IPv6 Allocation Policy and Procedure

Global IPv6 Summit in China 2007

April 13, 2007

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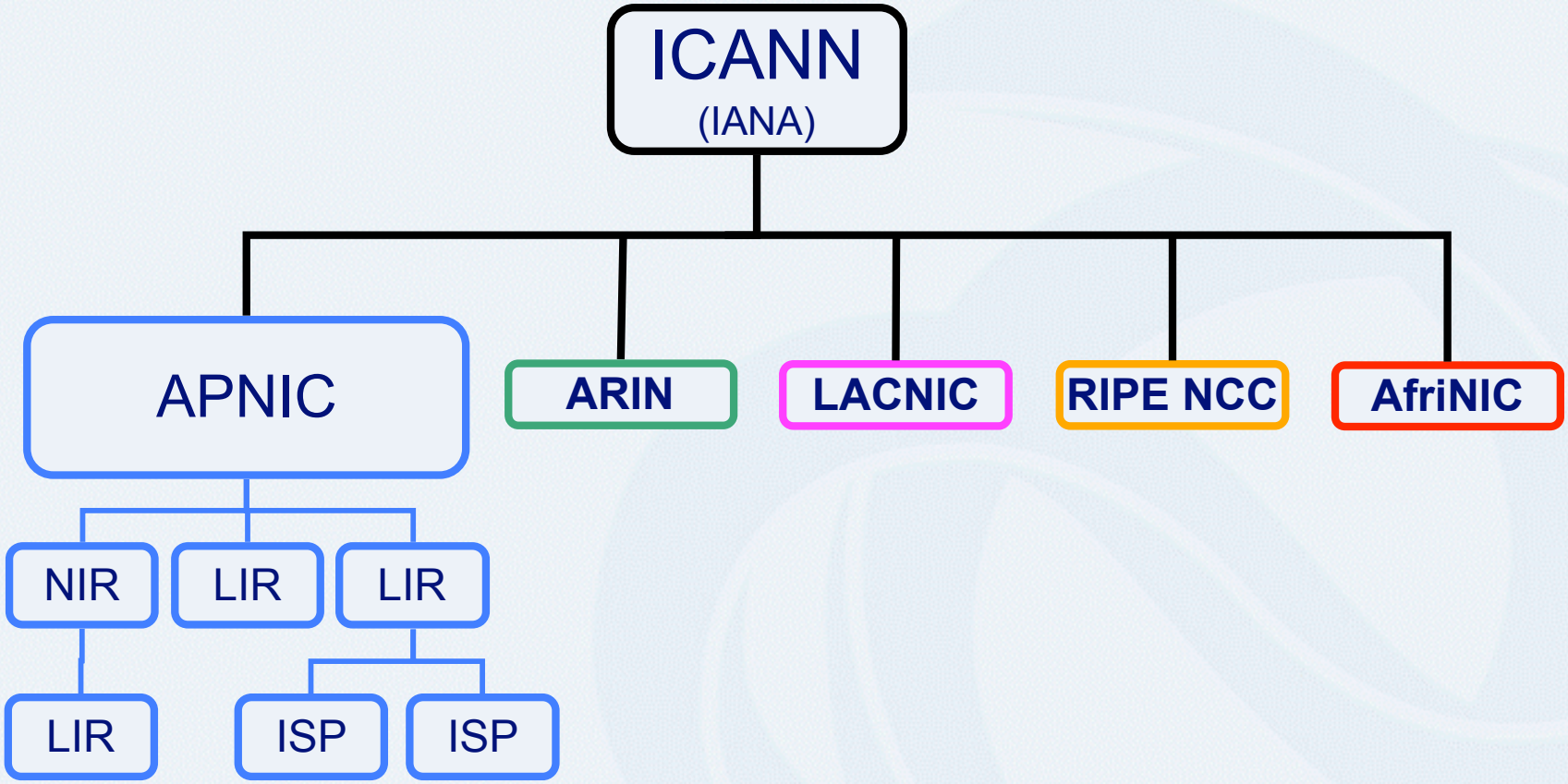
Overview

- Introduction to APNIC
- Policy development process
- IPv6 policy and procedures
- Obtaining IPv6 addresses
- IPv6 statistics

Introduction to APNIC

Internet Registry Structure

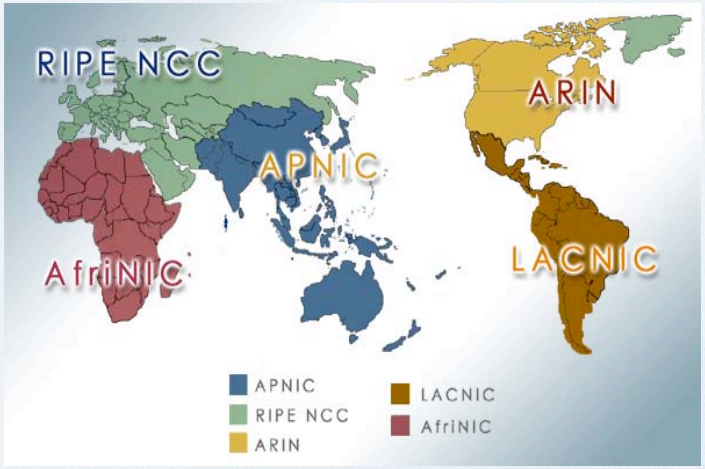


Internet address management structure

- A common management system based on consistent policies and procedures
  - Defined by consensus of the community of Internet network operators and users
  - Implemented through an infrastructure comprising the RIRs, NRO, ASO, IANA (ICANN)
  - RIRs are the only regional component of the Internet infrastructure with a neutral, permanent operational presence

The RIR structure

- Five RIRs today
  - Open
  - Transparent
  - Neutral and impartial



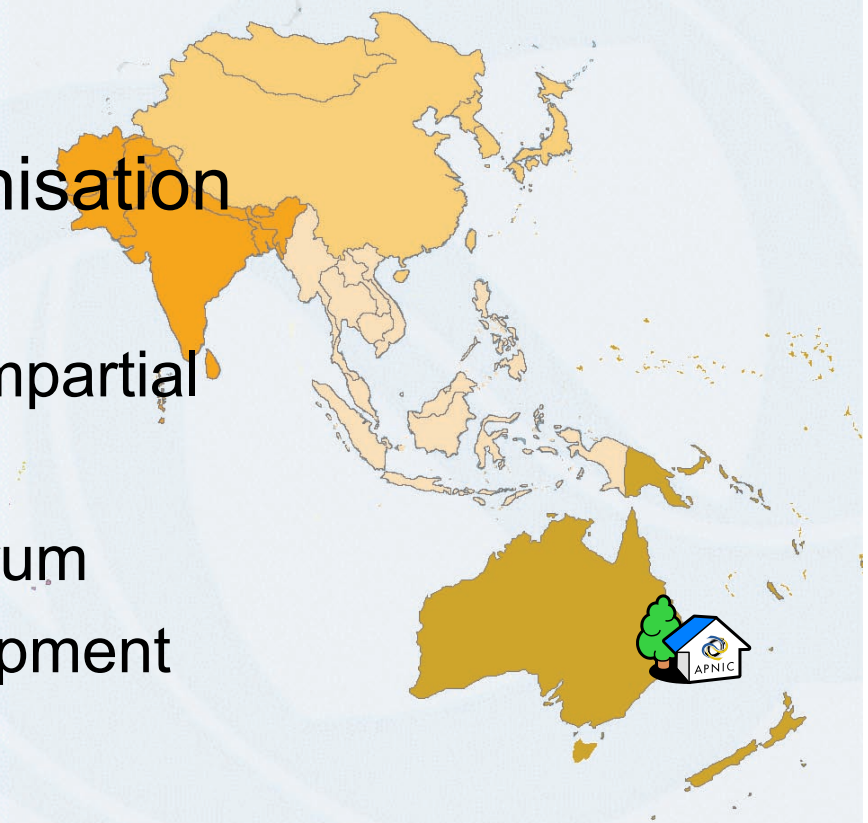
- Addresses distributed fairly
  - Based on need
  - No discrimination

- Not for profit membership organisation
  - Membership open to all interested parties
  - Bottom up, industry self-regulatory structure

- Policies developed by industry at large
  - Through open policy processes

What is APNIC?

- Regional Internet Registry (RIR) for the Asia Pacific Region
  - Regional authority for Internet Resource distribution
  - IP addresses (IPv4 and IPv6), AS numbers, in-addr.arpa delegation



- Membership-based organisation
  - Established 1993
  - Non-profit, neutral, and impartial

Not operations forum

Not standards development

Policy development process

Why a policy?

- Long term interests of the Internet require prudent management of address space
- While address management is not a purely ‘technical issue’, mismanaged resources can severely impact Internet operation
  - routing tables
  - filtering and accessibility
  - imbalance of distribution

Policy development

- Industry self-regulatory process
  - Policy is developed by the AP Internet community to suit needs of region
  - Facilitated by RIR staff
- Policy implementation
  - APNIC shares with its members and their customers a collective responsibility
    - RIR process
    - ISPs and other affected parties

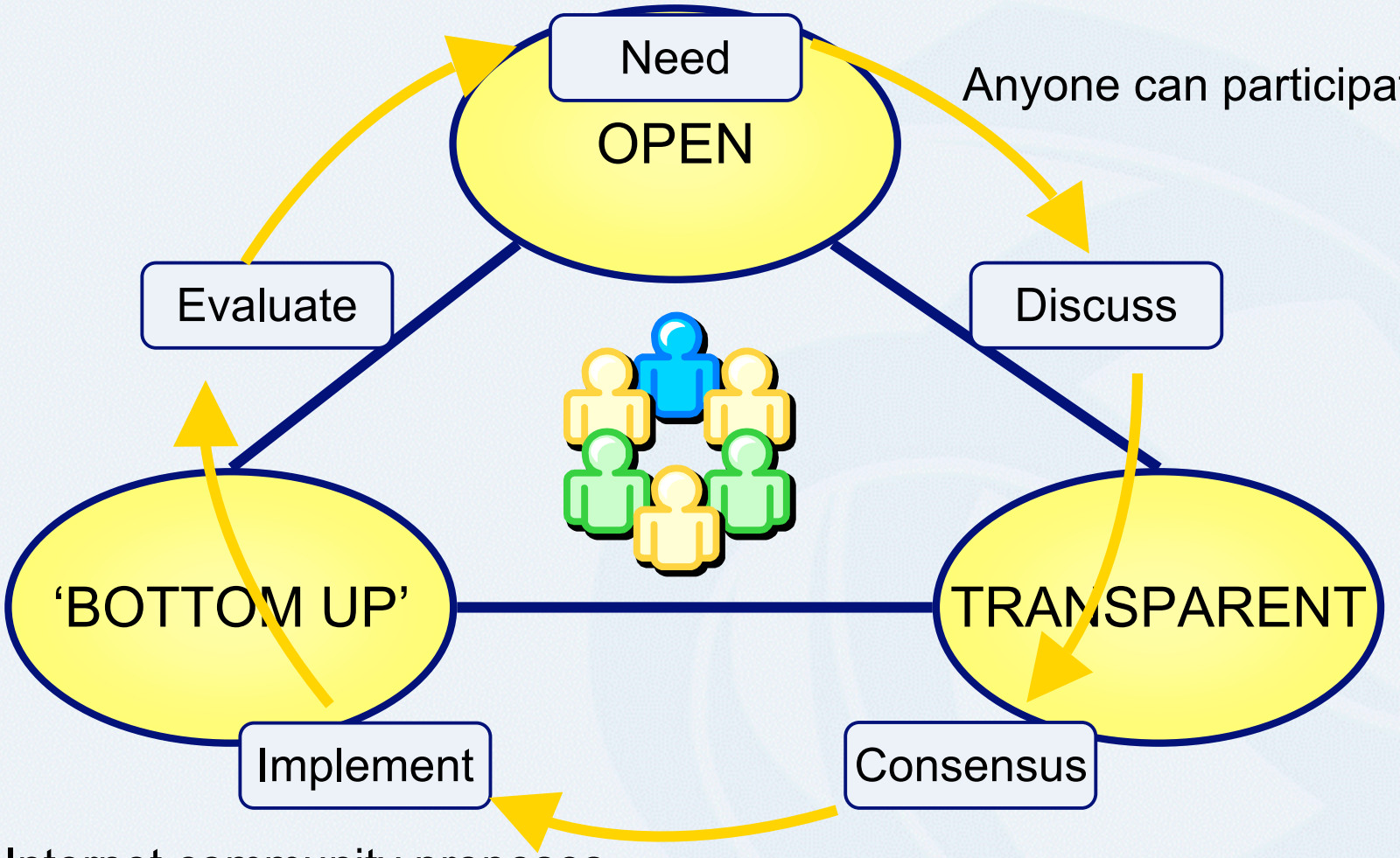
IPv6 Policy Principles (Similar to IPv4)

- Address space not freehold property
  - Understanding that globally unique address space is licensed for use – not owned
- Routability not guaranteed
- Minimum allocation is defined
- Current state of IPv4 structure (infrastructure and customers) can be used to justify larger initial allocation

Participation in policy development

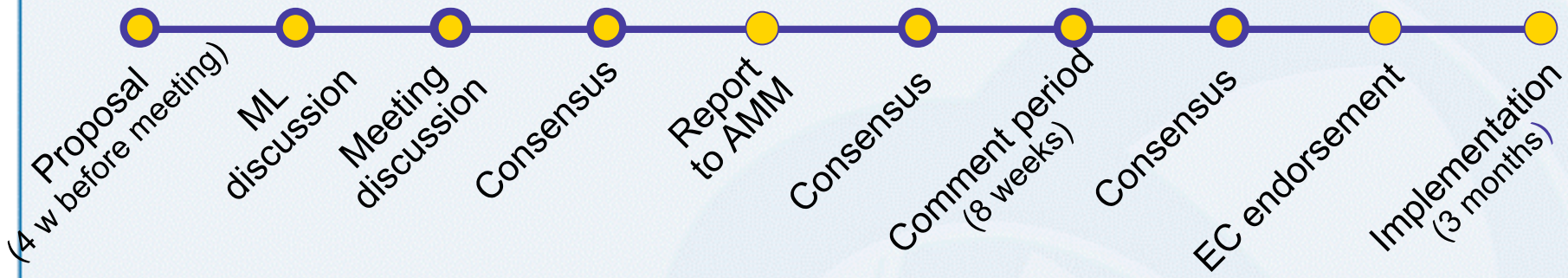
- Why should I bother?
  - Responsibility as an Internet community member
    - To be aware of the current policies for managing address space allocated to you
  - Business reasons
    - Policies affect your business operating environment and do change over time
    - Ensure your ‘needs’ are met
  - Educational
    - Learn and share experiences
    - Stay abreast with ‘best practices’ in the Internet

Policy Development Process



The policy development process

Need Discuss Consensus Implement



You can participate!

More information about policy development can be found at:
http://www.apnic.net/docs/policy/dev

IPv6 policy and procedures

IPv6 Address Policy

- IPv6 Address Allocation and Assignment Policy
  - http://www.apnic.net/docs/policy/ipv6-address-policy.html
- APNIC guidelines for IPv6 allocation and assignment requests
  - http://www.apnic.net/docs/policy/ipv6-guidelines.html

Some definitions

- RIR – Regional Internet Registry
- NIR – National Internet Registry
- LIR – Local Internet Registry (Top level ISP)
- End Site defined as an end user of an ISP where the ISP:
  - Assigns address space to the end user
  - Provides Internet transit service to the end user
  - Advertises an aggregate prefix route that contains the end user's assignment
- POP – Point of Presence

Allocation and assignment

Allocation

"A block of address space held by an IR (or downstream ISP) for subsequent allocation or assignment"

- Not yet used to address any networks

Assignment

"A block of address space used to address an operational network"

- May be provided to LIR customers, or used for an LIR's infrastructure ('self-assignment')

IPv6 initial allocation

- Initial allocation criteria
  - Plan to connect 200 end sites within 2 years
    - Default allocation (“slow start”)
- Initial allocation size is /32
  - Provides 16 bits of site address space

  - Larger initial allocations can be made if justified according to:
    - IPv6 network infrastructure plan
    - Existing IPv4 infrastructure and customer base
- License model of allocation
  - Allocations are not considered permanent, but always subject to review and reclamation

IPv6 customer assignments

- Assignment /48 - /64 for all end sites (POP also defined as end site)
  - Defined in revised policy – effective19 March 2007
  - Provides for up to 16 bits of space for subnets

- Other assignment sizes
  - /64 only one subnet
  - /128 only one device connecting
- Larger assignments (to ISP)- Multiple /48s
  - Should be reviewed by RIR/NIR
    - Follow second opinion procedure

IPv6 IXP assignment

- Criteria
  - Demonstrate ‘open peering policy’
  - 3 or more peers
- Assignment size: /48
  - All other needs should be met through normal processes
  - /64 holders can “upgrade” to /48
    - Through CNNIC / APNIC
    - Need to return /64

IPv6 Critical Infrastructure Assignment

- Organisations seeking assignment for critical infrastructure must be an actual operator of the network infrastructure performing the following functions:
  - root domain name system (DNS) server
  - global top level domain (gTLD) DNS server
  - country code TLD (ccTLDs) DNS server
  - Regional Internet Registry (RIRs)
  - National Internet Registry (NIRs)

* Minimum assignment size is /48

IPv6 Multihoming Assignment (New)

- An organisation is eligible to receive a portable assignment from APNIC if it:

- is currently multihomed with provider-based addresses, or demonstrates a plan to multihome within three months and,

- agrees to renumber out of previously assigned address space.

* Minimum assignment size is /48

Obtaining IPv6 addresses

Where to request IPv6 addresses?

- 1. From your upstream ISP
  - Receive an assignment or sub-allocation
  - Address space is non-portable
- 2. From CNNIC
  - CNNIC member
  - Address space is portable
- 3. From APNIC
  - APNIC member
  - Address space is portable

Note: 6bone address is no longer available

Request IPv6 addresses from APNIC

- Become APNIC member
  - http://www.apnic.net/member/index.html
- IPv6 Allocation Request Form
  - http://ftp.apnic.net/apnic/docs/ipv6-alloc-request
- IPv6 Portable Assignment Request Form
  - http://www.apnic.net/services/portable-assign/index.html

How do I apply for IPv6 addresses?

Check your eligibility for IPv6 addresses

↓

Read IPv6 policies

http://www.apnic.net/docs/policy/ipv6-address-policy.html

Read IPv6 guideline

http://www.apnic.net/docs/policy/ipv6-guidelines.html

↓

Do you have an APNIC account?

If not, become an APNIC member or open a non-member account

↓

Complete an IPv6 address request form

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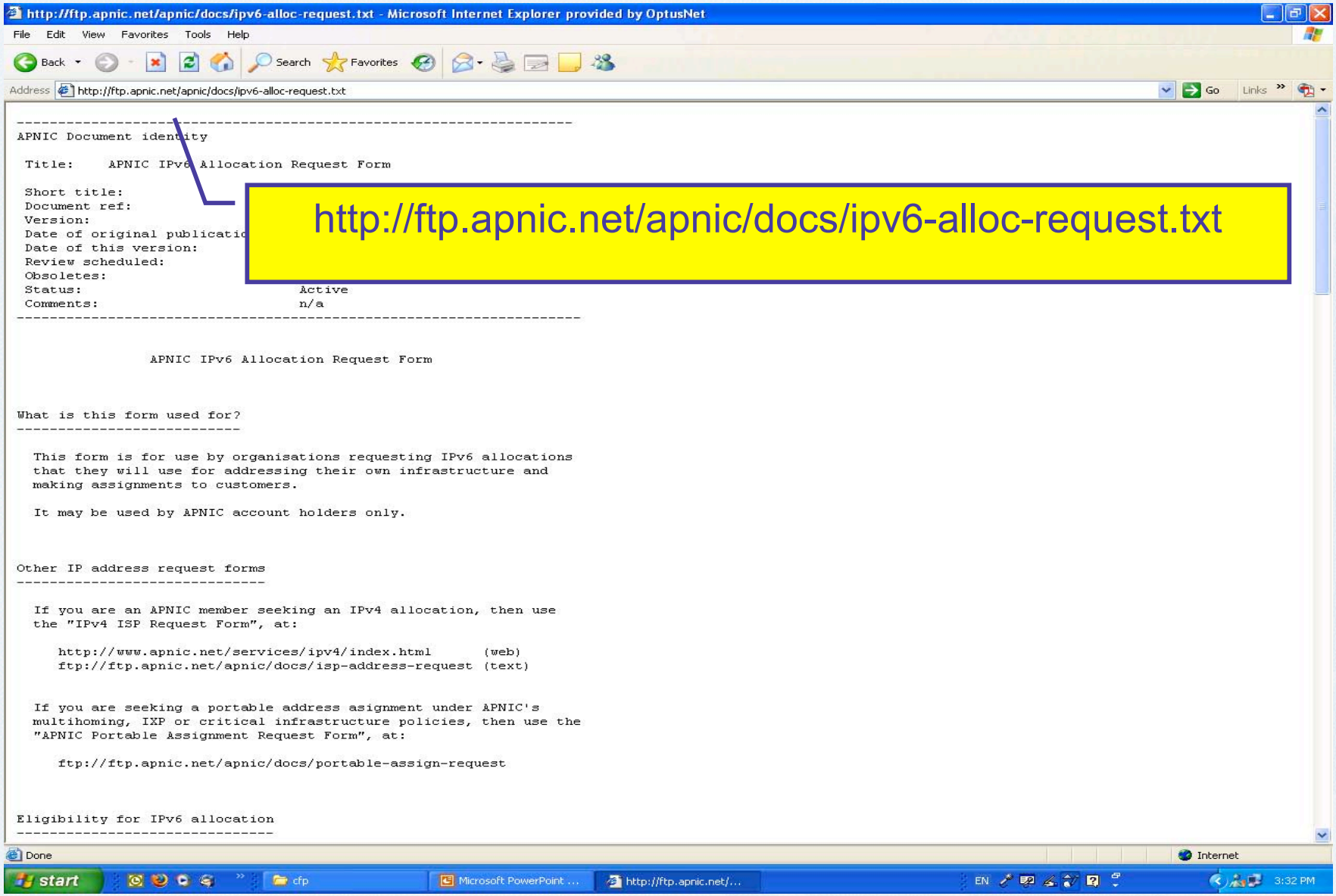
Submit the form hostmaster@apnic.net

Questions:
email: helpdesk@apnic.net

Helpdesk chat: http://www.apnic.net/helpdesk

IPv6 address request form



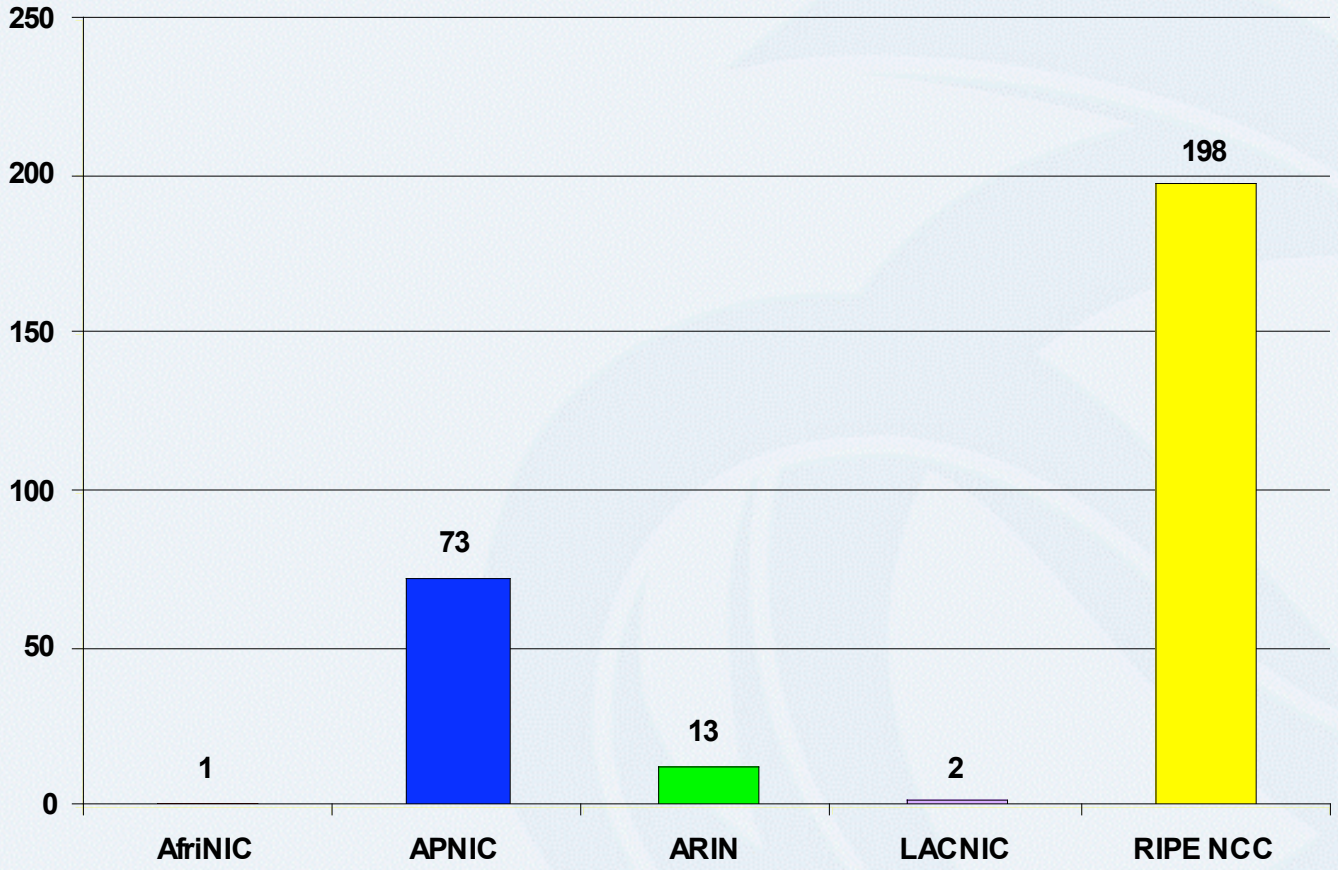
IPv6 address request form

- Requester template
  - Name, email, acct-name, org-relationship:
- Network template
  - Netname, descr, country, admin-c, tech-c, remarks, changed, mnt-lower
- IPv6 usage template
  - Services, cust-types, cust-network, infrastructure, network-plan
- Additional information

IPv6 statistics

IANA IPv6 Allocations to RIRs

issued as /23s prior to Oct 2006



IANA IPv6 Allocations to RIRs

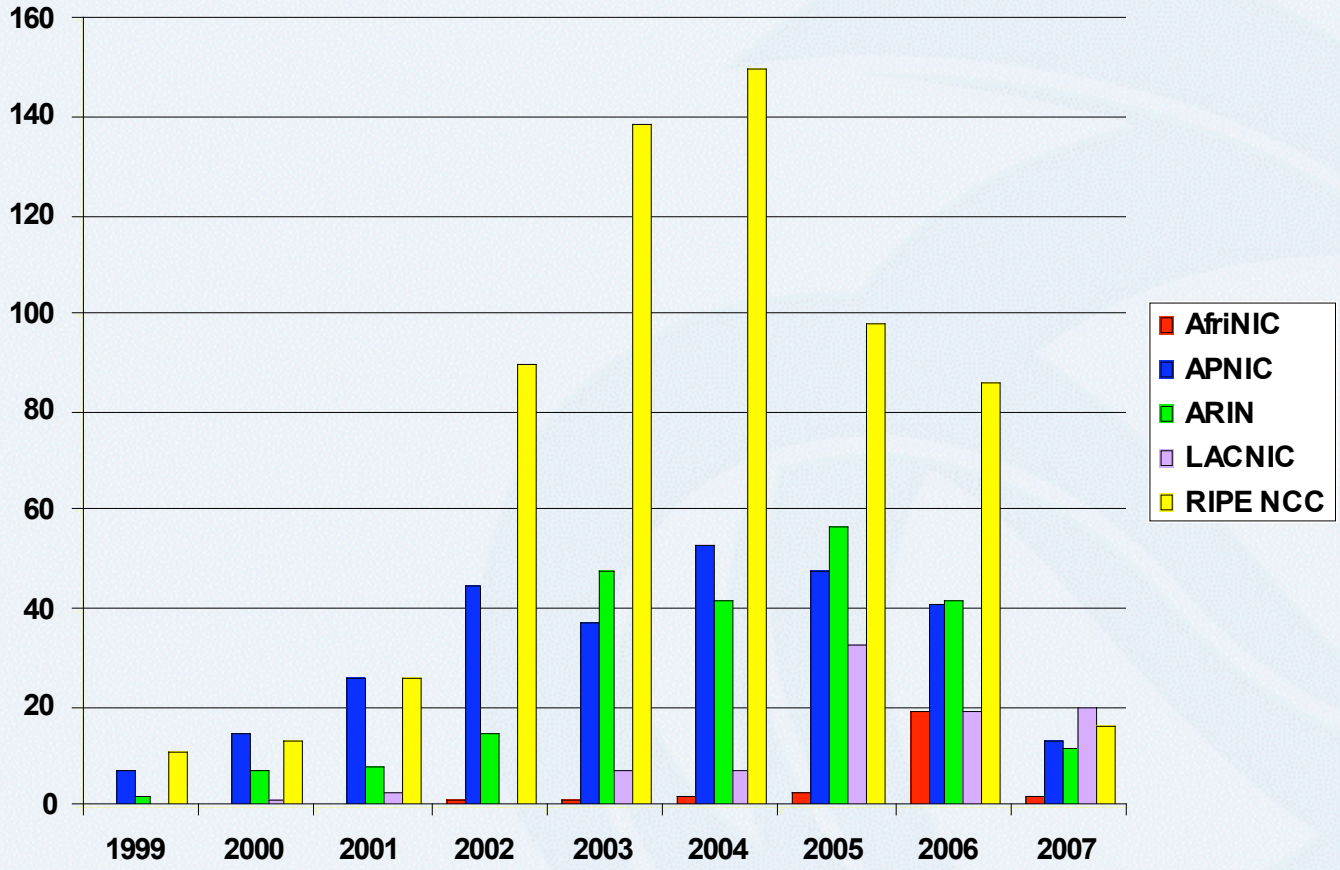
issued in Oct 2006

RIR	IPv6 Address
AfriNIC	2C00:0000::/12
APNIC	2400:0000::/12
ARIN	2600:0000::/12
LACNIC	2800:0000::/12
RIPE NCC	2A00:0000::/12

Some /23s from the previous slide are incorporated in these /12s

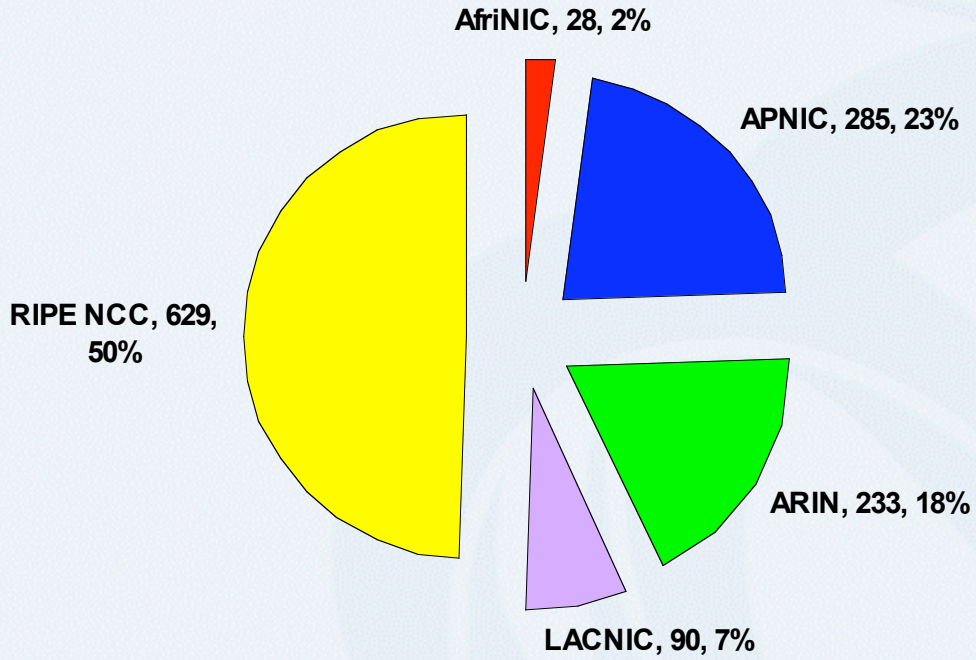
IPv6 Allocations RIRs to LIRs/ISPs

Yearly Comparison

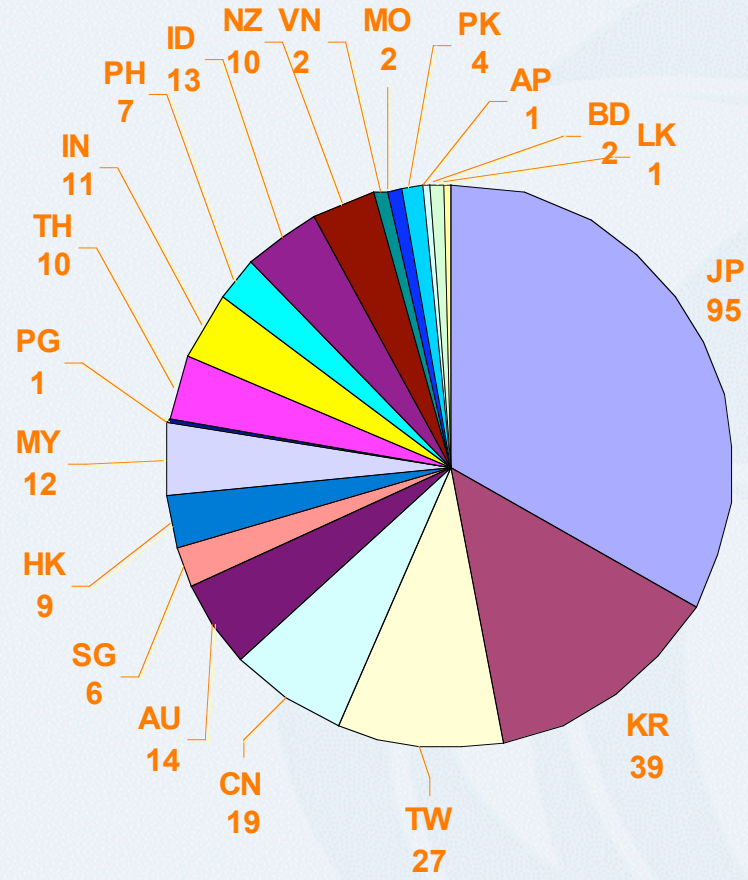


IPv6 Allocations RIRs to LIRs/ISPs

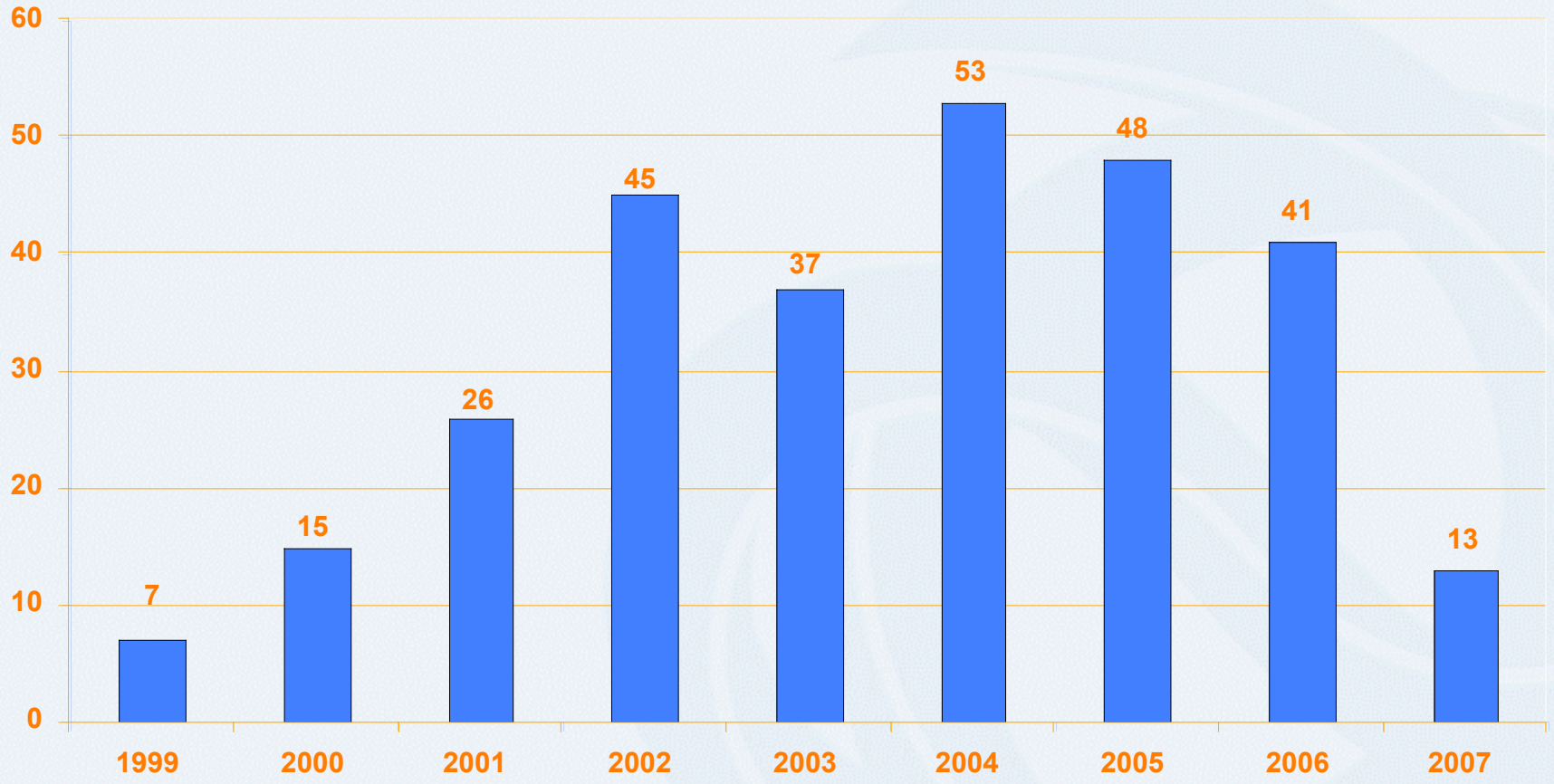
Cumulative Total (Jan 1999 – Mar 2007)



APNIC allocations by economies



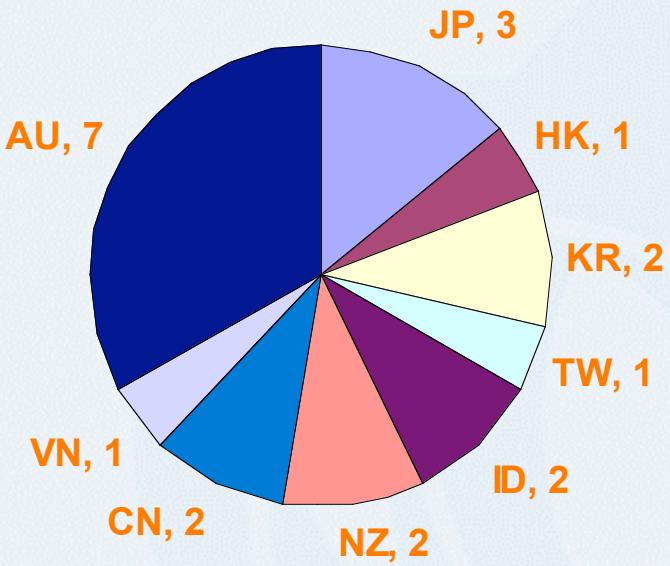
APNIC annual allocations



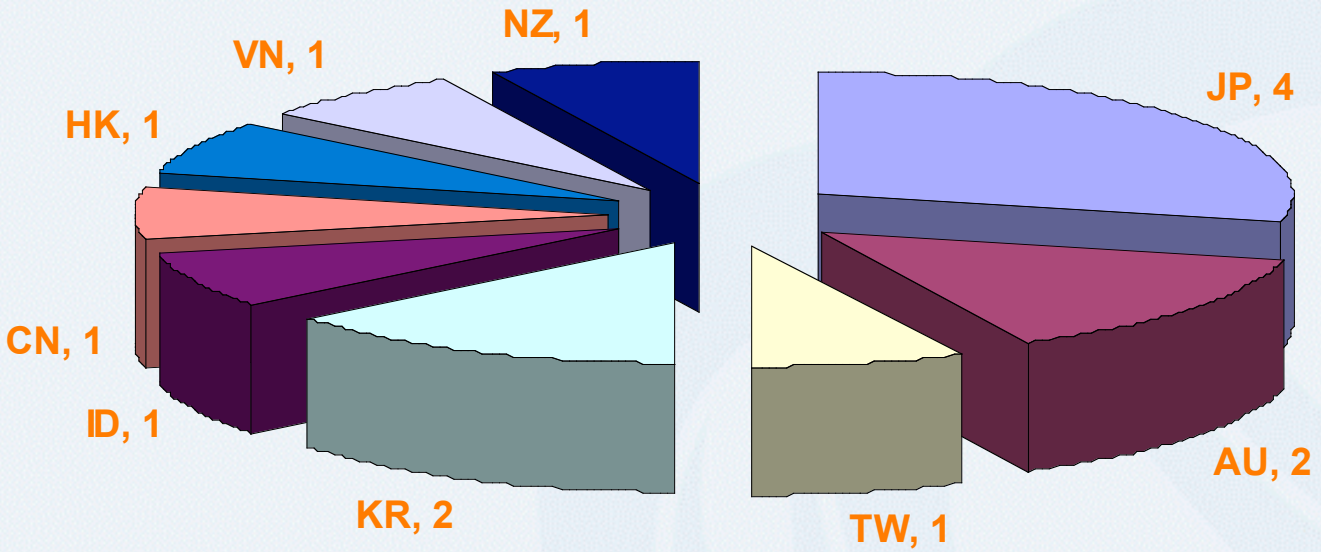
APNIC allocations by sizes

APNIC IXP assignments

All /48s except 4 are /64s

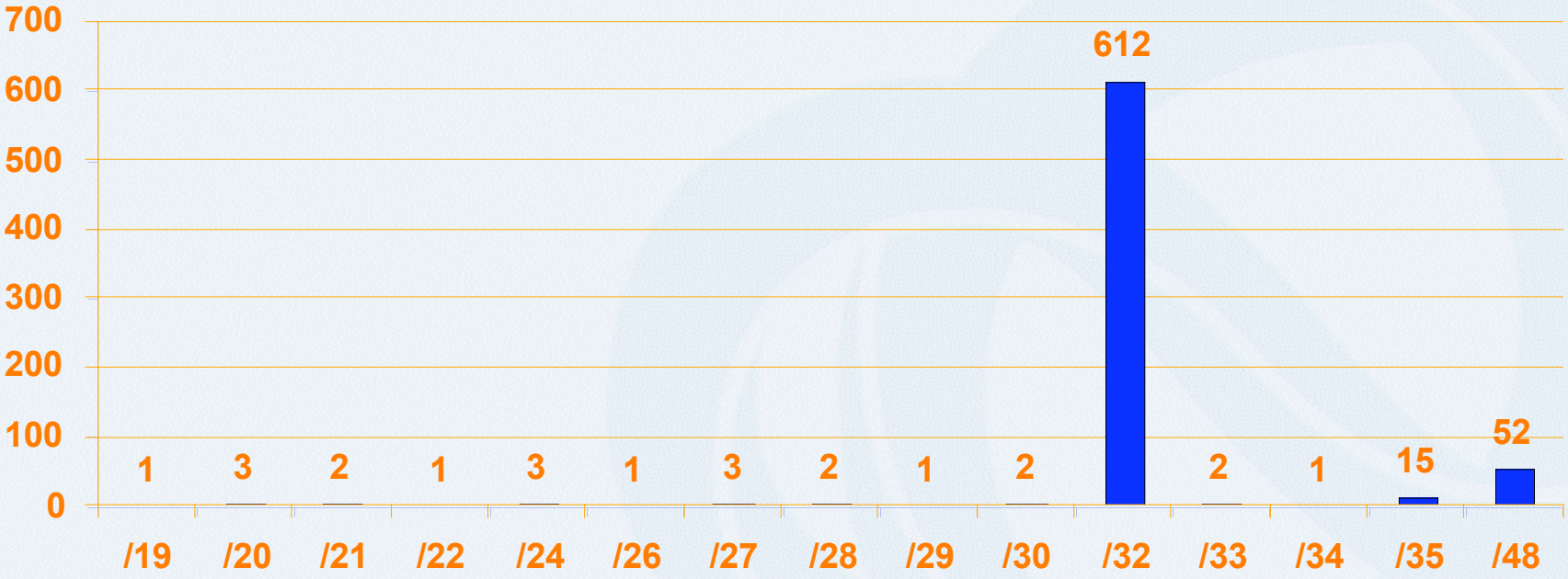


APNIC critical infrastructure assignments (/32s)



Global IPv6 root routing table

Data as 1 April 2007 from
http://bgp.potaroo.net/v6/as1221/index.html



Questions?

»Thanks!