

TRANS-EUROPEAN NETWORKING TASK FORCE

Minutes of the 16th TF-TEN meeting held on the 2nd and 3rd of July 1998 at CESNET, Prague, Czech Republic.

Kevin Meynell 20/07/98

PRESENT

Name	Organisation	Country
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Michael Behringer (Chair)	DANTE	-
Mauro Campanella	INFN Milano	Italy
Zlatica Cekro	ULB/STC	Belgium
Vegard Engen	BDC/Uninett	Norway
Tiziana Ferrari	INFN Bologna	Italy
Olav Kvittem	Uninett	Norway
Simon Leinen	SWITCH	Switzerland
Ladislav Lhotka	CESNET/USB	Czech Republic
Vassilis Merikoulias	NTUA	Greece
Kevin Meynell (Sec)	TERENA	-
Jan Novak	DANTE	-
Victor Reijs	SURFnet	The Netherlands
Guenther Schmittner	JKU/ACOnet	Austria
Pavel Smrha	CESNET/UWB	Czech Republic
Robert Stoy	RUS/DFN	Germany
Daniel Sturm	CESNET	Czech Republic
Jean-Marc Uze	RENATER	France

Apologies were received from:

Celestino Tomas	RedIRIS	Spain
Baoyu Wang	UKERNA	United Kingdom

1. APPROVAL OF MINUTES

The minutes of the last meeting held on the 27th and 28th April 1998 were approved.

2. STATUS OF TEN-34 & QUANTUM

Michael reported the TEN-34 connection to the US had recently been upgraded from 34 to 45 Mbps, and the 2 Mbps connection from EuropaNet to Japan had been moved to the TEN-34 PoP in the UK. An Mbone overlay network had also been running across TEN-34 for a few

months, with workstations running mouted located at each PoP. Some problems had been experienced with newer versions of mouted not supporting SNMP which meant the mouters had to be downgraded, and there were still unresolved problems with the backup tunnels. These however, were not major concerns. The TEN-34 contract had been extended to December on a month-to-month basis to allow nodes to be gradually moved over to the QUANTUM network.

The selection of a supplier to provide the QUANTUM network was now in the final stages. The Policy Committee had shortlisted two suppliers and would probably make a final decision in the next few days. Unfortunately, these suppliers could not be named, but they both offered similar prices and solutions. A letter of intent would be sent to the successful bidder and a contract would be negotiated over the next month. There was still no decision as to what the new network would actually be called.

The Policy Committee had also decided the network would be based on ATM running over SDH. The core switches and routers would be maintained by the supplier, with NRNs having the option of being connected via ATM or a leased line. Both IP and managed bandwidth services would be available.

Guenther asked whether the network would use a full mesh. Michael replied this still had to be determined, but the Technical Committee had proposed full-mesh UBR as this required less interfaces than other solutions. Victor suggested that FUNET in Finland should be investigated as they were currently running fully-meshed UBR.

Guenther also asked whether an ATM switch would be located in each country. Michael believed this would be the case.

Tiziana asked whether any research bandwidth had been incorporated into the network. Michael replied the design of the network made it possible for each NRN to allocate bandwidth, if any, for this purpose.

Victor requested clarification that an NRN would be required to use ATM if it wished to conduct experiments over QUANTUM. Michael replied this was indeed the case unless an NRN used an alternative connection.

Olav asked whether four STM-1 connections could be aggregated over an STM-4C line. Michael replied this was possible provided Cisco could supply the necessary OC-12 interfaces.

3. NATIONAL ACTIVITIES

Michael asked each NRN to provide an update on their current activities and future plans.

3.1 Germany

Robert reported that DFN had just started to offer native ATM services. They were also participating in the MECCANO (the successor to MERCI) and EDISON (the successor to ATV-DSD) projects. Other projects included investigation of QoS over IP.

3.2 Czech Republic

Ladislav reported that CESNET had just moved to over to a new provider. Most of the network now ran over fibre, and the Cisco switches had been upgraded with PFQ cards. An Mbone overlay had been deployed, but they had been unable to use sparse-mode PIM successfully. A group was also working on caching technology - some bug fixes had been made on Squid, and the Cisco Caching Engine was being tested. Unfortunately, there were still some copyright problems to resolve.

3.3 Austria

Guenther reported that JKU would be participating in two distributed events: IDC'98 in September and Global 360 in November. These would utilise ATM to bring together sites in Europe, North America, Japan and Russia). The ISABEL multicasting software, which was available for Sun, SGI and Linux platforms, would be used for the broadcasts.

The PFQ card for the Cisco LS-1010 was now in production and logical multicasting via LANE had been implemented. The latest version of the IOS (11.3.2A) had also been tested which made it possible to use different numbers for each end of a VP tunnel.

3.4 Norway

Olav reported the 155 Mbps connections providing between 50 and 120 Mbps of usable bandwidth were now operational. The network used a double-star topology and ran over VBR which was believed to be over-subscribed. A full mesh was not used because the PTO did not use packet discard.

A test IPv6 backbone had been established over ATM VPs, and PNNI was also running. In addition, four students were working on a traffic measurement project to produce traffic profiles of their customers.

Guenther asked about IPv6 performance with Cisco equipment. Olav replied the network had just been set-up, but routing did not appear to work very well.

3.5 Greece

Vassilis reported they were upgrading three of their backbone connections to 34 Mbps. The rest were being upgraded to 4 Mbps, although they were experiencing some funding problems. They had also been a lot of complaints about the amount of bandwidth the Mbone was consuming over the existing 2 Mbps connections and this would hopefully improve things.

A managed bandwidth service was proposed for GRNet and was being piloted on the Athens MAN. They hoped to write an application that would allocated bandwidth via a WWW interface. They were also running two projects to investigate Voice over IP and Voice over ATM and were hoping to offer these services to universities. Other projects were investigating IPv6, Mbone, video-conferencing and video-on-demand applications. Finally, there was an initiative under the Q-MED framework to upgrade the current 2 Mbps connection with Cyprus to 10 Mbps ATM. Unfortunately, the chances of this did not appear too promising at the present time.

3.6 Italy

Mauro reported their new backbone network should be operational by September. The logical topology would be similar to the physical topology.

Tiziana reported a proposal to test IP QoS had been submitted. A decision about this was due in September. They would also like to analyse MPLS, WDM and optical switching in the next couple of years.

3.7 France

Jean-Marc reported the RENATER US bandwidth had been divided into 35 Mbps for universities and CNRS (which was totally congested), and 10 Mbps for research organisations. They were experimenting with a one-way satellite connection from the US which would add, if tests were successful, another 15 Mbps (for a total of 75 Mbps). Production traffic had also been added to the national ATM testbed for testing purposes. This was using automatic recovery with a 2-3 minute delay, so they planned to test OAM shortly.

RENATER II was planned for mid-1999 and would run at 155 Mbps to all 25 regions. It would offer both IP and native ATM services, in addition to a VPN service.

3.8 Belgium

Zlatica reported there were rumours that BELNET would move to usage-based charging. There were plans to base the ULB/VUB campus network on Cisco LS-1010s, although they no longer had an external ATM connection. IPv6 was currently being investigated and some interworking tests with IPv4 were being conducted. Finally, there had been some theoretical work on resource management using simulation.

3.9 The Netherlands

Victor reported they had decided not to upgrade their network to STM-4C as it had proved difficult to procure the necessary equipment. In the meantime, they had migrated their multicast overlay network to use PIM instead of DVMRP.

The ADSL project (Snelnet) in conjunction with PTT Telecom and NOB had been extended until the end of the year. The television feed had been withdrawn due to copyright problems, but it was still possible to obtain the World Cup goals and the Top 40 videos on demand. SURFnet was providing the IP connectivity and DNS services.

Other projects were investigating RSVP, IPv6, distributed computing over ATM, VBR overbooking and IP over lossy ATM. They were also currently writing the proposal for SURFnet 5 which would focus on the use of WDM.

3.10 Switzerland

Simon reported the SWITCH Next Generation network was planned to be operational next year and would be ATM-based. They were also conducting experiments with IPv6, and developing charging and accounting mechanisms.

4. NHRP TUTORIAL

Vegard gave a tutorial about NHRP. This monitors traffic flows between routers and attempts to dynamically set up shortcuts using SVCs in order to bypass them. If a particular traffic flow is too small for this mechanism to be efficient, the traffic is routed as normal. NHRP can also theoretically be used by IPX and X.25, but there are not currently any known implementations

NHRP works reasonably well with a moderately number of nodes, but it does not appear to scale to large networks. The number of SVCs on each interface is limited to 255, and the load on the NHRP server eventually becomes too large. In addition, every router must support NHRP for it to work effectively, it does not work across ATM network boundaries, and it does not yet support QoS.

Guenther asked whether NHRP was fully implemented in MPOA considering the NHRP specification had only recently been finalised. Vegard was unable to comment as he was unaware of any implementations of MPOA. Guenther however, believed one was available from Cisco.

Simon commented that he expected NHRP to be supported by IPv6 over ATM end-system implementations, as this was relatively simple with the Neighbour Discovery protocol.

Michael asked whether NHRP could be used on QUANTUM. Simon replied this was unclear, but it might be interesting if end-to-end ATM was offered.

5. ATM MIB PRESENTATION

Zlatica gave a presentation about the different MIBs that supported ATM. A number of standards bodies were working on these including the ATM Forum, IETF, ITU-T, ETSI, ANSI and the Network Management Forum. There were also a number of proprietary MIBs produced by the likes of Cisco. Recent Cisco IOS releases however, standardised MIBs on both switches and routers. Unfortunately, important functions such as OAM had still not been fully implemented by vendors, and there also appeared to be competition between the SNMP and CMIP approaches to network management.

Mauro asked about the version of SNMP used by the SNMP-based MIBs. Zlatica replied they mainly required SNMP 1.0.

Mauro also commented it was difficult to determine which MIBs were relevant. Jean-Marc proposed this should be investigated as part of the QUANTUM project.

6. FUTURE ACTIVITIES

Michael said this was the last meeting of the TF-TEN. A lot of useful work had been undertaken and members needed to think whether this should continue. They also needed to decide whether experiments for both QUANTUM and on behalf of other organisations could be undertaken by a single group. It seemed clear however, the scope of any future group or groups should concern Layer 3 and below as there were already a number of projects (e.g. MECCANO) that were conducting application-level experiments.

The QUANTUM network would offer managed bandwidth facilities and this offered opportunities for conducting experiments. It had been

recognised the procedures for requesting bandwidth on the JAMES network had been unsatisfactory, and DANTE was determined that all requests would be handled within 24 hours (but normally within 15 minutes). The policy as to who may request bandwidth had yet to be determined, but it was likely to include EU Telematics and ACTS projects. There was a proposed charge for the bandwidth in order to discourage frivolous requests and to fund additional bandwidth if demand was high.

Guenther asked how much of the QUANTUM bandwidth would be available for research purposes. Michael believed not more than 20%.

Victor believed any new group should follow the example of the TF-TEN and should not be restricted to members of QUANTUM. Michael believed this would remain the case. All the TF-TEN deliverables were publicly available even though this was not the case with the other TEN-34 deliverables.

Olav, as Convenor of the TERENA WG-LLT (Working Group for Lower Layer Technologies), said the TERENA Technical Committee felt the joint TERENA/DANTE TF-TEN had been a great success and would support something similar. As a result, they had granted him a mandate to create a new task force if necessary.

Michael was asked whether the QUANTUM consortium had made a decision about the role of any successor to TF-TEN. He replied this was still under discussion by the Policy Committee.

The meeting recommended that a new task force open to anyone should be formed. This would undertake experiments on behalf of NRNs as well as QUANTUM, and as a result, it should be run under the auspices of TERENA. It was also agreed that deliverables must be defined as these were the key aspect of producing good results.

Michael was asked about the duration of QUANTUM. He replied it had a three year timescale, but an experiment programme should only be scheduled for one year initially. The programme should also try not to be too ambitious, as this had been a problem with the TF-TEN. Further experiments could always be defined at a later date.

The following areas were identified for possible investigation:

- Network Management tools for IP and ATM.

- Quality of Service provision over IP and ATM.

- Managed video-conferencing over ATM, ISDN and the Mbone.

- IPv6 implementations, interworking, routing protocols and applications.

- IPv4 route monitoring and services.

Label-based Switching.
Wave Division Multiplexing.
Access methods (e.g. ADSL, satellite).

As a WG-LLT meeting was already scheduled at the TERENA Networking Conference in October, this could be used to launch any new task force. The intervening period was an opportunity to define the terms of reference and to draft the programme of experiments. It was proposed that someone from the QUANTUM Technical Committee should be invited to the meeting.

7. DELIVERABLE WORK

Michael reported that Deliverable 14.2 had been completed and was available in HTML and Word 8 format (<http://www.dante.net/ten-34/DELIVERABLES/D14.2/>). Unfortunately, a PostScript version had not been made available as the file size was in excess of 27 Mb.

Deliverable 14.3 was already due and there was little time to produce this, especially as he was leaving DANTE at the end of the week. This was intended to be a concise document that would summarise the current possibilities in a production network, and would discuss the pros and cons of different traffic classes. A draft would be circulated by Wednesday for comment, with the final document being completed by the end of the week.

Mauro asked whether ATM would be recommended for the WAN. Michael believed it was necessary for some networks, but not for others.

Jean-Marc suggested the document should include a comparison of different backbone designs (e.g. PVC, SVC, MPLS).

Guenther believed Deliverable 14.3 should contain new material and not cover old ground. Michael partially agreed, but said that re-stating certain points would reinforce their views.

8. CONCLUSION OF TF-TEN

Michael said that most people were aware he was leaving DANTE to join Cisco. Any remaining work relating to TF-TEN would therefore be taken over by Jan Novak. Nevertheless, there was a possibility he could maintain some involvement with the successor Task Force.

He went on to say he had enjoyed working with the group on both a professional and personal level and thanked all the participants. He added that Howard Davies had also asked him to pass on the thanks of the TEN-34 consortium.

Olav, on behalf of the TERENA, thanked Michael for chairing the TF-TEN and commended his work. This also regrettably meant a new chair had to be found for the successor task force. He asked for expressions of interest.

Finally, Michael thanked Ladislav and CESNET for hosting the meeting and declared the task force closed.

9. DATE OF NEXT MEETING

A meeting of the TERENA WG-LLT will be held on Sunday, 4th October 1998 in Dresden, Germany. This coincides with the TERENA Networking Conference and will be used to discuss the establishment of a new task force.

10. ACTIONS FROM LAST MEETING

- 15.1 Victor Reijs to check whether the JAMES document comparing ABR and VBR was freely available.
 - Done. The document could not be circulated.
- 15.2 Kevin Meynell to send details of ITU-T document listing all the national registration authorities to the mailing list.
 - Done.
- 15.3 Victor Reijs to send URL of ATM loopback tests conducted by the University of Twente to the mailing list.
 - Superseded.
- 15.4 Michael Behringer to announce Mbone meeting on the mailing list.
 - Superseded.
- 14.8 Zlatica Cekro to investigate which version of Cisco IOS supports OAM and send this information to the mailing list.
 - Done.
- 14.9 All to check whether their switch can support OAM.
 - Done.
- 14.10 Jose Vilela to send a summary of the ATM Forum security recommendations to the mailing list.
 - Done.