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Abstract: Deliverable D3.3.13 is produced after part of Euro6IX network infrastructure is up and running. The main goal of these documents is to report regarding the Euro6IX networks status, deployment state and usage by internal activities as well as public events.
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Keywords: Euro6IX, IPv6, Network Maps, Network Reports, Network Status, Statistics, Traffic.
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Revision History

Revision	Date	Description	Author (Organization)
v1.0	16/02/2003	Document creation	Jesus Lopez (TID) Carlos Ralli Ucendo (TID)
v1.1	19/2/2003	Added web statistics graphics	Álvaro Vives (Consulintel)
v1.2	13/03/2003	Template update and final review	Jordi Palet (Consulintel)

Executive Summary

D3.3.13 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 13 (January 2003). D3.3.13 aims to summarize the status and usage of the different Euro6IX networks and services during January 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

Euro6IX project has, as a key goal, to accelerate the introduction of IPv6 protocol in Europe. To reach this purpose, an appropriate architecture will be researched in order to design, develop, deploy and validate the first Pan-European pre-commercial IPv6 Internet Exchanges Network.

The network will connect regional and strategic neutral IPv6 Internet Exchanges across Europe in order to achieve higher levels of robustness and service quality than currently offered by IPv4 Networks.

The project will give the possibility to test advanced network services and IPv6 enabled applications that need to be properly monitored and reported, as part of the deployment activity, as is actually done in production networks.

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 (January 2003, M13) the relevant news include:

- **LIS6IX-MAD6IX-LON6IX-PAR6IX-BER6IX:** Now packets flow within Euro6IX links instead of going from LON6IX to BER6IX through the 6Bone.
- **BER6IX-TOR6IX** has been fully configured and it is now up and running. A possible bug regarding Juniper-Hitachi interoperation has been found and some tests are being run at TID, TILAB and T-Systems to report this bug.
- Some IPv6 services are being tested during these days: Network Statistics & Network Management/Monitoring tools (see proposals in Deliverable D3.2), IRC, ISABEL multi-videoconference system.

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.

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:** TILAB has configured the Torino-Zurich section but a local loop is needed. Euro6IX consortium is negotiating with external carriers to have this local loop sponsored.
- **TOR6IX-MAD6IX:** It has been decided to use a tunnel to enable routing tests depending on a ring topology.

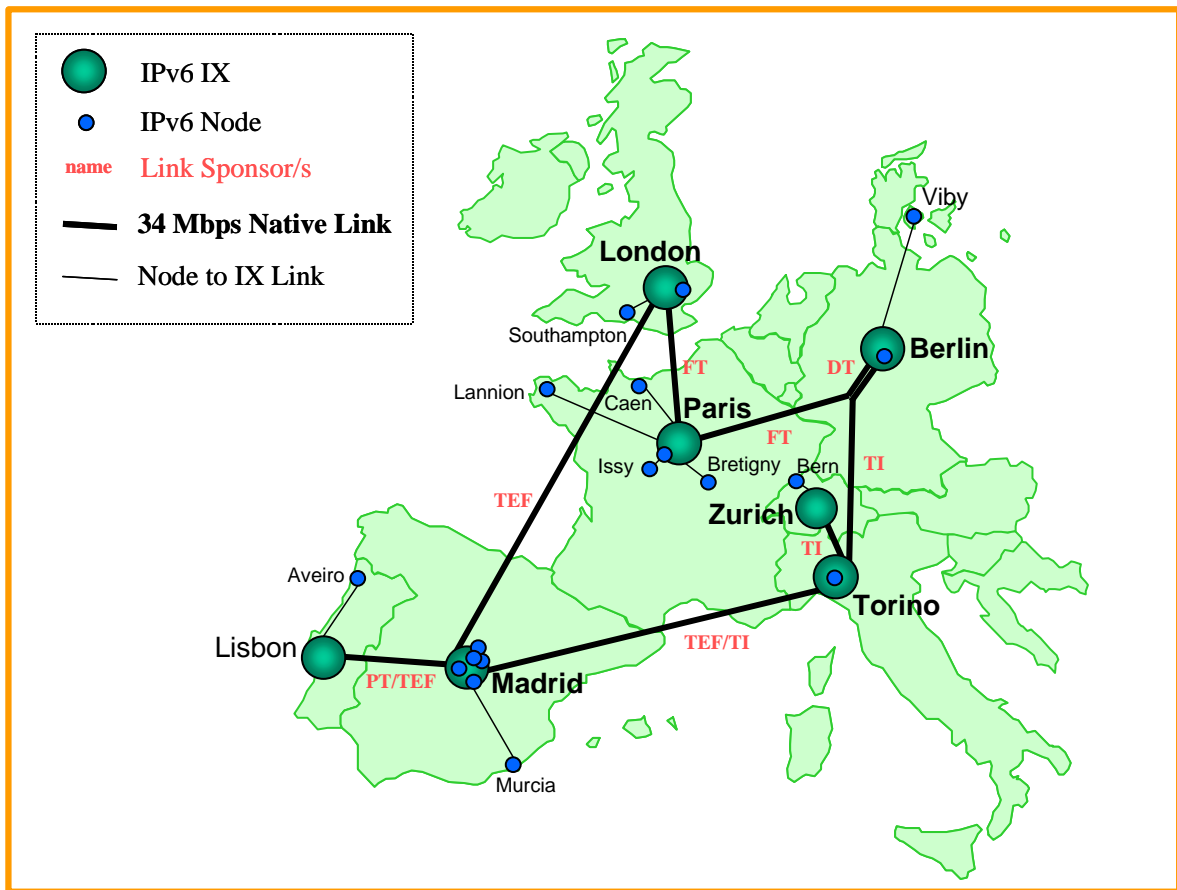


Figure 2-1: Planned Euro6IX International Links as of January 2003

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 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 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/statistics/> 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 "ping_stat" 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 as the example showed below.

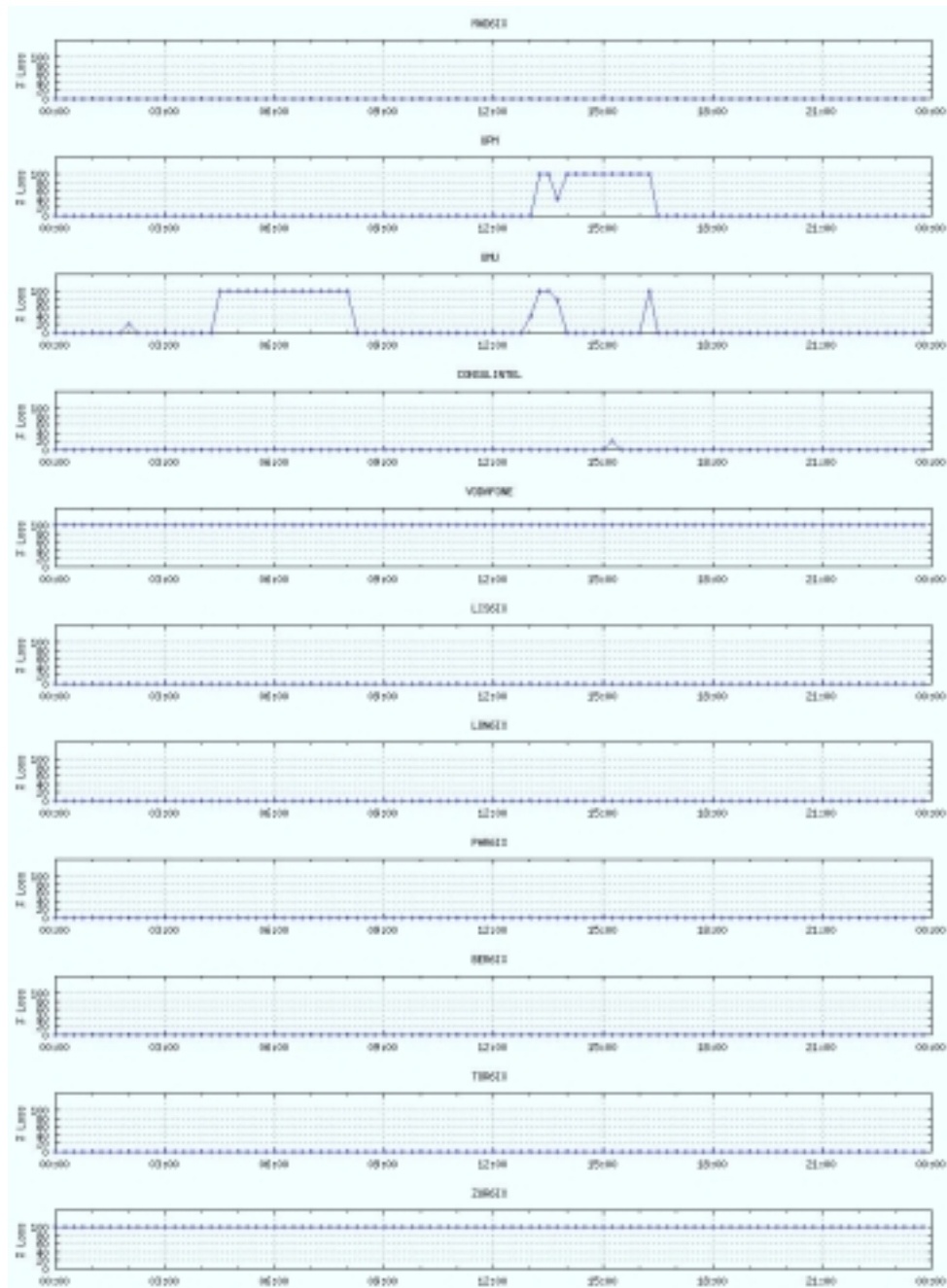


Figure 3-1: Example of Network Losses

As said before, the system was thought to generate daily graphics but it is being improved to show monthly diagrams for these monthly reports regarding the 6IXs:

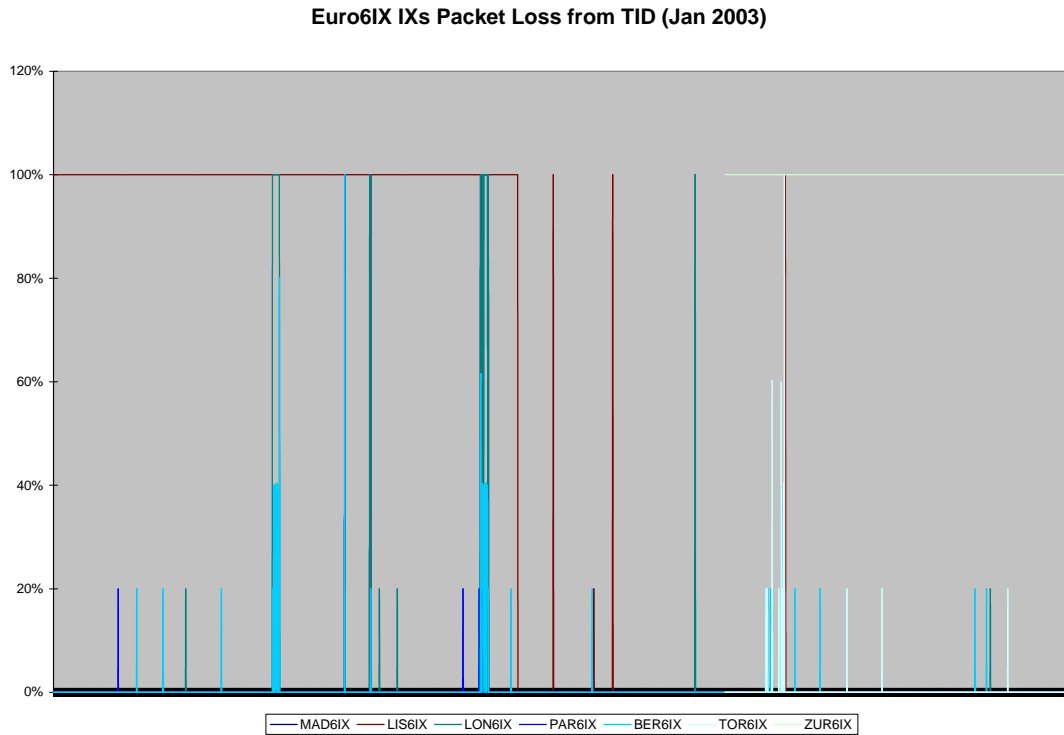


Figure 3-2: Euro6IX IXs Delay Measured from TID Premises in January 2003

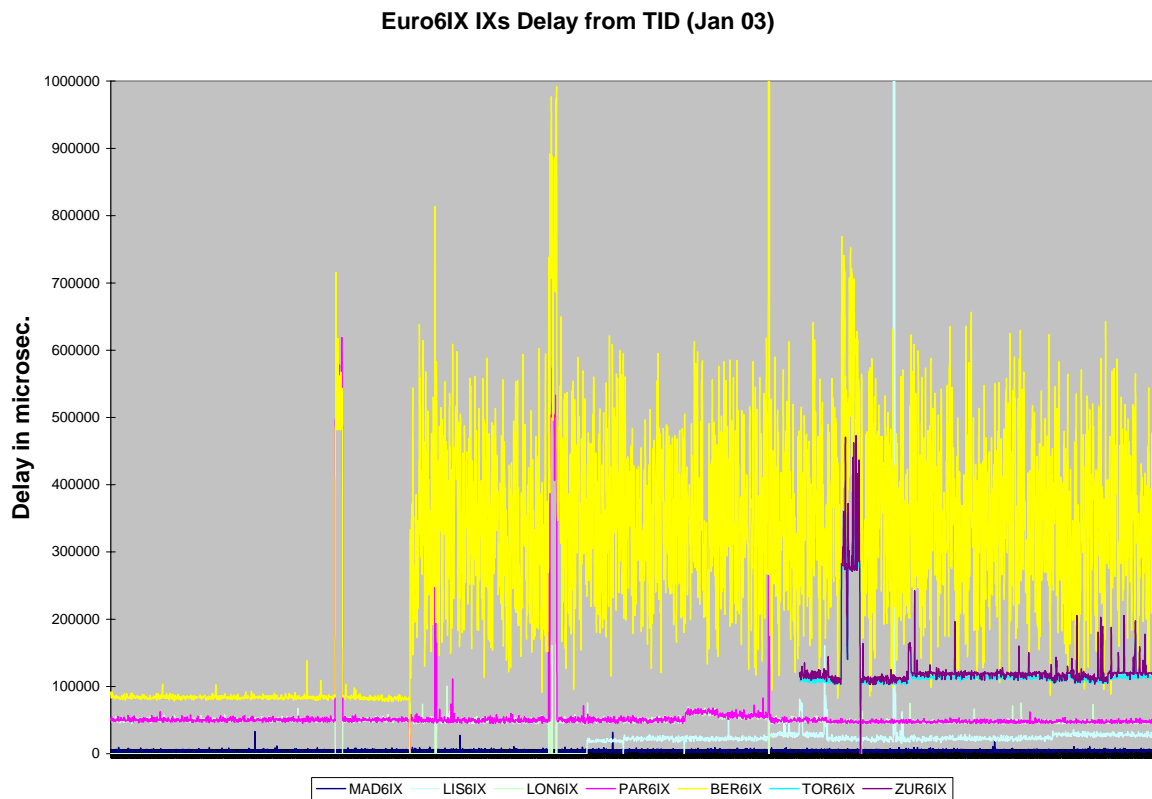


Figure 3-3: Euro6IX IXs Delay Measured from TID Premises in January 2003

The same measurements are being taken for all Spanish partners accessing via MAD6IX.

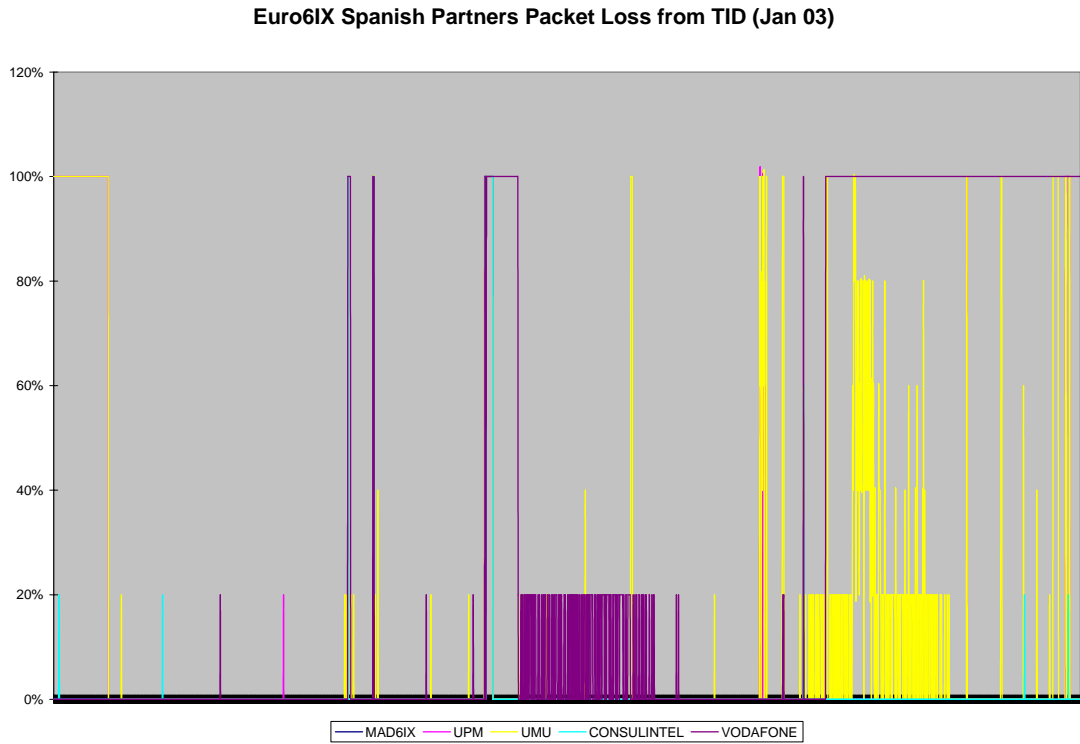


Figure 3-4: Spanish Partners Packet Loss Measured from TID (January 2003)

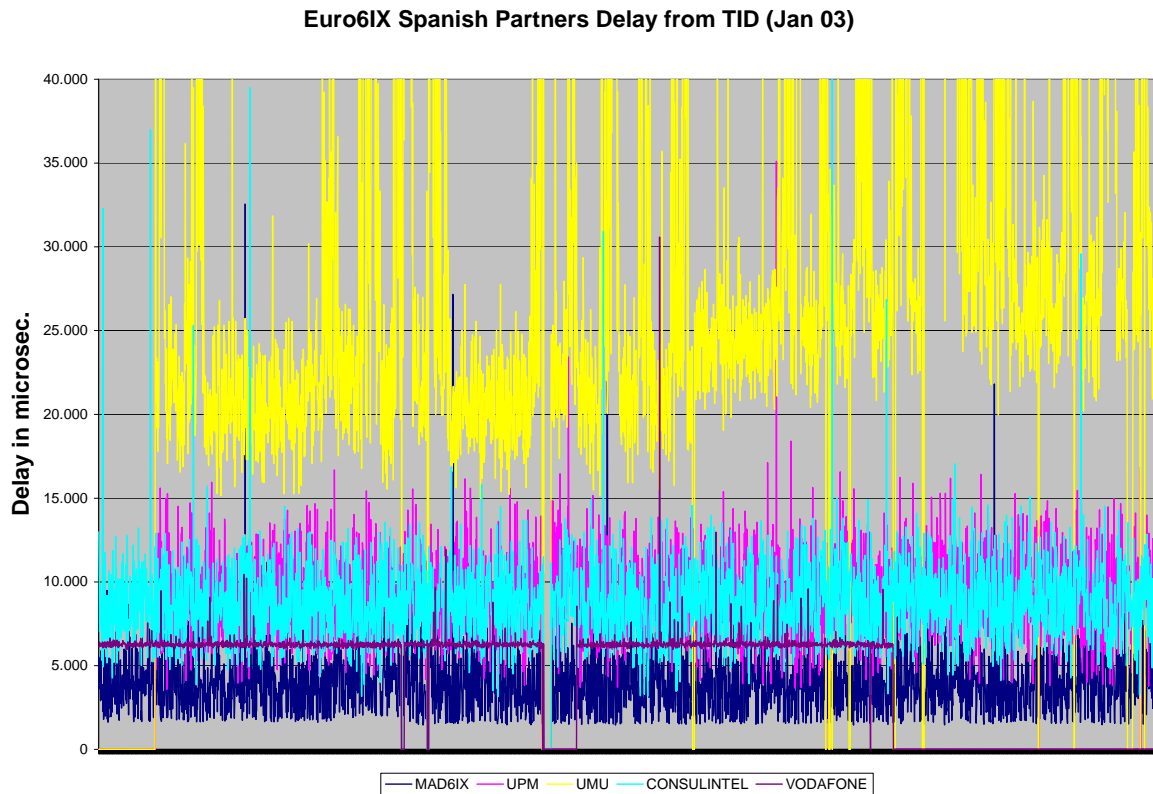


Figure 3-5: Spanish Partners Delay Measured from TID (January 2003)

3.2 Links Traffic Measurement Statistics

No Links Traffic Measurement system is available by Jan 2003. See Euro6IX Deliverable D3.2 for proposed systems to be used in Euro6IX.

In the future, this section will compile the traffic sent by Euro6IX international and national links. It will include also the traffic sent and received in the links connecting Euro6IX to other IPv6 backbones.

After installing the systems proposed in D3.2, some figures should be available for the network report of March/April (D3.3.15/16).

3.3 Euro6IX Services Statistics

The Euro6IX Statistics Service will show not only the availability of Euro6IX network gateways/routers, but also the availability of relevant or public IPv6 host/servers in <http://stat6.tid.euro6ix.org/statistics/> for consortium members.

In the future, this section will include several servers statistics related to the usage of a set of stable services implemented in Euro6IX.

3.3.1 Euro6IX Web Server Statistics

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

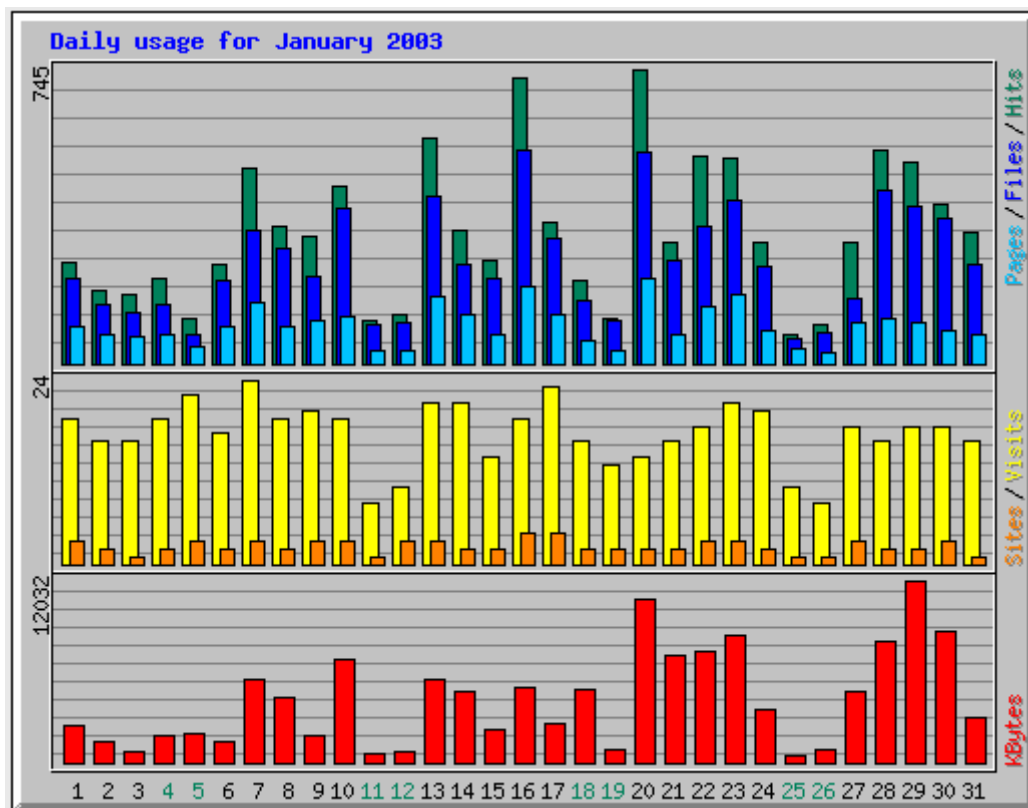


Figure 3-6: Web Daily Usage for January 2003

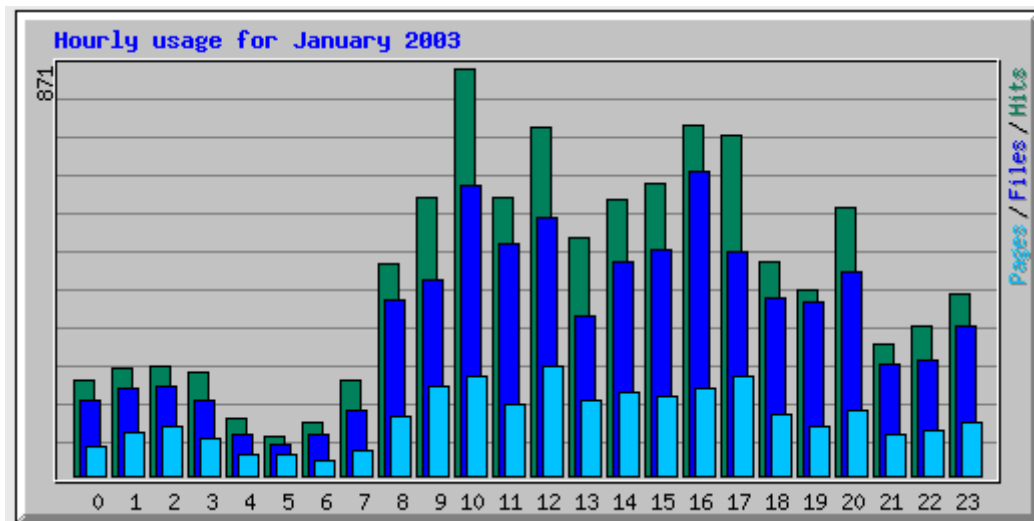
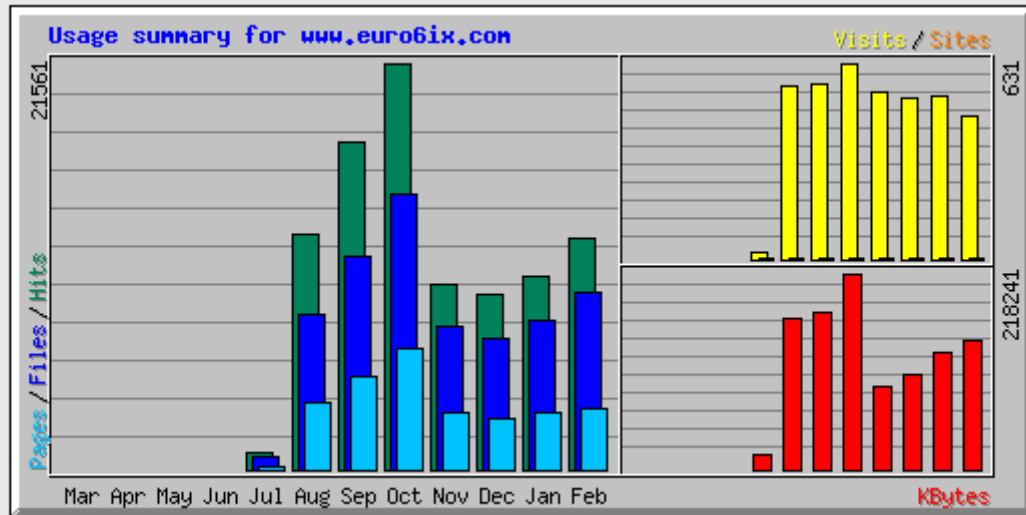


Figure 3-7: Web Hourly Usage for January 2003

Monthly Statistics for January 2003		
Total Hits	10284	
Total Files	7946	
Total Pages	3014	
Total Visits	525	
Total KBytes	129950	
Total Unique Sites	4	
Total Unique URLs	128	
Total Unique Referrers	206	
Total Unique User Agents	230	
	Avg	Max
Hits per Hour	13	158
Hits per Day	331	745
Files per Day	256	542
Pages per Day	97	215
Visits per Day	16	24
KBytes per Day	4192	12032
Hits by Response Code		
Code 200 - OK	7946	
Code 206 - Partial Content	215	
Code 301 - Moved Permanently	17	
Code 304 - Not Modified	1748	
Code 403 - Forbidden	17	
Code 404 - Not Found	341	

Figure 3-8: Monthly Statistics for January 2003



Summary by Month										
Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
Feb 2003	492	377	129	18	4	143072	458	3235	9427	12314
Jan 2003	331	256	97	16	4	129950	525	3014	7946	10284
Dec 2002	299	226	86	16	4	104962	517	2685	7008	9271
Nov 2002	329	251	99	17	4	91887	535	2975	7548	9873
Oct 2002	695	471	206	20	4	218241	631	6404	14622	21561
Sep 2002	580	378	164	18	4	173809	566	4927	11352	17402
Aug 2002	402	264	113	17	4	167111	557	3515	8199	12483
Jul 2002	128	91	26	3	3	16489	22	185	642	896
Totals						1045521	3811	26940	66744	94084

Figure 3-9: Web Usage Summary for the Last 12 Months

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

5. SUMMARY AND CONCLUSIONS

Up to end of January 2003, most links of the Euro6IX network are active and fully operational, BGP4+ routing is running among most IXs and a routing policy based in communities tagging is being discussed (see Euro6IX Deliverable D2.2) to improve network behavior.

Also Euro6IX network has connectivity to/from 6NET and the 6Bone. Since the routing policy is not decided and installed most times traffic between two Euro6IX/6NET partners flows by the right route (inside Euro6IX links) in one way but sometimes comes back by a wrong one (usually, through the 6Bone).

Anyway, it is time to start using Euro6IX for useful tasks so a big ISABEL IPv6 event with more than 20 European sites is scheduled by February 12-13rd 2003.

Also, the next WP leaders conference (February 19th) will be performed using ISABEL IPv6 instead of setting up a call conference.

For the previous internal trials IPv6 IRC (chat) will be used since many tests will be necessary the days before both events.

In the next Network Monthly Report some concrete measures and information of the network usage in these two trials will be included.