GRENA
Georgian Research and Educational Networking Association

Network and computing infrastructures for scientific applications in Georgia

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GRENA network

- **45 Organizations**
- **17 research and educational institutions**
- **1 Gbps fiber optic backbone**
- **Users conectivity:**
  - Fiber optic
  - DSL
- **International connectivity**
  - 300 Mbps
  - Redundant link (full backup)

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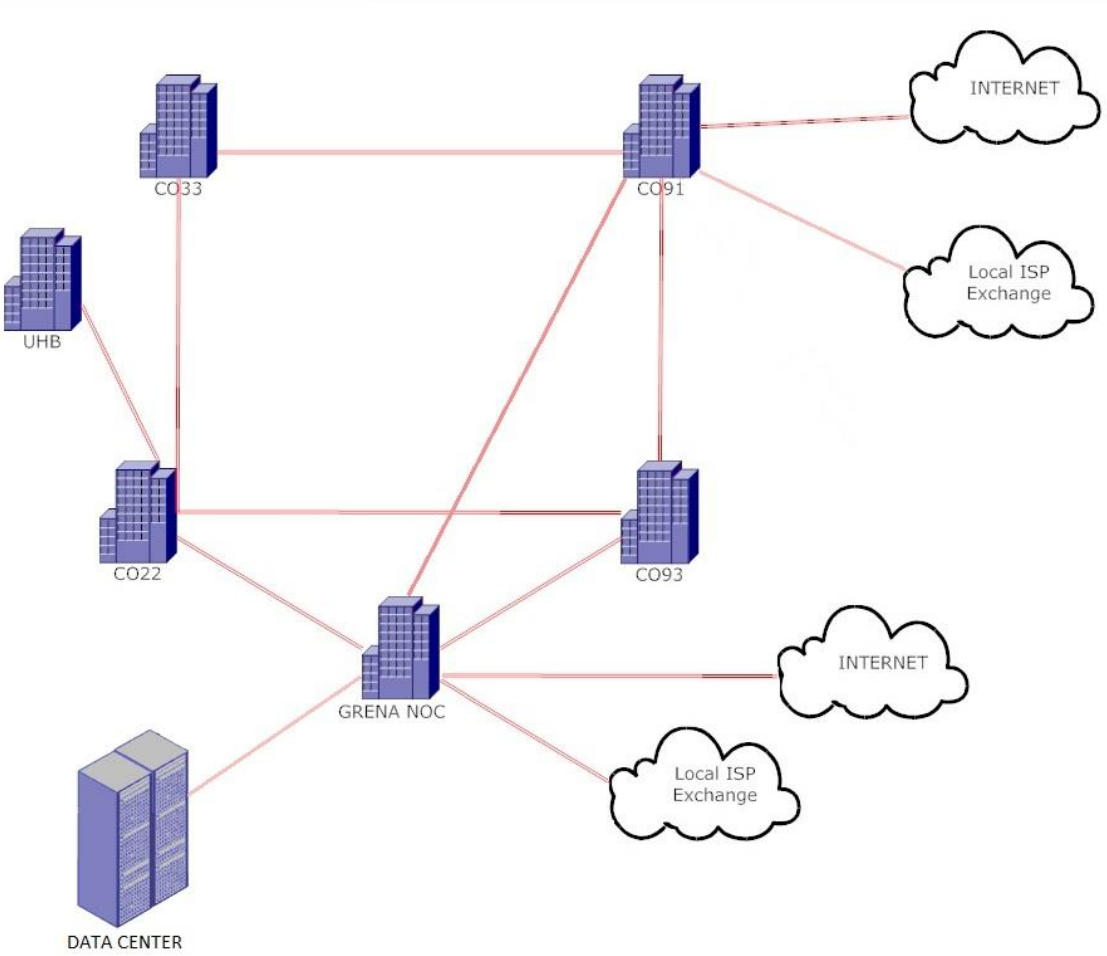
Network in Tbilisi



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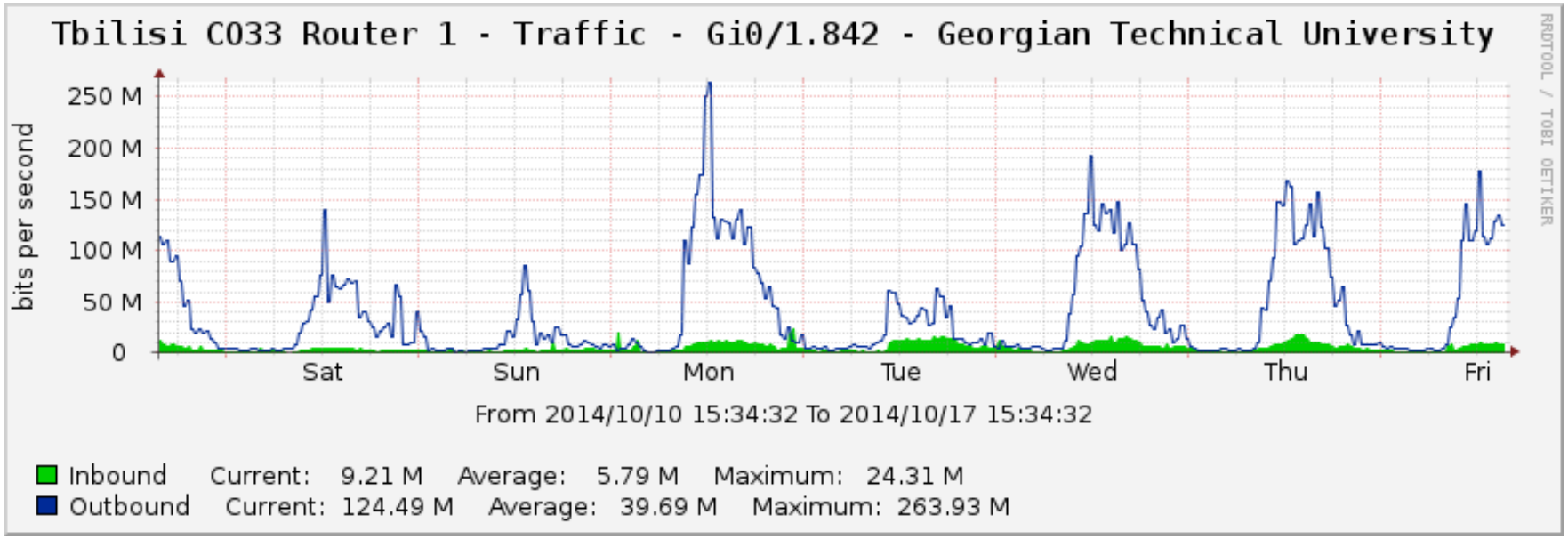
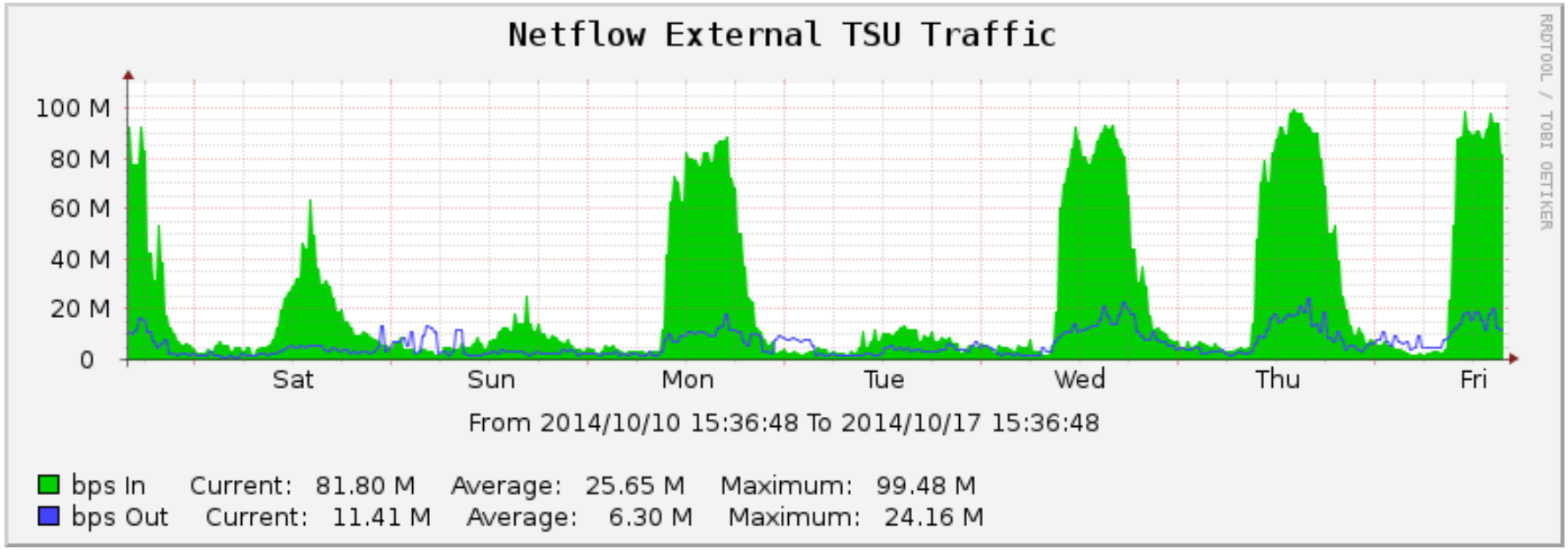
Network services

- **Internet connectivity**
  - Managed and guarantied 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)
  - e-learning system based on Moodle
- **Network security**
  - Intrusion detection and prevention systems (Sophos UTM, Snort)
  - Computer Emergency Response Team – CERT-GE
  - Software licenses SOPHOS Microsoft AVIRA eset symantec.
- **Technical support – hot-line**

Georgian Technical University network traffic



Tbilisi State University international traffic



- **Web traffic – 60%**
- **SSL traffic – 35%**

GÉANT network

GÉANT is a pan-European research and education network interconnecting European National Research and Education Networks (NRENs).

GÉANT provides a high-bandwidth, first-class network infrastructure and services connecting over 50 million users at 10,000 institutions across Europe.
Current GÉANT project GN3plus is a collaboration between 41 partners: 38 European NRENs, DANTE, TERENA and NORDUnet (representing Norway, Sweden, Finland, Denmark and Iceland). In total, the project represents 43 NRENs including Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine.
New GÉANT2020 proposal was submitted to the European Commission on 02.09.2014.

GÉANT

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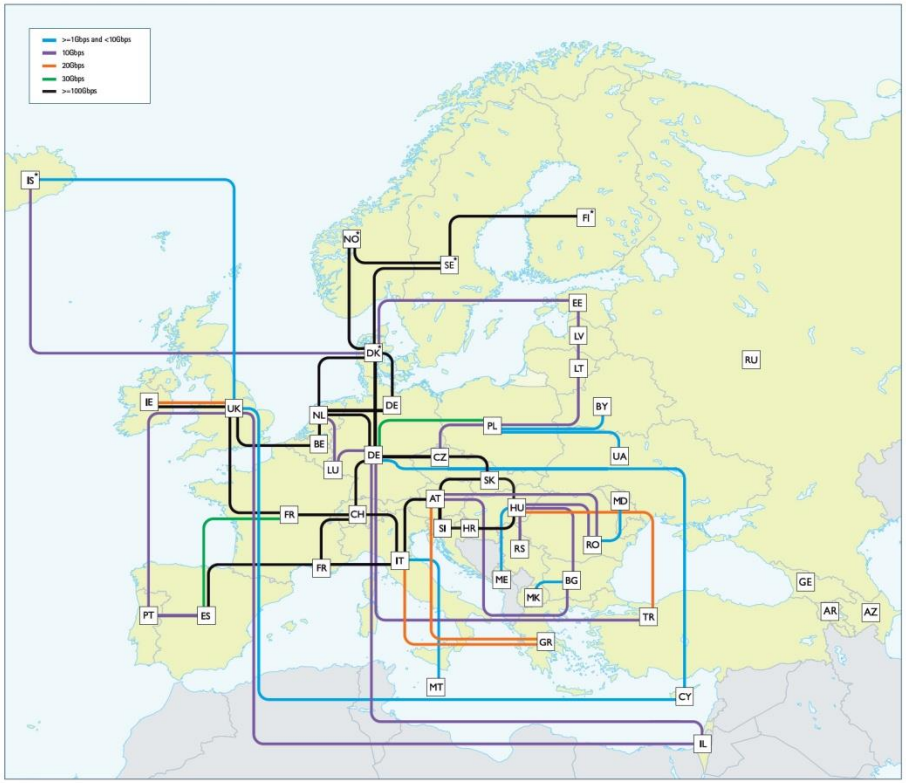
The Pan-European Research and Education Network

GÉANT interconnects Europe's National Research and Education Networks (NRENs). Together we connect over 50 million users at 10,000 institutions across Europe.



GÉANT connectivity as at January 2014. GÉANT is operated by DANTE on behalf of Europe's NRENs.

AR Armenia · BG Bulgaria · DE Germany · FI Finland* · HR Croatia · IS Iceland* · LV Latvia · NL Netherlands · RO Romania · SE Sweden* · TR Turkey

AT Austria · CH Switzerland · DK Denmark* · FR France · HU Hungary · IT Italy · ME Montenegro · NO Norway* · RS Serbia · SI Slovenia · UK United Kingdom

AZ Azerbaijan · CY Cyprus · EE Estonia · GE Georgia · IE Ireland · LT Lithuania · MK F.Y.R. Macedonia · PL Poland · BY Belarus · MD Moldova · UA Ukraine

BE Belgium · CZ Czech Republic · ES Spain · GR Greece · IL Israel · LU Luxembourg · MT Malta · PT Portugal · RU Russia · SK Slovakia

*Connections between these countries are part of NORDUnet (the Nordic regional network)

DANTE
www.dante.net

GÉANT is co-funded by the European Union within its 7th RtD Framework Programme.

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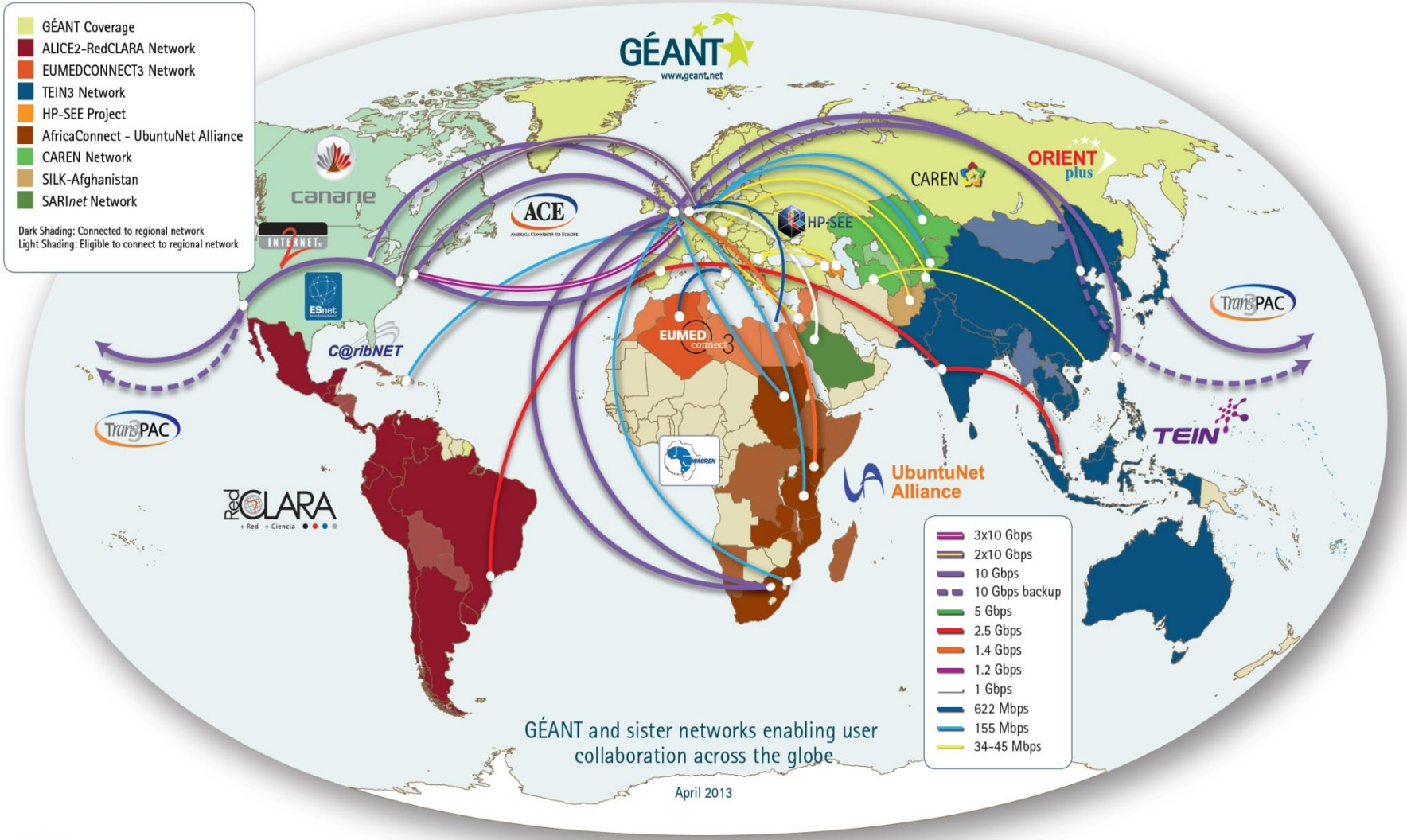
GÉANT At the Heart of Global Research Networking



DANTE www.dante.net

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connect • communicate • collaborate

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SEVENTH FRAMEWORK PROGRAMME

Co-funded by the European Union

Regional network for Eastern Partnership countries

E@PConnect proposal – integration of research and Education networks from Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine in GÉANT network. DANTE/GÉANT - coordinating partner.

- **Provides large capacity increase and fulfills connectivity requirements of EaP Countries.**
- **Implementation of GÉANT network services: eduGAIN (identity federations), eduroam (secure access to wireless networks on campuses from mobile devices), etc.**
- **4.5 years project, 2 phases: A - Planning and Procurement, B - Operational Phase**
- **Total contract value of €13.7 MEUR. Funding scheme: 95% from EC (DEVCO) and 5% from 6 beneficiaries.**
- **Final decision Q1 2015, implementation Q2 2015.**

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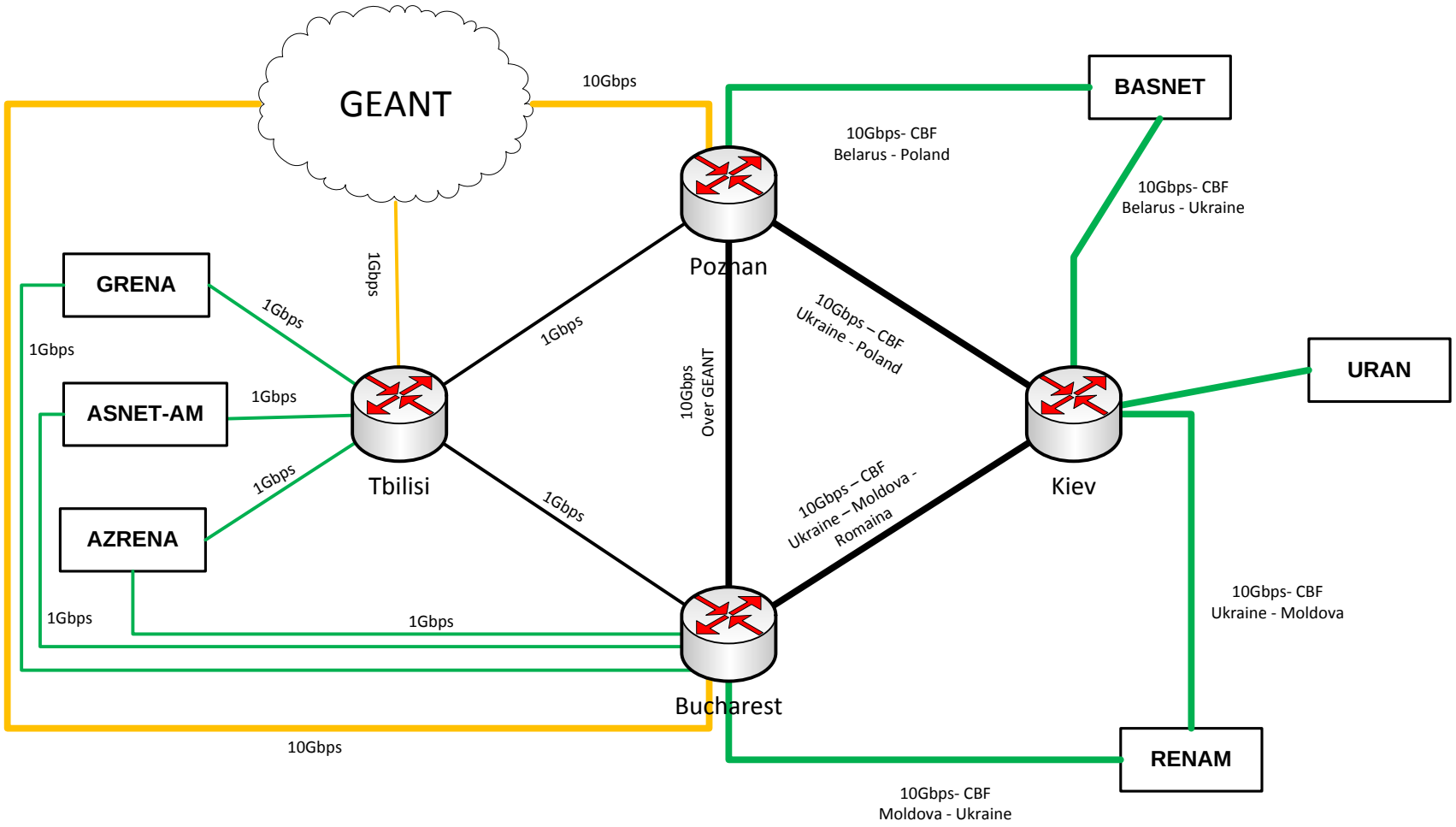
E@PConnect



Integrated Sustainable Pan-European Infrastructure for Researchers in Europe (EGI-InSPIRE)

The goal of EGI-InSPIRE project is to establish a sustainable European GRID infrastructure and provide European scientists and their international partners with a sustainable, reliable e-Infrastructure that can support their needs for large-scale data analysis and simulations. 51 national and international institutions from Europe and Asia Pacific region are partners of the project, among them organizations from Armenia, Belarus, Georgia and Moldova.

GRID Georgia

GRID site GE-01-GRENA in Georgia is located at GRENA and is included in European GRID infrastructure.

- **Logical CPU – 64**
- **Storage Capacity – 8 TB**
- **Supported VOs – 7**
- **Registration Authority (RA) at GRENA, establishment of Certification Authority (CA) is in progress.**
- **The average availability and reliability of the site is more than 99%.**

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Scientific applications

- **Advanced Research WRF (ARW) modeling system for weather research and forecasting for Georgia.**
- **Investigation of highly mono-energetic low Z-ion beams production at GeV energies with very small divergence angle using extremely high intensity laser beams.**
- **Quantum-chemical modeling of proton transfer in nitrogen containing biological active compounds using Density Function Theory (mutation processes in DNA).**
- **High resolution climate scenarios construction using Regional Climate Model. The RegCM v4.3 model was adopted for the South Caucasus region and executed for various time periods and boundary conditions on 20 Km grid.**
- **Quantum-chemical description of influence of the R-groups on the formation of peptide bond.**
- **Calculations of tumor cells concentration in the points taking into account proliferation migration and angiogenesis.**

Cloud

BSEC gEclipseGrid project: Experimental deployment of an integrated Grid and Cloud enabled environment in BSEC countries on the base of g-Eclipse.

Main Objective: to introduce a federated Cloud infrastructure in Romania, Armenia, Georgia and Moldova.

Partners: IIAP NAS RA (Armenia), RENAM (Moldova), GRENA (Georgia), ICI (Romania).

GÉANT2020 proposal has important Cloud component.

Discussions with the Ministry of Education and Science of Georgia about GRID and Cloud development.

Cloud project

Project proposal:

- Establishment of Cloud Computing Infrastructure for Research and Education at Tbilisi State University
- **Partners:**
- Tbilisi State University
- GRENA

Funding body:

- Shota Rustaveli National Science Foundation

Main objectives:

- Cloud infrastructure deployment
- Usage of Cloud infrastructure in education
- Usage of Cloud infrastructure in research projects

Submitted on June 2014

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Education program

- Cisco Networking Academy
- Cisco Academies' Support Center (ASC) and Instructors' Training Center (ITC) - supporting academies in Georgia and Armenia
- Linux Professional Institute Academic Partner
- Juniper Networks Academic Alliance member
- e-Learning center
- Authorized partner of Pearson VUE for student's certification in IT field

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Current projects

- **FP7:** European Grid Initiative: Integrated Sustainable Pan-European Infrastructure for Researchers in Europe **(InSPIRE)**
- **FP7:** Multi-Gigabit European Research and Education Network and Associated Services **(GN3plus)**
- **FP7:** Bringing the EU-EECA cooperation and policy dialogue in ICT in the HORIZON 2020 era **(EECA-2-HORIZON)**
- **TEMPUS:** Modernization of Mathematics curricula for Engineering and Natural Sciences studies in South Caucasian Universities by introducing modern educational technologies **(MathGeAr)**
- **BS CBC:** CULTURe EXchange Platform **(CULTUR-EXP)**

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

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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.**
- **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.**

Acknowledgments

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Thank you for attention!

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Questions ?