Fibre Link Moldova-Romania Inauguration Event
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The Case for NRENs, and European Collaboration in Research Networking

TRANS-EUROPEAN RESEARCH AND EDUCATION NETWORKING ASSOCIATION

Research networks and the Internet

› The Internet had its origins in the world of research and universities. Today, many years later, and despite enormous changes, research networks are still the most advanced part of the Internet.

› Technologies and applications find their way from research networks to the general Internet. Research networks are an important source of innovation.
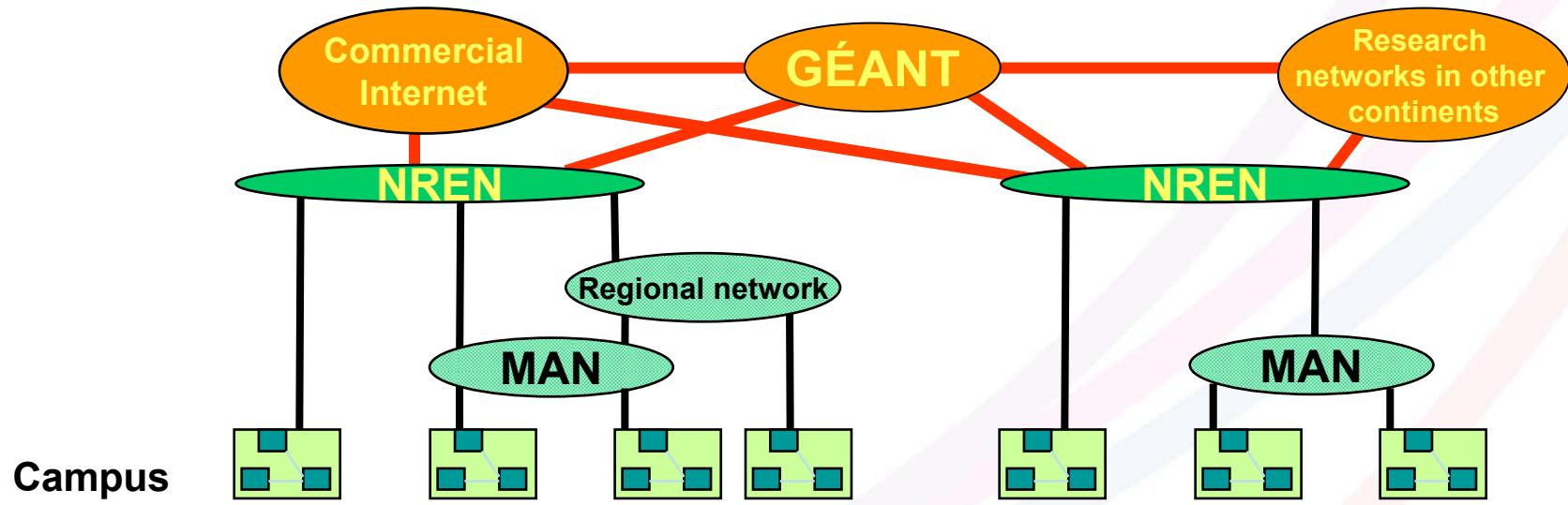
Research networking is organised in a three-level model

› In Europe, research network services are organised at three (or four) levels:

  › the Local Area Network (campus)

  › the national network provided by the National Research and Education Network organisation (the NREN)

  › international connectivity in Europe provided by GÉANT

  › [intercontinental connectivity]

The three-level model in Europe

› Peering with the commercial Internet takes place both at the NREN level and at the GÉANT level.

› Connectivity to research networks in other continents is through GÉANT or is provided directly by the NREN.

› In some countries, campuses are connected to the national networks via MANs and/or regional networks.

Commercial Internet — **GÉANT** — **Research networks in other continents**

NREN — **NREN**

Regional network

MAN — **MAN**

Campus

Why do NRENs exist?

› Despite the emergence of commercial Internet Service Providers, NRENs continue to exist because:
  › The research and education community represents the most demanding network users
  › Satisfying their needs requires large investments
    › not only in infrastructure but also in the testing and deployment of new technologies and the development of new services
  › Research and education is not a community with a very significant purchasing power
  › Therefore, research and education network services do not offer a compelling business case for commercial companies

Why must a government support the country's NREN?

› Market imperfections (see previous slide)

› Education and research are areas of government responsibility in their own right

› The NREN is a national asset; it has a much wider importance than just providing connectivity and services to research and education
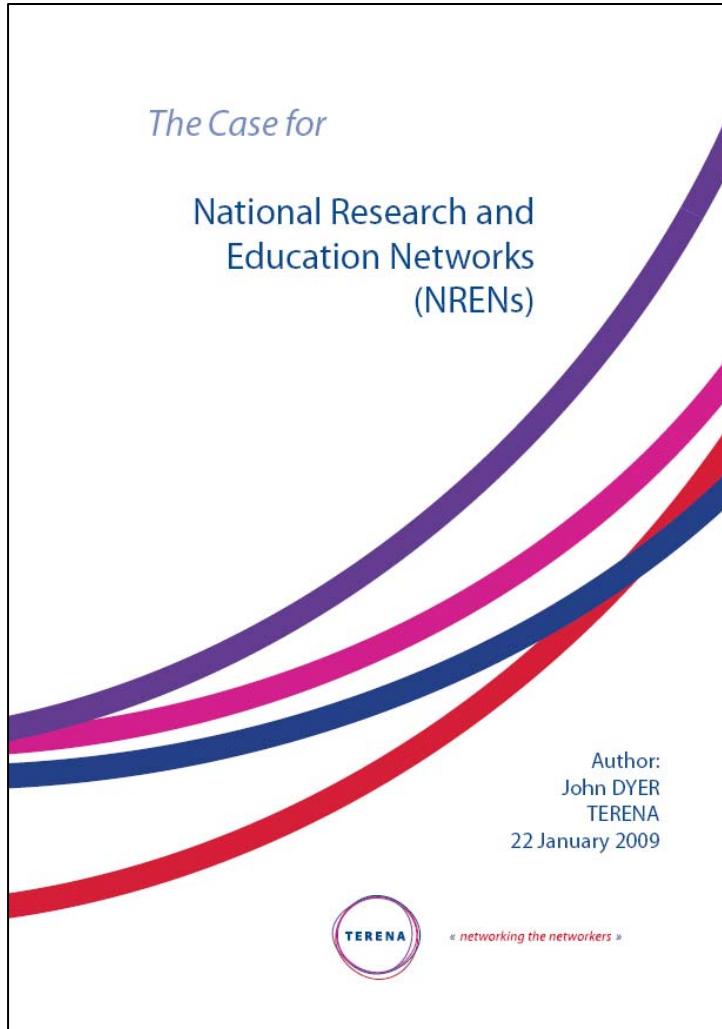
An NREN is a national asset

"National governments should be aware that research and education networking in their country, and in particular their National Research and Education Network (NREN), is an asset for economic growth and prosperity. It is a source of innovation and provides fast and widespread technology transfer to society and industry. Promoting such technology transfer should be an explicit goal of NRENs."

Summary Report SERENATE foresight study

December 2003
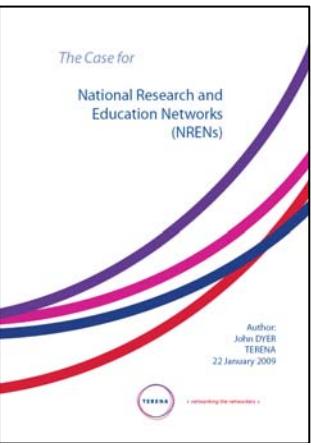
The Case for NRENs
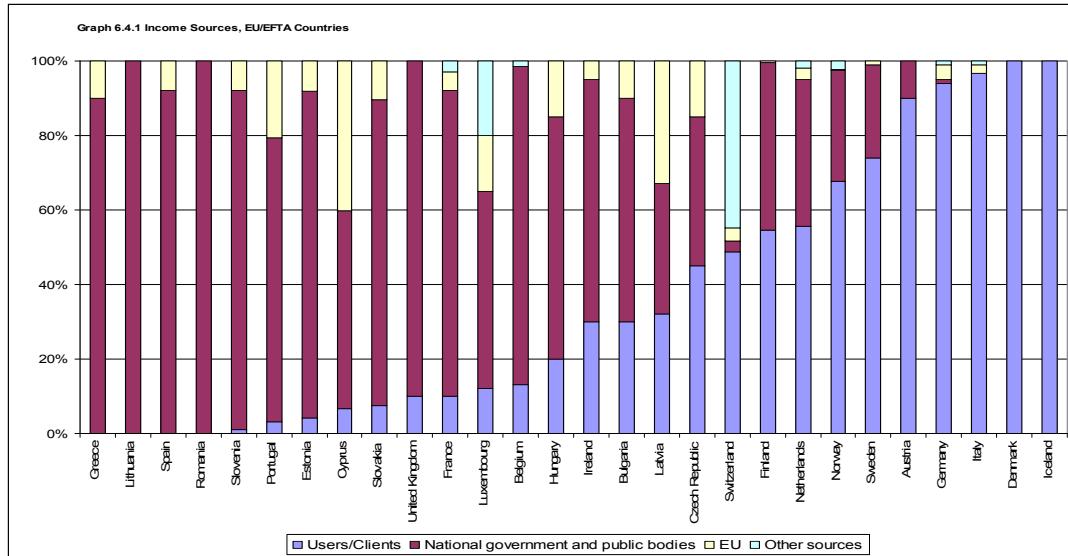
# What is the need for NRENs when commercial ISPs exist?

› Affordable access to necessary facilities
  › Commercial ISPs do not satisfy the requirements of our demanding users at an economically justifiable price

› "The NREN Club" model
  › NRENs have a history of collaborating globally on finding solutions in a way that would be difficult for commercial ISPs

  › Services can be developed better jointly

  › International multi-domain collaboration
    › Common approaches to things like QoS

The question of funding
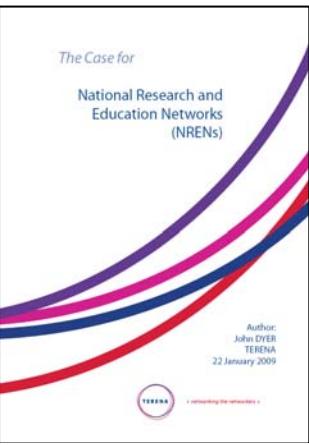
Non-User /Client Funding

User/Client Funding

Graph 6.4.1 Income Sources, EU/EFTA Countries

Users/Clients National government and public bodies EU Other sources
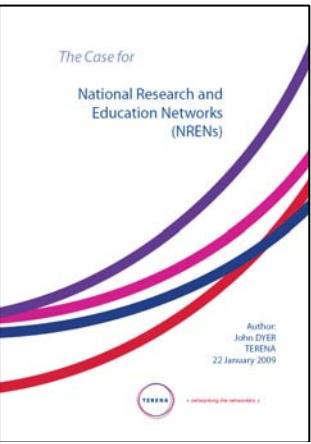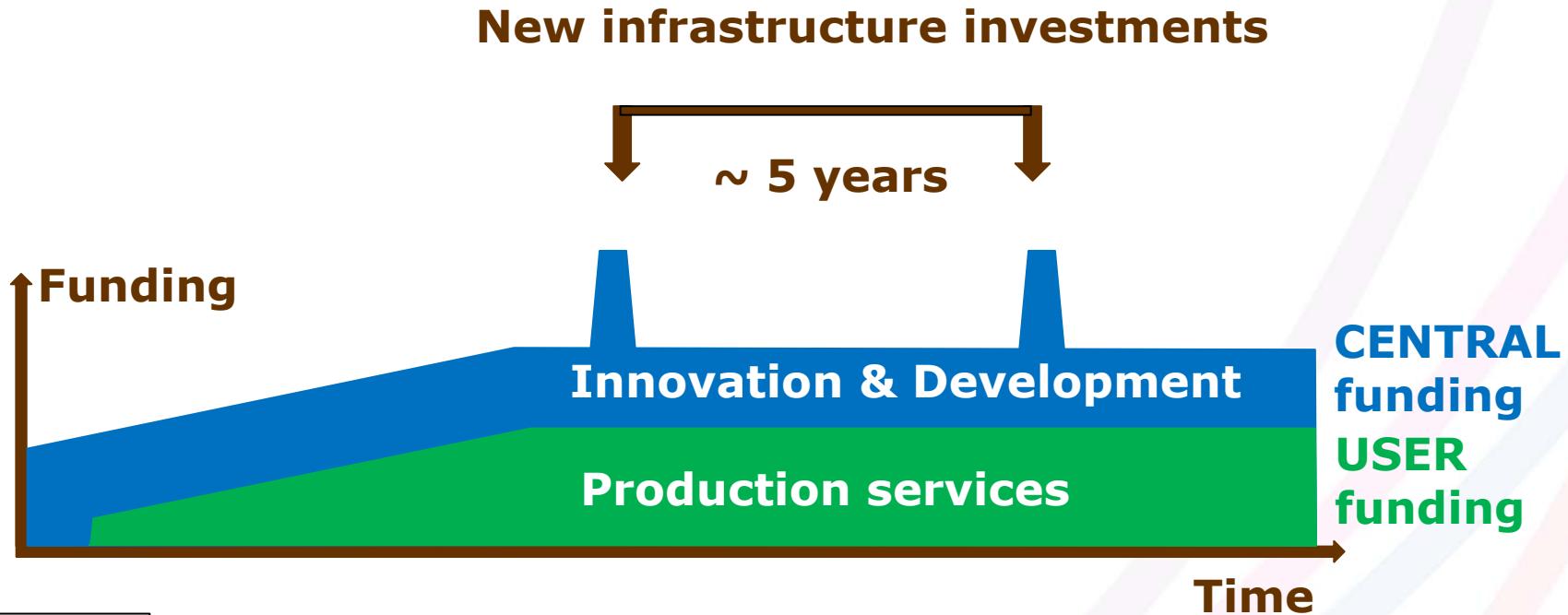
› A complete spectrum exists in Europe:

  100% user-client funding
  100% non-user-client
  and . . . . everything in between

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National Research and
Education Networks
(NRENs)

Author:
John DYER
TERENA
22 January 2009

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Why is there a need for central/government funding of NRENs?

New infrastructure investments

~ 5 years

Funding

Innovation & Development

CENTRAL funding

Production services

USER funding

Time
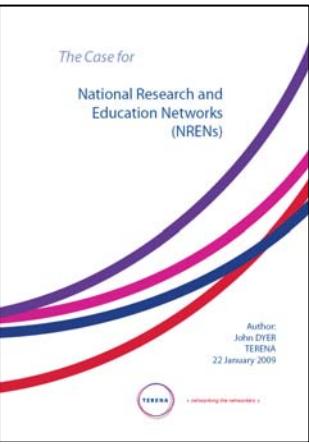
› Users have short term investment horizons
› Governments can invest in long term innovation
› The most sustainable is probably a hybrid

The NRENs' relationship with the ISP market
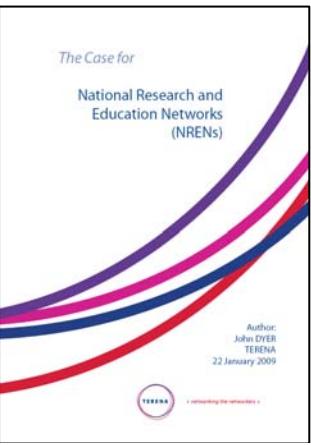
› NRENs serve a closed user group of advanced users

› NRENs buy infrastructure in the commercial market.

› NRENs can use the competitive market to the best advantage just as any other purchaser

› Collaboration between NRENs and commercial ISPs is encouraged and will result in mutual benefits

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The regulatory position of NRENs
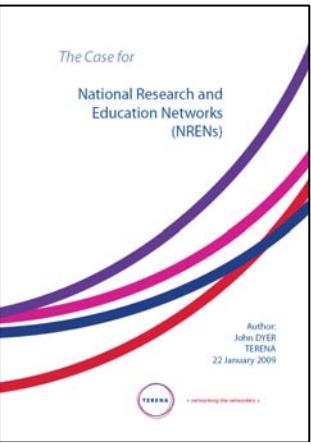
› NRENs serve a well bounded community
› CLOSED USER GROUP

› Not in the business of providing public access
› NOT A PUBLIC NETWORK

› NRENS should adopt best industry practice

› Not be compelled to register as a public network

› Detracts from the innovative and pioneering mission of NRENs

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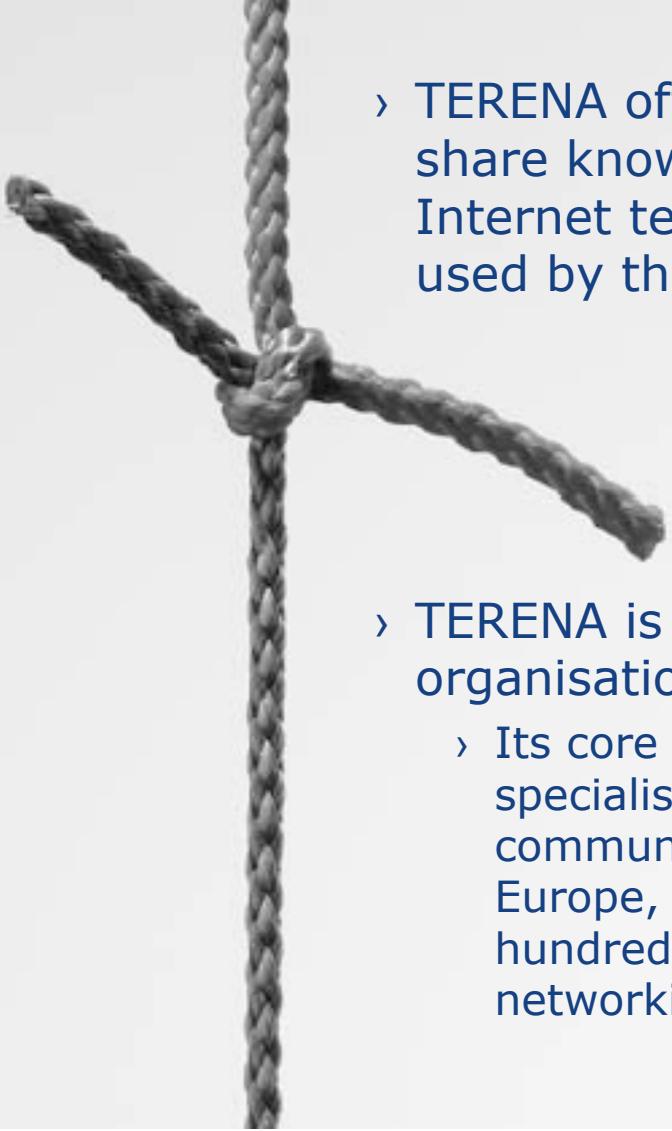
Conclusions from 'The Case for NRENs'

› NRENs occupy a special position in the data-communications sector

› They are innovative and pioneering

› They are not-for-profit   -   and should remain so

› They contribute to national and international development

› Recognised as a national asset

› Ultimately benefit industry and society generally

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About TERENA

› TERENA offers a forum to collaborate, innovate and share knowledge in order to foster the development of Internet technology, infrastructure and services to be used by the research and education community.

› TERENA is first and foremost a collaborative organisation.

   › Its core business is to bring together managers, technical specialists and other people in the research networking community with their counterparts from other countries in Europe, mobilising the expertise and experience of hundreds of professionals in the research and education networking area.

TERENA membership

› RENAM is expected to join on 3 June 2010

TERENA's Technical Task Forces (1)

› CSIRT (Computer Security Incident Response Teams)
  › a forum where members of the CSIRT community can exchange experiences and knowledge in a trusted environment

› EMC2 (European Middleware Coordination & Collaboration)
  › TF-EMC2 has given birth to several activities, such as SCHAC, REFEDs, TACAR

› Mobility and Network Middleware
  › focus on roaming and network middleware

TERENA's Technical Task Forces (2)

› Media Management & Distribution
  › audio and video recording, repository and distribution services to universities (where e.g., lectures can be recorded, archived and distributed), taking into account special requirements regarding quality, searchability, copyright, policy, etc.

› Storage
  › exchanging and promoting ideas, experience and knowledge and fostering collaborations among NRENs and academic and research institutions on the topics of data storage, data management, and cloud storage.

› NOC ? – under discussion
  › Exchange of information and best-practices between Network Operation Centres

TERENA's non-technical Task Forces

› TF-CPR (Communications and Public Relations)
  › Information Dissemination Increasingly important
  › Sharing of Best Practice & Experience
  › Electronic News distribution

› TF-MSP (Management of Service Portfolios)
  › Business aspects of setting up and running NRENs
  › **The Case for NRENs**
  › Exchange of Best Practice
  › Inter-NREN collaboration of developing services
  › Market place for NRENs to exchange services
  › Effects of Commoditization of Service

Some of TERENA's services
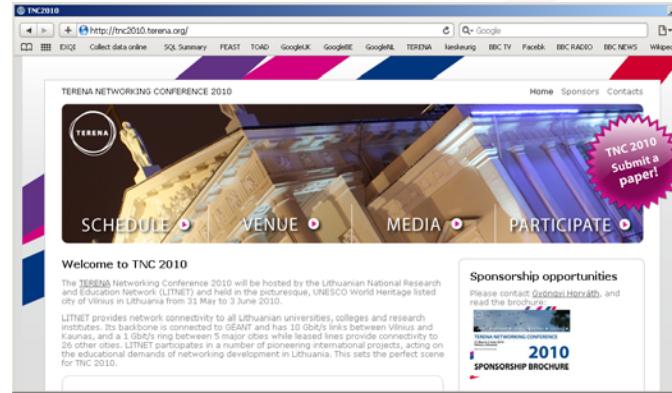
› eduroam®
  › "open your laptop and be on-line"

› Trusted Introducer service
  › Accreditation of CSIRTs
    › having an accredited CSIRT is a requirement for an NREN to become a full participant in GN3 (GÉANT)
    › TERENA also organises training for staff of CSIRTs ("TRANSITS")

› TERENA Certificate Service
  › Very cheap large-scale provision of certificates
    › server certificates, personal certificates, code-signing certificates
    › 22 NRENs participating already

› TACAR ®
 › Trusted repository of root certificates of academic CAs

TERENA's events

› TERENA Networking Conferences
  › Vilnius, 31 May – 3 June 2010
  › Prague, 16-19 May 2011

› Workshops
  › NRENs and Grids
  › EuroCAMPs (identity management training)
  › CSIRT training ("TRANSITS")
  › Quality of e-mail services (fighting spam)
  › End-to-end provisioning
  › Performing Arts Production
  › ....

Other TERENA activities

› TERENA Compendium
  › Collection of data about NRENs in Europe

› Networking Development Support
  › Support to the development of research networking in less-advanced countries and regions

› Partner Services Promotion
  › Promoting the roll-out and uptake of services offered by/through NRENs

Many TERENA activities are financially supported by the European Union through the GN3 project

More information

› TERENA activities are open to everybody, and participation is strongly encouraged

› Full information is available on the TERENA website:

www.terena.org

› Overview is in the TERENA Annual Report
  › www.terena.org/publications

Questions?

Much more information at
www.terena.org