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## Deliverable DN7.0.4,2: CD-ROM or Website Presentation of the TERENA Networking Conference 2006 (TNC2006) Papers and Presentations



### Deliverable DN7.0.4,2

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### Abstract

This deliverable makes the presentations of the TERENA Networking Conference 2006 available, including, but not limited to, any presentations and papers at the GN2 workshop and exhibition/demonstration

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## 0 Executive Summary

The GN2 project organises an annual event in conjunction with the TERENA Networking Conference. These conferences serve as a focus for the exchange of information between research and education networking organisations in Europe and in the world-wide research networking community, making them, and the Internet community at large, aware of relevant developments. The TERENA Networking Conferences are prominent annual events, offering an opportunity to present and discuss technical and strategic aspects of the provision of networks and services to the research and education community, and the corresponding research and development activities. They bring together leading people from the research and education networking community in Europe and world-wide, and provide a unique opportunity to learn about the latest developments and plans. The TERENA Networking Conferences are one of at least three major events per year at which the GN2 project is demonstrated. In particular, every year there is a specific GN2 workshop as part of the overall programme of the conference, and the GN2 project also presents itself in the exhibition/demonstration area of the conference.

The TERENA Networking Conference 2006 took place in Catania, Italy on 15-18 May 2006. This Deliverable makes the presentations and papers from that conference available, including, but not limited to, any papers and presentations at the GN2 workshop and exhibition/demonstration. The papers and presentations from the entire conference are available at the conference website (<http://www.terena.nl/events/tnc2006/>), which also includes the complete programme, slide presentations, speaker information, the video archive of the live stream and a photo gallery. The same information specifically about the GN2 workshop at the conference is also available on a CD-ROM. A copy of that CD-ROM is attached to printed copies of this report.

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# 1 TERENA Networking Conference 2006 (TNC2006) and website

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The TERENA Networking Conference 2006 attracted some 500 participants. The event took place in Catania at Le Ciminiere, an unusual and attractive conference centre converted from a sulphur factory. The conference programme was composed of up to five parallel tracks of talks by invited speakers, complemented by presentations of selected papers. Each day, there was a plenary session in which prominent experts delivered keynote presentations introducing topics that were discussed further in parallel sessions.

The conference ended with an inspiring call to arms from Harald Alvestrand of Google. The theme of the conference was "Follow the User", but the bumper sticker for the conference, as recommended by Mike Nelson, Director of Internet Technology and Strategy at IBM, would have to be "The Internet is a Place". It is not a simple network to communicate; it is a place to go to work and play and people go there every day. We have been challenged to create an "Internet place" for research and education in Europe: to build it, to provision it, to provide the services needed for our community to use it and to protect it.

Harald Alvestrand characterised the Internet in its current phase as so important in our lives that "Internet" is mentioned 6 billion times on Google, compared with 443 million for "God" and 731 million for "sex". Using some figures from Norway, he made the case that the Internet is really quite cheap, especially when compared to the

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cost of other infrastructures and that it is good - "best effort is usually good enough" - with problems that usually go away quickly. He suggested that perhaps the Internet is too good for itself. He then gave a clear, graphic demonstration that the Internet is fast – very fast.

Harald Alvestrand pointed out that oceanographer John Delaney in his keynote address in the opening plenary session had just assumed the Internet was there as a tool for him to use: an internationally accessible, interactive, real-time natural laboratory for collaborative scientific research and able to reach millions of users. The Neptune project is just beginning to explore the oceans and to discover how much we do not know about them and how vital they are to the planet and to our future. At 3,000 metres below the sea, the Internet provides a place for scientists to observe, to measure, to experiment in a place that is too remote and often too dangerous for them to be; a place for scientists of many disciplines to collaborate and also a place where all the rest of us can watch them do it, share with them and learn.

In a presentation by videoconference from the University of Washington, Mike Wellings outlined the Internet technology provided by the Research Channel to broadcast the high-definition video of the Neptune project from the ocean floor.

Egon Verharen, Innovation Manager at SURFnet, explained the work being carried out to test the transmission of high-definition television over their research and education network in the Netherlands. He pointed out that research networks are uniquely positioned to experiment and challenged the community to support such technologies as IPv6, multicast and other advanced applications and services, and not only on the backbone.

A very full and lively panel session addressed the question "What are national research and education networks for?" On the one hand, research and education network organisations should strongly support the education sector if they want to keep sustained political and funding support. At the same time, it is essential that they play a leading role in developing Internet technology and this involves conducting disruptive research on the network. The problems of security and the controversy about ownership and copyright have to be balanced against the rights of academia to share ideas, working and playing in a "creative commons". The research networking community should educate policy makers, provide an unbiased source of technical advice, act as a canary in the coal mine to warn of danger, tackle issues like privacy and security early, test out new technologies and standards, and promote open standards and open source.

Ann Doyle, Manager of the Internet2 Arts and Humanities Initiative and Marco Berni of the Institute and Museum of the History of Science in Florence demonstrated how the network can make available resources that are both uniquely educational and visually stunning. Ann Doyle presented how some of the world's leading musicians and conductors give master classes to students in other locations and then showed a live performance combining performers on-stage and others joining in via high-speed, high-quality videoconferencing, with the result being enjoyed by both live audiences and Internet viewers.

Ted Hanss of the University of Michigan Medical School presented the applications of leading-edge information and communications technologies that are changing biomedical research, education, and healthcare delivery, enabling international collaborations and using Grid computing, advanced videoconferencing, remote visualisation and modelling, simulations and mobile computing. The medical faculty is now using the Internet for such applications as image sharing to review complex cases, as a scaleable test bed, for teaching and remote consulting and for patient monitoring.

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Two large applications were presented of current work being done in Catania. Participants were given an interesting look at the control laboratory that monitors Mt. Etna and other volcanic activity in the region and world-wide. At the University of Catania, the Department of Astronomy has developed a useful tool for visualisation (VisIVO) and another (VizieR2) for data mining on the Internet.

The panel discussion on "switched versus routed networks" was a lively occasion. Simon Leinen (SWITCH) provided strong and entertaining arguments for using classical routed networks. Ronald van der Pol of SARA in the Netherlands explained the practical implications of using lightpaths, based on their experiences, while Cees de Laat of the University of Amsterdam and Mauro Campanella of Consortium GARR added controversy by delivering the facts as they saw them. There was much discussion from the floor with the conclusion that both technologies will have their place. It is clear that the choice between switched and routed networks will continue for some time to come and that we all need a better understanding of the convergence of switches and routers.

In the first session on federations, it was shown that the technology for federations is maturing and road maps for institutes and additional services are being introduced. In other sessions, presentations dived deeper into the technology, including the relationship with the technology deployed by the Grid community.

There were three conference sessions devoted to security issues. Security on and for IPv6 was presented in a dedicated session and other presentations included several that could not be streamed due to the sensitive nature of the content. One of these illustrated the extent of the threat and the evil nature of people working day and night to keep their botnet up, actively destroying networks and computers. Keeping the balance of open and closed created a lot of discussion on how to police undesirable traffic and users.

Security is also a key element in mobility and roaming. Here eduroam is big step forward, providing users with seamless, secure Internet (wireless) access from any other eduroam university in Europe and beyond. The need today is to move eduroam towards a full service and one of the Joint Research Activities of the GN2 project is working on the enhancement of the eduroam infrastructure. Some national research network organisations are now offering wireless Internet connection beyond campus borders, via some agreements with commercial providers.

"Follow the User", the conference theme, meant an emphasis on education and services, with interesting presentations in the sessions on campus networks, connecting schools, content networks and real-time services like streaming and videoconferencing. The lifecycle of services – how to introduce them, manage them and later phase them out - is an interesting topic.

An increasing amount of scientific work is depending on large-scale data collection and sharing the analytic work between researchers, both within and outside the Grid community. The next steps in this scientific ecosystem are large-scale data storage, data visualisation and user-adapted presentation of results. Supporting data is an important trend in the community, and there were discussions on how to put in place structures sharing services.

There was a conference session on "Bridging the Mediterranean" with presentations by representatives from Jordan, Egypt, Syria, Morocco and Tunisia, and another session on infrastructures in southeast Europe. "Networking beyond Europe" introduced initiatives in Brazil, South Africa and Australia.

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The new challenges and opportunities for development of the networks were outlined in a special session on infrastructures and the 7th Framework Programme of the European Union.

Like last year, the GN2 project was presented as a "distributed workshop" with eleven presentations on many of the current activities and achievements included in the appropriate topic sessions, and a twelfth presentation in the special session mentioned above.

Two other major workshops running in parallel took place on the day before the conference. A Control Plane Tutorial and a Workshop on Service-oriented Optical Networks were led by Gigi Karmous Edwards (MCNC) and Admela Jukan (Georgia Institute of Technology) and was sponsored by Juniper Networks. An IP Telephony Workshop, led by Erik Dobbelsteijn of SURFnet gave an overview of relevant VoIP and videoconferencing technologies, from an application point-of-view. The workshop included hands-on time spent using and setting up videoconferences with equipment from different vendors.

The conference was organised by TERENA and hosted by Consortium GARR, the national research and education network of Italy and the Catania section of INFN, the Italian National Institute of Nuclear Physics. Local support was provided by Shougun Travel. Generous sponsorship for the conference was provided by Cisco Systems, Juniper Networks, Ciena, IBM, ADVA, COLT, Extreme Networks, Cybertrust, Level 3 Communications, Symantec, Glimmerglass, Nortel, Internet Security Systems and Consortium GARR.

The conference programme was planned by a committee of international experts, ably led by Ingrid Melve of UNINETT. Selected papers from the conference will be published in September 2006 by Emerald Publishing in a special edition of the journal "Campus-Wide Information Systems". Two of the six selected papers are from the GN2 Workshop.

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## 2 GN2 workshop at TNC2006

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In consultation with the European Commission it was decided that, like last year, the GN2 workshop at the TERENA Networking Conference 2006 would not take the form of separate sessions; instead, the GN2 presentations were included in the appropriate topic-oriented parallel sessions throughout the conference programme.

The list of presentations was as follows:

1. eduGAIN: Federation Interoperation by Design - Diego R. López, RedIRIS, Spain
2. Usage of SAML in the eduGAIN AAI Architecture - Stefan Winter, Fondation RESTENA, Luxembourg
3. AA-RR & Hello SAML: Building Tools for AAI Plumbers - José Manuel Macías and Diego R. López, RedIRIS, and Cándido Rodríguez, Universidad de Sevilla, Spain
4. GÉANT2: Experiences in Building a Pan-European Network over Dark Fibre - Marian Garcia Vidondo and Michael Enrico, DANTE
5. A Study on Network Performance Metrics and Their Composition - Andreas Hanemann, DFN, Germany, Athanassios Liakopoulos, GRNET, Greece, Maurizio Molina, DANTE and D. Martin Swany, University of Delaware, USA

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6. Hardware-accelerated NetFlow Probe - Ladislav Lhotka and Martin Žádník, CESNET, Czech Republic
7. Towards eduroam-NG in Europe: Overview and Comparison of Inter-domain Authentication Protocols - Henk Eertink, Arjan Peddemors, Remco Poortinga and Roy Arends, Telematica Instituut, and Klaas Wierenga, SURFnet, Netherlands
8. eduroam in a box: Easy Setup of an eduroam Server - Rok Papež, ARNES, Slovenia
9. The GÉANT2 Advanced Multi-domain Provisioning System - Anand Patil and Toby Rodwell, DANTE, Bartosz Belter and Michal Przybylski, PSNC, Poland, and Andreas Polyrakis and Maria Grammatikou, NTUA/GRNET, Greece
10. Design and Implementation Issues of a Multi-domain BoD-service for the NREN Community - Mauro Campanella, GARR, Italy, Radek Krzywania, PSNC, Poland, Noel McKenna, Victor Reijs and Dave Wilson, HEAnet, Ireland, and Afrodite Sevasti, GRNET, Greece
11. User Support: a Mechanism to Support the Research Community - John Chevers, DANTE
12. European National Research & Education Networks and GÉANT: Experience & Challenges - Vasilis Maglaris, Chairman of the National Research & Education Networks Policy Committee (NREN PC).

The following information is provided on the CD-ROM:

- GÉANT2 presentations. Abstracts of the presentations, final papers (optional), slide presentations, and links to profiles of the speakers as well as to the video archive of the live stream for the twelve GÉANT2 presentations.
- Conference programme. The GÉANT2 presentations were tagged with a GÉANT2 logo in the the printed conference programme.
- Conference schedule. The GÉANT2 presentations were also indicated by a GÉANT2 logo in the the pocket-sized folding schedule.
- Conference website. In the conference programme on the TERENA website, the GÉANT2 presentations were indicated by (GN2) before the presentation title and also included a GÉANT2 logo on the individual presentation pages.
- TNC2006 Programme Committee. Dale Robertson of DANTE was a member of the conference TNC 2006 Programme Committee with special responsibility for the GÉANT2 presentations in the programme. She took an active role in the planning of the programme, inviting speakers and reviewing papers up until the end of March.
- Poster presentations. Helga Spitaler of DANTE submitted a set of eight posters about GÉANT2 for the Poster Exhibition at the conference. These were prominently displayed in the poster exhibition

area during the conference and members of the DANTE staff were available on Tuesday and Wednesday during the afternoon coffee break to answer questions.

- Evaluation. The conference was attended by 503 participants - a record for TERENA.
- Published papers. Selected papers from TNC 2006 will be published in September 2006 in a special edition of the journal "Campus-Wide Information Systems".

### 3 Conclusions

The TERENA Networking Conference 2006 was a very successful event. The same holds for the "distributed" GN2 workshop at the conference. The GÉANT2 presentations and the project's presence in the exhibition area have succeeded in achieving the objective of spreading information about the project and its various activities, and of raising interest with target communities.

## Appendix A **CD-ROM "GÉANT2 Workshop at TNC2006"**

Attached to printed copies of this report.

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