



Enabling Grids for E-science

## NGIs – Turkish Case : TR-Grid

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- **TÜBİTAK ULAKBİM - Who we are and what we are doing**
- **Five Year History of our NGI**
- **TR-Grid Infrastructure**
- **Plans**

- **TÜBİTAK:**
  - The Scientific and Technological Research Council of Turkey (TÜBİTAK) established in 1963 is an autonomous institution and is governed by a Scientific board.
  - Nation-wide research is conducted in 15 different research institutes.
- **TÜBİTAK ULAKBİM:**
  - Turkish National Academic Network and Information Center is an institute of TÜBİTAK which is responsible for:
    - Managing national academic network ULAKNET
    - Acting as a (digital) library for academic publications
    - Managing national grid initiative and infrastructure
  - Our institute is located in Ankara

- **TR-Grid National Grid Initiative is established in 2003 with a MoU between:**
  - TÜBİTAK ULAKBİM
  - Boğaziçi University
  - Bilkent University
  - İstanbul Technical University
- **This MoU was an important document to show collaboration of national grid experts and opened gates to the FP6 e-Infrastructure projects.**
- **SEE-GRID (05/2004-04/2006) was the first project of the NGI which brought together experts from all NGI members and other countries in the South East Europe region.**
- **ULAKBİM and Boğaziçi University joined EUMEDGRID (01/2006-12/2007) which aimed to follow up the success of SEE-GRID to form a sustainable grid infrastructure in the Mediterranean region.**

- **In parallel with the improvements at the infrastructure, TR-Grid NGI was extended with the participation of four universities:**
  - Erciyes University
  - Middle East Technical University
  - Çukurova University
  - Pamukkale University
- **ULAKBİM joined EGEE-2 (04/2006-04/2008) project with all the resources (1024 cores and 60 Tbyte of storage) provided by 7 of the NGI members.**
- **In the FP7 TR-Grid is involving in the projects as a Joint Research Unit. TR-Grid agreement was updated with the advises from EU.**
- **EGEE-3 is the first project in which all 7 university and 2 governmental members of the NGI are taking a part.**
- **METU, Boğaziçi University and ULAKBİM are also partners of SEE-GRID-SCI project.**

- With the infrastructure and human network which were provided by all of these EU FP projects 6 major national grid applications developed.
- Under the management of ULAKBIM, TR-Grid NGI has been coordinating national grid related activities for over 5 years.
- TR-Grid NGI is advised by an advisory board which is composed of experts from universities and related governmental bodies.
- The major project of TR-Grid NGI was the 1 MEuro TR-Grid e-Infrastructure Project (TUGA) which was supported by TUBITAK (2006-2007).
- Current TR-Grid infrastructure is mostly composed of resources from TUGA project.

- **2003**
  - Different sites with between 4-128 CPUs
  - Sites were generally equiped with gigabit ethernet
  - Only batch schedulers at the site, no nation-wide middleware installed

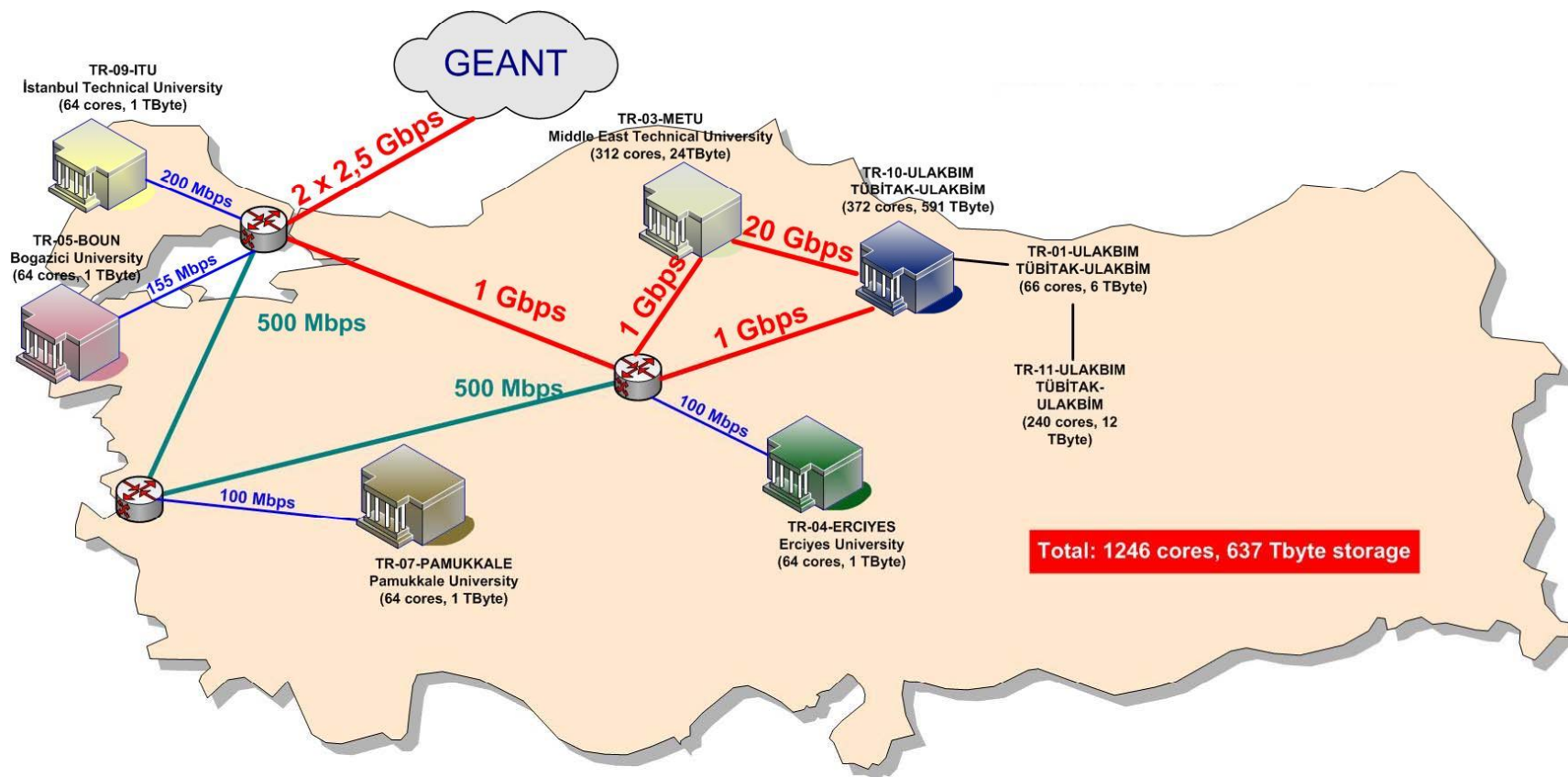




- **2008**
  - 1250 CPU Cores, 650 Tbyte of storage in 8 clusters
  - 7 of these clusters are using gLite middleware
  - Users can also send job to 3 of these clusters directly over the TR-Grid central authentication, job submission layer

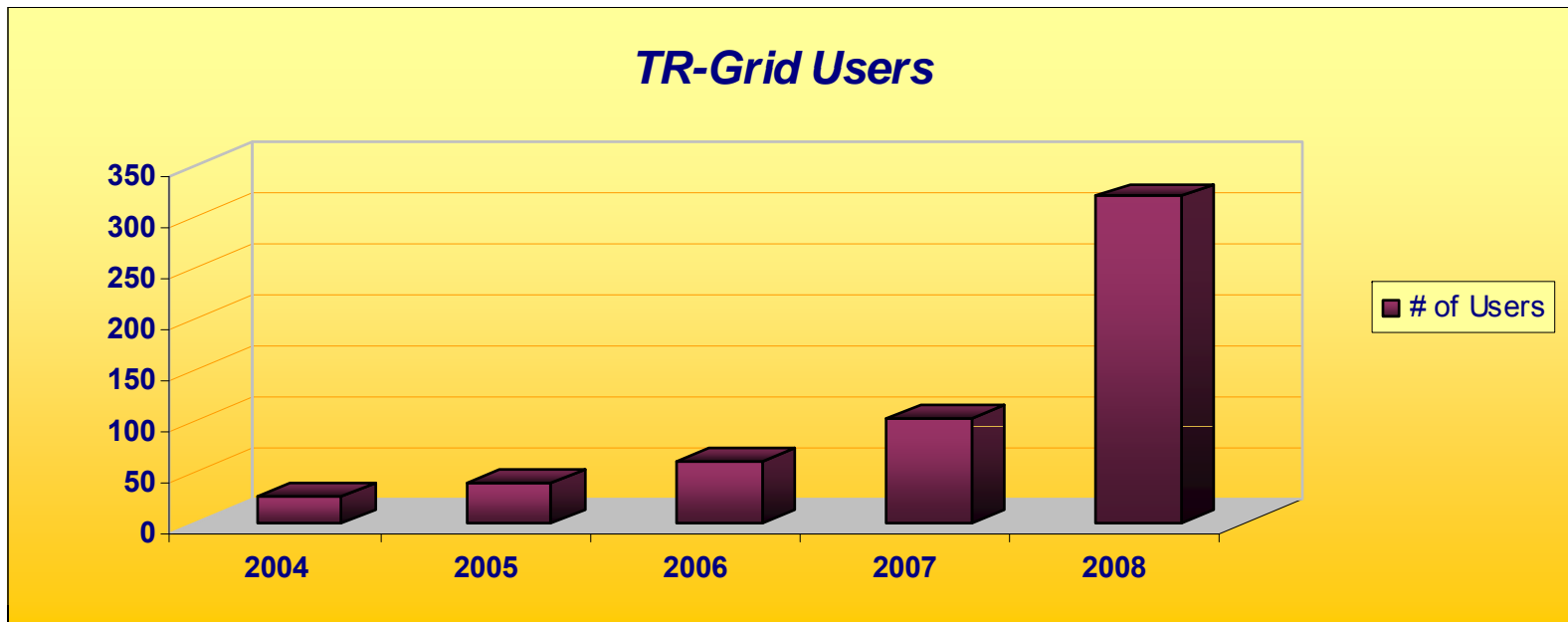




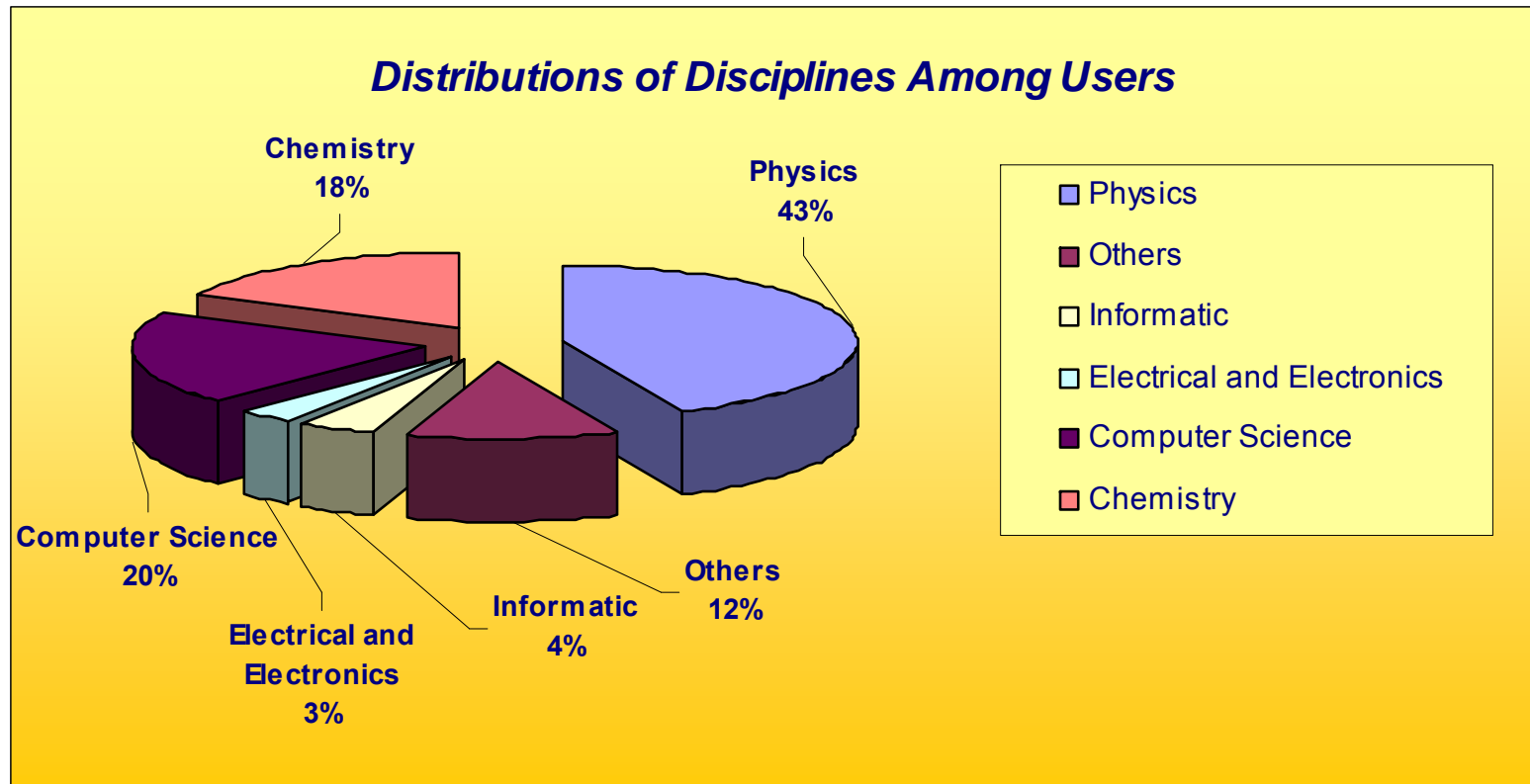


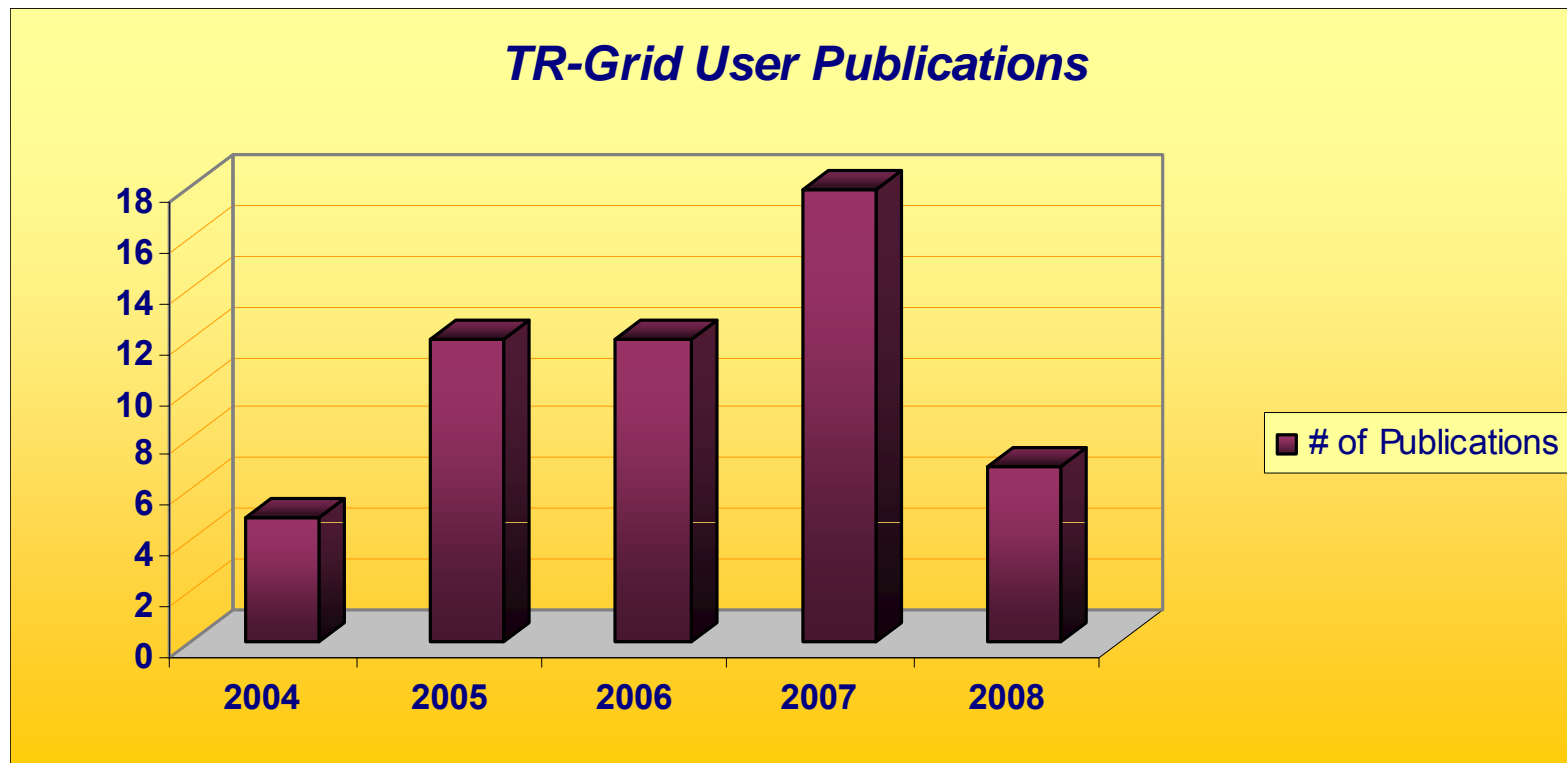
- All sites except TR-01-ULAKBIM can be remotely managed from the scratch by TR-Grid Operation Center which is located in ULAKBIM.
- For all sites hardware, network and operating system are managed by local site managers.
- Middleware and operating system management of all sites are in responsibility domain of TR-Grid Operation Center.
- 7 out of 8 TR-Grid clusters are involved in EGEE infrastructure and using gLite middleware.
- Infiniband connectivity is provided for tightly coupled applications and Lustre file system for TR-11-ULAKBIM site users.
- Experts in the Operation Center are also designing, developing, customizing and packaging lightweight solutions for TR-Grid users.

- **Total # of users: 320**
  - HEP
  - TÜBİTAK Research Groups
  - Researchers

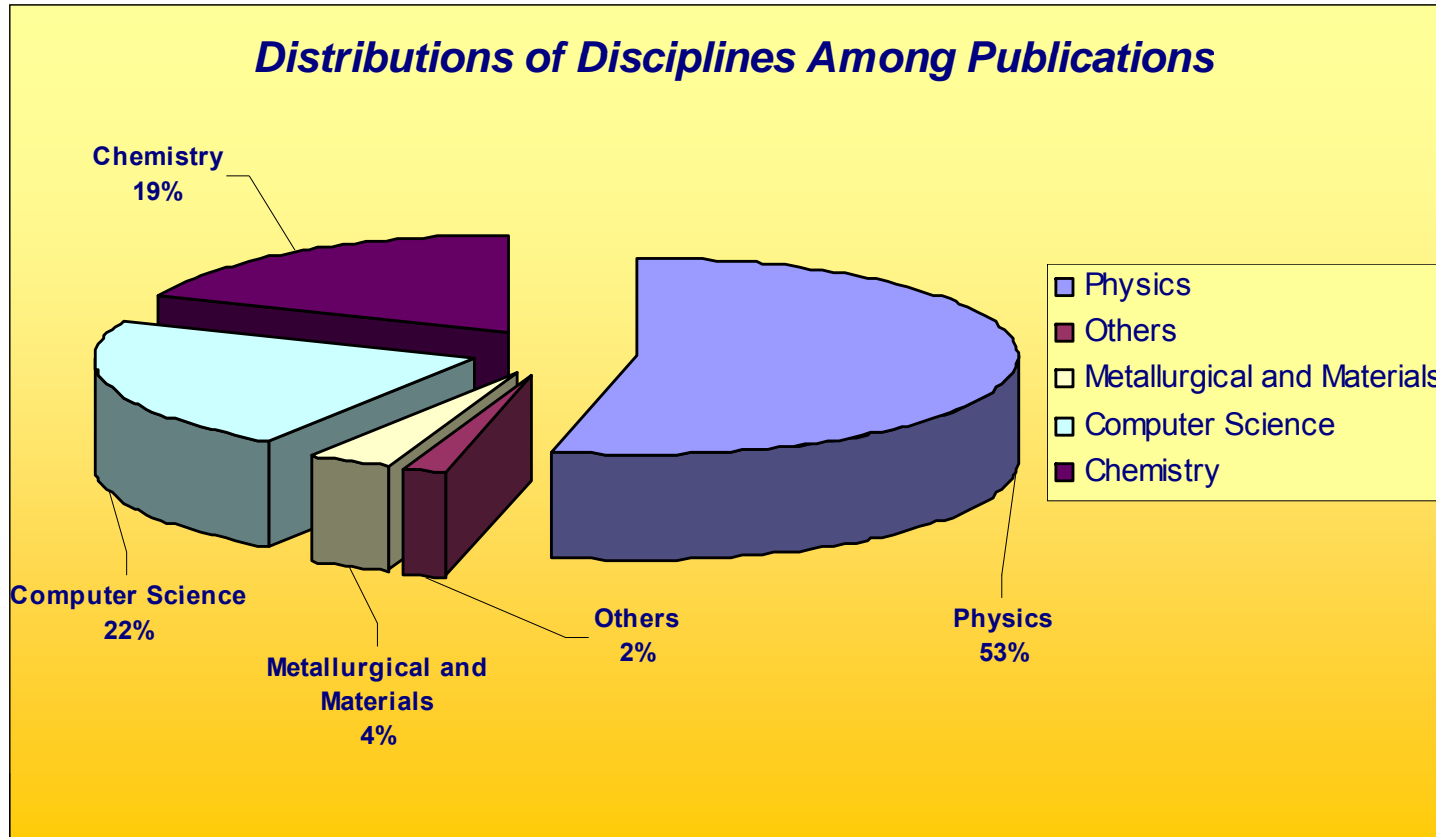


- 18 different disciplines
- 43 different research institutes





- 6 different disciplines



- **Definitely need financial and expert support for a sustainable infrastructure:**
  - New project submitted to the State Planning Agency for funding hardware
  - TR-Grid is supported by full time TUBITAK researchers who are experts in their fields
  - Will continue to submit new FP projects



- **Deploy all new storage servers in the last quarter of 2008**
- **Expand the infrastructure on the Infiniband connected side**
- **Offer custom built accounting services and virtual billing system to balance huge number of users with the resources**
- **Test, customize and use a more lightweight middleware**

# EGEE '08 CONFERENCE

22-26 September 2008

Harbiye Askeri Museum - Istanbul, Turkey

[www.eu-egee.org/egee08](http://www.eu-egee.org/egee08)



Grid computing is now an essential daily tool for an ever increasing number of researchers and scientists to meet their e-science challenges.

As EGEE and related grid infrastructures move towards a sustainable, interoperable model it is important for new and existing Grid users to come together with national, regional and scientific audiences to develop and coordinate plans for a reliable, seamless infrastructure on a global scale.

The EGEE 08 conference will provide the perfect opportunity for both business and academic sectors to network with the EGEE communities, collaborating infrastructure and application projects, developers, decision makers alike, to realize this vision and make it happen.

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