



Enabling Grids for E-science

# Εισαγωγή στο EGEE και το HellasGrid

## *Introduction to EGEE and HellasGrid*

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



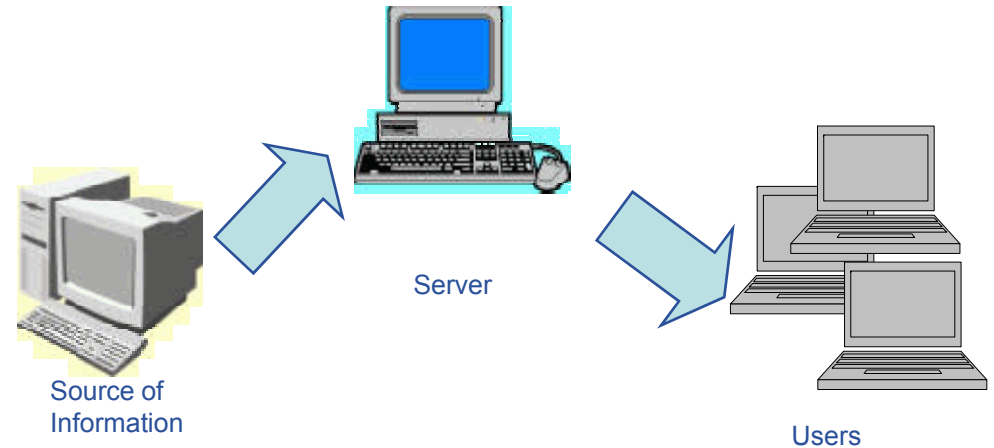
Information Society  
and Media





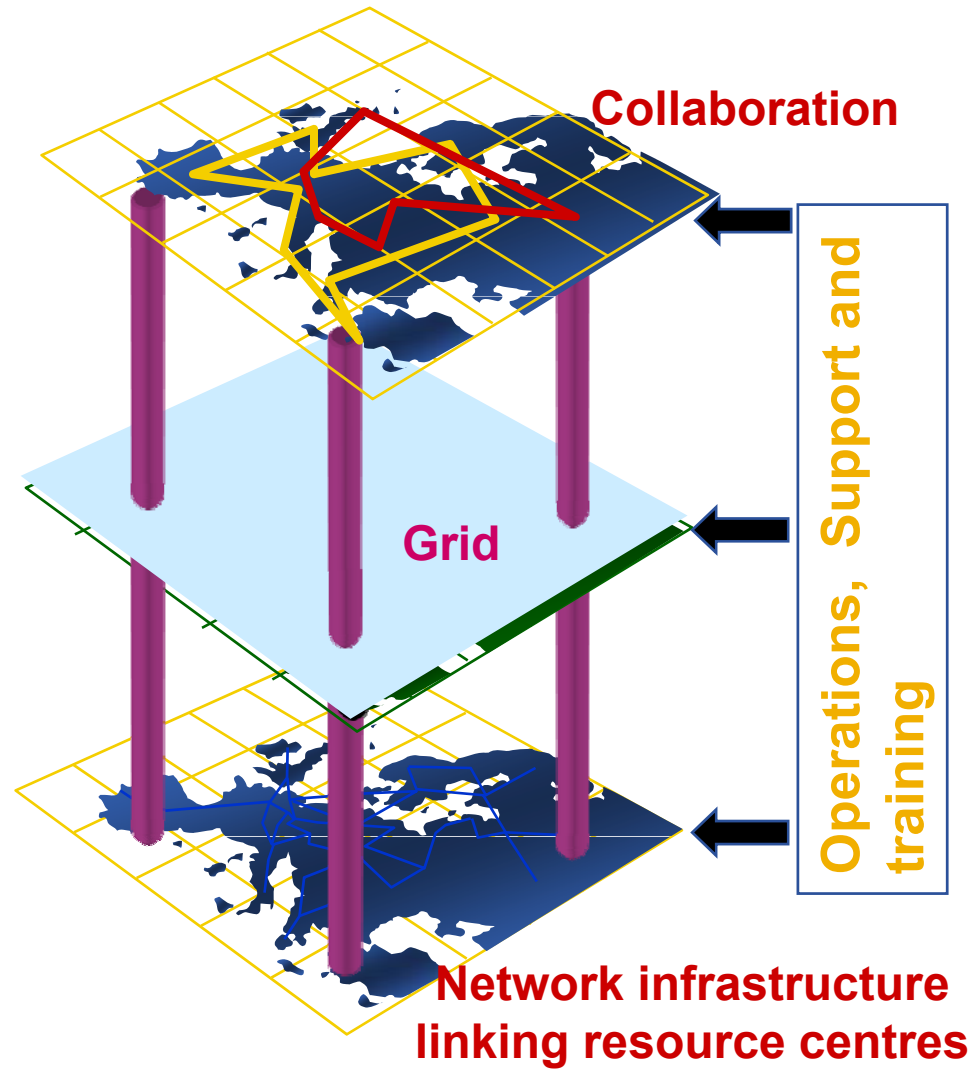
# What is the Grid?

- The *World Wide Web* provides seamless access to information that is stored in many millions of different geographical locations



- The *Grid* is an emerging infrastructure that provides seamless access to computing power and data storage capacity distributed over the globe





- **Collection of geographically distributed heterogeneous resources**

*“Most generalized, globalized form of distributed computing”*

- **“An infrastructure that enables flexible, secure, coordinated resource sharing among dynamic collections of individuals, institutions and resources”**

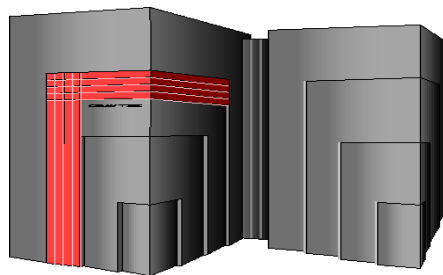
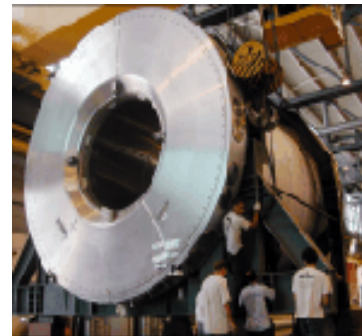
***Ian Foster and Carl Kesselman***

- **Offers access to a virtual and very powerful computing system**
- **A user does not care, in which resource his / her job / jobs is going to be executed**

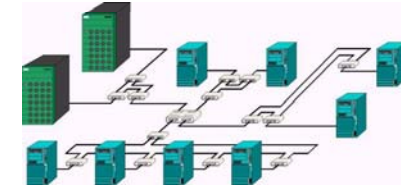
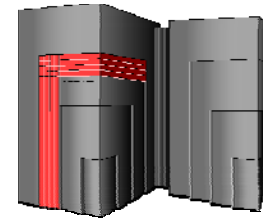
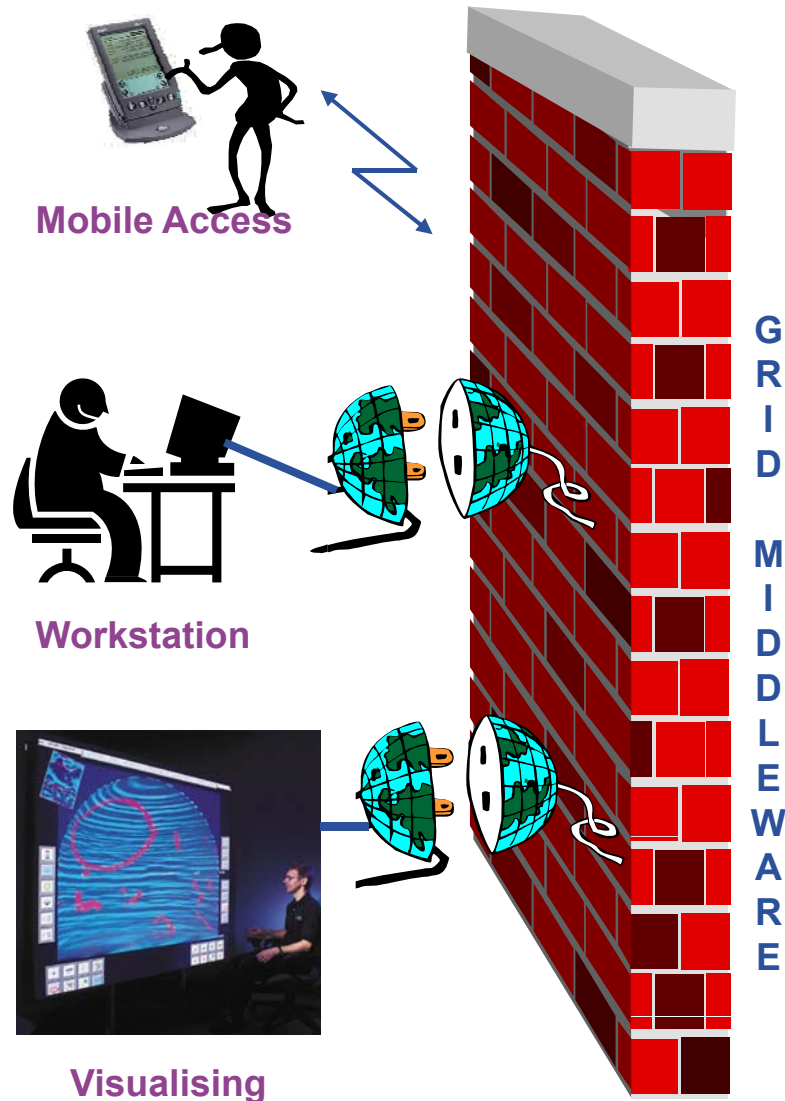
- An entity that is going to be shared

such as:

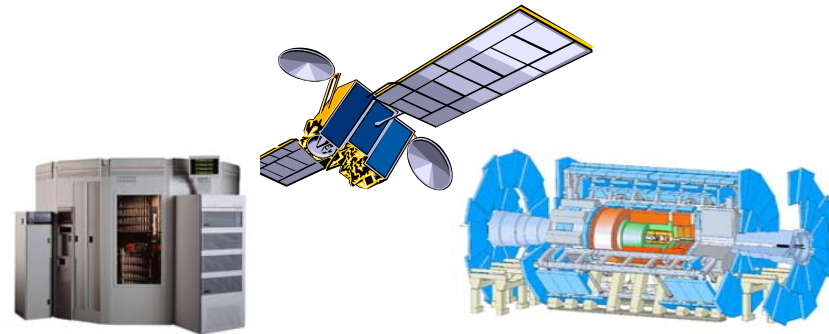
- ✓ computational units
- ✓ storage units
- ✓ sensors
- ✓ visualization tools
- ✓ software



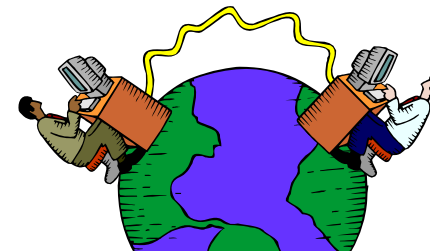
- **Resource sharing**
  - Geographically distributed resources offer computational power, storage capacity and bandwidth to the users
- **Secure and reliable access**
  - Authentication
  - Authorization
  - Access policy
- **Open standards**
- **Co-operation among people belonging to different organizations, institutes, groups**



Supercomputer, PC-Cluster



Data-storage, Sensors, Experiments



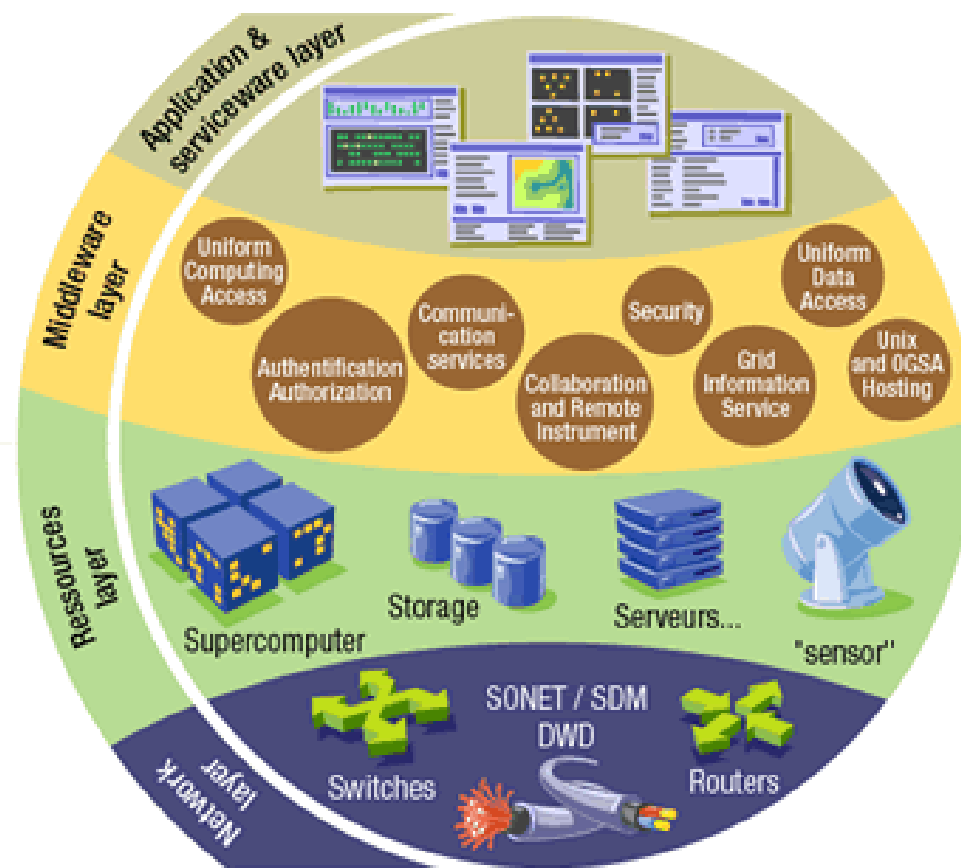
Internet, networks



- The Grid relies on advanced software, called **middleware**, which interfaces between resources and the applications

- **The Grid middleware:**

- Basic services
  - Secure and effective access to resources
- High level services
  - Optimal use of resources
  - Authentication to the different sites that are used
  - Job execution & monitoring of progress
  - Problem recovery
  - Transfer of results back to the user

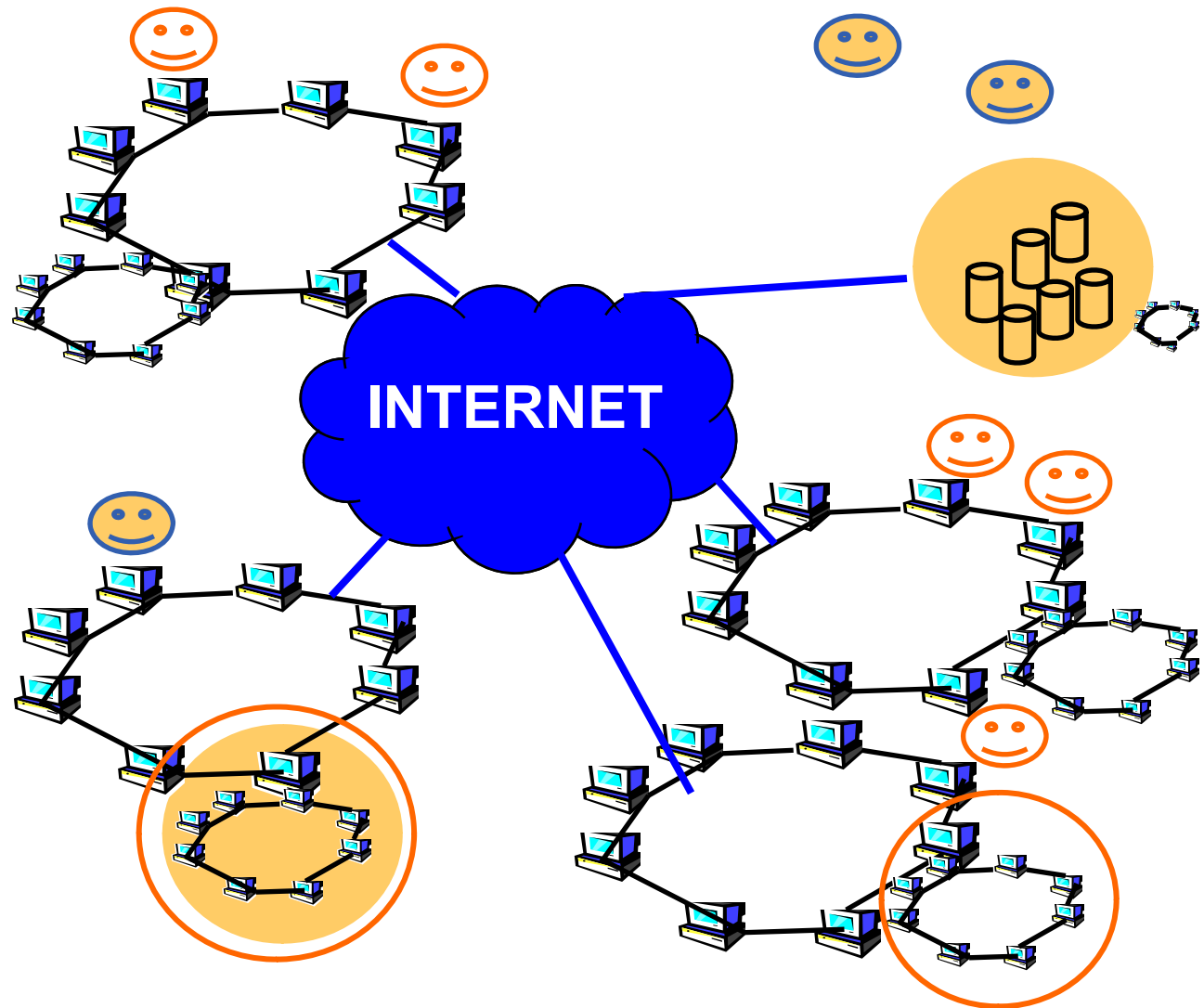


- **When using a PC or workstation you**
  - Login with a username and password (“Authentication”)
  - Use rights given to you (“Authorisation”)
  - Run jobs
  - Manage files: create them, read/write, list directories
- **Components are linked by local hardware**
- **Operating system**
- **One admin. domain**
- **When using a Grid system**
  - Login with digital credentials – single sign-on (“Authentication”)
  - Use rights given you (“Authorisation”)
  - Run jobs
  - Manage files: create them, read/write, list directories
- **Services are linked by the Internet**
- **Middleware**
- **Many admin. domains**

- **Development of networking technology (doubling every nine months or so over the last years) and high-speed networks**
  - ✓ widespread penetration of optical fibers
  - ✓ wireless connections
  - ✓ new Internet technologies (ADSL, WiMax)
  
- **Moore's law everywhere**
  - ✓ Instruments, detectors, sensors, scanners, ...
    - ⇒ Organising their effective use is the challenge
  
- **Applications require a huge amount of computations to be executed and the collaboration among scientists**

- **Science that became feasible and promiscuous by resource sharing (sharing of data, scientific instruments, computational resources, colleagues) across the Internet**
  - ✓ Often very compute intensive
  - ✓ Often very data intensive (both creating new data and accessing very large data collections) – data deluges from new technologies
  - ✓ **Crosses organisational and administrative boundaries**

- gLite middleware runs on each shared resource to provide
  - Data services
  - Computation services
  - Security service
- Resources and users form Virtual organisations: basis for collaboration
- Distributed services (both people and middleware) enable the grid



- **Virtual Organization**

“A set of individuals and / or institutions defined by highly controlled sharing rules, with resource providers and consumers defining clearly and carefully just what is shared, who is allowed to share and the conditions under which sharing occurs”

*Ian Foster*

- **Abstract entities grouping users, institutions and resources in the same administrative domain**

- ↳ **What is going to be shared ?**

- ✓ resources

- ✓ software

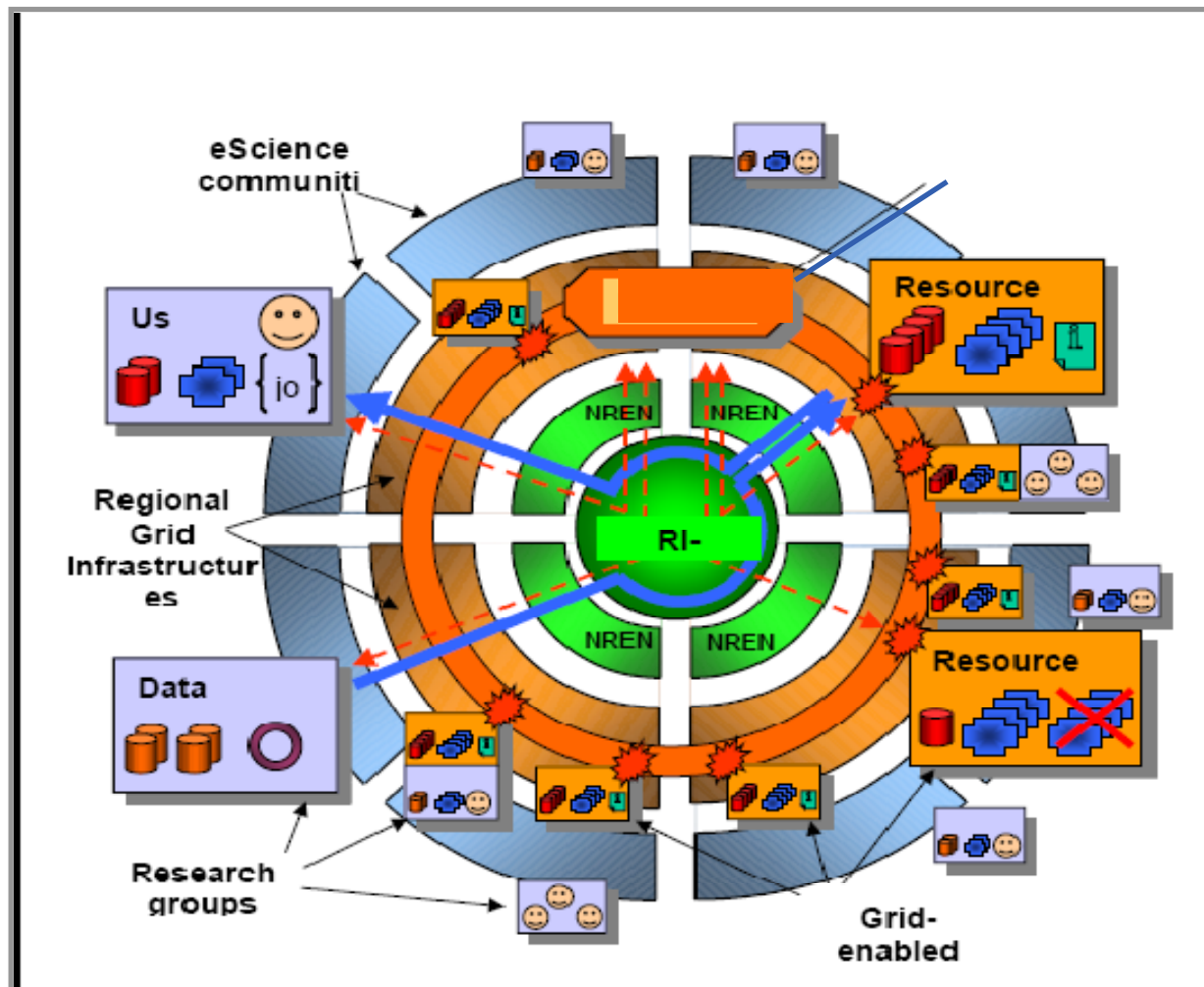
- ✓ special equipment

- ✓ licenses








- ✓ services

- ✓ Internet bandwidth

- Astrophysics, astro-particle physics
- Biomedical and Bioinformatic Applications
- Computational chemistry
- Earth sciences
- Finance
- Fusion
- Geophysics
- High-energy physics
- Infrastructure
- Other ...
  
- Our regional VO: SEE
- VO for trainings : hgdemo
  
- **List of existing VOs**
  - <http://cic.gridops.org/index.php?section=home&page=volist#1>



### Key

-  User
-  Storage
-  CPU/processing
-  Information
-  Instrumentation
-  User data flow
-  Requests, information, monitoring and control





“GÉANT2 is the seventh generation of pan-European research and education network, successor to the pan-European multi-gigabit research network GÉANT”



European Commission  
Information Society  
and Media

<http://www.geant2.net/>

- The project officially started on 1 September 2004 and will continue to take place for the next 4 years
- The project is supported by the European Committee and by 30 European National Research and Education Networks (NRENs) in 34 countries and is administrated by DANTE (*Delivery of Advanced Network Technology to Europe*).
- It provides services of high quality and readability in the European Education and Research community and connects all the National Research Networks of European Union, Centre and East Europe, Israel and Cyprus

- **It provides:**
  - Basic IPs services
  - Quality of service levels
- **Two main services:**
  - Routed (Internet) and switched (L1-L2)
- **Backbone mixed:**
  - Part of will be based on dark fiber
  - Part of it on leased services
- **Greece interconnection:**
  - 2 \* 10Gbps lambdas

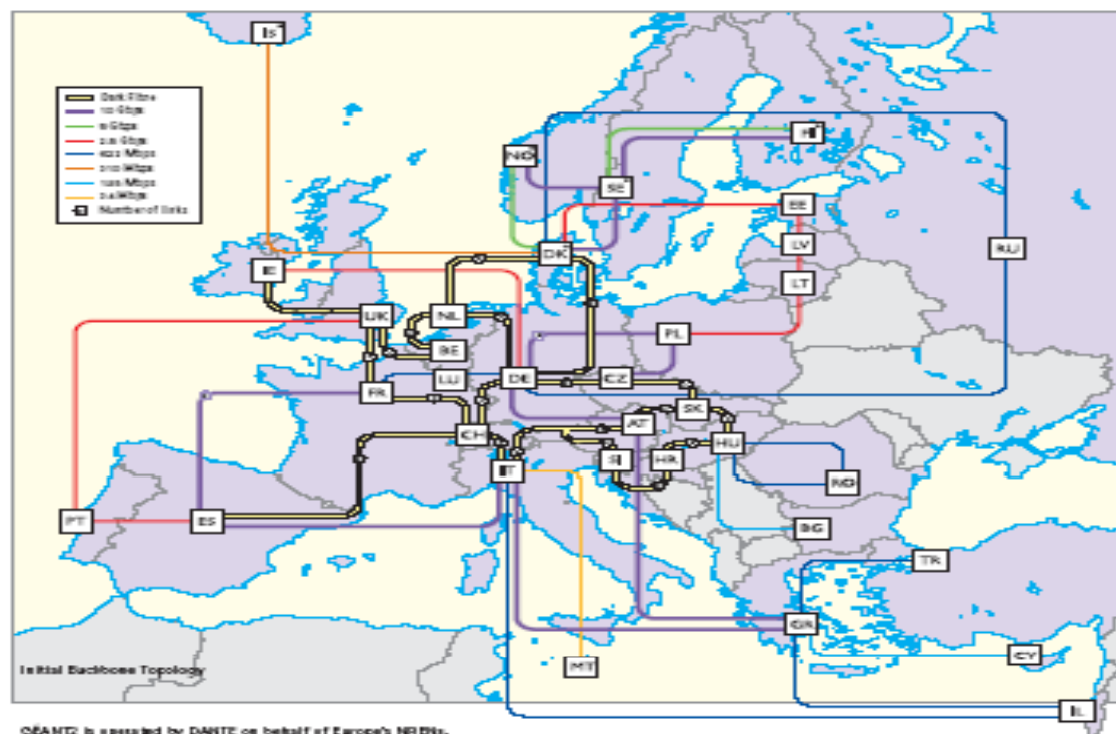


## GÉANT2



The world-leading research and education network for Europe.

★ Connect ★ Communicate ★ Collaborate



GÉANT2 is operated by DANTE on behalf of Europe's NRENs.

AT Austria	BE Belgium	CH Switzerland	CY Cyprus	DE Germany	DK Denmark	EE Estonia	ES Spain	FR France	GR Greece	HR Croatia	HU Hungary	IE Ireland	IL Israel	IS Iceland	IT Italy	LT Lithuania	LV Latvia	LU Luxembourg	MT Malta	NL Netherlands	NO Norway	PL Poland	PT Portugal	RO Romania	RU Russia	SE Sweden	SI Slovenia	SK Slovakia	TR Turkey	UK United Kingdom
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GÉANT2 is co-funded by the European Commission  
its 6th R&D Framework Programme.



- **EGEE objective:**

*“to establish a seamless European Grid infrastructure for the support of the European Research Area (ERA)”*

- **EGEE:**

- Accomplished all of its objectives
- Scope expanded beyond Europe



- **EGEE-II start:**

- Full capacity from day one
- Large-scale, production-quality infrastructure
- Supporting a wide range of applications
- Staff with extensive knowledge of Grid technology

- **EGEE-II aims to provide a production quality Grid infrastructure across the European Research Area and beyond.**

↪ Started on 1 April 2006

↪ Available infrastructure to the Research and Academic community 24 hours per day and 7 days per week

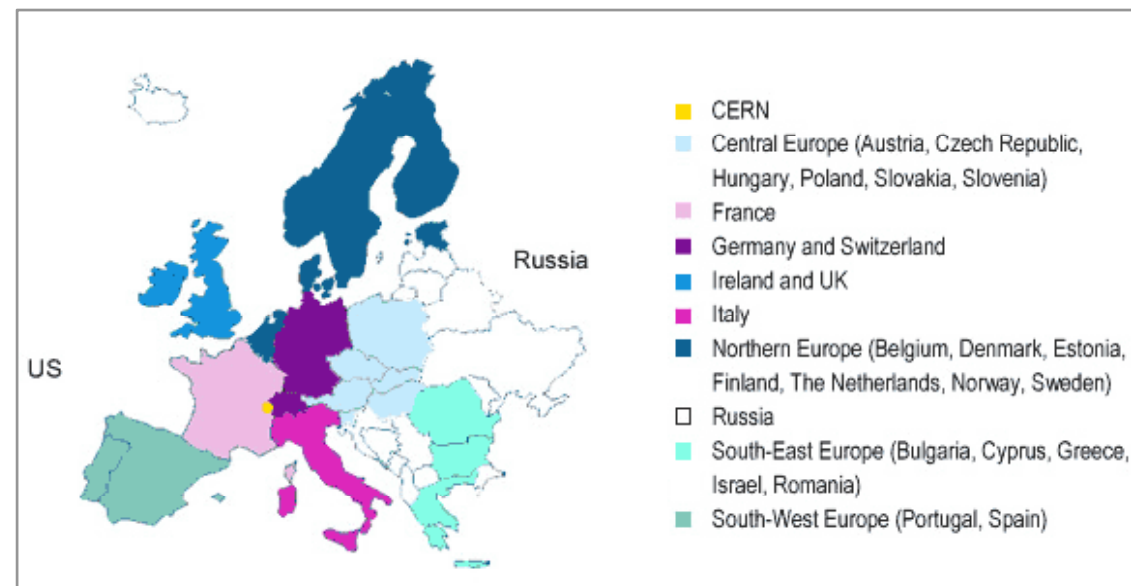
↪ Participants:

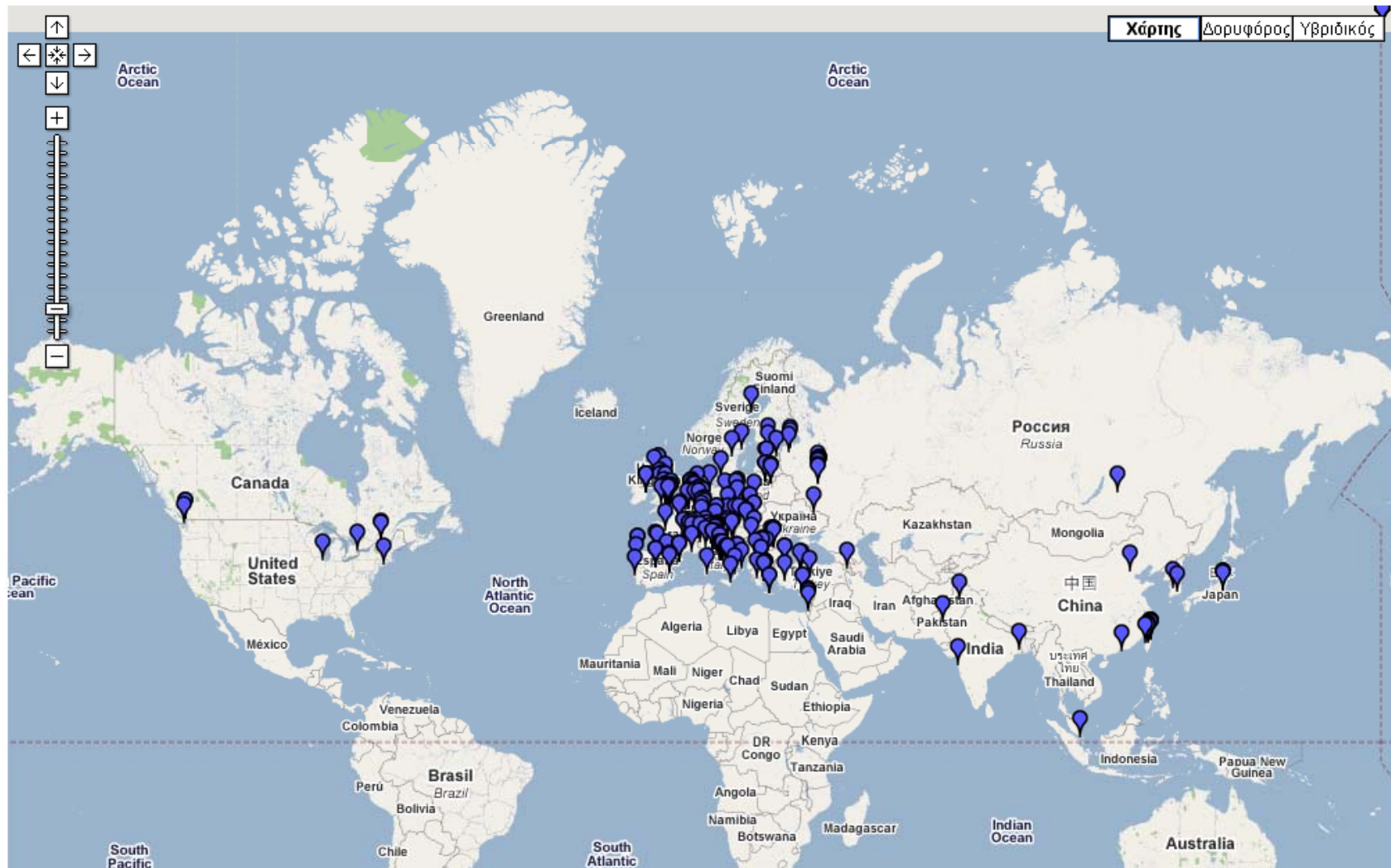
- ✓ 240+ institutions
- ✓ 45 countries

↪ Consists of:

- ✓ 202 sites
- ✓ ≈41.000 CPUs
- ✓ ≈5 PB
- ✓ 100,000 concurrent jobs

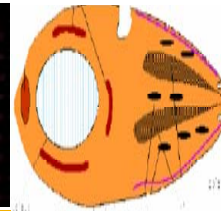
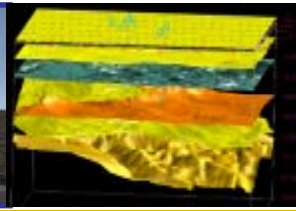
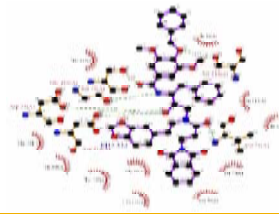
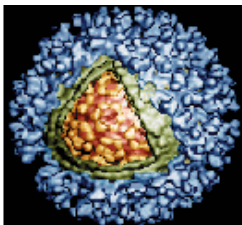
- <http://www.eu-egee.org/>





- Information about sites: <http://goc.grid.sinica.edu.tw/gstat/>

- **Mission:**
  - ✓ Manage and operate production Grid infrastructure for the European Research Area
  - ✓ Interoperate with e-Infrastructure projects around the globe (Open Standards-GGF) and Contribute to Grid standardisation efforts
  - ✓ Incorporate new users from the industry and from the research community as well assuring the best possible training and support
- **Support applications deployed from diverse scientific communities:**
  - ✓ High Energy Physics
  - ✓ Earth Sciences
  - ✓ Computational Chemistry
  - ✓ Fusion
  - ✓ Biomedicine
  - ✓ Astrophysics
  - ✓ Finance, Multimedia
  - ✓ Geophysics
  - ...
- Prepare for a permanent/sustainable European Grid Infrastructure (in a GÉANT2-like manner)



- **Networking activities**

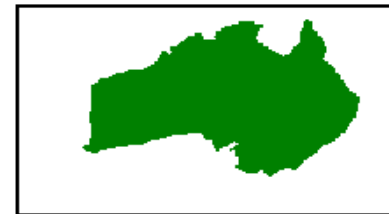
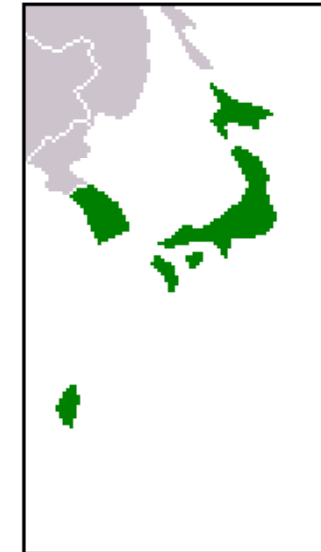
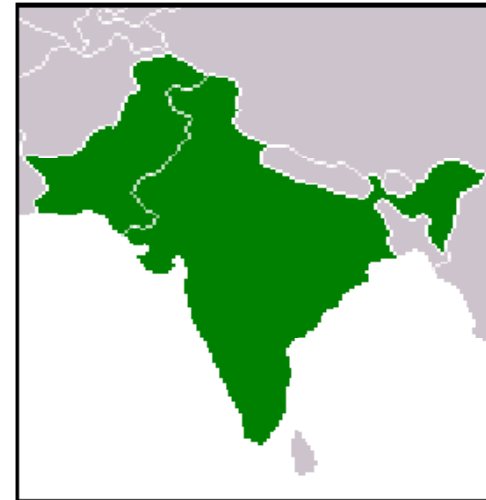
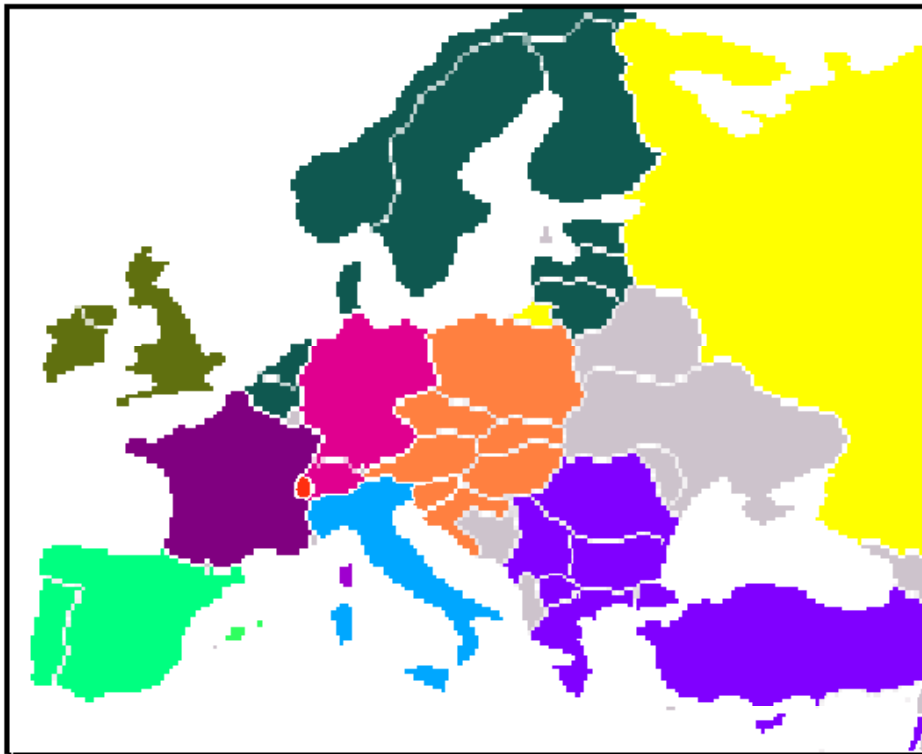
Include NA1 (Project Management), NA2 (Dissemination, Outreach and Communication), NA3 (User Training and Induction), NA4 (Application Identification and Support), and NA5 (Policy and International Cooperation)

- **Service activities**

Consist of SA1 (European Grid Operations, Support and Management), SA2 (Networking Support) and SA3 (Middleware Integration, Testing and Certification) combining software elements from a variety of sources to provide integrated releases for deployment on the infrastructure

- **Joint Research activities**

JRA1 (Middleware Re-Engineering) will continue to develop and support the gLite middleware and JRA2 (Quality Assurance) will manage quality throughout the project, including overall security and coordination.



## Regional Operations Centres (ROC)

- Front-line support for user and operations issues
- Provide local knowledge and adaptations
- One in each region – many distributed

## User Support Centre (GGUS)

- In FZK: provide single point of contact (service desk), portal

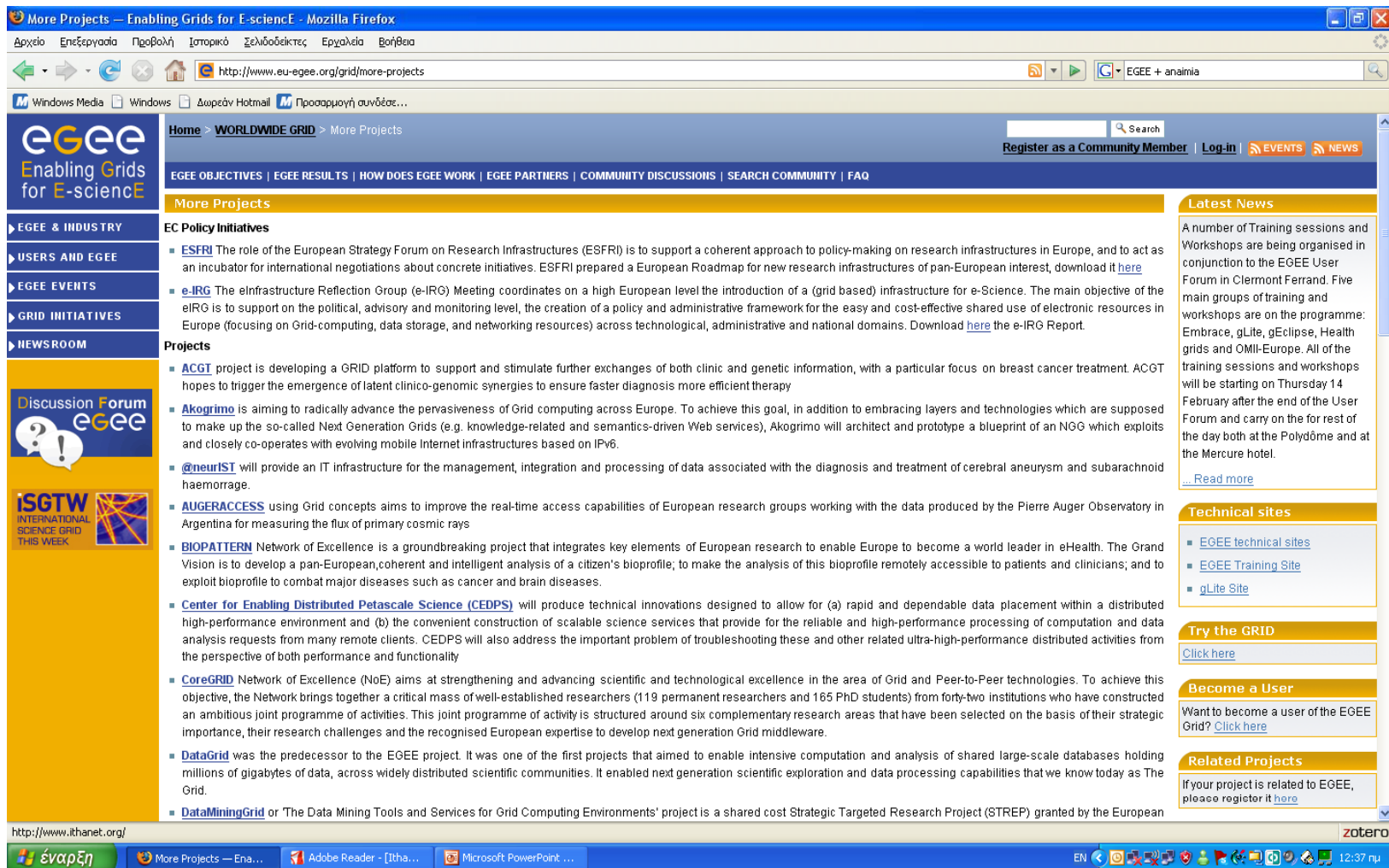
• <https://gus.fzk.de/pages/home.php>



- **Part of the EGEE project**
- **Next generation middleware for grid computing**
- **In its development participate from different academic and industrial European centers**
- *Provides services for computing element, data management, accounting, logging and bookeping, information and monitoring, service discovery, security, workload management*



• <http://www.eu-egee.org/grid/more-projects>

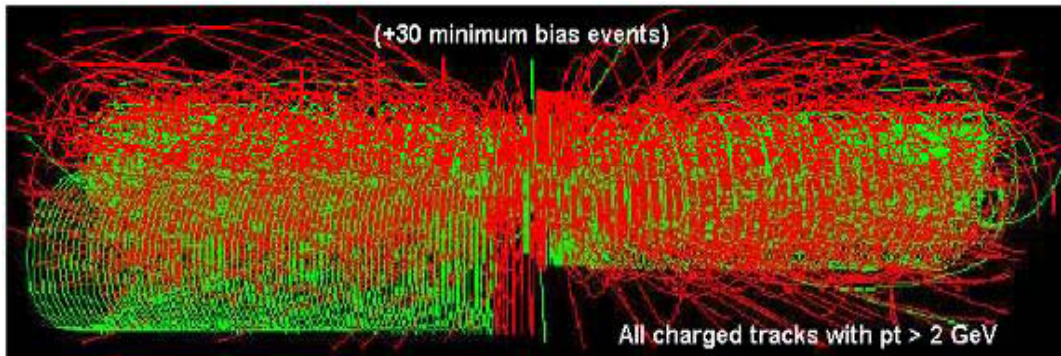


The screenshot shows the 'More Projects' page on the EGEE website. The page is titled 'More Projects - Enabling Grids for E-science' and is viewed in Mozilla Firefox. The browser's address bar shows the URL 'http://www.eu-egee.org/grid/more-projects'. The website's navigation menu includes 'Home', 'WORLDWIDE GRID', and 'More Projects'. The main content area is divided into several sections:

- EGEE OBJECTIVES | EGEE RESULTS | HOW DOES EGEE WORK | EGEE PARTNERS | COMMUNITY DISCUSSIONS | SEARCH COMMUNITY | FAQ**
- More Projects**
  - EC Policy Initiatives**
    - ESFRI**: The role of the European Strategy Forum on Research Infrastructures (ESFRI) is to support a coherent approach to policy-making on research infrastructures in Europe, and to act as an incubator for international negotiations about concrete initiatives. ESFRI prepared a European Roadmap for new research infrastructures of pan-European interest, download it [here](#)
    - e-IRG**: The Infrastructure Reflection Group (e-IRG) Meeting coordinates on a high European level the introduction of a (grid based) infrastructure for e-Science. The main objective of the eIRG is to support on the political, advisory and monitoring level, the creation of a policy and administrative framework for the easy and cost-effective shared use of electronic resources in Europe (focusing on Grid-computing, data storage, and networking resources) across technological, administrative and national domains. Download [here](#) the e-IRG Report.
  - Projects**
    - ACGT**: project is developing a GRID platform to support and stimulate further exchanges of both clinic and genetic information, with a particular focus on breast cancer treatment. ACGT hopes to trigger the emergence of latent clinico-genomic synergies to ensure faster diagnosis more efficient therapy
    - Akogrimo**: is aiming to radically advance the pervasiveness of Grid computing across Europe. To achieve this goal, in addition to embracing layers and technologies which are supposed to make up the so-called Next Generation Grids (e.g. knowledge-related and semantics-driven Web services), Akogrimo will architect and prototype a blueprint of an NGG which exploits and closely co-operates with evolving mobile Internet infrastructures based on IPv6.
    - @neurIST**: will provide an IT infrastructure for the management, integration and processing of data associated with the diagnosis and treatment of cerebral aneurysm and subarachnoid haemorrhage.
    - AUGERACCESS**: using Grid concepts aims to improve the real-time access capabilities of European research groups working with the data produced by the Pierre Auger Observatory in Argentina for measuring the flux of primary cosmic rays
    - BIOPATTERN**: Network of Excellence is a groundbreaking project that integrates key elements of European research to enable Europe to become a world leader in eHealth. The Grand Vision is to develop a pan-European, coherent and intelligent analysis of a citizen's bioprofile; to make the analysis of this bioprofile remotely accessible to patients and clinicians; and to exploit bioprofile to combat major diseases such as cancer and brain diseases.
    - Center for Enabling Distributed Petascale Science (CEDPS)**: will produce technical innovations designed to allow for (a) rapid and dependable data placement within a distributed high-performance environment and (b) the convenient construction of scalable science services that provide for the reliable and high-performance processing of computation and data analysis requests from many remote clients. CEDPS will also address the important problem of troubleshooting these and other related ultra-high-performance distributed activities from the perspective of both performance and functionality
    - CoreGRID**: Network of Excellence (NoE) aims at strengthening and advancing scientific and technological excellence in the area of Grid and Peer-to-Peer technologies. To achieve this objective, the Network brings together a critical mass of well-established researchers (119 permanent researchers and 165 PhD students) from forty-two institutions who have constructed an ambitious joint programme of activities. This joint programme of activity is structured around six complementary research areas that have been selected on the basis of their strategic importance, their research challenges and the recognised European expertise to develop next generation Grid middleware.
    - DataGrid**: was the predecessor to the EGEE project. It was one of the first projects that aimed to enable intensive computation and analysis of shared large-scale databases holding millions of gigabytes of data, across widely distributed scientific communities. It enabled next generation scientific exploration and data processing capabilities that we know today as The Grid.
    - DataMiningGrid** or 'The Data Mining Tools and Services for Grid Computing Environments' project is a shared cost Strategic Targeted Research Project (STREP) granted by the European
- Latest News**
  - A number of Training sessions and Workshops are being organised in conjunction to the EGEE User Forum in Clermont Ferrand. Five main groups of training and workshops are on the programme: Embrace, gLite, gEclipse, Health grids and OMII-Europe. All of the training sessions and workshops will be starting on Thursday 14 February after the end of the User Forum and carry on the for rest of the day both at the Polydôme and at the Mercure hotel. [... Read more](#)
- Technical sites**
  - [EGEE technical sites](#)
  - [EGEE Training Site](#)
  - [gLite Site](#)
- Try the GRID**
  - [Click here](#)
- Become a User**
  - Want to become a user of the EGEE Grid? [Click here](#)
- Related Projects**
  - If your project is related to EGEE, please register it [here](#)

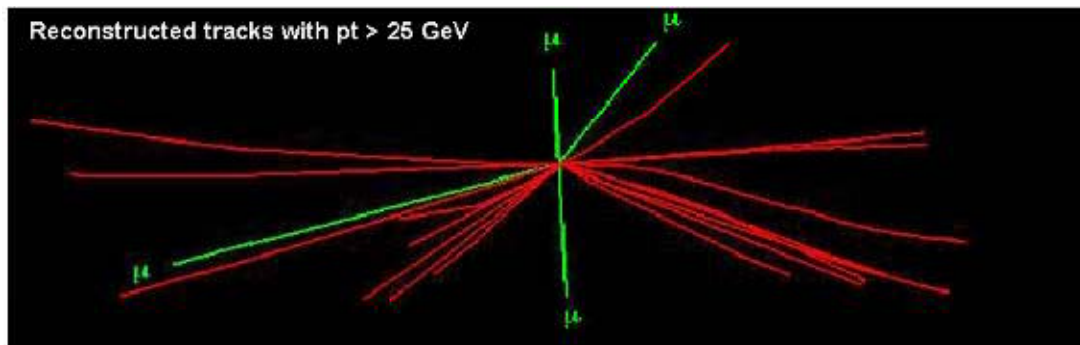
The page also features a sidebar with 'Discussion Forum EGEE' and 'ISGTW INTERNATIONAL SCIENCE GRID THIS WEEK' logos. The browser's taskbar at the bottom shows the system tray with the time 12:37 and the language set to EN.

Starting from this event (particle collision) ...



- ✓ Data Collection
- ✓ Data Storage
- ✓ Data Processing

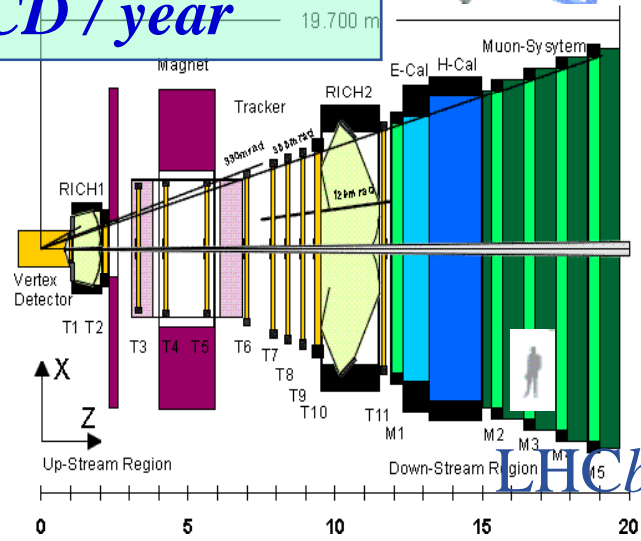
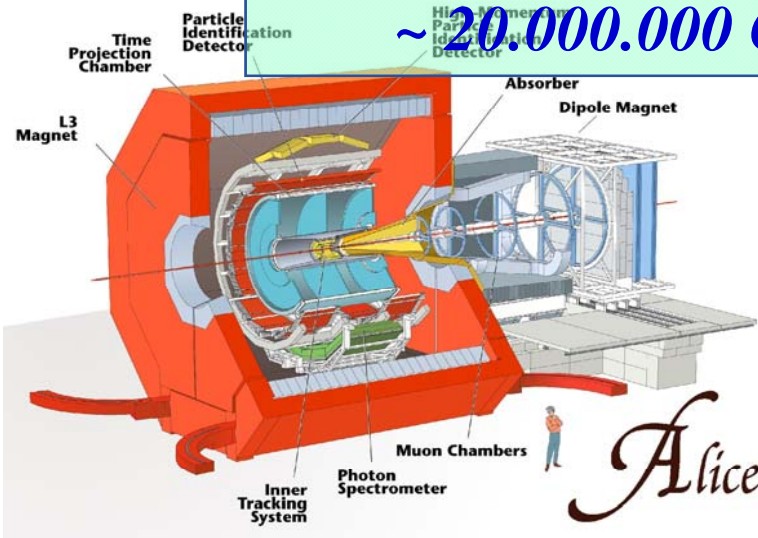
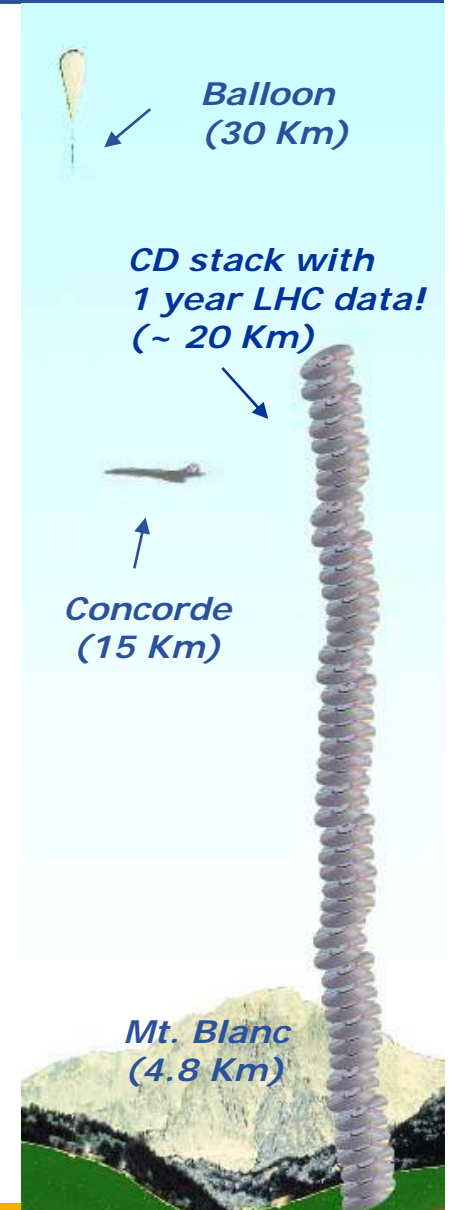
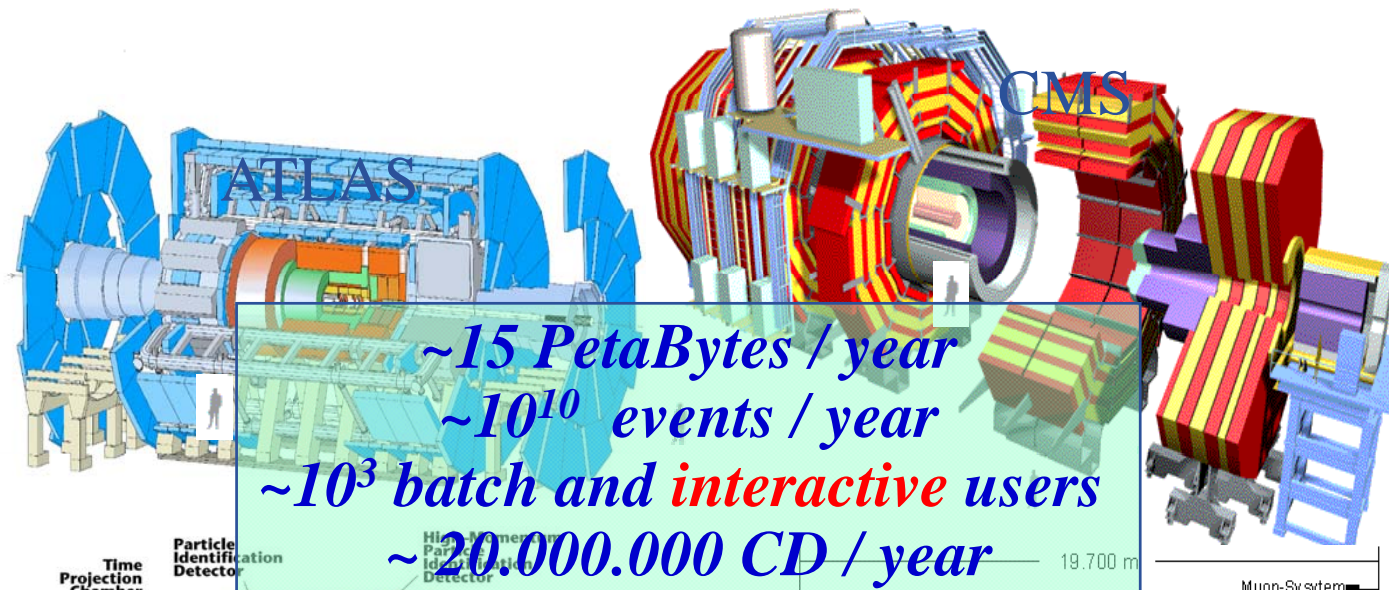
You are looking for this “signature”...



• *Selectivity: 1 in 10<sup>13</sup>*

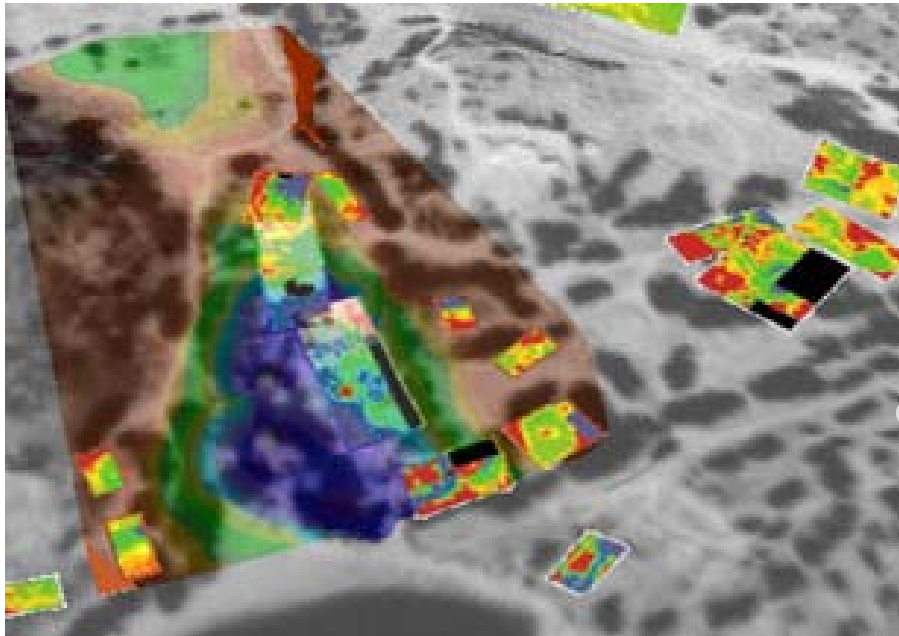
✓ *Like looking for 1 person in a thousand world populations!*

✓ *Or for a needle in 20 million haystacks!*



- The LHC Computing Grid Project (LCG) was born to prepare the computing infrastructure for the simulation, processing and analysis of the data of the Large Hadron Collider (LHC) experiments.
- ⇒ The processing of the enormous amount of data, that will be generated, will require large computational and storage resources and the associated human resources for operation and support.
- ⇒ Preparation of a common infrastructure of
  - ✓ libraries
  - ✓ tools
  - ✓ frameworks
 required to support the physics application software



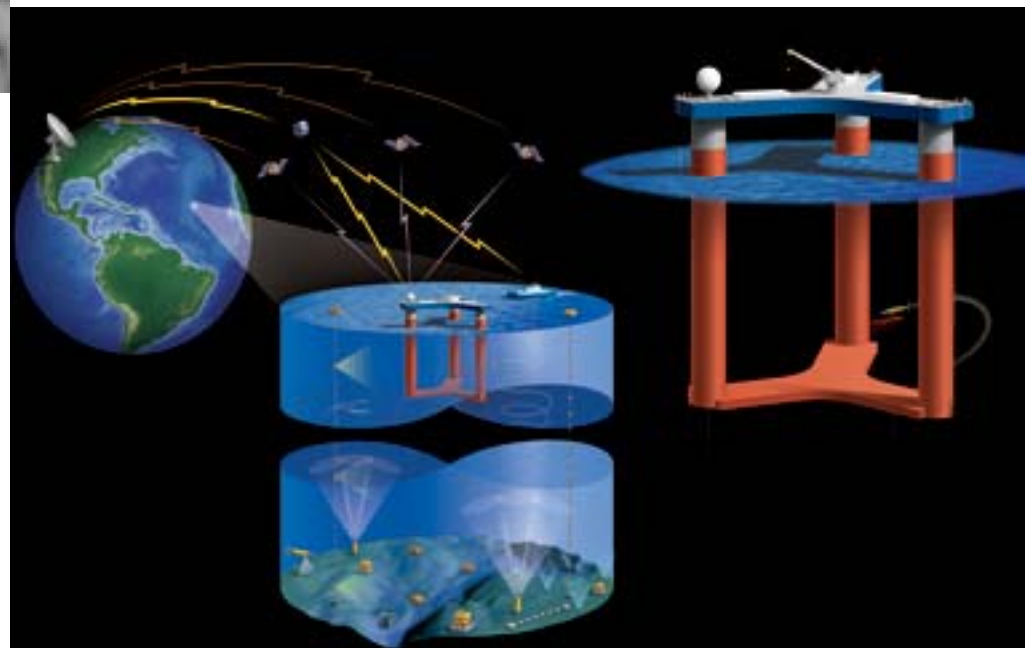


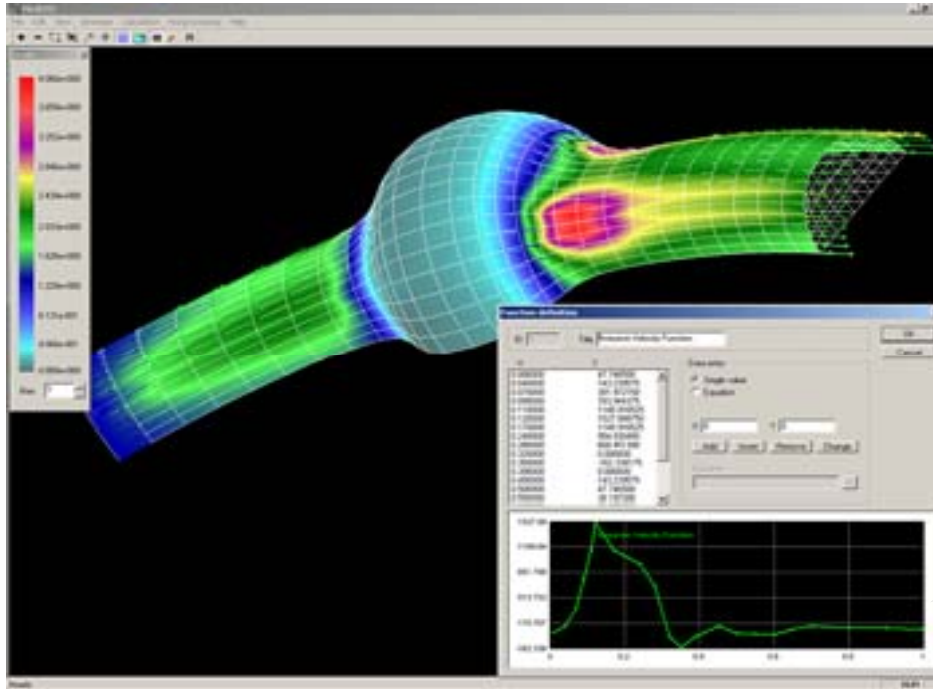
## ArchaeoGrid

Create a computer model that weaves together data from many sources and predicts feedback interaction

## LOOKING

Observe and analyze data streams in real time. A sensor grid with thousand of different sensors providing real time data and measurements from ocean-going researchers enabling an enormous data grid infrastructure.



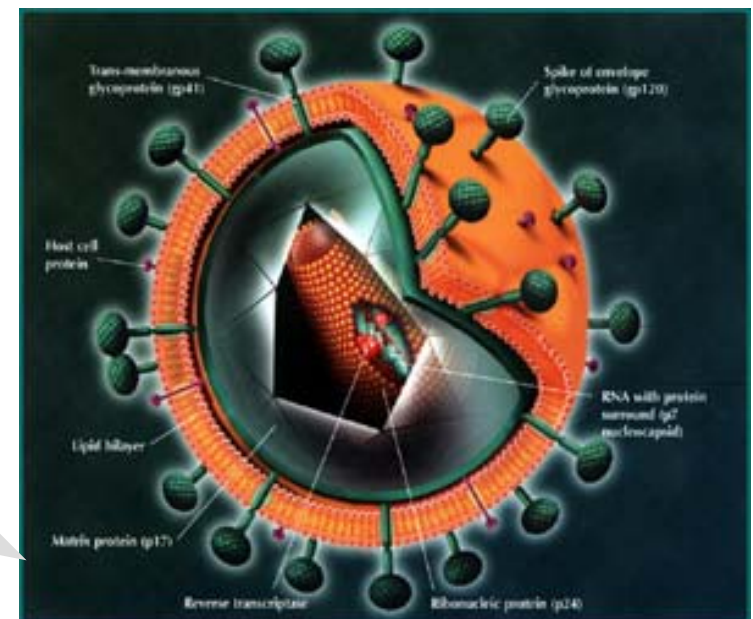


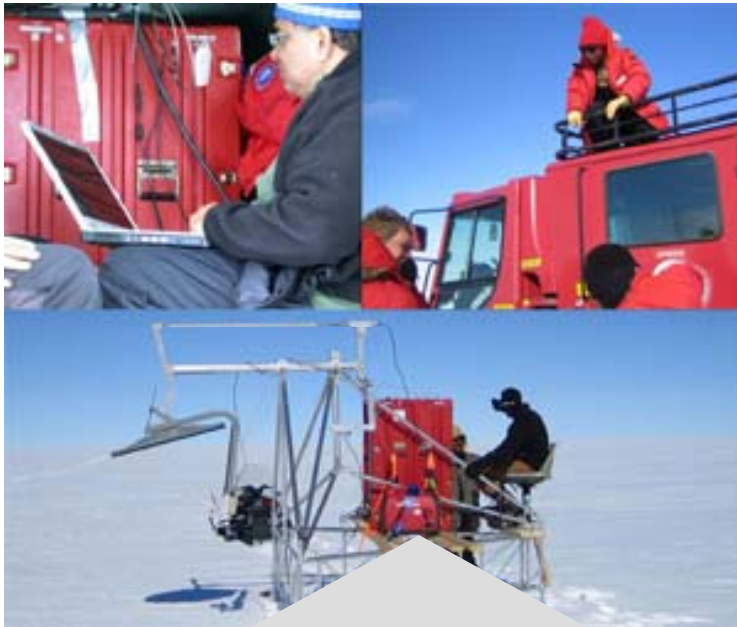
## Parallel Blood Flow Simulation

Allows surgeons to perform virtual stent surgery until they get it just right. It combines parameters such as blood velocity and pressure with a series of medical images to automatically create a 3D computational model.

## ViroLab

Aims to create a collaborative virtual laboratory for grid-based decision support for viral disease treatment. HIV treatment in the increasingly common case of HIV drug resistance is mainly studied. ViroLab “vertically” integrates biomedical information relating to viruses, patients and literature resulting in a rule-based decision support system for drug ranking.





## Polar Grid

A planned project for an advance cyberinfrastructure, empowering smaller universities, and provide scientists with a gateway to teraflops of power: enough to drive new and improved high-performance simulations and enable measurement and prediction of ice sheet response to climate change and effect on ocean levels.

Image © [Electronic Arts Inc.](#)  
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## MoSES (Modelling and Simulation for e-Social Science)

Runs predictive models integrating real Census data, survey data, healthcare data of UK population. Determine the impact of different policy decisions and various social aspects like increasing life expectancy, immigration, aging population.



- **Operating system:**
  - Linux (+GNU utilities), usually a RHEL3-like, for example Scientific Linux 3.0.7, Fedora Core 3, etc
- **Middleware:**
  - gLite v3.0 (LCG)
- **Libraries and Applications**
  - Defined by the system and VOs administrators' foresight
  - The user can install and execute its own programmes

**Each VO according to its needs installs experimental software:**

- **ATLAS: atlas software (a big collection, v12.2.0 etc)**
- **CMS: cmkin, cobra, famos, geometry, ignominy, orca, oscar**
- **ALICE: alien, alice, root, proof**
- **LHCb: dirac, boole, DC, decfiles, gauss, paramfiles**
- **BIOMED: gate, cdss, gps@, gromacs, simri3d, gptm3d**
- **ESR: (earth science specific... eg, idl package)**
  
- **The users can negotiate with their VOs for the installation of needed software**



• <http://www.grid.auth.gr/pki/seegrid-ca/>

GridAUTH Operations Center

On July 2007, the GridAUTH Operations Center of the Aristotle University of Thessaloniki, implemented the SeeGrid Certification Authority, in order to facilitate the needs for Grid computing in the wider area of the Balkans.

The scope of the SeeGrid CA is to provide PKI services to the SEE countries - members of the SeeGrid project - that did not have the opportunity to establish their own national grid PKI infrastructure.

The SeeGrid CA is operated by the GridAUTH Operations Center at the Aristotle University of Thessaloniki under the supervision of GRNET as the SeeGrid Coordinator. GRNET is owned and supervised by the General Secretariat of Research and Technology, Greek Ministry of Development.

Find more info in the SeeGrid CA CP/CPS

Navigation: Main Page, Community portal, Current events, Recent changes, Random page, Help, Donations

Search: Go, Search

Toolbox: What links here, Related changes, Upload file, Special pages, Printable version, Permanent link

Interesting Links: The SEE-GRID project, The EGEE project, EGEE-SEE, The European Grid Policy Management Authority (euGridPMA)

EGEE Enabling Grids for E-science

SEE-GRID Wiki

Contents (hide)

- 1 News
- 2 SEEGRID Infrastructure
  - 2.1 Monitoring and Operational tools
  - 2.2 Core Services
- 3 Site Admins
  - 3.1 For new sites
  - 3.2 Site Installation and Configuration
    - 3.2.1 Middleware guides
    - 3.2.2 Configuration guides
  - 3.3 Site certification Procedure
  - 3.4 Installation of Specific Services and Tools
  - 3.5 Middleware Assessments
- 4 Users
  - 4.1 User Tools
- 5 Developers
- 6 SEEGRID Operations Organization and Procedures
  - 6.1 SEEGRID Operations
  - 6.2 CA, RA
  - 6.3 Support Organization
  - 6.4 Security Incidence Response
- 7 FAQs
  - 7.1 For Site Admins
  - 7.2 For Users
- 8 Contacts

• [http://wiki.egee-see.org/index.php/SEE-GRID\\_Wiki](http://wiki.egee-see.org/index.php/SEE-GRID_Wiki)

EGEE Enabling Grids for E-science South East Europe

Path: Home page > Documentation > User documentation

Home page

News

Organization and Contacts

Documentation

Grid status

Security

Support

Per-country Grid Initiatives

Events

Training

Newsletter

Advanced Courses

Search

Google search

User Documentation

Overview

Does the Grid sound complex and obscure? Want to know more? For complete beginners, please have a look at this introduction from CERN: <http://gridcafe.web.cern.ch/gridcafe/>

The following pages guide you through the process of using the Grid. The instructions cover three different kinds of perspective users:

1. New experimental users; and application.
2. New production users; those new to the regional Grid.
3. Experienced production users of the regional Grid.

Also, this document gives the acceptable usage of the Grid.

The general documentation for user access to the Grid is available at [sa1.web.cern.ch/egee-sa1/using.htm](http://sa1.web.cern.ch/egee-sa1/using.htm). Refer to this page if you are not familiar with how to access the grid.

If you are a cluster administrator (and want to know more about the Grid) refer to the Europe cluster RC Administrator's documentation [here](#)

• EGEE Helpdesk:

• <https://helpdesk.egee-see.org/index2.php>

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

This is the web user interface of the VOMS Admin service for the seegrid VO. It provides services relating to VO membership for VO users and VO managers.

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

Navigation: 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

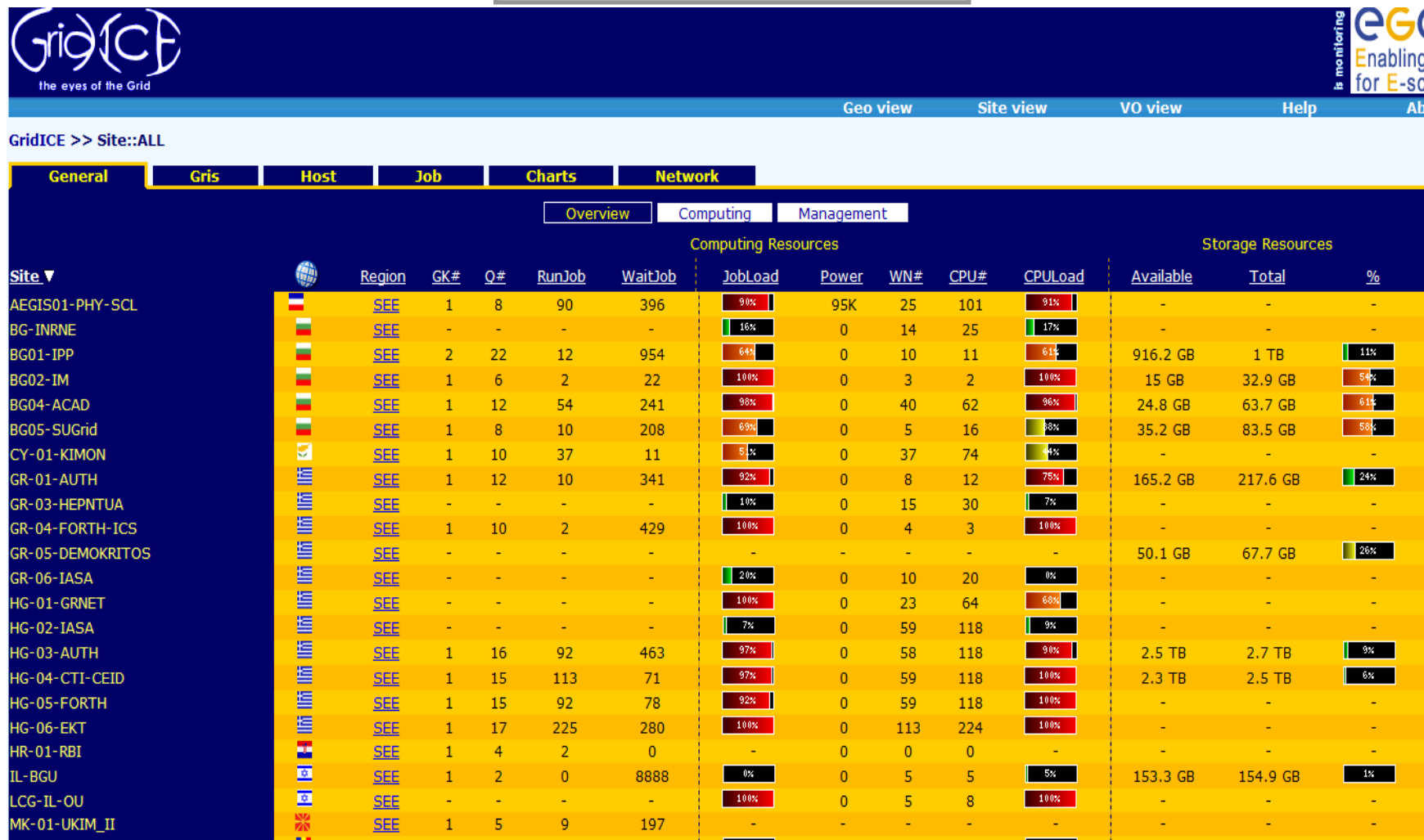
VOMS Admin 1.2.14  
Release 1  
Copyright © 2007, 2008, 2009, 2010

You are logged in as "7C=GR/O=HellasGrid/OU=ntua.gr/CN=Athanasia Assiki" certified by "7C=GR/O=HellasGrid/CN=HellasGrid CA".

• [http://www.egee-see.org/User\\_documentation.php](http://www.egee-see.org/User_documentation.php)

• <https://voms.irb.hr:8443/edg-voms-admin/seegrid/index.html>

<http://mon.egee-see.org>



The screenshot shows the GridICE monitoring interface for the SEE region. It features a navigation bar with 'Geo view', 'Site view', 'VO view', 'Help', and 'About'. Below the navigation bar, there are tabs for 'General', 'Grids', 'Host', 'Job', 'Charts', and 'Network'. Under the 'Grids' tab, there are sub-tabs for 'Overview', 'Computing', and 'Management'. The main content area displays a table of computing resources, categorized into 'Computing Resources' and 'Storage Resources'.

Site	Region	GK#	Q#	RunJob	WaitJob	Computing Resources					Storage Resources		
						JobLoad	Power	WN#	CPU#	CPUload	Available	Total	%
AEGIS01-PHY-SCL	SEE	1	8	90	396	90%	95K	25	101	91%	-	-	-
BG-INSRE	SEE	-	-	-	-	16%	0	14	25	17%	-	-	-
BG01-IPP	SEE	2	22	12	954	64%	0	10	11	61%	916.2 GB	1 TB	11%
BG02-IM	SEE	1	6	2	22	100%	0	3	2	100%	15 GB	32.9 GB	50%
BG04-ACAD	SEE	1	12	54	241	98%	0	40	62	96%	24.8 GB	63.7 GB	61%
BG05-SUGrid	SEE	1	8	10	208	69%	0	5	16	88%	35.2 GB	83.5 GB	58%
CY-01-KIMON	SEE	1	10	37	11	51%	0	37	74	44%	-	-	-
GR-01-AUTH	SEE	1	12	10	341	92%	0	8	12	75%	165.2 GB	217.6 GB	24%
GR-03-HEPNTUA	SEE	-	-	-	-	10%	0	15	30	7%	-	-	-
GR-04-FORTH-ICS	SEE	1	10	2	429	100%	0	4	3	100%	-	-	-
GR-05-DEMOKRITOS	SEE	-	-	-	-	-	-	-	-	-	50.1 GB	67.7 GB	26%
GR-06-IASA	SEE	-	-	-	-	20%	0	10	20	0%	-	-	-
HG-01-GRNET	SEE	-	-	-	-	100%	0	23	64	68%	-	-	-
HG-02-IASA	SEE	-	-	-	-	7%	0	59	118	9%	-	-	-
HG-03-AUTH	SEE	1	16	92	463	97%	0	58	118	90%	2.5 TB	2.7 TB	9%
HG-04-CTI-CEID	SEE	1	15	113	71	97%	0	59	118	100%	2.3 TB	2.5 TB	6%
HG-05-FORTH	SEE	1	15	92	78	92%	0	59	118	100%	-	-	-
HG-06-EKT	SEE	1	17	225	280	100%	0	113	224	100%	-	-	-
HR-01-RBI	SEE	1	4	2	0	-	0	0	0	-	-	-	-
IL-BGU	SEE	1	2	0	8888	0%	0	5	5	5%	153.3 GB	154.9 GB	1%
LCG-IL-OU	SEE	-	-	-	-	100%	0	5	8	100%	-	-	-
MK-01-UKIM_II	SEE	1	5	9	197	-	-	-	-	-	-	-	-



Enabling Grids for E-science

# HellasGrid Infrastructure, Phase I & II

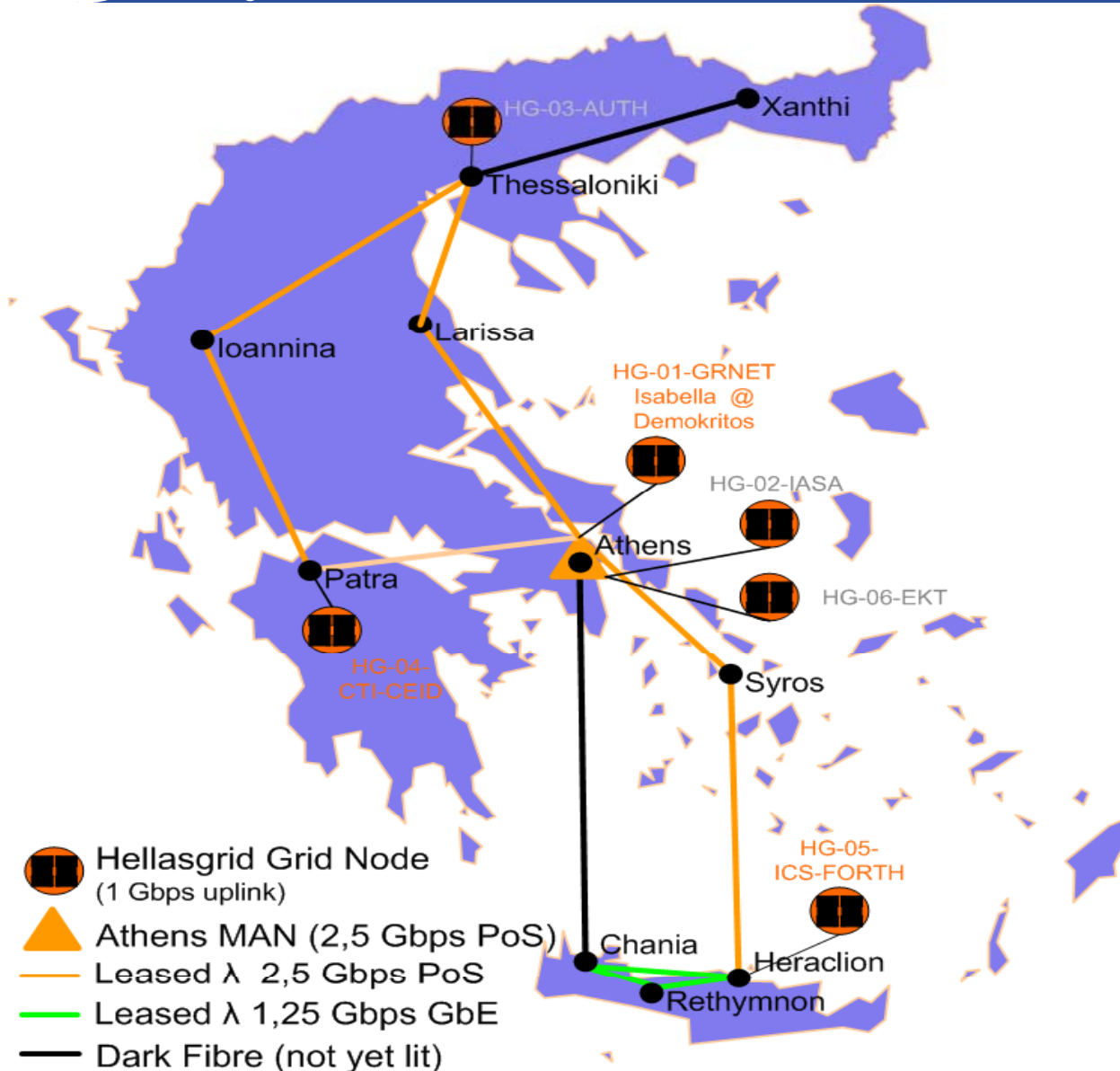
- **HellasGrid I**

- Located at N.C.S.R. Demokritos (a.k.a. Isabella)
- 34 dual Intel **P4 Xeon @ 2.8GHz, 1GB RAM, 2x 70GB SCSI HDD**, 2x Gbit
- IBM FAStT900 Storage Area Network
  - 2x Redundant Fiber Channel Controllers with 1Gbyte Cache each
  - 70x146.8GB= **10,276TB raw storage capability**, over 5 disk shelves
- Tape Library ~30 TBytes, integrated monitoring
- December 2004

- **HellasGrid II**

- 5 sites: EKT (>220), IESSE (48), ΑΠΘ (128), ITE (128), ITY (128)
- ~700 CPUs **x86\_64, 2 GB RAM, 1x 80GB SATA HDD**, 2x Gbit
- ~20 TBytes storage space in SAN (5x 4TBs)
- ~50 TBytes Tape Library in National Documentation Center

<http://www.hellasgrid.gr/>



- Main site: HG-01-GRNET (Isabella, cslab@ICCS/NTUA)
- HG-02...HG-06 sites @ (NDC, IASA, AUTH, FORTH, CTI)
- Smaller sites (AUTH, UoM, FORTH, Demokritos, HEP-NTUA, IASA)



- HG CA and VOMS (AUTH):

<http://www.grid.auth.gr/pki/seegrid-ca/>



- Helpdesk (CTI):

[user-support@hellasgrid.gr](mailto:user-support@hellasgrid.gr)



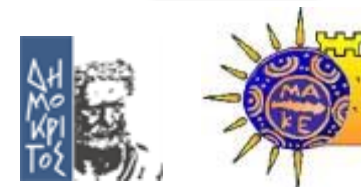
- Regional monitoring tools (FORTH):

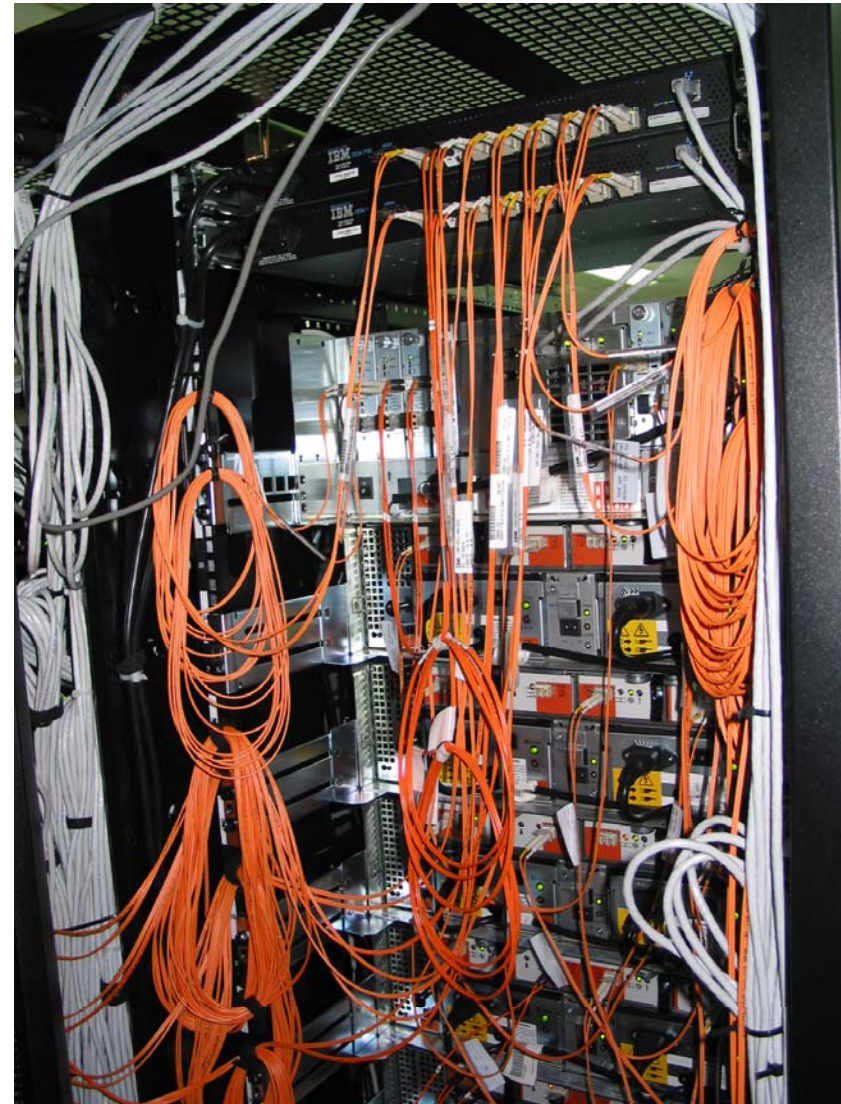
<http://hellasgrid-ui.ics.forth.gr/acctROC/>



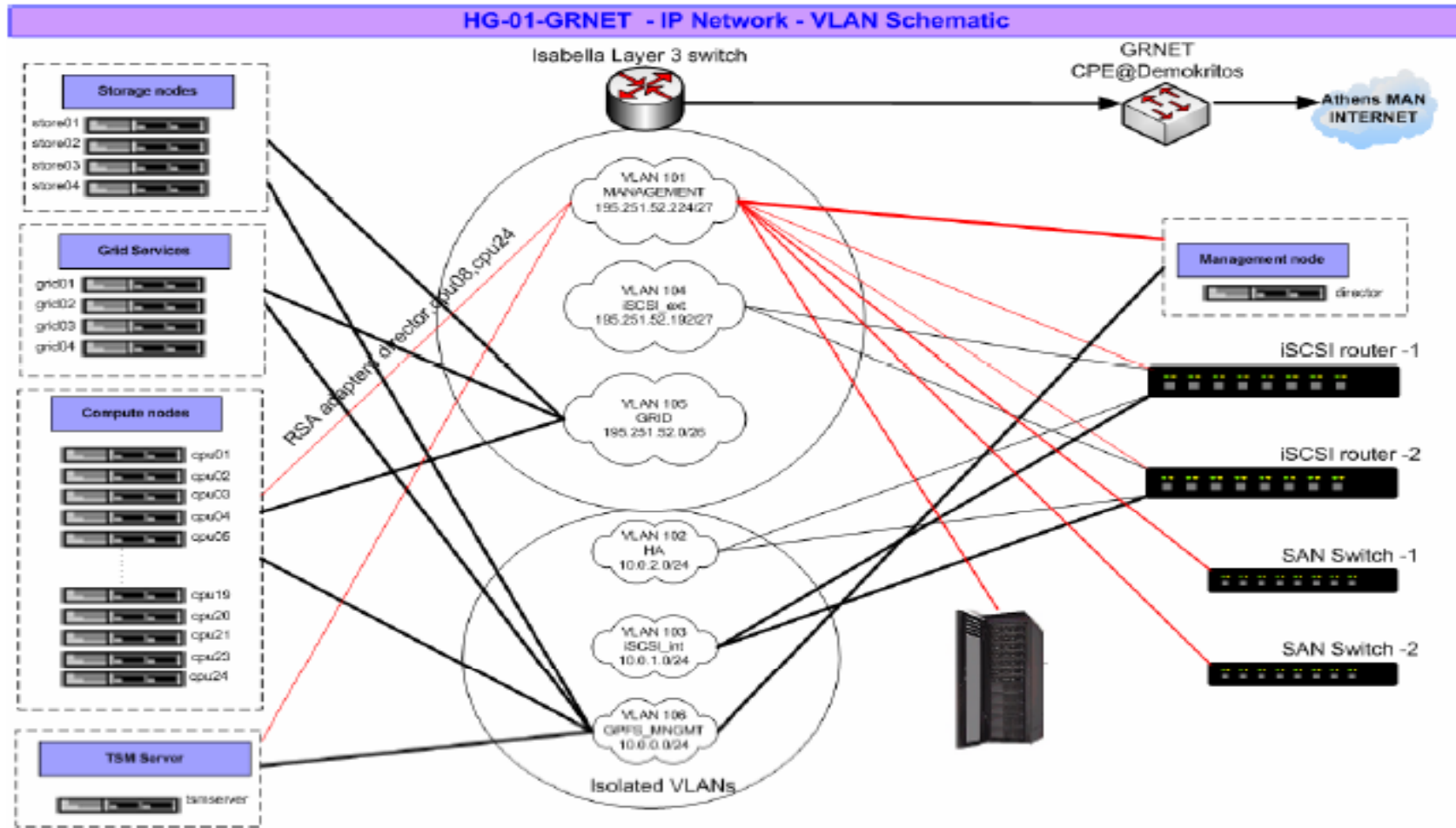
- Apps support (IASA):

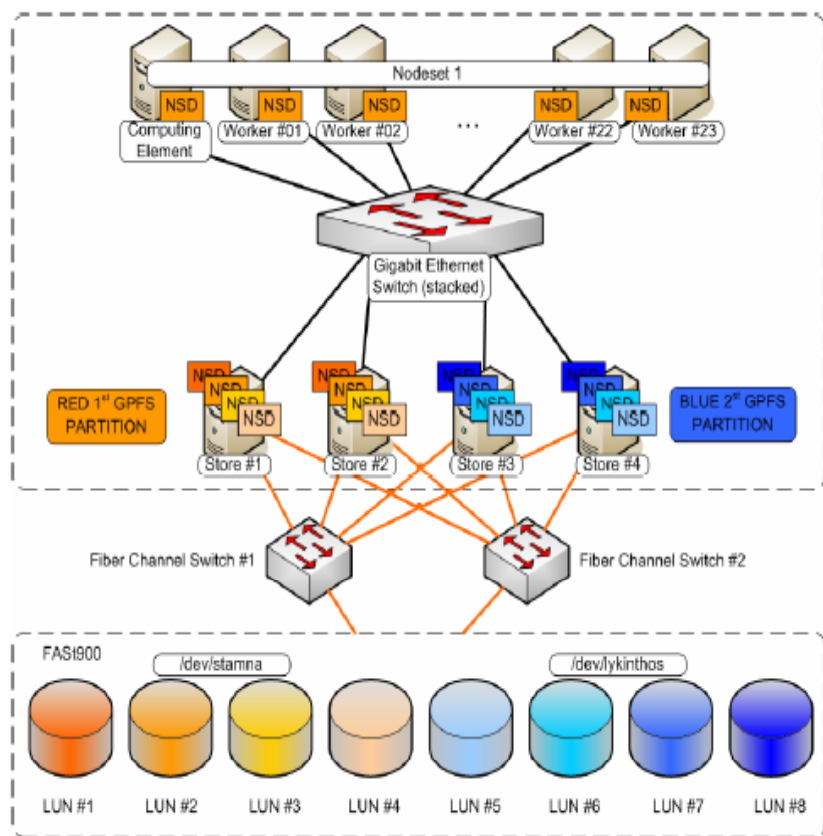
[application-support@hellasgrid.gr](mailto:application-support@hellasgrid.gr)











- The first node of the Greek Grid Infrastructure, consisting a prototype for the next HellasGrid nodes
  - Remarkable and innovative organization of SAN and filesystems
- ⇒ Scientific Linux, gLite 3.0., LCG, MPICH, CODESA3D-1.0, VO-alice, VO-atlas, VO-biomed, VO-dteam, VO-cms, VO-esr, VO-lhcb, VO-see (octave), VO-seegrid

- **Core Services**
  - Central LCG File Catalog (LFC) for the users of the VOs:
    - eumed, hgdemo, see
  - Resource Broker and Information Index (BDII) which can be accessed by the users of the VOs:
    - atlas, alice, lhcb, cms, dteam, sixt, biomed, esr, magic, compchem, see, planck, hgdemo, eumed
  - Catch-All User Interface for HellasGrid
    - Registration is handled through the Hellasgrid User-Support Team
    - UI services are offered by all HG sites
- **Certification Services for new sites (SFTs)**
  - <https://mon.isabella.grnet.gr/sft/lastreport.cgi> (Need a valid HellasGrid Certificate)




- **HG-02-IASA** (Institute of Accelerating Systems and Applications (IASA) (iasa) located in the campus of the University of Athens (uoa) ):
  - ✓ Cluster of 66 Dual CPUs, 4,2 TB SAN Storage
  - ✓ Scientific Linux, gLite 3.0.\_, LCG, VO\_atlas, VO\_cms, VO\_lhcb
- **HG-03-AUTH** (Aristotle University of Thessaloniki (auth) ):
  - ✓ Cluster of 64 Dual CPUs, 4 TB SAN Storage
  - ✓ Scientific Linux, gLite 3.0.\_, LCG, MPICH, VO\_atlas, VO\_lhcb
- **HG-04-CTI-CEID** (Research-Academic Computer Technology Institute (CTI) in Patra )
  - ✓ Cluster of 64 Dual CPUs, 4 TB SAN Storage
  - ✓ Scientific Linux, gLite 3.0.\_, LCG, MPICH, VO\_atlas, VO-biomed, VO\_cms, VO\_lhcb,

- **HG-05-FORTH** (Institute of Computer Science - Foundation for Research and Technology Hellas (ICS-FORTH) ):
  - ✓ Συστοιχία με 64 Dual CPUs (3.4GHz), 4,2 TB SAN Storage
  - ✓ Scientific Linux, gLite 3.0.\_, LCG, VO\_atlas, VO-biomed, VO\_cms, VO\_lhcb,
- **HG-06-EKT** (National Documentation Centre ):
  - ✓ Συστοιχία με 64 Dual CPUs, 4 TB SAN Storage
  - ✓ Scientific Linux, gLite 3.0.\_, LCG, VO\_atlas, VO\_biomed, VO\_lhcb
- Statistics: <http://mon.egee-see.org/gridice/site/site.php>

[https://access.hellasgrid.gr/register/registration\\_form](https://access.hellasgrid.gr/register/registration_form)

Not Logged In



Εγγραφή νέων χρηστών > Φόρμα Εγγραφής Χρήστη

**Διαδικασία**

**Καταχώρηση προσωπικών στοιχείων**

Αίτηση ψηφιακού πιστοποιητικού

Αποστολή αιτήσεως

---

**Επικοινωνία**

GridAUTH Support

Εγγραφή νέου χρήστη




Όνομα	<input type="text" value="Ελληνικά"/> <input type="text" value="Αγγλικά"/>	
Επώνυμο	<input type="text" value="Ελληνικά"/> <input type="text" value="Αγγλικά"/>	
E-mail	<input type="text"/>	
Οργανισμός	<input type="text" value="Ανωτάτη Σχολή Καλών Τεχνών"/>	
Τηλέφωνο εργασίας	<input type="text"/>	
Επιστημονικός τομέας	<input type="text" value="Άλλο"/>	
Τμήμα	<input type="text"/>	
Ιδιότητα	<input type="text" value="Ερευνητής"/>	
<input type="button" value="Καταχώρηση"/>		


Υπάρχοντες Χρήστες

Αν στο παρελθόν είχατε αποκτήσει ψηφιακό πιστοποιητικό από την Α.Π. HellasGrid CA το οποίο έχει πλέον λήξει, συμπληρώστε στο πεδίο που ακολουθεί το e-mail σας για να προχωρήσετε στη διαδικασία αίτησης καινούργιου ψηφιακού πιστοποιητικού.

Αναζήτηση E-mail

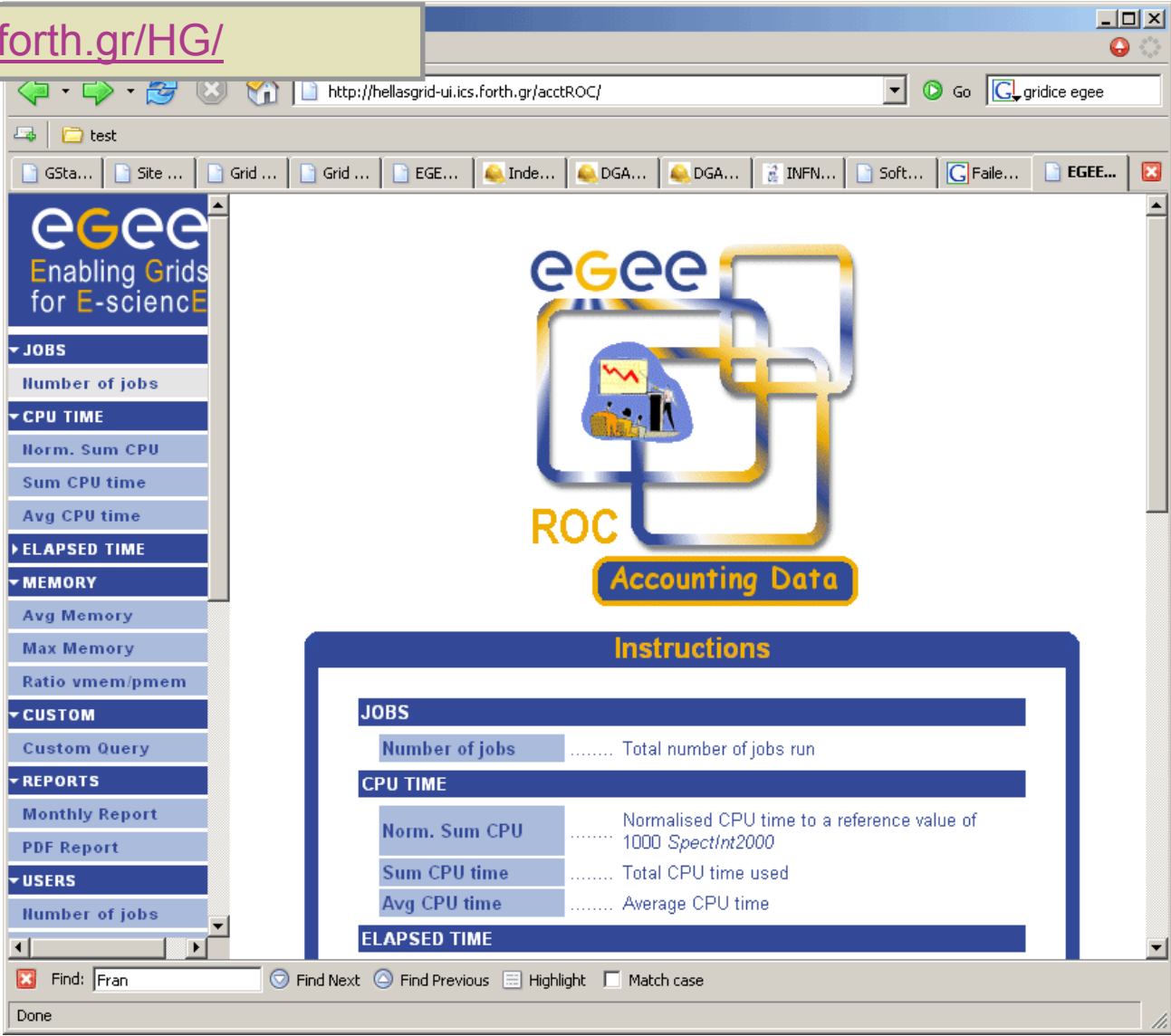
GridAUTH (HellasGrid User Registration)



[www.edet.gr](http://www.edet.gr)

<http://hellasgrid-ui.ics.forth.gr/HG/>



ROC Accounting Data

Instructions

<b>JOBS</b>	
Number of jobs	..... Total number of jobs run
<b>CPU TIME</b>	
Norm. Sum CPU	..... Normalised CPU time to a reference value of 1000 Spect/nt2000
Sum CPU time	..... Total CPU time used
Avg CPU time	..... Average CPU time
<b>ELAPSED TIME</b>	





Thank you!

- **Grid café:**  
<http://gridcafe.web.cern.ch/gridcafe>
- **Open Grid Forum:**  
<http://www.gridforum.org/>
- **HellasGrid Task Force**  
<http://www.hellasgrid.gr/>
- **EGEE (Enabling Grids for E-science)**  
<http://public.eu-egee.org/intro/>
- **The Globus Alliance**  
<http://www.globus.org/>
- **Worldwide LHC Computing Grid**  
<http://goc.grid.sinica.edu.tw/seegridwiki/>
- **Grid Operations Centre**  
<http://goc.grid-support.ac.uk/gridsite/gocmain/>
- **gLite UserGuide**  
<https://edms.cern.ch/file/722398//gLite-3-UserGuide.pdf>

- **EGEE**  
<http://www.eu-egee.org/>
- **EGEE – South East Europe**  
<http://www.egee-see.org/>
- **SEE-GRID**  
<http://www.see-grid.org/>
- **Hellas Grid Task Force**  
<http://www.hellasgrid.gr/>
- **GRNET**  
<http://www.grnet.gr/>
- **gLite**  
<http://glite.web.cern.ch/glite/>
- **SEE-GRID Wiki**  
<http://goc.grid.sinica.edu.tw/seegridwiki/>
- **GOC Wiki**  
<http://goc.grid.sinica.edu.tw/gocwiki/>
- **SEEREN2**  
<http://www.seeren.org/>