IPv4 Consumption and transition to IPv6

LACNIC Campaign
Latinamerica and the Caribbean in IPv6
1/1/11

Haiti, August 2008

Agenda

- Initial concepts.
- Why IPv6?
- IPv4 Runout Policies.

Some initial concepts.

- IPv6 is the evolution of IPv4, the most successful network protocol of the history.
- IPv4 and IPv6 are not “compatibles on the wire”, which means an IPv4 only host can’t communicate with an IPv6 only host by itselves.
- IPv6 will not substitute IPv4, both protocol will co-exists for several years. Just like IPX is still existing in your networks. There won’t be an “IPv4 Blackout”.

IPv6 Advantages

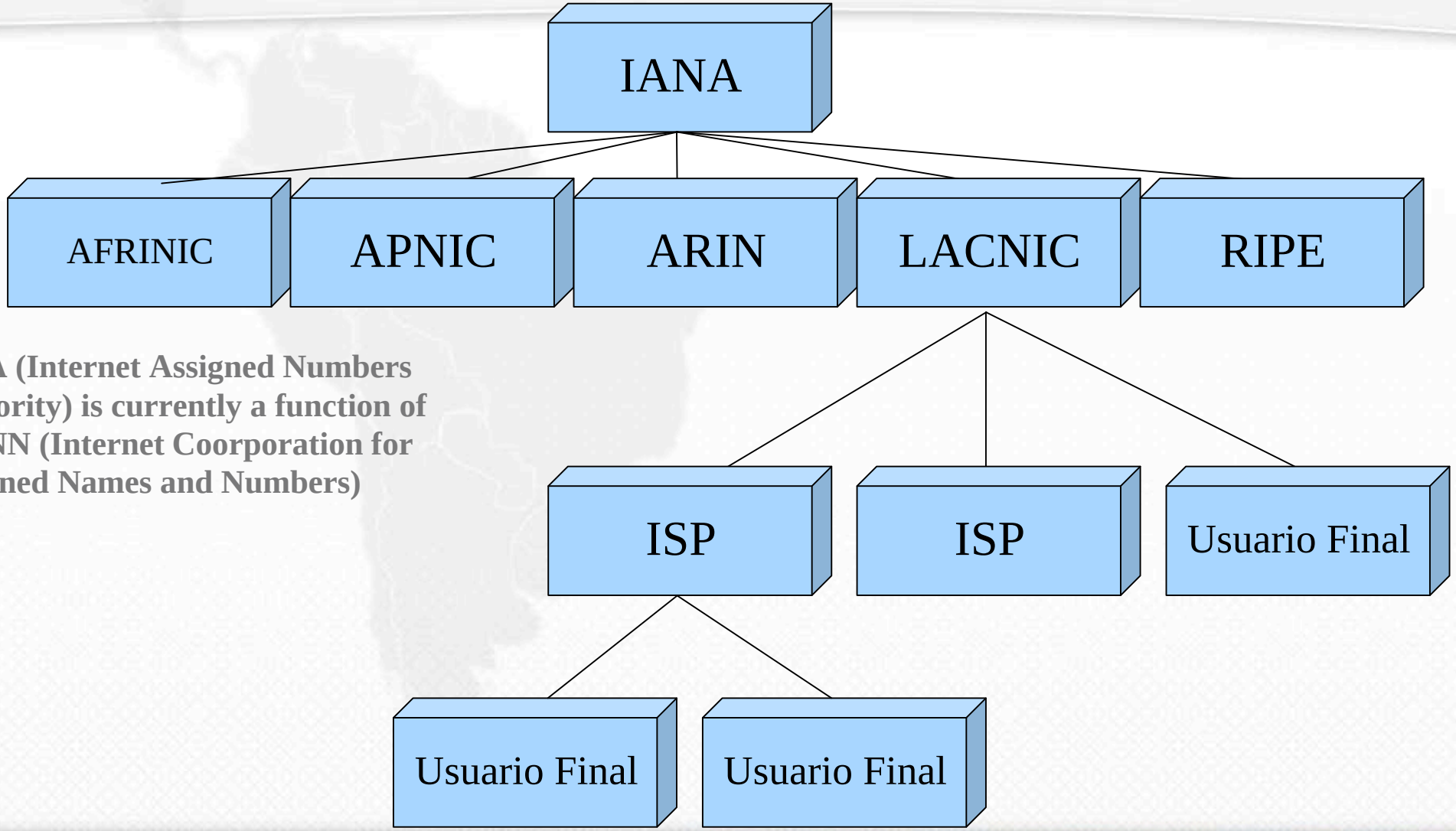
- **Many more addresses:**
  340,282,366,920,938,463,374,607,431,768,211,456 available addresses.
- **It makes simpler IPv4 tasks:**
  - Auto-configuration.
  - Renumbering.
  - Security (IPSEC).
  - Multicast.
  - IP Mobility.
- **Innovation.**
- **Efficiency.**

¿Why do we need a new network protocol?

We need more addresses!

- **Thousand of millons “always on” users.**
- **More divises to connect: cell phones, PDA, games consoles, etc.**
- **New applications: Home control, sensor networks.**
- **New broadband technologies: Wimax, DOCSIS 3.0, etc.**

Internet Number Resources Distribution



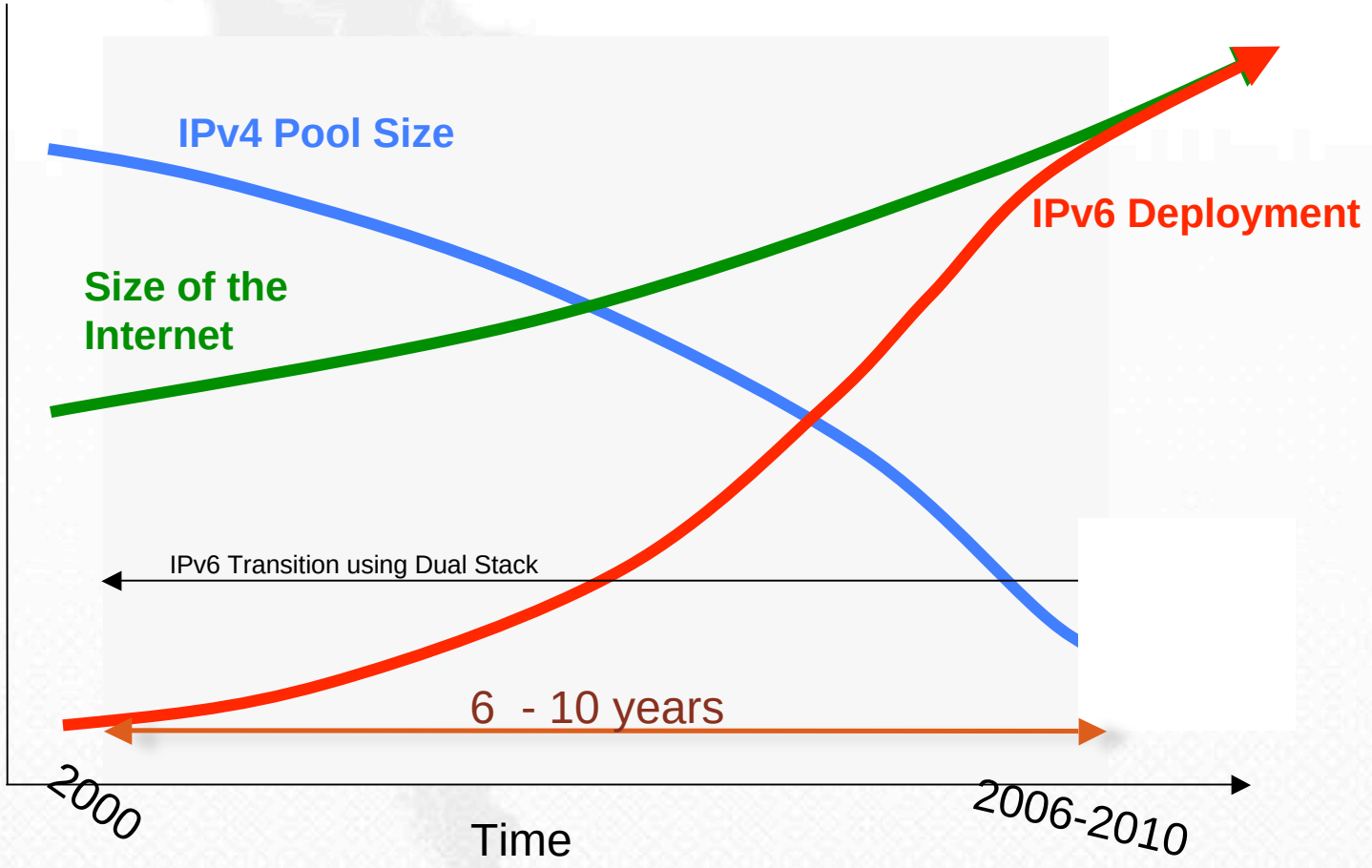
IANA (Internet Assigned Numbers Authority) is currently a function of ICANN (Internet Coorporation for Assigned Names and Numbers)

Regional Internet Registries

IPv4 Run-out

- IPv4 has 4.3 billons available addresses.
- Initial allocations did not considered the success of the network.
- In the early 90s there was already fear about the run-out of IPv4 addresses and worked started on a successor.
- In 1993, CIDR arrives and then NAT. The end of IPv4 gets postponed.

IPv4 Run-out. The plan 10 years Ago.

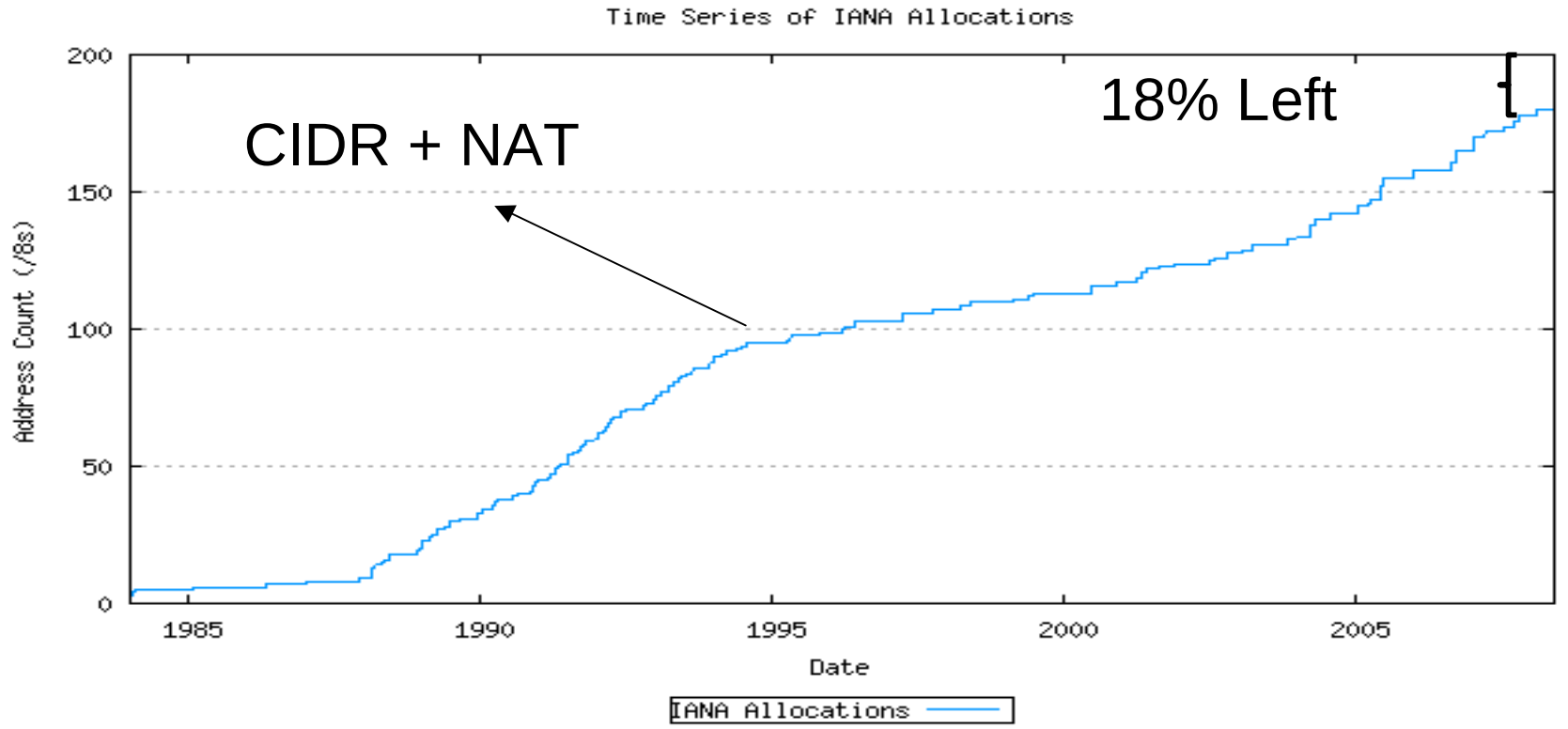


From Geoff Huston - RIPE 56.

¿What happened then?

- Thanks to CIDR and NAT the network grew without needing IPv6.
- The industry did not invest in IPv6.
- 2000 crisis?
- So, IPv6 did not flied.

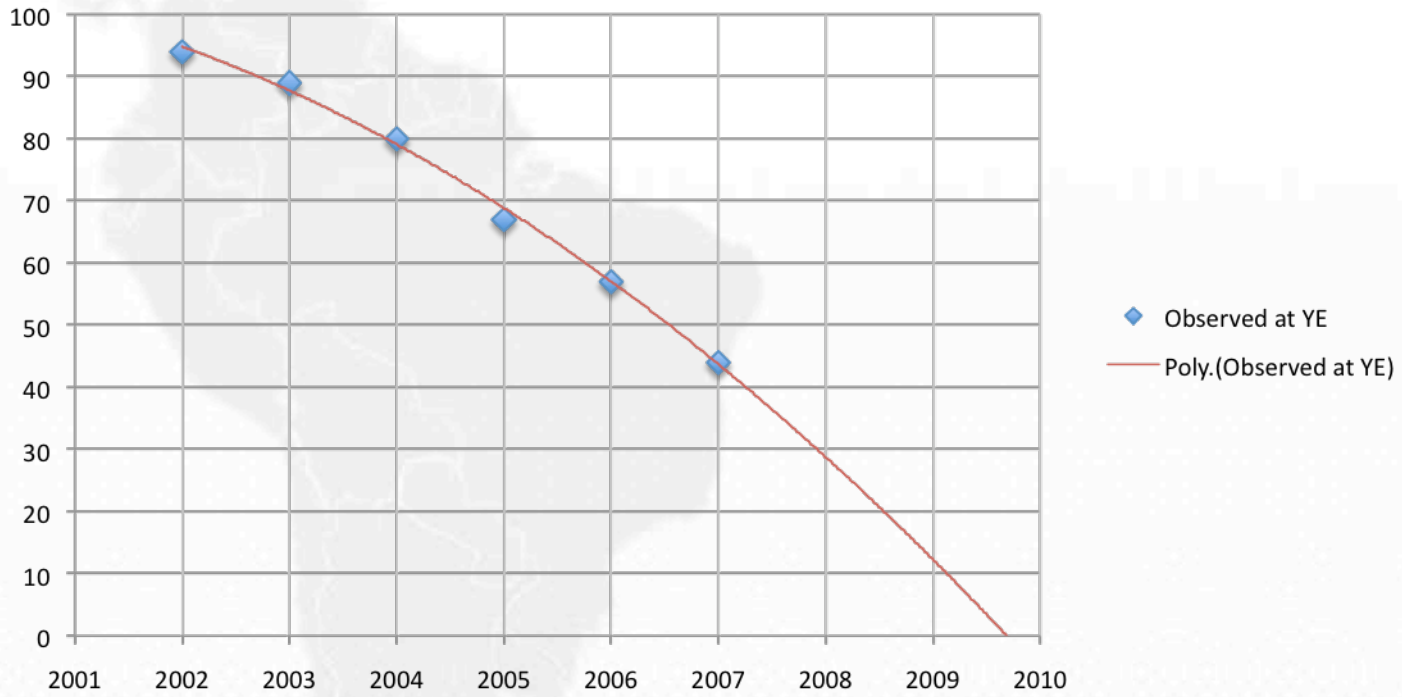
So, ¿What is the problem now? (1)



Central Pool Run-out Forecast : June 2011.

Source: http://www.potaroo.net/tools/ipv4/index.html

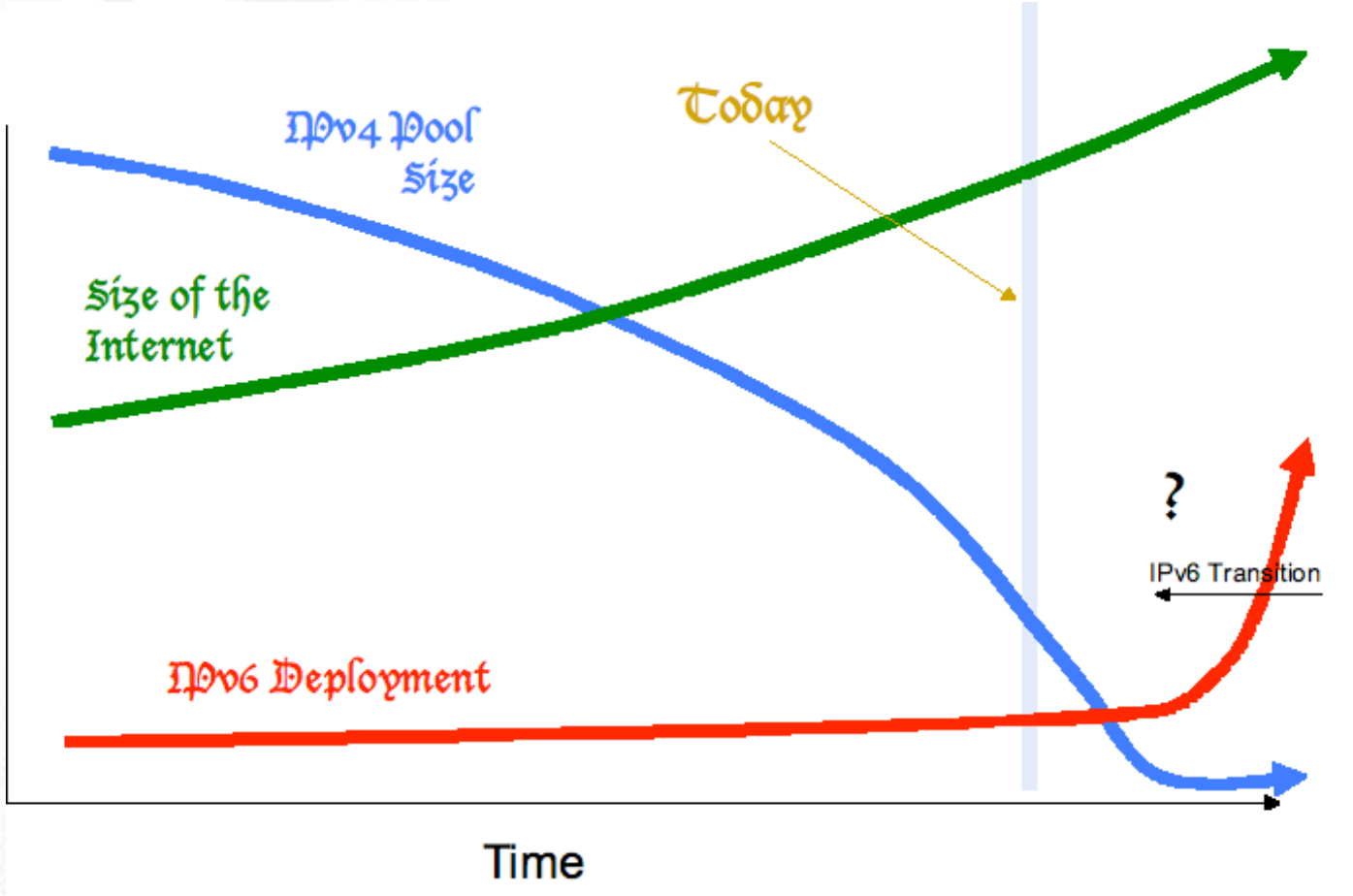
So, ¿What is the problem now? (2)



Other forecasts talk about 2010.

Source: Alain Durand, Comcast.

The new plan...



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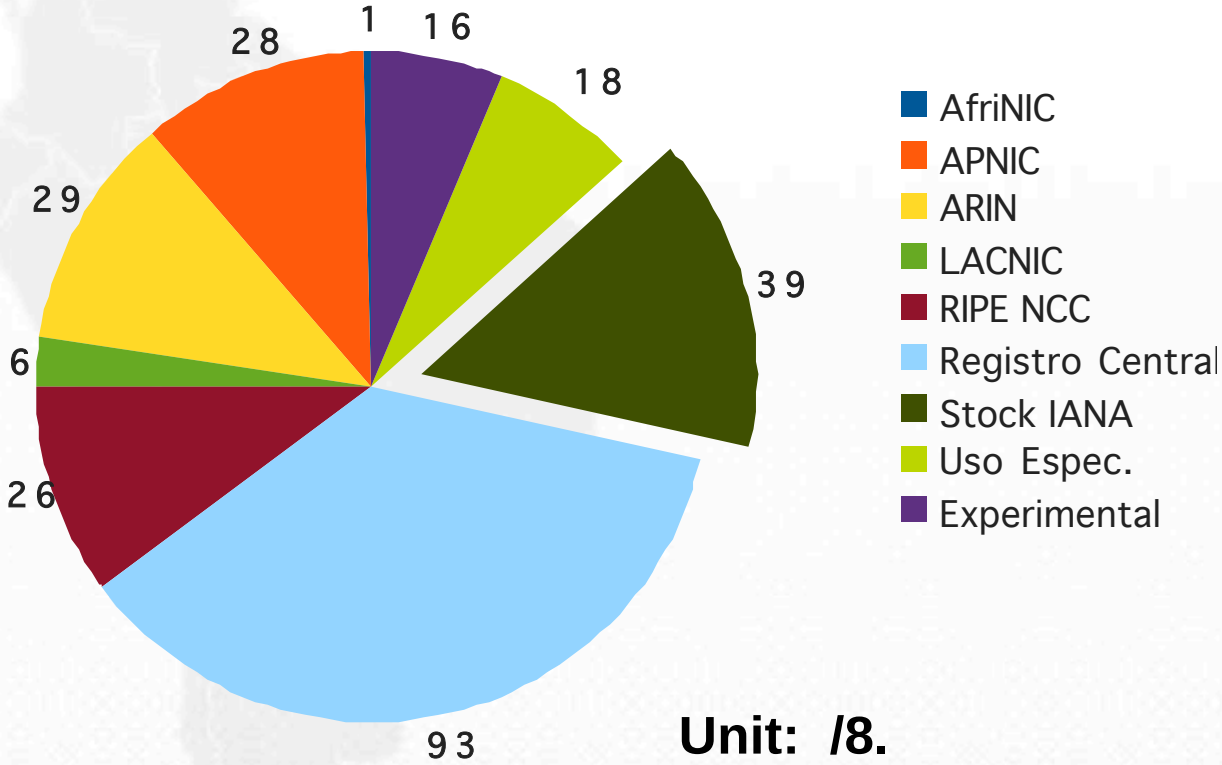
Life After Run-out

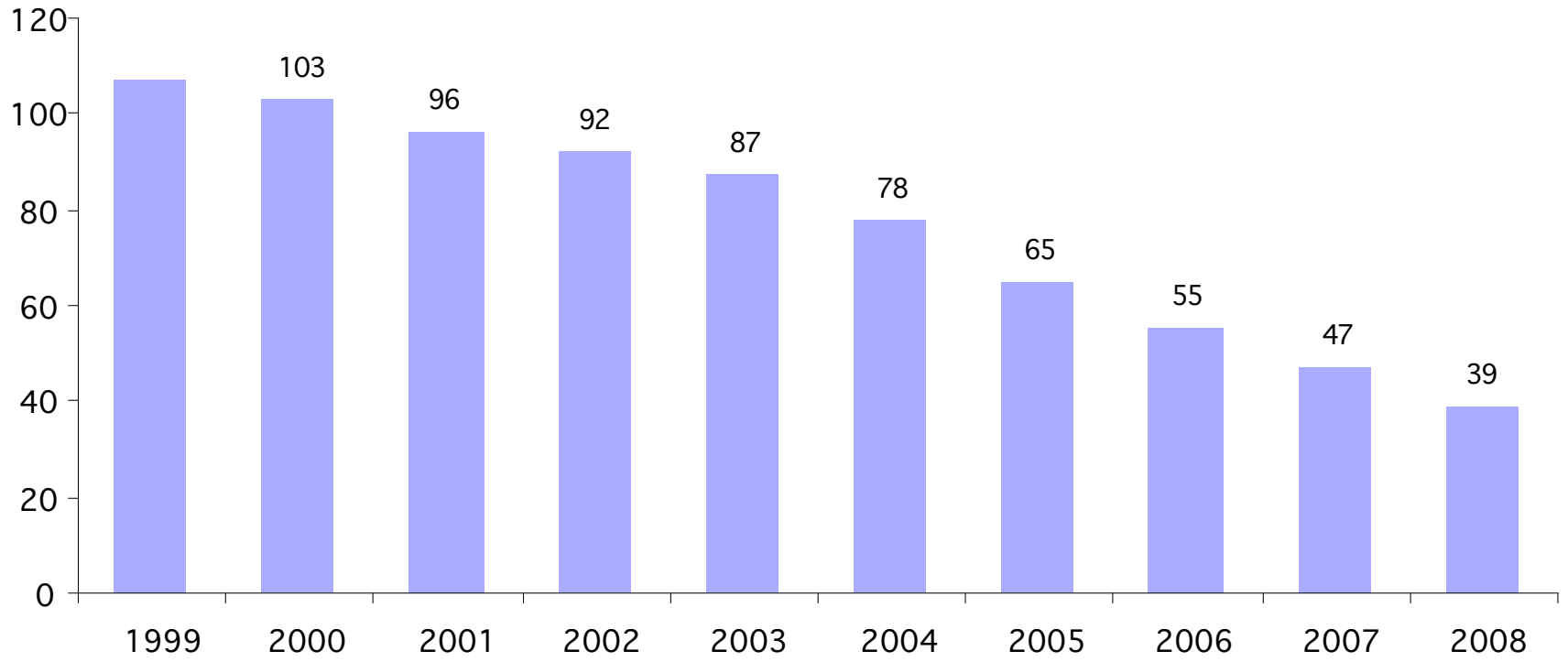
Current distribution of IPv4 addresses



Unit: /8.

A /8 = 1/256 of the total IPv4 addresses space.

Stock de IANA



/8 UNITS

What could happen?

- There will be IPv4 addresses for many years. (in different ways).
- Difficulties for allocating big (and not so big) contiguous blocks.
- IPv6 could not be broadly used until IPv4 is exhausted or until there are adequate economic incentives.
- At some point, there could be “only IPv6” users.
- NAT Use Increases
- Secondary/Gray Market

Reflections

- IPv6 will not replace IPv4 neither in the short term nor in the midterm. Both protocols will coexist for many years.
- The policies for receiving IPv6 addresses are not an obstacle. Neither the associated costs. They aim to facilitate IPv6 adoption.
- IPv6 is ready for its utilization. As any other technology, it is something live that will be improved along the time. But it is ready.
- Many efforts should be focused in promotion and training.
- It is also a very good opportunity for innovation.

Policy discussion

- **There are several proposal being discussed in the RIRs' open policy forums.**
  - To encourage adoption of IPv6
  - For facilitating the transfer of IPv4 addresses between organizations.
  - For distributing one part of the remaining unallocated pool.
  - For ensuring IPv4 addresses to new entrants.
- **Any adopted or rejected proposal has impact in our communities, and in your businesses.**
- **Participation is very important.**
  - Information about how to participate in LACNIC policy development processes is available in the website.

Scenarios

- Different possible scenarios based in what measures are taken and what policies are adopted.
- It is not possible to ensure that the access to IPv4 addresses in secondary markets (grey markets) will be equitable.
- There are a lot of things to do, but the most iportant is to work in IPv6 deployment and adoption.

LACNIC

Thank you !
Obrigado !
Gracias !