

Turkish National Grid enabled HPC Infrastructure TRUBA

Milli Kütüphane
07/07/2011 – Ankara

ULAKBİM

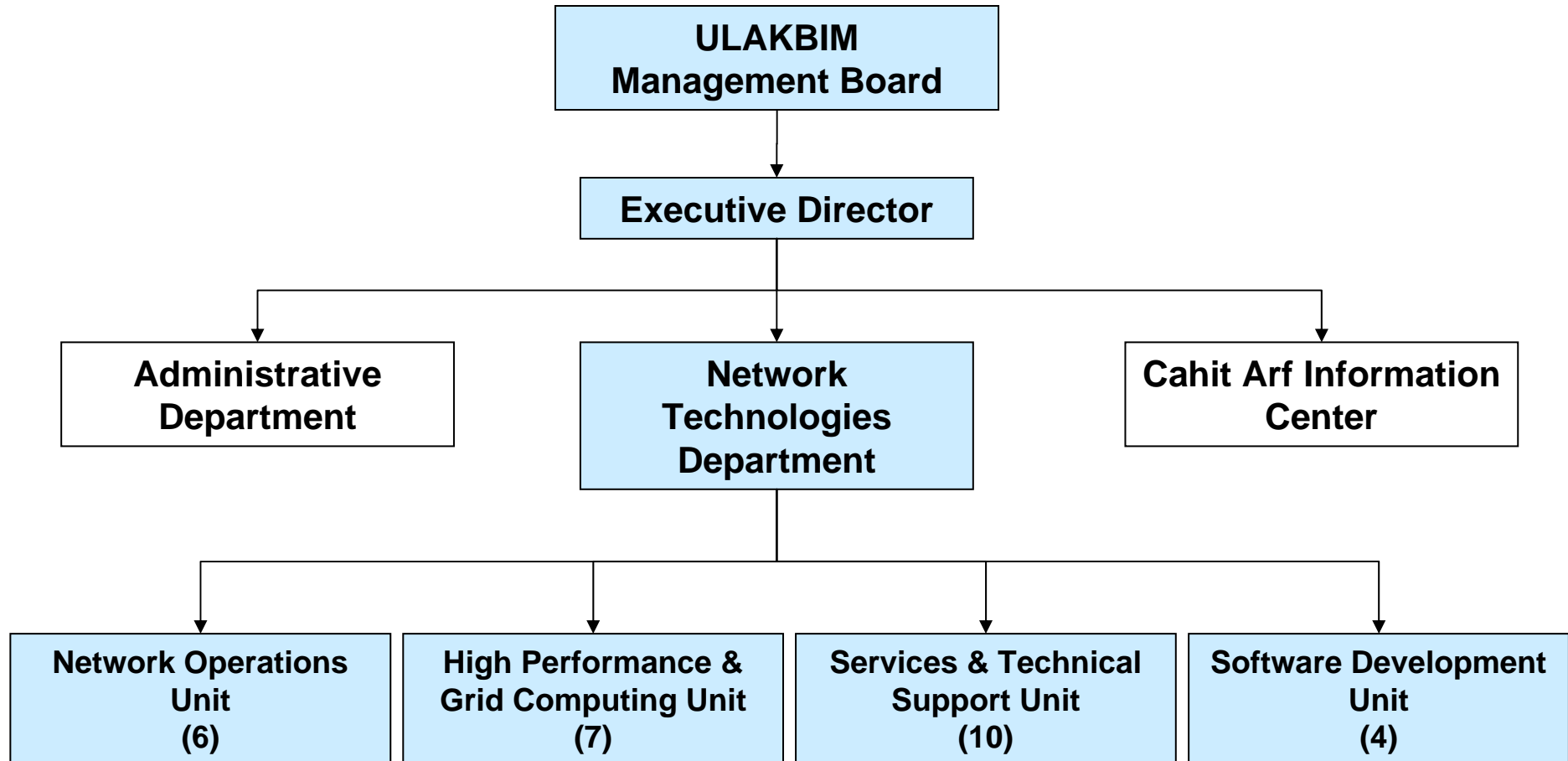


- Founded in 1996
- R&D institute of TUBİTAK (The Scientific and Technological council of Turkey)
 - The institute has no commercial targets, nor is it aligned with profit-making
 - Semi-independent government organization
 - Funding is entirely from government
 - Serving research and education community

ULAKBİM Organization



Organization and Staffing



- **ULAKBİM Management**
 - Management Board members are nominated by TUBITAK Presidency and appointed by Scientific Board of TUBITAK.
 - Management Board of ULAKBİM consists of 7 members (Executive Director of ULAKBİM plus 6 members appointed by Scientific Board of TUBITAK)
 - Executive Director is nominated by TUBITAK and appointed by Scientific Board of TUBITAK
 - Deputy Directors are nominated by Executive Director and appointed by President of TUBITAK.
- **Includes 3 departments:**
 - **Administrative Department**
 - **Cahit Arf Information Center Department**
 - Provides nationwide information and document delivery services in order to meet the information requirements of universities, public and industrial sectors.

Network Technologies Department



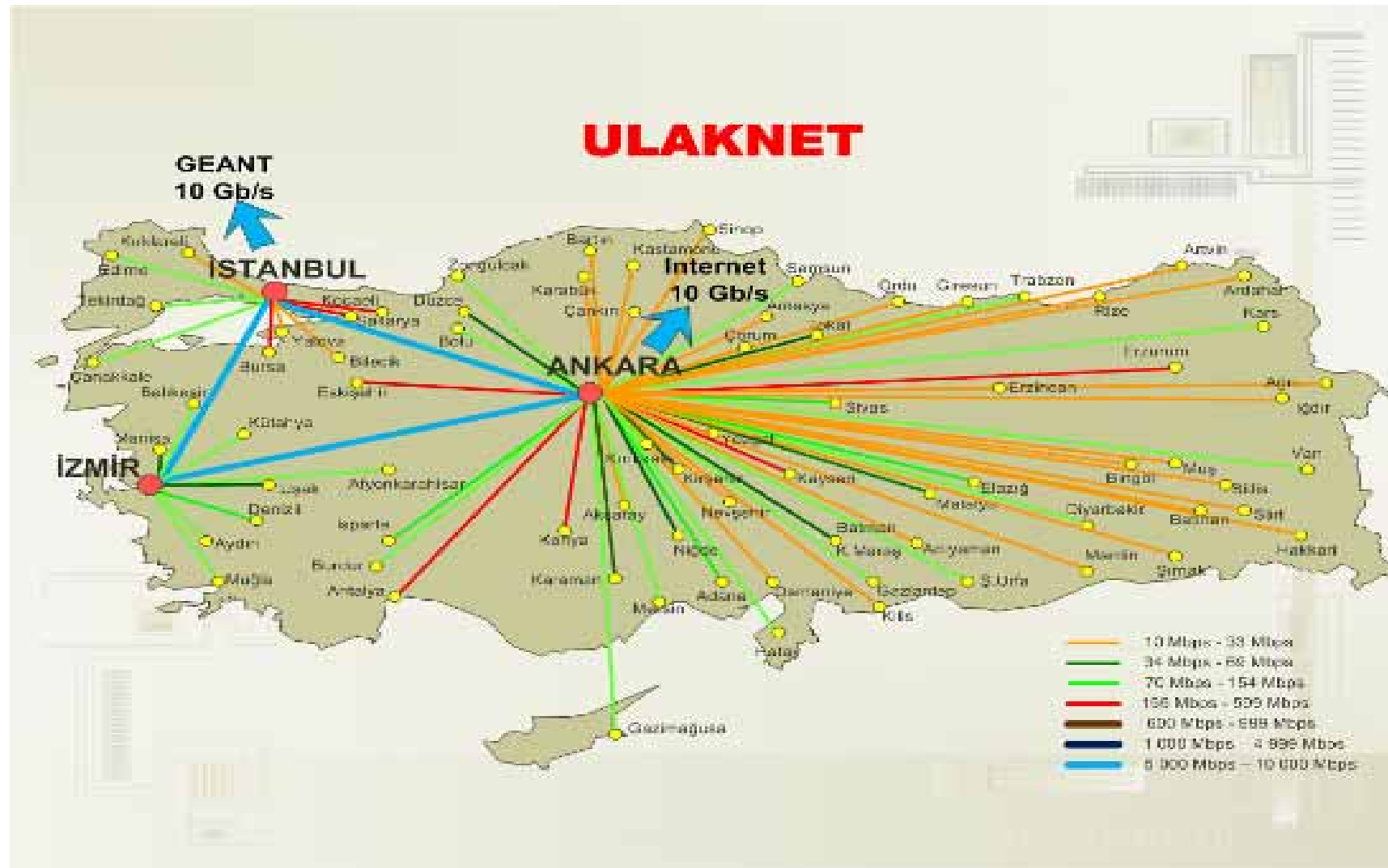
- operates National Academic Network – ULAKNET
- coordinates NGI (National Grid Initiative) and operates TRUBA (Turkish e-Science e-Infrastructure)
- carries out security needs of ULAKNET backbone via ULAK-CSIRT (Computer Security Incident Response Team)
- coordinates nationwide IPv6 protocol transition with collaboration with Telecommunication Authority Office of Ministry of Transportation
- participates in research and development studies on network and information technologies

ULAKNET 2011



158 Universities & Research Institutions

~ 870 Connections ~ 100.000 Researchers ~ 2.500.000 Students

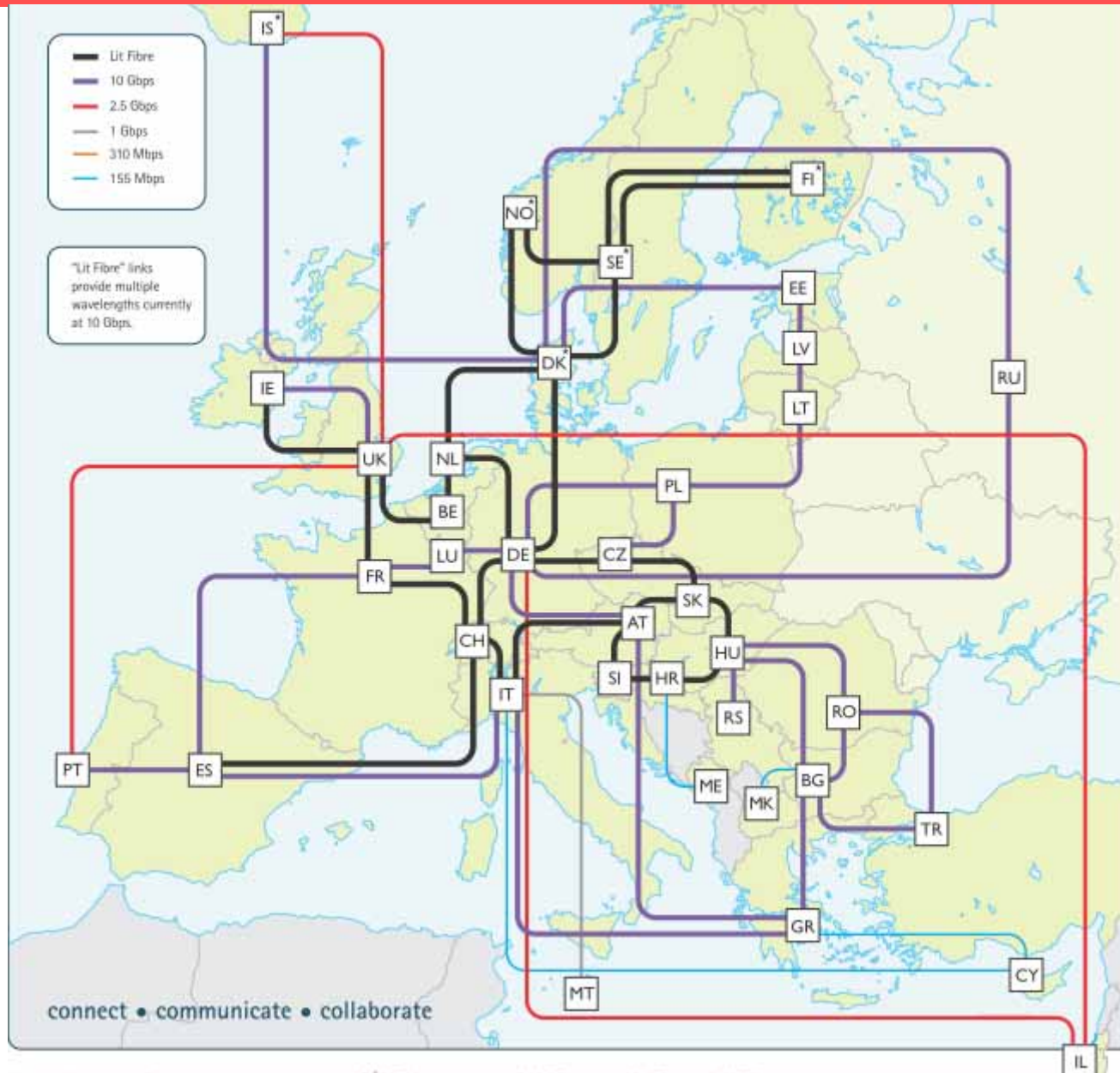


GEANT – 2011



TUBITAK

ULAKBİM



ULAKNET Services



Network Operations Center (NOC)

- Operating a huge network (+850 connection, 7x24 service)

Network Statistics

- Netflow, MRTG, NAGIOS, Weather map

Basic Network services

- Mirror+hosting, Root DNS, FTP, Proxy, Content Provider, Mailing lists, Blogs

Advanced Network Services

- Multicast
- eduroam (fully integrated with European eduroam Federation)
- Quality of Service
- VoIP – national academic voice network telephoning
- Ulak-CSIRT: Computer Security Incident Response Team for NREN
 - accredited by Trusted Introducer, European CSIRT Directory (first in Turkey)

Storage Services

- National Seismic data from hundreds of sensors of different national institutes related with earthquake
- TIER-2 Center for ATLAS and CMS experiments of CERN (Unique in the region)
- Distance Education data of various institutes

Training Services

- Grid and Parallel Computing
- VoIP,
- IPv4 and IPv6 Routing, IPv4 and IPv6 Security,
- 802.1x based authentication and system administration

Grid and HPC services through TRUBA e-infrastructure

ULAKBİM in FPx's



FP6 & FP5 Projects (9 Projects)

- **EUMEDCONNECT**
- **GEANT2**
- **EGEE-II** , • **EGEE-III**
- **EUMEDGrid**
- **SEE-GRID**, • **SEE-GRID-2**, • **SEE-GRID-SCI**
- **BSI: Black Sea Interconnection**

Ongoing FP7 Projects (7 Projects)

- **SEERA-EI: SouthEast European Research Area for e-Infrastructure**
- **GEANT3**
- **EuMed-Support**
- **EGI-InSPIRE** European Grid Initiative
- **e-IRGSP3** e-Infrastructure Reflection Group Support Project
- **HP-SEE** High Performance in South Eastern European
- **PRACE-2IP**

International Organizations



- **TERENA** (Trans-European Research and Education Networking Association)
- **EGI.eu** (European Grid Infrastructure)
- **RIPE NCC** (Reseaux IP Europeens Network Coordination Center)
- **CEENet** (Central and Eastern European Networking Association)
- **TI** (TRUSTED INTRODUCER)
- **e-IRG** (e-Infrastructure Reflection Group)

National Projects



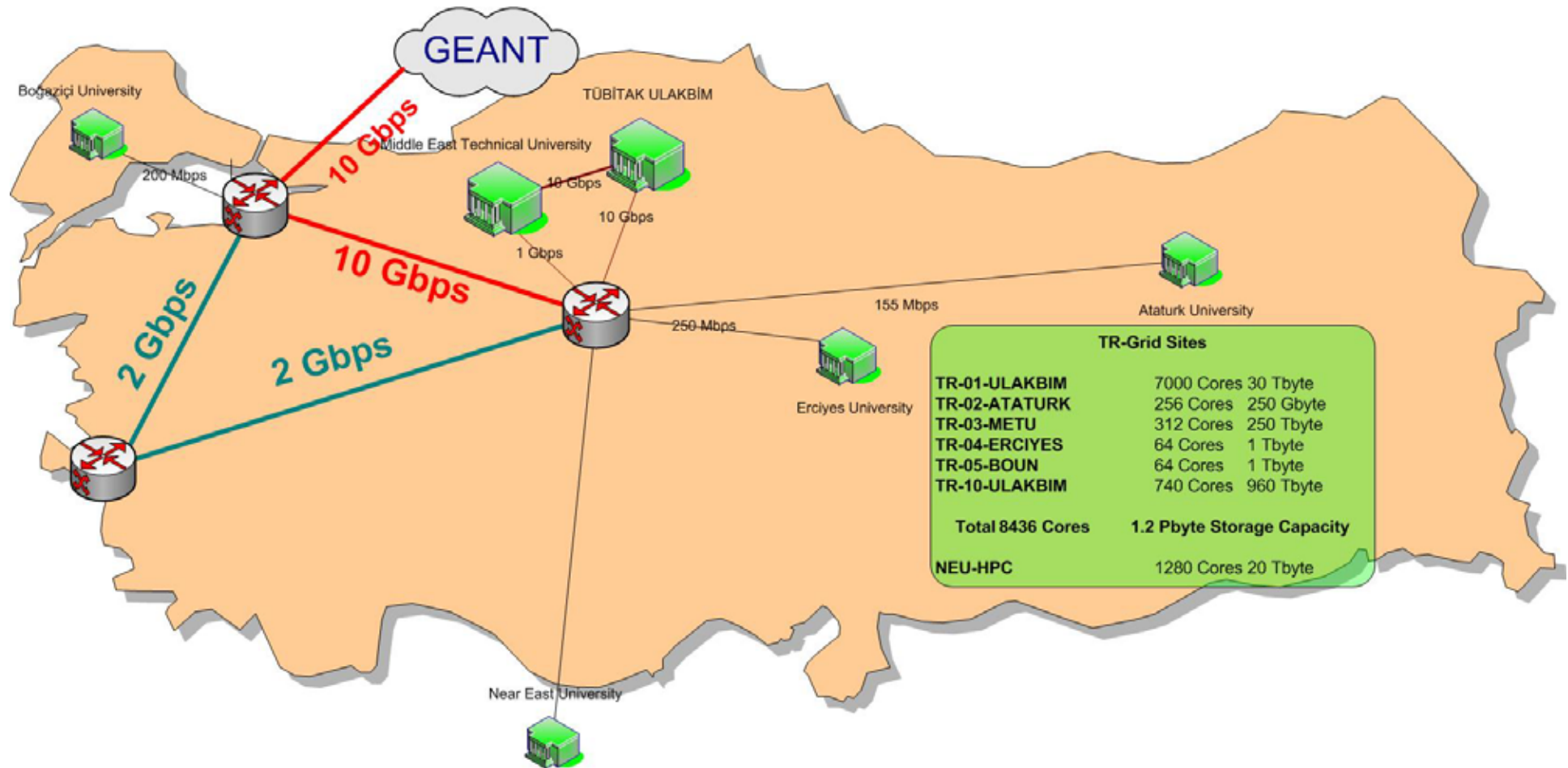
- 20M Euro annual ULAKNET Connectivity Costs (Ministry of Finance) (1996→ 201X)
 - New National Lightpath Project
 - xWDM and/or Ethernet based fiber optic access (own or leased)
- **New National Academic Network Infrastructure (ULAKNET2)**
 - **funded by State Planning Organization (2009-2011)**
 - **10 Gbps triangle backbone in 2011 between Istanbul-Ankara-Izmir**
- **Development of National Union Catalog Software for hundreds of libraries**
 - **Supported and funded by Ministry of Culture and Tourism (2009-10)**
- **Design of National IPv6 Infrastructure and Transition to IPv6 Protocol**
 - **Supported by Ministry of Transportation**
 - **Funded by Turkish Research Area Budget (2009-2011)**
- **Turkish National Grid enabled HPC Infrastructure project (TRUBA)**
 - **funded by State Planning Organization (2009-2013)**

National Projects: National Seismic Repository



Supported by State Planning Organization (2011-2013)
Real time and offline data collection from 3 major institutes and 9 regional university based seismic network

TRUBA (Turkish e-Science e-Infrastructure)



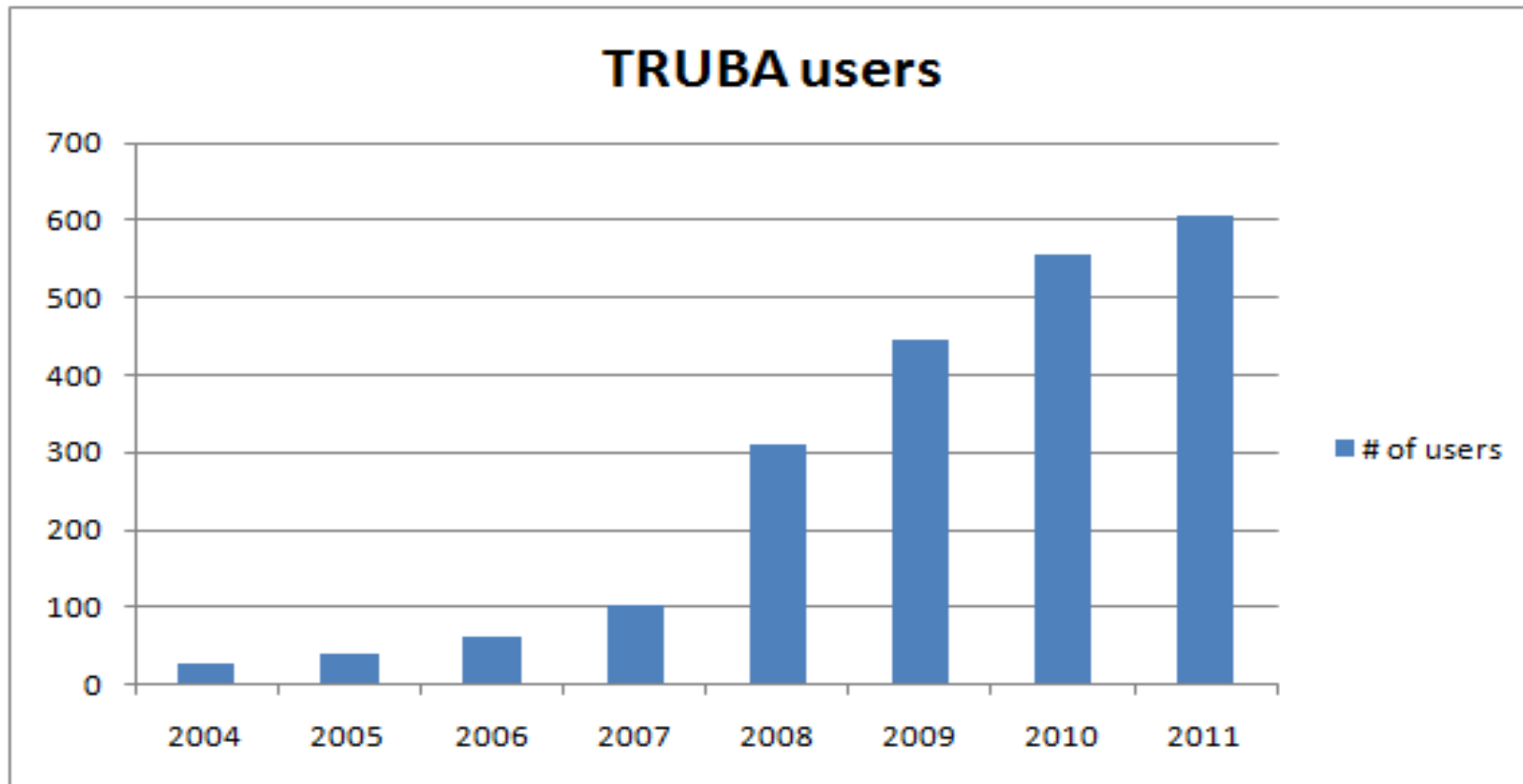
5 million euro support from State Planning Organization (2006-2010)

+10M during (2011-2015)

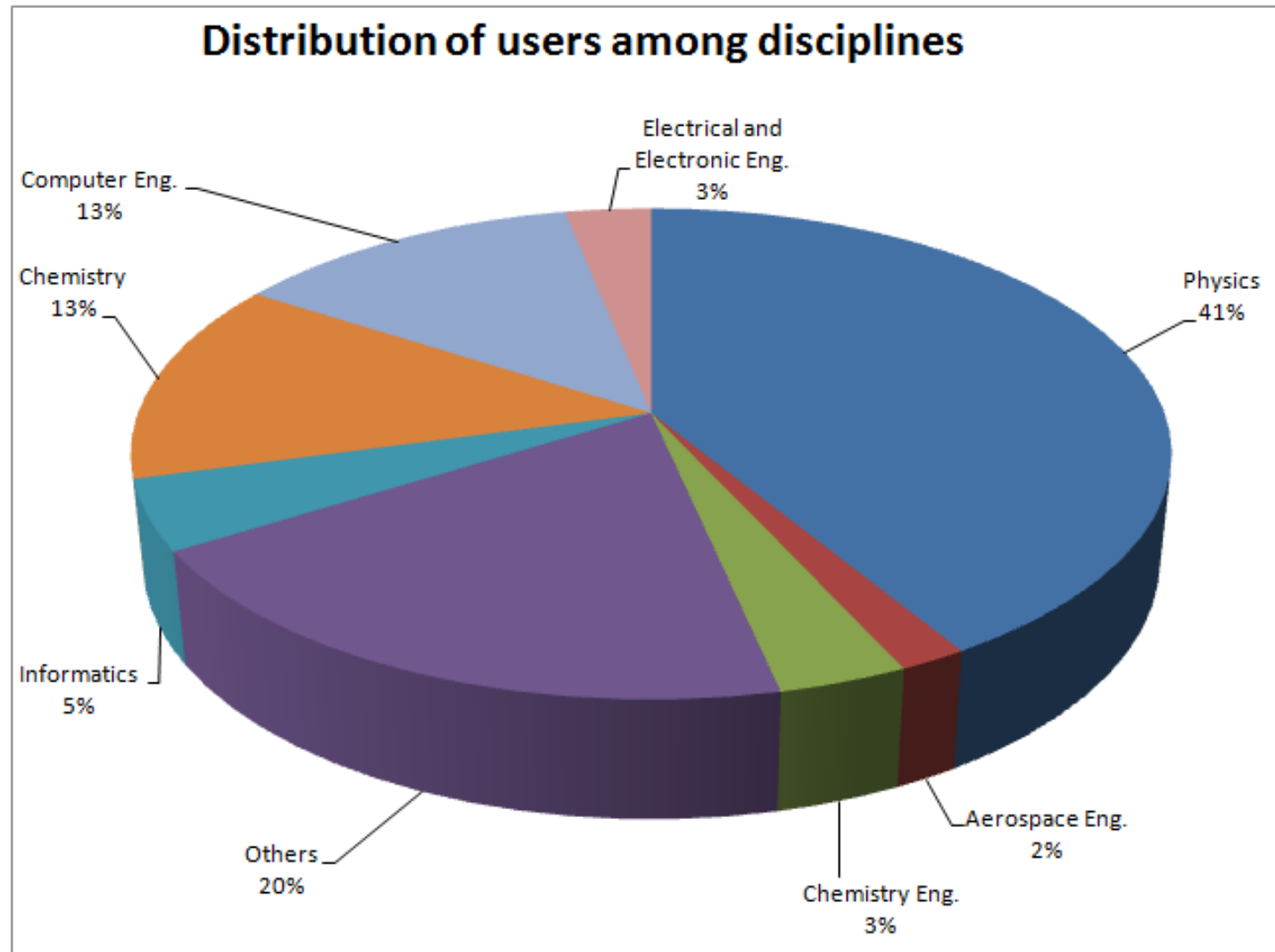
TRUBA Users



- **605 users**
- **34 different disciplines**
- **55 different institutes/universities**



TRUBA User Distribution



TRUBA Strengthening Activities 2011



- New 1MWatt datacenter with ability to support High Density installations (ready for operation)
- HPC cluster upgrade from 40 Tflops to 100 Tflops (Q4)
- Lustre DFS upgrade from 640 Tbyte to 1.2 Pbyte
- Dark fiber or high capacity WAN links to beneficiary institutes

Conclusion



- **ULAKNET and TRUBA are both leading infrastructures in their geographical region.**
- **ULAKBİM also identifies critical areas to improve and fully supports these areas with TRUBA infrastructure.**
- **TRUBA is a unique collaborative infrastructure that brings together universities, public agencies and industry.**