



6meter: Measuring Real Global IPv6 Traffic

Jordi Palet (jordi.palet@consulintel.es)

Alvaro Vives (alvaro.vives@consulintel.es)

AfriNIC 8th, June 2008

Rabat

Introduction

- 6meter application is intended to **count packets and bytes** of different kinds of **IPv6 traffic**
- Its objective is just to listen on a given interface for network packets and update each traffic counter
- Writes the counter values on a text file in order to have permanent record of the counters and to process the data to obtain useful reports
- **IPv4 traffic is also measured**, all included in just **one category**. This is done to allow comparisons of IPv6 vs. IPv4 traffic
- C + pcap library
- Tested on Linux platform

Types of traffic

- 6meter considers the following categories of traffic:
 - Native IPv4
 - Native IPv6
 - 6to4
 - Teredo (Data and Signaling)
 - Proto-41
 - IPv6 GRE IPv4
 - ULA (ULA-C and ULA-L)
 - Site-local
 - Multicast
 - Others
- Also classifies the traffic on source address (6Bone, AfriNIC, APNIC, ARIN, LACNIC, RIPE NCC)

Capturing packets (I)

- 6meter listen on **promiscuous mode** so all packets that reach the listening interface will be processed. This means that in a switched LAN all multicast traffic and only 6meter-running-host directed Unicast traffic will be captured
- The **recommended** configuration in a switched LAN is to connect the listening interface to a **mirrored port**, that receives all LAN's traffic, both Unicast and Multicast. This will improve accuracy (in case of Multicast traffic being sent along with Unicast traffic) and coverage of the statistics

Capturing packets (II)

- `6meter <device> (<run_time>|<run_time>=0 <output_time>) <output_file>`

<device> : Interface on which listen for packets. E.g. eth0 on Linux.

<run_time> : Time in seconds (>0) 6meter should listen, then exits.

<run_time>=0 <output_time> : A value of zero (0) means run indefinitely. Statistics will be put on a file in a periodic way each <output_time> (>0) seconds.

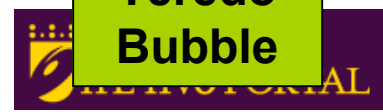
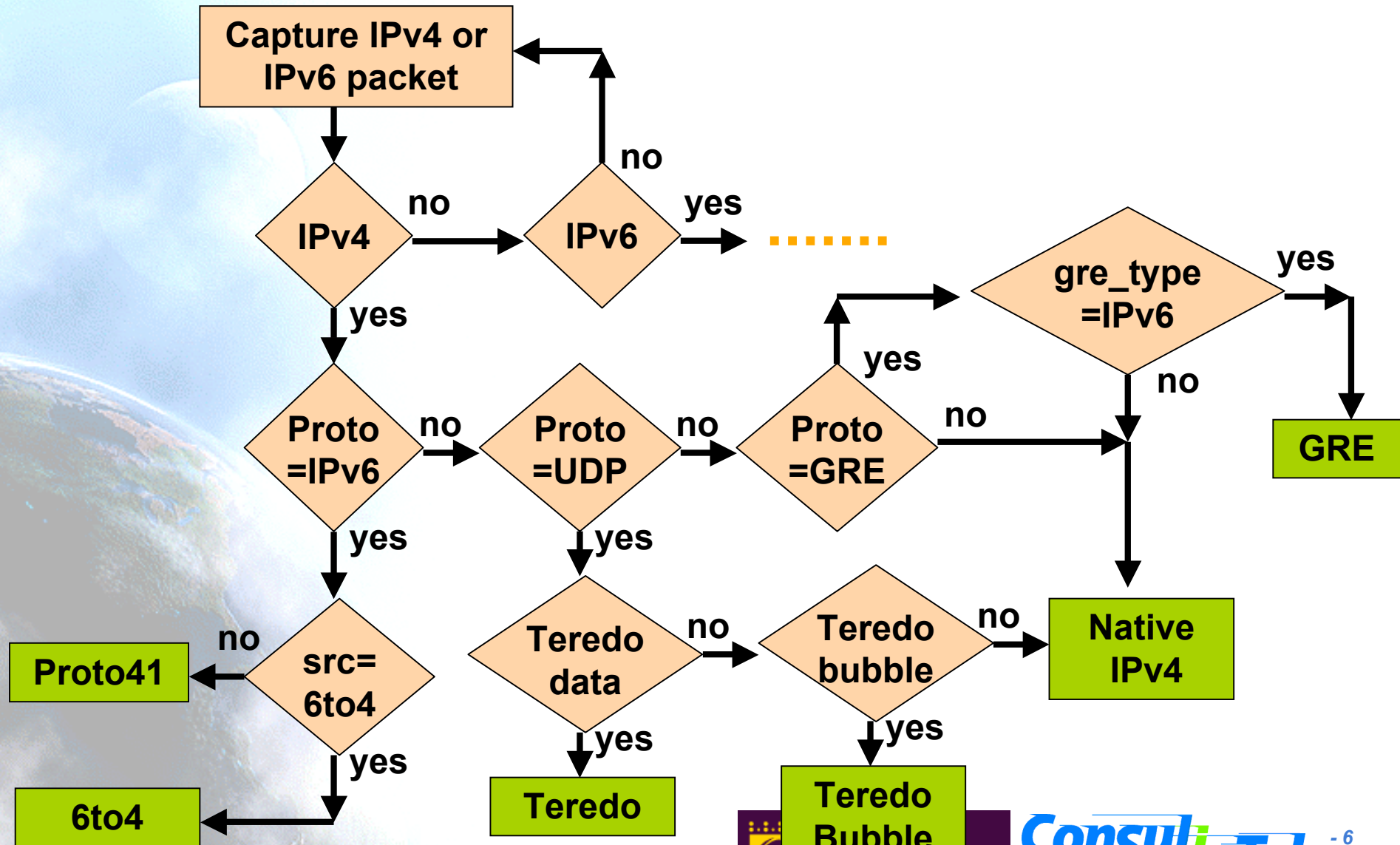
<output_file> : Output file to where the results are written. The date and time is appended to file name.

- EXAMPLES:

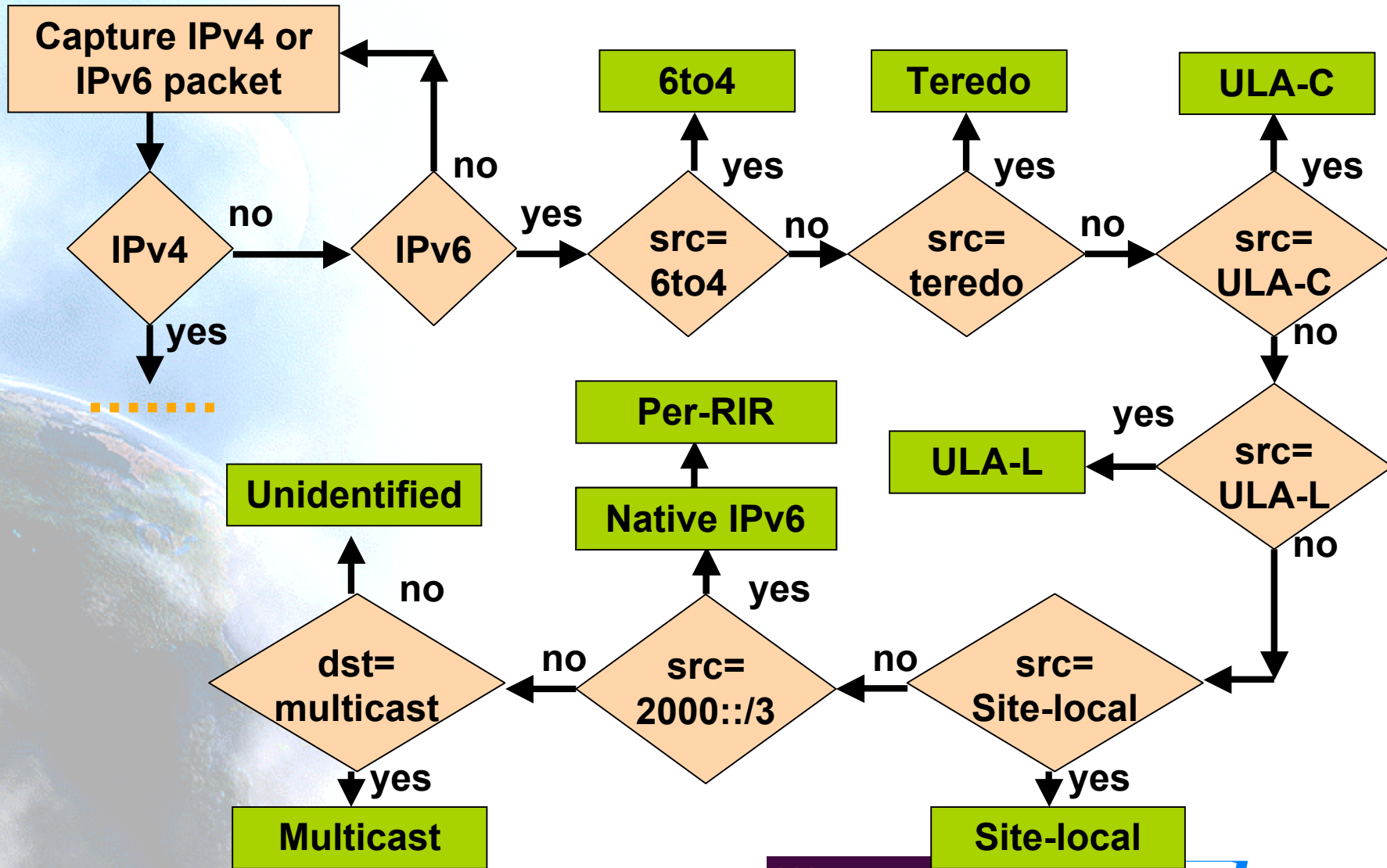
6meter eth0 300 6meter_output_file : 6meter will capture packets on eth0 for 5 minutes and at the end put the result in 6meter_output_file_<date>_<time>

6meter eth0 0 600 6meter_output_file : 6meter will run indefinitely capturing packets on eth0 and update 6meter_output_file_<date>_<time> each 10 minutes

Capture Algorithm: IPv4 pkts

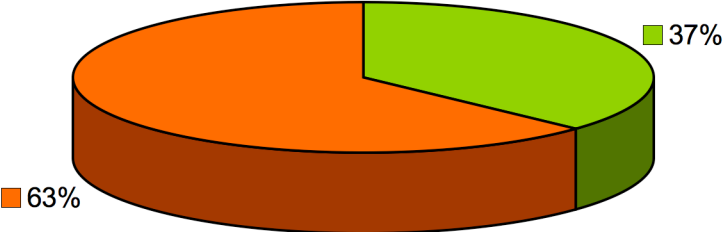


Capture Algorithm: IPv6 pkts



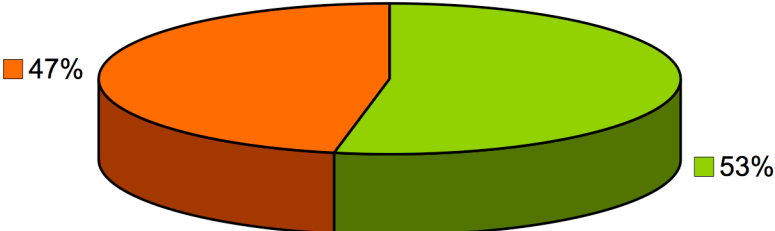
Packets + Bytes

IPv4 vs. IPv6 (packets)



■ Total IPv4 pkts ■ Total IPv6 pkts

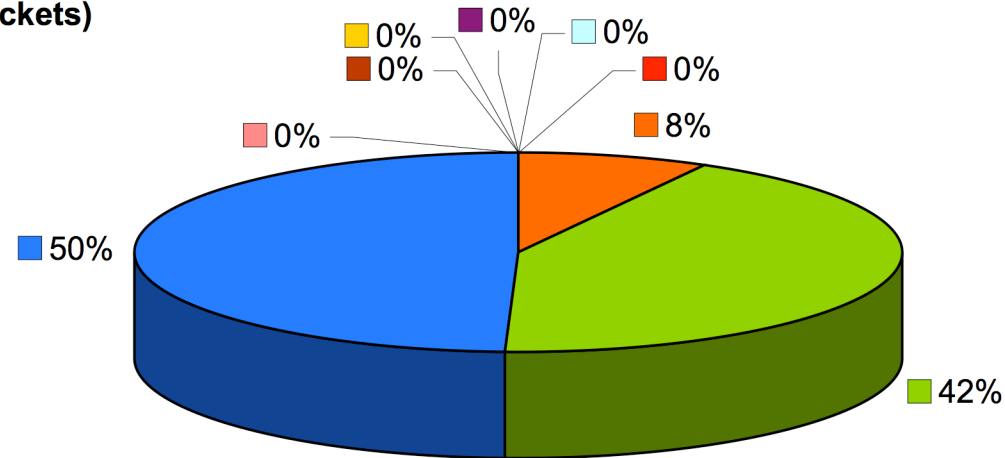
IPv4 vs. IPv6 (bytes)



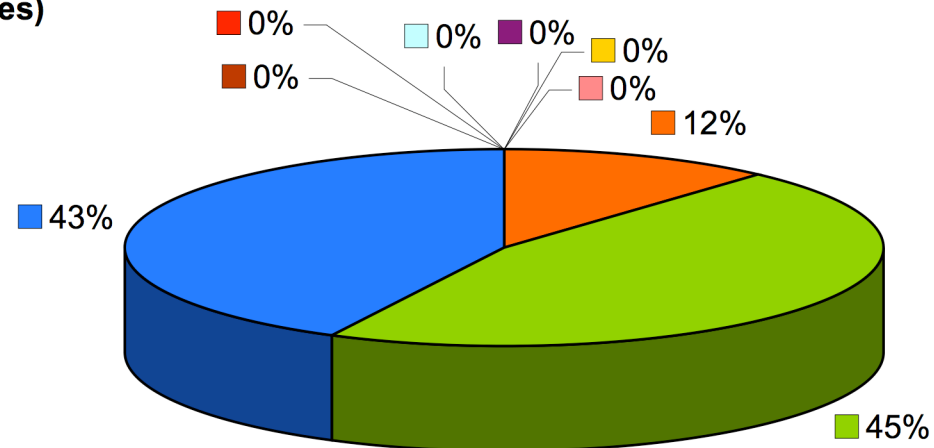
■ Total IPv4 bytes ■ Total IPv6 bytes

Types of Traffic

IPv6 traffic by type (packets)



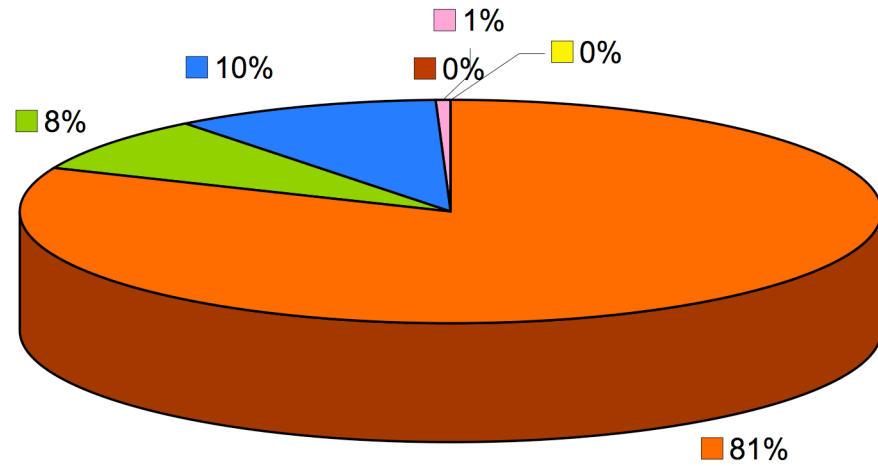
IPv6 traffic by type (bytes)



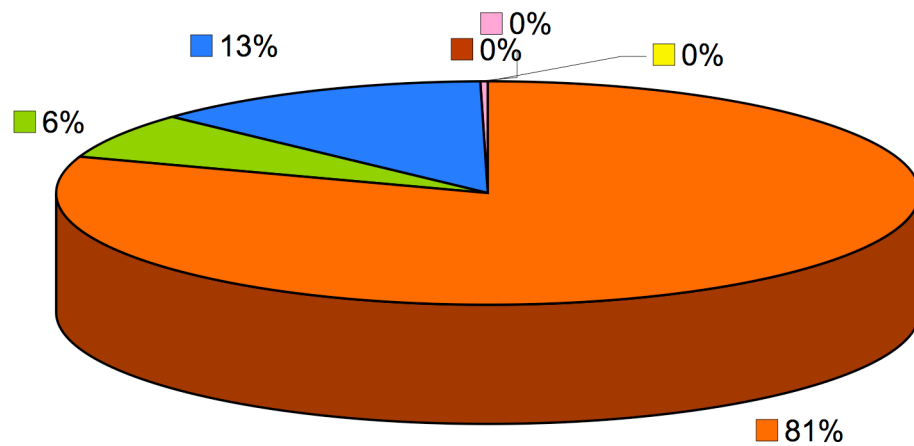
Native IPv6 Bytes	6to4 bytes	Teredo bytes	Proto41 bytes	IPv6-o-GRE bytes	ULA-C bytes	ULA-L bytes	Site-local bytes	Multicast bytes
-------------------	------------	--------------	---------------	------------------	-------------	-------------	------------------	-----------------

Origin of Source Address

Per RIR traffic (packets)



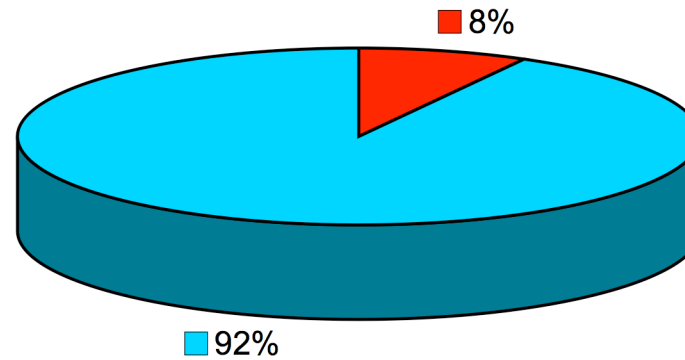
Per RIR traffic (bytes)



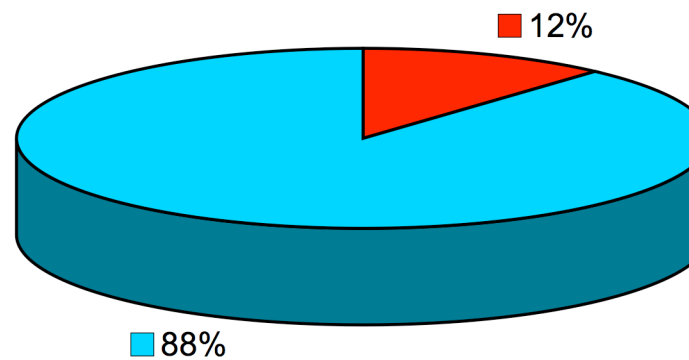
RIPE NCC	APNIC	ARIN	LACNIC	AfriNIC	6Bone
bytes	bytes	bytes	bytes	bytes	bytes

Native vs. Transition

Native vs. Transition IPv6 (packets)



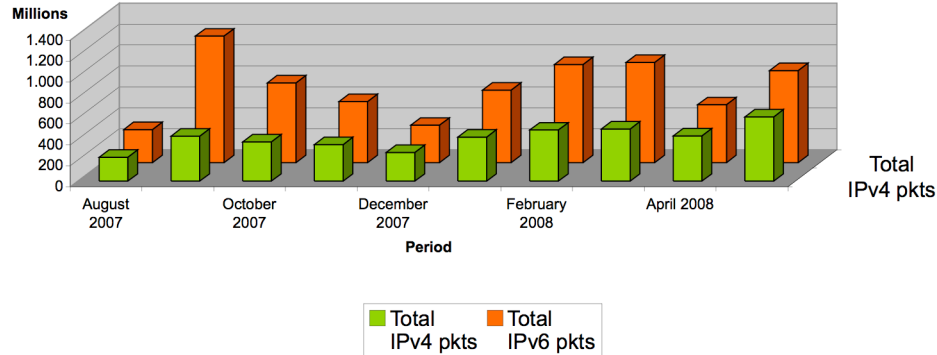
Native vs. Transition IPv6 (bytes)



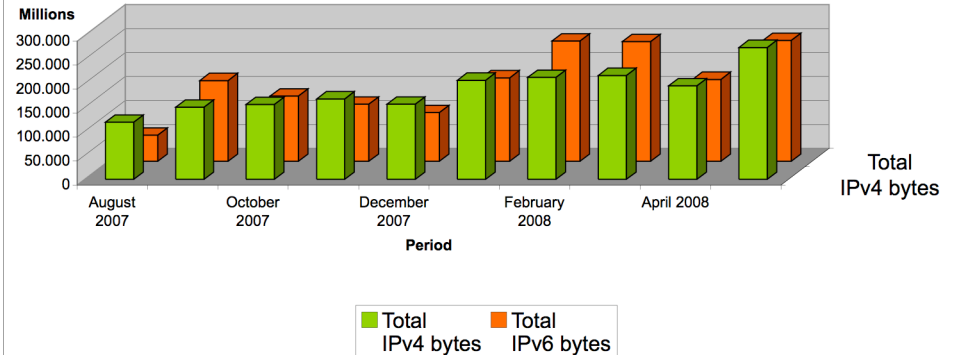
■ Native IPv6 bytes ■ Transition IPv6 bytes

Monthly Stats.

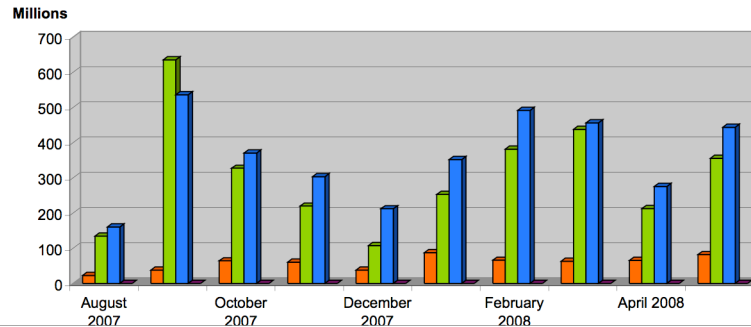
IPv6 vs. IPv4 per month (packets)



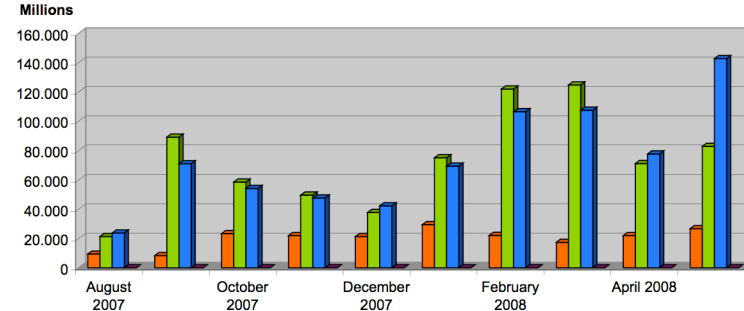
IPv4 vs. IPv6 per month (bytes)



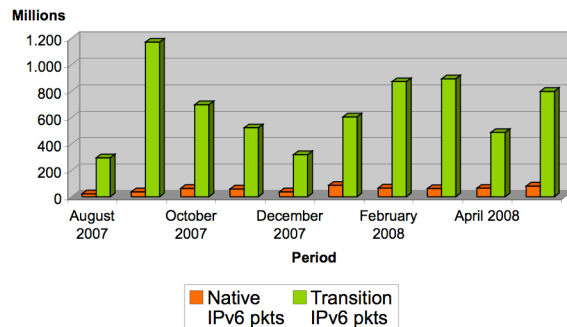
IPv6 traffic by type and month (packets)



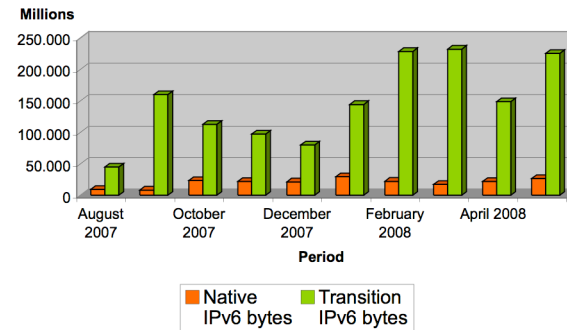
IPv6 traffic by type and month (bytes)



Transition vs. Native IPv6 (packets per month)



Transition vs. Native IPv6 (bytes per month)



Thanks !

Contact:

– Jordi Palet Martínez (Consulintel): jordi.palet@consulintel.es

The IPv6 Portal:

<http://www.ipv6tf.org>

