

IPv4 Depletion and IPv6 Deployment

Cisco World IPv6 Launch
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RIPE and RIPE NCC



RIPE / RIPE NCC

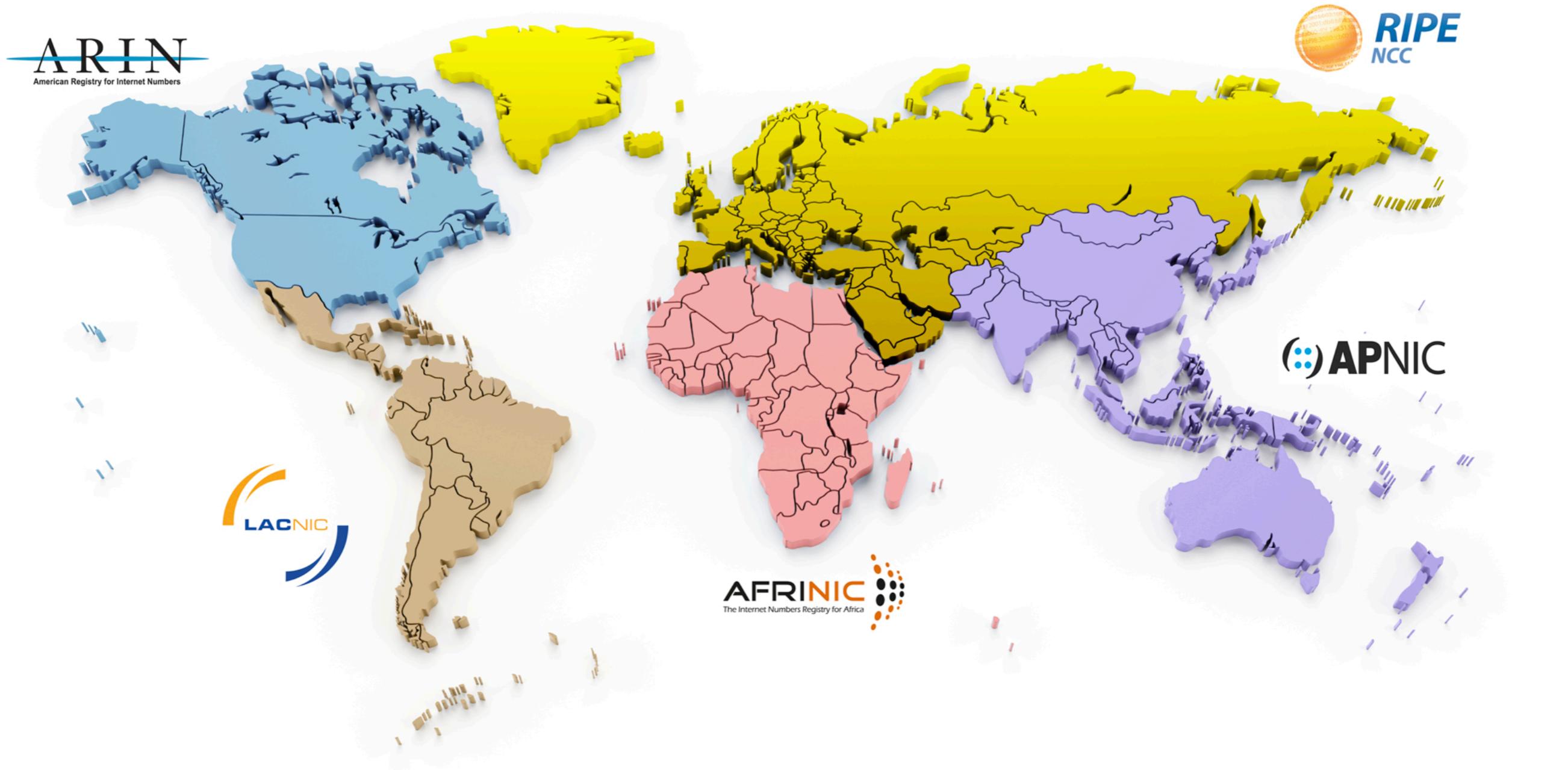
RIPE

- Open community
- Develops addressing policies
- Working group mailing lists

RIPE NCC

- Located in Amsterdam
- Not for profit membership organisation
- One of five RIRs

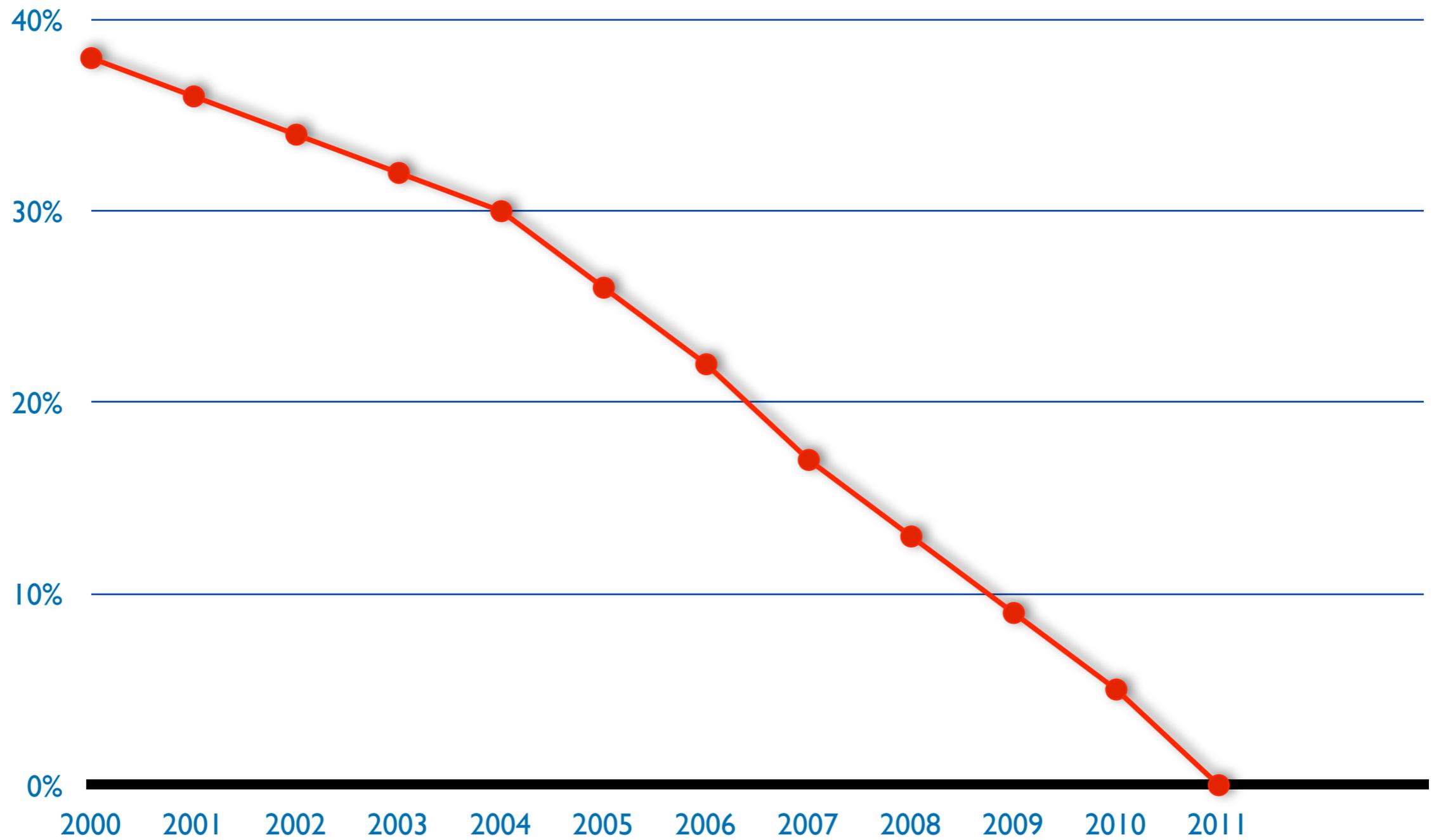
The five RIRs



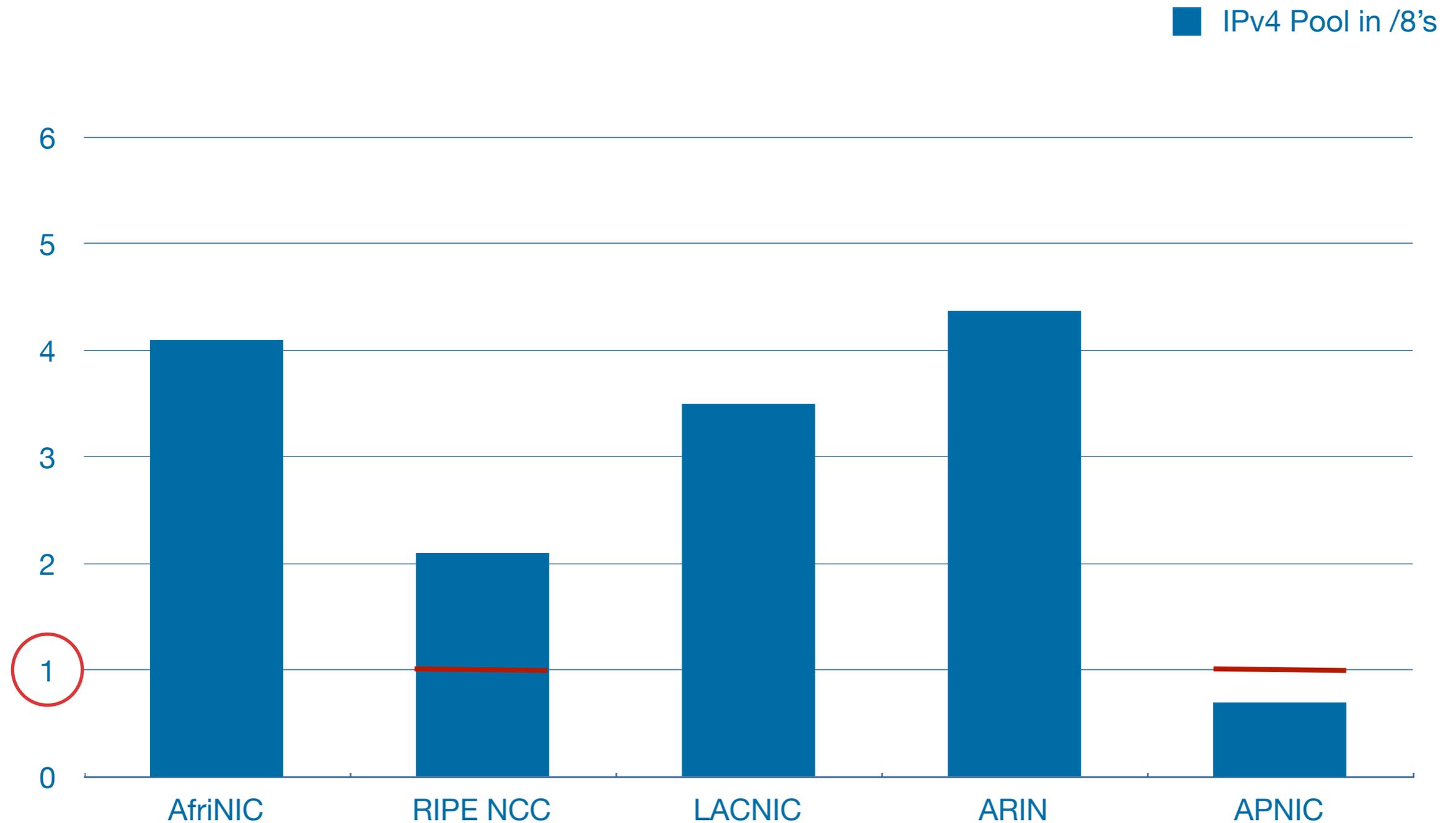
IPv4?



IANA IPv4 Pool

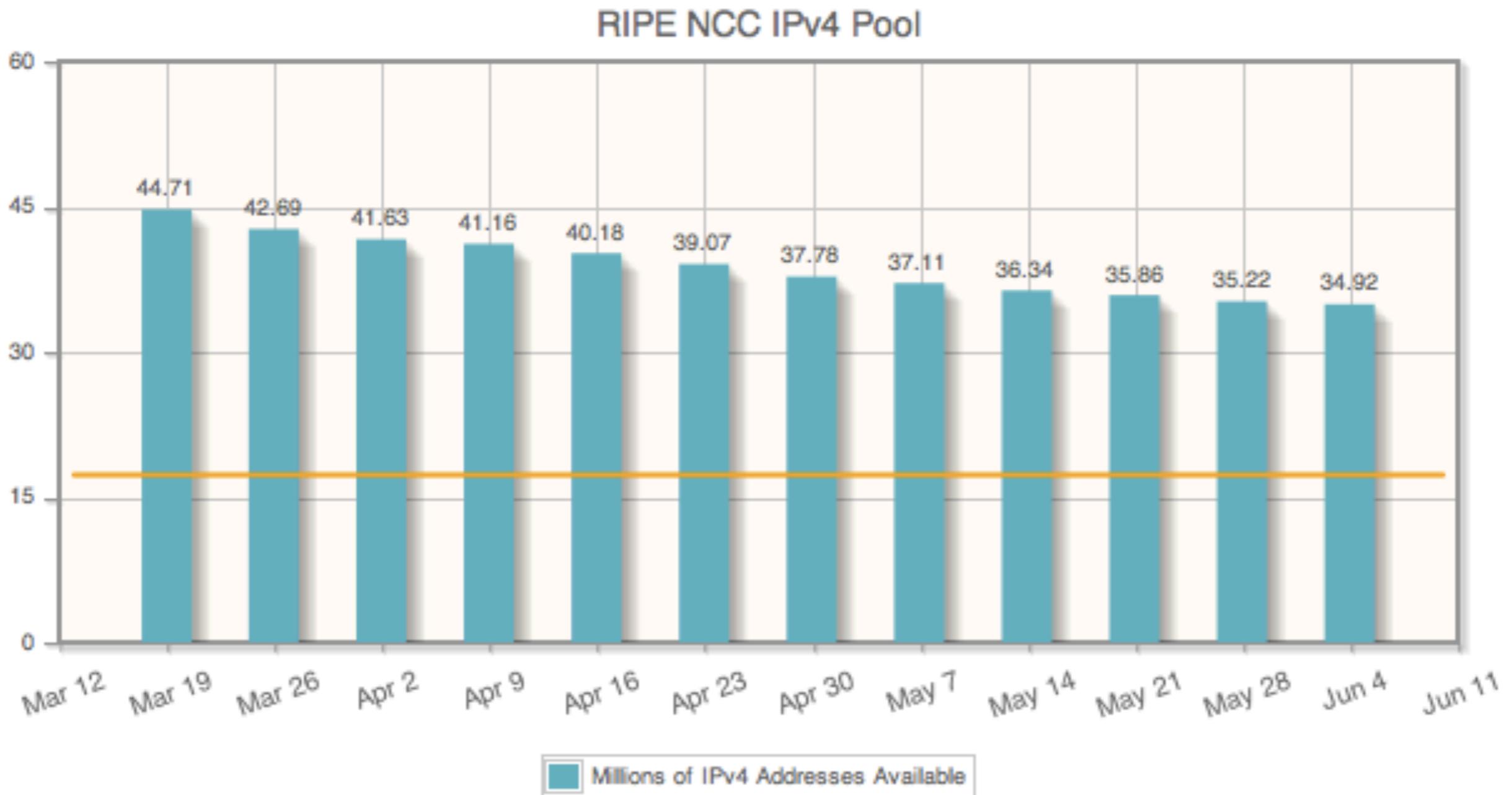


IPv4 Depletion Worldwide



RIPE NCC IPv4 Pool

04 Jun 2012



Allocations From the Final /8

- When the RIPE NCC reaches the final /8:
 - Every member can get a **/22** (1024 addresses)
 - Only if they already have IPv6 addresses
 - Only when there is justified need
- Current policy does not allow for PI assignments
 - Policy proposal 2012-04 under discussion
 - Intends to allow for PI assignments

Transfer of IPv4 Allocations

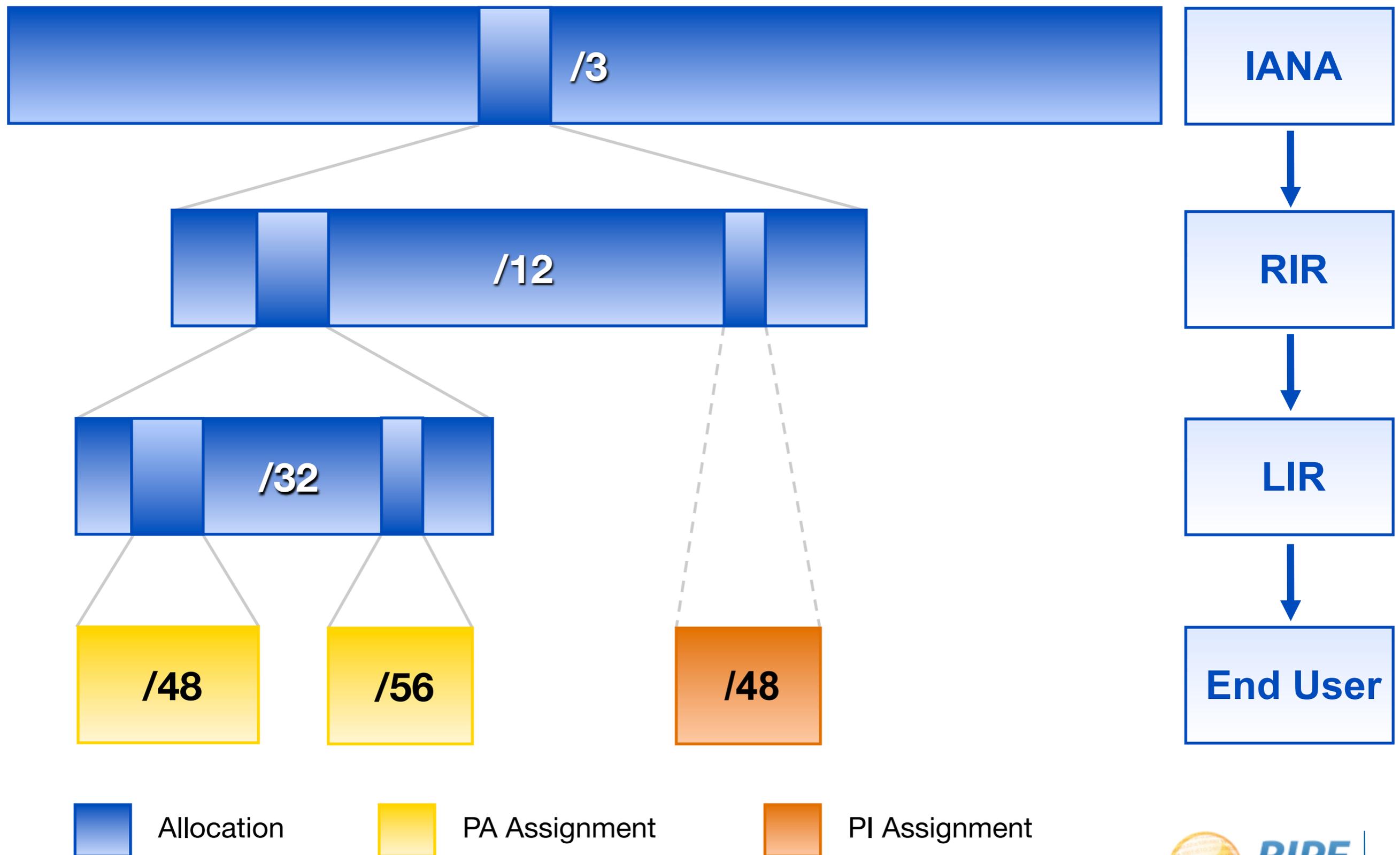
- Policy 2007-08: Allocation Transfer Policy
 - Don't buy your IPv4 on eBay!
 - Transfer unused allocations to another member
 - Minimum allocation size /21
 - Evaluated by RIPE NCC
 - Update in RIPE Database

<http://www.ripe.net/lir-services/resource-management/listing>

IPv6!



IPv6 Address Distribution



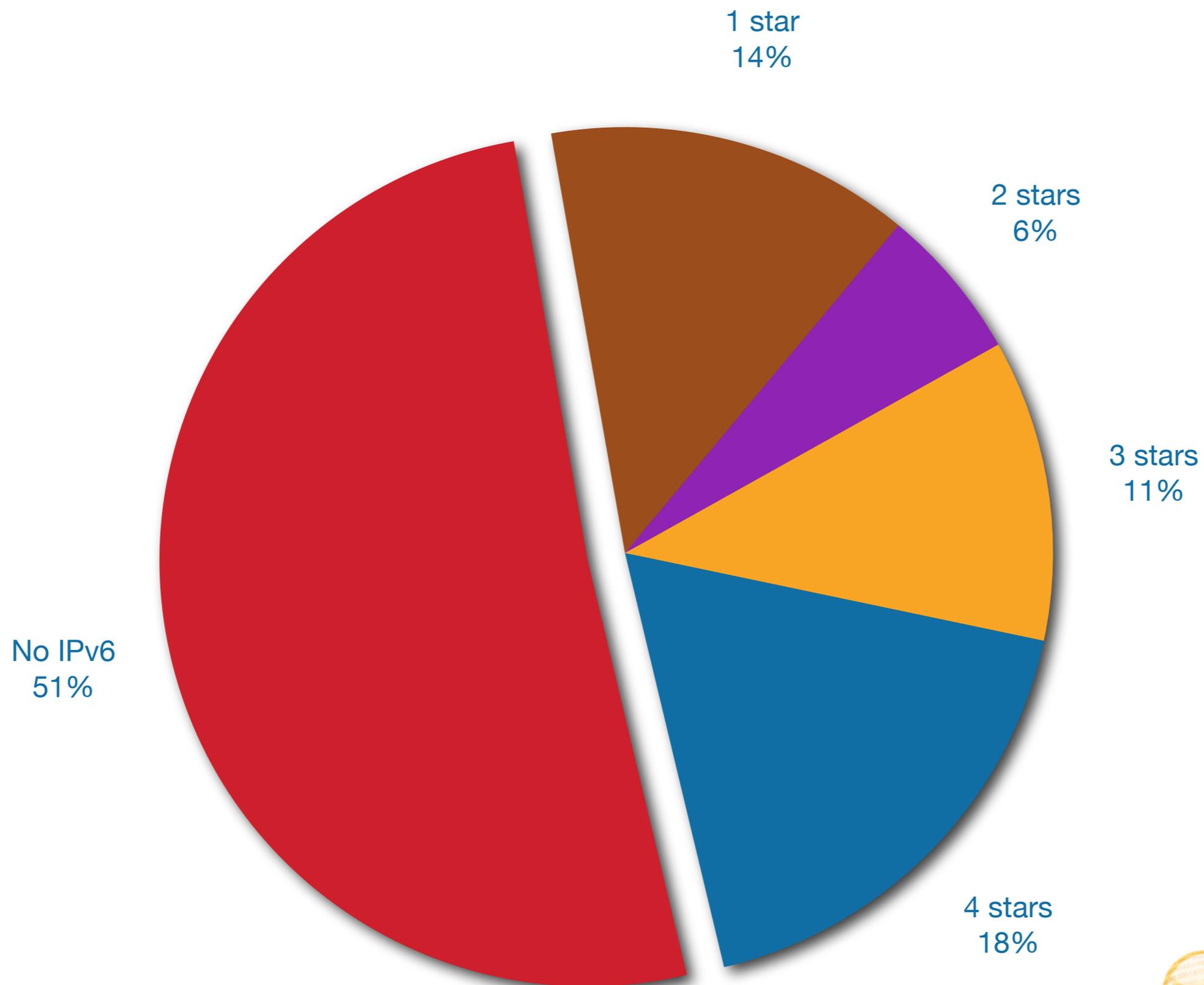
IPv6 Ripeness

- Rating system:
 - One star if the LIR has an IPv6 allocation

 - Additional stars if:
 - IPv6 Prefix is announced on router
 - A route6 object is in the RIPE Database
 - Reverse DNS is set up

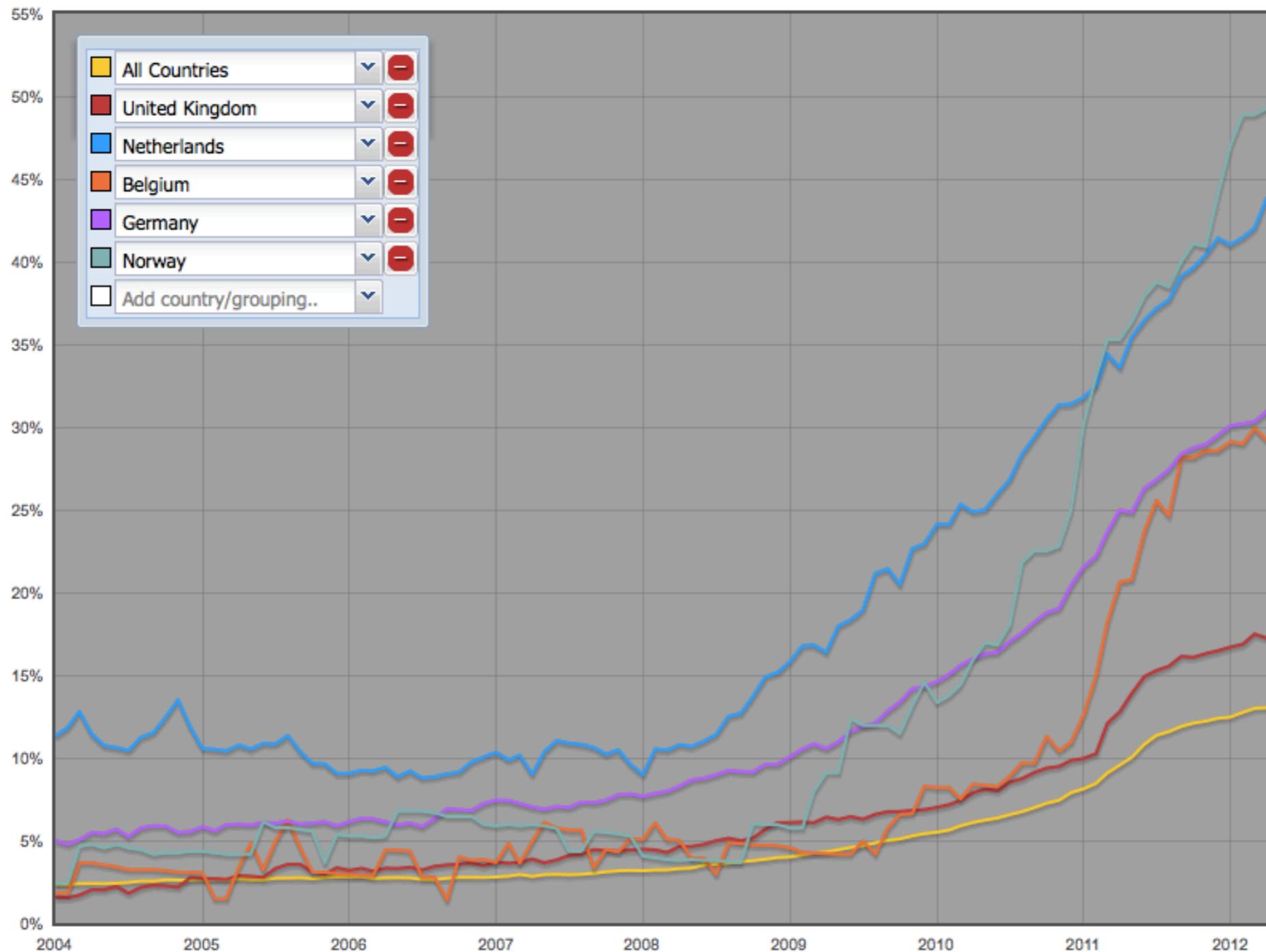
 - A list of all 4 star LIRs: <http://ripeness.ripe.net/>

IPv6 RIPEness: 8201 LIRs



IPv6 Enabled ASes in Global Routing

- Any country or region possible, updated daily



<http://v6asns.ripe.net>

Getting an IPv6 allocation

- To qualify, an organisation must:
 - Be a member of the RIPE NCC
 - Have a plan for making assignments
- Minimum allocation size /32
- Allocation size is based on customer numbers and growth, not on transition technique!

Customer Assignments

- Every “end site” can be assigned up to a /48 without prior approval of the RIPE NCC
 - That is 65536 subnets per site
 - If they need more, ask for approval first
 - Or make a sub-assignment
- Assignments for your own infrastructure
 - /48 per Point of Presence
 - One additional /48 for the core network

Provider Independent Assignments

- PI assignments in IPv6
 - Must have a contract with a member of RIPE NCC
 - Minimum assignment size is a /48
 - More if there is justified need
- No sub-assignments are allowed
 - Not even a single address for the connection
 - If you have customers, you can not use PI for them

Creating an Addressing Plan



Why Create an IPv6 Addressing Plan?



- Mental health during implementation(!)
- Easier implementation of security policies
- Efficient addressing plans are scalable
- More efficient route aggregation

IPv6 Address Management

- Your Excel sheet might not scale
 - There are 65.536 /48s in a /32
 - There are 65.536 /64s in a /48
 - There are **16.777.216** /56s in a /32

- Find a suitable IPAM solution

Administrative Ease

- If possible assign on 4 bit boundaries
 - Matches a hexadecimal digit
 - Easier to read and remember
 - Aligns with reverse DNS zones

- Possibly follow the structure of the network or organisation
 - Can aid in access control and troubleshooting

Making Customer Assignments

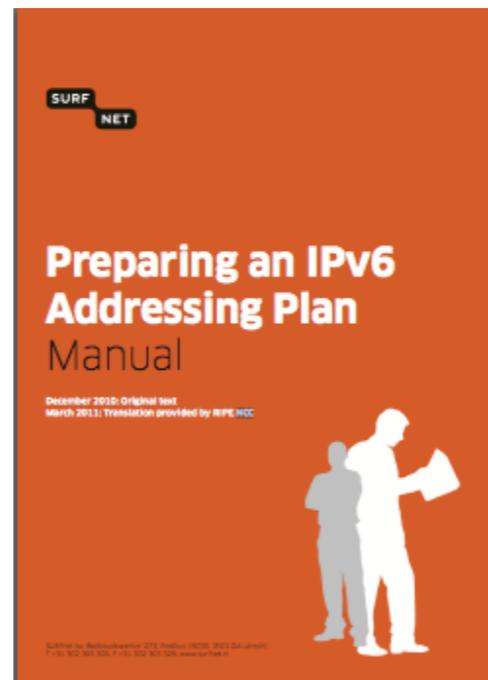
- Don't be too conservative
- Assign a generous amount of subnets
- /56 is a popular size for residential
 - Allows for 256 subnets
 - Future proof
- Business customers often get a /48
- You don't want to renumber later on

“Smart” Addresses Example

- Assume you got 2001:db8:1234::/48
- In your subnet 2001:0db8:1234:**XYZZ**::/64
 - **X** can represent a location, i.e. “north building”
 - **Y** can represent a function, i.e. “workstations”
 - **ZZ** can represent the specific subnet (number)
- 2001:0db8:1234:**1316**::/64 could mean:
 - **South building**, **printers**, area 16 (accounting)

Need Help Making a Plan?

- Surfnet, the Dutch NREN, prepared a document
 - How to divide your /48 on a site?
- Available in English on our website



https://www.ripe.net/lir-services/training/material/IPv6-for-LIRs-Training-Course/IPv6_addr_plan4.pdf

Deploying IPv6

- IPv4 and IPv6 are not compatible by design
 - Allows to deploy IPv6 without breaking things
- To communicate freely a computer needs both an IPv4 and IPv6 address
 - This is known as “Dual Stack”
- It is all about adding IPv6 to your network
 - IPv4 will remain as well for now

Make Sure You Have a Plan

- In the near future you need IPv6
- Take a phased approach:
 - Make an inventory of what you need
 - When purchasing add demand for IPv6 support
 - Identify which elements need replacing
 - Plan every step and test it before deploying
- No longer depend on IPv4 alone

RIPE-554 Document

- “Requirements for IPv6 in ICT Equipment”
- Best Current Practice describing what to ask for when requesting IPv6 Support
- Useful for tenders and RFPs

- Originated by the Slovenian Government
 - Adopted by various others (Germany, Sweden)
- Updated yesterday!

IPv6 Act Now!

(but take it slowly)



Questions?

