Your slice of the IPv6 cake

Nathalie Trenaman

IP Resource Analyst

RIPE NCC

IPv6 space odyssey
06-03-2009 / Ede, The Nederlands

RIPE NCC

RIPE NCC

Located in Amsterdam

Not for profit membership organisation

6000+ active members

Started by the RIPE community in 1992

One of five RIRs

RIPE NCC services

Member services

Distributing resources
- IPv4
- IPv6
- AS numbers

Training Courses
- LIR
- Routing Registry
- DNS for LIRs

Public services

RIPE Database

Reverse DNS

ENUM (e164.arpa)

K-root nameserver

E-learning

All RIPE NCC services IPv6 enabled

External online services	IPv6 transport	IPv6 content
E-mail (ripe.net, nro.net, aso.icann.org)	Yes	N/A
ftp.ripe.net	Yes	N/A
www.ripe.net	Yes	N/A
LIR Portal	Yes	N/A
RIPE DB (whois)		Resource DB, IRR
Queries (whois)	Yes	Yes
Updates	Yes	Yes
DNSMON	Yes	Yes
Hostcount	Yes	Yes
RIS	Yes	Yes
MyASN	Yes	Yes
TTM	Yes	Yes
Auth DNS	Yes	Yes
Rev DNS provisioning system	Yes	Yes
K-root	Yes	Yes

Why IPv6

Only 32 /8s left in IPv4 address pool

12%
available

Other

Central Registry

RIPE NCC

AfriNIC

ARIN

LACNIC

APNIC
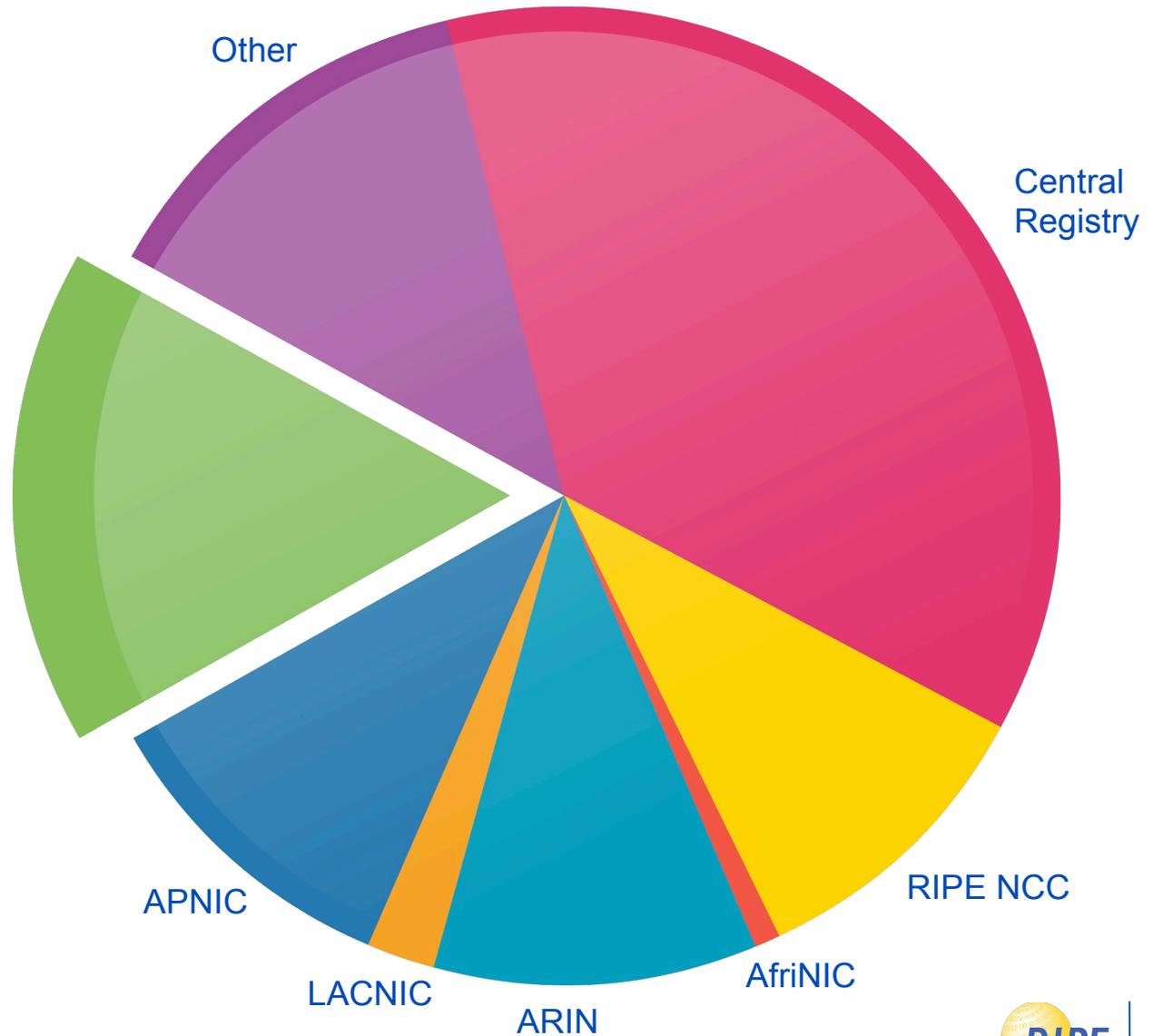
Running out in 2011?
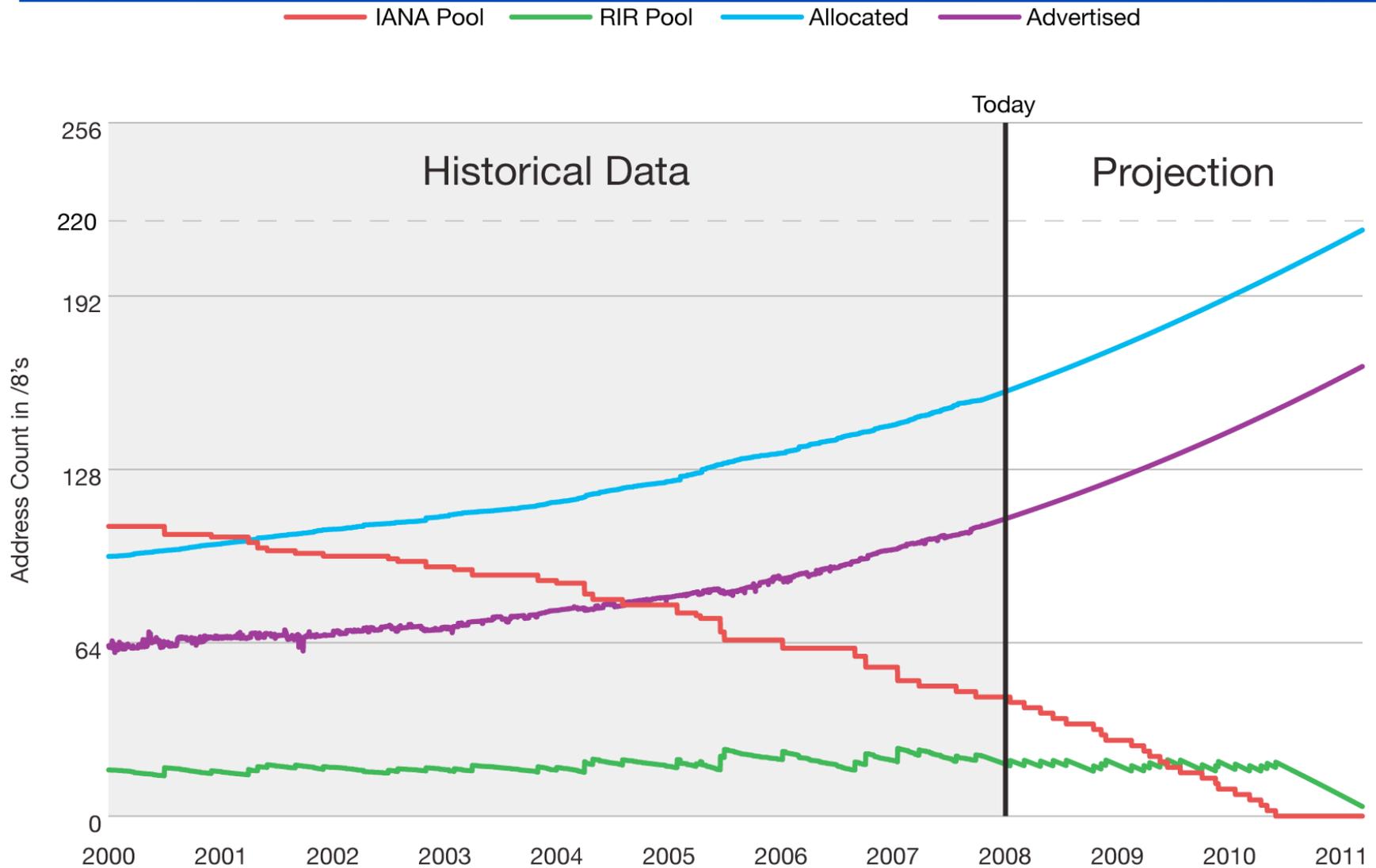
IPv6: more addresses available

IPv6 address: 128 bits

- − 32 bits in IPv4

Huge subnets

Huge allocations

Extra levels or hierarchy

IPv6 deployment challenges

Legacy devices

Firewalls

IPv6 / IPv4 priority

Challenges for staying with IPv4

Finding "available" addresses

- redeploying?

- buying?

Network Address Translation (NAT)

- management overhead

- lower class Internet hosts
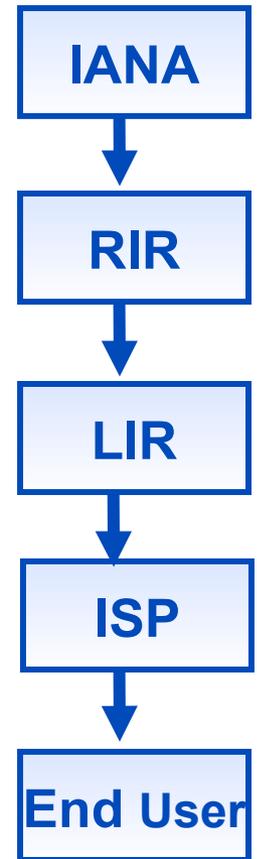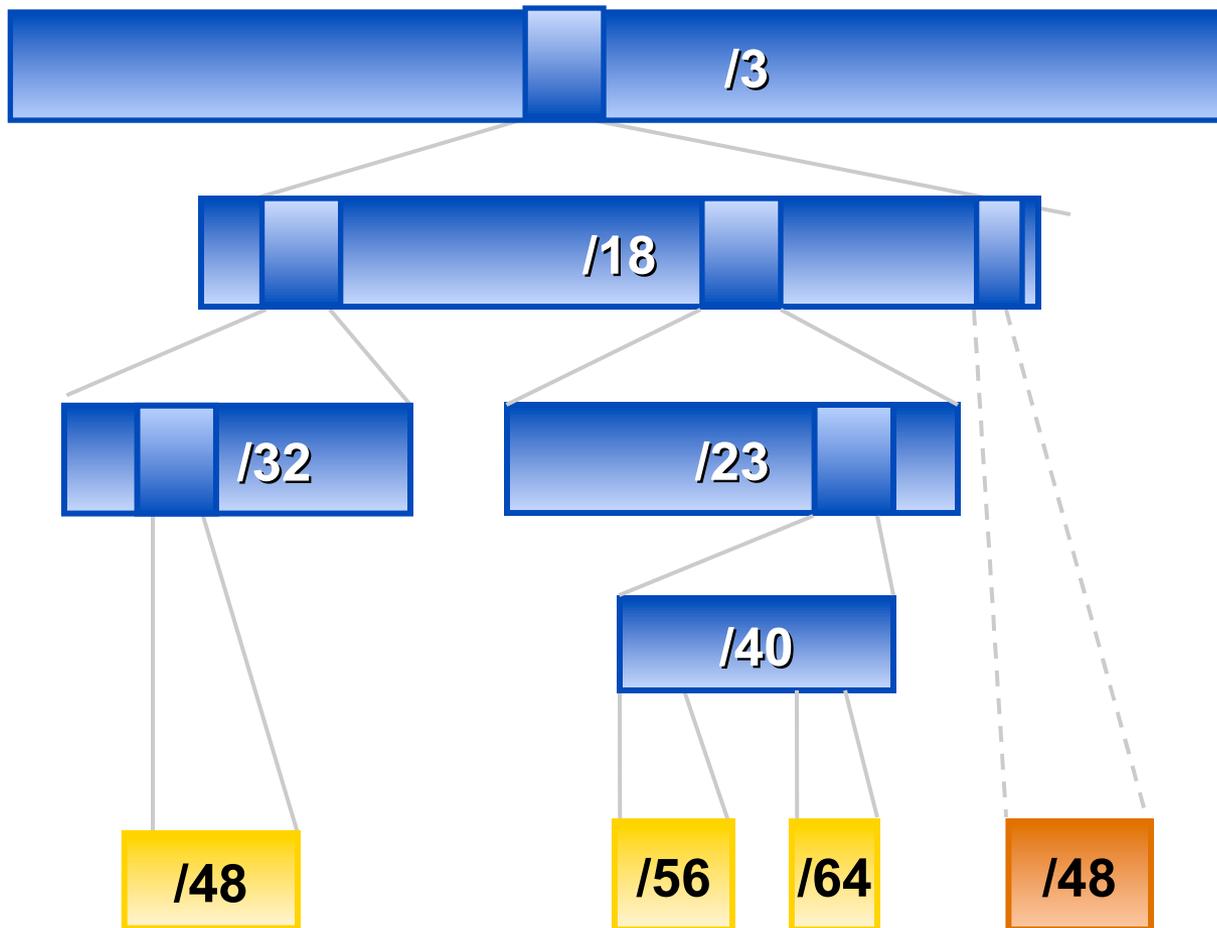
Make the transition on time

Give priority to IPv6 deployment

Get IPv6 addresses

Train your staff

Make your services available over IPv6 and IPv4
  ("dualstacking")

Getting IPv6

IPv6 address space distribution

/3

/18

/32   **/23**

/40

/48   **/56**   **/64**   **/48**

IANA

RIR

LIR

ISP

End User

Allocation   Assignment   PI Assignment

RIPE NCC | 13

To get an IPv6 allocation

Be an LIR

Advertise the allocation as a single prefix

Have a plan for making assignments within two years

Minimum size: /32

For further allocations
- allocation should be used by HD ratio of 0.94
- the unit of measurement is /56

Getting IPv6 if you are not LIR

Get a sub-allocation from an LIR

Get an assignment from an LIR
- /48 or /56 for the End User sites
- /64 for one subnet
- /128 for hosts

Provider Independent (PI) IPv6 assignments - soon

http://www.ripe.net/ripe/policies/proposals/2006-01.html

How much does IPv6 allocation cost?

IPv6 allocations do not cost anything extra to LIRs
- a resource covered with a yearly membership fee

New LIRs start in the "Extra Small" billing category
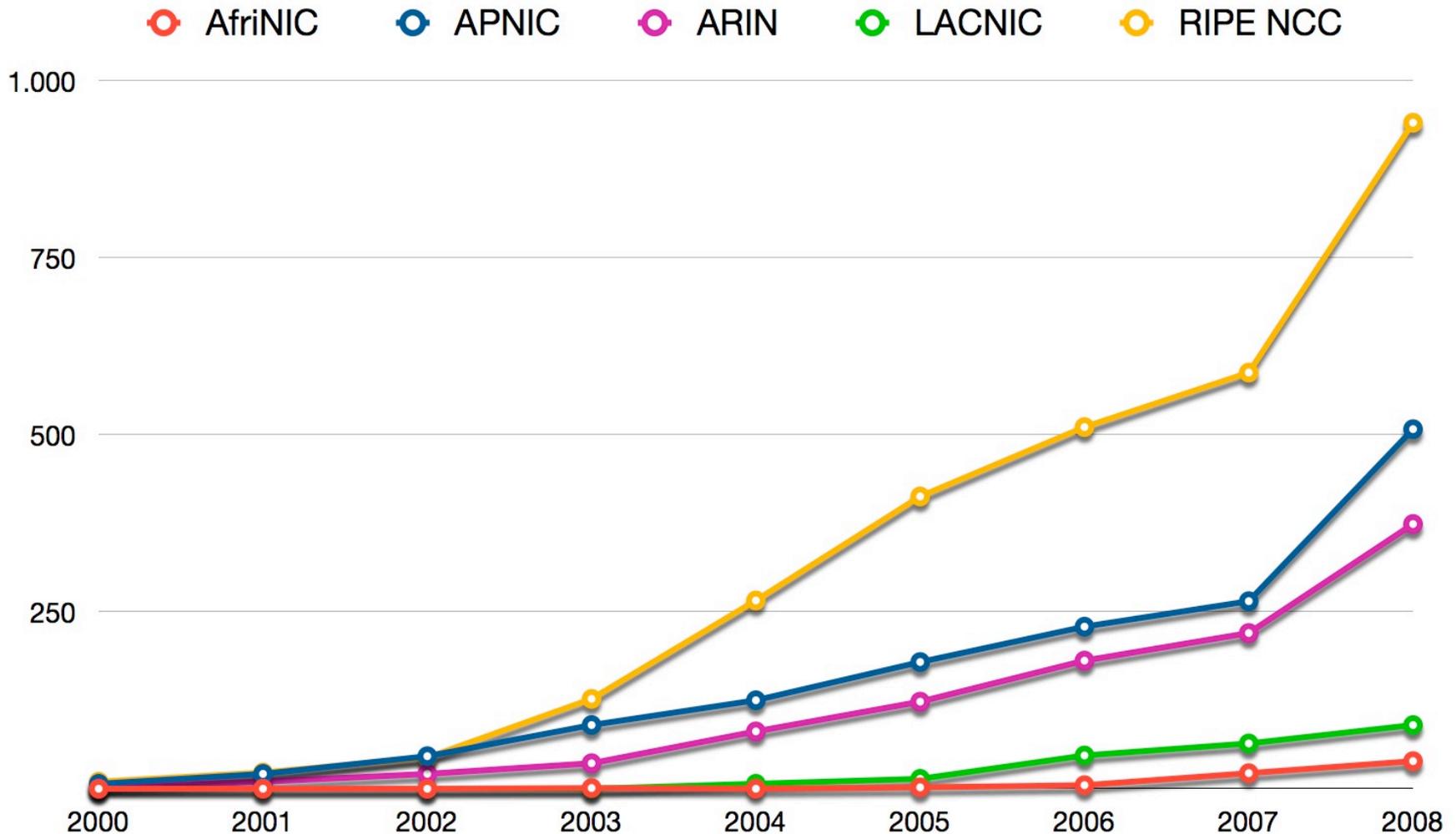- yearly fee for 2009 is 1,300.- EUR

/32 of IPv6 is worth "1 scoring point"
- the same as /21 of IPv4, or one AS number
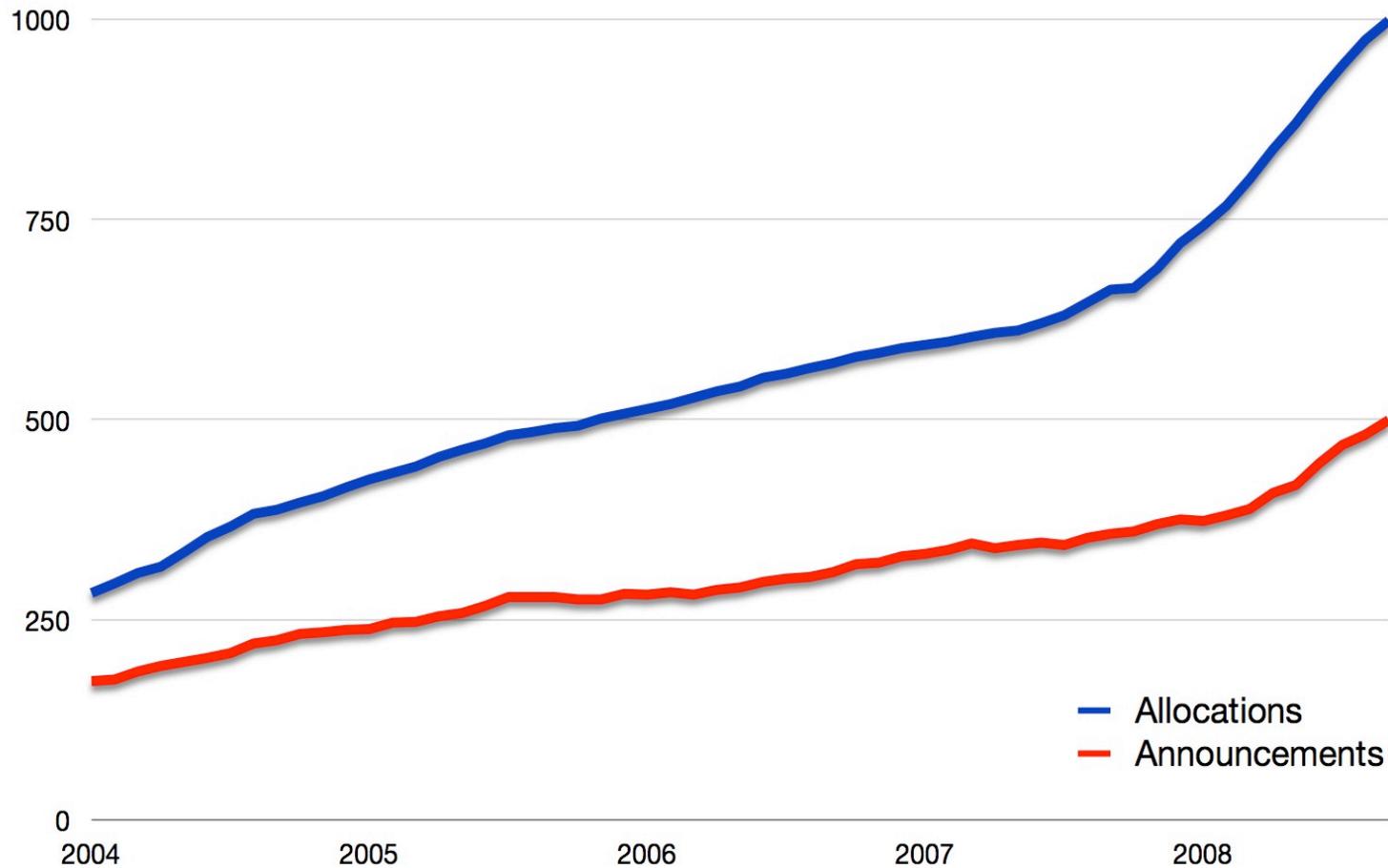- /48 of PI IPv6 will also "cost" 1 scoring point

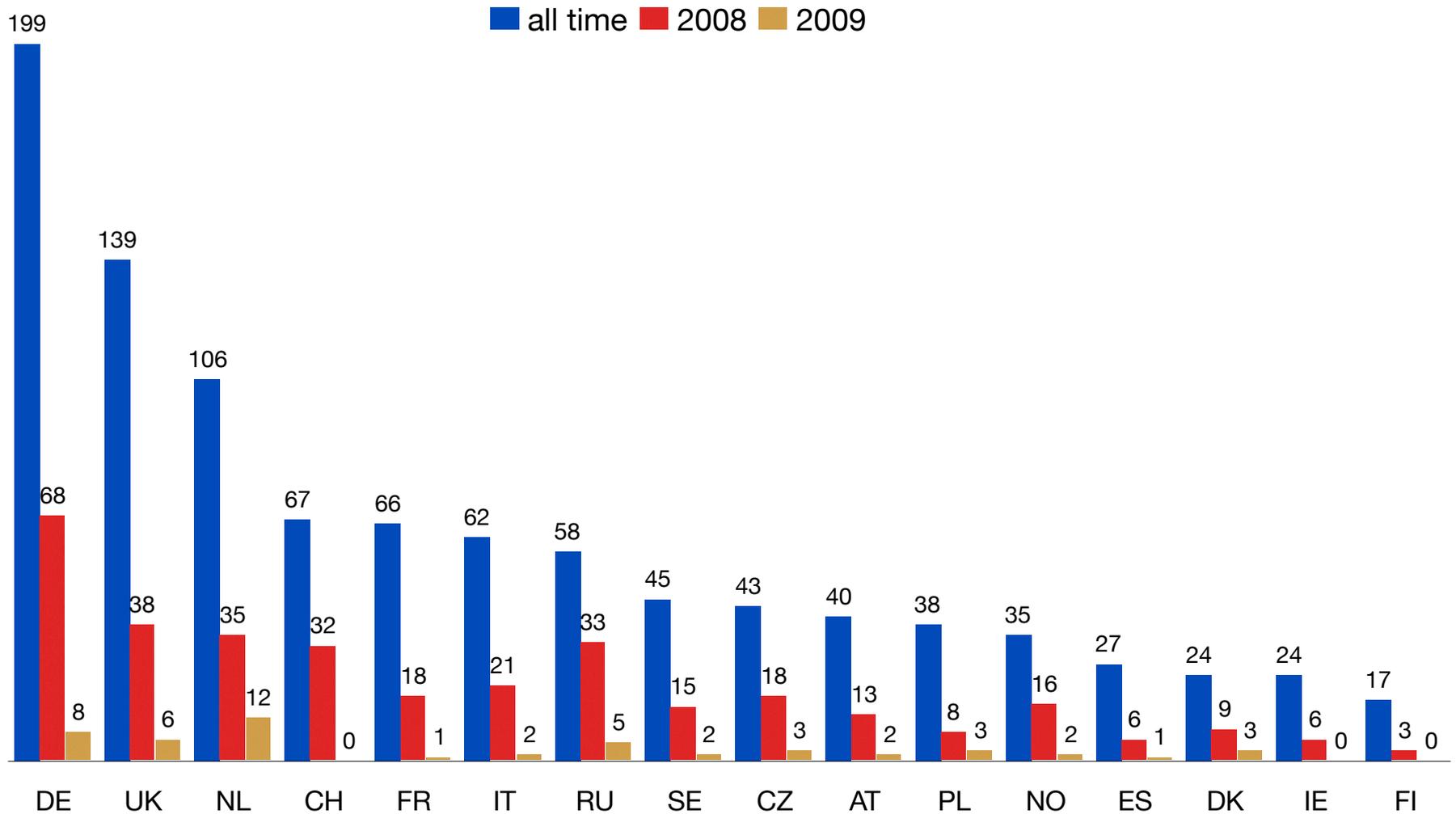http://www.ripe.net/ripe/docs/charging.html

Numbers on IPv6

IPv6 allocations by region, cumulative

IPv6 allocations and announcements
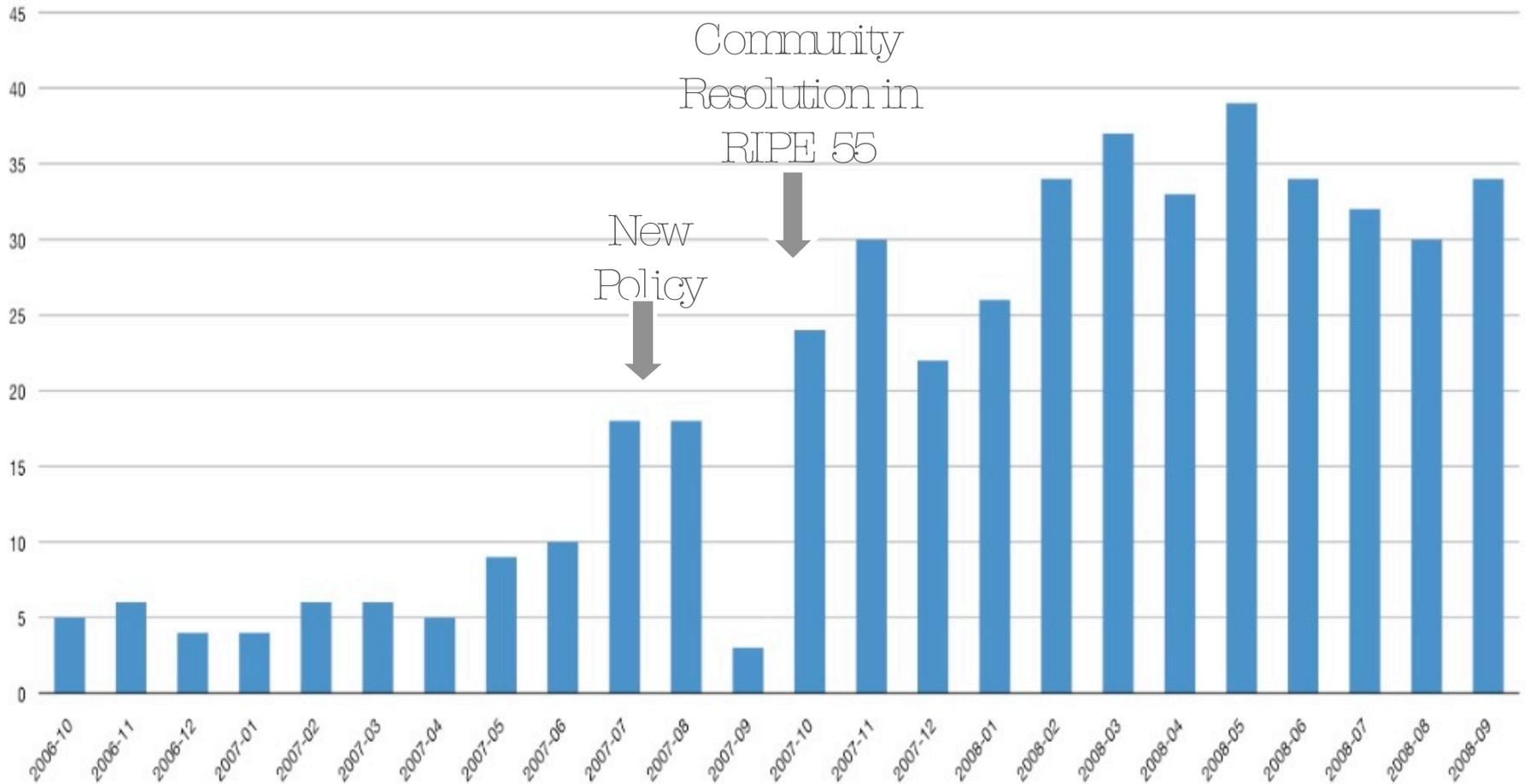
IPv6 allocations per country

Legend: all time (blue), 2008 (red), 2009 (gold)

Country	all time	2008	2009
DE	199	68	8
UK	139	38	6
NL	106	35	12
CH	67	32	0
FR	66	18	1
IT	62	21	2
RU	58	33	5
SE	45	15	2
CZ	43	18	3
AT	40	13	2
PL	38	8	3
NO	35	16	2
ES	27	6	1
DK	24	9	3
IE	24	6	0
FI	17	3	0

RIPE NCC

IPv6 penetration in your region
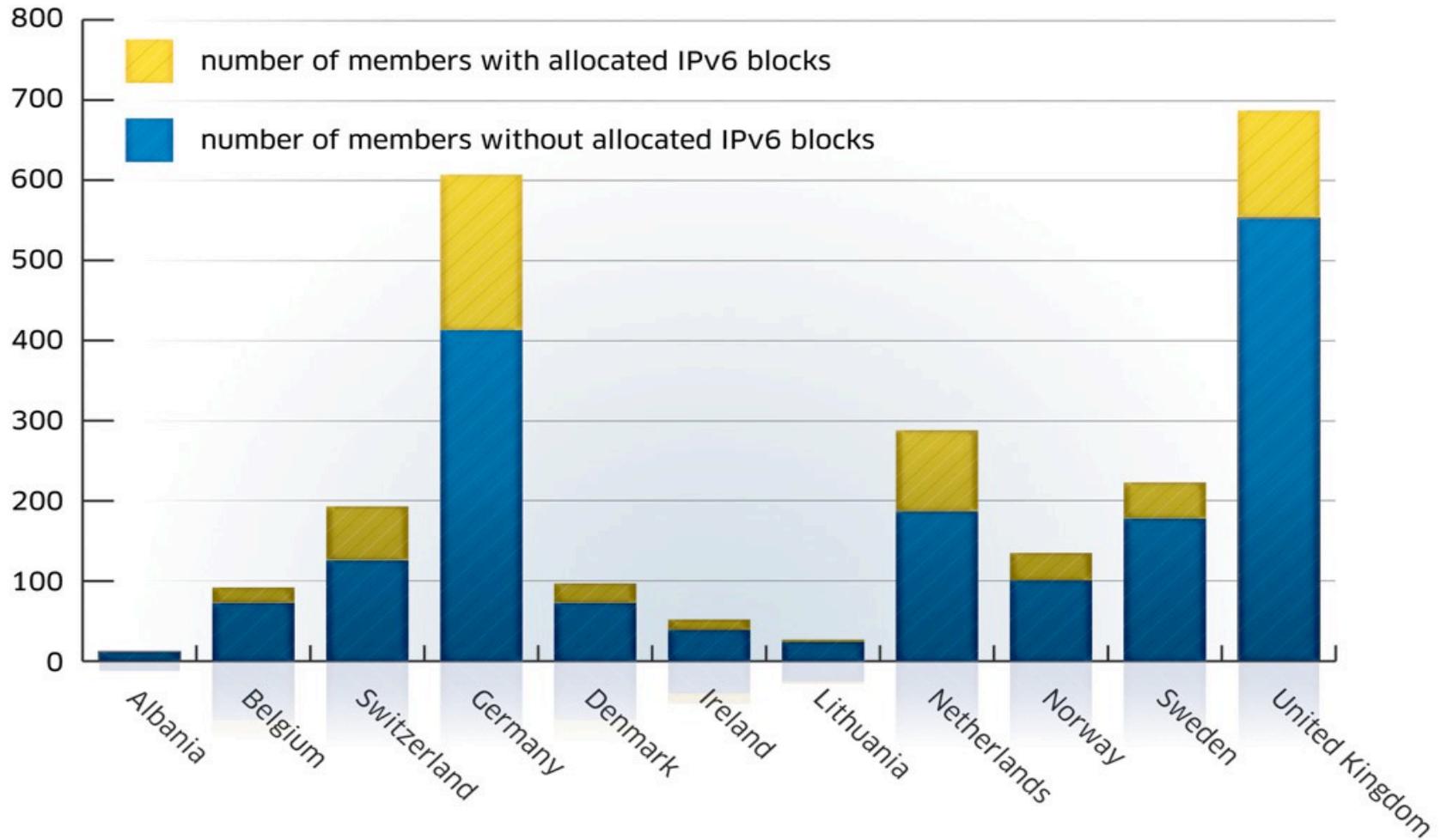
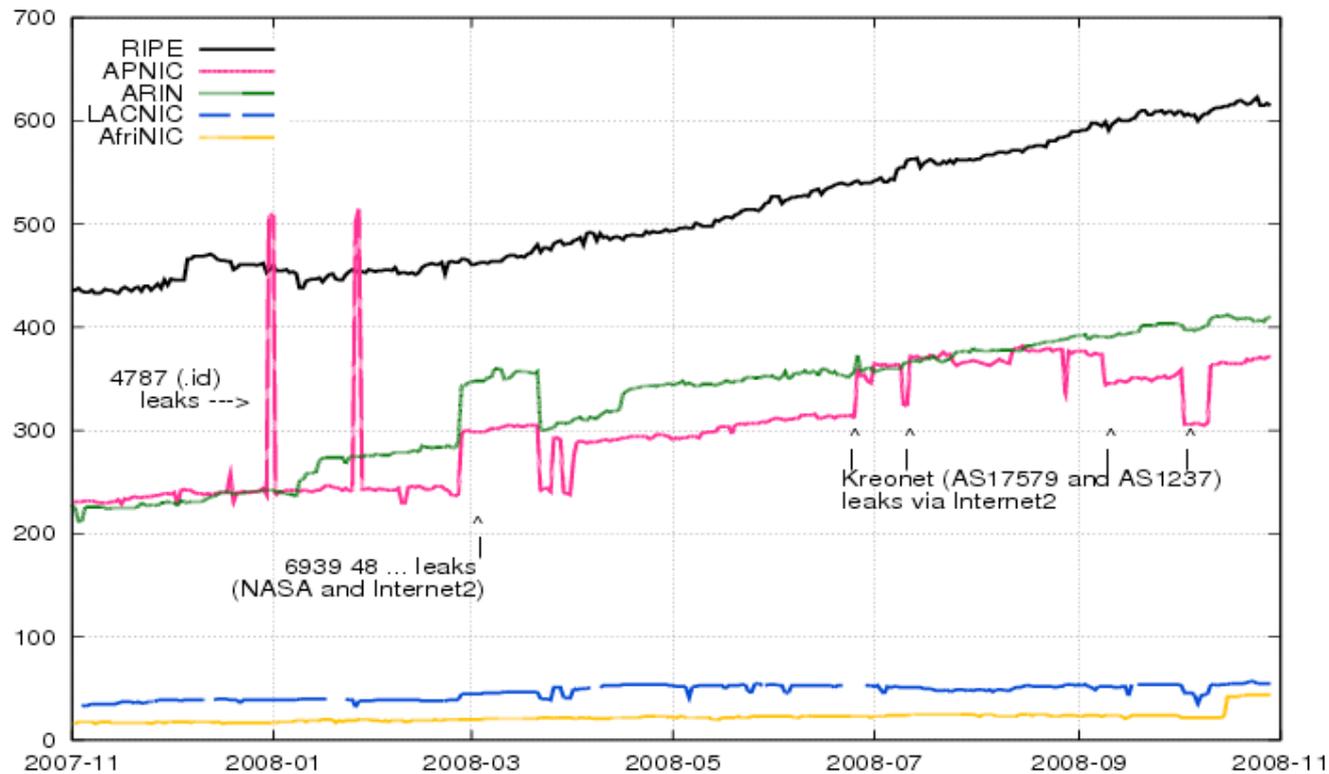# IPv6 allocations in the last 12 months

IPv6 routing table (prefixes by region)

Graphics: prefixes by RIR region

Questions?

AS Number Change

32-bit AS numbers

Global policy on 32-bit ASN deployment schedule:

1 Jan 2008:   16-bit default, 32-bit on request

1 Jan 2009:   32-bit default, 16-bit on request

1 Jan 2010:   Only 32-bit AS Numbers

16-bit AS Numbers will not be deprecated

32-bit AS numbers and you

Can you handle the new formats: "AS 1.10"?
And 65546?

IETF has now made "asplain" a standard
as.dot is still in the RIPE DB for 1 month

Prepare in your organisation:
- ask your hardware vendor for support
- encourage your upstream provider to upgrade

Requesting AS number

Assignment requirements

- Address space
- Multihoming
- One AS Number per network

Requesting AS Numbers

- Create **organisation** and **mntner** objects
- Submit the AS Number request form
- Submit company registration documents

Questions?

LIR course slogans… about IPv4

Will work for /24

RIPE NCC - absolutely classless

You're too late - we have a /8

Soon it will be all too late, no space to allocate

You have reached the end of the Internet

 IPv4 - eats, shoots and leaves!

LIR course slogans… about IPv6

I will miss IPv4

2011: make a date with a /48

Get your IPv6, because the clock ticks

IPv6 is the fix

Ignoring IPv6 since 1996

Links

IPv6 info, news, education, fun
http://www.ripe.net/ipv6/ | http://www.getipv6.info/ | http://www.6diss.org/e-learning
http://yapc.tv/2008/ye/lt/lt2-15-kane-fck/ | "The day that routers died" |

32-bit AS numbers
http://www.ripe.net/news/asn-32-pr2008.html

RIPE Policy Development Process
http://www.ripe.net/ripe/policies/

RIR Comparative Policy Overview
http://www.nro.net/documents/comp-pol.htm

RIPE NCC Member Update
http://www.ripe.net/membership/newsletter/2008/newsletter14.pdf