Welcome to TERENA

The Trans-European Research and Education Networking Association

Today’s students, teachers and researchers rely on electronic media and computer networks more than ever before: for simple email communication; for remote learning, teaching and conferencing; for transferring and analysing large and complex data sets; and for experimenting with network technologies and applications.

Dedicated research and education networking organisations provide the necessary networking infrastructure and services to research institutes and educational establishments.

TERENA is the association in which Europe’s research networking organisations, research institutes, equipment vendors and telecommunications operators meet, exchange information and experience, and collaborate on a range of activities.

Those activities - projects, task forces and events - are open to any organisation or individual who can offer appropriate expertise, manpower or other resources.

www.terena.org
Leafing through this annual report you will see that 2010 was a year full of TERENA activities. In addition to all the successful ongoing endeavours, we have taken initiative on many interesting new developments. Our outreach towards the research and education networking community keeps growing at a steady pace with ever more people participating in the TERENA conference, workshops and task forces and benefiting from TERENA services. I am also very glad that two new national members joined our cause this year – Azerbaijan and Moldova, welcome aboard!

Following high interest from the community, 2010 saw the launch of two new TERENA task forces supported by the GN3 project. TF-Media works on federated production, management and distribution of multimedia content to support teaching and learning. Network Operating Centres (NOCs) are a critical and costly part of the core service of any national research and education networking organisation (NREN), but NRENs have very different ways of carrying out that task. TF-NOC brings together managers and engineers involved in the operation and development of NOCs to share their experience, best practises and tips for tools of the trade.

The emphasis on security increases constantly as NREN services grow more critical to their users. The wide adoption of federated identity and services, cloud services and social media brings new security challenges. Many NRENs and their customers face the need to audit the quality and security of their operational processes and systems. TERENA's Trusted Introducer service now adds the possibility to certify Computer Security Incident Response Teams as well as accrediting them, with the first successful certification by the end of 2010. This service is nicely complemented by a new in-depth TRANSITS-II security training and the expansion of the TERENA Certificate Service to provide personal certificates for general and e-science use.

Cloud services are increasingly breaking through to the research and education sector. This trend was widely discussed in various TERENA meetings. Universities and research institutes have started moving server farms from university premises to be hosted elsewhere, procuring virtual workstations, servers and data storage from cloud providers, and moving email, calendars and other office applications to clouds.

Many NRENs are gradually evolving from providers of network connectivity and related services to more comprehensive centralised ICT support organisations. They are the first natural choice to support the adoption of cloud services for academia. Some cloud services can be provided by NRENs themselves. For volume and off-the-shelf services it may be more advantageous to work with a commercial partner, but there too NRENs are crucial as integrators and brokers.

Towards the end of the year TERENA conducted its first ever comprehensive stakeholder satisfaction survey. As I write, the input is still being analysed but the first findings look very encouraging. We had an overwhelmingly good response rate and results will certainly help TERENA to put the right emphasis on future activities. Surprisingly, the TERENA services got the best ratings in our activity portfolio. It is very satisfying to note that we have been able to achieve such highly appreciated and tangible results as with the TERENA Certificate Service, Trusted Introducer or eduroam through our collaborative efforts.

I would like to thank everyone contributing to and participating in our collaborative work during the year – the members of the General Assembly and all the committees and councils, the hard-working staff who were recognised as TERENA's best asset in the satisfaction survey and everyone attending the meetings and events. In fact, there have been over 4000 people directly involved with TERENA activities in recent years. Thank you all and let's keep on making the case for NRENs!

Janne Kanner
President
Differences and commonalities

Financially, National Research and Education Networking organisations (NRENs) in Europe are in very different positions. Governments have different views on the nature of the current economic crisis and the best ways to promote recovery, and a lot of uncertainty remains. By contrast, NRENs’ activities and policies show a lot of commonalities.

Almost all NRENs have progressed far along the road to deploying hybrid IP-optical networks and offering associated end-to-end services. In this area they collaborate in the GN3 project, which is co-funded by the European Union and provides the GÉANT backbone network that interconnects the national research networks. The development and deployment of Authentication and Authorisation Infrastructures (AAI) for access to resources and services has become one of the most important activities of research networking organisations. Increasingly, other services are offered as well. More generally, many NRENs are reviewing and diversifying their service portfolios.

Increased need for European collaboration

Many NRENs are restricted by limited resources. Keeping current services running smoothly remains the highest priority. Many NRENs have only very limited resources for testing technologies and developing new services, and much has been committed to the GN3 project. In this situation, European collaboration is more important than ever. NRENs learn from each other’s experiences when reviewing their service portfolios. The model of NRENs providing certain services to one another is receiving more attention. In investigating new technologies and developing new services, technicians from different countries need to work together to obtain the critical mass that is needed to undertake such work. Consequently, increasingly requests are made to TERENA to organise events for the dissemination of information and to coordinate initiatives at a European level.

TERENA funding and strategy

While the demand for TERENA to undertake activities keeps growing, the association, like many of its members, faces limits to manpower and finances. The membership fees and co-funding of activities by the European Union through projects are expected to remain the major sources of income, but diversification of funding will be pursued more strongly. The principle of recovering the full costs of services provided or coordinated by TERENA from the service customers is being implemented. For certain activities it may be possible to obtain additional funding from TERENA members and other organisations; a new example of this in 2010 was the REFEDS (Research and Education Federations) work.

Closer collaboration with campus networkers

Closer collaboration between research networkers at national and international level and providers of connectivity and services on campus remains important. Campus networkers are crucial in the provision of AAI and end-to-end services. They provide first-line support to users and, to a large extent, determine the rollout and uptake of services and technologies. TERENA is bringing together different activities within the GN3 project to address the development and deployment of services, creating synergies and undertaking joint campaigns in close collaboration with NRENs.
General Assembly

Meetings in 2010
3-4 June, hosted by LITNET in Vilnius, Lithuania
20-21 October, hosted by RESTENA in Luxembourg, Luxembourg

In June, Pierre Bruyère (Belnet) was elected Treasurer of TERENA in place of Lajos Bálint (HUNGARNET), who had served the maximum six years in office. Christoph Graf (SWITCH) and Alberto Pérez (RedIRIS) were re-elected as Vice President Technical Programme and Member at Large of the TERENA Executive Committee, respectively. The Azerbaijan National Academy of Sciences and RENAM from Moldova were welcomed as national members, and national membership for Cyprus was transferred from the University of Cyprus to the CYNET foundation. The assembly approved TERENA’s financial accounts for 2009.

In a presentation, Jean-Luc Dorel (European Commission) explained the Public-Private Partnership initiative for Future Internet research, which will be supported by 300 million euro from the budget of the European Union’s Seventh Framework Programme. Vasilis Maglaris (National Technical University, Athens) pointed out that industry lobby groups were targeting the budget, and pleaded for a stronger role of the research networking community in the initiative.

In October, the assembly adopted the TERENA budget for 2011 and agreed not to correct the TERENA membership fees for ongoing inflation for the third consecutive year. A presentation by the TERENA Secretariat on the ongoing series of meetings with TERENA members to discuss their expectations of TERENA led to spontaneous discussion about strategies that NRENs themselves should adopt. A special agenda item was a discussion on cloud services and the advantages and risks of NRENs and research and education institutions outsourcing IT services to commercial companies.

www.terena.org/about

TERENA’S ROLES IN THE GN3 PROJECT

Some of TERENA’s core activities are co-funded by the European Union through GN3: production of the annual TERENA Compendium, the Networking Development Support activities and the support provided by the TERENA Secretariat to the technical TERENA task forces. The project also provides funding for ‘distributed GN3 workshops’ at the TERENA Networking Conferences and for GN3 training workshops, as well as the European eduroam service, the eduPKI service, the eduGAIN service, the educonf feasibility study and the Partner Services Promotion activities. Two TERENA Secretariat staff members have a management role in the GN3 project, as leaders of the Activity ‘Multi-domain User Application Research’, and of the Networking Activity ‘Status and Trends’. The TERENA Secretariat also contributes to the organisation of several GN3 events. All this work is reported on in this report.

www.geant.net
Outreach

As a trusted body of the European research and education networking community, TERENA plays a role in exchanging information through various means: presenting TERENA activities at external events, participating in events that benefit the wider research networking community, issuing printed materials and publishing relevant news and events announcements online.

COMMUNITY INFORMATION ONLINE

In addition to information about TERENA’s many activities, the TERENA website holds other information that is of value to the research networking community. In 2010, the online calendar listed almost 200 relevant events and the ‘PeaR’ Community News column published more than 190 news reports and announcements, almost 75% of which were posted directly by staff in NRENs and other Internet-related organisations.

Information Dissemination

Research networking presentations

At the Internet2 Spring Member Meeting in Arlington, Virginia in April, Licia Florio gave a presentation on middleware developments in Europe. At a workshop on IP telephony that was organised by the Campus Best Practices Task of the GN3 project in Prague in April, Péter Szegedi presented an overview of TERENA activities in the area of real-time communications. At the Internet2 Fall Member Meeting in Atlanta, he presented an overview of some TERENA activities. An overview was presented by John Dyer at an ALICE project meeting in Madrid in May, and by Valentino Cavalli at the inaugural event of the Belarus-Poland NREN cross-border link in Minsk in November.

In May, Karel Vietsch attended the inaugural event of the Romania-Moldova fibre link, organised by RENAM in Chisinau, Moldova, and gave a presentation on ‘The Case for NRENs’ and European collaboration in research networking. In June, at an e-IRG workshop in Madrid, he participated in a panel debate on managing and funding e-infrastructures. And he chaired a session on harnessing European NRENs’ best practices to shape the African NREN landscape, at the Euro-Africa e-Infrastructures Conference in Helsinki in December. Valentino Cavalli presented about the positioning of NRENs at a symposium to mark ACOnet’s 20th anniversary, in Vienna in June.

History book published

In February, Wiley-Blackwell published “A History of International Research Networking - The People who Made it Happen”, edited by Howard Davies and Beatrice Bressan. The book describes the development of research and education networking at the European level, with an emphasis on the 1980s and 1990s. Many key personalities from this period contributed to the publication.

The idea for the book originated at TERENA’s 20th anniversary celebration in 2006. Then TERENA president Dorte Olesen was the main driver behind the project and saw it through to its final completion.

Meetings with TERENA members

The TERENA Secretariat conducts meetings with member organisations in order to better understand their interests, priorities and their expectations of TERENA. In 2010, meetings were held with GRNET, RedIRIS, SUNET, IUCC, BREN, LITNET and FCCN.

Rossend Llurba (NCF), Matthew Scott (DANTE), Steven Newhouse (EGI.eu), Francesc Subirada (PRACE) and Karel Vietsch (TERENA Secretariat) at the June e-IRG workshop. (Copyright Victor Castela)

Wim Jansen (EC), Karel Vietsch (TERENA Secretariat) and Petru Bogatencov (RENA M) at the inaugural event of the Romania-Moldova fibre link.
Networking Development Support

Advisory panel 2010
Artur Binczewski (PSNC)
Sabine Jaume-Rajaonina (RENATER)
Baiba Kaskina (IMCS UL, SigmaNet)
Agathoclis Stylianou (CYNET)

Development Support looks East

During recent years, TERENA's Networking Development Support activity assessed the research networking needs of a number of eastern European countries. Although not homogeneous, many share common needs and goals, for example, aiming to become more integrated in the GÉANT region. Recognising the commonalities, it was decided to take a regional approach to some Networking Development Support activities.

A Birds of a Feather session was arranged at the 2010 TERENA Networking Conference, where invited representatives of the European Commission, the HP-SEE and CEENGINE projects and of eastern European countries discussed opportunities for collaboration in that region. They agreed to organise a high-level eastern European partnership policy event in 2011; in December Bucharest was confirmed as the location.

It was seen that the region could also benefit from a greater focus on the development and deployment of services. In September, the Networking Development Support team proposed a joint action with the GN3 project’s eduroam, Training and Partner Services Promotion tasks to support the rollout and uptake of eduroam in six eastern European countries. Information was provided to the NRENs in that region about how to join the European eduroam confederation, and joint plans were drawn up for further work in 2011.

New country needs assessments

Georgia
Following information gathering in 2009, Kevin Meynell and Valentino Cavalli (TERENA Secretariat) and Jacek Gajewski (CEENGINE) met with stakeholders of the Georgian NREN, GRENA, on 16-17 March. They examined how GRENA could become more integrated in the European NREN environment and how to sustain the Black Sea Interconnection project, which provided GÉANT connectivity to Azerbaijan, Georgia and Armenia through most of 2010.

Telecommunications operators were invited to discuss options for connecting GRENA to GÉANT in future. It became clear that connectivity is not sufficient: GRENA needs to highlight the end-user services it can offer; eduroam in particular would offer higher visibility. This realisation helped to form the idea of a joint action to support eduroam rollout and uptake as described above.

In May the result of the country needs assessment was reported in a confidential document that was distributed to key stakeholders in Georgia and to the European Commission.

Bulgaria
Work to assess the research networking needs of Bulgaria started in 2010. After preparatory talks with BREN representatives, Valentino Cavalli and Kevin Meynell met with the NREN’s stakeholders on 26-27 October. The study’s confidential report was finalised in November.

Follow-up on previous work

EU-Med Event
Following the success of EU-Med Events in 2007 in Brussels and 2008 in Amman, a third event was requested by Mediterranean research and education networking organisations. EU-Med Event 3 brought together more than 90 participants, including ministers, high-ranking government officials and e-infrastructures experts from across Europe, the southern Mediterranean rim and the Middle East, to discuss collaborations in e-infrastructures and networking for research and education.

The event’s key focus was how to sustain ICT infrastructures for research and education in the Mediterranean region. Insights into the status of regional e-infrastructures were presented and members of the user community shared their experiences in interactive sessions. Options were explored for the longer-term stability of infrastructure resulting from the EUMEDCONNECT2 and EUMEDGRID projects, and network extensions, future funding and management structures were discussed.

A major development announced at EU-Med Event 3 was the creation of ASREN - the Arab States Research and Education Network organisation, which was later officially launched in Cairo, on 8-9 December.

In line with EU-Med Event 3’s main theme, Valentino Cavalli gave a presentation on the sustainability of NRENs and why well-resourced NRENs are vital if countries are to be competitive in research and education.

The event was collaboratively organised by TERENA, DANTE and GARR with financial support from the GN3, EUMEDCONNECT2 and EUMEDGRID-Support projects.

www.terena.org/development-support

WHAT IS NETWORKING DEVELOPMENT SUPPORT?

Supporting the development of research and education networking in and around Europe and narrowing the gap between the most and the least advanced is a core activity of TERENA. This task is conducted by studying the needs of less advanced regions and carrying out specific actions to assist the development of research networking organisations in countries that will be connected, directly or indirectly, to the GÉANT network. This activity is funded through the GN3 project, with overall guidance and quality control provided by an advisory panel of NREN experts.
WHAT IS THE COMPENDIUM?

TERENA gathers information about NRENs and the issues they face. An annual compendium documents the work, budgets and users of these organisations in Europe and beyond. Basic data and information about the organisation, staffing, finances, user base, capacity, services and developments are available online. The most important information is available in an online and printed publication that signals and analyses trends over time.

The TERENA Compendium provides an authoritative reference source for anyone with an interest in the development of research and education networking. Production of the TERENA Compendium of National Research and Education Networks in Europe is financially supported by the European Union through the GN3 project.

TERENA Compendium

Review panel 2010
Tryfon Chiotis (GRNET)
Lars Fischer (NORDUnet)
András Kovács (HUNGARNET)
Ingrid Melve (UNINETT)
Mike Norris (HEAnet)

Tenth edition shows growth despite economic crisis

More than 50 organisations submitted data for the 2010 edition of the TERENA Compendium of National Research and Education Networks in Europe. Publication of this tenth edition was expected in late March 2011. This means a partial catching up on delays incurred in preparing the 2009 edition, which appeared in print in May 2010.

One area the survey explored is whether the economic crisis was having an effect on NRENs. Results indicated that four faced budget cuts of 20% or more, while budgets for the rest remained largely unchanged during the past five years. At the same time, NRENs have continued to deliver more services and have coped with a sustained increase in average traffic per inhabitant at an average annual growth rate of 21.3%.

Growth in services

Other findings showed a rapid growth in identity federations during the past year; in 2010, the total number of users passed the 16 million mark. This growth is expected to continue, with federations becoming a standard service. Many NRENs have also made substantial progress towards deploying hybrid networks and offering associated end-to-end services; 18 NRENs in European Union and EFTA (European Free Trade Association) countries now offer dedicated wavelengths to customers. However, there is still a substantial ‘digital divide’.

Although most European NRENs were quick to adopt IPv6 (Internet Protocol version 6) and are ready to make the transition from IPv4, the actual proportion of IPv6 traffic remains minimal, showing that clients are not yet making the change.

www.terena.org/compendium

GN3 Status and Trends

TERENA leads the ‘Status and Trends’ activity in the GN3 project. In 2010 this consisted of four separate tasks which ran to plan. Two of them are reported on elsewhere in this document: the production of the TERENA Compendium and the support provided by the TERENA Secretariat to TERENA’s technical task forces. Another task, led by HEAnet, is a study of the environmental impact of research and education networks. In 2010, this team completed baseline audits for the greenhouse gas emissions of GÉANT and some national research networks and began case studies on the effects of videoconferencing and teleworking. The team also organised a workshop in collaboration with TERENA, in February, focusing on how to measure networks’ emissions. The fourth task, led by UNINETT, addresses key challenges for campus networks in Europe; in 2010 it produced a large number of best-practice documents on a number of technical and organisational topics and disseminated them via the TERENA website.

www.terena.org/campus-bp
www.geant.net/Environmental_Impact
GOALS OF TF-MSP

TF-MSP promotes collaboration between research and education networking organisations in Europe in the management of service portfolios. It explores common organisational aspects of finding, developing and introducing new services and supporting them during their production phase and eventual withdrawal.

TF-MSP
Task Force on Management of Service Portfolios

Chair: Alberto Pérez (RedIRIS) (until 28 February)
Walter van Dijk (SURFnet) (from 1 March)

Meetings in 2010
4 February, hosted by GARR in Rome, Italy
31 May, Vilnius, Lithuania (joint meeting with TF-CPR)
6-7 September, hosted by RedIRIS in Madrid, Spain
9-10 November, TERENA Secretariat offices

Clouds and crowds at TF-MSP meetings

The number of people attending TF-MSP meetings remotely and in person rose substantially in 2010. The task force reviewed its terms of reference, which were approved in March, giving a second two-year mandate for TF-MSP.

Two key themes recurred: the growing importance of externally provided commodity services (such as email, storage and calendars) and the way that NRENs react to and are impacted by them - in particular cloud services; and the continuing push to adopt more business-oriented approaches to providing services in the research networking community.

In the latter category, the February meeting addressed customer relationship management tools and account management within NRENs, while in November the task force explored managerial aspects of installing and managing dark fibre networks.

Clear thinking on cloud services
Commoditisation was the topic of a joint meeting between TF-MSP and TF-CPR immediately preceding the TERENA Networking Conference. Around 45 participants, including several from Latin America, discussed NREN services and how they compare with commercial services. Four speakers gave short presentations about their experience with cloud or commodity services in Spain, the United Kingdom, the Netherlands and Denmark. It was agreed that the combined skills of business management, strategic planning, public relations and communications will be needed to define a successful future for NRENs.

The theme arose again in September, with a focus on how certain NRENs interact with commercial providers of cloud services. The task force also suggested cloud topics be presented at the TERENA General Assembly meeting in October. Information about the availability and uptake of cloud services and the impact on the research and education networking community was documented on the task force wiki. A list of documents relating to network policy development was started, with a number of documents being summarised and linked online, to provide a ‘one-stop shop’ for the community.

Liaison with other groups
TF-MSP interacted with various groups during the year. In follow-up to a presentation by DANTE at the February meeting, TF-MSP members provided input to GÉANT’s process for responding to requests for pan-European connectivity support by large user groups. The task force also explored directions for a pan-European videoconferencing service with the GN3 project’s educonf team. And TF-MSP invited TF-NOC to participate in its November discussion about dark fibre networks.

www.terena.org/tf-msp
ABOUT TF-CPR

TF-CPR promotes collaboration between research and education networking organisations in Europe in the areas of communications, marketing and public relations. It helps exchange ideas, experiences, methods and techniques among research and education networking organisations in order to improve their communications with organisations and individuals that use their services, and with other organisations that are relevant for the research and education networking community.

TF-CPR
Task Force on Communications and Public Relations

Chair: Goran Škvarč (CARNet)

Meetings in 2010
4-5 March, hosted by ARNES in Ljubljana, Slovenia
30-31 May, Vilnius, Lithuania (incl. joint meeting with TF-MSP)
7-8 October, hosted by UNINETT in Trondheim, Norway (incl. joint meeting with TF-Media)

Growing participation and a practical focus

In 2010 TF-CPR broadened contacts with organisations not previously involved with the task force. Latin American participants provided useful input at the May meeting and invited input to their plans to replicate the task force in their own region. Several Internet-related organisations began publishing their news via ‘PeaR’ – the online community news service originated and maintained by the task force. TF-CPR held its first joint meeting with a technical task force, TF-Media. The group also continued its tradition of meeting back-to-back with the GN3 PR Network and TF-MSP.

PeaR was discussed throughout the year. In March the task force determined a list of improvements to its functionality. In May they debated changing the name, deciding to keep the name but improve aspects of the look and feel.

Effort went into expanding the newsletter’s distribution and, to increase the value of the content to readers, TERENA also pursued new sources of news, granting publishing rights to staff from RIPE NCC, Internet2, CLARA, RENATA, StarLight, EGI.eu and the Australian Access Federation. By the end of 2010, PeaR readership had increased by 30%.

Practical issues get workshop attention

Considerable effort went into shared planning and preparation of task force meeting agendas and interactive workshop components that focused on practical concerns. In March, participants received training in using Adobe Connect for remote participation. In May, teams competed to devise campaigns to promote NREN videoconferencing services. In October, participants brainstormed on promotional messaging for an ARNES brochure about AAI services. A workshop focusing on the promotion of media services, which took place in collaboration with TF-Media participants as part of October’s joint meeting, is described in the TF-Media section of this report. The joint meeting held with TF-MSP in May is reported upon in the TF-MSP section.

To enable collaboration between PR-communications staff in different NRENs, the year’s TF-CPR Compendium added a section on NRENs’ communication priorities, so that task force participants working on similar topics can identify each other. In addition, a repository in which participants can store and exchange promotional and other materials about topics of common interest was created in the TF-CPR wiki space and presented to the task force.

User engagement in safety issues

Internet safety for users was a major topic in the March meeting. Tomi Dolenc (ARNES) presented an overview of national campaigns in Slovenia to engage with teachers, parents and school children and raise awareness of dangers and solutions. SURFnet had tried similar campaigns in the past, Lonneke Walk reported, but had taken a different approach in a new campaign called ‘Cybersave Yourself’, in which SURFnet and institutions work together rather than running separate campaigns.

www.terena.org/tf-cpr
**Partner Services Promotion**

**Interactive approach to collaboration**

The Partner Services Promotion (PSP) task continued to develop its modus operandi during 2010, defining collaborative groups to develop promotional materials and to give technical advice. Interactive workshops focusing on service promotion became a regular feature of meetings of the community’s PR-communications staff.

Early in the year, TERENA Secretariat and DANTE staff created a shared online repository in which promotional and other materials relating to PSP, GÉANT and TF-CPR can be stored and shared. The repository was presented by the PSP task leader Laura Durnford (TERENA Secretariat) in the March meeting of TF-CPR. This meeting was co-located with a GN3 PR Network meeting, during which a PSP workshop was held to brainstorm about aspects of PERT (Performance Enhancement Response Team) service promotion. A week later, a PSP meeting via Adobe Connect brought together a small group of communications and technical experts from NRENs with PERTs, to explore opportunities for collaboration on promotional work.

Collaborative approach stimulates eduroam promotion

The concept of ‘working groups’ of PR-communications staff creating promotional materials, with advice from ‘consultation groups’ of technical staff and service managers, was developed and applied to the eduroam service. Five eduroam experts contributed to the consultation group, while AMRES, ARNES, Belnet and JANET(UK) participated in the working group. Following an initial meeting of both groups on 27 May, the working group met three times via Adobe Connect or teleconference. Their ideas contributed significantly to the content of materials later produced by the PSP team and, independently, by AMRES, the Serbian NREN.

Individual PSP support was given to ARNES, in the production of an eduroam leaflet, to AMRES, in the production of a case study and marketing plan, and to the Georgian NREN, GRENA, in sharing information resulting from the working group’s discussions. The PSP team reported on eduroam developments in PeaR and the GN3 project’s internal and external newsletters. And the PSP task leader coordinated work to transform the old eduroam ‘cookbook’ into more user-friendly wiki pages of technical information.

A kind offer by the Australian NREN, AARNet, allowed European NRENs to adapt and re-use an AARNet video about eduroam. PSP’s leader liaised between NRENs and the video’s producer with the result that several translated versions became available online. Towards the end of the year PSP began a collaboration to support the deployment and uptake of eduroam as described in the Networking Development Support section of this report.

**Workshop evaluation**

In October’s PR Network meeting, a PSP workshop was held to brainstorm on the promotion of connectivity services, in particular point-to-point services. A survey was conducted among participants to assess the value of such workshops. The positive results formed the core for a GN3 project deliverable, submitted in December, which also summarised lessons learned from the PSP experience to date and recommended improvements.

[www.terena.org/activities/psp](http://www.terena.org/activities/psp)

**WHAT IS PSP?**

TERENA leads the Partner Services Promotion (PSP) task in the GN3 project’s Networking Activity ‘Communication and Promotion’. PSP helps national research networking organisations to prepare and implement plans for the promotion of end-user services, by facilitating the exchange of ideas, experience and expertise between organisations in different countries, by coordinating collaborative work to create and adapt promotional and training materials, and by offering individual support to NREN-specific activities. The GN3-related services that were ready for PSP promotional support during 2010 were eduroam, point-to-point services (lightpaths) and eduPERT.

At the GN3 Symposium in November, Laura Durnford (TERENA Secretariat) and Sergei Kozlov (BASNET) discuss a plan to support the rollout and promotion of eduroam in eastern Europe. (Image courtesy of DANTE.)
Through its projects and task forces, the TERENA Technical Programme supports European collaboration in developing, testing and evaluating innovative networking technologies, applications and services. It brings together technical specialists in the research networking community and their colleagues from other countries. Two TERENA bodies assist the management of the Technical Programme: the Technical Advisory Council and the TERENA Technical Committee.

TECHNICAL TASK FORCES

TERENA task forces are open groups of experts from the research and education networking community at large. Each task force is a forum for discussion and information exchange as well as a platform for collaboration on specific work items. Task force participants work together on defined and focused programmes laid down in the task force’s terms of reference. Secretariat support for the technical TERENA task forces is funded by the European Union through the GN3 project.

Technical Advisory Council

Meeting in 2010
31 May, Vilnius, Lithuania

During its annual meeting, the council reviewed progress in the TERENA Technical Programme and the formulation of the Special Interest Areas. It also discussed developments in potential new directions, such as work to complement the GN3 Green Study and research information systems.

Following discussion about the revision of the special interest areas, the following list was agreed:

• Network services and technologies: This area concerns organisational aspects, coordination and exchange of best practices in the provisioning and delivery of network services. Work supports research on network technology and innovative network services. Campus network mobility is included.

• Security: This broad area is concerned with the confidentiality, integrity and availability of information and information systems. TERENA’s activities include defining and implementing appropriate security requirements for various types of systems. One requirement common to many systems is incident response: detecting and investigating failures and restoring the system to its intended security state.

• Middleware: TERENA’s middleware activities focus on identity management federations, harmonisation and standardisation of interfaces, access control, service location and diagnostics, and involve liaison with other communities when relevant. This area also addresses user and application mobility in a networked environment.

• Media services: This area encompasses information exchange and best practice in traditional and web-based collaboration, webcasting and video-on-demand solutions, while providing a platform for activities supporting live media and videoconferencing. TERENA’s activities in this field vary from the investigation of next-generation real-time communication services to the establishment of rich media production and recording solutions, metadata and content repositories as well as distribution platforms.

• Virtualisation and cloud services: Virtualisation refers to abstraction of resources, usually creating a logical view of resources while hiding the underlying arrangement of various physical elements including storage, hardware, servers and networking components. This area also includes the investigation of in-house services using private clouds and of services outsourced to public clouds.

In addition, campus and end-to-end issue coordination are challenges that have an impact across all special interest areas, while Grid collaborations span many of the areas.

www.terena.org/about/tac
www.terena.org/about/tech
The relationship between NREN and Grid communities was a recurring topic in 2010, and the recommendation was made in November to discontinue TERENA’s NRENs and Grids workshops in favour of other approaches. A new task force was created and three others had their lifespans extended.

In June the terms of reference for TF-CSIRT and for a new task force, TF-NOC, were approved, while revisions to the two middleware-related task forces, TF-MNM and TF-EMC2, were discussed in November.

Having launched NRENs and Grids workshops in May 2005, and with the advent of the European Grid Infrastructure, discussions about liaisons between the NREN and Grid communities concluded that informational workshops are no longer the best way of interacting. TERENA had already offered additional ‘bridges’, by inviting Grid community members to participate in other of its activities, and will encourage further participation in a broader range of areas, such as federations.

www.terena.org/about/ffc

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TF-CSIRT
Task Force on Collaboration of Security Incident Response Teams

Chair: Lionel Ferette (Belnet)

Meetings in 2010
26 January, hosted by DFN-CERT in Hamburg, Germany
20-21 May, hosted by FORTH CERT in Heraklion, Greece
16-17 September, hosted by ULak-CSIRT in Istanbul, Turkey

Continuing to grow and adapt

In 2010 TF-CSIRT revised its terms of reference, which came into effect in June, granting a further mandate to the task force until 31 March 2013. It continued efforts to liaise with other security-related organisations and promoted relevant training to the CSIRT (Computer Security Incident Response Team) community.

During the year, the task force heard about the activities of new and established security teams, including ULak-CSIRT (Turkey), CERT-MD (Moldova), RoCSIRT (Romania), CIRCL (the government CSIRT for Luxembourg) and CZ.NIC-CSIRT, which is the CSIRT of the Czech Internet Service Providers’ association. There were also presentations about the Danish GovCERT created by the Danish National IT and Telecom Agency, about the Swedish IT Incident Centre, and about the new DFN-CERT portal that aims to improve handling of incident warnings and alerts.

Liaison and learning
The task force organised a joint seminar with FIRST (Forum of Incident Response and Security Teams) as part of a three-day event in January. With 150 participants, this broke the high-attendance record set in 2009. The seminar covered social networking risks, detecting and analysing malicious pdf files, a ‘do-it-yourself kit’ for mass malware analysis, understanding the insider threat, a view inside ‘the war room’ of the TD Bank Financial Group and a report about an anti-malware engineering workshop that took place in Japan in 2009.

During the TF-CSIRT meeting that preceded this seminar, on 25 January, Greg Rattray presented the activities of ICANN (Internet Corporation for Assigned Names and Numbers) regarding the stability, resilience and security of the Domain Name System, which is critical to the entire Internet infrastructure. Maurizio Molina (DANTE) and Baiba Kāškina (SigmaNet) presented the latest developments in the GN3 project’s...
GOALS OF TF-CSIRT

TF-CSIRT promotes collaboration between Computer Security Incident Response Teams (CSIRTs) at the European level and liaises with similar groups in other regions, providing a forum where members of the CSIRT community can exchange experiences and knowledge in a trusted environment. Participants in TF-CSIRT are actively involved in establishing and operating CSIRT services in Europe and neighbouring countries.

security activities, in particular a survey to obtain details of how multi-domain anomalies were handled in NRENs.

A topic that recurred throughout the year was developments in Grid security. In May, Serge Droz (SWITCH) talked about the evolution of the European Grid Infrastructure (EGI) and the establishment of EGI-CSIRT, Andrew Cormack (JANET(UK)) presented a paper on legal aspects of incident response and data protection and Lionel Ferette (Belnet) reported on discussions as to whether TF-CSIRT (through TERENA) should be involved in the drafting process for the ISO/IEC 27035 “Security Incident Handling” standard.

Updating the terms of reference

A major area of discussion in the Heraklion meeting was renewal of the task force’s terms of reference. It was agreed that changes were needed regarding a few activities, since some work items had been completed or handed over to other organisations, while some new initiatives were added to the task force plans.

Training for CSIRTs

During the September meeting, Don Stikvoort (S-CURE) gave an update on the recent and forthcoming TRANSITS training workshops for CSIRT staff, and the task force discussed the new, advanced ‘TRANSITS-II’ approach, which would be trialled in October 2010.

Immediately following the task force meeting, on 17 September, a TF-CSIRT workshop trained almost 30 people in why and how to use the Request Tracker for Incident Response (RTIR) tool. Carlos Fuentes (RedIRIS) taught the course, which also provided an opportunity to explore whether any further RTIR features need developing.

www.terena.org/tf-csirt
TERENA PROJECTS

TERENA projects are regulated by contractual relationships between TERENA and one or more subcontractors. Often they originate from TERENA task force activities but cannot be completed with volunteer effort alone. Sources of funding vary depending on the size and scope of the project. Very small projects can be funded by TERENA from its own resources, but larger projects require financial contributions from TERENA members and possibly other interested organisations. In 2010 there were two TERENA projects: the TCS Portal Project that is reported on in the Services chapter, and REFEDS.

REFEDS makes evolutionary leap

TERENA invited organisations whose staff participate in REFEDS to sponsor further REFEDS work. This dedicated funding allows more assertive pursuit and completion of deliverables, leading REFEDS to become a stronger voice for e-identity federations in the research and education community. During 2010, the Australian Access Federation, CESNET, GARR, Internet2, the Internet Society, JISC, NORDUnet, RedIRIS, SWITCH and SURFnet became REFEDS sponsors.

For a number of years, there has been significant and increasing interest in expanding REFEDS globally, with lively, interactive meetings regularly attracting participants from several continents. In the May 2010 meeting, a number of critical work items were identified and two documents were later produced: a business case and a budget for August 2010 – August 2011. In July, sponsorship was committed by a number of organisations from around the world. Work began on a new, comprehensive website with information about federations and entities participating in REFEDS, to go live in early 2011. Another significant area is to address publishers’ concerns relating to joining and understanding the requirements of research and education federations. Part of the REFEDS work was subcontracted by TERENA to Nicole Harris (JISC Advance).

First meeting under new model

The new organisational model and the planned website were reviewed during the October meeting, which was the first to be held outside Europe, in conjunction with the Internet2 Fall Member Meeting. Improving the experience of logging in via federations was another core topic, along with the ‘discovery problem’ of finding out to what institution a user belongs. Participants agreed that Level of Assurance (LoA) should be addressed in more depth by REFEDS, and should also take the work done by the Kantara Initiative Identity Assurance Framework into consideration.

www.refeds.org

EVOLUTION OF REFEDS

REFEDS began in 2005 as an interest group within TF-EMC2, looking at policies that define procedures and guidelines for interoperability of federations. With the growing number and broadening deployment of identity federations in Europe and beyond, REFEDS became a global forum, with regular participation from across five continents and included technical and outreach topics about privacy, assurance, relationships with partner communities and support for emerging federations. Due to its geographic coverage, REFEDS became well placed to address general and non-project-specific federation policies issues. Participants repeatedly expressed the wish to increase efforts to solve various inter-federation issues and to elevate REFEDS’ profile. As a task force activity, REFEDS was restricted by limited funding and manpower within the TERENA Secretariat. Now it has evolved into a truly global group with an assertive plan: additional new funding means its work can progress more reliably, collaboratively and structurally, raising its visibility to related, external communities.
TF-EMC2
Task Force on European Middleware Coordination and Collaboration

chair: Diego Lopez (RedIRIS)

Meetings in 2010
16-17 February, hosted by ACOnet in Vienna, Austria
22 September, hosted by WAYF in Copenhagen, Denmark

Consolidation and further evolution

The task force continued to provide a ‘playground’ for young initiatives and to liaise with older activities that have ‘graduated’ from the task force. It also revised its terms of reference, which were approved and took effect from September 2010.

Several activities that started within TF-EMC2 have taken on a new life in other contexts or under a broader umbrella. For example, TACAR contributes to the eduPKI service in the GN3 project, Project Moonshot is pursued in the context of the IETF, and REFEDS has evolved from an interest group within TF-EMC2 to a truly global forum. During 2010, the task force maintained interaction with these activities, but also attended to new developments in other key areas, particularly in discovery service approaches, SAML (Security Assertion Markup Language) testing, social identity providers, and single logout.

The task force consolidated its connections with user communities too, notably, with the Rome Student Systems and Standards Group in meetings on 18 March in Bologna and on 13-15 December in Malaga that focused on solutions for the automatic synchronisation and exchange of student data across institutions internationally. The task force also liaises with other groups active in middleware at international level, such as the International Grid Trust Federation (IGTF), Internet2’s Middleware Architecture Committee for Education (MACE) and numerous identity federations worldwide.
Renewed and revised task force mandate

In 2010 the task force reviewed its work and revised its terms of reference. Previous work items relating to services were consolidated into one new task, and those involving liaison with other relevant organisations were likewise amalgamated. Other previous work items continued or emerged from the process in a different form and a few new ones were created:

**Services to the community:** This analyses the status and promotes the use of TF-EMC2-developed services, proposes and validates enhancements, contributes to their maintenance and sustainability, explores their use in additional application domains and explores the feasibility of new services.

**Community outreach:** This continues support to previous initiatives, such as the organisation of EuroCAMP workshops, collaboration with national and international IT practitioners’ associations, support and promotion of REFEIS and liaison with Grids communities, and it initiates and fosters the development of other outreach activities.

**Academic data mobility:** This tracks the evolution of homegrown, consortia and vendor systems for campus management information systems, focusing on data aggregation and mobility between compatible and competing systems. The goal is to strengthen existing technical liaisons with similar initiatives and assess the application of TF-EMC2 results in support of this application area.

**Service-oriented collaboration infrastructures:** This monitors, tracks and disseminates activities and progress in the use of identity federations and other initiatives to support collaboration across institutional borders. It also fosters the harmonisation of (open standards) interfaces between emerging collaboration platforms, virtual research environments, Grids, identity federations, services and instruments; the re-use and sharing of service deployments for common collaboration services and components; and the shared development of new services in the field of online collaboration.

**Alternative forms of expressing identity:** SAML-based protocols have proved successful in the exchange of identity data and in their interoperability with similar infrastructures, such as X.509-based Grid identities. Identity data exchange is attracting interest from sectors such as social networks and governmental services, which translates into new formats, protocols, architectures and procedures. The most relevant are user-centric identity systems. Academic infrastructures must explore ways of interoperating with these systems while maintaining distributed architecture, trust assessment and privacy preservation.

**Reputation systems:** This addresses the propagation of trust in highly distributed and/or data-intensive environments, such as publication environments, social networks and data repositories. The systems that assess reputation information range from well-established systems, like anti-spam tools, to new environments like data provenance or social networks. It also facilitates the evolution of the reputation systems and information that use both DNS and other sources of reputation data for architectures that enhance email quality.

[www.terena.org/tf-eme2](http://www.terena.org/tf-eme2)
ECAM
European Committee for Academic Middleware

Reputation building and consolidation

In 2010, ECAM undertook a number of activities that helped to raise the profile of TERENA’s middleware activities in a variety of settings. Diego Lopez (RedIRIS) stepped down as chair after four years, and was succeeded by Klaas Wierenga (Cisco Systems).

ECAM members met with Knowledge Exchange - a collaborative group that promotes standards, produces case studies and works with specific groups to support solutions – to explore how the two communities can better support each other. In March, ECAM was represented at a European e-Identity Interoperability Conference in Brussels: Andrew Cormack (JANET(UK)) and David Simonsen (WAYF) gave presentations on international federated identity in education and the corresponding policies, standards, applications and technologies in a roundtable session chaired by Licia Florio (TERENA Secretariat).

A new initiative is SSEDIC (Scoping the Single European Digital Identity Community), which provides a platform for all electronic identity stakeholders to collaborate on a strategy for a single European digital community that will support the European Union’s digital agenda for Europe. At the first SSEDIC meeting, in December, ECAM was represented by Victoriano Giralt (University of Malaga).

www.terena.org/ecam

TF-MNM
Task Force on Mobility and Network Middleware

Chair: Klaas Wierenga (Cisco Systems)

Meetings in 2010
18 February, hosted by ACCInet in Vienna, Austria
23 September, hosted by WAYF in Copenhagen, Denmark

Broadening engagement in network middleware

The task force showed its global appeal with participation once again from Australia, Japan and the United States. The task force liaised with TF-EMC2 and met back-to-back with Project Moonshot in Copenhagen. It also revised its terms of reference, which were approved in November, giving it a mandate to continue until September 2012.

In 2010 the deployment of DNSSEC (Domain Name System Security Extensions) was gathering momentum and becoming more important for the NREN community and their connected institutions. The signing of the DNS root in July made it possible to query, end-to-end, whether a connection has been tampered with, and large-scale deployment of DNSSEC became possible for the first time. In anticipation of this, TF-MNM held a workshop at the end of the TERENA Networking Conference in June. The workshop addressed a broad spectrum of DNSSEC-related topics, from a short introduction to DNSSEC, to the impact on resolvers and authoritative DNS servers. Almost 40 participants attended, and the event succeeded in raising awareness of platforms and the visibility of network middleware as part of the task force’s activities.

Engaging with eduroam

One of the task force's work items ensures the engagement of the wider community of eduroam providers and users and their input regarding technical developments in Europe that are taking place as part of the GN3 project. A dedicated discussion mailing list of eduroam practitioners worldwide helps to coordinate the participation of regions or countries in the global development of the eduroam service.

At the February task force meeting, Mark O’Leary (JANET(UK)) presented a ‘flight map’ visualisation of eduroam usage that could prove useful as an analytical and promotional tool. He invited other NRENs to use the available prototype code and suggested a pan-European version of the map could be created.

In September the task force discussed usability issues related to the ‘mute’ nature of eduroam authentication which provides limited feedback if something goes wrong, leaving the user in the dark about the reasons of the failure. Victoriano Giralt (University of Malaga) advocated using ‘walled garden’ networks to access portals as a mechanism to provide better user feedback.

The task force was also presented with results of an investigation by SURFnet and PSNC into whether or not the EAP-FAST (Extensible Authentication Protocol - Flexible Authentication via Secure Tunneling) authentication method is actually fast, from a user perspective. A
comparison showed that PEAP (Protected Extensible Authentication Protocol) - which is increasingly popular - is the least efficient, while EAP-FAST is faster because it sends fewer and smaller packets, thereby reducing the risks of packet loss, re-ordering and retransmission.

Revised terms of reference

Two new work items were added to the task force terms of reference during their revision in 2010.

‘Two factor authentication’ involves the use of an additional authentication mechanism beyond username-password, for example, a ‘token’ or ‘biometric identifier’ such as a fingerprint. Exploring two-factor authentication solutions and assessing their applicability, flexibility and scalability for identity federation-sized deployments will be the focus of one of the new work items.

The other new work item, ‘integration of network middleware with identity federations’, will focus on enabling community contributions to initiatives in the application of technologies for web single sign on (SSO) for non-web uses (e.g. Project Moonshot), which blur the border between web SSO technologies (SAML) and network middleware (EAP, RADIUS). Due to the nature of this work a strong collaboration with TF-EMC2 is envisioned: this TF-MNM task will be the ‘twin’ of TF-EMC2’s ‘beyond single sign on’ work item and will concentrate on lower middleware components.

www.terena.org/tf-mobility

GOALS OF TF-MNM

The development and deployment of mobile technologies and the use of network middleware to support interoperable roaming services are becoming key activities among research networking organisations and research institutions. TF-Mobility and Network Middleware promotes the adoption of such technologies.

Licia Florio (TERENA Secretariat) leads the GN3 project’s activities on multi-domain user application research. (Image courtesy of DANTE.)

GN3 Multi-domain User Application Research

TERENA leads the Joint Research Activity for federated applications in the GN3 project. The main goal is to expand the federated (web) framework to provide seamless access to (multi-domain) services and infrastructure. All work progressed according to plan in 2010.

This activity encompasses three tasks. The first addresses roaming developments with the objective of enhancing the current eduroam infrastructure. In 2010, a new operational model for eduroam was defined, introducing RADIUS over TLS (also referred to as RadSec) into the eduroam hierarchy. This makes the whole eduroam architecture more secure, scalable and reliable. RadSec will also allow RADIUS servers to establish direct connections (as opposed to the current model in which data is transferred over the RADIUS hierarchy).

The second task addresses issues that arise when different identity federations interoperate. A ‘basic aggregation profile’ was defined, to standardise the way a metadata aggregator, such as eduGAIN, should act; and work began to create ‘FedLab’, a set of tools to debug, verify and diagnose identity federation components before they are connected to a production identity federation.

The third task, renamed ‘GEMBUS’ (GÉANT Multi-domain Bus), will provide a set of application programming interfaces to allow access to both network and applications and to compose new services. In 2010 the initial specifications for the GEMBUS architecture were defined.
TF-Storage facilitates discussions among NRENs and academic and research institutions about open and interoperable data storage, management infrastructures and services. It provides a forum for the exchange and promotion of ideas, experience and knowledge and for gathering storage expertise. The task force liaises with other communities such as Internet2 and APAN and those involved in Grids and high-performance computing.

For smaller universities and colleges, the reliable and secure handling of large amounts of scientific data is not economically and/or technically viable. By moving data off campus, there is an opportunity for NRENs to provide backup services, and even complete disaster recovery or cloud services. TF-Storage discussions help to further NRENs’ efforts in this field.

TF-Storage Task Force on Storage
Chair: Jan Meijer (UNINETT)

Meetings in 2010
4-5 March, hosted by SURFnet in Utrecht, Netherlands
3 June, Vilnius, Lithuania
9-10 September, hosted by PSNC in Poznan, Poland

Goals of TF-Storage

TF-Storage is a task force that facilitates discussions among NRENs and academic and research institutions about open and interoperable data storage, management infrastructures and services. It provides a forum for the exchange and promotion of ideas, experience and knowledge and for gathering storage expertise. The task force liaises with other communities such as Internet2 and APAN and those involved in Grids and high-performance computing.

Working to resolve community issues

The task force had its terms of reference renewed in February, with a fresh emphasis on providing a forum for exchanging knowledge and experience, and with a focus on data storage, data management and cloud storage.

In March, TF-Storage heard an update from the Northern Europe Cloud Computing project. Plans for a second generation of the FEDERICA project were also presented and the relationship between FEDERICA and cloud computing was explored.

Continuing its engagement with relevant communities, the task force invited vendors to present updates about their solutions, with Cisco Systems, DDN and Bluearc participating during the course of the year. Storage issues and requirements relating to libraries were also discussed: the digitisation of historical newspapers and associated IT infrastructure were presented in March by Koninklijke Bibliotheek, the national library of the Netherlands, and storage issues in the digital library of Wielkopolska in Poland were presented by PSNC in September. TF-Storage heard about high-speed continuous recording and playback for Very Long Baseline Interferometry (VLBI) in radio astronomy from Paul Boven of JIVE (Joint Institute for VLBI in Europe), with a focus on future requirements and solutions. In the June meeting, the task force provided expert advice to Åbo Akademi University in Finland, which was seeking scalable storage solutions for 50-500 terabytes of data from collaborating bioscience users from different organisations.

The amount of data in the research and education (networking) community keeps growing and NRENs must examine what they can offer in competition to or collaboration with commercial providers: as a result of updates throughout the year about national activities, the task force agreed to produce a document summarising national perspectives on, and strategies for, data storage.

FileSender nears stable release

The open-source FileSender project was inspired by TF-Storage discussions and uses the task force as a forum for building its developer and user community. FileSender develops web-based software for easy transfer of large files and uses SimpleSAMLphp to allow for a wide variety of federated authentication methods.

The FileSender project was initiated in 2009 by AARNet, HEAnet and UNINETT, with SURFnet joining as a major contributor in 2010. Throughout the year several beta versions were released for testing, the last of which was sufficient for a stable service. FileSender pilot installations can be found at AARNet, Belnet, FCCN, SURFnet, the TERENA Secretariat and UNINETT, while HEAnet and Srce offer a production service to their communities. A stable 1.0 software release was expected early in 2011.

www.terena.org/tf-storage
www.filesender.org
TF-Media
Task Force on Media Management and Distribution

Chair: Andy Zbinden (SWITCH)

Meetings in 2010
18-19 March, hosted by GRNET in Athens, Greece
27 May via Adobe Connect
30 May, Vilnius, Lithuania
7-8 October, hosted by UNINETT in Trondheim, Norway
(incl. joint meeting with TF-CPR)

New task force quickly establishing contacts

Although the new task force started officially on 1 January 2010, preparations were already well advanced, with more than 100 people on the mailing list and a meeting to prepare the way held in November 2009. At this event, hosted by CESNET in Prague, Czech Republic, more than 30 participants discussed terms of reference and collected recommendations on potential work items. The first official task force meeting was co-located with a GRNET workshop on academic media casting.

The GRNET workshop, on 18 March, was co-organised by TERENA and provided an opportunity to raise awareness of technical and service development aspects of academic media production, management and distribution, and to attract participation in the task force. The first task force meeting, which began later the same day, involved more than 50 participants. Legal and policy issues surrounding content distribution formed a key area of discussion, with presentations covering royalties for Internet broadcasting and a summary of the EU Broadcasting Regulation – Audiovisual Media Services Directive. The importance of metadata and its consistent creation and management was another topic area. The librarians’ community represented by Europeana has better understanding and good practices on metadata handling, so the task force agreed to a liaison in this area. The meeting concluded that the task force should collect information on media-related services and tools, and working relationships should be built quickly with other relevant communities and groups.

Contact with relevant communities

Plans to liaise with various groups were discussed during a virtual meeting in May, held for the benefit of people unable to attend a face-to-face meeting a few days later, preceding the TERENA Networking Conference. At this second gathering, the video lecturing and presentation system ‘ViPS’ and the social media and web conference platform ‘Global Plaza’ were presented. The task force was asked to test the beta version of Global Plaza and give feedback to its developers. Global Plaza was introduced to interested TF-Media participants in a two-hour workshop held via Global Plaza itself on 13 September.

In June, the task force chair gave a presentation about TF-Media activities at the EUNIS conference in Warsaw, in the hope of starting discussions with the EUNIS e-learning task force. The same month, a ‘liaison statement’ was agreed between TF-Media and the Opencast community. Several areas for cooperation were identified, including sharing knowledge about ‘Matterhorn’, an end-to-end, open-source platform developed by Opencast, which supports the scheduling, capture, managing, encoding and delivery of educational audio and video content.

Exploring tools and liaisons

Matterhorn and SURFnet’s open-source media management tool ‘MediaMosa’ were presented during the October meeting. Participants also heard about various service implementations using these open-source components, for example Cineca’s Live to e-Learning service, based on MediaMosa, which performs semi-automatic transformation of live lectures into e-learning activities and readies them for publication and delivery through an e-learning platform. During the meeting, a subgroup initiated a survey to find out what media-related tools, services, file formats and standards are in use by institutions and national research networking organisations.

This meeting was preceded by an open podcast workshop hosted by the UNINETT eCampus project on 6 October, and included a half-day joint meeting with TF-CPR on 7 October. Preparation for this joint meeting had begun in March, when TF-Media discussed issues regarding the promotion of media services and identified major target groups. A communications plan to help increase the use of multimedia tools in the European research and education community was the main objective of the joint meeting. Participants brainstormed ideas and discussed concepts, with a subset expressing interest in developing the plan further.

www.terena.org/tf-media

GOALS OF TF-MEDIA

NRENs are in a good position to provide multimedia recording, management, repository and distribution services, taking into account the special requirements of the academic and research community. A key example is to record, manage, distribute and archive lectures and training events.

TF-Media explores the architectures, workflow processes and functionalities of different media management and distribution systems and services, as well as the possibility to federate media repositories at the European level.
**GOALS OF TF-NOC**

Network Operation Centre functions are essential, costly and critical to the main business of national, regional, metropolitan and campus network providers. There is great diversity in the organisation, structure and roles of NOCs. It is also hard to find information about common practices in their day-to-day operations. NOCs cope with similar issues, but use different tools, procedures and workflows.

TF-NOC brings together NOC managers, engineers, developers, operators, controllers and project managers interested in NOC functions to share experience and knowledge as well as to investigate the creation of best common practices.

TF-NOC Task Force on Network Operation Centres

Chair: Stefan Liström (NORDUnet)

Meeting in 2010
2-3 September, hosted by CESCA in Barcelona, Spain

Enthusiastic start for new task force

Following a proposal by SWITCH and NORDUnet, preparations began in 2010 for a new task force to facilitate the exchange of experiences and best practices between Network Operation Centres, TF-NOC. The terms of reference were approved by the TERENA Technical Committee in June, giving a three-year mandate from 1 September 2010.

On 3 May a meeting to investigate support for TF-NOC plans was hosted by NORDUnet in Copenhagen, Denmark. Basic objectives were discussed and it was agreed to propose the creation of a task force that would concentrate on the structural, functional and operational aspects of network operation centres.

In September twenty NOC managers, engineers, developers, operators and project managers from across Europe participated in the first official task force meeting. In addition to finalising the description of short-term goals, deliverables and deadlines, they formulated questions for a survey to determine the various NOC taxonomies. They each also agreed to formulate five attributes describing their respective NOCs and five things they wanted to know about other NOCs. This contributed to the creation of an online matrix that facilitates ‘matchmaking’ between participating organisations by mapping their needs and interests against what they are willing to share.

It was planned that TF-NOC would liaise with related task forces, the GÉANT Access Port Managers, and other communities. Acting swiftly, task force members attended a meeting at the invitation of TF-MSP in November, to discuss non-technical aspects of dark fibre management. By the end of 2010, the task force mailing list had more than 100 subscribers, including people from research institutes and research networking organisations in Australia, Canada, Brazil, Africa and the United States.

www.terena.org/tf-noc
FEDERICA
Federated E-infrastructure Dedicated to European Researchers Innovating in Computing Network Architectures

Successful completion of extended project

In 2010, testing of an interoperability prototype showed the importance of early prototyping and validation of standards and protocols, while extensive outreach to users generated interest in using the FEDERICA infrastructure. These were the outcomes of TERENA-led project activities.

Most of the work by the research activity to explore novel paradigms and user control had been completed in 2009, but the FEDERICA-IPsphere interoperability prototype that had been created that year required validation testing in 2010. Thanks to a four-month extension of the project, there was ample time for testing, not only in the laboratory, but also using a FEDERICA ‘slice’ that was provided during the summer, led by i2CAT and Juniper Networks and aided by partners of the service activities and by the FEDERICA NOC. With tests proving successful, the prototype could be used in future by the FEDERICA NOC and by end-users to interconnect various slices following standardised business procedures of the IPsphere framework.

The project’s extension also gave time for the networking activity responsible for building and consolidating the user community to get more users involved. By the end of the project there were five project ‘internal’ users, and applications from ten external users had been assessed and approved by the User Policy Board. A key opportunity to engage with external users was the 2010 TERENA Networking Conference: collaboration between this networking activity and another TERENA-led FEDERICA activity - responsible for information dissemination and event organisation – resulted in a user tutorial on 30 May, immediately preceding the conference. The tutorial attracted 13 participants and explained virtualisation features and how users could request, connect, use and monitor slices. A panel discussion then allowed prospective users to ask questions and to provide feedback. The event was recorded and made available via the project website as an online tutorial.

Contributing further to project information dissemination, a FEDERICA workshop was held at the TERENA Networking Conference, on 2 June, distributed over two sessions. Thirty participants heard about FEDERICA developments and other Future Internet research activities.

www.fp7-federica.eu

WHAT WAS FEDERICA?

The FEDERICA project created a unique infrastructure that allowed ‘slices’ of both network and computing resources to be allocated to researchers for potentially disruptive experiments. These slices provided a flexible but safe ‘environment’ for testing new technologies and architectures that will help shape the future Internet.

The FEDERICA infrastructure depended on cooperation between researchers, vendors and NRENs, and on connections to the NRENs via the GÉANT network. The project was coordinated by GARR and involved CESNET, DANTE, DFN, FCCN, GRNET, HEAnet, HUNGARNET, Fundació i2CAT, ICCS, Juniper Networks, KTH, Martel Consulting, NORDUnet, Politecnico di Torino, PSNC, RedIRIS, SWITCH, TERENA and UPC. FEDERICA was co-funded by the European Union as part of its 7th Framework Programme.

FEDERICA in 2010

The FEDERICA project was extended by four months, ending in October 2010. During the year, two articles were published by project members and another submitted, and nine presentations were given, in Europe, Vietnam, Australia and South Africa. Participants agreed to continue supporting the project infrastructure, the User Policy Board and the Network Operations Centre until March 2011, in order to support some ongoing users. FEDERICA’s final review was in January 2011 and was very positive.

TERENA’s roles in FEDERICA

TERENA led a joint research activity on novel architectural paradigms and user control, as well as two networking activities to build and consolidate the user community, and to disseminate information and organise training events related to use of the infrastructure.

PARTICIPATION IN EXTERNAL PROJECTS

TERENA Secretariat staff members take part in projects that are fully or partially funded from external sources. Often such work is part of a Framework Programme project that is co-funded by the European Union and in which TERENA is a partner.
WHAT DOES THE TERENA CERTIFICATE SERVICE DO?

TERENA member organisations participating in the TERENA Certificate Service can offer their research and education constituencies five types of certificates:

- server certificates - for authenticating servers and establishing secure sessions with end clients
- e-science server certificates (IGTF compliant) - for authenticating Grid hosts and services
- personal certificates - for identifying individual users and securing email communications
- e-science personal certificates (IGTF compliant) - for identifying individual users accessing Grid services
- code-signing certificates - for authenticating software distributed over the Internet.

The service started officially on 1 July 2009 and is based on a three-year contract between TERENA and Comodo CA Ltd. The contract also allows research and education institutions in the countries of the TERENA member organisations that participate in the service to buy EV (Extended Validation) certificates from Comodo at a reduced price. EV certificates are issued after a more thorough vetting process than with other certificates, and can be used to secure online financial transactions. In the summer of 2010 Comodo launched a one-year promotion offering its customers a free upgrade of server certificates to EV certificates.

The evolution of TERENA's certificate services

The current service is the successor of an earlier arrangement between TERENA and GlobalSign NV/SA, which covered only the issuance of server certificates. That started in January 2006 with eight national TERENA member organisations participating. The contract with GlobalSign expired in January 2010; in the second half of 2009 and during part of January 2010, the old and the new service ran in parallel.
A year of growth for TCS

In 2010 the TERENA Certificate Service (TCS) began officially providing personal, e-science personal, code-signing and e-science server certificates. CYNET, RoEduNet and IUCC joined the service during the year, taking the number of participating NRENs to 25. Almost 36,000 server certificates were issued, compared to fewer than 10,000 in the second half of 2009.

In 2009 many NRENs had made it a priority to replace GlobalSign certificates that were issued through the old service with new Comodo certificates. That process being largely completed by the start of 2010, the rate of issuing certificates in these countries gradually slowed. On the other hand, a new growth was created when JANET(UK), CSC/Funet, AMRES, CYNET, RoEduNet and IUCC joined the service late in 2009 or in 2010.

New kinds of certificates launched

Initially, TCS enabled only the issuance of regular server certificates. After the European Policy Management Authority for Grid Authentication (EUGridPMA) completed an accreditation process at the end of 2009, e-science personal certificates compliant with the standards of the International Grid Trust Federation (IGTF) could be issued, launched on 5 February 2010. The same day was the official start date for the issuance of regular personal certificates. Twenty of the 25 TERENA member organisations participating in TCS subscribed to issue personal and e-science personal certificates.

Code-signing certificates could be issued officially from 1 June. The market for these certificates is much smaller than for server and personal certificates, and only nine NRENs subscribed to this part of the TERENA Certificate Service.

After completion of a separate accreditation process with the EUGridPMA, the issuance of IGTF-compliant e-science server certificates became possible on 1 October.

www.terena.org/tcs

TCS Portal Project

TCS portal makes provisioning certificates easier and cheaper

Building on plans that were developed towards the end of 2009 by a number of NRENs, in January 2010 TERENA started a 16-month project to build and test a common portal for issuing (regular and e-science) personal certificates from the TERENA Certificate Service. The set-up phase was successfully completed after four months, and from 1 May the TCS Portal was offered as a pilot service to the NRENs participating in the project.

It is possible to issue personal certificates by checking the identity of each user individually, but that does not scale to large numbers of users. The Confusa software developed by Henrik Austad (UNINETT Sigma) and Thomas Zangerl (Nordic Data Grid Facility) uses existing identity provider services to verify identities, making it possible to issue large numbers of personal and e-science personal certificates efficiently. Because such services are commonly hosted by organisations participating in established identity federations, national TERENA members can delegate verification to these organisations, enormously reducing the amount of work and allowing certificates to be issued quickly.

Installing and maintaining Confusa takes some effort and economies of scale can be achieved by sharing a common implementation. That is the goal of the TCS Portal project. The portal is hosted on resilient servers at Tilburg University in the Netherlands, operating as a subcontractor to SURFnet, which was contracted by TERENA to carry out the project. The project is paid by the participating NRENs: CSC/Funet, UNINETT, SUNET, SURFnet, Forskningsnettet, RENATER, GARR, ACoNet and Belnet. They are all represented in the TCS Portal Project Review Committee, chaired by Jan Meijer (UNINETT), one of the project’s initiators.

https://tcs-personal-portal.terena.org
https://tcs-escience-portal.terena.org
HOW DOES TI WORK?

Many research and education networking organisations, commercial Internet service providers, telecommunications operators and governments have established CSIRTs to deal with network security incidents. The TI fosters trust by collecting information about CSIRTs, publishing it online, and by accrediting those CSIRTs that meet certain criteria. The information is checked on a regular basis to ensure that CSIRTs still fulfil the accreditation criteria. Accredited CSIRTs can participate in closed meetings that are organised back-to-back with TF-CSIRT meetings. They hear sensitive and confidential information about incidents and threats. The TI also provides accredited CSIRTs with statistical information, a re-encrypting secure mail gateway and out-of-band alerting. The addition of a new level of the service, certification of CSIRTs, is expected to strengthen ties of trust still further.

The Trusted Introducer service is provided by S-CURE B.V. and PRESECURE GmbH, under a contract between TERENA and S-CURE. TERENA pays S-CURE for providing the service and re-charges these monthly fees to the accredited CSIRTs. The Trusted Introducer Review Board reviews the operations of the service and addresses any issues that may arise.

Trusted Introducer

Trusted Introducer Review Board
Jimmy Arvidsson (TeliaSonera CERT) (until 16 September, chair)
Lionel Ferette (BELNET CERT and CERT.be) (chair from 16 September)
Przemek Jaroszewski (CERT POLSKA)
Chelo Malagón (IRIS-CERT) (until 16 September)
Kevin Meynell (TERENA Secretariat)
Erika Stockinger (CERT-SE) (from 16 September)
Wilfried Wöber (ACOnet-CERT) (from 16 September)

Service expands and certifies first team

In September 2010 the Trusted Introducer (TI) service expanded from a simple accreditation of Computer Security Incident Response Teams (CSIRTs) to include a more comprehensive and in-depth certification process. The first team was certified in November.

CSIRTs that have been accredited by TI differ significantly, in their size, services offered, professionalism of their organisation and processes, tools used and level of experience. Accreditation gives CSIRTs limited information about the support and expertise that can be expected when collaborating. The more stringent process used in certification stimulates stronger trust between CSIRTs across different organisations, leading to increased collaboration.

To be certified by TI, accredited CSIRTs must pass a strict qualification process in which scores are assigned on 45 parameters that are grouped in four categories: organisation, human, tools, and processes. A pre-defined minimum score is required and CSIRTs must also provide documentation and participate in an on-site workshop that investigates the CSIRT, offers coaching, consultancy and a final assessment. After successfully completing the process, a CSIRT remains certified by maintaining the relevant information with the Trusted Introducer and by undergoing re-certification every three years.

The design of the new certification scheme is mainly due to the work of Don Stikvoort (S-CURE), Klaus-Peter Kossakowski (PRESECURE) and members of a working group established by accredited CSIRTs: Serge Droz (SWITCH-CERT), Gorazd Božič (SI-CERT), Miroslaw Maj (CERT POLSKA) and Urpo Kaila (CERT-FI).

GOVCERT.NL first team certified

The Dutch government’s computer emergency response team, GOVCERT.NL, was the first team to be certified under the new TI scheme. The announcement was made and the first certificate awarded on 16 November at the international GOVCERT.NL symposium in Rotterdam, the Netherlands. This was the result of hands-on work with GOVCERT.NL by Klaus-Peter Kossakowski from the TI team. As this was the first of its kind, there was an initial learning and evaluation period for the TI team as well as for GOVCERT.NL. Six more CSIRTs from five European countries were pursuing TI certification at the end of 2010.

www.trusted-introducer.org
TACAR®
TERENA Academic Certification Authority Repository

TACAR extended and upgraded

The TACAR upgrade planned in 2009 was completed in August 2010. An improved interface allows CA (Certification Authority) administrators to submit documents directly into the repository and there is now much faster access to the root certificates and other documents contained. A new ‘category manager’ also lets appointed people indicate which CAs have been accredited by a Policy Management Authority (PMA). This benefits TACAR’s users as they can immediately see and download CA root certificates accredited by a specific PMA.

The beta-version of the enhanced TACAR was released in March; the software was presented to the IGTF meeting in April then underwent testing by the eduPKI PMA before migration of TACAR content to the new system, which was launched in July 2010. These developments were co-funded by the GN3 project as part of its eduPKI service development. The new category management feature will enable the eduPKI PMA to manage the categorisation of certificate profiles that are designed for the GN3 services.

The continued operation of the TACAR service during 2010 was funded by TERENA. One new CA joined TACAR during the year, bringing the total number of root certificates stored in the repository to 62.

* TACAR is a registered trademark of TERENA.

www.tacar.org

WHAT IS TACAR?

Since its launch in 2003, TACAR has become a trusted online store of trust anchor certificates, related certificate policies and certificate practice statements registered by the Certification Authorities of organisations in the academic community.

A root CA certificate validates all certificates originating from a Certification Authority and may be used for this purpose if a CA is not recognised by operating systems or applications. Therefore users who want to trust certificates issued by a CA need to be able to obtain the root CA certificate in a secure way. TACAR allows users to securely download multiple root certificates at the same time.

TACAR does not evaluate the policies adopted by the CAs nor enforce compliance with any particular technical minimum requirements. This has proven to be a strength, as it allows TACAR to cooperate with different Policy Management Authorities which are better placed to assess policies. TACAR has become the official repository of the IGTF, and the majority of the CA root certificates hosted by TACAR have been accredited by the IGTF. Now TACAR will be used to support the GÉANT community as well.

Christian Gijtenbeek (TERENA Secretariat) works on the new TACAR tool.
edupKI

edupKI service ready to move into production

TERENA leads the edupKI service, which is a task within the GN3 project’s Multi-domain End-User Services activity. Work progressed on time during 2010: by summer the edupKI service was operating as a pilot, documents outlining edupKI PMA procedures and general governance of the service were drafted, and the edupKI Certification Authority was ready for testing. By December the edupKI CA policy was issued, the governance documents were finalised and tests on the edupKI CA gave positive feedback, all preparing the edupKI service to enter into production in early 2011.

Work also began to identify use-cases: edupKI collaborated with the eduroam service team towards the definition of an eduroam trust profile, which describes the format of eduroam certificates and the procedures for CAs that wish to issue them. The edupKI service team will encourage existing CAs to support the eduroam trust profile and will define new trust profiles for other GN3 services in 2011. TACAR will be used as a trusted support tool to list CAs supporting edupKI-proposed solutions.

WHAT IS EDUPKI?
The Public Key Infrastructure (PKI) service being developed within the GN3 project supports other GN3 services by defining their security requirements and providing them with digital certificates. A number of GN3 services build their trust on X.509 certificates and some have very specific requirements regarding their trust procedures and the contents of certificates used. Many NRENs also operate national PKIs and provide X.509 certificates for their constituency. Whenever possible, edupKI relies on existing national Certification Authorities, thus offering a federated service.

The edupKI service consists of:
- edupKI PMA (Policy Management Authority) - the heart of the service. It defines procedures for edupKI as a whole, and analyses and categorises services’ requirements.
- edupKI CA - a dedicated Certification Authority that supports users of GÉANT services who cannot obtain service-specific certificates from national CAs and / or for test purposes.
- TACAR is used as a trusted support tool to list CAs supporting edupKI-proposed solutions.

www.edupki.org

eduroam®
Education Roaming

Global eduroam Governance Committee
Paul Dekkers (SURFnet)
Hideaki Goto (Tohoku University)
Jens Haeusser (University of British Columbia)
Philippe Hanset (University of Tennessee, Knoxville)
Miroslav Milinovic (Srce, chair)
James Sankar (APRNet)
Klaas Wierenga (Cisco Systems, non-voting expert member)
Stefan Winter (RESTENA)

TERENA expands participation in global governance of eduroam

A new group to lead the governance of eduroam around the world was constituted in 2010, supported by TERENA.

eduroam is the focus of two work items in the TERENA Task Force on Mobility and Network Middleware: ‘support for the development of next-generation eduroam’ provides a public forum in which members of the GN3 project’s Joint Research Activity responsible for eduroam technical developments can interact with experts outside the project; and ‘support for eduroam worldwide’ coordinates best practice in deployment and operation of the service in regions outside Europe. In 2010, the ‘next-generation eduroam’ team and their GN3 counterparts worked with edupKI and agreed how to issue certificates for a secured eduroam infrastructure; and the ‘eduroam worldwide’ team highlighted the need for global participation in the governance of the service.

eduroam has been growing worldwide: within Europe Montenegro joined the eduroam confederation in November 2010, bringing the last of the 37 GN3 project partner countries into the eduroam fold, and more countries in other world regions are also implementing the service. To oversee issues related to the growing number of regions and technological changes, the Global eduroam Governance Committee (GeGC) was constituted, in November 2010, with seven members elected to represent North America, Asia-Pacific and Europe. After extensive consultation with eduroam leaders from these regions, TERENA finalised the summary charter for global eduroam governance. TERENA staff
provide secretariat support to the GeGC, which had its first meeting early in 2011. TERENA Secretariat staff participate in the European eduroam Operational Team, with responsibility for maintaining the eduroam website. Secretariat staff also help to stimulate the adoption and promotion of eduroam in Europe through the GN3 project’s Partner Services Promotion task. A joint action between this task, Networking Development Support (also led by TERENA), the European eduroam Operational Team and the training task of the GN3 project was initiated by TERENA in 2010, to support eduroam rollout and promotion in six eastern European countries.

* eduroam is a registered trademark of TERENA

**WHAT IS EDUROAM?**

eduroam® is a global service, pioneered in 2003 by the TERENA task force TF-Mobility. It enables students, researchers and staff from participating institutions to obtain Internet connectivity across campus and when visiting other participating institutions by simply opening their laptop or activating their smartphone or other portable device.

   eduroam removes the requirement for visitor accounts, reducing the administrative and support burden for IT support staff within thousands of institutions, many of which own and operate the service’s infrastructure. National and pan-European coordination of this infrastructure is undertaken by the National Roaming Operators and the eduroam Operational Team that is funded by the GN3 project. Outside Europe, eduroam is available in Australia, Canada, China, Hong Kong, Japan, New Zealand, Papua New Guinea, Taiwan and the USA, and is under development in some African countries.

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**eduGAIN**

The goal of eduGAIN is to interconnect the GN3 partners’ identity federations. TERENA updated the eduGAIN website and contributed to policy developments in 2010.

TERENA participates in the GN3 project’s eduGAIN task and is active in its policy group, with this work consuming the majority of effort in 2010. TERENA has responsibility within the task for maintaining the content of the eduGAIN website. During 2010 the old website was archived, migrated to PSNC from former host RedIRIS, new content was created and the look and feel was updated. The site was also restructured to allow a wider group of people to maintain it than previously possible.

TERENA liaised with SURFnet during the year to connect the eduGAIN pilot service and the Dutch federation, SURFfederatie, of which TERENA is a member.

www.edugain.org

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A video about eduroam is now available in several languages. It was produced by AARNet and To the Point Productions. (Image courtesy of AARNet)
ABOuT EDUCONF

In 2010 a new task was created within the GN3 project to explore the feasibility of providing a high-quality collaboration environment for research and academic users. The first goal was to study the potential of a pan-European videoconferencing service as part of this overall vision: other services may be considered for investigation at a later stage. The study built upon work within the GN2 project that was discontinued with the end of GN2 in March 2009. This GN2 educonf work in turn was inspired by the TERENA task force on Videoconference Service Studies (TF-VSS), which in 2006-2007 evaluated the need for a Europe-wide videoconferencing service as well as the equipment and technology that would be required for its technical realisation.

EDUCONF

European Videoconferencing Service Feasibility Study

The feasibility of a pan-European videoconferencing service was studied during 2010. TERENA participated in the core expert group and provided logistical support and a workshop website.

Péter Szegedi (TERENA Secretariat) was one of the experts who carried out the study, which was a GN3 project task. A first meeting of this group was hosted by SURFnet in Utrecht, Netherlands on 10 May. The group made contact with videoconference service managers and other relevant members of the research networking community and videoconferenced with many to explore their requirements. The expert group created an online survey to further question these contacts, 26 of whom then attended the educonf workshop in order to provide as many inputs for the feasibility study as possible.

The educonf workshop was hosted by FCCN in Lisbon, Portugal, on 18-19 October. The survey results were presented and participants brainstormed various questions. The results of the workshop, survey and consultations were distilled into a business case by the expert group. Proposals to start four educonf sub-services – addressing, phonebook and monitoring, NREN certification, and an MCU cloud service – were submitted to the management of the GN3 project on 15 December, and decisions about these proposals were expected early in 2011.

www.terena.org/activities/educonf

EACU

Following a request from the community, the TERENA Secretariat supported the Adobe Connect users group in the European research networking community by providing a wiki space and mailing list, and facilitating a meeting at the TERENA Networking Conference 2010. The group focuses on Adobe Connect webware, but also accommodates discussions related to all kinds of web conferencing solutions.

www.terena.org/activities/educonf

Péter Szegedi leads TERENA’s involvement in NRENs.net, EACU and educonf. Pictured at a ‘Campus Best Practices’ meeting in April, focusing on IP telephony issues.
In November 2010, CARNet joined NRENum.net, bringing the number of participating countries to eleven. The educonf feasibility study sparked renewed interest in this service.

Discussions about addressing plans that took place within various communities - such as the GN3 educonf feasibility study among the European NRENs, and the Internet2 Audio Video Communications Infrastructure Group - concluded that NRENum.net is a useful tool and is one potential way forward as an addressing scheme for a possible unified communication service for the research and education community.

The NRENum.net pilot service has continued to work, with minor technical updates by some participants during 2010. TERENA will investigate the potential extension of the service’s lifetime after 2010.

www.nrenum.net

WHAT IS NRENUM.NET?

NRENum.net translates IP (Internet Protocol) addresses to a code that uses the same format as telephone numbers. It provides a solution for seamless dialling interconnection between multiple technologies in countries where the standard system, using ENUM (E.164 Number mapping), is unavailable and facilitates services such as videoconferencing and VoIP (Voice over IP).

TERENA ensures the coordination of this pre-existing service, following a proposal by the Task Force on Enhanced Communications Services (TF-ECS), which concluded its activities in 2008. The country code delegations to the NRENum.net tree are technically done by SWITCH NOC, with a backup service provided by NIIF/HUNGARNET.
GLIF Secretariat
Global Lambda Integrated Facility

GLIF events in 2010
3-4 February, Technical Working Group Meeting in Salt Lake City, USA
13-14 October, 10th Annual Global LambdaGrid Workshop, hosted by CERN in Geneva, Switzerland

New task forces and a new project
TERENA is contracted by GLIF participants to provide secretariat support as a service to GLIF, organising meetings and maintaining the website. This work is funded through voluntary contributions by a number of GLIF participants. In 2010, twenty-three organisations provided sponsorship amounting to almost 56,000 euro - 5,000 euro less than in 2009 because a build-up of reserves allowed a reduction. The number of GLIF participants increased from 52 to 60.

The February event mainly involved short meetings of the Technical Issues Working Group’s various task forces. Three new task forces were created to work on distributed topology exchange, resource allocation issues, and end-to-end support. The global identifiers task force published its final proposal on lightpath naming and was disbanded. It was also agreed to begin a pilot project to create a dynamic GOLE (GLIF Open Lightpath Exchange) infrastructure. This automated GOLE pilot would allow lightpaths to be established on demand or reserved in advance for specific periods, along with dedicated capacity and performance characteristics. Eight GOLEs and a number of supporting networks participated in the pilot which used the Fenius software developed by ESnet to interconnect various domains. The pilot was demonstrated at...
Supercomputing 2010 in New Orleans and at the Annual Global LambdaGrid Workshop in October.

The October event provided an opportunity for more than 100 people working on global optical networking to discuss new development and operational issues, and to be informed of the latest trends in optical networking such as 100 Gb/s technologies. It was also an opportunity to demonstrate the latest applications such as high-definition visualisation over 40 Gb/s links, high-performance packet inspection, and dynamic set-up and tear-down of lightpaths.

During the year, GLIF liaised with the Open Grid Forum’s Network Service Interface (NSI) Working Group on the development of standards, with Fenius likely to become the first early implementation of the NSI-approved standard, with work continuing into 2011. In the coming year, the global reach of the GLIF infrastructure is also expected to grow, with optical connectivity extended to parts of Africa, South-East Asia and India.

www.glif.is
Conferences and Workshops

Students from various disciplines presented posters.

For the first time, TERENA provided TNC participants with a webspace where they commented on the event via blogs and tweets, clocking up around 800 tweets and more than 30 blog entries and attracting around 600 visitors per day to the TNC2010 ‘Coverage’ web page:

http://tnc2010.terena.org/coverage

Edgars Znots (University of Latvia) won a ‘best student poster’ award sponsored by Cisco Systems – the first time a prize for sponsored student participants has been offered at TNC:


High-definition TV interviews with TNC speakers were recorded by Kobra TV – a team of students from across Lithuania – and were broadcast via university and city-wide TV as well as online:


NEW AT TNC2010

William E. Johnston of ESnet (right) with Christoph Graf (left).

Laimutis Telksnys of LITNET (right) and Janne Kanner (left).

Thomas Schmidt (Hamburg University of Applied Sciences) being interviewed by Kobra TV.

Students from various disciplines presented posters.
TERENA Networking Conference

31 May - 3 June, hosted by LITNET in Vilnius, Lithuania

Programme Committee
Chair: Jean-Paul Le Guignier (CRU)

Members
Bartosz Belter (PSNC)
Jacqueline Brown (Pacific Wave)
Serge Droz (SWITCH)
Baiba Kalina (IMCS UL, SigmaNet)
András Kovács (NIF/HUNGARNET)
Otto Kreiter (DIANTE)
Jan Meijer (UNINETT)
Jürgen Rauschenbach (DFN)
Brook Schofield (TERENA Secretariat)
Raimundas Tuminauskas (KTU ITPI / LITNET NOC)
Stefan Winter (RESTENA)

How can research and education networking facilitate ‘the network life’?

Participants at this year’s TERENA Networking Conference (TNC) really ‘lived the network life’, in keeping with the event’s theme. Social networking was discussed in many presentations and was available for the first time as a tool for participants to comment on the conference.

The opening presentation by Hannes Lubich (University of Applied Sciences Northwestern Switzerland) was widely praised. He explored issues surrounding the question of how the older, ‘digital immigrant’ generation can set rules and create work and study environments for ‘generation Y’ without ‘throttling access to their creativity tools’. Ingrid Melve (UNINETT) said that the expectations of ‘digital native’ students offer opportunities for research networking organisations. This generation demands more from life on wireless, but, she asked in the closing plenary talk, can we adapt and do we have the mindset? A further challenge came from Mark Ellisman (University of California, San Diego). He said digital-age brain research has a growing need for adequate networks and lower data storage costs, with certain microscopes generating 4 terabytes of data in just one afternoon.

Other plenary talks highlighted how developments in networking, storage and processing technologies are changing the way that scholars work. Clifford Lynch (Coalition for Networked Information) described new possibilities that emerge once large datasets of all kinds are accessible for machine processing. Chad Kainz (University of Chicago) showed how this type of success creates challenges for university computing services, as researchers who hear about network-enabled projects quickly come up with ideas for using them in their own fields. As a result, IT people can no longer think in terms of ‘easy’ and ‘demanding’ faculties to service.

Identity, and individual action

Plenary speaker Kim Cameron (Microsoft) provided an overview of issues related to digital identity, which topic cropped up in various guises throughout the conference. The growing importance of virtual organisations, authorisation, and the need to aggregate attributes from sources of authority other than the home identity provider were popular topics of discussion, compared with previous years. New ways to expand the use of identity federation were proposed by Josh Howlett (JANET(UK)) in his presentation of the Moonshot project. He called for wider involvement in order to make this a truly community-led project.

With climate change being accepted as a fact by most people, a session about green computing inspired participants: instead of talking about how bad climate change is, presenters focused on how to do something about the problem within the work environment of the research networking community. A big part of the problem is the ever rising need for energy. The local challenge of getting energy in and heat out of data centres is increasingly the limiting factor. Preliminary results from a carbon footprint study of the GÉANT network indicated that emissions from the network infrastructure are not as high as one might expect. Major savings will come in changes in individual usage.

To outsource or not

A panel discussion about outsourcing concluded that this approach is likely to become a common choice in the research networking environment for commodity services that can be well-defined and where sharing provision with others can give economies of scale. Security is often a concern when outsourcing, and so are questions of control of data. Further developments are needed in the use of open standards, both to allow integration between outsourced and internally operated services and to reduce the risk.

TNC2010 – FACTS AND FIGURES

In Vilnius 495 participants from 41 countries attended the conference, which was rated very highly by attendees. Participants welcomed the new award for best student poster and the conference’s new aggregated social media page. Particular praise went to the overall organisation and the high quality of the network and streaming.

Sponsorship was provided by HP, Juniper Networks, Cisco Systems, ADVA Optical Networking, Extreme Networks, Vidyo, Comodo, NLnet, Tata Communications, Skaidula, TEO, Fima, EMTC, Kobra TV, LITNET and the European Commission.

Fourteen out of more than one hundred papers presented at TNC2010 were selected for online publication as the conference proceedings:

www.terena.org/publications/tnc2010-proceedings

A record number of thirty-two posters were shown in the poster exhibition and can be seen online along with archived streams of presentations:

http://tnc2010.terena.org/schedule
of becoming locked in to a single outsourcing platform. Persuading vendors that this is in their interest is likely to need joint efforts at national or higher level.

A session about the Internet Engineering Task Force provoked a thirst for more on this topic in future. This session was dedicated to IETF’s current activities and speakers involved in these shared their views on what may have a major impact on the development and standardisation of the future Internet.

Events around the conference
As usual, many smaller events surrounded TNC2010, including TERENA task force meetings, project meetings and workshops. Two sponsors held special workshops: the Juniper Networks R&E Summit 2010, and an ADVA Optical Networking event on ‘Backbone Network Innovation’.

A workshop on OpenDRAC (Open Dynamic Resource Allocation Controller), which can reserve and provision bandwidth on demand, invited conference participants to contribute to the software’s further development through discussion and cooperation.

A PERT workshop brought together experts from Performance Enhancement Response Teams (PERTs) and others interested in network performance and quality of service issues.

Birds of a Feather meetings were held on a range of topics. The policy findings of the e-Infrastructure Reflection Group (e-IRG) were presented in one; another highlighted progress in discussions about improving the quality of email services, following a workshop organised by TERENA in December 2009. There was also a closed meeting to explore common project initiatives in eastern Europe and the Caucasus.

Other TERENA and project meetings held during the conference week are mentioned elsewhere in this report.

http://tnc2010.terena.org
This set the tone for a session on mobility and identity federation, during which Brook Schofield (TERENA Secretariat) drew parallels between eduroam and identity federations, explaining how lessons learned with eduroam could be applied to benefit campus and federated authentication services. Victoriano Giralt (University of Malaga) described how the Andalusian Federation, CONFIA, supports students’ mobility by enabling collaboration with peers at 10 institutions in Spain. And David Simonsen closed the session with an in-depth technical explanation of the WAYF.dk federation infrastructure, how it is used to create inter-federated and federated services beyond Denmark’s borders and how the federation has been useful in engaging with banking, commercial and citizen identity initiatives in addition to the research and education communities.

Towards a reduction in duplicated community effort

In the two-day Vienna workshop, more than 25 participants discussed the hurdles of ‘domestication’ that face institutions seeking interoperability of their campus systems and services. They shared ideas and requirements for future identity management systems and services and were given the opportunity to influence the direction of community software roadmaps targeting campuses.

Organisations in the research and education community evidently still struggle with cooperating on similar issues; representatives talked about needing federation support for their applications, but were unaware of each other’s similar problems and solutions for the same applications. The workshop concluded that it would be beneficial to pool resources to solve interoperability issues rather than to duplicate work.

To that end, participants learned about the ‘Domestication Wiki’, a new community-maintained repository for information on the availability and domestication level of various software packages and services. Domesticated applications are advantageous, because they enable single-sign-on features for users, as well as the ability to share group context between multiple applications.

Niels van Dijk (SURFnet) presented the work of project COIN (Collaboration Infrastructure), a collaborative effort between SURFnet and the higher education and research sector to develop an infrastructure based on open standards that will allow applications and systems to share information online.

Virtual Organisations (VO) enable collaboration between different federated organisations. Participating federations need to externalise certain identity management functions, which are then shared and managed within the VO. Lukas Hämmerle (SWITCH) gave a status update of the SWITCH VO Platform, also known as “Combo”, which started its public pilot in October for SWITCHaai.

Benn Oshrin (Internet2) provided an overview of the COmanage project, an effort by the Internet2 Middleware Initiative to develop a set of capabilities that allow collaborative organisations to meet their objectives using collaboration tools in a secure and effective framework.

Participants also learned about OneSocialWeb, an initiative of Vodafone Group Research and Development to create a free, decentralised social network platform.

www.terena.org/eurocamp
NRENs and Grids Workshop
15 September, co-located with EGI Technical Forum in Amsterdam, Netherlands

Workshop advisory group 2010
David Kelsey (Rutherford Appleton Laboratory)
Diego Lopez (RedIRIS)
Mario Reale (GARR)
Milan Sova (CESNET)

An ending and a new beginning for NRENs and Grids

The NRENs and Grids workshop series ended in 2010 with a final event in September. But collaboration between the NREN and Grid communities is set to thrive in the coming years.

The final workshop brought together Grid federations and federations from the NREN community that use SAML as the building block for their federated identity. The purpose was to highlight their goals, similarities and differences as well as the technologies used to implement services.

Three streams of interest were covered:
- monitoring and measuring of services
- SAML federation and Grid federation progress
- virtual organisations from the SAML and Grid perspectives.

A keynote presentation from the LifeWatch project, which aims to construct and operate a distributed infrastructure for collaborative environments for biodiversity and ecosystem science, framed the event and highlighted the importance of SAML and Grid cooperation. Several talks focused on network monitoring, with updates on developments within the GN3 project related to the PerfSONAR tool and a look at Grid Jobs, for Grid network monitoring.

Issues relating to identity management were at the forefront of discussions. David Groep (Nikhef) gave an overview of Grid technology for authentication and authorisation in which he advocated using identity federations as a mechanism to hide the internal workings from users. David Simonsen (WAYF) discussed the state of the SAML federation landscape and how it is moving closer to the Grids, with growing inter-federation, availability of Grid-friendly certificates and levels of assurance (LoA) initiatives. Policy issues for identity management and other attributes were the subject of a talk by David Kelsey. He suggested that Grid participation in federation activities such as REFEDS should be encouraged, as well as working together on best practices for registration authorities.

The AAI requirements for distributed computing infrastructure were examined with a survey that questioned various research communities tied to large projects. Christoph Witzig (SWITCH) and John White (Helsinki Institute of Physics) shared the results, which showed that diverse user communities have different requirements, plus limited knowledge of and enthusiasm for complex IT solutions. The key requirement for authentication and authorisation solutions is that they should be standards-based and interoperable. www.terena.org/nrens-n-grids
CSIRT Training Workshops

4-5 March, co-organised and sponsored by ENISA and SUNET, hosted by SUNET CERT in Uppsala, Sweden
7-8 September, co-organised and sponsored by ENISA and hosted by KIT in Karlsruhe, Germany
5-7 October, TERENA Secretariat offices (pilot of TRANSITS-II)

Course expands to include advanced training

As the CSIRT world has matured, so have its training requirements. With this in mind, TERENA formulated a new structure for its training courses and piloted advanced CSIRT training for the first time in 2010.

Two ‘standard’ TRANSITS-I training events took place during the year. Thirty trainees from 24 organisations in 18 European countries attended the March workshop. The September event handled 32 trainees from 22 organisations in 14 different countries. Don Stikvoort (S-CURE) and JP Velders (University of Amsterdam) were trainers at both events. In September they were joined by Wilfried Wöber (ACOnet-CERT) and David Pybus (Diageo), while in March Serge Droz (SWITCH-CERT) and Miroslaw Maj (CERT POLSKA) gave training. The latter led a role-play exercise that was developed by CERT POLSKA as part of a package of materials for ENISA (European Network and Information Security Agency): this was the first time that role-play was included in TERENA’s CSIRT training.

In October, 15 experienced CSIRT members were invited to the TERENA offices to participate in a trial run of the proposed advanced TRANSITS-II training course, intended to take experienced CSIRT operatives deeper into key topics. Peter Haag and Adrian Leuenberger (SWITCH-CERT) presented materials on forensics and on network flow analysis, developed by SWITCH. Miroslaw Maj (now with the Cybersecurity Foundation) and Przemek Jaroszewski (CERT POLSKA) presented exercises such as ‘fire drills’ that were created as part of the package for ENISA. And Don Stikvoort presented a ‘soft skills’ module on communication techniques to assist relationships between technical staff and their management colleagues. Participants compared existing and proposed course materials and evaluated which parts are best suited to the basic and the advanced workshops. In December, plans for future workshops were discussed and it was agreed that the first TRANSITS-II workshop would take place in April 2011.

Non-TERENA training workshops

TERENA regularly gives permission to experienced members of the CSIRT community to use the TRANSITS-I course materials for training events. FIRST (Forum of Incident Response and Security Teams), the global association of CSIRTs, organised training workshops in Seoul, Korea in September and in Lima, Peru in October. The EUMEDCONNECT project ran a workshop in Madrid in February. NTT-CERT used the TRANSITS-I materials for training days in Tokyo in February and December. The Information Security Group of Africa brought European trainers to Johannesburg, South Africa for a workshop in March. The materials were also used in a course on security at St. Pölten University of Applied Sciences in Austria in the first half of the 2010-2011 academic year. Several TERENA member organisations organised TRANSITS training workshops for their constituencies: UNINETT in Trondheim in April, FCCN in Lisbon in May, and SURFnet in Utrecht in May and November.

www.terena.org/csirt-training
www.terena.org/activities/csirt-training/transits-ii/courses/pilot

COURSE MATERIALS

Since 2002, TERENA has been organising training workshops for members of Computer Security Incident Response Teams. Course materials were originally developed as part of the TRANSITS (Training of Network Security Incident Teams Staff) project, which ended in 2005, and are maintained by volunteers from the CSIRT community, coordinated by Don Stikvoort of S-CURE as a subcontractor to TERENA.

TRANSITS-I is aimed at new or potential CSIRT operatives who wish to gain basic grounding in the main aspects of working in an incident response team. It covers the legal, technical, operational and organisational aspects of running a CSIRT, as well as the role of CSIRTs in dealing with vulnerabilities.

TRANSITS-II advanced training goes into more depth and is aimed at more developed CSIRTs and experienced operatives.
End-to-End Provisioning Workshop
29-30 November, hosted by CESNET in Prague, Czech Republic

Applications and services set a framework for the future

Almost thirty network engineers, end-site administrators and scientific application designers took part in lively discussions at the third and final TERENA end-to-end provisioning workshop. The fundamental challenge of the last mile should be the main focus of future discussions, they concluded. They discussed the future of the community that has built up around this workshop series, and explored key applications for emerging user communities.

Speakers from CESNET and Masaryk University talked about the needs of emerging user communities, such as ultra-high performance digital media applications for cinema post-production, real-time high-quality video conferencing and multi-channel streaming for teaching medicine, and virtual laboratories for high-performance computing and data sharing. These applications require high-capacity, low-latency and low-jitter end-to-end connection services from one application end to the other. Major networking challenges relate to the service architecture, including the need for standardised protocols and interfaces, on-demand tools, management solutions for accurate troubleshooting, as well as clear service provider roles and responsibilities.

Non-technical issues were further explored in a presentation from Trinity College Dublin, showing how emerging end-to-end connection service demands triggered changes in security and access policies, and how the process of change had to be managed on campus and at other end-sites.

Sharing knowledge
Updates were given about GN3 tools and service architectures, including the Bandwidth on Demand service based on AutoBAHN and perfSONAR, and about Internet2’s ION service based on OSCARS/DRAGON and perfSONAR. The Mantychore and DYNES projects reported achievements in provisioning virtual IP and dynamic network systems for end sites.

During the event, SURFnet called for collaboration on dynamic lightpath services and a presentation from the United States promoted international collaboration opportunities in the framework of ACE (America Connects to Europe) and TransPAC3, which connects Asia and the United States.

The future of TERENA’s end-to-end activities
Participants agreed that the community that has formed around the end-to-end workshops should be maintained to tackle the fundamental challenge of the last mile. They concluded that instead of broad, informational workshops it would be more productive to organise Birds of a Feather (BoF) meetings at major events in order to consult with various communities. Plans for 2011 included BoFs at the GLIF meeting in February, at the TERENA Networking Conference in May, and at the NORDUnet conference in June. The results will help to determine how TERENA should support the end-to-end community in future.

www.terena.org/e2e/ws3

WORKSHOP HISTORY

A series of TERENA end-to-end provisioning workshops brought together key players from NRENs, metropolitan, campus and local networking organisations, and others with expertise and experience in establishing real end-to-end connection services for universities and research laboratories in Europe.

The first workshop, in December 2008, focused on establishing lightpaths and discussed the technical feasibility of end-to-end connection services, especially the last mile challenge. The second workshop, in December 2009, considered the provisioning of end-to-end services, taking into account all network domains from campuses to the core and discussing all the service provisioning and potential business aspects. The 2010 workshop was the last in this series.
Network Performing Arts Production Workshop
22–24 November, hosted by IRCAM in Paris, France

Advancing the artistic application of networks

Following a successful workshop on performing arts production in 2009, this second event continued TERENA’s activities addressing the arts and humanities communities.

The workshop blended a special combination of topics relating to the networking aspects and the artistic production of performing arts using advanced research networks. With IRCAM, the hosting organisation, being a centre specialising in acoustic and musical research, coverage of state-of-the-art in sound, sound research and music were particularly strong features, but the following were also included:

- overview of the network performing arts scene;
- presentation of useful concepts for network performance;
- hands-on sessions of established and emerging technologies such as DVTS, JackTrip, ConferenceXP, EchoDamp and LOLA;
- audio and lighting for best results in video-conferencing;
- live networked master class;
- networking technical presentations;
- performances and discussions of works by Bernhard Lang (composer), Christine Gaigg (choreographer) and Andrea Cera (composer).

The core goal of these workshops is to create a community that can benefit from exchanging experiences in this pioneering field, and to start building collaboration within Europe. The success of these events shows that large communities exist with very specific user requirements and that serving them is worthwhile and presents an opportunity to raise awareness of TERENA community activities and of the opportunities to NRENs in providing services.

http://npapw-2010.ircam.fr/wordpress

ABOUT PERFORMING ARTS WORKSHOPS

The second performing arts production workshop was a collaborative effort between TERENA, Internet2, RENATER and GARR, with major contributions to the programme by the host, IRCAM. The event was supported by the European Commission’s EACEA (Education, Audiovisual and Culture Executive Agency) Project Culture 2007-2013.
GN3 Events

In 2010, TERENA and DANTE continued a close cooperative effort to develop and organise training workshops and other events as part of the GN3 project. Overall training coordination was done by DANTE. Course tutors came from various TERENA member organisations. The TERENA Secretariat handled logistical functions such as registration and production of materials.

For some events, TERENA provided only online registration and supporting information: webinars on how to use the GN3 intranet (various dates) and for I-SHARE (Information Sharing across Heterogeneous Administrative Regions) end user training (10 November); and workshops on secure code training (22-23 June) and on ITIL (Information Technology Infrastructure Library) (20-22 July), both hosted by PSNC in Poznan, Poland.

GN3 Project Symposium

24-26 November, Vienna, Austria

TERENA provided online and on-site registration and logistical support for the second symposium of the GN3 project, which attracted more than 230 invited participants for a plenary session and parallel sessions on individual project tasks and activities or cross-activity coordination.

The event provided an opportunity to review the project’s progress and to explore the potential of cross-activity collaboration to meet the challenges ahead. For the TERENA Secretariat staff who participated as project task or activity leaders, it proved a useful opportunity to meet colleagues and collaborators from other parts of the project and from participating organisations.

In recognition of the 10-year anniversary of pan-European networks under the GÉANT brand name, a large cake was cut to mark the occasion.

www.terena.org/training

PERT Training

18-19 November, hosted by SWITCH in Zürich, Switzerland

Following earlier courses in 2007-2008, seventeen network engineers trained in Performance Enhancement and Response Team (PERT) skills in 2010.

This hands-on workshop equipped participants to operate a national or local PERT within the eduPERT structure of federated PERTs. The course covered the technical aspects of PERT work and advised participants about software tools for diagnosing performance issues. It provided a short overview of network performance fundamentals and TCP (Transmission Control Protocol), including recent developments. The course culminated in an interactive case study that allowed participants to consolidate and extend their knowledge by studying a real PERT case.

www.terena.org/training
IPR Workshop
23 June, Amsterdam, Netherlands

TERENA provided online registration and local logistical support for a one-day workshop of GN3 project partner representatives to discuss Intellectual Property Rights (IPR) issues related to the project.

Because of the large size of the GN3 project, it took time and effort to design an IPR policy. An inventory of the rights on software that was imported into the project resulted in a very long list. These rights and the conditions attached to use of the software were discussed at the workshop, as well as the principles for making software resulting from the project available for use by project participants and others.

Multidomain Services Workshop
24-25 June, Amsterdam, Netherlands

TERENA provided online registration and local logistical support for a two-day workshop for 30 invited participants, who discussed various aspects of the GN3 project’s multidomain services.

Presentations covered the project’s service and management architectures, a survey of monitoring and connectivity services, and proposals for new services. The workshop also looked into the involvement of NRENs in security, operations, and authentication and authorisation infrastructures, as well as in driving developments in multidomain services.
Memberships and Liaisons

ENPG and European Commission

ENPG meeting in 2010
28 January, hosted by the Higher Education Authority in Dublin, Ireland

Planned ENPG activities merge into e-InfraNet project

ENPG wound down in the first half of 2010, and its intended activities were integrated in the new e-InfraNet project. Contacts between TERENA and the European Commission (EC) were intensified.

In 2009, ENPG members had developed a revised strategy determining the group’s mission, outlining achievements to be made in the next 3-5 years and defining key activities. In parallel, members had contributed to the preparation of a proposal for an ERA-NET project in the European Union’s Seventh Framework Programme to establish a more stable, effective and sustainable framework for realising, among others, the goals set out by the strategy. As a result, a three-year project called e-InfraNet was launched on 1 January 2010, and had its first meeting back-to-back with the final ENPG meeting.

In spring, ENPG and e-InfraNet agreed to merge ENPG’s strategic goals and e-InfraNet’s objectives and to integrate ENPG’s intended activities in the e-InfraNet project. A document detailing how and why this merger was carried out was published on the ENPG website.

During 2010, TERENA intensified its contacts with the EC unit that deals with research networking and e-infrastructures. EC representatives attended both TERENA General Assembly meetings. On 31 August, TERENA’s president and secretary general visited the unit in Brussels. Talks focused on future support to research networking from the European Union: the Commission would establish a group of independent experts to study the grounds for further European Union involvement in this area during the remainder of the lifetime of the Seventh Framework Programme and in the future Eighth Framework Programme. The small TERENA-led GN3 project foresight study that would start in April 2011 would contribute to these policy preparations.

www.enpg.org
http://e-infranet.eu

WHAT WAS ENPG?

The European Networking Policy Group (ENPG) was created in 1995 to succeed the COSINE Policy Group (1985-1993) and the EuroCAIRN Representatives Group (1993-1995). It brought together representatives of national ministries and government agencies in Europe with responsibility for policy towards, and funding of, research and education networking. TERENA had the status of permanent observer in the group and was also subcontracted to host the ENPG website and mailing lists.

Memberships and Liaisons
Collaboration continues

The sister organisations TERENA and DANTE collaborate intensively. In 2010 this was most apparent in the GN3 project, where each of the organisations is responsible for a number of activities and tasks.

TERENA’s president and secretary general are members of the Executive Committee of the GN3 project. The latter is also an observer in the DANTE Board of Directors. Two TERENA Secretariat staff members are activity leaders and met frequently in the GN3 Project Management Team, in which many DANTE staff members also participated. Other TERENA and DANTE staff worked together in a number of project tasks, most notably to promote services and to organise events.

Both organisations were also partners in the FEDERICA project.

www.dante.net

WHAT IS DANTE?

DANTE (Delivery of Advanced Network Technology to Europe Ltd.) is a limited-liability company and a not-for-profit organisation, based in Cambridge, England. Its mission is to plan, build and operate pan-European networks for research and education. The company was established in 1993 and has played a pivotal role in six consecutive generations of the backbone network that interconnects national research networks in Europe. The current network is called GÉANT and is co-funded by the European Union through the GN3 project. Many national research and education networking organisations in Europe are shareholders of DANTE. Since 2007, plans had been made to transform DANTE into a company limited by guarantee; in 2010 these plans were abandoned and instead it was proposed to create a company limited by guarantee that would become the single shareholder of DANTE Ltd.
CCIRN

The Co-ordinating Committee for Intercontinental Research Networking (CCIRN) was created in 1987, making it the oldest forum in the global research and education networking community. CCIRN meetings are attended by representatives of national and regional research and education networking organisations who are nominated by their continental research networking bodies. The European deputation is appointed by the TERENA Executive Committee.

Intercontinental Collaboration

CCIRN meetings in 2010
12 February, hosted by APAN in Sydney, Australia
12 October, hosted by CERN in Geneva, Switzerland

Clouds and policy integration hot topics

Two exciting topics raised in the annual CCIRN meeting prompted the organisation of an extra meeting in 2010. This was the first time since 1991 that CCIRN held more than one meeting in a calendar year.

The annual CCIRN meeting was co-located with the 29th APAN meeting in Australia. A large part was devoted to developments in research networking in different continents. The afternoon discussion session focused on two topics: the integration of policies for research networking, supercomputing, Grids and storage into a single e-infrastructure policy, and the impact of commercial cloud services on the research and education networking community. These topics were of high interest and conveyed a sense of urgency, triggering a decision to hold an additional meeting later in the year.

The second meeting was organised by TERENA and was held back-to-back with the Annual Global LambdaGrid Workshop. Presentations were given on e-infrastructure policy convergence and on collaboration between NRENs and commercial cloud service providers. It became clear that thinking on both topics was further advanced in Europe than in other continents. Another subject that attracted attention was news about a very large investment by the United States government, through its Broadband Technology Opportunities Program, to connect so-called community anchor institutions, including public libraries, schools, community colleges, research parks, and public safety and healthcare institutions, with advanced broadband capabilities.

In 2010, TERENA Secretariat staff attended the Internet2 Member Meetings and one of the semi-annual APAN Meetings, for which TERENA provides a member of the programme committee. Conversely, there was increasing participation from other continents in TERENA’s own conference and other activities including REFEDS and TF-CPR.

www.ccirn.org
Internet Society

Growing collaboration in middleware

In addition to TERENA’s traditional support of the Internet Society, collaboration between the organisations has been growing in the middleware area.

TERENA was a founding member of the Internet Society and has remained supportive, especially because of the society’s role in the area of standards, which TERENA considers to be its main purpose.

In recent years, collaboration between TERENA and the Internet Society has been growing in the area of middleware. Having sponsored a EuroCAMP workshop in 2009, the Internet Society was very supportive of REFEDS activities and became the largest REFEDS sponsor at the end of 2010.

www.isoc.org

WHAT IS THE INTERNET SOCIETY?

The Internet Society was founded in 1992 as a non-profit organisation to provide leadership in Internet related standards, education and policy. It ensures the open development, evolution and use of the Internet for the benefit of people around the world. The society has more than 100 organisational members and more than 40,000 individual members in over 90 chapters around the world. It is the organisational home for groups responsible for Internet standards, including the Internet Engineering Task Force and the Internet Architecture Board.
The balance sheet, statement of income and expenditure, and summary cash flow statement for TERENA for the year 2010 that are presented below are extracted from the draft accounts of the association. A full understanding of the association’s financial position and results can be obtained only from the final version of the annual accounts as adopted by the General Assembly in its meeting of 19-20 May 2011 and the accompanying auditor’s report. These documents are available from the TERENA Secretariat upon request. All figures are in euro.

### Balance sheet as at 31 December 2010

<table>
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<tr>
<th>Assets</th>
<th>31 December 2010</th>
<th>31 December 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed Assets</strong></td>
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<td><strong>Tangible Fixed Assets</strong></td>
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<td>Other fixed assets</td>
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<tr>
<td></td>
<td>3,839,262</td>
<td>3,886,365</td>
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## Liabilities

### 31 December 2010

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<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
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<tr>
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<td><strong>1,438,734</strong></td>
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### 31 December 2009

<table>
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<td><strong>1,357,930</strong></td>
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<td><strong>Current Liabilities</strong></td>
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## Statement of income and Expenditure 2010

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<th></th>
<th>Budget 2010</th>
<th>2010</th>
<th>2009</th>
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</thead>
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<td>Bad debts written off</td>
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<td>Financial expenses</td>
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<td>Project results from earlier years</td>
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<td><strong>Total Expenditure</strong></td>
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<td>General reserves</td>
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Cash Flow Statement

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<th></th>
<th>2010</th>
<th>2009</th>
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</thead>
<tbody>
<tr>
<td><strong>NET RESULT</strong></td>
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<td>Depreciation charges</td>
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<td>Investments in tangible assets</td>
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<td>(Increase)/Decrease in accounts receivable</td>
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<tr>
<td>Increase/(Decrease) in current liabilities</td>
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<tr>
<td><strong>NET CASHFLOW</strong></td>
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</table>

Cash in bank and on hand, 1 January 3,256,147 2,365,927

Cash in bank and on hand, 31 December 3,294,009 3,256,147

Membership Fees

The annual membership fees for National Members are in eight categories, depending on the gross national income of the countries that they represent. A National Member pays the unit fee multiplied by the number of units linked to its category. The membership fees for National Members in categories 1 and 2 are further differentiated according to the gross national income per capita of their countries. National Members in categories 1 and 2 from countries that are classified by the World Bank as an ‘upper-middle-income economy’ receive a reduction in the fee and in the number of votes of 20%. That reduction is 40% if their country is classified as a ‘lower-middle-income economy’ and 60% if their country is classified as a ‘low-income economy’.

International Members have 10 votes and pay the unit fee. Associate Members pay half the unit fee.

The unit fee for 2010 was set at 5,027 euro

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<tr>
<th>Category</th>
<th>Units</th>
<th>Votes</th>
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<td>0.2</td>
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<td>Moldova</td>
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<tr>
<td>1</td>
<td>0.3</td>
<td>3</td>
<td>FYRoMacedonia, Montenegro</td>
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<tr>
<td>1</td>
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<td>0.8</td>
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<td>20</td>
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<td>4</td>
<td>30</td>
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<td>5</td>
<td>6</td>
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<td>6</td>
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<td>7</td>
<td>12</td>
<td>60</td>
<td>Spain</td>
</tr>
<tr>
<td>8</td>
<td>16</td>
<td>70</td>
<td>France, Germany, Italy, United Kingdom</td>
</tr>
</tbody>
</table>
The TERENA management team: Valentin Cavalli (Chief Technical Officer), John Dyer (Business and Technology Strategist), Bert van Pinxteren (Chief Administrative Officer) and Karel Vietsch (Secretary General).

Brook Schofield, above, and Kevin Meynell, Licia Florio and Péter Szegedi, right (Project Development Officers)
Dick Visser (Senior Systems Engineer)

Christian Gijtenbeek (Senior Software Engineer)

Carrie Solomon (Communications Officer)

Jim Buddin (Workshop Organiser), Laura Durnford (Senior Communications Officer), Hanna Cherigui (Secretary) and Gyöngyi Horváth (Conference and Workshop Organiser)

Harriëtte Raaymakers (Assistant Bookkeeper until 1 August) and Wilma Overdevest (Financial Administrator)

Mirko Ampt (Assistant Bookkeeper from 1 September)

Carrie Solomon (Communications Officer)

Harman Korte (Data Analyst from 1 September to 17 December)
<table>
<thead>
<tr>
<th>Letter</th>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>A</td>
<td>AAI</td>
<td>Authentication and Authorisation Infrastructure</td>
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<tr>
<td>ALICE</td>
<td>América Latina Interconnectada Con Europa</td>
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<tr>
<td>APAN</td>
<td>Asia-Pacific Advanced Network</td>
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<tr>
<td>AutoBAHN</td>
<td>Automated Bandwidth Allocation across Heterogeneous Networks</td>
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<tr>
<td>B</td>
<td>BoF</td>
<td>Birds-of-a-Feather</td>
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<tr>
<td>C</td>
<td>CA</td>
<td>Certification Authority</td>
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<tr>
<td>CAMP</td>
<td>Campus Architecture and Middleware Planning</td>
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<tr>
<td>CCIRN</td>
<td>Co-ordinating Committee for Intercontinental Research Networking</td>
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<tr>
<td>CEENGINE</td>
<td>Central and Eastern European Networking Engine</td>
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<tr>
<td>CERN</td>
<td>European Laboratory for Particle Physics</td>
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<tr>
<td>CESCA</td>
<td>Centre de Supercomputació de Catalunya</td>
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<td>CLARA</td>
<td>Cooperación Latino Americana de Redes Avanzadas</td>
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<td>COSINE</td>
<td>Cooperation for Open Systems Interconnection Networking in Europe</td>
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<td>CSIRT</td>
<td>Computer Security Incident Response Team</td>
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<td>D</td>
<td>DANTE</td>
<td>Delivery of Advanced Network Technology to Europe</td>
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<tr>
<td>DNS</td>
<td>Domain Name System</td>
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<td>DNSSEC</td>
<td>DNS Security Extensions</td>
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<td>DRAGON</td>
<td>Dynamic Resource Allocation via GMPLS Optical Networks</td>
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<td>DYNES</td>
<td>Dynamic Network System</td>
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<td>E</td>
<td>e-InfraNet</td>
<td>European network for coordination of policies and programmes on e-infrastructures</td>
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<td>e-IRG</td>
<td>e-Infrastructure Reflection Group</td>
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<td>EAP</td>
<td>Extensible Authentication Protocol</td>
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<td>European Commission</td>
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<td>ECAM</td>
<td>European Committee for Academic Middleware</td>
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<tr>
<td>eduroam</td>
<td>Education Roaming</td>
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<td>ENISA</td>
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<td>European Networking Policy Group</td>
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<td>Telephone Number Mapping</td>
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<td>European University Information Systems</td>
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<td>EuroCAIRN</td>
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<td>European CAMP</td>
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<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>FEDERICA</td>
<td>Federated E-infrastructure Dedicated to European Researchers Innovating in Computing Network Architectures</td>
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<tr>
<td>Gb/s</td>
<td>Gigabits per second</td>
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<td>GÉANT</td>
<td>Gigabit European Academic Network Technology</td>
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<td>Global eduroam Governance Committee</td>
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<td>GEMBUS</td>
<td>GÉANT Multi-domain Bus</td>
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<td>GLIF</td>
<td>Global Lambda Integrated Facility</td>
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<td>GMPLS</td>
<td>Generalised MPLS</td>
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<td>GN2</td>
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<td>GN3</td>
<td>Multi-Gigabit European Research and Education Network and Associated Services</td>
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<td>GOLE</td>
<td>GLIF Open Lightpath Exchange</td>
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<td>HP-SEE</td>
<td>High-Performance Computing Infrastructure for South East Europe's Research Communities</td>
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<td>Information and Communication Technologies</td>
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<td>IETF</td>
<td>Internet Engineering Task Force</td>
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<td>IGTF</td>
<td>International Grid Trust Federation</td>
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<tr>
<td>ION</td>
<td>Interoperable On-demand Network</td>
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<tr>
<td>IP</td>
<td>Internet Protocol</td>
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<td>NSI</td>
<td>Network Service Interface</td>
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<td>pdf</td>
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<td>perfSONAR</td>
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<td>R</td>
<td>RADIUS</td>
<td>Remote Authentication Dial-in User Service</td>
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