TERENA/DANTE TASK FORCE FOR TESTING ADVANCED NETWORKING TECHNOLOGIES

Minutes of the 10th TF-TANT meeting held on the 5th and 6th of October 2000 at the
Vienna University, Vienna, Austria.

Valentino Cavalli - Issue 1

PRESENT

Name	Organisation	Country
Werner Almesberger	EPFL	Switzerland
Kostas Anagnostakis	TERENA	-
Alain Bidaud	Crihan	France
Michael Behringer	CISCO	Spain
Marc Berenschot	Univ. of Twente	The Netherlands
Mauro Campanella	INFN - GARR	Italy
Valentino Cavalli (Secr)	TERENA	-
Tryfon Chiotis	GRnet	Greece
Tim Chown	Univ. of Southampton	United Kingdom
Joel Corral	ENST-France	France
Raffaele D`Albenzio	CSELT SPA	Italy
Howard Davies	DANTE	-
Cees de Laat	Univ. of Utrecht	The Netherlands
Peter Feil	T-Nova Berkom	Germany
Tiziana Ferrari	INFN Bologna	Italy
Joop Joosten	CERN	Switzerland
Dimitrios Kalogeras	GRnet	Greece
Daniel Karrenberg	RIPE NCC	-
Tom Kosnar	CESNET	Czech Republic
Olav Kvittem	Uninett	Norway
Simon Leinen	SWITCH	Switzerland
Ladislav Lhotka	CESNET	Czech Republic
Octavio Medina	ENST Bretagne	France
Agnes Pouele	DANTE	-
Herve Prigent	Crihan	France
Victor Reijs	SURFnet The Netherlands & HEAnet Ireland	
David Remondo	Univ. of Twente	The Netherlands
Esther Robles	RedIRIS	Spain
Roberto Sabatino (Chair)	DANTE	-
Christian Schild	JOIN-Univ. of Muenster	Germany
Wim Siouw	Univ. of Utrecht	The Netherlands
Trond Skjesol	Uninett	Norway
Miguel Angel Sotos	RedIRIS	Spain
Robert Stoy	DFN	Germany
Alex van der Plas	Ericsson Telebit	Denmark
Stig Venaas	Uninett	Norway
Karel Vietsch	TERENA	-
Franz Widhofner	Univ. of Linz/ACOnet	Austria
Wilfried Woeber	ACOnet	Austria
Jean Marc Uze	Air France	France

Apologies were received from
Larry Dunn Cisco
Antonio Pinizzotto IAT-CNR Italy
Juergen Rauschenbach DFN-verein Germany

1. APPROVAL OF MINUTES

The minutes of the 9th TF-TANT meeting held on the 13th and 14th of July 2000 were approved.

2. TEN 155 update

Roberto said that the five cities ring and the new E3 for Luxembourg were operational at the end of August, however there were problems in the capacity doubling to Switzerland and Italy and this would probably not happen. Instead of doubling capacity to Stokcholm, a STM-4 from Amsterdam or Frankfurt to Stockholm was being discussed.

DANTE had to change POPs in the United Kingdom and in Germany and at the moment some international connections still needed to be moved. Roberto said the NRENs would need to change their access to the new POPs.

Other upgrades on the TEN-155 circuit were the connection of Athens via STM1 to London, and the delay of STM1 connection between Paris and Madrid. The upgrade to 622Mbps access to TEN-155 for SURFNET and DFN was still pending. The 200 MBPS upgrade to NORDUnet was postponed.

3. GEANT update

Howard reported the status of the GEANT project and briefed about the GEANT technical programme. On the 29th of September the Commission formally decided to award the GEANT contract, and signature were being collected from the participating contractors. The same date was also the deadline for the Call for Tender for the GEANT procurement. DANTE received 44 offers of which 29 regarded bandwidth provision, 17 offered network management and 37 POP housing. The evaluation of offers was still ongoing.

Howard said the technical work items for year one regard migration of the TEN 155 MBS to a mixed technology, specification of premium IP service (distinguish between one/more CoS), improving multicast, prepare the introduction of IPv6, and traffic measurement.

4. Final informal report

It was agreed that the work done after the submission of the QUANTUM final report in May 2000 would be published as a final informal deliverable. The report will be a simple collection of articles and other information produced as results of the activities carried out from June till October 2000. The ideal format is Microsoft Word, but the report does not need to comply with any particular document format or structure.

ACTION 10.1 Roberto to coordinate the collection of input to the informal QUANTUM report. Target date for collection of input is mid November 2000.

5. Overview of future activities

In the period preceding the meeting there had been a discussion about the future of TF-TANT regarding both work items and organisational aspects. The creation of a new TERENA task force about Next Generation Network (TF-NGN) was proposed, meeting back-to-back with the GEANT working groups. However, DANTE and TERENA agreed not to discuss organisational aspects during the meeting, and on that respect it was only

remarked that TF-TANT, and TF-TEN before it, were very successful and it was hoped to continue with similar arrangements for the future. The group would then make plans with the assumption that it will continue as a single one in the future.

Karel and Valentino outlined a draft terms of reference with proposed work items for the new task force TF-NGN. The draft document, as well as Karel`s and Valentino`s presentations are available at http//www.terena.nl/task-forces/tf-ngn. On the site all presentations given at the meeting will be made available as soon as the authors send notification to the secretary.

ACTION 10.2 All, send pointer of presentations to Valentino.

6. Optical Networking

Victor presented plans about activities related to optical networking. These were divided into information gathering/assimilation and hands-on experience. On the first side the group should investigate into existing standards in ITU, ANSI, etc. as well as into physical layer issues. This kind of activity would be reported into half-yearly presentations/deliverables. Hands-on experience would include on the one hand building layer-1 networks by investigating the possibility of renting lit fiber/WDM, and on the other hand the feasibility of IP WDM, possible options like MPLambdaS, resiliance on Layer-1 and/or Layer-3 and management issues.

Full presentation will be available at
http//www.surfnet.nl/surfnet/persons/reijs/optical.ppt

Tiziana said that INFN is interested in Lambda switching and MPLambdaS, as well as in studying fiber architectures in view of deployment for next generation experiments in nuclear physics. However she was afraid that organising loans for that kind of equipment could be very difficult and expensive. Daniel Karrenberg replied that experience show it is not so difficult, because companies are eager to offer their contribution.

It was observed that the possibility of carrying out tests at broad scale depend on the availability of an international test-bed. However, this was not felt as a problem anymore. More and more countries in Europe have fibers in place throughout their territory. In that particular context Switzerlad, Poland, Croatia and Denmark were mentioned. Tiziana asked if GEANT would provide Lambda switching, but this was depending on the offers that bidder had submitted and due to the ongoing evaluation of tenders it was not possible to comment.

There was a significant interest in the topic, 6-10 people raised their hand at the question about who was interested to actively contribute. It was also observed that MPLambdaS and Lambda switching are just the tip of an iceberg, and there are many other interesting related work items which could be added to the topic.

ACTION 10.3 Victor to involve people and make concrete plans about optical networks for the next meeting.

7. Flow measurement - network monitoring

Simon briefly suggested to keep the measurement activity ongoing and the web site up to date. He said he would prepare a report for the GEANT deliverable about the activity.

Daniel Karrenberg was invited to present new measurement activity from RIPE NCC.

These were mainly focused on active measurement based on a GPS synchronised clock
they were measuring one-way delay and packet loss in traffic between ISPs routers.
Daniel said there were about 50 machines being monitoring different kinds and size
of ISPs and they were targeting at having 100 operational by the first quarter of
2001.

Daniel said the activity was open to everybody and invited all interested people to
join it. He also invited people to attend the PAM 2001 workshop that is going to be
held in Amsterdam on 23-24 April 2001.

Daniel presentation is available at

http//www.ripe.net/ripencc/mem-services/ttm/index.html

There were some remarks and questions regarding the possibility to run the
experiments without the need of fully integrating them in the RIPE NCC architecture.
Other questions were about the possibility that the information stored in the
database could be made available to the applications so that they are aware of the
network performance in order to provide real QoS services.

8. Multicast

Robert briefed about the current work of the multicast group and about his proposal
for future activity. The group has been busy in organising analyses of BGMP and
MALLOC architecture but progress was slower than expected. It was also involved in
testing MRM hosts (and router implementation). The ideas for the future included
-        interdomain multicast routing, MBGP to BGMP
-        multicast addressing MALLOC model implementation
-        PIM SM upgrade plus IGMPv3 single source multicast
-        closed multicast user groups
-        MPLS and IP multicast
-        sufficient QoS in native IP multicast environment

Lada gave a presentation about user perspective of IP multicast. He maintains a web
server providing links to info sources, distribution of SW etc. The URL is http//www.
ten.cz/english/doc/multicast. Activity plans for the future include, among other new
applications, measurement and diagnostic infrastructure, IP Multicast monitor,
address allocation for IPv4 and IPv6, end user related protocols (IGMPv3), multicast
and firewalls (RFC2588).

Lada`s presentation is available in (TeX source and PostScript)at
ftp//ftp.jcu.cz/pub/lhotka/geant

9. MPLS

Herve presented the test plan for the GEANT project. The HTML slides are available
at
http//www.crihan.fr/MPLS/doc/PRES/Vienna051000/mpls.html
and in PowerPoint format
http//www.crihan.fr/MPLS/doc/PRES/Vienna051000/mpls_files/mpls.html.ppt

The activity will follow the work of the IETF and will regard a number of trial
fields about
- new services for the backbone and the customers, including GLS, value added
services and new needs
- interdomain (autonomous system) interoperability

- inter-vendor interoperability
- scalability
- QoS
- management and administration monitoring tools
- MplambdaS

Herve`s presentation also reported about ongoing MPLS TE tests which were due to be finished in the week of 9-13 October, information about that was provided at the web site http//www.crihan.fr/MPLS/tests/pres/TE/TE-config.html

Part of the present and future activity regarded MPLS guaranteed services using Dual Bandwidth Pool Traffic Engineering (DBP-TE) from Cisco. Test plans were due to be provided to Cisco by 11-10-2000 with actual tests to be started on 23-10-2000. A detailed presentation about DBP-TE was scheduled at the end of the meeting for people who signed NDA with Cisco. In the current session Agnes just provided a brief introduction to DBP-TE. She said the QoS model is simple but weak in guarantee, there is no topology aware admission control, and is mostly useful for building point-to-point guarantee. Dual Bandwidth Pool Traffic Engineering DBP-TE is an extension of the existing MPLS TE. It is a particular Cisco implementation combining Diffserv/RSVP/MPLS in order to provide MPLS Guaranteed Bandwidth. In the architecture, a separate bandwidth pool for constraint based routing will guarantee that the capacity is always kept below the maximum threshold.

Slides on the MPLS DBP-TE Test Plan & Info (restricted access) are available at http//www.crihan.fr/MPLS/dbp-test/dbp-test.html

10. IP version 6

Alex had been leading the IPv6 group and briefly announced that TELEBIT is not going to play a major role in the upcoming IPv6 activity. Tim would lead the group in the future.

Tim started his presentation by assessing the four areas of activity in the lifetime of TF-TANT interoperability, DNS, multihoming and applications. He said interoperability tests were not carried out very regularly, and the focus should be shifted from the hardware to the infrastructure level. The DNS group was very active with Wilfried, David, and other playing a major role in monitoring and testing beta releases of BIND9. An almost stable production version of BIND9 had been released, and there was no reason to continue those tests anymore. Wilfried added that the issue now was to deploy IPv6 aware DNS, and in fact, he remarked, there is no root server now operational in Europe, which is able to handle IPv6 addresses. Some IPv6 capable application had been developed and tested in the past, but there was still interest in them. In particular, Christian said JOIN is interested in statistics of IPv6 application generated traffic. It was remarked that there is not much http and! ftp traffic, but also that traffic doubles every five weeks and therefore this is something that has to be looked after.

Tim outlined the possible activity to be carried out in the next stage. There is a need to continue to operate test-bed networks, but also to shift the focus from the qtpv6 areas to different ones, and these needs would be reflected in detailed plans for the GEANT deliverables in 2001. The core logistic area for deployment regard mainly test platforms and hardware operability, registry, addressing policies and site allocation, transition scenarios. New IPv6 capable equipment was going to be delivered in the future, like the Cisco 12.2.1(T) expected in January 2001 which needed to be tested. On the registry area Tim and Wilfried said the group would work with RIPE who had already started some activity as collaboration between the routing and IPv6 working groups. Wilfried said also that the Regional Registries request

IETF a formal statement about addressing policies and site allocation with a clear decision between /48 /56 /64. In fact, it was said, the IESG recommended stickin! g to a fixed boundary of /48 but the whole discussion will need to be sorted out before the end of the year otherwise it would harm the deployment of IPv6.

Some continuation of previous work will need to be carried out, but most activity would regard the transition scenarios, in particular the group should figure out how the backbone and the university will migrate to IPv6. There will also be additional study areas of interest regarding test of security mechanisms and IPsec, VPNs, firewalls, and new mobile devices as soon as they will become available. Some other activity would be overlapping with other areas in GEANT and TF-NGN, like multicast (e.g. KAME PIM SM), QoS and MPLS. Tim concluded by saying that there is a need to focus on core items but also include other interest and most of all establish collaboration with existing initiatives outside the current group and projects like 6INIT, 6WINIT and others.

Tim`s presentation is available at http//www.terena.nl/task-forces/tf-ngn

Among the comments there was a suggestion from Mauro to carry out tests on the effect of fragmentation. Other remarks from Wilfried regarded the expectation that the real IPv6 devices will not have anymore an IPv4 stack within 2-3 years, and the huge amount of IP addresses requested by mobile operators.

11. Policy based networking

Cees de Laat was invited to present the activity of the IRTF AAAARCH research group in view of fostering related activity in the context of TF-NGN. Cees is chairing the research group since last year. The group works on server building blocks for AAA. They are collaborating with GMD Fokus who are building a whole metering/accounting module. Cees also reminded that AAA has relations with middleware and GRID. There are still open fundamental questions, like should all A`s stay together, or be dealt with separately? Should the architecture stay at the middleware level or be visible at the application level? etc.

Possible testing activity for TF-NGN would be
-       use the European research networks as test-beds for AAA
-       VLL type of service
-       top-down approach from application to middleware AAA to Bandwidth Brokers and Diffserv
-       concentrate on aggregation of authentication
-       SLA policy metering and verification

Tiziana Olav and Dimitrios were interested in participating in such activity and said they had more questions to be discussed with Cees offline. Mauro reminded two problems related to middleware, general slow down of performance and generation of lots of small packets. Wilfried said the proposal from Cees was an interesting one, but ACONET did not have resources available to contribute.

Cees talk can be found on both his home page and the page of the AAA-ARCH Research Group
http//www.phys.uu.nl/~delaat
http//www.phys.uu.nl/~delaat/#Recent_talks
http//www.phys.uu.nl/~wwwfi/aaaarch
http//www.phys.uu.nl/~wwwfi/aaaarch/vienna/index.htm

Information on how to join the mailing list of the AAAARCH RG is available at
http//www.phys.uu.nl/~wwwfi/aaaarch/charter.html

Cees briefly reported also the results of the policy group led by Leon Gommans.
Iphighway and Cisco QPM were evaluated in experiments carried out recently with
participants from Switzerland, Spain, Italy and the Netherlands. Both solutions
offer a GUI interface, but little or no abstraction and are not topology/service
aware. They are not really management tools yet. The main interesting results can be
found at http//www.phys.uu.nl/~Lgommans/policy/policy.html

ACTION 10.5 Cees or Leon, to provide information about the Policy tests to the TF-
TANT chair to be included in the informal report

12. Diffserv

Tiziana, briefed bout the recent results of the group. There were a few practical
tests, mainly some preliminary tests by Octavio about traffic conditioning for AF.
Shaping on EF would be continuing in the coming weeks. A
paper based on TF-TANT work was presented at the QoFIS workshop in Berlin. Some test
on priority queuing was carried out, and Tiziana said it would be interesting to see
if that result could validate theoretical studies carried out in the IETF Diffserv
working group.

Octavio reported about some tests on parameters configuration for the usage of WRED.
The test-bed included IRISA in France, DANTE and the University of Stuttgart in
Germany. The test was run three times, with the aim of understanding how to
configure the max queue length. However, WRED parameters were not properly
configured because it was not able to assure 0% loss of highest priority green
packets. Octavio had plans to repeat the experiments by tuning WRED parameters,
testing other marking mechanisms, like single rate and double rate TCM, studying
difference between flows and
forcing "fairness". However there were criticisms, especially from Mauro addressing
the fact that the experiment was not appropriate, because it did not investigate
real traffic, which is mostly TCP not UDP. In fact WRED had to be used to optimize
TCP not UDP, which is usually dropped in real traffic conditions. Tiziana commented
that the aim of the experiment was to test functionality and not to tune WRED,
however she recognised that the work should be better focused in the future.

The main part of Tiziana`s session was about the TF-NGN test programme on QOS. She
grouped all proposals discussed previously in the TF-TANT mailing list into eight
tasks, and in addition, she identified four interdisciplinary QoS aspects, with
relations to other work item in different groups
-        QoS aware policy based networking
-        MPLS TE QoS support
-        performance of QOS at high speed
-        interoperability.

The full presentation is available at
http//www.cnaf.infn.it/~ferrari/papers/myslides/tf-ngn-qos.ppt

Dimitrios commented on Tiziana presentation that EF would be beneficial to real time
applications and tests could go in that direction. He also suggested studying
scenarios about provision/management of US connectivity end-to-end. The University
of Twente and the University of Pisa were interested in Task 5 " end-to-end QOS with
different access technologies", and in particular in studying COS needs and effects
of COS for different network access technologies in interdomain scenarios.

The amount of work envisaged in Tiziana`s presentation was considerable, and the
main part of the discussion was targeted to identify people who wanted to actively

work and people who could lead the individual tasks. For each task, the people mentioned below agreed to take responsibility in the coming week to coordinate the production of concrete action plans to be proposed and discussed to the group at the next meeting in Paris.

Task 1 Over provisioned network performance
   Wim, University of Utrecht

Task 2 Delay Jitter based services
   Tiziana, INFN

Task 3 AF based services
   Octavio, IRISA

Task 4 Inter NREN/ intra NREN/ inter-continental services
   Dimitrios, GRNet

Task 5 end-to-end QOS with different access technologies
   David University of Twente

Task 6 QOS in multicast scenario
Robert, DFN

Task 7 Bandwidth Brokerage
   INFN/ University of Utrecht

Task 8 QOS monitoring
   Victor Reijs
1)   application monitoring
2)   QOS/SLA measurement (consistency with SLA)
3)   network monitoring
4)   traffic analysis for predictive services is interesting for Tiziana, but she could not take it and therefore will be postponed
ACTION 10.6 Tiziana, Wim, Octavio, Dimitrios, David, Rober and Victor, to coordinate the planning of concrete experiments to be carried out in the QoS work area before the Paris meeting.

At the end of the session David Remondo briefly presented the work about Access technologies being carried out at the University of Twente. He said that past and current activities span from Diffserv in radio access networks, to QoS support in mobile networks, Micro mobility (MM) protocols and IP in cellular and wireless networks. The future activities will regard mostly network interoperability between UMTS, wireless LANs, Bluetooth on the one hand, and Ad hoc networks (infrastructure-less, self-configuring networks) on the other hand. Finally, they will look after mobile IP and interoperability of IPv4 IPv6.

13. DATE OF NEXT MEETING
The next meeting will be held on the 20th and 21st of November 2000. The venue will be Paris, France.

14. ANY OTHER BUSINESS

No other business.

15. ACTIONS FROM LAST MEETINGS

6.10 Robert Stoy to produce test description for BMGP/MASC.
- Ongoing

8.1 Simon to check who are using Cabletron routers in their networks.
- Ongoing

9.1 Those who have the IBM boxes to ship them back to CERN.
-       Ongoing
-
9.3 Olav to post URL (the password is the same as for QTP)
-       Done

9.4 Herve Prigent to send information/URL about "netnet" tool
- Done

9.5 Tom Kosnar to send new URL on MIB design and tool creation
- Ongoing

9.6 Lada to distribute his action plan for the next month
- Done

9.7 Ladislav to co-ordinate collection and publishing on dante's web of
known problems/solutions.
- Ongoing

9.8 Leon to define what has to be tested and then to decide whether he
wants to connect Utrecht to IN
- Ongoing

9.9 Phil to mail his presentation to Tiziana.
- Done

9.10 Tiziana to put presentation by Phil on the Diffserv web site.
- Ongoing

9.11 University of Twente to write recommendations based on
experiments reported by Mirjana.
- Done

OPEN ACTIONS

6.10 Robert Stoy to produce test description for BMGP/MASC.
- Ongoing

8.1 Simon to check who are using Cabletron routers in their networks.
- Ongoing

9.1 Those who have the IBM boxes to ship them back to CERN.
-       Ongoing

9.5 Tom Kosnar to send new URL on MIB design and tool creation
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known problems/solutions.
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9.10 Tiziana to put presentation by Phil on the Diffserv web site.
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10.1 Roberto to coordinate the collection of input to the informal QUANTUM report.
Target date for collection of input is mid November 2000.

10.2 All, send pointer of presentations to Valentino.

10.3 Victor to involve people and make concrete plans about optical networks for the
next meeting.

10.5 Cees or Leon, to provide information about the Policy tests to the TF-TANT
chair to be included in the informal report.

10.6 Tiziana, Wim, Octavio, Dimitrios, David, Rober and Victor, to coordinate the
planning of concrete experiments to be carried out in the QoS work area before the
Paris meeting.