



Minutes of 2nd TF-TANT Meeting



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Date: Sun, 21 Mar 1999 15:06:29 +0100
From: Kevin Meynell
Subject: Revised minutes of the 2nd TF-TANT meeting
To: TF-TANT@TERENA.NL

TERENA/DANTE TASK FORCE FOR TESTING ADVANCED NETWORKING TECHNOLOGIES

Minutes of the 2nd TF-TANT meeting held on the 25th and 26th of January 1999 at the TERENA Secretariat, Amsterdam, The Netherlands.

Kevin Meynell - Issue 2

PRESENT

Name	Organisation	Country
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Bob Aiken	Cisco	United States
Pantelis Balaouras	GRNET	Greece
Michael Behringer	Cisco	United Kingdom
Rui Bettencourt	FCCN	Portugal
Mauro Campanella	INFN Milano	Italy
Zlatica Cekro	VUB/ULB	Belgium
Howard Davies	DANTE	-
Rob van Dinther	KPN	The Netherlands
Armando Domingues	FCCN	Portugal
Francis Dupont	INRIA	France
Alain Durand	IMAG/G6	France
Tiziana Ferrari	INFN Bologna	Italy
Dusan Gabrijelcic	IJS	Slovenia
Silvia Giordano	EPFL	Switzerland
Leon Gommans	U.Utrecht/Cabletron	The Netherlands
Christoph Graf (Chair)	DANTE	-
Jaap Heffels	KPN	The Netherlands

Dimitrios Kalogeras	GRNET	Greece
Olav Kvittem	Uninett	Norway
Cees de Laat	U.Utrecht	The Netherlands
Ladislav Lhotka	CESNET/USB	Czech Republic
Olivier Martin	CERN	Switzerland
Vassilis Merikoulias	GRNET	Greece
Kevin Meynell (Sec)	TERENA	-
Jan Novak	DANTE	-
Simon Nybroe	Telebit	Denmark
Herman Pals	KPN Research	The Netherlands
Juergen Rauschenbach	DFN	Germany
Victor Reijs	SURFnet	The Netherlands
Esther Robles	RedIRIS	Spain
Roberto Sabatino	DANTE	-
Robert Stoy	RUS/DFN	Germany
David Sutherland	KPN	The Netherlands
Jean-Marc Uze	RENATER	France
Bert Wijnen	IBM	The Netherlands
Wilfried Woeber	ACOnet	Austria

Apologies were received from:

Brian Carpenter	IBM UK	United Kingdom
Simon Leinen	SWITCH	Switzerland
Guenther Schmittner	JKU/ACOnet	Austria
Istron Tetenyi	HUNGARNET	Hungary
Bernard Tuy	CNRS	France

1. APPROVAL OF MINUTES

The minutes of the TF-TANT meeting held on the 5th and 6th of November 1998 were approved.

2. STATUS OF QUANTUM & TEN-155

Howard reported the QUANTUM contract had been received from the European Commission in mid-January having been dated the 28 December 1998. As expected, the project start date was specified as the 1st of October 1998 which meant a number of deliverables were already due.

The first lines for TEN-155 had already been delivered. These were the lines in the UK-Netherlands-Germany-France-UK loop, and the lines between the Netherlands, Switzerland, Germany and Sweden. The line from TEN-155 to the US was also operational. Lines from the Netherlands to Belgium, Germany to Sweden, Germany to the Czech Republic, and Greece to the Netherlands, were due shortly.

Unfortunately, the line between Austria and Germany had failed testing and was having to be re-tested. This would cause a knock-on delay for the Austria to Hungary connection. In addition, the Hermes supplied line between Germany and Italy had not yet been delivered. As Hermes had also failed to supply the connection from the Netherlands to Luxembourg on-time, this had raised some concerns about their performance.

There were still problems with Spain, Portugal and Slovenia that needed to be resolved before the old TEN-34 contract expired at the end of March. Spain was due to be connected to TEN-155 sometime in April, but a contract had not yet been signed with Portugal Telecom as they were quoting extortionate rates. In Slovenia, the telecommunications monopoly were offering reasonably acceptable prices, but they wished to retain ownership and control of all the equipment. This was mainly because they considered ARNES (the Slovenian NRN) a threat to their business.

Three more countries were also planning to connect to TEN-155. Cyprus and Israel would be connected in the context of the EU-funded Q-MED project, whilst POL-34 (the Polish Supercomputer Network) would provide the access point in Poland.

On the equipment front, the Ascend ATM switches were showing some problems under high traffic loadings. This was because each interface had a single processor queue that was equally balanced between CBR and UBR, but TEN-155 was currently configured to solely run UBR. It was likely this problem could be solved by adding more interfaces. In addition, the new Cisco 12000 router in New York had a VC queueing problem. If this could not be resolved, a Cisco 7500 would be moved from Washington D.C.

The roll-out of TEN-155 also meant interconnections with some commercial networks had to be re-negotiated. BT still peered with TEN-155, but AUCS had stopped routing traffic to Ebone despite agreeing to continue doing this for another six months. Unfortunately, commercial networks did not appear to be willing to sign zero-cost peering agreements any longer.

Wilfried was concerned about when the Cisco 7000 series routers were due to be replaced on TEN-155, especially given the problems with the new 12000 series routers. Howard replied there was no defined timetable, but the 7000s ultimately had to be replaced because they would not be adequate. They were looking at equipment from other vendors, but their requirements were quite specialist.

Dimitrios expressed unhappiness at the number of routes to commercial networks that had been lost. He said some customers had

been charged 10 million drachma because their traffic was having to use backup routes.

3. MANAGED BANDWIDTH SERVICE

Howard reported the QUANTUM Policy Committee had approved use of the TEN-155 Managed Bandwidth Service (MBS) for TF-TANT activities. The amount of bandwidth dedicated to the MBS had still not been defined, but it would be in the order of 15-20% as originally envisaged. An alpha test phase would commence in January with the MECCANO Project as the users, and this would be followed by a beta test phase with 4 or 5 users (possibly including TF-TANT). It was envisaged the full service would start from May onwards.

In order to capacity plan, some information would be required from the NRNs on how much bandwidth they planned to dedicate to the MBS. In addition, it was important to obtain information on local connectivity. It was no coincidence that the projects given early access to the MBS had good access to their national PoPs.

Tiziana asked whether a permanent 2 Mbps overlay network could be established for the TF-TANT activities. Howard thought this would not be a problem.

Jean-Marc asked whether specific test equipment could be located at a PoP. Howard replied this was generally not a problem, provided there was sufficient space to accommodate it.

4. REVIEW OF EXPERIMENT DESCRIPTIONS

4.1 RSVP

Simon Leinen was not present at the meeting, but Christoph reported there did not appear to be much interest in RSVP as a separate activity. Simon had proposed to amalgamate this experiment with the RSVP to ATM SVC mapping experiment.

Victor thought RSVP was experiencing an identity crisis. It did not appear to scale well and it would be difficult to manage. In addition, the QBone was currently drawing attention away from it.

Bob said that some people were looking at using RSVP as a signalling protocol in conjunction with DiffServ. RSVP had problems handling many small flows, so it may not scale to backbones in general. Nevertheless, it may be possible to use it in a core network with small subsets of users, or in an campus environment.

Christoph concluded there was not enough support for this experiment on its own. Simon should therefore contact Tiziana to determine what activities could be included in the RSVP to ATM SVC Mapping Experiment.

ACTION 2.1 - Simon Leinen

4.2 Multicasting (IP and ATM)

Robert presented his proposal for establishing a native multicast network over TEN-155 (<http://www-ks.rus.uni-stuttgart.de/TF-TANT/Multicast-test-spec.htm>). This would allow performance issues and multicast routing protocols to be investigated.

Jan added the current TEN-155 multicast overlay had to be re-designed anyway, as the Mbone feed from MCI would shortly disappear. They had an offer of a DVMRP feed from UUNET, but this required tunnels to be moved around.

Christoph suggested that Robert and Jan should specify the TEN-155 multicast facilities together.

ACTION 2.2 - Robert Stoy and Jan Novak

4.3 Differentiated Services

Tiziana presented her proposal for testing Differentiated Services (<http://www.cnaf.infn.it/~ferrari/tfng/diffserv.html>). She proposed to investigate IP precedence-based QoS mechanisms and DiffServ during the 1st Quarter of 1999, and then a mixed DiffServ-intServ architecture during the 2nd Quarter. There were also some issues related to policy and security that needed to be investigated.

Christoph said the point of DiffServ was that applications did not need to know about it. Bob added that policy servers were responsible for allocation of bandwidth, although these were still being developed.

Christoph then asked what this experiment required from QUANTUM. Tiziana replied that a CBR class of service was required, but the tests would not require equipment to be located at the PoPs. At a later stage however, it might be useful to establish a domain over the core network itself.

Mauro asked about the type of applications being considered for the tests. Tiziana suggested involving the Condor (distributed computing) and MONARC (simulation and modelling) projects for this. Bob added it might be interesting to include the Globus Project

(<http://www.globus.org/>) which had similar aims to the Condor Project.

Cees de Laat asked to be involved in this experiment as the DYNACORE Project (real-time control) required QoS for its activities. Tiziana agreed to integrate the project into her proposal.

ACTION 2.3 - Tiziana Ferrari

Finally, Silvia mentioned that EPFL were developing a DiffServ implementation. They were interested to become involved in this experiment.

4.4 RSVP to ATM Mapping

Tiziana presented her proposal that aimed to determine whether the integration of IP and ATM QoS mechanisms was viable (<http://www.cnaf.infn.it/~ferrari/tfng/rsvp-atm.html>). Tunnelling could be used for this experiment, but per-VC shaping would be necessary over TEN-155.

Ladislav asked how the RSVP to SVC mapping would be implemented. Tiziana replied that EPFL were currently developing an RSVP add-on to the Linux ATM distribution which should be available shortly. Bob added that Cisco would also be including RSVP mapping facilities in IOS.

4.5 IP Version 6

Simon presented his proposal for implementing an IPv6 service over TEN-155 (<http://www.dante.net/tf-tant/experiments/IPv6/>). This would be closely mapped to the existing IPv4 service and would consist of a single routing domain running EBGP.

Alain added the goal of the experiment was to establish a production-quality network that would allow IPv6-compliant applications to be tested. The 6Bone currently provided some facilities, but this was tunnelled over the regular Internet and was not very robust. Internet2, vBNS, CANARIE, ESnet, CAIRN and WIDE had therefore formed a native IPv6 network known as the 6REN (<http://www.6ren.net/>) which enforced certain conditions. It would be useful to have something similar in Europe which could be interconnected with the 6REN via the STARTAP in Chicago.

Roberto asked how much bandwidth would need to be dedicated to such a network. Alain replied that 1 Mbps was recommended.

Roberto also asked whether the proposal required dedicated routers instead of workstations. Alain replied that using workstations for

routing did not present a good image to NRNs and vendors. It was possible the activity would not be taken seriously.

Juergen asked whether it was possible to interconnect with the 6REN other than at the STARTAP. Alain replied it would soon be possible to peer via ESnet on both the East and West coasts.

Mauro said the first step would be to set-up an IPv6 DNS Server. Alain agreed and added the latest version of BIND could handle AAAA records; both IPv4 and IPv6 could be used to make a query. Nevertheless, this system would not scale in the long-term and a new scheme had been proposed which dynamically builds DNS records.

Francis commented that DANTE probably needed to become a PTLA before it could become a Sub-TLA. The draft guidelines for issuing IPv6 addresses required organisations to have involvement with IPv6 networks before they were granted registry status.

Christoph concluded this was an interesting activity. The goal of the Task Force was to investigate technologies that may be used in a production environment, and NRNs were already looking at migration strategies from IPv4 to IPv6. He proposed the 6REN procedures should be adopted for the TEN-155 IPv6 service. Simon was asked to mention this initiative at the forthcoming RIPE meeting to determine the level of support.

ACTION 2.4 - Simon Nybroe

4.6 IP over ATM

Roberto said he needed to test the performance of IP over ATM as part of the management of TEN-155, but he asked whether anyone else was interested.

Victor replied that SURFnet had conducted such tests over VBR together with KPN and the University of Utrecht. A report would be available shortly. He added that he would like to see similar tests over lossy ATM.

Wilfried said he might be interested in this activity if VPs from TEN-155 were being extended into NRN infrastructure.

Jean-Marc asked whether NRNs without Ascend switches could participate. Christoph replied this may be possible.

Roberto was asked to draft a detailed proposal for this experiment.

ACTION 2.5 - Roberto Sabatino

4.7 ATM Signalling

Jan reported that KPN planned to start using ATM signalling from the 1st of June, and were currently defining the resources. A pilot SVC service would be operated during September and October, with the full service coming before the end of the year. The ATM signalling experiment would investigate point-to-multipoint mapping, RSVP to ATM mapping and PNNI.

Victor asked whether it was possible to investigate NNI. Jan replied it would not be possible to define resources at that level. Rob confirmed that KPN proposed to offer UNI, not NNI signalling to TEN-155.

Jean-Marc asked whether a mesh of VPs could be established between the core switches, with PNNI running over this. Rob replied this might be possible, but their priority was to ensure production services were not affected.

4.8 Policy Control

Victor reported that Leon Gommans from the University of Utrecht had been asked to conduct a study of policy control. This would be necessary to run things such as RSVP, differentiated services and ATM switched services. A number of proprietary solutions were currently available and these would be investigated, but some input was required on what else was available.

Christoph asked Leon to send details of the policy control mechanisms that were being investigated to the mailing list.

ACTION 2.6 - Leon Gommans

4.9 Route Monitoring

Simon Leinen was not present at the meeting, but he was looking for comments on his proposal to investigate BGP analysis tools. This was being done for SWITCH anyway, but it would be useful to know if other NRNs were doing something similar.

Wilfried said Austria was currently conducting route monitoring, but the tools being used were quite old. It would therefore be useful to investigate the RATool set as a possible replacement. Roberto also expressed DANTE's interest in this experiment.

Francis mentioned they had developed some PERL scripts to analyse routing tables. These had been used for TEN-34 and would also be used for TEN-155. Roberto was asked to make these available on the

WWW.

ACTION 2.7 - Roberto Sabatino

4.10 Flow-based Monitoring

Simon Leinen was not present at the meeting, but his proposal was discussed.

Wilfried was concerned about interpretation of network statistics. They could provide a general overview of a network, but they should not be used to produce reports. Christoph however, said network statistics were already being used in the UK and the Netherlands for accounting purposes.

Dimitrios pointed out that NetFlow produced erroneous figures in certain circumstances. This had currently halted their project to evaluate traffic statistics.

It was agreed this experiment was useful to most NRNs, but it was felt the aims and methodology could be better specified. Simon was therefore asked to revise the proposal.

ACTION 2.8 - Simon Leinen

4.11 QoS Monitoring

Tiziana presented her proposal for monitoring QoS (<http://www.cnaf.infn.it/~ferrari/tfng/qosmon.html>). This aimed to utilise network monitoring tools to determine whether requested levels of service were being met.

Jean-Marc said that MIBs should be included in the list of monitoring tools for this activity. Tiziana agreed to incorporate these.

Dimitrios mentioned the RIPE Test Traffic Project was undertaking similar work. Kevin however, said this project involved commercial networks and he believed much of the data was confidential.

Jean-Marc felt that traffic measurement issues justified a separate meeting. Kevin replied that TERENA had already established a Task Force for this purpose, but it had not met for some time. Nevertheless, another meeting could be arranged if there was sufficient interest.

4.12 MPLS

Jean-Marc presented his proposal for testing MPLS (<http://www.>

renater.fr/jmu/QTP/mpls-desc.html). This aimed to survey the existing implementations, gain experience of the technology, test advanced features, and determine its scalability over a European ATM backbone. Cisco had agreed to loan the necessary equipment which meant a list of requirements had to be made.

ACTION 2.9 - MPLS experiment participants

Christoph noted the proposal mainly concentrated on Tag Switching. Jean-Marc replied that he was starting with Tag Switching, but other implementations of MPLS could be investigated in a later phase.

Christoph went on to ask whether the NDA signed for the TF-TEN experiments was still in force. This could be a problem as results from TF-TANT activities were being made public. Jean-Marc replied the terms of the NDA still applied, but some compromise could probably be reached.

Dimitrios also asked whether such NDAs would affect multi-vendor interoperability tests. Jean-Marc replied this issue would have to be investigated.

Juergen asked when the MPLS specification would be published as an RFC. Jean-Marc was not aware of the current status of this, but he would put references to the drafts on the WWW.

ACTION 2.10 - Jean-Marc Uze

Mauro asked whether MPLS was tied to IPv4. Bob replied it would be reasonably easy to port MPLS to use IPv6, but he was not sure when this would happen.

4.13 VPNs

Victor said SURFnet had started to investigate some products that allowed VPNs to be established over public networks. This investigation was also linked to policy control as VPN users often needed to connect via external services (such as dial-up).

Wilfried suggested that end-to-end encryption should also be investigated as part of this study.

4.14 WDM

Victor said he was still investigating the possibilities of testing WDM. Unfortunately, PNOs were generally not willing to provide dark fibre, so complicated negotiations were necessary.

Juergen commented they had some experience of WDM over the Gigabit test network provided by Deutsche Telekom. They were currently only using three wavelengths, but they planned to increase this number. The test network had recently been extended to Berlin and this required the installation of seven amplifiers. These appeared to be working well.

Christoph asked Juergen to send some information about their WDM experiences to the mailing list.

ACTION 2.11 - Juergen Rauschenbach

It was agreed this activity should be dropped from the list of experiments until further progress was possible.

4.15 SDH Issues

Victor was investigating the issues related to STM-4. Any findings would be sent to the mailing list for discussion.

Christoph said this was an important issue and could be discussed at future meetings, but it probably did not need to be an experiment. This was agreed.

5. VENDOR INTEGRATION

Christoph said he needed to determine what equipment needed to be procured for the testing activities. He therefore asked experiment leaders to specify equipment requirements in their proposals by mid-February. In addition, he asked everyone to produce a list of the equipment they already have.

ACTION 2.12 - Experiment Leaders

ACTION 2.13 - All

6. DATE OF NEXT MEETING

The next meeting will be held on the 29th and 30th of March 1999 at NTUA, Athens, Greece.

7. ANY OTHER BUSINESS

Bob announced that Cisco planned to host a peering workshop on the 23rd and 24th of March 1999 in Amsterdam. This would be preceded by a workshop on multicasting on the 22nd of March and would be attended by Cisco engineers working in this area. Both workshops

were aimed at NRNs and Internet Exchange personnel, but attendees would require an invitation.

Christoph mentioned that he had drafted some designs for a TF-TANT logo. He asked participants to review these and let him know which design they liked most.

8. ACTIONS FROM LAST MEETING

- 1.1 Kevin Meynell to rename the TF-TEN mailing list.
- Done.
 - 1.2 Kevin Meynell to create a link from the TERENA WWW pages to the TF-TANT WWW pages.
- Done.
 - 1.3 Christoph Graf to give the TF-TANT WWW pages a 'neutral' URL.
- Done.
 - 1.4 Robert Stoy to produce a multicasting experiment proposal.
- Done.
 - 1.5 Telebit to produce a proposal for for establishing an IPv6 network over TEN-155.
- Superseded.
 - 1.6 Mauro Campanella to send the URL of the MONARCH project to the mailing list.
- Done.
 - 1.7 All Experiment Leaders to produce a list of requirements by the 1st of December.
- Superseded.
- 981004-1 Victor Reijs to send URL of GigaPort Activity Plan to the mailing list.
- Done

OPEN ACTIONS

- 2.1 Simon Leinen to contact Tiziana Ferrari to determine what activities could be included in the RSVP to ATM SVC Mapping Experiment.
- 2.2 Robert Stoy and Jan Novak to specify the TEN-155 multicast facilities.
- 2.3 Tiziana Ferrari to integrate DYNACORE project into the

Differentiated Services proposal.

- 2.4 Simon Nybroe to mention IPv6 proposals at RIPE32 to determine levels of support.
- 2.5 Roberto Sabatino to draft a detailed proposal for the IP over ATM experiment.
- 2.6 Leon Gommans to send details of the policy control mechanisms under investigation to the mailing list.
- 2.7 Roberto Sabatino to make routing analysis scripts available on the WWW.
- 2.8 Simon Leinen to revise the flow-based monitoring proposal.
- 2.9 MPLS experiment participants to specify their equipment requirements.
- 2.10 Jean-Marc Uze to put references to IETF MPLS drafts on the WWW.
- 2.11 Juergen Rauschenbach to send some information about WDM experiences to the mailing list.
- 2.12 Experiment Leaders to specify equipment requirements in their proposals by mid-February.
- 2.13 All to produce a list of the equipment they already have.

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[March 1999]