

# Global Research and Education Networks & The Role of GEANT

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# A European Model



- 30 National Research & Education Networks-NRENs of the extended European Research Area (ERA)
  - More than 3000 Research & Education Institutions
  - Millions of end-users + eScience Projects (e.g. Grids) under *Accepted Usage Policy* (AUP) rules
  - A 3-tier Federal Architecture, subsidized by National and EU Research & Education funds:
    - The Campus Network (LAN/MAN)
    - The NREN (MAN/WAN)
    - The Pan-European Interconnection: TEN34 ↯ TEN155 ↯ GEANT (GN1 in FP5) ↯ **GEANT2 (GN2 in FP6)**
- NREN Policy Committee, DANTE, TERENA

## **GEANT/GEANT2:**

The Pan-European Network *for Research & Research on* Next Generation Internet

# The NREN PC



Austria (**ACOnet**)

Belgium (**BELNET**)

Bulgaria (**ISTF**)

Croatia (**CARNet**)

Czech Republic (**CESNET**)

Cyprus (**CYNET**)

Germany (**DFN**)

Estonia (**EENet**)

Fance (**RENATER**)

Greece (**GRNET**)

Hungary (**HUNGARNET**)

Ireland (**HEANet**)

Israel (**IUCC**)

Italy (**GARR**)

Latvia (**LATNET**)

Lithuania (**LITNET**)

Luxembourg (**RESTENA**)

Malta (**UoM**)

Netherlands (**SURFNET**)

Nordic Countries – Denmark, Finland,  
Iceland, Norway, Sweden (**NORDUNET**)

Poland (**PSNC**)

Portugal (**FCCN**)

Romania (**RoEduNet**)

Russia (**RBnet**)

Slovakia (**SANET**)

Slovenia (**ARNES**)

Spain (**RedIRIS**)

Switzerland (**SWITCH**)

Turkey (**ULAKBIM**)

United Kingdom (**UKERNA**)

Delivery of Advanced Network Technologies  
to Europe Ltd. (**DANTE**)

Trans-European Research & Education  
Networking Association (**TERENA**)

# GN2 project

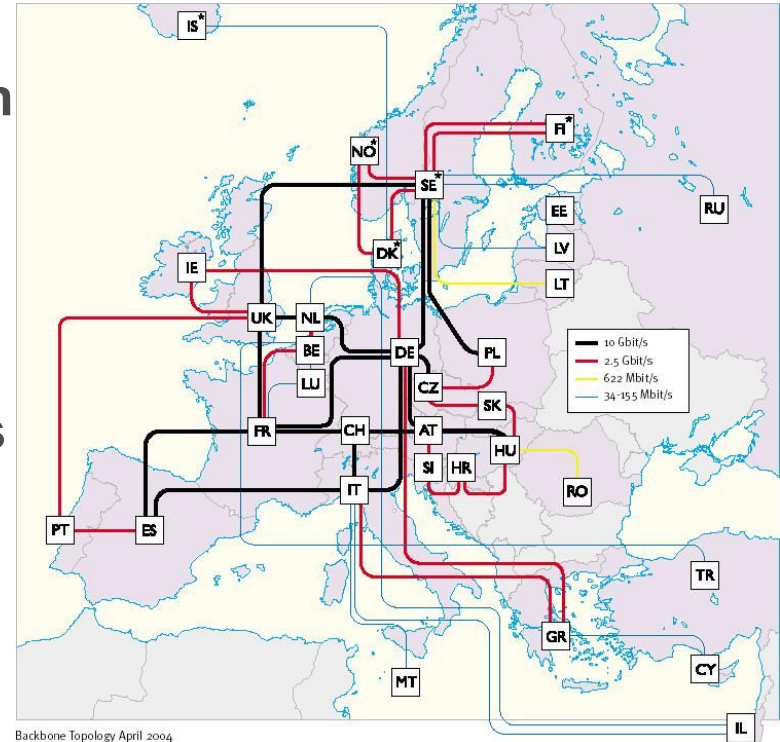


- **Funded from FP6, under Research Infrastructures**
  - An Integrated Infrastructure Initiative
  - Combining in a single contract, several activities essential to reinforce research infrastructures and to provide an integrated service at the European level
    - Networking activities
    - Provision of access to transnational users
    - Joint Research Activities
- **32 partners**
  - NRENs
  - DANTE, TERENA
- **Total expected budget: 178.643.730 €**
- **EC contribution requested: 93.000.000 €**
- **Duration: 4 years**

**The EU (GN2) subsidy covers < 10% of the total Research & Education Networking European Infrastructure (Campus LAN, MAN, NREN, GEANT/GEANT2)**

# Scope

- Further develops the successful GN1 (FP5) project which has created the GEANT pan-European network
- Upgrade of the network backbone: GEANT2
- Emphasis on switched **end-to-end** provision of services across multiple interconnected networks
- Gaining improved understanding of user needs
- Direct support and performance monitoring
- Migration from IP services to combination of routing and switching, network control, light paths



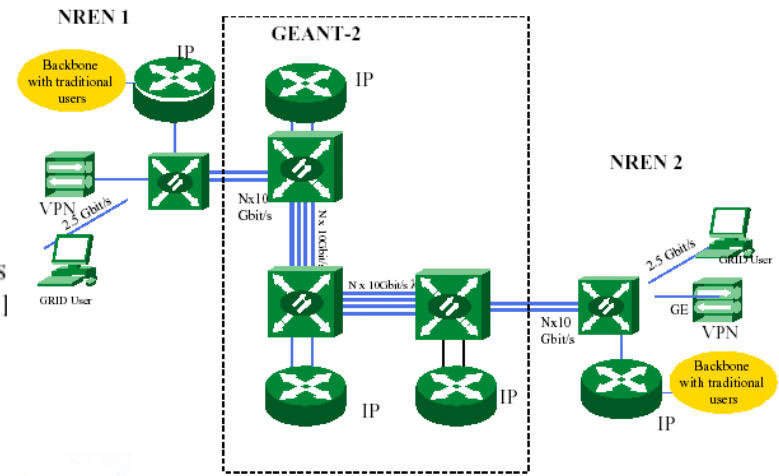
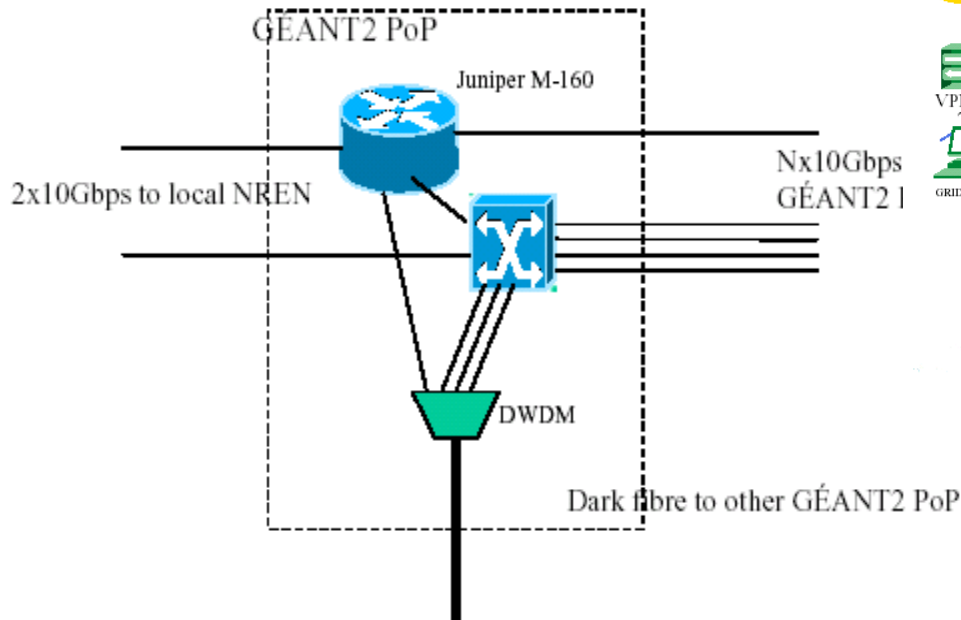
# Structure

- **Networking activities (NAs)**
  - Mutual co-ordination and the pooling of resources among the consortium of participants
  - Spreading good practice, promoting common protocols and interoperability, encouraging complementarity
  - Strategic study
- **Service Activities (SAs)**
  - Coherent access to infrastructures so as to improve the overall services available to the research community
- **Joint Research Activities (JRAs)**
  - Joint research into higher performance techniques, instrumentation or technologies
  - Innovative and exploring new fundamental technologies or techniques underpinning the use of infrastructures

# GEANT2: The network



- Node architecture
- End-to-end services



- 90% of the GN2 project budget allocated to GEANT2

# Joint Research Activities

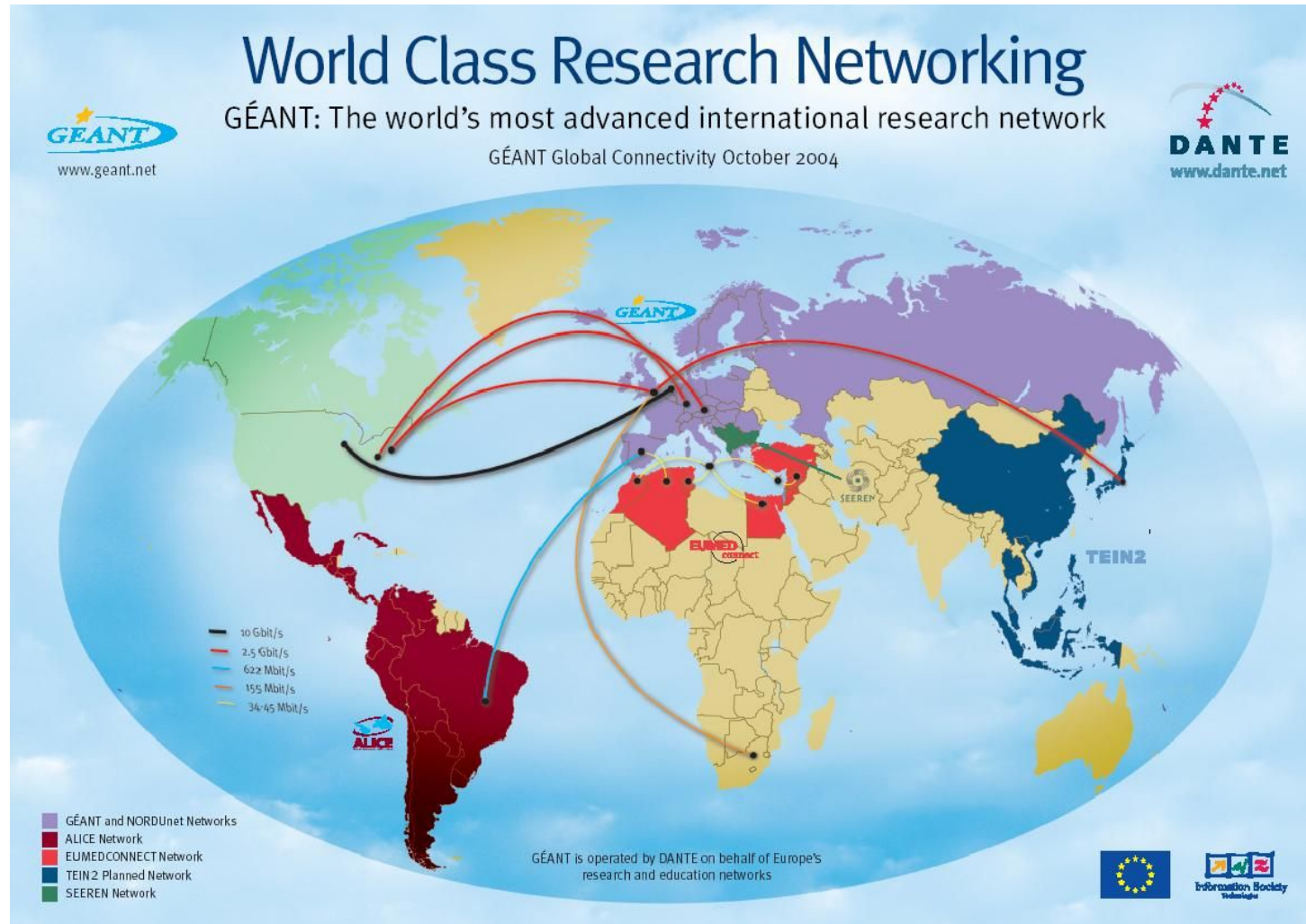


- **JRA1: Performance Measurements and Management**
  - End-to-end monitoring services
- **JRA2: Security**
  - Securing GN2 network elements and services
  - Security services
  - Coordination infrastructure
- **JRA3: New service development**
  - Bandwidth on Demand service (Extended layer-2 VLANs, Point-to-point switched layer-1 connections)
- **JRA4: Technology and service testing**
  - Distributed test bed in support for other activities and other FP6 projects
  - Technology testing
- **JRA5: Ubiquity and Roaming access to services**
  - Roaming among different networks and network technologies (like WLANs, UMTS and GPRS)
  - Inter-operable Authentication and Authorisation Infrastructures (AAI)



# GEANT Global Connectivity

GEANT2



# NREN/GEANT Hot Potatoes



- Test & deploy GEANT- wide **AAI** (prerequisite know-how for e-schools, digital libraries, e-government, e-health ...)
- Establish **virtual cooperative environments** (e.g. VRVS, Access Grid)
- Enhance **global connectivity** (USA, Canada, China, Japan, Korea, South Africa, Latin America, SEEREN, EUMED, **India** ...)
- Promote NRENs – GEANT as a **European success story**
- Strengthen coordination among NREN PC, DANTE, TERENA & EGEE
- Provide inputs to CREST, ESFRI, eIRG
- Interact with decision makers for FP7: EP – ITRE, European Council (Competitiveness), EC DG RESEARCH & DG INFSOM (*Media*)

**while at the same time**

- *Keep-up the good work and meet new challenges in the GTREN – eScience world (deploy optical technologies, provide e2e L1/L2 connectivity, update cost sharing models, investigate new business models ...) **Not a mission impossible!***

**Thank You**

**Questions?**