

The Italian Grid Infrastructure (IGI)

CGW08 Cracow

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INFN CNAF Director

EGEE -> EGI

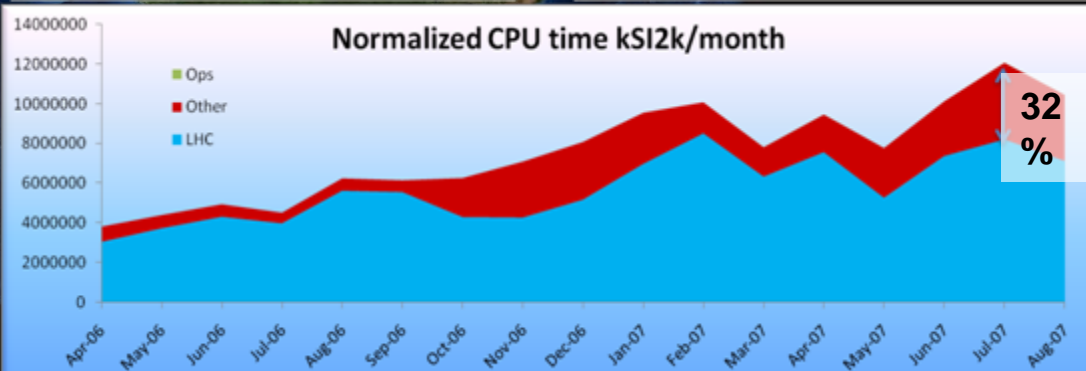
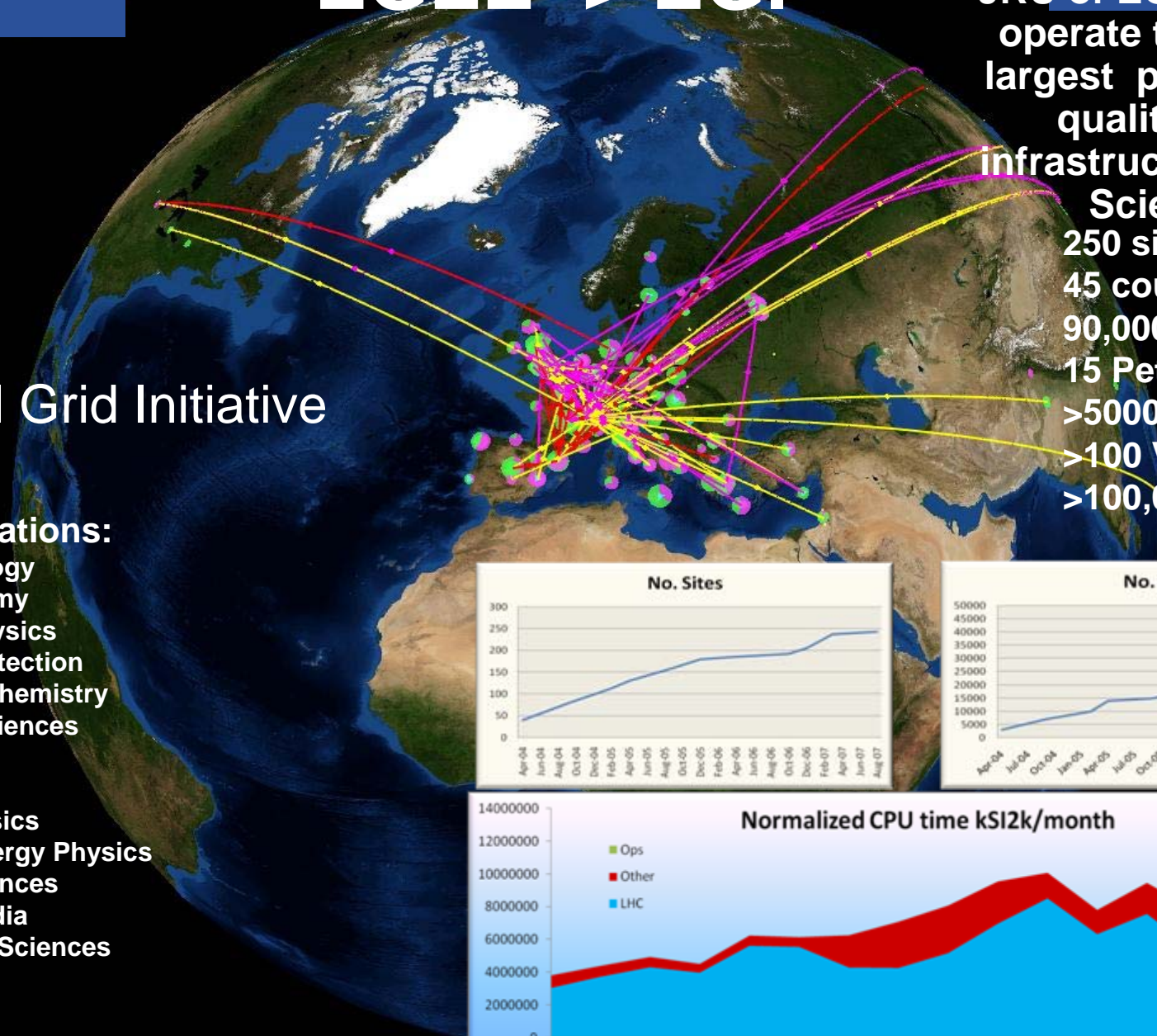
IGI is a currently a
JRU of EGEE which
operate the world
largest production
quality grid
infrastructure for e-
Science

- 250 sites (IGI:40)
- 45 countries
- 90,000 Cores
- 15 PetaBytes
- >5000 users
- >100 VOs
- >100,000 jobs/day

IGI ->
National Grid Initiative

Applications:

- Archeology
- Astronomy
- Astrophysics
- Civil Protection
- Comp. Chemistry
- Earth Sciences
- Finance
- Fusion
- Geophysics
- High Energy Physics
- Life Sciences
- Multimedia
- Material Sciences
- ...



- **At National level IGI is making the steps to:**
- **become a legal recognized national organization (NGI) acting as a single national point-of-contact for e-Research**
- **Take over the operation of the national e-Infrastructure**
- **represent and support all national Research user communities and resource providers (application independent)**
- **In coordination at European Level with:**
- **The European Grid Initiative (EGI)**
 - EGI.Org Central Organization
 - National Grid Initiatives (NGI)
- **Prepare permanent, common production EU Grid infrastructure**
- **Coordinate the integration between National Grid Infrastructures (NGIs)**
- **Operate the production Grid infrastructure on a European level for a wide range of scientific disciplines**

- The Italian Grid Infrastructure (IGI) is
 - an EU Joint Research Unit
 - Based on a MoU signed in December 2007
 - Recognized and supported by the Italian Ministry of the University and Research
 - Recognized by the EU Commission
 - Providing a unique International interface for what concern the Italian grid infrastructure
 - Providing a common coordination of the Italian Grid infrastructure for e-Research by public Institutions
 - Open to new partners

- Istituto Nazionale di Fisica Nucleare (INFN),
- Ente per le Nuove tecnologie, l'Energia e l'Ambiente (ENEA),
- Consiglio Nazionale delle Ricerche (CNR)
- Istituto Nazionale di Astrofisica (INAF),
- Istituto Nazionale di Geofisica e Vulcanologia (INGV),
- Università degli Studi di Napoli Federico II,
- Università degli Studi della Calabria,
- Sincrotrone Trieste S.C.p.A. (ELETTRA),
- Consorzio COMETA,
- Consorzio COSMOLAB,
- Consorzio SPACI,,
- Consortium GARR
- L'Università' di Perugia
- L'Università' del Piemonte Orientale
-ongoing discussions with Computing Centres



eGEE
 Enabling Grids
 for E-science

EGI
 European GRID Infrastructure

IGI = A sum of grids
Italian GRID Infrastructure

Several Universities
 Campus Grid
 Computing Centers



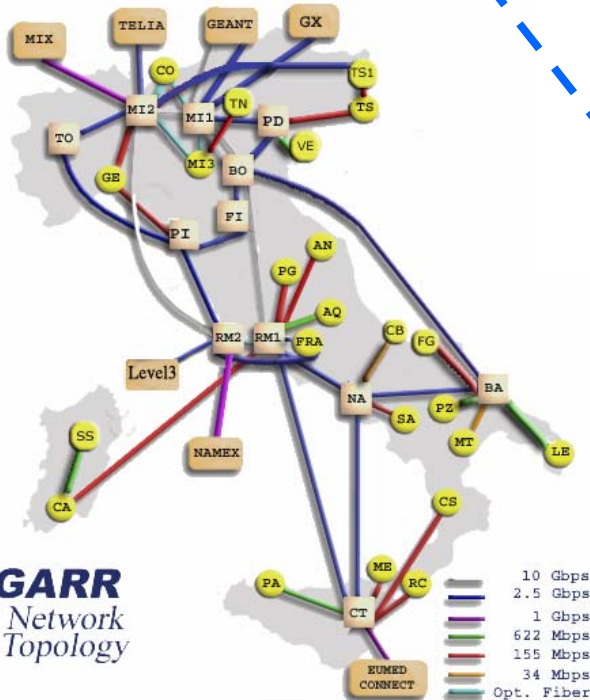
• BRINDISI
 • LECCE
 • TRISAIA



+Several Universities
+ Compute Centers



GARR Network

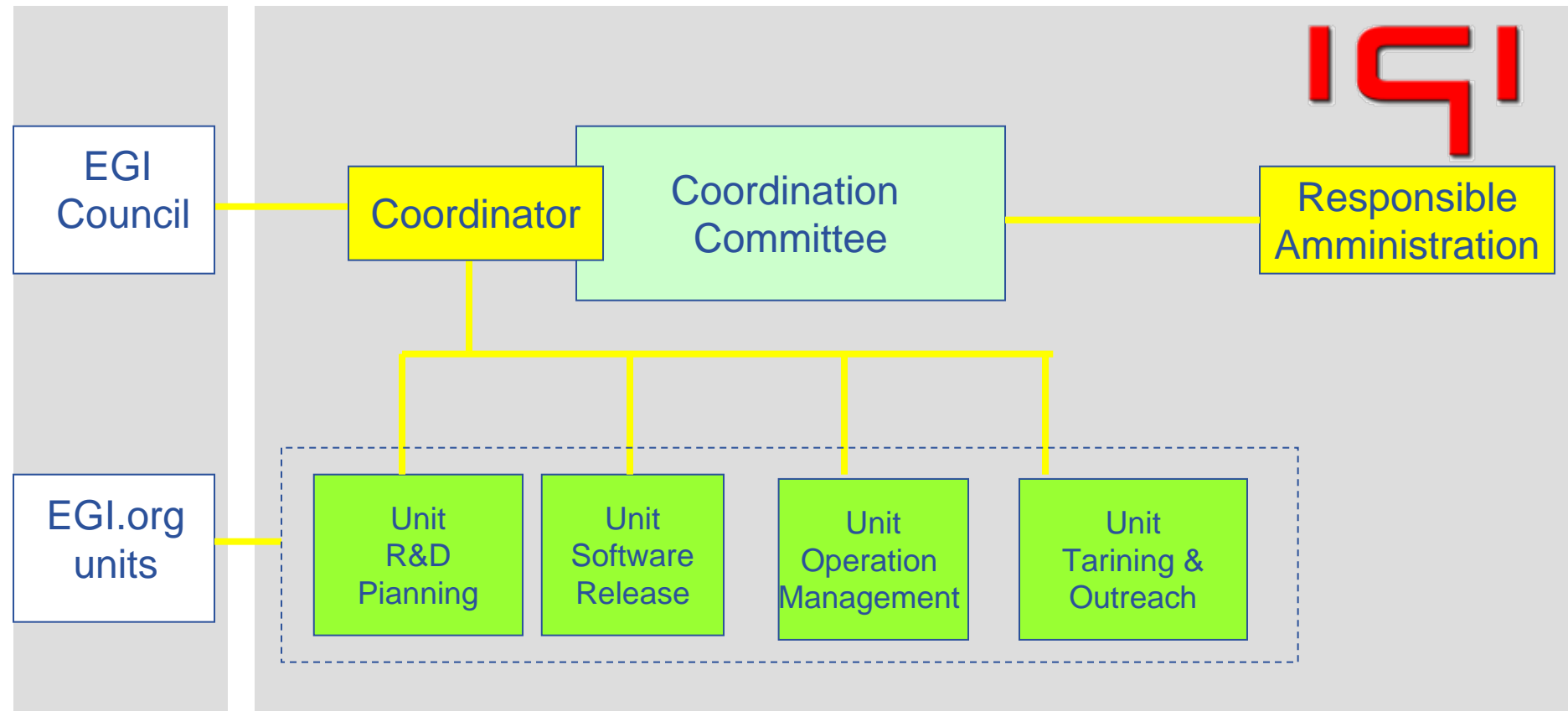


The IT Grid



FESR
PONTI
POR
SC
PE
UNIVERSITÀ DEGLI
CRESCO
SPACI
Trisolaris Grid
Virtual Laboratory
PIS2

EGI.org



- **Keep initially the structure as simple as possible to make it sustainable**
- **Allow representation of all active Institutions both at technical and managerial level**
- **Leverage from what already exists (from EGEE) and adapt to a broader scope**
- **4 Units with technical responsibilities:**
- **1 Coordination Committee**
 - **Coordinator**
 - **Responsible of the administration**

- **Unit Operation Management (Infrastructure and Grid Services)**
 - Management of Grid central services and *catch-all* for production infrastructure and test
 - Planning of infrastructure and interoperability
 - Help desk for users site manager
 - Monitoring, accounting
 - Management of other tools and services supporting operations
 - Grid infrastructure management
 - Grid security (security and incident response coordination in the region)
 - Contribution to EGI operations, technical collaboration with EGI.org (Unit Operations)
- **Unit software Release (Release mw and certification)**
 - Adapt UMD (Unified Middleware Distribution) to national needs , add required missing components
 - Integration and certification of missing components componenti aggiuntive
 - Technical Collaboration with EGI.org (Unit Developments)

- **Unit Planning (Planning, R&D):**
 - Scope: verify user requirements and plan grid infrastructure enhancement
 - Participants: 1 representative per IGI Institution
 - Promote participations to R&D national and international Calls
 - Plan common R&D activities (mw and management tools)
- **Unit Training and Application support (Applications and Training)**
 - Support to porting of applications
 - Collect new requirements and user feedback
 - Training for users and site managers
 - Dissemination and contacts with industrial partners
 - → All IGI Units collaborate and coordinate their activities with EGI.org to get common things done with a common unique effort

Ongoing merge from INFN + Other Grids -> IGI :

- **Provide common services for e-Research**
- **Common middleware releases**
- **General Guidelines**
- **Common management of the Italian Grid infrastructure**
- **Initial set of supported services:**
 - National CA
 - Provision and support of the Grid portal
 - Management of Grid Services (also for applications)
 - Monitoring tool
 - Accounting tool
 - Management and control infrastructure
 - Users support

- **EGEE Grid: focus on production quality**
 - gLite based, strong hierarchical model. Include Globus/ Condor
 - Guarantee stable and high quality services
- **NorduGrid**
 - ARC based, many commonalities with EGEE, more flexible model
- **DEISA as the supercomputing Grid**
 - UNICORE based, less overlap with ARC/gLite
- **Smaller Grid islands**
 - Mostly Globus and Condor based
 - Default choice for general grid R&D publications and prototypes
 - Some serving specific application communities
 - Includes also activities of some European countries
- **Commercial products**
 - Usually single components, basic functions, limited use in academic world
 - Cloud: Amazon S2 and S3 services still not used by Science

- Ian-Carl definition in the Anatomy of the Grid:
- *Grid : set of services which enable dynamic ICT resource sharing (CPU, Storage, Data, Archives, Instruments...) in multi-administrative domains for the benefit of multi-institutional virtual organizations*
- Did we practically achieve this after 8 years?
- Not yet!!!!
- ->A set of different implementations not inter-operating each other
 - Globus, Condor, gLite, Unicore, Arc, Naregi....
- **A shared large scale production infrastructure like IGI or at larger EGI could be theoretically achieved**
 - Trying to interconnect “free” individual Grid islands – however no proofs that scalability and quality problem can be solved – can not remove barriers (lack of widely accepted standards) for building easily global collaboration
 - Accepting a unified “standard” compliant middleware certified solution – no barriers, quality and scalability at the price of less flexibility, some danger of middleware ossification
- ->**Problems pushed at the borders but EGEE is there to show this strategy can be successful**
- **IGI has certainly valued the high quality and no barrier the best choice in line with EGEE**
- **Put effort on making the grid access simpler**
- **IGI is ready to support an EU effort to improve standards and interoperability**
- **Will support a Unified Middleware Distribution**

- Aims
 - Autonomy → using a common infrastructure for local and international work for greater efficiency
 - Sustainability: Pass from project activities to useful services paid by Research Institutions and Resource Providers
 - Subsidiarity: do things at as local a level as possible (EGI.org pulls things together)
 - Increased reliability through pushing responsibility down to sites
 - Preserving current scalability in presence of more middleware stacks to be supported, more non-EGEE Grids integrated, ...

- **NGIs are expected to:**
 - operate in autonomy secure Grid infrastructures in the countries
 - coordinate Grid operations in the countries
 - collaborate to the definition of common operational procedures, policies, standards/specifications
 - adhere to standards/specifications to ensure interoperability
 - support users and operational problems
- **Very much in line with IGI strategy**

Overall Grid management is essential to guarantee quality. Well consolidated practice in Italy from INFN Performed by the Italian Regional Operation Center (ROC). The main activities are:

- Production of Italian MW release and test
- Deployment of the release to the sites, support to local administrators and sites certification
- Periodical check of the resources and services status
- Support at the Italian level
- Support at the European level
- Introduction of new Italian sites in the grid
- Introduction of new regional VO's in the grid
- Support to experimental services

GENIUS+GILDA Demo [Administrator]

GENIUS [Grid Web Portal]

GILDA [Administrator]

FORGE [Development]

INFN-GRID [Project Site]

Agenda [Project's Agenda]

Welcome to the INFN and Grid.it Production Grid for Scientific Applications!

This is the official web site of the [INFN](#) and [Grid.it](#) Production Grid.

INFN-GRID is a research project which features solutions, innovative methodologies and technologies for the implementation and widespread use of large-scale grid platforms. We participate to several national and international research projects on Grid Computing.

The national [Grid.it](#) project span from high performance networks to middleware services and programming environments. Important institutes and universities from different areas (Earth Observation, Geophysics, Astronomy, Biology, Genomics, Computational chemistry) are also involved.

We're coordinating our objectives with the strategies of the European Community to build the Next Generation Grid.

Our efforts are evaluated in terms of our capability to solve real and critical problems in the medium/long term. The best standards in ICT (OOD, XML, Web services, Globus) are employed as the technological building blocks over which new technologies are researched and developed.

Read how real users are running their applications on the Grid ([Applications area](#))

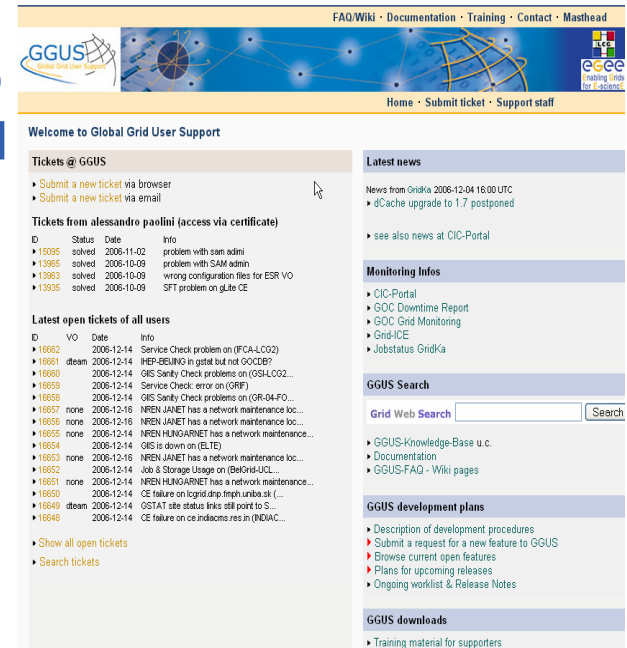
Latest news

- 13-11-06 09:00 [SIC06 INFN-GRID SuperComputing 2006](#) [[more...](#)]
- 07-06-06 09:00 [Released INFN-GRID 3.0.0](#)
- Release 3.0.0 is now available... [[more...](#)]
- 07-02-06 09:00 [Released INFN-GRID 2.7.0](#)
- Release 2.7.0 is now available [[more...](#)]

~ 40 Centers

- **Required to allow tests of new components at a sufficient scale before final releases**
- **Jointly made by developers, operations and users**
 - Normally run tests based on real user applications and real user feedback
 - Fast cycle: feedback, correction patch, deployment, new feedback

- The Italian Regional Operation Centre ticketing system based on XOOPS/xHelp
- Integrated with EGEE GGUS (Global Grid UserSupport) ticketing system
- Web services are used to:
- Transfer tickets from the global to national system
- Transfer tickets from the national to the global system
- The user support group handles the tickets according to addressing
 - At national level when appropriate
 - Either send them to GGUS



The screenshot shows the GGUS website interface. At the top, there are navigation links: [FAQ/Wiki](#), [Documentation](#), [Training](#), [Contact](#), and [Masthead](#). Below this is a banner with the GGUS logo and a globe graphic. The main content area is titled "Welcome to Global Grid User Support" and contains several sections:

- Tickets @ GGUS**:
 - Submit a new ticket via browser
 - Submit a new ticket via email
- Tickets from alessandro paolini (access via certificate)**:

ID	Status	Date	Info
13985	solved	2008-11-02	problem with sam admin
13985	solved	2008-10-09	problem with SAM admin
13983	solved	2008-10-09	wrong configuration files for ESR VO
13935	solved	2008-10-09	SFT problem on glite CE
- Latest open tickets of all users**:

ID	VO	Date	Info
16682		2008-12-14	Service Check problem on (FCA-LCO2)
16691	deam	2008-12-14	INER BEJUNO in gstat but not GOOCEP
16680		2008-12-14	GIS Sanity Check problems on (GSL-LCO2...
16659		2008-12-14	Service Check: error on (GRIF)
16658		2008-12-14	GIS Sanity Check problems on (GR-04-FD...
16657	none	2008-12-16	NREN JANET has a network maintenance loc...
16656	none	2008-12-16	NREN JANET has a network maintenance loc...
16655	none	2008-12-16	NREN HUNGARNET has a network maintenance...
16654		2008-12-14	GIS is down on (ELTE)
16653	none	2008-12-16	NREN JANET has a network maintenance loc...
16652		2008-12-14	Job & Storage Usage on (BelGrid-UCL...
16651	none	2008-12-14	NREN HUNGARNET has a network maintenance...
16650		2008-12-14	CE failure on loggrid/dip-trip-unibo.it (...)
16649	deam	2008-12-14	GSTAT site status info: site point to S...
16648		2008-12-14	CE failure on ce.indiana.res.in (INDIAC...
- Buttons: [Show all open tickets](#), [Search tickets](#)
- Latest news**:
 - News from GriKa 2008-12-04 16:00 UTC
 - Cache upgrade to 1.7 postponed
 - see also news at CIC-Portal
- Monitoring Infos**:
 - CIC-Portal
 - GOC Downtime Report
 - GOC Grid Monitoring
 - Grid-ICE
 - Jobstatus GridKa
- GGUS Search**:

 - GGUS-Knowledge-Base u.c.
 - Documentation
 - GGUS-FAQ - Wiki pages
- GGUS development plans**:
 - Description of development procedures
 - Submit a request for a new feature to GGUS
 - Browse current open features
 - Plans for upcoming releases
 - Ongoing worklist & Release Notes
- GGUS downloads**:
 - Training material for supporters

apaolini

Main Menu

- Home
- Tickets
- Summary
- Log Ticket
- My Profile
- View All Tickets
- Search
- View Reports
- Calendar
- Knowledge base
- RSS feed
- File archive
- IRC Chat
- EGEE SAI Wiki
- Frozen Bubble
- External News

User Menu

- Home Page
- View Account
- Inbox
- Logout
- Administration Menu

Ticket Main Actions

- Summary
- Log Ticket
- View All Tickets
- Search
- My Profile

Grid admin

- Downtime calendar
- Timesheets
- Admin SFT submission
- Site Functional Tests (SAM)
- Security Coordination
- LCG/EGEE OSCT
- rss Feed

checklists

Incident Response Procedures

This document is provided by the EGEE Operational Security Coordination Team (OSCT) for guidance only and is aimed at minimising the impact of security incidents, by encouraging post-mortem analysis and promoting cooperation between the sites. It is based on the LCG/EGEE Incident Handling and Response Guide

Incident Response Guide

Ticket red (not so red) alert

Tickets highlighted in a salmon color are older than a week and are still waiting for a solution. Check them as soon as possible!

Highest Priority Unassigned Tickets

ID:	GGUS-ID	Priority:	Subject:	Status:	Department:	Logged By:	Log Time:	Owner:
<input type="checkbox"/> 3966			Configurazione procedure di indi...	On hold	Site INFN Cascina	pueronesi	2008/1/11 15:12:53	No owner
<input type="checkbox"/> 4316			log-cp funziona a intermittenza	Waiting for reply	GRID SERVICES	cpalomba	2008/3/26 10:36:59	No owner
<input type="checkbox"/> 4508			Errore REPO	In progress	CMT	fcalzolari	2008/5/19 17:48:03	No owner
<input type="checkbox"/> 4222			problemi con gfal al tier-1	Waiting for reply	INFN Tier1	cpalomba	2008/3/6 11:57:35	No owner
<input type="checkbox"/> 4342			certificazione SISSA-TRIESTE	Waiting for reply	Site SISSA Trieste	apaolini	2008/4/1 16:11:30	No owner
<input type="checkbox"/> 4461	36102		7 authentication failed: GSS Maj...	Waiting for reply	Site INFN Catania	SupportTeam	2008/5/5 11:31:00	No owner
<input type="checkbox"/> 4514			pubblicazione informazioni errate	Waiting for reply	Site INFN Roma1	apaolini	2008/5/20 15:19:32	No owner
<input type="checkbox"/> 2919			Bug in lsf.pm	Unsolved	Release & Documentation	Santoro	2007/5/21 10:29:01	No owner
<input type="checkbox"/> 3913			downtime lungo, sito uncertified	Waiting for reply	Site INFN Napoli-CMS	apaolini	2007/12/21 9:45:13	No owner
<input type="checkbox"/> 4264			Proposal for a small yaim change	On hold	Release & Documentation	Tommaso.Boccali	2008/3/19 18:37:02	No owner

New Tickets

ID:	GGUS-ID	Priority:	Subject:	Status:	Department:	Logged By:	Log Time:	Owner:
<input type="checkbox"/> 4519	36669		SE failure on gridse3.pg.infn.it...	Waiting for reply	Site INFN Perugia	Anonymous	2008/5/21 14:43:04	No owner
<input type="checkbox"/> 4516	36660		LFC failure on lfc-lhcb-ro.cr.cn...	Assigned	INFN Tier1	Anonymous	2008/5/21 12:49:02	No owner
<input type="checkbox"/> 4514			pubblicazione informazioni errate	Waiting for reply	Site INFN Roma1	apaolini	2008/5/20 15:19:32	No owner
<input type="checkbox"/> 4508			Errore REPO	In progress	CMT	fcalzolari	2008/5/19 17:48:03	No owner
<input type="checkbox"/> 4505			Accounting: spedizione dati	Waiting for reply	Site INFN Roma1-CMS	gpatania	2008/5/19 13:46:02	No owner
<input type="checkbox"/> 4493	36356		cannot log-rep to grid009.to.infn...	Waiting for reply	Site INFN Torino	Anonymous	2008/5/13 9:28:00	No owner
<input type="checkbox"/> 4490			Problemi di accounting	Waiting for reply	Site Univ. Perugia	cristofori	2008/5/12 14:34:28	No owner
<input type="checkbox"/> 4483			non esiste la directory \$VO_CYCL...	Waiting for reply	Site INFN Roma2	sdalpra	2008/5/9 16:08:19	No owner
<input type="checkbox"/> 4477	36217		RGMA failure on grid03.ge.infn.i...	Waiting for reply	Site INFN Genova	SupportTeam	2008/5/8 9:03:55	No owner
<input type="checkbox"/> 4476	36216		\$BDII failure on grid01.ge.infn....	In progress	Site INFN Genova	SupportTeam	2008/5/8 9:01:57	No owner

Open Tickets Assigned to Me

- **Via User Interface (UI). Could be:**
 - A dedicated server, installed in a similar way as the others grid elements
 - UI Plug-and-Play (UI PnP), a software one can install on any pc without root privileges
- **A web portal: <https://genius.ct.infn.it/>**

Welcome to GENIUS Portal

ver. 3.1.1
 compliant with [gLite 3.0](#) middleware
[Credits](#)

This portal is best viewed with Mozilla 1.7.12 or higher.
 Netscape (4.79, 4.80, 6 or 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.
 powered by

Last update: **Mon 3 July 2006**

- Resource Brokers
- Logging & Bookkeeping
- Top Level BDII
- voms servers + replicas
- gridice server
- LCG File Catalog server
- Server MyProxy
- FTS server
- SRM Data storage service

VO Name ▼	Q#	MinSlotFree	MaxSlotFree	RunJob	WaitJob	Storage Available	Storage Total	Storage Load
alice	24	625	625	203	253	154.1 TB	266.5 TB	
argo	20	365	365	-	-	147.2 TB	253.1 TB	
astro	6	78	78	-	-	-	-	
atlas	34	881	881	10	167	3.2 PB	3.8 PB	
auger	7	157	157	-	-	357.1 GB	357.1 GB	
babar	23	396	396	173	0	59.9 TB	121.1 TB	
bio	18	203	203	0	82	59.5 TB	118.9 TB	
biomed	20	222	222	360	1778	61.8 TB	122.7 TB	
cdf	19	630	630	303	0	60 TB	120.6 TB	
cms	34	700	720	413	1187	188.7 TB	346.5 TB	
compassit	9	138	138	-	-	30.6 TB	74.1 TB	
compchem	26	289	289	2	89	59.4 TB	118.7 TB	
cyclops	12	165	165	-	-	38.4 TB	80.9 TB	
diligent	0	-	-	-	-	-	-	
dteam	45	1150	1150	13	80	250.2 TB	407 TB	
edteam	4	45	45	-	-	21.2 TB	37.6 TB	
eela	1	45	45	-	-	21.2 TB	37.6 TB	
egee	2	78	78	-	-	-	-	
egrid	21	273	273	-	-	59.8 TB	119.2 TB	
embrace	1	2	2	-	-	5.3 GB	58.7 GB	
enea	23	271	-	-	-	-	118.7 TB	
enmr	8	93	-	-	-	-	-	
esr	15	217	-	-	-	-	118.4 TB	
euchina	10	194	-	-	-	-	39.4 TB	
euindia	14	348	-	-	-	-	50.3 TB	
eumed	5	155	-	-	-	-	39.4 TB	
fusion	7	78	-	-	-	-	357.1 GB	
geant4	11	150	-	-	-	-	37.6 TB	
gear	10	142	-	-	-	-	37.6 TB	
gilda	0	-	-	-	-	-	-	
gridit	27	477	-	-	-	-	119.2 TB	
ildg	0	-	-	-	-	-	8.8 GB	
inaf	17	201	-	-	-	-	118.8 TB	
infngrid	43	1150	-	-	-	-	127.6 TB	
ingv	14	193	-	-	-	-	118.3 TB	
lhcb	30	686	686	228	82	247.9 TB	404.3 TB	
libi	13	189	189	-	-	51.6 TB	109.8 TB	
lights	14	171	171	-	-	-	-	
magic	15	235	235	-	-	59 TB	118.4 TB	
na48	6	178	178	-	-	399.3 GB	2.2 TB	
omiieurope	1	44	44	-	-	0	0	
ops	41	1150	1150	76	230	250.2 TB	407 TB	
pamela	18	341	341	126	11	53.6 TB	112.7 TB	

49 VOs supported:
 4 LHC (ALICE, ATLAS, CMS, LHCb)
 3 test (DTEAM, OPS, INFNGRID)
 20 Regional
 1 catch all VO: GRIDIT
 21 Other VOs

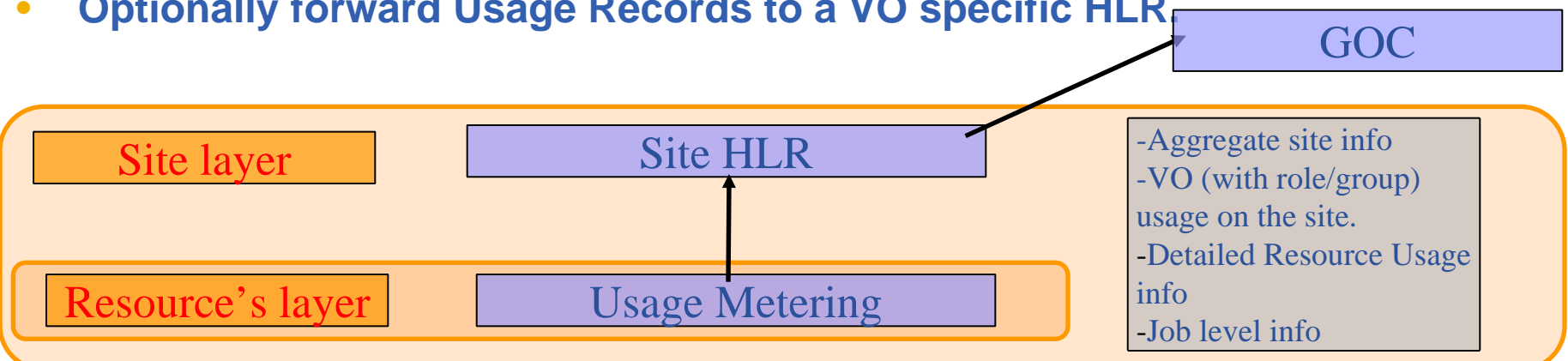
DGAS (Distributed Grid Accounting System) is fully deployed in INFNGrid (13 site (Home Location Registers) HLRs + 1 HLR of 2nd level (summaries).

The site HLR is a service designed to manage a set of 'accounts' for the Computing Elements of a given computing site.

For each job executed on a Computing Element (or a on local queue), the Usage Record for that job is stored on the database of the site HLR.

Each site HLR can:

- Receive Usage Records from the registered Computing Elements.
- Answer to site manager queries such as:
 - Detailed job list queries (with many search keys: per user, VO, FQAN ,CEId...)
 - Aggregate usage reports, such as per hour, day, month..., with flexible search criteria.
- Optionally forward Usage Records to EGEE database.
- Optionally forward Usage Records to a VO specific HLR



- In Italy different grids, single centers and Research Institutions are joining in the National Grid Infrastructure (NGI) called IGI
- Following a similar process at EU level which will bring to the European Grid Infrastructure i.e.
 - a central EU organization: EGI.org
 - NGIs in each country
- IGI is well advanced in offering all services requested to an NGI
- Will look progressively for more sustainability introducing service charges for more consolidated services