IP addressing policies: what does this mean?

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APT PRF for the Pacific: August 2013

APNIC

Overview

- APNIC in the Internet ecosystem
- Policy development
- IPv4
- IPv6
- Public policy responses

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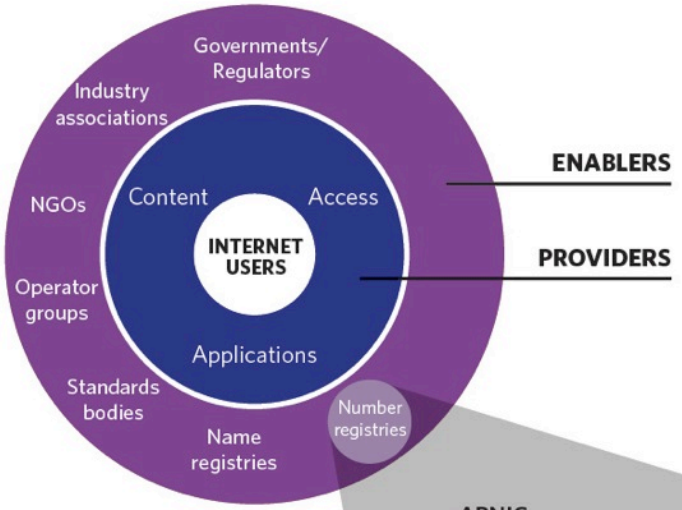
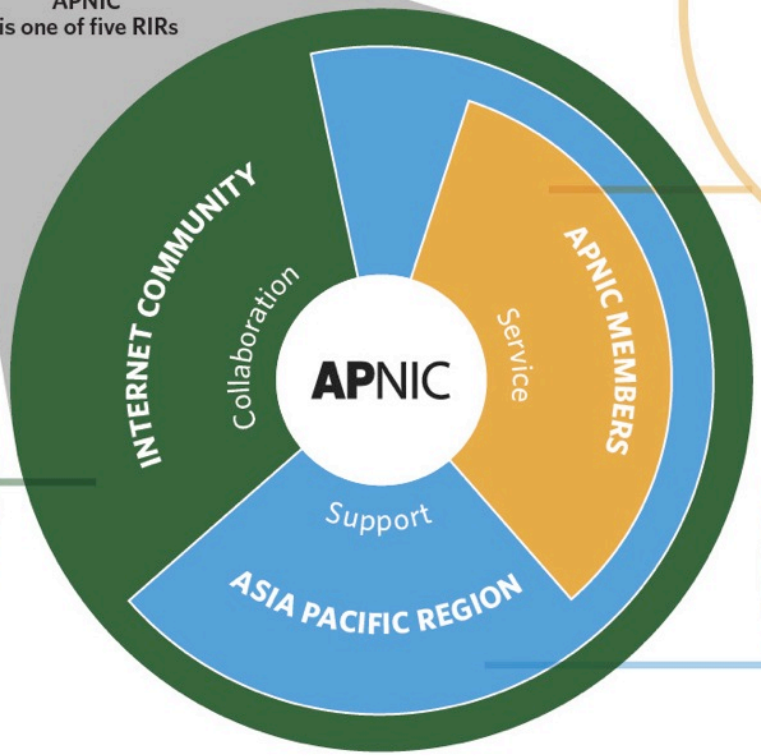
addressing the Internet in the Asia Pacific



APNIC
is one of five RIRs



Resource distribution
- IP addresses
- AS numbers

Registration services
- reverse DNS
- Internet routing registry
- resource certification
- whois registry

Original research

Data collection and measurements

Publications

Local/regional/global events

Internet governance

Internet security

Policy development

Capacity building
- training
- workshops
- conferences
- fellowships
- grants

Infrastructure
- root servers
- IXPs
- engineering assistance

Asia Pacific Network Information Centre

- APNIC established 1993 (20 years anniversary)
- Not-for-profit membership organization
- Primary function the management of Internet Numbers
  - Internet Protocol version 4 address numbers (IPv4)
  - Internet Protocol version 6 address numbers (IPv6)
  - Autonomous System Numbers (ASNs)

APNIC's Vision

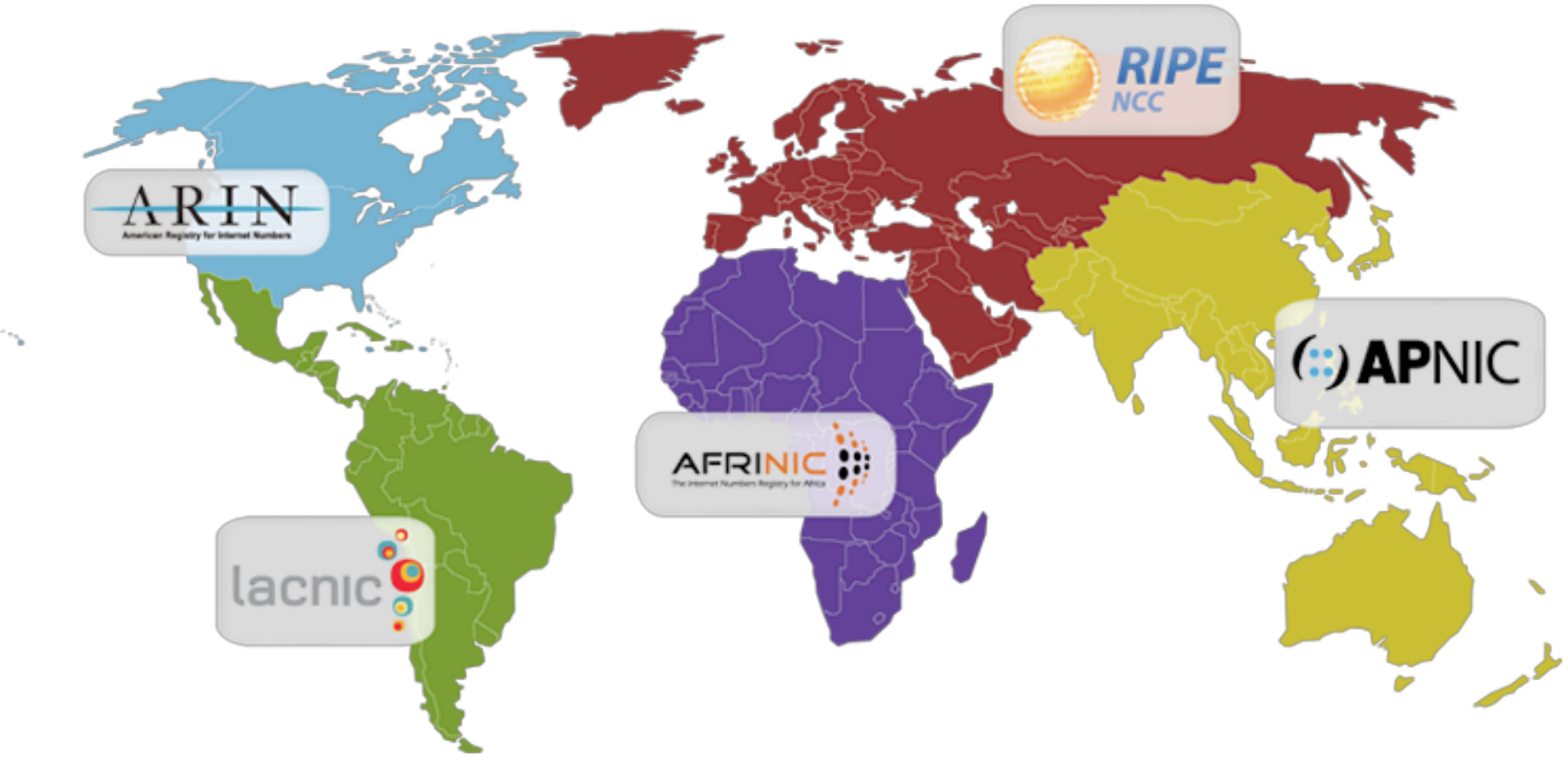
A global, open, stable, and secure Internet that serves the entire Asia Pacific community.

- How we achieve this:
  - Serving Members
  - Supporting the Asia Pacific Region
  - Collaborating with the Internet community

APNIC's Mission

- Function as the Regional Internet Registry for the Asia Pacific, in the service of the community of Members and others
- Provide Internet registry services to the highest possible standards of trust, neutrality, and accuracy
- Provide information, training, and supporting services to assist the community in building and managing the Internet
- Support critical Internet infrastructure to assist in creating and maintaining a robust Internet environment
- Provide leadership and advocacy in support of its vision and the community
- Facilitate regional Internet development as needed throughout the APNIC community

All the RIRs


RIPE
NCC
ARIN
American Registry for Internet Numbers
APNIC
AFRINIC
lacnic

APNIC and the NRO

- Coordinating body for the five RIRs
- NRO exists to:
  - Protect the unallocated Number Resource pool
  - Promote and protect the bottom-up policy development process
  - Act as a focal point for Internet community input into the RIR system
- Joint activities
  - Resource certification
  - Global statistics and report publication
  - Internet governance
  - Global policy development

Five RIRs

- AFRINIC
- APNIC
- ARIN
- LACNIC
- RIPE NCC

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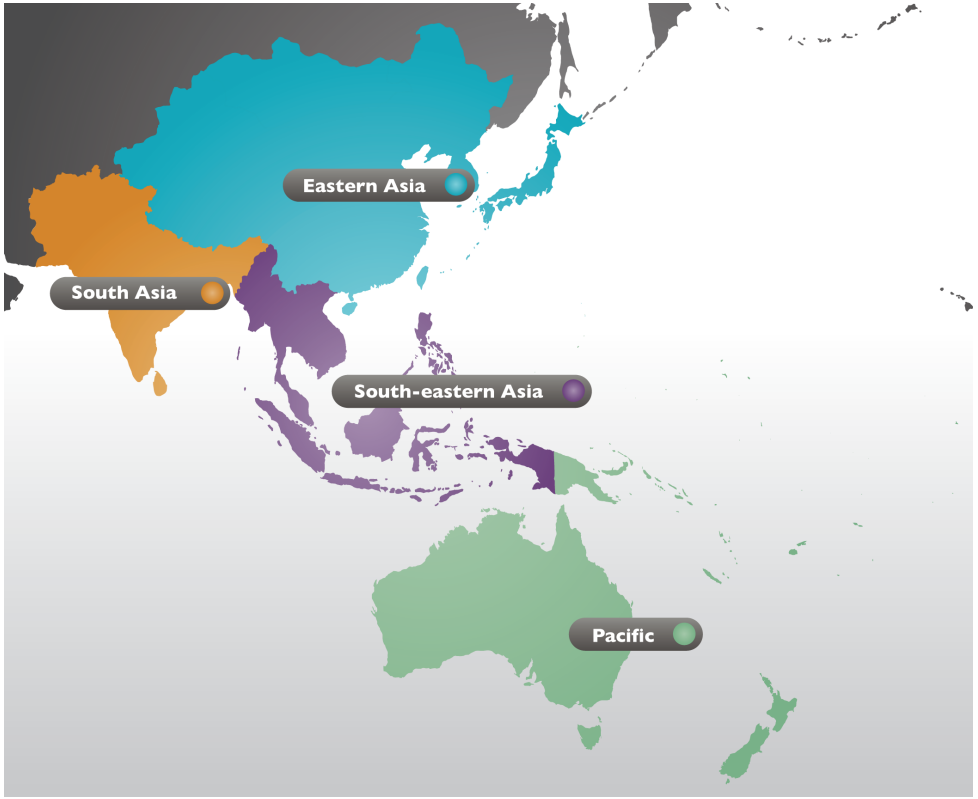
APNIC sub-regions



The APNIC service region includes 56 economies across the Asia Pacific

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Policy development is a cycle

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Policy development

- APNIC Policy Development Process
  - www.apnic.net/policy/policy-development
- SIG Guidelines
  - www.apnic.net/sigs/sig-guidelines.pdf
- Mailing list archive
  - mailman.apnic.net/mailing-lists/sig-policy
- Mailing list subscription
  - mailman.apnic.net/mailman/listinfo/sig-policy
- Mail to list
  - sig-policy@apnic.net

Policy SIG Charter:

Develop policies and procedures which relate to the management and use of Internet address resources by APNIC, NIRs and ISPs within the Asia Pacific region

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Multistakeholder policy development

- Open
  - Anyone can propose, discuss, and help decide policy
- Transparent
  - APNIC publicly documents all policy discussions and decisions
- Bottom up
  - Policy Development Process (PDP) and the policies are determined by the community they serve

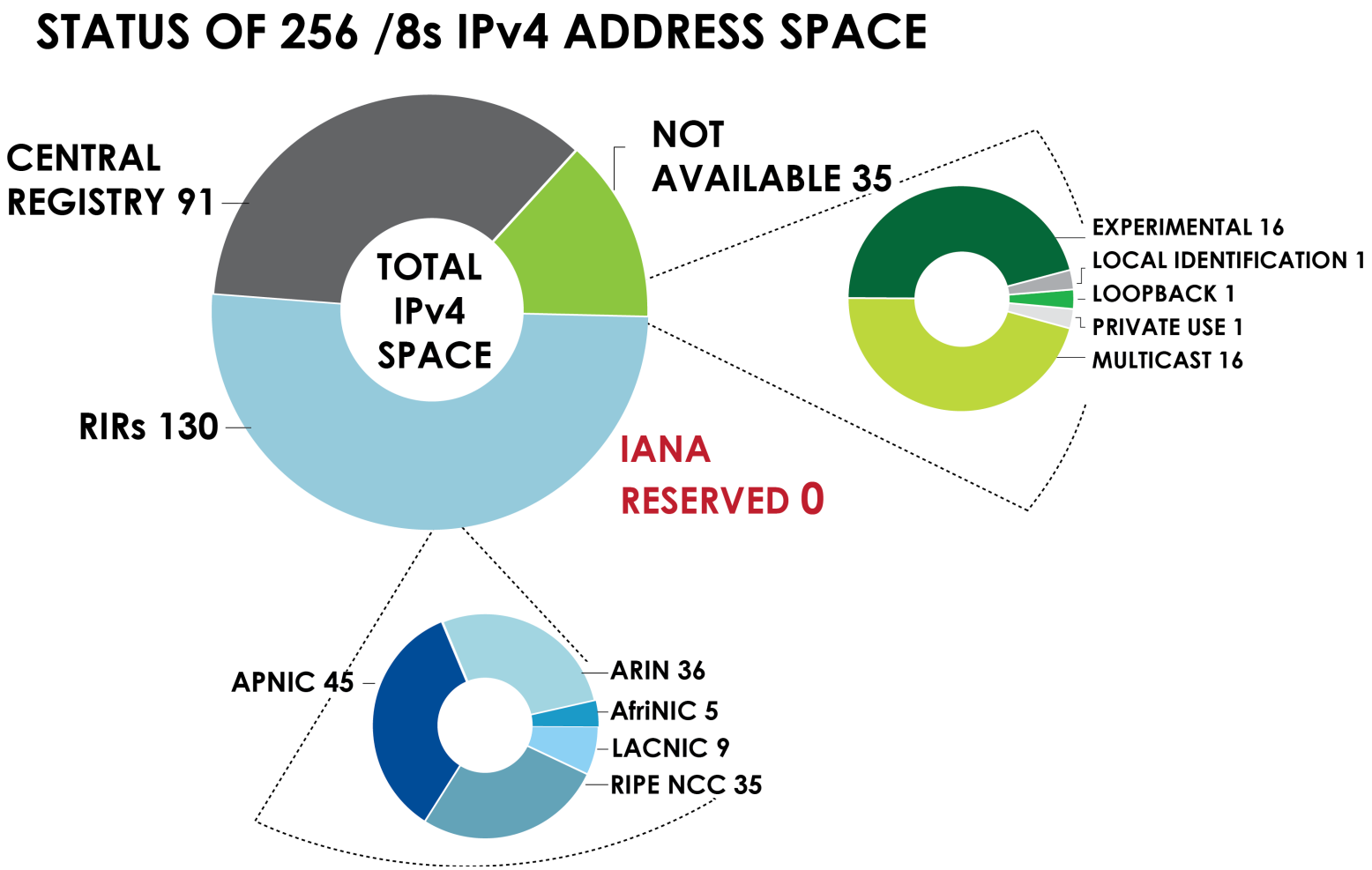
Resource management goals

- Conservation
  - Efficient use of resources
  - Based on demonstrated need
- Aggregation
  - Limit routing table growth
  - Support provider-based routing
- Registration
  - Ensure uniqueness
  - Facilitate trouble shooting

The current state of IPv4 address pools

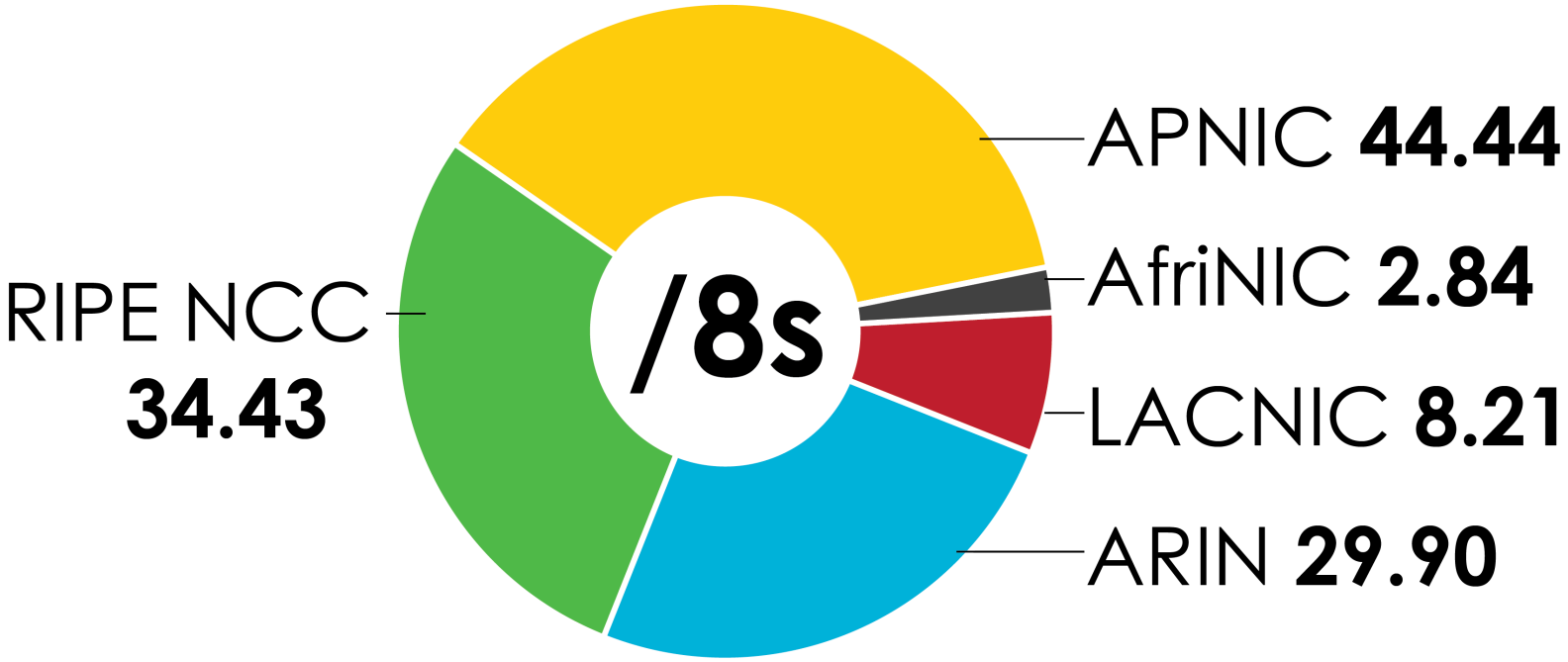
IPv4 address space

What is the status of each of the 256 /8s?

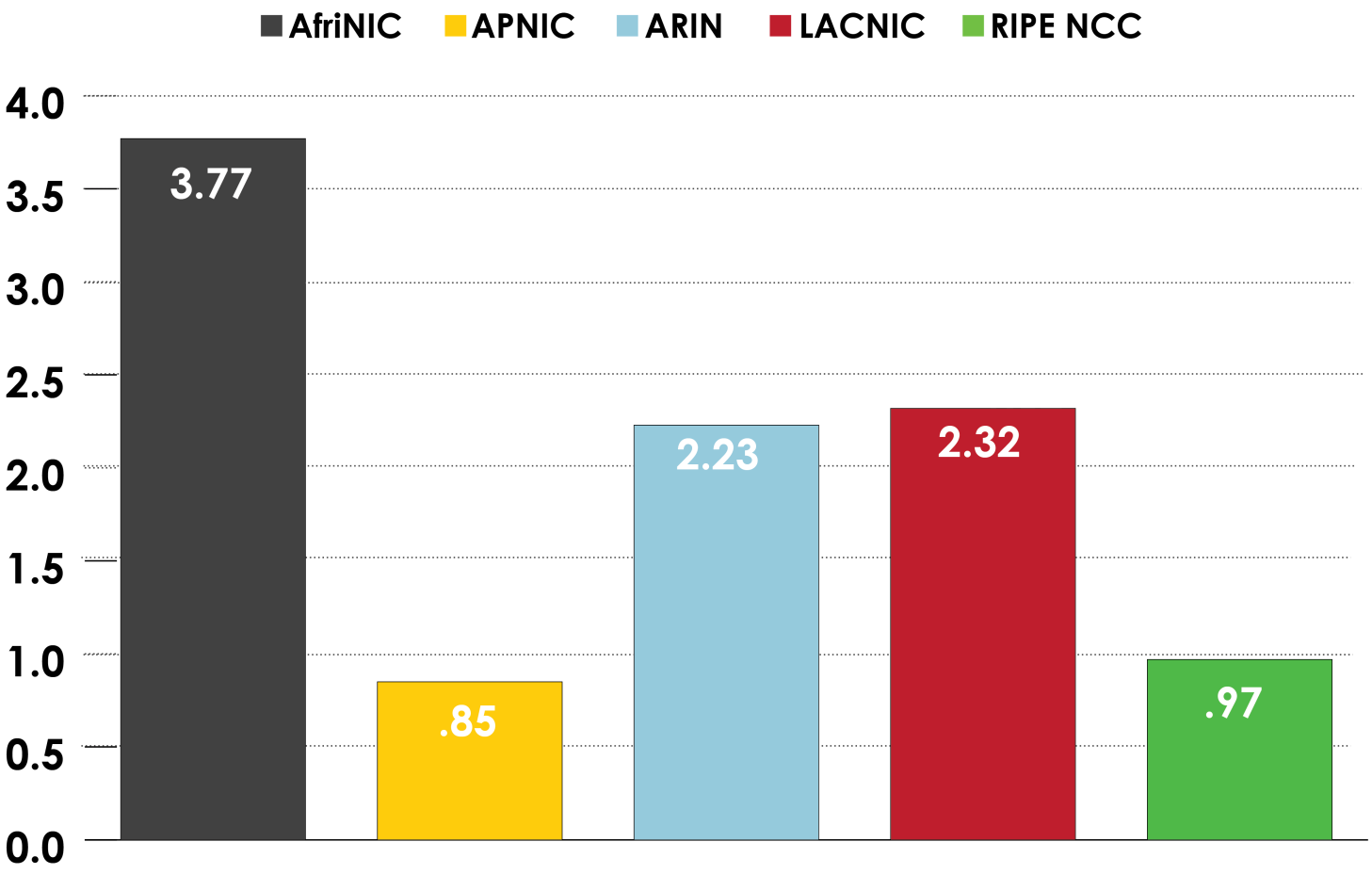


IPv4 address space issued (RIRs to customers)

In terms of /8s, how much total space has each RIR issued?
(Jan 1999 – Jun 2013)



Available IPv4 /8s in each RIR



In preparation for exhaustion…

- Soft landing
- Liquidity and supply
- Transition support

What measures did the APNIC policy community take to prepare for IPv4 exhaustion and the deployment of IPv6?

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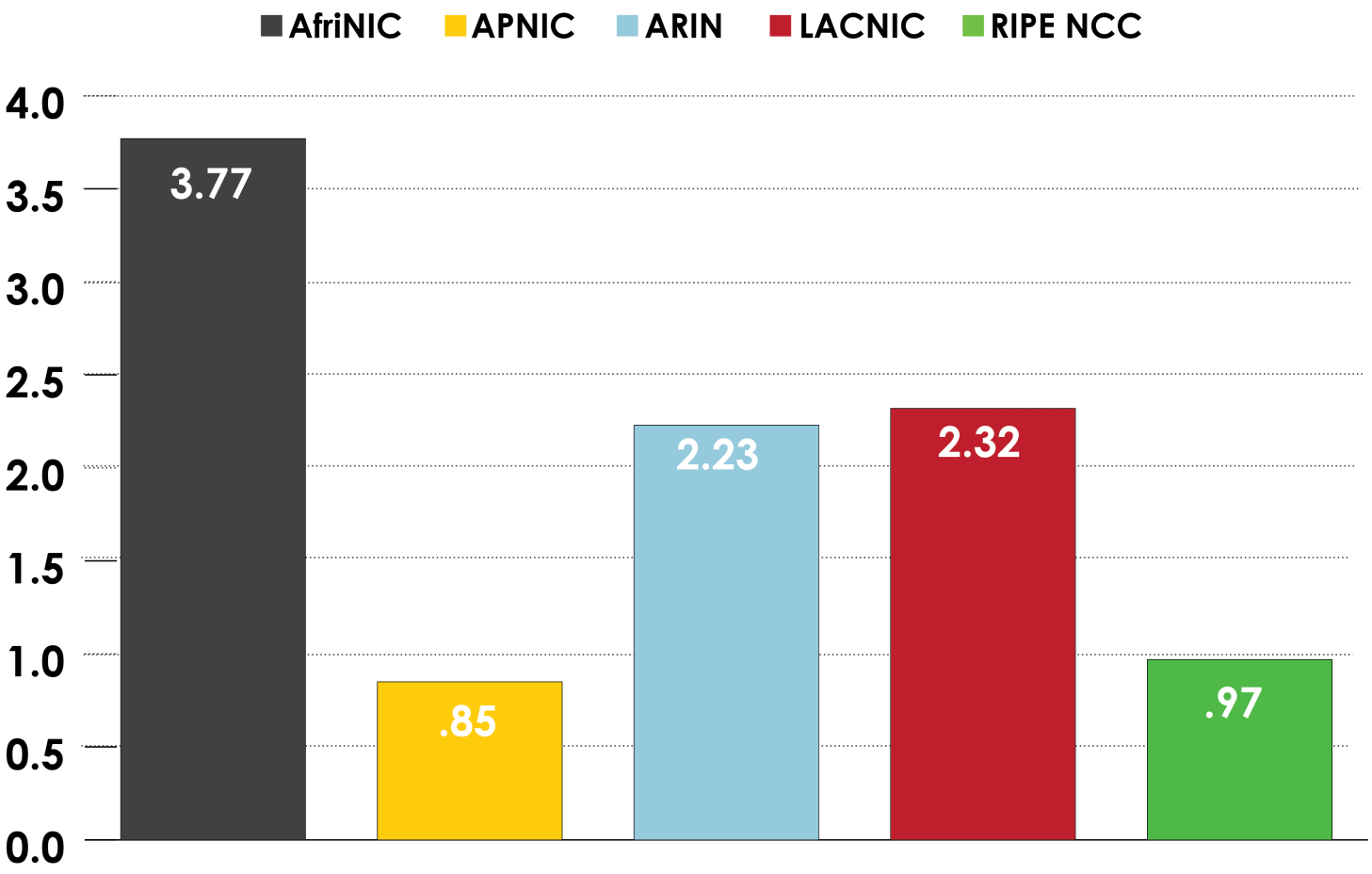
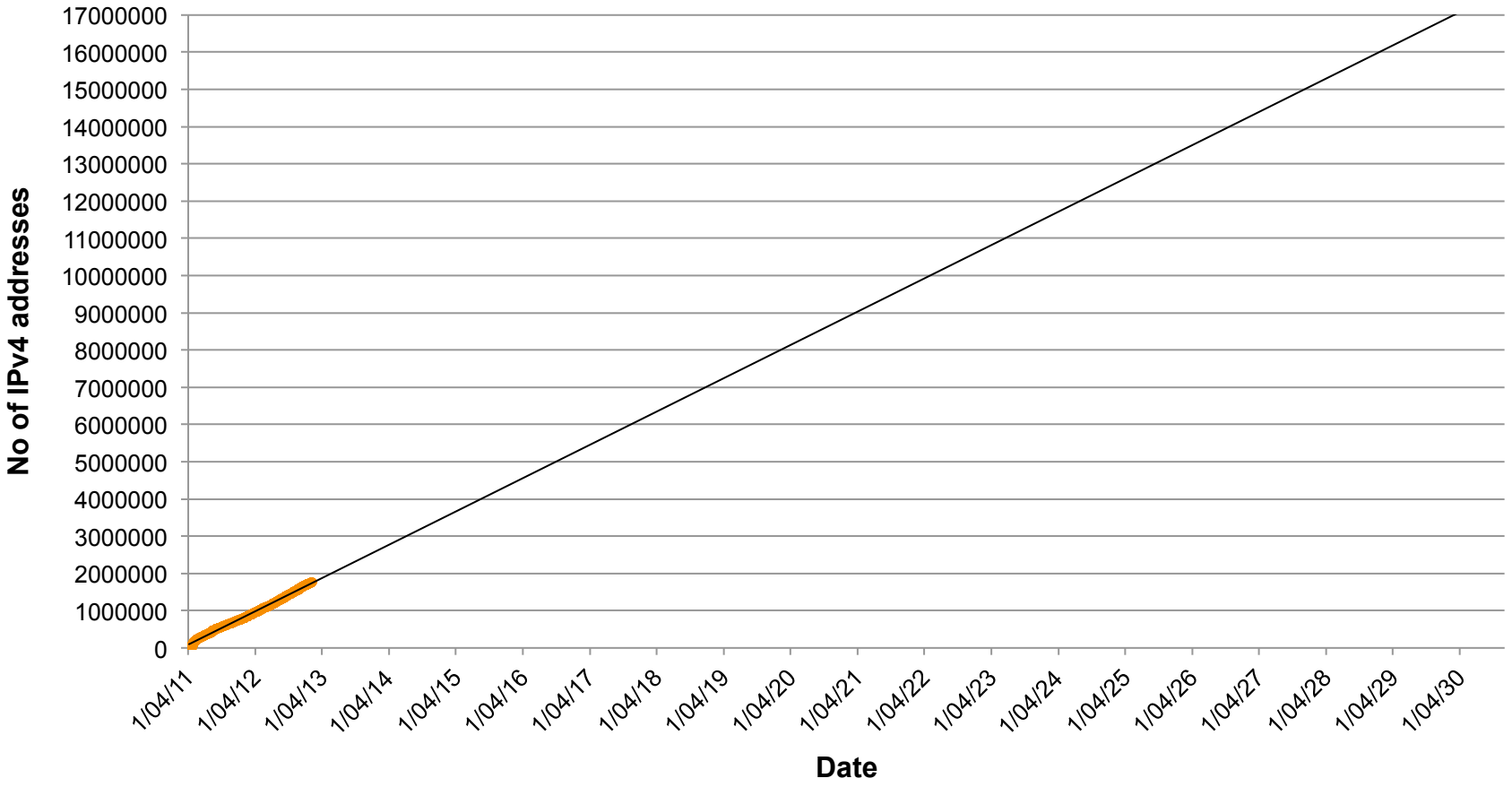
Soft landing austerity measures

- Restrictions on access to the free pool
- Enabled assignments from the final /8
- Reduced the minimum delegation size for the final /8 policy

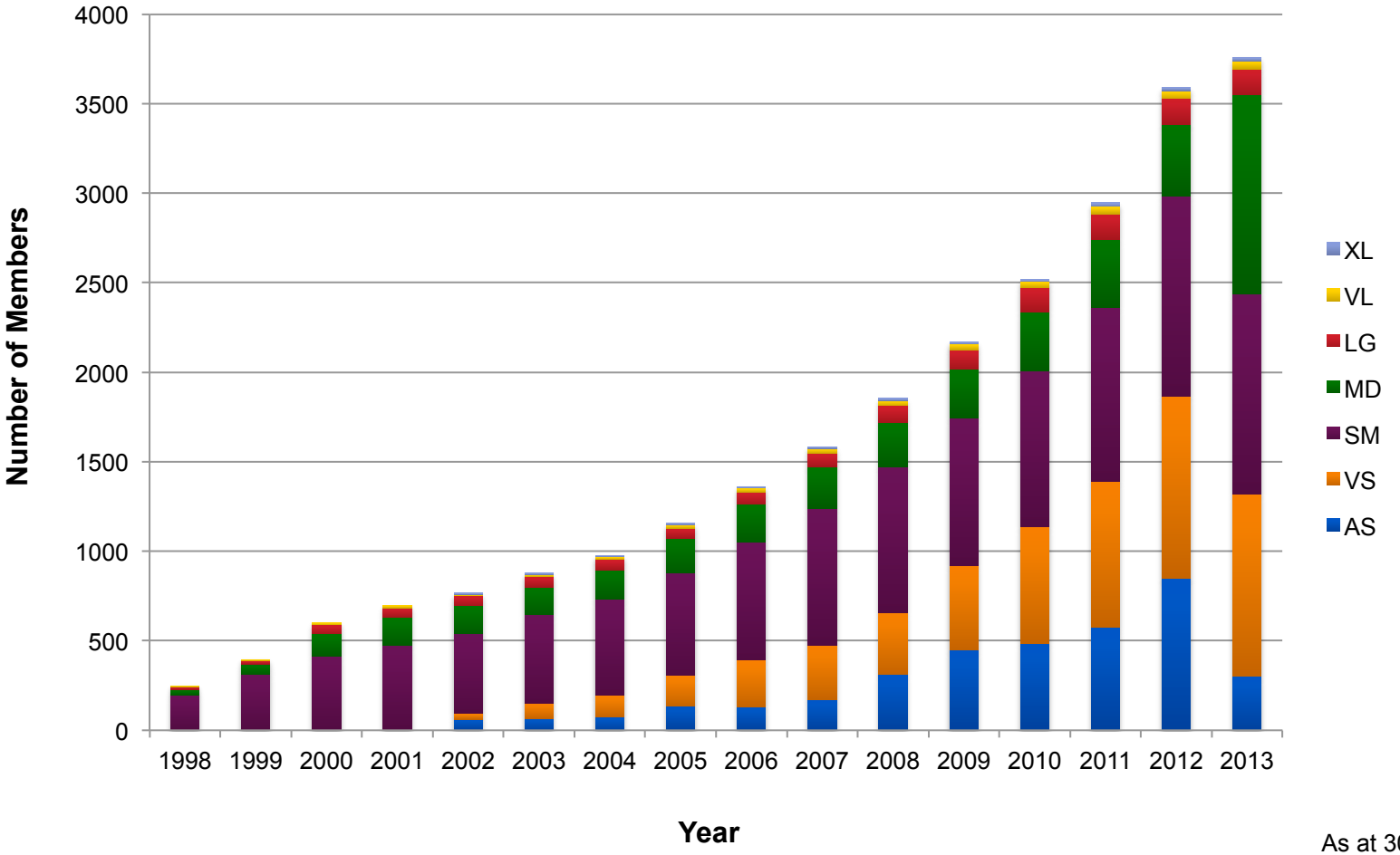
Available IPv4 /8s in each RIR



IPv4 last /8 delegation trend



Membership growth

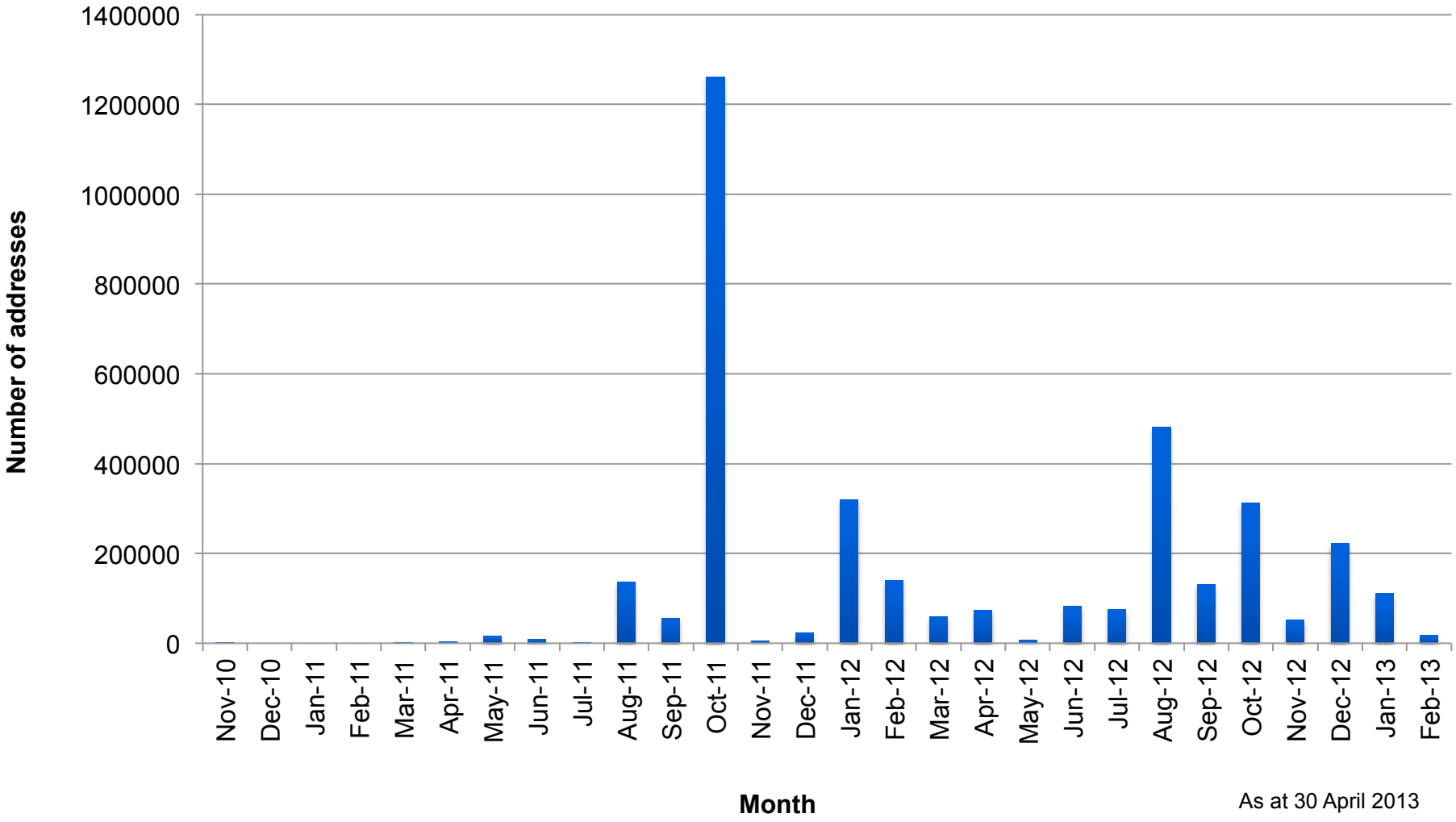


As at 30 April 2013

APNIC address transfer services

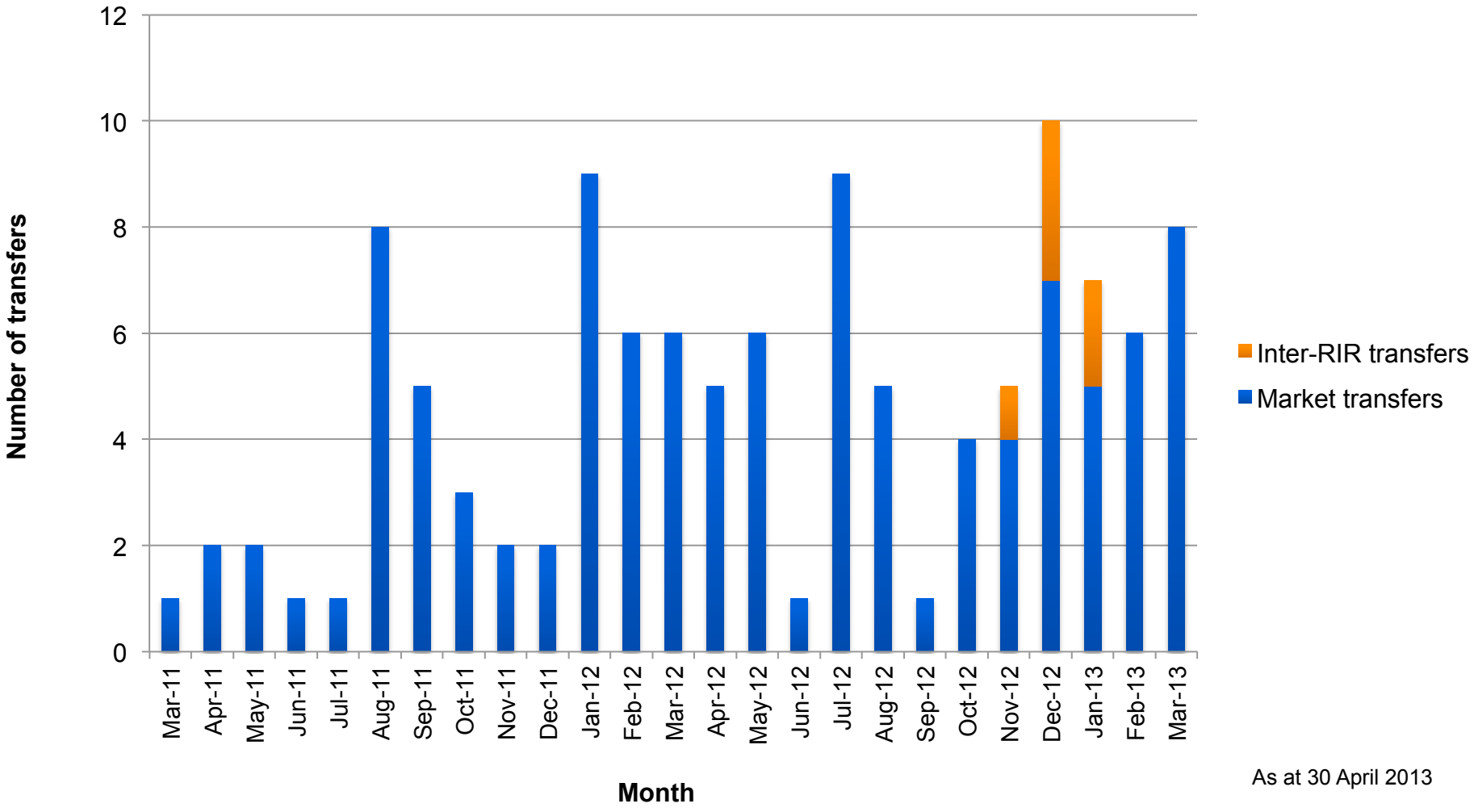
- Pre-approval service, with opt-in anonymous listing
- Broker listing service
- Mailing list for discussion and sourcing
- Public transfer log (transparency)
- Transfer fees apply (user pays)

IPv4 Market Transfer Size



As at 30 April 2013

IPv4 Market Transfers



As at 30 April 2013

Transition support

- Policy responses
  - IPv6 Kickstart
  - Remove aggregation criteria
  - Remove multihoming requirement
  - Alternative criteria for allocations
- Training
- Outreach

Policy changes encourage IPv6 delegations, while training and outreach build awareness and capacity

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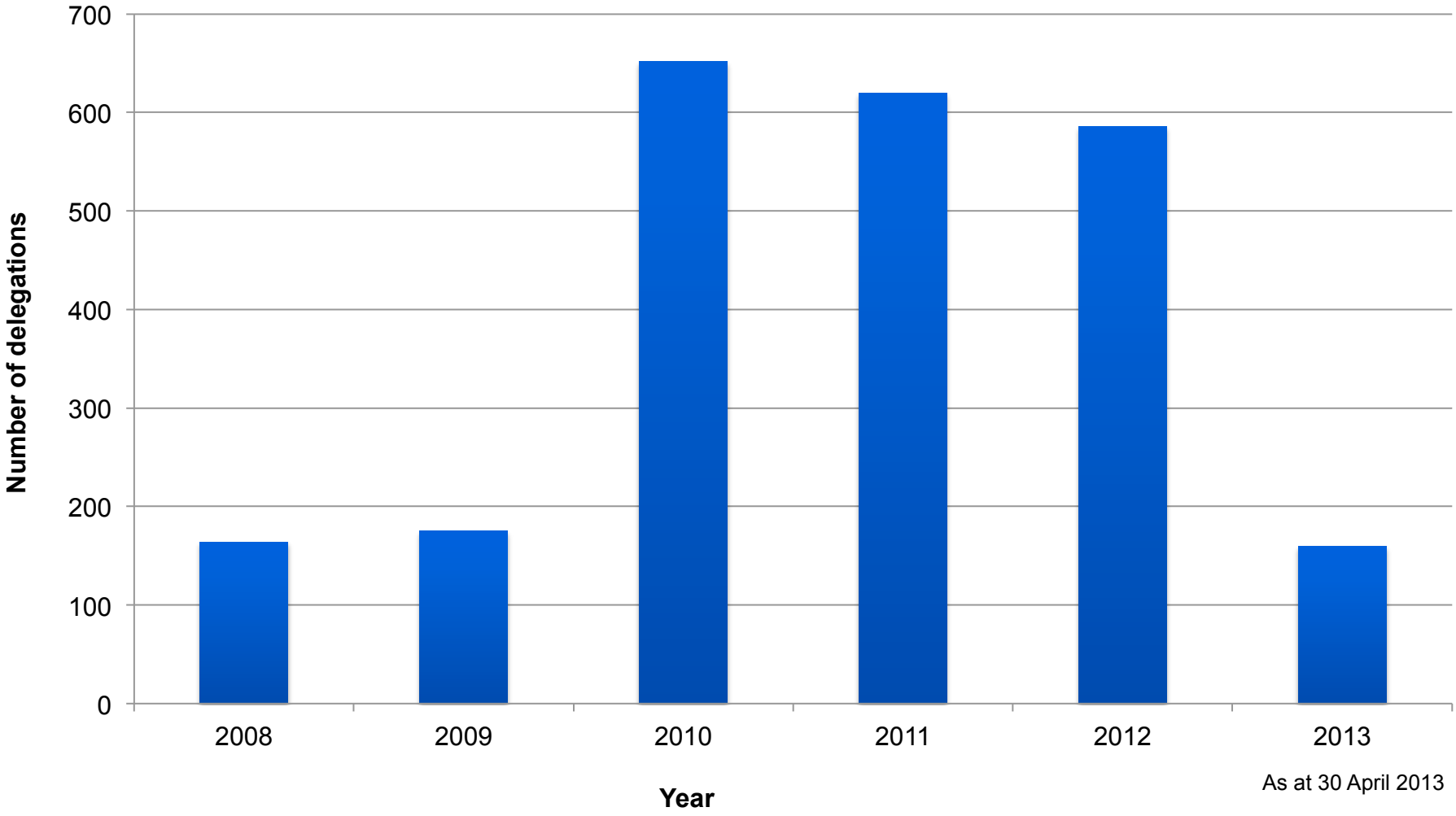
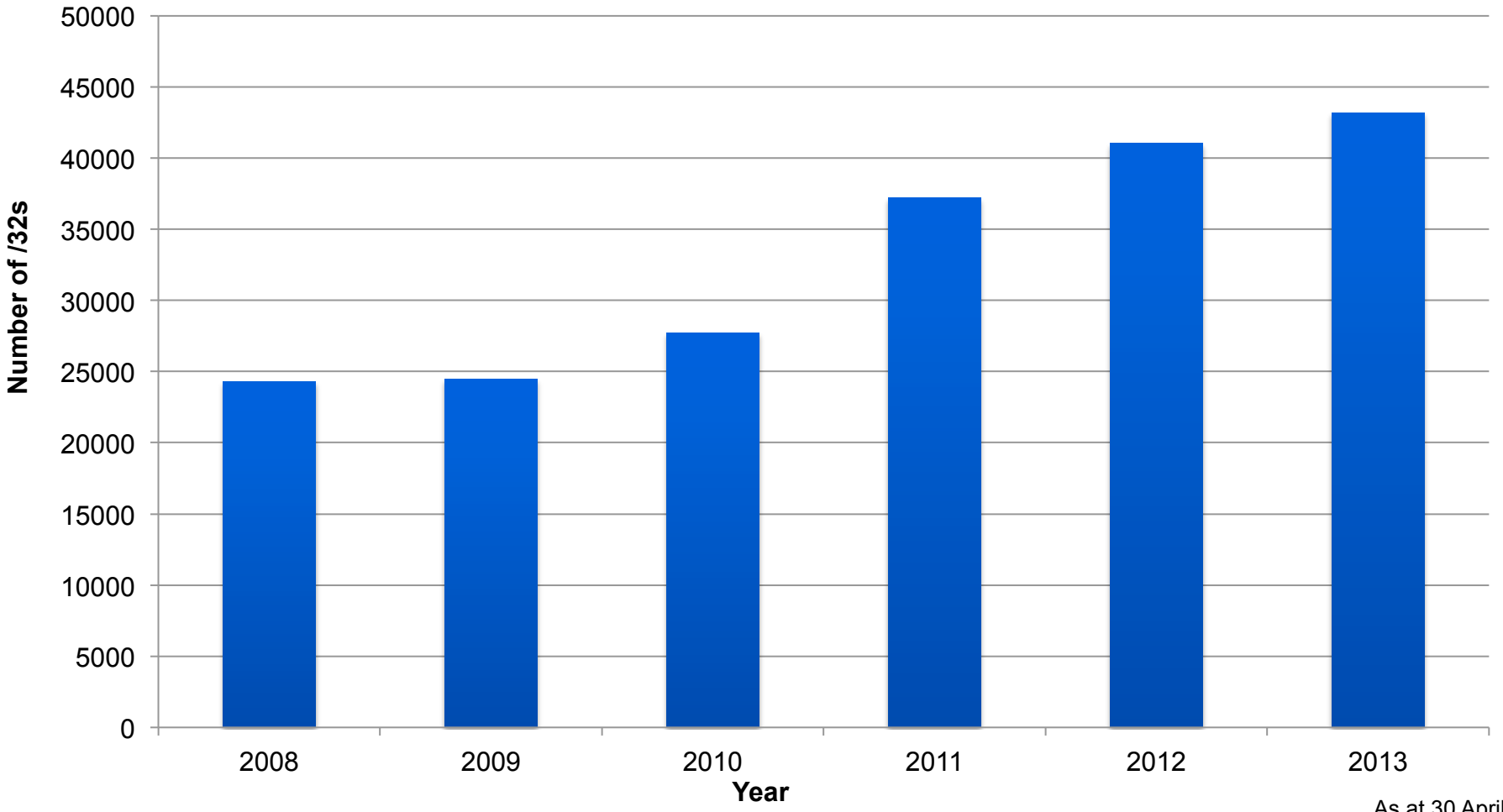
IPv6 delegations by year

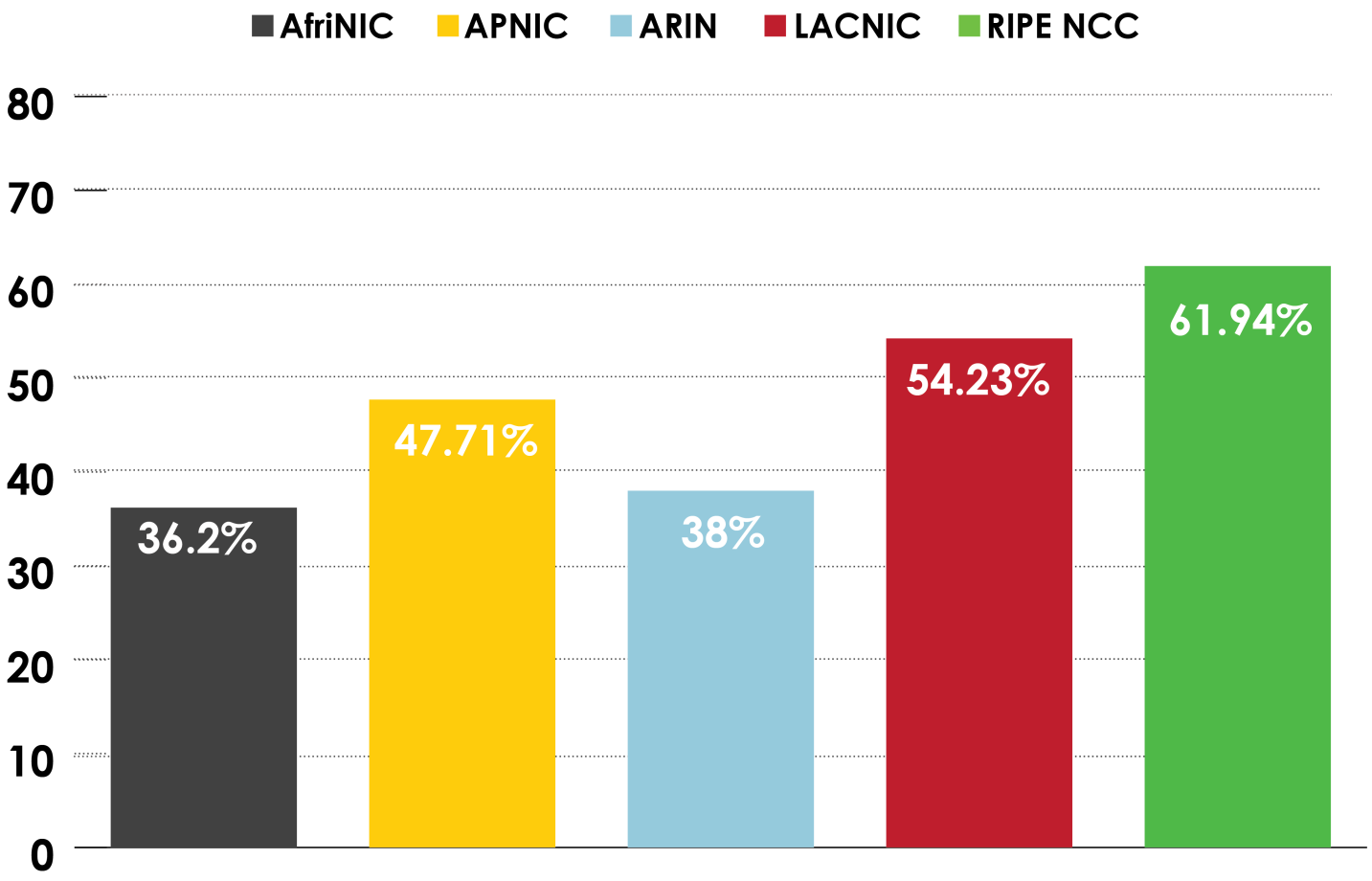


Cumulative IPv6 delegations (/32s)



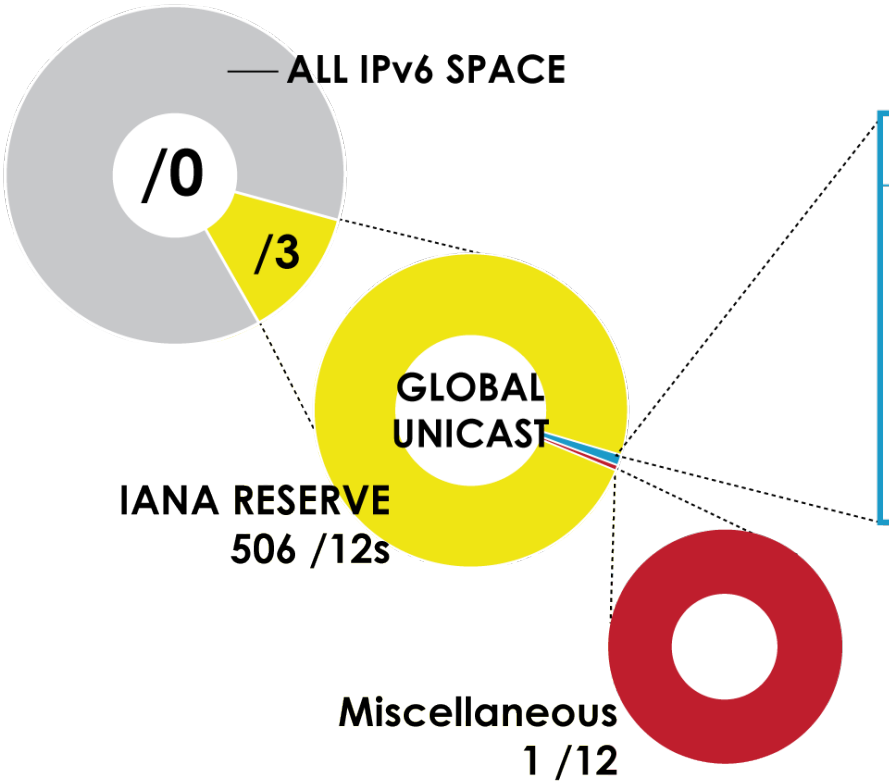
As at 30 April 2013

Percentage of Members with both IPv4 and IPv6 in each RIR



IPv6 address space

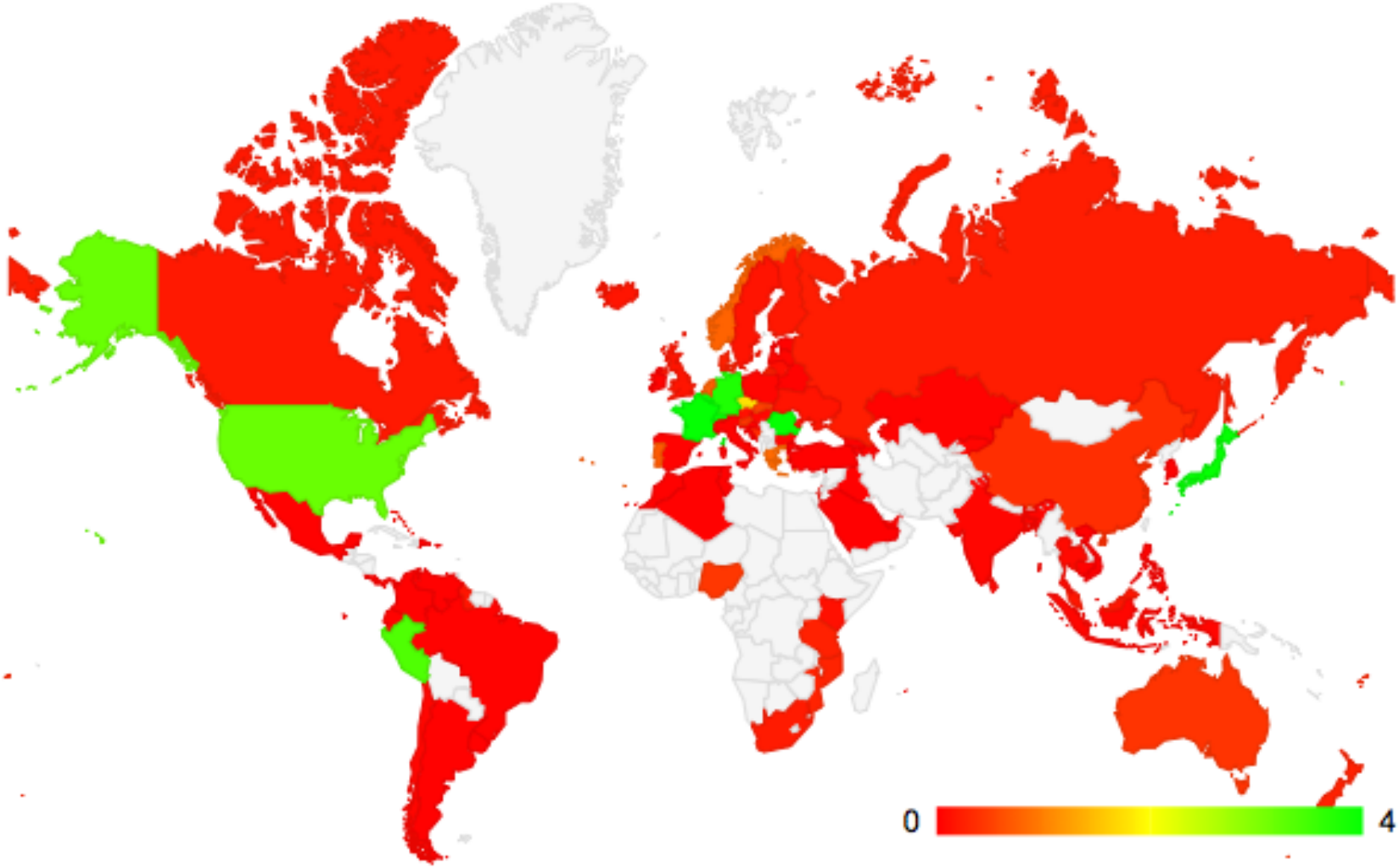
How much has been allocated to the RIRs?



RIRs 5 /12s (October 2006)

RIR	IPv6 ADDRESS
AfriNIC	2C00:0000::/12
APNIC	2400:0000::/12
ARIN	2600:0000::/12
LACNIC	2800:0000::/12
RIPE NCC	2A00:0000::/12

IPv6 end-user capability



APNIC Labs: IPv6 measurement

- Comprehensive reports on IPv6 uptake
  - Global, economy, and network levels
- IPv6 Capability Tracker
  - Free tool for website operators to measure client IPv6 capabilities
- Measuring IPv6
  - IPv6 readiness data for intergovernmental organizations and economies
- http://labs.apnic.net

Barriers to IPv6 transition

- Soft landing reduces immediate need
- More urgent operational issues
- Lack of:
  - Financial benefit compared to cost
  - Demand
  - First mover advantage
- To be effective it needs to be deployed everywhere
  - Regional and local transit providers
  - Access providers
  - Content providers

IPv6 needs to be deployed by

- Service providers
- Mobile network operators
- Content providers
- Data centers, hosting, and cloud providers
- Enterprise networks
- Hardware / software providers
- Government
- End users

APNIC IPv6 outreach and training

- APNIC Conference program
- APNIC supports NOG activities
- Work with NIRs to reach their community
- Inter-governmental outreach
- www.apnic.net/ipv6

APNIC training activities

- Continuing focus on IPv6 deployment
  - 30 courses per year
  - 500 participants per year
- eLearning
  - Every Wednesday in three time zones
  - 24 modules (1-hour duration per module)
- Face-to-Face
  - Extensive hand-on exercises
  - Physical and Virtual Training Labs
- training.apnic.net

The Role of Governments?

Potential public policy responses

- Implementation:
  - Government services should support IPv6
- Procurement:
  - Contract should require IPv6 compliance
- Standards:
  - Requirements should reference specific standards (RFCs)
- Certification:
  - Certification recognizing specific products as “IPv6 ready”

Potential public policy responses

- Incentives:
  - Consider tax relief
- Capacity building:
  - IPv6 training and related services
- Leadership:
  - Promote IPv6 activities
- Monitoring:
  - Monitor progress towards IPv6 goals

Meetings

APNIC Conferences

- APNIC 36: Xi-an, China
  - 20 to 30 August 2013
  - conference.apnic.net/36/home

- APNIC 37: Bangkok, Thailand
  - 18 to 28 February 2014
  - In conjunction with APRICOT 2014
  - www.apricot2014.net

APNIC

8th annual Internet Governance Forum
22-25 October 2013 - Bali, Indonesia

- APNIC strong supporter
  - Only global, multistakeholder venue for Internet Governance
  - NRO doubled its financial contribution in 2013
  - Paul Wilson on the IGF's Multistakeholder Advisory Group (MAG)
- Organizers
  - Government-led multistakeholder group
  - Strongly supported by industry (APJII)
- Theme
  - Building Bridges - Enhancing Multistakeholder Cooperation for Growth and Sustainable Development
  - Six sub-themes
- Local IGFs, Australia, India, NetHui
- APrIGF 4-6 September 2013 – Seoul RoK
  - www.aprigf.asia

Questions?

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