# APNIC & Internet Address Policy in the Asia Pacific

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# Overview

- Introduction to APNIC
- Policy Development
- Address Management
- APNIC Update
- Questions

# What is APNIC?

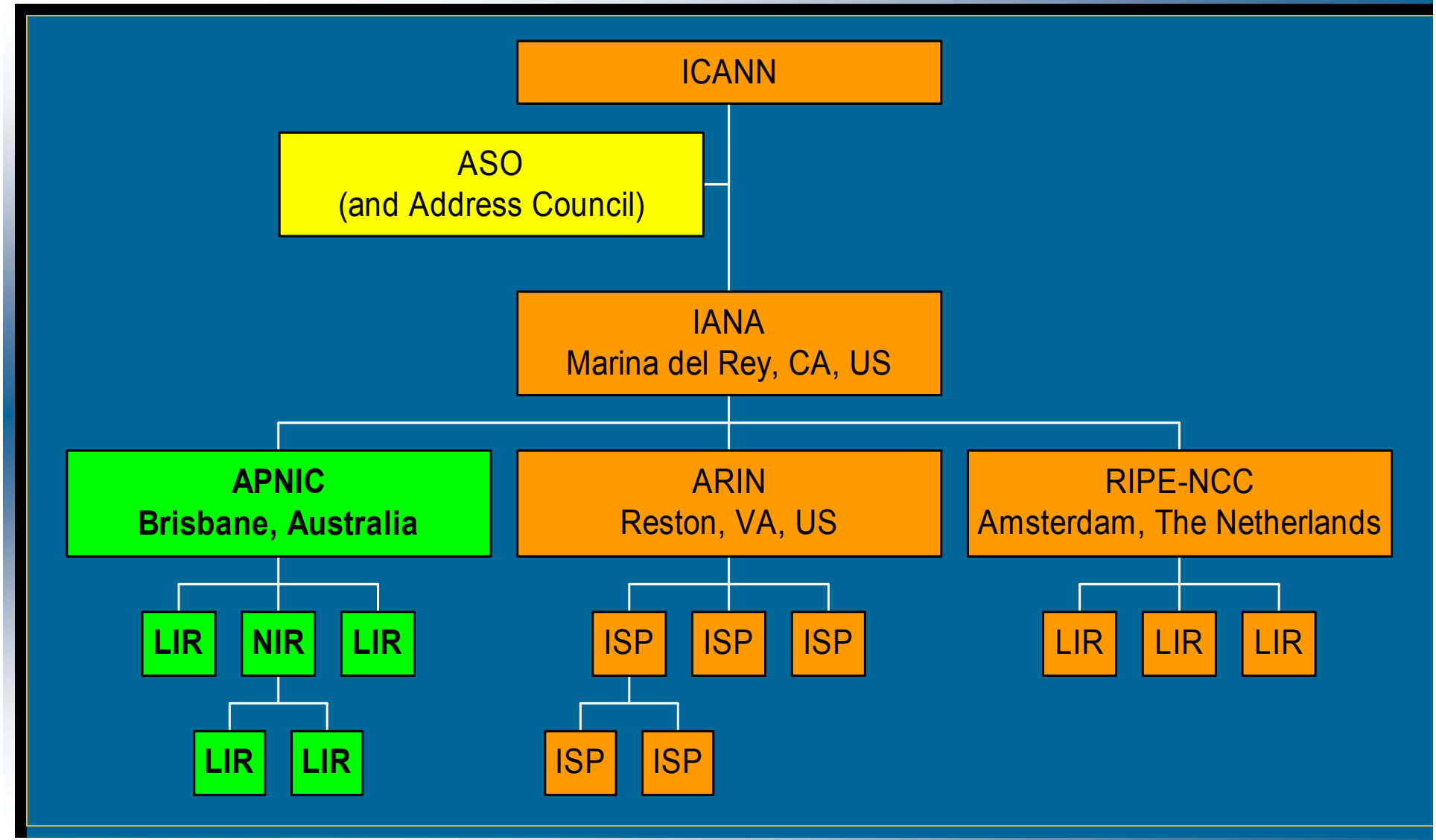
- Regional Internet Registry (RIR) for the Asia Pacific Region
  - Regional authority for Internet Resource distribution
  - IP addresses (IPv4 and IPv6), AS numbers, in-addr.arpa delegation
- Established 1993
  - Operating within ICANN (IANA) structure
  - Pilot project of APNG in Tokyo, Japan
  - Relocated to Brisbane, Australia in 1998

# What is APNIC?

- Industry self-regulatory body
  - Consensus-based, open and transparent
  - Non-profit, neutral and independent
- Membership-based structure
  - Open to any interested party
  - Provides formal structure for cost recovery, election of representatives etc
- Is NOT
  - Standards body like IETF, or a network operator
  - Domain name registry or registrar

# APNIC Region

# Delegated Hierarchy



# What does APNIC do?

Critical Internet administrative services

- Internet resource management
  - IP address allocation and assignment
  - AS number assignments
- Resource registration
  - Authoritative registration server: *whois*
- DNS management
  - Delegate reverse DNS zones/domains
  - Authoritative DNS server: *in-addr.arpa*

# What else does APNIC do?

- Policy development
  - Open Policy Meetings: SIGs, WGs, BOFs
  - Mailing list discussions
- Training and Seminars
  - 2 training courses per month in 2002
  - Seminars with AP Outreach
- Publication & Information
  - Newsletter, web and ftp site
  - Joint RIR statistics

# What else does APNIC do?

- Co-ordination & Representation
  - Extensive liaison with development, industry communities
    - IETF, IEPG, IPv6 Directorate, GSM-A, IPv6 Forum, ISOC
  - Asia Pacific peak bodies in Internet industry, technology, policy and law
    - APNG, APIA, APAN, APTLD, APRICOT
  - Other RIRs and ICANN
    - ARIN, RIPE-NCC, LACNIC, AFRINIC
    - ICANN, IANA and ASO

# Policy Development

## Processes

# Address Management - Problems

By the end of 1992

- Address space depletion
  - IPv4 address space is finite
  - Historically, many wasteful allocations
- Routing chaos
  - Legacy routing structure, router overload
  - Increasing instability of routing structure
- Inequitable management
  - Early adopters received more address space than many countries have today!

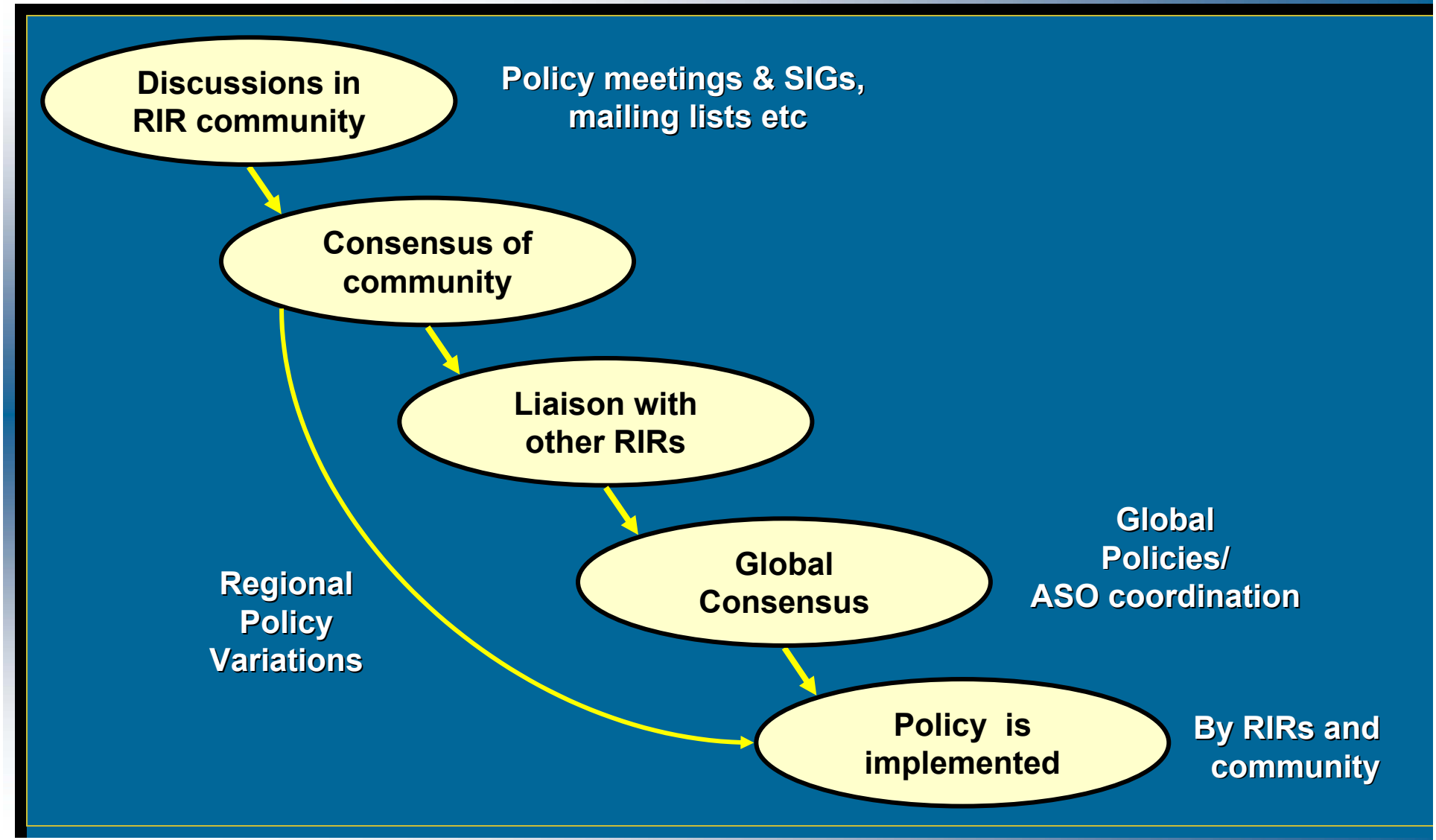
# Goals of the Registry System

- Conservation
  - ensuring efficient use of resources, and allocation policies based on demonstrated need
- Aggregation
  - limiting growth of routable prefixes, through provider-based addressing policies
- Registration
  - ensuring that resource use is registered and that resources are allocated or assigned uniquely
- Fairness and Consistency
  - In the interests of regional and global communities

# Open Policy Development

- Policy development processes (regional & global)
  - Open - anyone can participate
  - Within self-regulatory environment
  - Must be adaptive and flexible to meet changing requirements of industry
    - New challenges posed to address management eg. G3 phones, GPRS, cable
- Global policy
  - ASO responsible for coordination within ICANN framework
    - ASO formed by RIRs (ASO MoU) with reliance on existing and proven regional policy structures

# Open Policy Development



# APNIC's Open Policy Forum

- APNIC Open Policy Meeting
  - 2 meetings a year, open to all
  - Many 'special interest groups'
    - Open public forum to discuss topics of interest to APNIC and the Internet community in the region
- Document Revision
  - Documents posted for public comment
  - Via web sites and mailing lists
  - Translated documents available
- Training & Education
  - Delivered across the region
  - Feedback into policy discussions

# Address Management

## Policies

# Address Management Policies

- Allocations as 'Provider Aggregatable' address space
  - Provider responsible for aggregation
  - Customer assignments must be non-portable
- Allocations based on demonstrated need
  - Detailed documentation required
  - All address space held to be declared
  - Address space to be obtained from one source
    - Routing considerations may apply
  - Stockpiling not permitted

# Address Management Policies

- "Slow start"
  - All organisations receive minimum allocation initially, regardless of initial requirement
    - Minimum allocation is currently a /20
  - Request more address space when consumed
- Assignment of address space
  - "Assignment Window" limits the size of "autonomous" assignments
  - "Second Opinion" must be requested when larger assignment is required

# Address Management Policies

- Criteria for initial minimum address allocation
  - Must have a /22 or demonstrate immediate need for a /22 and a plan for a /21 in one year
    - Including customer projections & infrastructure equipment
    - Applicants may be required to show purchase receipts
  - And agree to renumber within one year
  - Demonstrate efficient usage of IP addresses
- Implementing criteria follows global trend

# Address Management Policies

NEW policies

- Small multihoming portable **assignment**
  - Multihomed or have a plan to within 1 month
  - Agree to renumber
  - Demonstrate need to use 25% of requested space immediately and 50% within 1 year (rfc2050)
- IX address space requests
  - /64 for IPv6, /24 for IPv4
  - Must have more than 3 peers
  - Demonstrate ‘open’ peering policy
- Reserved block for IXes
  - 218.100.0.0/16

# Address Management Policies

- IP addresses are not considered property
  - “Licensed” allocations
  - Internet resources are public resources
  - ‘Ownership’ is contrary to management goals
    - Need to avoid the mistakes of the past
  - Transfer of license requires approval from the registry
    - ‘Automatic’ if policies are followed
- Address registration – whois database
  - Not considered valid unless registered
- Reverse DNS – in-addr
  - Not mandatory but strongly encouraged
    - APNIC maintains authoritative servers for address space

# Current Policy Discussions

- IPv6
  - Rough consensus on need for different initial allocation size - /32 suggested
  - Flexible utilisation measure needed
  - Global mailing list to further discuss
    - global-v6@lists.apnic.net
- RFC2050
  - Global effort to evaluate rfc2050 to see if relevant to today's Internet
  - Mailing list
    - 2050-wg@arin.net
    - To subscribe <majordomo@arin.net>

# New APNIC Membership Structure

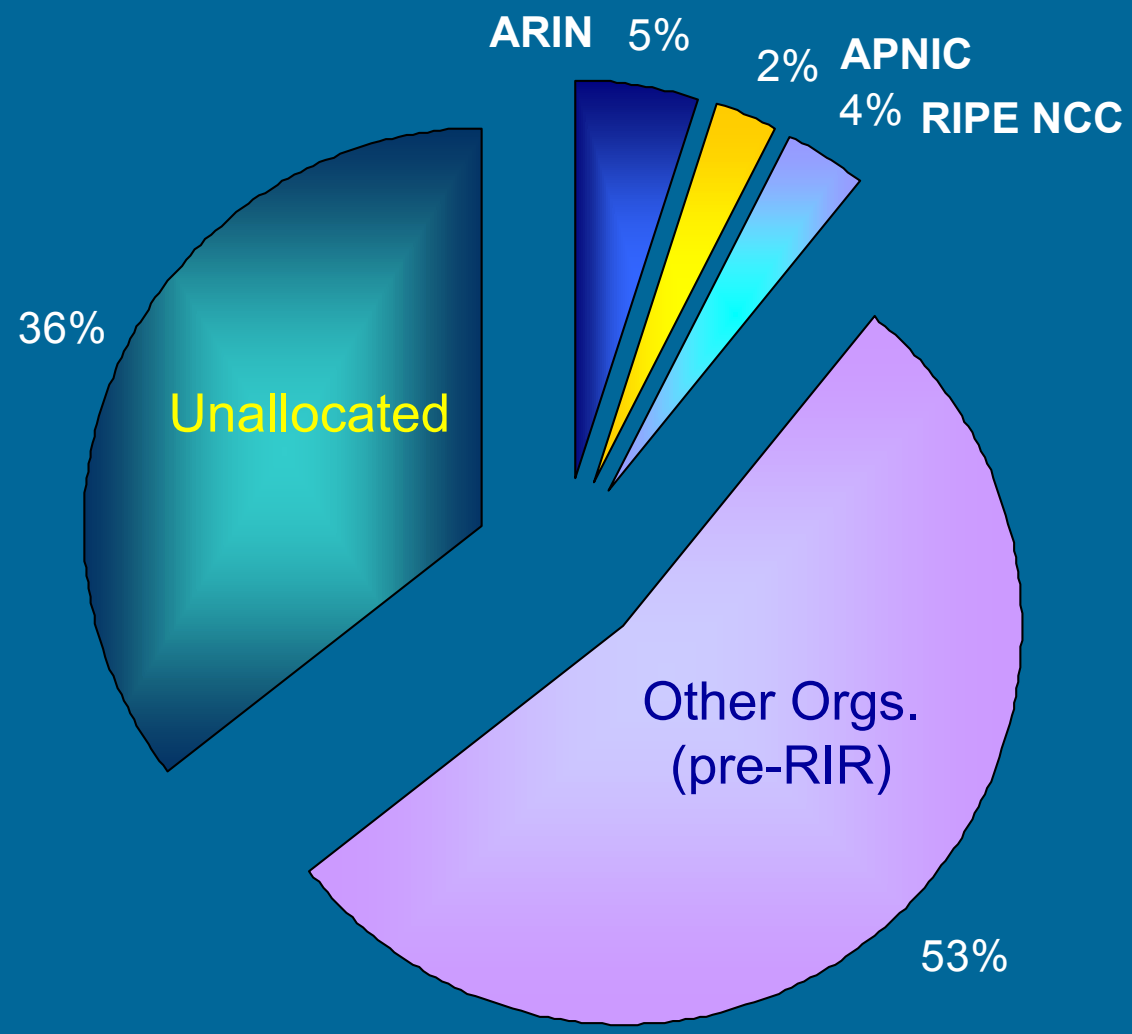
| Prefix | Category | New Fee | Votes |
|---|---|---|---|
| **> /10** | **X-large** | **$40,000** | **64** |
| <= /10 | V-large | $20,000 | 32 |
| <= /13 | Large | $10,000 | 16 |
| <= /16 | Medium | $5,000 | 8 |
| <= /19 | Small | $2,500 | 4 |
| **<= /22** | **V-small** | **$1,250** | **2** |
| **n/a** | **Assoc** | **$625** | **1** |

- Implementation:
  - 1 December 2001 for new member
  - 1 March 2002 for existing members

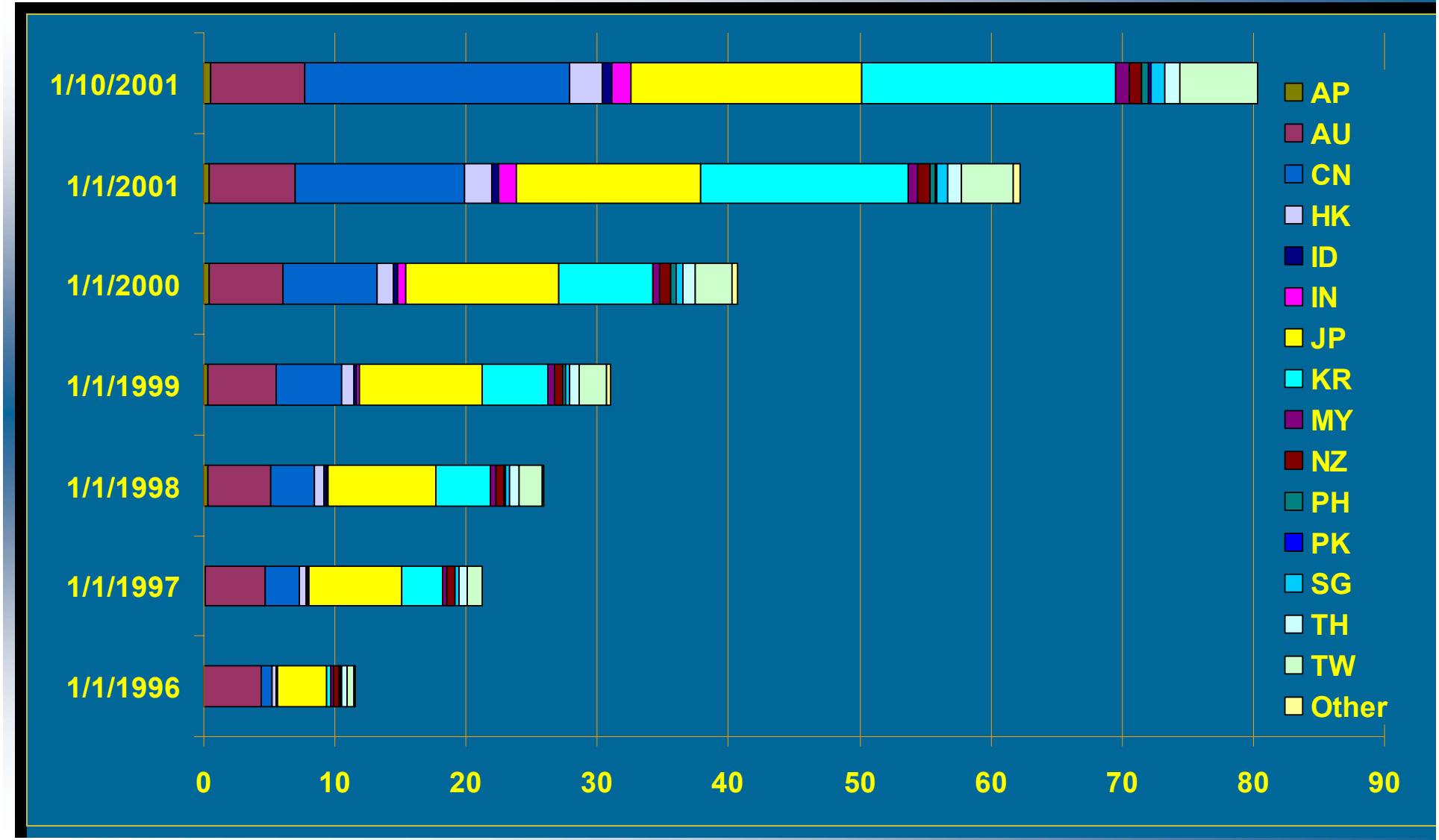
# APNIC Update

## Statistics and Security

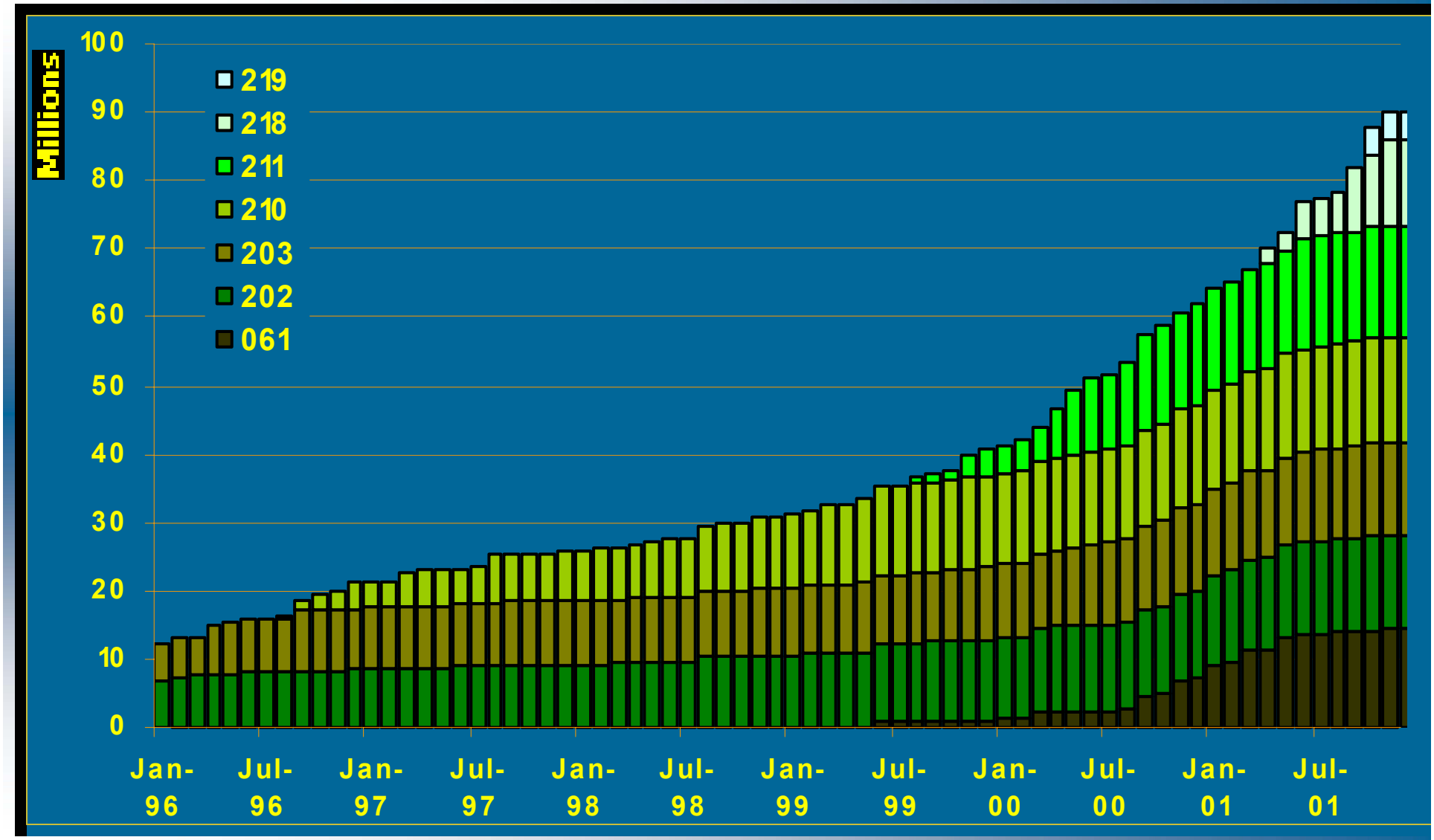
# IANA Delegations (Apr 2001)



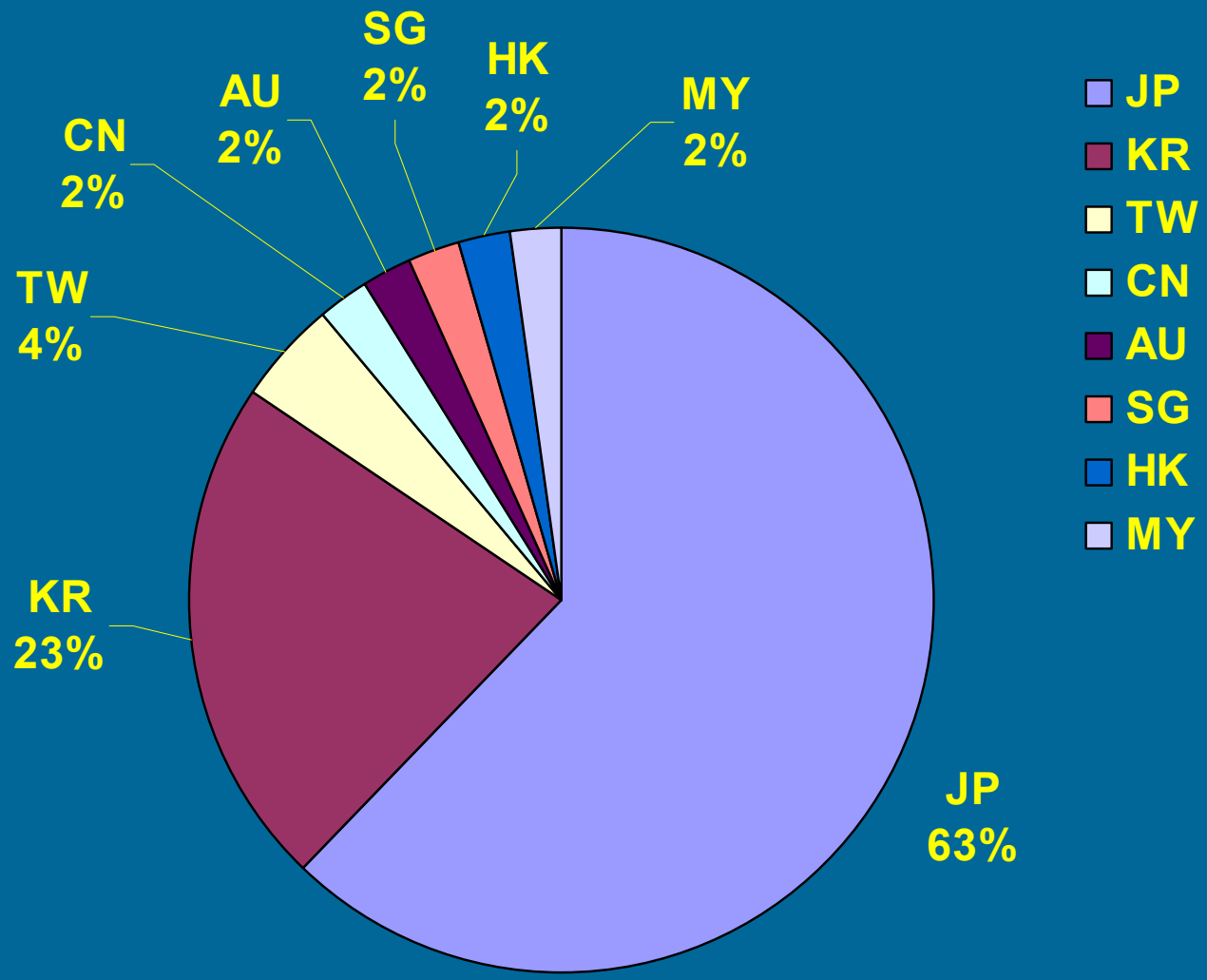
# Where are the IPv4 Allocations?



# IPv4 Addresses Allocated in AP



# IPv6 Allocations in the AP Region



# Security of APNIC Services

- No change after Sept 11
  - Security is always under constant review
  - Increased public awareness
- Security measures consistent with “Medium” security site
  - Backups with secure off site storage
  - Secured entry and alarm systems
  - Backup power – UPS with generator provisions
  - Redundant servers hardware, RAID etc
  - Distributed architecture (DNS, and more planned…)
- Security provisions implemented with diligence

# Security of APNIC Services

- 'whois'
  - Brief outages not regarded as critical
    - But 'highly available'
  - External machines separate from internal
- DNS (in-addr.arpa)
  - Zone authority for address blocks delegated to APNIC
    - Essential service – requires 24x7 availability
  - Secondaries at Japan POP and other sites (eg RIRs)
- RIR co-operation
  - Engineers liaise frequently to address issues of redundancy and backup
    - Mirror servers deployment planned at ARIN & RIPE NCC

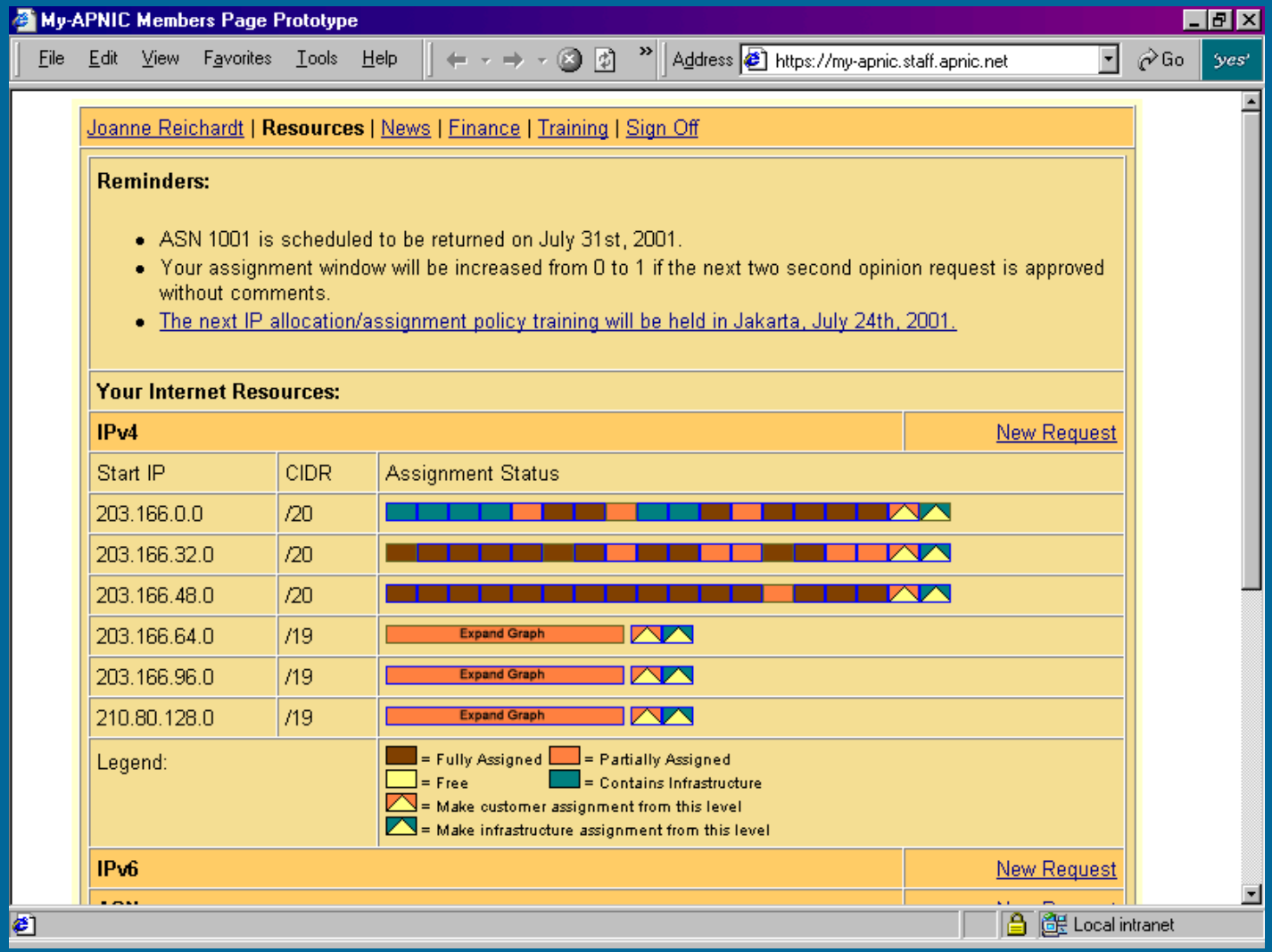
# Future Plans

- Distributed POP architecture
  - Providing all essential services
    - ‘whois’, DNS, web, email
    - With dynamic load distribution
  - Deployment
    - Existing WIDE/NSPIXP site to be upgraded
    - First new site early 2002 - probably HKIX
    - More planned in region
- DNSsec
  - Testing currently underway

# Future Plans

- Certification Authority
  - Response to member concerns on security
  - Email, website auth* and privacy
  - Industry-standard X.509 certificates
  - Trial certificates being issued now (still?)
- “MyAPNIC” website
  - Access to members’ private information
  - Use of certificates for secured access
  - Prototype/demonstration development…

# Future Plans




# Questions?