“Small but interesting things”

Three lightning talks in a row

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PI usage trends

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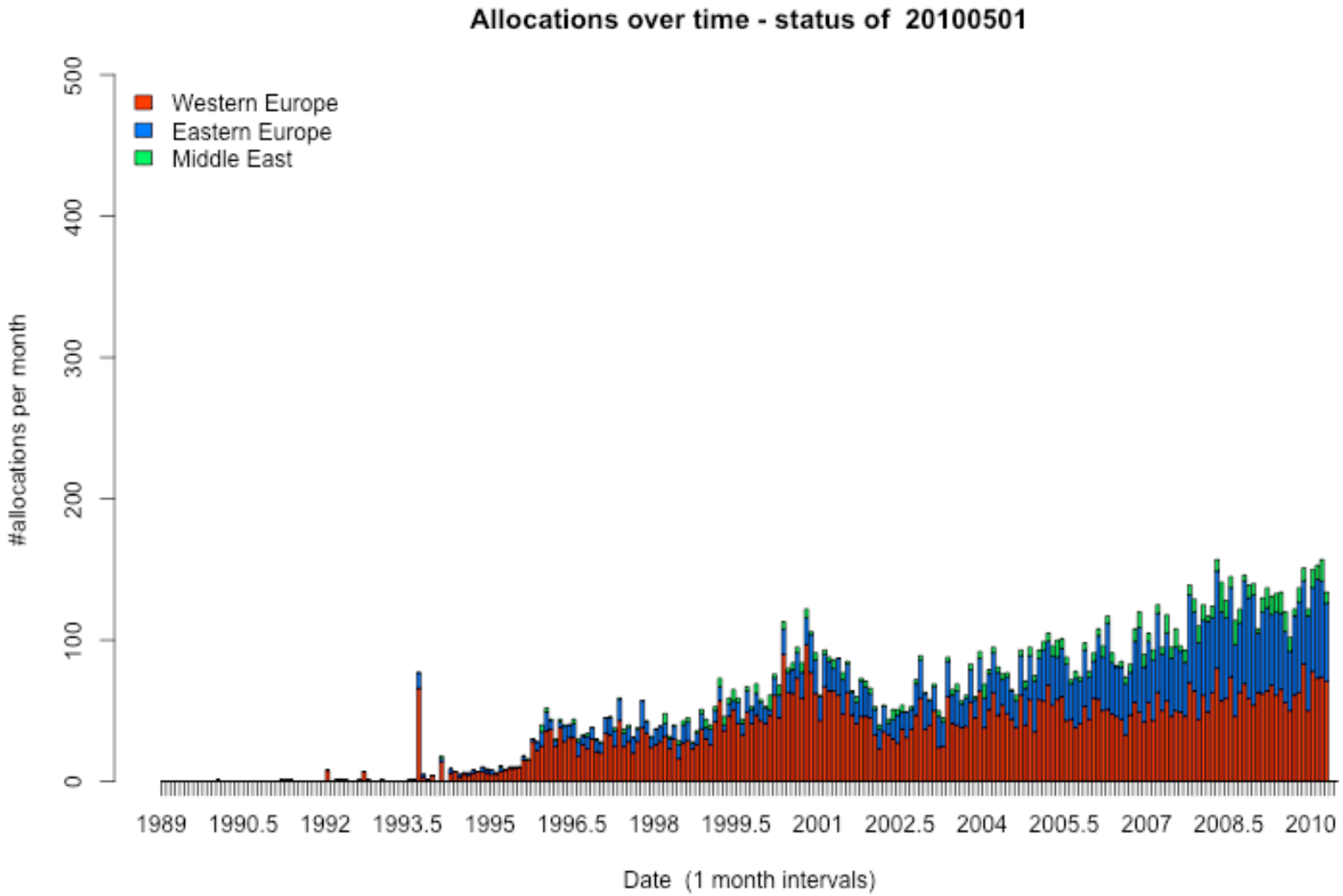
PI usage trends

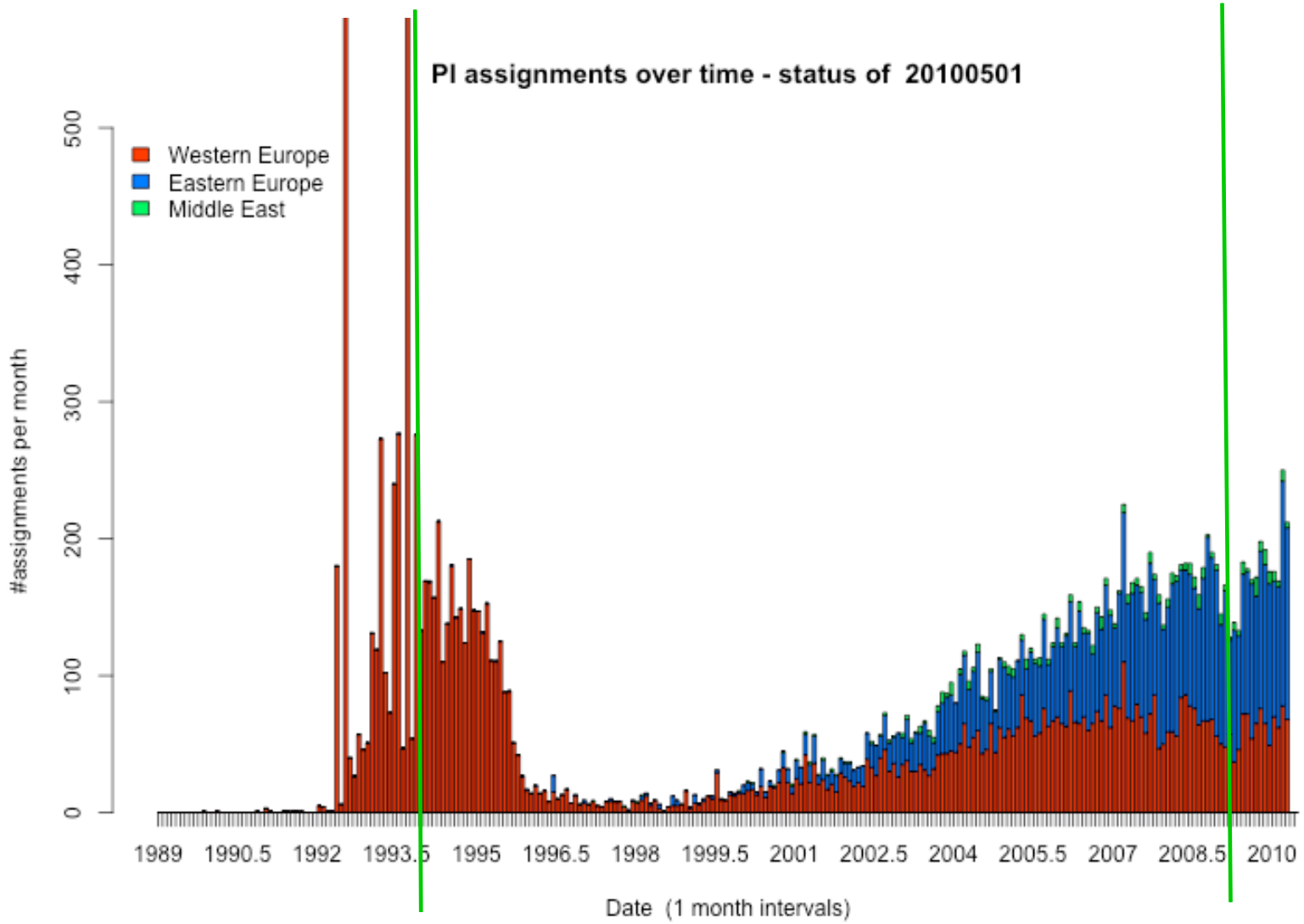
Initial questions:

- Identify typical usage scenarios of PI resources with particular emphasis on LIRs that hold the largest numbers of these resources.
- Identify changes and new trends since introduction of 2007-01.
- Identify and quantify substitution of PI for PA resources. Identify the drivers of such substitution.
- If there's a trend: identify revenue consequences for the RIPE NCC.

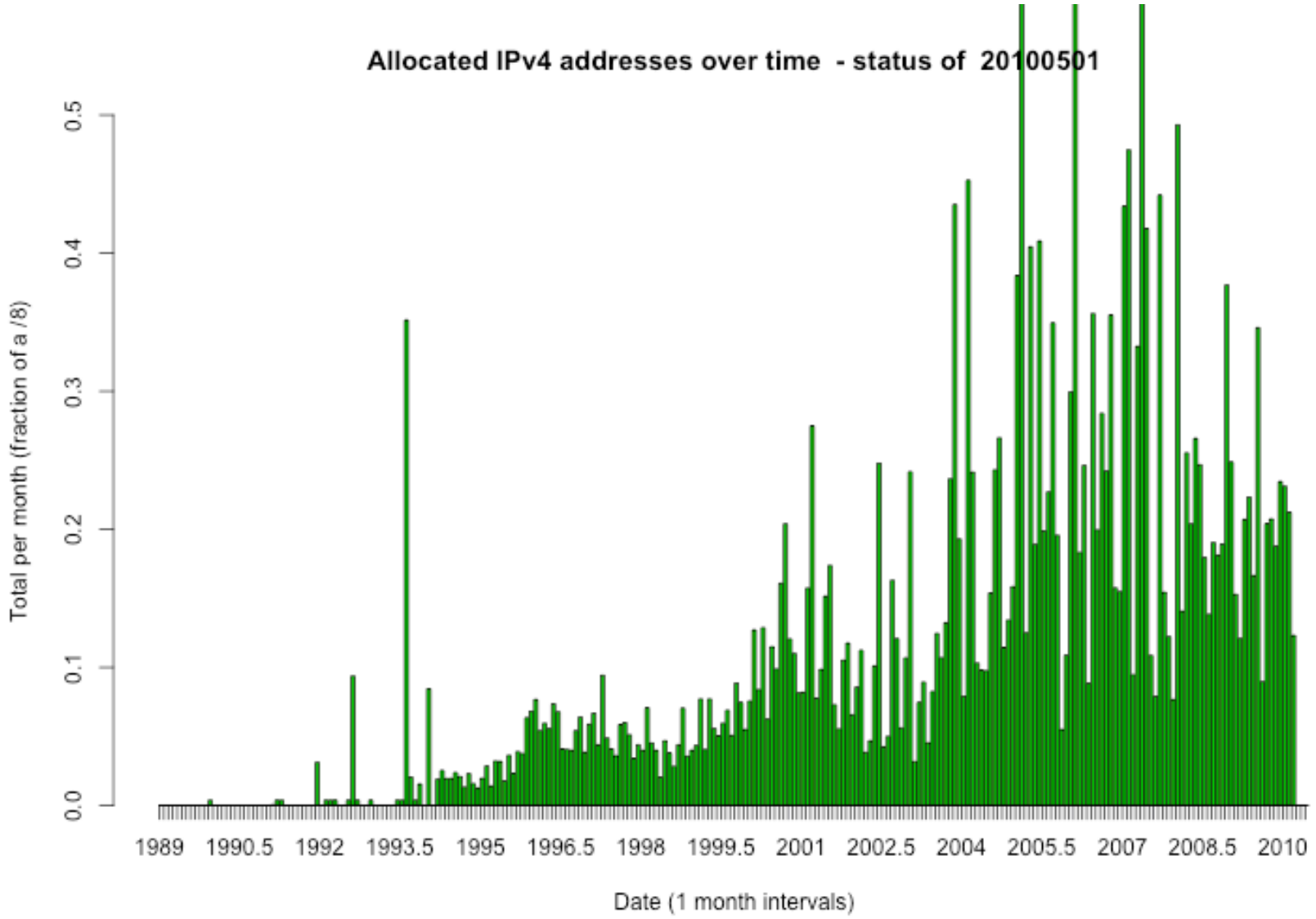
PI usage trends



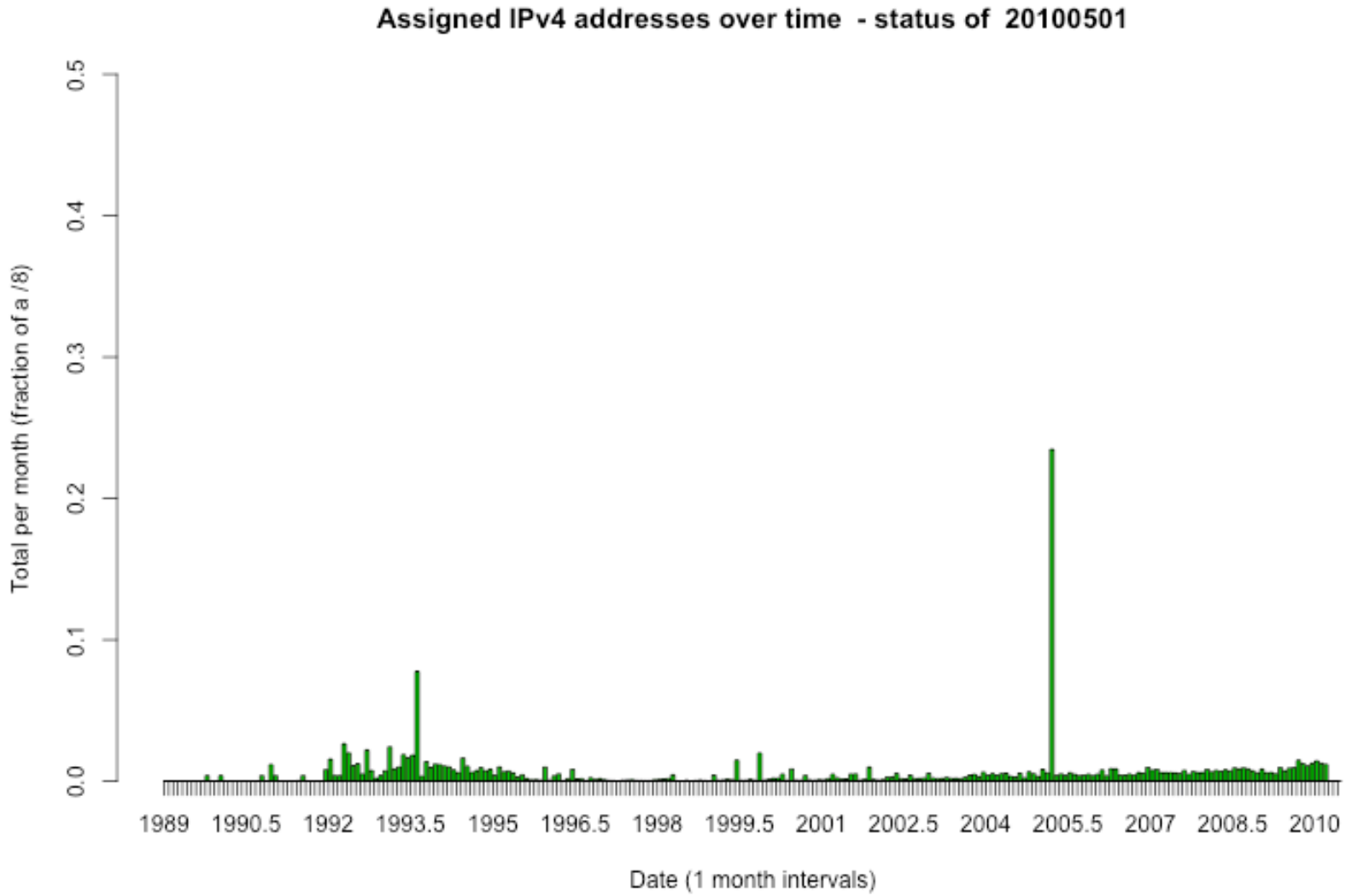
PI usage trends



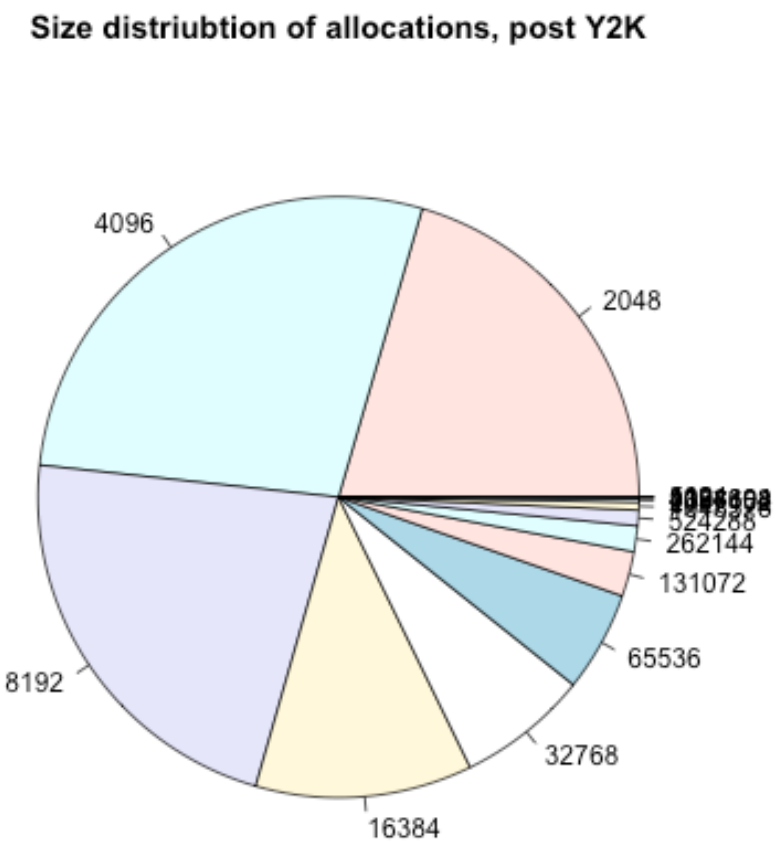
PI usage trends

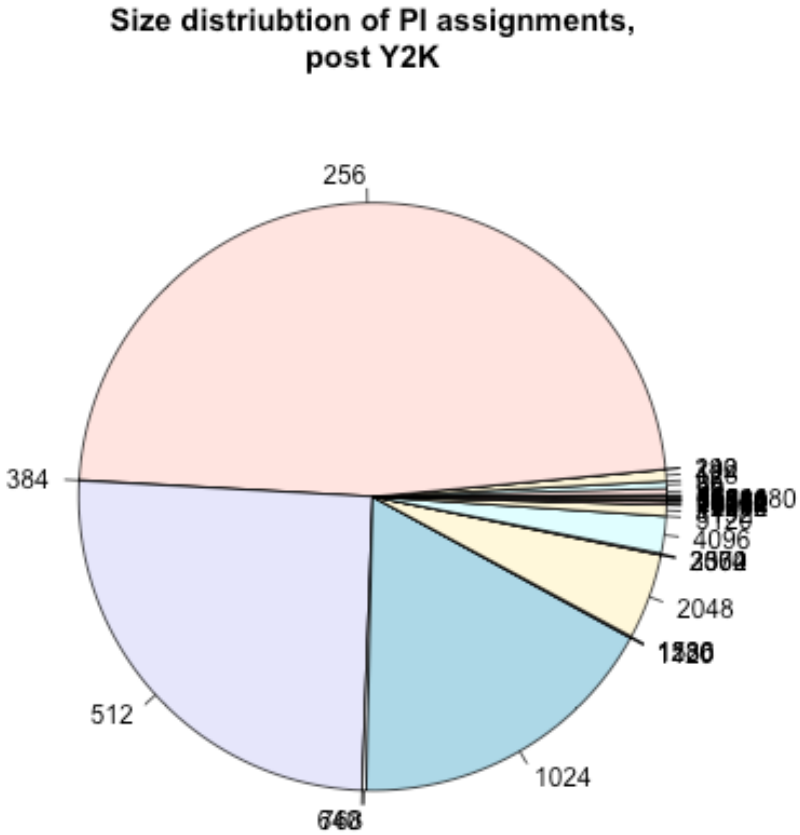


PI usage trends



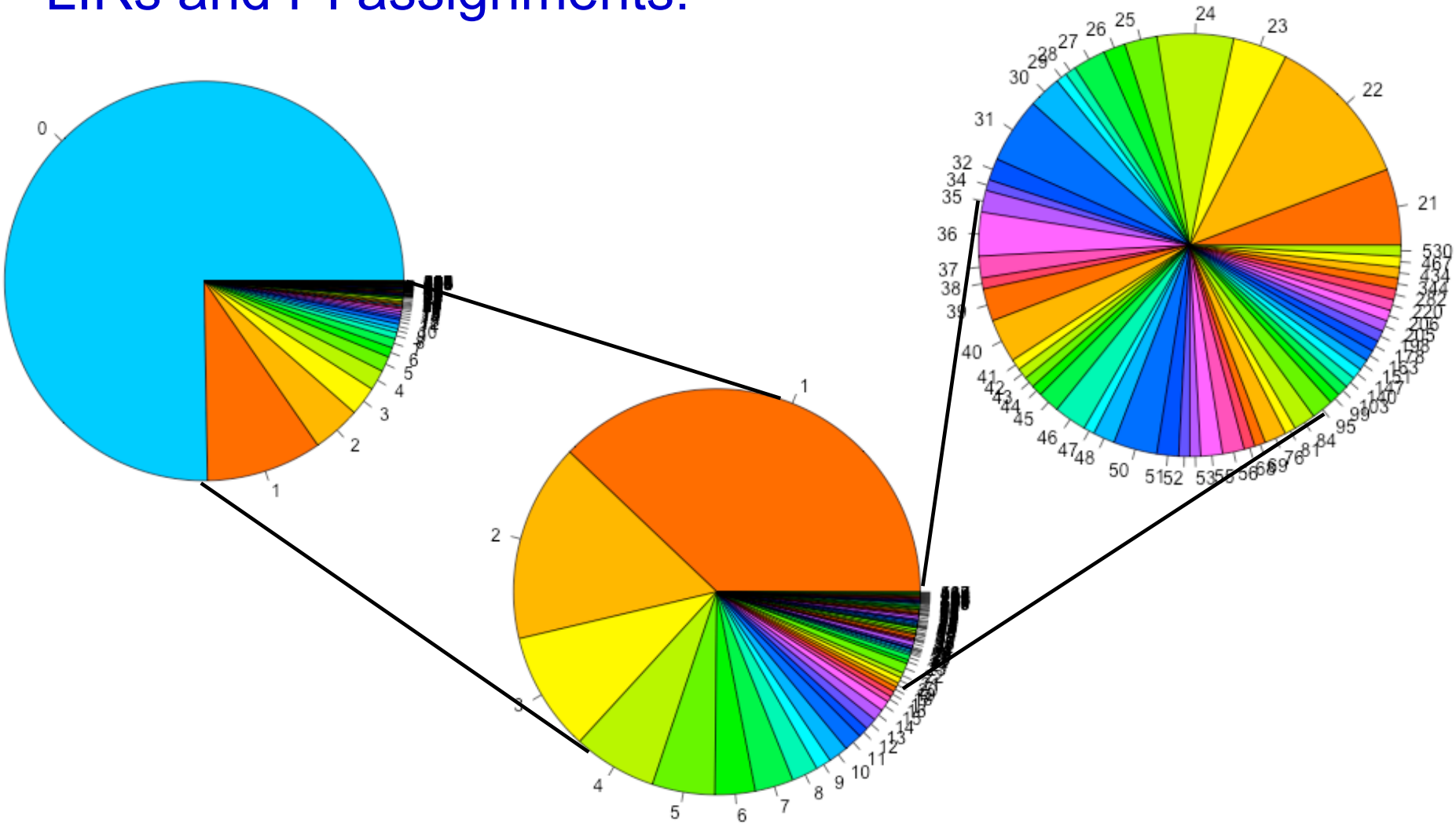
PI usage trends



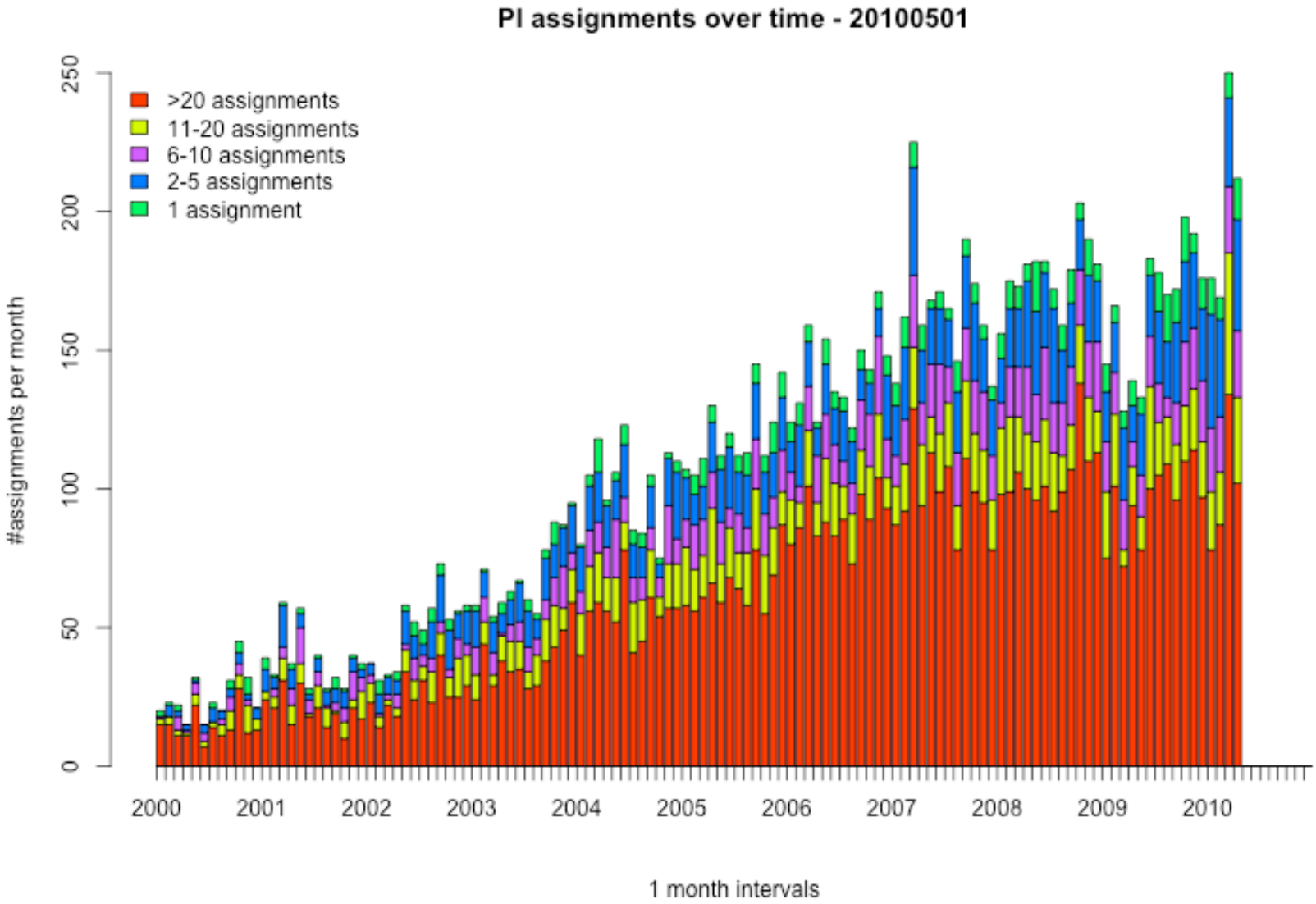


PI usage trends

LIRs and PI assignments:



PI usage trends



PI usage trends

Stories for PA to PI substitution we've found:

- Looking at examples where PA decreased, PI increased:
  - LIR1: new PI to end user, 1 of LIR's own PAs returned
  - LIR2 and LIR3: part of reclamation process, a fraction of the original PA was morphed into and kept as PI
  - LIR4: part of business (subsidiary) is sold, PA went with it, new end user acquired
  - LIR5: was split, the part that had PA was closed.
- IPRA story:
  - LIR wants to convert PA to PI "just because"

So far there are no visible trends for this!

IPv4 “dirtyness”

IPv4 “dirtyness”

Starting point:

We have noticed an increase in returns of “dirty” prefixes in the holy name of aggregation.

(Where “dirty” means it’s partly or completely listed in one or more spamlists, do-not-route lists, etc.)

IPv4 “dirtyness”

This made us wonder:

- How often does it happen that an address block becomes “dirty” soon after we assign/allocate it?
- Is it significant in terms of address space consumption?
- Are there any LIRs that are more prone to this?
- How often do they come back to exchange the “dirty” block for another (preferably clean) block?

We do have historical data for allocations/assignments and for some blacklists, we can check!

IPv4 “dirtyness”

Methodology:

- Look at recent allocations/assignments
- Gather basic data (LIR, date, type, …)
- Check resource in RIS and in various blacklists
  - Weeks and months after assignment/allocation
  - Weeks/months *before* assignment/allocation

Look at cases where the resource was “clean” before the handout, but less so after it.

Play with thresholds.

IPv4 “dirtyness”

Caveats:

- Spamlists / blacklists have their own semantics
  - And they can be wrong too!
- Having a small number of addresses marked can happen to anyone
  - Anyone can have hacked clients
- Having a larger number of addresses marked is still no proof of ISP wrongdoing

However: significant differences can serve as indicators to pay more attention!

IPv4 “dirtyness”

Results – relaxed approach (some dirtiness is OK)

Number of prefixes	Address space (/16s)	LIR
5	0.25	ru.LIR1
4	0.4	ua.LIR2
2	0.015	ua.LIR3
2	2	ru.LIR4
2	0.75	ru.LIR5
2	0.27	ru.LIR6
2	0.14	ru.LIR7
2	2	pl.LIR8
2	12	it.LIR9
2	0.625	hr.LIRA
2	8	de.LIRB
2	10	de.LIRC

Total: 128 blocks from 111 LIRs, 106 /16s of address space.

IPv4 “dirtyness”

Results – strict approach (any dirtiness counts)

Number of prefixes	Address space (/16s)	LIR
41	0.875	ru.LIR1
30	0.645	cz.LIR2
28	0.875	ua.LIR3
19	0.551	cz.LIR4
11	8.07	ro.LIR5
8	0.328	ru.LIR6
7	0.109	ua.LIR7
6	0.176	ru.LIR8
6	0.516	rs.LIR9
5	0.203	pl.LIRA
5	0.766	pl.LIRB

Total: 704 blocks from 494 LIRs, 258 /16s of address space.

IPv4 “dirtyness”

Summary:

- Depending on level of paranoia, one can draw different conclusions
- In any case, Registration Services is aware of this phenomenon and takes it into account
- Once IPv4 runs out, reassignment / reallocation will very likely happen more often.
  - Should the RIPE NCC think about this aspect?

Historical BGPlay

Thesis work of Claudio Squarcella

Historical BGPlay

Starting points:

- We have a long history of BGP recorded in RIS
- We also have an efficient (prototype) mechanism to dig deep into this (INRDB)
- There are nice tools to visualize this kind of data – BGPlay from Roma Tre Uni being one of them

Let's combine these components into something more useful!

Historical BGPlay

Results:

- A new tool that anyone can try out
  - Very similar to BGPlay
  - It starts from RIS table dumps, not updates
    - So it doesn't capture the fine details
    - But it does show the interruptions to stability and major changes
  - It lets you check the "long term" view of a IPv4/IPv6 prefix and/or ASN
  - You can filter temporary events, where you can define what "temporary" means in the order of days-weeks

Check it out – details are on RIPE Labs!

Historical BGPlay

DEMO

Questions?