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Abstract:

This deliverable describes the goals and activities of the 6NET Tiger Team, a focus for dissemination of 6NET expertise to external communities. A web resource with wiki, problem tracker, document store and interactive chat has been set up. Tutorial material has been built, and most recently delivered in a 3-day workshop in Belgrade in March 2005. The report describes how the resource will be handed over to 6DISS project management on 1st July 2005.

Keywords:

IPv6 virtual helpdesk, IPv6 tutorials, IPv6 deployment assistance

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1. Introduction

This report documents the activities of the 6NET ‘Tiger Team’ that were carried out in the latter stages of the 6NET project (Jan’05 to Jun’05).

The activities were split into three general areas:

- Providing assistance to sites and networks deploying IPv6, through enquiries to the project – including the generic ‘helpdesk@6net.org’ contact point.
- Developing material for and running IPv6-focused training events – for example, a joint 6NET-SEEREN workshop in Belgrade in March 2005
- Providing a resource for online help for users and administrators – a ‘virtual helpdesk’

These activities are described in this brief summary report.

In the course of the period, the project learnt that a ‘follow up’ dissemination project to 6NET, called 6DISS (www.6diss.org), had been funded by the Commission, and thus the activities of the Tiger Team could be continued into 6DISS. It was thus very important to have the virtual support framework in place, to be handed from 6NET to 6DISS by 30th June 2005 (the end of 6NET). 6DISS already has quite firm plans for training events in countries (e.g. South Africa), thus the material will be timely for these audiences.

We also plan to open up the set of IPv6 ‘experts’ that interact with the virtual helpdesk problem tracker once 6NET is concluded, e.g. to invite experts from Euro6IX and from the European IPv6 community.

The domain 6pack.org has been used for the Tiger Team online resource. This is supported by the main 6NET web presence (6net.org) and the IPv6 eprints archive (6journal.org).

2. Tiger Team Goals

The goals of the Tiger Team were as follows:

- *Assist in the deployment of IPv6, with a focus on site (campus) deployment.* With the major European NREN networks IPv6-enabled (dual-stack), the current challenge is to ‘kick start’ IPv6 deployment into end sites. However, tutorial material for network operators is also seen as important.
- *Build an IPv6 ‘knowledge base’.* This would manifest itself as an online presence, containing links to appropriate tutorial material, white papers, presentations, etc.
- *Disseminate the 6NET project’s experience.* 6NET has produced over 100 public deliverables on IPv6 technology, but for a casual reader finding general information can be difficult. The Tiger Team aims to distill the key messages in a public web presence, while offering a point of contact into the project for those seeking help.
- *Provide a foundation for continued collaboration beyond 6NET.* It is important that 6NET partners continue to work together at least loosely, to maximise the impact of 6NET. Many

are doing so in the 6DISS project, which targets IPv6 dissemination to certain non-European regions, e.g. South Africa.

- *Exchange knowledge with other initiatives.* The Team seeks to share findings and experience with other projects, e.g. GEANT2, Moonv6 (US) and WIDE (Japan). Both Moonv6 and WIDE (with their 'ipfix' WG) are analysing IPv6 deployment issues, and we seek to share results in these areas.

The activities of the IPv6 Cluster (www.ist-ipv6.org) helped draw together IPv6 experience from IST research projects during the lifetime of the supporting 6LINK project (www.6link.org). The Tiger Team can assist in offering advice to research projects seeking to add IPv6 functionality to their scenarios and platforms.

The main target audiences of the Tiger Team are:

- Universities in European research networks
- NREN communities
- SEEREN
- The Greek School Network (a deployment documented in D5.14)
- SILK
- Research communities, e.g. EGEE

As the Tiger Team resource migrates to 6DISS management, the targets will be expanded, in particular to include the specific target regions of the 6DISS project, outside Europe.

The specific areas of coverage of the Tiger Team is focused on the core expertise of those 6NET partners that contribute to it, but includes and is not limited to:

- Address allocation and management plans
- Transition tool selection and configuration
- Host and local router configurations
- Multicast deployment and usage
- Mobile IPv6 deployment and usage

The Tiger Team also has a relationship with the 6NET IPv6 NOC and the Cisco TAC, such that specific NOC or TAC issues can be fed to the appropriate channels.

The activities of the NOC largely fall under 6NET Work Package 6 (network management and monitoring).

3. Provisioning of Tiger Team Resources

The Tiger Team web site is maintained at the University of Southampton on a Linux server running Apache 2, available over IPv4 or IPv6. The domain 6pack.org has been set aside for Tiger Team use, i.e. the web presence is centred on www.6pack.org and the general point of contact is helpdesk@6pack.org, though helpdesk@6net.org (and helpdesk@6diss.org) will reach the same problem tracking back-end (see below).

3.1. Web site

The Tiger Team web site currently holds the following features/tools:

- A Wiki (collaborative web editing tool) with ‘user friendly’ IPv6 information content
- A ‘problem tracker’ (*rt*) that handles emails directed to ‘helpdesk@6net.org’.
- An RSS feed from www.6journal.org for the latest uploaded presentations/papers/etc
- An irc server, irc.6pack.org, with a chat channel for IPv6, #ipv6.

3.1.1. The Wiki

The online material is focused around a Wiki. A wiki is a tool that allows collaborative web authoring by authenticated users. All Tiger Team members can edit the wiki. The wiki keeps all pages of information held and change tracked, so it’s possible to see who changed which pages, and to allow ‘back out’ of edits.

The wiki is a ‘friendly front end’ that seeks to explain the work of 6NET, to provide pointers into the most relevant of the 6NET materials, including:

- Cookbooks (transition, security, management, etc)
- Applications
- Management tools
- Tutorial material (6NET material and 3rd party resources)
- Presentations
- White papers
- Fact sheets
- (IETF) Standardisation notes

The aim is to – in a nutshell – summarise the 6NET results in a more ‘user friendly’ way (we estimate that 6NET has up to 10,000 pages of documentation in its 100 deliverables).

3.1.2. The problem tracker

The ‘rt’ problem tracker provides a back end for the ‘Tigers’ to interact with and handle email queries that are directed to ‘helpdesk@6net.org’. When an email comes in, it appears as a new ‘problem’ to be handled. A Tiger can assign the problem to a ‘queue’, where each queue is a topic of expertise (e.g. mobility, firewalls, transition) with one or more Tigers who will receive notifications and who can take ownership of the ‘problem’. The Tigers can interact with the web back end for the problem tracker, while the users will see an email exchange.

Examples of queues that are configured are:

- Transition (Southampton and Lancaster)
- Mobility (Lancaster)
- Conferencing applications (UCL)
- Network management (Renater)
- Multicast (Renater and Southampton)
- e-business solutions (IBM)
- Site address allocation planning (FCCN)
- IPv6 host configuration (FCCN)

There are currently 12 experts registered in the rt system

3.1.3. The RSS feed

The RSS feed from *www.6journal.org* presents the latest document additions to the IPv6 eprints site to users visiting the home page of the Tiger Team web site. RSS is now the de-facto method for sharing news feeds between web sites.

3.1.4. The IRC chat server

The internet relay chat (IRC) chat server allows users to connect over IPv4 or IPv6 transport to the IRC channel *#ipv6* on the server *irc.6pack.org*. There will usually be one or more Tigers logged to the chat server who can speak to people connecting. The channel is for general usage, not just user interaction with Tigers.

3.2. Connectivity testing

In order to help sites debug connectivity issues for Multicast IPv6, we have authored and deployed a SSM connectivity tool, *ssmping*¹. This is in use by other projects and sites, e.g. many of the Euro6IX sites, who are using *ssmping* to test connectivity as part of their SSM-enabled ISABEL tests. The tool is an example of development done as a result of an end-user need for debugging assistance. New users include the Canadian Research Council, the University of Aberdeen, France Telecom, IABG and T-Systems, with over 200 downloads of the source code.

We also have *dbeacon*² installed, and views of the test matrix available from the web site to assist others in viewing their connectivity to our site.

The Tigers have helped a number of sites to debug multicast (m6bone) and deploy beacons.

We have handled reports of embedded-RP implementation issues on IOS, from sites deploying the technology (tunnel config interface name, and register issues), and fed back improvements and comments to Cisco.

¹ <http://www.venaas.no/multicast/ssmping/>

² <http://artemis.av.it.pt/~hsantos/dbeacon/>

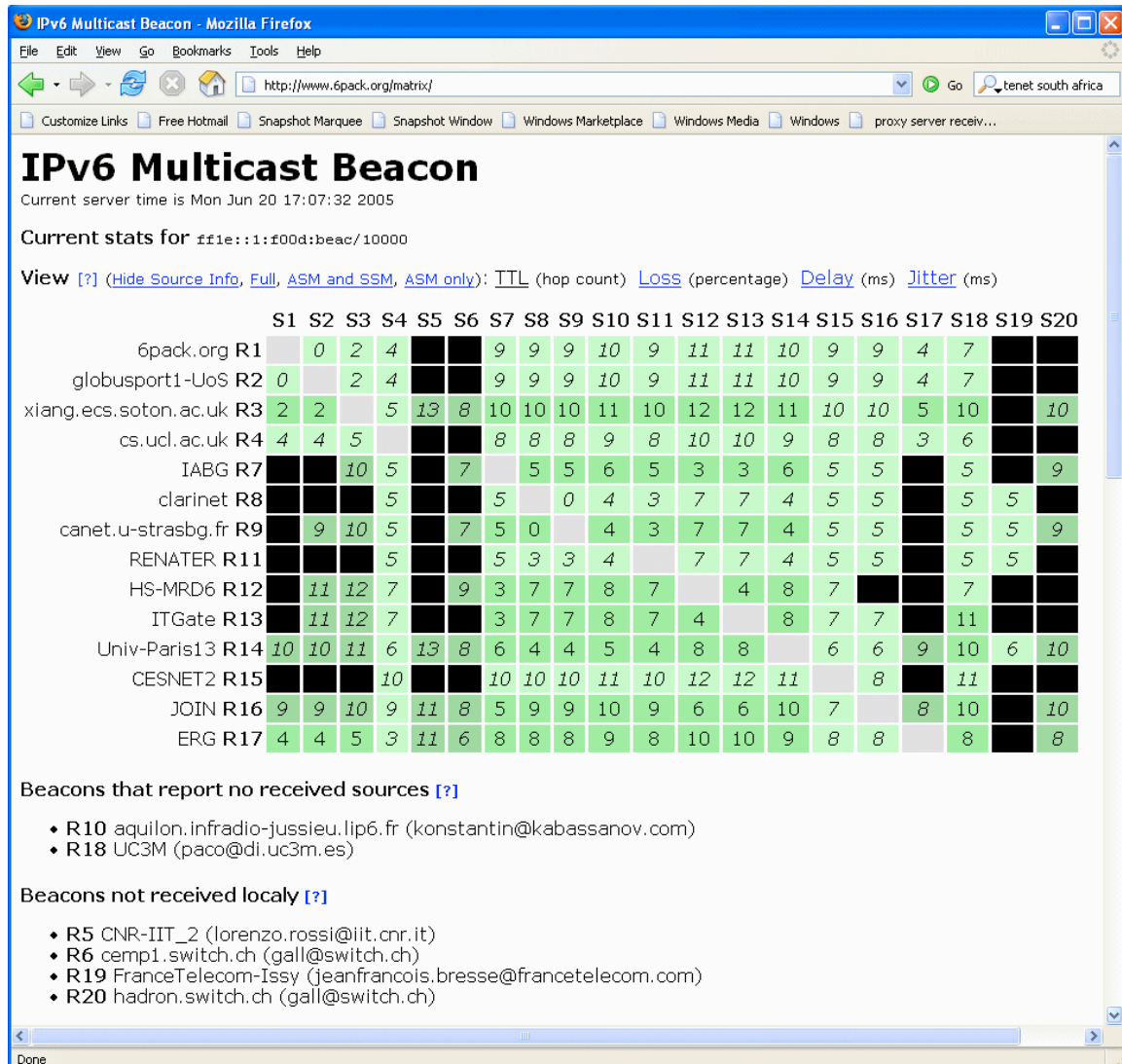


Figure 3-1: Output from dbeacon multicast connectivity tool

3.3. H.323 Conferencing MCU

An Open H3.23 MCU has been set up and available for videoconferencing with remote sites/users. The MCU supports interactive videoconferencing between up to 4 users connecting with H.323 compatible clients over IPv4 or IPv6 (the MCU is dual-stack).

3.4. Other tools

We also plan to deploy a bulletin board system (using *phpbb*). This will probably be done after the Tiger Team resource passes over into 6DISS management in July 2005. At the same time we will review other technical options that 6DISS partners may suggest.

4. Activities and Material Available

4.1. IPv6 Tutorial Belgrade

This training event was held as a joint workshop by 6NET and the regional NRENs. This was the third running of a 6NET workshop. The presentations were made available at the event web site³, and also published via 6journal.org.

The material covers topics including:

- Campus and backbone transitions
- Inter and Intra site routing
- OSPFv3
- Case study with 6PE
- IPv6 multicast
- Basic network services
- BGP
- Application support
- Management tools
- Operating system support

These also represent technology areas covered by the 6DISS project and will be enhanced as they are taken into that project.

4.2. M6bone – IPv6 multicast

Two of the Tiger Team partners (Renater and Southampton) are very active in the m6bone IPv6 multicast deployment (www.m6bone.net). The m6bone is the premier IPv6 multicast testbed, spanning many European and worldwide sites.

4.3. SSM connectivity testing

The 6NET project has demonstrated the viability of IPv6 and source specific multicast (SSM). Applications such as Mad-FLUTE show the advantages of SSM in use.

As mentioned above, we have implemented and distributed a tool to test SSM connectivity (*ssmping*). This is in use by many sites outside of 6NET.

4.4. General connectivity

The Tiger team advises on the best points of contact or services for users to gain IPv6 connectivity where they have no native service at present, e.g. by use of NREN supported tunnel broker or 6to4 services.

³ <http://www.bg.ac.yu/university/University?service=info&xsl=rcub-disc&content=html&ID=D1076>

4.5. Standardisation reporting and analysis

The 6LINK project produced a tri-annual Standardisation Report on IPv6 technology, the most recent being the project's last report as of March 2005. We plan to keep this series running as part of the 6DISS dissemination and assistance plan. Thus IETF 63 (Paris) activity will be included in the next release of this Report.

4.6. Software testing

The Tiger Team member sites are willing to test IPv6 software and tools from their commercial or open source communities, and to give feedback to vendors on requirements for IPv6.

An example of recent activity has been feedback to Cisco on features for IOS to help support IPv6 network renumbering.

5. Summary and Future Exploitation and Work

The Tiger Team, as a set of experts within the 6NET project, has managed to offer advice and assistance in IPv6 deployment issues, in particular in IPv6 multicast (a topic in which 6NET has been particularly strong), campus transition and network management. These three areas seem to be the ones of most interest outside 6NET at present.

An ever-evolving set of tutorial material is being built up. The most recent running of the IPv6 6NET tutorial was undertaken in Belgrade in March 2005. There are already plans for future events in France and the UK in September 2005 for academic communities (network operators).


We have perhaps been most active in direct user assistance in the IPv6 multicast area, where 6NET has done groundbreaking work, and Tiger Team observations led to the specific development of the *ssmping* SSM connectivity test tool as a result of end user need, and assistance with deployment and use of debugging tools.

The Tiger Team management will pass over to the 6DISS project as of 1st July 2005, where the web resource will continue to be maintained at Southampton. Dissemination of IPv6 transition material has already led to new contacts that wish to receive training, and whose needs can be met under 6DISS (e.g. TENET in South Africa, www.tenet.ac.za).

Non-6NET experts will be solicited to join the Tiger Team, e.g. those from the concluding Euro6ix project. The existing *rt* system will enable the experts to offer assistance on demand.

The authors would be very happy to receive feedback and suggestions for improvements to the content of this cookbook, with a view to improving its usefulness and applicability, such that further point revisions can be issued beyond the lifetime of the 6NET project if necessary. Please send such comments to the editor, Tim Chown at tjc@ecs.soton.ac.uk.

In addition, readers are welcome to contact helpdesk@6net.org for specific assistance and guidance on issues to do with IPv6 network renumbering.

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