Supporting Internet Growth and Evolution:
The Transition to IPv6

Future of the Internet in Mongolia

Ulaanbaatar, Mongolia

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APNIC

Overview

Recap
- About APNIC

Reality check: where are we now?
- Transition to IPv6: statistics
- IPv6 deployment edges
- Resource delegations
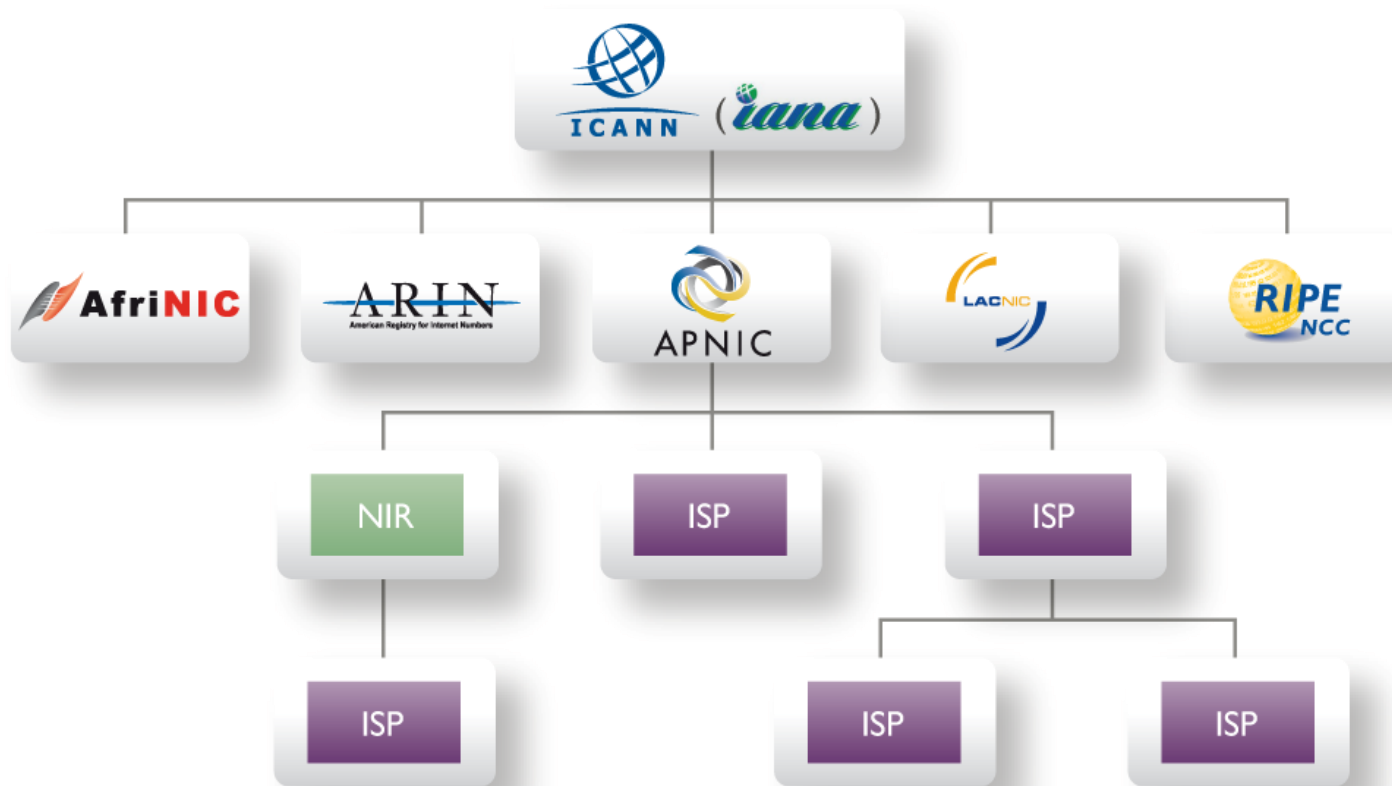- Recent policy implementations

Multi-stakeholder approach
- APNIC's efforts
- Way forward

Recap: About APNIC

Regional Internet Registries

The Internet community established the RIRs to provide fair and consistent resource distribution and accurate resource registration throughout the world.

Internet Registry Structure

APNIC's Mission

Assist the Asia Pacific community in effective resource management

- Equitable allocation and registration services

Provide educational opportunities

- 77 courses in 36 locations to over 1870 participants in 2009
- Fully equipped Training lab (IPv6 supported)
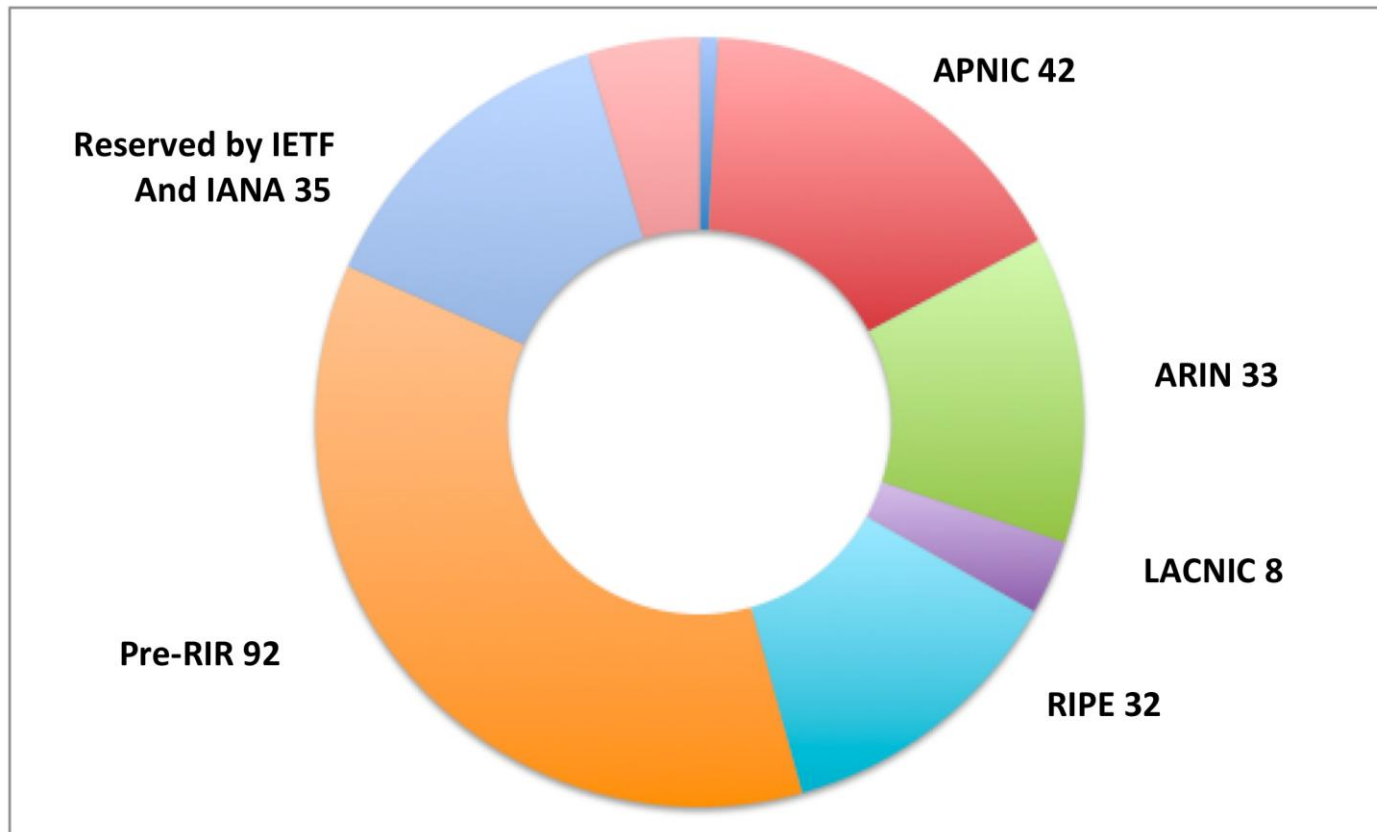- eLearning web classes twice per month

Coordinate IP addressing policy development.

Where are we now?

IPv4 Address Global Distribution

Available unallocated
Pool 12 < 5%

AfriNIC 2

APNIC 42

Reserved by IETF
And IANA 35

ARIN 33

LACNIC 8

RIPE 32

Pre-RIR 92

October 2010

IPv4 Consumption: Projection

Projected IANA exhaustion:		**January 2011**
Projected RIR exhaustion:		**January 2012**

http://www.potaroo.net/tools/ipv4/index.html **18/10/2010**

IPv4 Consumption: Projection

Projected IANA exhaustion: January 2011
Projected RIR exhaustion: January 2012

When will your ISP run out of IPv4 addresses?

http://www.potaroo.net/tools/ipv4/index.html 9/9/2010
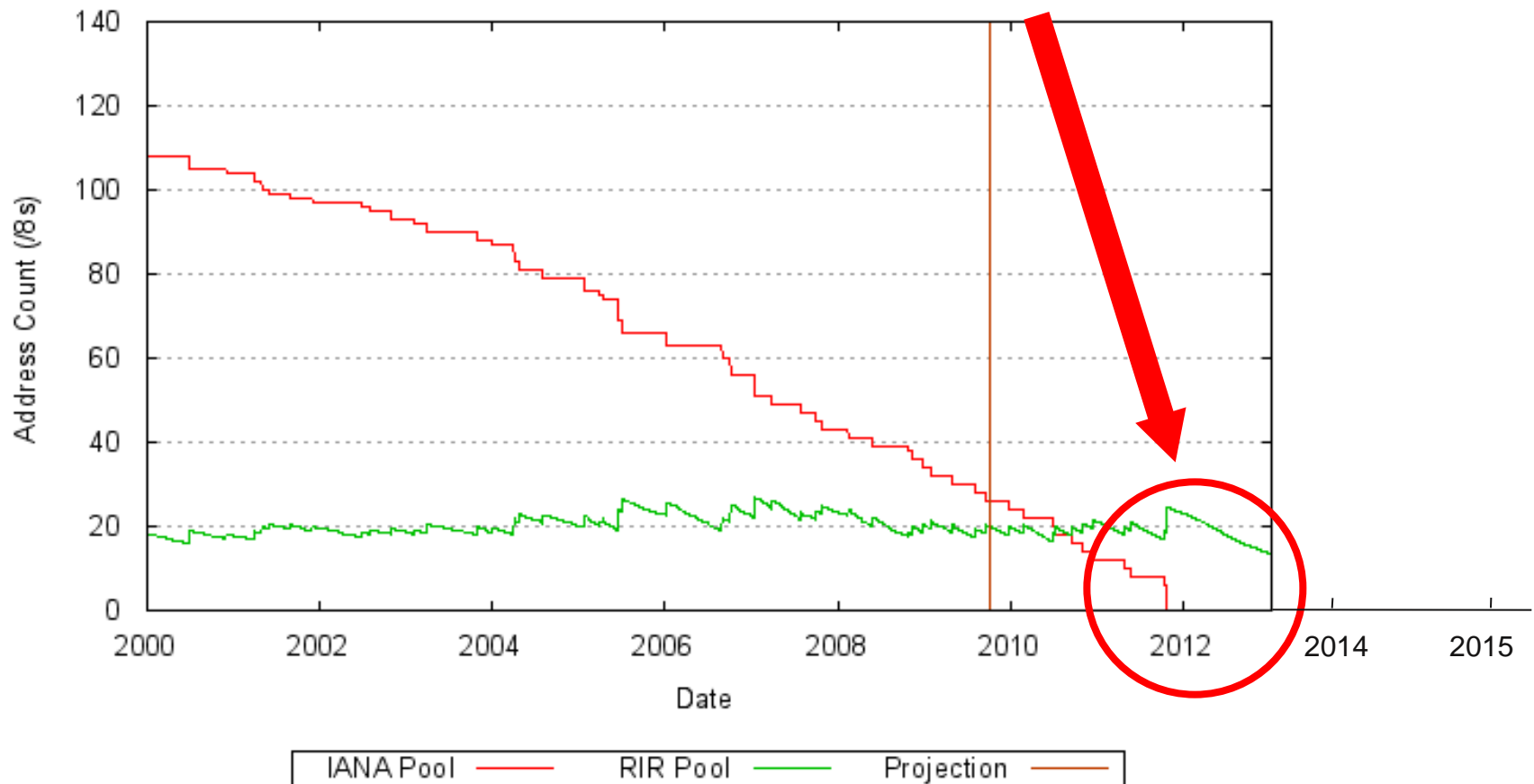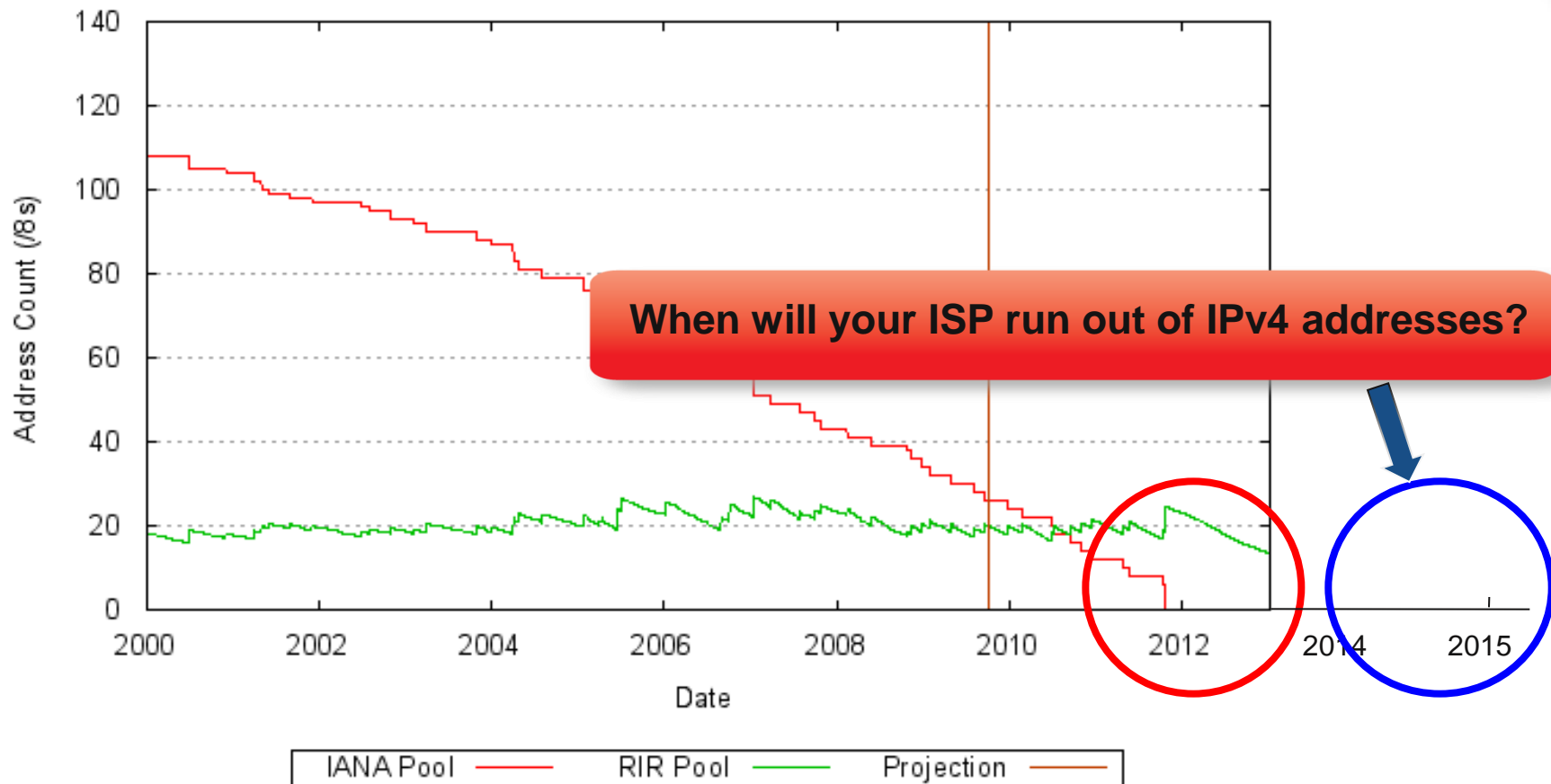
Transition to IPv6

IPv4 address exhaustion inevitable

- January 2011: IANA allocates the last /8
- January 2012: APNIC first RIR to exhaust IPv4
- Even now, some IPv4 address blocks have reachability concerns,
- IPv6 should be inevitable
- The only solution to IPv4 exhaustion
- Protocol is 10 years old
- Under a new spotlight for at least 18 months

How far have we come?

Spotlights on Deployment

- IPv6 Deployment Surveys
  - APNIC & EU survey 2009
- IETF 77 in Anaheim, March 2010
  - ISOC Panel "IPv6: Are you there yet?"
  - Leslie Daigle (ISOC), Geoff Huston (APNIC) et al
    - http://www.isoc.org/isoc/conferences/ipv6momentum

IPv6 address allocations and assignments (ISPs)
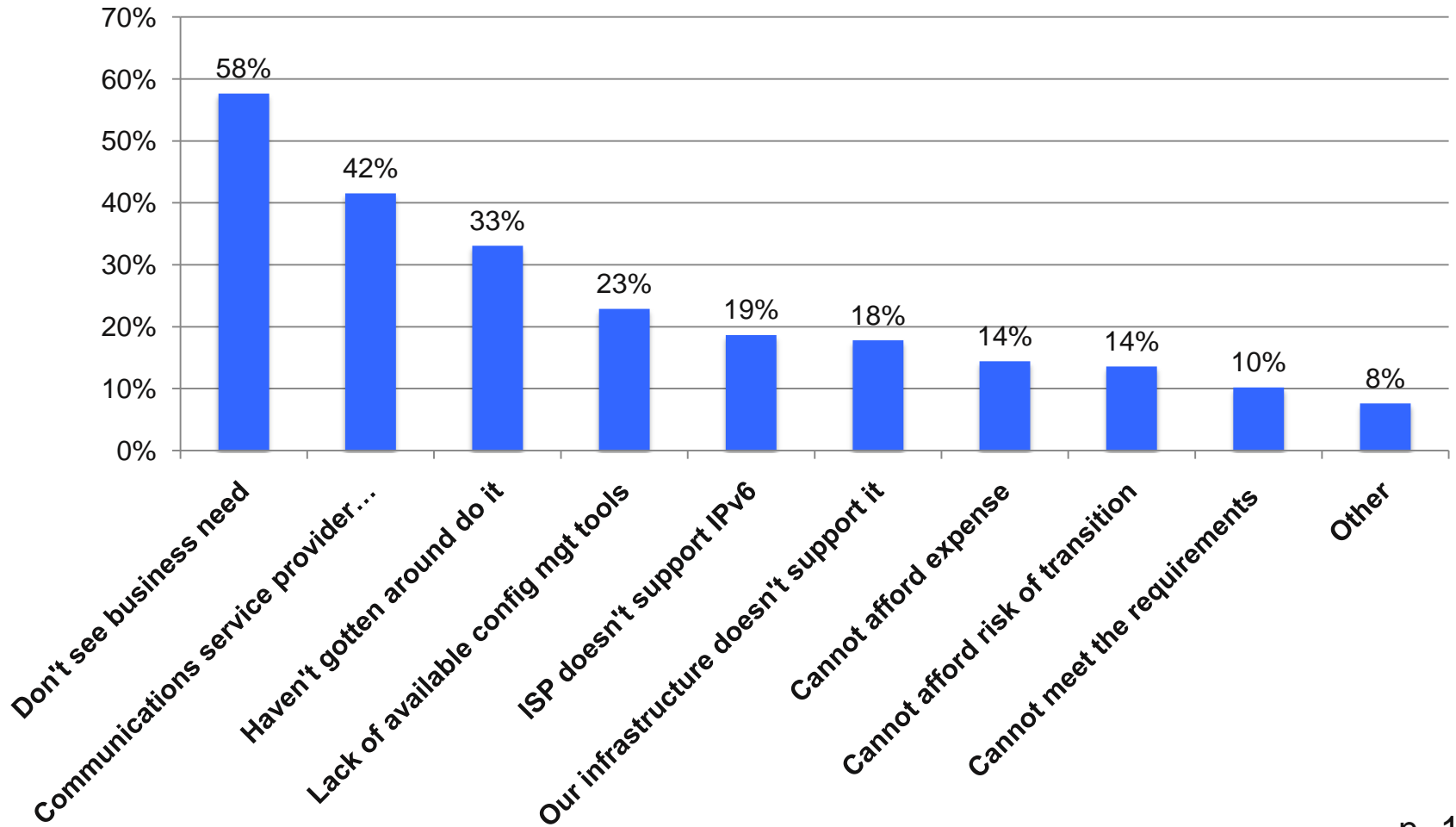

No
29%

Yes
71%
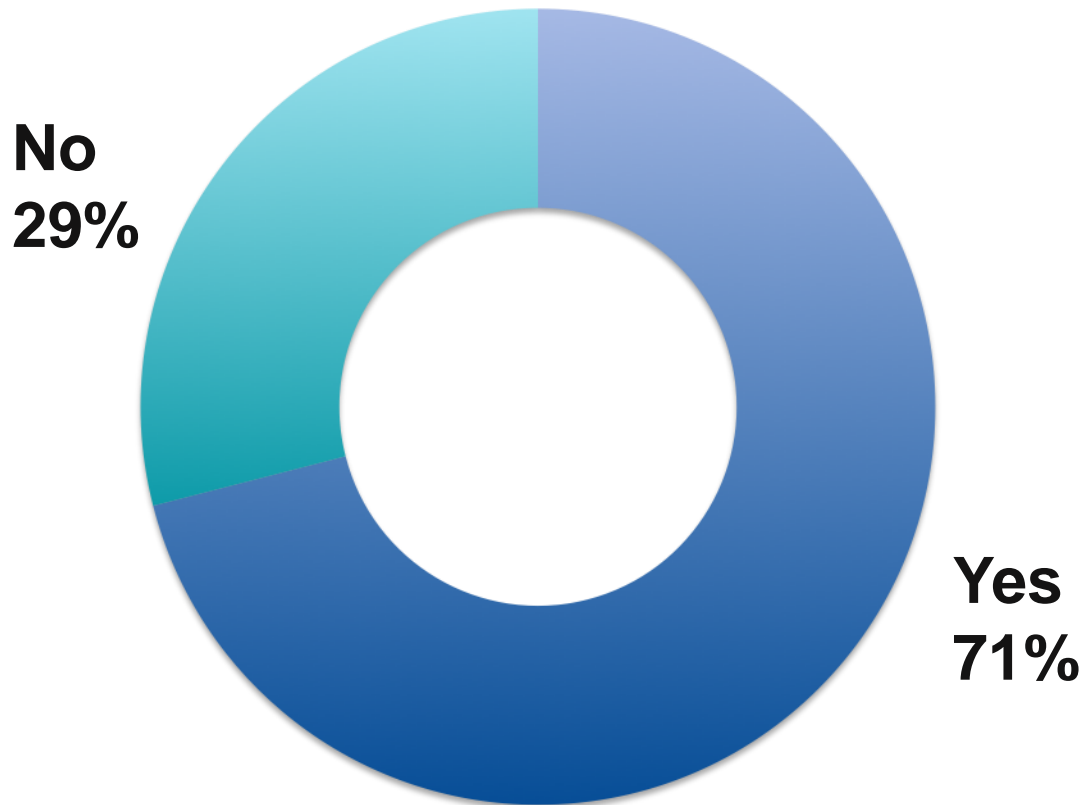
Does your organization have, or consider having an IPv6 allocation and/or assignment? (Sept 2009)

n=192

APNIC: Survey 2009
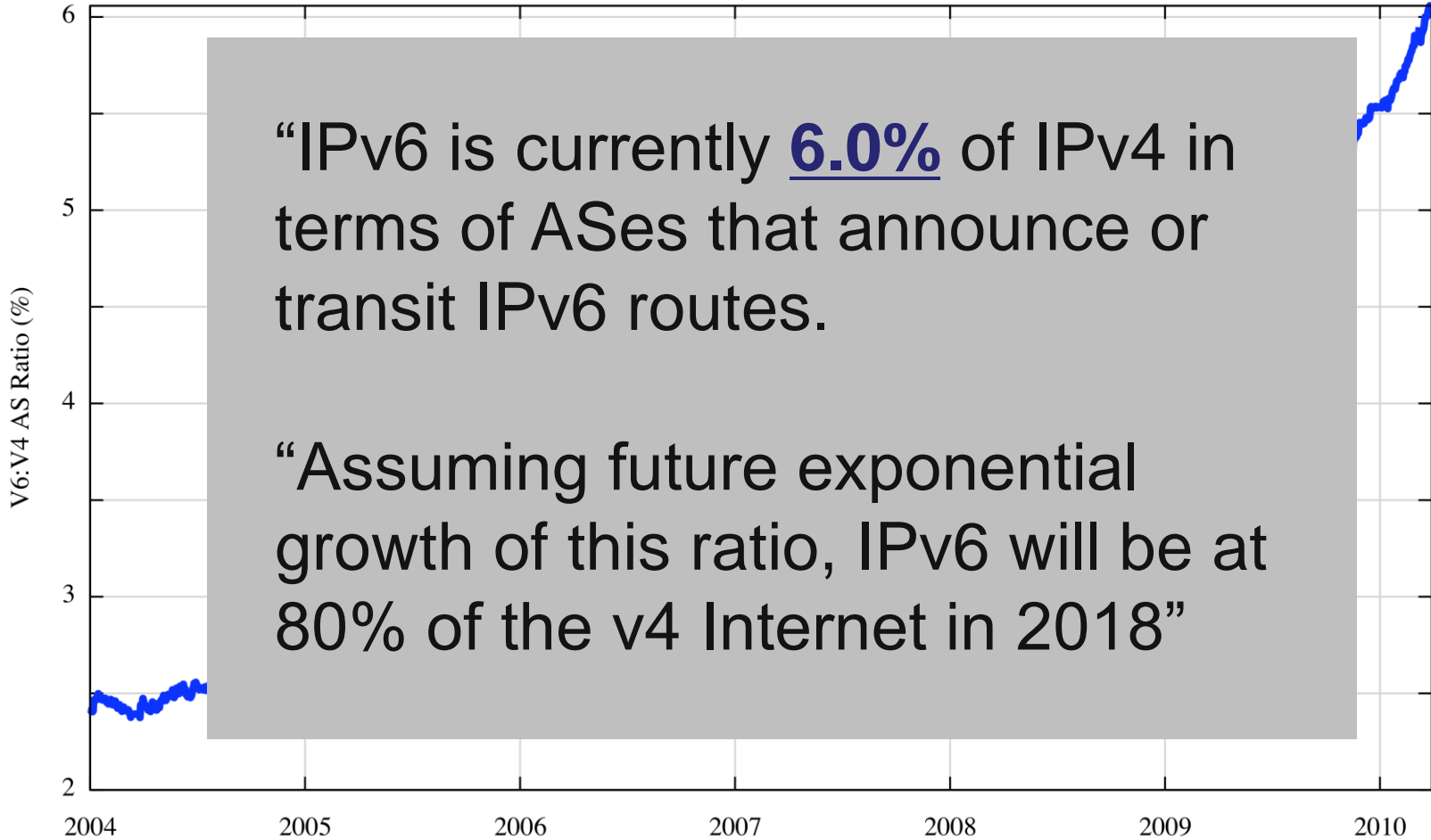
If not, why not considering IPv6?

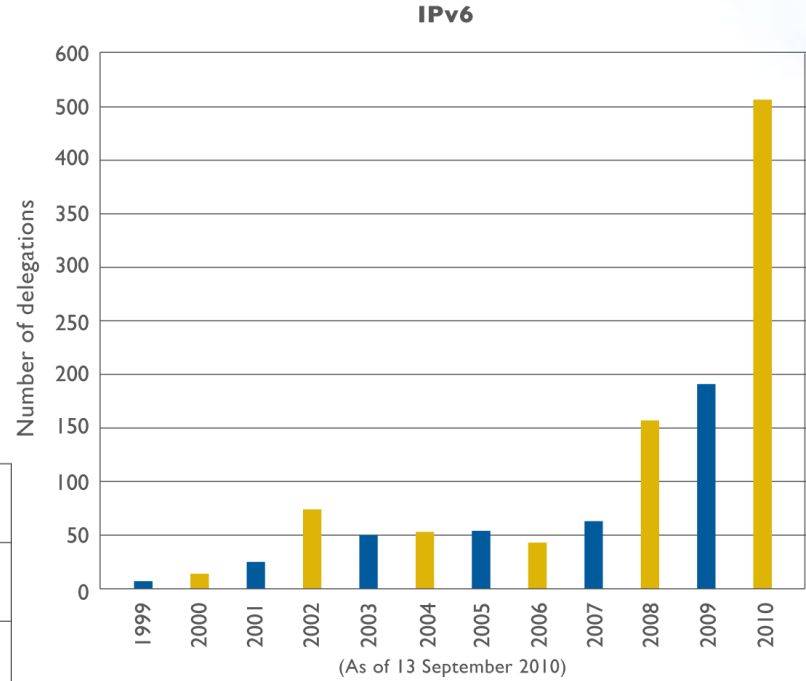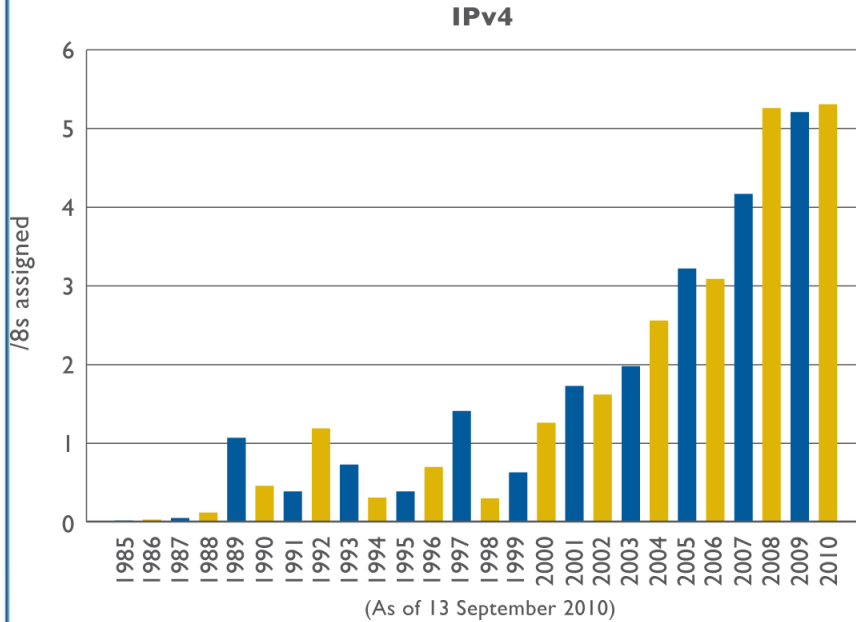Bar chart showing reasons for not considering IPv6:
- Don't see business need: 58%
- Communications service provider...: 42%
- Haven't gotten around do it: 33%
- Lack of available config mgt tools: 23%
- ISP doesn't support IPv6: 19%
- Our infrastructure doesn't support it: 18%
- Cannot afford expense: 14%
- Cannot afford risk of transition: 14%
- Cannot meet the requirements: 10%
- Other: 8%

n=118

Ratio of IPv6 to IPv4 ASes

Measuring IPv6 Deployment by Geoff Huston, APNIC http://www.isoc.org/isoc/conferences/ipv6momentum/

Ratio of IPv6 to IPv4 ASes

"IPv6 is currently **6.0%** of IPv4 in terms of ASes that announce or transit IPv6 routes.

"Assuming future exponential growth of this ratio, IPv6 will be at 80% of the v4 Internet in 2018"

Measuring IPv6 Deployment by Geoff Huston, APNIC http://www.isoc.org/isoc/conferences/ipv6momentum/

Resource Delegations

IPv4

(As of 13 September 2010)

IPv6

Number of delegations

(As of 13 September 2010)

Recent Policy Implementations

Proposal	Title	Overview
Prop-073	Simplifying allocation/assignment of IPv6 to APNIC Members with existing IPv4 addresses	Kickstart IPv6: Available from the public and MyAPNIC websites as a simple, one-click application for current IPv4 address holders to obtain an appropriately sized block of IPv6 addresses.

http://www.apnic.net/policy/proposals

Need IPv6 Addresses?
IPv6 Kickstart Policy

What next?

Challenges and Opportunities!

Sometime in 2012…

- ISPs will need addresses for new network infrastructure

  - and will receive only IPv6

- End users will start receiving IPv6 Internet services

  - With or without private IPv4 addresses

- Enterprises and businesses will get IPv6 for their new networks

- Are you ready?

ISPs

- *Note well: One day soon, you will only get IPv6 addresses for new deployments…*

- Is your infrastructure ready for IPv6?
- Can you deliver IPv6 services in 2012?
- What is your plan for IPv4 services to your customers? None? Customer NAT? CGN?
- Are your services and systems ready?
  - DNS, SMTP, web, mail, etc
  - Security, monitoring, customer admin, billing…

Enterprises and Content Providers

One day, your customers and business partners may only have IPv6 addresses…

- Will your website and services be visible via IPv6 in 2012?
- Do you have an upgrade plan?
- Does your domain name have AAAA?
- Do all your service providers, integrators and vendors have their plans in place?
- Have you asked them?

Governments

- Do you have procurement criteria mandating IPv6 capabilities?

- Are your agencies ready with IPv6?

- Are your online and e-government services ready with IPv6?

- Are your Internet industries up to speed?

Others…

- System integrators and consultants
  - Can you put all the pieces together?
  - Are your people trained to answer questions?
  - Can you help your customers with their planning?

- Academics and educators
  - Is your institution ready for IPv6 in 2011?
  - Are you producing IPv6-ready graduates?
  - Have you upgraded your skills?

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In Conclusion

IPv6 Address Management?

- RIRs will continue providing equitable services to the Internet community
  - A stable and proven structure to manage Internet resources for the past 20 years
- Address management is not the issue in IPv6 deployment
  - Policies are stable and unrelated to deployment
- All efforts should go to IPv6 deployment
  - In the core and at the edges

"What's the Killer App for IPv6?"

The Internet !

Thank You!

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