

27.10.06

Deliverable DN6.0.1,2: Annual Report on Task Force Activities - Year 2



Deliverable DN6.0.1,2

Contractual Date:	31/10/2006
Actual Date:	27/10/06
Contract Number:	511082
Instrument type:	Integrated Infrastructure Initiative (I3)
Activity:	NA6
Work Item:	N/A
Nature of Deliverable:	R (Report)
Dissemination Level	PU (Public)
Lead Partner	TERENA
Document Code	GN2-06-254v2

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Abstract

In the second year of the GN2 project, there were five TERENA technical task forces covering the following topics: Middleware, Security, Mobility, Lower Layer Technologies and Voice/Video Collaboration. This document explains the relationship between the individual TERENA task forces, the JRAs and SAs, reports on the status of the work and discusses plans for the future.

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0 Executive Summary

The GN2 Networking Activity 6 (NA6) provides support for the work of the TERENA technical task forces with the aim to help catalyse the co-ordination and the pooling of resources and technical knowledge among GN2 participants as well as with other groups that are active in the technical development work that is directly relevant to research and education networking. This includes coordinating collaboration and information exchange between the GN2 Joint Research Activities and the TERENA technical task forces. This report summarises the activities and achievements of the second year of the GN2 project.

TF-CSIRT is the TERENA task force where members of Computer Security Incident Response Teams (CSIRTs) collaborate, exchange information and experiences, and develop a cohesive environment of trust. In the reporting period, TF-CSIRT worked among others on a clearinghouse for incident handling tools, the upgrading of the RTIR tool, a Vulnerability and Exploit Description Exchange Format, and assistance to the establishment of new CSIRTs. TF-CSIRT has been collaborating with JRA2, providing the GN2 project participants with advice on specific topics, information on the evolution of network security and incident handling as well as recommendations for work in the subsequent years of JRA2.

The GN2 JRA5 activity on roaming and authorisation collaborates tightly with two TERENA task forces: TF-EMC2, the task force on European Middleware Coordination and Collaboration and TF-Mobility. JRA5 and these task forces have been holding back-to-back meetings during the reporting period and frequently exchanged information and feedback via the relevant email distribution lists.

TF-EMC2 has regular intercontinental participation, which enriches the GN2 RTD developments with the perspectives and developments from North America, Australia, Asia and the global Grid community. The most relevant achievements of TF-EMC2 are AA-RR (the Authentication and Authorisation Requester-Responder), TACAR (the TERENA Academic CA Repository) and SCHAC, (the Directory Schema Harmonisation). TF-EMC2 has been active in promoting advances in campus middleware issues through EuroCAMP workshops.

The collaboration between TF-Mobility and GN2 JRA5 focuses strongly on authorisation and roaming for the mobile user. TF-Mobility focuses on the exploration of new technologies not covered by JRA5. Important TF-Mobility successes include the operation and expansion of the eduroam® pilot. Work in this area has included the integration of commercial offerings such as iPass, the development of access point directory services and the development of generic eduroam clients and tools for monitoring and control. The task force participants have been assisting the work of JRA5 in rolling out a high quality roaming service for GN2 users.

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The TERENA task force TF-NGN (Next Generation Networks) has a long tradition of working with the pan-European interconnect networks on the evaluation and development of new lower layer technologies needed to support innovative networks. Topics studied by TF-NGN include improvements to multicasts services, implementation of IPv6 on campuses, network monitoring and new technologies that will be essential for implementing future intelligent networks. In the reporting period TF-NGN has been interacting specifically with JRA1, JRA3, JRA4 and SA3.

The TERENA task force TF-VVC (Voice and Video Collaboration) has been working on guidance on providing voice, video and data collaboration services; new architectures for Content Delivery Infrastructures; IP based telephony; a Global Dialling Scheme; improvements to user interfaces and the development of monitoring techniques. In the reporting period task force members have discussed plans for the creation of a GN2 pan-European H.323 videoconferencing service. The proposal did not receive enough support, but a feasibility study for such a service will be pursued in the following period possibly as part of a new TERENA task force.

In conclusion, TERENA task forces provide a unique resource with leading experts from the global networking community collaborating in open fora. The GN2 NA6 activity provides support for GÉANT2 to benefit from this collaboration, drawing on the knowledge of the TERENA task force participants, many of whom are not contractually part of the GN2 project.

1 Introduction

Technical experts from NRENs and other organisations all over Europe and, to some extent, other continents participate in TERENA task forces, where they develop, evaluate, test, integrate and promote new networking, middleware and application technologies. This deliverable reports on the second year of the GN2 Networking Activity NA6: Coordination of RTD activities, which supports the collaboration of these experts in task forces for the exchange of information, co-ordination of activities and preparation for new joint activities.

The main objective of the NA6 activity is to support the co-ordination and the pooling of resources and technical knowledge among GN2 participants as well as with other groups of experts contributing to technical development work that is directly relevant to research and education networking, with the aim of fostering a culture of co-operation between them.

Mutual feedback between task forces and GN2 RTD activities is also provided by this activity. The progress of GN2 RTD activities is being reported regularly at task force meetings, whose participants provide advice and feedback on such developments. Ideas and RTD originating in the task forces can lead to joint work that will be taken up in GN2 JRAs. In the past year this has actually been the case for DAME, (Deploying Authorisation Mechanisms for Federated Services in the eduroam¹ Architecture; see section 3 below for more details), which has become part of the GN2 JRA5 plan for year 3. Some results are also expected to be incorporated at a later stage in GN2 SAs. Other, longer-term development, testing and integration work will be mostly relevant for the development of the research and education networking infrastructure and services after the lifetime of GN2. This transfer model from NA6 to JRAs and eventually SAs is an essential element of the overall GN2 structure.

The relationship and interaction between task forces and GN2 RTD activities described in section 1.1 of deliverable DN6.0.1 (document GN2-05-226) is still applicable and is not repeated in this report.

TERENA task forces are created and dissolved by the TERENA Technical Committee (TTC) according to the Terms of Reference of the TERENA Technical Programme. The mandates of all technical task forces mentioned in this report were either started or extended by the TTC in the first three months after the start of the GN2 project in September 2004. They were all due to be renewed or terminated in the course of 2006.

¹ eduroam® is a registered trade mark of the Trans-European Research and Education Networking Association - TERENA

Each task force has a chairperson (in the case of TF-Mobility there are 2 co-chairs), who co-ordinates the work. Each task force meets 3-4 times a year. Most of the work is conducted through discussions on dedicated mailing lists. All information about the task force activities is available on the TERENA website.

In the reporting period the TERENA Project Development Officers Licia Florio, Baiba Kaškina (until 31 January 2006), Kevin Meynell (until 30 March 2006) and Cătălin Meiroșu (from 1 April 2006) have been providing secretariat support to the activities of the task forces and to the organisation of the meeting logistics. Only this specific work is funded by the GN2 project.

In the following chapters, this deliverable reports on the progress of each technical task force from 1 September 2005 until 31 August 2006, focussing on the achievements that are most relevant to the work of the GN2 RTD activities.

The task forces on middleware and mobility (TF-EMC2 and TF-Mobility) focus on actual collaboration in specific areas and have people involved in some specific common tasks, whereas the task forces on security, lower-layers technologies and voice-video collaboration are mostly fora for exchange of information about developments which are mostly carried out separately by the various participating organisations. This fact is reflected in the different approach used in this document to report about the task-force activities in the relevant period. The description of TF-EMC2 and TF-Mobility focuses on the technical aspects of the common work and highlights the work most relevant to GN2 activities, whereas TF-CSIRT, TF-NGN and TF-VVC are mostly described by giving a traditional overview. Administrative information about all task forces, including objectives, chair-persons, list of activities and meetings, is provided separately in Appendix A.

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2 TF-EMC2

The task force on European Middleware Co-ordination and Collaboration (TF-EMC2²) was established in September 2004 with a two-year mandate. A two-year extension of the TF-EMC2 charter was proposed to the TERENA Technical Committee in the summer 2006; the new charter was approved in September 2006. A detailed description of the constituency, as well as work items covered by the initial mandate of TF-EMC2, are included in Appendix A.

TF-EMC2 focuses on the adoption of common standards to ease the interoperability of different middleware components used in the various research and education networks in Europe. TF-EMC2 also looks at authentication, authorisation and directories as elements of what is identified as middleware. One of the most important added values of the task force is to provide an international forum where discussion about state-of-the art technologies can take place. The task-force meetings offer an opportunity for people coming from different communities (such as Grids, Internet2, European NRENs, the industrial sector) to meet and discuss the ongoing developments in the field of middleware.

Over the last years, TF-EMC2 has grown a lot; TF-EMC2 has established very close liaison with ongoing Grids activities, bringing the NRENs and the Grids communities close to each other and providing the two worlds with an opportunity to exchange information about the technologies in use.

TF-EMC2 is a well-established TERENA activity, which attracts interest and participation by the international academic community, as well as by the larger community involved in e-government AA-related activities and other not-for-profit middleware activities worldwide.

The sections below report on the TF-EMC2 work items where most progress has been made during the reporting period.

SCHAC

² <http://www.terena.nl/activities/tf-emc2/>

SCHAC³, which stands for SCHEMA HARmonisation Committee, is a dedicated working group that operates since February 2005 within TF-EMC2 with the aim of defining and promoting common schemas for inter-institutional data exchange in higher education.

For computational purposes information is stored as schemas; each schema is a collection of attributes definitions, where the attributes describe the characteristics of the object that the schema is meant to represent. SCHAC was established to address the need of agreeing on common definitions among the various schemas used by various institutions when these institutions need to exchange information with each other. Interoperability between different software and/or different federations translates in fact into schema and attributes exchange. In different contexts (in other words, schemas used in different countries) the same attributes can mean different things, not to mention that different regulations deal with privacy issues related to attributes in different ways.

The first release of "SCHAC Individual Attributes Specification" v.1.0.0 was issued in May 2006. This release defines a set of attributes to describe individuals in the academic and research institutions and contains also an appropriate LDAP profile in appendix. With such a release SCHAC has definitely reached a level of maturity that makes its usage attractive.

FUNET, the NREN of Finland, announced in June 2006 the new version (v2) of the "funetEduPerson" schema, which includes selected attributes from SCHAC. RedIRIS, the Spanish NREN, is recommending the adoption of the SCHAC schema to its constituency as part of its "iris-*" schema set.

SCHAC aims to provide support for international research activities, such as the work on authentication and authorisation being carried out in the GN2 project, eduroam, development of federations and the Bologna process.

Server Certificate Service – SCS

Although many NRENs have set up a Certification Authority (CA) they have not been able to issue server certificates, due to the well known 'pop-up' problem that occurs using server certificates issued by a CA whose root is not listed among those recognised as trusted by web browsers. The increased awareness of security mechanisms to protect sensitive on-line resources and the foreseen demand for server certificates for AAI middleware services, Grid applications and federations, have led some of the participants in TF-EMC2 to explore ways to provide the academic community with 'pop-up free' server certificates at lower costs than what is available on the market.

After a preliminary cost analysis of the available options, a number of organisations have joined forces to contract via TERENA a commercial CA to issue server certificates to these organisations and their constituency. A call for tender was issued in August 2005 to ask commercial CAs to submit a proposal to offer 'pop-up free' server certificates available to the participating NRENs at a much lower cost per certificate through combined buying power. A committee of experts from the participating NRENs was appointed to review the proposals received and in December 2005 GlobalSign NV/SA of Leuven (Belgium) was appointed as selected supplier.

³ <http://www.terena.nl/activities/tf-emc2/schac.html>

The contract between TERENA and GlobalSign was signed in early 2006 and will run for an initial year, with the possibility to renew it for a longer period.

The service is known as SCS, Server Certificate Service⁴. SCS makes the cost per certificate very low when large numbers of certificates are issued; this enables a large-scale use of SSL certificates in the research and academic community. The NRENs initially involved were AConet, CARNet, CESNET, RENATER, RedIRIS, SWITCH, SURFnet and UNI•C. New NRENs will join the service after the reporting period. TERENA has been working during the summer 2006 on preparing an extension of the contract with GlobalSign.

The SCS service has been noted especially for addressing an important topic, that of service certificates, and for defining a new business model. Consequently it has attracted a lot of interest in the academic community in Europe and beyond.

REFEDS

The necessity to share resources between different administrative domains (such as different departments inside the same faculty, different universities, or even different countries) and the need to reduce the number of username and password that users are requested to remember and store, has led to the creation of identity federations. Within these federations, individual entities agree to allow access to each others' resources and adopt compatible technology to enable this.

A federation makes it possible for end-users to access information from another entity (which is also part of the federation) without the necessity of requesting new credentials from this entity. The benefit of this is a reduced number of credentials that users are requested to manage. In addition, different federations can make agreements to share resources among them (in arrangements known as confederations), but the functionality of the required trust models and how to manage the increased complexity are still open questions.

Federations build upon two elements: technologies to allow for authentication and authorisation, and policies to be agreed by the parties involved in the federations. To ease the interoperability, federations are recommended to use a 'common language'; today the preferred choice seems to be SAML, the Security Assertion Markup Language developed by OASIS (the not-for-profit consortium that drives the development, convergence and adoption of e-business standards). SAML is a vendor-neutral, XML-based framework for exchanging security-related information, called "assertions," between business partners over the Internet.

The number of federations keeps increasing and building federations appears to be the way forward. There are various examples of federations in the academic community in Europe and beyond. Roughly they can be grouped into three main categories:

- Federations to access on-line (mostly web-based) resources. Examples of these federations in Europe are: the Finnish federation HAKA and the Swiss federation SWITCH-AAI, both based on customised implementations of Shibboleth authentication and authorisation technologies; the Spanish federation PAPI; the Norwegian federation FEIDE; the Dutch federation A-Select. All the federations mentioned above are SAML-standard based or compatible.

⁴ <http://www.terena.nl/activities/tf-emc2/scs.html>

- Federations to access the network. The most successful example of this is eduroam, the pan-European educational roaming infrastructure to provide wireless access to visited institutions. Eduroam allows users visiting another institution connected to eduroam to log on to the WLAN using the same credentials the user would use if she/he were at her/his home institution. Eduroam is evolving today into a confederation, where each individual federation is run at national level by the local NREN or a similar organisation.
- Federations to support Grid applications. The best example of this is represented by the International Grid Trust Federation (IGTF), the body to establish common policies and guidelines between its regional and continental Policy Management Authorities (PMAs).

REFEDS⁵ (Research and Education Federations) is a dedicated working group created by some of the most active people within TF-EMC2 to define technical specifications as well as policy guidelines to allow for interoperability of federations. REFEDS explores ways to allow users from one federation to become part of another federation or to use resources belonging to different federations.

REFEDS is one of the examples of how TF-EMC2 gathers knowledgeable people to co-operate and solve common problems.

AA-RR

The Authentication and Authorisation Requester-Responder (AA-RR⁶) is a tool developed by RedIRIS to verify the interoperability of AA components. Whenever a new component is developed and has to be integrated in a given infrastructure, or two different infrastructures need to be interconnected, there should be some assessment mechanisms in place to verify the compatibility of the new element into a system. The main purpose of the AA-RR is the use of metadata to describe the requirements of a certain infrastructure in order to validate (or make at least an assessment of) the interoperability of a new component.

It is assumed that AA interactions consist of queries for data and/or authorisation decisions and responses to these queries. Each query contains either the set of attributes to be retrieved, or a set of attribute/value pairs to be verified against the existing components. Responses to an attribute query contain attribute/value pairs or data relative to authorisation. Queries and responses may make use of mechanisms to establish trust between components, such as X.509 certificates and shared keys. The actual aspect of these interactions depends, obviously, on the protocol binding to be applied.

The first release of the AA-RR software was available at the beginning of 2005 but since then further development took place. The latest AA-RR version (version 1.1) supports different protocols, such as SAML and RADIUS, as well as the Spanish SSO system PAPI. The AA-RR design offers an open framework for easily incorporating support for new protocols (such as A-Select and RADIUS).

The availability of AA-RR will translate into:

⁵ <http://www.terena.nl/activities/refeds/>

⁶ <http://www.rediris.es/app/aarr/>

- Easier interoperability efforts: it is easier not to use operational infrastructure for testing purposes;
- A coherent collection of profile data, applicable not only to different pieces of software but to entire infrastructures;
- Simpler (con-)federation mechanisms, because requirements on syntax and semantics can be published and shared in a normalised way.

HelloSAML project

HelloSAML⁷ is the first public service for AAI interoperability offered by means of AA-RR. It is intended as an open test site on the Internet in which it is possible to test various SAML exchanges. The service has been conceived to be simple to use and to provide testing for basic capabilities, in order to allow initial testing of SAML usage. The name of the service, derived from the “Hello, world” message used in the first-in-all program used for any programming language example, is based on this simple concept.

The HelloSAML website offers a web interface for user registration (about 100 users are registered so far) and for initiating AA-RR instances able to send queries for authentication, authorisation or attributes exchange.

⁷ <http://hellosaml.rediris.es/>

3 TF-Mobility

The task force on Mobility (TF-Mobility⁸), established in 2002, focuses on exploring new roaming technologies as well as security issues that may affect roaming services. The third mandate of the task force expired in September 2006. A detailed description of the constituency, as well as work items covered by that mandate is included in Appendix A. New terms of reference were approved by the TERENA Technical Committee in September 2006. Under the new charter the task force will run for another two years.

TF-Mobility provides an international forum for discussing mobility related issues with other communities that have a potential interest in using mobility technologies, like the Grids community and American and Asia-Pacific research and academic networks. Most of the TF-Mobility activity is carried out over the mailing list, which is a very active discussion forum and plays an important role in the exchange of ideas and experiences related to testing new technologies and equipment.

Over the last year, TF-Mobility work has focused mainly on testing new mobility devices (i.e. access points), on exploring new technologies in the mobility field and on supporting and ease deployment of eduroam, the European roaming network infrastructure for research and education. In addition, by making available the experience gained over the years in setting-up eduroam, TF-Mobility has provided valuable support and an on-line forum to help new institutions and NRENs to join eduroam.

A very tight bond between TF-EMC2 and TF-Mobility has also been established over the last two years, which has led to a very synergic interaction in what relates to authentication and authorisation technologies between the two groups. As results of this interaction and co-operative effort, initiatives like DAME (which aims at the integration of the eduroam infrastructure and the Authentication and Authorisation Infrastructures - AAls - operated by the NRENs) have been born and got to a mature enough stage to become part of the GN2 project. In fact, DAME has been selected as a component of the GN2 JRA5 SSO and is indeed an example of the important role played by TERENA task forces in fostering new ideas and projects and feeding them into GN2.

TF-Mobility, like TF-EMC2, also provides a dissemination forum for the results of the Joint Research Activity on Roaming and Authorisation (JRA5) in the GN2 project to be discussed with international counterparts in America and Asia-Pacific. In this respect TF-Mobility has made significant progress concerning support for eduroam deployment, liaison with other eduroam federations world-wide and WLAN monitoring.

⁸ <http://www.terena.nl/activities/tf-mobility/>

Support for eduroam deployment

Part of this work consists of the maintenance of the eduroam website⁹, making sure that the content is constantly up-to-date. The eduroam website provides the first level of information to learn about eduroam, eduroam members and the essential information to join eduroam.

With the aim to promote eduroam deployment, the TF-Mobility group has made ad-hoc tools available to the community to support the installation and configuration of all necessary elements to run eduroam and to help end-users to solve problems when roaming between institutions. An example of this activity is the web-based open software known as *eduroam-in-a-box*¹⁰ developed by ARNES, the Slovenian NREN, to ease the configuration of eduroam especially in the case of small institutions with a limited number of technical staff.

Once eduroam is up and running, users can still experience problems connecting to eduroam when they visit other institutions. This is due to the multiplicity of SSIDs and encryption ciphers in use. Even when the newly agreed policy states that 'eduroam' is the SSID to use, in practice legacy problems make the change to uniform SSIDs slower than planned. TF-Mobility has therefore investigated how to develop an intelligent user client that makes the process to connect to eduroam at visited institutions transparent to the users. Unfortunately the client has not been finalised yet, due to the limited resources available.

Liaison with other eduroam Federations world-wide

Eduroam is evolving into a federation of federations: almost all countries in Europe have established a national eduroam federation, in which the NREN (or equivalent entity) runs the national top-level RADIUS server and where each institution that intends to join eduroam signs an agreement with the relevant NREN. This allows users to roam within their own country.

Each eduroam federation defines and rules (at the national level) the way institutions and research centres can join eduroam in that particular country. Typically, the national policy takes into account the agreements already in place between the NREN and its constituency as well as some specific privacy regulation.

The major benefit of eduroam is to allow eduroam-enabled users to roam not only in their own countries but also internationally; this is becoming increasingly relevant in Europe. For this purpose the national federations are part of regional federations, which are called also confederations: to date the regional confederations are the European eduroam confederation and the Asia-Pacific eduroam confederation (the latter is still in the process of being built).

JRA5 has been exchanging information with TF-Mobility over the last year in its definition of a framework policy defining eduroam joining conditions and regulations at the European level. The policy is expected to be in place by the end of 2006.

The growth of eduroam has brought on board non-European countries such as Australia and Taiwan; some preliminary tests to join eduroam have also been performed by some American universities. The Grid

⁹ <http://www.eduroam.org>

¹⁰ <http://eduroam.sourceforge.net/>

community has expressed a lot of interest in using eduroam and some studies are ongoing to verify the possibility of using the Grid collaborative environment (managed by Virtual Organisations) to provide user authentication. If this makes eduroam very attractive and of course successful, it opens other problems related to the way the trust is built among the various parties and how the policy model should work. TF-Mobility is working closely with Asia-Pacific, American and Grid communities in order to build a model that could allow different eduroam federations (or to be more precise: confederations) to peer with each other. The field is very new, so a lot still needs to be done, but international co-operation is crucial to implement a model that will work for everybody.

WLAN Monitoring

The WLAN monitoring task¹¹ comprises two activities. The first activity is to provide information on the availability status of national top-level RADIUS servers, by sending regular requests to ensure the physical connections to/from the servers and the servers themselves. The second activity focuses on the monitoring of the RADIUS authentication, both in a specific time interval and between paths (end-to-end). Work on this task has progressed in the reporting period and many countries have set up a RADIUS weather-map.

¹¹ <http://www.terena.nl/activities/tf-mobility/monitoring.html>

4 TF-CSIRT

The task force on Collaboration of Security Incident Response Teams (TF-CSIRT¹²) provides a forum for collaboration between CSIRTs from NRENs, universities, government bodies and industry. The mandate of the task force was renewed from the 15th of May 2006 for another two years. A detailed description of the constituency, as well as work items covered by TF-CSIRT, is included in Appendix A.

The task force met three times during the reporting interval, on 15-16 September 2005, 23-24 January and 25-26 May 2006. A half-day seminar on issues related to computer security was organised on one of the two days of each of the meetings. The TF-CSIRT meeting in January 2006 was co-located with a FIRST Technical Colloquium. The minutes of the TF-CSIRT meetings are available on the TF-CSIRT website. On average, the meetings of TF-CSIRT were attended by more than 55 people.

The close collaboration between TF-CSIRT and the GN2 JRA2 activity continued throughout the reporting period. Meetings of the JRA2 team were held back to back with TF-CSIRT meetings. TF-CSIRT participants were regularly updated on the latest development of JRA2 via reports presented by the JRA2 activity leader. In the context of the liaison service provided by JRA2 to other activities within the GN2 framework, a request by JRA1 to help with analysing the security aspects of a distributed monitoring system was handled by an ad-hoc voluntary group of TF-CSIRT members. The report, co-ordinated by the JRA2 activity leader, proposed a solution that, if adopted, would significantly reduce the security issues with the original design. The report was written between May and July 2006.

Updates on the activities of other fora in the computer security area such as FIRST, APCERT and E-CoAT were regularly presented at TF-CSIRT meetings. A special relationship was developed between TF-CSIRT and ENISA. Some TF-CSIRT participants are members of the Permanent Stakeholders Group that advises the Executive Director of the agency on general issues.

The TRANSITS project that developed and organised training courses for CSIRT staff members ended during the first month of the reporting interval. A memorandum of understanding was signed between TERENA and FIRST, in which it was agreed that the FIRST Secretariat would take over the function of editor-in-chief and maintain a repository of the TRANSITS course materials. Also, TERENA and FIRST will jointly organise training workshops in Europe, while FIRST will organise the workshops in the other regions of the world. Two workshops were organised in Europe during the reporting period, in November 2005 and March 2006. TERENA

¹² <http://www.terena.nl/activities/tf-csirt/>

was successful in obtaining sponsorships from ISPA and ENISA for these workshops, which allowed reducing the fees for the participants. Experienced experts from the TF-CSIRT community volunteered to teach at the courses. Another workshop is scheduled for November/December 2006.

A contract was signed by TERENA, acting on behalf of participants of the Request Tracker for Incident Response (RTIR) working group within TF-CSIRT, and Best Practical, the software company that develops the RTIR software. Within the framework of this contract, Best Practical will develop and integrate into RTIR a set of features as specified by the working group. The contract started on 6 October 2005. A first milestone was reached in April 2006, in accordance with the contractual schedule. The software was accepted after a second round of testing.

Grids are becoming widespread in the academic and research environments, as scientists diversify the topics and increase the number of problems that could be solved in such distributed computational environments. The very structure of Grids, based on virtual organisations encompassing physical infrastructures belonging to multiple organisations, poses a new set of challenges to security teams. TF-CSIRT members acknowledged this set of potential security issues by introducing a new activity in the Terms of Reference document that governs the activity of the task force from mid-May 2006. It was decided that TF-CSIRT will take a pro-active approach and work with developers of Grid applications and middleware to encourage the adoption of good security practices. The key areas to be addressed would be Grid incident response and vulnerability management.

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5 TF-NGN

The task force on Next-Generation Networking (TF-NGN¹³) is aimed at investigating the suitability of advanced networking technologies to be deployed at the lower layers in research and education networks. The reporting period covers almost entirely the last year of the mandate of TF-NGN, which has expired at the end of October 2006. A detailed description of the constituency, as well as the work items covered by TF-NGN, is included in Appendix A.

The task force met three times during the reporting interval, in November 2005, in January and July 2006. The first two meetings were co-located with meetings of the GN2 project. The average number of attendees for these three meetings was 33 people. The minutes of the meetings are available on the TF-NGN website.

Most of the technical areas covered by the terms of reference of TF-NGN were also addressed by research activities carried out in the JRAs of the GN2 project. In many cases, in view of the small number of people involved in lower-layer activities at the NRENs, the same people contributed to both GN2 and TF-NGN-related work. For them, during the reporting period the commitments related to the GN2 project took priority over the voluntary collaboration within the TF-NGN framework. The main goals of TF-NGN continued nevertheless to be pursued by the community. This section of the report focuses on the work items that showed the highest level of activity during the reporting interval. Updates on the GN2 research activities were presented regularly at TF-NGN meetings, in order to inform and collect feedback from the TF-NGN participants that were not involved in the GN2 project.

Support for IPv6 multicast traffic was deployed in several European research and education networks during the reporting period, with the GÉANT2 and RENATER-4 case studies being discussed at TF-NGN meetings. Embedded RP was supported by NORDUnet and RENATER on the production networks and by UKERNA on a test bed, and was considered for deployment in GÉANT2. A series of tools (known as *ssmping* and *asmping*) were developed by Stig Venaas of UNINETT to address IPv6 connectivity troubleshooting for multicast traffic.

Generic IPv6 unicast traffic is supported as a production service by most of the NRENs. This was influenced by the many IPv6 test bed projects funded by various initiatives within the European Framework Programmes. However, the end-users were very slow in using the new service. The TF-NGN meeting in July 2006 featured a debate on whether IPv6 is still a topic for next-generation networks. The conclusion was that certain aspects of

¹³ <http://www.terena.nl/activities/tf-ngn/>

IPv6 (like the lack of multi-homing and DOCSIS¹⁴ support) are still a topical research area and are being addressed by standards under development in the IETF.

The collaboration in the area of MPLS and Layer 2 VPNs was very active during the reporting interval. The i2CAT Foundation in Barcelona implemented the UCLP v2 specification for CANARIE. They also improved the UCLP v1.5 in collaboration with HEAnet and Cisco to support equipment deployed in the HEAnet network. HEAnet implemented a tool (known as *BLUENET*) for provisioning Ethernet Layer 2 point-to-point circuits, based on code developed by GRNET for defining Layer 3 VPNs. HEAnet planned to use the *BLUENET* tool for production services and the UCLP v1.5 implementation for research-oriented point-to-point circuits.

The optical networking work area was addressed at TF-NGN meetings by presentations from optical networking vendors like Glimmerglass and Meriton, and state-of-the-art test bed projects such as the IST project MUPBED¹⁵.

A group of TF-NGN participants planned and conducted an evaluation of the Juniper TX Matrix router in the framework of the work area on hands-on evaluation of new routers and switches. The planning started at the TF-NGN meeting in November 2005 and the actual evaluation took place at the Juniper test lab in Amsterdam in June 2006. The results of the comprehensive series of tests covering the performance of the forwarding plane with interface up to STM-256 speed, routing protocol convergence under induced route flaps and quality of service in a GÉANT2-like provisioning scenario were reported at the TF-NGN meeting in July 2006.

The future of TF-NGN was debated at the meeting in July 2006. The discussion revealed that the community agreed on the usefulness of TF-NGN as a communications and discussion forum. However, the opinions were more sceptical about the actual work that could be performed within this framework, in view of the increased time pressure posed by participation in national and international projects directly supported by funding bodies.

¹⁴ The Data Over Cable Service Interface Specification, ratified as an international standard by the ITU-T Recommendations J.112 and J.122

¹⁵ <http://www.ist-mupbed.org/>

6 TF-VVC

The task force on Voice, Video and Collaboration (TF-VVC¹⁶) was mandated to investigate the suitability of voice, video and collaboration technologies for deployment in research and education networks in Europe. The mandate of the task force ended at the end of the reporting period. A detailed description of the constituency, as well as work items covered by TF-VVC, is included in Appendix A.

The task force met four times during the reporting interval, on 8 November 2005, on 7 February, 4 April and 18 May 2006. Two of these meetings were face-to-face meetings. All the meetings were accessible by H.323 videoconference. The last meeting, held at the TNC 2006 conference, allowed for desktop sharing between the participants through Macromedia Breeze technology deployed by SWITCH. The average number of participants per meeting was 18.

The most notable highlights of the TF-VVC work during the reporting period are summarised below. Detailed information, including the reports mentioned, minutes of the meetings, as well as other deliverables resulting from activities carried out by the task force, is available on the website of the task force.

A workshop on High-Quality Video over IP was organised by TF-VVC on 7 November 2005 and hosted by SURFnet in Utrecht, the Netherlands. Representatives of several European NRENs participated in the workshop. The programme included presentations from the WIDE project in Japan and the i2CAT foundation in Barcelona.

TF-VVC participants updated the list of real-time group communication and collaboration services offered in production by the TERENA members¹⁷.

The University of North Carolina stopped hosting the Global Dialling Scheme (GDS) world gatekeepers for North America, documentation and directory services. Ohio State University agreed to take over the gatekeepers. The TERENA Technical Committee agreed that the TERENA secretariat would temporarily maintain a directory listing the GDS deployments at the NREN level, together with contact details.

TERENA commissioned SURFnet to carry out a study entitled "Recommendations on real-time group communication and collaboration services in support of international projects for TERENA". The document is available at the following URL: <http://www.terena.nl/publications/files/videoconf-recommendations-dec2005.pdf>

¹⁶ <http://www.terena.nl/activities/tf-vc/>

¹⁷ The list is available at <http://www.terena.nl/activities/tf-vc/F/vc-services-jan2006.html>.

The document highlighted a trend towards adopting web-based group collaboration tools, which were found to be suitable for both small and large groups working on different hardware platforms. The study also emphasised the need for coordinating the services currently offered by NRENs in a distributed environment.

The study commissioned to SURFnet served as a basis for an attempt to develop plans for a new GN2 Service Activity concerning a pan-European H.323 Videoconference Service to start in Year 3. The discussion did not lead to a new GN2 service yet but the idea has been taken up by a new TERENA task force that was created by the TERENA Technical Committee at the end of the reporting period.

Among the deliverables resulting from TF-VVC activities the following documents are particularly interesting:

- Videoconference archiving and streaming state of the art¹⁸, authored by András Kovács of NIIF/HUNGARNET
- Good Practice Guide for Voice, Video and Data Collaboration¹⁹, compiled by Nuno Gonçalves of FCCN.

During the last months of the TF-VVC mandate, attention centred on discussing possible successors of the task force. At the request of the community, TERENA agreed to maintain the website and the email list of the task force beyond the end of the mandate. Two initiatives were discussed, aimed at precisely focused projects. A few NRENs showed a strong commitment in these initiatives; many more NRENs have shown interest but are not expected to play an active role.

The task force on Enhanced Communication Services (TF-ECS) led by Fabio Vena of SWITCH and Erik Dobbelssteijn of SURFnet will focus on web-based collaboration tools and the use of SIP and ENUM protocols. The aim is to design inter-NREN trusted real-time communication services based on these protocols. The intended life-time for this initiative is two years, starting from September 2006.

A group led by András Kovács of NIIF/HUNGARNET and Dimitris Daskopoulos of GRNET debated another proposed task force as a forum for discussing the options for a videoconferencing service that could potentially be offered in the GN2 framework later on. The task force will be known as TF-VSS (task force on Videoconference Service Studies). The group will produce a feasibility study and an architecture proposal for such a service. Compatibility with the installed base of H.323 equipment is one of the major areas that the group is planning to address in the architecture document.

¹⁸ http://www.terena.nl/activities/tf-vvc/TF-VVC_Activity-G_vc-archiving-streaming_v0.3.pdf

¹⁹ http://www.terena.nl/activities/tf-vvc/TF-vvc_Activity_A.pdf

7 Acronyms

AA	Authentication and Authorisation
AAA	Authentication, Authorisation and Accounting
AA-RR	Authentication and Authorisation Requester-Responder
APAN	Asia-Pacific Advanced Network
APCERT	Asia Pacific Computer Emergency Response Team
CA	Certification Authority
CAMP	Campus Architectural Middleware Planning
CAP	Content Access Portal
CSIRT	Computer Security Incident Response Team
DAMe	Deploying Authorisation Mechanisms for Federated Services in the eduroam Architecture
DOCSIS	Data Over Cable Service Interface Specification
E-CoAT	European Co-operation of Abuse-fighting Teams
ENISA	European Network and Information Security Agency
ENUM	Electronic Number Mapping
EU	European Union
EuroCAMP	European CAMP
FEIDE	Federated Electronic Identity for Education
FIRST	Forum of Incident Response and Security Teams
GDS	Global Dialling Scheme
GGF	Global Grid Forum
HD	High Definition
HTML	Hyper Text Markup Language
IETF	Internet Engineering Task Force
IGTF	International Grid Trust Federation
IODEF	Incident Object Description and Exchange Format
IP	Internet Protocol
IPv6	Internet Protocol version six
ISPA	Internet Service Providers Austria
IST	Information Society Technologies
JRA	Joint Research Activity
LDAP	Lightweight Directory Access Protocol
MPLS	Multi Protocol Label Switching
NA	Networking Activity
NREN	National Research and Education Network
OASIS	Organization for the Advancement of Structured Information Standards
PAPI	Point of Access to Providers of Information
RADIUS	Remote Authentication Dial-In User Service
REFEDS	Research and Education Federations
RP	Route Processor.
RTD	Research and Technological Development
RTIR	Request Tracker for Incident Response

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SA	Service Activity
SAML	Security Assertions Markup Language
SCHAC	Schema Harmonisation Committee
SCS	Server Certificate Service
SIP	Session Initiation Protocol
SSID	Service Set Identifier
SSL	Secure Sockets Layer
SSO	Single Sign-On
TACAR	TERENA Academic Certification Authority Repository
TCP	Transfer Control Protocol
TERENA	Trans-European Research and Education Networking Association
TF-CSIRT	Task Force on Collaboration of Security Incident Response Teams
TF-ECS	Task Force on Enhanced Communication Services
TF-EMC2	Task Force on European Middleware Co-ordination and Collaboration
TF-Netcast	Task Force on Academic Netcasting
TF-NGN	Task Force on Next-Generation Networking
TF-VSS	Task Force on Videoconference Service Studies
TF-VVC	TERENA Task Force on Voice, Video and Collaboration
TNC	TERENA Networking Conference
TTC	TERENA Technical Committee
UCLP	User Controlled LightPath
VEDEF	Vulnerability and Exploit Description and Exchange Format
VPLS	Virtual Private LAN Service
VPN	Virtual Private Network
WIDE	Widely Integrated Distributed Environment
WLAN	Wireless Local Area Network
XML	Extensible Markup Language

Appendix A Description of Task Forces

A.1 TF-CSIRT

TF-CSIRT is the task force where members of Computer Security Incident Response Teams (CSIRTs) meet, collaborate, exchange information and experiences, and develop a cohesive environment of trust. The task force participants come from different communities: national research and education network organisations, universities, government institutions and commercial companies.

The task force activities started in the year 2000; the current Terms of Reference of TF-CSIRT were approved by the TERENA Technical Committee on the 6th of June 2006.

TF-CSIRT is chaired by Gorazd Božič from SI-CERT (ARNES). The task force has a deputy chair in the person of Kauto Huopio from CERT-FI. Staff members of several NRENs, such as ARNES, SURFnet, UKERNA, SWITCH, AConet and DFN, are among the most active participants in TF-CSIRT. In addition to formal commitments for collaborating with FIRST (Activity G) and GN2 JRA2 (Activity J) and liaising with ENISA (Activity K), E-CoAT (Activity L), the Trusted Introducer initiative (Activity B) and the European Commission (Activity K), the following work items are included in the Terms of Reference document that defined the current TF-CSIRT mandate:

Activity A. Organise meetings and seminars to exchange experiences and discuss common interests of CSIRTs

Activity C. Security Contact Information for Internet Resources

The task force will continue to track and support the deployment of abuse contact lookup mechanisms, help with improving documentation and propose changes in technology and procedures as appropriate; investigate the usefulness of extending those mechanisms to other unique Internet Resources (e.g. Autonomous System Numbers); track the impact of applying privacy and data-protection laws and regulations to this particular set of data, in particular with regard to the diverse legal landscape (national, EU-coordinated, international); and investigate possibilities, as well as support activities, to implement similar mechanisms in other Regional Registry or Routing Registry environments.

Activity D. Clearinghouse for Incident Handling Tools

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The task force maintains a web-based clearinghouse for security software, covering both free software and commercial products. The focus of the clearinghouse is on tools that are in actual use in CSIRTs whose staff members participate in TF-CSIRT. Developments in the clearinghouse service will be reported to the task force.

Activity E. Training of new (staff of) CSIRTs

The task force will review the needs for specific training for staff members of CSIRTs and will promote the development and delivery of appropriate training materials to meet these needs. The task force will receive reports on the TRANSITS trainings organised by TERENA and by FIRST, and on the measures that are taken to guarantee the continuity of the TRANSITS training effort.

Activity F. Assistance to the establishment of new CSIRTs

The task force will develop and maintain appropriate resources and services to assist the establishment and development of new CSIRTs. Where appropriate this will be done in collaboration with other groups or organisations working in this area.

Activity H. Request Tracker for Incident Response

The task force will set requirements, investigate ideas, develop new modules and generally monitor the progress of the RTIR Incident Handling tool. This work will be carried out under a statement of work with Best Practical Solutions or by task force participants themselves. The aim of the activity is to extend the current application, by making it more stable and adding new functionality, thus making it more adaptable for the general use of new, as well as established CSIRTs.

Activity I. Collaboration with Information Security Metadata Activities

The task force will collaborate with relevant activities in the production and maintenance of Information Security Metadata, such as Incident Description (IODEF) and Vulnerability and Exploit Description (VEDEF), both of which were formerly activities of the task force. Progress reports will be provided on a liaison basis by task force participants who have an existing co-ordination function in this area and will collate inputs from other task force participants as appropriate.

Activity M. Incident handling and security guidelines for NREN Grids

Task force members will work with Grid communities to identify, and encourage the adoption of good security practice. Key areas of work will be in Grid incident response and vulnerability management. Other activities such as development of Grid-related risk assessments, security policies, security guidelines and technical security implementations may also be considered. Results will be disseminated through a website and mailing list and will be reported to the task force.

TF-CSIRT meetings held in the reporting period:

- 15-16 September 2005, Lisbon, Portugal
- 23-25 January 2006, Amsterdam, Netherlands
- 25-26 May 2006, Vilnius, Lithuania

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A.2 TF-EMC2

The TERENA task force TF-EMC2 aims to provide a forum to discuss middleware issues and foster collaboration in the middleware arena.

TF-EMC2 objectives are:

- to provide a forum for exchanging experiences and knowledge;
- to promote the development and testing of innovative middleware technologies;
- to promote the use of common standards and procedures in the middleware infrastructures;
- to promote the actual use of middleware infrastructures at the campuses; e. to liaise with other middleware activities at international level, such as GGF (Global Grid Forum) and Internet2.

The task force is chaired by Diego Lopez (RedIRIS). Staff members from many NRENs are actively involved, including RedIRIS, SURFnet, FUNET, CESNET, UNINETT, ARNES and RENATER. The participation from universities (especially from the UK and Spain) is also quite high.

The terms of reference document states that the task force shall focus on the activities listed below:

- Authentication and Authorisation Requester-Responder
- Directories
- Liaison with other international organisations, like Internet2, GGF,
- European AAI update
- Campus Middleware Issues

TF-EMC2 meetings held in the reporting period:

- 8-9 September 2005, Barcelona, Spain
- 31 January - 1 February, 2006, Zagreb, Croatia
- 14 May 2006, Catania, Italy

A.3 TF-Mobility

The TERENA task force on Mobility investigates the issues that arise when users move between different organisations (generally campuses and NRENs) and try to gain access to the Internet using their own mobile devices.

The goals of the task force are:

- to provide a forum for exchanging experiences and knowledge;
- to promote the benefits of the technology and assist in the rollout of the roaming infrastructure;
- to provide a technical-knowledge repository containing information about standards and product for roaming services;
- to test, update and extend current roaming infrastructure among NRENs and beyond;
- to consider the impact of future development in roaming.

The task force is co-chaired by Klaas Wierenga (SURFnet) and David Simonsen (UNI•C). Staff members from many NRENs are actively involved, including SURFnet, SWITCH, RedIRIS, UNI•C, DFN, FCCN, ARNES and CESNET.

The terms of reference document states that the task force shall focus on the activities listed below:

- Next Generation
- End Users Mobility
- Managing Monitoring
- Deployment Issues

TF-Mobility meetings held in the reporting period:

- 6 September 2005, Barcelona, Spain
- 1-2 February, 2006, Zagreb, Croatia
- 14 May 2006, Catania, Italy

A.4 TF-NGN

TF-NGN aims to investigate the suitability of advanced networking technologies for possible implementation in GÉANT2 and other research and education networks. The main goals of the task force are as follows:

- to provide a forum for exchanging experience and knowledge;
- to promote development and testing of innovative networking technologies;
- to define, develop and test new networking services which can subsequently be introduced by national research and education networks and/or in the European research networking backbone infrastructure;
- to provide a forum for wider discussion of the work of the GÉANT2 joint research activities, and the service activity on end-to-end Quality of Service.

The task force is chaired by Michael Enrico from DANTE. Staff members from many NRENs are actively involved, including HEAnet, GRNET, PSNC, UNINETT, RENATER and GARR.

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The terms of reference document states that the task force shall focus on the activities listed below:

- Improvement of current multicast services
- IPv6
- IP routing
- MPLS for Layer 2/3 VPNs and VPLS
- Intelligent control plane architectures
- Transport Protocols (TCP limitations and tuning, fast TCP, new transport protocols)
- Optical Networking
- Hands-on evaluation of new router and switching hardware

TF-NGN meetings held in the reporting period:

- 3-4 November 2005, Athens, Greece
- 13 January 2006, Cambridge
- 4-5 July 2006, Ljubljana, Slovenia

A.5 TF-VVC

TF-VVC was mandated to investigate the suitability of voice, video and collaboration technologies for implementation in research and education networks in Europe.

TF-VVC is chaired by Egon Verharen from SURFnet. Staff members from many NRENs are actively involved, including SURFnet, FCCN, CESNET, FUNET, SWITCH, NIIF/HUNGARNET and RedIRIS. Also participants from universities, research institutes and commercial companies are contributing to the task force activities. The task force is collaborating and exchanging information with working groups and organisations all over the world, e.g. Internet2 and APAN working groups.

The twelve initial activity areas mentioned in the terms of reference are the following:

- A. The task force will provide a collection of best-practice documents, overviews and guidelines related to the provision of voice, video and data collaboration services.
- B. TF-VVC will support the development, testing and rollout of Content Delivery Network software.
- C. In the area of Content Access Portals (CAPs), the task force will collaborate with other initiatives worldwide in order to gather information about existing content and to investigate other CAP-related questions. An example is the co-ordination with the Internet2 Research Channel Global Initiative.
- D. TF-VVC will promote existing materials about the metadata published by TF-Netcast and will encourage discussion about models and metadata.

- E. The task force will promote the announcements portal that was developed by TF-Netcast; it will investigate its possible extension to an Academic Netcasting Channel.
- F. The task force will actively contribute to discussions on international dial and numbering plans for videoconferencing and voice-over-IP (independent of protocol), and will make recommendations on how to set up interconnected systems.
- G. Information on how different collaborative multimedia technologies can be integrated will be collected and made available to the task force participants.
- H. A Workshop will be organised about high-end/quality systems and a new communication system for HD conferencing will be investigated.
- I. In relation to usability and the improvement of user interfaces, the task force will promote discussion about user needs, collect these and contact equipment vendors to ask for the required improvements.
- J. TF-VVC will collaborate with the TERENA task forces TF-EMC2 and TF-Mobility to investigate the middleware requirements for access to video resources.
- K. As regards to the deployment of IP telephony, TF-VVC will produce, among others, a survey of existing IP telephony deployments, and recommendations on how to connect different nodes.
- L. The task force will publish recommendations on how to measure end-to-end performance of real-time conferencing applications.

With the full agreement of the participants, activities I and L were not worked on after the first year.

TF-VVC meetings held in the reporting period:

- 8 November 2005, Utrecht, the Netherlands
- 7 February 2006, H.323 videoconference
- 4 April 2006, H.323 videoconference
- 18 May 2006, Catania, Italy