



# GÉANT2 User Support: helping to enable international research projects

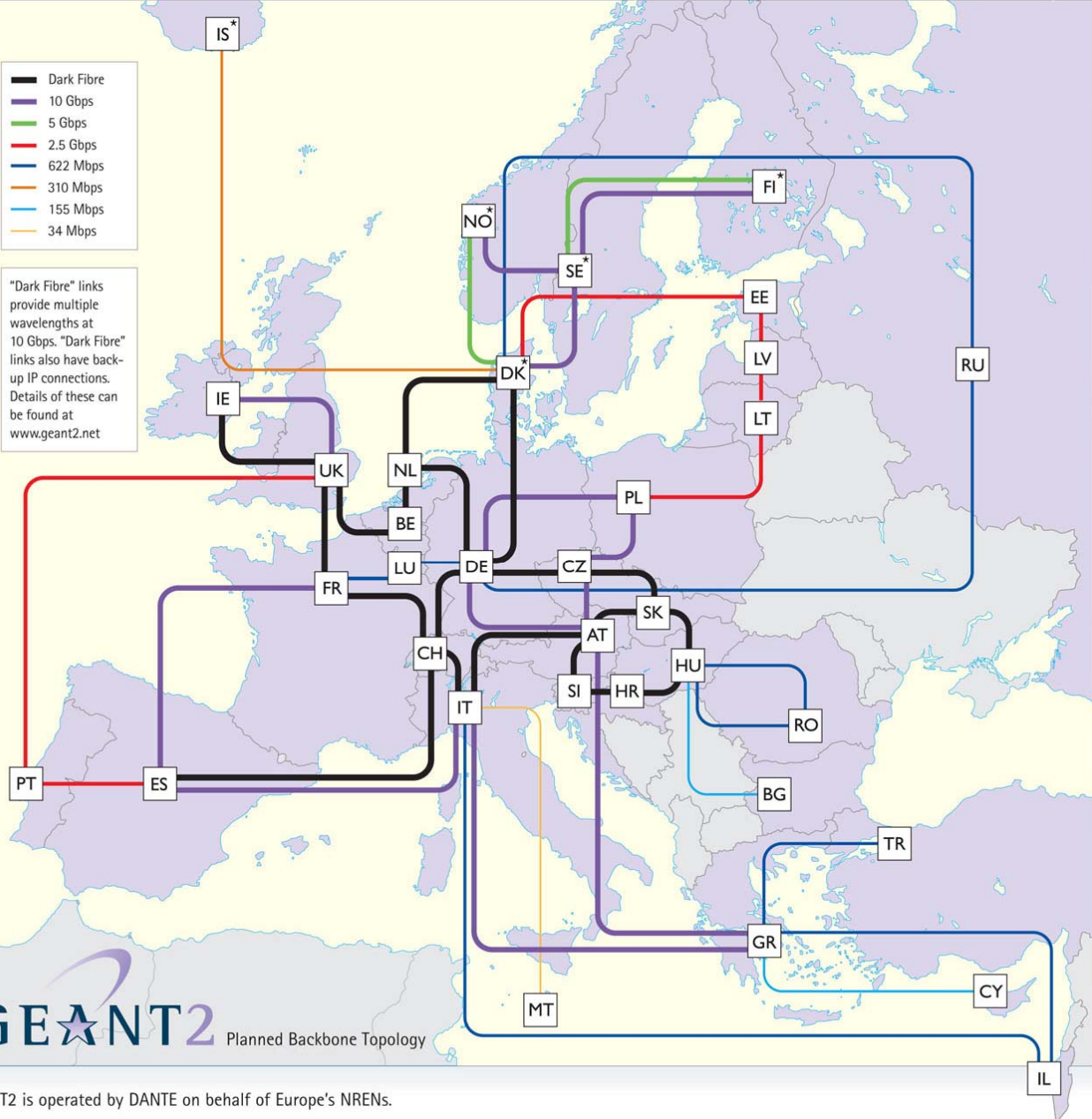
John Chevers, DANTE  
TERENA Networking Conference  
17<sup>th</sup> May 2006, Catania



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- Dark Fibre
- 10 Gbps
- 5 Gbps
- 2.5 Gbps
- 622 Mbps
- 310 Mbps
- 155 Mbps
- 34 Mbps

"Dark Fibre" links provide multiple wavelengths at 10 Gbps. "Dark Fibre" links also have back-up IP connections. Details of these can be found at [www.geant2.net](http://www.geant2.net)



# GÉANT2: a unique European resource

**GEANT2** Planned Backbone Topology

GEANT2 is operated by DANTE on behalf of Europe's NRENs.





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# Setting the scene....

GÉANT2 has a userbase of 3 million+ researchers spread across 34 countries in Europe....and many more in other world regions....

....they range from primary school children to nuclear physicists....from weather forecasters to cancer specialists....

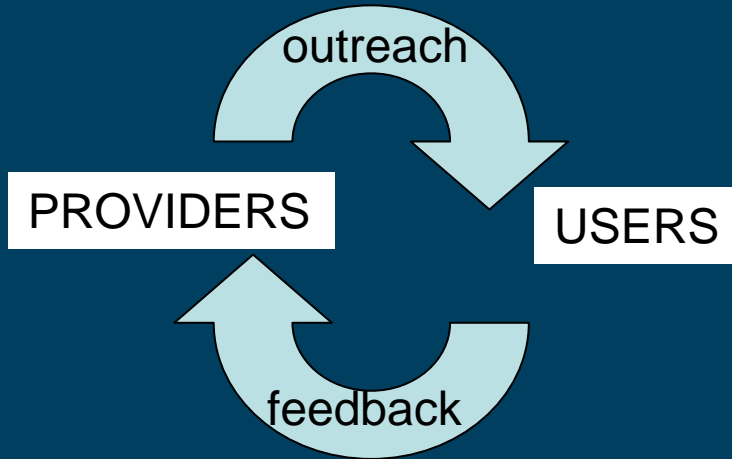
.....their requirements range from a few Kbps to many Gbps....from email to dedicated circuits....

....How do the NRENs and GÉANT2 support them?





# Understanding the users...



- Segmentation aims at developing a structured approach to assessing the user base in order to provide basis for communication to and from users:
  - to users:** raise awareness and understanding of GÉANT2 and its benefits
  - from users:** understand and meet requirements
- But...segmentation takes time....the studies are ongoing
- The users will not wait for the outcome of lengthy studies to decide how to meet their networking requirements
- Need to target priority groups to achieve desired outcomes...
- ....but what are the desired outcomes???
  - Increased usage of network bandwidth? By existing users? In new fields?
  - Increased take-up of specialised services? Meeting the highest demands?
  - Optimised configuration for network applications? Enhancing performance?



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# Defining who to address:

- The most immediately addressed group can be defined as **Demanding Users**
  - Applications with the highest level of network requirements
  - These are the users who need research networks most!
  - They help justify cutting-edge networks, networking research and help pioneer new services. Their needs might otherwise not be met...
  - The projects whose network usage is such that it is of interest to the networks involved
  - The users who will raise the profile of research networks and inspire other users



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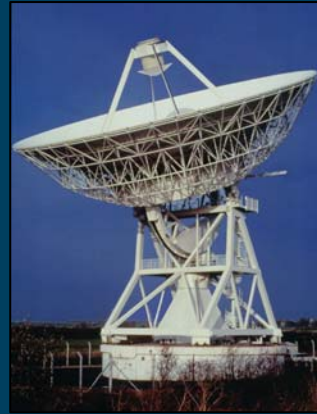
# Supporting them?

- A wide range of requirements
  - there is no universal ‘quick fix’
- A framework is required to handle **all** user requests  
.....but it must have facilities to meet the most complex requirements
- It should address the following aims:
  - Capture of requirements
  - Storage of and access to information
  - Planning and design of appropriate solution
  - Implementation and operation
  - Ongoing management

# A GÉANT2 User Group: eVLBI



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- What is eVLBI?
  - A radio-astronomy technique that uses great distances between telescopes to vastly increase their resolution
- Why do they use research networks?
  - To send transfer data from the telescopes to a central correlator whilst the measurement is ongoing. Vastly improves the speed for analysis and allows Window of Opportunity observations
- What is EXPReS?
  - A new eVLBI project, aiming to ‘production-ise’ the technique. It will increase the bandwidths to existing telescopes and expand the number of connected telescopes, both in Europe and globally
  - First EXPReS ‘science’ run has already proved a success

# What does GÉANT2 do for eVLBI?



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- Monitoring: counters set up and
- Planning (EVN-NREN forum)
- PERT case –aiming to optimise end-to-end performance (includes LSL sub-project)
- Point-to-point connections will be implemented:
  - Requests received for UK and DE
  - Many more expected in 2006-2007
- Switching capabilities retain flexibility eg UK-SE UK-NL
- What new telescopes? DE ES FI etc
- New connections –ZA, CN, AU, AR–made possible by the global reach of GÉANT2 -with TEIN2, ALICE/CLARA and ORIENT



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## The ESA HiSEEN Network

- 11 sites in 7 countries across Europe
- Collecting earth-observation data to better understand the environment and the changes it is undergoing

# An increasingly demanding user: ESA



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The European Space Agency –  
distributing Earth Observation data  
around the world using GÉANT2  
(and several of Europe's NRENs)

- ESA collects data on climate, the oceans and other macroscopic phenomena from EO satellites
- Satellite base-stations receive data and distribute it to other ESA sites for storage and analysis
- The HiSEEN network is based upon Europe's research networks and allows high-volume data transfers to take place between ESA sites



Photo courtesy ESA

# ESA: current and future requirements



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- GÉANT2 User Support is actively engaged with ESA to facilitate improved service levels across Europe and beyond
- Discussions are ongoing into:
  - Improving and streamlining the administration of services
  - Investigating the provision of fully protected circuits for essential mission monitoring and control data
  - Enhancing performance for TCP transfers over long distance paths (PERT case opened)
  - Looking into the connection of new sites across the globe (ESA and 3<sup>rd</sup> Party Missions)

# MUPBED: researching next-generation network technologies



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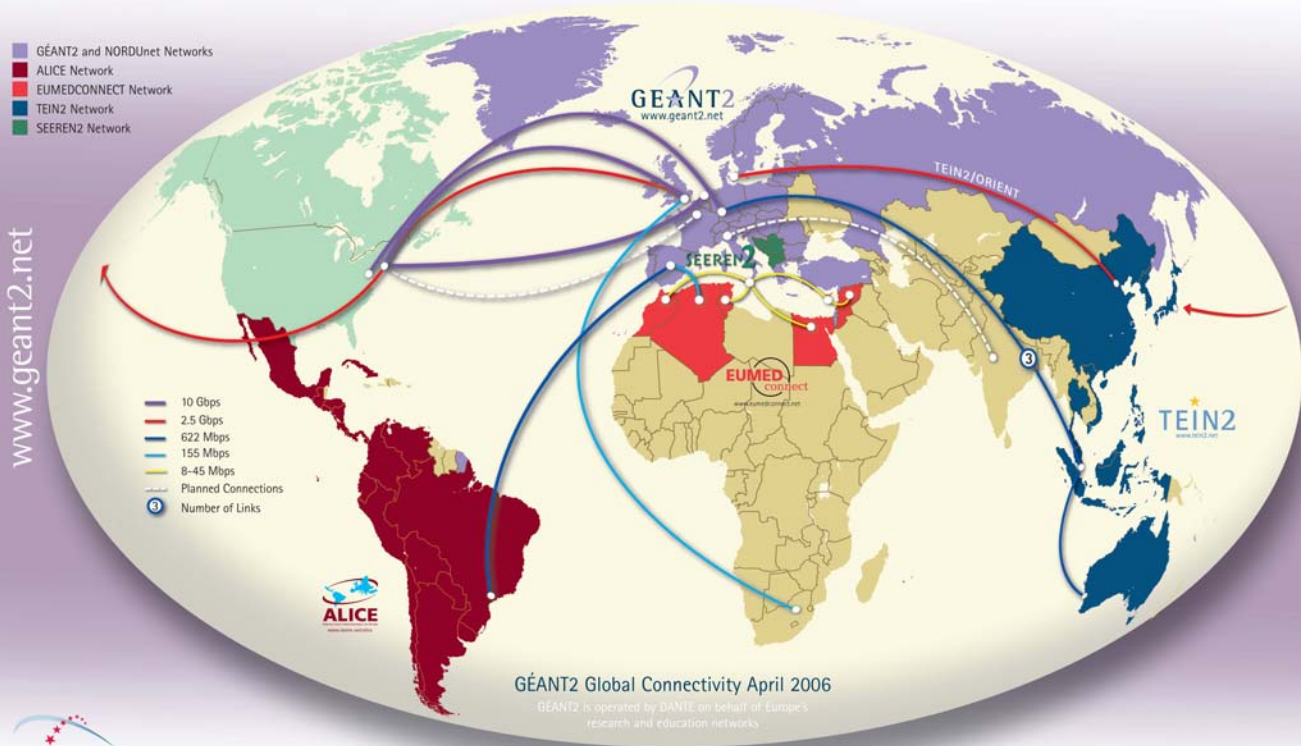
- Testing new network technologies on a truly international scale: ASON, GMPLS, etc
- Commercial, academic and NREN partners
- Network connectivity c/o GÉANT2, DFN, RedIRIS, PSNC, GARR [and NORDUnet]
- Full mesh of 68 LSPs implemented between 5 sites
- Special circuit to ACREO: direct access to the GÉANT2 router
- Careful handling of migration from GÉANT to GÉANT2
- As demonstrated at TNC2006!

# Beyond Europe: user demands across the globe



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## GEANT2 At the heart of Global Research Networking



- Users increasingly collaborate beyond traditional boundaries
- GÉANT2 provides a total of 48 connections globally
- Many international projects exist, specifically due to the available infrastructure



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# The future

- Development of a dedicated User Support database –to draw together many elements of the process and allow cross reference of user groups, network services, circuit and human resources
- Working together with GÉANT2 Performance Measurement and Monitoring work to enhance the users' understanding of network behaviour in a multi-domain environment
- TERENA TF LCPM –a forum for information exchange and services across Europe's research networks



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# Conclusions

- GÉANT2 offers unique opportunities for academics across Europe
- It is different from any previous international research backbone –we must be prepared to adapt to remain relevant to the research and education community
- The new services –particularly point-to-point circuits –make GÉANT2 different from all previous generations of network
- It is important to ensure that the roll-out of new services is efficient and that users derive maximum benefit
- Providing support at a European level compliments NREN support services nationally and is essential for a cohesive end-to-end solution



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# Any Questions?

....but remember....  
...the coffee is excellent...

....and the glories of the GÉANT2  
exhibition stand await you!

