Asia Pacific Network Information Centre

APNIC

IP Address Management

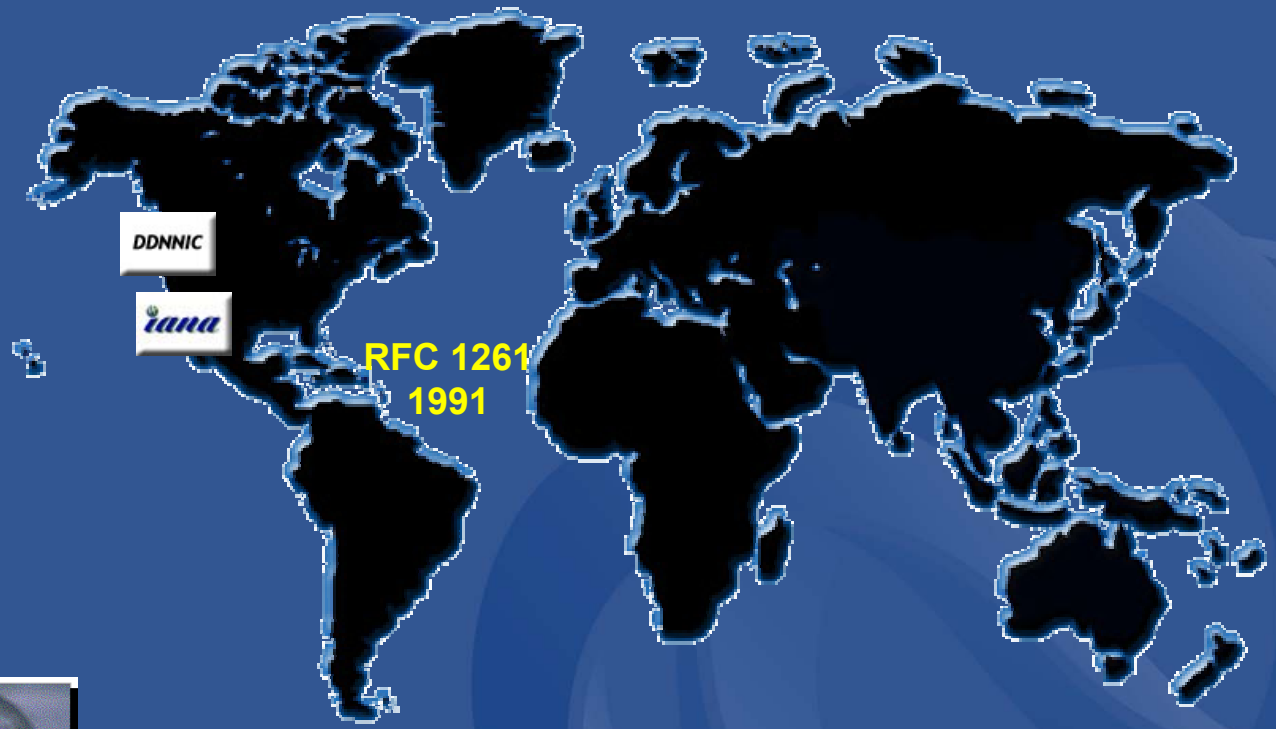
The RIR System & IP policy

Nurani Nimpuno
APNIC

Overview

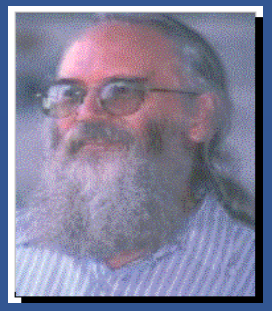
- Early address management
- Evolution of address management
- Address management today
- Address policy development

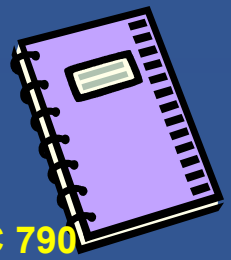
IP allocation Pre 1992



RFC 1020
1987

RFC 1261
1991



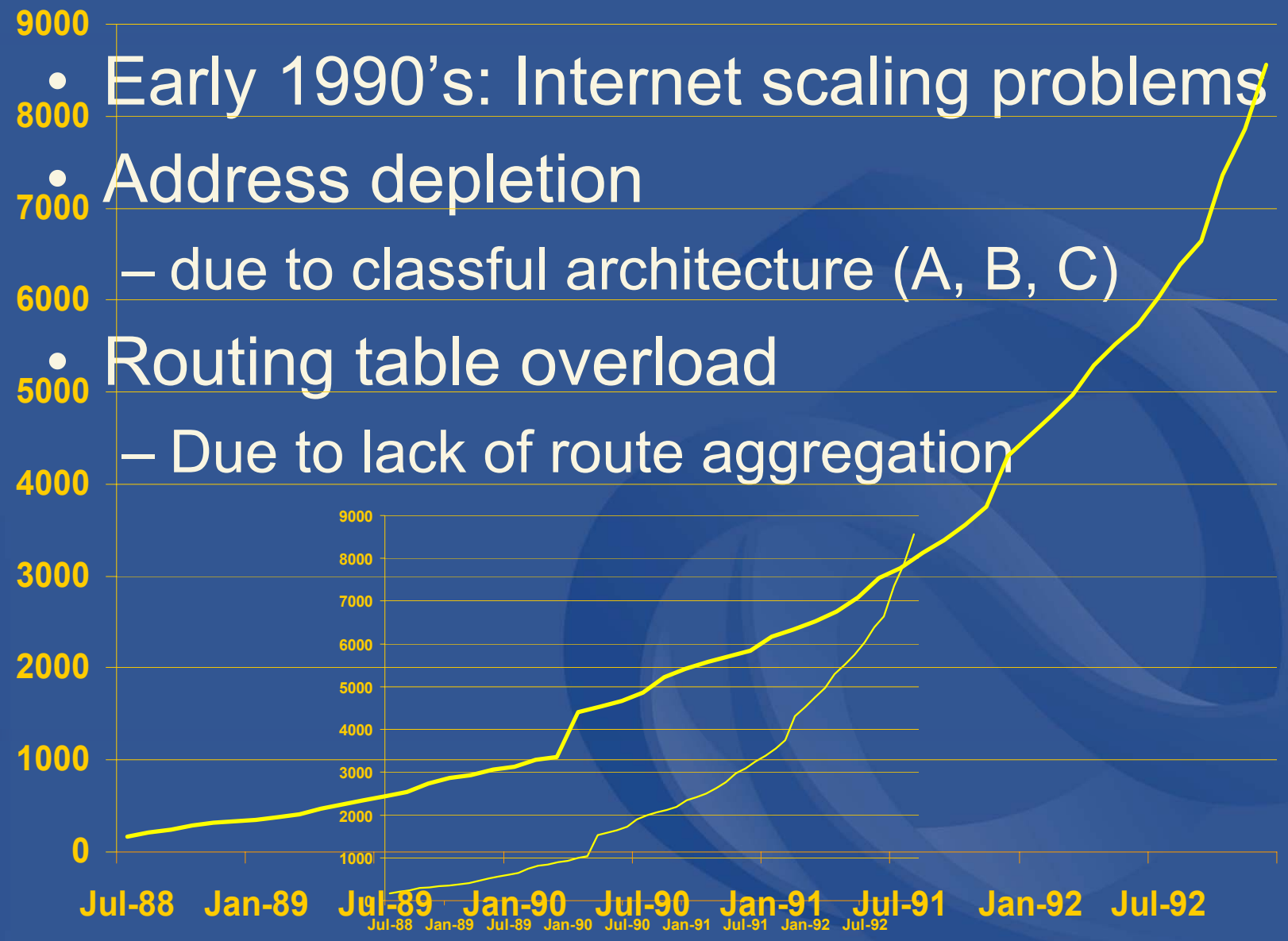


RFC 790
1981

"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 1990's

- Early 1990's: Internet scaling problems
- Address depletion
  - due to classful architecture (A, B, C)
- Routing table overload
  - Due to lack of route aggregation



Early address management

- Internet widely projected to fail
  - Growth would stop by mid-'90s
  - Urgent measures required
  - Action taken by IETF / Internet community

- 1993: Development of "CIDR"
    - addressed both technical problems

  ⇒ Address depletion
    - Through *more accurate* assignment

  ⇒ Routing table overload
    - Through address space *aggregation*

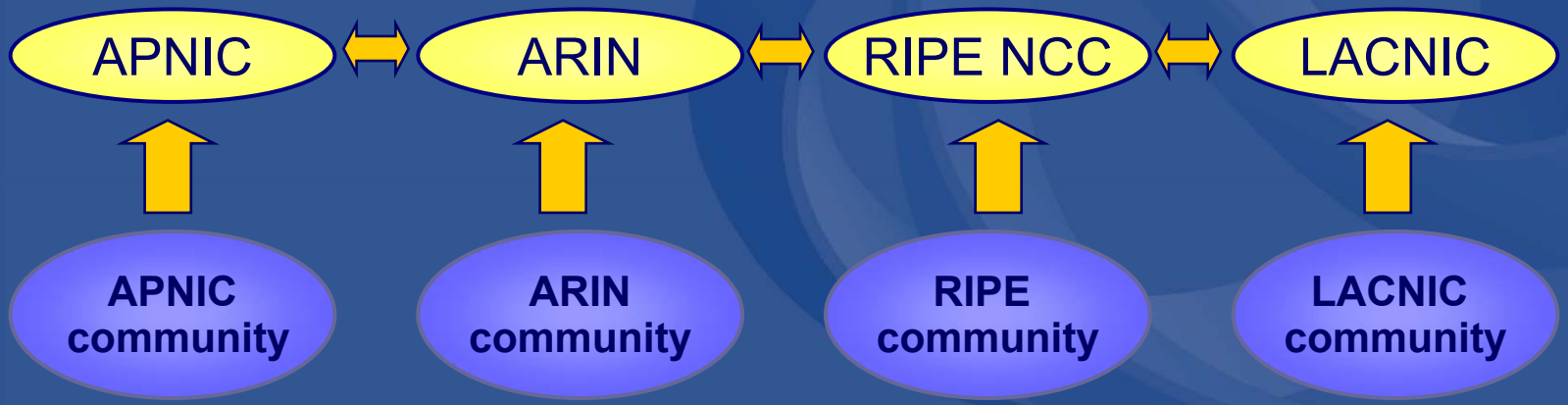
Evolution of address management

- Administrative problems remained
  - Increasing complexity of CIDR-based allocations
  - Increasing awareness of conservation and aggregation goals
  - Need for fairness and consistency

- RFC 1366 (1992)
  - Described the “growth of the Internet and its increasing globalization”
  - Additional complexity of address management
  - Set out the basis for a regionally distributed Internet registry system

Evolution of address policy

- 1990s - establishment of RIRs
  - APNIC, ARIN, RIPE NCC (LACNIC later)
  - Regional open processes
  - Cooperative policy development
  - Industry self-regulatory model
    - bottom up

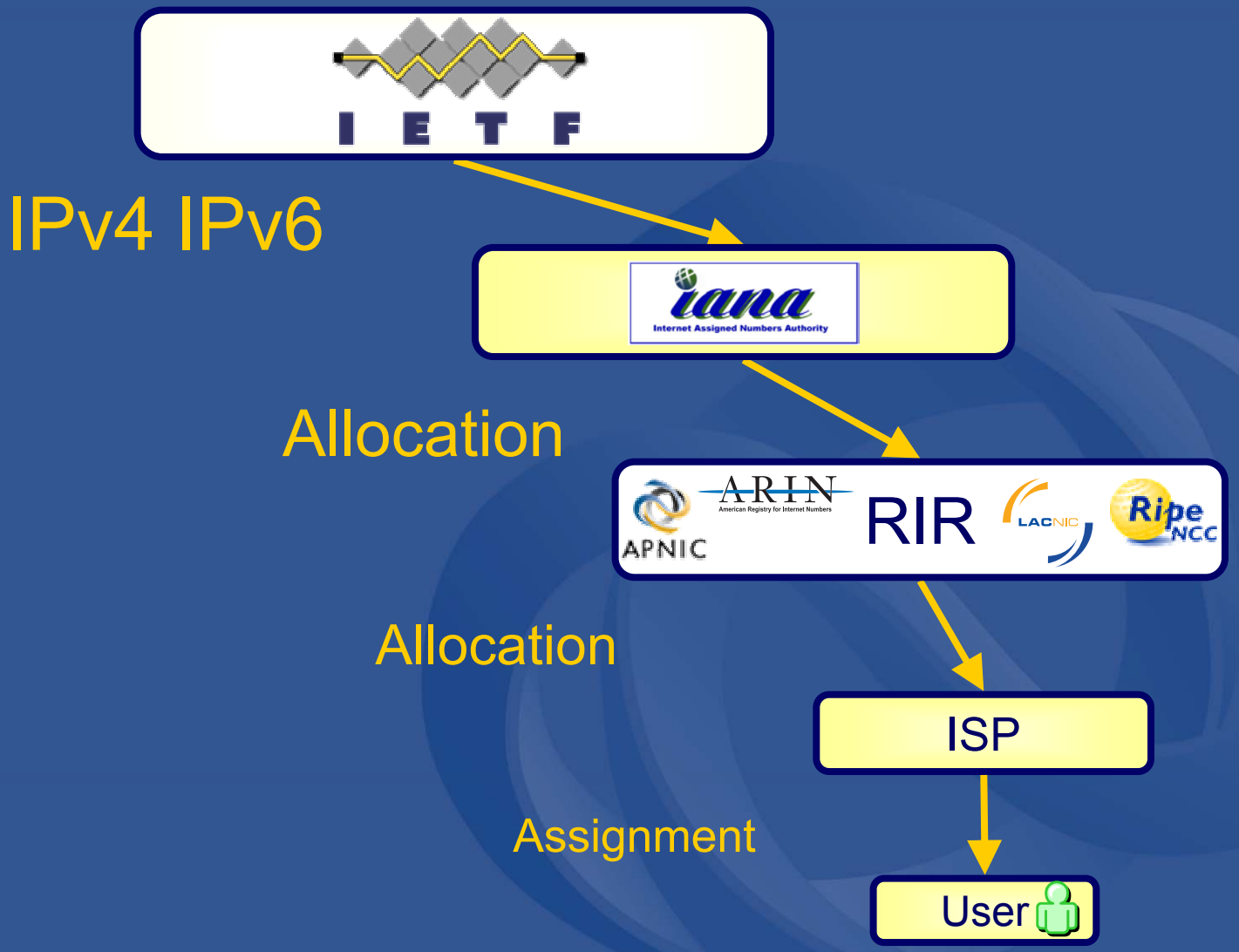


Address management today

Asia Pacific Network Information Centre

APNIC

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

What is APNIC?

- Regional Internet Registry for the Asia Pacific
  - Regional authority for Internet Resource distribution (IPv4 & IPv6 addresses, AS numbers, reverse DNS delegation)
- Non-profit, open membership
  - 850 ISP members in 42 economies
  - Any interested party can join
- Industry self-regulatory structure
  - Open Policy Meetings
  - Bottom-up structure

Neutral, impartial, open and transparent

Asia Pacific Network Information Centre

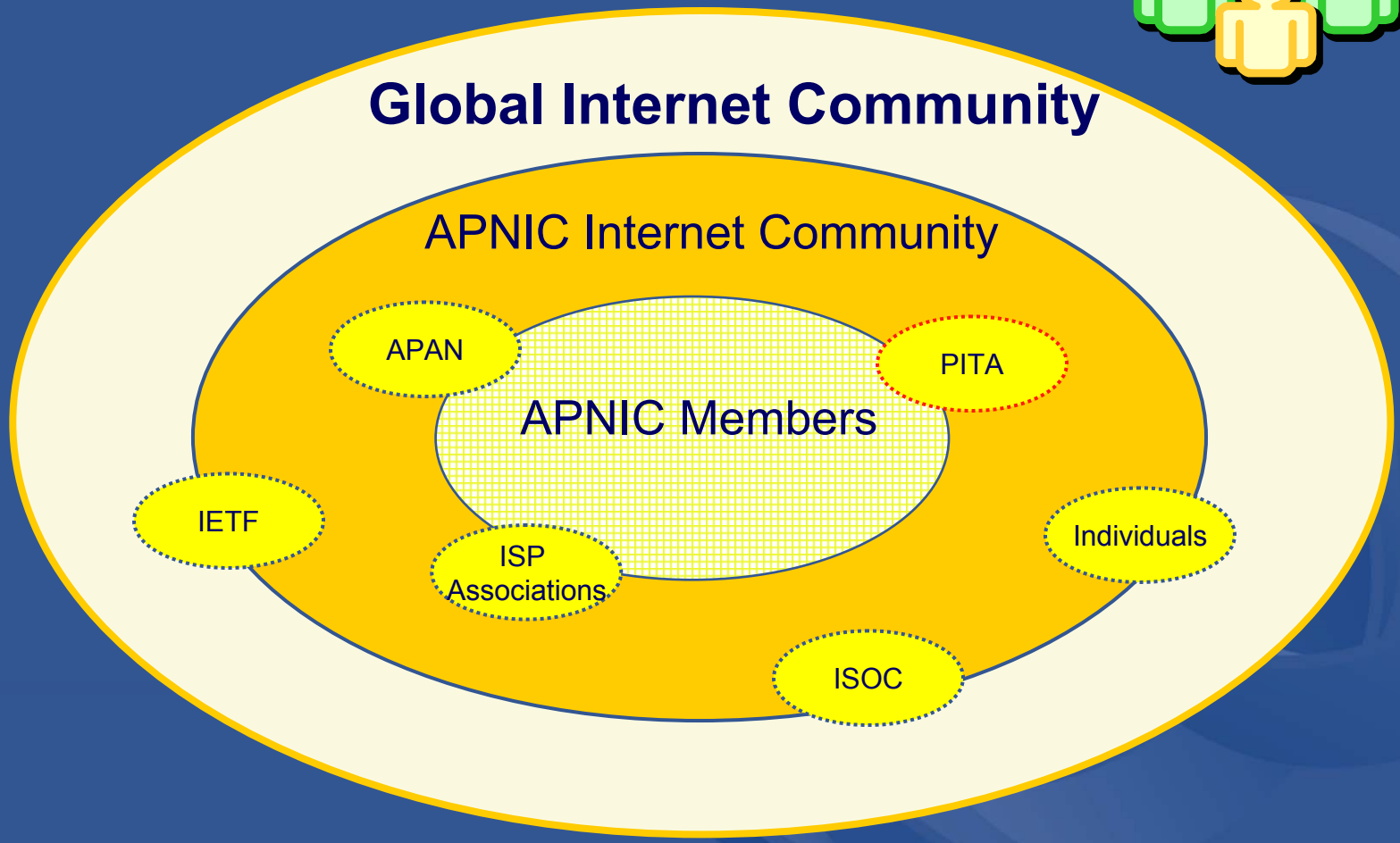
APNIC

What is the APNIC community?

- **Open** forum in the Asia Pacific
  - Open to any interested parties
- Voluntary participation
- Decisions made by consensus
- Public meetings
- Mailing lists
  - web archived

- *A voice in regional Internet operations through participation in APNIC activities*

Internet community



Asia Pacific Network Information Centre

APNIC

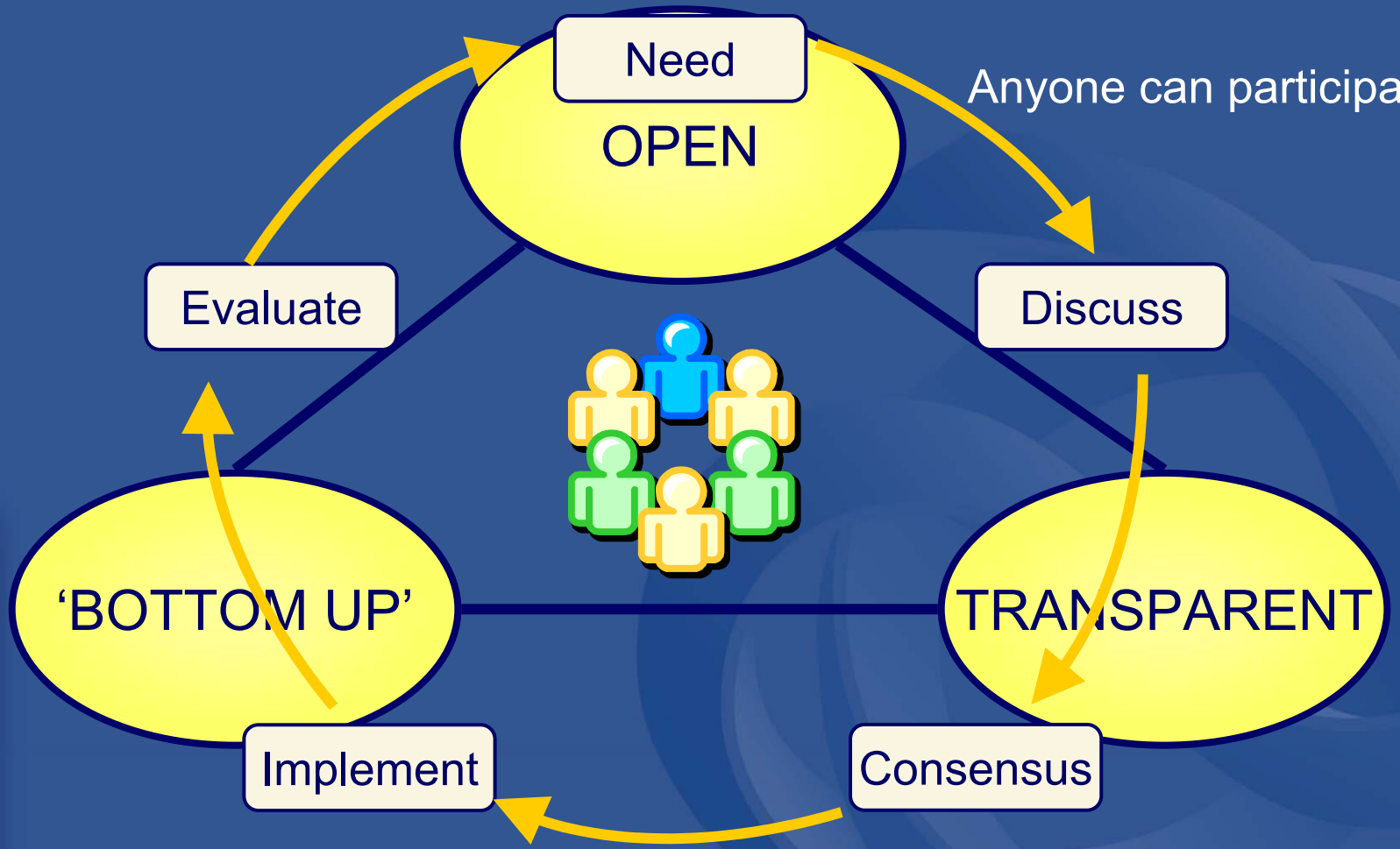
Policy development

- Industry self-regulatory processes
  - Open to all interested parties
  - Facilitated by RIR staff
- Policy implementation
  - RIR processes
  - ISPs and other affected parties

Why should I bother participating?

- Business reasons
  - Policies affect your business operating environment and are constantly changing
  - Ensure your ‘needs’ are met
- Responsibility as APNIC member
  - To be aware of the current policies for managing address space allocated to you
- Educational
  - Learn and share experiences
  - Stay abreast with ‘best practices’ in the Internet

Policy development cycle



Asia Pacific Network Information Centre

APNIC

Elements of the process

Current discussions

- Lowering min allocation size & criteria
  - Lower min allocation size from /20 to /21 (criteria: /23 immediate need, /22 within a year)
- IPv6 allocations to IPv4 networks
  - ISPs with large existing IPv4 network that qualify for an IPv6 allocation may use their existing v4 infrastructure to qualify for a larger allocation.
- Global unicast IPv6 to “unconnected” networks?
  - Not covered in current policy (no rfc1918 for IPv6)
- Protecting historical networks in the APNIC whois DB
  - Provide protection of historical objects in APNIC db
- Recovery of unused address space
    - (A lot of historical address space not in use, Increasing amount of cases of hijacking)
  - Historical addresses determined to be unused (not visible in the routing table for x amount of time) to be reclaimed.

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

How to make your voice heard

- Contribute on the public mailing lists
  - http://www.apnic.net/community/lists/
- Attend meetings
  - Or send a representative
  - Gather input at forums
- Give feedback
  - Training or seminar events
  - Through APNIC staff

Come to the APNIC meeting!

Next meeting in conjunction with

APRICOT 2004

Kuala Lumpur, Malaysia, 18-27 February 2004

Fellowship program registration now open!

- Participate in policy development
- Attend workshops, tutorials & presentations
- Exchange knowledge and information with peers
- Stay abreast with developments in the Internet
- View multicast online
- Provide your input in matters important to you

http://www.apnic.net/meetings/

Asia Pacific Network Information Centre

APNIC

Conclusions

- IP address management
  - Result of 20 year evolution on the Internet
  - Supported Internet growth to date
  - Stable well-understood system
  - Open to all interested participants
- IP address policy is in Your hands
  - You are affected by IP address policy
  - You set the policy

Asia Pacific Network Information Centre

APNIC

Thank you

nurani@apnic.net

References

- Short history of the Internet
  - "*Development of the Regional Internet Registry System*" (Internet Protocol Journal)
    - http://www.cisco.com/warp/public/759/ipj_4-4/ipj_4-4_regional.html
  - Policy Documentation
    - http://www.apnic.net/docs/
- APNIC policy development process
    - http://www.apnic.net/docs/policy/dev/