TERENA Annual Report 2013

« networking the networkers »
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>3</td>
</tr>
<tr>
<td>Governance and Strategy</td>
<td>5</td>
</tr>
<tr>
<td>Outreach and Supporting Community Development</td>
<td>9</td>
</tr>
<tr>
<td>Security</td>
<td>14</td>
</tr>
<tr>
<td>Middleware, Identity, and Mobility</td>
<td>17</td>
</tr>
<tr>
<td>Real-time Communication, Media, e-Learning and Culture</td>
<td>20</td>
</tr>
<tr>
<td>Network Architecture and Operations</td>
<td>23</td>
</tr>
<tr>
<td>Storage and Clouds</td>
<td>25</td>
</tr>
<tr>
<td>Financial Statements</td>
<td>27</td>
</tr>
<tr>
<td>TERENA Staff in 2013</td>
<td>29</td>
</tr>
</tbody>
</table>
Foreword

I cannot write this foreword without recalling the sad loss of our friend and colleague Karel Vietsch, who passed away in February 2014.

Karel had dedicated his life to the development of the research and education networking community and to TERENA. Under his leadership, our organisation had grown and its position was largely consolidated within the activities of the members. The annual TNC conference, the various task forces, the community’s security-related activities, as well as operational services such as eduroam®, TCS and identity federations are part of his legacy. It behoves us now to take care to continue the development of our community and its activities with the determination and enthusiasm that characterised Karel’s career. He will be missed by all of us.

In 2013, TERENA made valuable steps in addressing the three main objectives that were described in its 2013 Activity Plan. TERENA secured a more significant role in the GÉANT project for the months and years to come. Good progress was made in maintaining and developing services, with some expanding globally, and relations were strengthened with stakeholders and sister organisations around the world. This all helps us to continue offering our members opportunities for cooperation, information sharing and innovating together.

The year 2013 was strongly influenced by the ongoing project to restructure DANTE and TERENA. Following the Reykjavik Group’s recommendations, in July the TERENA Executive Committee (TEC) and the DANTE board established ‘the Brussels Group’ - a working group in charge of making a concrete proposal to bring DANTE and TERENA under common governance or to merge them into a single new organisation.

The main expected benefits of the restructuring process are simplified governance, more efficient management and more flexible use of resources.

The first conclusion of the Brussels group was presented to the TERENA General Assembly in Geneva in October 2013, whereupon the group was asked to continue its work, to refine the proposal and to come back with a more concrete scenario. This should take into account all potential issues concerning the costs, tax implications, legal aspects and procurement policies. The follow-up to this initiative would be decided in spring 2014 during a joint meeting.
of TERENA and DANTE members - a major milestone that will heavily impact the future of our organisation.

While these events unfold, I have every confidence that the TERENA Secretariat staff, TERENA members and the wider community will continue to work together to ensure a bright future for research and education networking and the user communities whom we ultimately serve.

Pierre Bruyère
TERENA President

TERENA Secretary General Karel Vietsch (left) was honoured with a royal decoration for his outstanding contribution to research and education networking and the Internet in general. On Monday 13 May, 2013, he was appointed an Officer in the Order of Orange-Nassau, and presented with the Dutch royal insignia by the Vice-Mayor and Alderman of Leiden, Mr. Robert Strijk (right).
TERENA focused on three priorities throughout the year, based on its 2013 Activity Plan: to ensure a significant role for TERENA in the GN3plus project, to enhance TERENA services and to improve relationships with the European Union and other stakeholders. Investigations into the feasibility of integrating TERENA and DANTE were also initiated.

In spring 2013, with the closing of the GN3 project and the start of GN3plus, TERENA increased its already very substantial role in the project. Some of TERENA’s core activities continue to be co-funded by the European Union through GÉANT: production of the annual TERENA Compendium, Networking Development Support activities – now known as ‘Digital Inclusion’ – and support provided by the TERENA Secretariat to TERENA task forces, which extended to include TF-CPR for the first time.

As before, GÉANT also provides funding for a ‘distributed workshop’ at the TNC, for training workshops, the European eduroam® service and for the eduGAIN and eduPKI services in which TERENA plays significant roles.

TERENA maintains its management role in GN3plus through its leadership of the activities ‘Status and Trends’ and ‘Identity and Trust Technologies for GÉANT Services’. New tasks led by TERENA staff in GN3plus belong to the organisation of internal project events, training arrangements, and development of a ‘Testbed as a service’.

**Serving the community**

In order to enhance its way of serving NRENs and their stakeholders, approaches were made to understand the needs of various user communities as part of TERENA’s new marketing activity. Special attention was given to TERENA’s international members and other international user organisations, particularly through TERENA’s participation in the relevant activities of GN3plus.

Fruitful relations were maintained with the wider research and education community, attending e-IRG (e-Infrastructure Reflection Group) workshops and meeting with other e-Infrastructures such as EGI.eu (European Grid Infrastructure) and EUDAT (European Data Infrastructure). TERENA liaised with EUNIS (European University Information Systems Organization) with presentations given at each other’s annual conferences, about MOOCs (Massive Open Online Courses) and the TERENA OER Portal pilot.
European and global relations

Following the Eastern Partnership Event that TERENA had organised in December 2012, in February 2013, 39 stakeholders of e-Infrastructures in the six Eastern Partnership countries and in the EU signed and published a joint declaration, which was sent to relevant Members of the European Commission. The declaration recognised the importance of e-Infrastructures for research and education, and of NRENs and their international collaboration activities in supporting their development.

Further liaison led to the development of a concept note for a regional project, which was presented by Valentino Cavalli (acting Secretary General of TERENA) at a conference on the Enhancement of European International Cooperation and Eastern Partnership in R&D, held in Vilnius in September.

Throughout 2013, TERENA supported the participation of global partners in REFEDS, provided secretariat support to the GeGC (Global eduroam Governance Committee) and the GLIF (Global Lambda Integrated Facility), promoted the global take-up of the NRENum.net service and agreed a Memorandum of Understanding with FIRST (Forum of Incident Response and Security Teams) regarding the use and promotion of TRANSIT I security training materials worldwide. TERENA also collaborated with organisations around the world to develop a Common Information Model for NREN benchmarking.

TERENA continued to build on existing collaborations with counterparts in other regions. With RedCLARA, TERENA participated in the ELCIRA project, assisting Latin American partners in the deployment of eduroam® and eduGAIN. In Asia, TERENA explored collaboration opportunities with APAN (Asia-Pacific Advanced Network) and TEIN*CC (Trans-Eurasia Information Network Cooperation Center). MoUs were signed with both organisations in January 2014.

TERENA staff members participated in the incipient Global PR Network initiated by DANTE, in the APAN and the Internet2 programme committees, and in the Kantara Board of Trustees. In return, the TNC2013 programme committee included representatives from Internet2, DANTE, AARnet and CERN as well as European NRENs, and the Internet Society, which co-sponsored the conference’s student contest as well as investing substantially in REFEDS.

Stakeholder community satisfaction

The annual stakeholder satisfaction survey was completed by members’ representatives in the GA and the results were published in September. Respondents were positive about TERENA. 

TERENA governance

TERENA (Trans-European Research and Education Networking Association) is legally established in the Netherlands. Its highest governing body is the General Assembly (GA), in which representatives of TERENA member organisations meet twice a year. The GA elects members to the TERENA Executive Committee (TEC), which manages and administers the organisation. Day-to-day operations are carried out by the Secretariat, based in Amsterdam. An essential element of TERENA work is the Technical Programme. This is coordinated and supervised by the TERENA Technical Committee (TTC), a group of experienced and knowledgeable networking professionals, who are appointed by the TEC. Each year, senior technical managers nominated by member organisations meet in the Technical Advisory Council (TAC) to advise on the direction of the Technical Programme. The TAC meets at the TNC.

General Assembly meetings

6-7 June, hosted by SURFnet, Maastricht, the Netherlands
21-22 October, hosted by SWITCH, Geneva, Switzerland

TTC members

David Groep, Esther Robles, Peter Schober (from 25 September), Yannis Mitsos (from 25 September), Vicente Goyanes, Josh Howlett (until 8 July), Jan Meijer (until 8 July), Karel Vietsch (ex-officio), Valentino Cavalli (ex-officio), Michael Nowlan (secretary, ex-officio)

TTC meetings

28 February, 20 June (video conference), 19 September, at the TERENA Secretariat in Amsterdam, the Netherlands

TAC meeting

3 June, Maastricht, the Netherlands
activities: task forces, training and other events were deemed relevant or highly relevant and their quality remained ‘above average’ to ‘excellent’. Several ideas for new initiatives were suggested and the feedback is being used to improve TERENA activities in 2014 and beyond.

**TERENA welcomes new members**

ANA, the Academic Network of Albania was admitted as a new national member, effective from 1 January 2013. ECI Telecom GmbH was admitted as a new associate member of TERENA, effective from receipt of the membership fee for the first year. Google had applied for membership earlier and having met all requirements, was also accepted as an associate member.

**Investigations into aligning TERENA and DANTE**

Discussions about the governance of research and education networking in Europe intensified in 2013. Mandated by the General Assembly (GA), the Reykjavik Group recommended that TERENA and DANTE jointly propose a solution for restructuring the organisation of collaborative European research and education networking.

The Brussels Group was tasked to prepare a detailed proposal. With assistance from EY (formerly Ernst & Young) they started a due diligence investigation on restructuring DANTE and TERENA. This work continues into 2014.
TERENA Membership in 2013
(as at 31 December)

www.terena.org/about/terena-members-map.html
Outreach and Supporting Community Development

TERENA’s continuous efforts to facilitate the development of member organisations and the wider research and education networking community are reflected in its outreach activities. In 2013, TERENA supported the community in sharing knowledge, disseminating information and organising events.

Bringing the community together: TNC2013

One of TERENA’s main outreach activities is to organise the annual TERENA Networking Conference (TNC). With around 660 participants engaging in sessions, side meetings and informal ‘birds of a feather’ (BoF) discussions, TNC2013 broke all previous records for attendance and had the highest ‘excellent’ rating in participant feedback. Under the theme ‘Innovating Together’, participants met with sponsors at exhibition booths, presented posters, demonstrated ideas and connected with their peers. New this year were OpenSpace sessions, with topics proposed and selected during the course of the conference.

About 130 speakers from all over the world presented their work and ideas. Keynote speakers were from Microsoft Research Connections EMEA (UK), Telefónica Digital Barcelona R&D Lab (Spain), Internet2 (USA), ISOC (UK), NETNOD (Sweden) and SUNET (Sweden). Live streaming of the sessions was supported by NORDUnet and SURFnet and was viewed by hundreds of remote participants from numerous countries: archived streams are available online, along with twenty-seven posters. Twelve papers were selected for publication as conference proceedings.

The TERENA booth was opened to NRENs to show off their innovations. CARNet used the opportunity to present its prize-winning Schools 2.0 project, SURFnet to highlight the ‘Enlighten Your Research’ global competition, and GARR to promote the LoLa technology. PSNC’s PlatonTV team also took this opportunity, as well as recording video interviews and daily impressions of the conference.
TNC2013 was hosted by SURFnet, which celebrated its 25th anniversary during the conference gala evening with a spectacular fireworks show. Cisco Systems and ISOC provided sponsorship for student participation for the fifth and second consecutive year respectively, with the ten selected students’ lodgings paid by SURFnet. Other sponsorship was provided by F5, RIPE NCC, Comodo, Microsoft Research, ADVA Optical Networking, EURid, Green Qloud, Vidyo Inc., Juniper Networks, Tata Communications, Ciena Corporation, ECI Telecom, Cyan, City of Maastricht, European Commission, Janet, GARR, ArtEZ Institute of the Arts, and Hanze University of Applied Sciences.

Recognising community contributions

For the second year, TNC was the place where TERENA publicly thanked a member of the community for his contributions to research and education networking. Milan Sova (CESNET) was posthumously honoured with a speech noting his professional commitment and personal qualities. Information about this and the 2012 award were published on a new page created in the TERENA website.

Practical support for community events

TERENA’s strengths in organising and supporting events and training were consolidated in new roles in the GÉANT project from April 2013. Registration, logistics and training support were provided for a number of GÉANT events throughout the year. The kick-off meeting in May gave activity and task leaders insights into the new structure and functioning of the project. Two ‘leading high performing virtual teams’ training sessions in October equipped activity and task leaders to get the best from their geographically-distributed colleagues in achieving the project’s goals. And the annual GÉANT Symposium in Vienna involved an even greater input than before, with TERENA taking charge of organising the programme for the first time. A one-day session highlighted the TERENA task forces and the many ways they interact with GÉANT project activities.

Registration and some logistical support was provided for a tutorial session on OpenFlow testbed operations. TERENA also provided online registration for two eduPERT events, PerfSONAR training, a ‘School for Developers’ event and for a product lifecycle management, launch and training event.

Community information online

The TERENA website supports the dissemination of valuable community information. In 2013, the online calendar listed around 200 events. PeaR Community News published nearly 230 articles, of which 73 percent was posted by NRENs, projects and other organisations in the wider research and education networking community. Contributions were made to other organisations’ publications, like EGI newsletters, e! Science News and Connect magazines.
Facilitating community communication and services

TERENA has a long-standing commitment to the support of community outreach activities. In Autumn 2013, the Task Force on Communications and Public Relations (TF-CPR) celebrated its tenth anniversary as it renewed its terms of reference for another two years. Hot topics throughout the year included how to integrate marketing and communications, strategies for social media use, and getting the best out of measuring and monitoring tools. The task force also brainstormed on ways to reach researchers when wanting feedback or promoting events and services, and presented lightning updates on activities within their own organisations.

Preceding TNC2013, the TF-CPR meeting included a joint meeting with the new Global PR Network and joint preparation for a BoF about the purpose and activities of the Global PR Network. Laura Durnford (TERENA Secretariat) was a member of the panel invited to lead the discussion. Liaison between the two groups was formalised as a new work item in TF-CPR’s revised terms of reference. Other new focuses are the sharing of video materials and the development of best practice documents relating to marketing and communications.

TF-MSP, the Task Force on Management of Service Portfolios continued its successful work, offering an important forum for NRENs to exchange information on the business aspects of their services and the ways in which they are organised.

Topics discussed at TF-MSP meetings vary depending on community interests. During 2013, TF-MSP participants discussed pricing of services and apportionment of costs, the important roles NRENs can play in brokering of Cloud Services, approaches to improve the security-preparedness of NRENs’ connected institutions, the integration of Wi-Fi and future mobile technologies.

Early in the year, TF-MSP had met with participants in TF-CPR in a TERENA Workshop on CRM (customer relationship management) Systems. Many NRENs had adopted the open-source SugarCRM solution. The nearly forty participants from about twenty-five organisations agreed to coordinate a continuous effort to develop and share modules of CRM software. Since then, the Community Platform, run by Janet (UK), has been used to provide a space where follow up collaboration takes place.

Supporting community developments

TERENA’s annual gathering of information about NRENs’ organisational, technological and economic developments resulted in the December publication of the TERENA Compendium of National Research and Education Networks in Europe. For the first time, the collection of data

TF-CPR celebrated its tenth anniversary during the September meeting in Rome, Italy.

TF-CPR
Chair: Gitte Julin Kudsk (DeIC)
Co-chairs: Virginie Blanquart (RENATER), Maria Ristkok (EENet)

Meetings
4-6 February, hosted by SURFnet in Utrecht, the Netherlands
19 April, VC on social media strategies
2 June, Maastricht, the Netherlands
24-26 September, hosted by GARR in Rome, Italy

TF-MSP
Chair: Walter van Dijk (SURFnet)
Co-chairs: Alberto Pérez Gómez (RedIRIS), Koen Schelkens (Belnet), Martin Bech (DeIC)

Meetings
7-8 February, hosted by SURFnet in Utrecht, the Netherlands
6-7 May, hosted by RedIRIS in Alcalá de Henares, Spain
10-11 September, hosted by UNINETT in Trondheim, Norway
was achieved through a Common NREN Information Model survey, which was the result of a
global collaborative effort with APAN, ASREN, CANARIE, RedCLARA, UbuntuNet and WACREN.
During 2013, work began to overhaul the Compendium online interface and database, which
continues into 2014.

TERENA’s work in support of research and education networking organisations and activities
in less advanced regions of Europe and the Mediterranean was financially supported by the
GN3 project until March 2013. From April onwards, GN3plus provided a suitable framework
for continuing that work. For the first time, several NRENs in Eastern Europe and the south
Caucasus became part of the project and most of TERENA’s development-support effort was
devoted to NRENs in those countries. TERENA followed up on policy events organised in
previous years in the region and worked in raising awareness among various stakeholders on
the importance of e-infrastructures in the region, as well as preparing the ground for a potential
regional project in the future.

In the Mediterranean region, collaboration between TERENA and ASREN (Arab States Research
and Education Network) brought federated identity infrastructure training to Amman, Jordan.
The three-day event was funded by the EUMEDCONNECT3 project and attracted twenty people
from nine countries. The hands-on, practical training enabled staff on campuses and from
NRENs to set up federated identity infrastructure in their own environment and to pass that
knowledge on to their broader constituencies in their own language.

TERENA guest speakers

TERENA maintains community contacts and presents its own activities at external research and
education networking events.

John Dyer gave an overview of TERENA activities at the e-IRG delegates meeting and spoke
about the ASPIRE project and the future of NRENs at the EENet 20th anniversary conference and
at e-AGE 2013.

At the 3rd Learning Analytics & Knowledge Conference, Peter Szegedi showcased TF-
Media work and, with Ilias Hatzakis (GRNET), presented the OER pilot portal. He also addressed
NRENum.net issues at the Internet2 Annual Meeting and, at the SUCRE Workshop, discussed
open-source clouds in the public sector.
Licia Florio discussed advancing federated technologies for different communities at the March FIM4R meeting and attributes management in federated AAI at the EGI Towards Horizon 2020 workshop.

Brook Schofield gave presentations about eduGAIN at the EGI Community Forum during the LITNET conference, and at a meeting of the DARIAH project. At TICAL 2013 he presented ‘ELCIRA and eduGAIN: practical aspects of interfederation for academic collaboration’. At the 10th e-Infrastructure Concertation Meeting he spoke about ELCIRA using eduroam to bootstrap interest in Identity Federation.

**Links**

Homepage TNC2013 – https://tnc2013.terena.org
Schedule TNC 2013 – https://tnc2013.terena.org/core/poster/list
TNC2013 schedule – https://tnc2013.terena.org/core/schedule/list
TNC2013 poster – https://tnc2013.terena.org/core/poster/list
Winner TNC2013 poster contest (download) – http://www.terena.org/about/people/awards/dolnicar.html

TERENA events – www.terena.org/events
TERENA publications page – www.terena.org/publications/
TERENA activities – http://www.terena.org/activities/

TERENA TF-CPR – www.terena.org/tf-cpr
TERENA TF-MSP – www.terena.org/tf-msp

Global Lambda Integrated Facility homepage – www.glif.is/
Connect magazines – http://www.GEANT.net/MediaCentreEvents/CONNECT/Pages/Archived_Issues.aspx
Security

Large-scale Internet traffic monitoring hit the headlines in 2013 as it was revealed that our daily activities online are being monitored in ways not previously imagined. In such an environment, it is increasingly important for NRENs to strengthen their position as world leaders in privacy and security. Throughout 2013, TERENA continued to invest in its services and activities supporting these areas.

2013 saw the Task Force on Computer Security Incident Response Teams (TF-CSIRT) continue to grow, using the cornerstone of trust to build its community. A new working group on Network Security Monitoring was established, joining the already successful RTIR (Request Tracker for Incident Response) as a regular working group within the TF-CSIRT framework.

Across the three meetings held by the task force in 2013, participants discussed and debated a wide range of topics concerning vulnerabilities, incidents, tools and all other issues that affect the operation of incident response and security teams. They also debated the role of the Chief Information Security Officer (CISO) within NRENs and strategies for increasing the importance given to this role.

Responding to a request by the TERENA Advisory Committee, the CISO group reconvened as a side session at the September TF-CSIRT meeting. It was pointed out that NRENs generally show little awareness and commitment to the concept of security and that this awareness should be increased, especially at the management level. It was agreed to validate the CISO profile and role with an aim to report results to the TERENA General Assembly in May 2014.

Increasing worldwide take-up of security training

A special meeting took place during TF-CSIRT in 2013, with an event focused on training security experts to become TRANSITS trainers. During the year, the legal module of the TRANSITS I course was revised and updated.

In 2013, two TRANSITS I and one TRANSITS II security training workshops were organised by TERENA in Europe. In addition, TERENA licensed nine experienced members of the wider CSIRT community to use the TRANSITS course materials in other workshops.

TF-CSIRT Steering Committee
Lionel Ferette, ENISA (chair)
Nicole Harris, TERENA (secretary) (ex-officio)
Erika Stockinger, CERT-SE
Wilfried Woeber, ACOnet-CERT
Jacques Schuurman, XS4ALL
Baiba Kaskina, CERT.LV (from September 2013)
Przemek Jaroszewski (until September 2013)

Meetings
28-30 January, hosted by FCCN, Lisbon, Portugal
23-24 May, hosted by Agency ARNIEC/RoEduNet, Bucharest, Romania
26-27 September, hosted by BT, London, United Kingdom
In July, TERENA and the Forum of Incident Response and Security Teams (FIRST) signed a Memorandum of Understanding (MoU) regarding the use and promotion of TRANSITS I materials for licensed events worldwide. The MoU lasts until December 2015, with the intention to renew it based on periodic reviews.

**Trusted Introducer providing world-class service**

Besides TRANSITS trainings, TF-CSIRT continues to oversee the Trusted Introducer (TI) service, with planning towards a TI re-procurement in 2014. The service, which is outsourced to PRESECURE GmbH, provides listing, accreditation, and certification of CSIRTS. TERENA has offered this service to the security community in Europe for over twelve years and continues to see a demand to expand the service to include international teams from as far afield as the Caribbean.

2013 saw a redesign of the TI website, providing an easier-to-use interface for users wishing to search and review the 207 listed teams – including 37 added in 2013.

**Security certification grows**

Twenty-nine countries participated in the TERENA Certificate Service (TCS) in 2013. Almost 50,000 server certificates were issued in 2013, whereas 2012 saw around 33,500 given out, up from 28,000 in 2011. Also the number of e-Science personal certificates issued more than doubled.

Around the end of the year, TERENA started preparing a public procurement in order to be able to continue the service, as the current contract between TERENA and Comodo CA Ltd. expires in 2015 and, for legal reasons, cannot be extended. The procurement process is expected to lead to a contract between TERENA and a preferred supplier by mid-2014, enabling an overlap period in service provision.

**Trusted certificate store providing support**

The TERENA Secretariat maintains TACAR® (TERENA Academic Certification Authority Repository), the online repository of trust anchor certificates, related certificate policies and certificate practice statements registered by Certification Authorities (CAs). TACAR provides excellent value to the International Grid Trust Federation (IGTF) communities, which rely on digital certificates to authenticate their users.

---

**TRANSITS I & II CSIRT trainings**
- 21-22 March, sponsored by ENISA, co-organised by TERENA, Prague, Czech Republic
- 8-10 April, hosted by CESCA , co-organised by TERENA, sponsored by ENISA and Dell SonicWall, Barcelona, Spain
- 28-29 November, sponsored by ENISA, co-organised by TERENA, Prague, Czech Republic

**Licensed workshops TRANSITS-I**
- SURFnet workshop - 23-24 April 2013, Utrecht, The Netherlands, 11 participants
- NCA Workshop - 10 June 2013, Tokyo, Japan, 29 Participants
- CSIRT.SK Military workshop - 12 June 2013, Trencin, Slovakia, 16 Participants
- DANTE NOC Offices - 1-4 July 2013, Cambridge, UK, 9 Participants
- krCERT/CC workshop - July 2013, Seoul, Korea, 20 Participants
- SURFnet workshop - 9-10 October 2013, Utrecht, The Netherlands
- FIRST workshop at the Energy Symposium - 29 October 2013, Washington DC, USA
- FIRST workshop (AfriNIC) - November 2013, Cote d’Ivoire
- NCA Workshop - 19 November 2013, Tokyo, Japan

**Licensed workshops TRANSITS-II**
- SURFnet workshop - 2-4 October 2013, Utrecht, The Netherlands

**What to get from TRANSITS-I**

TRANSITS I courses are aimed at personnel from Computer Security Incident Response Teams (CSIRTs) who wish to gain a good grounding in the main aspects of working in an incident handling and response team. They cover basic incident handling and response techniques, operational practices, as well as organisational and legal issues. Trainees also get a unique opportunity to mix with their peers and discuss security issues in a secure and trusted environment, while being tutored by leading members of the CSIRT community.
TACAR supports GN3plus project services by including the eduPKI-CA, which issues certificates that comply with the service trust profiles. TERENA successfully led the eduPKI (European Public Key Infrastructure) service within the GN3 project until the end of March 2013.

*TACAR® is a registered trademark of TERENA.*

**Links**
- TF-CSIRT – www.terena.org/tf-csirt
- TF-CSIRT Trusted Introducer – www.trusted-introducer.org
- CSIRT trainings – www.terena.org/csirt-training
- TERENA Certificate Service (TCS) – www.terena.org/tcs
- TERENA Academic Certification: Authority Repository – www.tacar.org
Middleware, Identity, and Mobility

The development and deployment of mobile technologies and the use of network middleware to support interoperable roaming services have become key activities among NRENs as well as research and education institutions. In 2013, TERENA continued its activities to broaden the deployment of middleware and federated identity technology and standards globally. A prime example of this is the continued growth and development of eduroam®, one of the success stories of TERENA.

REFEDS makes strong progress

REFEDS (Research and Education Federations) focuses on highlighting existing standards, engaging with user groups and improving policies and processes in maturing identity federations.

Completing work begun in 2012, a REFEDS working group published an online ‘Discovery Guide’ that demonstrates best practices in managing the login experience for users. This defines standard practices for the use and presentation of logos and error messages and helps service providers understand the business model for improving the user experience. This guide is now being used by organisations such as publishing houses.

In response to researchers’ needs, REFEDS promoted Entity Categories and a Code of Conduct for service providers, both aiming to increase the confidence of identity providers such as universities to release user information to third parties.

REFEDS also developed Federation Operator Best Practice guidelines to help interested organisations understand how research and education federations operate. These guidelines were discussed in detail at the second annual Virtual Organisation Architectural Middleware Planning (VAMP) workshop, which was co-organised by TERENA.

The work to develop services for the community continued. The REEP service that started as a pilot in 2012 was launched in the summer. REEP provides a secure metadata repository, look-up service and a web interface that allows service providers and identity providers to register, store, and easily retrieve each other’s metadata.
Middleware, Identity, and Mobility

A new version of the Metadata Explorer Tool (MET) was also released, providing an effective way for users to gather usage and management data in thirty federations worldwide.

**Task forces re-charter**

TERENA’s two middleware task forces, the Task Force on European Middleware Coordination and Collaboration (TF-EMC2) and the Task Force on Mobility and Network Middleware (TF-MNM), renewed their terms of reference in June. Cross task force coordination throughout the year continued under the European Committee for Academic Middleware (ECAM) and thanks to co-located meetings, including a day of open space discussion in October, where participants pitched ideas for discussion and development within the respective task forces. The open space approach was also tried for the first time during TNC2013, spearheaded by this community.

The new terms of reference of TF-EMC2 provide a framework for supporting the innovation lifecycle. With its new remit, the task force now focuses on identity infrastructure and application-oriented middleware.

TF-EMC2 highlighted Group Management as a ‘technology need’. The task force facilitated interactions between members of the Grouper (an Internet2 project) development community and the Joint Research Activity on Attributes and Groups (part of the GN3plus project), improving the support for these projects.

**TF-MNM sets its sights on eduroam**

TF-MNM provides a forum for input and feedback to eduroam research and service activities within the GN3plus project. Pioneered by TF-Mobility in 2002, the eduroam education roaming service has become an international success. Such success brings new challenges, and these are discussed by TF-MNM participants alongside the need to address common global eduroam operational issues as well as better solutions for implementing eduroam in commercial spaces, such as hotels and train stations. Proposals for possible solutions were made by task force participants, including a lightweight eduroam-ready access point, which would allow ‘plug-and-play’ eduroam for small meeting spaces, and an eduroam-ready certification model. These proposals will be investigated further in future TF-MNM work.

TF-MNM continuously liaises with industrial stakeholders and standardisation groups. Increasingly, the focus is on non-wifi issues, in line with the European Commission’s campaign

---

**ELCIRA**

TERENA is an active participant in the ELCIRA (Europe Latin America Collaborative e-Infrastructure for Research Activities) project. The main objectives of ELCIRA are:

1. to promote the trustworthy exchange of information between research groups in Latin America and Europe. This is done by fostering the creation of federations for authentication, authorisation and identity mechanisms.
2. to strengthen collaboration in developing and deploying cooperation services and tools capable of better integrating research communities in Europe and Latin America.
3. to establish the necessary co-ordination and agreements to move towards better integrated mobility services for researchers.
4. to actively promote the participation of Latin American researchers in European Commission Calls and other international funding agencies with high impact in the region.

---

**TF-EMC2**

Chair: Roland Hedberg (Umeå University)

**Meetings**

14 February, hosted by Fachhochschule Technikum Wien and ACONet in Vienna, Austria
15-16 October, hosted by the University of Malaga in Malaga, Spain

**TF-MNM**

Chair: Klaas Wierenga (Cisco Systems)

**Meetings**

14-15 February, hosted by Fachhochschule Technikum Wien and ACONet in Vienna, Austria
15-16 October, hosted by the University of Malaga in Malaga, Spain
on roaming charges. In the task force's new terms of reference, the group's focus was consolidated on mobility.

**eduroam and eduGAIN expanding**

TERENA provides secretariat support for the Global eduroam® Governance Committee (GeGC). The GeGC ensures interoperability between eduroam regions worldwide, and defines technological and administrative improvements for the operation of eduroam at the global level. 2013 marked the beginning of the GeGC second term with the election of a new chair and the recognition of SingAREN as the world's 60th roaming operator. In 2013, eduroam saw its deployments growing from 59 to 67 territories worldwide, with more territories expected to join in the future.

TERENA staff member, Brook Schofield leads the eduGAIN inter-federation service task in the GN3plus project. In 2013 eduGAIN made great progress towards students and researchers collaborating via online services and sharing content across many countries. The service grew from eighteen to twenty-four member federations by the end of the year, with six more federations in the process of joining. A new constitution for eduGAIN was agreed upon by participating identity federations, giving them more technical flexibility and more say in the direction of the service. The TERENA Secretariat produced a video to promote the benefits of participating in eduGAIN for service providers, identity providers and users.

*eduroam is a registered trademark of TERENA

---

**Links**

- AAA study – goo.gl/buczk
- REFEDS – www.refeds.org
- REFEDS Discovery project – https://refeds.terena.org/index.php/Discovery_Project
- eduGAIN – www.edugain.org
- VAMP – http://www.terena.org/activities/vamp/
- TF-EMC2 – www.terena.org/tf-emc2
- TF-MNM – http://www.terena.org/tf-mobility
- ECAM – www.terena.org/ecam
- eduroam – www.eduroam.org
- EduGAIN video – http://youtu.be/x1YhuFPxMz8
- IETF – www.ietf.org
- REEP Project – https://reep.refeds.org/

---

**GeGC representatives**

Europe: Paul Dekkers (SURFnet)  
Miroslav Milinović (Srce - chair until 14 March)  
Stefan Winter (RESTENA)

Latin America:  
Leandro Marcos de Oliveira Guimarães (RNP)
Alejandro Lara (REUNA - from 14 March)

North America:  
Chris Phillips (CANARIE - chair from 14 March)  
Shel Waggener (Internet2 - from 14 March)

Asia-Pacific:  
Hideaki Goto (Tohoku University)  
Neil Witheridge (AAANet)

Africa:  
Kennedy Aseda (KENET)  
Simeon Miteff (SANReN/TENET)

Non-voting expert: Klaas Wierenga (Cisco Systems)

**Meetings**

- 14 March, videoconference
- 3-6 June, face-to-face at TNC2013
- 23 August, videoconference
- 19 November, videoconference

---

**Other workshops and meetings**

- 30 September-1 October, VAMP Workshop, hosted by CSC and ELIXIR, co-organised by TERENA, Espoo, Finland
- 2-3 October, FIM4R/REFEDS meeting, hosted by CSC and ELIXIR, co-organised by TERENA, Espoo, Finland
Real-time Communication, Media, e-Learning and Culture

The TERENA research and education networking community has shown growing interest in the areas of arts, humanities, cultural heritage, real-time communications, and e-Learning over the past years. Consistent with this demand, TERENA supported several activities in these areas.

NRENNum.net expanding globally

In 2013, the global NRENNum.net end-user telephone number mapping service for academia, coordinated by TERENA, grew from nineteen to 32 delegated country codes. This service supports real-time communications by enabling NRENs, and their stakeholders, with a VoIP or VC system to locate other NRENs with such systems and call them directly across the Internet, bypassing the ordinary telephone system and thereby costing no more than the fee already being paid for the Internet connection.

Actions towards unified dialling in videoconferencing were agreed at a joint working-group meeting of NRENNum.net and the GÉANT project’s eduCONF service, hosted by TERENA. More than twenty participants discussed how ‘virtual’ numbers introduced by eduCONF could be handled by NRENNum.net. This resulted in Internet2, AARNet and NORDUnet making the existing top level DNS (Domain Name Server) architecture more reliable and robust by distributing the slave/secondary servers across the globe.

A milestone towards service maturity was marked with the development of training materials, which were put to use in a session on SIP-based video calling via NRENNum.net at TNC2013.

The wider deployment and growing use of NRENNum.net worldwide led to a community request for a firmer basis for the service operations and governance. An updated service policy was adopted and a Global NRENNum.net Governance Committee (GNGC) was established in September. The GNGC is responsible for overall NRENNum.net service definition, sustainability

New NRENNum.net members in 2013

India (ERNET), Hong Kong (HARNET), France (RENATER) also responsible for France in the Indian Ocean, Guadeloupe, French Guiana, Martinique, New Caledonia and French Polynesia, Denmark and Sweden (both represented by NORDUnet), New Zealand (REANNZ) and Romania (RoEduNet).

GNGC members

Europe - Tim Boundy (Janet), Erik Kikkenborg (NORDUnet)
Americas - Ben Fineman (Internet2), Alex Galhano Robertson (RNP)
Asia Pacific - Bill Efthimiou (AARNet), Praveen Misra (ERNET)

Meetings

18-19 March, NRENNum.net and eduCONF workshop, TERENA Secretariat offices
28 November, via videoconference
and long-term strategy. This includes formulating and recommending service governance principles and policies. The GNGC mandated a Virtual Network Expert Group to consult stakeholders, regulators and industry with the aim to recommend solutions for the virtual number delegation issue in NRENum.net by mid 2014.

Support for Arts and Humanities and performing arts over advanced networks

Research and education networks open the door to artistic performances that would normally never be possible. Thanks to high bandwidth, low-latency and jitter-free long-distance connections, they enable real-time performances involving participants in different locations.

For several years TERENA has been supporting arts and humanities and performing arts. Besides its involvement in the FP7 project DCH-RP, dedicated to Digital Cultural Heritage (see side box), TERENA, together with Internet2, and additional technical expertise provided by the University of Music and Performing Arts Vienna (mdw), GARR and CESCA, organised the fourth European Network Performing Arts Production Workshop, which was held in March, in Vienna. At this event, which was hosted by mdw and ACOnet, participants learned how to use cutting-edge distance-education technology, and explored new ways of incorporating audio and visual technology into artistic performances. They also enjoyed master class sessions, live music and dance distance-performances over research and education networks.

The opening reception at TNC2013 included a jazz concert featuring performers in Maastricht and Edinburgh, which demonstrated the effectiveness of LoLa technology in enabling performers to interact in a natural way even though thousands of kilometres apart. The performance was organised in collaboration with GARR, the Trieste Music Conservatory G. Tartini, and Janet.

Multimedia legacy for teaching and learning

With the close of 2013, the second term of TERENA’s Task Force on Applied Media in Teaching and Learning (TF-Media) came to an end. Having completed its objectives and deliverables, the task force left a legacy of multimedia activities that continue to develop with further community participation.

The primary aim of the Open Education Resource (OER) Portal, a spin-off of TF-Media, is to create a one-stop-shop linking learning object repositories, managed and/or federated by
Real-time Communication, Media, e-Learning and Culture

national learning resource providers, with global repositories. In 2013, some early prototypes were made available to the community and the task force successfully called for partners – primarily in the TERENA community – to join the OER platform development project. By the end of the year, a community Wiki ‘living document’ for OER project discussion and idea-sharing had been produced. Further steps towards a pilot service were anticipated to occur in early 2014.

The TERENA OER portal platform can help make open content available in a way that helps to realise the MOOC (Massive Open Online Course) concept, in which lessons and materials are offered online to students and non-students in a cost-effective model. As mentioned in Chapter 2, MOOCs gained interest in the European NREN community in 2013, with a presentations from EUNIS at a dedicated TNC2013 session and a discussion in the TERENA Advisory Council.

Links
TF-Media – www.terena.org/tf-media
OER Wiki page – http://goo.gl/EHrsy
European University Information Systems – www.eunis.org
A prototype version of the OER Media Portal, which highlights the possible future portal features, can be found here.

NRENum.net – http://nrenum.net

Network performing arts production workshop – www.terena.org/activities/network-arts/vienna/
Performing Arts Workshop Vienna, promo video – http://www.youtube.com/watch?v=fXKFrpXRwQY
Digital Cultural Heritage Roadmap for Preservation – www.dch-rp.eu

TF-Media
Chair: Zenon Mousmoulos (GRNET)
Meetings
2-3 April, hosted by Université Pierre et Marie Curie in Paris, France
Videoconferences
21 February, 1 March, 27 March, 14 May, 9 July
Network Architecture and Operations

For the second consecutive year, TERENA provided a forum for network architects to collaborate and share expertise in 2013. The on-going exchange of experience between network operating centres through the Task Force on Network Operating Centres (TF-NOC) also continued.

Restructuring the task force

TF-NOC renewed its terms of reference in a new ‘lightweight’ format in 2013, for a fixed period of eighteen months, as a transition step towards becoming a TERENA Special Interest Group in future. This TF-NOC restructuring removes the requirement for the task force to have work items, deliverables, and timescales, and introduces a Steering Committee instead of a Chair, along with periodical assessment and reporting of the task force activities and progress. Additionally, specialised TERENA support, tailored to the task force’s needs, may be available if requested by the Steering Committee. These changes in TF-NOC provided a basis for a new template terms of reference for Special Interest Groups - a new type of TERENA-supported community collaboration that became possible for the future after the TERENA Technical Committee approved the template towards the end of the year.

Co-location of events to maximise inspiration

TF-NOC made efforts to ensure useful co-location with other relevant events and groups in 2013. In November, the task force met back-to-back with the second TERENA Network Architects Workshop, in order to inspire experts within the TERENA community and beyond. This allowed participants to discuss the implications of novel network concepts and architectures for day-to-day operations. A key topic addressed was DDoS (Distributed Denial of Service) mitigation solutions and practices. Participants shared their experiences of the growing number of such incidents in research and education networks, and how to detect and mitigate these attacks. Internal and external NOC communications, and the potential use of social media as a secondary information channel, were also discussed. DANTE and the GÉANT Operations Centre committed to be represented at all future TF-NOC meetings.
The workshop focused on network architecture design, deployment, and operations, and provided a forum for knowledge transfer from GÉANT Service Activities and Joint Research Activities to community members who are not directly involved. Attendees heard updates on the Bandwidth on Demand production service, the new Multi-Domain Virtual Private Network service pilot, and the Testbed-as-a-Service initiative. NRENs were given the opportunity to provide updates on their network life-cycle and to share ideas that could lead to GÉANT services in future. Thirty-five participants included staff from regional networks, campuses and commercial organisations as well as NRENs and the user community, with representatives from AzScienceNet and SANReN for the first time.

**GLIF progress**

GLIF, the Global Lambda Integrated Facility, is an international consortium that promotes the paradigm of lambda networking. The 13th Annual Global Lambda Grid Workshop, held on October 2-4 in Singapore covered a wide variety of subjects, including GLIF support for network virtualisation and integration with computing and storage facilities and updates on GLIF Open Lightpath Exchanges (GOLE). Several demonstrations were held at the A*STAR Biopolis research and development centre: the High Performance Digital Media Network (HPMDnet) supporting extremely high volume data streams over the iGENI international OpenFlow testbed; a GLIF Automated GOLE pilot using the OGF Network Service Interface to set-up inter-domain lightpaths on demand; the RISE controller running an OpenFlow/SDN testbed on the JGN-X network: an intelligent OpenFlow controller implementation that can address the performance limitations due to large round-trip times of control messages inherent to intercontinental-scale OpenFlow networks.

GLIF
Kees Neggers (SURF) (chairman)
Kevin Meynell (secretary)
Peter Szegedi (TERENA) (co-ordinator)

Meetings
Technical Working Group meeting: 17-18 January, Honolulu, USA
GLIF/OGF Techs meeting: 6-7 June, hosted by TNC2013, Maastricht, the Netherlands
13th Annual Global LambdaGrid Workshop, hosted by SingAREN, Nanyang Technological University: 2-4 October, Singapore

Links
TF-NOC – www.terena.org/tf-noc
NOCs in Europe – www.terena.org/tf-noc/nocs.html
Network Architects workshops – www.terena.org/activities/netarch
GLIF – www.glif.is
13th Annual Global LambdaGrid Workshop proceedings – http://www.glif.is/meetings/2013/
Although storage and cloud services have been in the spotlight for several years, interest from the NREN community is growing. The 2012 ASPIRE report on ‘The Adoption of Cloud Services’ highlighted the need for NRENs to collaborate and become leaders in the fields of cloud brokering and cloud middleware infrastructure. One of the fora to take a lead on this has been TERENA’s storage task force, TF-Storage. Having set clear recommendations in 2013, a discounted file-based sync-&-share cloud service platform was to be made available to TERENA members in early 2014.

Trusted Cloud Drive delivers

Providing a trusted, open source platform for a personal data storage service that NRENs can offer their academic and research communities was the original goal of the TERENA Trusted Cloud Drive (TCD) pilot project, which was initiated by TF-Storage in 2012. Following recommendations from the final TCD pilot project report published in May, TCD 2.0 was developed: a lightweight privacy-protecting middleware component that can be installed at the back-end of personal data-storage applications chosen by users. By separating content from metadata, and storing metadata in a trusted place while content is encrypted and stored securely in the cloud, encrypted content cannot be accessed without the data owner being involved. This model addressed legal concerns highlighted by the US-EU Safe Harbor Framework, the USA Patriot Act, and the European Commission Directive on fighting cybercrime and protecting privacy in the cloud. The TCD pilot results would also help the GÉANT Cloud Services team in planning live services.

To ensure close interaction with TF-Storage in the future, TERENA will continue to maintain and develop the TCD platform in consultation with the task force.

ownCloud framework agreement

In parallel with this work, TF-Storage participants looked for an open-source file-based sync-&-share platform on the market that would meet the TCD pilot recommendations. This led to a framework agreement with ownCloud, which was signed by TERENA in December, and offers its cloud service platform at a greatly discounted price to the broader TERENA community.

FileSender growing

FileSender is a web-based application that allows authenticated users to securely and easily send large files to other users. It was originally inspired in TF-Storage discussions and used the task force as a forum for building a funder, developer and user community. FileSender is an initiative of AARNet, HEAnet, SURFnet and UNINETT, which provide sustained funding, staff and resources.

User authentication is provided through SimpleSAMLphp, supporting SAML2, LDAP, RADIUS and more. Users without an account can be sent an upload voucher by an authenticated user.

In December 2013, a production version 1.6beta1 was released. During the year, nine organisations, including NRENS, government bodies and universities installed FileSender for production or testing purposes.
Storage and Clouds

community. At the end 2013, six organisations were making use of the agreement, whilst more than a dozen had expressed interest. Investigation of how ownCloud and TCD2.0 could work together and potentially be integrated will be carried out in early 2014.

<table>
<thead>
<tr>
<th>Links</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASPIRE (activity finished on 31 March, 2013) – <a href="http://www.terena.org/aspire/">www.terena.org/aspire/</a></td>
</tr>
<tr>
<td>TF-Storage – <a href="http://www.terena.org/tf-storage">www.terena.org/tf-storage</a></td>
</tr>
<tr>
<td>Filesender – <a href="http://www.filesender.org">www.filesender.org</a></td>
</tr>
</tbody>
</table>

TF-Storage

Co-Chairs: Maciej Brzeźniak (PSNC) and Peter Stefan (NIIF)

Meetings

5-6 March, hosted by Cisco Systems GmbH in Berlin, Germany
18-19 September, hosted by Belnet in Brussels, Belgium
## Financial Statements

### Balance Sheet as of 31 December 2013 (in €)

(After appropriation of the result)

<table>
<thead>
<tr>
<th></th>
<th>31 December 2013</th>
<th>31 December 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fixed Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tangible Fixed Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office upgrade</td>
<td>52,640</td>
<td>23,679</td>
</tr>
<tr>
<td>Computer equipment</td>
<td>3,906</td>
<td>11,708</td>
</tr>
<tr>
<td>Other fixed assets</td>
<td>30,570</td>
<td>28,429</td>
</tr>
<tr>
<td><strong>Total Fixed Assets</strong></td>
<td>87,116</td>
<td>63,816</td>
</tr>
<tr>
<td><strong>Current Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts Receivable</td>
<td>1,291,500</td>
<td>891,319</td>
</tr>
<tr>
<td>Cash at Bank and on hand</td>
<td>2,591,858</td>
<td>2,503,450</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td>3,970,474</td>
<td>3,458,585</td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Reserves</td>
<td>1,690,146</td>
<td>1,599,409</td>
</tr>
<tr>
<td><strong>Current Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creditors</td>
<td>73,932</td>
<td>42,105</td>
</tr>
<tr>
<td>Taxes and social premiums</td>
<td>66,046</td>
<td>64,798</td>
</tr>
<tr>
<td>Deferred income TERENA projects</td>
<td>827,687</td>
<td>427,848</td>
</tr>
<tr>
<td>Pre-issued invoices</td>
<td>1,118,484</td>
<td>1,082,063</td>
</tr>
<tr>
<td>Other payables and deferred income</td>
<td>194,179</td>
<td>242,362</td>
</tr>
<tr>
<td><strong>Total Current Liabilities</strong></td>
<td>2,280,328</td>
<td>1,859,176</td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td>3,970,474</td>
<td>3,458,585</td>
</tr>
</tbody>
</table>
## Statement of Income and Expenditure, 2013 (in €)

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>Budget 2013</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Membership fees</td>
<td>1,084,575</td>
<td>1,078,000</td>
<td>1,066,604</td>
</tr>
<tr>
<td>Earmarked contributions</td>
<td>2,090,567</td>
<td>1,889,000</td>
<td>2,109,567</td>
</tr>
<tr>
<td>Interest</td>
<td>32,655</td>
<td>60,000</td>
<td>52,680</td>
</tr>
<tr>
<td>Late payment charges</td>
<td>6,294</td>
<td>0</td>
<td>3,193</td>
</tr>
<tr>
<td>Project results from earlier years</td>
<td>14,536</td>
<td>0</td>
<td>-4,960</td>
</tr>
<tr>
<td>Prepayments TERENA projects</td>
<td>84,683</td>
<td>-5,000</td>
<td>-7,587</td>
</tr>
<tr>
<td>Other income</td>
<td>7,593</td>
<td>1,000</td>
<td>5,964</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td>3,320,903</td>
<td>3,023,000</td>
<td>3,225,461</td>
</tr>
</tbody>
</table>

|                     |            |             |            |
| **Expenditure**     |            |             |            |
| Personnel costs     | 1,680,769  | 1,802,000   | 1,650,694  |
| Other administrative costs | 340,928 | 389,000     | 329,267    |
| Travel/meetings     | 398,122    | 274,000     | 351,611    |
| Minor projects funding | 9,963   | 50,000      | 30,602     |
| Membership subscriptions | 3,964   | 4,000       | 4,072      |
| Contracted services | 775,231    | 599,000     | 742,626    |
| Financial expenses  | 20,933     | 22,000      | 26,138     |
| Bad debts written off | 256     | 0           | 0          |
| **Total Expenditure** | 3,230,166 | 3,140,000   | 3,135,010  |

| **Result**          | 90,737     | -117,000    | 90,452     |

<table>
<thead>
<tr>
<th><strong>Destination of the result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>General reserves</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
TERENA Staff in 2013

1. Nadia Sluer, Project Management Assistant
2. Magda Haver, Project Management Assistant
3. Gyöngyi Horváth, Conference and Workshop Organiser
4. Valentino Cavalli, Acting Secretary General
5. Hanna Cherigui, Secretary
6. Laura Durnford, Senior Communications Officer
7. Brook Schafield, Project Development Officer
8. Karim Mostafi, Communications Officer (since 1 December 2013)
9. Jim Buddin, Workshop Organiser
10. Michael Nowlan, Chief Technical Officer
11. John Dyer, Business and Technology Strategist
12. Peter Szegedi, Project Development Officer
13. Bert van Pinxteren, Chief Administrative Officer
14. Mirko Ampt, Assistant Bookkeeper
15. Dick Visser, Senior System Engineer
16. Licia Florio, Project Development Officer
17. Christian Gijtenbeek, Senior Software Engineer
18. Nicole Harris, Project Development Officer (since 1 March 2013)
19. Wilma Overdevest, Financial Administrator
20. Mohamed Dahhouch, IT Support Engineer (since 1 March 2013)
21. Cora Van den Bossche, Communications Officer (until 30 November 2013)
22. Alper Topçuoğlu, Data Analyst (15 May - 14 October)
For further information please contact:

TERENA Secretariat
Singel 468 D
1017 AW Amsterdam
The Netherlands
t. +31 20 530 44 88
f. +31 20 530 44 99
secretariat@terena.org
www.terena.org

Contributions
TERENA Secretariat staff and task force chairs

Writing and Production
Karim Mostafi

Graphic Design
Morel Studio

Photographs
TERENA Secretariat and NREN staff

Staff group photograph
ASA Foto & Video

© TERENA 2014