

**Report of the TERENA Technical Advisory Council
Zagreb
Monday 19 May 2003**

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TERENA

Final Version: 4 June 2003

The meeting was chaired by Claudio Allocchio, VP Technical Programme who gave a presentation on the current status of the TERENA Technical Programme. He reminded members of the Technical Advisory Council that although the TAC meeting takes place once per year, continued interaction throughout the year using the email distribution list is anticipated. Claudio encouraged the TAC members to actively participate in the discussions.

Claudio reported the TTC membership as of April 2003:

- Claudio Allocchio - VP Technical Programme
- Roberto Barbera - GRID
- David Chadwick - Directories
- Christoph Graf - Security
- Dimitrios Kalogeras - High Speed Networking
- Olav Kvittem - Diffserv and Quality of Service
- Ton Verschuren - Middleware
- John Dyer - Chief Technical Officer
- Karel Vietsch - Secretary General

He pointed out that the statutes of TERENA allow for TTC members to serve for no more than 2 consecutive terms and that David Chadwick and Olav Kvittem had now reached that maximum period in office. He called on members of the TAC to make suggestions for new members bearing in mind the need to effectively cover the Special Interest Areas (SIAs) of the Technical Programme with expertise in the TTC.

The Technical Programme SIA areas are:

- Lower Layers (IPv6, MPLS, VPNs etc.)
 - Quality of Service (including DiffServ)
 - Videoconferencing and Streaming (Including IP Telephony)
 - Content Delivery, Indexing and Searching
 - Middleware (security, AAA)
 - Mobility
- With Grid and Campus coordination across all the SIAs

This list of SIAs was formally agreed at the 2002 TAC and according to the statutes should not be revised until 2004. The consensus was that the list of areas remains appropriate for the TERENA technical programme although some minor shift in emphasis is apparent.

Ton expressed his feeling that Content Delivery, Indexing and Searching could mostly be accommodated in the remit of TF-NETCAST. Similarly the SIA focussed on QoS could easily accommodate within the Lower Layers SIA. Andrew Cormack expressed his agreement with these ideas adding that content delivery should be specifically highlighted as a sub-topic of TF-NETCAST.

In particular, although the QoS area has been fruitful, providing the basis of the development of three levels of service on GÉANT (Premium, Best Efforts and Less than Best Efforts), it is no longer of central development importance to the technical programme. It was agreed that QoS should be covered in future under in the context of the Lower Layer work.

The meeting then moved on to examine each of the technical areas, the format being a short presentation followed by open discussion.

Interactions between grids and networks, Roberto Barbera

Roberto presented his view of "Interactions between grids and networks", based on his experience in the European DataGrid project. In particular he mentioned the critical importance of good IO and network access as being central to the effective use of Grid applications. Roberto mentioned the four level hierarchical or tiered model used for DataGrid, specifically in the Monarc Project. The tiers and expected inter-tier traffic levels being:

- Tier 0, Online Raw Data Capture and CERN Computer Farm
 - Data Rate between T0 and T1 approximately 650-2500Mb/s
- Tier 1, Regional (national) Centers
 - Data Rate between T1 and T2 approximately 2.5-10Gb/s
- Tier 2, Centers within the regions
 - Data Rate between T2 and T3 approximately 155-622Mb/s
- Tier 3, Institutes
 - Data Rate between T3 and T4 approximately 100-1000Mb/s
- Tier 4, Individual Workstations

Recently, the paradigm of each computer being closely coupled to its own local storage facilities has been extended. In the next release of the Grid middleware, processors will be expected to be able to retrieve and store data in any of the distributed storage elements in the Grid. In addition, there will be intra-tier data replication and backup, which Roberto sees as a potential network killer.

Opening the discussions, Claudio suggested that the traffic generated by a single grid user could appear to network administrator as a Denial of Service attack, preventing other from undertaking their normal work. There was further discussion on the solution. Approaches discussed included the use of Bandwidth on Demand (BoD) and bandwidth over provision. There was a view that BoD was of little use if the underlying physical capacity (in the form of over provision did not already exist). David Williams explained that in his view the concept of a coherent European wide AAA service is key to delivering reliable Grid services. David urged the TAC to think of the development of such a service as a project akin to the 6NET project in scale and reminded the TAC of the large investment of resources that will be required.

Campus Middleware & Grids, Ton Verschuren

Ton started his presentation by reviewing the authentication and authorization activities that are currently underway within the academic community. He mentioned:

- UK: Athens, new: devolved authN and PERMIS (experimental authZ)
- Spain: PAPI (focus on authZ)
- Nordic: FEIDE (focus on attrs & dirs)
- Sweden: SPOCP (authZ only)
- Switzerland: Shibboleth
- Netherlands: A-Select (focus on authN)
- Scattered: PKI
- Internet2: Shibboleth

He reported on the discussions that had taken place within the context of the TERENA Task Force TF-AACE. In particular this Task Force has been working on tying these elements together using technology such as SAML (an XML framework for exchanging authentication and authorization information). Detailed information on SAML can be found at: <http://www.oasis-open.org/home/index.php>.

Ton discussed how SAML can be used as a “glue” to bring together the different elements that are already available and make them work together. He explained that he sees the future challenges as:

- Interoperability of GRID tools and campus software to provide the same functionality for Virtual Organisations as for campuses.
- The need for assertion about identity to be securely transferred
- The definitions of the appropriate Schema
- Building of trust (infra)-structures

Ton posed the question of what could be supported through the use of PKI.

Roberto opened the discussion by explaining that an important concept to be included in any AAA system is that of the role of the individual. He pointed out that when using Grids people may undertake several roles. For instance the role of administrator will have extensive rights over resources, whilst at other times the same person may be a “normal” user that should be prevented from having unlimited access to resources. Ingrid asserted that the implementation of identity of individual and role is not so difficult, but the concept of federations and indeed the concept of federations of federations is considerably more difficult.

Future lower layers work items, Victor Reijs

In setting the context for his presentation, Victor explained the current status of the Lower Layer work being carried out in our community. He reported on the establishment of a Performance Enhancement Response Team (PERT) along the lines of the CERT model. In principle, there would be PERT team(s) that would investigate problems in end-to-end performance, exploring issues of hardware, software and networks. In order to operate effectively it is important that PERT teams (or indeed individual users) have access to an appropriate network performance measurement

infrastructure. The major issue in this respect is developing a multi-domain testing environment that can operate truly end-to-end.

Victor reported on the work of the ASTON group (A Step towards Optical Networking) specifically focusing on the White Paper that provides a discussion and framework of European NREN requirements in the field of optical networking. A copy of the white paper may be obtained from the TERENA website at:

<http://www.terena.nl/tech/projects/testbed/NREN-WhitePaper-v1.0.pdf> .

Victor explained that the work of TF-NGN is largely driven by the development and testing requirements of the GEANT network managed by DANTE. Victor believes that additionally there are more distant technical issues that need to be addressed (such as the understanding, planning and installation of optical networks and their associated support systems and services). The existing project such as 6NET and possible future projects such as GARDEN, GRANDE and GN2 can be used as vehicles for practical experience feeding into this work. In defining how this work might be organized, Victor offered some guiding principles:

- The work should address topics that are of importance to the NRENS
- A suitable leader with the appropriate expertise and sufficient time must be found.
- The leader should not be expected to undertake all of the work, it needs to be distributed around a number of active group members
- The group should only attempt work items that are considered achievable

Victor presented a list of possible topics for inclusion in the work programme which is detailed in his presentation material. These included major items such as:

- Enhancement of IPv6 monitoring
- IPv6 multicast
- Multi domain Issues
- Sharing of NREN experience on issues such as optical networking and service models

Many of these items will require building strong liaison links with other TERENA Task Forces such as TF-AACE (for authorization technology) and with external groups such as the IETF (on topics like the definition of simpler link protocols).

There was some discussion regarding the issues involved providing 40Gb/s over a single 40Gb/s interface versus four parallel 10Gb/s interfaces. Mauro suggested that whilst four 10Gb/s is viable in the short term, issues such as appropriate splitting of single large streams and the correct configuration of ACLs across multiple interfaces makes it less than ideal as a long term solution. Practically, the use of four parallel 10Gb/s interfaces in a large network will lead to a highly meshed network which will make routing difficult to manage.

Mobility, James Sankar

James reported on the origins of the TERENA Task Force chartered to work on mobility issues and mentioned that he and Carston Borman are the co-chairs. He presented the key objectives of TF-MOBILITY which are:

- Evaluate AAA techniques in mobile environments (802.1X, VPN, Web).
- Create an Inter-NREN WLAN roaming architecture and testbed.
- Evaluate mobile equipment and technology.
- Evaluate next generation mobile technology for handover and roaming (mobile IP v4 and v6).

In addressing these objectives the Task Force has developed three "inventories" of how the authorisation model for granting mobile access could be implemented on a European scale. These inventories address how existing local systems could be extended to work on a pan-European scale. The models are:

- VPNs model using a concept of relay networks, which is not thought to be scaleable
- Cross-Domain 802.1x with VLAN assignment – using a hierarchical system of radius servers, in which the users information being held on a radius server on the network on which the user normally resides
- Web Based – which would give an interface to a public access controller which would be based on the work emerging from AAA developments

In essence all these approaches have some similarity and furthermore have already been implemented for local use in some of the European Research and Education Networks. The Task Force decided that rather than choose one solution as being technically superior over the other two, it would be more appropriate to provide a pan-European pilot that would support them all. It is likely that this will be based on a hierarchical radius server system.

The inventories will be published on the TF-MOBILITY web pages on the TERENA web server in early June 2003.

Task Force TF-NETCAST, Dan Mønster

TF-NETCAST clearly has its heritage in the work of the former TERENA Task Force, TF-STREAM. Whilst TF-STREAM had a broad remit investigating video conferencing and streaming of multimedia material, TF-NETCAST is focussed specifically at the issues involved in streaming. In particular TF-NETCAST is currently working on a system to announce the availability of streamed material. The system will be based on an integration of systems developed by CESNET and UNINETT and has been localized into seven languages supporting multiple time zones. Whilst the immediate goals are defined by a number of deliverables (the first of which is already delivered), in the longer term it might be possible to develop a European equivalent to the US Research Channel. The video encoding standards being used by the group include ISMA (Internet Streaming Multimedia Alliance – based on MPEG-4) and WM (Windows Media).

Certificate Hosting at TERENA, Licia Florio

Licia presented a proposal originating from TF-AACE which envisages TERENA piloting the collection and storage of some NREN certificates. The proposal originated from the situation that many NRENs use their own private certificates within their own domains, but these certificates have no authoritative standing outside that domain. It is proposed that the pilot could provide a trusted linkage between the

different domains by hosting these certificates. The Task Force proposes the following role for the project:

- Defining a process to gather NREN CA root certificates
- Define a policy for verifying these certificates
- Host the certificates in such a way that they can be made available to authorised entities.

Licia went on to explain the practical steps that would be required including the secure storage of a file containing all the root certificates and there was some discussion on this topic.

Roberto asked how the CRL will be managed, however this has not yet been defined. He went on to suggest that the policy adopted for the DataGrid project would be a good starting point for TF-AACE to use for its own policy definition. It was noted that DataGrid uses four or five files per institution to contain the certification information.

In further discussions it was suggested that rather than mandating that individuals attend the TERENA office for formal identification as part of the verification process, this could be delegated to local agencies. Licia responded that since this pilot was initially intended to be quite small, and members of TF-AACE regular meet, formal verification in the pilot should not be a problem. Licia agreed to send Roberto a copy TF-AACE policy document for review and comment.

Report on the work of TF-AACE, Rodrigo Castro

Rodrigo reported that three of the planned deliverables have already been presented to the Task Force members. At the TF-AACE meeting that took place on Sunday 18th May, in Zagreb, the objectives of the group was reviewed and restated. The agreed areas are now:

- Development of a framework architecture
- Definition of a common schema and set of attributes
- Study and agreement of an appropriate Trust Models
- Definition of a common list of Terminology
- Dissemination of Information about AAA to the TERENA community

Concluding Discussions

Claudio opened the discussion, reviewing the list of Special Interest Areas (SIA) as agreed in 2002. He pointed out that last year the TAC added Grid and Campus Coordination across all of the SIAs. He explained that much work has started in this topic, spread across many Task Forces. It was agreed that the current list of SIA's is still appropriate bearing in mind the minor changes in emphasis explained earlier.

David Williams expressed his amazement at the breadth and extent of the technical activities undertaken within our community and the depth of expertise that is available. David suggested that the challenge will be to keep up the enthusiasm of those involved and spread the message of what has been achieved to those outside our community. He went to reflect on the make up of our culturally diverse community. In some respects this is a major strength, bringing different attitudes

and views to problem solving. In another respect encouraging such a diverse set of bodies to work together in a common language may not always be straightforward. David expressed his view that AAA will be a key component of middleware support of Grids. He believes that such a project will be similar in size and extent as the IPv6 initiatives (such as 6-NET). We need to move from a disparate set of experiments to a coherent pan-European service environment.

Claudio urged the TAC members to start thinking about how this service development and what steps could be undertaken by TERENA. Ingrid pointed out that the authorisation activities being undertaken as not stand-alone, but in fact are all related.

Claudio moved the discussion to the need to identify two new members to fill the vacancies on the TTC. He asked the TAC members to send possible names as soon as possible.

In closing the meeting Claudio reminded the TAC members that TERENA needs their support and input throughout the whole year, not just for one-half-day at TNC. He informed them that he intends to consult them through use of the TAC email distribution list.

The meeting was closed at 12:45

TERENA Technical Advisory Council
Monday 19 May 2003, Zagreb
Attendees and Apologies

PRESENT

Claudio	Allocchio	GARR, Italy	TTC
Pål	Axelsson	SUNET/ Uppsala Univ., Sweden	
Andrea	Baldi	ESA	
Lajos	Bálint	HUNGARNET, Hungary	
Roberto	Barbera	Univ. of Catania, Italy	TTC
Martin	Bech	UNI-C, Denmark	
Artur	Binczewski	PSNC, Poland	
Marko	Bonać	ARNES, Slovenia	
Carsten	Borman	TZI/DFN, Germany	
Thomas	Brunner	Switch, Switzerland	
Mauro	Campanella	GARR, Italy	
Victor	Castello	RedIRIS, Spain	
Rodrigo	Castro	RedIRIS, Spain	
Valentino	Cavalli	TERENA	
Didier	Colle	IMEC, Univ. Gent, Belgium	
Andrew	Cormack	UKERNA, UK	
Marián	Đurkovič	SANET, Slovakia	
John	Dyer	TERENA	
Jón Ingi	Einarsson	RHnet, Iceland	
Licia	Florio	TERENA	
Brian	Gilmore	University of Edinburgh, UK	TTC
Christoph	Graf	Switch, Switzerland	TTC
Jan	Gruntorad	CESNET, Czech Republic	
Sæþór L.	Jónsson	RHnet, Iceland	
Janne	Kanner	CSC, Finland	
Baiba	Kaskina	TERENA	
Peter	Kaufmann	DFN, Germany	
Roman	Lapacz	PSNC, Poland	
Tamás	Máray	NIIIF/HUNGARNET	
Kevin	Meynell	TERENA	
Miroslav	Milinovic	CARNet/SRCE, Croatia	
Dan	Mønster	UNI-C, Denmark	
Mike	Norris	HEANET, Ireland	
Wiktor	Procyk	PSNC, Poland	
Erik	Radius	SURFnet, The Netherlands	
Victor	Reijs	HEANET, Ireland	
James	Sankar	UKERNA, United Kingdom	
Petzias	Sulcas	LITNET	
Jani	Tiihonen	CSC, Finland	
Igor	Velimirović	CARNet, Croatia	
Ton	Verschuren	SURFnet, The Netherlands	TTC
Karel	Vietsch	TERENA	
Peter	Villimoos	Nordunet	
Tibor	Weis	SANET, Slovakia	
Klass	Wierenga	SURFnet, The Netherlands	
David	Williams	CERN	

APOLOGIES

Brian	Carpenter	IBM
Olivier	Martin	CERN
Peter	Rastl	ACOnet, Austria
Wilfried	Wöber	ACOnet, Austria