



# **Romania's jump to 1st place as exporter of IPs**

analysis on IPv4 ALLOCATED PA resources

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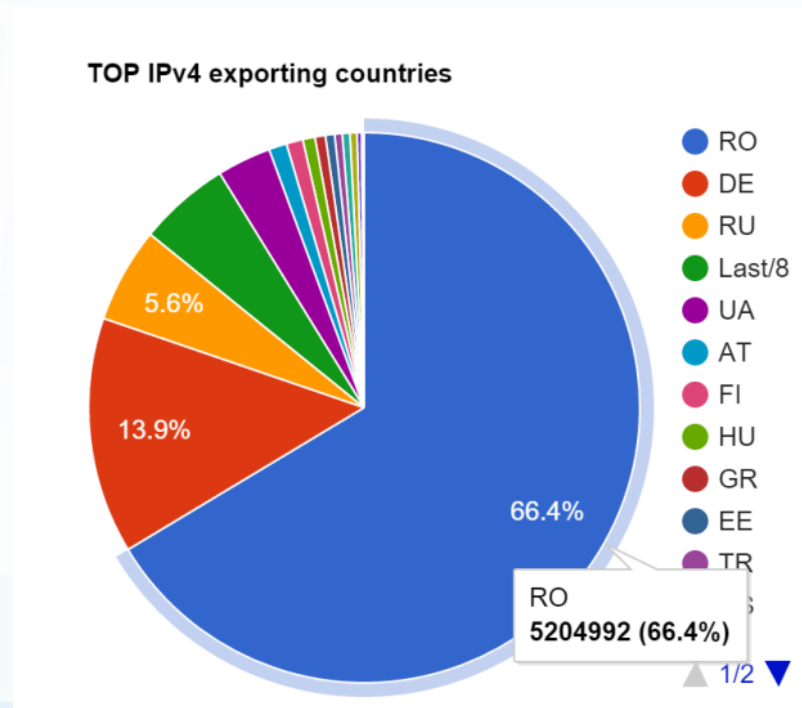
**iP.BROKER**

# Summary

- Top IPv4 exporting countries
- The situation before IPv4 exhaustion in RIPE region
- Confusion between PA and PI
- Actual usage of IPv4 resources for "honest" internet services
- Analysis of the source of transferred IPv4 resources from the largest exporting country in the RIPE region
- IPv6 - high expectations before the IPv4 exhaustion

# Top IPv4 exporting countries

- Romania has exported IPv4 PA allocations totalling 5,245,440 IPs, followed by Germany with 1,377,280 IPs and Russia with 624,896 IPs. For Romania it's over 1/3 of the total allocated IPs, while for Germany the export represents 1.81% and for Russia it is 1.53% of their allocations.



# Pre-exhaustion situation

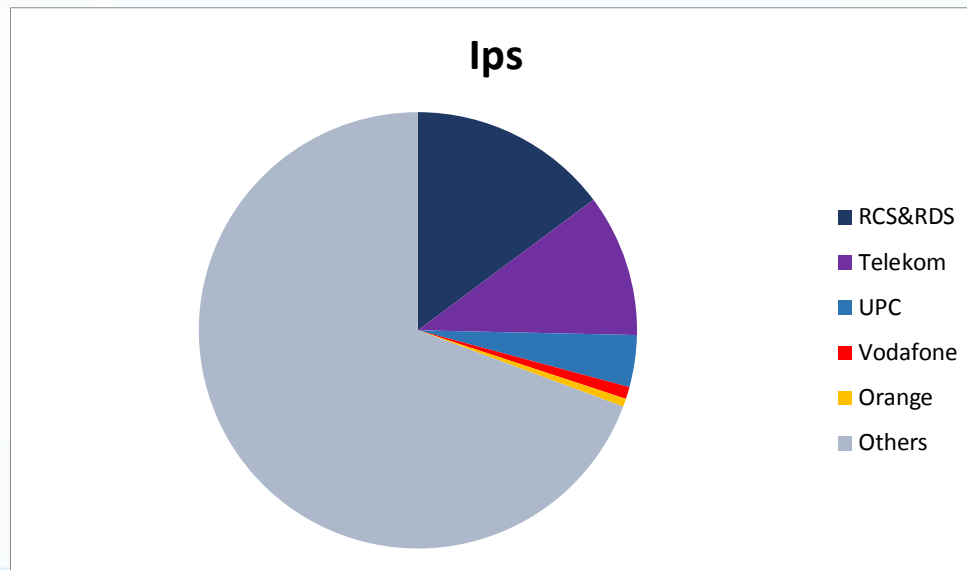
- Fragmented market with many small ISPs, the number of "neighbourhood networks" exploded
- Most of the small ISPs were renting IPs from a few LIRs instead of becoming LIR themselves
- Misunderstanding the difference between PI and PA
- Low understanding of the RIPE policies
- The "snowshoe spam" business reached Romania so there was a need for many IPs obtained on different companies that would generate high revenues from rental to "mailers"

# PA instead of PI

- Most of the small ISPs, the so-called "neighbourhood networks" did not want to become LIR and pay RIPE's yearly fees so they have preferred leasing IPs from some LIRs at much lower costs
- Since there was no clear information and the RIPE policies were permissive, the small ISPs would get PA instead of PI from an LIR that was not their upstream provider
- The PA assignments were used just like PI assignments, announced from the ISPs AS number
- The only difference for obtaining PI was that the request needed to be approved by RIPE NCC so it was much quicker to get a PA assignment
- After the small ISPs were taken over by larger ISPs, their IPs would remain unused

# Actual usage

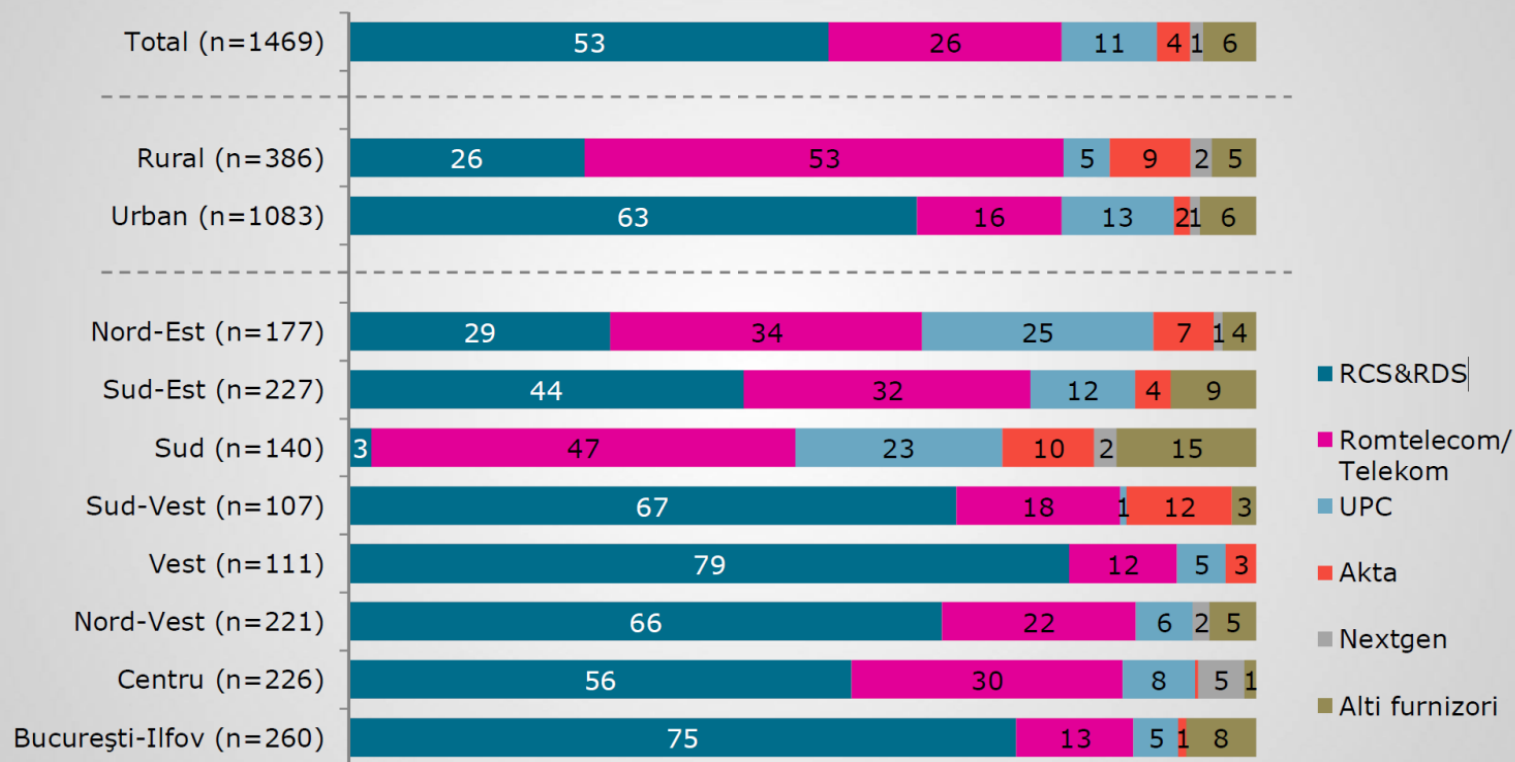
- Top 3 ISPs according to ANCOM (national regulation authority) have 90% market share and a total 4,044,288 IPv4 PA Addresses. RCS&RDS and Telekom are also mobile internet providers. Adding the other 2 mobile providers, Vodafone & Orange with 206,848 IPs (both), at the exhaustion date (september 2012) there were 4,251,136 IPs from the total of 13,853,696 IPs allocated for probably ~ 95% internet users.



## September 2015 - ANCOM's statistics on fixed internet - residential customers

### Cote de piață furnizori de internet fix – gospodării

%



# 30% IPs covering 95% customers ?

- We do not have accurate info regarding the marketshare on the business segment but most likely the 5 ISPs are covering also almost all of the market so we can consider the percentages very close to reality
- Small ISPs were taken over and their IPs returned to the LIRs from where they were leased
- Selling the IPs became more profitable than leasing them to spammers.
- 37,81% of the total IPs allocated by RIPE NCC to Romanian LIRs have been already sold to LIRs from other countries



# Romania's export analysis

- The main sources for export were IPs used for spam and IPs rented by small ISPs. The values below are based on our estimates and analysis of each company's activity
- 1,538,048 IPs (29.32%) that have been exported have been previously rented by small ISPs
- 3,578,368 IPs (68.22%) have been used for spam
- 129,024 IPs (2.46%) have been sold by LIRs that have obtained the IPs for their internal use
- 747,264 transferred from Jump to romanian LIRs
- 1649 (49.68%) of the 3319 IPv4 transfers originated from Jump

# Confidence in IPv6

- The top residential provider from Romania has been one of the first in the world to massively deploy IPv6 (dual stack) one year before the RIPE IPv4 exhaustion was announced
- The major ISPs from Romania have been fair in obtaining IPv4 allocations from RIPE and have efficiently used them, being confident that it will not take long for IPv6 to be massively adopted worldwide
- In 2012 there was close to 30% IPv6 adoption rate within the provider's residential network
- For a long time Romania has been in top 3 per-country IPv6 adoption\*
- Today Romania has 6.31% IPv6 adoption rate\*

\*according to Google statistics

# Who/what will drive IPv6 adoption ?

- Top 1% (120) LIRs in RIPE region have a total 359,721,984 IPs representing 62% of the total RIPE allocations
- Top 20 LIRs hold 30% of the RIPE allocations
- IPv4 is still going to be needed and the largest exporter so far has almost reached the "exhaustion" of exportable resources

**Questions ...**

