

European NRENs and GTREN

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Athens, June 12th, 2003

Business model adopted (1)

- In the vast majority of European nations, a single state-controlled advanced infrastructure serves all Universities and Research Centers networking needs.
- NRENs do not compete with the ISP community and do not distort electronic communications markets in a highly competitive environment.
- The NREN community maintains the academic – research networking tradition that was the driving force for the ARPAnet – NSFnet – Internet early stages in the USA.
- NRENs in Europe and their Pan-European gigabit interconnection GEANT, serves more than 3000 Institutions, half of which using it as their sole gateway to the global Internet.

Business model adopted (2)

- The European Research & Education networking model evolved into a three-tier architecture: The campus LAN, the national MAN – WAN (the NREN) and the federal gigabit interconnection GEANT.
- All three tiers enable end-users to communicate with gigabit speeds as if the campus LAN is extended into the whole European Research Area.
- The three-tier structure may arrange for the provision of Virtual Private Networks (VPN) resources to eScience projects (e.g. GRIDs) on request, with possibly end-to-end Quality of Service guarantees (jitter, speed, security etc.)
- The strictly hierarchical structure of Research & Academic networking in Europe may facilitate the provision and management of user, national and Trans-European resources, but may suffer from rigidity to follow the overall Internet paradigm, which is based on peering and neutral interconnection facilities (GigaPoP telehousing).
- Fourth level in the hierarchy or may eventually render the Trans-European level (GEANT) obsolete and replaced by peering arrangements?

Business model adopted (3)

- The European “federal” Research & Education Networking platform attracted global interest as it unified hundreds of thousands of advanced European researchers into a critical mass comparable or superior to US, Canadian and Japanese networked communities.
- The successor to GEANT is expected to be the driving force in the Global Terabit Research & Education Network – GTREN.
- As a first step, European NRENs (together with their non-for-profit corporation DANTE and TERENA) are tying together the European Research Area (GEANT) including South-East Europe (SEEREN initiative), North America (gigabit Transatlantic connections to Internet2 and Canarie), South American (@lice initiative), Third Mediterranean countries (EUMED-CONNECT initiative), links to NRENs in the Russian Federation, Ukraine, Asia – Pacific (TEIN initiative) etc.