



Enabling **G**rids for E-science

# SEE resources in EGEE and next steps

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IPP-BAS

*“gLite middleware Application Developers Course”,  
Plovdiv, Bulgaria, 4.04.2008*

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

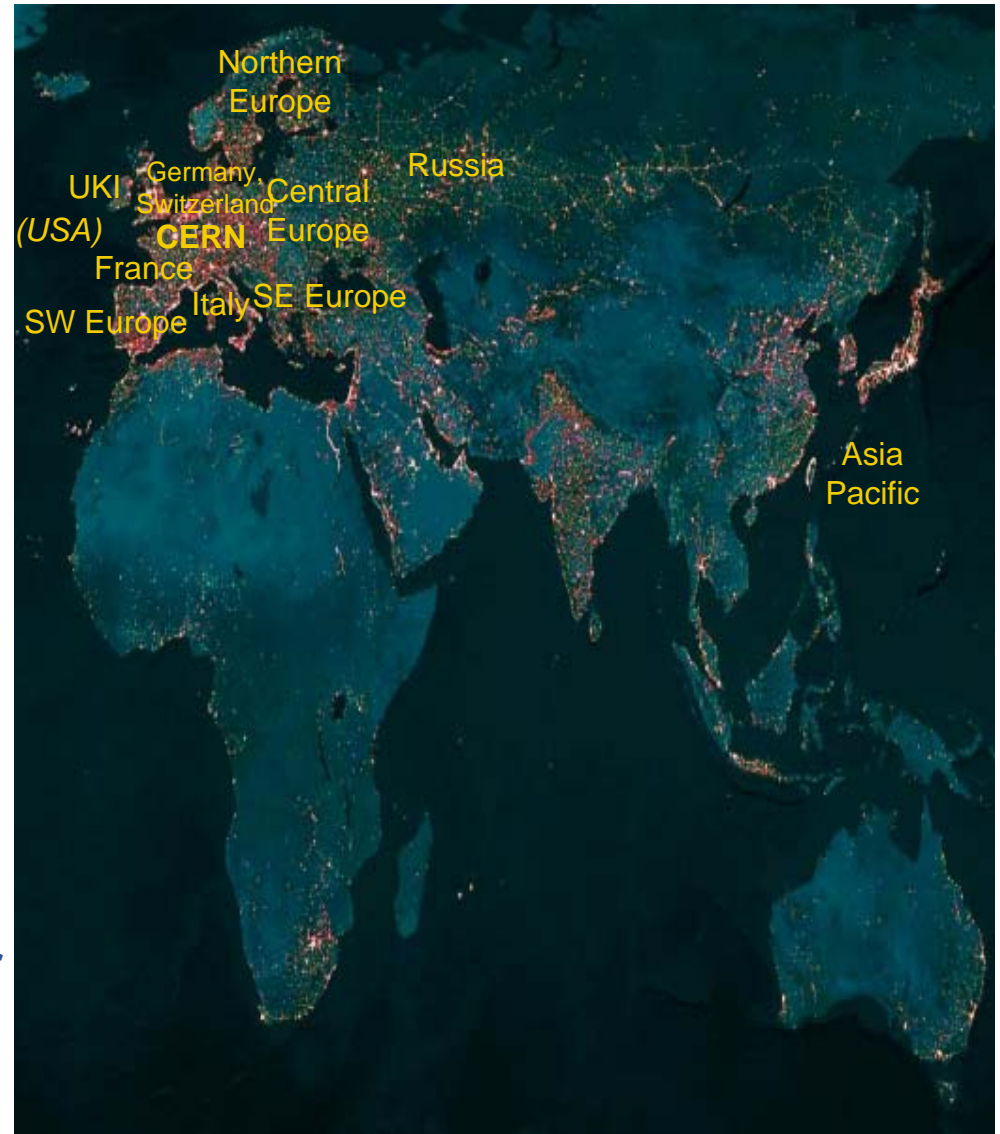


- **Thanks to**

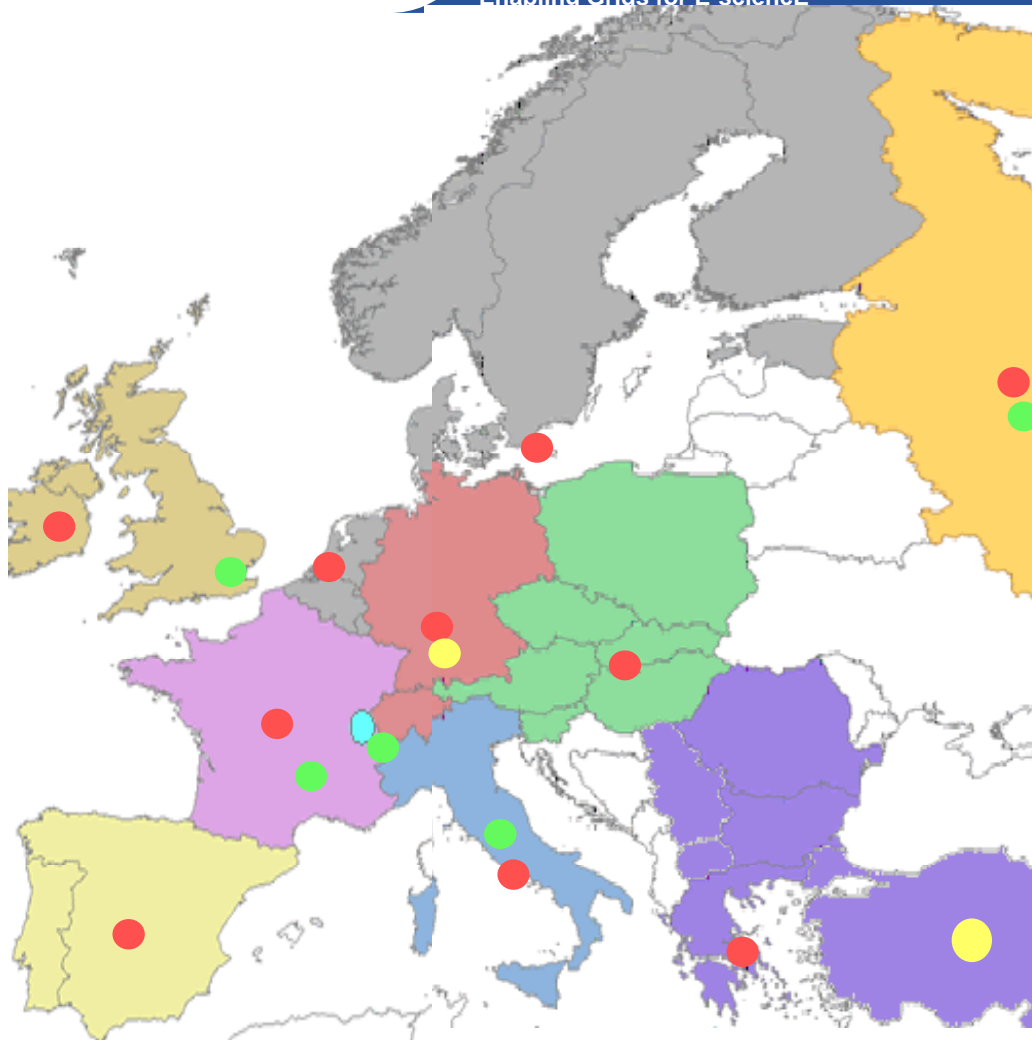
Emanouil Atanassov, Todor Gurov,  
Ognjen Prnjat, Kostas Koumantaros, Ioannis Liabotis

- **Organization of EGEE project**
- **Organization of EGEE SEE ROC**
- **Authorization/Authentication resources**
- **Information system resources**
- **Workload Management System resources**
- **Monitoring Tools**
- **Bulgarian Grid sites in EGEE**

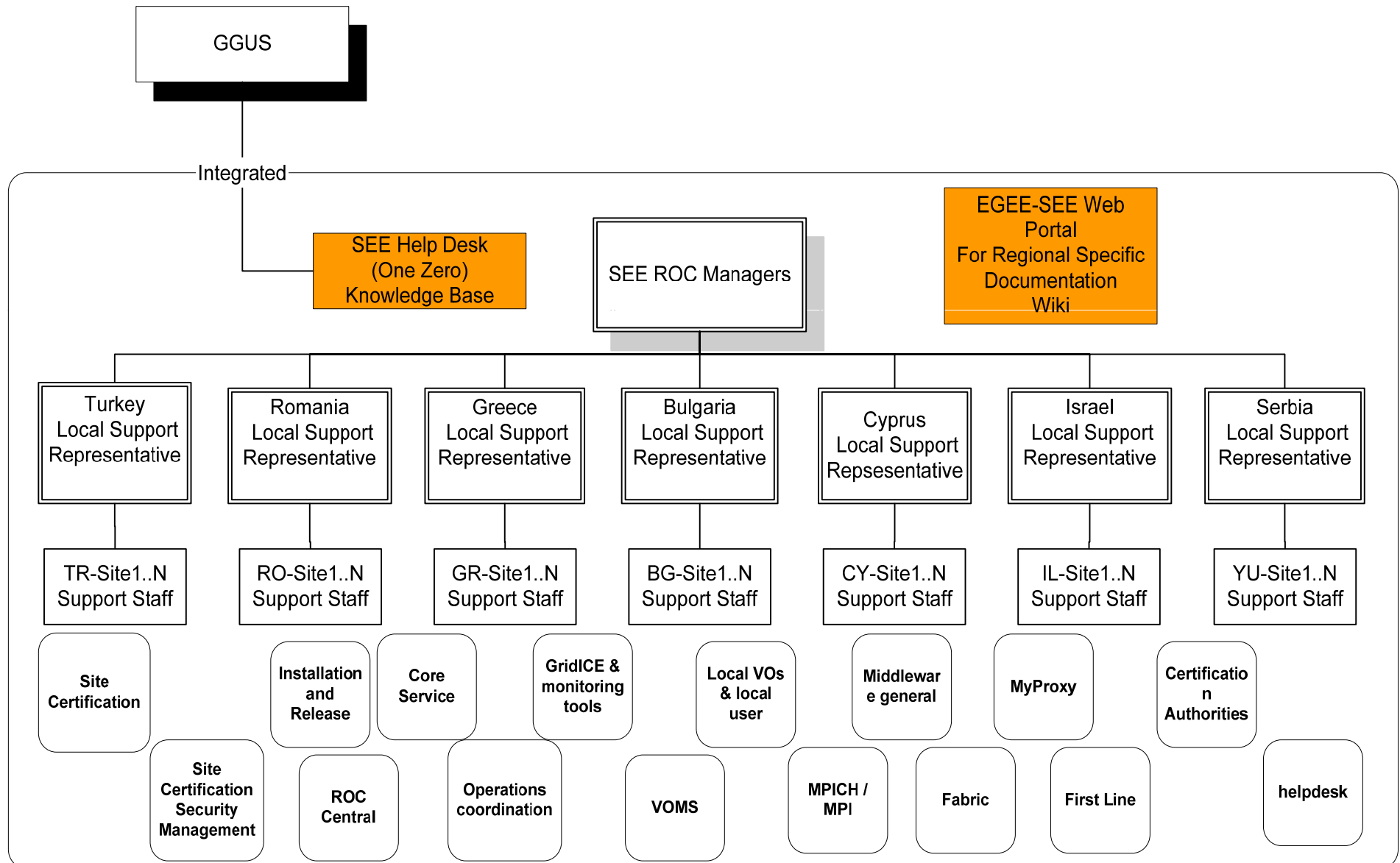
- The **EGEE** project brings together experts from over 45 countries with the common aim of building on recent advances in Grid technology and developing a service Grid infrastructure which is available to scientists 24 hours-a-day.
- The project provides researchers in academia and industry with access to a production level Grid infrastructure, independent of their geographic location. The EGEE project also focuses on attracting a wide range of new users to the Grid.
- The EGEE II project is organized in 11 federations. Bulgaria is a member of the **South Eastern Federation**



# Structure of EGEE operations



- **Resource centres (RC)** are controlled by the **Regional Operation Centres (ROC)**
- Bulgaria is a member of South East European ROC, which comprises:
  - Greece
  - Bulgaria
  - Romania
  - Turkey
  - Serbia
  - Cyprus
  - Macedonia
  - Israel
- ROC managers are located at **GRNET**, Greece
- Every country has country representative in SEE ROC
- Bulgaria is represented by Emanouil Atanassov (emanouil@parallel.bas.bg)



- Regional web site: <http://www.egee-see.org>
- Regional SEE helpdesk: <http://helpdesk.egee-see.org>
- SEE wiki pages: <http://wiki.egee-see.org>
- Country web sites: <http://www.grid.bas.bg> for Bulgaria
- Country representatives: Emanouil Atanassov for Bulgaria
- Security contact for SEE: Eddie Aronovich - [eddiea at cs.tau.ac.il](mailto:eddiea@cs.tau.ac.il)

# SEE ROC production sites

The picture of SEE ROC sites and their status is obtained from GStat monitoring site:

<http://goc.grid.sinica.edu.tw/gstat/SouthEasternEurope.html>

In SEE ROC there are **39 production sites** with a total number of CPUs **3694** right now, and the total storage of **3.2 PB**.

In EGEE production infrastructure: Over **250 Grid sites** with **56700 CPUs** and **408 PB storage** (Apr'08).

Advanced users and application developers must understand the meaning of the **GStat** report:

GStat: 06:46:32 04/03/08 GMT - @wgoc01

[home](#) [alert](#) [table](#) [service](#) [regional](#) [service](#) [metrics](#) [links](#) [?](#) [prod](#) [pps](#) [test](#) [baltic](#) [eela](#) [euchina](#) [eumed](#) [seegrid](#) [gilda](#) [trigrid](#) [euindia](#) [pi2s2](#) [grisu](#) [ireland](#)

AsiaPacific NorthernEurope	CERN Russia	CentralEurope SouthEasternEurope	France SouthWesternEurope	GermanySwitzerland UKI	Italy
<a href="#">AEGIS01-PHY-SCL</a> <b>ok</b> <b>ok</b>	<a href="#">BG-01-KIMON</a> <b>ok</b>	<a href="#">BG01-IPP</a> <b>ok</b>	<a href="#">BG02-IM</a> <b>ok</b>	<a href="#">BG04-ACAD</a> <b>ok</b>	
<a href="#">BG05-SUGrid</a> <b>ok</b>	<a href="#">GR-04-FORTH-ICS</a> <b>sd</b>	<a href="#">GR-05-DEMOKRITOS</a> <b>ok</b>	<a href="#">GR-01-AUTH</a> <b>ok</b>	<a href="#">GR-03-HEPNTUA</a> <b>ok</b> <b>ok</b>	
<a href="#">HG-02-IASA</a> <b>ok</b>	<a href="#">HG-03-AUTH</a> <b>ok</b>	<a href="#">HG-04-CTI-CEID</a> <b>ok</b>	<a href="#">HG-07-VOI-HEPLAB</a> <b>ok</b>	<a href="#">HG-01-GRNET</a> <b>ok</b>	
<a href="#">IL-BGU</a> <b>ok</b>	<a href="#">IL-IUCC</a> <b>ok</b>	<a href="#">LCG-IL-OU</a> <b>er</b>	<a href="#">HG-05-FORTH</a> <b>ok</b>	<a href="#">HG-06-EKT</a> <b>ok</b>	
<a href="#">RO-01-ICI</a> <b>ok</b>	<a href="#">RO-02-NIPNE</a> <b>ok</b>	<a href="#">RO-07-NIPNE</a> <b>ok</b>	<a href="#">MK-01-UKIM_II</a> <b>er</b>	<a href="#">NIHAM</a> <b>ok</b>	
<a href="#">TAU-LCG2</a> <b>er</b>	<a href="#">TR-01-ULAKBIM</a> <b>ok</b>	<a href="#">TR-03-METU</a> <b>ok</b>	<a href="#">RO-08-UVT</a> <b>sd</b>	<a href="#">RO-11-NIPNE</a> <b>ok</b>	
<a href="#">TR-07-PAMUKALE</a> <b>ok</b>	<a href="#">TR-09-ITU</a> <b>ok</b>	<a href="#">TR-10-ULAKBIM</a> <b>ct</b>	<a href="#">TR-04-ERCYES</a> <b>ok</b>	<a href="#">TR-05-BOUN</a> <b>ok</b>	
			<a href="#">WEIZMANN-LCG2</a> <b>ok</b>		

Color Legend									
GSTAT	. OK	INFO	NOTE	WARN	ERROR	CRIT	MAINT	OFF	
SFT	. OK			WARN	ERROR	CRIT	SchedDown		

No	Site Reports	GIIS Host	bnode	cernse	qperf	sanity	serv	serEntry	version	sclust	totalCPU	freeCPU	runJob	waitJob	seAvail TB	seUsed TB	maxCPU
1	<a href="#">BG-01-KIMON</a>	ce1.inrne.bas.bg	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.1.0	ScientificSL 4.5	18	18	0	0	0.86	0	20
2	<a href="#">BG01-IPP</a>	ce002.ipp.acad.bg	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.1.0	ScientificSL 4.5	22	17	5	25	0.82	0.08	22
3	<a href="#">BG02-IM</a>	ce001.imbm.bas.bg	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.1.0	ScientificSL 4.5	21	9	10	4	0.01	0.04	21
4	<a href="#">BG04-ACAD</a>	ce02.grid.acad.bg	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.1.0	ScientificSL 4.5	80	21	59	7	1.59	0.06	80
5	<a href="#">BG05-SUGrid</a>	ce001.grid.uni-sofia.bg	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.1.0	ScientificCERNSLC 4.5	22	4	7	23	0.02	0.05	24
6	<a href="#">CY-01-KIMON</a>	ce101.grid.ucy.ac.cy	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.1.0	ScientificSL 4.5	82	0	73	2	2.19	1.31	82
7	<a href="#">CY-03-INTERCOLLEGE</a>	ce301.intercol.edu	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.0.2	Scientific Linux 3.0.7	10	2	8	0			10
8	<a href="#">GR-01-AUTH</a>	node001.grid.auth.gr	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.0.2	Scientific Linux 3.0.7	98	43	10	20	0.55	0.15	98
9	<a href="#">GR-03-HEPNTUA</a>	ce.hep.ntua.gr	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>ok</b>	GLITE-3.1.0	Scientific Linux 3.0.8	37	22	30	0	2.04	0.22	37
10	<a href="#">GR-04-FORTH-ICS</a>	grid001.ics.forth.gr	<b>ok</b>	<b>ok</b>	<b>ok</b>	<b>warn</b>	<b>error</b>	<b>ok</b>	GLITE-3.1.0	ScientificSL 4.4	8	8	0	0			8



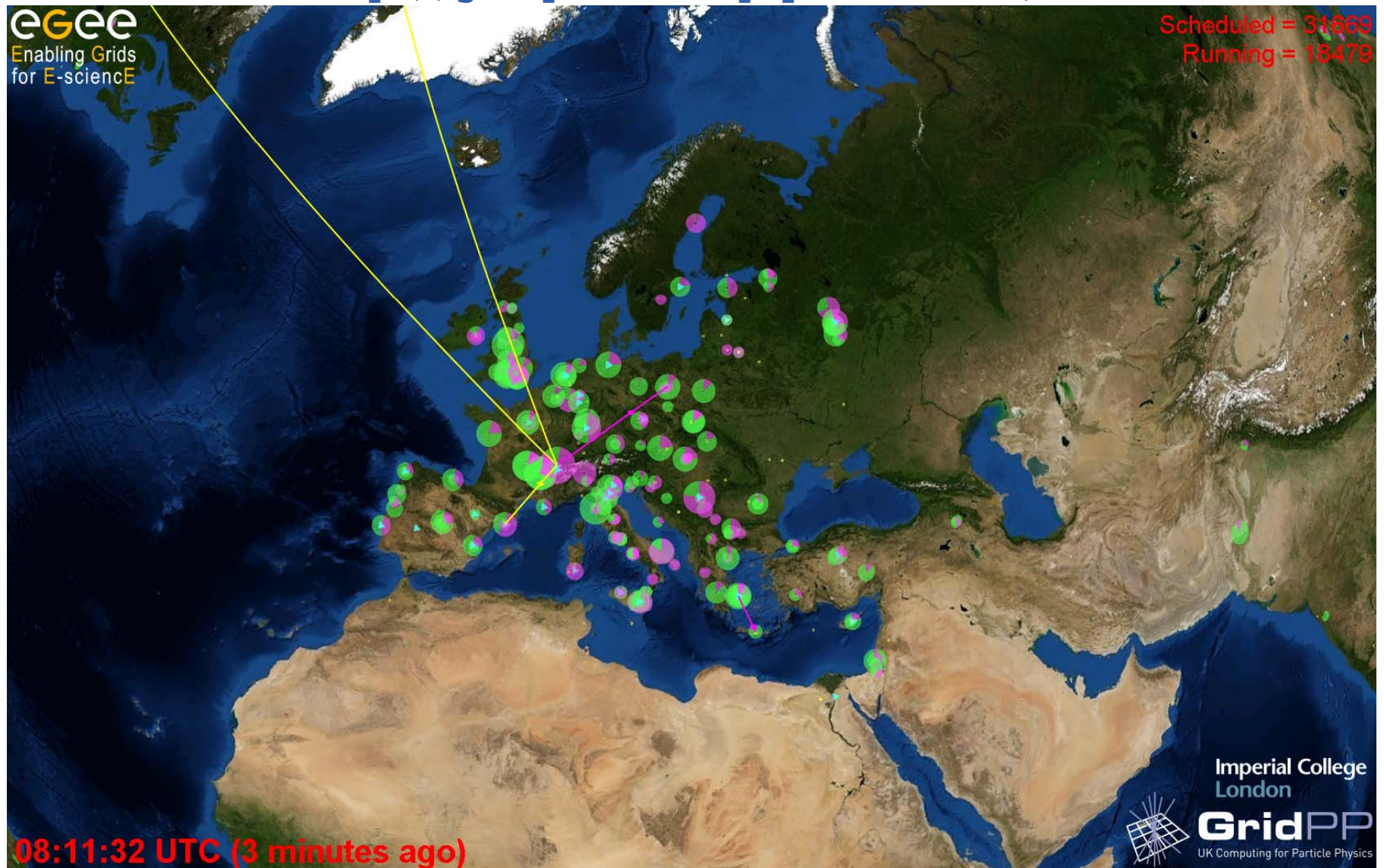
<http://gridice2.cnaf.infn.it:50080/gridice/site/site.php>



GridICE >> Site::ALL

General														XML	
Gris															
Host															
Job															
Charts															
Overview															
Computing															
Management															
Downtime															
Computing Resources															
Storage Resources															
Site ▼		Region	GK#	Q#	RunJob	WaitJob	JobLoad	Power	WN#	CPU#	CPUload	Available	Total	%	MH#
AEGIS01-PHY-SCL	●	SEE	2	16	804	4720	99%	290K	30	121	100%	68.8 TB	68.8 TB	0%	125
AMD64.PSNC.PL	●	CentralEu	1	8	9	8	-	-	-	-	-	-	-	-	-
AUVERGRID	●	France	4	30	94	3	-	-	-	-	-	12.2 TB	12.7 TB	4%	-
Australia-UNIMELB-LCG2	●	World	1	5	0	2222220	-	-	-	-	-	65.9 GB	11.2 TB	99%	-
BEIJING-LCG2	●	CERN	1	9	103	95	-	0	0	0	-	26.3 TB	30.4 TB	13%	4
BEgrid-KULeuven	●	NorthEu	1	6	5	9	-	-	-	-	-	-	-	-	-
BEgrid-ULB-VUB	●	NorthEu	1	7	45	7	-	0	0	0	-	-	-	-	2
BG-INRNE	●	SEE	-	-	-	-	0%	0	9	18	0%	-	-	-	2
BG01-IPP	●	SEE	1	11	5	218	60%	0	12	20	25%	845 GB	928 GB	9%	2
BG02-IM	●	SEE	1	6	7	1	-	-	-	-	-	9.1 GB	32.9 GB	72%	-
BG04-ACAD	●	SEE	1	12	56	37	86%	0	40	80	71%	1.5 TB	1.6 TB	4%	2
BG05-SUGrid	●	SEE	1	9	14	251	-	-	-	-	-	-	-	-	-
BIFI	●	SWE	1	6	1	0	-	-	-	-	-	-	-	-	2
BMEGrid	●	CentralEu	1	3	27	3	-	-	-	-	-	427.1 GB	427.3 GB	0%	-
BNL-LCG2	●	CERN	-	-	-	-	-	-	-	-	-	-	-	-	-
BUDAPEST	●	CentralEu	1	9	174	50	-	-	-	-	-	-	-	-	5
BelGrid-UCL	●	NorthEu	1	3	3	2	-	-	-	-	-	-	-	-	-
CESGA-EGEE	●	SWE	1	13	81	23	83%	0	18	107	78%	869.4 GB	870.8 GB	0%	10

<http://gridportal.hep.ph.ic.ac.uk/rtm>





- 5 clusters in EGEE production. The biggest cluster is **BG04-ACAD**, located at IPP-BAS, with 80 CPUs equipped with **Myrinet** interconnect, allowing for high-speed low-latency MPI communications. Each Worker Node on this site has 4 GB RAM.

	CPUs	Storage	Tape
Mar 2006	43	1 TB	-
Mar 2008	160	5 TB	10 TB
Jan 2009	350	30 TB	10 TB

**BG01-IPP** (22 CPU)

**BG04-ACAD** (80 CPU)



In order to access the Grid, every user needs a valid certificate from an accepted **Certification Authority (CA)**

**Bulgarian Academic Certification Authority – BG.ACAD | CA**, is established:

<http://www.ca.acad.bg>

The procedure requires a Memorandum of Agreement between IPP-BAS and the respective institute, before the certificate can be issued.

A **certificate request** is created on a UI computer and must be transferred through a secure channel to the **RA**.

The signed request (the **certificate**) can be used for any Grid activity.

Look for more details at the above **CA** web page.

After the user has a valid certificate, the next step is to request membership in the appropriate **VO**.

Users from areas like **biomedicine** and **high-energy physics** (HEP) are advised to join the respective EGEE-wide VOs:

<http://lcg.web.cern.ch/LCG/users/registration/registration.html>

For users that can not locate an appropriate VO, we provide membership in SEE VO:

<https://www.grid.auth.gr/services/voms/SEE/request.php>

In order to join SEE VO the user must submit a description of the application that he or she is going to develop and/or use to the BG country representative in SEE ROC.

- Upon approval of the request, the user joins the SEE VO or SEEGRID and can submit jobs and perform data management.
- Users are advised to always use **voms-proxy-init** instead of **grid-proxy-init** command. The SEE VO VOMS server is located at:  
**voms.grid.auth.gr**

The command **voms-proxy-init -voms see** uses automatically this VOMS server  
The main myproxy server for SEE VO is located at  
**myproxy.grid.auth.gr**

See: [https://www.grid.auth.gr/services/myproxy/user\\_guide.php](https://www.grid.auth.gr/services/myproxy/user_guide.php)

Always check if the **RB / WMS** you are using works correctly with the **MyProxy** server that you specify!

- In order to submit jobs in EGEE SEE sites using SEE VO, one can use:

- ✓ The production Resource Broker: [rb.isabella.grnet.gr](http://rb.isabella.grnet.gr)

- ✓ The production WMS: [wms.egee-see.org](http://wms.egee-see.org)

- In order to locate resources in SEE ROC, one can use the BDII **bdii.isabella.grnet.gr**
- Changing the BDII used on a UI (User Interface) is accomplished by changing **LCG\_GFAL\_INFOSYS** in **/etc/profile.d/lcgen.sh** and **/etc/profile.d/lcgen.csh**
- Example:  
**export LCG\_GFAL\_INFOSYS=bdii.isabella.grnet.gr:2170**  
Using the BDII for finding information about available resources:  
**lcg-infosites -vo see ce** – for computing elements  
**lcg-infosites -vo see se** – for storage resources  
**lcg-infosites -vo see lfc** – the name of the LFC server for SEE VO



# Types of the Grid nodes

- **User Interface** – provides user access to the Grid resources;
- **Worker Node** – basic building block, performs the computations;
- **Computing Element** – manages the received jobs inside the cluster;
- **Workload Management System** – manages the jobs between clusters;
- **Berkeley Database Information Index** – Information system;
- **MON** – cluster monitoring;
- **R-GMA** – RDBMS for accounting;
- **Storage Element (Castor, dCache, DPM)** – reliable storage server;
- **File Transfer Service** – guaranteed fast file transfer;
- **Logical File Catalogue** – information about the data files and their locations;
- **AMGA** – metadata file catalog;
- **MyProxy** – storage for user certificates;
- **HYDRA** – encrypting data services;
- **Web-portals** – for easy access to the Grid resources;

