IPv6 - where are we?

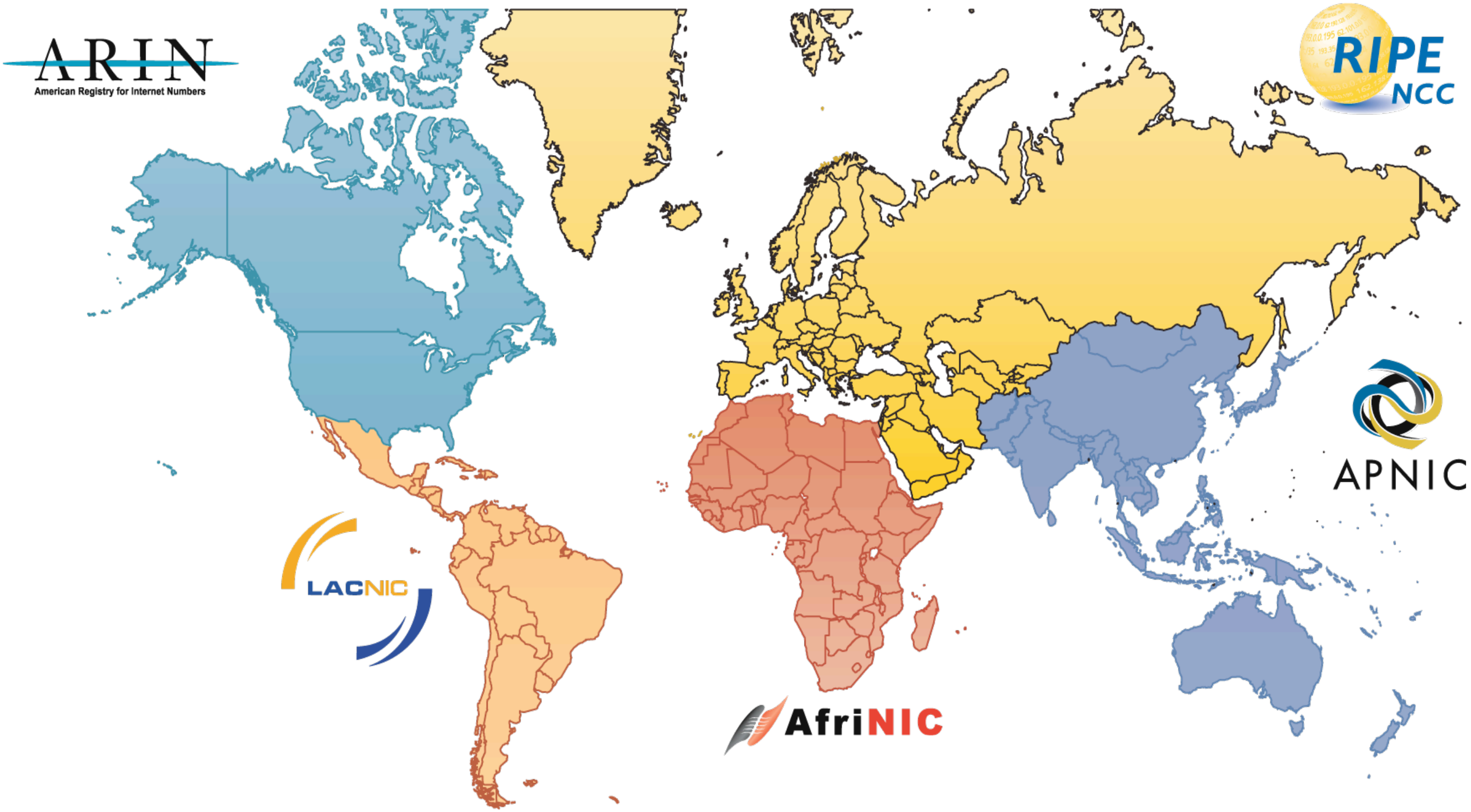
Internetdagarna - Stockholm, SE

November 2010

Emile Aben

Internet Resource Management

The 5 RIRs


ARIN
American Registry for Internet Numbers
RIPE NCC
APNIC
LACNIC
AfriNIC

RIPE / RIPE NCC

RIPE

- Network operator community
- Develops addressing policies
- Working groups + mailing lists
- Upcoming meetings:
  - Rome 15-19 Nov 2010
  - Amsterdam May 2011

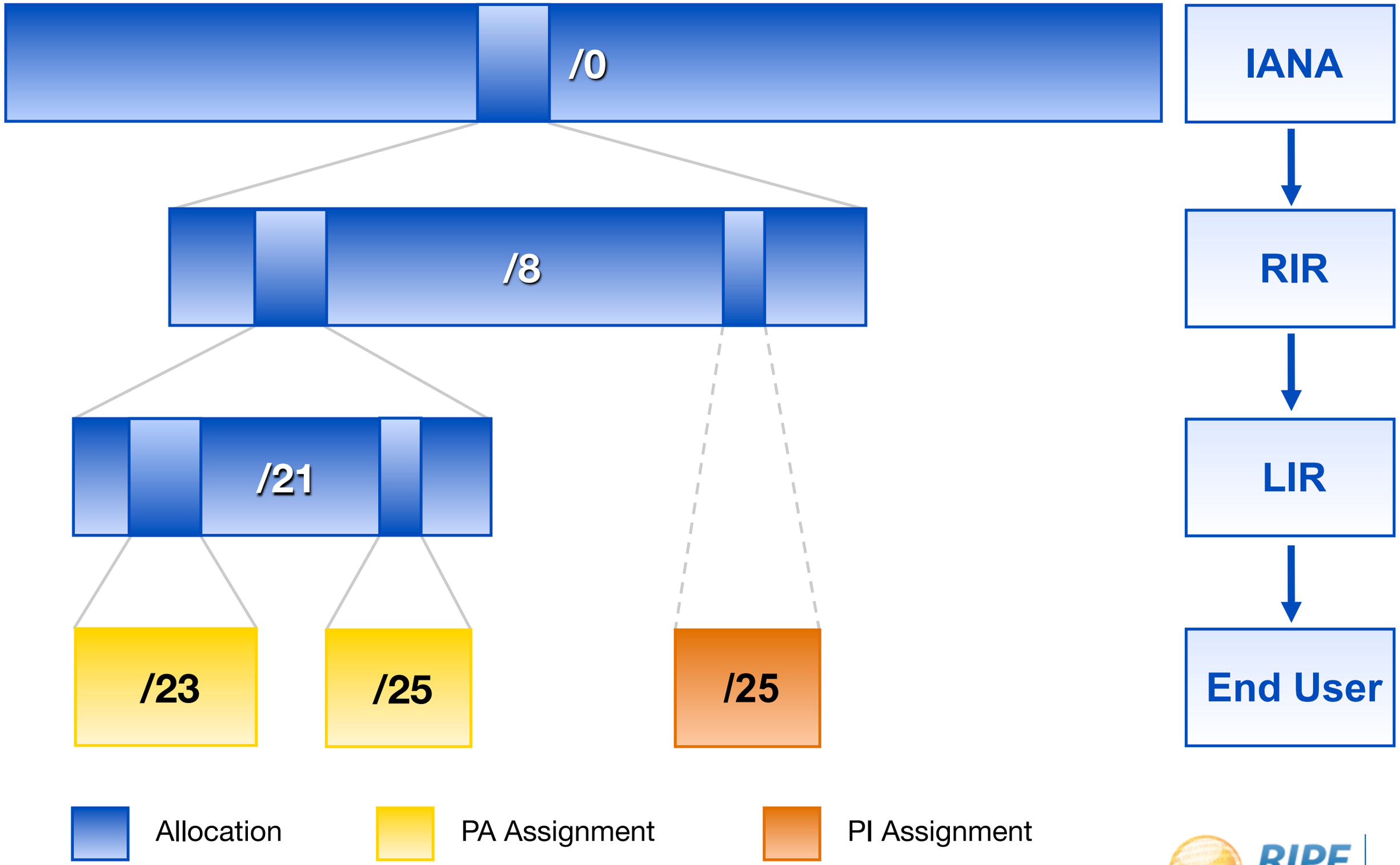
RIPE NCC

- In Amsterdam, since 1992
- Not for profit membership organisation
- One of five RIRs - distributes IP & ASN

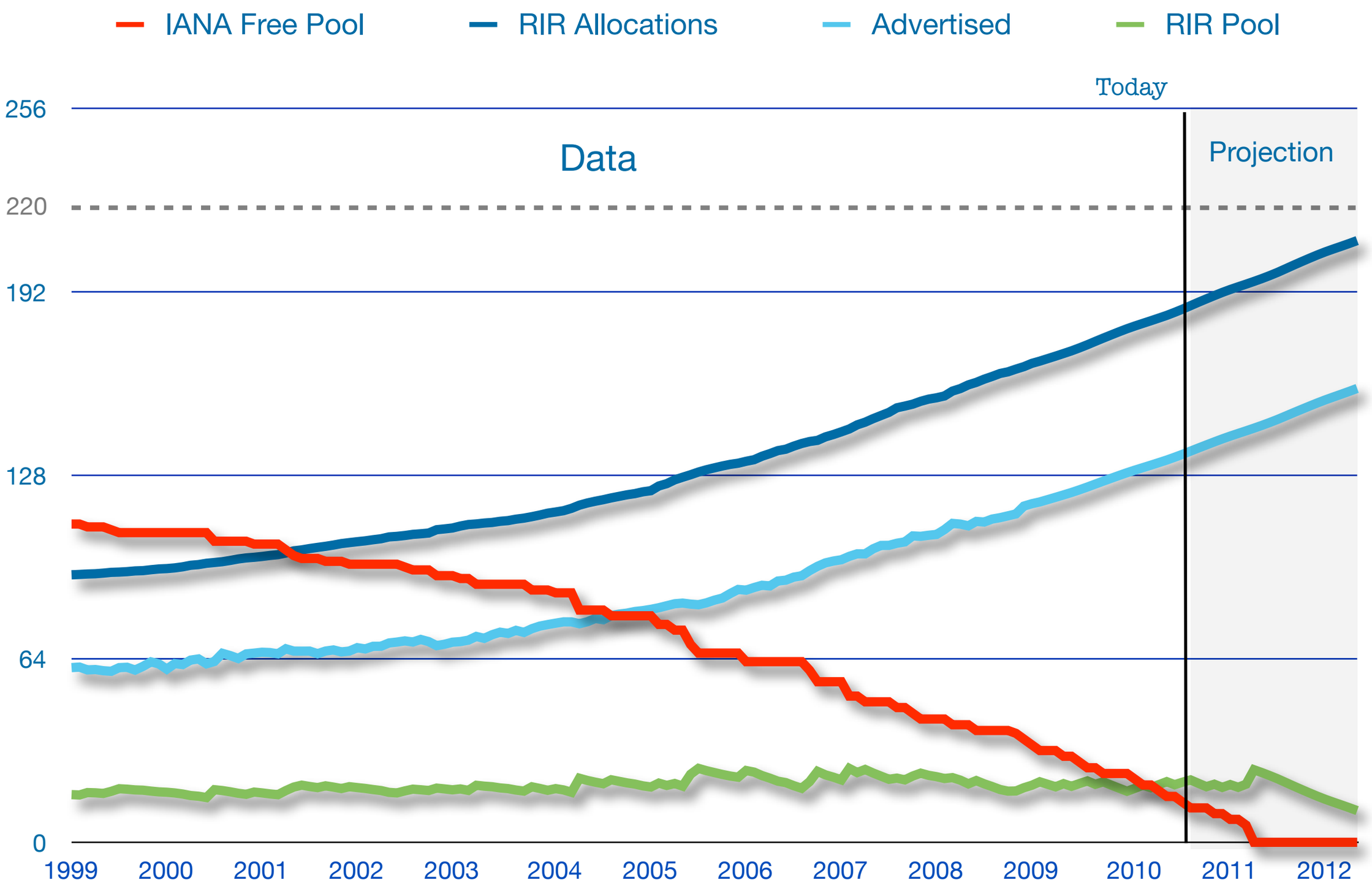
IPv4

The old ways

IPv4 Address Distribution



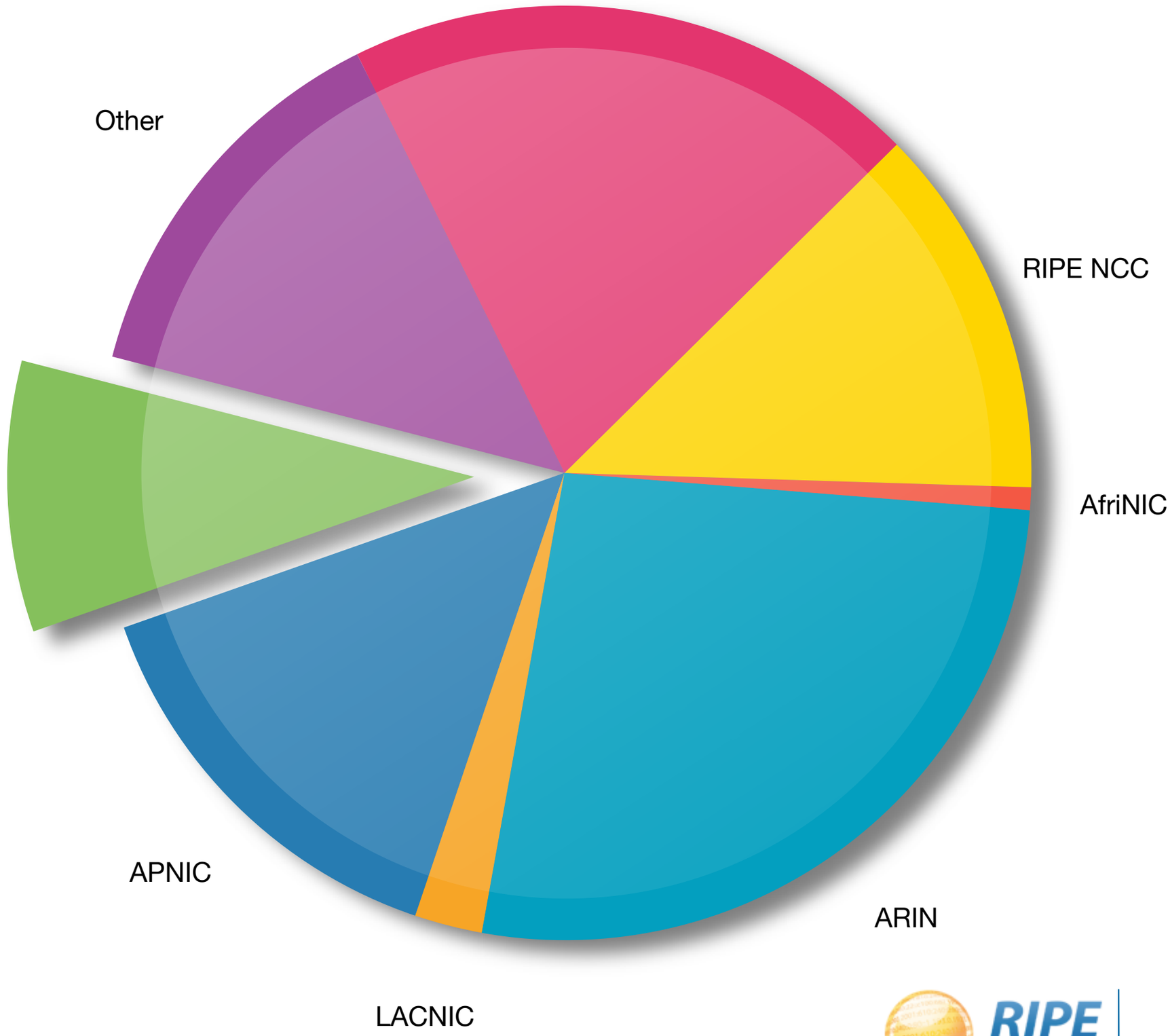
IPv4 Allocation Timeline



RIPE NCC

IPv4 Address Pool

5%
available



What We Know

- RIRs allocated 14 /8s in 2010 already
- There are 12 /8s remaining at the IANA
  - Last 5 /8s are special
- Projected exhaustion of unallocated IPv4 pool:
  - Early 2011 (**in a couple of months!**)
- IPv6 adoption is the only way to ensure continued Internet growth

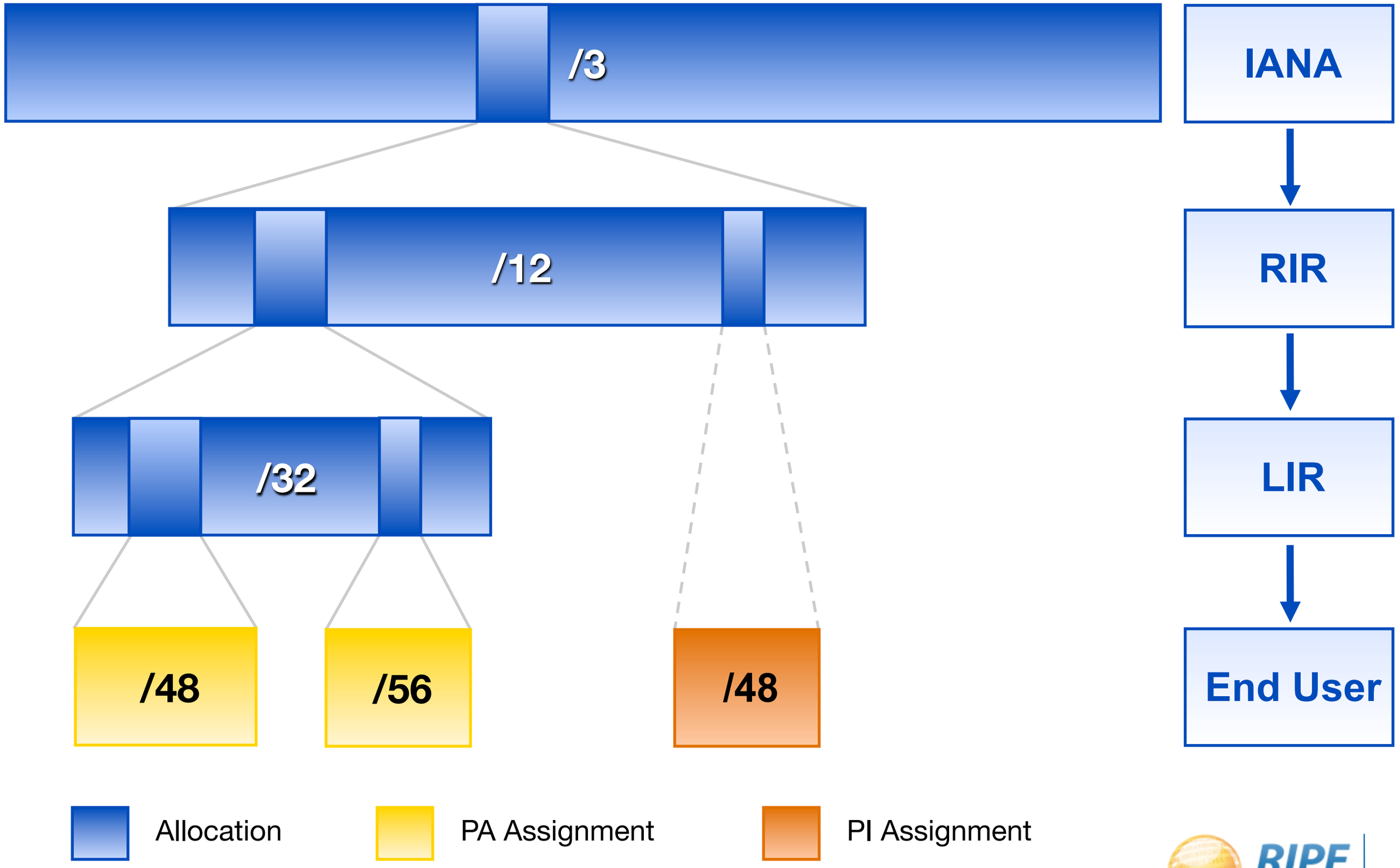
Wait and See?

IPv6

"96 more bits, no magic"

Gaurab Upadhaya

IPv6 Address Distribution



IPv6 Address Basics

- IPv6 address: 128 bits
  - example: `2620:0:1cfe:face:b00c::3`
- A subnet (LAN) is a /64
- Assignments from ISPs to customers between:
  - /64 (1 subnet)
  - /48 (65,536 subnets)

Getting an IPv6 allocation (RIR to LIR)

- To qualify you must:
  - Be an LIR
  - Have a plan for making assignments within two years

Where are we?

3 indicators of IPv6 deployment

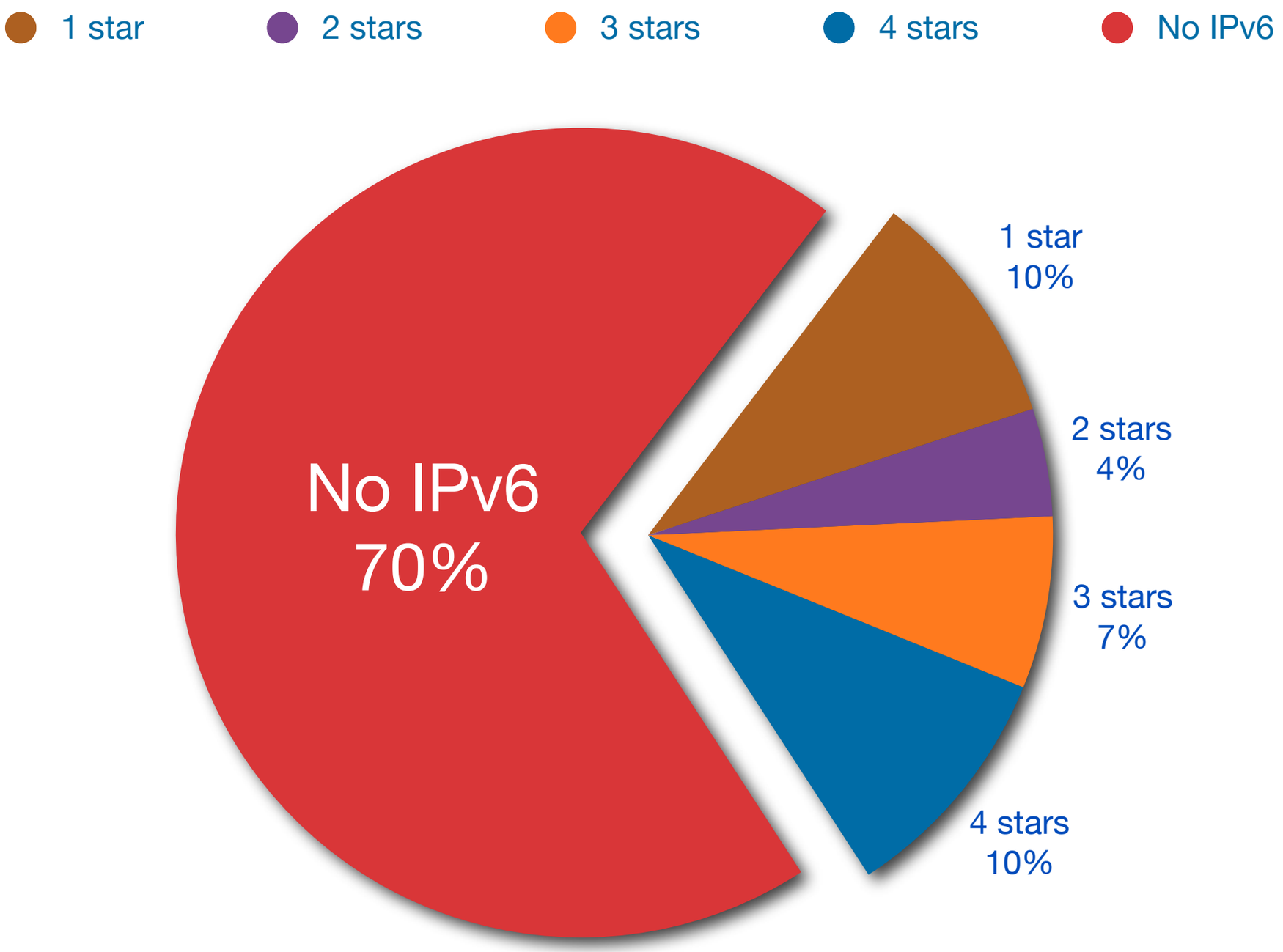
IPv4-only to dual-stack - small steps

1. Get IPv6 address space
   - from RIR (LIR), or ask your upstream ISP
2. Start routing it
3. Enable on servers
   - DNS is a good first candidate
   - Web server
   - Mail server
4. Provide to end-users

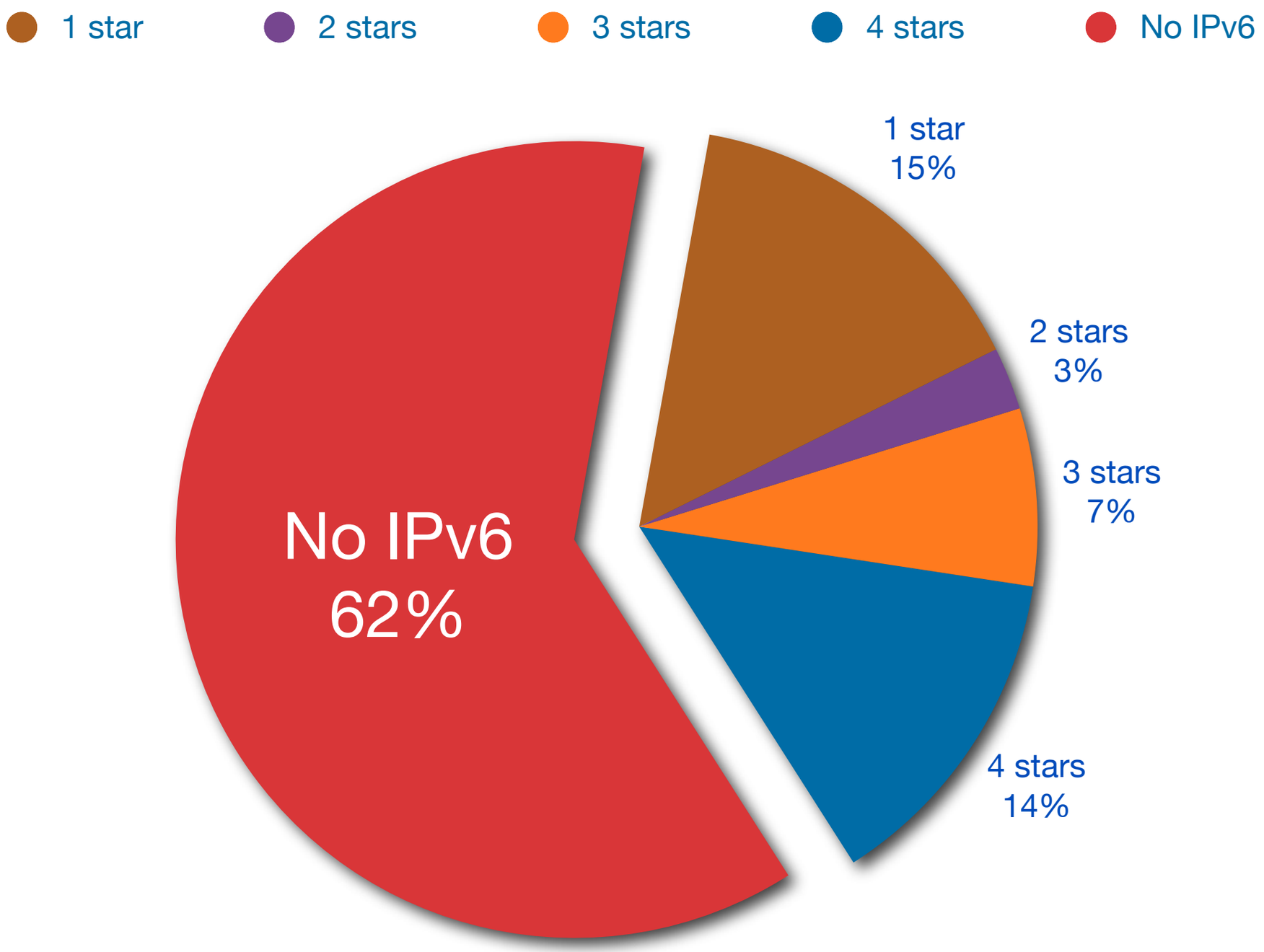
1) IPv6 RIPEness

- Rating system:
  - One star if the LIR has an IPv6 allocation
  - Additional stars if:
    - IPv6 prefix is visible in global routing
    - A route6 object is in the RIPE Database
    - Reverse DNS is set up

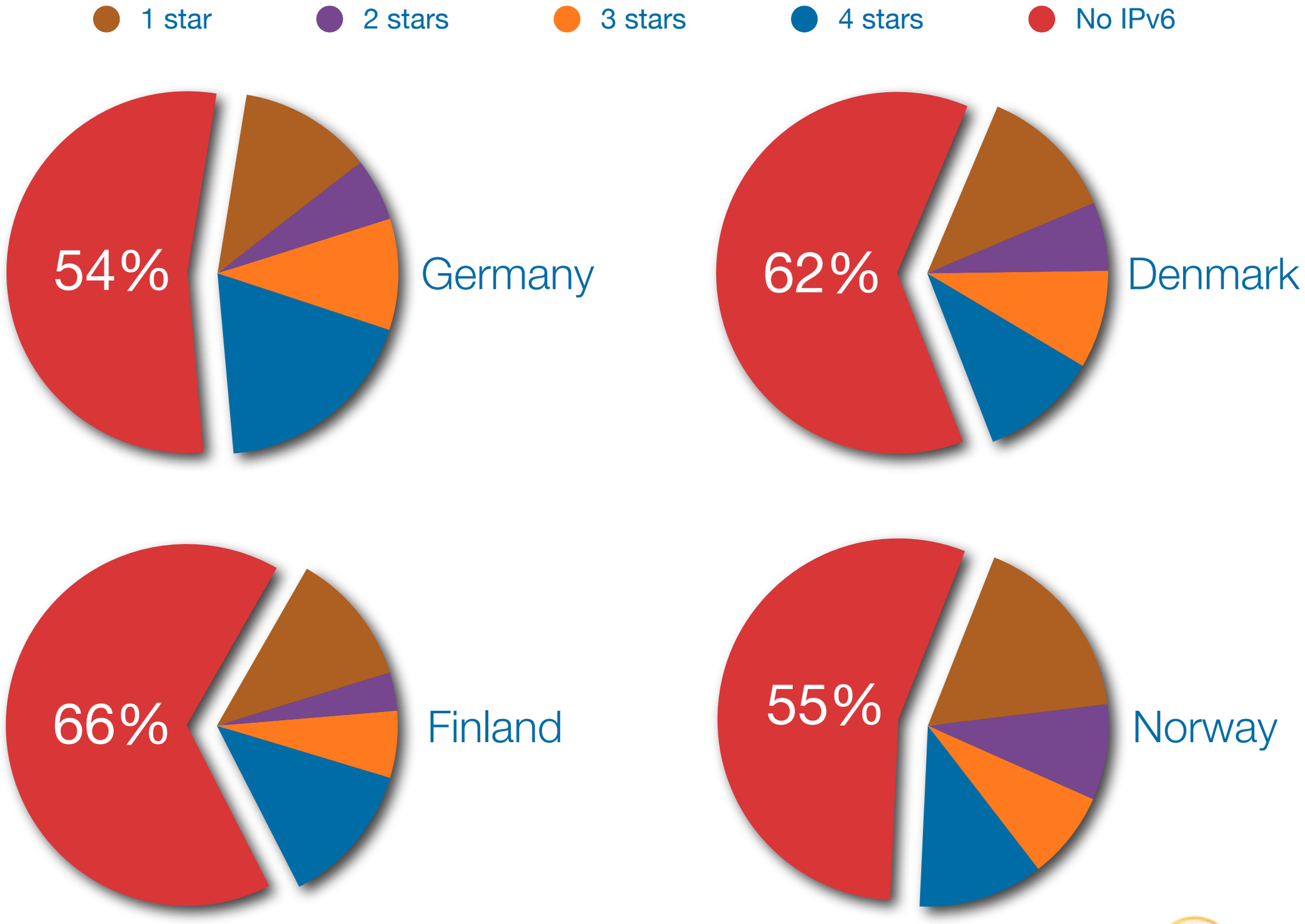
IPv6 RIPEness – Total Membership



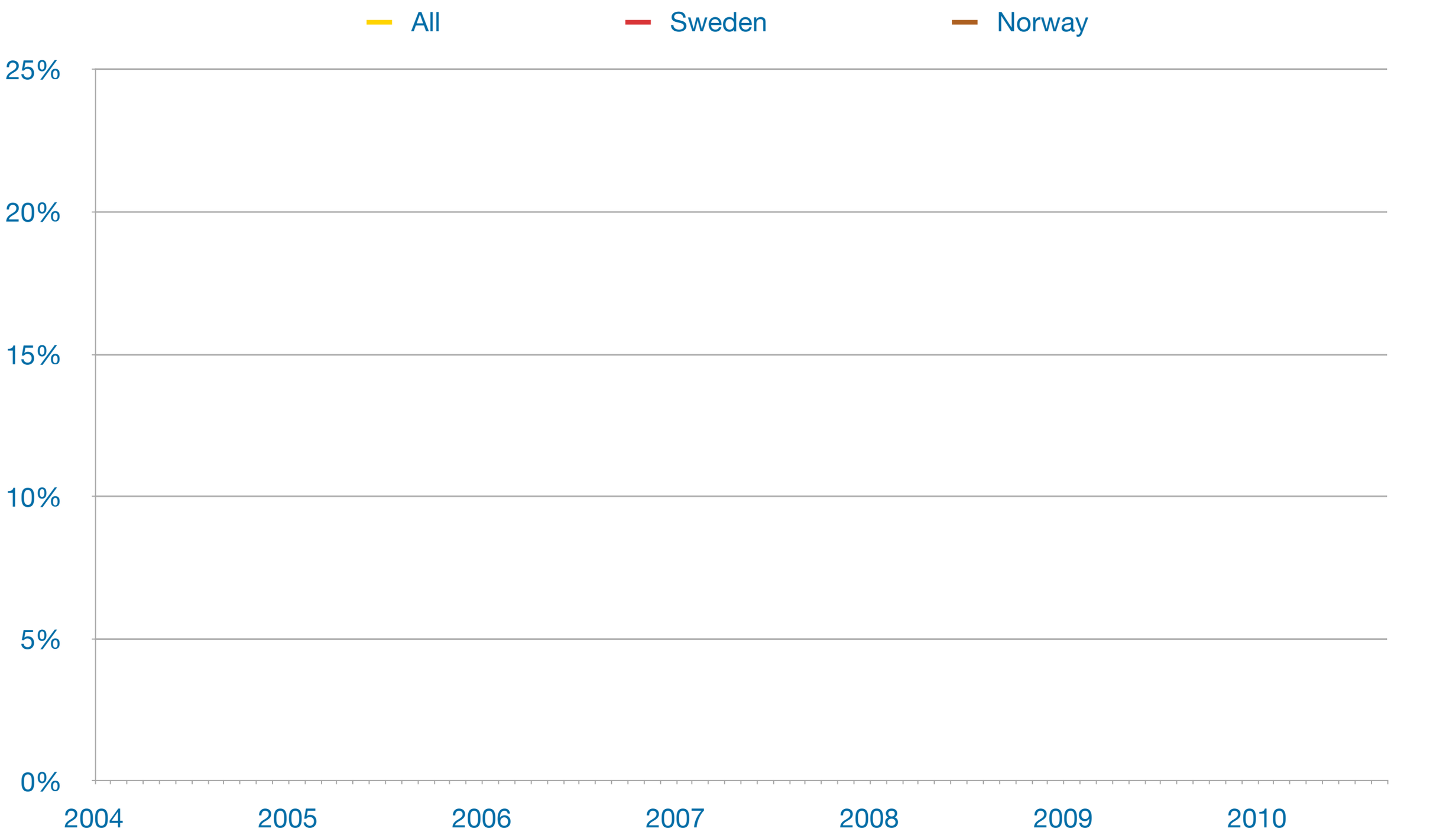
IPv6 RIPEness – Sweden (236 LIRs)



IPv6 RIPEness – Your Neighborhood



2) IPv6 enabled ASs in global routing



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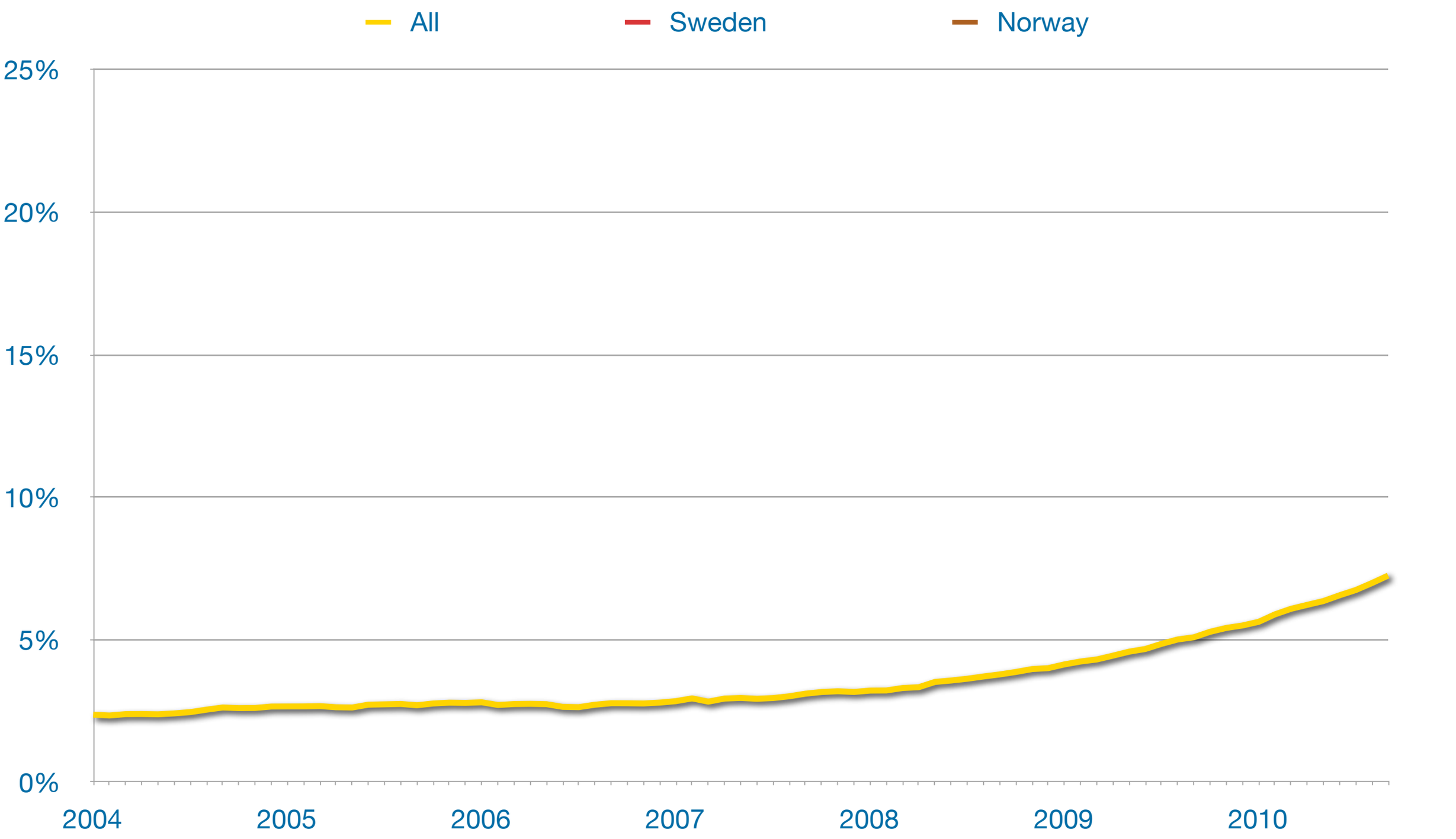

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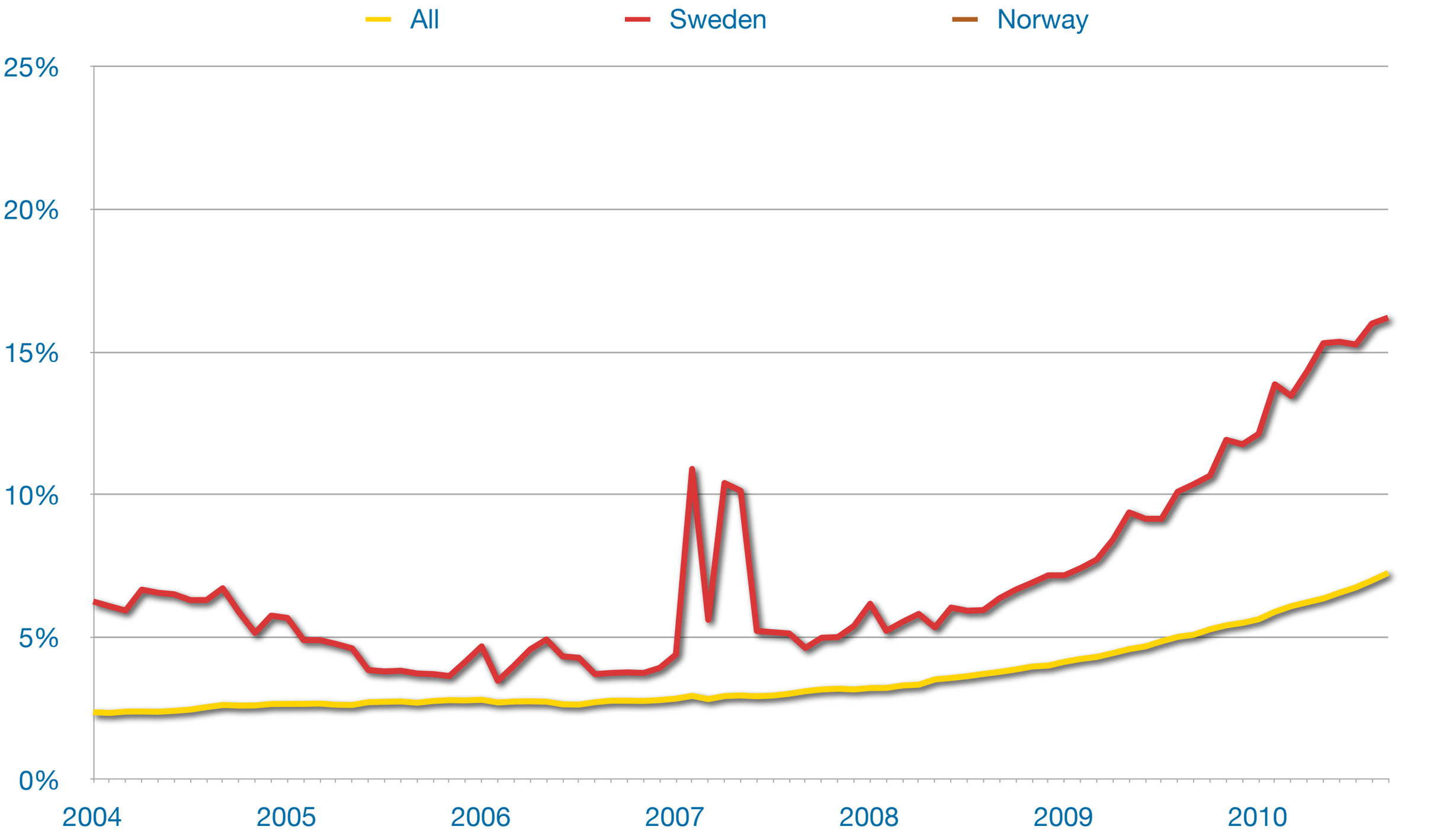

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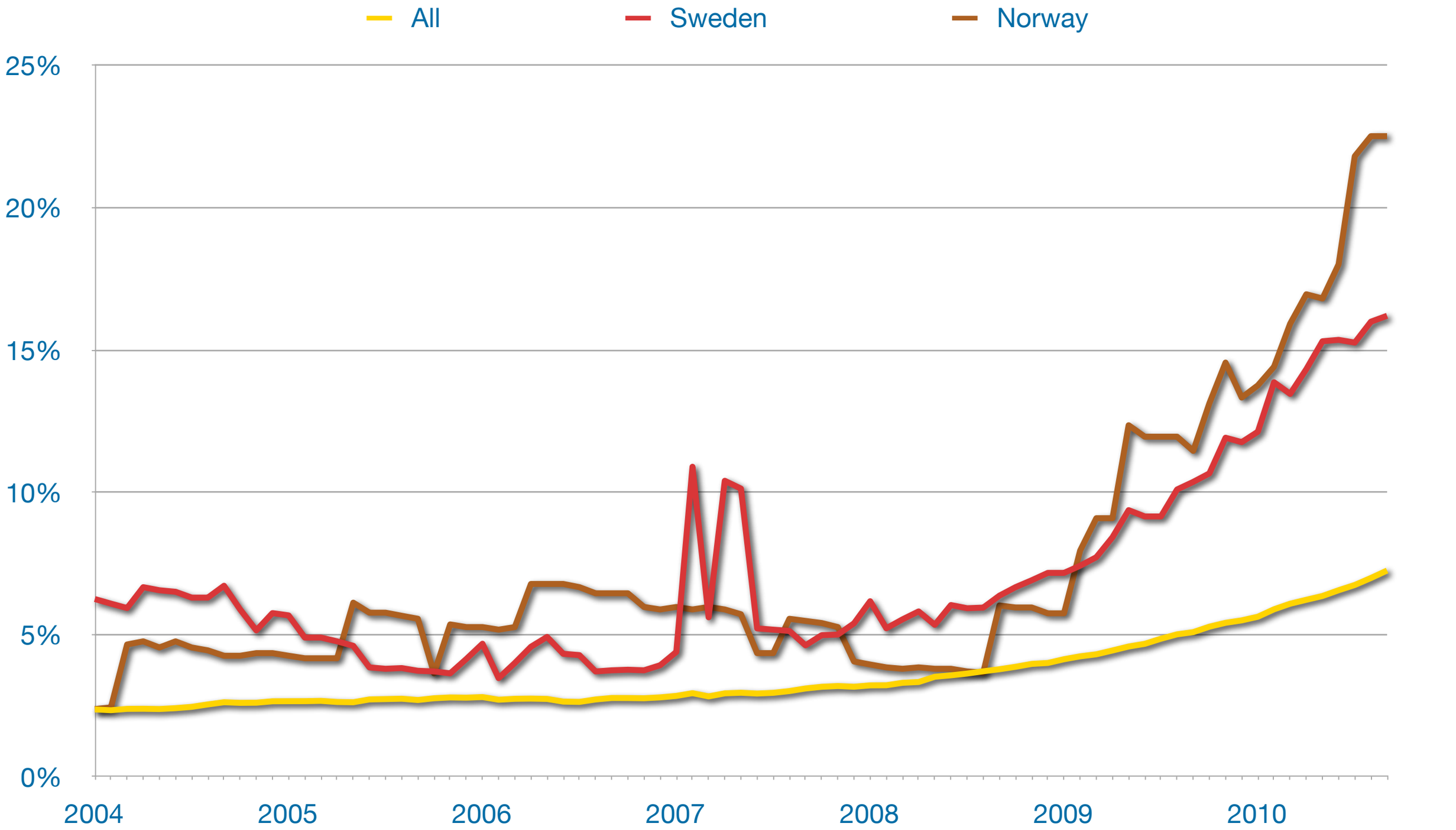
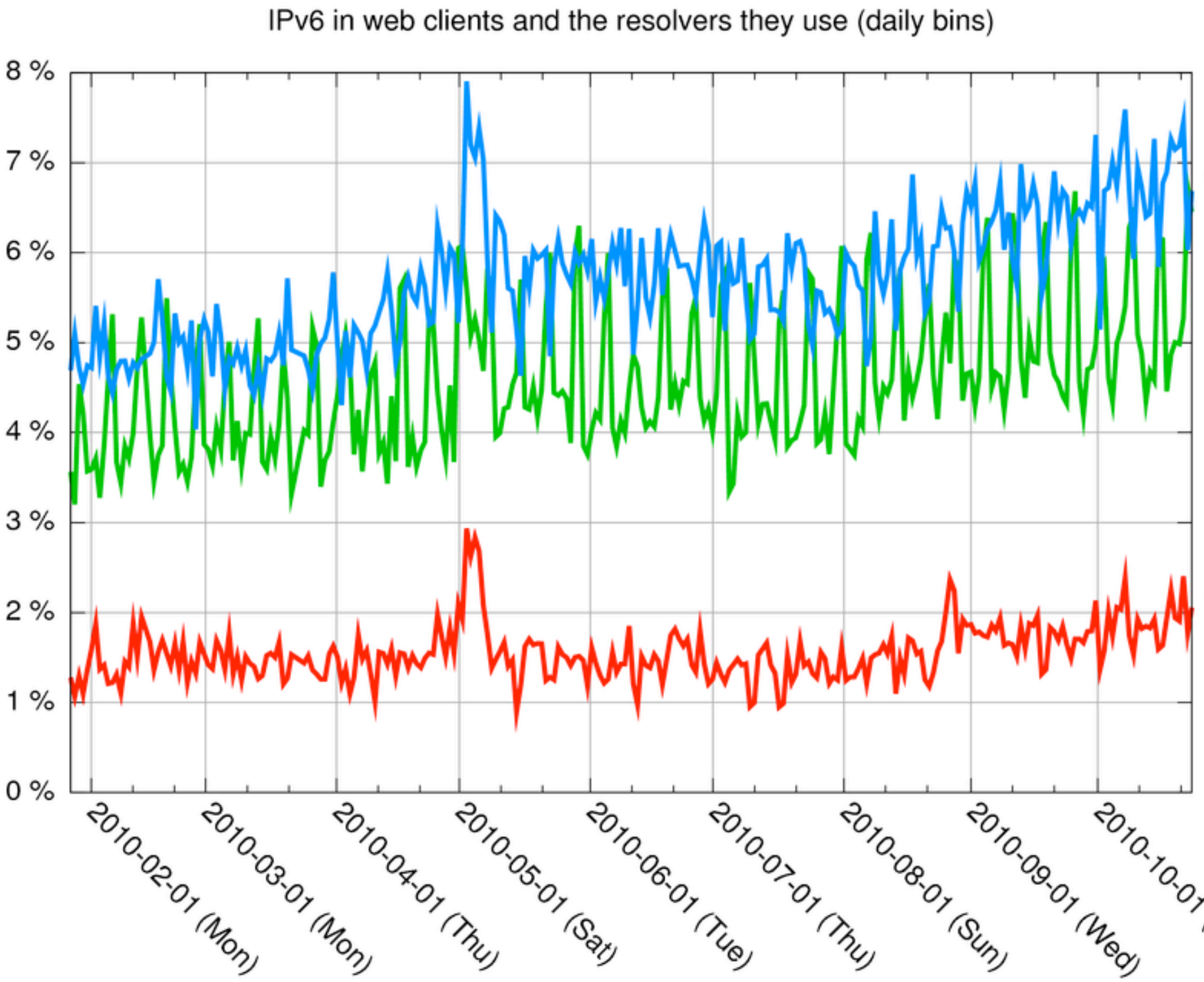


3) IPv6 at infrastructure and end-users

- Measuring web clients and the DNS resolvers they use
- javascript on participating websites
  - www.ripe.net
  - 5 others (1 in SE!)
- Bias by website-audience
  - allows for adoption stats per audience type

IPv6 at clients and resolvers (www.ripe.net)

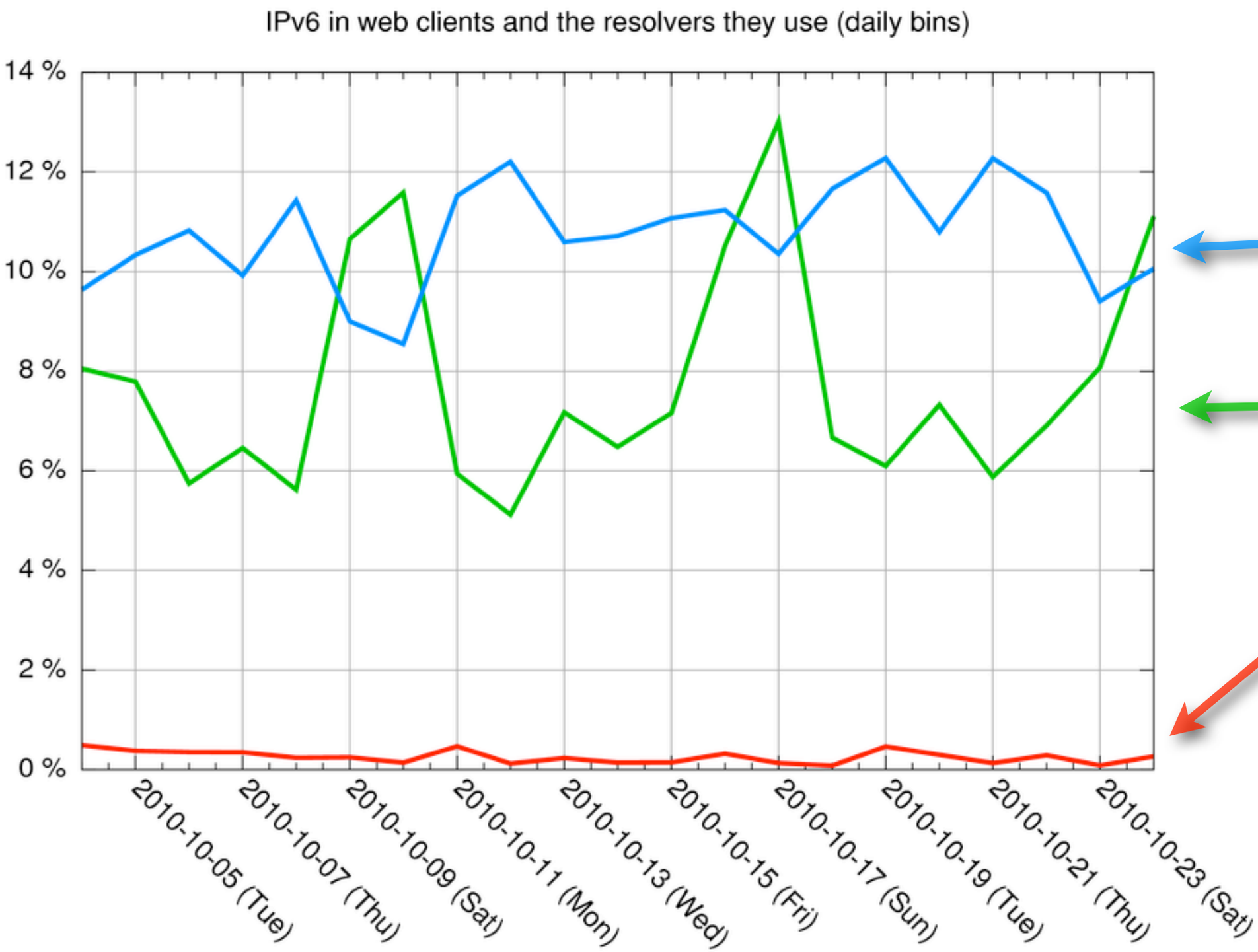


DNS resolvers (infrastructure)

Web clients (dual stack + transition tech)

Web clients (dual stack)

IPv6 client/resolver (SE gov agency website)



DNS resolvers (infrastructure)

Web clients (dual stack + transition tech)

Web clients (dual stack)

Side-by-side stats

	Global	Sweden
IPv6 RIPEness (1+ stars)	30% (RIPE region)	38%
IPv6 AS	7%	16%
Dual stack web clients	2% (techies)	< 0.5% (govt)

Are we ready for IPv4 depletion?

Why act now?

- IPv6 adoption is the only way to ensure continued Internet growth
- Business continuity/opportunity
  - IPv6-only parties can still communicate with you
- To calm your panicked CEO when he reads about IPv4 depletion
- For governments:
  - How is an IPv6-only citizen going to e-vote or file e-tax?

More information

RIPE IPv6 Working Group

- Launched in 1995 (first meeting at RIPE 22)
- Charter of the RIPE IPv6 Working Group:

IPv6 is the next generation IP protocol. The IPv6 working group exists to promote IPv6 adoption. The working group activities may be anything useful in helping people to deploy IPv6, and to manage IPv4/IPv6 co-existence. These activities include:

- *Outreach*
- *Education*
- *Sharing deployment experiences*
- *Discussing and fixing operational issues*

The working group will cooperate with operators and others, both inside and outside the networking industry, to share resources and combine efforts.

IPv6 Act Now www.ipv6actnow.org

- One-stop shop for IPv6 information, launched in June 2009
- Audience includes business, government and technical communities
- Sections include:
  - How To Act Now
  - Community interviews
  - Statistics
  - RSS feed of IPv6-related news and developments
  - Links and information

IPv6 ACT NOW

RIPE NCC

RIPE Labs

- A platform and a tool for the community
- You can
  - Test and evaluate new tools and prototypes
  - Contribute new ideas and research results
  - Discover and discuss in forums and blogs

RIPE Labs

RIPE Labs and IPv6

- IPv6 RIPEness
- IPv6 Measurements Compilation
- Measuring IPv6 at Web Clients and Caching Resolvers
- Untunneling IPv6
- IPv6 CPE Survey

Questions?