IPv4/IPv6 Update

Andrew de la Haije, COO
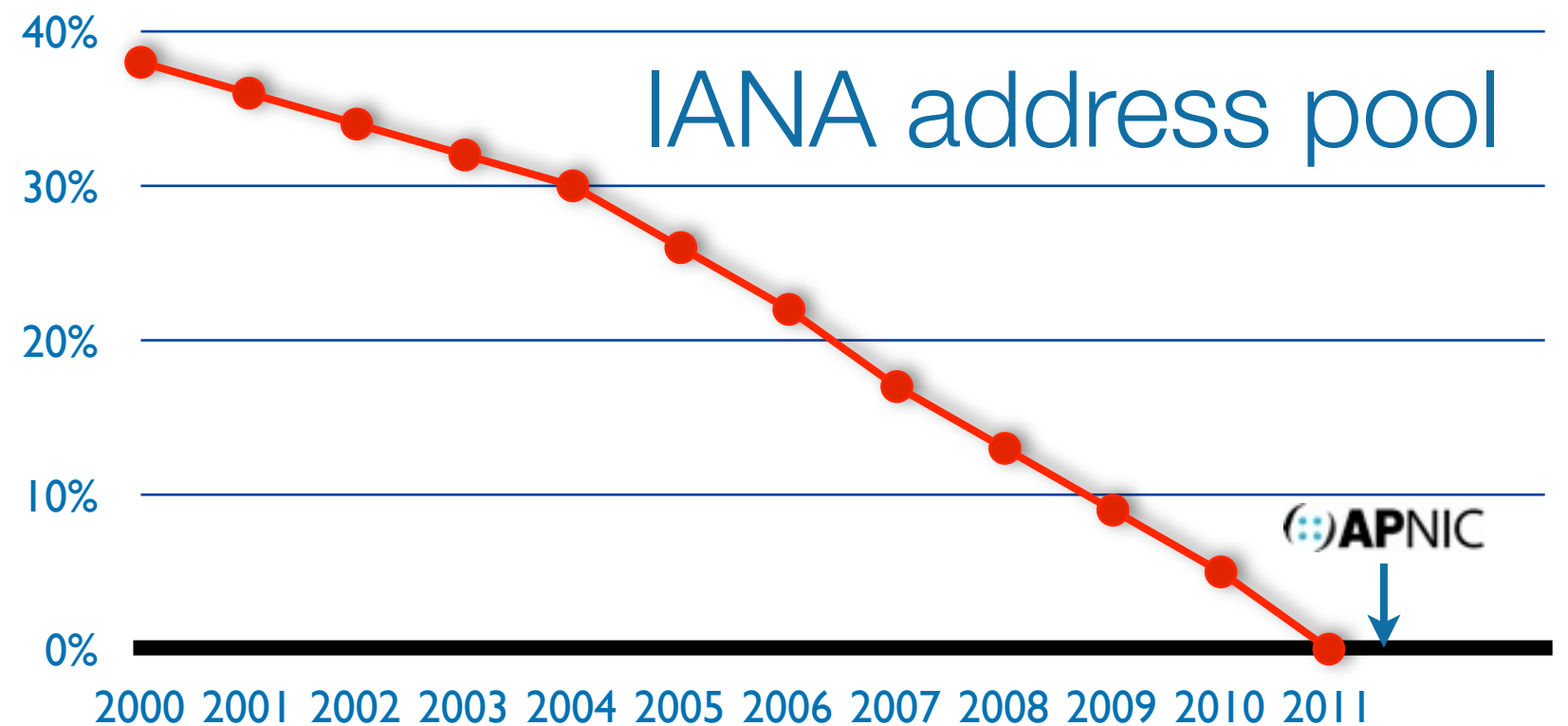Roundtable Brussels, 21 February 2012

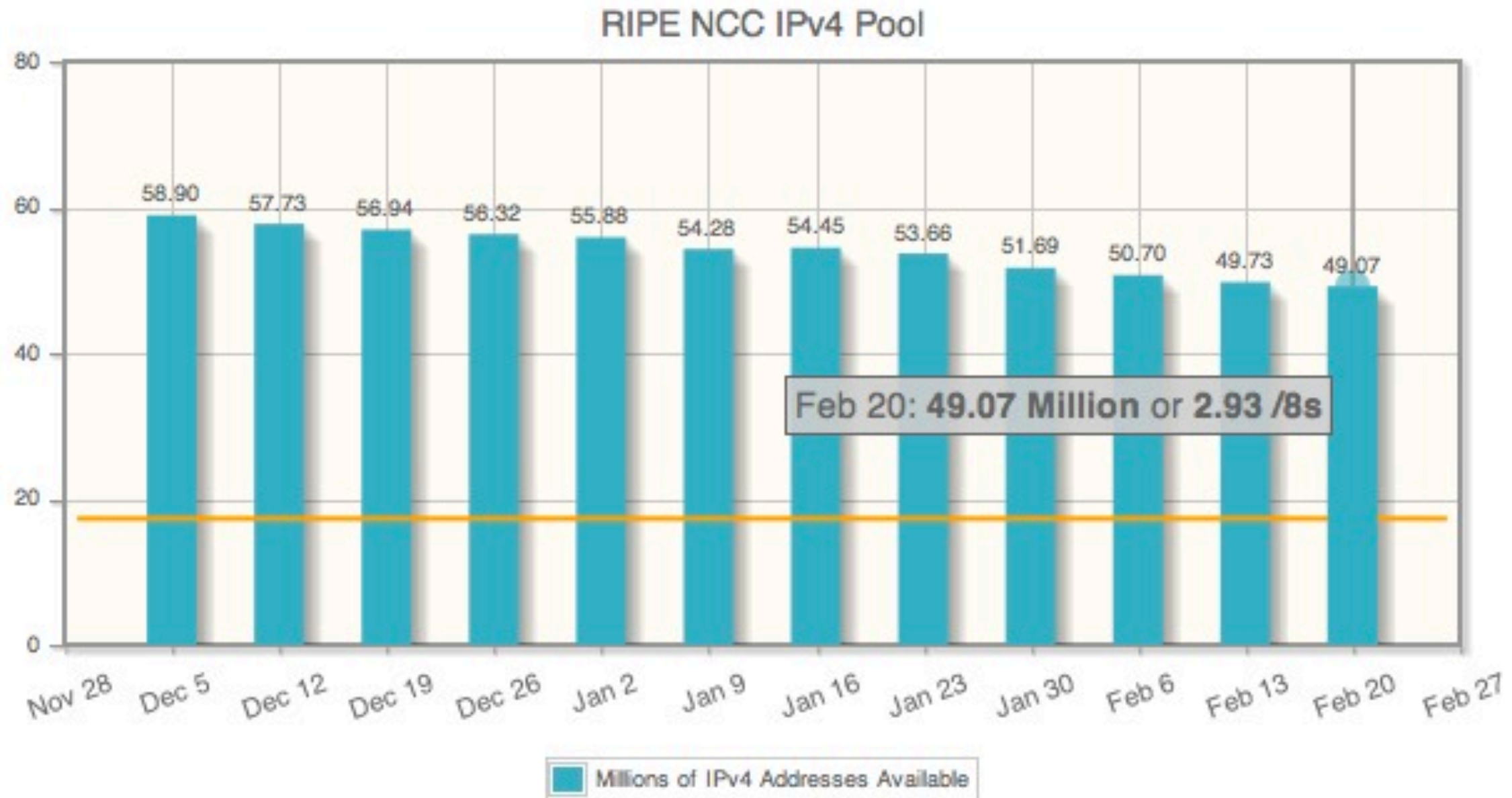# IPv4

Where are we?

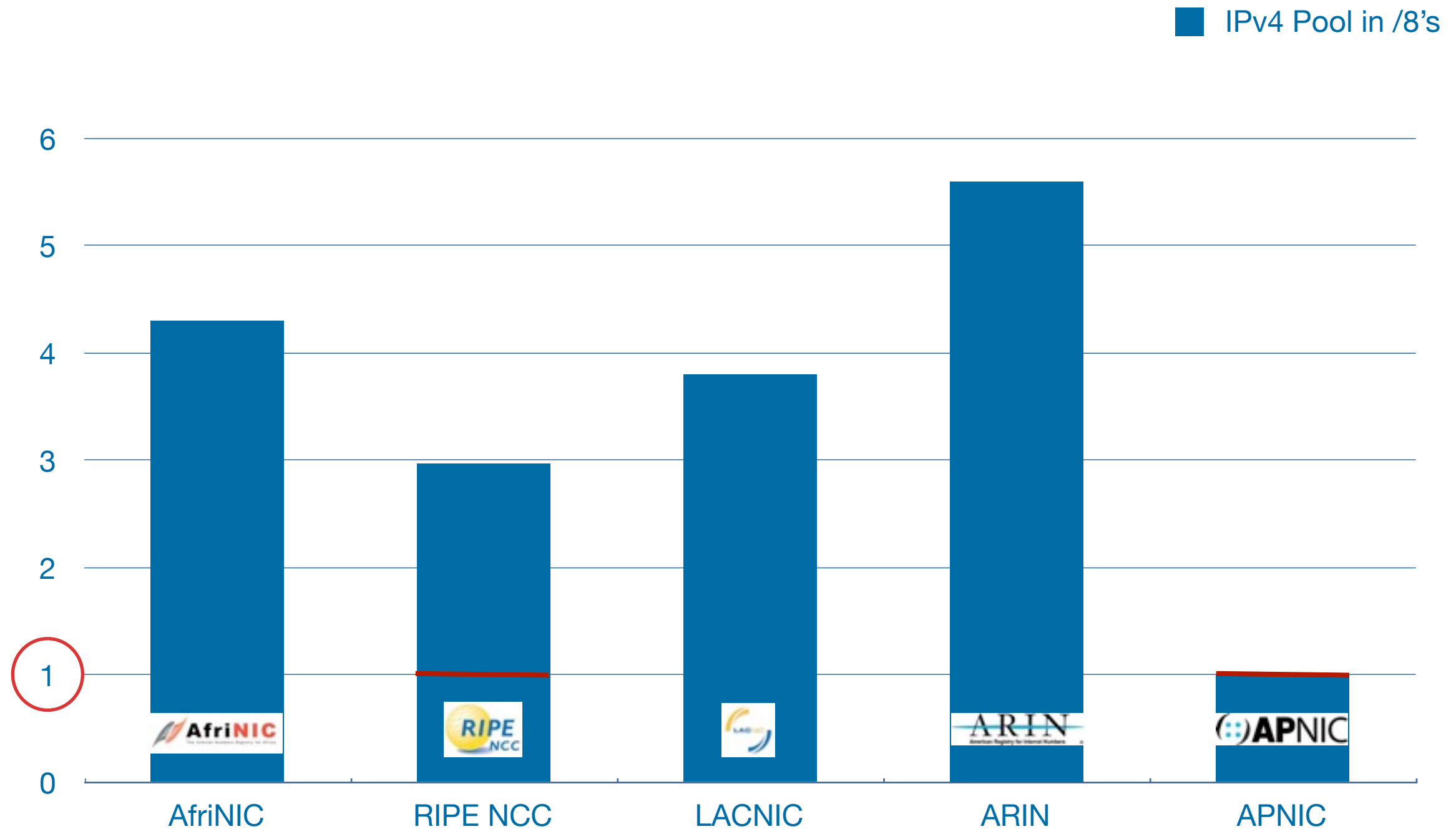IANA address pool

40%
30%
20%
10%
0%

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011

APNIC

RIPE
NCC

RIPE NCC IPv4 Available Pool

RIPE NCC IPv4 Pool

58.90	57.73	56.94	56.32	55.88	54.28	54.45	53.66	51.69	50.70	49.73	49.07	

Feb 20: **49.07 Million** or **2.93 /8s**

Nov 28 · Dec 5 · Dec 12 · Dec 19 · Dec 26 · Jan 2 · Jan 9 · Jan 16 · Jan 23 · Jan 30 · Feb 6 · Feb 13 · Feb 20 · Feb 27

Millions of IPv4 Addresses Available

http://www.ripe.net/internet-coordination/ipv4-exhaustion/ipv4-available-pool-graph

IPv4 Depletion Worldwide

Tuesday, February 21, 12

Due diligence during last phase

- Transparency

  - Full transparency on processes and wait-queue

- Consistency

  - One single ticket queue - FIFO (first in - first out) based on auditable timestamps

  - Two-eyes principle & senior management approval

- Due diligence

  - Audit logs for timestamp

  - Audit logs for ticket handling

RIPE NCC's last /8

- We do things differently!

- Ensures IPv4 access for all members and beyond
  - 16000+ /22s in a /8
  - members can get one /22 (=1024 addresses)
  - must already hold IPv6
  - must qualify for allocation

- /16 set aside for unforeseen situations
  - if unused, will be distributed

- No Provider Independent

Transfer of IPv4 Allocations

- Policy 2007-08: Allocation Transfer Policy

  - Transfer unused allocations to another LIR

  - Minimum allocation size /21

  - Evaluated by RIPE NCC; policies still apply!

  - Update in RIPE Database

- Objective is completeness and accuracy of the Registry

IPv6

Getting an IPv6 allocation from the RIPE NCC

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

- Minimum allocation size /32

- Allocation size is based on customer numbers and growth, not on transition technique!
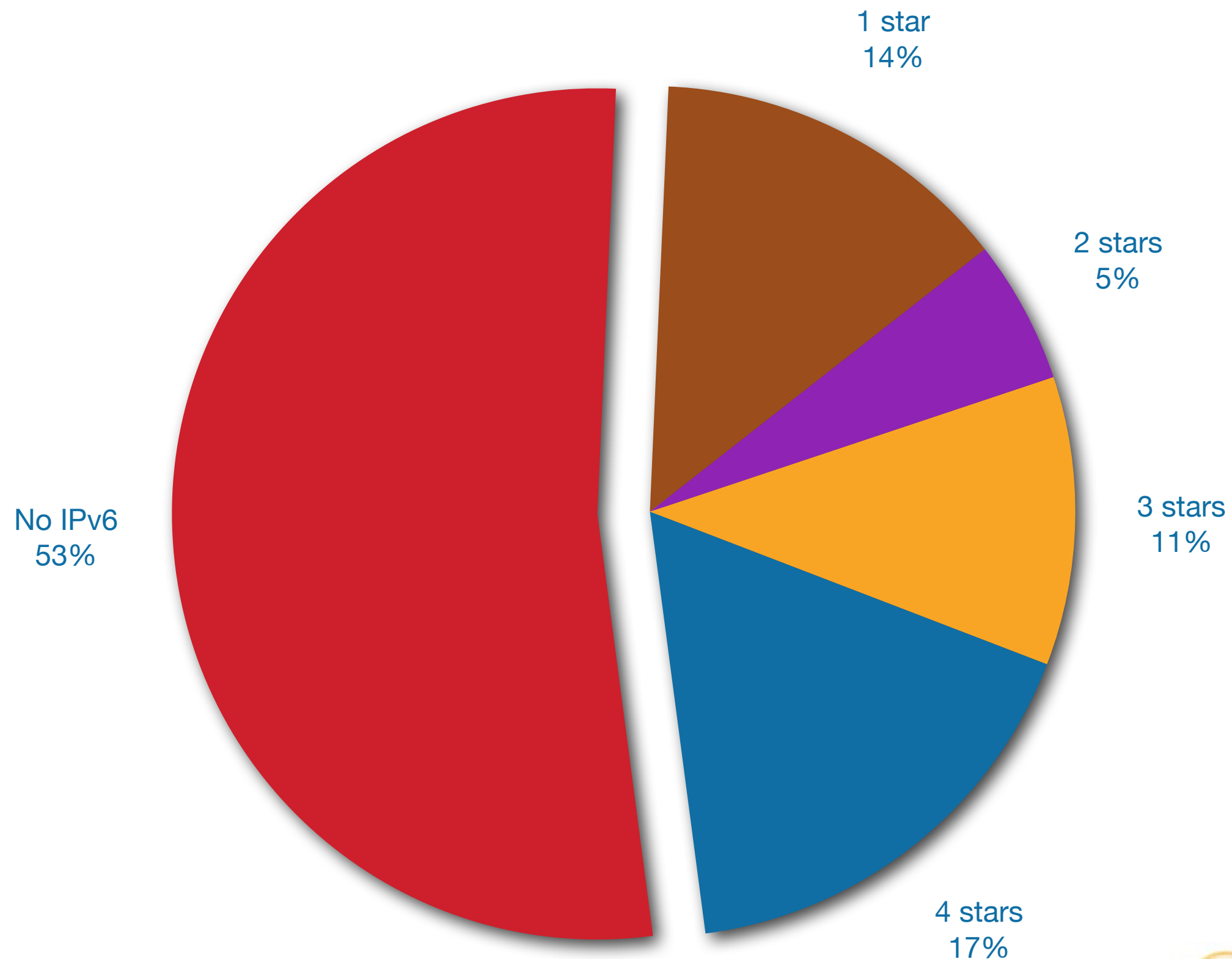
RIPE Policy Proposal 2011-04

- Extension of the Minimum Size for IPv6 Initial Allocation

  - Proposes initial allocation up to a /29

  - For example, for small LIRs to deploy IPv6 via 6RD (RFC 5969)

- Proposal currently in Review Phase

- The RIPE NCC is working on impact analysis
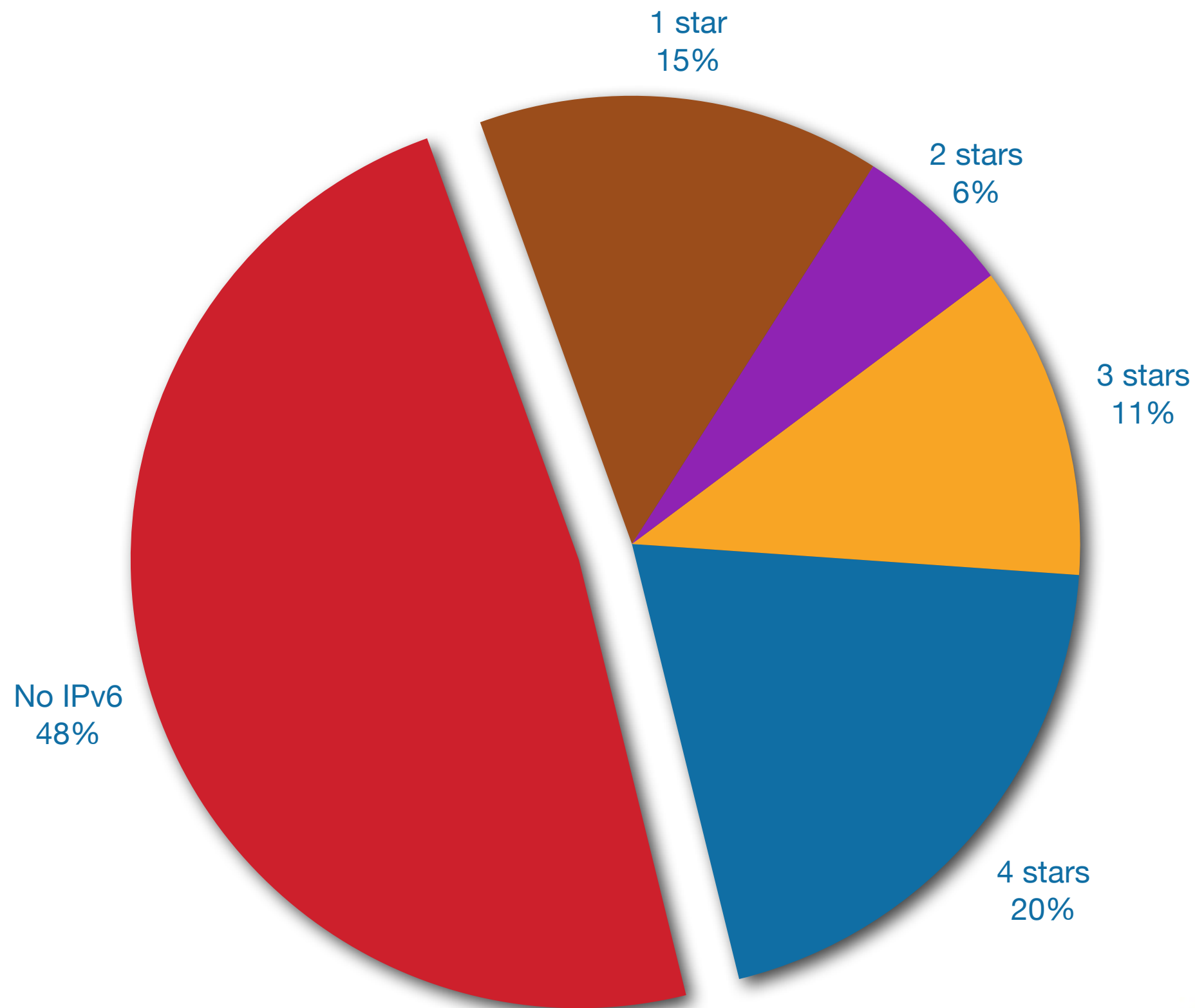
IPv6 (RIPEness) deployment

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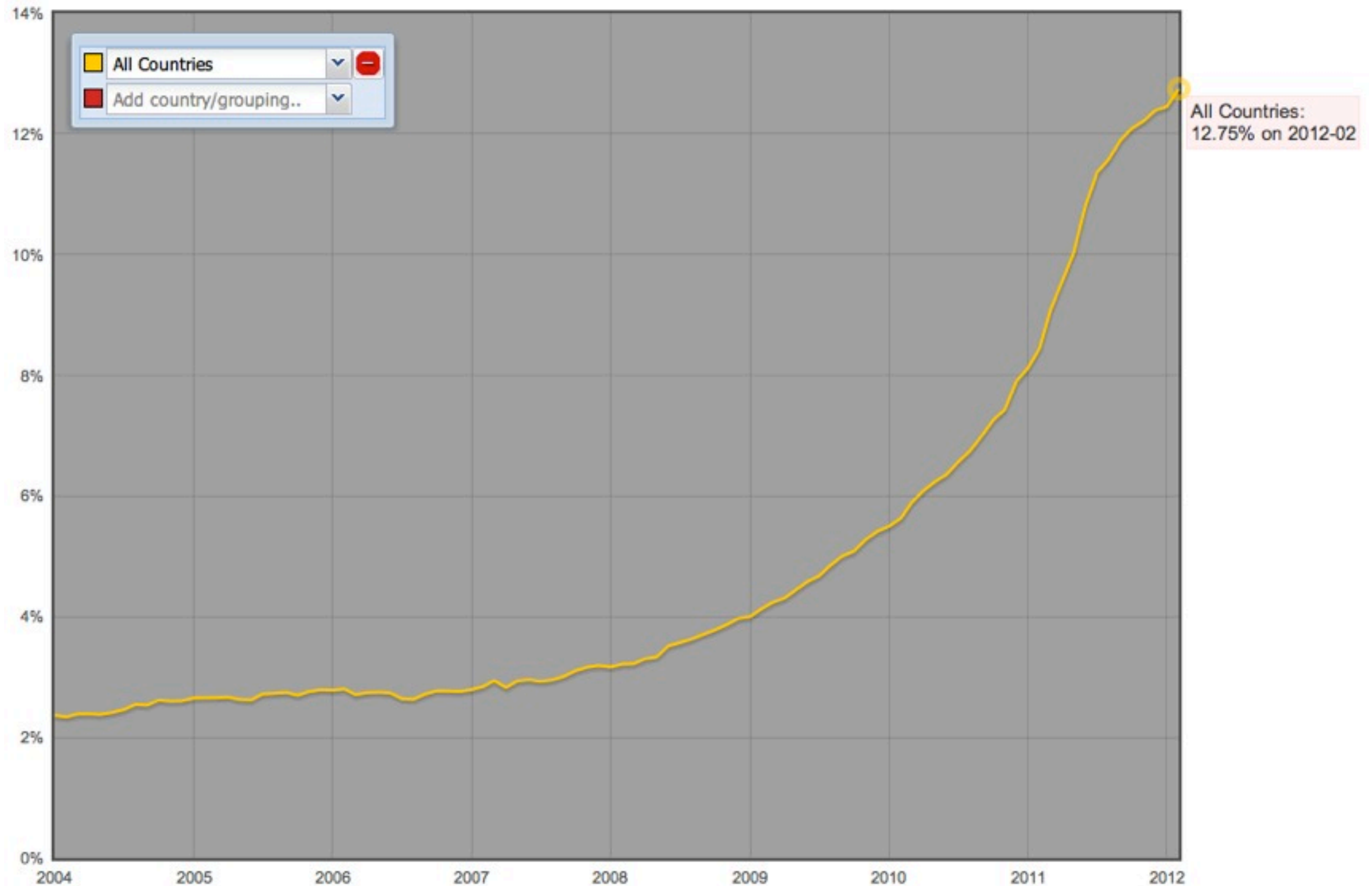
- A list of all 4 star LIRs: http://ripeness.ripe.net/

IPv6 RIPEness: 8029 LIRs

1 star
14%

2 stars
5%

3 stars
11%

4 stars
17%

No IPv6
53%

RIPE
NCC

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IPv6 RIPEness: European Union (5287 LIRs)

1 star
15%

2 stars
6%

3 stars
11%

4 stars
20%

No IPv6
48%

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IPv6 Enabled ASes in BGP (v6asns.ripe.net)

http://v6asns.ripe.net/

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IPv6 Enabled ASes in BGP (v6asns.ripe.net)

This graph shows the percentage of networks (ASes) that announce an IPv6 prefix for a specified list of countries or groups of countries

Legend:
- All Countries
- RIPE region
- LACNIC region
- ARIN region
- AfriNIC region
- APNIC region
- European Union
- Add country/grouping..

European Union: 19.05% on 2012-02
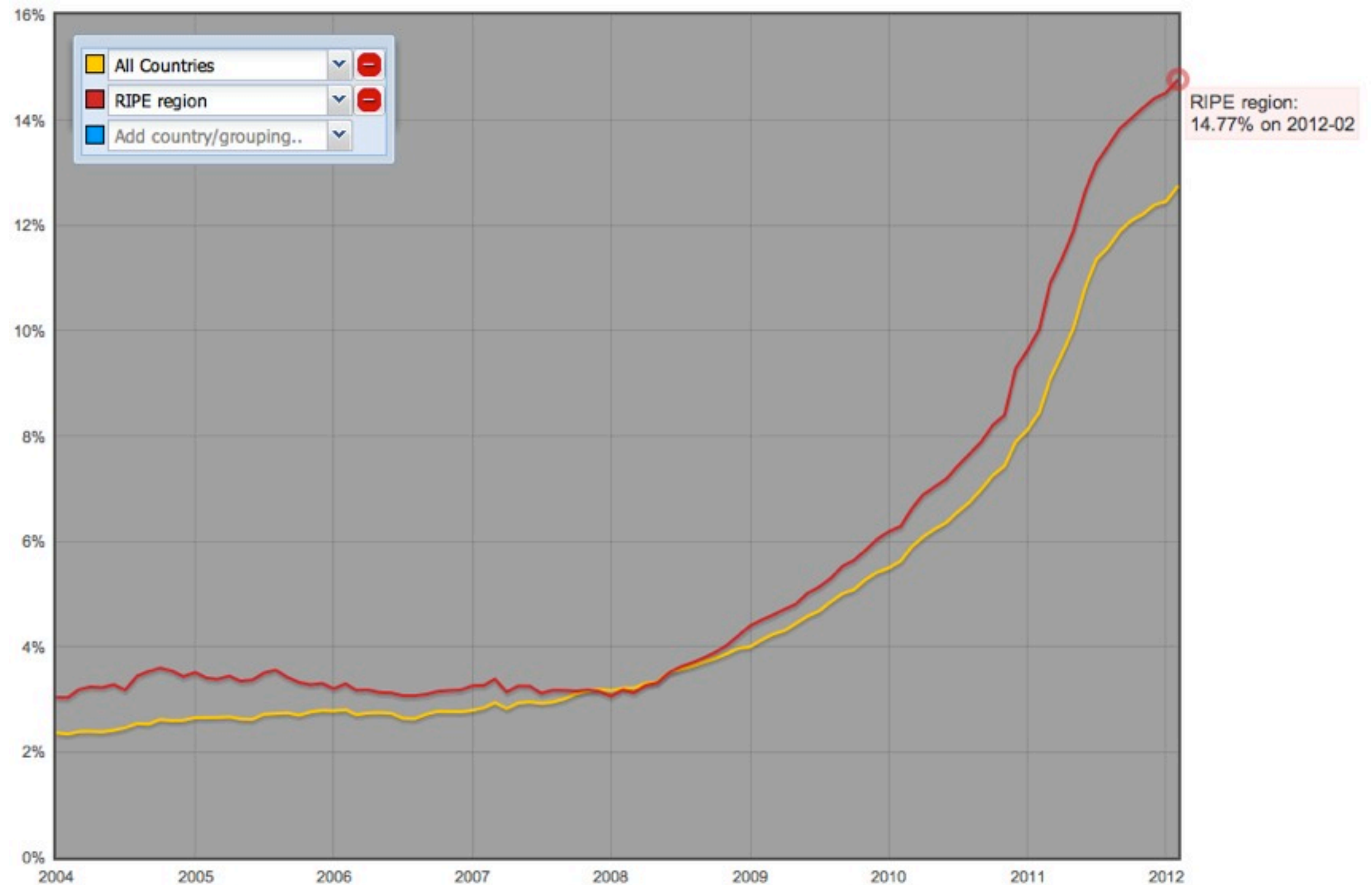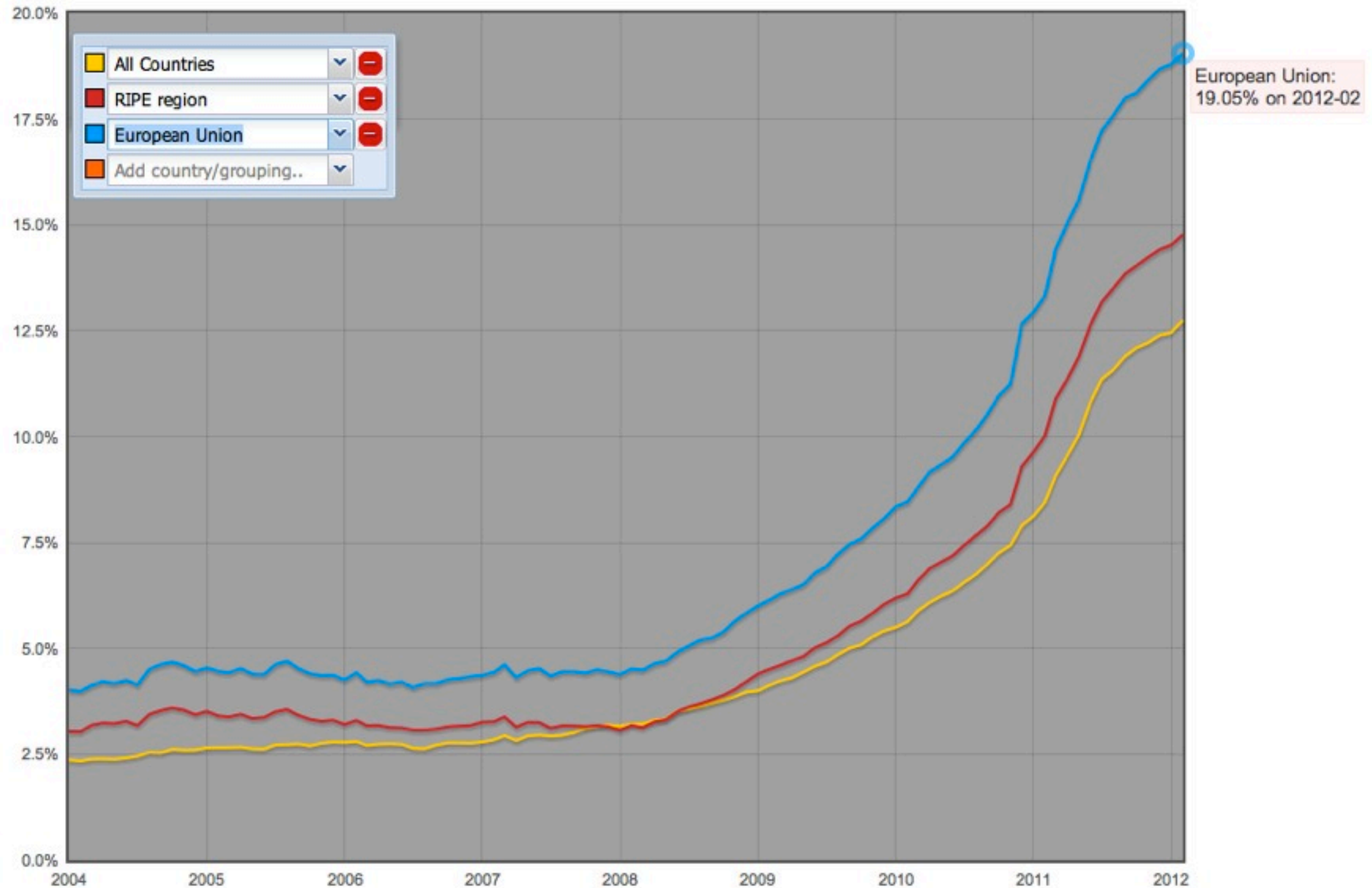
http://v6asns.ripe.net/
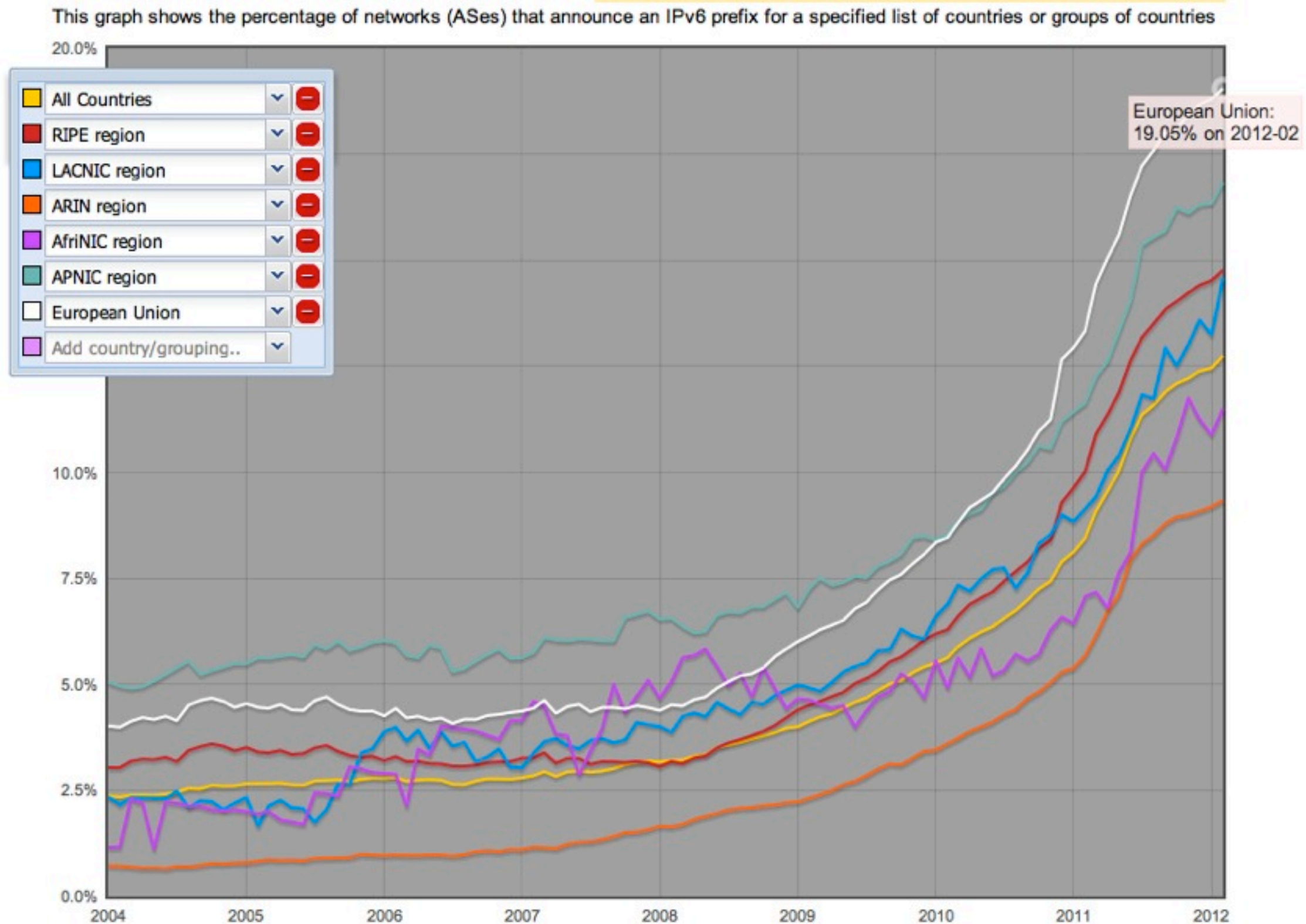
Resource Certification (RPKI)

Resource Certification

- A system providing validatable proof that an Internet resource (e.g. a block of IP addresses) has been registered by a Regional Internet Registry (RIR)

- A vital element in efforts to secure the routing system

- RIPE NCC launched prototype system at the beginning of 2011

RIPE NCC

Resource Certification Adoption
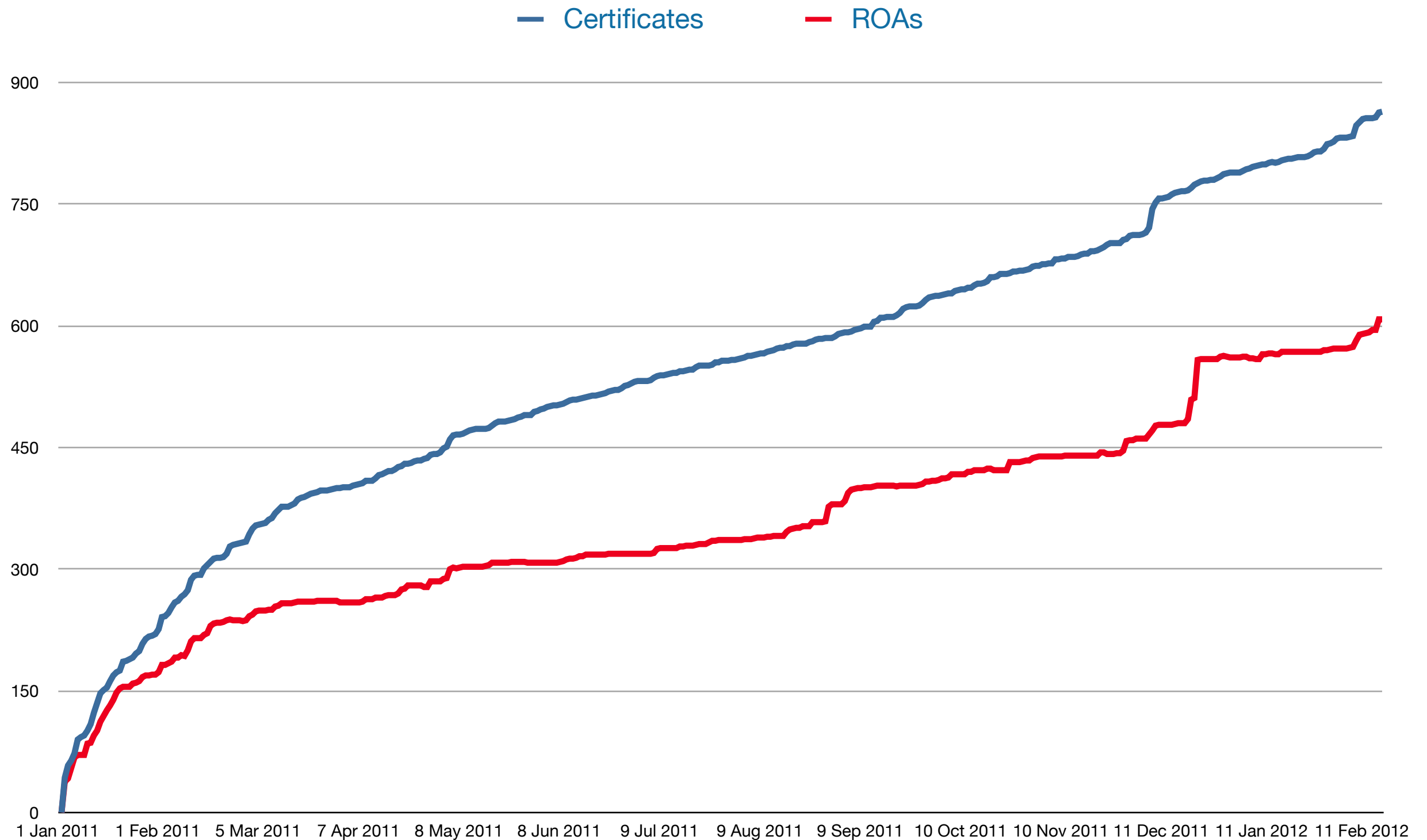
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Resource Certification (RPKI)
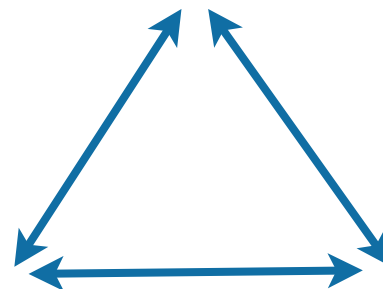
- Message from membership at RIPE 63 was clear

Proceed with caution!

- Our focus for 2012:
  - Security, Resilience, Auditing
  - Operator trust and control

- Proposal with actions presented at RIPE 64

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RIPE NCC RPKI efforts

Infrastructure

Protocol

Tools allowing users to validate and take autonomous decisions

Questions?