



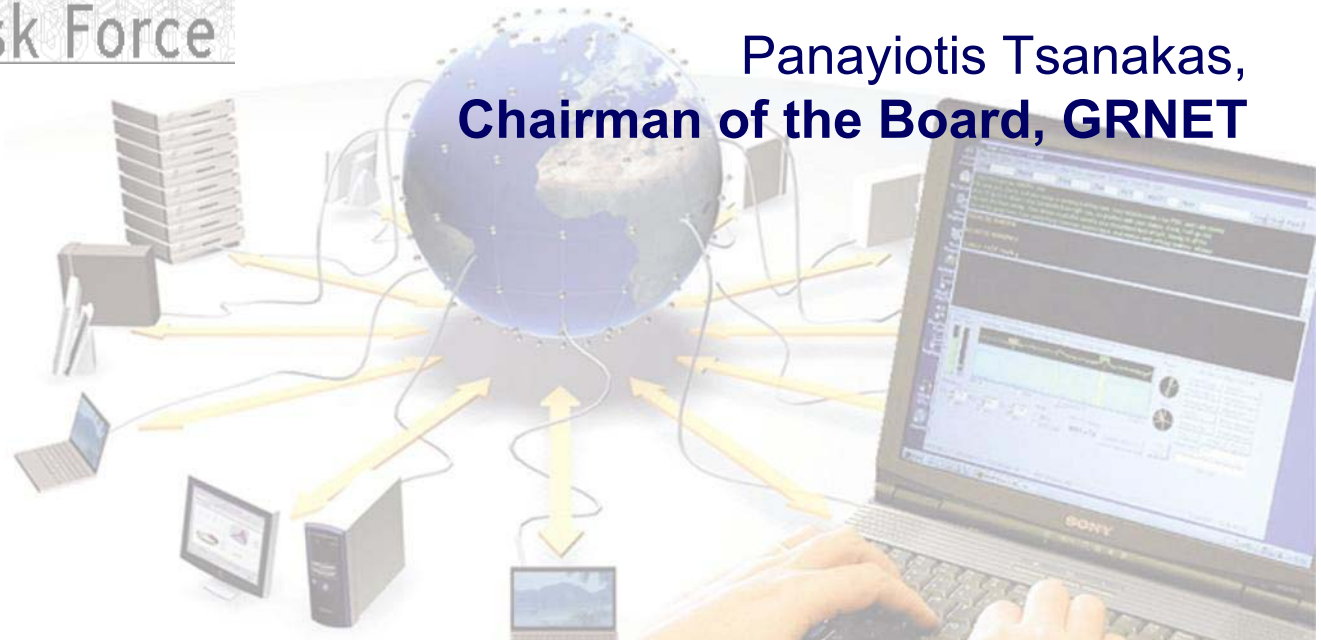
Enabling Grids for
E-science in Europe

*EGEE 3rd parties Advanced Induction Course,
Athens 20-21/01/05*

Strategy for HellasGrid and project approval conditions



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Chairman of the Board, GRNET



- Background and History
- HellasGrid Task Force achievements
- HellasGrid project brief overview
- Strategy for HellasGrid

- **Grid-enabled infrastructures are very promising:**
 - Relatively (to supercomputers) **inexpensive** in building and operating (cluster based infrastructure, Open source OS & middleware) – economies of scale
 - **Expandable - scalable** over high speed networks
 - Provide access to **different resources** (CPUs, storage, bandwidth, sensors, etc.)
 - Can serve **multiple disciplines** / applications (not only eScience)
 - Promote scientific **collaboration culture** (Virtual Organizations)
 - Hide resources heterogeneity and complexity
 - Enable **equal opportunities** and global participation
 - Access to **other administrative** domains' resources through a minimal local infrastructure (though policy issues unresolved)
 - Still a long way to go...

- **National Setting at the end of 2002:**
 - **No national body** to coordinate Grid activities in Greece
 - Numerous **Greek participations in FP5 GRID projects**, many GRID expert groups
 - Grid-enabled eScience applications are the optimum way of **exploiting the broadband** (underutilized) research networks - GRNET **DWDM-based network** becoming available
 - GRNET already providing **research networking infrastructure services** to the Research and Academic Community
 - No **clear grid priority** in Greek Operational Programme for Information Technology
 - EU intended to **invest heavily** in Grid-enabled infrastructures (FP6 Research Infrastructures 1st call → EGEE) – Available national-funded infrastructure was a prerequisite
- **GRNET proposed to the Greek government the formation of HellasGrid Task Force**
 - GRNET was one of the first to adopt the infrastructures model: offering integrated networking + grid infrastructures

National Grid initiative becomes a necessity



- Grids: key for the development of National and Global research collaboration in the Information Society
- e-Europe 2002 και 2005 initiatives and 6th Framework Programme
 - 2002: “*Grid computing*”
 - 2005: “*World Wide Grid*”
 - National representation in FP6 EU projects →EGEE
- Need for strategic planning and coordination of Grid activities in the national programme for the Information Society
 - For Research and Education
 - At National and Regional level

The HellasGrid initiative



- Formed by the Secretary for the Information Society, Ministry of Economy and Finance - www.hellasgrid.gr
 - First meeting in December 2002 – Task Force ratified in January 2003
 - Coordinated by GRNET
- Main group (Task Force)
 - 28 Members from the Academic and Research Community– (Deans, Research Centres Directors, Professors) – political body (decision making)
- Scientific Committee (Technical Group)
 - 11 Members (experts in broadband networking, middleware and eScience applications) – technical body (preparing recommendations)

HellasGrid - Members

- **Coordinator**
 - National Research and Education Network, GRNET – www.grnet.gr
- **Universities**
 - Aristotle University of Thessaloniki – www.auth.gr
 - National Technical University of Athens www.ntua.gr
 - Athens University of Business www.aueb.gr
 - University of Athens www.uoa.gr
 - University of the Aegean www.aegean.gr
 - University of Ioannina www.uoi.gr
 - University of Crete www.uoc.gr
 - University of Macedonia www.uom.gr
 - University of Patras www.upatras.gr
 - University of Piraeus www.unipi.gr
- **Research Centres**
 - National Meteorology Service www.emy.gr
 - National Observatory of Athens www.noa.gr
 - Research Centre Demokritos www.demokritos.gr
 - Computer Technology Institute www.cti.gr
 - Institute of Computer Science – FORTH www.ics.forth.gr
 - Institute of Accelerator Systems and Applications www.iasa.gr
 - Institute of Communication and Computer Systems www.iccs.ece.ntua.gr

HellasGrid objectives

- **National representation and participation in EU activities**
- **Development of a National Strategy and coordination of Grid activities**
 - Initial emphasis on Research and Academic communities - **eScience**
 - Requirements gathering – **questionnaires**
 - Review **state of the art** and future trends
 - Propose plan for Grid solutions development:
 - **National infrastructure** and services
 - Investigate adoption of Grid technologies in other areas (eBusiness, eGovernment)
- **Document all the above in the Hellas Grid Strategy Document**
- **Deployment of National GRID infrastructure (2 phases)**

HG TF major achievements

- **Strategy document:**

- National strategy and guidelines (November 2003)
 - Chapters:
 - Grid technologies and use models (review state of the art in networking, m/w, apps)
 - The strategic importance of Grid technologies worldwide
 - The Greek status and development perspectives (including HG questionnaire analysis)
 - The role of the Government and intervention plan
 - Proposal for the National infrastructure and policy framework
 - Outlook - Conclusions
 - <http://www.hellasgrid.gr/content/downloads/strathgikh.pdf>

- **Infrastructure proposal:**

- Submitted in December 2003 (2.1 MEuro) –refined and resubmitted in February 2004 – accepted in November 2004 (1.78MEuro)

- **Dissemination:**

- HG Open Day held in December 2003 – combined with a DataGrid Training event
- <http://www.hellasgrid.gr> <http://agenda.cern.ch/fullAgenda.php?ida=a036418>
- WCIT : Scientific Forum on Grid Services www.hellasgrid.gr/wcit

Requirements for HG success

- Widely available distributed **Infrastructures** (network, storage, computer nodes)
 - GRID aware **communities**
 - Infrastructure integrators and operators
 - Middleware developers
 - End-users
 - Policy makers
 - Training of all the above
 - Needs: GRID-enabled **applications**
 - Local needs?
 - Integration with **European** efforts and teams
- *Hellasgrid plays this role*

HellasGrid Phases

- **1st phase** (“proof of concept”):
 - GRNET node (Demokritos) already integrated with EGEE pan-European infrastructure
 - 64 CPU, 10TB on-line storage (FC), 12 TB Tape Library
 - Running LCG-2.3.0 Middleware in Scientific Linux 3.0.3 Platform
- **2nd phase** (“big rollout”, ready by 3Q 2005):
 - 6 site installations connected with 2,5 Gbps GRNET2 network:
 - 96 CPU nodes NTUA
 - 96 CPU nodes IASA-UoA
 - 128+64 CPU nodes Demokritos (GRNET)
 - 128 CPU nodes AUTH (Thessaloniki)
 - 128 CPU nodes CTI (Patras)
 - 128 CPU nodes FORTH (Heraclion)
 - Additional 6 x 4 TB on-line storage in local sites
 - Additional 50 TB Tape Library in Demokritos (GRNET)
 - 4 Access Grid nodes
 - Integration of other clusters, supercomputers, desktop grids (study/implementation planned in Hellasgrid project)

Phase 1 – GRNET central node

**Location: Athens,
Demokritos Research Centre**

Computing: 32 Dual-CPUs

Storage: 10TB SAN

Tape Library: 12 TB

Network: Gig Ethernet Access

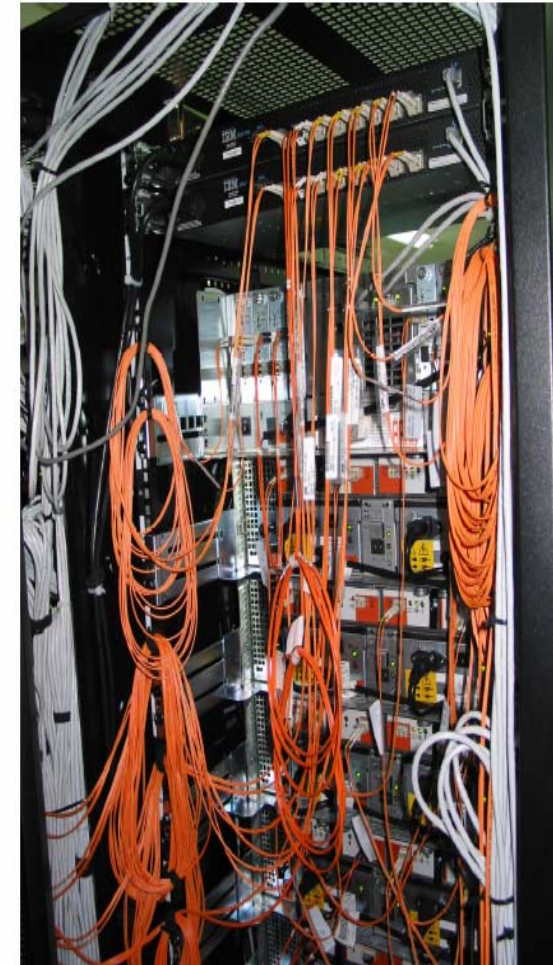
OS: Scientific Linux 3.0.3

**M/W: LCG-2.3.0 (following
EGEE)**

Operations: ICCS, NTUA Team

**Integrated in EGEE
infrastructure**

**Current VOs: HEP experiment
VOs, BioMed, (Generic soon)**



Phase 2 - HellasGrid project overview

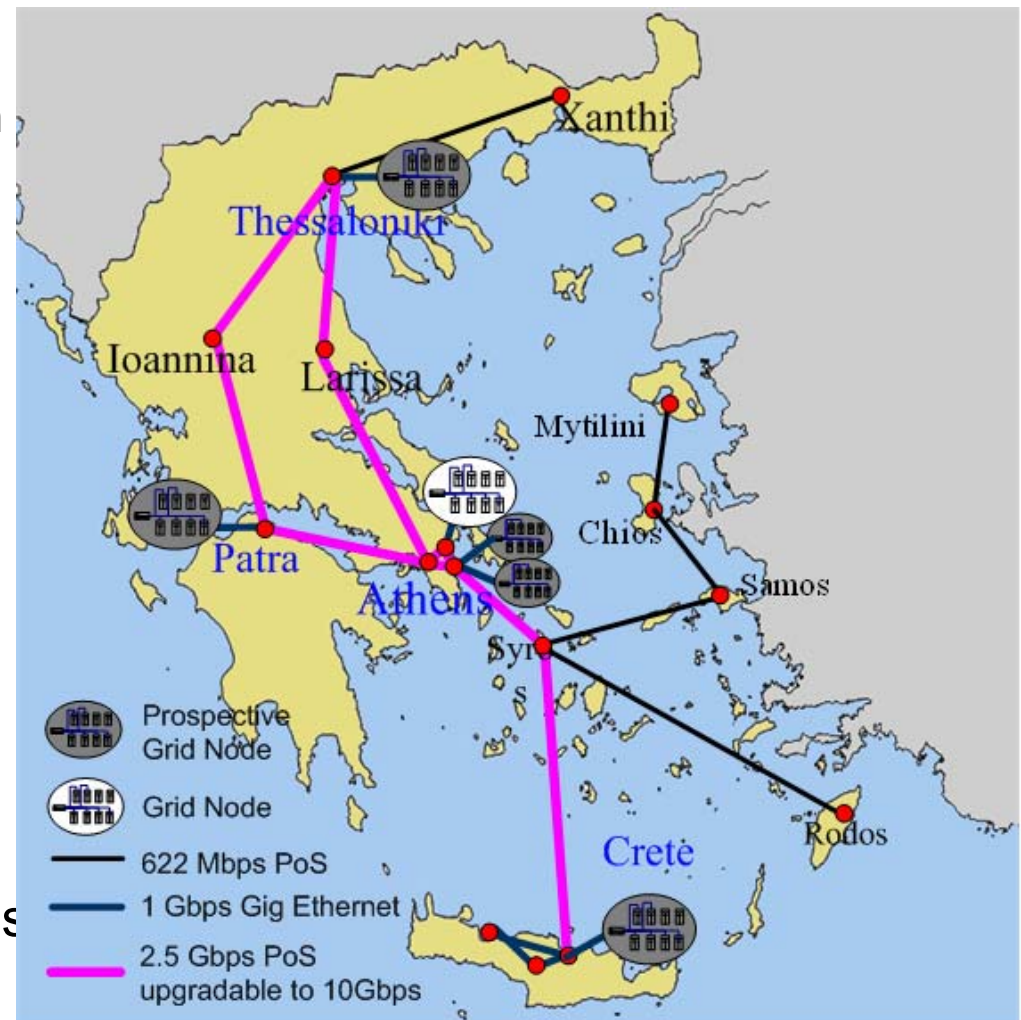
OPIS Area:	2.1 “ eGovernment for the citizen”
Category	3: “Pilot and innovative applications”
Title:	Design and development of pilot infrastructures and advanced Grid-enabled services – HellasGrid
Budget:	1,78 Million Euros
Duration:	26 months (start date 01/11/04)

HellasGrid project objectives

- Develop a national Grid infrastructure and support operations
- Evaluate and adapt the Grid technologies for different areas including **eGovernment**, eScience, and others:
 - Tax, Insurance, Social security, Demographic, Recruitment enlistment
 - Civil protection (meteorological prediction of extreme weather conditions), geophysical surveillance (forests, fires, oceans, tsunamis), earthquake prediction etc
 - Access, processing and mining information in distributed databases for Health (eHealth)

HellasGrid project activities

- Procurement and integration of
 - 6 Grid computing nodes in Athens (3), Thessaloniki, Patras, Heraclion
 - 4 AccessGrid nodes
 - 60 TB Tape and 30TB SAN
- Middleware deployment, customization and porting
- Establishment of Grid Operational Centers
- Studies:
 - Middleware
 - Security
 - eGovernment
- Dissemination: EGEE conference and other workshops



HellasGrid project activities

Y1 - Προμήθεια Συστοιχιών Υπολογιστικών & Αποθηκευτικών Συστημάτων

Y2 - Προμήθεια Συστήματος Εφεδρικού Αποθηκευτικού Χώρου

Y3 - Προμήθεια Κόμβων Εικονικού Περιβάλλοντος Διαχείρισης Access Grid

Y4 - Ανάλυση απαιτήσεων & σχεδιασμός, Λογική και Φυσική Αρχιτεκτονική, Προδιαγραφές Έργου, Τεχνική Υποστήριξη (με ίδια μέσα)

Y5 - Μελέτη, Προσαρμογή & Εγκατάσταση Ενδιάμεσου Λογισμικού στις Συστοιχίες Υπολογιστικών Συστημάτων

Y6 - Μελέτη και Πιλοτική Ολοκλήρωση υφιστάμενων εθνικών Υπολογιστικών Υποδομών με τις Υποδομές HellasGrid

Y7 - Προσαρμογή Λογισμικού Διαχείρισης Δεδομένων & Αποθηκευτικού Χώρου

Y8 - Σχεδιασμός Λειτουργίας και Ανάπτυξη Πανελλήνιας Αρχής Πιστοποίησης & Πολιτικών Ασφαλείας

Y9 - Μελέτη & Λειτουργία Κόμβων Διαχείρισης Υπολογιστικών Συστημάτων και Αποθηκευτικού Χώρου (Grid Operation Centers) και Προσαρμογή/Ανάπτυξη Λογισμικού Διαχείρισης Πλέγματος

Y10 - Μελέτη Αξιοποίησης Υποδομών Grid σε Υπηρεσίες Ηλεκτρονικής Διακυβέρνησης για τον Πολίτη και τις Επιχειρήσεις

Y11- Επικοινωνία & Μεταφορά Αποτελεσμάτων (με ίδια μέσα)

Project status

- Started 1st November 2004
- Conditions for project approval:
 - Clusters CPU numbers/locations given
 - Applications projects must be supported (Call 3.3)
 - Grid use only
 - Common access policies – safeguarded by GRNET
 - Sites should provide proper telehousing conditions – Should sign SLAs

- HG *provides* for the infrastructure
 - Clusters should be stable as soon as possible
- EGEE *operates* the infrastructure
 - basic Grid cluster management
 - **Operational support** on clusters
 - Training
 - Policies
- HG builds on operations in terms of:
 - LOCAL **user (application) support**
 - Generic management functions (CA, monitoring, helpdesk, core services – HG VO, etc)

Applications uptake

- A number of communities encouraged through EGEE
 - Existing communities: HEP, BioMed, etc.
 - Support to emerging communities
 - New communities to be encouraged through
 - Local funding – **Grid-Application call (GSRT)**
 - EU funding: application projects will be encouraged to run on the infrastructure
 - Attract further EU funding (GN2 already running, EGEE2 to be submitted in September 2005)
- **The 3rd parties work will be crucial in order to attract more funding for EGEE2**
- But the emerging user communities need to be deeply involved at all levels!

GSRT Application Call



- **Application call will be launched by GSRT end of March (500K)**
 - Μέτρο 3.3. Έρευνα και Τεχνολογική Ανάπτυξη για την Κοινωνία της Πληροφορίας
 - **Proposals SHOULD comply with the directions of the call**
 - **Proposals submission END OF APRIL - !START PREPARING!**
 - **60K per proposal**
 - **90% labour, 10% consumables**
 - **Final acceptance of proposals within June**

Conclusion

- It is essential to:
- Form the community
- Enlarge the community
- Train the community
- Disseminate further