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Abstract:

Deliverable D3.3.17 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.

This document includes also the traffic from the demos of the Madrid 2003 Global IPv6 Summit organized by Consulintel in May.

Keywords:

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

Revision History

The following table describes the main changes done in the document since its creation.

Revision	Date	Description	Author (Organization)
v0.1	05/08/2003	Document creation and Addition of Stat6 graphics	Jesús López (TID) Aurora Ferrándiz (TID)
v1.0	06/08/2003	Addition of WP3 “Stable” Services List and Results of Madrid Global Summit 2003	Aurora Ferrándiz (TID)
v1.1	06/08/2003	Comments on MRTG Statistics	Antonio Lucientes (TID)
v1.2	31/08/2003	Final review	Jordi Palet (Consulintel)

Executive Summary

D3.3.17 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 17 (May 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.

Table of Contents

Table of Figures

1. INTRODUCTION

Euro6IX network monthly reports are intended to show network and services evolution, current status, stability and usage.

Until D3.3.14 these reports did not include useful information regarding end user services but since D3.3.15 this issue as a primary objective. In this way, a list of updated stable services per partner has been compiled and included as part of WP3 activities.

Only stable and operational services are listed, since there are other lists for specific trials/tests within A4.1, A4.2 & A4.3 including also unstable services.

In next D3.3.x documents this list of services will be updated and also it will be checked if some of these services are using advanced network services studied and tested within A4.1.

1.1 In section 3.4, "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.

First visit	Summary			Last visit
01 May 2003 - 00:58	Month May 2003			31 May 2003 - 23:28
Unique visitors	Number of visits	Pages	Hits	Bandwidth
630	1047 (1.66 visits/visitor)	7058 (6.74 pages/visit)	11725 (11.19 hits/visit)	126.22 MB (123.44 KB/visit)

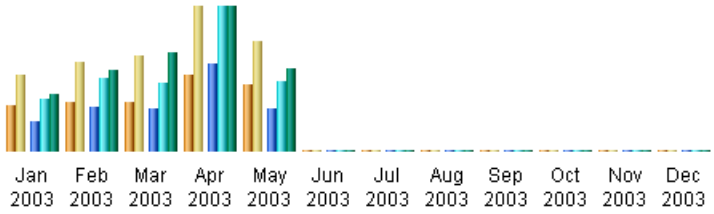

Figure 3-4: Web Usage Summary this Month and Last 12 Months

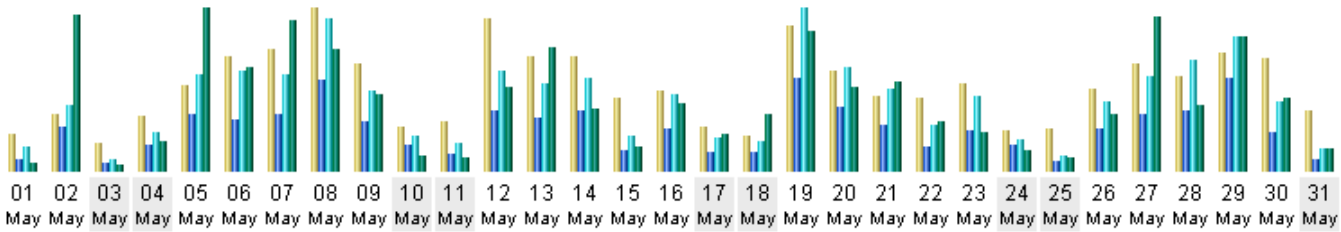

Figure 3-5: Monthly Statistics for May 2003

Day	Number of visits	Pages	Hits	Bandwidth
01 May 2003	15	63	129	512.09 KB
02 May 2003	23	240	350	8.79 MB
03 May 2003	11	39	62	386.78 KB
04 May 2003	22	141	202	1.66 MB
05 May 2003	34	302	513	9.15 MB
06 May 2003	46	277	538	5.82 MB
07 May 2003	49	303	513	8.45 MB
08 May 2003	65	489	809	6.87 MB
09 May 2003	43	263	425	4.30 MB
10 May 2003	18	137	185	894.19 KB
11 May 2003	20	95	153	812.46 KB
12 May 2003	61	323	536	4.71 MB
13 May 2003	46	285	469	7.01 MB
14 May 2003	46	325	495	3.48 MB
15 May 2003	29	115	185	1.42 MB
16 May 2003	32	224	407	3.80 MB
17 May 2003	18	100	175	2.04 MB
18 May 2003	14	97	160	3.21 MB
19 May 2003	58	496	865	7.86 MB
20 May 2003	40	343	548	4.71 MB
21 May 2003	30	241	440	4.98 MB
22 May 2003	29	133	246	2.76 MB
23 May 2003	35	216	403	2.16 MB
24 May 2003	16	142	169	1.21 MB
25 May 2003	17	54	80	759.20 KB
26 May 2003	33	229	370	3.21 MB
27 May 2003	43	298	502	8.65 MB
28 May 2003	38	325	590	3.73 MB
29 May 2003	47	493	713	7.54 MB
30 May 2003	45	207	373	4.12 MB
31 May 2003	24	63	120	1.28 MB
Average	33.77	227.68	378.23	4.07 MB
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Figure 3-6: Web Daily Usage for May 2003

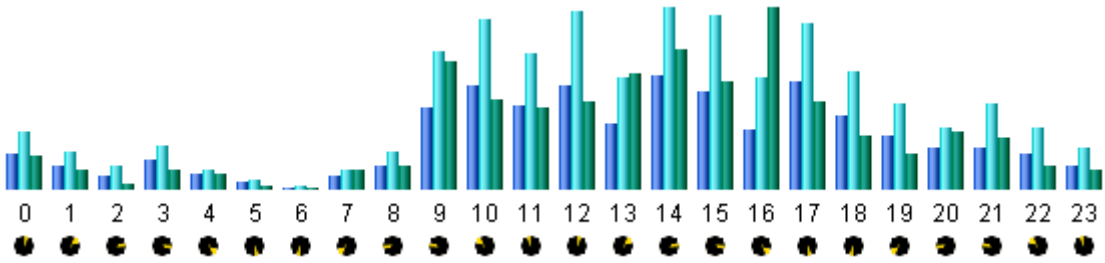


Figure 3-7: Web Hourly Usage for May 2003

Detailed Network and Services Usage in Events/Trials", the demos organized in the Madrid 2003 Global IPv6 Summit and the network architecture used to make this event reachable by all IPv6 world, are detailed.

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 (May 2003, M15) the relevant news include:

- TOR6IX-ZUR6IX. Same as in March 2003: Physical connection Up & Running thanks to a link provided by Swisscom/Fixnet. It stills need some configuration to be IPv6 reachable.
- LON6IX and MAD6IX have started to configure 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

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:** Up and running.
- **TOR6IX-MAD6IX:** It was decided to use a tunnel to enable routing tests depending on a ring topology. Not configured yet.

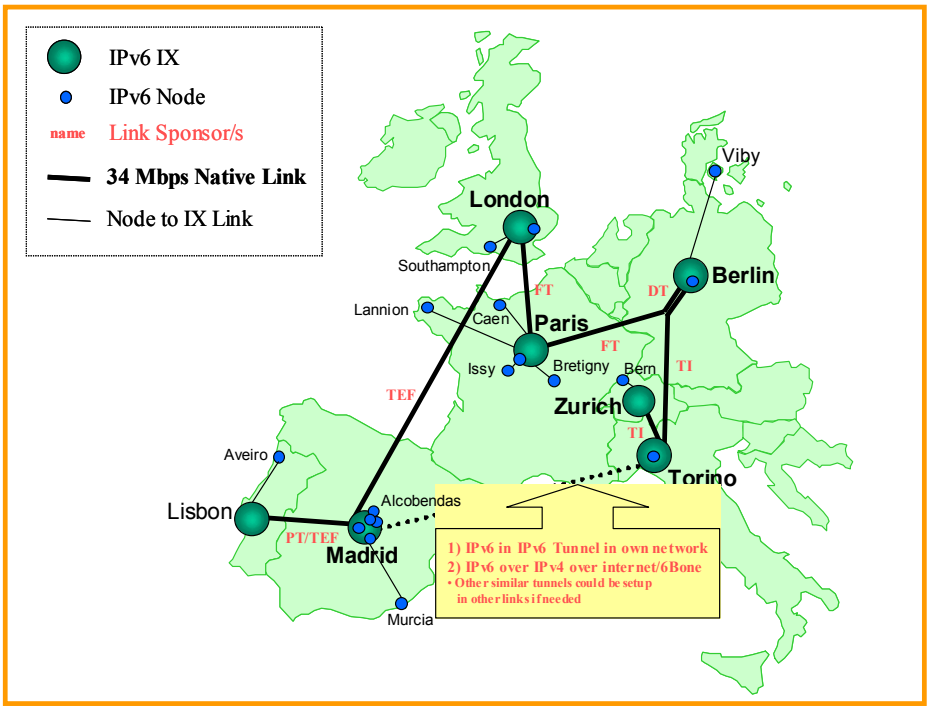


Figure 2-1: Planned Euro6IX International Links as of May 2003

3. NETWORK STABILITY AND GLOBAL TRAFFIC REPORTS

The following subsections show the global statistics systems that have been identified as necessary to characterize the Euro6IX network stability and 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 (http://stat6.tid.euro6ix.org/). As stated in D3.3.14, this system allows through the WEB interface to display any day or month graphic on demand.

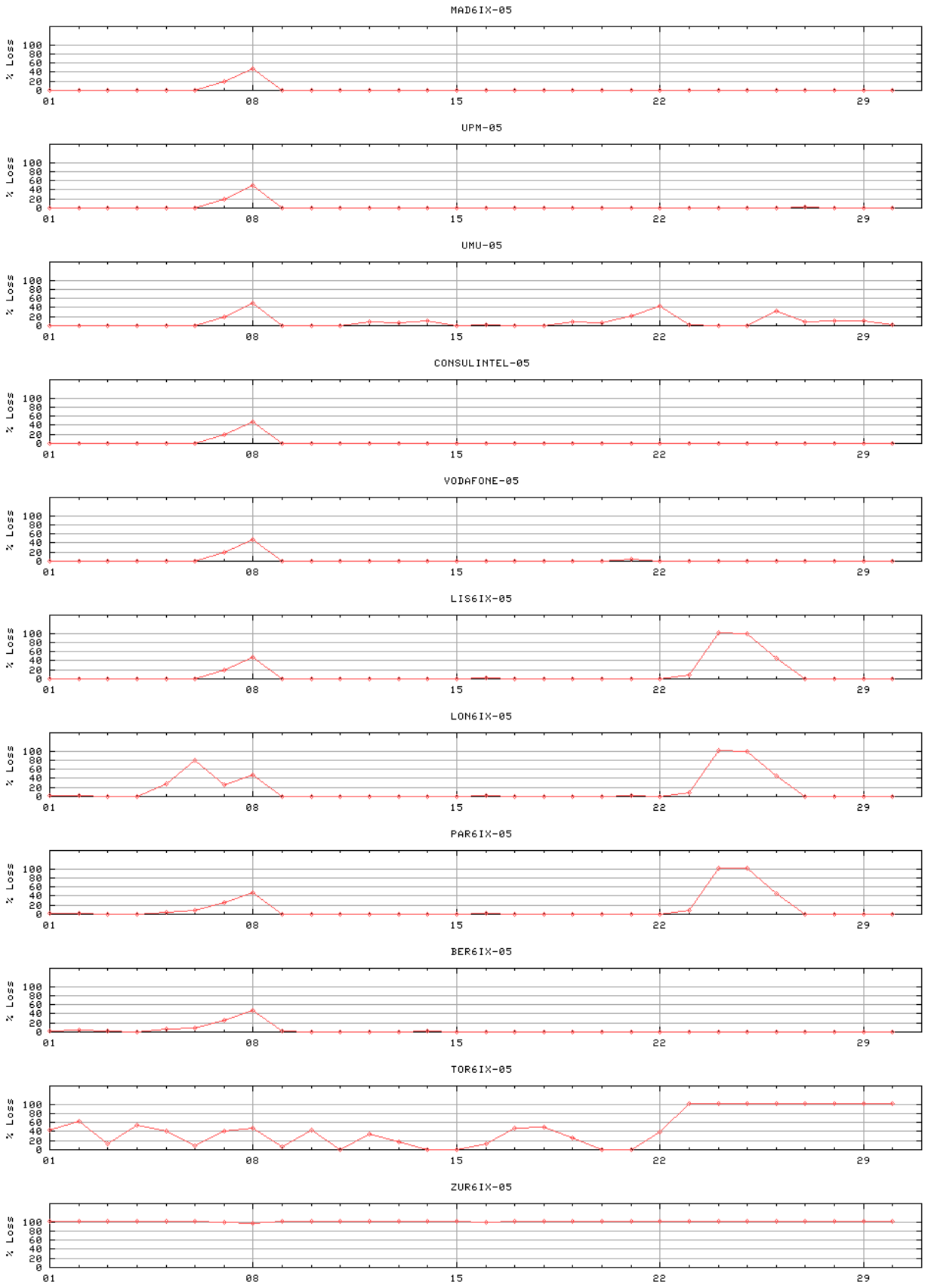


Figure 3-1: Euro6IX IXs LOSS Measured from TID Premises in May 2003

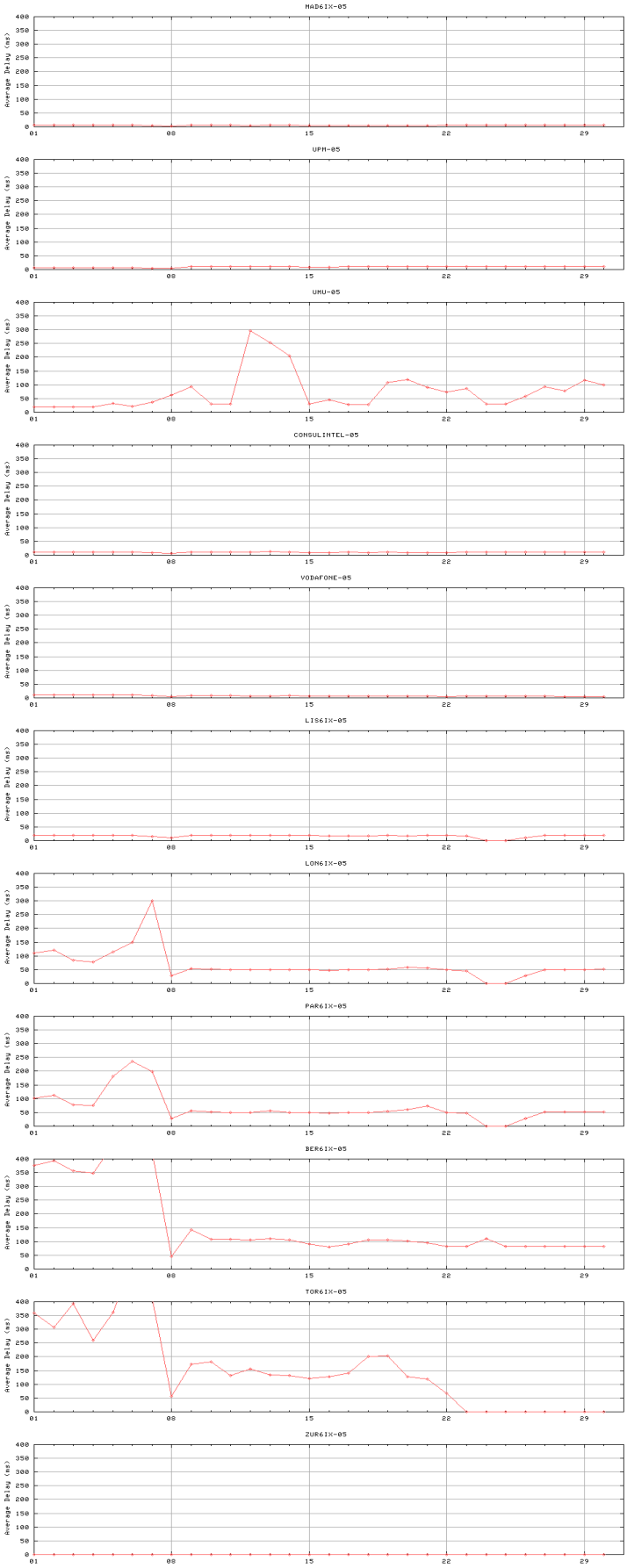


Figure 3-2: Euro6IX IXs DELAY Measured from TID Premises in May 2003

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.

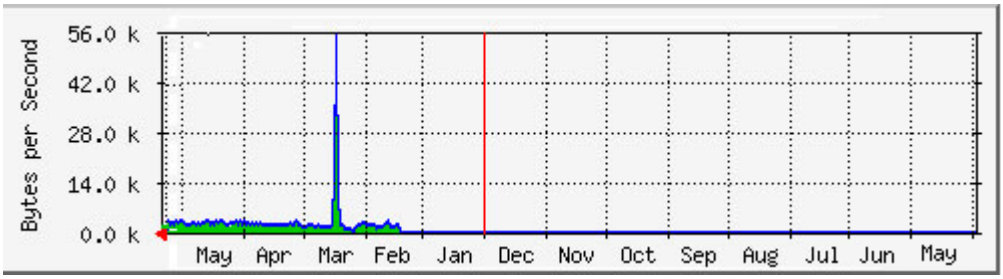


Figure 3-3: Monthly Graph, IPv6 Traffic ,TID to Euro6IX (May 2003)

As seen in the graphics above, there is about 5 Kbytes/s traffic from TID to Euro6IX and vice-versa (symmetric. Blue = TID to Euro6IX, Green = Euro6IX to TID) due to some M6Bone and Magalia tests. There is a little bit more traffic due to the increment of internal test users at TID.

3.3 Euro6IX Servers List and Stability Statistics

In this section an updated release of the Euro6IX server/services list is included. In these tables all **stable** services per partner are described.

Part of these services was shown in the Madrid 2003 Global IPv6 Summit.

BT

Server	URL IPv6	URL IPv4	Recommended Client
Web	http://www.uk6x.com/	http://www.uk6x.com/	IPv6 Web Browser
Looking Glass	https://lg.ipv6.btexact.com/		IPv6 Web Browser
Nagios			IPv6 Web Browser
Jabber			
Quake 1 and Quake 2	quake.ipv6.btexact.com		Quake
Video Streaming	http://vod.ipv6.btexact.com		VLC
MP3 Streaming	http://radio.ipv6.btexact.com:8000/		Winamp (http://www.uk6x.com/applicationservices/radio.m3u) Windows Media 9 (http://www.uk6x.com/applicationservices/radio.asx) mpeg123 for Unix Systems

			xmms for Unix and Linux Systems Freeamp, now called zinf is a multimedia player for Linux or Windows systems. It has been tested under Linux and Windows 2000/XP. VLC
Tunnel Broker	https://tb.ipv6.btexact.com/		
GPRS Access	http://www.uk6x.com/networkservices/gprs.html		

Consulintel

Server	URL IPv6	URL IPv4	Recommended Client
Euro6IX Official Web	www.euro6ix.com www.euro6ix.org www.euro6ix.net		IPv6 Web Browser
Web Site Statistics	http://www.consulintel.euro6ix.net/_private_euro6ix/statistics/statistics.htm		IPv6 Web Browser
Project Repository	ftp://ftp.euro6ix.org		IPv6 Web Browser
Web Mail Tool	http://webmail.novagnet.euro6ix.org/		IPv6 Web Browser
Video Streaming	mms://6stream.consulintel.euro6ix.com/		Windows Media 9
DNSSec	https://pki.umu.euro6ix.org		IPv6 Web Browser
Free Radius IPv6	6radius.consulintel.euro6ix.org		

FTRD

Server	URL IPv6	URL IPv4	Recommended Client
Webcam	webcam.ftrd.euro6ix.org		
Proxy Web	proxy.ftrd.euro6ix.org		
Quake2	quake2.ftrd.euro6ix.org		Quake

nGn

Server	URL IPv6	URL IPv4	Recommended Client
Web	www.novagnet.euro6ix.org		IPv6 Web Browser
Project Repository	ftp://ftp.euro6ix.org		IPv6 Web Browser
Web Mail Tool	http://webmail.novagnet.euro6ix.org/		IPv6 Web Browser

PTIN

Server	URL IPv6	URL IPv4	Recommended Client
Web	http://www.ptin.euro6ix.com		IPv6 Web Browser

Chat/IRC	irc.ptin.euro6ix.com irc.ptin.euro6ix.org irc.ptin.euro6ix.net		Ipv6 Chat Client
Jabber	jabber.ptin.euro6ix.com jabber.ptin.euro6ix.org jabber.ptin.euro6ix.net		
Quake 1 and Quake2	quake.ptin.euro6ix.com quake.ptin.euro6ix.org quake.ptin.euro6ix.net		Quake
MP3 Streaming	mp3server.ptin.euro6ix.com mp3server.ptin.euro6ix.org mp3server.ptin.euro6ix.net		
Video Streaming	vic.ptin.euro6ix.com vic.ptin.euro6ix.org vic.ptin.euro6ix.net		Vic
6to4	6to4.ptinovacao.pt		

T-Nova

Server	URL IPv6	URL IPv4	Recommended Client
Web	www.t-nova.euro6ix.org	www.t-nova.euro6ix.org	IPv6 Web Browser
Chat/IRC	irc.t-nova.euro6ix.org		IPv6 Chat Client
NTP	ntp.t-nova.euro6ix.org		NTP Client/ntpdate
Video Streaming	video.t-nova.euro6ix.org		Windows Media 9
Tunnel Broker	http://tb.ipv6.berkom.de		Web Browser

Telscom

Server	URL IPv6	URL IPv4	Recommended Client
Web	http://www.telscom.ch		
vides Streaming	http://dnsv6.telscom.ch:8100/mediaplayer6.html rtsp://dss6.ipv6.telscom.ch		WindowsMedia MPEG4IP

TID

Server	URL IPv6	URL IPv4	Recommended Client
Web	www.tid.euro6ix.com		IPv6 Web Browser
Web Usage Statistics	www.tid.euro6ix.com/usage		IPv6 Web Browser
Magalia	Running at: mortadelo.tid.euro6ix.com:4444		Xges
Looking Glass	http://lg.tid.euro6ix.com		IPv6 Web Browser
MRTG	http://mrtg.tid.euro6ix.org/mrtg/		IPv6 Web Browser

Server	URL IPv6	URL IPv4	Recommended Client
MRTG for TID DNS	http://mrtg.tid.euro6ix.org/mrtg_dns/dns1.ist-long.com.html		IPv6 Web Browser
Web Statistics Tool	http://stat6.tid.euro6ix.com		IPv6 Web Browser
Chat/IRC	irc6.tid.euro6ix.com		Chat IPv6 Client
Video Streaming	vod.tid.euro6ix.com:9999		VLC
Free Radius IPv6	Running at: mortadelo.tid.euro6ix.com:4444		
Digital TV Multicast	dtv.tid.euro6ix.com:1234		
Access to a Digital Home through a NAT-PT	http://hogardigital6.tid.euro6ix.com		IPv6 Web Browser
Access to a Multimedia IPv4 Portal through a NAT-PT	http://cba.tid.es	http://cba.tid.es	IPv6 Web Browser

TILAB

Server	URL IPv6	URL IPv4	Recommended Client
Web	http://www.ngnet.it		
Web Statistics Tool	Running at TILAB's IPv6 laboratory		IPv6 Web Browser
TILAB AS-Path Tree	Running at TILAB's IPv6 laboratory		
Chat/IRC	irc6.ngnet.it		IPv6 Chat Client
News	news6.ngnet.it		IPv6 News Client
Mail for IPv6 Users	http://mail.ngnet.it/e/		IPv6 Web Browser (mail server available from Web)
Jabber	jabber.ngnet.it		
Quake 1 and Quake 2	games.ngnet.it		Quake
Tunnel Broker	http://tb.ngnet.it/		

UMU

Server	URL IPv6	URL IPv4	Recommended Client
Web	www.umu.euro6ix.org		IPv6 Web Browser
Looking Glass	http://www.umu.euro6ix.org/cgi-bin/router-wan/ntools.pl http://www.umu.euro6ix.org/cgi-bin/router-lan/ntools.pl		IPv6 Web Browser
Nagios	http://nagios.umu.euro6ix.org/nagios/		IPv6 Web Browser
Chat/IRC	http://www.uc3m.ist-long.com/irc/		IPv6 Chat Client

Server	URL IPv6	URL IPv4	Recommended Client
VPN Enforcement Tool	https://shire.umu.euro6ix.org		IPv6 Web Browser
PKIv6	https://pki.umu.euro6ix.org		IPv6 Web Browser
DNSSec	https://pki.umu.euro6ix.org		IPv6 Web Browser
PMTv6	https://shire.umu.euro6ix.org/pmtool		

UoS

Server	URL IPv6	URL IPv4	Recommended Client
Surge Radio	http://surge.ecs.soton.ac.uk:8090		

UPM

Server	URL IPv6	URL IPv4	Recommended Client
Web	http://www.upm.euro6ix.org	http://wamba.dit.upm.es	
FTP	ftp://ftp.upm.euro6ix.org	ftp://wamba.dit.upm.es	
Magalia	magalia.upm.euro6ix.org	nevada.saba.rediris.es	
Free Radius	radius.upm.euro6ix.org	nevada.saba.rediris.es	
Looking Glass	http://www.upm.euro6ix.org/cgi-bin/looking-glass-upm-v0.6/ntools.pl	http://wamba.dit.upm.es/cgi-bin/looking-glass-upm-v0.6/ntools.pl	IPv6 Web Browser
Nagios	nagios.upm.euro6ix.org	nevada.saba.rediris.es	IPv6 Web Browser
Chat/IRC	irc.upm.euro6ix.org:7000	viena.saba.rediris.es:7000	IPv6 Chat Client (i.e. xchat)
Quake 2	quake2.upm.euro6ix.org	wamba.dit.upm.es	
Teg	teg.upm.euro6ix.org	wamba.dit.upm.es	
Tetrinet	tetris.upm.euro6ix.org	wamba.dit.upm.es	
mangbad	mangbad.upm.euro6ix.org	wamba.dit.upm.es	
Mail	mail.upm.euro6ix.org	viena.saba.rediris.es	
WebCam	http://idefix.upm.euro6ix.org/webcam.html	http://idefix.saba.rediris.	

		es/webcam.html	
m6bone	m6bone.upm.euro6ix.org		
DNSSec	https://pki.umu.euro6ix.org		

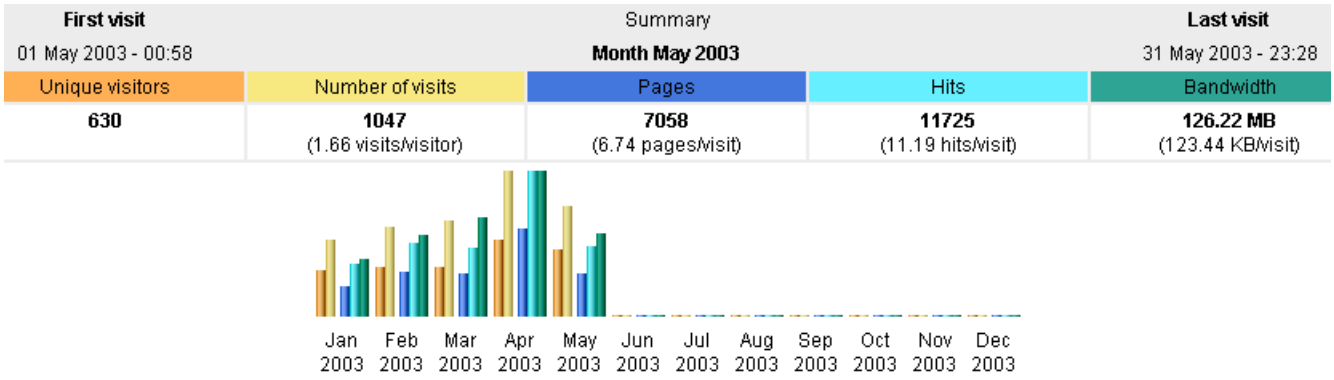
Vodafone

Server	URL IPv6	URL IPv4	Recommended Client
Web	www.vodafone.euro6ix.org		IPv6 Web Browser

TID Euro6IX Statistics Service ("Stat6") will show in the future the availability of some relevant or public Euro6IX IPv6 servers listed above (to be included also in http://stat6.tid.euro6ix.org).

3.4 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.



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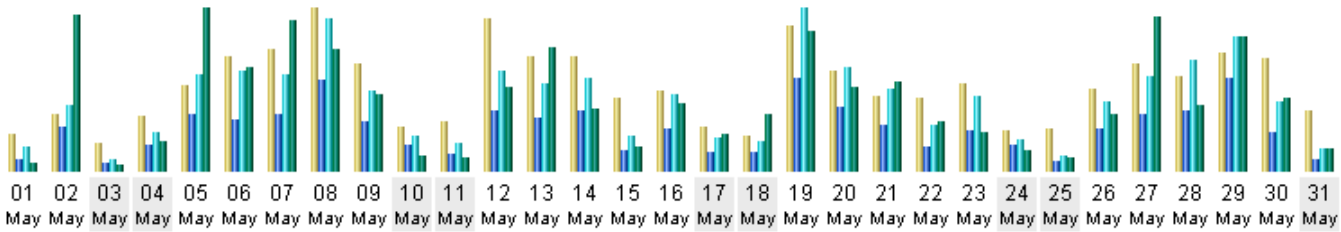

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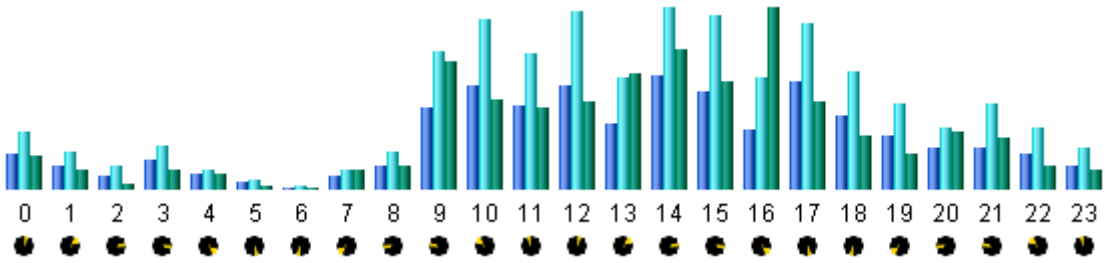

Figure 3-7: Web Hourly Usage for May 2003

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 May 2003, the Madrid 2003 Global IPv6 Summit (http://www.ipv6-es.com) was organized by Consulintel. This event was considered as the first Public Trial of the Euro6IX project. Included more international projects making demos and the visibility of this event was international.

This event started on 12th of May and finalized on 15th May. The main goals of this event were to show:

- The stability of the Euro6IX networks, showing how it works and how it is managed.
- The connectivity with other IPv6 networks in the world.
- And the availability of stable services within Euro6IX.

Next event will include a minimum of users testing Euro6IX services and statistics of the traffic generated by them.

To get the goal of showing the operation and the management of Euro6IX network, one of the main demonstration presented in the event was Magalia, the application used to monitor and control Euro6IX networks and developed by TID development team in the context of Euro6IX.

The applications showed at the event demonstrated the stability and the correct operation of Euro6IX network and the quality and stability of the services installed and deployed within Euro6IX.

This is the list of applications showed (and the partner responsible of each one) at the Madrid 2003 Global IPv6 Summit:

- Video Multicast, with recorded contents at its server (showed by TID).
- Digital TV Service, with live contents (showed by TID).
- Videoconference with WIDE-Japan using ISABEL v6 in the main room (ISABEL is an application developed and maintained by UPM).
- Video Reception in PDAs, mobility, etc. (showed by BT, TID, PTIN, UMU).
- Afoto, an application to show IPv6 mail service deployed in the context of LONG project (showed by TID).
- Access to an IPv4 service through a NAT-PT (showed by TID).
- Network games: Quake 1 and Quake 2 (showed by UPM).
- Video and Audio Streaming (showed by Consulintel, TID and UMU).

- Videoconference through M6Bone (Multicast Network, showed by 6WIND).
- Instant Messaging (showed by nGn).
- Voice over IPv6 between PCs (showed by Telscom).
- Isabel over VPN (showed by UPM).
- Secure Access to Services using Smartcard and PKIv6 (showed by UMU).
- Tunnel Broker (showed by BT).

4.1 Connectivity GIS2003 – Euro6IX

Consulintel was the organizer of the Madrid 2003 Global IPv6 Summit, and the best choice was to obtaing the connectivity to Internet and to IPv6 Networks, via a 34 Mbps connection offered by Iberbanda from the hotel to ESPANIX, the Madrid Neutral IX (IPv4 only at the moment).

This way, the connectivity to Internet was made following this path: **Hotel - ESPANIX – RedIRIS.**

Depending on the service showed, the connectivity had different paths to get Internet:

- **Distribution of the event through ISABELv6:** In this case, the IPv6 packets implied should go from the hotel to UPM with less delay and more bandwidth, so the choice was to establish an IPv6 tunnel over IPv4 between UPM and the hotel. The agents implied configured the IPv4 routing for the traffic to follow this path: Hotel – ESPANIX – RedIRIS – UPM.
- **Videoconference with Japan (ISABELv6):** To establish the connectivity with Japan, an IPv6 over IPv4 tunnel was configured between RedIRIS – ESPANIX – Hotel. Beyond RedIRIS, the packets traveled in a native way through RedIRIS – GEANT – JANET – LON6IX – NTT.
- **Euro6IX Demonstrators:** The connection beyond RedIRIS was: RedIRIS – GEANT – JANET – LON6IX (Euro6IX). In this case, it was necessary that JANET and GEANT had configured BGP4+ static filters allowing the pass of all Euro6IX prefixes; this solution was the cause of some problems at some demos.

As a conclusion, it has to be mentioned that:

- The connection between Euro6IX and the hotel wasn't native due to the pass through ESPANIX forced to use of IPv4 (Iberbanda router wasn't double stack).
- Because of all explained before, the access to a server like the server of Digital TV at TID premises followed the path: TID – MAD6IX – LON6IX – JANET – GEANT-RedIRIS – ESPANIX – Hotel. This fact helped to verify that the deployment of IPv6 native in the European networks it is very advanced.

4.2 Network and Distribution of Demos at the Hotel

The next graphic shows how the network and the demos were distributed:

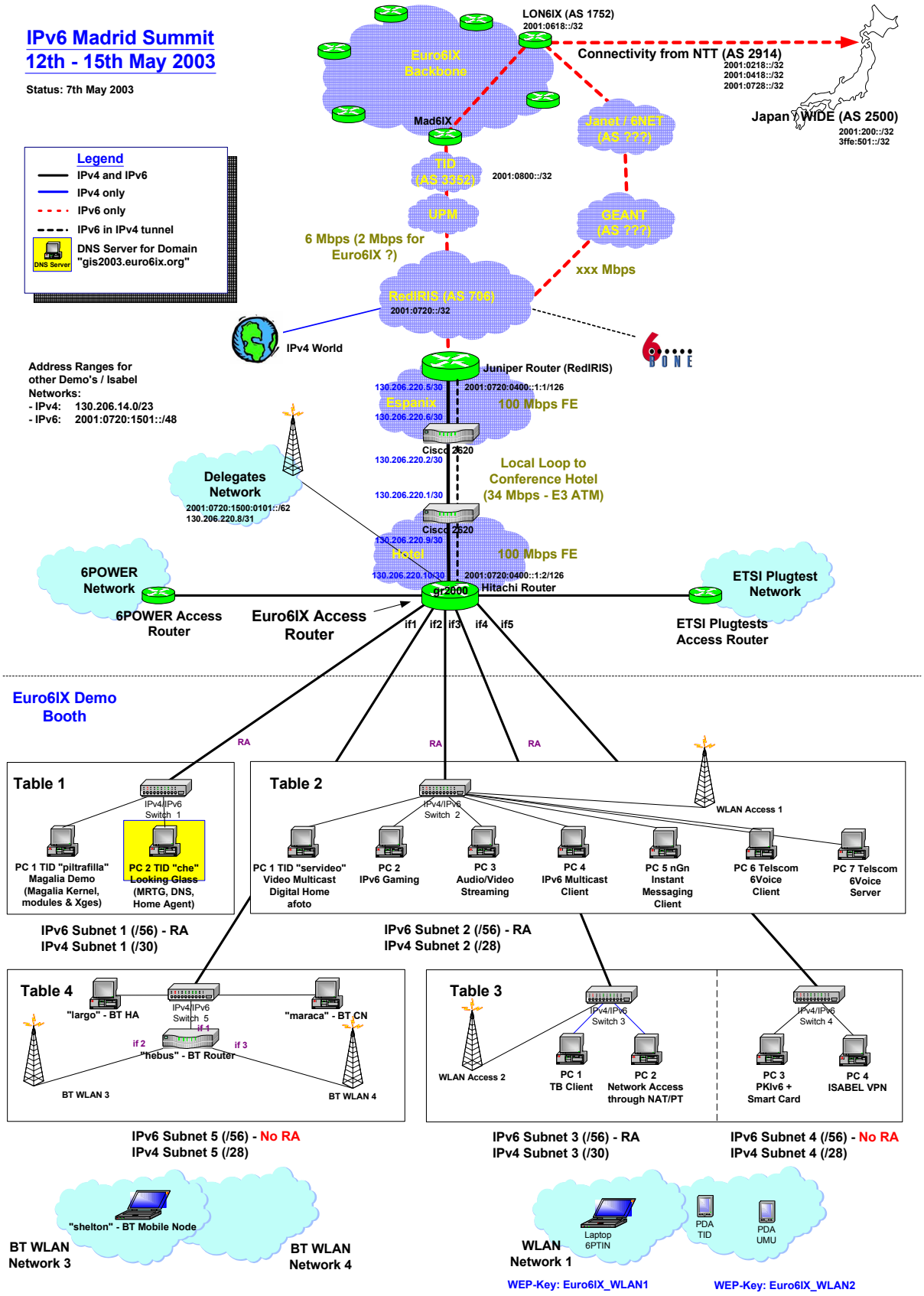

Figure 4-1: Network Map Proposed for GIS 2003

According to this map, a Magalia map was created to show the application as demo and to control the stability of the network at the hotel.

The following snapshot corresponds to the network map file used by Magalia:

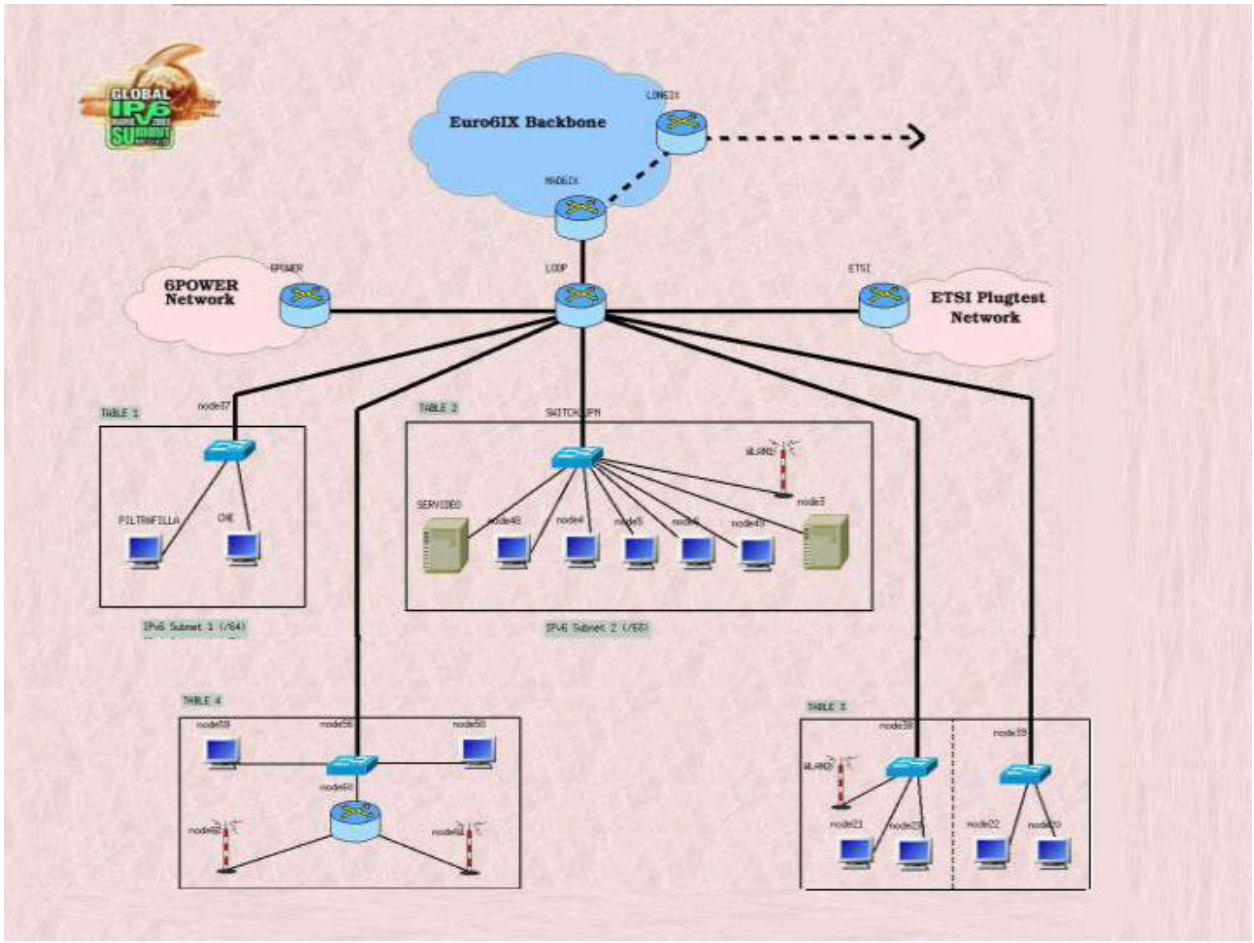

Figure 4-2: Snapshot from Xges

4.3 Stability of the Network

During GIS2003, the stability of the network was also monitored by TID's ping-stat system, obtaining graphics of LOSS and DELAYS from TID premises.

The system controlled the reachability from TID premises to Hitachi router and to "Che", the PC where the DNS of the event was running.

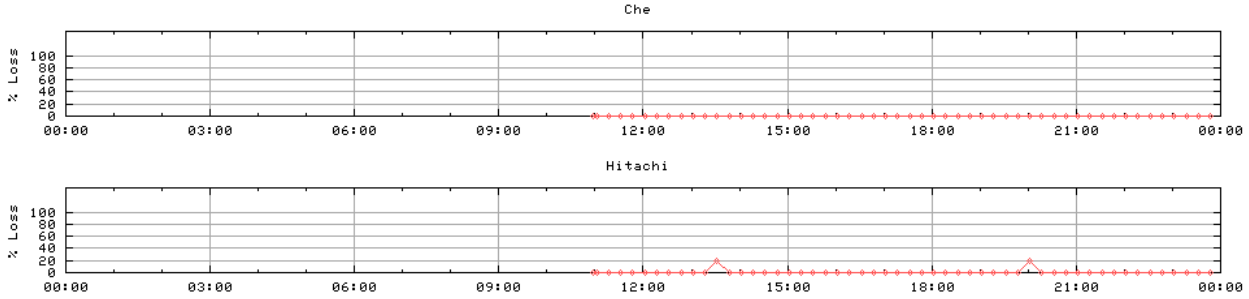

Figure 4-3: GIS2003 LOSS Statistics of 13th May 2003

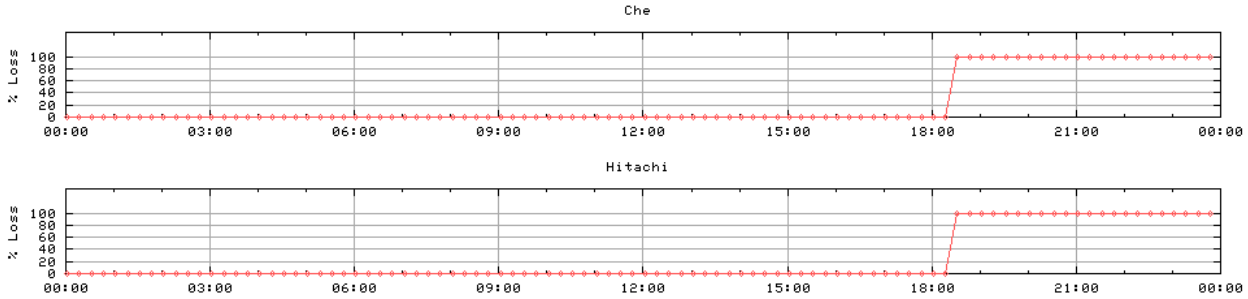

Figure 4-4: GIS2003 LOSS Statistics of 14th May 2003

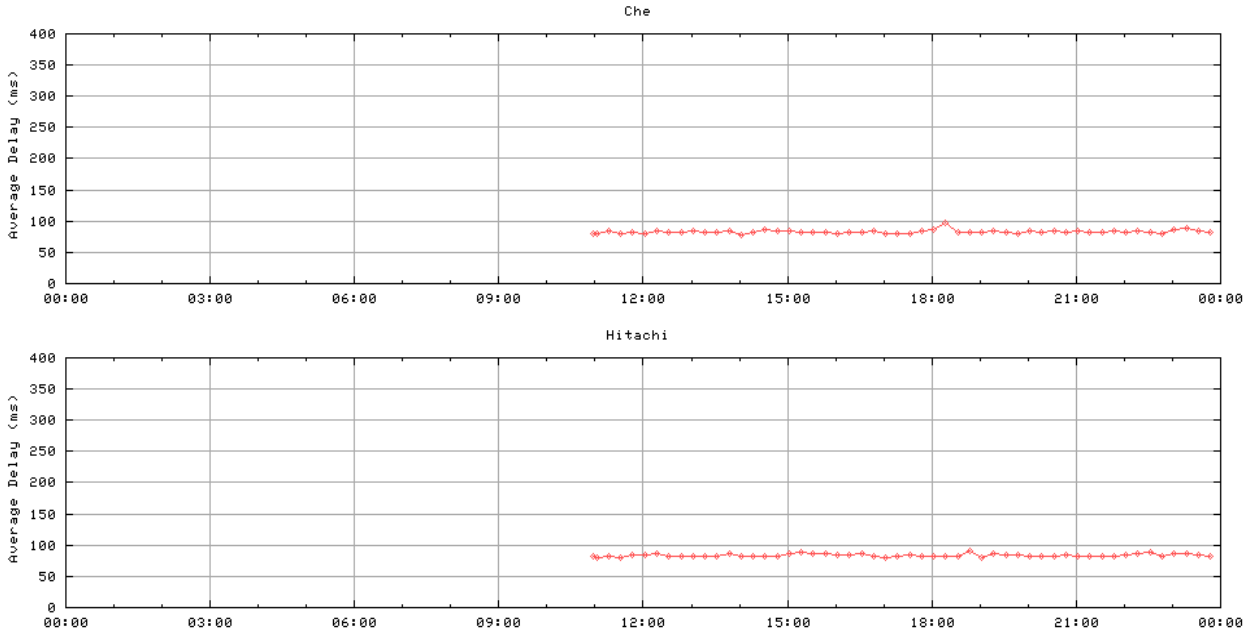

Figure 4-5: GIS2003 DELAY Statistics of 13th May 2003

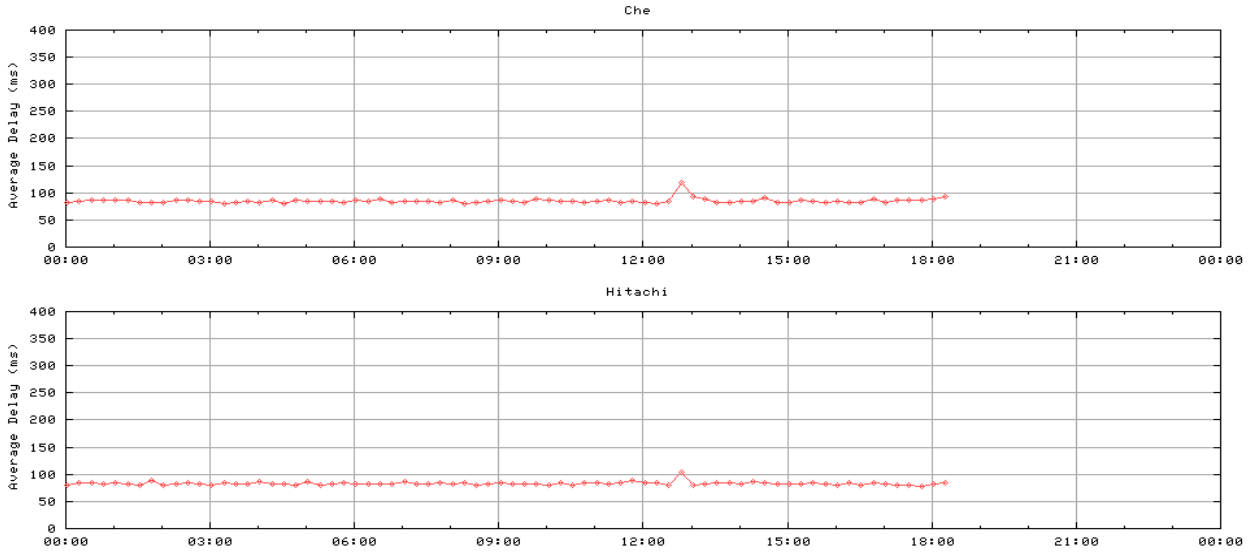

Figure 4-6: GIS2003 DELAY Statistics of 14th May 2003

5. SUMMARY AND CONCLUSIONS

The stability of the network and some services were tested during GIS2003. This is the first global event where these issues are shown in a previous step to involve users beta-testers in Euro6IX.

Both network and services had a good level of operation and the response of all the attendants to the event was very good.

Next objective of WP3 is to focus on the introduction of beta-testers access test-beds (Real users). To get this goal, it is necessary to create attractive final-user services and tools to control the traffic generated by Euro6IX users.