

# Transition to IPv6: Should ISPs consider it now?

PITA 11th AGM Meeting 2007  
Tahiti, French Polynesia  
24 April 2007

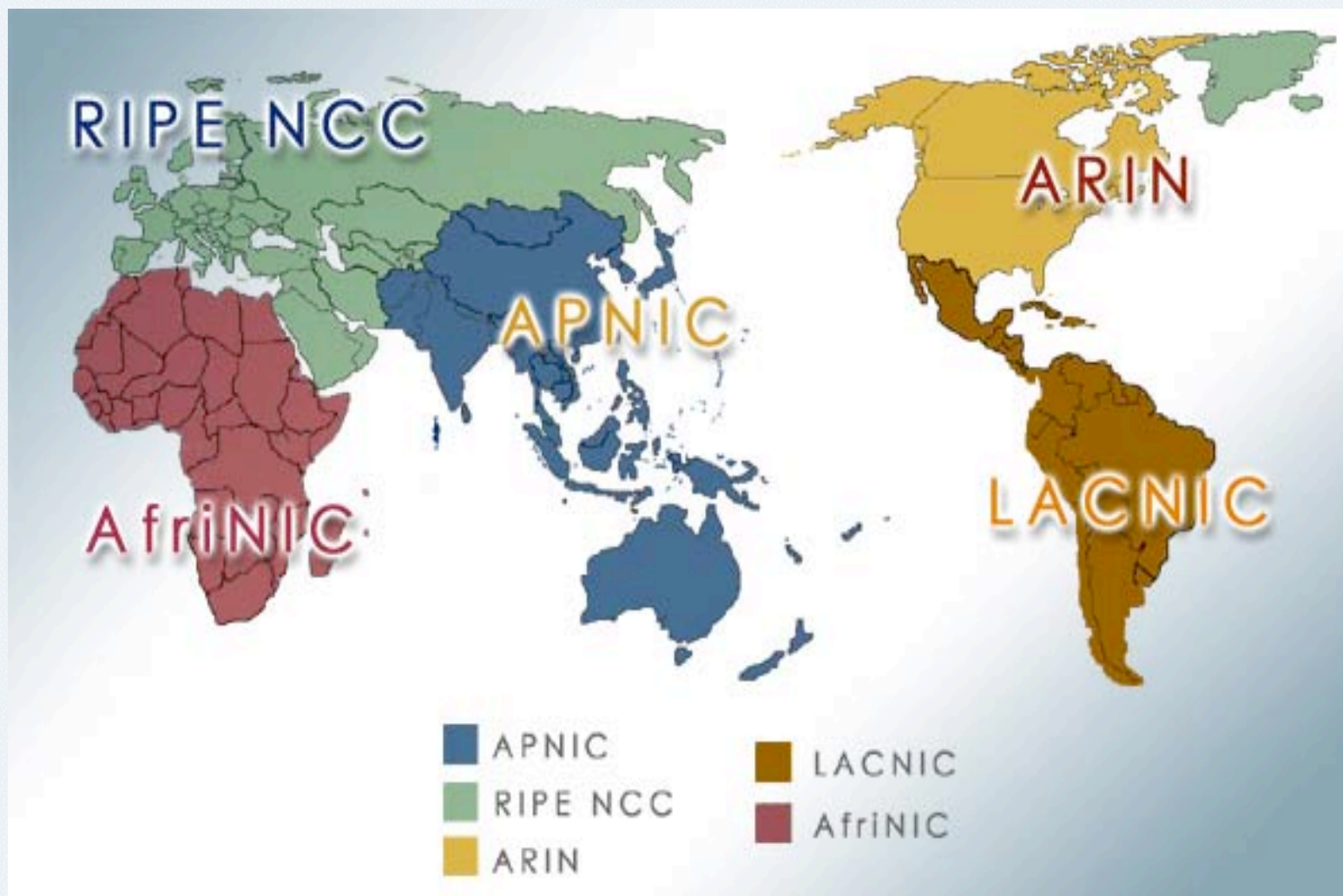


# Overview

- Current status of IPv4 address space
- Current policy discussion on transition
- IPv6 deployment trends
- APNIC IPv6 policies
- Possible steps ISPs could take

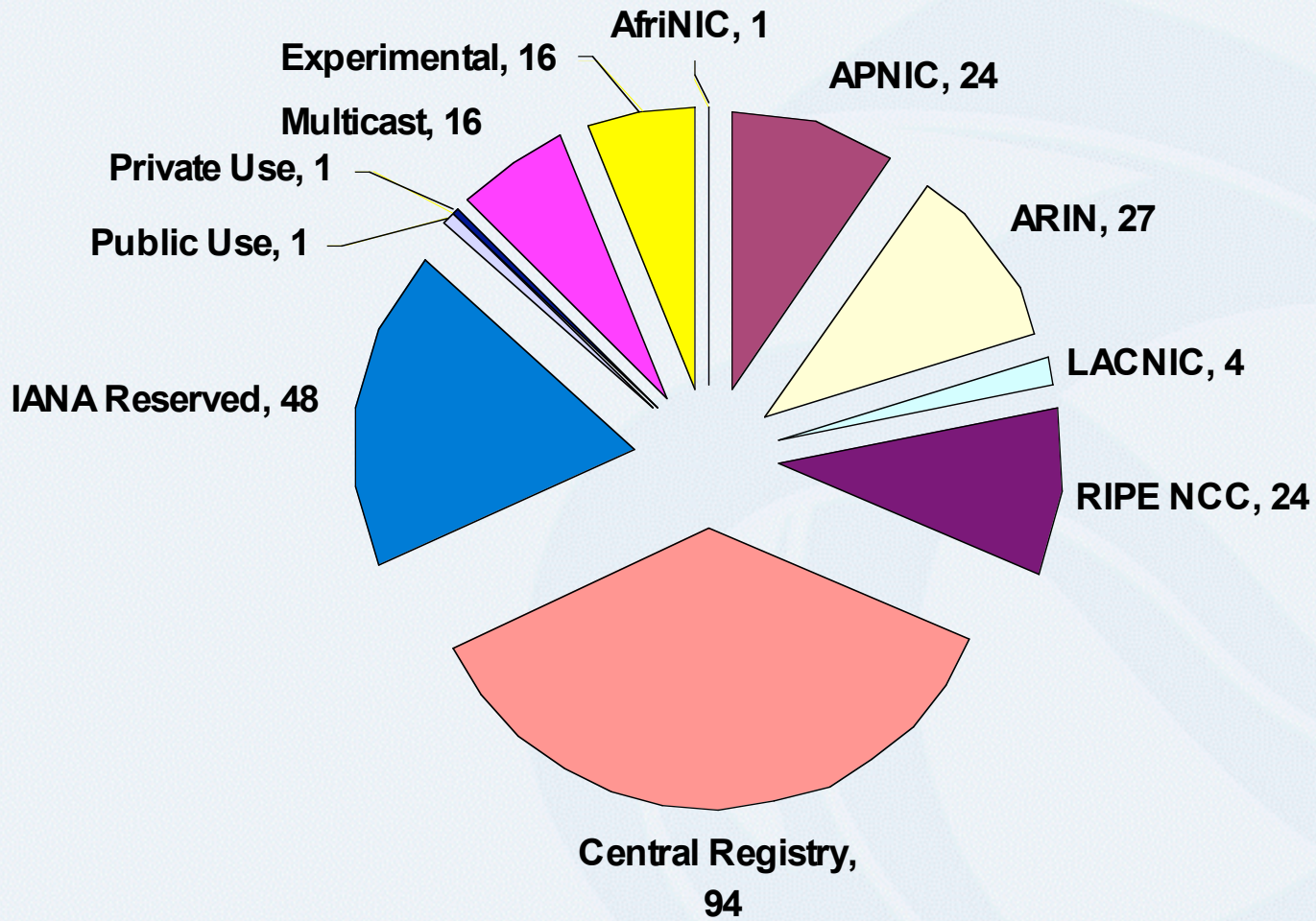


# Regional Internet Registry (RIR)



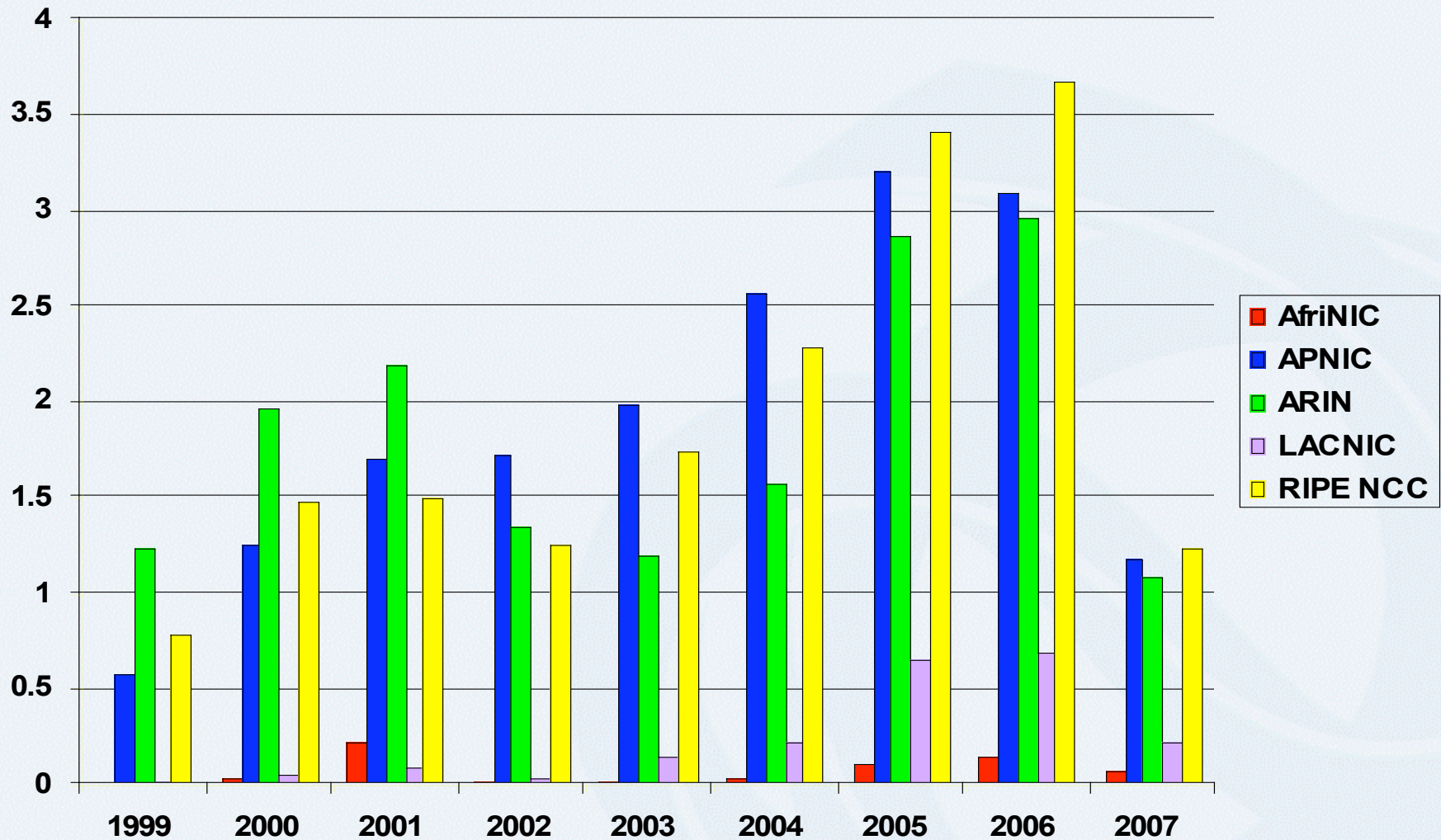


# Status of IPv4 address space (/8)





# IPv4 allocations: RIRs to LIRs/ISPs



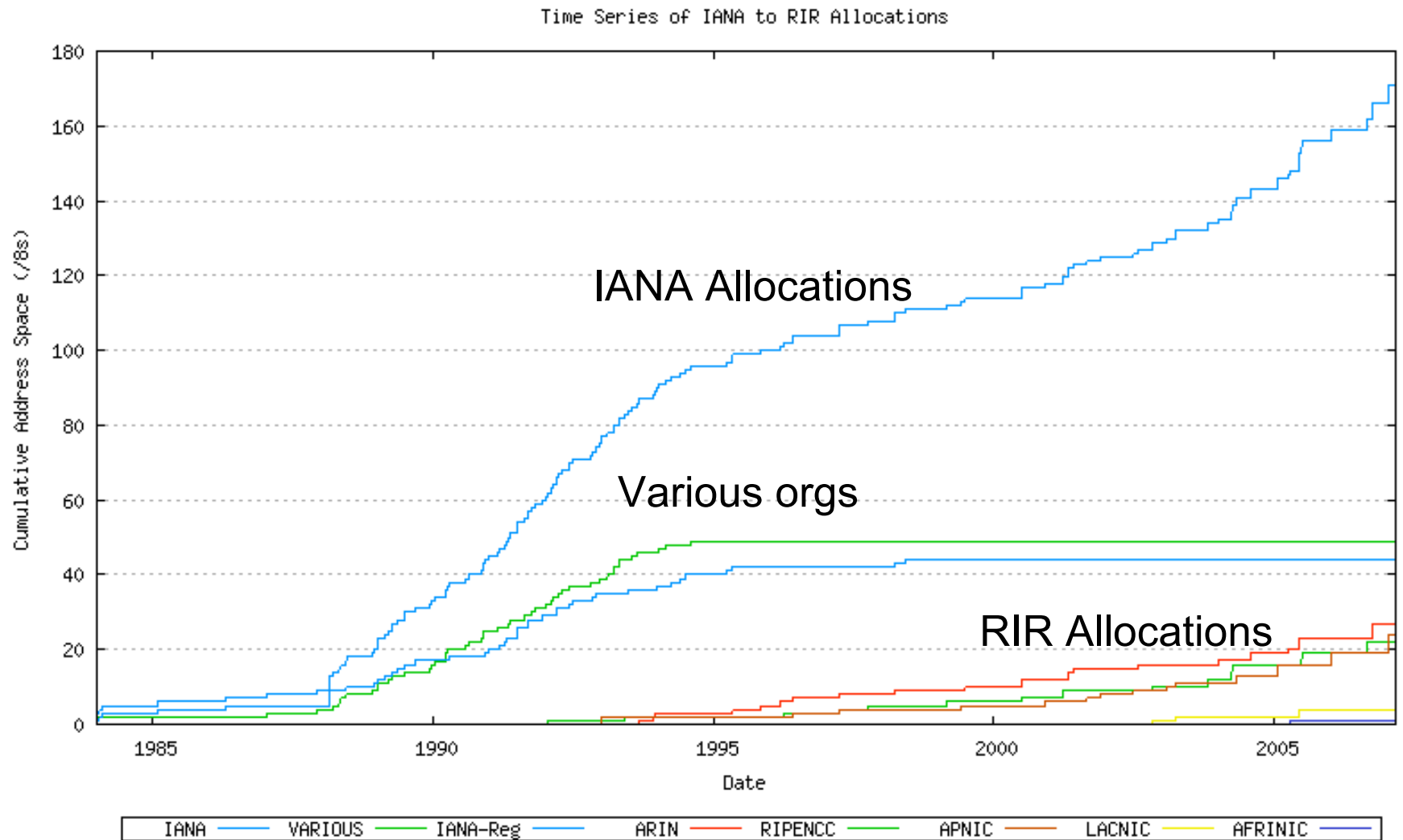


# Studies in IPv4 exhaustion

- RIRs release statistical data on their allocations
  - <http://www.nro.net/statistics/>
- Geoff Huston, chief scientist at APNIC, has studied the IPv4 allocation data
  - Projections based on current and past utilisation rates
  - Three sets of data analysed:
    - IANA allocations to RIRs (IANA IPv4 address registry)
      - Allocation of /8 blocks to RIRs and others
    - RIR allocations to ISPs (RIR statistics files)
      - Allocation of blocks to LIRs
    - ISP announcements (BGP routing table)
      - Amount of address space advertised



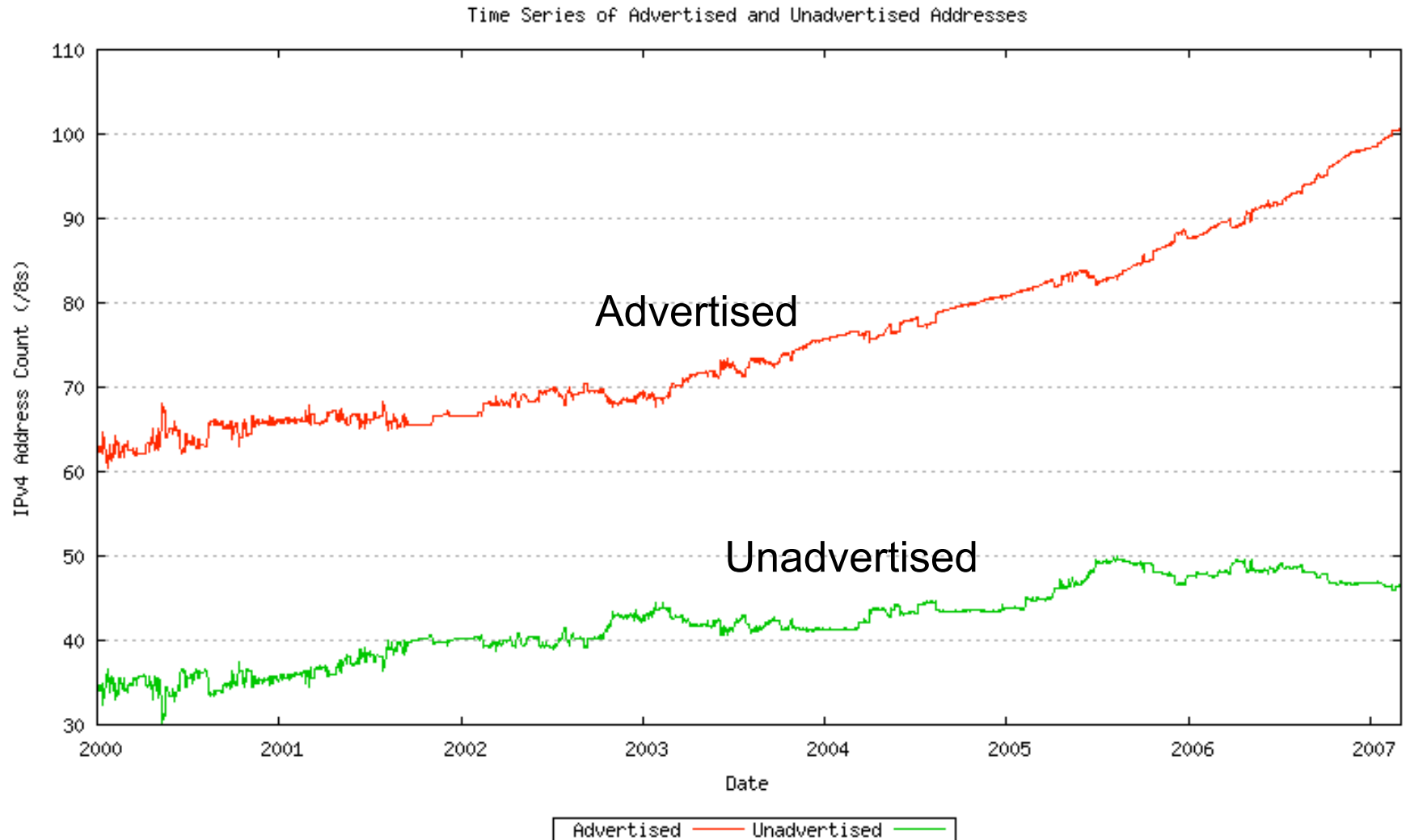
# Data analysed - IPv4 allocations



<http://www.potaroo.net/tools/ipv4/>

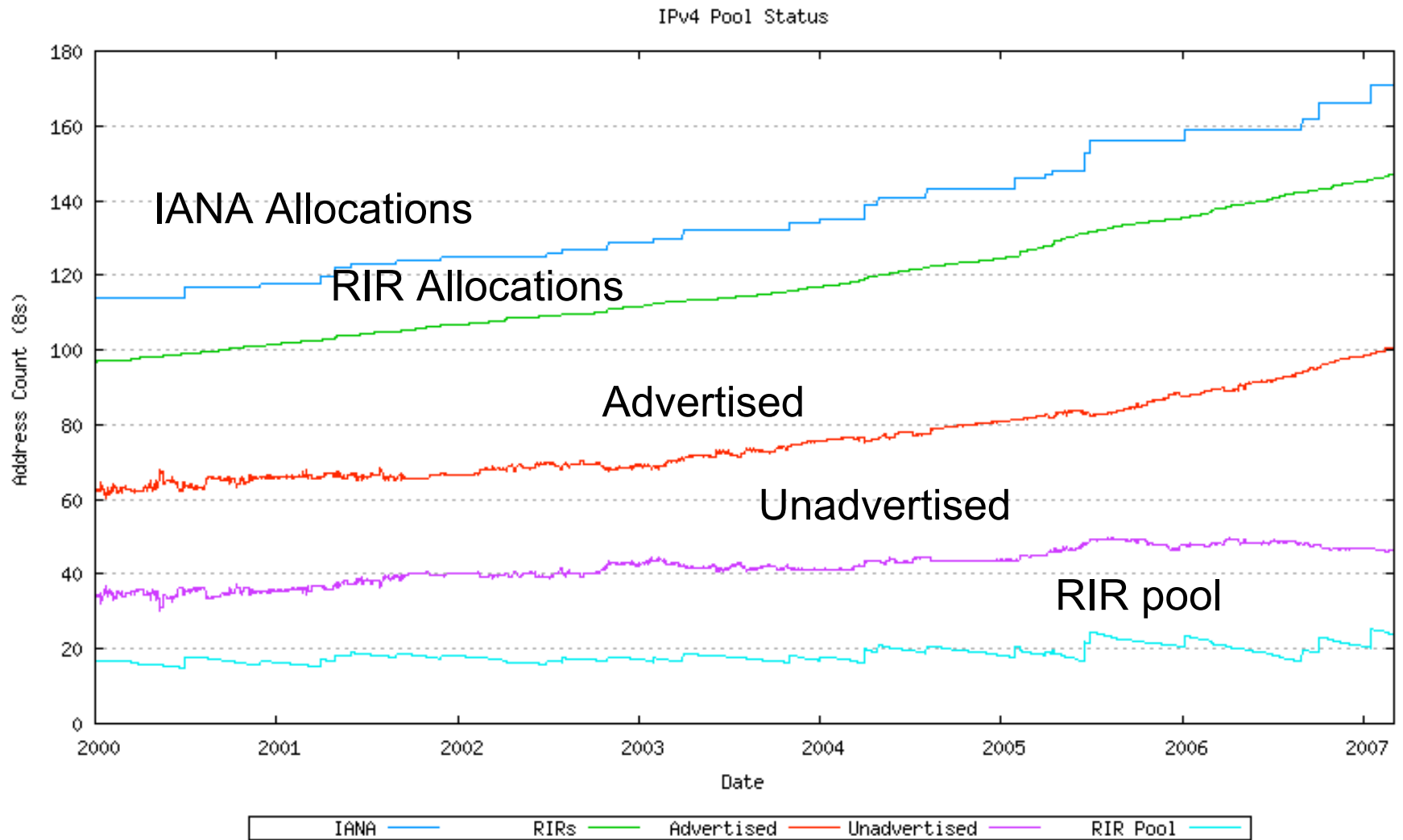


# Data analysed - BGP announcements



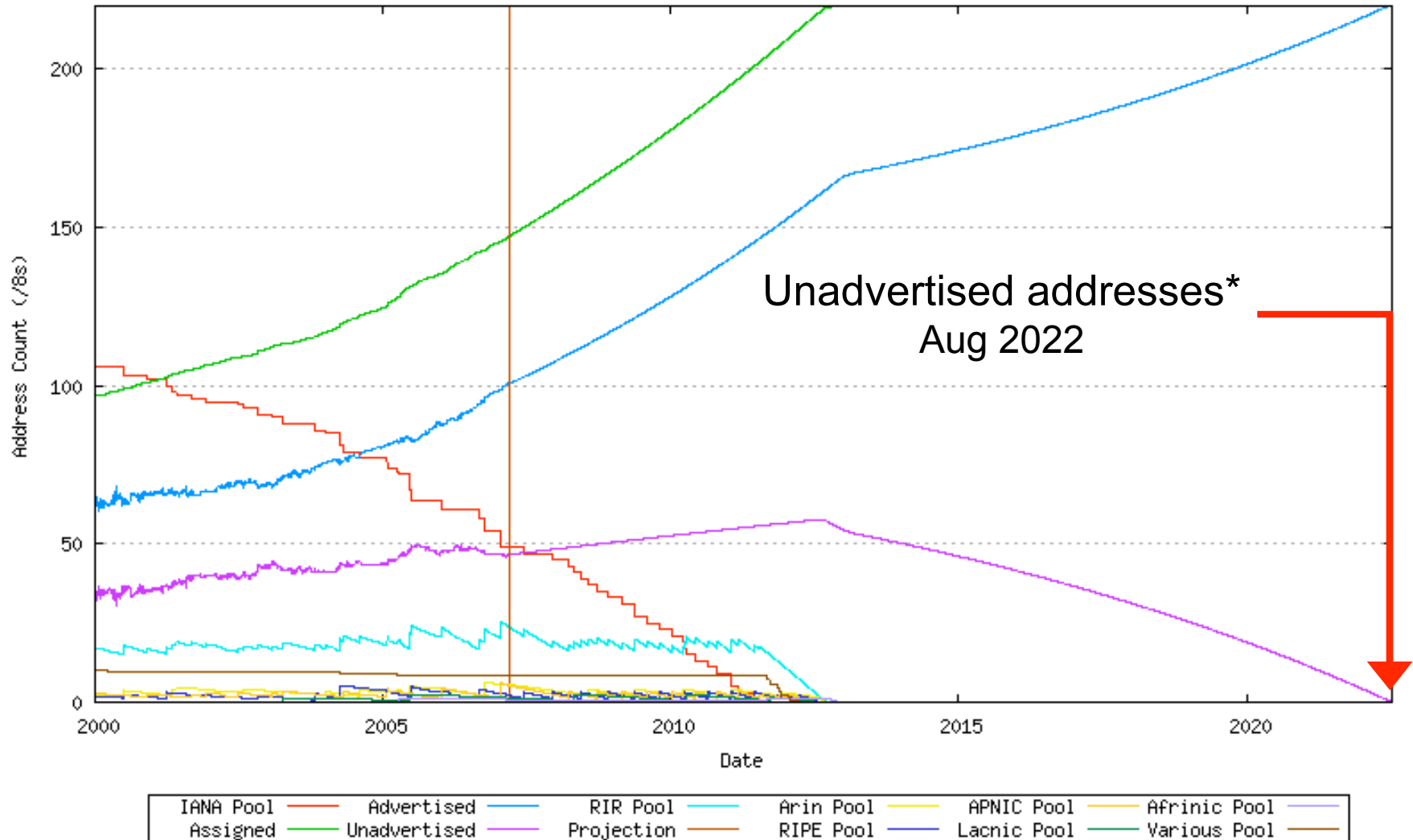


# Data analysed - complete picture





# Projection - including all unused pools



\*If all IPv4 addresses not in use were reclaimed and re-allocated

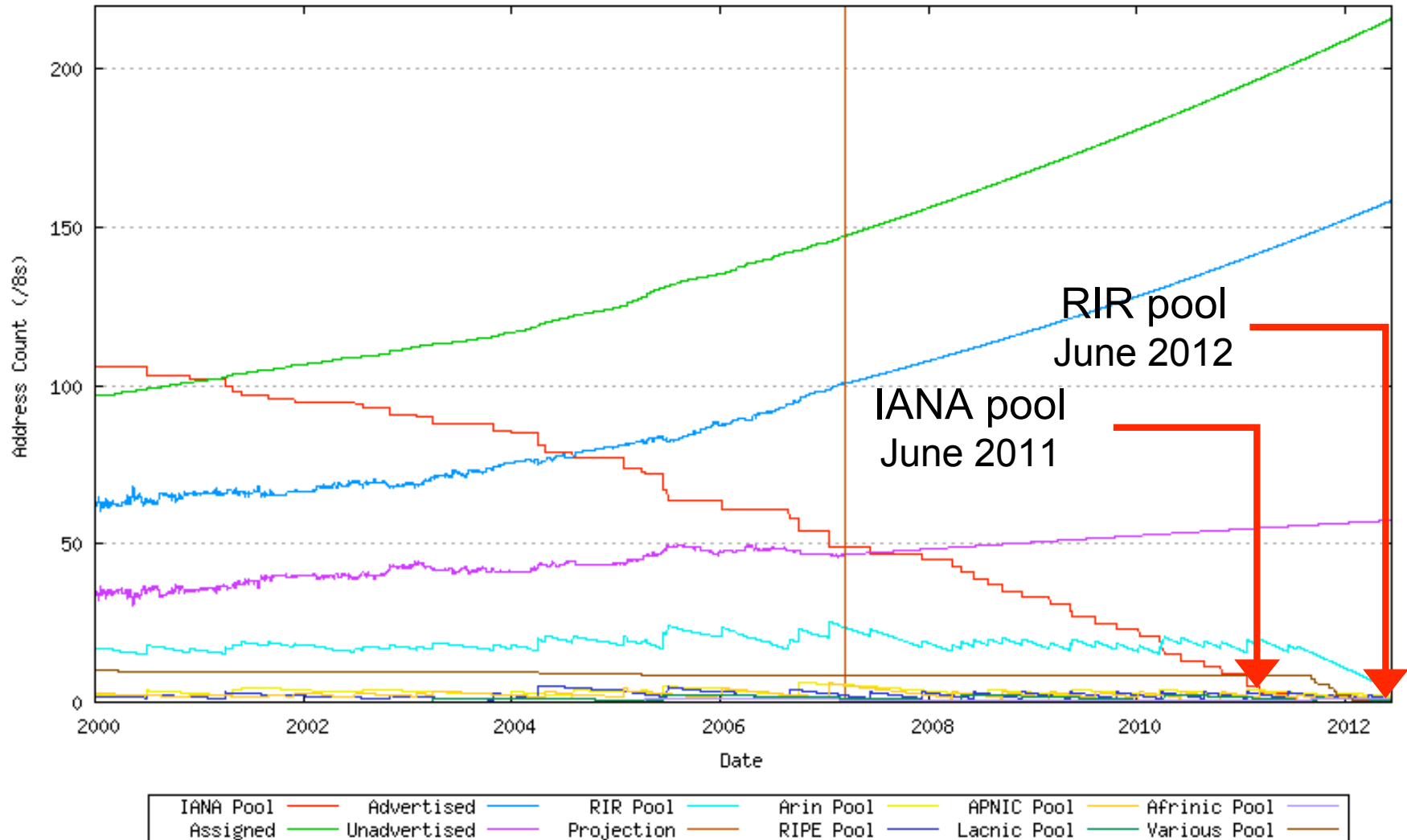


# Alternative solutions examined

- Recover unused historical IPv4 address space
  - Is the effort to recover worthwhile?
    - De-aggregation
    - Aggressive reclaiming only extend v4 lifetime a few years
    - Legal ramifications
  - Ability to recover is limited under current policies
- Use of Network Address Translator (NAT)
  - Originally designed to extend life of IPv4
    - Cannot cater for large network
  - Road block
    - Peer to peer
    - Security (IPsec)
    - QoS ( VoIP and real time video)



# Projection - RIR exhaustion point



As of 5 March 2007

# Current discussion on transition (policy)

- “IPv4 count down” proposal
  - Proposal seeks consensus on the following points
    - Define last date of allocation
    - Reserve blocks for critical infrastructure
    - Keep current policy framework
    - Recycling of resources to be discussed separately
    - Global coordination
  - <http://www.apnic.net/policy/proposals/prop-046-v001.html>
  - Will be discussed at other RIR meetings later in the year

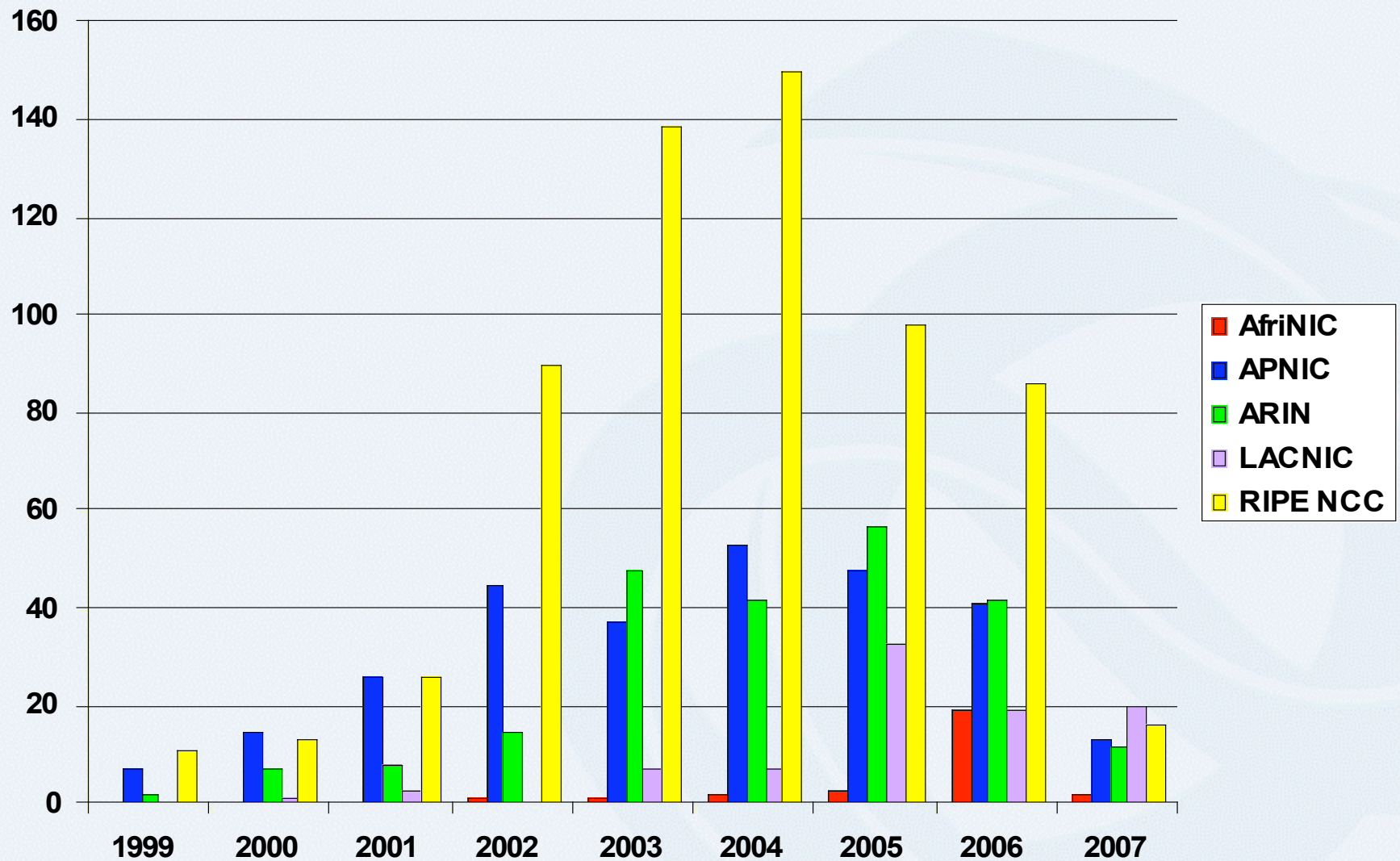


# IPv6 Deployment Trends





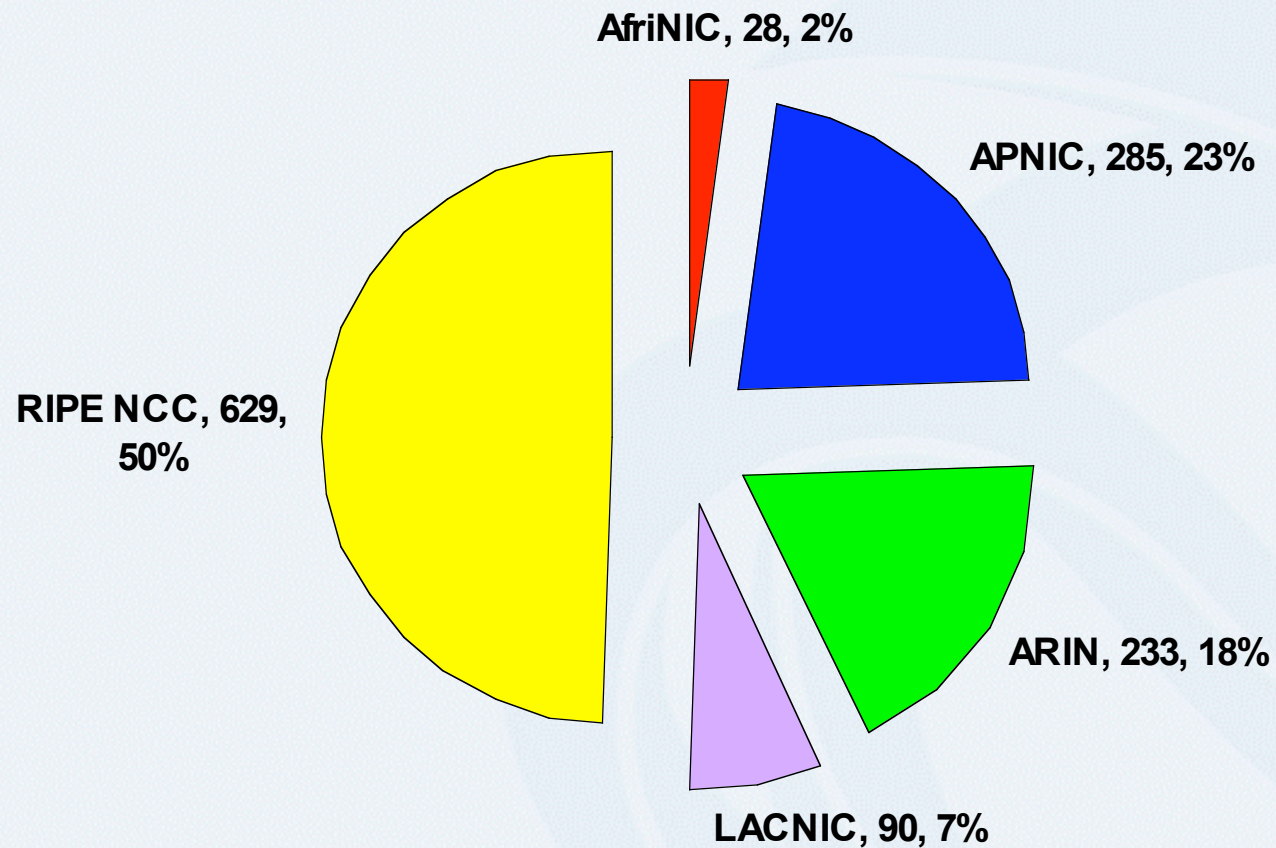
# IPv6 allocations: RIRs to LIRs/ISPs





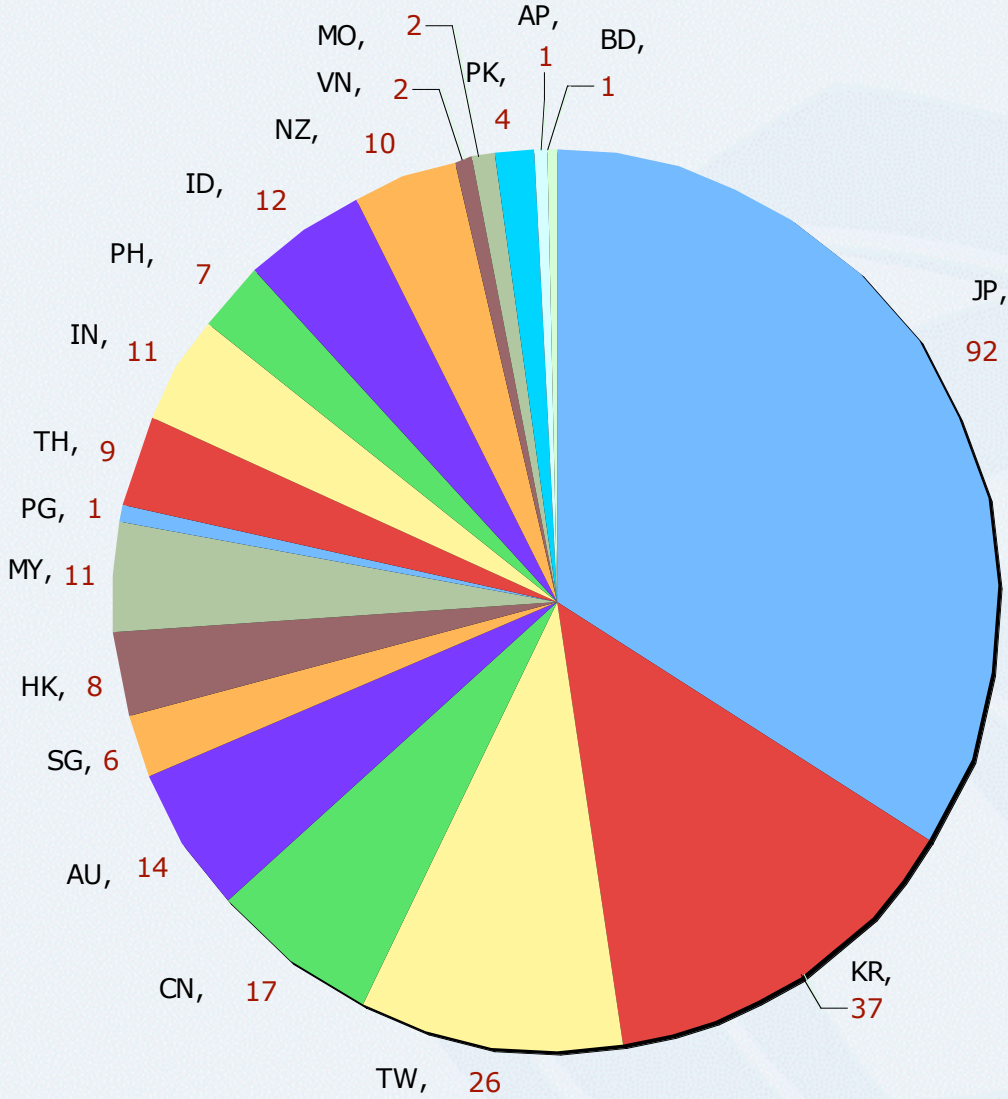
# IPv6 allocations: RIRs to LIRs/ISPs

Cumulative Total (Jan 1999 – Mar 2007)



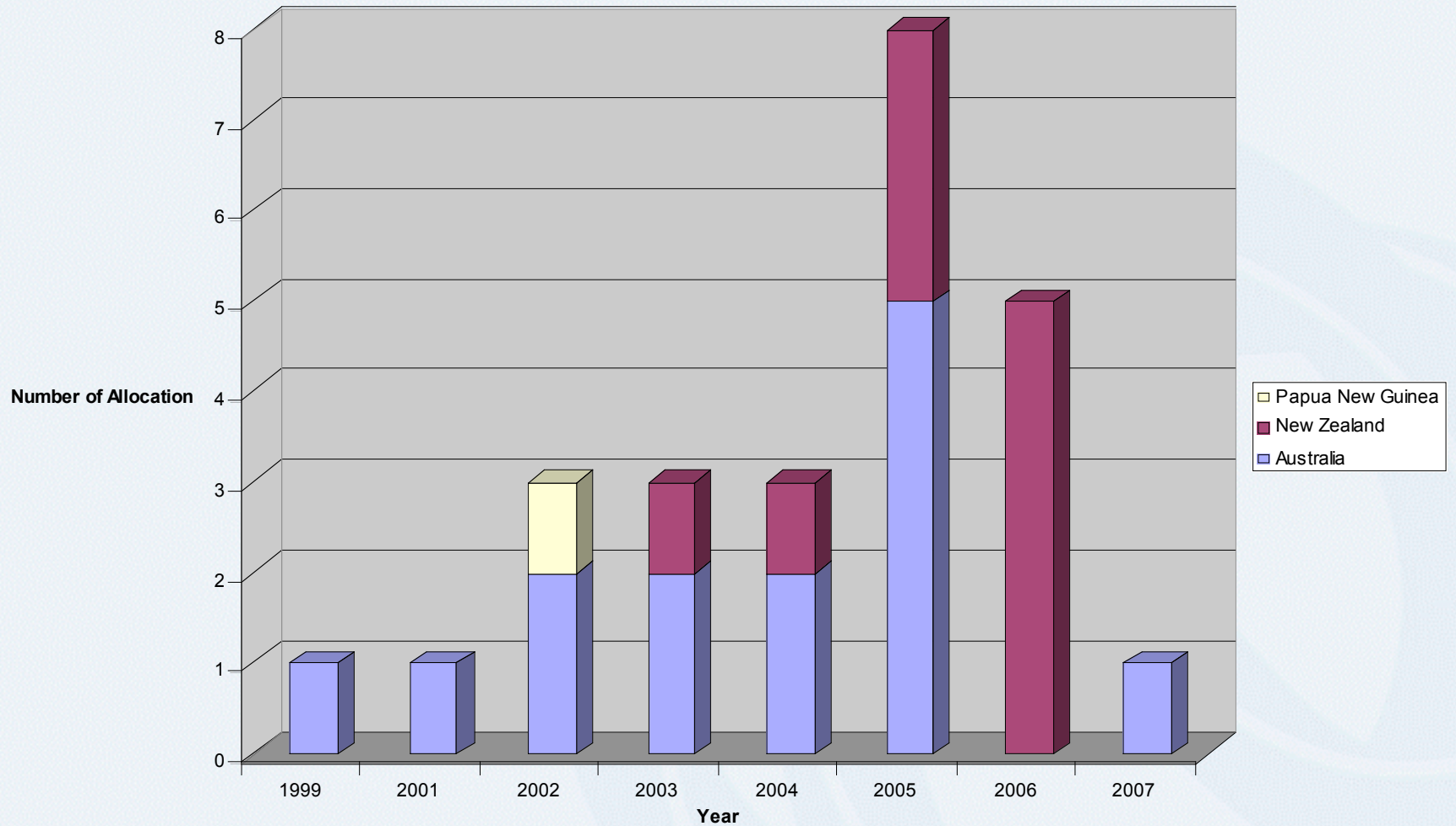


# IPv6 allocations in AP region





# IPv6 Allocations in AU, NZ & Pacific region





# APNIC IPv6 allocation policy

- Initial allocation
  - Criteria
    - Be a Local Internet Registry (LIR)
    - Plan to have 200 customers within 2 years
  - Minimum allocation /32
    - Can use IPv4 customers as justification



# APNIC IPv6 portable assignment policies

- Critical infrastructure assignment
  - Root DNS, ccTLD, gTLD, ICANN, RIR and NIR
  - Maximum of /32
- IXP assignment
  - Minimum /48
- Small multihoming assignment
  - Network has at least 2 different external connections
  - Minimum /48



# Possible steps ISP could take

- Staff training
  - Send staff to events like PACNOG, APNIC, APRICOT to participate in IPv6 training
  - Request APNIC to conduct IPv6 workshop in your economy
    - Send email to [training@apnic.net](mailto:training@apnic.net)
- Request for IPv6 allocation/assignment
  - IPv4 and IPv6 networks can co-exist
    - Most IPv4 software and hardware are IPv6 capable
  - No extra fees
    - Existing APNIC members with IPv4 space
- Start a test bed
  - Experiment with IPv6 while providing services in IPv4
- Start now
  - Transition takes time



## Possible steps ISP could take (cont)

- Join mailing lists to keep up to date on developments
  - APNIC mailing lists
    - <http://www.apnic.net/community/lists/index.html>
  - PACNOG mailing list
    - <http://mailman.apnic.net/mailman/listinfo/pacnog>
  - IPv6 global operator forum
    - <http://lists.cluenet.de/mailman/listinfo/ipv6-ops>
- Access relevant websites
  - Internet Community of Online Network Specialist (ICONS)
    - Keep up to date on operational matters
    - <http://icons.apnic.net/>
  - Global IPv6 forum
    - Latest events and information on IPv6 development
    - <http://www.ipv6forum.org/>



# APNIC meetings

- APNIC 24, SANOG 10
  - New Delhi, India
  - 29 August - 7 September 2007
- APNIC 25, APRICOT 2008
  - Taipei, Taiwan
  - 25 - 29 February 2008
- All invited !!!

<http://www.apnic.net/meetings>





Thank you !



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