

Resource Management Report

APNIC CEOs' Meeting

30 Aug 2004

APNIC 18, Nadi, Fiji

Overview

- Challenges of IP address management
- Regional resource statistics
- Trends and analysis
- APNIC member services

IP allocation pre-1992

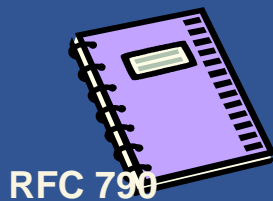
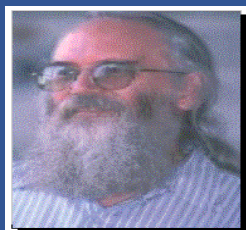


RFC 1020
1987

DDNIC

iana

RFC 1261
1991

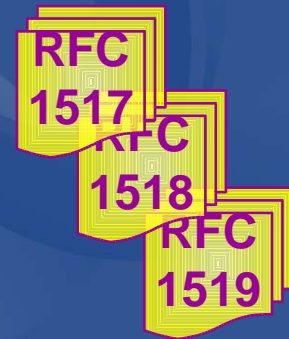
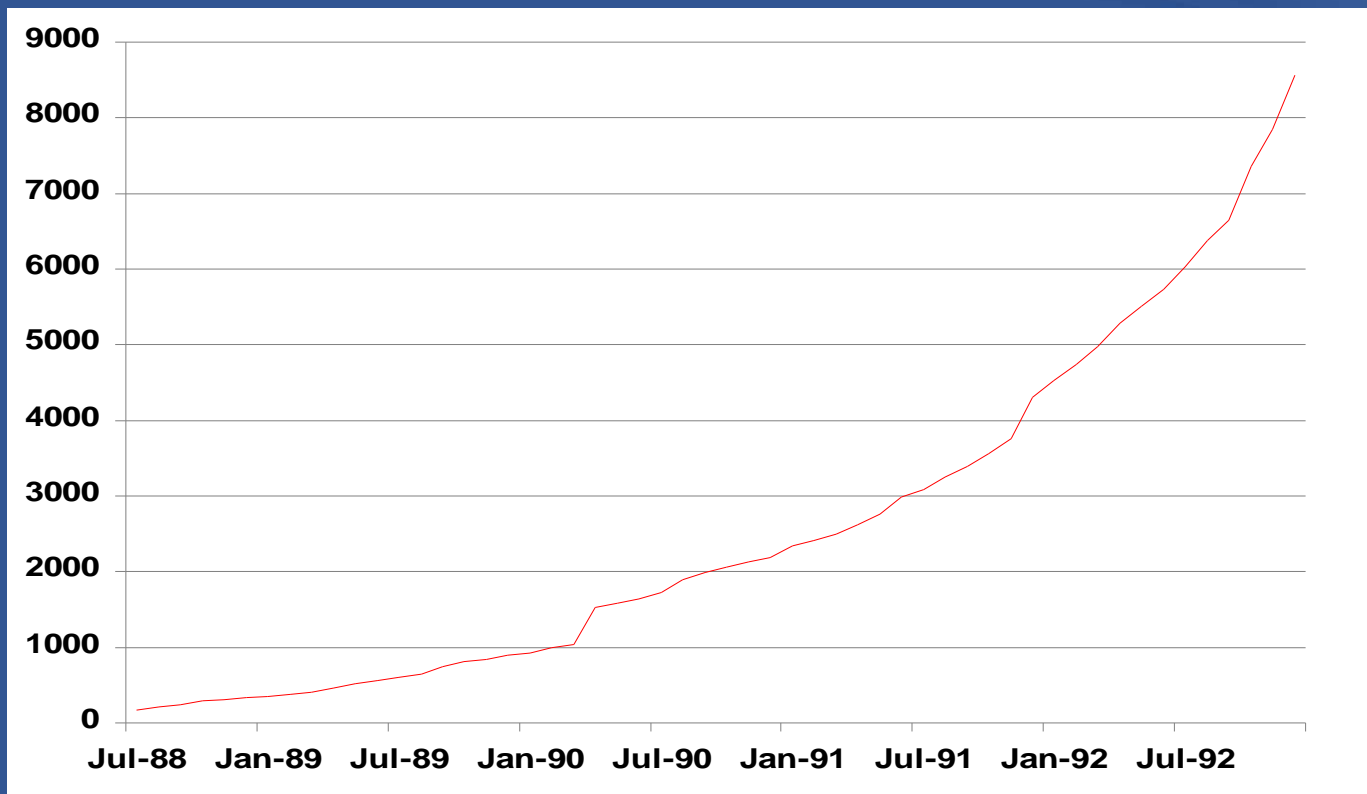


RFC 790
1981

“The assignment of numbers is also handled by Jon. If you are developing a protocol or application that will require the use of a link, socket, port, protocol, or network number **please contact Jon to receive a number assignment.**”

Early address management

- Early 1990's: Internet scaling problems
 - Address depletion
 - Classful architecture (class A, B, C)
 - Routing table overload



Address management today



Address management objectives

Conservation

- Efficient use of resources
- Based on demonstrated need

Aggregation

- Limit routing table growth
- Support provider-based routing

Registration

- Ensure uniqueness
- Facilitate trouble shooting

Uniqueness, fairness and consistency



Address management challenges today

- Technology changes
 - New services: GPRS, VoIP and wireless devices
 - Increasing demand for IP addresses
 - IPv4 address pool getting smaller
- Scalability
 - Routing table growth as number of networks increase
 - Aggregation still important
- Security
 - Registration becoming more important
 - Spam and abuse emails increasing
 - Hijacking of Internet resources
 - Privacy laws

Policy changes in response

- Improving fairness
 - Minimum allocation reduced /19 to /20 in 2000 and /20 to /21 in 2004
- New policies and terminologies
 - “Portable” and “non portable”
 - Requiring end user to renumber
 - “Assignment” and “allocation”
 - Catering for different types of organisation
 - IXP, critical infrastructure, IPv6
- Registration changes
 - Database privacy
 - Assignment objects hidden by default: public by choice

Challenges facing LIR

- Keeping knowledge to date is vital
 - APNIC policies can affect LIR business
 - All LIRs required to follow policies
- Education and training important
 - Attend APNIC training
 - Send appropriate staff
 - Attend APNIC meeting/follow webcasts
 - Apply for fellowship, where applicable
 - Subscribe to relevant mailing lists
 - <http://www.apnic.net/community/lists/>
 - Keep in contact with APNIC
 - Phone and email available

Benefits to LIRs

- Quicker to obtain resources
 - Understand and apply policies
- Participate in policy development
 - Provide feedback
 - New policies affect your business (\$\$)
- Provide better services for customers
 - Knowledgeable staff
 - Resources well managed
 - Follow ‘best current practices’ in Internet

‘Best Current Practices’

Frequently Asked Questions
about Policies

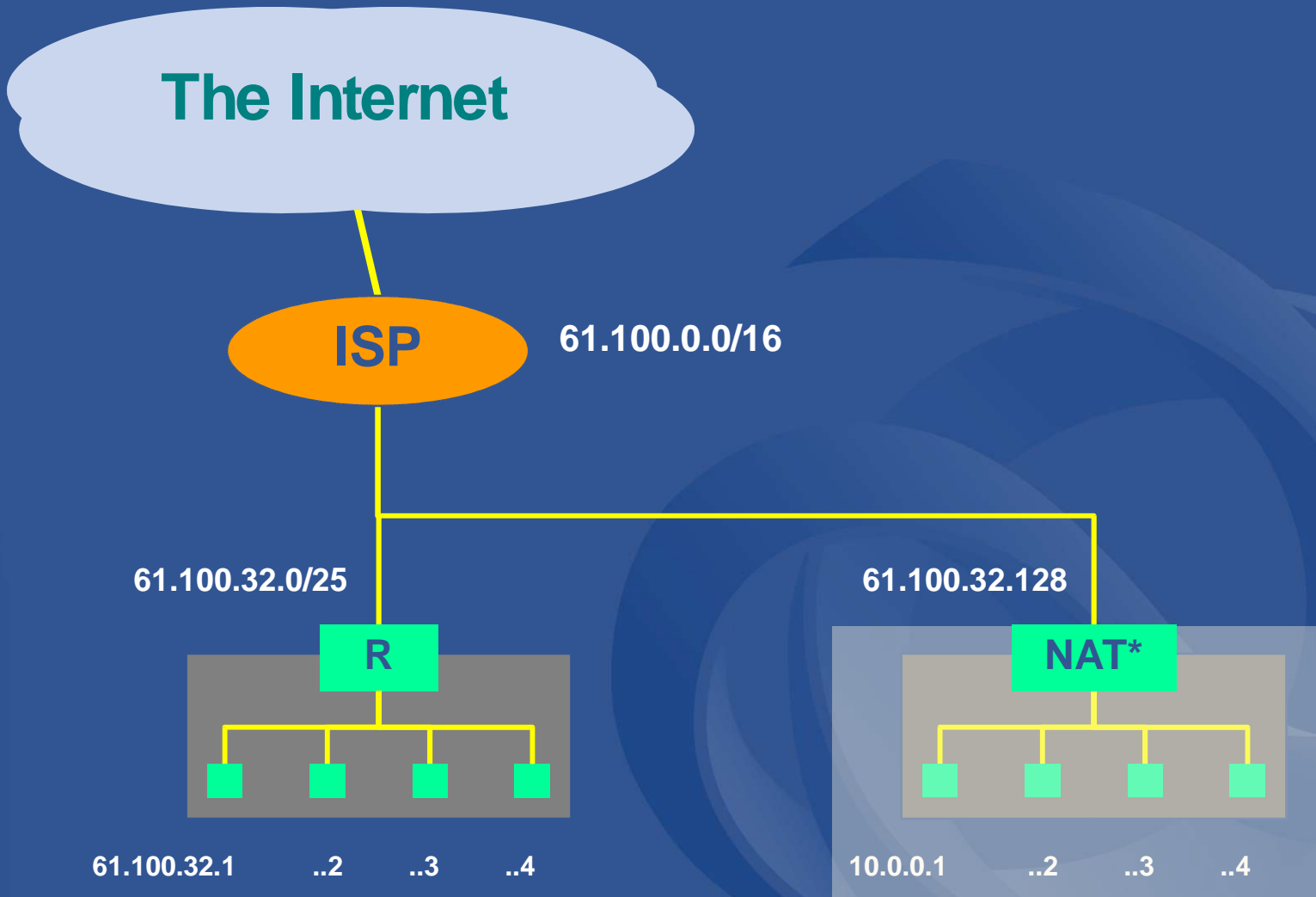
FAQ : customer assignments

- Should I distribute IP addresses to my downstream ISPs and customers?
 - By assigning your customers IP addresses...
 - You are building long-term relationships
 - You are providing a more complete solution
 - You are reducing the risk of losing your customers
 - You are being a good Internet citizen
 - IP address distribution is part of your responsibility as an LIR
 - This is considered best current practice across the world
 - Can always obtain more IP addresses from APNIC

FAQ: Network Addresses Translation (NAT)

- Should NAT be used to conserve IP addresses?
 - APNIC does NOT require any one to use NAT
 - NAT implementation is entirely up to user
- Can private network using NAT be used as justification to apply for public address?
 - Yes! APNIC will approve the equivalent amount of global address space

The NAT "Problem"



*AKA home router, ICS, firewall



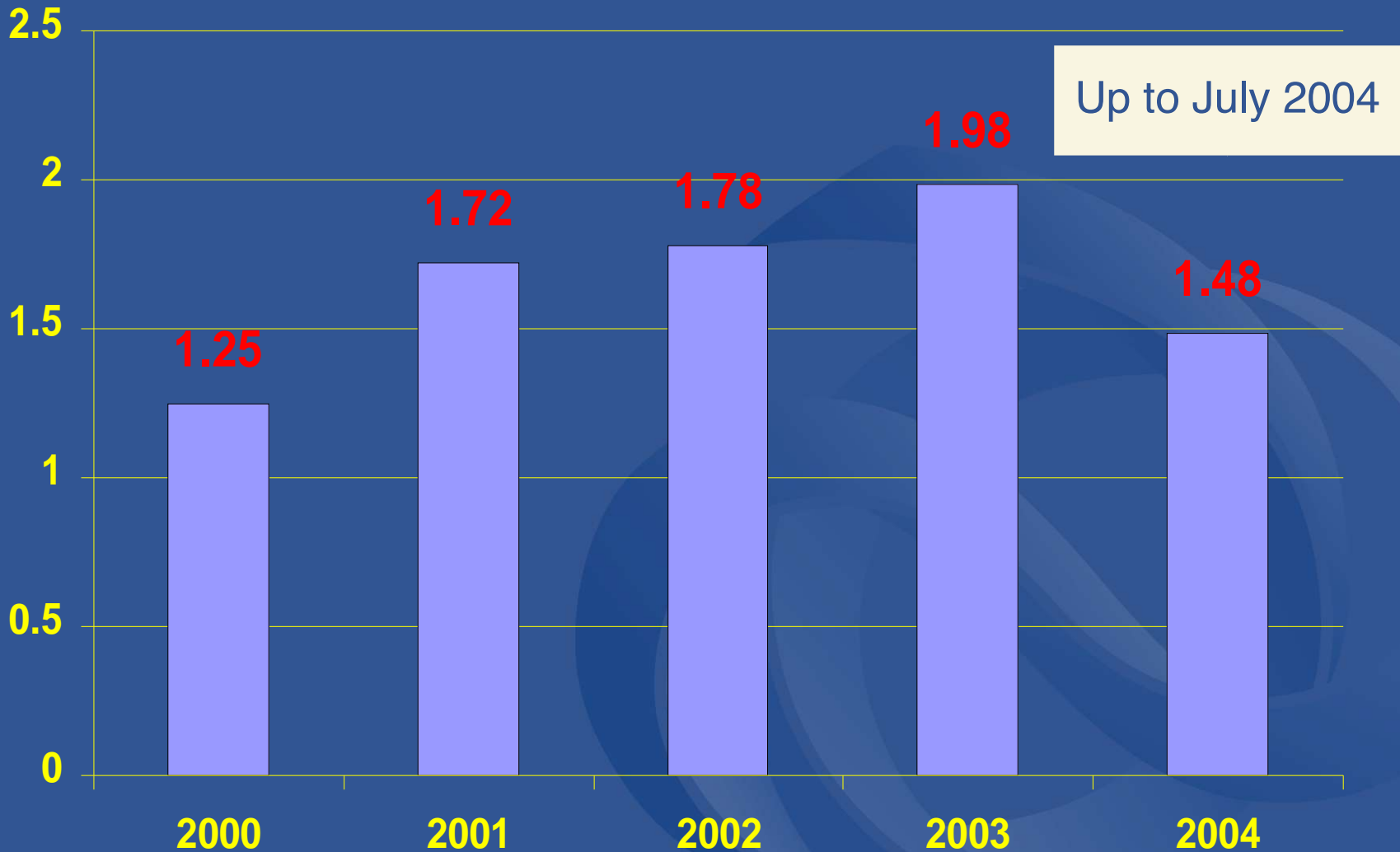
FAQ: unused internet resources

- Can I sell/buy IP addresses or AS numbers?
 - No, this goes against the goals of responsible management
 - Internet resource is a public resource
 - Unused resource should return to RIR for future distribution
- APNIC recovery of unused internet resource
 - Currently recovering closed members address space
 - Will recover historical unused address space in December
 - <http://www.apnic.net/docs/policy/proposals/prop-017-v001.html>
 - Can transfer historical resource to apnic member
 - <http://www.apnic.net/docs/policy/historical-transfer-policy.html>

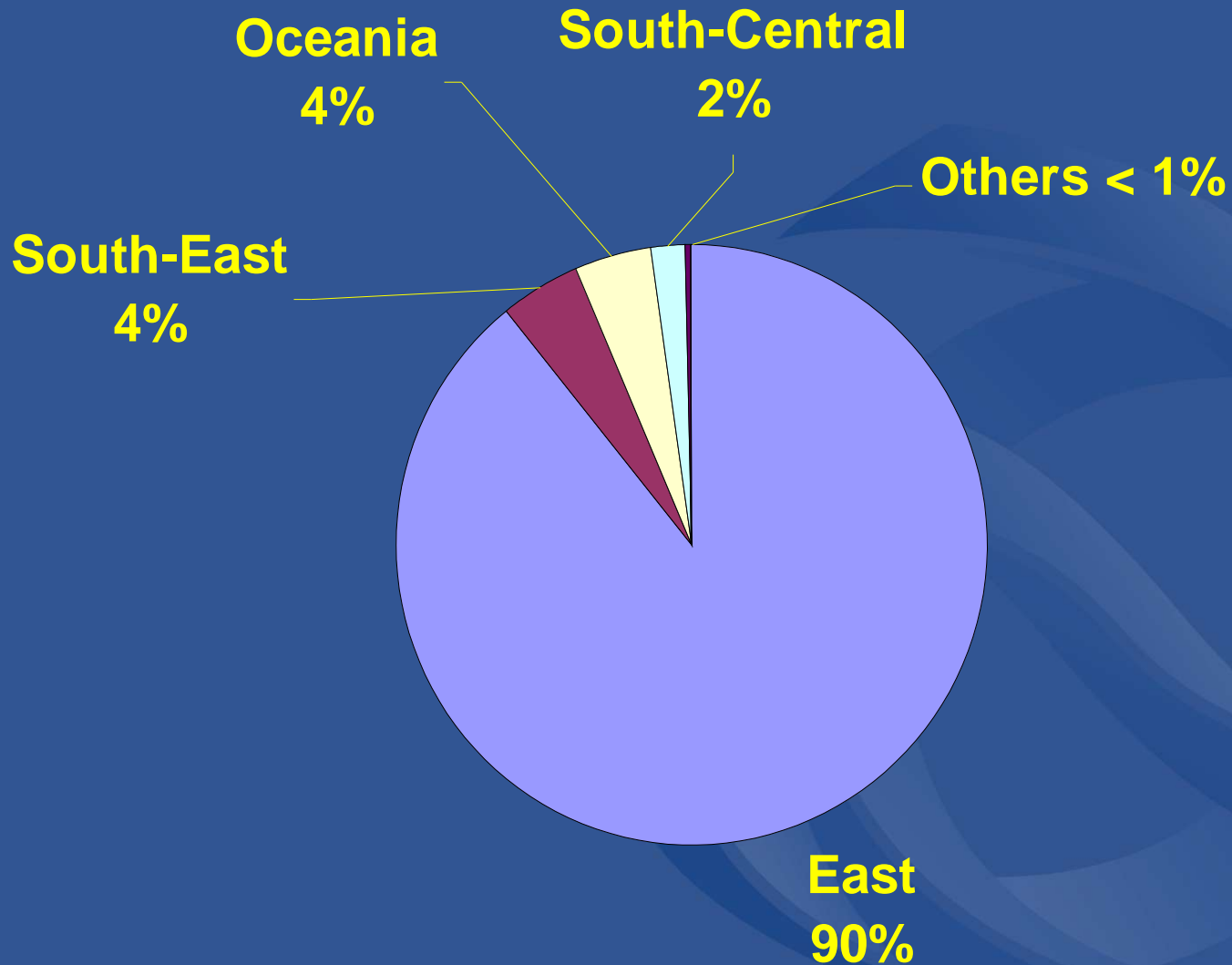
FAQ: others

- Routing and aggregation
- Static addressing
- Cable/DSL addressing
- IPv6

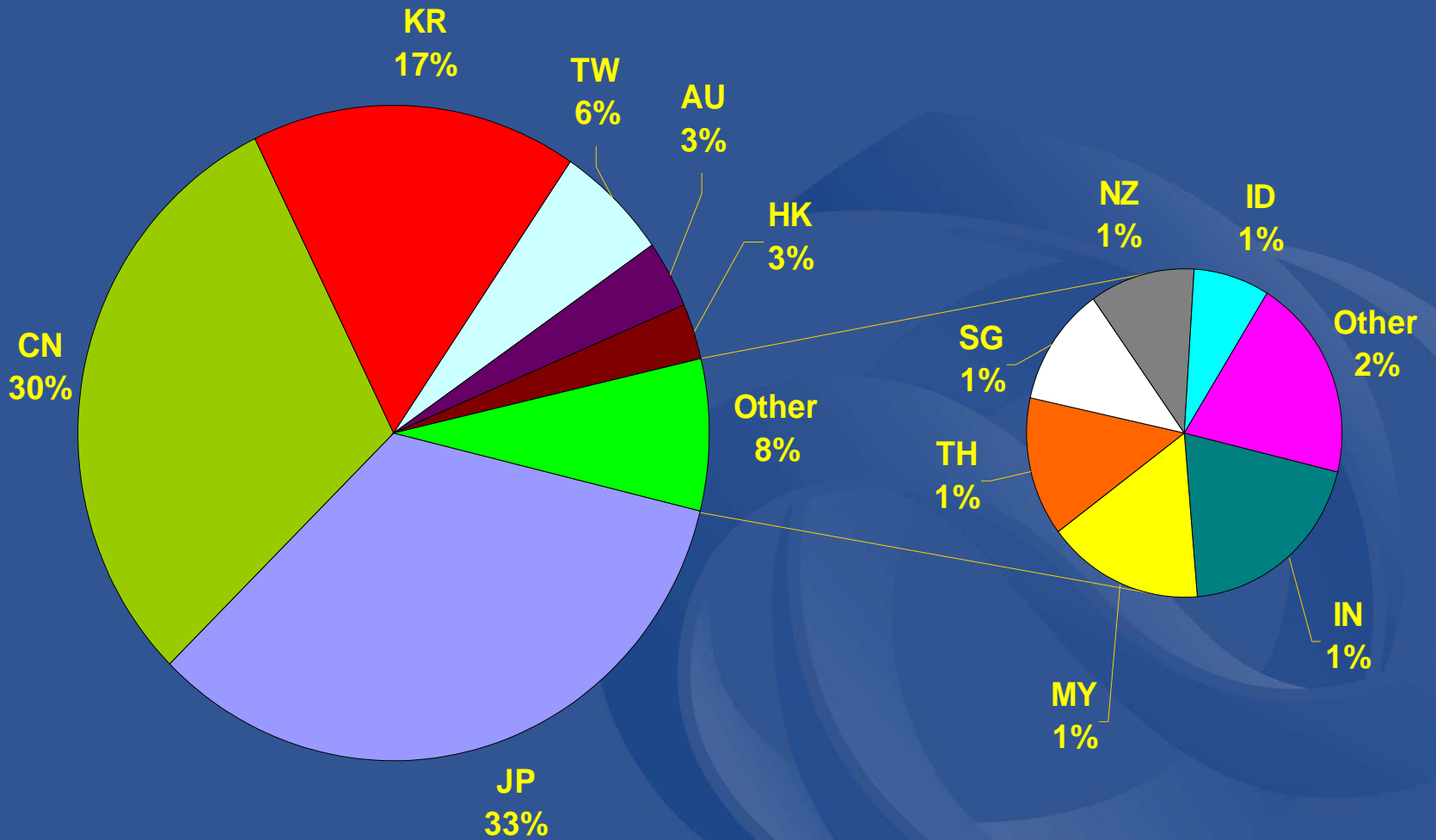
Total APNIC IPv4 allocations (/8s) by year



Total APNIC IPv4 allocations by sub-region

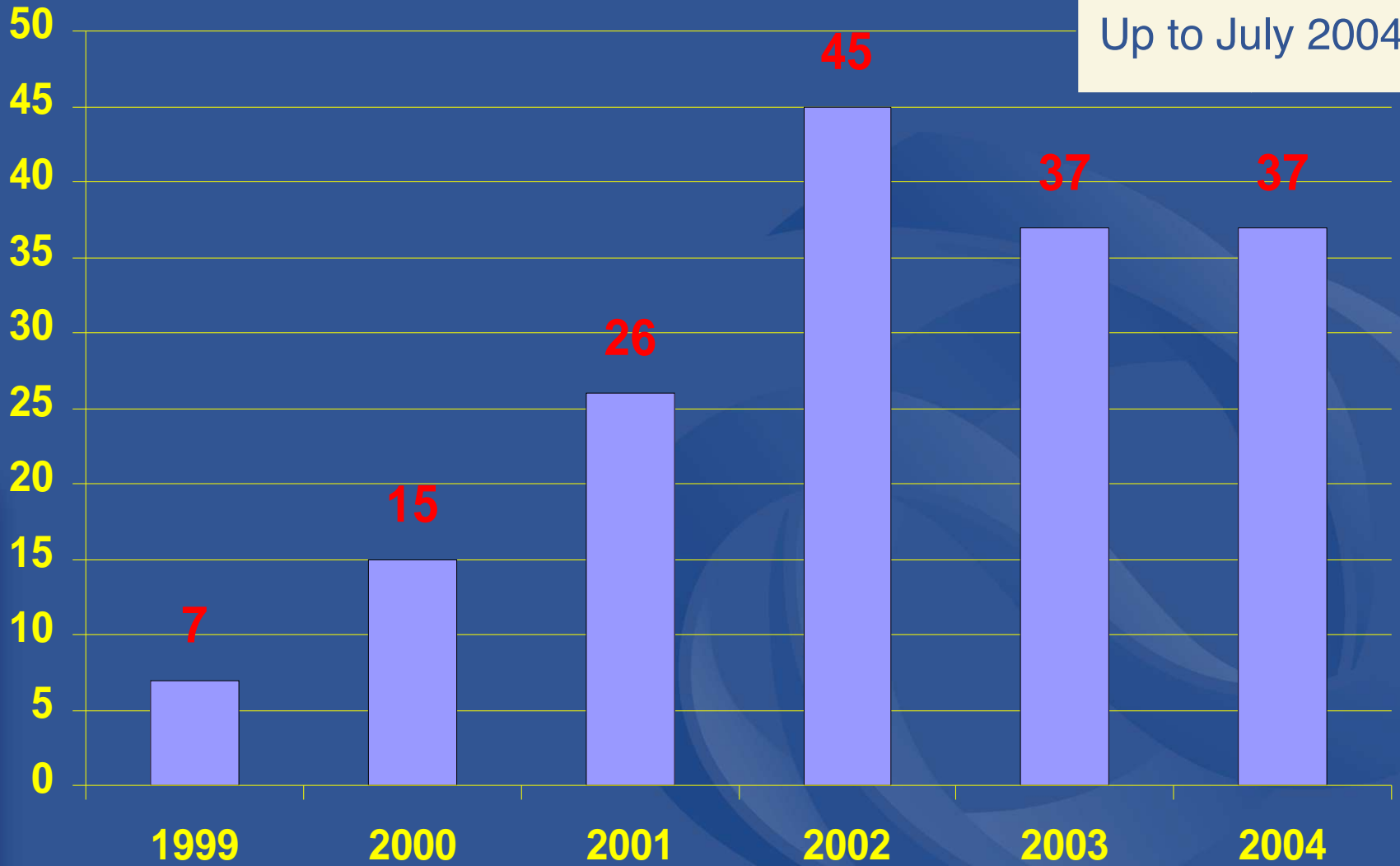


APNIC IPv4 allocations by economy

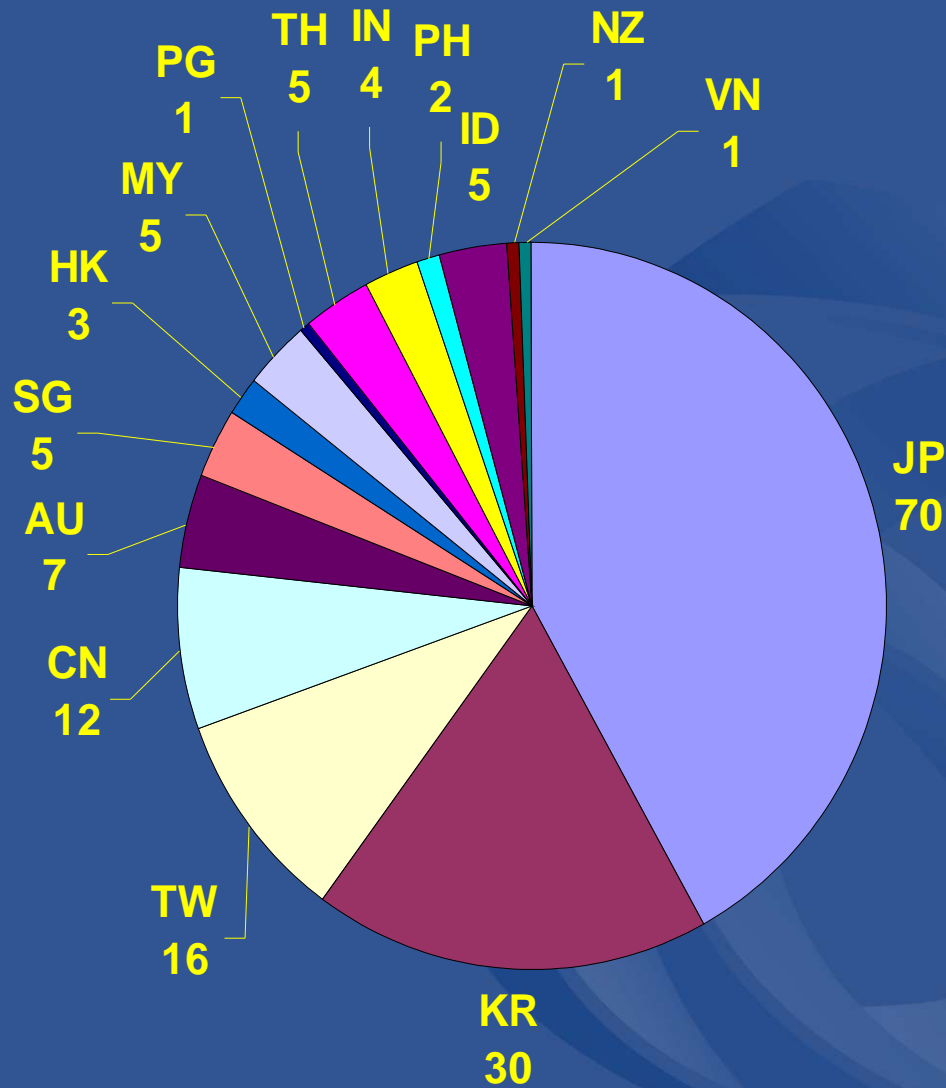


APNIC IPv6 allocations by year

Up to July 2004



APNIC IPv6 allocations by economy



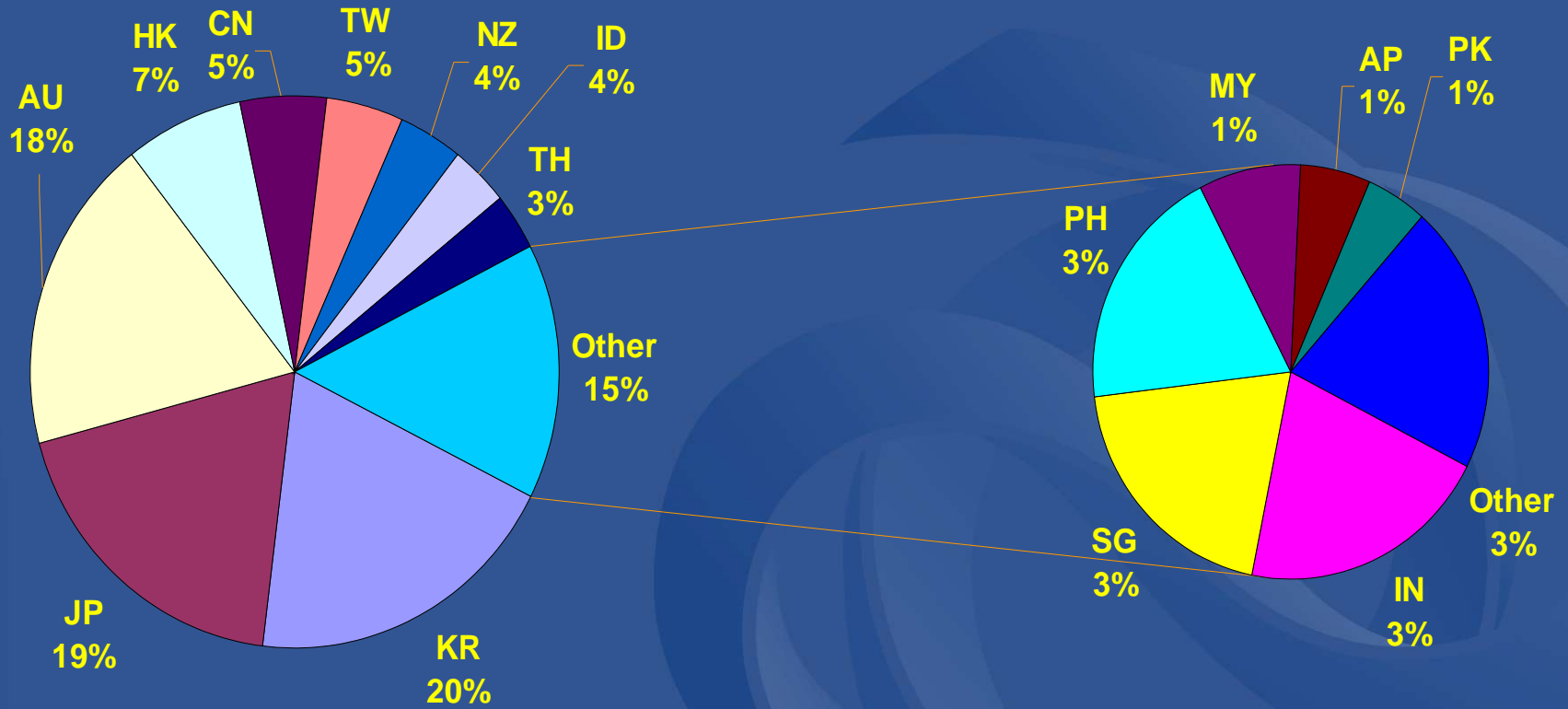
AS number assignments by year



Up to July 2004

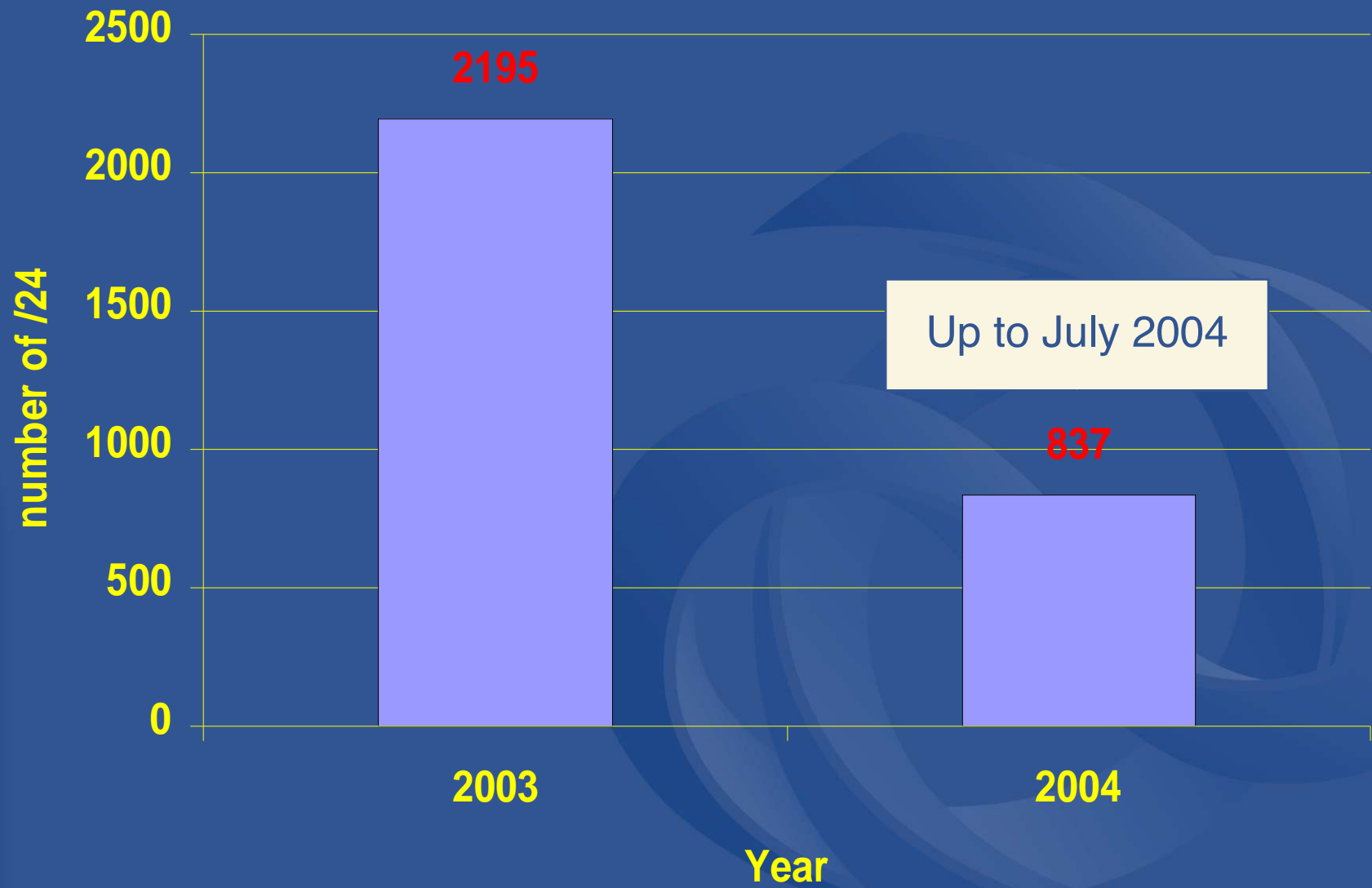


APNIC AS number assignments by economies





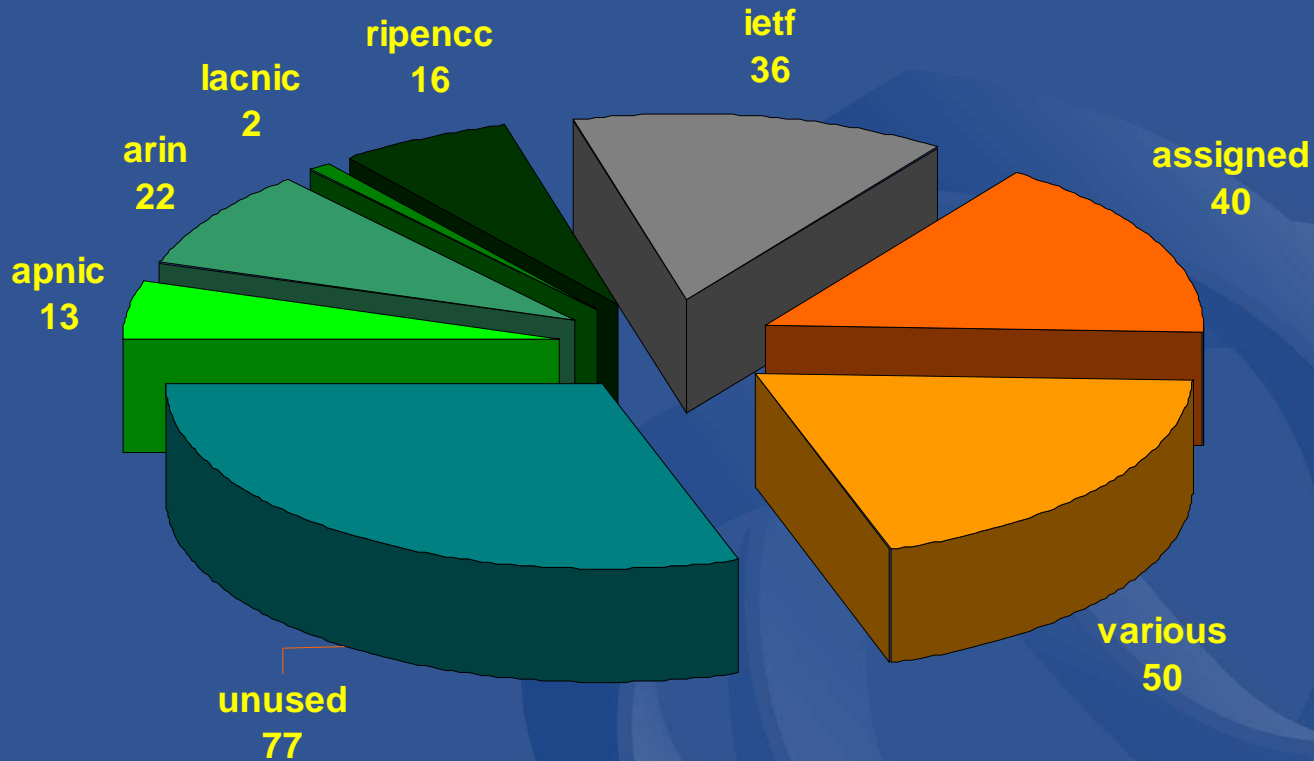
Recovered IPv4 address space (/24)



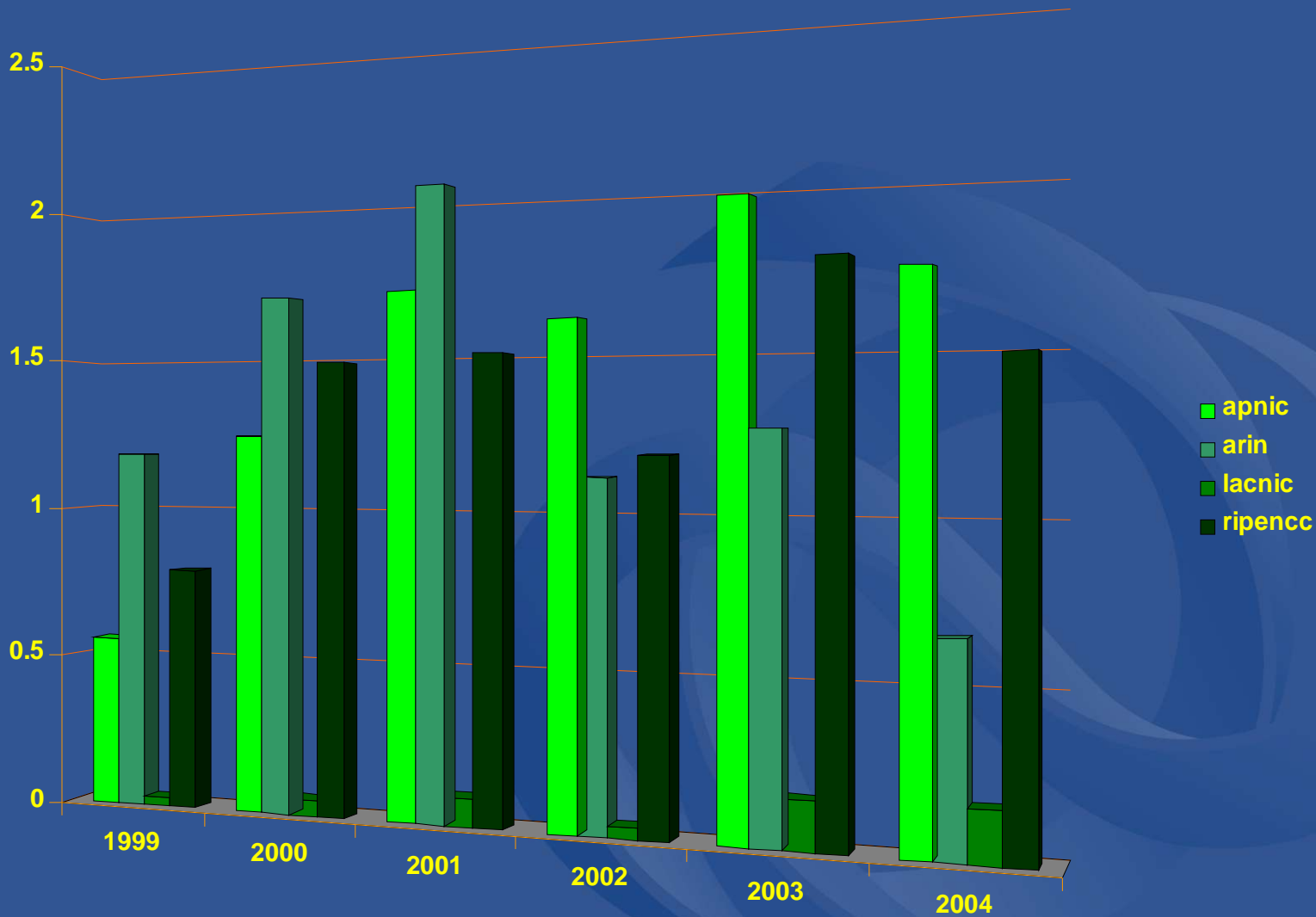
How long will IPv4 last?

- Few attempts in the past to predict future trends and consumption rates
 - All arrived at different conclusions
- Many factors influence utilisation
 - Economic wealth
 - Technological developments
 - Government regulation
 - Approved policies of RIR communities

How long will IPv4 last?



How long will IPv4 last?



How long will IPv4 last?

- Analysis by Geoff Huston
 - Projections based on current and past utilisation rates
 - IETF definition of IPv4, IANA, RIR and BGP announcement
 - Exponential growth model
 - Address space projected to last until **2018**
 - or **2022** if all unannounced space recovered
 - Linear growth model
 - Address space projected to last until **2023** (or **2042**)
- <http://bgp.potaroo.net/ipv4>

What about IPv6?

- RIRs support the deployment of IPv6
 - Transition will take time
 - Necessary to start now
 - IPv4 was slow to start, but grew exponentially over the last 10 years
 - Don't get left behind!
 - Be future ready!
- Responsible management essential to keep the Internet running

Can my organization qualify for IPv6?

- Summary of current criteria
 - Have a plan for making 200 /48 to organisations within two years
 - Can use existing IPv4 network as justification
- Example: an ISP with IPv4 network
 - Customers requirement
 - 120 dial up ports
 - 20 leased line customers
 - 50 ADSL customers
 - Infrastructure
 - 3 POPs
 - Qualify for /32 allocation

APNIC services - Internet resources

- Hostmaster response time
 - 1 working day for all request types
- Average time required to obtain resources
 - Initial IP request: 2-3 weeks
 - Including membership process
 - Additional IP request: 1-2 weeks
 - Process quicker if member uses “MyAPNIC”
 - Large requests can take longer
 - IPv6 request: within 1 week
 - Large requests can take longer
 - Others: IXP, small multi-homing, critical infrastructure within 1 week
 - Autonomous System Number: 1-2 days



APNIC services – Internet resources

- Helpdesk
 - Operating hours: 9:00-19:00 AEST
 - Phone: +61-7-3858-3188
 - Fax: +61-7-3858-3199
 - Email: helpdesk@apnic.net
 - Additional language spoken: Chinese (cantonese & mandarin), Tagalog, Hindi and Vietnamese
 - Starting IP phone service in 2005
- Problems that need face to face discussion
 - Meet hostmasters at training sessions
 - Meet hostmasters at meetings
 - Register hostmaster consultation (HMC) session
 - <http://www.apnic.net/meetings/18/programme/hmc.html>
 - Meet hostmaster at helpdesk



APNIC membership services

- “MyAPNIC”
 - Web interface software
 - Allows secure access to member information
 - Easy to update ‘whois’ Database
 - Easy to manage assignment information
 - Easy to manage reverse DNS
 - Easier to manage address space
 - Speed up requests for resources
- Need more information?
 - See demo at the helpdesk during meeting or check the online demo
 - <http://www.apnic.net/myapnic-demo/flash/>

Summary

- Challenges continue
 - Keeping knowledge up to date is vital
- APNIC is here to help your organisation
 - Please make use of the services available!

Vinaka vaka levu

- Questions?