TEN-155 Managed Bandwidth Service

Alpha phase test report

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Abstract:

This report summarises the results of the TEN-155 Managed Bandwidth Service alpha test phase. ERCIM, an Associated Contractor in the QUANTUM project, provided the alpha user in the form of the MECCANO project whose partners include several ERCIM institutes. The report reviews the service from both the user and the provider side - its usefulness and ease of use from the user perspective, as well as issues arising on the administrative and technical side in terms of providing the service. MBS was successfully demonstrated at the Fifth Framework Programme Launch event via the MECCANO application. Overall, the alpha test was successful. From the user's perspective it provided a valuable service, which performed well. However, it also highlighted certain problem areas where additional effort is required to ensure a smooth operation on a larger scale.

EXECUTIVE SUMMARY

In addition to the best-efforts IP service, TEN-155 will also provide a new Managed Bandwidth Service (MBS). Although the MBS facilities are already available at all the national access points to TEN-155, work still needed to be done to establish MBS as a reliable and easily used service. As MBS is new and untested, in the first instance the service was provided on a pilot basis to an alpha user in a limited set of countries (France, Germany, UK). ERCIM, an Associated Contractor in the QUANTUM project, provided the alpha user in the form of the MECCANO project whose partners include several ERCIM institutes.

The dual objectives of the MBS alpha test were to demonstrate that the service works, and to develop a complete set of operational procedures and tools while verifying that the evolving procedures work well. The approach taken was determined with a view to doing something simple successfully. This was achieved by limiting the test to one project group, MECCANO, with connections to one site in each of three countries.

MECCANO's initial requirement was to connect its three sites with a 4 Mbps Virtual Private Network (VPN) for regular Monday afternoon sessions. In addition to the weekly sessions, the VPN was active from 22-26 February, and extended to include an Essen conference centre, allowing DANTE and MECCANO to successfully demonstrate the TEN-155 Managed Bandwidth Service during the launch of the EU Fifth Framework Programme in Essen.

MECCANO found that the agreement phase for the requested VPN, whereby DANTE liased with the NRNs to arrange connection for the project, proceeded smoothly. As was expected, the delivery stage of the VPN was considerably more difficult. This was caused by some confusion in the chain of responsibility within the NRNs and the difficulty in ensuring that each NRN configured the same level of service to each partner site. When all the MECCANO sites and the NRNs had agreed on a common service, connections between them were established smoothly. Once the connections were established, they performed well.

MECCANO concluded that MBS, in general, performed well and the service has the potential to be very useful for the MECCANO project. MECCANO noted, however, that a pure ATM service, whilst allowing for great flexibility in

terms of its use - since it is a level 2 service - places a heavy burden on the users of that service, who must configure the IP level routing and set-up an IP VPN themselves. They also indicated that DANTE and the NRNs must clarify the charges that may apply for the service before they continuing using the service.

Even after the alpha test was complete, MECCANO was unsure who the designated contact is for each NRN - this is an area which should be clarified before the beta test starts, with procedures being more strictly enforced. Improved communications channels between the project, the NRNs and DANTE are required.

Experience has shown that it would be prudent that the first instance of supporting a project via MBS in a new NRN should be treated as a special case, even after the beta test phase, with DANTE and the NRN closely monitoring procedures and progress.

Overall, the alpha test was successful. It accomplished the objective of demonstrating that the MBS service works, and it has provided the opportunity to develop the necessary operational procedures which will be put in place during the beta test. From the user's perspective it provided a valuable service, which performed well. However, it also highlighted certain problem areas where additional effort is required to ensure a smooth operation on a larger scale. Adjustments to the administrative aspects are being made to improve the efficiency of the service, in particular in completing the compilation of an overview of the situation in each NRN, to facilitate the initial establishment of the VPN. The longer-term technical issues are also being investigated.

INTRODUCTION

In addition to the best-efforts IP service, TEN-155 will also provide a new Managed Bandwidth Service (MBS). MBS will enable connectivity among research projects in countries connected to TEN-155. This service will allow groups/projects to request bandwidth for specified periods, connecting specified nodes, with various service guarantees, via Virtual Private Networks (VPNs). The service is an end-to-end service and involves collaboration with the NRNs in its provisioning. Access to the service is via ATM and is available to institutions connected to an NRN or, exceptionally, directly at a Point of Presence (PoP) of TEN-155.

End-to-end connectivity between end-user organisations requires the use of possibly two or more NRN services as well as the international TEN-155 network. Precise and comprehensive procedures need to be put in place to ensure smooth interaction between the different network operators.

As the Managed Bandwidth Service is new and untested, an alpha and a beta test phase were planned before the service would be made generally available. In the first instance, the service has been provided on a pilot basis to an alpha user in a limited set of countries (France, Germany, UK). ERCIM, an Associated Contractor in the QUANTUM project, has provided the alpha user in the form of the MECCANO project whose partners include several ERCIM institutes.

This report reviews the findings of the alpha test from both the user and the TEN-155 perspectives. It considers the service with respect to its usefulness and ease of use from the user point of view, as well as issues arising on the administrative and technical side in terms of providing the service. It makes recommendations about ways to improve the operation of the service.

OBJECTIVES OF THE ALPHA TEST

A main objective of the MBS alpha test was to demonstrate that the service works. Equally important was to develop a complete set of operational procedures and tools and to verify that the evolving procedures work well. Particular attention was paid to the following:

- Procedures for establishing an MBS "account",
- Operation of the ATM NOC in support of MBS,
- Identification and resolution of issues re: interworking with NRNs,
- Identification and resolution of issues re: NRN internal workings.

The approach taken was determined with a view to doing something simple successfully. This was achieved by limiting the test to one project group, MECCANO, with connections to one site in each of three countries. The intention was to limit the number of entities involved in the process while any problems in the operation or procedures were worked out. The beta test will add several more projects, with sites in additional countries, before the service is made more widely available.

The alpha test period, mid January to end March, provided both DANTE and the MECCANO project the opportunity to assess the service with respect to:

- the usability of the service,
- the ATM NOC's interaction with the alpha user and with DANTE,
- DANTE's interaction with the alpha user,
- the NRNs' ability to provide the service nationally, including any constraints or limitations,
- the interaction with the relevant NRNs, and
- any procedural adjustments needed.

The success criteria were established at the start of the alpha test, and consisted of the following:

- Connections established through to end systems,
- Service usable by applications,
- Change requests handled correctly,
- Scheduled connections on time 95% of time,
- Appropriate interaction with NRNs established.

PRELIMINARY MBS PROCEDURES

DANTE produced a series of web pages to allow for service to be requested and for ongoing requests to be tracked. Each project is required to nominate a single Group Network Manager (GNM) who will liase with DANTE, primarily via these web forms and email.

With the exception of direct connections to a TEN-155 PoP, the national path is provided by the NRNs. The international path is provided by TEN-155, with the operational management of the service provided by the ATM-NOC operated by KPN. DANTE is responsible for coordinating all aspects in the establishment of the service for individual projects.

The projects request service from DANTE, who will liase with the NRNs to arrange connection of the individual projects. The procedures provided for DANTE to make the initial contacts with designated NRN Access Point Managers (APMs) to determine the resources required and what resources are available (both human and technical) to connect project members in each country. Since national connectivity is an NRN dependent issue and different in each country, detailed information about the project may be required for participants in different countries. The Group Network Manager is responsible for information gathering within the project.

Once the project feasibility has been verified, necessary arrangements may be made directly between APMs and the Group Network Manager according to defined operational procedures to implement the connection of each site with the NRN port. In case of difficulties, the GNM-DANTE channel remains the priority means of communication.

Projects (via their GNM) may liase directly with the ATM NOC if problems occur during the operation of the service, but should copy DANTE on all correspondence to ensure that all issues are correctly addressed.

Arranging access to MBS has four stages, which involve the following parties:

- Agreement stage (DANTE, GNM, APM)
- Delivery stage (DANTE, GNM, APM, ATM NOC)
- Production stage (DANTE, GNM, ATM NOC)

- Finish stage (DANTE, GNM)

Much of this interaction will be managed by electronic mail and via web forms. A list of authorised contacts (i.e. primarily GNMs) will be maintained. Such authorised persons may contact the ATM NOC to ask for changes or last minute modifications to their service. DANTE will define a policy for change requests for each project, establishing boundaries for changes. Within those boundaries, it is planned that changes can be made within a two-hour response time for the TEN-155 part of the network path.

DESCRIPTION OF THE ALPHA TEST ENVIRONMENT

The sole alpha tester was the MECCANO project acting on behalf of ERCIM. The objective of MECCANO is to provide all the technology components, other than the data network itself, to support collaborative research and technical development through the deployment of enhanced tools for multimedia collaboration in Europe. MECCANO had a clear interest in using the TEN-155 MBS, since it could provide them with a high-quality infrastructure for use with their conferencing technology. More details of the MECCANO project are available on the world wide web from http://www-mice.cs.ucl.ac.uk/multimedia/projects/meccano/.

MECCANO used MBS to interconnect three sites across Europe: the University College London, RUS in Stuttgart and INRIA in Sophia Antipolis. MECCANO's initial requirement was to connect the three sites with a 2 Mbps VPN for regular Monday afternoon sessions. Figure 1 shows the VPN configuration used by MECCANO.
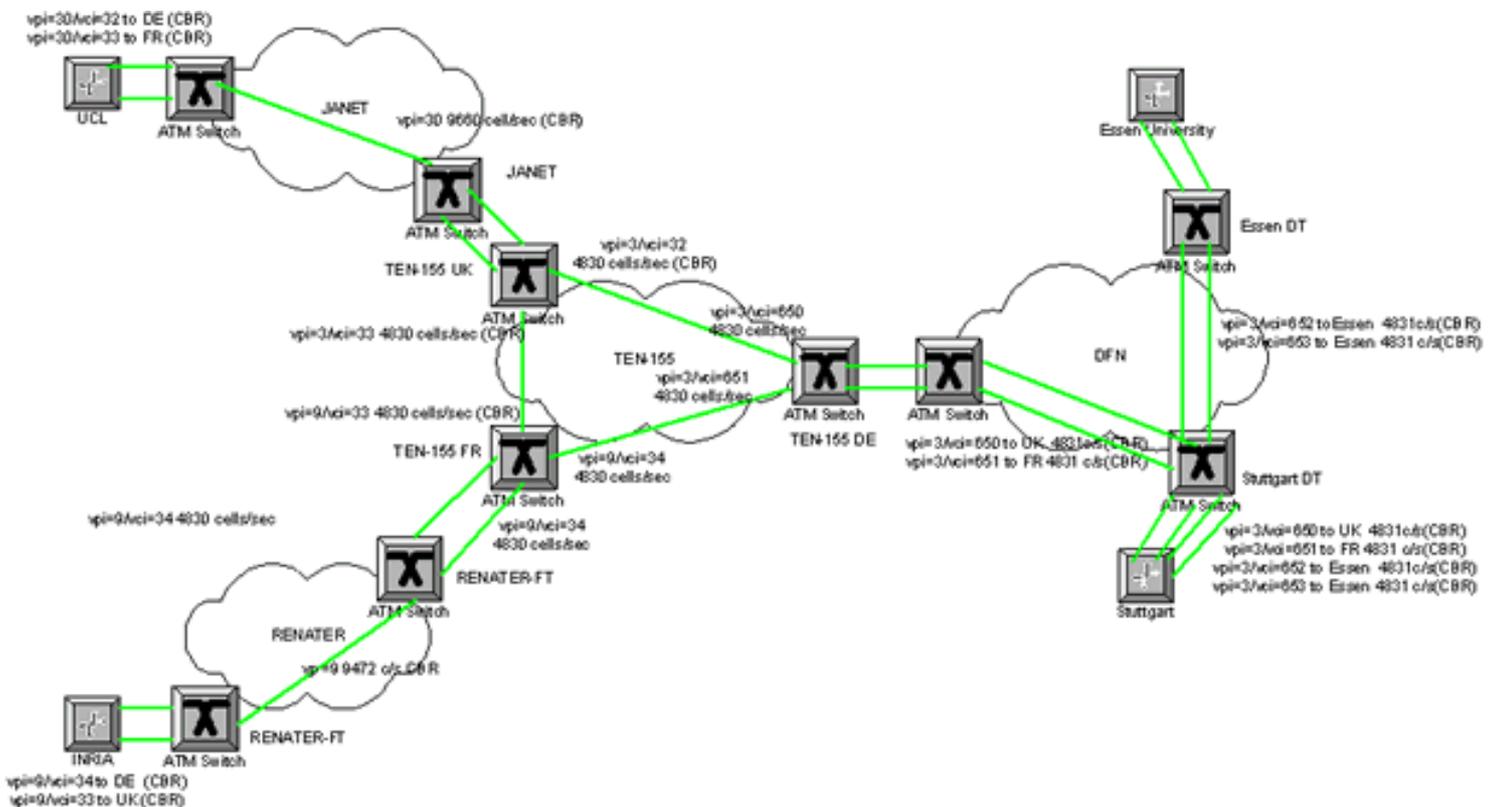
In addition to the weekly sessions, the VPN was active from 22-26 February allowing DANTE and MECCANO to successfully demonstrate the TEN-155 Managed Bandwidth Service during the launch of the EU Fifth Framework Programme in Essen. To achieve this the exhibition hall in Essen was connected to the MECCANO VPN via a 2 Mbps ATM link through the B-WIN switch at the University of Essen.

USER EXPERIENCE

This section documents the MECCANO perspective of the MBS service as provided during the alpha phase.

VPN Establishment

The agreement phase of the alpha test proceeded smoothly. MECCANO completed the forms produced by DANTE giving details of the GNM, sites to connect and technical contacts at those sites, together with details of the time period for which they desired connectivity. MECCANO found that the information requested was reasonable and simple to provide.

MECCANO initially requested three ATM VPs linking UCL, INRIA Sophia Antipolis and RUS. An additional link was later requested linking RUS and Messe-Essen for the purpose of providing a demonstration of the MBS at the launch of the Fifth Framework Programme. See Figure 1.

The links were requested for 14:00 to 17:00 (UK time) every Monday, between 1 March and 26 April 1999; and for continuous operation from 22 to 26 February 1999. A CBR service at 2 Mbps was requested. Some confusion arose due to the changing requirements, but on the whole, the agreement phase went well.

As was expected, the delivery stage of the alpha test was considerably more difficult. There are a number of stages involved in getting connectivity:

- Connections between partner sites and the NRN
- International connections between the NRNs and TEN-155
- National connections between multiple partner sites over an NRN

It was intended that each NRN would designate a single contact point, the APM, who would liase with partner sites to arrange connectivity between the NRN and the partner site. This process was to be initiated by DANTE, after the project GNM requested access to the MBS. In practice, possibly due to a shortage of time, the initial request for service to the NRN was made by the individual MECCANO partner sites in parallel with the request to DANTE. This lead to some confusion, since there was no clear chain of responsibility within the NRNs and it was unclear who should be contacted to resolve problems.

In a similar manner, it is difficult to ensure that each NRN configures the same level of service to each partner site. Again, MECCANO used email to coordinate this, but on a flat basis: they had a single mailing list. If the plan for each NRN to designate a single APM were realised, this would reduce the communication overload, since the APMs could communicate with each other, the GNM and DANTE only, rather than involving all participants.

This also overlaps onto the set-up of international connections. Once all the MECCANO sites and the NRNs agreed on a common service, connections between them were established smoothly. However, it took some time for a common service to be agreed.

MECCANO had experience of only a single national connection between multiple sites across an NRN - from RUS to Essen. This connection was unusual since the site at Essen is not a MECCANO project site, but rather a temporary addition to the alpha test for the purpose of the TEN-155 demonstration at the launch of the EU Fifth Framework Programme. Accordingly, coordination between the MECCANO project, DANTE and Essen was more difficult than between the MECCANO partners and DANTE.

VPN Performance

Once the connections were in place, they performed well and MECCANO observed very few problems during the launch demonstration. They had a number of problems setting up the demonstration, but these were not attributable to the TEN-155 network or to DANTE - the service provided worked very well, and the demonstration was a success.

It must be noted that, owing to links only being established late in the period, parts of the planned test procedure (changes to schedule/bandwidth) went untested.

Usefulness of Service

The TEN-155 MBS has, in general, performed well and the network has the potential to be very useful for the MECCANO project.

Problems Encountered

MECCANO operation is based upon an IP service. MECCANO noted that a pure ATM service, whilst allowing for great flexibility in terms of its use - since it is a level 2 service - places a heavy burden on the users of that service, who must configure the IP level routing and set up an IP VPN themselves. With the current level of maturity of the IP QoS and VPN services MECCANO recognises that it would not be possible for DANTE/TEN-155 to offer a layer 3 managed bandwidth service, but if such a service could be offered, it would simplify the job of the users significantly.

This aspect, namely construction of an IP overlay network over the MBS, is one of the main areas of technical difficulty MECCANO had in using the MBS. They wish to use IP multicast and trial IPv6 over this infrastructure and it is non-trivial to configure the IP routing to allow this to take place. This is not strictly an issue with the MBS, but is something that potential users of the MBS must consider: if a level 3 service more complex than unicast IPv4 is desired, then the users of the MBS must be prepared to put considerable effort into configuring this service.

Recommendations

MECCANO indicated that DANTE and the NRNs must clarify the charges that may apply for the service before they can continue using the service. Certain MECCANO partner sites have received considerable pressure from their NRNs, which wish to charge for the use of the MBS. This pressure is made worse by the apparent difficulty the NRNs have in providing occasional access to a link: the links MECCANO had requested to be active on Monday afternoons were active continuously for some time, before being disabled. (In fact, the first time slot was operated continuously from its establishment for the Essen conference until the second Monday after the conference.) In case charging is in force, it would generally only be acceptable to an end-user project to be charged for the service during the agreed session times (or less if links were not available for the whole of a session).

Even after the alpha test is complete, MECCANO is unsure who the designate APM is for each NRN - this is an area which should be clarified before the beta test starts, with procedures being more strictly enforced.

MECCANO Conclusions

Clearly, the service has been shown to function, and the NRNs involved capable of providing access. However, within the brief period of the alpha test, only an initial qualitative assessment of the management procedures has been possible.

In terms of the defined success criteria, the major technical goals of end-to-end connection establishment, and use by end-user applications were achieved, including a high-profile demonstration. It was, however, not possible in the timescales to test the procedures for change requests. Once procedural aspects, timing, and charging issues had been agreed for the duration of the alpha test, the links were all available reliably throughout the scheduled test sessions. Issues regarding appropriate interactions with NRNs have been commented on above. More generally, within the context of this initial use by MECCANO, there was a substantial burden of management and operational interaction placed upon the end-user project, and more specifically the designated project contact. Streamlining of these procedures will be an important aspect of evolution to full service.

MECCANO concluded that there are clearly a number of rough edges in the procedure that have to be sorted out before MBS becomes a production service, but this is only to be expected during an alpha test. On the whole, the alpha test can be considered a success, and MECCANO looks forward to working with the MBS in future.

TEN-155 EXPERIENCE

VPN Establishment

The first step in the set-up of the alpha phase network was identifying the participant sites and agreeing the numbering plan that would allow all the alpha test participant entities (MECCANO sites, the three NRNs and their respective suppliers) to establish the ATM connections.

DANTE's main role was to coordinate the activity, collecting all the information needed to set-up the backbone connection as well as information regarding the equipment the project would use to interconnect with the NRN's ATM access point. An information template, requesting the set of mandatory information for the participating project members in each country, was sent to Colin Perkins as the MECCANO Group Network Manager on 18 January 1999 and was returned to DANTE on 26 January 1999. The set of common information elements per site submitted by the project describes the site and connecting equipment, and in particular:

1. identifies a technical contact for ATM configuration and debugging,
2. identifies an administrative contact so the NRN representative can discuss administrative problems if needed, and
3. describes in detail the ATM port configuration, by site, to be used by the project as it is connected to the individual NRN ATM networks.

The detailed list of information elements requested is available on the web . This set of information allowed the configuration of the alpha phase network to be completed, but without numbering.

The numbering information was provided first by those entities with the least flexibility in the provisioning phase. France Telecom and Deutsche Telecom assigned numbers as managers of their respective NRN ATM networks, and their numbering scheme was followed whenever possible in the backbone and on the project side. The network map as shown in Figure 1 reflects the full VPI/VCI numbering.

Further information was gathered regarding the time slots to be used by MECCANO. "Time slots" refers to the reservation to be made in the ATM networks with respect to time periods and bandwidth. Three time slots were requested by MECCANO, each time slot corresponding to one PVC. Details of the requested time slots were sent to the NRNs for implementation after being agreed internally within the MECCANO project. Bandwidth requirements were discussed in megabits per second but specified in cell/sec as a provisioning unit.

The full set of information submitted by the MECCANO project is shown in Annex 1.

Interface to NRNs

The official point of contact for operational issues between DANTE and each TEN-155 NRN is the Access Port Manager (APM). Initial contact with the three APMs produced different results. Only in France was the APM the person responsible for handling ATM connection requests; Jean Marc Uze, the APM, forwarded requests to the France Telecom NOC where they were scheduled for implementation within 10 days. In Germany, the APM, Steffen Baur from the B-WIN NOC, is not responsible for ATM connection requests; DANTE learned that there is a named ATM management contact person, Hans-Martin Adler from the Berlin DFN office, and there exist procedures for requesting national connections. Hans-Martin took an active role in the implementation of the first ATM connection because it was part of the MBS "alpha" test. In England, the APM, Tim Kidd, forwarded the message to Baoyu Wang, who is responsible for the ATM service for UKERNA. She identified the technical contact for the London Area, Roland Trice, and he took care of the implementation once the information was sent to him.

The NRN contacts were at all times friendly and cooperative, but it was necessary to follow-up by telephone from time to time regarding the status of the provisioning. This was required mainly because of the nature of the contracts between DFN and RENATER and their respective providers, DT and FT; these contracts specify only approximate delivery dates of 7 to 10 days on a best efforts basis.

For the future, it is clear that the first project (site) participating in the TEN-155 MBS in each country will serve as a

test case in matters of procedures and contact persons. Even for the NRN itself, this may also serve to debug its procedures with the ATM provider or ATM network manager. A list of NRN contacts for the MBS service (MBS Service Managers - MSMs) and pointers to national procedures are being put in place; the need for these is highlighted as a result of the MBS alpha and beta test experience.

Interface to KPN ATM NOC

The interface with the TEN-155 ATM Network Operation Centre for provisioning the alpha user connections presented some unexpected results.

Initially, it was planned that a feature of the management software, known as Logical Port or Virtual UNI, would be used. This feature would allow DANTE to identify a Project's GNM to the TEN-155 ATM NOC giving the GNM access to a virtual interface. Via this interface, the GNM could create new PVCs, re-schedule them and trouble-shoot the project's connectivity without direct intervention from DANTE and without affecting the other circuits on the same physical interface.

Unfortunately, KPN informed DANTE that the behaviour of the Logical Port feature presented some problems in its interaction with the production traffic that required further investigation. During March and April 1999, several tests were performed in the KPN Labs in Hilversum to clearly establish the characteristics of the Logical Ports feature used in the TEN-155 network. It was found that, contrary to what was initially believed by KPN, use of this feature would not block the bandwidth reserved for the projects in such a way that it could not be used by the IP VPN when the bandwidth was not being used by the project VPN.

Nonetheless, as there was doubt about the impact on the production service, provisioning of the MECCANO VPN was made by DANTE in the same manner as for all other TEN-155 production ATM PVCs; i.e. it was scheduled by a normal request to the ATM NOC. This process did not allow the alpha test GNM, Colin Perkins, to contact the TEN-155 ATM NOC to ask for changes and to verify that the software tools were supported by the human technicians in place.

The scheduled PVCs were established on time throughout the alpha test period. No problems were observed with the PVCs.

Problems Encountered

A number of problems or issues were encountered from the TEN-155 perspective, which must be addressed in order to ensure the scalability of the MBS. These issues cover both administrative and technical matters.

It was anticipated that there would be variations in the service that could be provided by different NRNs. At the start of the alpha test, DANTE did not have a sufficiently clear view of the administrative contacts and procedures for each NRN, the ATM features that could be supported by the NRNs involved, the time required within each NRN to implement the required VCs, nor what costs would apply for the national parts of the service. There did in fact prove to be differences between the NRNs; it was quickly confirmed that a complete set of information needs to be compiled with respect to the MBS contacts, possibilities, delivery time scales and charging mechanisms in each country.

Establishing the numbering plan for each VPN is not a simple matter. It is an iterative process, dealing with each of the networking entities involved in the process, and constrained by those allowing the least flexibility. A network diagram (such as the one in Figure 1) is a very useful tool in this process. However, to be effective as a means of communication among the various parties, it must be updated with the latest data as soon as it becomes available. The alpha test involved only three NRNs; the problem is compounded the more countries are involved in any given VPN.

While investigating with KPN the use of the Logical Port feature for the MECCANO project, DANTE learned that with KPN's current software only 16 Logical Ports can be assigned for the whole network. One of these is already used for the production IP service; another is used for the TF-TANT test network. This leaves only 14 Logical Ports

that can be used to support projects using MBS, allowing GNMs to manage their own VPNs within agreed limits without DANTE intervention. While not every project will require frequent changes to an established VPN, in the longer term this limitation will create an undesirable additional layer of administration via DANTE, rather than allowing projects to communicate directly with the ATM NOC, whenever the number of projects requiring this flexibility is exceeded.

The alpha test has required a significant coordination effort from DANTE, which will not scale. However, this was expected, and is regarded as being unavoidable for the start-up of the service. Once the details of working with each NRN have been worked out and tested at least once, the process will operate more smoothly, and require less effort. It is important that the process also involve agreement on committed delivery times scales, reducing the requirement for DANTE to follow-up with all the parties.

Given the terms of the existing contracts of the alpha test NRNs with their ATM service providers, the granularity of the time periods for operating the VCs is not as fine as on the TEN-155 backbone. Currently DFN can only request VCs for a minimum period of one week; UKERNA must pay for each set-up and teardown of a VC, making it more attractive to leave the VC in place. Discussions are underway to try to improve these terms to allow for more flexibility in the operation. If bandwidth is not released when it is not required, this will limit the number of projects that can be supported.

Recommendations

A complete matrix of contacts, services offered, delivery time scales, costs and procedures by NRN should be compiled as soon as possible.

A set of testing procedures should be formalised to verify that each national path to the TEN-155 PoP is properly configured before starting end-to-end testing. This can be achieved either via a set of loop-back PVCs in the TEN-155 switch or via an interface with an IP address in the router or the workstation in the TEN-155 PoP.

Use of the TEN-155 ATM Logical Port/Virtual UNI feature is recommended for those projects where a significant number of changes are expected. Discussions with KPN should be progressed to determine how the current limitation of 14 such Logical Ports can be removed or attenuated.

The first instance of supporting a project via MBS in a new NRN should be treated as a special case, even after the beta test phase, with DANTE and the NRN closely monitoring procedures and progress.

CONCLUSIONS

Overall, the alpha test was successful. It accomplished the objective of demonstrating that the MBS service works, and it has provided the opportunity to develop the necessary operational procedures, which will be put in place during the beta test. From the user's perspective it provided a valuable service, which performed well. However, it also highlighted certain problem areas where additional effort is required to ensure a smooth operation on a larger scale. Adjustments to the administrative aspects are being made to improve the efficiency of the service, in particular in completing the compilation of an overview of the situation in each NRN, to facilitate the initial establishment of a VPN. The longer-term technical issues are also being investigated.

ANNEX 1

This Annex includes the full set of information submitted by the MECCANO project for the set up of their VPN in the alpha phase of MBS. The three end-points are UCL in London, Inria in Sophia Antipolis, and RUS in Stuttgart.

UCL:

Site: University College London Tech contact:
Name: John Andrews

Address: Computer Science
Gower St
London
WC1E 6BT
phone +44 171 419 3691
fax +44 171 387 1397
mail J.Andrews@cs.ucl.ac.uk
NOC-mail (for outages and troubleshooting)

Admin Contact:
Name
address
phone
fax
mail

ATM port: (The limit towards the NRN network, last point under project
configuration control)
Equipment code (if existing) Cisco 4700 multimode fiber ATM into ForeASX200 switch
Address: (ATM/IP?) 128.16.48.8, mcast via 12.16.48.10 (ATM Sun)
Location: B06 machine room
Address: UCL
Computer Science
Gower Street
London WC1E 6BT
UK
Room
Rack
Connectors positions
geographical info (long, lat, for future nice graphs)
London -- 52N 0W
vendor information:
vendor
model
hardware/software revision
features

INRIA

Site: Inria Sophia-Antipolis

Tech contact:
Name Franck Yampolsky
Address: Inria Sophia-Antipolis
Phone: (+33)4 92 38 77 33
fax: (+33)4 92 38 76 02
mail: Franck.Yampolsky@sophia.inria.fr
NOC-mail (for outages and troubleshooting)

Admin Contact:
Name: Franck Yampolsky
address: Inria Sophia-Antipolis
phone: (+33)4 92 38 77 33
fax: (+33)4 92 38 76 02
mail: Franck.Yampolsky@sophia.inria.fr

ATM port:
Equipment code (if existing)

Address (ATM/IP?):
Location: Inria Sophia-Antipolis
Address: 2004, route des Lucioles, BP 93
06902 Sophia-Antipolis cedex
France
Room: C023
Rack:
Connectors positions:
geographical info (long, lat, for future nice graphs)
vendor information:
vendor CISCO
model 7505
hardware/software revision:
IOS (tm) RSP Software (RSP-JSV-M), Version 11.3(6)
Cisco RSP1 (R4700) processor with 65536K/2072K bytes of memory
1 AIP controller (1 ATM)
2 VIP2 controllers (2 FastEthernet)(4 Ethernet)(4 Serial)

RUS

Site university of Stuttgart computing center

Tech contact:
Name: Robert Stoy, Tassilo Erlewein
Address: Allmandring 30, 70550 Stuttgart, Germany
Phone: +49 711 685- 5859 (Stoy) or 5871 (Erlewein)
Fax: +49 711 678 7626
Mail: (stoy | erlewein)@rus.uni-stuttgart.de
NOC-mail (for outages and troubleshooting) same email

Admin Contact:
Name: Paul Christ
Address: Allmandring 30, 70550 Stuttgart, Germany
Phone: +49 711 6852515
Fax: +49 711 6787626
Mail: christ@rus.uni-stuttgart.de

ATM port:
Equipment code (if existing)
Address (ATM/IP?) ATM 39.276f.3100.0110.0000.0001.0003.3333.3333.3333.00
Location Stuttgart
Address Allmandring 30a, 70550 Stuttgart, Germany
Room
Rack
Connectors positions
geographical info (long, lat, for future nice graphs)

vendor information:
vendor Cisco
model LS1010
hardware/software revision Cisco IOS 11.2
features 12x OC3 MM, 4x OC3 SM
remarks (interface to be configured, etc, how to access, pointer to brief procedures)

The time slot information, common to all sites:

Time slots:
from (UTC time): Mondays 14:00:00 GMT, starting February 15th
to (UTC time): Mondays at 17:00:00 GMT, until April 19th
from (UTC time): 00:00:00 GMT, February 22
to (UTC time): 00:00:00 GMT, February 27
Periodic? (periodicity specification) weekly
Usage (purpose, video, IP, best effort, etc) IP
ATM traffic capability:
dbr/sbr2/sbr3 ? DBR
pcr (forward/backward) cells/seg 4831
src (forward/backward) cells/seg -
mbs (forward/backward) cells/sec -

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