54 Gb
grid009.ct.infn.it	gilda:gilda	ct.infn.it	1.38 Tb
alifarm12.ct.infn.it	gilda:gilda	ct.infn.it	22.19 Gb
se.grid.unipg.it	gilda:gilda	grid.unipg.it	7.33 Gb
grid3.na.astro.it	gilda:gilda	na.astro.it	213.79 Gb
gilda-se-01.pd.infn.it	gilda:gilda	pd.infn.it	498.59 Gb
dgt02.ui.savba.sk	gilda:gilda	ui.savba.sk	68.54 Gb

Generated: Fri, 6 May 2005 12:49:01 +0200

GridICE Homepage



The Grid Tutor

(<https://grid-tutor.ct.infn.it>, <https://glite-tutor.ct.infn.it>)

Welcome to the GENIUS INFN GRID Portal - Mozilla

File Edit View Go Bookmarks Tools Window Help

https://grid-tutor.ct.infn.it/ Go Search

Home Bookmarks Webmail Tiscali Mail Missioni Offerte Ordini FastWeb Mozilla.org

INFN
Istituto Nazionale di Fisica Nucleare

enginframe

genius

eGEE
Enabling Grids for E-science

Grid Enabled web eNvironment for site Independent User job Submission

Welcome to GENIUS

[Important Notice](#)
[GENIUS User's Guide \(pdf\)](#)
[New Grid Authentication with MyProxy](#)
[GENIUS MyProxy Server Installation](#)
[GENIUS CVS Available](#)
[GENIUS Mailing List](#)
[GENIUS Mailing Archive \(Help on Majordomo Commands\)](#)
[GRID MOVIE](#)
[Useful Links](#)
[Credits](#)

This portal is best viewed with Mozilla 1.6.
Netscape (4.79, 4.80, 6 and higher) and Internet Explorer (5 or higher) can also be used.
The use of any other web browsers could induce some visualization mismatches and is not currently suggested.
GENIUS is based on Apache 1.3.31 and OpenSSL 0.9.7d.
Last update: Tue 12 April 2005

powered by
[EnginFrame 3.2](#)
compliant with
[LCG-2 GRID.IT](#)
[gLite-1](#)

- File Services
- Security Services
- Job Services
- Data Services
- Info Services
- Monitoring Services
- Interactive Services
- Grid Settings
- Set VO/VOMS
- Current VO Services
- Statistics
- Logout

fn.it/ Go Search

Offerte Ordini FastWeb Mozilla.org



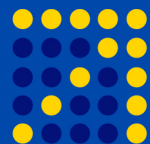
Grid Enabled web eNvironment for site Independent User job Submission

Welcome to GENIUS based on



[Important Notice](#)
[GENIUS User's Guide \(pdf\)](#)
[New Grid Authentication with MyProxy](#)
[GENIUS MyProxy Server Installation](#)
[GENIUS CVS Available](#)
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The Grid Demonstrator (1/2)

(<https://grid-demo.ct.infn.it>, <https://glite-demo.ct.infn.it>)

BiginfoGRID

Welcome to the GENIUS INFN GRID Portal - Mozilla

File Edit View Go Bookmarks Tools Window Help

https://grid-demo.ct.infn.it/

Home Bookmarks mozilla.org mozillaZine mozdev.org

INFN
Istituto Nazionale di Fisica Nucleare

- File Services
- Security Services
- Info Services
- Monitoring Services
- VO Services**
- Login

powered by
[EnginFrame 3.2](#)
compliant with
[LCG-2](#)
[GRID.IT](#)

enginframe

genius

eGee
Enabling Grids for E-science in Europe

Grid Enabled web eNvironment for site Independent User job Submission

Welcome to the **GILDA** Grid Demonstrator powered by **GENIUS**

GILDA Grid Demonstrator User's Guide ([html](#), [pdf](#))
[Credits](#)

This portal is best viewed with Mozilla 1.6.
Netscape (4.79, 4.80, 6 and higher) and Internet Explorer (5 or higher) can also be used.
The use of any other web browsers could induce some visualization mismatches and is not currently suggested.
Last update: **Fri 3 Sep 2004**

Demonstrator Applications

[LCG-2 GRID.IT](#)
[gLite-1](#)

inf.it/

Offerte Ordini FastWeb Mozilla.org

enginframe

genius

eGee
Enabling Grids for E-science

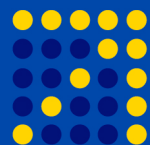
Grid Enabled web eNvironment for site Independent User job Submission

Welcome to the **GILDA** Grid Demonstrator powered by **GENIUS** based on

gLite

GILDA Grid Demonstrator User's Guide ([html](#), [pdf](#))
[Credits](#)

This portal is best viewed with Mozilla 1.6.
Netscape (4.79, 4.80, 6 and higher) and Internet Explorer (5 or higher) can also be used.
The use of any other web browsers could induce some visualization mismatches and is not currently suggested.
Last update: **Fri 24 May 2005**



The GILDA Accounting System (based on DGAS)

BioinfoGRID

```
alipc5.ct.infn.it - barbera@alipc5* - SSH Secure Shell
File Edit View Window Help
[Icons: Save, Print, Find, Home, Recent, Open Recent, Copy, Paste, Undo, Redo, Run, Stop, Break, Help]
Quick Connect Profiles

[barbera@glite-tutor:~]$ dgas-check-ce-price grid010.ct.infn.it:2119/jobmanager-
lcppbs-short

Price Authority queried at: Fri Oct 21 11:40:55 CEST 2005
Computing Element: grid010.ct.infn.it:2119/jobmanager-lcppbs-short
Price (credits for 100 CPU secs): 170

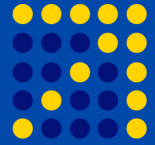
[barbera@glite-tutor:~]$
[barbera@glite-tutor:~]$
[barbera@glite-tutor:~]$
[barbera@glite-tutor:~]$ dgas-check-balance

User: Roberto Barbera
E-mail: roberto.barbera@ct.infn.it
Subject: /C=IT/O=INFN/OU=Personal Certificate/L=Catania/CN=Roberto Barbera/Email
=roberto.barbera@ct.infn.it
Assigned credits (0=infinite): 0
Booked credits: 0
Used credits: 17
Used wall clock time (sec): 377
Used CPU time (sec): 24
Accounted jobs: 4

[barbera@glite-tutor:~]$
```

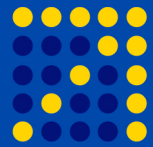
Connected to alipc5.ct.infn.it

SSH2 - aes128-cbc - hmac-md5 - none 80x24



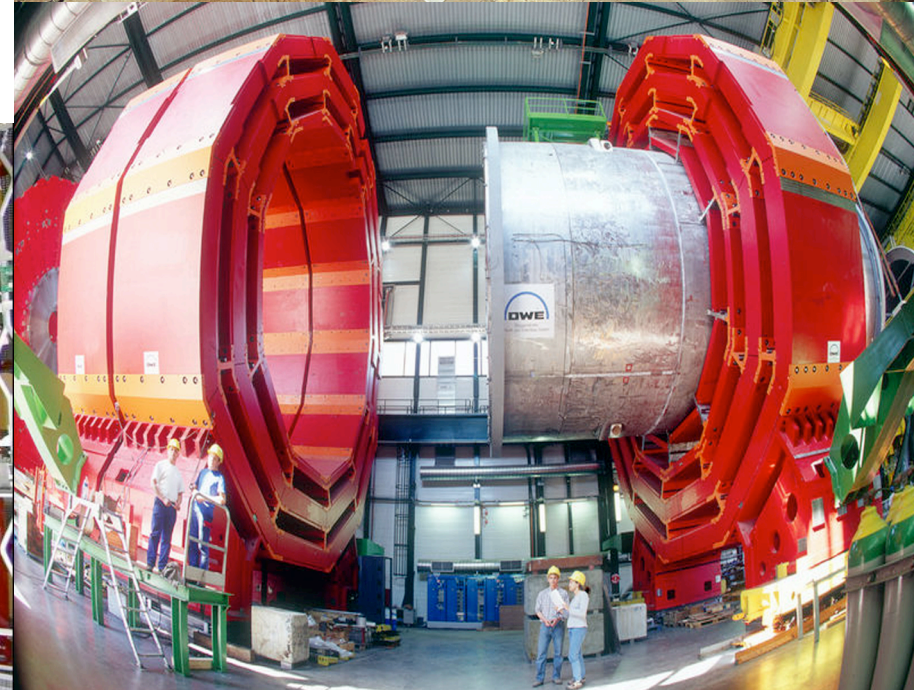
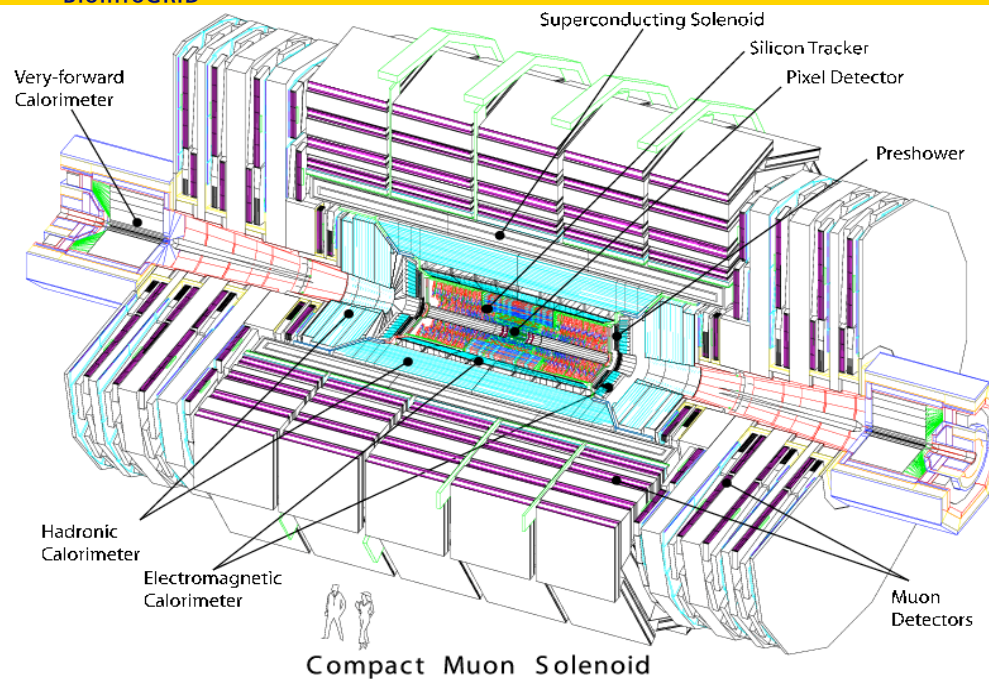
This presentation will cover the following arguments:

- The EGEE II project
- The Grid related projects
- The EGEE infrastructure
 - The INFN production Grid
- The middleware (gLite 3.0)
- The GILDA testbed (the t-infrastructure)
- **The applications**
- The future
- Conclusions

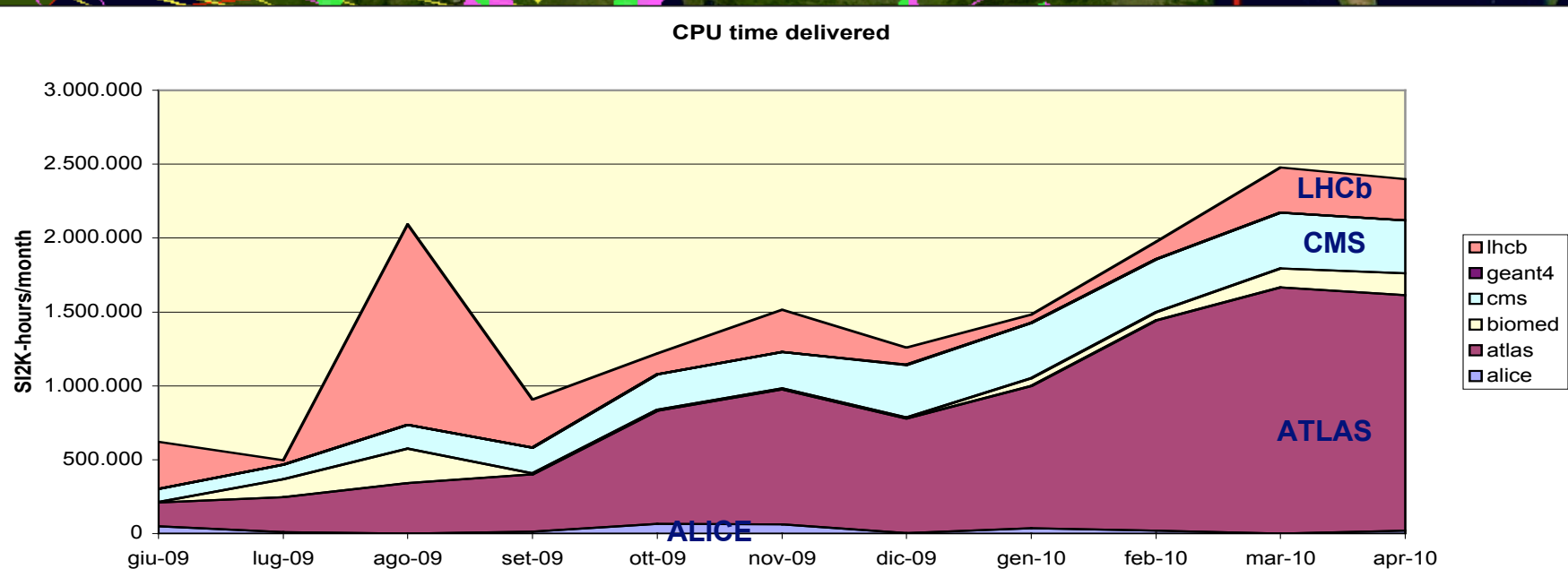
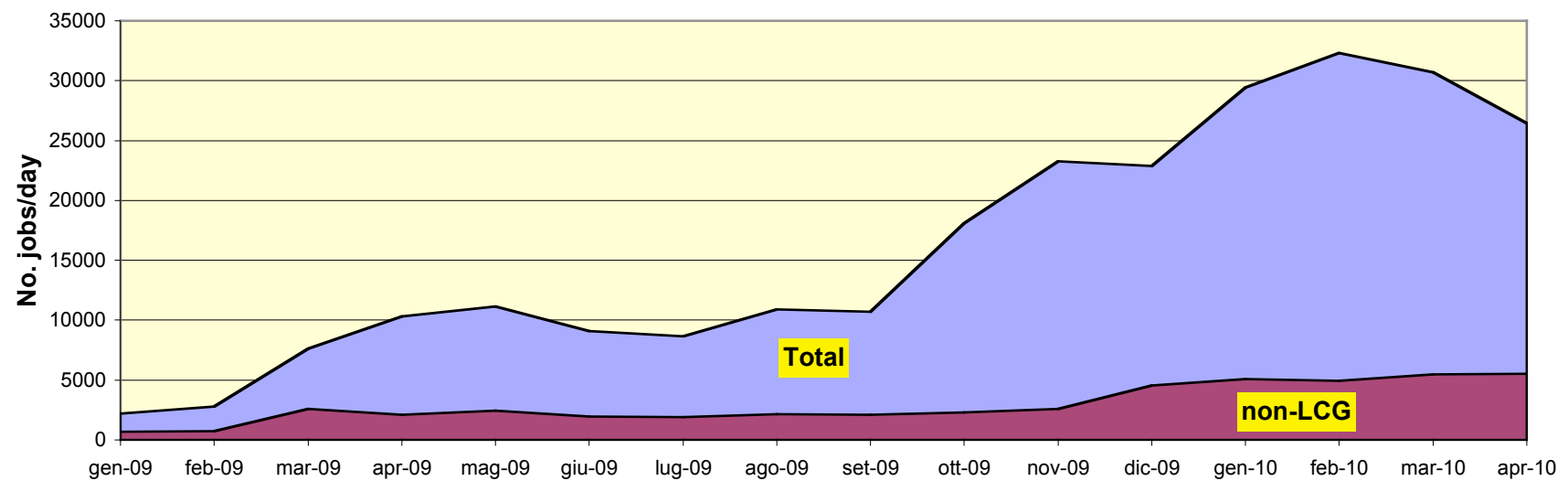


BioinfoGRID

The LHC experiment: CMS

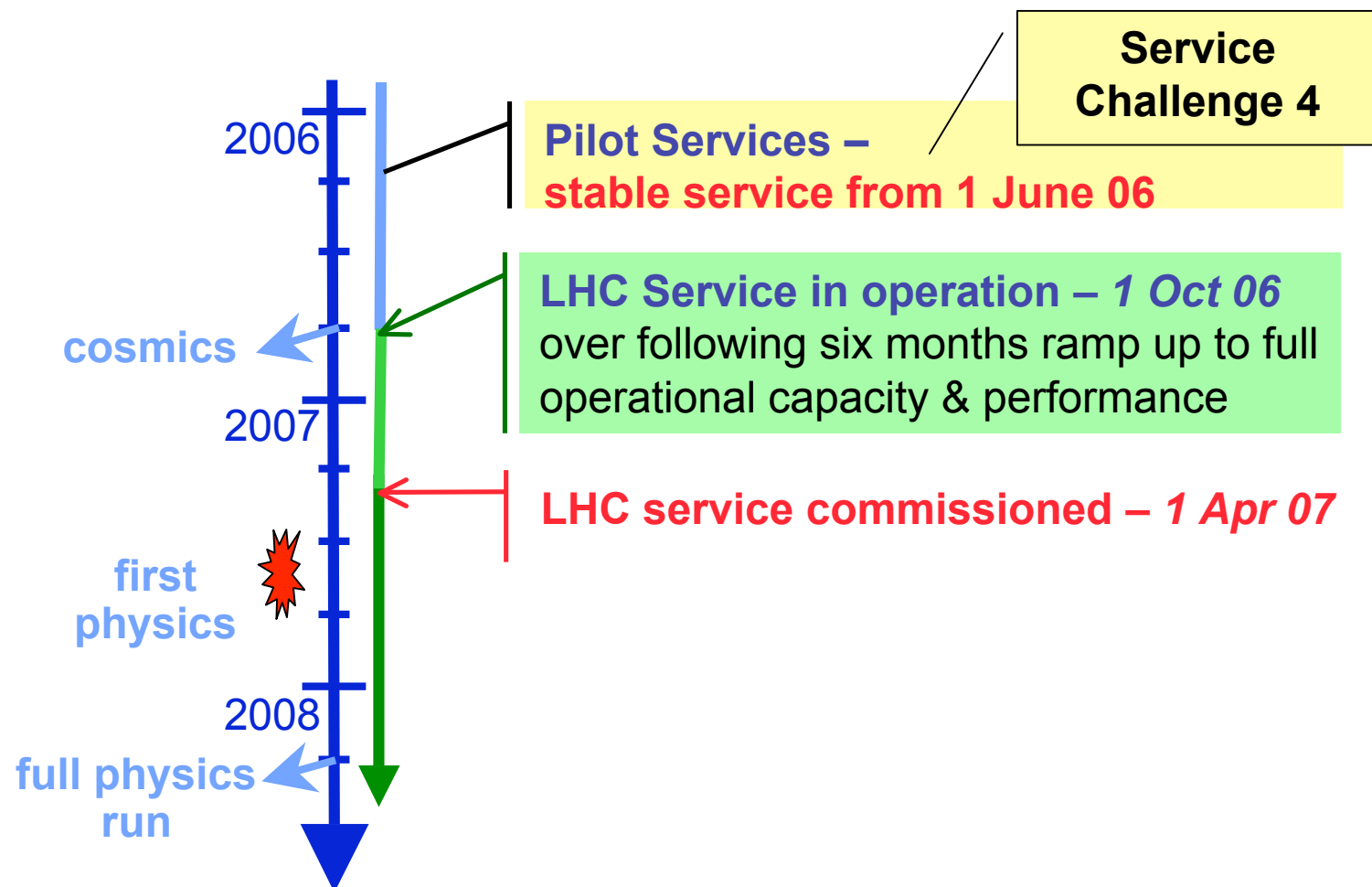


Use of the infrastructure





LCG Service Deadlines



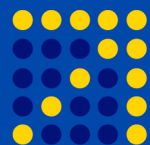
Embargoed until 4 May 2006, 18:00 CCT (10:00 GMT, 12:00 MEST)

EGEE GRID ATTACKS AVIAN FLU

During April, a collaboration of Asian and European laboratories has analysed 300,000 possible drug components against the avian flu virus H5N1 using the EGEE Grid infrastructure. The goal was to find potential compounds that can inhibit the activities of an enzyme on the surface of the influenza virus, the so-called neuraminidase, subtype N1. Using the Grid to identify the most promising leads for biological tests could speed up the development process for drugs against the influenza virus.

One of the targets of existing drugs today on the market is viral neuraminidase, an enzyme that helps the virus to proliferate and infect more cells. As this protein is known to evolve into variants if it comes under drug stress, drug resistance becomes a potential concern in case of an influenza pandemic.

The challenge of the *in silico* drug discovery application is to identify those molecules which can dock on the active sites of the virus in order to inhibit its action. To study the impact of small scale mutations on drug resistance, a large set of compounds was screened against the same neuraminidase target but with various, slightly different structures. With the results from the *in silico* screening, researchers can predict which compounds and chemical fragments are most effective for blocking the active neuraminidases in case of mutations.



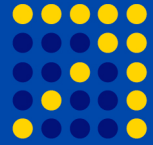
A GRID challenge to find functional analogous gene products

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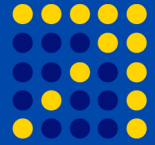
²INFN Bari, Via Amendola 173, Bari, Italy
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EGEE II new applications

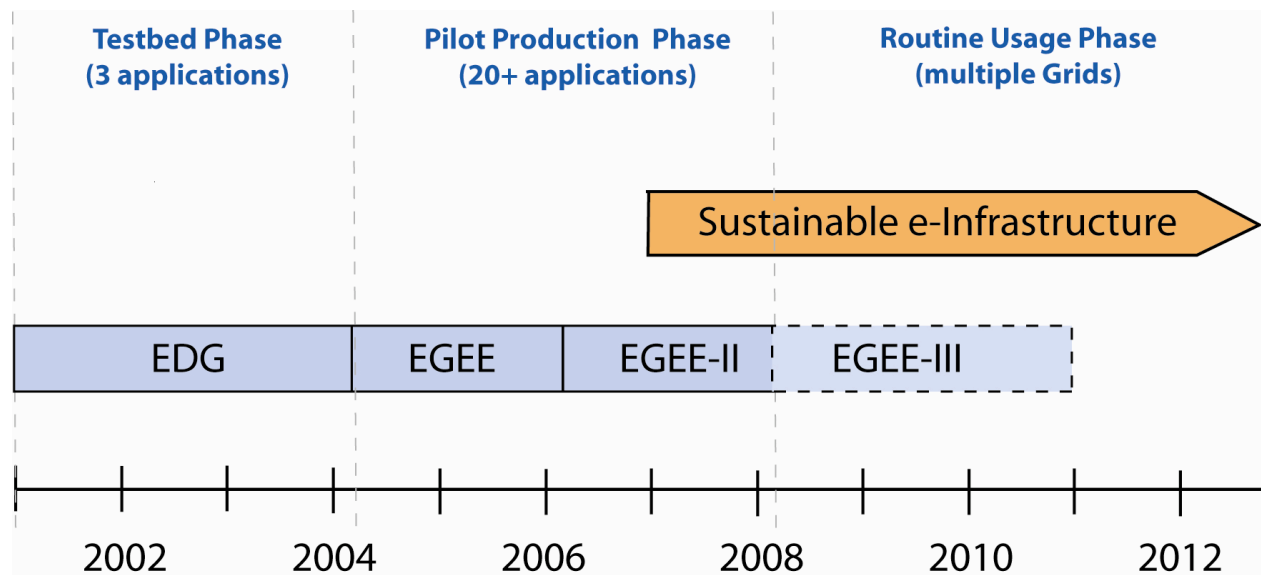
- New application are moving to the GRID
 - Astrophysics
 - Computational Chemistry
 - Earth Sciences
 - Finance
 - Fusion
 - Geophysics (incl. industrial application EGEODE)
 - Multimedia
 - ...
- In EGEE new application were selected (and followed) by an internal board (EGEE EGAAP)



This presentation will cover the following arguments:

- The EGEE II project
- The Grid related projects
- The EGEE infrastructure
 - The INFN production Grid
- The middleware (gLite 3.0)
- The GILDA testbed (the t-infrastructure)
- The applications
- **The future**
- Conclusions

- Need to prepare for permanent **Grid infrastructure**
 - Maintain Europe's leading position in global science Grids
 - Ensure a reliable and adaptive support for all sciences
 - Independent of project funding cycles
 - Modelled on success of GÉANT
 - Infrastructure managed centrally in collaboration with national bodies (in EGEE-II: **JRUs**)

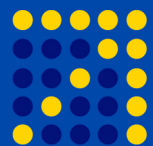


A European R&E Networking Model



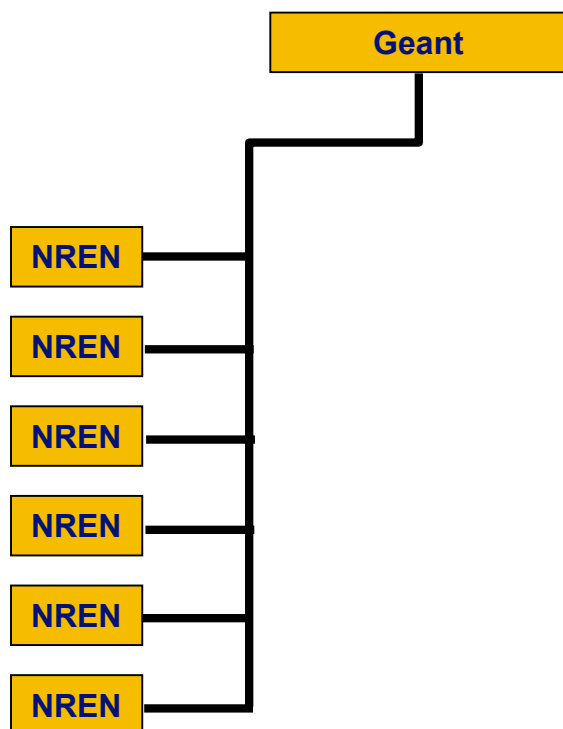
Connect. Communicate. Collaborate

- Interconnects **34 National Research & Education Networks-NRENs** of the extended European Research Area (ERA)
 - Connects more than **3500 Research & Education Institutions**
 - Serves millions of end-users + **eScience Projects** (e.g. Grids) under *Accepted Usage Policy (AUP)* rules
 - The model: **A 3-tier Federal Architecture**, partially subsidized by National and EU Research & Education funds:
 - The Campus Network (LAN/MAN)
 - The NREN (MAN/WAN)
 - The Pan-European Interconnection: **TEN34 → TEN155 → GÉANT (GN1 in FP5) → GEANT2 (GN2 in FP6): Hybrid Optical Backbone (+ Cross Border Fibers)**
- GN2 EC Subsidy < 10% of total European R&E Networking Cost**
- **Governance:** NREN Policy Committee, GN2 Exec, DANTE, TERENA

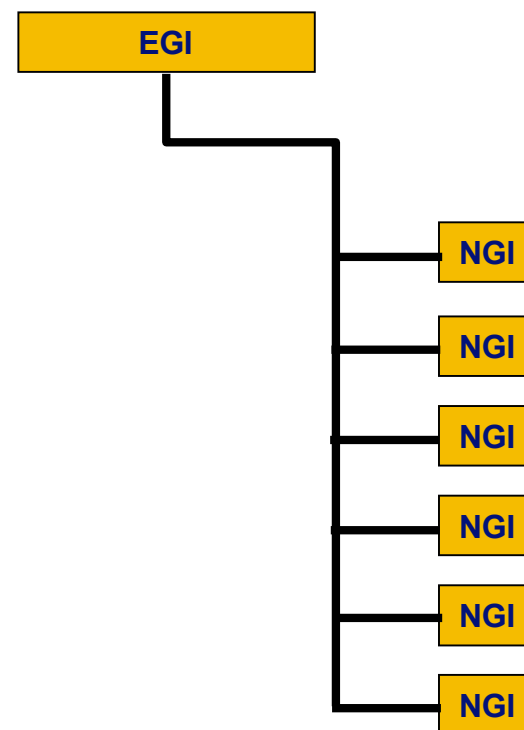


A possible schema

- NETWORK

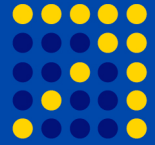


GRID



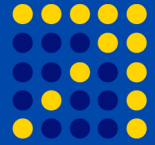
EGI = European Grid Infrastructure
NGI = National GRID Infrastructure

EGEE II as part of its program will prepare for sustainable European Grid Infrastructure
In each country a National Grid Infrastructure needs to be set up



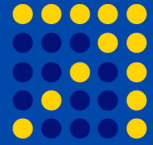
IGI: the Italian Grid Infrastructure

- Discussion is going on between EPR, Consortia, GARR, etc,
 - to form a *temporary scope association*
 - as a first step toward the construction of an IGI (Italian Grid Infrastructure) for the public research.
- Possible IGI partners:
 - EPR's
 - CNR, ENEA, INAF, INFN, INGV, MIUR
 - Resource and network providers
 - UNINA, ICTP, ELETTRA, GARR, CASPUR, CINECA, CILEA, COMETA, COSMOLAB, SPACI, CRS4



The sustainability of the Middleware

- The OMII-EU project
- The OMII-Europe vision is to harvest **open-source, WebServices-based**, grid software from across Europe and to supply these key grid services in a form that will allow them to **interoperate across heterogeneous infrastructures**, in particular EGEE, UNICORE and Globus.
- The OMII-EU project is strategic to develop and maintain a interoperable and robust grid middleware.



- Unprecedented scale of a world-wide grid infrastructure, production quality, has been set up by the EGEE project and will be improved by EGEE 2
 - Proven working model for operations and deployment
- The gLite Middleware has been released, with new functionalities. It can be expected that soon will become as robust as the LCG middleware.
- There are already applications which depend on the grid as their primary computing resources.
 - As the time goes on more applications are moving to the grid.
- There is still hard work to do either at national and European level for:
 - Providing a permanent multidisciplinary production grid infrastructure
 - Protecting investments of application developers and users
 - Ensuring that the grid infrastructure used today will still be there tomorrow