# News from
RIPE NCC, RIPE, and IPv6

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RIPE != RIPE NCC

- Réseaux IP Européens (1989)
  - Collaborative, open community for Internet operators, administration and development

- RIPE Network Coordination Centre (1992)
  - Independent not-for-profit membership organisation
  - One of five Regional Internet Registries

IPv4 address space distribution

IANA → RIR → LIR → End User

Legend:
- PA Allocation
- PA Assignment
- PI Assignment
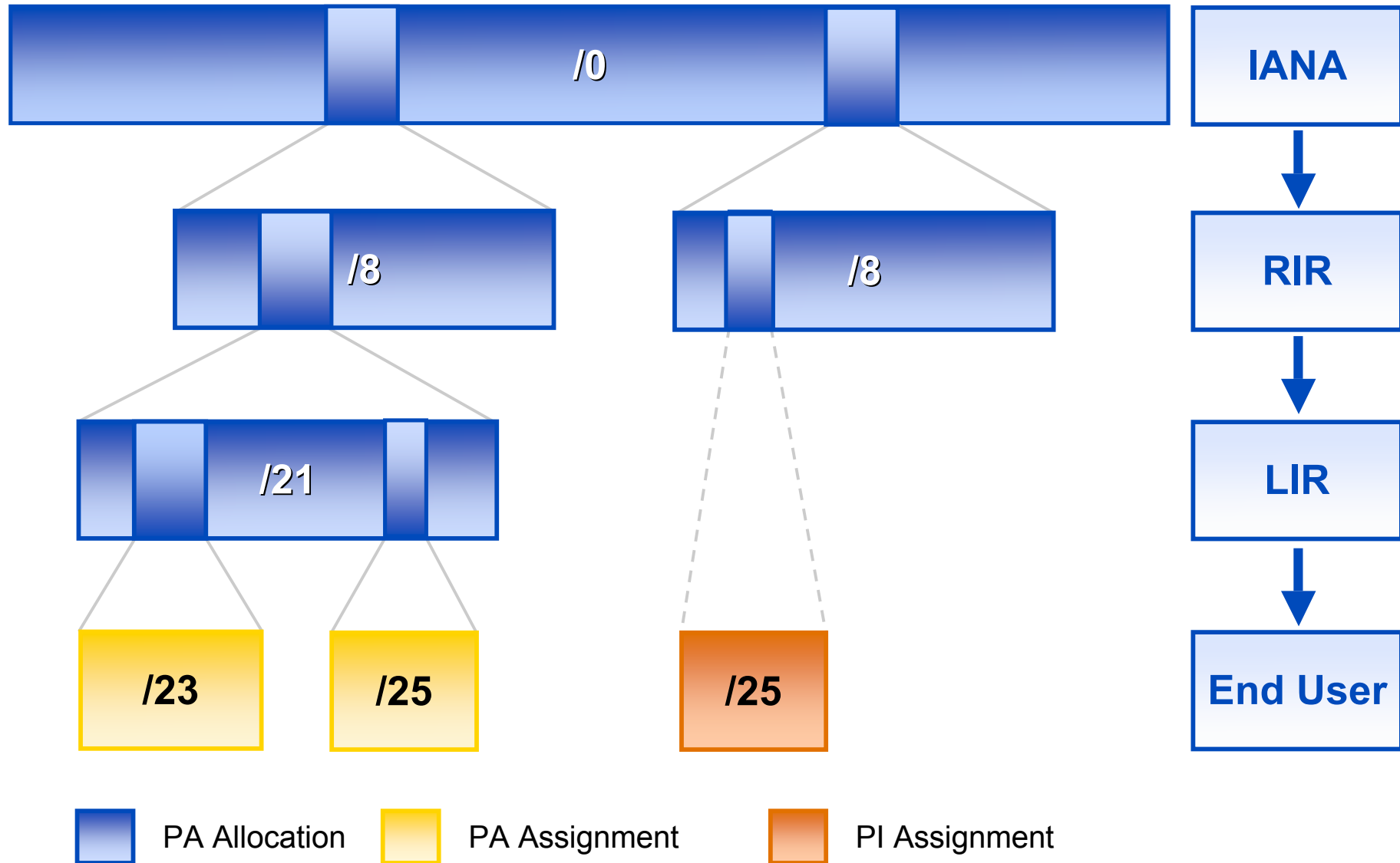
Types of address space
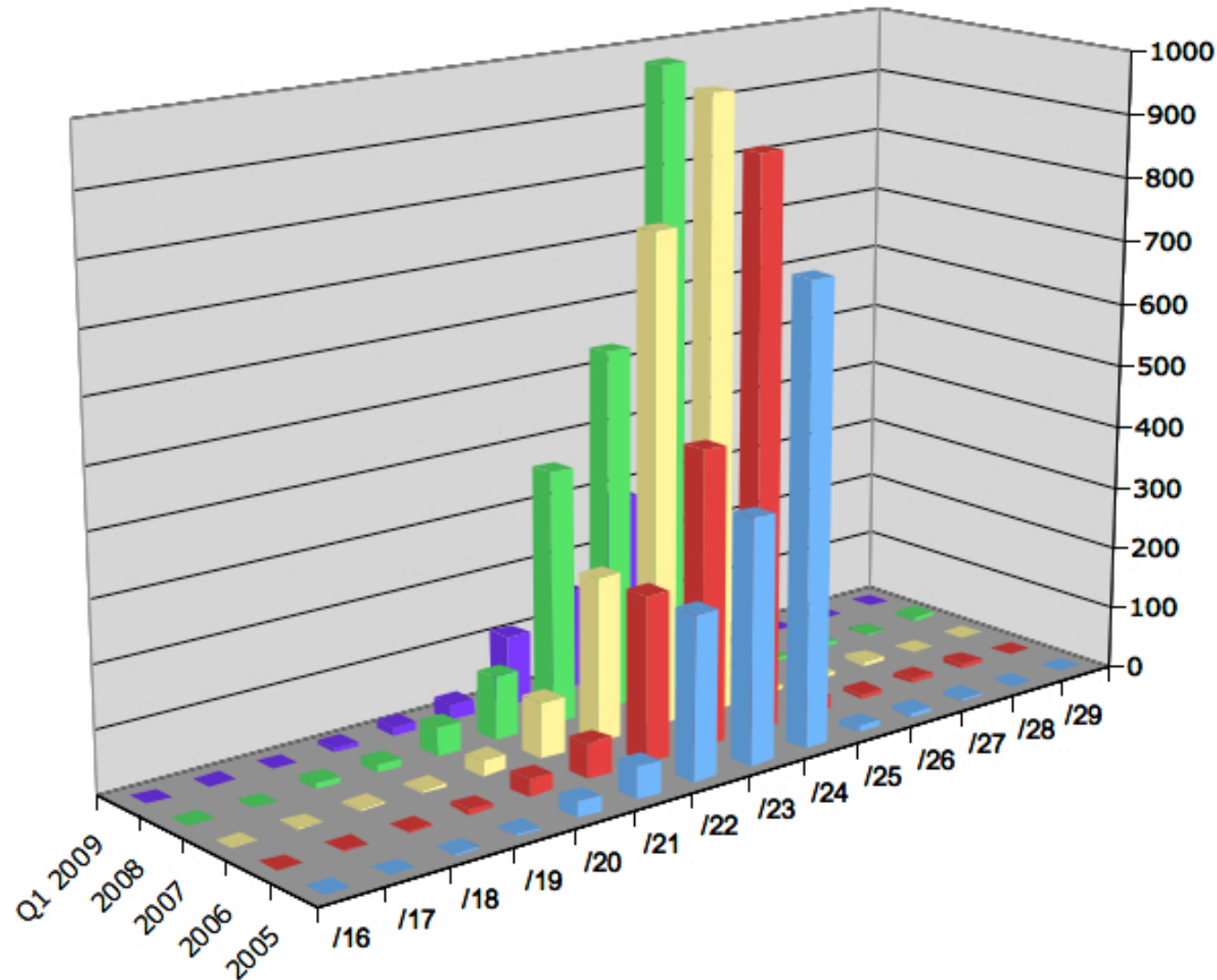
Provider Aggregatable (PA)

- Allocated to LIR/ Assigned by LIR

- Address space remains with LIR

Provider Independent (PI)

- Assigned to End User

- Address space remains directly with End User

Number of PI assignments over time

PI statistics

News about independent resources

- Independent resources
  - PI (IPv4 and IPv6)
  - ASN
  - IXP IPv6
  - Anycast

- Contract with End User required
  - Example contract available

- Yearly charges for Independent Resources
  - RIPE NCC Charging Scheme 2009

Requesting independent resources

- Sponsoring LIR can request for End User

- End User can sign contract directly with RIPE NCC
  - As Direct Assignment User can request for themselves

- End User can become LIR

Existing independent assignments

- ● End User choices (as of Q3 2009):

  - Sign contract with their original LIR

  - Find a new sponsoring LIR

  - Become an Direct Assignment User

  - Become an LIR

  - Return the resource (address space or ASN)

Contacting existing assignment users

Independent Resources	No. LIRs	AS	PI	Totals
0	1191	0	0	0
1	3190	3144	46	3190
2 - 5	1031	1971	1024	2995
6 - 10	260	1054	916	1970
➢10	**422**	**9326**	**9459**	**18785**
Totals	4903	15495	11445	26940

Autonomous System Numbers

- Assignment requirements

  - Address space

  - Multihoming

  - One AS Number per network

- For LIR itself

- For End User

  - Sponsoring LIR requests it for End User

  - Direct Assignment User requests it for themselves

RIR ASN Allocation Schedule

2007 and 2008:
• 16-bit ASN default
• 32-bit ASN optional

January 1, 2009:
• 32-bit ASN default
• 16-bit ASN optional

January 1, 2010:
• No distinction between 16-bit and 32-bit ASNs
• 32-bit ASN only
• Unallocated 16-bit ASNs are reserved

You are here!

RIR[1]	32-bit ASNs Allocated	32-bit ASNs Advertised
AfriNIC	4	1
APNIC	84	6
ARIN	7	2
RIPE NCC	24	7
LACNIC	1	0

[1] http://www.potaroo.net/tools/asn32/

32-bit AS Numbers and you

- Can you handle the new format, e.g.
  - "**AS4192351863**" ?
- If not, please act now!

- Prepare for 32-bit AS numbers in your organisation:
- Check whether your hardware is compatible; if not, ask your hardware vendor for support
- Check whether your upstream provider is running compatible hardware; if not, encourage them to upgrade!
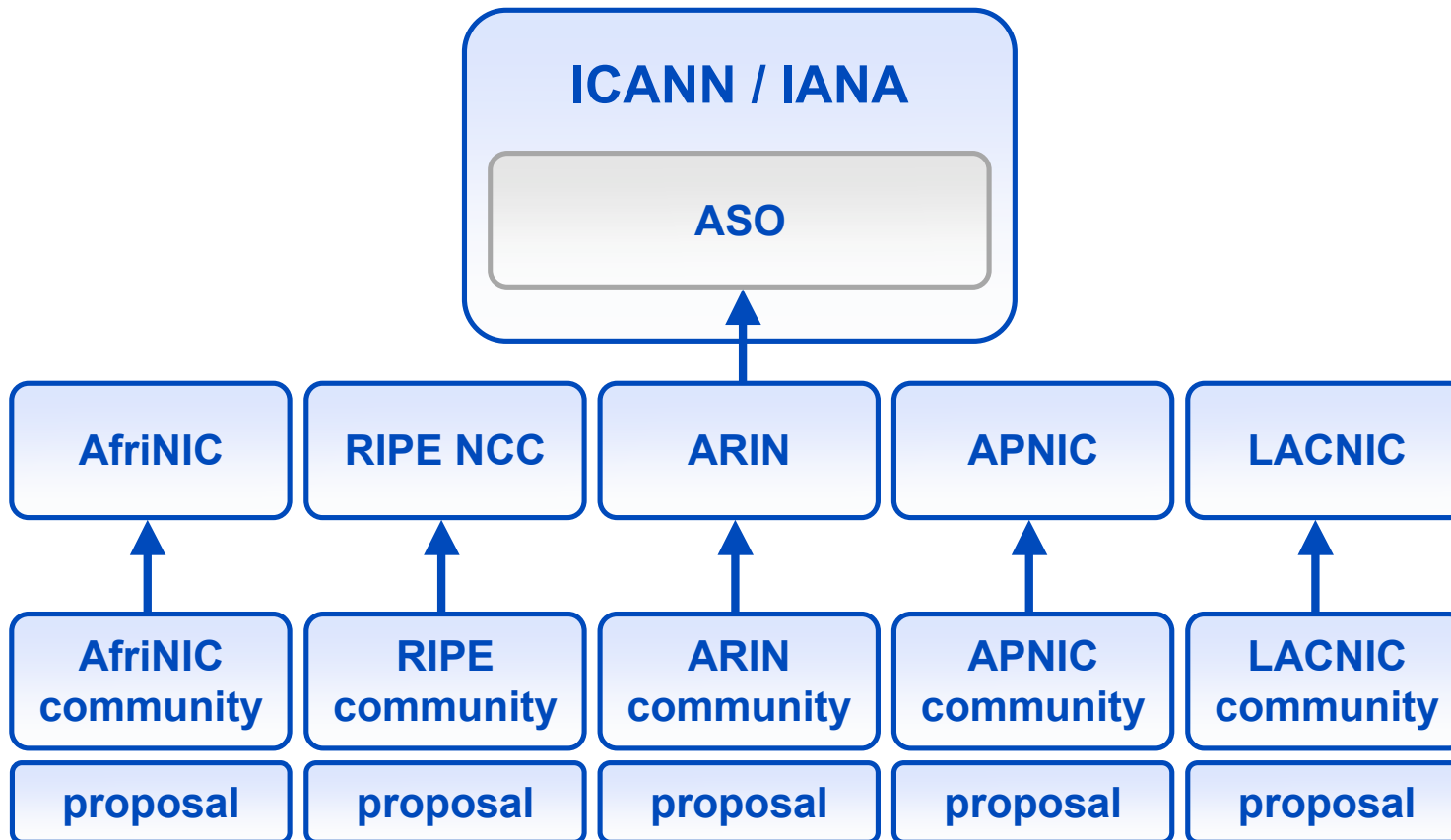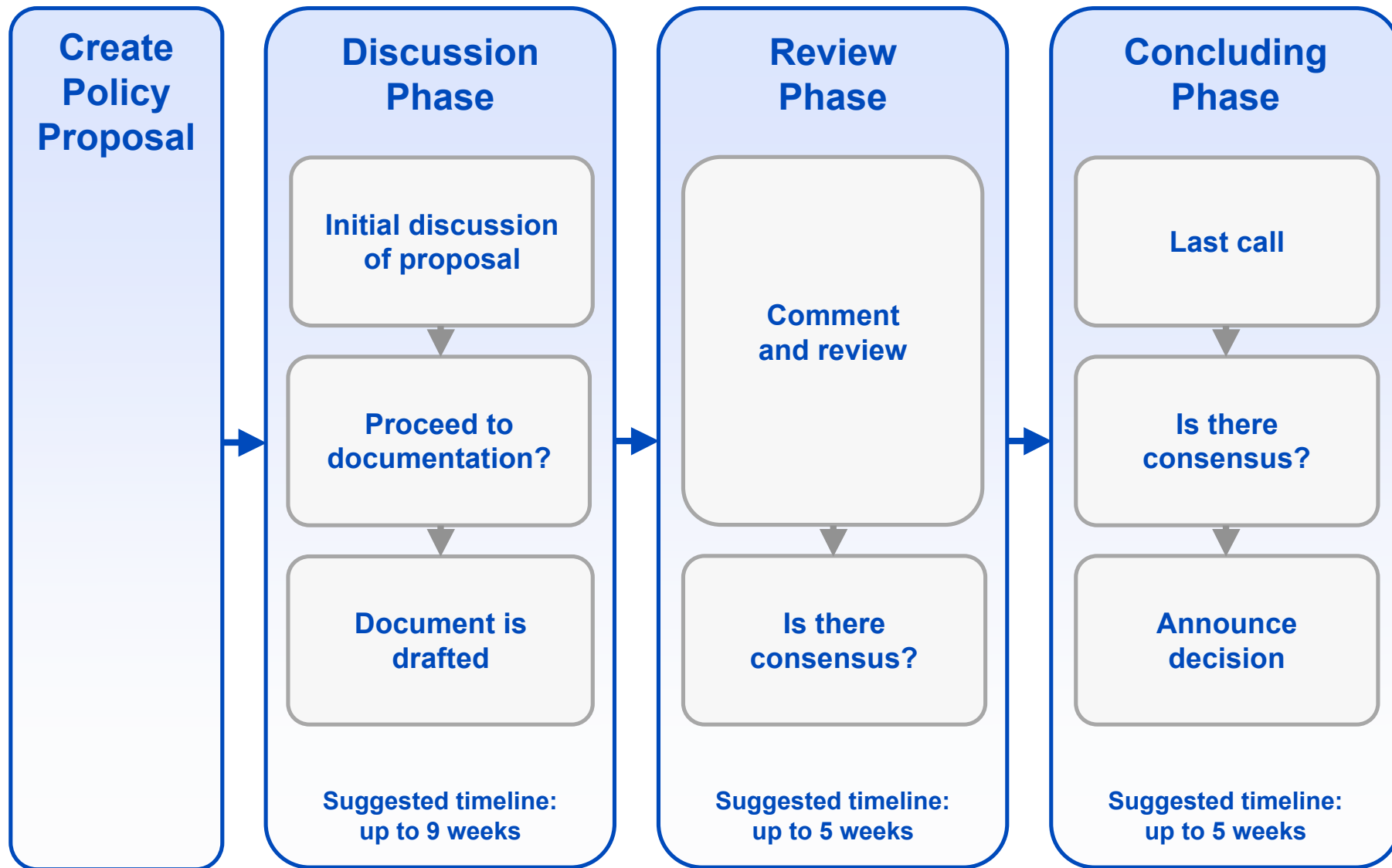
Questions?

RIPE and
the Policy Development Process

Who makes policies?

```
                    ┌──────────────────────────────┐
                    │        ICANN / IANA          │
                    │   ┌──────────────────────┐   │
                    │   │         ASO          │   │
                    │   └──────────────────────┘   │
                    └───────────────▲──────────────┘
                                    │
┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐
│ AfriNIC  │  │ RIPE NCC │  │   ARIN   │  │  APNIC   │  │  LACNIC  │
└────▲─────┘  └────▲─────┘  └────▲─────┘  └────▲─────┘  └────▲─────┘
     │             │             │             │             │
┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐
│ AfriNIC  │  │   RIPE   │  │   ARIN   │  │  APNIC   │  │  LACNIC  │
│community │  │community │  │community │  │community │  │community │
└──────────┘  └──────────┘  └──────────┘  └──────────┘  └──────────┘
┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐
│ proposal │  │ proposal │  │ proposal │  │ proposal │  │ proposal │
└──────────┘  └──────────┘  └──────────┘  └──────────┘  └──────────┘
```

Policy development process

Create Policy Proposal

Discussion Phase

- Initial discussion of proposal
- Proceed to documentation?
- Document is drafted

Suggested timeline: up to 9 weeks

Review Phase

- Comment and review
- Is there consensus?

Suggested timeline: up to 5 weeks

Concluding Phase

- Last call
- Is there consensus?
- Announce decision

Suggested timeline: up to 5 weeks

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Who does what?

- The community - that's you!
  - Creates & discusses proposals

- Working Group (WG) chairs
  - Chair the discussions
  - Decide if consensus has been reached

- The RIPE NCC
  - Acts as the secretariat to support the process
  - Implements the proposals

Why would you want to participate?

- Policy determines how you run your business

- Over 6000 LIRs, however;

- only a fraction are active participants in the PDP

How can you participate?

- Join mailing list discussions about policy proposals

- Read the Working Group mail archives
  - RIPE website → RIPE → Mailing Lists

- Come to the RIPE Meetings
  - Two free tickets for new LIRs
  - Remote participation possible

Newest policy proposals discussed

- End of IPv4
    - Use of Final /8
    - Run Out Fairly
    - IPv4 Allocation and Assignments to Facilitate IPv6 Deployment

- Multiple IPv6 /32 Allocations for LIRs
    - Or: Enable LIRs to also receive IPv6 PI assignments?
    - Or: Remove filtering guideline from IPv6 address policy?

- 32-bit ASN - policy adjustments needed?

- Transfers

Transfer Proposals Matrix

	APNIC	ARIN	LACNIC	RIPE
Prior RIR approval (need must be justified)		Yes	Yes	Yes
Min Block size	/24	Current	/24	Current
Block must be empty of End User assignments				Yes
Type of address space	All	All	All	Only PA
Transferring Org cannot receive space from the RIR within the next 24 months			Yes	
Recipient Org can not transfer the space within the next 24 months			Yes	Yes
Non-permanent transfers				Yes
Inter RIR transfers	Yes			

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Questions?

Getting IPv6

IPv6 address space distribution

/3

/18

/32

/23

/40

/48

/56

/64

/48

IANA

RIR

LIR

ISP

End User
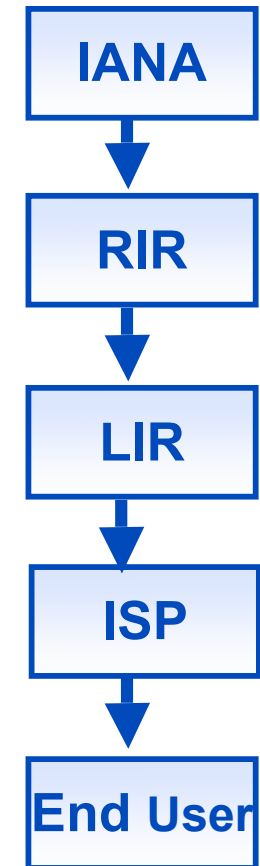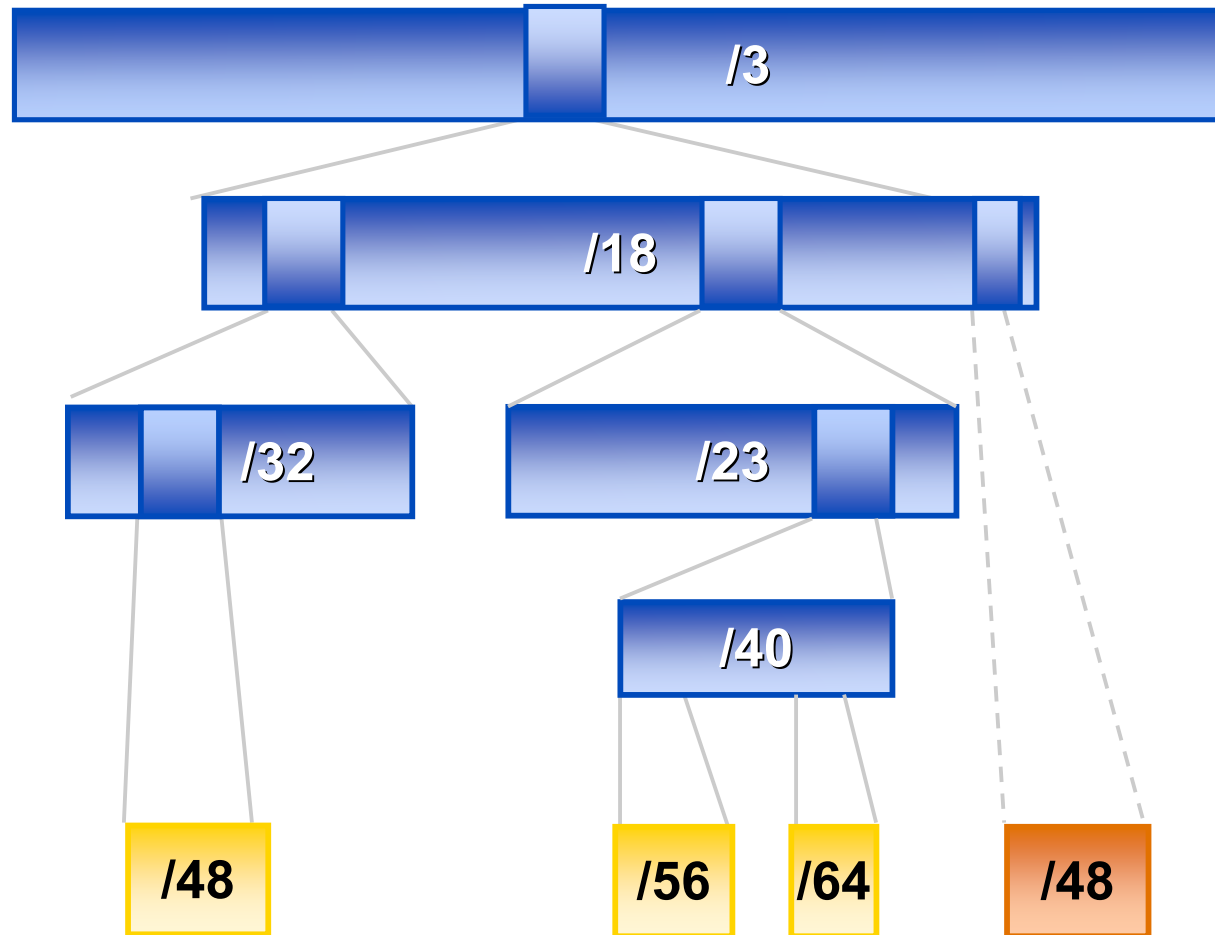
Allocation   Assignment   PI Assignment

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 0.86

  - the unit of measurement is /56

Getting IPv6 if you are not an LIR

- Get a sub-allocation from an LIR

- Get an (PA) assignment from an LIR
    - /48 or /56 for the End User sites

    - /64 for one subnet

    - /128 for hosts

- Provider Independent (PI) IPv6 assignments

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 PA IPv4 allocation, or one AS number

  - /48 of PI IPv6 also "costs" 1 scoring point

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

IPv6 allocations by region, cumulative
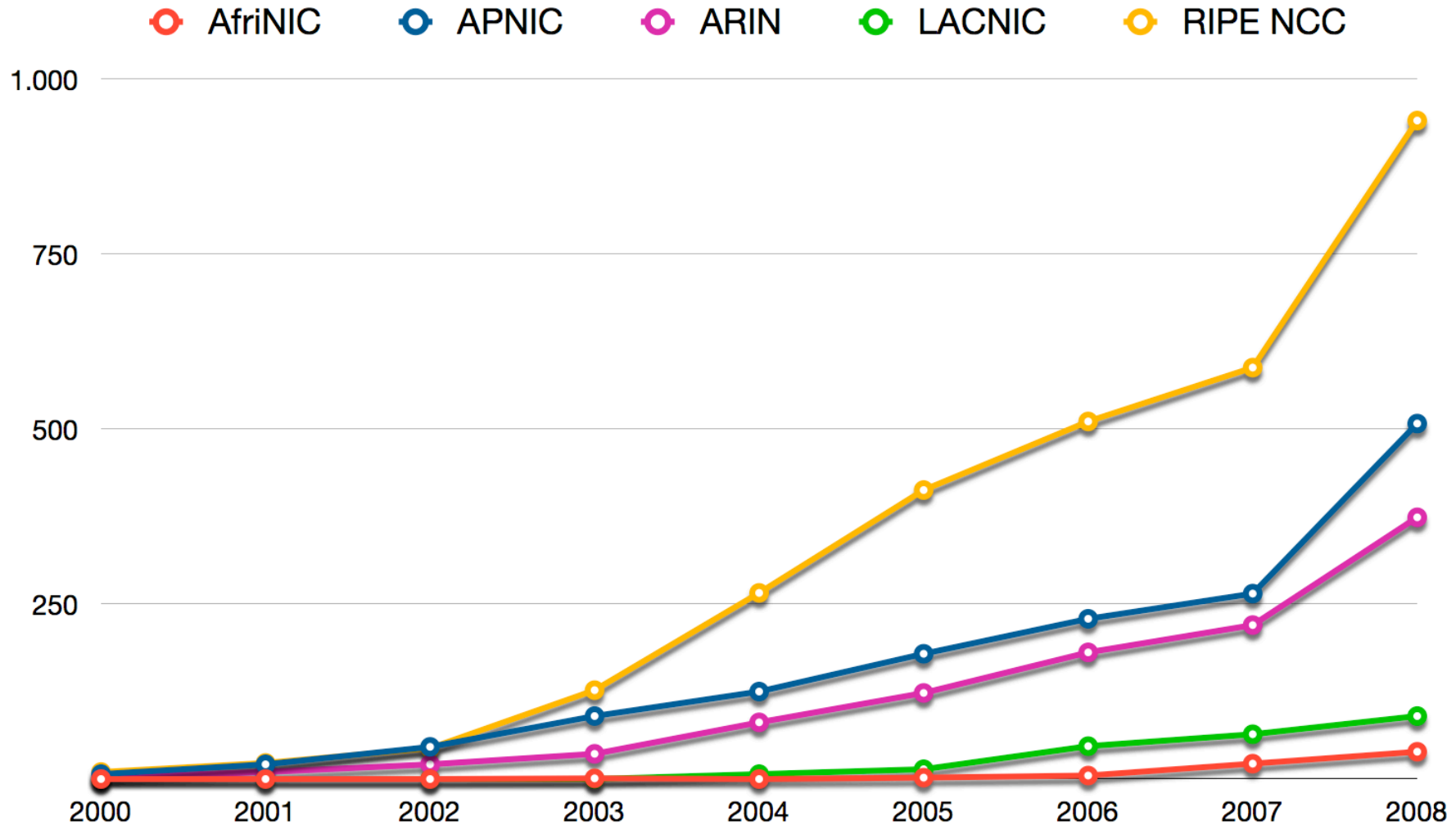
Using IPv6

IPv6 in the Routing Registry

- RPSLng compliant:
  - - - Ripe Database
  - - - IRRToolset: RtConfig

- Create "route6" objects for your IPv6 allocations
  - - - Example lookup: `whois -r -m -T route6 2001::/18`

- Describe routing policy in mp-import: / mp-export:

IPv6 in the reverse DNS

```
inet6num: 2001:0888::/32
status: ALLOCATED-BY-RIR
mnt-by: RIPE-NCC-HM-MNT
mnt-domains: LIR-MNT
```

```
domain: 8.8.8.0.1.0.0.2.ip6.arpa
mnt-by: LIR-MNT
nserver: ns.example.com
nserver: ns.ripe.net
```

First woman on native IPv6 ;-) (xs4all.nl)

The End!

Край

Y Diwedd

Fí

النهاية

Соңы

Վերջ

Finis

Liðugt

Ende   Finvezh

Кінець

Konec

Kraj   Ënn

Fund

پایان

Son

Крај

Lõpp   Beigas   Vége

An Críoch

הסוף   Endir

Fine

Sfârşit   Fin   Τέλος

Einde   Конец

Slut

Slutt

დასასრული   Pabaiga

Tmiem   Koniec

Fim   Amaia   Loppu

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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
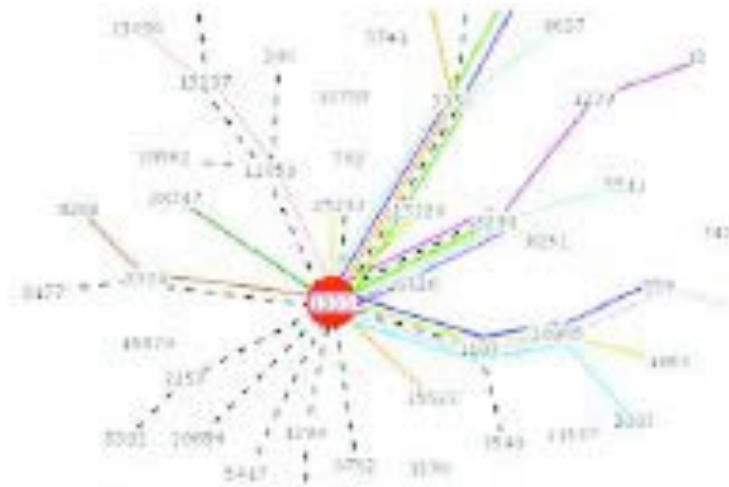
- IPv4 - eats, shoots and leaves!

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

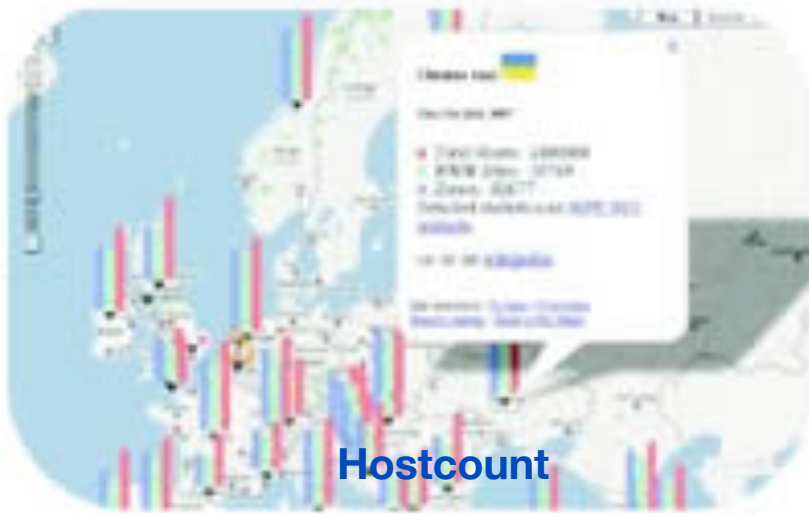- Ignoring IPv6 since 1996
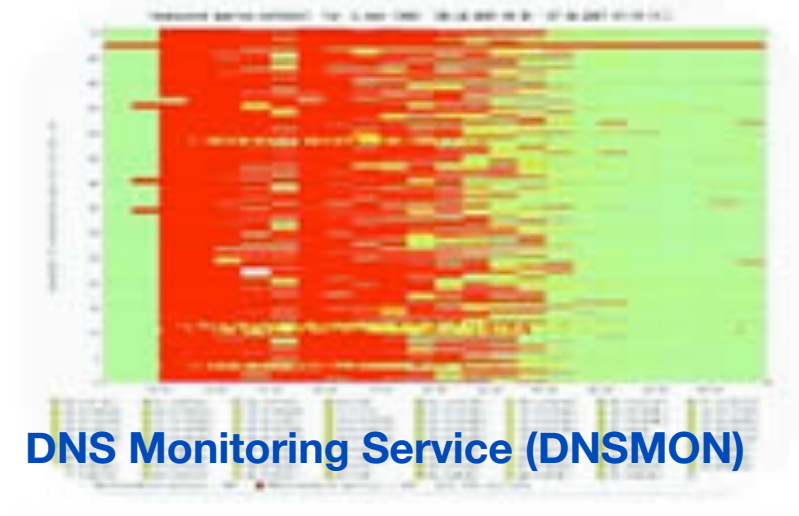
RIPE NCC Information Services

Routing Information Service (RIS)

Test Traffic Measurements (TTM)

Hostcount

DNS Monitoring Service (DNSMON)