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Abstract:

Deliverable D3.3.14 is produced when almost Euro6IX network infrastructure is up and running. The main goal of these documents is to report Euro6IX networks status, deployment stage and usage by internal activities as well as public events.

Keywords:

Euro6IX, IPv6, Network Maps, Network Reports, Network Status, Statistics, Traffic.

Revision History

Revision	Date	Description	Author (Organization)
v0.9	21/04/2003	Document creation	Jesus Lopez (TID) Carlos Ralli Ucendo (TID)
v1.0	01/05/2003	Addition of MRTG, Stat6 graphics	Aurora Ferrandiz (TID)
v1.1	20/05/2003	Added IPv6 Euro6IX's web statistics	Alvaro Vives (Consulintel)
v1.2	25/05/2003	Final Review	Jordi Palet (Consulintel)

Executive Summary

D3.3.14 deliverable has been produced in the context of activities A3.1 and A3.2.

Activity A3.1 covers the deployment of the local networks attached to the different Euro6IX IXs nodes. Activity A3.2 deals with all deployments related to Euro6IX Backbone network.

Deliverables D3.3.x are being produced every month, and this document corresponds to month number 14 (February 2003). D3.3.14 aims to summarize the status and usage of the different Euro6IX networks and services during February 2003.

As a first approach, the structure of these network usage reports is the following:

- First section (Current Network Status) is intended to clarify which links have been already deployed and which concrete networks have been attached.
- Second section (Network Stability and Global Traffic Reports) is intended to show the reachability of all network sections as well as a global view of the total traffic exchanged in Euro6IX network.
- Third section (Detailed Network and Services Usage in Events/Trials) is intended to show and analyze the traffic produced in some internal trials and in all public events where Euro6IX contributes in any way.

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1. INTRODUCTION

During the first year of the project Euro6IX WP3 has been focussed in pure network development (alternatives for links, links configuration, BGP routing configuration, connection of local sites). Also some feed-back has been provided to other WPs.

When establishing the European backbone many doubts appear about the concept of the Euro6IX network itself. Since these issues affect network design, they were provided to WP2. After some discussions WP2 decided at a first stage to deploy a network with 7 IXs using each one its own IPv6 prefixes and AS numbers. Then the idea of a "Euro6IX" backbone is a group of IPv6 exchanges sharing a common routing policy.

These first/provisional results of WP2 are being applied in WP3 to create stable test-beds.

When deploying management networks and statistics systems it has been identified a lack on IPv6 SNMP monitoring tools and security tools like IDS (Intrusion Detection Systems). These request have been provided to A4.2 (to develop/port such tools) and A4.1 (to study security models, filters, firewalls, etc).

Although the work described above has meant a lot of work, there is still a lot to do in order to have a real IPv6 Internet test-bed.

During these last months some sub-activities within A4.1 and A4.2 (Advanced network services and SW development) have obtained early stable results, so they are ready to be installed in an "operational" way in the Network.

In this way, A4.1 & A4.2 responsibles have provided a list of stable services/facilities to WP3 leader. WP3 work will consist now in talking with all partners to rationally distribute those services. For instance, some of them will be a must for all, such as an IPv6 WEB page, other will be distributed geographically (one server per country, for instance) and one or two concrete partners will install others.

Then, in the next Network Report (D.3.3.14) a table of current Euro6IX & other services will be included. The idea will be to improve services deployment to reach the desired distribution and also to have some end services using advanced network facilities (i.e. multicast, QoS).

After reaching this optimal distribution of IPv6 services, WP3 will start to focus its work on user access test-beds to provide beta-testers using those services. Before these beta-testers appear in the network the services testers will be the project members so production useful services such as IRC, instant messaging, file sharing, etc will be pushed.

2. CURRENT NETWORK STATUS

This section is intended to update and clarify which links have been already deployed and which concrete networks have been attached to Euro6IX backbone.

2.1 Remarkable News Related to Euro6IX Network & Services

In this period (February 2003, M14) the relevant news include:

- TOR6IX-ZUR6IX: Physical connection Up & Running thanks to a link provided by Swisscom/Fixnet. It stills need some configuration to be IPv6 reachable.
- LON6IX and MAD6IX will be the first IXs installing the Routing policy agreed in WP2. This policy is necessary to keep Euro6IX traffic within Euro6IX links and establish useful peerings with external networks (such as 6NET, Abilene, etc).

2.2 Status of International Links

As stated in the contract Euro6IX will join all IXs with native and dedicated IPv6 high bandwidth links. If an agreement is finally signed with an external operator/carrier for the link TOR6IX-ZUR6IX, all foreseen links in the contract will be possible except the one that brings the ring topology: MAD6IX-TOR6IX.

In Paris Euro6IX plenary meeting it has been decided to replace MAD6IX-TOR6IX by a 6Bone connection or a tunnel over the Internet so that routing tests based in a ring topology and different quality ways to reach other IX could be made.

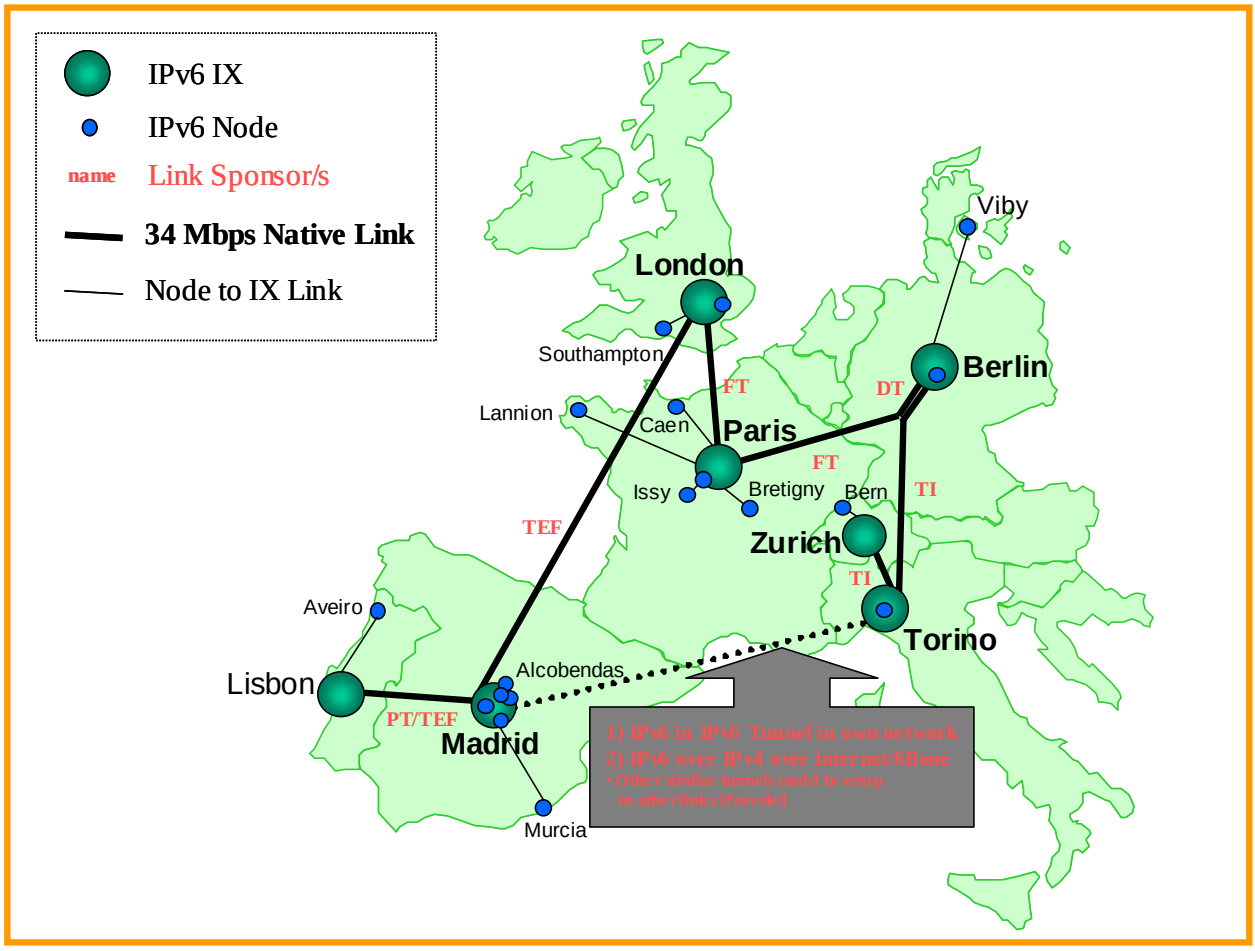

Figure 2-1: Planned Euro6IX International Links as of February 2003

The updated status of the links is as follows:

- **LIS6IX-MAD6IX:** Up and running.
- **MAD6IX-LON6IX:** Up and running.
- **LON6IX-PAR6IX:** Up and running.
- **PAR6IX-BER6IX:** Up and running.
- **BER6IX-TOR6IX:** Up and running.
- **TOR6IX-ZUR6IX:** Physical connectivity OK thanks to Swisscom/Fixnet.
- **TOR6IX-MAD6IX:** It was decided to use a tunnel to enable routing tests depending on a ring topology. Not configured yet.

3. NETWORK STABILITY AND GLOBAL TRAFFIC REPORTS

This section is intended to compile the traffic statistics diagrams automatically generated in order to have a global view of the Euro6IX network stability and usage.

The following subsections show the global statistics systems that have been identified as necessary to characterize the Euro6IX network usage each month.

3.1 Hosts/Networks Reachability Statistics from TID

The "ping_stat" tool, or simply "stat6", automatically generates these statistics from TID premises.

This system has been installed successfully at TID's Euro6IX local network and statistics are being shown in http://stat6.tid.euro6ix.org/ to consortium members.

All Spanish sites currently reachable from TID (Consulintel/nGn, UMU, UPM, Vodafone) and IX nodes (MAD6IX, LIS6IX, LON6IX, PAR6IX, BER6IX, TOR6IX) have provided a stable host/router interface, which is checked by "stat6" tool. As links became up and stable, more host/router interfaces will be added (for instance, ZUR6IX).

The system was designed to get statistics and show them in daily diagrams but during February 2003 the system has been improved in order to provide not only today's statistics, but also any other day graphic (if stored data is available, of course).

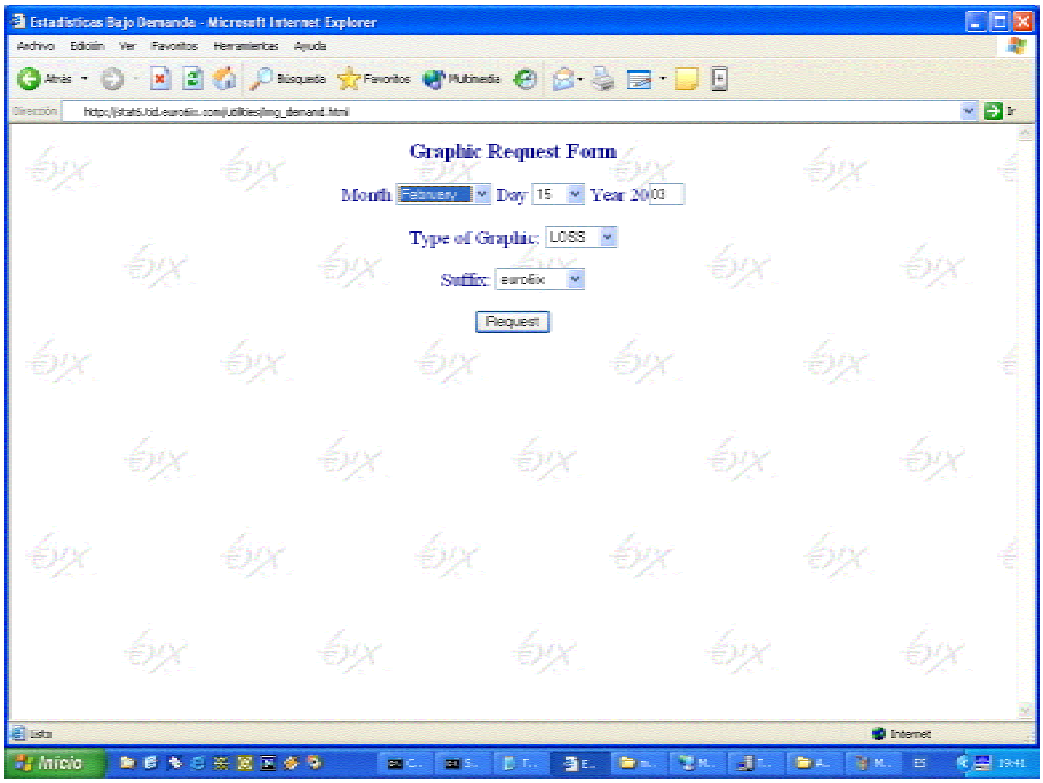

Figure 3-1: "Stat6" Statistics Day Selection WEB Page

In January 2003 report (D3.3.13) monthly-based statistics graphics were included. These diagrams were made joining all the daily measures and using Microsoft Excel software to generate the graphic. The result was very bad since there was too much information in a single diagram.

Then, TID has improved the system to generate monthly reports calculating the average of each day and enabling the presentation of any month on demand.

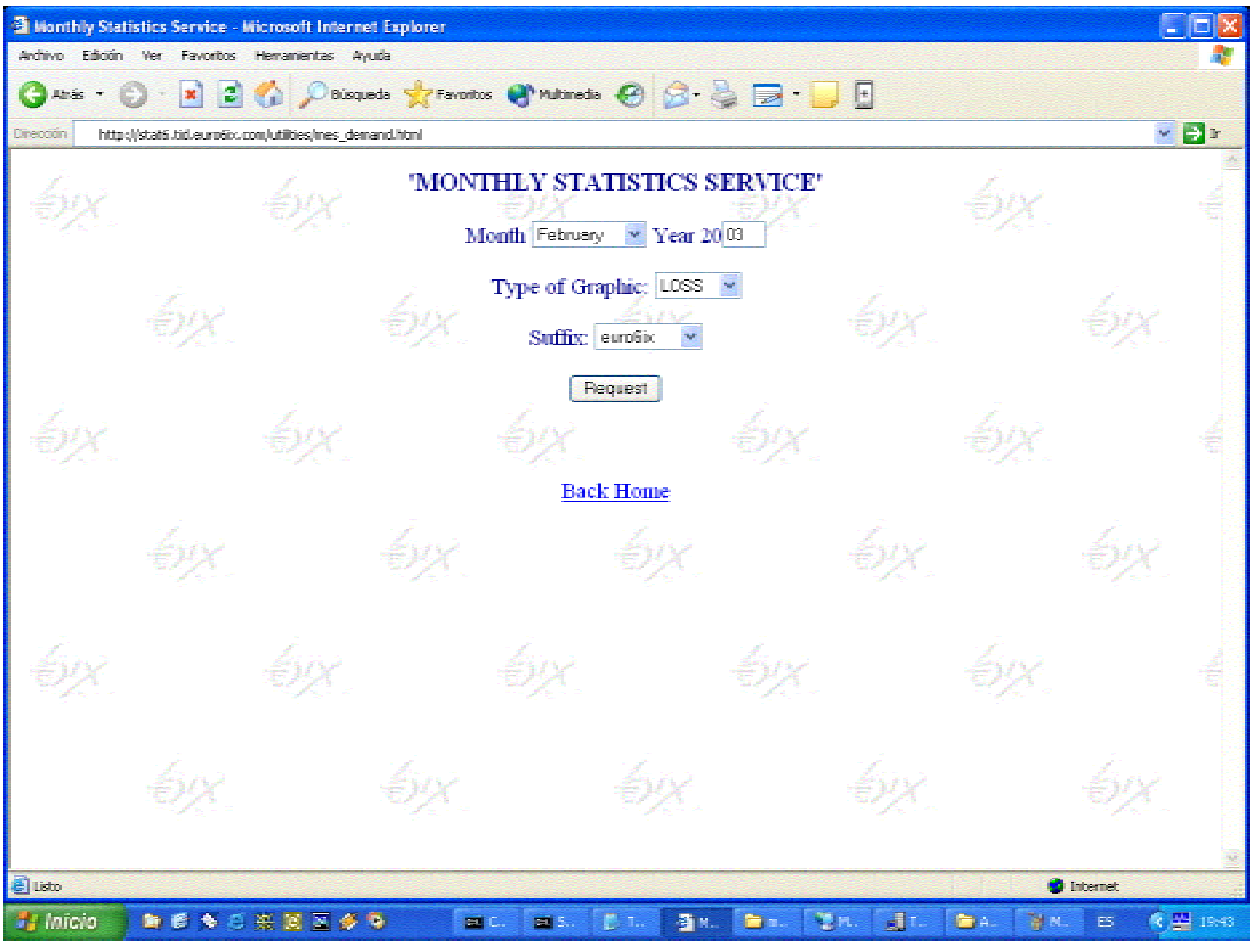

Figure 3-2: "Stat6" Statistics Month Selection WEB Page

So, it will be easier from now on to include in D3.3.x reports stability (ping6 loss and delay) statistics diagrams of Euro6IX network (as seen from TID premises).

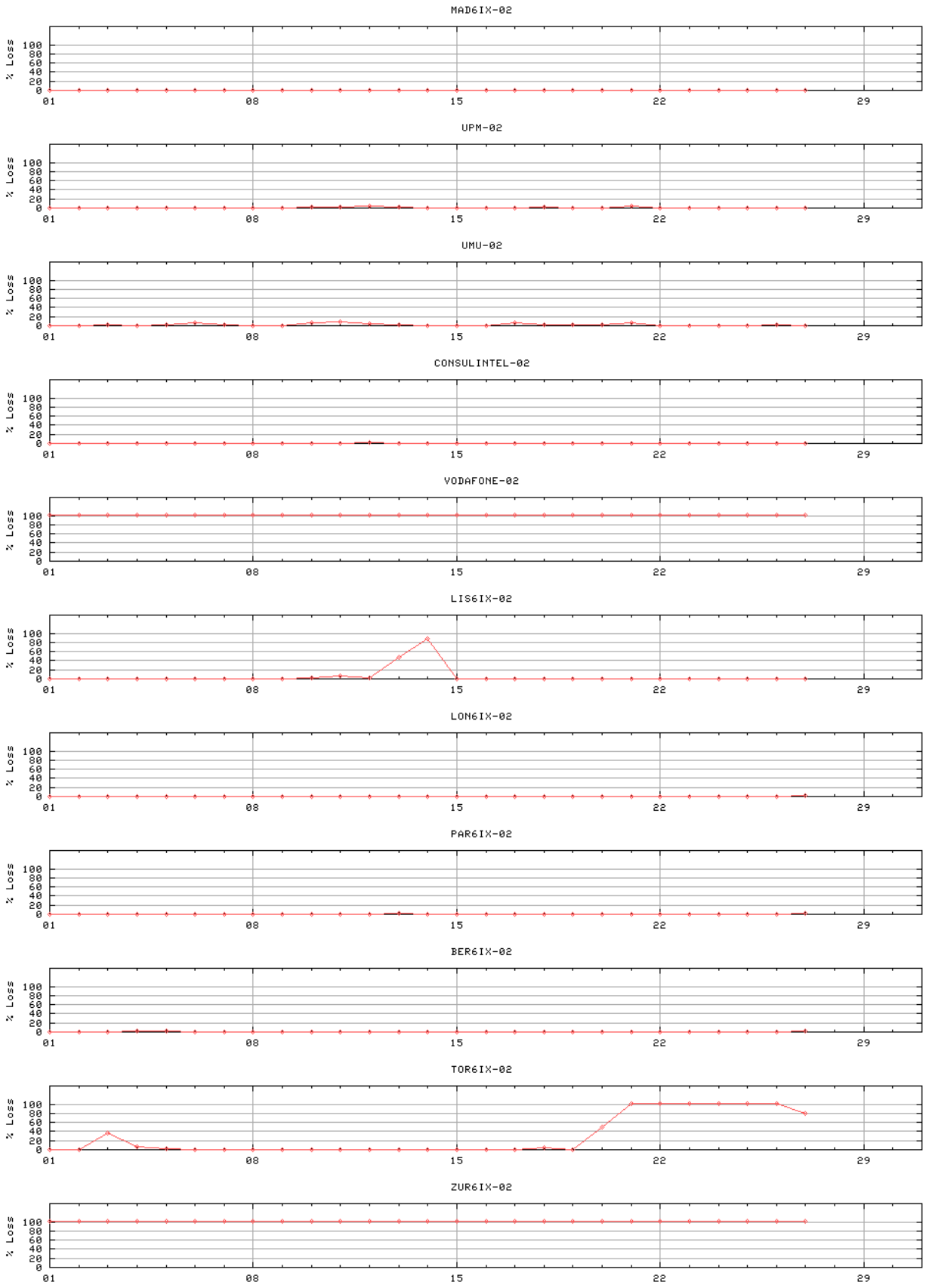

Figure 3-3: Euro6IX IXs LOSS Measured from TID Premises in February 2003

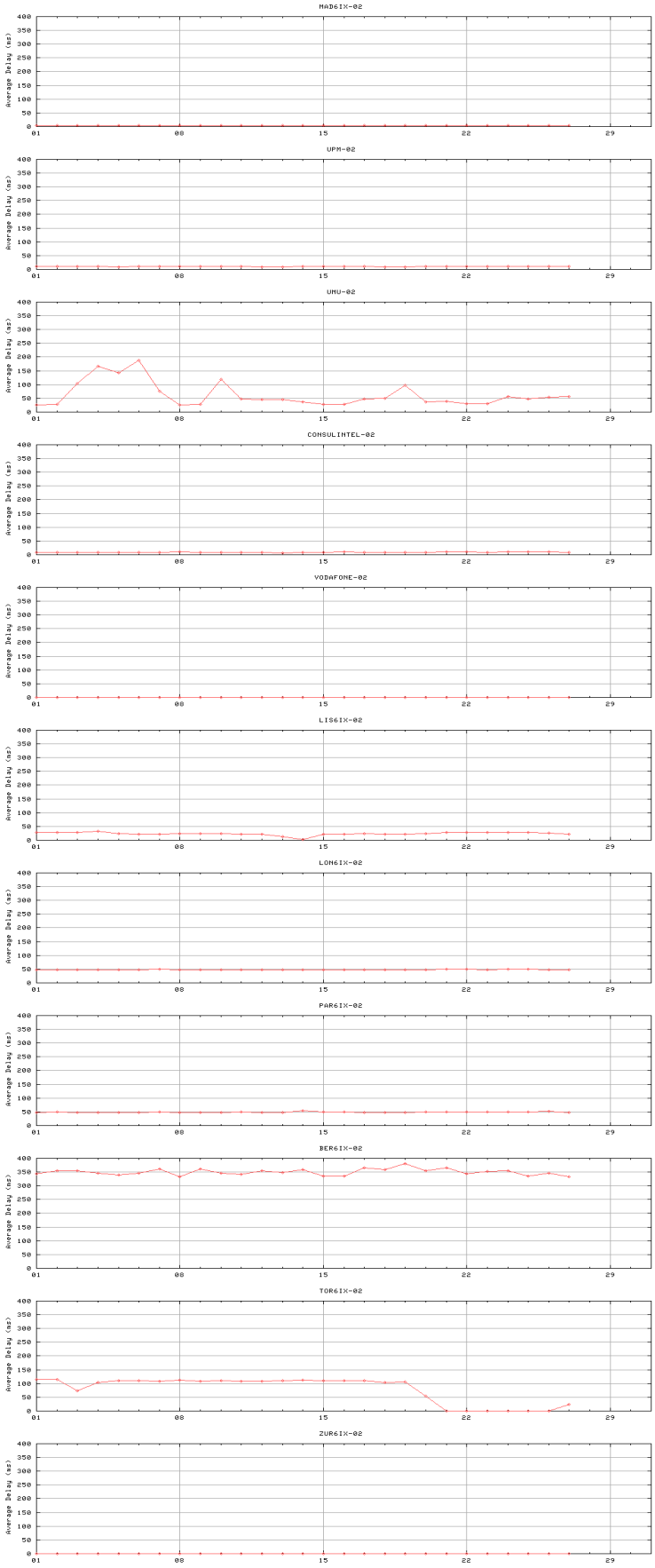

Figure 3-4: Euro6IX IXs DELAY Measured from TID Premises in February 2003

3.2 Links Traffic Measurement Statistics

Until today, only an IPv4 MRTG tool has been installed in TID premises. When nGn porting of MRTG to IPv6 is ready more partners will install it obtaining useful link traffic statistics.

Although MRTG IPv4 is used at TID, it measures only IPv6 traffic since it is configured to show all ATM interface throughputs and there is no IPv4 traffic on those ATM PVCs.

Since it was installed in February 2003 there is no historic data available for all the month. As an example, a day capture is shown. The capture shows IPv6 TID connection to Euro6IX, which represents some kind of constant traffic (3-4 Kbytes/s).

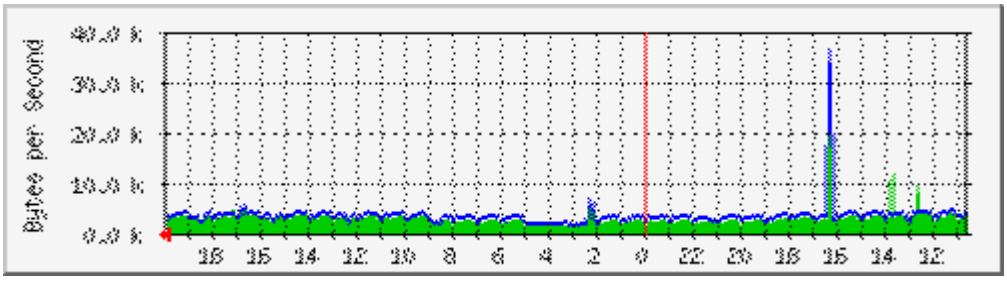

Figure 3-5: Daily Graph: IPv6 Traffic, TID to Euro6IX (February 2003)

3.3 Euro6IX Servers Stability Statistics

The Euro6IX Statistics Service will show the availability of relevant or public Euro6IX IPv6 servers (it will be included also in http://stat6.tid.euro6ix.org/).

3.3.1 Euro6IX Web Server Statistics

This section contains the statistics related to IPv6 accesses to Euro6IX official web site, that are already being logged in advance to the start of the project, so it can be processed and displayed at any time.

The tool used to generate the statistics is AWSTATS, which is freely available (http://awstats.sourceforge.net), and it seems to be the one that best supports IPv6. Using this tool we obtain yearly and monthly statistics about:

- Summary: unique visitors, number of visits, pages, hits and bandwidth
- Statistics for each day of the month
- Statistics for each day of the week
- Hourly statistics
- Visitors domains/countries
- Visitors hosts
- Robots/spiders visitors
- Visits duration
- File types
- Pages-URLs
- OS

- Browsers
- Connect to site from
- Search keyphrases and keywords
- HTTP error codes

Euro6IX partners can see more details in http://www.consulintel.euro6ix.org in Private Euro6IX section.

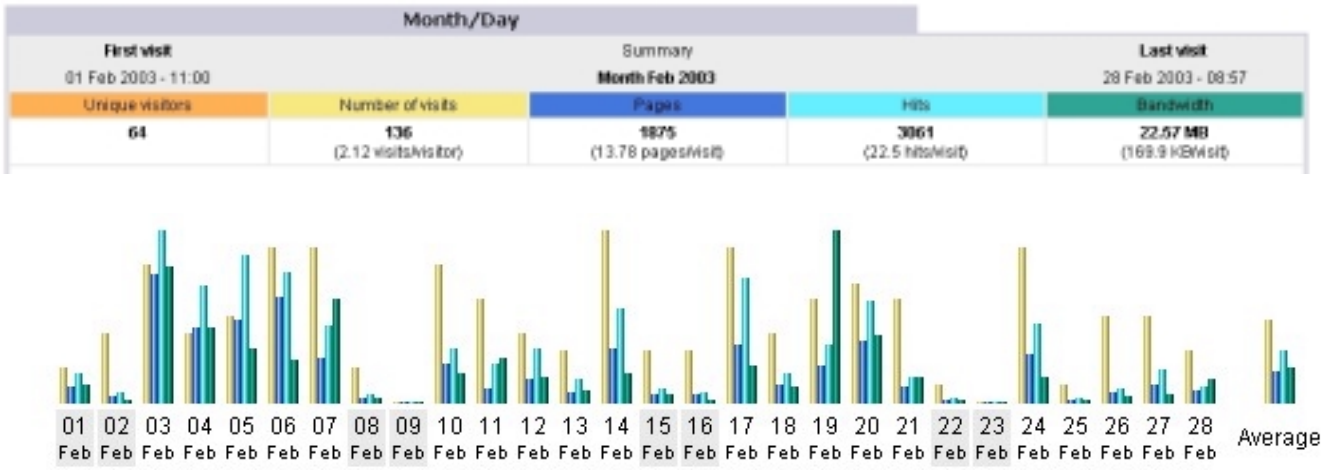

Figure 3-6: Web Usage Summary for February 2003

Day	Number of visits	Pages	Hits	Bandwidth
01 Feb 2003	2	33	60	448.28 KB
02 Feb 2003	4	12	21	67.78 KB
03 Feb 2003	8	267	355	3.15 MB
04 Feb 2003	4	154	244	1.75 MB
05 Feb 2003	5	170	307	1.25 MB
06 Feb 2003	9	219	272	1003.97 KB
07 Feb 2003	9	93	161	2.40 MB
08 Feb 2003	2	9	19	109.39 KB
09 Feb 2003	0	0	0	0
10 Feb 2003	8	79	114	708.77 KB
11 Feb 2003	6	30	82	1.04 MB
12 Feb 2003	4	48	113	610.55 KB
13 Feb 2003	3	23	51	306.64 KB
14 Feb 2003	10	111	196	685.77 KB
15 Feb 2003	3	17	29	193.89 KB
16 Feb 2003	3	17	21	53.92 KB
17 Feb 2003	9	122	259	874.08 KB
18 Feb 2003	4	36	61	366.27 KB
19 Feb 2003	6	76	121	3.96 MB
20 Feb 2003	7	128	210	1.56 MB
21 Feb 2003	6	33	55	585.82 KB
22 Feb 2003	1	6	10	80.47 KB
23 Feb 2003	0	0	0	0
24 Feb 2003	9	101	163	592.56 KB
25 Feb 2003	1	4	8	51.29 KB
26 Feb 2003	5	22	28	154.91 KB
27 Feb 2003	5	38	68	197.57 KB
28 Feb 2003	3	27	33	543.30 KB
Average	4.86	66.96	109.32	825.24 KB
Total	136	1875	3061	22.57 MB

Figure 3-7: Web Daily Usage for February 2003

Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2003	56	96	976	1721	15.78 MB
Feb 2003	64	136	1875	3061	22.57 MB
Mar 2003	57	156	1781	2774	27.88 MB
Apr 2003	3	3	201	449	903.46 KB
May 2003	0	0	0	0	0
Jun 2003	0	0	0	0	0
Jul 2003	0	0	0	0	0
Aug 2003	0	0	0	0	0
Sep 2003	0	0	0	0	0
Oct 2003	0	0	0	0	0
Nov 2003	0	0	0	0	0
Dec 2003	0	0	0	0	0
Total	180	391	4833	8005	67.10 MB

Figure 3-8: Web Usage Summary for 2003

4. DETAILED NETWORK AND SERVICES USAGE IN EVENTS/TRIALS

This section is intended to study and analyze the network traffic generated in the following situations:

- **Internal Trials:** Internal Euro6IX trials performed in the context of activity A4.3 will generate traffic within the Euro6IX networks. In some of these trials, the detailed study and analysis of the traffic generated could be interesting. In such cases, particular diagrams and statistics will be shown in this section although they could be included in the general statistics showed in previous sections.
- **Public Events:** After a public event has been performed, the traffic processed by the network during it must be studied and analyzed. The study must be focused in the traffic obtained as a result of this concrete event.

During February 2003 there was no relevant events with the participation of Euro6IX but some tests in other to start using ISABEL IPv6 multi-videoconference tool.

5. SUMMARY AND CONCLUSIONS

Euro6IX has been focused in deploying a stable infrastructure to allow the rest of the project activities to cooperate. In this way, project partners working in A4.1 (advanced network services) and A4.2 (SW development) have started to claim to WP3 more presence of stable services in the network. WP3 has started to include stable end services within its priorities generating first a list of such services (input from A4.1 and A4.2) that will be included in D3.3.15. After this list is clear and stable services are found, the idea is to coordinate an optimal distribution of such services to generate useful traffic among all Euro6IX nodes.