JOINT QPC/TF-TANT WORKSHOP

Minutes of the Joint QPC/TF-TANT Workshop held on the 1st of October 1999 at the Steigenberger Esprix Hotel, Frankfurt, Germany.

Kevin Meynell - Issue 1

PRESENT

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John Boland	HEAnet	Ireland
Spiros Bolis	GRNET	Greece
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Joao Cunha	RCCN	Portugal
Dai Davies	DANTE	-
Howard Davies (Chair)	DANTE	-
Trei Duhautpas	RESTENA	Luxembourg
Larry Dunn	Cisco	United States
John Dyer	TERENA	-
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Joao Nuno Ferreira	FCCN	Portugal
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Andreas Pombortsis	GRNET	Greece
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Valeria Rossi	GARR	Italy
Roberto Sabatino	DANTE	-
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Jean-Marc Uze	RENATER	France
Enzo Valente	INFN-GARR	Italy
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Peter Villemoes	NORDUnet	-
Guido Wessendorf	U.Muenster/DFN	Germany
Wilfried Woeber	ACOnet	Austria

1. Introduction

Howard Davies outlined the objectives of the workshop. These were to inform the QPC of the TF-TANT activities and progress, to inform the QPC about proposed future activities, and to obtain feedback on the priorities of the QPC.

2. ATM Signalling

Jan Novak gave a presentation on the ATM Signalling experiment (http://www.dante.net/tf-tant/fft-ws/SVC/index.htm). An SVC service specification had been defined in conjunction with KPN, and SVCs had been implemented on the TEN-155 backbone. The next stage was to extend an SVC pilot service towards the NRNs, but this aimed to facilitate NRN research projects rather than production traffic.

Howard Davies asked how many NRNs planned to use SVC signalling. No NRNs currently had intentions to use this.

3. Policy control

Leon Gommans gave an overview of policy control (http://www.dante.net/tf-tant/fft-ws/policy/index.htm). This was required to allocate resources to person or processes according to a defined set of rules. This would initially be applied to DiffServ and would consist of simple access lists. Eventually, it was hoped that all resources could be controlled through AAA policy servers.

The short-term goals of the TF-TANT activity were to investigate how vendor-specific solutions (Cisco, IBM, IP Highway and Cabletron) could assist the DiffServ overlay network. The participants would be the University of Utrecht, the University of Twente and INFN. In the longer-term, AAA policy servers would need to be evaluated.

Cees de Laat added that establishing policies in single domains was relatively easy. The real challenge was to achieve consistent policies over multiple domains, and this was an area where Europe was playing a strong role. Nevertheless, good feedback from the NRNs was important.

4. Multicasting

Robert Stoy gave a presentation on the multicast activity (http://www.dante.net/tf-tant/fft-ws/Multicast/index.htm). The current Mbone was reaching its limitation. DVMRP was not scalable as dedicated tunnels had to be configured, multicast routing did not relate to unicast routing, and the single domain approach was inefficient. MSDP/MBGP had been developed as an interim solution, but the eventual aim was to use MASC/BGMP.

MSDP/MBGP had been successfully tested on a Cisco 7505 at the Frankfurt PoP, and was now being deployed in the TEN-155 backbone. It was currently running between France, Netherlands, Sweden and the UK, whilst MBGP peering had been established with Belnet, CESNET, DFN, GRNET NORDUnet, RCCN, RENATER, SURFnet, SWITCH, Israel and the US (Alter.net). It was hoped the remaining countries would migrate from DVMRP later in the year.

PIM Sparse Mode was being used for intra-domain routing with TEN-155. As the backbone routers were partially meshed using ATM PVCs, some testing of an ATM point-to-multipoint SVC service was desirable. Some tests had been conducted by TF-TEN during 1998, but these would be continued later in the year.

Robert also gave an overview of the MECCANO overlay network. This used the TEN-155 Managed Bandwidth Service to provide a private videoconferencing network, the performance of which had improved

dramatically since migration to MSDP/MBGP.

Kees Neggers asked whether MSDP/MBGP solved the packet loss problems of the Mbone. Roberto Sabatino replied that as DVMRP was tunnelled, it was not matched to the unicast network and packets were often dropped as a result. The Mbone could now use unicast IP routes which meant the only limitation was bandwidth. Of course, it was not yet possible to reserve bandwidth, so packet loss could still occur on overloaded connections.

5. IP over ATM

Roberto Sabatino gave a presentation on the IP over ATM activity (http://www.dante.net/tf-tant/fft-ws/ipatm/index.htm). As TEN-155 used IP over a variety of ATM traffic classes, it was important to determine the optimal configuration. As a result, tests were conducted during April 1999 at the KPN QWest facilities in Hilversum.

Three workstations were used to send concurrent traffic streams with different SCR values (70, 40 and 0) to a single workstation. Unfortunately, the results were disappointing. SBR3 simply shared available bandwidth between all contenders. This was attributed to a problem with the Ascend switches.

Ian Smith said he was suspicious of results where a single destination existed. Roberto agreed, but added that basic functionality needed to be tested. More comprehensive tests were clearly required.

Dimitrios Kalogeros asked whether ABR would be used on TEN-155. Roberto replied the latest version of Cisco IOS had ABR support. This could be tested if there was demand for ABR.

6. IP Version 6

Simon Nybroe gave a presentation on the IPv6 activity (http://www.dante.net/tf-tant/fft-ws/IPv6/index.htm). This aimed to provide a forum where NRNs could share information, to conduct interoperability tests, and to run a native IPv6 network in order to gain experience of the technology.

An Ericsson Telebit router had been installed in the TEN-155 PoP in Amsterdam, and an IPv6 network had been established over 512 Kbps ATM PVCs. It was similar to the 6REN, and represented a scaled-down version of the existing IPv4 service.

Enzo Valente asked how long the IPv6 network would operate. Simon replied it would operate until the end of the QUANTUM project. The aim was to test as many applications as possible.

Wilfried Woeber was concerned about the lack of vendors offering IPv6 routers. In addition, there were still problems with the DNS. Unless these issues could be resolved, it would be difficult to offer pilot services to end users.

Joop Joosten commented that IPSEC was not being investigated as part of this activity. Simon however, believed this should not initially be a priority.

7. Differentiated Services

Tiziana Ferrari gave a presentation on the differentiated services activity (http://www.dante.net/tf-tant/fft-ws/ds/index.htm). A lot of work had already been undertaken, but there were still many areas to investigate. The interim results were discussed, along with an overview of the planned activities.

Jean-Marc Uze asked whether anyone was using DiffServ. Kees Neggers replied they had tried it on their US connection about a year ago. They had not experienced any problems, but neither had the line been congested.

Mike Norris (?) asked whether CAR worked properly on Cisco routers. Tiziana replied it seemed fine with predominantly TCP traffic, although it was important to set the parameters correctly. In addition, performance suffered with large access lists.

Dimitrios Kalogeros asked whether Voice over IP could be run on TEN-155. Howard Davies replied this was possible if enough NRNs requested it, but they would have to offer it on their own networks as well.

8. Flow-based Monitoring

Simon Leinen said he was investigating how accurate traffic statistics could be produced for exchange points. This could help facilitate volume-based charging, detection of network abuse (e.g. smurf attacks), identify long-term trends (e.g. application mix, new applications, interesting source/destination networks), and detection of routing anomalies. The available tools would be described, compared and deployed where appropriate.

Enzo Valente asked how much router CPU time was required to run

NetFlow. Simon was not sure, but it was being used on their busiest routers without problems. Nevertheless, bandwidth was growing faster than CPU power, and this was starting to have implications at higher speeds. For example, Cisco did not currently offer NetFlow on its high-end routers.

Larry Dunn commented that Cisco would incorporate NetFlow in their high-routers where there was a demand for this. It may however, be necessary to do statistical sampling at very high speeds.

9. RSVP to ATM Mapping

Tiziana Ferrari outlined the RSVP to ATM test specification (http://www.dante.net/tf-tant/fft-ws/RSVP/index.htm). This activity required ATM signalling (and provision of such a service on TEN-155), but it was hoped some tests could be conducted between INFN and CSELT by the end of the year.

Larry Dunn questioned the purpose of this activity. Cisco had been asked by MCI to provide RSVP to ATM mapping for the vBNS, but it had never really been used. In any case, many people were now looking at DiffServ rather than RSVP.

10. MPLS

Jean-Marc Uze presented the objectives and results of the MPLS activity (http://www.dante.net/tf-tant/fft-ws/MPLS/index.htm). The first phase ran from April to June 1999 and had used Cisco equipment. Tests were conducted over the TEN-155 Managed Bandwidth Service. The second phase was scheduled for late-1999/early-2000. This would investigate interoperability, VPNs, and possibly QoS.

Kees Neggers asked when MPLS might be used in a production network. Jean-Marc replied it was already being deployed by some networks. There were still a number of traffic engineering issues to resolve, but the technology was usable.

Howard Davies commented that VPNs did not seem to be quite so 'private' as with normal ATM. Jean-Marc replied that VPNs were isolated through routing rather than switching.

11. Open Discussion

Howard Davies said the migration from DVMRP to MBGP had seemingly improved the quality of the Mbone, which would hopefully encourage use. Of course, widespread use of the Mbone would absorb more

bandwidth, but he believed TEN-155 still had sufficient capacity to cope.

Dimitrios Kalogeros thought the main problem with the Mbone was the lack of user-friendly tools. The main Mbone tools were not commercial, and were difficult to use. Peter Villemoes agreed, but this was likely to change as Microsoft were planning to include multicast support in their operating systems. Cees de Laat added that SURFnet had established the SURFnet Expertise Centrum in order to advise users about these sorts of issues.

Simon Leinen said many people were currently unable to take advantage of the TEN-155 facilities, because their NRNs did not always support multicasting. This was an issue that needed to be resolved.

Howard Davies asked about the urgency of moving from IPv4 to IPv6. The main issue was whether networks should promote the technology, or whether they should wait for user demand.

Simon Nybroe said there were many potential uses for IP technology that were limited by lack of addresses (e.g. mobile telecommunications). Wilfried Woeber agreed, and added that research institutions did not appreciate this problem because many already had Class B addresses. Nevertheless, it was becoming increasingly difficult for smaller organisations to obtain addresses.

Ian Smith believed few users knew about IPv6, and even fewer cared about the issues. It was the role of networks to encourage or force users to make the change. Mike Norris (?) agreed, adding that the advantages of IPv6 would only be realised when it achieved critical mass. The networks needed to be proactive in this respect. Dimitrios however, was not sure how many of the supposed advantages of IPv6 were relevant to the research community.

Enzo Valente said the research community should at least be prepared for the move to IPv6 when it finally occurred. Nevertheless, it would seem there was little requirement for this in the next six months.

Howard Davies asked about new services. Dimitrios Kalogeros replied he would like to see Voice over IP, and integrated directory services. Mike Norris (?) concurred, adding that the telephone costs for a single institution in Ireland exceeded the total expenditure of the research network. Leon Gommans thought the policy control activity had a lot of relevance for these types of service.

Enzo Valente asked for information on the RN2 action item in the EU Fifth Framework Programme. In particular, how this was relevant to

the so-called low bandwidth countries. Howard Davies replied this had only just been issued and was typically very vague. They would need more time to investigate this.

12. Summary

Christoph Graf concluded the workshop with a final thought. There used to be many different network protocols (e.g. CLNS, CONS, DECnet, IP and X.25), but most were gradually obsoleted. Unfortunately, as the number of horizontal layers was compressed, so the number of vertical layers expanded, and we now had to deal with WDM, SDH, ATM, IP, TCP/UDP and HTTP. Hopefully, TF-TANT was taking care of most of the eventualities.

Fernando Liello thanked the speakers and TF-TANT on behalf of the QPC. He also expressed his wish that similar workshops be held in the future.

Finally, Howard Davies thanked his secretary, Edna Hussey, for organising both the QPC and TF-TANT meetings.