



e-IRG Workshop
4-5 April 2011, Budapest

John DYER
Business & Technical Strategist
TERENA

www.terena.org

« networking the networkers »

ASPIRE

The TERENA/GN3 foresight study

NRENs & the European Networking Ecosystem


TRANS-EUROPEAN RESEARCH AND EDUCATION NETWORKING ASSOCIATION

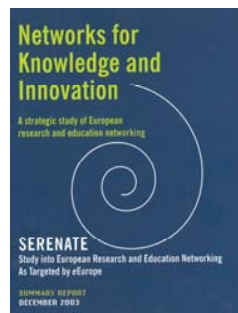


ASPIRE

A Study on the Prospects of the Internet for Research & Education

Direct one's ambitions towards achieving something Oxford English Dictionary

- › Foresight Update Study
- ›  GÉANT GN3 NA2 task
- › Policy input for initiatives to keep ERA networking at the worldwide forefront



2002-2003



2006-2008



2011-2012



SERENATE (2002 - 2003) Topics



- › **Infrastructure availability**
- › **Regulatory situation**
- › **Telecoms market**
- › **Infrastructures models & scenarios**
- › **Equipment technologies and availability**
- › **User needs and priorities.**
- › **Costing of European networking infrastructure**
- › **Extending the user communities.**
- › **Geographic issues**



SERENATE Summary



- › Research networks are a national asset
- › Optical networking - everyone can and should participate
- › Very demanding applications - need careful attention
- › There is a digital divide inside the EU R&E community
- › The campus is often the weakest link in the network chain
- › Users need end-to-end service quality AAI and Value added services
- › Need for inclusiveness & benefits of economies of scale
- › There is a crucial role for the European Union

<http://www.terena.org/publications/files/SERENATE-FINAL.pdf>



EARNEST (2006 – 2008)



- › Researchers' requirements
- › Technical issues
- › Campus issues
- › Economic issues
- › Geographic issues
- › Organization and governance issues
- › Users in schools, healthcare arts, humanities, social sciences



EARNEST



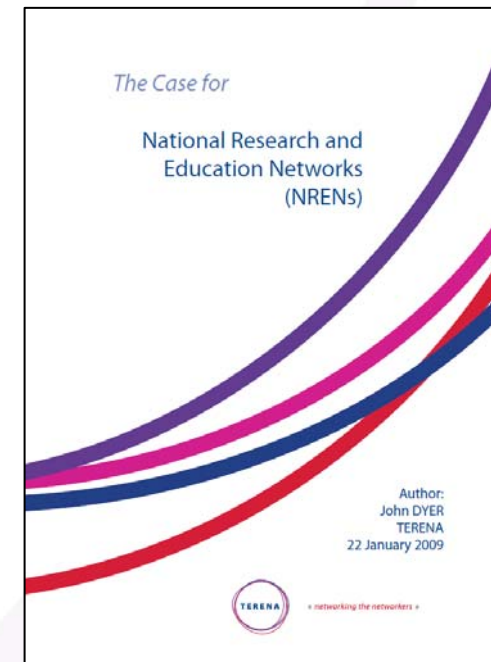
- › **Change: providing connectivity to service provision**
- › **Teams at local and national level should be more integrated**
- › **NRENs should implement best management practices**
- › **Collaboration between NRENs needs to be intensified**
- › **Establish links with content providers and large users**
- › **New Challenges with the arrival of Optical**
- › **Charging should not a disincentive for innovation**
- › **Digital and geographic divides need to be addressed**
- › **User groups with different requirements need special attention**

<http://www.terena.org/publications/files/EARNEST-Summary-Report.pdf>



A view of NRENs in 2009

- › R&E community is both user & supplier (NRENS)
- › Unique symbiotic relationship
- › NRENS complementary to the commercial ISPs
- › Serve Closed user group - non-public networks
- › Source of much Internet innovation
- › Societal Benefits flow from NRENS
- › NRENs are a national asset



2009

<http://www.terena.org/publications/files/20090127-case-for-nrens.pdf>



ASPIRE Project



› Personnel

- › Lead: Janne Kanner: CSC & President of TERENA
- › Project Management: John Dyer; Magda Haver
- › Community and Industry
- › Studies: contractors and project team

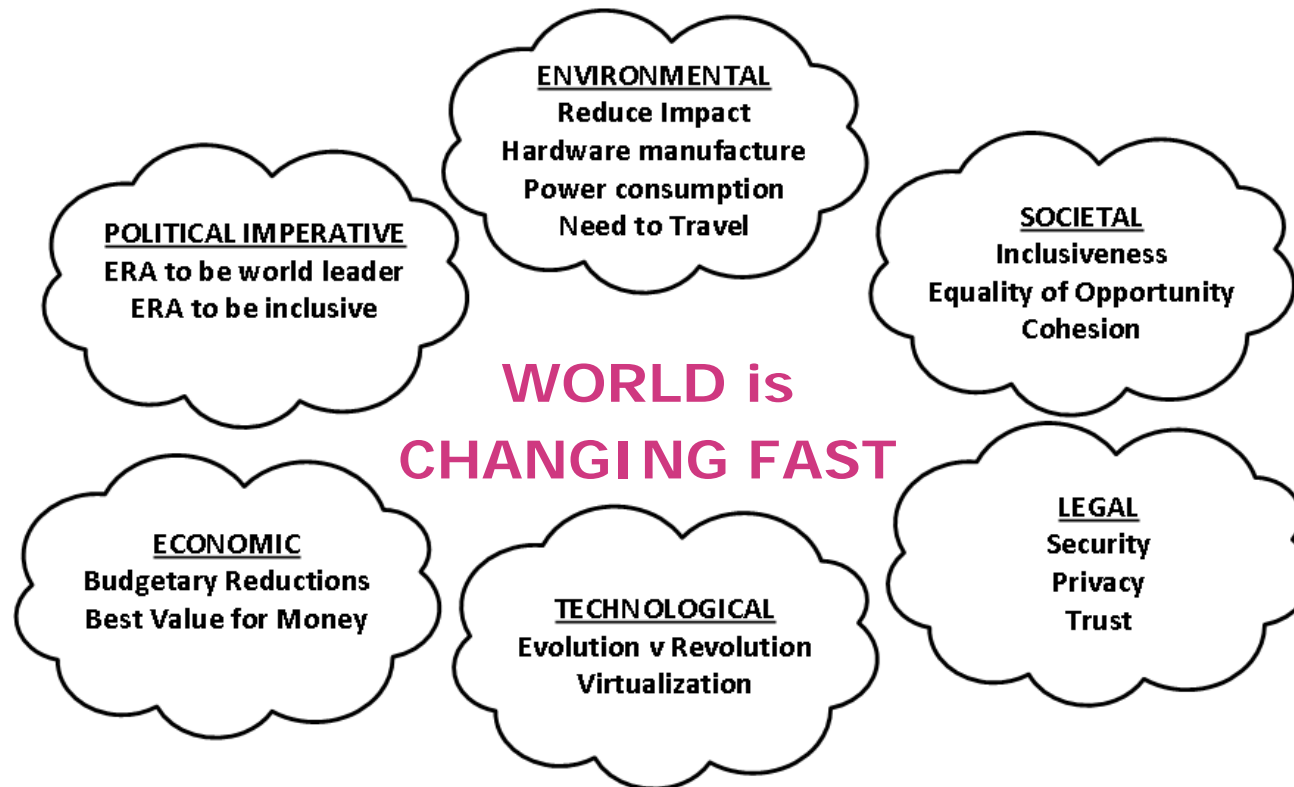
› Phase 1 (April 2011 – Sept 2011)

- › Consultation – workshop 23/24 May
- › Identification of study areas

› Phase 2 (Sept 2011 – July 2012)

- › 2-4 studies
- › Report delivery – summer 2012

Assessing the Environment



We must adapt !

But how ...



Security; Privacy; Trust; Legal Issues

- › Network Services - critical tasks
- › Authorization and Authentication of Identity
- › Confidential or private data
- › Cloud services the situation is complex
 - › divisions of responsibility: provider and user
 - › hybrid clouds - more complex
- › **FEDERATION can provide some solution**



Solving The Digital Divide

- › **Digital Divide inhibitor to EU integration**
 - › **Political**
 - › **Economic**
 - › **Geographic**

- › **Democratization of the Internet**
 - › **Open Exchange Points**
 - › **Federated Access**
 - › **Cloud services**
 - › **Equality to participate in ERA and beyond**



Cloud Services



- › Ownership v Guaranteed Access to Services
- › CAPEX & Recurrent v Tariff schedule
- › Trusting 3rd parties v Internal Integrity
- › Agility & Elasticity v Internal planning
- › **STANDARDS & FEDERATION are KEY**



Social Media adoption and use in the R&E Community

› Build and maintain communities

- › Ground up
- › Users - need driven
- › Democratic

› Popular in R&E community

› Global Reach

› Pool Innovation

› Expertise & Best Practice





Architectures; Technologies and Organizational approaches for Future R&E networking

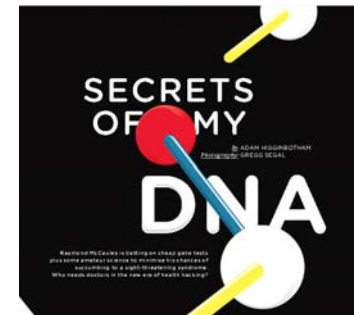
- › **Technologically**
 - › Evolutionary rather than revolutionary
- › **Virtualization**
 - › Increased capability and efficiency
- › **Availability of Gbps bandwidth**
 - › R&E investments in Dark Fibre / Long Term
 - › Commoditization of high bandwidth
 - › Need for open exchange points
- › **Organisational Maturity**
 - › Better transparent governance & accountability
 - › Increasing Cooperation with Commercial sector



Content and Access

The Data Deluge

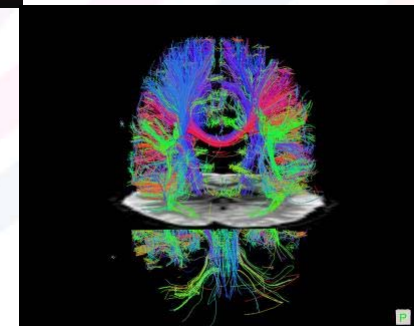
- › Adequate, authentication and authorization
- › Inherent value of community datasets
 - › Largely Funded by Public Purse
 - › Common Good
- › Access
- › Data provenance
- › Sustainability



Citizen Science
Looking for
gene-disease links

Human Connectome Project datasets
likely to dwarf LHC datasets
Single Human Brain:
 10^{11} Neurons 10^{14} synapses

New Scientist 5 Feb 2011





Change is happening



- › Target near zero carbon footprint
- › The Kajaani Data Center, Northern Finland
- › Three hydropower stations on site
- › Low energy transfer loss in supply chain
- › Raw water from the river is used for cooling



The World in becoming Cloudy

malaria atlas project



Summary

- › **Need to maintain ERA world leadership**
- › **Innovation is driven by advanced NREN networks**
 - › **Build on the early adoption and novel use**
 - › **NRENs will continue to play a major role for R&E (+)**
 - › **Partnership & collaboration with industry**
- › **Open & Transparent operation and management**
- › **Need to embrace adoption of new approaches**
 - › **Virtualization;**
 - › **Public/Private/Hybrid Cloud**
 - › **Social media to support community**
 - › **Growth in number & sophistication of wireless devices**

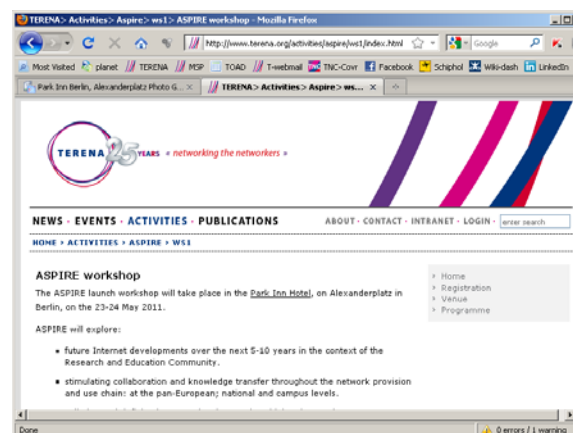


ASPIRE

Direct one's ambitions towards achieving something

Oxford English Dictionary

ASPIRE workshop
Park Inn Hotel
Alexanderplatz, Berlin
23-24 May 2011



**We cordially invite e-IRG
members and workshop
attendees to participate in
the workshop**

<http://www.terena.org/activities/aspire/>

Slide 19

Email: dyer@terena.org