Asia Pacific Network Information Centre

APNIC

The Business Case for IPv6

PITA CEOs' Forum

24 April 2010

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Director General, APNIC

Why IPv6?

Internet fundamentals

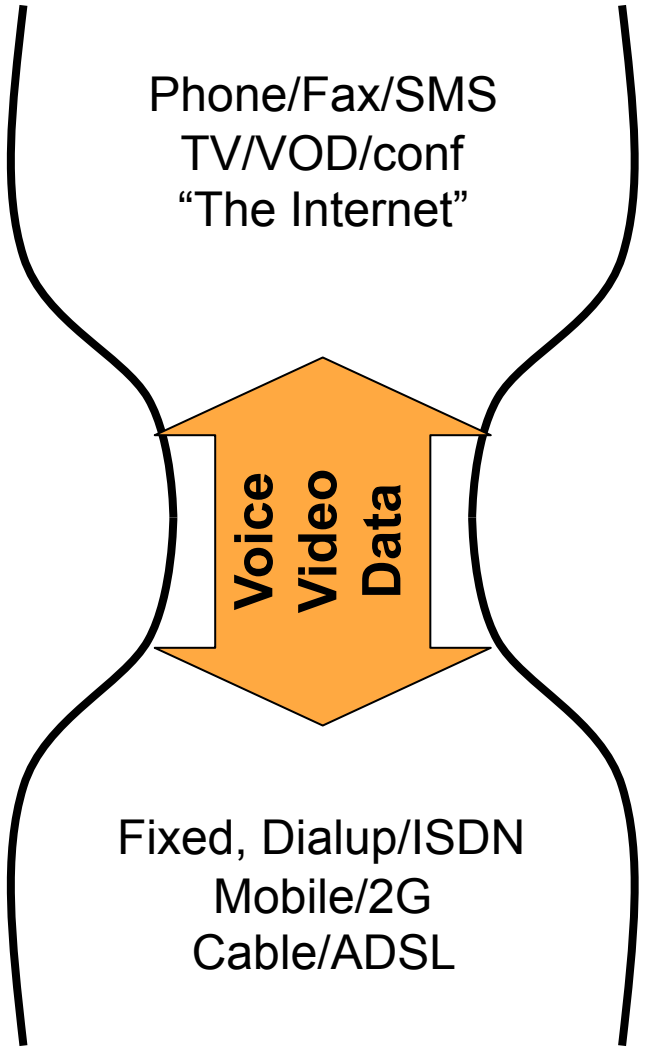
- Open network, open standards
  - Developed within IETF system (RFC series)
  - TCP/IP, DNS, DHCP, HTTP, IPSEC, etc etc
  - “Dumb network” – global p2p datagram service
- “IP over Everything”
  - Layered networking model (a la OSI)
  - Relying on ITU and IEEE standards
  - Serial line, Modem, Ethernet, ISDN, xDSL, cable/fibre, MPLS, 802.11x, Mobile 2G/3G…
- Platform for competition and innovation
  - Great benefits to consumers

The “Protocol Hourglass”

Applications

Network

Infrastructure

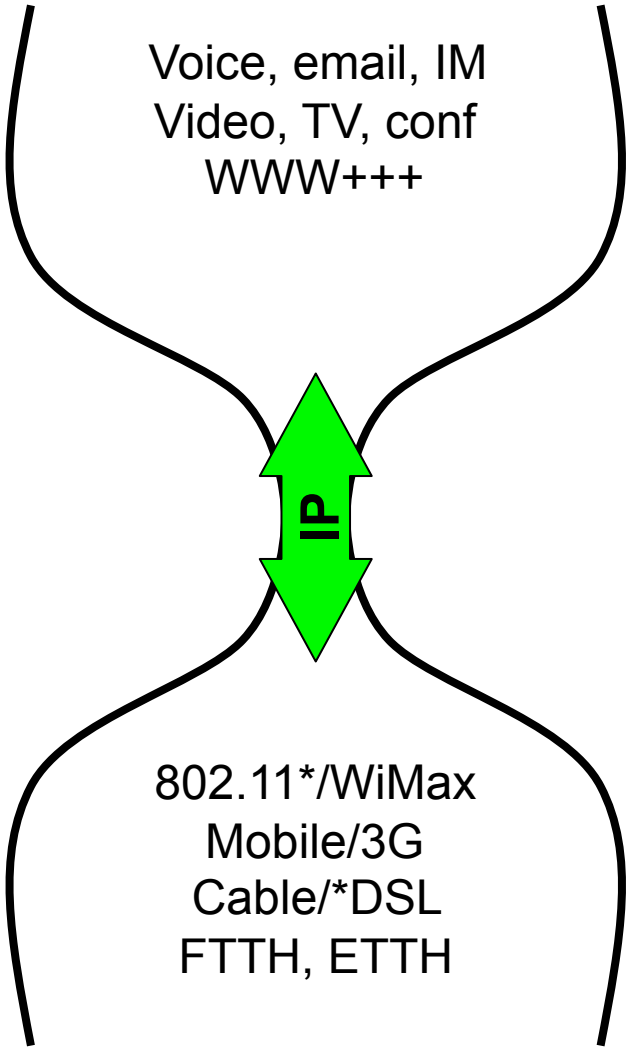


The Hourglass – Tomorrow

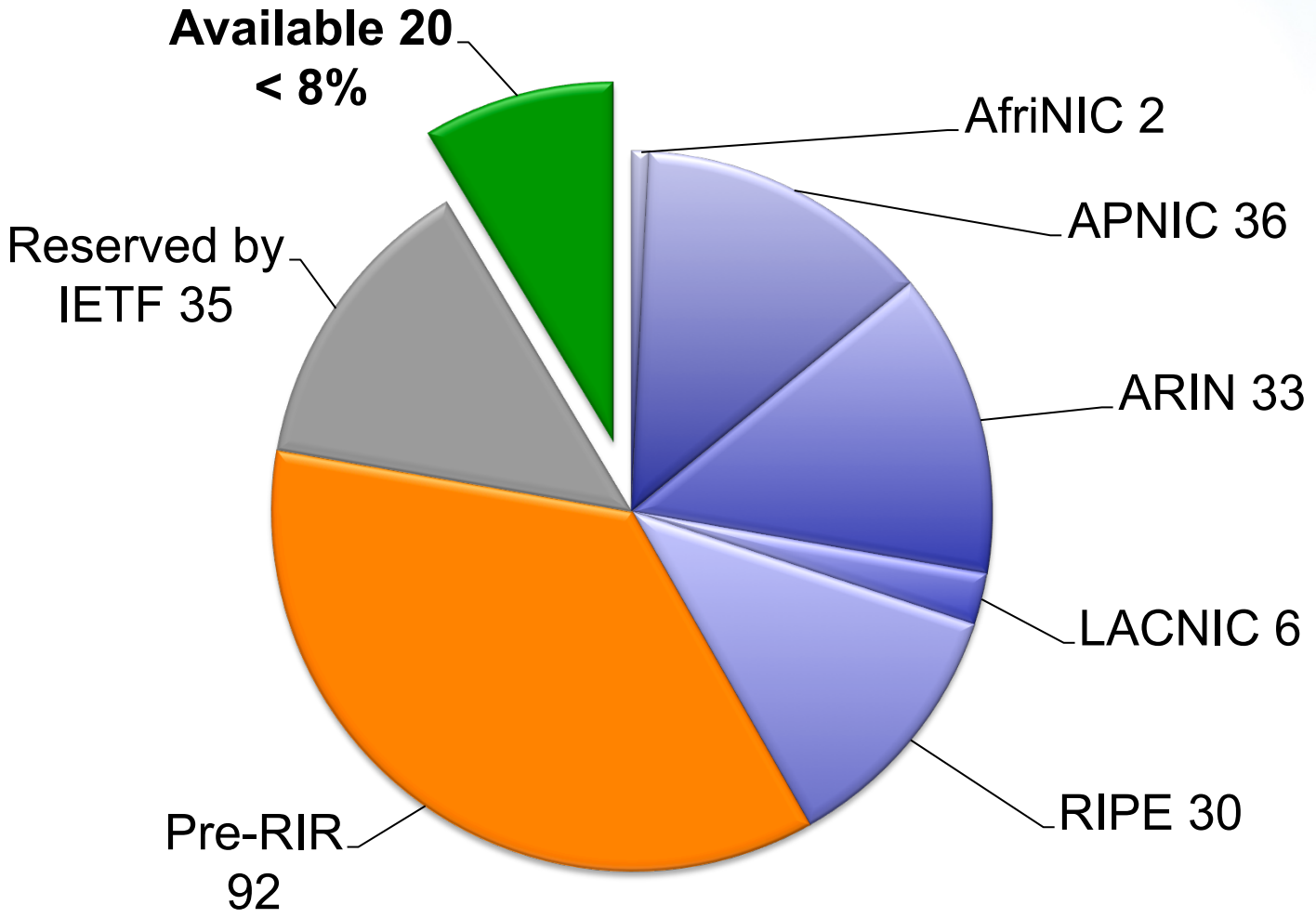
Applications

Network

Infrastructure

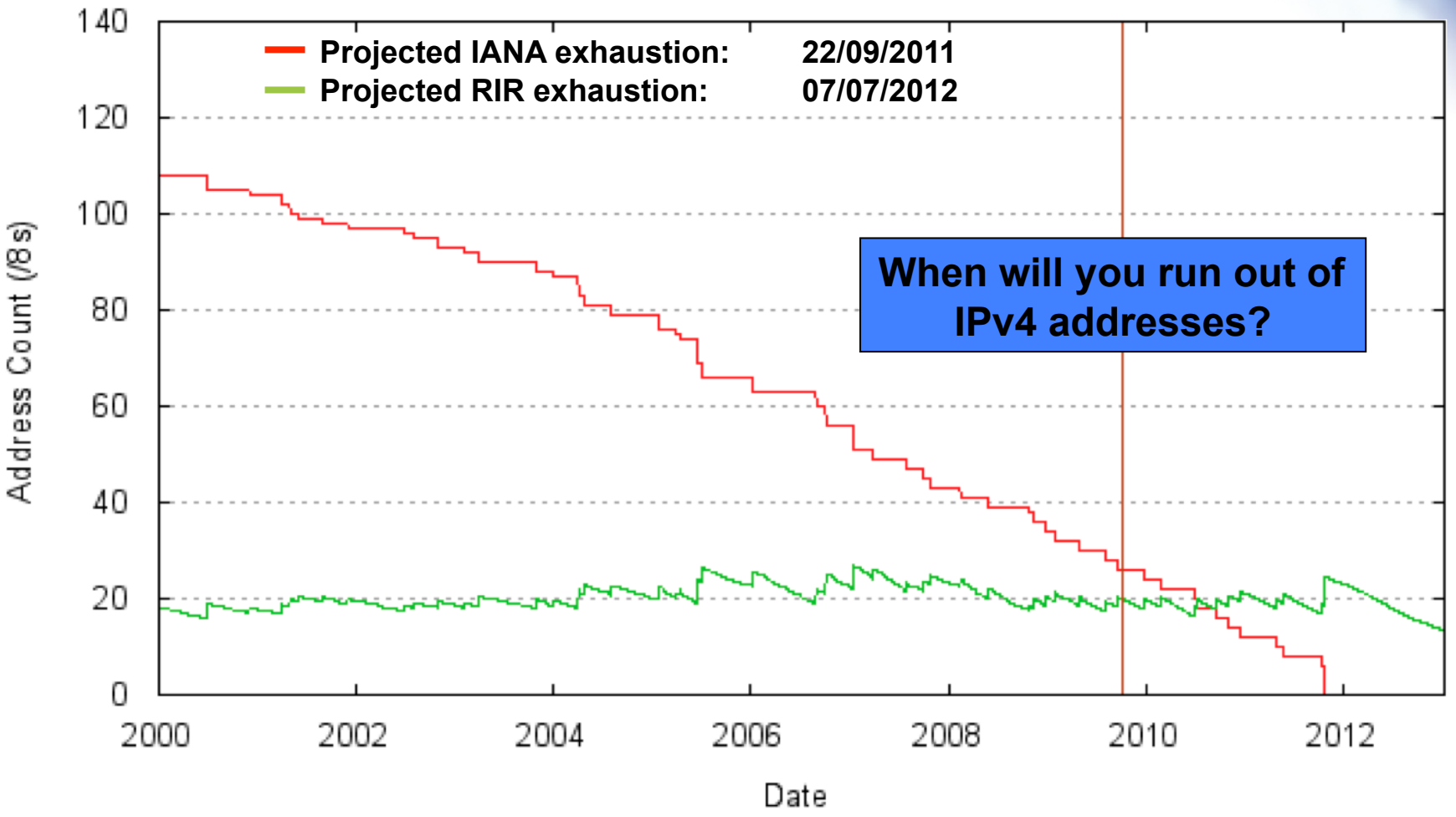


IPv4 Address Global Distribution



As of April 2010

Projected IPv4 Consumption



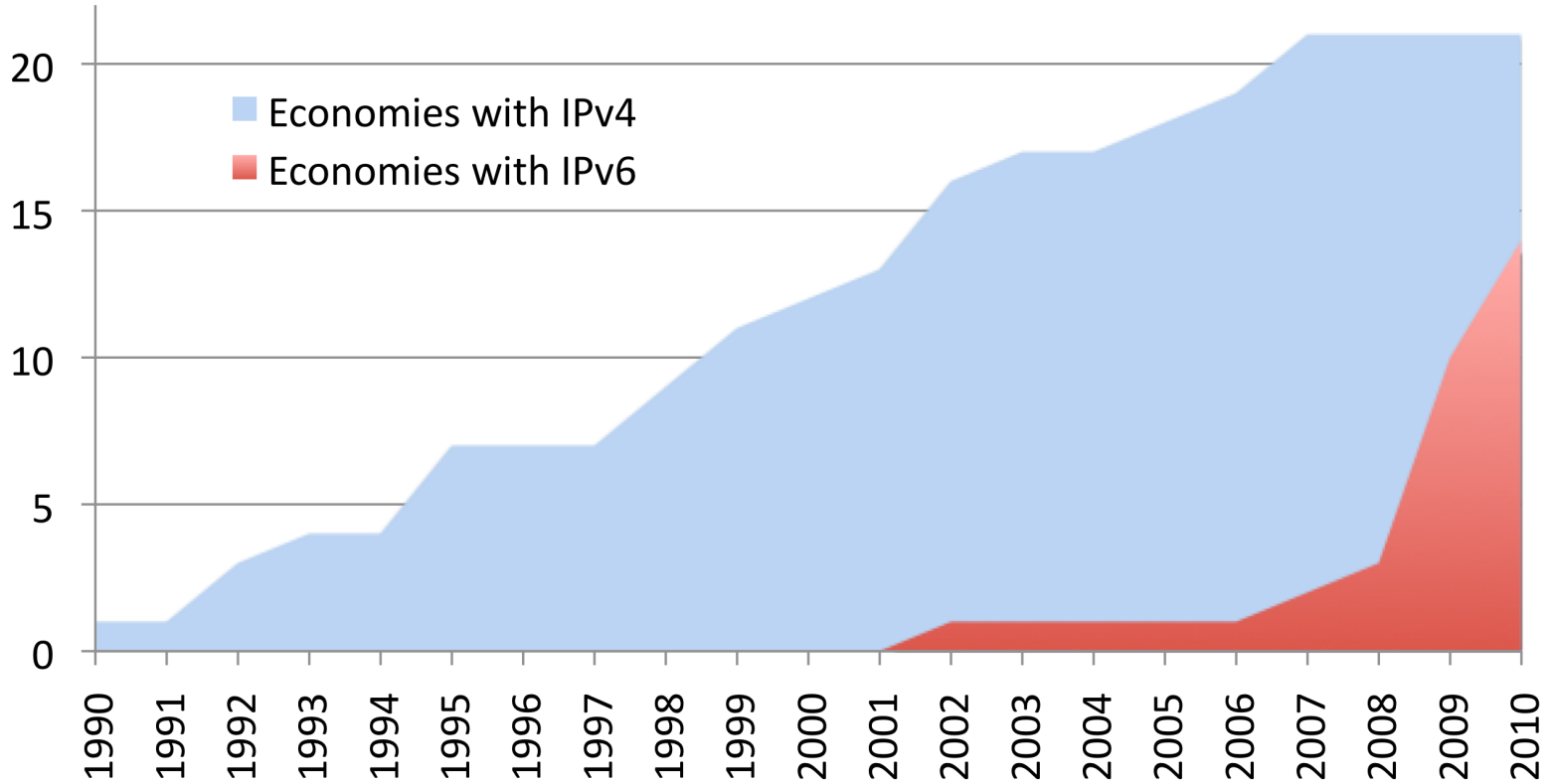
http://www.potaroo.net/tools/ipv4/index.html 10 Apr 2010

Transition to IPv6

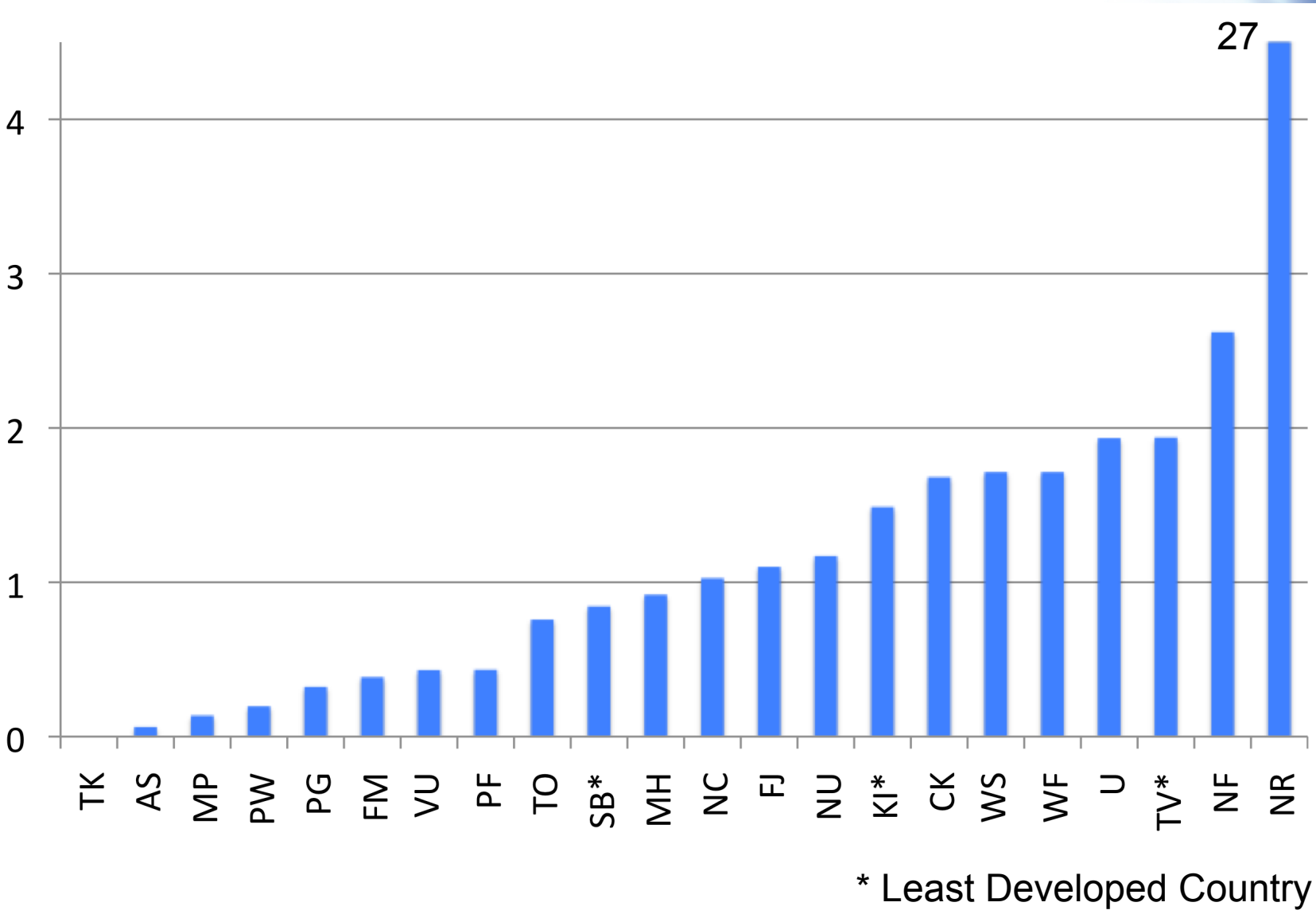
- IPv4 address exhaustion is inevitable
  - September 2011: IANA allocates the last /8
  - July 2012: APNIC is the first RIR to exhaust its IPv4 address pool
- IPv6 should be inevitable
  - The only solution to IPv4 exhaustion
  - Protocol is 10 years old
  - Under a new spotlight for at least 18 months
- The transition…
  - Requires all stakeholders to act, but differently
  - Will take 10+ years to complete

IP Address Status in the Pacific

IP Addresses in the Pacific

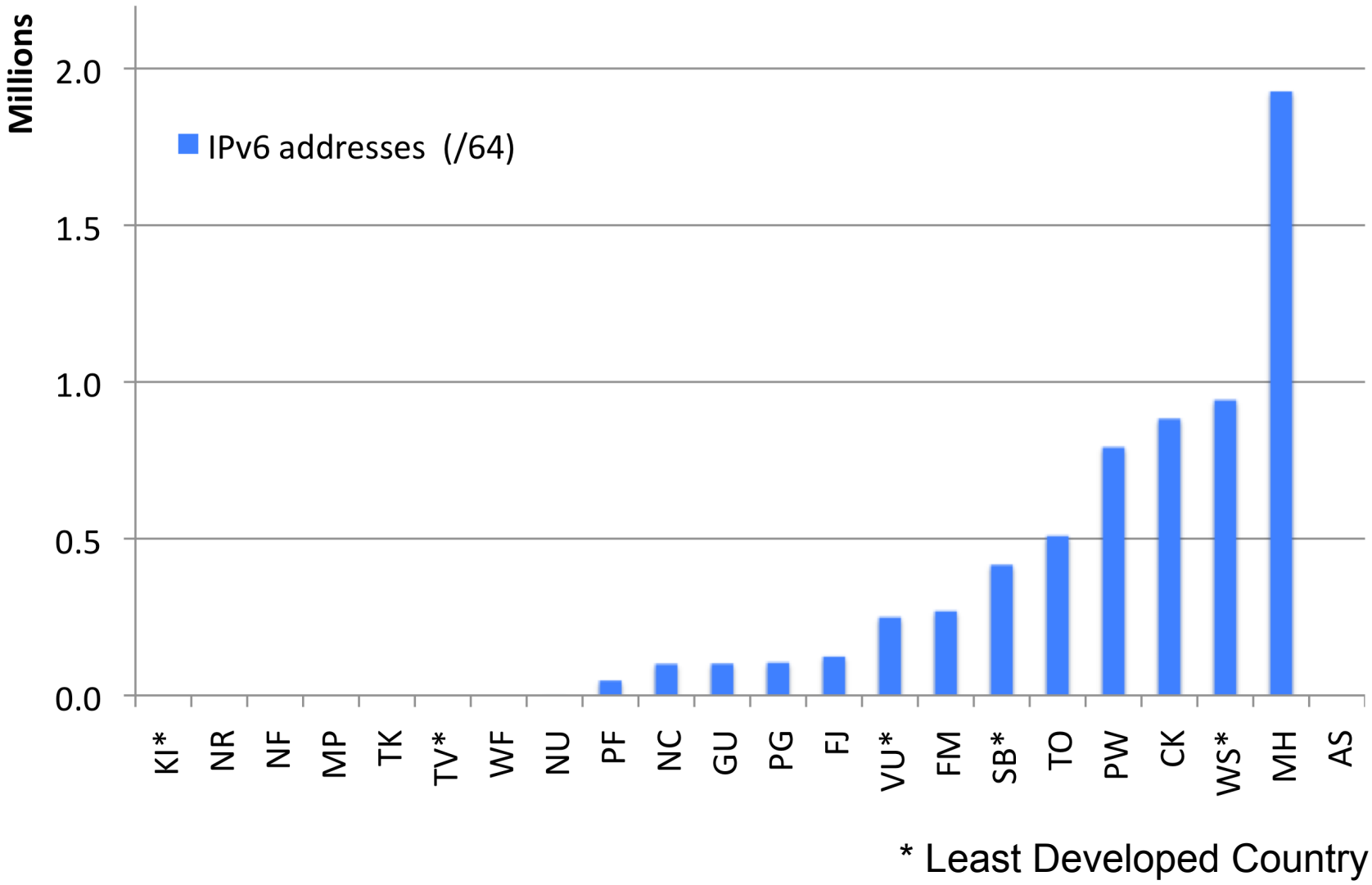


IPv4 Addresses per Capita



* Least Developed Country

IPv6 Addresses per Capita



* Least Developed Country

Pacific IPv6 Address Trends

- 10 allocations after PITA AGM in 2009
  - APNIC helpdesk staff onsite to provide advice
- 12 allocations under the “Kickstart IPv6” policy since Feb 2010
  - IPv6 now available to any member with IPv4 addresses but no IPv6 addresses
  - A “one-click” form

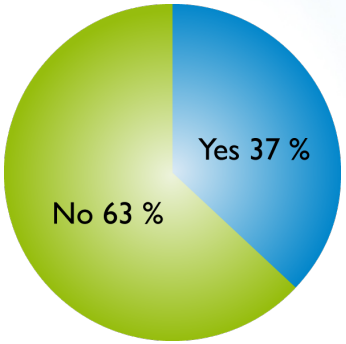
IPv6 Address Cost

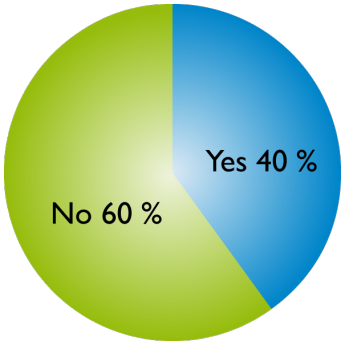
- Usually no additional APNIC fee
  - If IPv4 fee ≥ IPv6 fee, IPv4 fee applies
  - Additional fees only if IPv6 fee > IPv4 fee
  - Fee calculator available on APNIC website
- New fee structure (2010)
  - Now favours small ISPs
- Note 50% discount for Members in LDCs
  - Kiribati, Samoa, Solomon Islands, Tuvalu, Vanuatu

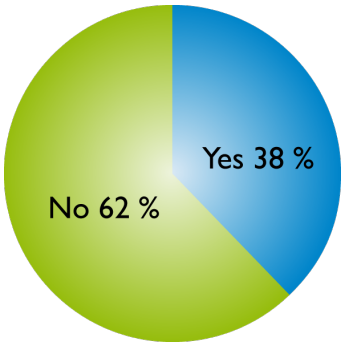
How far have we come?

APNIC IPv6 Survey 2009

- Deployed or ready for immediate deployment?
- Formal plan for future deployment?
- Budgeted for future deployment?

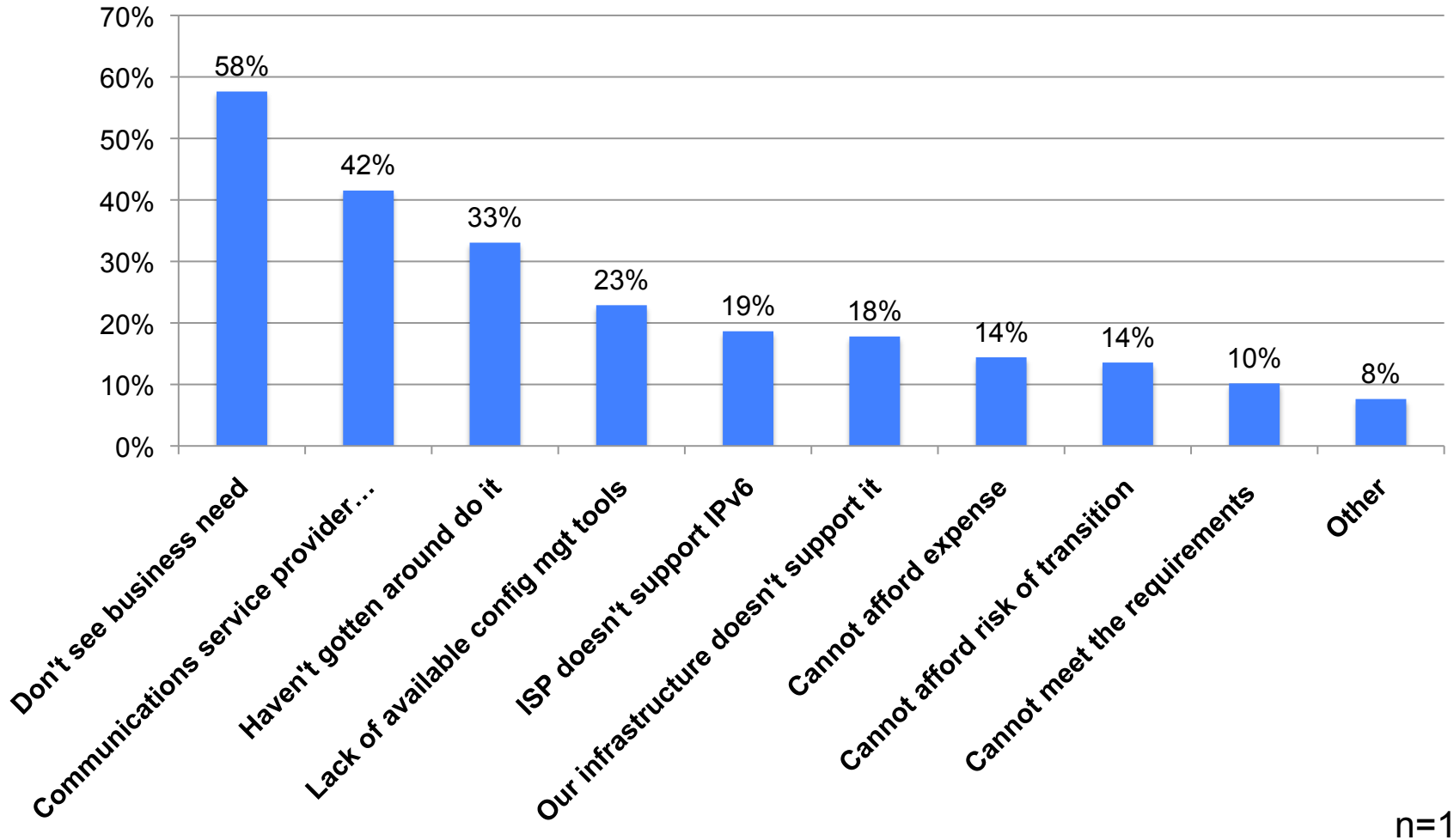






APNIC IPv6 Survey 2009

If not, why not considering IPv6?



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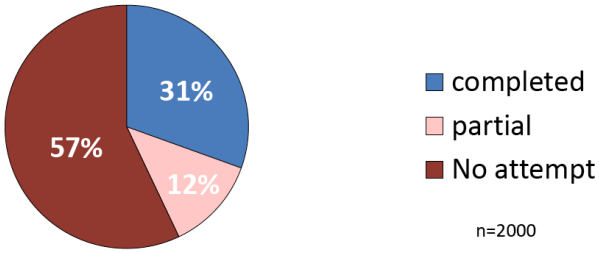
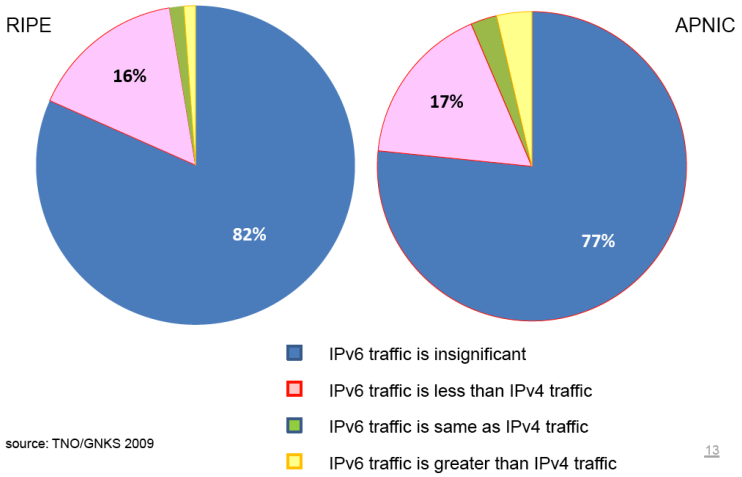
EU Survey 2009

Response to questionnaire



610 repondents from 54 countries

IPv6 vs IPv4 traffic



source: TNO/GNKS 2009

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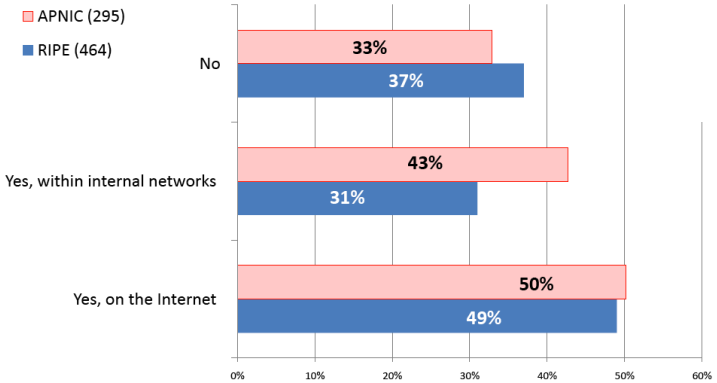
IPv6 presence respondents



source: TNO/GNKS 2009

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http://www.ipv6monitoring.eu

http://www.ipv6.eu/admin/bildbank/uploads/Documents/Commision/COM_.pdf

Large ISPs Announcing IPv6

1998	Verizon (for govt customers)
2001	Hurricane Electric
2005	NTT (JP)
2007	Free (FR)
2008	Internode & Vocus (AU)
2009	XS4ALL (NL)
2010	Comcast (residential trial)

Major Content Providers

2008	Google begins IPv6 service
2009	Netflix streaming content over IPv6
2010	YouTube over IPv6 eBay internal network over IPv6* Facebook over IPv6*
2011	eBay public website over IPv6 And more…

Some Government Targets

2008	US federal agencies IPv6 compliant
2010	25% of EU traffic to be over IPv6
2011	JP govt target to have all JP ISPs over IPv6
2012	AU govt networks over IPv6

What Next?

More Users, More Devices

- In 2010s…
  - Commodity Internet service provision
  - Broadband, mobile, always-on
  - Large reduction in consumer electronics costs
- A network-ready society
  - Ubiquitous pervasive networking
  - Bringing online the “Next 5 Billion”
  - Plus a device population some 2–3 orders of magnitude larger than today’s Internet
  - “Internet for Everything”

IPv6 is Here!

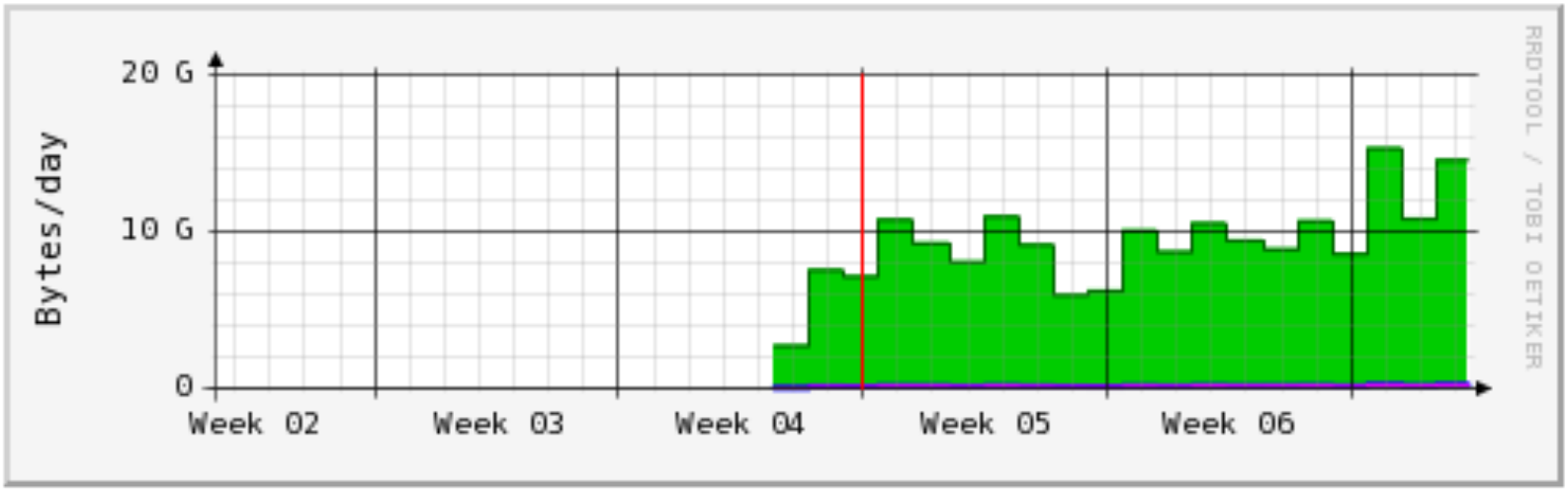
- IPv6 is no longer experimental
- IPv6 is in commercial use
- Signification acceleration in deployment over past year
- Start planning now
  - Don't wait until IPv4 runs out
  - What will you do the first time a customer complains they can't reach a site because you don't support IPv6?
- The main questions have answers…

Chicken or Egg?

"Google has quietly turned on IPv6 support for its YouTube video streaming Web site, sending a spike of IPv6 traffic across the Internet…"

– 1 Feb 2010 Networld

- Monash University, Melbourne, Australia:



“What’s the Killer App for IPv6?”

The Internet !

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
  - “Customer NAT” will apply to IPv4
- All Internet users will be affected
- What will you need to do?

Existing in a world of IPv4 and IPv6

- What are the practical issues?
  - Costs, planning, contingencies
  - Network architecture issues
  - Security issues
  - User issues for individuals and enterprises
- To be continued…
  - More at Internet Forum Workshop, Thursday

Thank You!

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