



# Research Network in Georgia

Prof. Ramaz Kvatadze ([ramaz@grena.ge](mailto:ramaz@grena.ge))  
Georgian Research and Educational Networking  
Association – GRENA  
Assoc. prof. Zurab Modebadze ([zurab@tsu.ge](mailto:zurab@tsu.ge))  
Ivane Javakhishvili Tbilisi State University

# Georgian Research and Educational Networking Association - GRENA founded in 1999

- **Tbilisi State University**
- **Georgian Technical University**
- **Ilia State University**
- **Tbilisi State Medical University**
- **Georgian State Agricultural University**
- **Georgian National Academy of Sciences**
- **Open Society - Georgia Foundation**

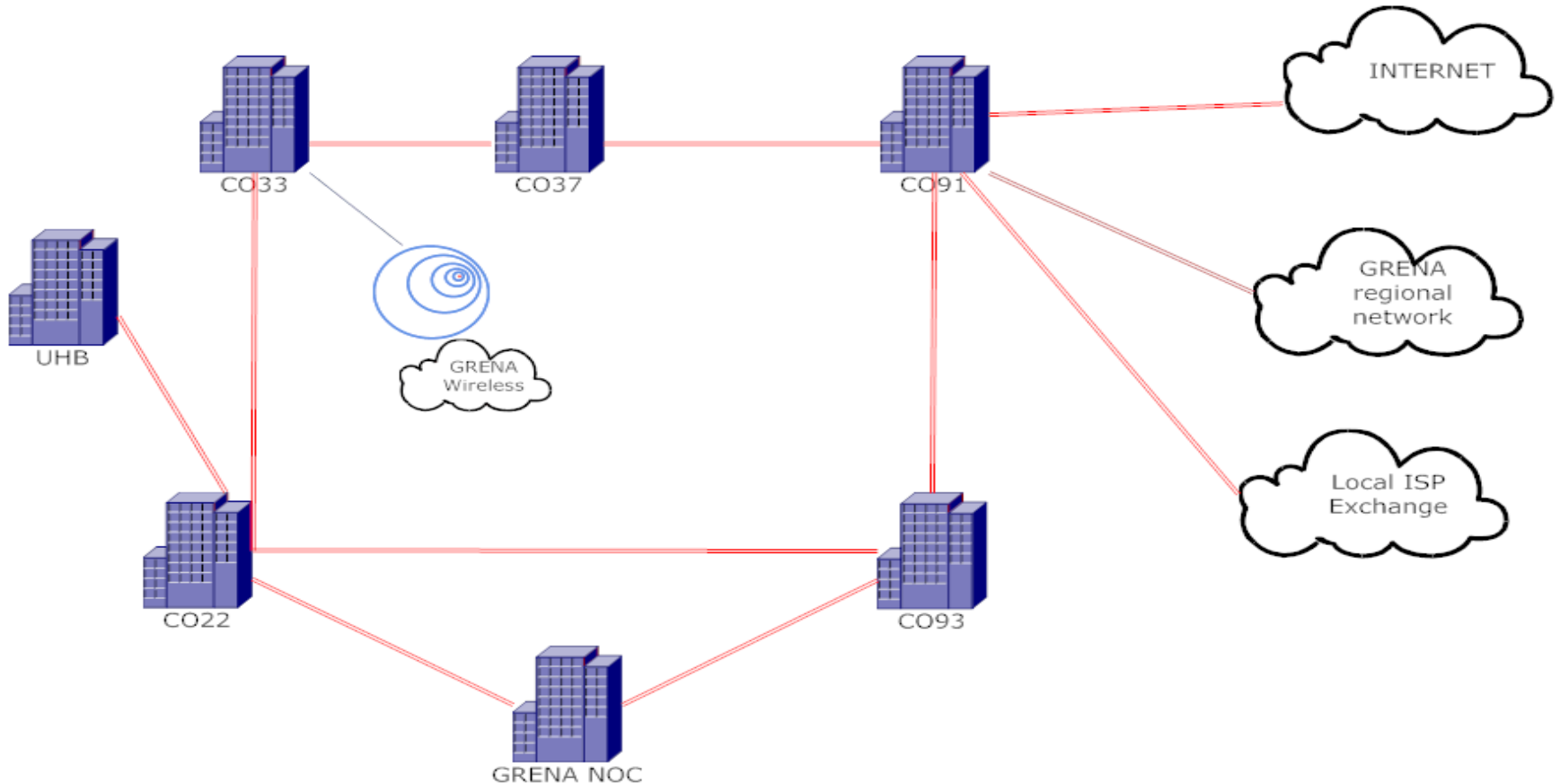
XXIV International Symposium on Nuclear Electronics and Computing  
(NEC'2013), September 09-16, 2013 VARNA , BULGARIA

# Main Fields of Activity


- **Providing Information Technology services to research and educational organizations**
- **IT Education**
- **Implementation of international and local R&D projects**
- **Promoting and supporting the ICT development in Georgia**

- **32 research and educational institutions**
- **71 physical connections**
- **1 Gbps fiber optic backbone**
- **Users connectivity:**
  - Fiber optic
  - DSL
  - Wireless technology
- **International connectivity (Caucasus Online)**
  - 200 Mbps
  - Redundant link (full backup)

# GRENA Network in Tbilisi

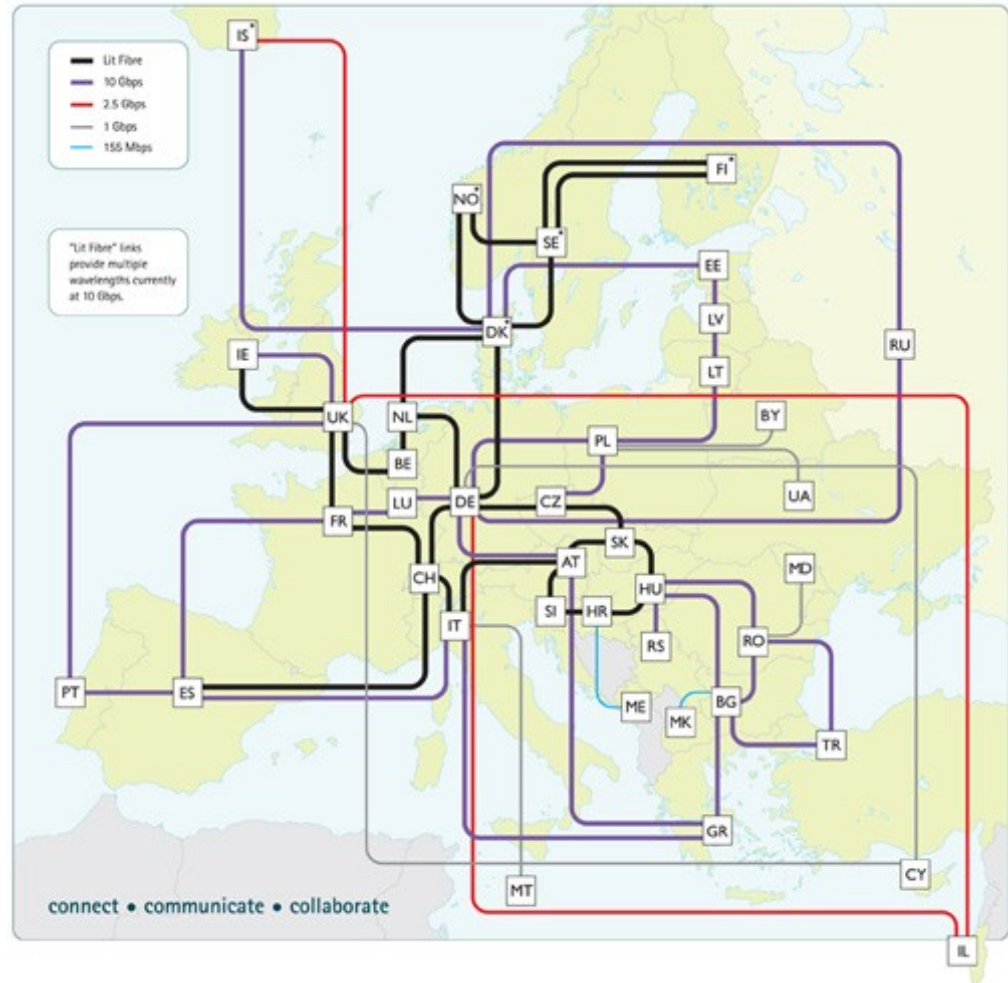


XXIV International Symposium on Nuclear Electronics and Computing  
(NEC'2013), September 09-16, 2013 VARNA , BULGARIA

- **Internet connectivity**
  - Managed and guaranteed bandwidth (QoS)
  - Virtual Private Network (VPN)
  - Network traffic monitoring and analyses (Nfsen, Nagios, Cacti)
- **Network services**
  - E-mail, Web-hosting, FTP
  - Virtual servers
  - H.323 based videoconferences (partner of Eyenetwork)
- **Network security**
  - Intrusion detection and prevention systems
  - Computer Emergency Response Team – CERT-GE
  - Performance and Enhancement Response Team – PERT
  - Software licenses      
- **Technical support - hot-line**

# Pan-European Research Network GEANT

- **GEANT and Europe's NRENs connect over 40 million researchers and academics across 8,000 institutions and 40 countries**
- **50,000 km of network infrastructure, of which 12,000 km is based on own fiber**
- **Data transfer speeds up to 40 Gbps**
- **2012/13 - network upgraded to 100 Gbps**



XXIV International Symposium on Nuclear Electronics and Computing  
(NEC'2013), September 09-16, 2013 VARNA , BULGARIA

# Relations with Pan-European Research Network GEANT

## 2002

- Establishment of satellite connectivity to GEANT via DESY Germany (NATO Virtual Silk Highway project)

## 2009

- E3 connection to GEANT co-funded by EC project Black Sea Interconnection
- GRENA obtained observer status at GEANT NREN PC

## 2013

- GRENA is participating in GN3plus project.
- Eastern European countries (Ukraine, Belarus, Moldova, Armenia, Azerbaijan and Georgia) were asked by EC to investigate possibilities and costs of upgrading links to GEANT.



**GRID site GE-01-GRENA in Georgia is located at GRENA and is included in European GRID infrastructure with following hardware:**

- Computing Element - Fujitsu/Siemens Primergy S200 server: 2x3,6 GHz Intel Xeon CPU, 2 GB RAM, 2x70 GB HDD.
- Storage Element - virtual server: 2x2.8 GHz CPU, 1 GB RAM, 1 TB HDD.
- User Interface - virtual server: 2x2.8 GHz CPU, 1 GB RAM, 100 GB HDD.
- Accounting Service - virtual server: 1x2.8 GHz CPU, 512 MB RAM, 32 GB HDD.
- Virtual Organization Membership Service - virtual server: 2x2.8 GHz CPU, 1024 MB RAM, 32GB HDD.
- Top-BDII and site BDII service - virtual server: 2x2.8 GHz CPU, 4 GB RAM, 40 GB HDD.
- Worker Nodes - 3 Fujitsu/Siemens Primergy S200 servers: 2x3.6 GHz Intel Xeon CPU, 2 GB RAM, 2x70 GB HDD.

**The average availability and reliability of the site is almost 100%.**

## Part of Cluster was located at the High Energy Physics Institute of Tbilisi State University

- **Computing Element - HP Compaq dx7500 Microtower server: 2x2,8 GHz Intel® Core™ 2 Duo E7400, 2 GB RAM, 320 GB HDD.**
- **Storage Element - HP ProLiant ML150 G6 server: 8x2.27 GHz Intel® Xeon® E5520, 4 GB RAM, 3,2 TB HDD.**
- **User Interface - HP Compaq dx7500 Microtower server: 2x2,8 GHz Intel® Core™ 2 Duo E7400, 2 GB RAM, 320 GB HDD.**
- **Accounting Service - HP Compaq dx7500 Microtower server: 2x2,8 GHz Intel® Core™ 2 Duo E7400, 2 GB RAM, 320 GB HDD.**
- **Site BDII service - HP ProLiant DL160 G6 server: 4x2.27 GHz ® Xeon® E5520, 8 GB RAM, 250 GB HDD.**
- **Worker Nodes - 6 HP ProLiant DL160 G6 servers: 4x2.27 GHz ® Xeon® E5520, 8 GB RAM, 250 GB HDD.**

# Cluster at the High Energy Physics Institute of Tbilisi State University



XXIV International Symposium on Nuclear Electronics and Computing  
(NEC'2013), September 09-16, 2013 VARNA , BULGARIA

# GRID Upgrade

## **Project proposal:**

- Development of Grid Infrastructure and Services to Support Research Communities in Georgia

## **Partners:**

- Tbilisi State University
- GRENA

## **Funding body:**

- Shota Rustaveli National Science Foundation

## **Objectives:**

- To upgrade Georgian grid infrastructure (to over 100 CPUs and 10 TB)
- To implement new services available at the European Grid infrastructure
- To support Georgian researchers in full exploitation of new infrastructure

# Running GRID and HPC Applications

- **Advanced research in modeling of the system for weather forecasting in Georgia**
- **Quantum-chemical modeling using modern non empirical method (mutation processes in DNA)**

**Simulations are performed at GRID and HPC facilities according to the European Commission InSPIRE and HP-SEE projects**

# Education Program in GRENA

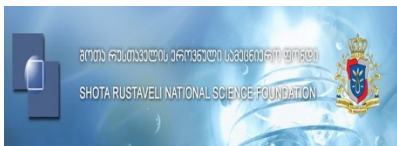
- **Cisco Networking Academy providing CCNA, CCNA Security CCNP and CCIP (not academy) courses (7 courses)**
- **In 2011 GRENA obtained two important roles in Cisco Networking Academy new structure: Cisco Academies' Support Center (ASC) and Instructors' Training Center (ITC) and supporting academies in Georgia and Armenia**
- **In 2012 GRENA became Linux Professional Institute Academic Partner and will start providing LPIC courses starting from January 2013**
- **In 2012 GRENA became Juniper Networks Academic Alliance member**
- **In 2010 distance learning center established at GRENA**
- **From 2009 GRENA is authorized partner of Pearson VUE for student's certification in IT field**



# Current Projects



- **European Grid Initiative: Integrated Sustainable Pan-European Infrastructure for Researchers in Europe (InSPIRE)**
- **High-Performance Computing Infrastructure for South East Europe's Research Communities (HP-SEE)**
- **Central and Eastern European Networking Engine (CEENGINE)**
- **Policy Dialogue in ICT to an Upper Level for Reinforced EU-EECA Cooperation (PICTURE)**
- **Multi-Gigabit European Research and Education Network and Associated Services (GN3plus)**
- **Implementation of New Learning Programs, Courses and Services in Information Technology**
- **Development of Grid Infrastructure and Services to Support Research Communities in Georgia**



# Conclusions

- **During last few years some development of E-Infrastructure for education (mainly for secondary schools) and science has been made, however there is still large gap between the developed European countries and Georgia**
- **Importance of cooperation with European E-Infrastructure flagship projects GEANT, EGI, PRACE is not well recognized by the Government**
- **Support from Government, European Commission and other donor organizations for the farther development of E-Infrastructure for education and science in Georgia is essential for the integration of scientific potential of country in the European Research Area**





**Thank you for attention!**

XXIV International Symposium on Nuclear Electronics and Computing (NEC'2013),  
September 09-16, 2013 VARNA , BULGARIA