

TRANS-EUROPEAN NETWORKING TASK FORCE

Draft Minutes of the 12th Meeting of the TF-TEN held on the 15th and 16th of September 1997 at FCCN, Lisbon, Portugal.

Version 3

Kevin Meynell 14/10/97

PRESENT

Name	Organisation	Country
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Stefania Alborghetti	INFN/GARR	Italy
Michael Behringer (Chair)	DANTE	-
Zlatica Cekro	ULB/STC	Belgium
Tiziana Ferrari	INFN	Italy
Christoph Graf	DANTE	-
Olav Kvittem	Uninett	Norway
Cees de Laat	U.Utrecht	The Netherlands
Simon Leinen	SWITCH	Switzerland
Vassilis Merikoulias	NTU Athens	Greece
Kevin Meynell (Sec)	TERENA	-
Edmundo Monteiro	U.Coimbra	Portugal
Manuel de Oliveira Duarte	U.de Aveiro	Portugal
Paulo Pinto	IST/INESC	Portugal
Goncalo Quadros	U.Coimbra	Portugal
Victor Reijs	SURFnet	The Netherlands
Rui Rocha	IST/INESC	Portugal
Guenther Schmittner	JKV/ACOnet	Austria
Robert Stoy	RUS/DFN	Germany
Jean-Marc Uze	RENATER	France
Jose Vilela	RCCN	Portugal

Apologies were received from:

Mauro Campanella	INFN/GARR	Italy
Olivier Martin	CERN	Switzerland
Celestino Tomas	RedIRIS	Spain
Baoyu Wang	UKERNA	UK

1. APPROVAL OF MINUTES

The minutes of the last meeting held on the 20th and 21th July 1997 were approved.

## 2. STATUS OF TEN-34

Michael said there was very little to report from the last meeting. Greece and the Czech Republic were now connected to the TEN-34 network, and Slovenia was expected to connect in the next few weeks. Deliverable 14.1 was also now available on the WWW in HTML as well as postscript format. The URL was:

<http://www.dante.net/ten-34/DELIVERABLES/D14.1/>

Jean-Marc asked how the TEN-34 statistics were provided. Michael replied a script opened a telnet session to each switch, issued a command to display the status of the VCs, and processed the output.

Guenther said the counters on Cisco switches gave incorrect results because of a bug. A new MIB was supposed to be available that could poll data, but did not provide interface descriptions.

Victor asked whether VC multiplexing was being used. Michael replied this had just started.

## 3. STATUS OF JAMES

Michael reported that several members of the TF-TEN group had attended the JAMES User Forum in Munich. Not a great deal of information came out of this, but it was confirmed that the JAMES project would officially finish on 31st March 1998. A few PNO representatives however, speculated that some parts of the network might still be available for a while after this date.

Michael also mentioned that DANTE were investigating whether any test capacity could be incorporated into 'Quantum', the successor to TEN-34.

Jean-Marc asked how many people had attended the User Forum. Michael replied there had been approximately 100 delegates including representatives of the PNOs.

## 4. STATUS OF EXPERIMENTS

### 4.1 ATM Routing

Guenther reported PNNI was running in the local environment at JKU without any problems, although the Cisco LS-1010 currently only supported one peer group. This meant all partners needed to use the

same group prefix, which in the case of JKU, was 24-bits in length. Tests were now about to start across JAMES with INFN/GARR and SWITCH, but other partners were still being sought.

Tiziana said INFN Bologna was interested in participating in both this experiment and the RSVP experiment. To this end, she asked whether it was possible to obtain an additional VP to the TF-TEN Overlay Network. Simon replied this was not a problem in theory, but Italy was connected via SWITCH who had to pay for every connection. Nevertheless, he would investigate moving the VP to Bologna.

#### ACTION 12.1 - Simon Leinen

Robert said RUS was interested in participating and would be able to start later in the week. Jean-Marc said RENATER was also interested and could probably start during the next week.

Jose said RCCN would participate if the Fore ASX-200 was capable of supporting PNNI 1.0. RedIRIS however, would need to tunnel their VP if they did not wish to join the experiment. Fore PNNI did not currently interwork with Cisco PNNI, but there was a new version of the switch software available. He and Stefania agreed to try and obtain this through their technical support channels.

#### ACTION 12.2 - Jose Vilela and Stefania Alborgheiti

Christoph said the UK would also participate if Fore was able to support PNNI 1.0. Norway, Belgium and Greece however, were unable to join the experiment at the current time.

Guenther thought everyone should run Signalling 4.0 if possible. This was supported on Cisco LS-1010s from IOS 11.2.11 onwards, although there were some problems with end-systems when using version 11.2. He asked users of other switches to check whether they supported Signalling 4.0

#### ACTION 12.3 - All

Guenther mentioned that GDC were planning to produce a version of PNNI by the end of the year. He had also heard that Fore would no longer provide software updates for the ASX-200 (as opposed to the newer ASX-200BX) after the current release 4.1.

During the lunch break, Guenther and Simon successfully established a PNNI connection between Switzerland and Austria, although it was necessary to use a 1-bit prefix.

## 4.2 ATM Resource Reservation

Guenther said the ATM Resource Reservation tests could not start until PNNI was running successfully across JAMES.

## 4.3 Label-based Switching

Jean-Marc proposed an additional experiment to test the Ipsilon IP Switching technology. Whilst he was a little uncomfortable with proprietary technology, he felt it was important to gain experience with another label-based switching technique.

Some basic testing of Cisco Tag Switching had already been conducted in a local environment. The next step was to test this between RENATER and France Telecom.

Assuming this was successful, testing on the TF-TEN Overlay Network could probably begin in November. This would not be a long experiment and was concerned with running the BGP protocol in addition to a few performance and resilience tests. He was currently looking for project partners, and added Cisco appeared to be interested in providing some hardware (e.g. new LS-1010 feature cards). Michael was asked whether he could contact the Cisco TEN-34 representative to obtain firm commitments.

### ACTION 12.4 - Michael Behringer

Simon and Stephania confirmed the participation of SWITCH and INFN in the experiment. Guenther said he was interested, but the hardware at JKU needed upgrading first. Robert was also interested if he could obtain a router.

Jean-Marc added the LS-1010 required 32Mb of memory to run the Tag Switching software.

## 4.4 IP Resource Reservation

Simon reported he was using PVCs between RENATER, SWITCH and INFN as leased lines to run an RSVP-capable IP network. The Cisco routers were running IOS 11.2 which provided RSVP support, and an implementation of RSVPD for SunOS 4 was being run on the end-stations. Mbone tools (vic and vat) were being used to generate test traffic, and QoS parameters were specified with Sun Bandwidth Manager 1.0.

Testing RSVP over JAMES was ideal as underlying bandwidth was guaranteed, and the load could be easily controlled. There was still a chance that traffic might be dropped, but this was very

rare and did not really concern multimedia applications. It was important however, that test traffic did not leak onto production networks which meant that static routes were probably necessary.

Stefania asked whether Cisco IOS 11.2 was stable enough for production routers. Simon believed it was fairly stable when RSVP was disabled. He added that ANS ran it on their routers.

Jean-Marc asked whether RSVP could run on a Cisco 4500 router. Simon understood this was possible if the router had an ATM interface card capable of shaping.

Michael asked whether RSVP was supported on any other platforms. Simon replied that RSVPD was available for most BSD-based systems, SGI had a similar application to Sun Bandwidth Manager, and Telebit claimed their routers had full support for RSVP.

#### 4.5 ATM Point-to-Multipoint

Robert said this experiment required PNNI to be running successfully on the TF-TEN Overlay Network, and was also dependent on the outcome of the SVC signalling tests. It was therefore unlikely that tests could begin until November. Nevertheless, it was possible to specify the project requirements.

Cisco routers would be required to run IOS 11.2.8, whilst the Cisco LS-1010 switches needed to run IOS 11.2.4 or higher. Those with Fore switches needed to ensure they were running ForeThought 4.x.x. Mbone tools were obviously required, but participants must ensure the Mbone across the Overlay Network was separated from the 'production' Mbone.

In order to establish a multicast network across the Overlay Network, it was necessary to prepare routing tables for each nodes. Guenther agreed to do this.

#### ACTION 12.5 - Guenther Schmittner

Michael asked whether it was possible to specify metrics that prevented leakages. Guenther replied this was not possible.

#### 4.6 ATM Signalling

Christoph reported the software on all switches except those in Spain and Luxembourg had been upgraded to the latest version. Tests were due to start on the 29th September and would initially use UNI 3.1. Signalling 4.0 was supported by the LS-1010, but there did not appear to be any implementations of this for host adapters.

A reverse NSAP zone had been obtained from the RIPE-NCC, and UKERNA was now one of three organisations in Europe to have one. The procedure for doing this would be sent to the mailing list.

#### ACTION 12.6 - Christoph Graf

Christoph asked everyone to send him their current NSAP and IP addresses so the TF-TEN WWW pages could be updated.

#### ACTION 12.7 - All

Several people commented the NSAP addresses on the WWW pages were difficult to find. Michael agreed to move them to a more prominent place.

#### ACTION 12.8 - Michael Behringer

Guenther asked whether each country could use an NSAP with just an AFI and a national prefix. He did not see the point of using additional prefixes for testing. Victor said this was not a problem if a switch was not being used for other purposes, but he didn't believe this should be encouraged.

Guenther also asked how to define default and secondary routes on a Cisco. Christoph replied a strict routing plan was unnecessary as it was never more than five hops across the TF-TEN Overlay Network. There was no point defining secondary routes because neither Cisco or Fore switches currently implemented re-routing.

### 4.7 ATM Policy and Accounting

Victor reported the University of Twente had produced a paper about ATM policy and accounting issues (see <http://www.surfnet.nl/surfnet/persons/reijs/eng/>). One of the biggest problems was distinguishing between workstations and users, but the solution may be something along the lines of a Radius database. The paper was being put to the sales people at SURFnet for comment as they had experience of selling services to customers, but the TF-TEN group was also asked for it's input.

### 4.8 ATM Traffic Management

Cees reported the results of the ABR tests with Digital switches were available on the WWW (<http://www.fys.ruu.nl/~delaat/>). The end-stations used PCI-based Digital ATM cards that supported ABR and had been tested with LANE and Classical-IP. Unfortunately, the large queue sizes on the switches meant it was difficult to get

them to drop cells during testing.

The next phase of testing was unlikely to start until November due to an office relocation, but project partners with Fore interface cards were being sought. Robert and Christoph agreed to participate, whilst Jean-Marc and Jose were interested if time permitted.

Victor was asked whether he could send the URL (and access password) of his VBR test page to the mailing list. He agreed to do this.

ACTION 12.9 - Victor Reijs

#### 4.9 ATM Address Resolution

Olav said this experiment could not be started until PNNI was running successfully across JAMES. Timescales could probably be discussed at the next meeting when the status of the network was known. AConet, DFN and SWITCH would be the project partners.

Olav was asked whether he was aware of Multicast Address Resolution (MARS). The software for this was available from Bellcore.

#### 4.10 ATM Addressing

Kevin said testing address translation between the NRNs and PNOs was not currently possible as the PNOs did not appear to have address translation capability on their switches. As it was important to obtain experience of this, these tests should be conducted between TF-TEN members. This should be possible between Cisco LS-1010s running IOS 11.2.

Guenther, Jean-Marc and Olav expressed interest in running such tests.

Michael said it was now clear that NRNs wished to use NSAP-based addressing schemes. This case should be presented to the European Commission so they could exert pressure on the PNOs to offer such addressing. Kevin agreed to write a discussion paper about NSAP versus E.164 addressing for this purpose.

ACTION 12.10 - Kevin Meynell

#### 4.11 Native ATM Performance

Stefania reported she hoped to start native ATM tests with ENST in France shortly. An implementation of Mosaic and an MPEG-2 viewer

would be used initially, but it was hoped that TCP/ONIP could be used later. Fore had just released a XTI-based API that supported UNI 3.1, but without QoS on SBA-200 adapters (QoS was supported on SBA-200E adapters). This was a beta release supplied with some example code and no documentation. The original proposal to test a native ATM X application was unlikely to happen as no-one was developing this any further.

The project was also looking to test Arequipa which ran on a Linux platform. Whilst this was not a true native ATM application, it did guarantee QoS for WWW browsing. Unfortunately, it was necessary for SVC signalling to work properly before it could be tested.

Tiziana mentioned the Arequipa Home Page and said she would circulate the URL on the mailing list.

ACTION 12.11 - Tiziana Ferrari

Victor expressed surprise that no-one appeared to be testing Winsock. If so, the MESH project (SURFnet, KPN, Lucent) might be interested in becoming involved. Stefania replied that INFN unfortunately did not have any PCs with ATM cards.

#### 4.12 Network Management

Zlatica presented her proposals for setting-up pings to periodically check whether the VPs were still up. These could then be analysed to produce graphical displays of the network status. She was working with Christoph to try and define an optimal set of PVCs that could detect any problems within the TF-TEN Overlay Network.

#### 4.13 Security

Jose said there were known security holes with ATM ARP and LANE, but the obvious danger was unauthorised access to switches. The new version of ForeThought had a number of new security features including secure access, authorisation levels and access lists. These features had to be implemented because Fore had started to sell a lot of switches in Israel.

Michael asked whether any ATM switches supported a secure shell. Jose was not aware of any switches that supported this.

## 5. OVERLAY NETWORK PLANNING

Christoph asked everyone to ensure their VPs on the TF-TEN Overlay

Network were operational so testing could commence. The VP from Belgium to Germany should also be re-established to improve resilience for network management purposes. He would change the JUD to reflect this.

#### ACTION 12.12 - Christoph Graf

Christoph also expressed concern about a potential shortage of IP addresses on the Overlay Network. Each router required a separate IP number, but the Fore ATM cards only supported a maximum of four. This could be a problem if additional routers were utilised.

### 6. CO-OPERATION WITH NEW PARTNERS

Edmundo said his university was interested in developing ATM software. He also asked whether it was possible to obtain a connection to JAMES.

Michael explained the purpose of TF-TEN was to test ATM solutions on behalf of the TEN-34 (a European Commission project), and just identify problems. It was not really involved with developing hardware or software (other than by providing feedback to developers). In addition, the TF-TEN group only organised connections between NRNs. It was the responsibility of each NRN to organise connections within their own country. This was FCCN in the case of Portugal.

Vassilis said Greece was interested in ATM network monitoring, but they still did not have a connection to JAMES. They hoped this would soon be resolved, but they could undertake some experiments locally.

### 7. REPORT FROM IETF

Simon reported on the IETF meeting in Munich, Germany. It had been decided that work on RSVP, that had begun in 1984, should now cease. Further activities would concentrate on implementing the standard. Unfortunately, the future of RSVP was unclear as many people considered it would not scale with large numbers of users. In addition, it was felt the political problems would eventually prove insurmountable as competing ISPs were unlikely to cooperate.

The IP over MPOA group discussed Juha Heinanen's proposal for 'intelligent routing' which was an extension to OSPF. This looked extremely interesting, and had it been available a year ago, the TF-TEN group should definitely have tested it.

## 8. REPORT FROM JAMES USER FORUM

Michael reported the JAMES User Forum had been attended by representatives of three European Commission Directorate-Generals, in addition to a number of projects using JAMES. As mentioned earlier in the meeting, it was confirmed that the JAMES Project would officially finish on 31st March 1998.

Unfortunately, it was unclear how JAMES would be replaced and the European Commission was not sure how to proceed. Basic ATM services (CBR) were now considered stable enough to be offered commercially, but PNOs still required an experimental network to test the more advanced services. One possibility was bilateral agreements between PNOs to provide test capacity. Another possibility was that members of ETNO (European Telecommunications Network Operators) would sign a Memorandum of Understanding to operate a common ATM network. This would be similar to how the European GSM network had been provided.

There were presentations from the ESPIRIT/CANET and ACTS MULTICUBE projects. These had problems obtaining VPs, and there were complaints about missing services (e.g. point-multipoint). There was also a presentation from the ATM Forum that claimed ATM was now a stable technology!

Three Special Interest Groups were also held. Olav chaired SIG which related to IP over ATM. There had been presentations from Michael and Guenther putting forward the perspective of the Internet users, and then from JAMES. A number of issues and concerns were expressed, but the general impression was that PNOs were rather opposed to the Internet.

Kevin attended SIG2 which related to Multimedia Applications over ATM. There was a presentation from BT relating to multimedia applications over switched services, and from NICE Distributed Events regarding the ISABEL CSCW Application. Users were also asked to discuss the areas of multimedia (multimedia retrieval, CSCW, video/audio/data broadcasting, electronic commerce and video games) in which they had interest.

Tiziana attended SIG3 on Performance Measurement. There were presentations from JAMES, the EXPERT and the TEN-34 projects about the types of measurements conducted. It seemed however, the ATM Forum was not undertaking much work in this area as ITU-T standards already existed.

Victor asked whether the TEN-34 project should complain to the

European Commission about the lack of a replacement for JAMES. Michael replied this was already happening.

## 9. DATE OF NEXT MEETING

The next meeting will be held on the 20th and 21st November in Paris, France. This was after the Cisco Networkers Conference held on the 17th to 19th September at Euro Disney. The meeting would start at 14.00 on the 20th September to allow members to attend a Cisco seminar in the morning.

A subsequent meeting was provisionally scheduled for the 2nd and 3rd February 1998 in Spain. These dates immediately preceded the European Telematics Event in Barcelona and Michael said he would contact Celestino Tomas about arranging a venue.

ACTION 12.13 - Michael Behringer

## 10. ANY OTHER BUSINESS

Michael said he intended to tidy the TF-TEN WWW site by clearing any pages from Phase I that were no longer relevant. Members should contact him if anything needed to be kept.

Cees asked about the European Telematics Event in Barcelona. Michael replied this was organised by the European Commission as a showcase for projects in the Telematics for Applications sector.

Finally, Michael thanked Jose and FCCN for hosting the meeting.

## 11. ACTIONS FROM LAST MEETING

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

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

11.3 Victor Reijs to try and find a project partner for conducting VBR/SBR trials.  
- Superseded. There were problems finding a partner and experiments were being conducted locally.

- 11.4 Mick Palfrey to send an updated list of experiments and JAMES collaborators to the mailing list.
  - Ongoing.
- 11.5 Mick Palfrey to circulate a list of JAMES deliverables on the private JAMES/TEN-34 mailing list.
  - Ongoing.
- 11.6 Kevin Meynell to speak to UKERNA about moving the TF-TEN equipment to a separate physical subnet.
  - Done.
- 11.7 All to check their Overlay Network VPs as soon as possible.
  - Done.
- 11.8 Michael Behringer to speak to Zlatica Cekro about network management issues.
  - Done.
- 11.9 All Experiment Leaders to investigate precisely what software (version and sub-version) was required for their experiments.
  - Done.
- 11.10 All people with a Fore switch to check whether it was PNNI 1.0 compliant.
  - Done. It seemed Fore PNNI was proprietary.
- 11.11 Tiziana Ferrari to investigate whether Digital switches supported PNNI 1.0.
  - Done. Digital switches did not support 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.
  - Ongoing. Not everyone had provided updates.
- 11.13 Christoph to apply for a reverse NSAP zone from the RIPE-NCC.
  - Done.
- 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.
  - Done.

#### OPEN ACTIONS

- 12.1 Simon Leinen to investigate moving VP from INFN Milano to

INFN Bologna.

- 12.2 Jose Vilela and Stefania Alborgheiti to try and obtain Fore PNNI 1.0.
- 12.3 All to check whether their switch supports Signalling 4.0.
- 12.4 Michael Behringer to contact Cisco TEN-34 Representative about obtaining hardware for the Label-Based Switching Experiment.
- 12.5 Guenther Schmittner to prepare ATM routing tables for all switches on the TF-TEN Overlay Network.
- 12.6 Christoph Graf to send procedure for obtaining reverse NSAP address zones to the mailing list.
- 12.7 All to send their current NSAP and IP addresses to Christoph Graf for updating the TF-TEN pages.
- 12.8 Michael Behringer to move ATM addresses to a more prominent place on the TF-TEN WWW site.
- 12.9 Victor Reijs to send URL (and access password) of VBR test page to the mailing list.
- 12.10 Kevin Meynell to write discussion paper about NSAP versus E.164 addressing.
- 12.11 Tiziana Ferrari to send URL of Arequipa page to the mailing list.
- 12.12 Christoph Graf to prepare JUD for re-establishing VP from Belgium to Germany.
- 12.13 Michael Behringer to speak to Celestino Tomas about arranging a meeting venue in Barcelona.
- 11.1 Mick Palfrey to obtain a map of the JAMES PoPs and the type of switches each partner is using.
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