TRANS-EUROPEAN NETWORKING TASK FORCE

Draft Minutes of the 11th Meeting of the TF-TEN held on the 20th and 21st of July 1997 at the DANTE Offices, Cambridge, UK.

Kevin Meynell 23/07/97

PRESENT

Name	Organisation	Country
Stefania Alborghetti	INFN/GARR	Italy
Michael Behringer (Chair)	DANTE	-
Mauro Campanella	INFN/GARR	Italy
Woohyong Choi	KAIST	South Korea
Tiziana Ferrari	INFN	Italy
Christoph Graf	DANTE	-
Simon Leinen	SWITCH	Switzerland
Kevin Meynell (Sec)	TERENA	-
Mick Palfrey	BT	UK
Victor Reijs	SURFnet	The Netherlands
Roberto Sabatino	DANTE	-
Guenther Schmittner	JKV/ACOnet	Austria
Robert Stoy	RUS/DFN	Germany
Dave Sutherland	BT	UK
Celestino Tomas	RedIRIS	Spain
Jean-Marc Uze	RENATER	France
Jose Vilela	RCCN	Portugal

Apologies were received from:

Zlatica Cekro	ULB/STC	Belgium
Olav Kvittem	Uninett	Norway
Olivier Martin	CERN	Switzerland
Ramin Najmabadi Kia	ULB/STC	Belgium
Paolo Neves	RCCN	Portugal
Baoyu Wang	UKERNA	UK

1. APPROVAL OF MINUTES

   The minutes of the last meeting held on the 11th and 15th July 1997 were approved.

2. STATUS OF TEN-34

Michael reported that Austria and Hungary were now connected to the TEN-34 network. Greece still had no connection but this was expected in the next few weeks. This was likely to be provided as a single VC from Telecom Italia. Portugal was expected to be connected in the last week of July, but this was not likely to be via Spain as originally envisaged. The connection to the Czech Republic was expected on the 1st August, but this would probably be delayed. The connections to Greece and the Czech Republic were slightly unusual as they would be provided as leased lines at one end, and as an ATM service at the other. Finally, a connection to Luxembourg was scheduled for August, but this would only be 4 Mbps as there was really only one university situated there.

TEN-34 had interconnections with BT in the UK and Switzerland. These gateways were being used by some NRNs that were still connected to EuropaNet. There was also an 5 Mbps interconnection with the Ebone located in Stockholm.

A link from Slovenia to Austria was planned, and it was hoped Poland and Slovakia would also connect at a later stage. A proposal to obtain a connection from TEN-34 to the United States was still being discussed, but this was likely to be a T3. Interconnection points with other networks were also proposed for London and Frankfurt.

The TEN-34 network was still experiencing a lot of problems, but these were gradually decreasing. Unfortunately, the SDH technology used in some parts of the network had not proved resilient and it took up to a day to switch over to the backup.

Victor asked why the ATM part of the network didn't experience the same problems as he thought that also ran over SDH. Furthermore, SDH had been around for a few years and should be fairly stable. Michael replied the ATM part of the network mainly ran over PDH. Dave mentioned that BT has experienced a number of subtle problems with their SDH equipment that were difficult to trace.

Mick asked what services were being offered by TEN-34. Michael replied they only operated an IP service because they did not have access to the ATM-layer across the entire network. In addition, it was difficult to obtain investment for further services as the project formally finished in July 1998.

Simon asked whether the European Commission in Luxembourg would be connected to TEN-34 through RESTENA. Michael replied that 40% of TEN-34 was funded by the European Commission, but there was a question of whether this would contravene the Acceptable Use Policy.

Guenther mentioned rumours of an additional link between Prague and

Vienna. Michael confirmed these were true.

Michael mentioned that DANTE and a number of NRNs were formulating a proposal for a new research network known as 'Quantum'. This was to take advantage of the residual funds available under the EU's Fourth Framework Programme.

3. STATUS OF JAMES

Mick reported that Greece was still not connected to the JAMES network as they were still deciding switch to purchase. The date when they would be connected was not currently known. Israel had also joined the JAMES consortium and were likely to be connected via Paris.

A diagram was displayed showing the services offered by each of the JAMES partners. All partners offered CBR, whilst a number offered VBR, SVCs and multicasting although not all partners could interconnect. IP over ATM using CBR was available from 13 partners, but BT and Tele Danmark were also trialling this service using VBR. A LAN Emulation service with two interconnected ELANs was available from P&T Austria, Portugal Telecom, France Telecom and Tele Danmark. SMDS was also due to be tested from August between 3 Telecom Eireann, Portugal Telecom and P&T Austria. There was not yet any support for ABR although this was planned. JAMES hoped to test this in conjunction with the TF-TEN group.

Unfortunately, most of the advanced JAMES services had very few users. For CBR services, figures showed that only 5% of the bandwidth was utilised on average, and as a consequence, BT were considering support of VBR services only. They currently did not overbook CBR services as a matter of policy, but they had to occasionally turn away users because lines were fully booked at particular times.

Michael commented that it didn't make sense to provide VBR services for the TEN-34 tests, when VBR was not generally supported on the local loop within each partner country. He asked which partners currently supported VBR on the local loop. Mick replied he only knew of the UK (UKERNA) doing this, but added BT's commercial CellStream service also supported VBR.

Michael requested that CBR be maintained for the TF-TEN Overlay Network. Most of the TF-TEN tests had been conducted over CBR, and it would be difficult to compare results if the overlay network was run over VBR. This was agreed by Mick.

Guenther asked whether it would be possible to obtain a map of the JAMES PoPs and the type of switches each partner was using. Mick replied he would attempt to obtain this.

ACTION 11.1 - Mick Palfrey

Guenther also asked whether the performance tests of switches could be published. Mick replied there would be problems with this. Whilst JAMES figures appeared very good, the JAMES network was currently under-utilised and comparisons would not be fair. Michael however, said a distinction could be made between making the results public, and making them available to TF-TEN. The members of the group could sign non-disclosure agreements if necessary. Mick agreed to take this back to the JAMES consortium.

ACTION 11.2 - Mick Palfrey

Christoph asked whether the Czech Republic were joining the JAMES consortium. Mick replied that no more partners were being accepted, but countries could still interconnect to the network.

Mick also discussed the Xcoop Project that a number of JAMES partners were working on. This provided a method by which to automatically configure switches across the JAMES network using X.25. It would also provide a WWW interface for customers to make TFD requests or modifications.

Victor said SURFnet were interested in ATM network management tools, and asked whether XCoop was public. Mick replied it was an ETSI standard.

Mauro urged PNOs to only implement open WWW standards when implementing XCoop, and not something like Microsoft ActiveX. He also asked whether PGP was being used for authenticating requests. Mick replied only a username/password pair was currently in use. Victor added SURFnet had used WWW pages for two years and they had never received one bogus request during that time. Nevertheless, they were currently implementing SSL.

Guenther suggested that standard times should be implemented in any network management system. During the recent Global 360 event, some VCs had come up an hour late which he attributed to time differences.

Dave reported that bilateral SVC compliance tests had been conducted between eleven JAMES partners. These however, only tested call set-up and tear down and were not concerned with stress testing, failure rates or call set-up times. The next stage was to

create regional groupings to avoid tunnelling problems. Unfortunately, Germany was at the centre of the JAMES network and they used Siemens switches that had signalling problems.

Victor asked whether IISP or UNI 3.1 would be offered. Dave replied this hadn't yet been considered, so they could offer either. He added they were not planning to implement PNNI in the context of the JAMES Project.

Guenther asked how the multicast services were being implemented. Mick replied they were using static point-to-point connections on a unidirectional basis only. Bi-direction multicasting was possible, but requires two separate VP identifiers when using the current software of the Newbridge switches.

Mick mentioned that a JAMES User Forum was being held on 4th and 5th September in Munich. Further information was available from:

http://www.labs.bt.com/profsoc/james/forum/

4. CO-OPERATION WITH JAMES

Michael said the contract between the JAMES and the European Commission required joint experiments to be conducted between the PNOs and TEN-34. To date, little progress had been made on this, but JAMES were keen to start collaborating with the TF-TEN group. The following areas of cooperation were identified:

ATM Traffic Management - Irfan Soneji (BT), Telefonica and Victor Reijs (SURFnet).

SVC Management - Dave Sutherland (BT) and Christoph Graf (DANTE).

ATM Point-Multipoint Testing - Irfan Soneji (BT) and Robert Stoy (RUS).

ATM Addressing - Dave Sutherland (BT) and Kevin Meynell (TERENA).

Network Management - Reinhard Zagolla (Deutsche Telekom) and Zlatica Cekra (ULC/STC).

Native ATM Performance - Dirk Hetzer (?) and Stefania Alborghetti (INFN).

It was agreed that ATM Routing and Resource Reservation, Security, Integrated Services and Address Resolution could not considered as areas of cooperation due to lack of interest from one or both

parties.

Both parties were interested in IP over VBR, but TF-TEN did not yet have anyone to lead this experiment. In addition, Victor said SURFnet were interested in VBR/SBR trials provided they could find a project partner.

ACTION 11.3 - Victor Reijs

Mick said he would send an updated list of experiments and JAMES collaborators to the mailing list.

ACTION 11.4 - Mick Palfrey

Michael said a meeting with JAMES in Cambridge had produced a large action list, but little had come of it. He asked whether activities could be conducted on a more formal basis with deliverables. Mick replied he could only take this request back to the JAMES partners. Unfortunately, there were a number of non-disclosure clauses in the JAMES contract to prevent non-European PNOs from obtaining sensitive information.

Dave agreed that TEN-34 required more information in order to conduct tests. The joint experiments were part of the contract with the European Commission and needed to be moved forward. Mauro reminded JAMES the data would be outdated in six months anyway.

Mick suggested a list of JAMES deliverables could be circulated to the TF-TEN group. Michael said this would be useful as they had no idea what JAMES was doing. He suggested using the private JAMES/TEN-34 mailing list

ACTION 11.5 - Mick Palfrey

Mauro asked whether there were any 155 Mbps links remaining in the JAMES network. Mick replied there was one running between either Koln and Helsingborg or between Koln and Zuerich; he could not remember exactly. There had originally been three 155 Mbps links, but one had been downgraded and one had been removed. This had been due to lack of demand and for commercial reasons.

5. OVERLAY NETWORK PLANNING

Michael asked about the status of the VPs on the TF-TEN Overlay Network. As testing was about commence, it was important to ensure all the connections were operational.

Kevin said there were problems with the switch at UKERNA. Whilst it was still operational, access via the Internet had been blocked by UKERNA for security reasons. The switch and the host machine were situated on their LAN, and they were unhappy at allowing root access (as was necessary) from outside their firewall. Arrangements had been made to move the equipment to separate physical subnet, but there were no free interfaces on the UKERNA router. Nevertheless, an interface would become available once the JANET X.25 network ceased operation on the 1st August. Kevin said he would speak to UKERNA about moving the equipment.

ACTION 11.6 - Kevin Meynell

Most members were uncertain whether the status of their VPs had changed from the previous meeting. Michael asked everyone to check their VPs as soon as possible.

ACTION 11.7 - All

Guenther suggested setting-up pings to periodically check whether the VPs were still up. Mauro thought this was a good idea, but the use of ping would require IP to be configured on the overlay network and routing protocols could cause problems. OAM cells were suggested as an alternative. Christoph however, said OAM was only supported by Cisco and some sites were using Fore equipment.

Michael thought this type of network management should come under Zlatica Cekro's project. Jose however, said that Zlatica used out-of-band access to the switches and did not monitor the links themselves.

It was agreed that Michael should speak to Zlatica about this issue.

ACTION 11.8 - Michael Behringer

Michael mentioned that TEN-34 now had direct support from Cisco that could be accessed by the TF-TEN group. It was unclear whether members had to contact Cisco through DANTE, but Michael suggested the group should try contacting them directly.

Victor asked whether anyone had access to the Cisco database. Robert replied that RUS did.

Michael requested that all experiment leaders investigate precisely what software (version and sub-version) would be required for their experiments. This information should be mailed to him.

ACTION 11.9 - All Experiment Leaders

6. STATUS OF EXPERIMENTS

6.1 ATM Routing

Guenther said the initial goal of this experiment was to prove interoperability between different implementations of PNNI, but he thought only Cisco had an ATM Forum implementation of this. This still had a number of problems, but he could nevertheless start configuring it on his switch.

Christoph said Fore supported a proprietary version of PNNI, but he thought they should have a PNNI 1.0 compliant version by now. Jose believed this was supported by Version 4.0.2 of the Fore software. Michael asked everyone with Fore switches to check this.

ACTION 11.10 - All people with a Fore switch.

Tiziana said she would investigate whether Digital switches supported PNNI 1.0.

ACTION 11.11 - Tiziana Ferrari

6.2 ATM Resource Reservation

Guenther said the ATM Resource Reservation tests would follow on from the ATM Routing tests. Routing either worked or it didn't, but establishing routing with a certain quality of service was more complicated. He thought however, it may be difficult to obtain accurate results whilst utilising tunnels.

Michael suggested the ATM Routing and Resource Reservation tests could be integrated into a single PNNI experiment.

6.3 Label-based Switching

Jean-Marc reported that the Cisco implementation of label-based switching (Tag Switching) was already available as a beta release for their 7200 and 7500 routers. A beta release for the LS-1010 was scheduled for September. He intended to first test this in a local environment, then on the France Telecom network over CBR tunnels, and later on the TF-TEN Overlay Network. The commercial version of Tag Switching was scheduled for the end of year.

Michael asked whether RENATER intended to use Tag Switching on their production network. Jean-Marc said they were considering it, but it was early days yet. In addition, the initial implementation of Tag

Switching would only utilise VP0, and not SVCs.

Guenther asked whether Tag Switching could be integrated with PNNI. Jean-Marc replied this was not possible without a full SVC environment.

Michael asked who was willing to participate in these tests. Simon, Victor, Tiziana and Guenther replied they were interested.

6.4 IP Resource Reservation

Simon reported he was setting-up an RSVP-capable IP network using ATM connections as leased lines. Mbone tools and a variety of background traffic would then be used to see if quality of service is affected. He thought however, that RSVP would be difficult to implement in the overlay network because no QoS signalling was available, and Cisco did not yet have ATM mapping in their routers.

Michael mentioned he had spoken with Telebit and there was a chance to loan a couple of their routers. A detailed proposal would be required though, and he was not sure they could be obtained within a reasonable timescale.

Stefania said there had been serious problems running RSVP on their production routers. Guenther added there were a lot of bugs in IOS Version 11.2 anyway, and RSVP may not be entirely responsible for this.

6.5 ATM Point-to-Multipoint

Robert Stoy said the first stage of this experiment was to map IP multicast onto ATM multicast using SVCs. This however, was dependent on the outcome of the SVC Signalling tests.

The participants in this experiment would be Germany, Austria and Portugal.

6.6 ATM Signalling

Christoph said this experiment was really a continuation from Phase I. The software on the switches required upgrading to the latest version possible, although Signalling 4.0 was currently only supported on the LS-1010. Fore switches currently only supported UNI 3.1, and he was also not aware of any host adapters that could support anything above this.

Christoph asked everyone to update the equipment list on the TF-TEN pages, and to check whether their NSAP addresses were still valid.

ACTION 11.12 - All

Simon suggested the NSAP addresses should be entered into the DNS. He understood BIND Version 4.9.4 supported NSAP record types. Christoph agreed, but he said NSAP addresses should be allocated their own zone so they could be transferred easily. They would also need to apply to the RIPE-NCC for a reverse NSAP zone.

ACTION 11.13 - Christoph Graf

Guenther said there was a signalling tool that ran under Linux and wondered whether it could be developed or modified for other operating systems. Tiziana replied she knew the author and would contact him for more information.

ACTION 11.14 - Tiziana Ferrari

6.7 ATM Policy and Accounting

Victor said this was mainly theoretical work, but he asked for input on a technical and strategic level. He was unsure whether any practical work could be conducted, but any implementations could be tested if they became available (e.g. for Northern Telecom).

Simon suggested discussing this at the IETF. The Internet Policy Control Working Group had only started in December, but they had already produced a document known as OOPS (Open Outsourcing Policy Service).

Michael said this could be discussed further on the mailing list.

6.8 ATM Traffic Management

Victor reported tests with proprietary ABR running on Digital Flowmaster switches had provided a number of ideas for this experiment. Unfortunately, most switches required a feature card upgrade that meant potential project partners would probably have to invest some money.

Guenther said he planned to upgrade their LS-1010, but he could not commit to any participation yet. Victor replied this was not a problem as the ABR experiment did not have to commence until the end of the year. In the meantime, he would ask suppliers whether the necessary hardware could be loaned.

Guenther asked whether anyone had any information on LS-1010 feature cards. Michael replied he would raise it with TEN-34's contact at

Cisco.

6.9 ATM Address Resolution

Olav Kvittem was not present at the meeting, but Michael reported these tests were an extension of what happened in Phase I. Uninett, SWITCH, DFN and ACOnet were interested in participating.

Guenther mentioned he was planning to set-up MPOA across his LAN to run IP. Cisco would not have an implementation before the end of the year, but Fore currently had a beta software available.

6.10 ATM Addressing

Kevin said this project was a continuation from Phase I although address translation should be tested if possible.

Michael thought address translation should really be tested in conjunction with JAMES, but loopback could be tried if this was not possible. Kevin agreed to draft a proposal about this.

ACTION 11.15 - Kevin Meynell

Jean-Marc suggested designing a European scheme using an ICD format NSAP. He thought this would be necessary if signalling was implemented on a future ATM-based European academic network. Michael agreed this was interesting, but he did not believe this work should be prioritised.

6.11 Native ATM Performance

Stefania intended to use TCP/ONIP and NetPerf, but the Fore API was based on SPANS which meant it was difficult to test performance across the wide-area. Nevertheless, an implementation based on UNI 3.1 was now available and they were on the waiting list for the beta software.

Jean-Marc asked whether other applications such as video-conferencing could be tested before March. Stefania replied they were not too interested in video applications, but they were looking at an X implementation for native ATM. Jose added that Vegard Engen (formerly of Uninett) was also developing a WWW Server for native ATM.

6.12 Network Management

Zlatica Cekro was not present at the meeting. Michael had already agreed to update her on the JAMES developments, and to discuss the

use of OAM on the TF-TEN Overlay Network (see Action 10.8).

6.13 Security

Jose said RCCN intended to revise their experiment proposal as it was too general. They did not envisage much practical work because this involve a lot of effort for a short scale project. As there had been no known attacks on an ATM network (although this may be due to their relative scarcity), there wished to concentrate on identifying potential security holes (e.g. the lack of access lists on switches).

Victor thought it would be useful to develop a tool to detect security holes just to prove ATM networks were as vulnerable as IP networks. A similar tool (SATAN) had been developed for use on IP networks. Jose pointed out however, the problems were with applications rather than network protocols.

7. PRESENTATION ON SVC SET-UP TIMES

Stefania gave a presentation on SVC set-up times and failure rates. Standard UDP pings were used for measuring the SVCs, and it was discovered that a Cisco LS-1010 switch introduced an average delay of around 6 ms. This means that set-up times may not be negligible in a complex WAN. The tests however, showed that set-up times are related to a variety of parameters including hardware, software and the loadings on hosts.

8. DATE OF NEXT MEETING

The next meeting will be held on the 15th and 16th September at RCCN in Lisbon, Portugal.

Subsequent meetings were also scheduled as follows: 17th and 18th November at RENATER in Paris; then 9th and 10th February 1998 at a venue to be arranged.

9. ANY OTHER BUSINESS

Michael asked Woohyong about the APAN (Asia-Pacific Advanced Network) initiative. Woohyong said information was available from:

http://www.apan.net/

Victor said the results from his overhead calculations were

available on the SURFnet WWW pages. There were a lot of differences in the data, but a number of conclusions could be made. ATM was 10-15% less efficient than other technologies, whilst SONET added a further overhead of 5%. These figures had been calculated over SURFnet's 6 Mbps link to the United States.

Kevin mentioned that TERENA were organising a workshop on behalf of NATO during April/May 1998 in Lithuania. They were considering including a session about ATM in the programme and were looking for people interested in giving a tutorial.

10. ACTIONS FROM LAST MEETING

10.1 All Experiment Leaders to produce their proposals by the 31st May.
- Done.

10.2 All Experiment Leaders to aggregate proposals where possible.
- Done.

OPEN ACTIONS

11.1 Mick Palfrey to obtain a map of the JAMES PoPs and the type of switches each partner is using.

11.2 Mick Palfrey to ask the JAMES consortium whether the performance tests of switches can be made available to TF-TEN group.

11.3 Victor Reijs to try and find a project partner for conducting VBR/SBR trials.

11.4 Mick Palfrey to send an updated list of experiments and JAMES collaborators to the mailing list.

11.5 Mick Palfrey to circulate a list of JAMES deliverables on the private JAMES/TEN-34 mailing list.

11.6 Kevin Meynell to speak to UKERNA about moving the TF-TEN equipment to a separate physical subnet.

11.7 All to check their Overlay Network VPs as soon as possible.

11.8 Michael Behringer to speak to Zlatica Cekro about network management issues.

11.9 All Experiment Leaders to investigate precisely what software (version and sub-version) was required for their experiments.

11.10 All people with a Fore switch to check whether it was PNNI 1.0 compliant.

11.11 Tiziana Ferrari to investigate whether Digital switches supported PNNI 1.0.

11.12 All to update the equipment list on the TF-TEN pages, and check whether their NSAP addresses were still valid.

11.13 Christoph to apply for a reverse NSAP zone from the RIPE-NCC.

11.14 Tiziana Ferrari to contact the author of the signalling tool for Linux to discover whether it can be ported to other operating systems.

11.15 Kevin Meynell to draft proposal for testing ATM address translation.