Internet Resource Management

APNIC 30

Gold Coast, Australia

Introduction

- Presenters
  - Champika Wijayatunga
    - Training Manager
    - champika@apnic.net

  - Stella Best
    - Training Officer
    - stella@apnic.net

Objectives

- To provide an understanding of address management

- To keep membership up-to-date with the latest policies and procedures for requesting resources from APNIC and managing these
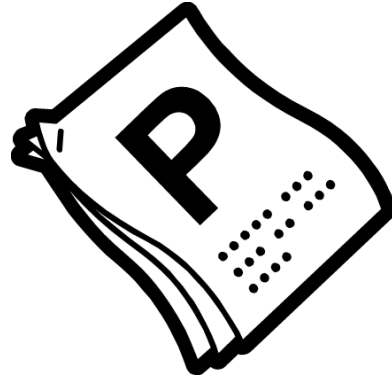
- Liaise with members

Overview

- Internet Registry Policies
- Policy Development Process
- Managing IP addresses

Regional Internet Registries

The Internet community established the RIRs to provide fair and consistent resource distribution and accurate resource registration throughout the world.
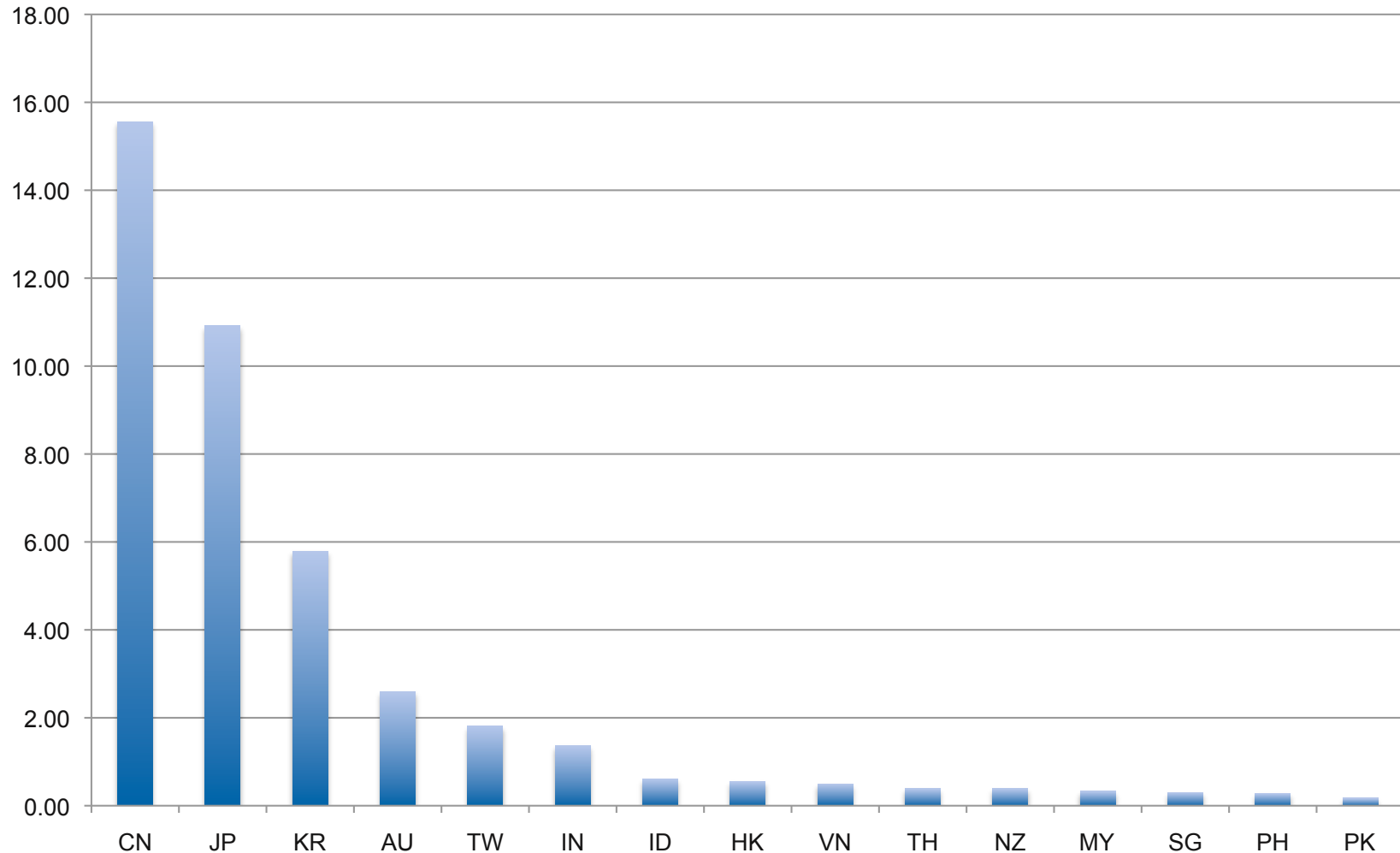
CURRENT POLICIES: INITIAL ALLOCATIONS

Initial IPv4 Allocation

- APNIC minimum IPv4 allocation size /22
  - An ISP must have used a /24 from their upstream provider or demonstrate an immediate need for a /24
  - An ISP must demonstrate a detailed plan for use of a /23 within a year
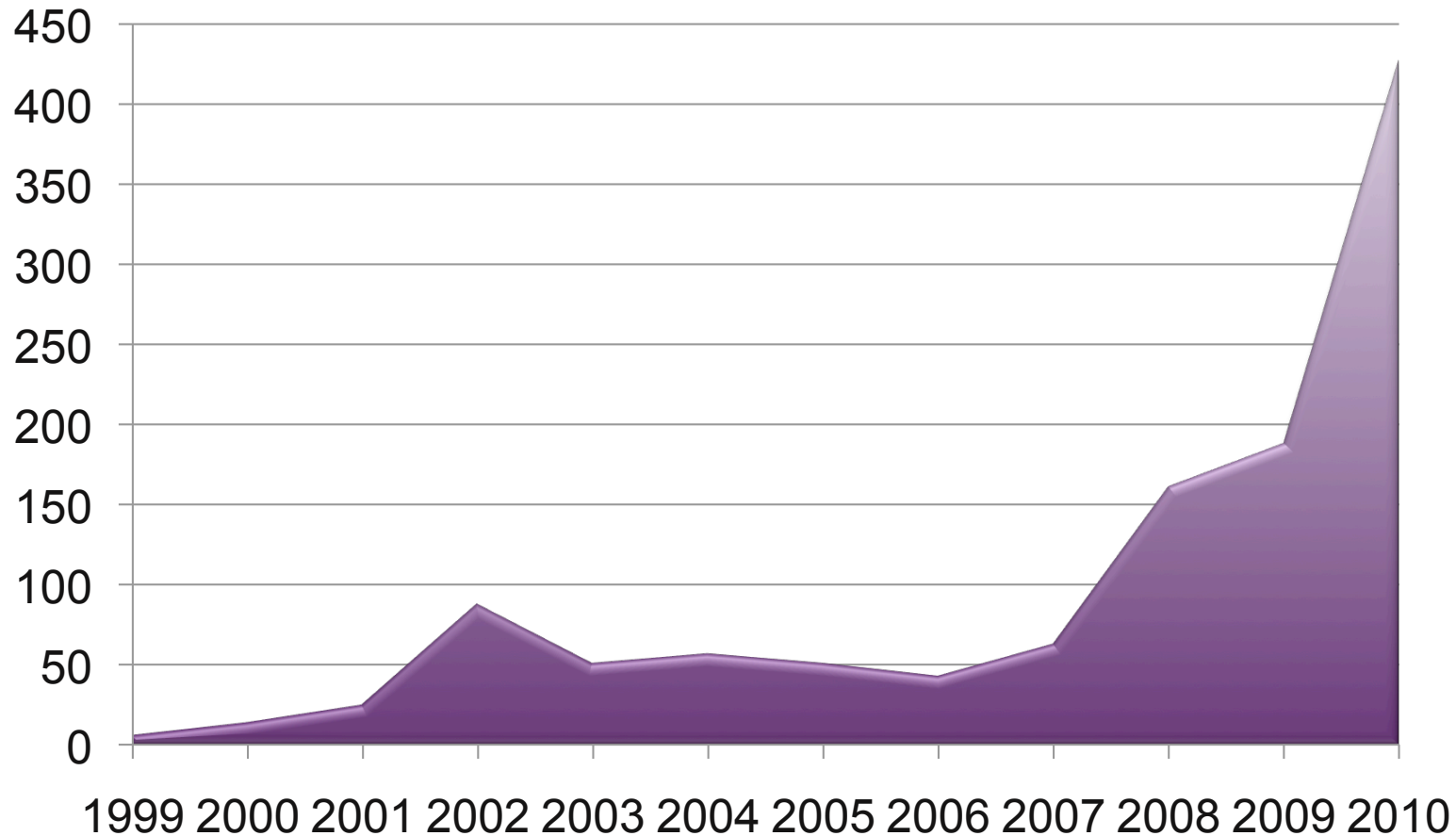
APNIC IPv4 Allocations By Economy

Initial IPv6 Allocations

- Initial IPv6 block for APNIC members with existing IPv4 space
- 'One Click' IPv6 Policy
- Criteria
  - APNIC members that have received an IPv4 address block from APNIC but have no IPv6 space can qualify for an appropriately sized IPv6 block under the matching IPv6 policy.

Initial IPv6 Allocations

- Initial Allocation Criteria

- Criteria
  - Be an LIR
  - Not be an end site
  - Plan to provide IPv6 connectivity to organizations to which it will make assignments.
  - Meet one of the two following criteria:
    - Have a plan for making at least 200 assignments to other organizations within two years
        OR
    - Be an existing LIR with IPv4 allocations from an APNIC or an NIR, which will make IPv6 assignments or sub-allocations to other organizations and announce the allocation in the inter-domain routing system within two years
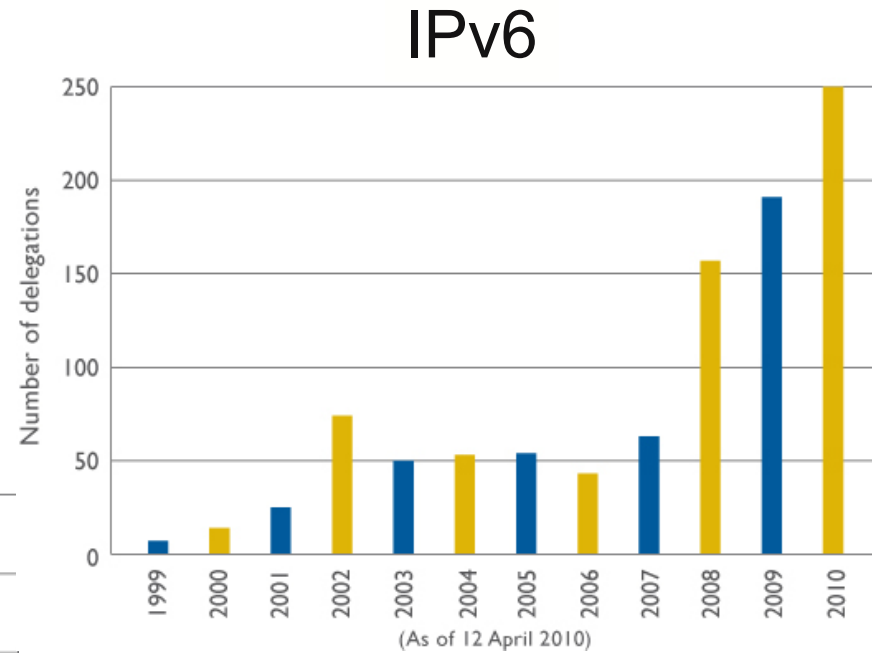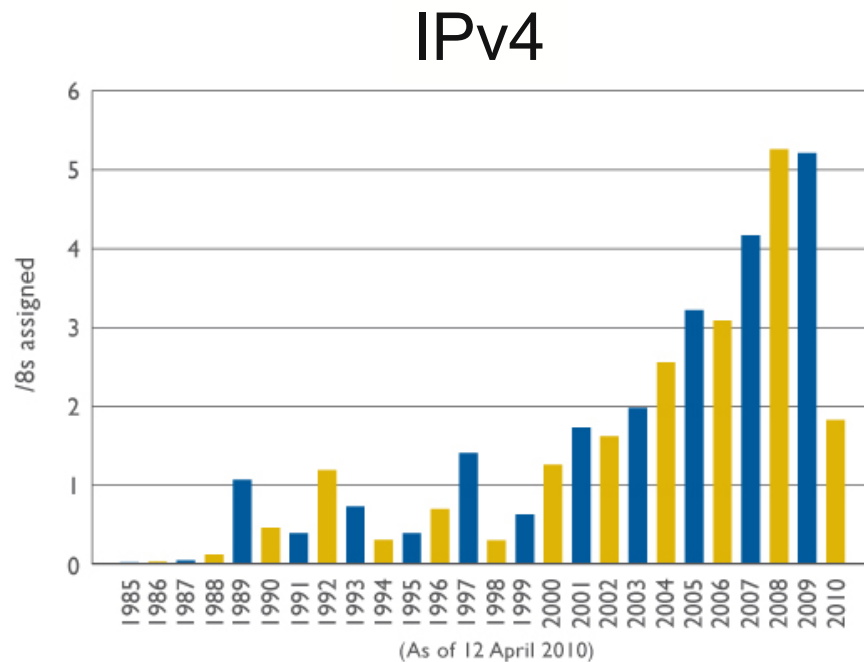
Total IPv6 Delegations in AP

prop-073: Simplifying allocation/assignment of IPv6 to APNIC members with existing IPv4 addresses - *implemented on 10 February 2010*

APNIC IPv6 Allocations By Economy
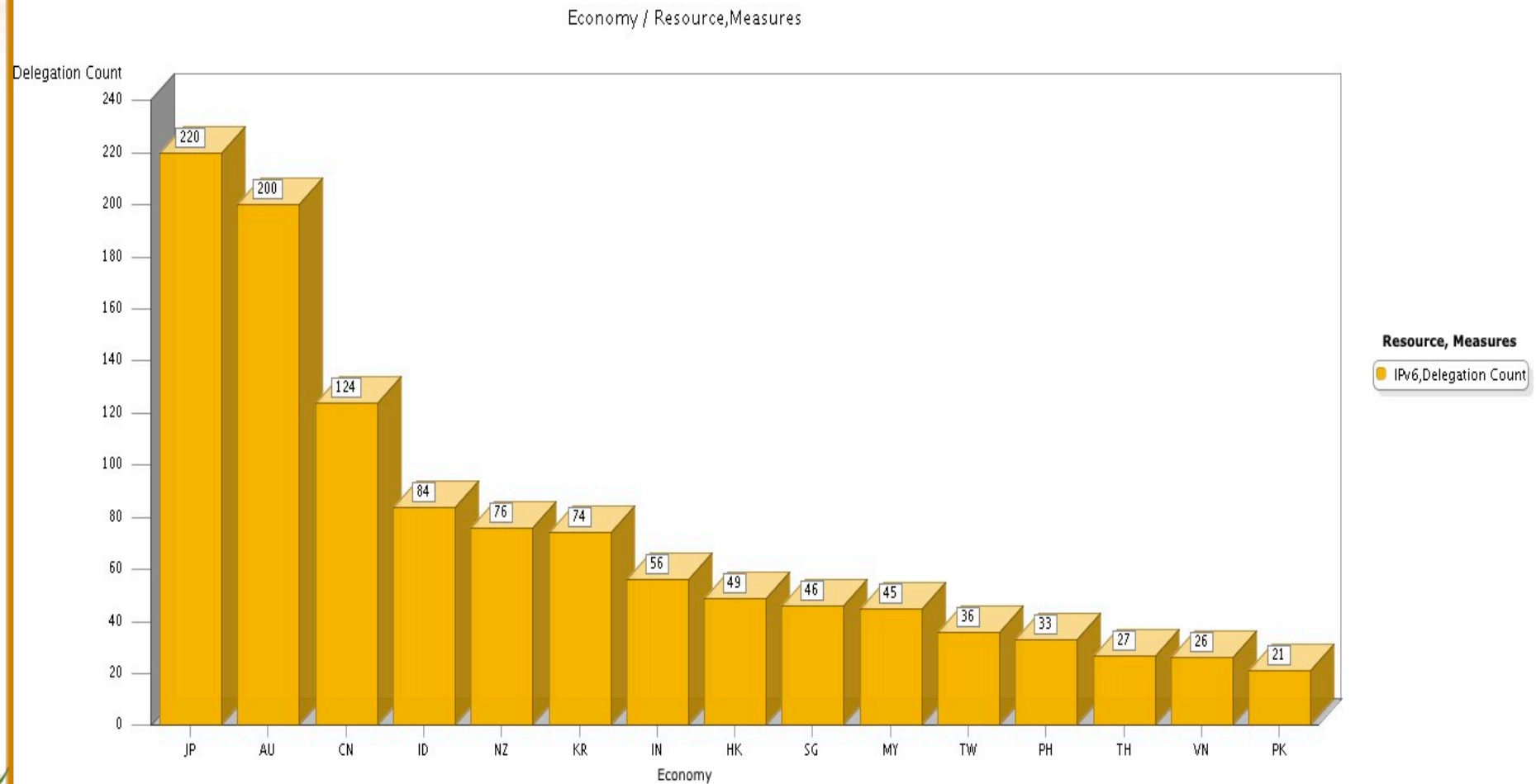
APNIC Resource Delegations

IPv6

IPv4

Source: NRO Internet Number Resource Report

WHERE DO POLICIES COME FROM?

Policies and their Development

- Policies are constantly changing the meet the technical needs of the Internet

- There is a system in place called the Policy Development Process

  - Anyone can participate
  - Anyone can propose a policy
  - All decisions & policies documented & freely available to anyone

Why Participate In Policy Development?

This is your opportunity to comment on policies that may directly affect the way your organisation obtains, manages and deploys Internet resources

```
        Open
       ↗    ↘
Bottom up ← Transparent
```

16
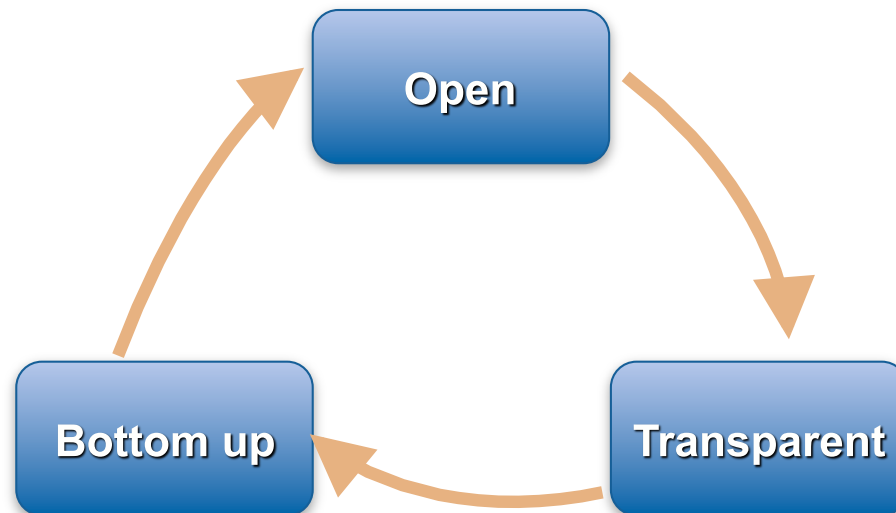
You Can Participate!

- Send a proposal to the Secretariat
- Discuss proposals via public mailing lists
  - http://www.apnic.net/community/participate/join-discussions
- Attend meetings
  - http://meetings.apnic.net/30
  - Remote participation available

Policy Development Process

18
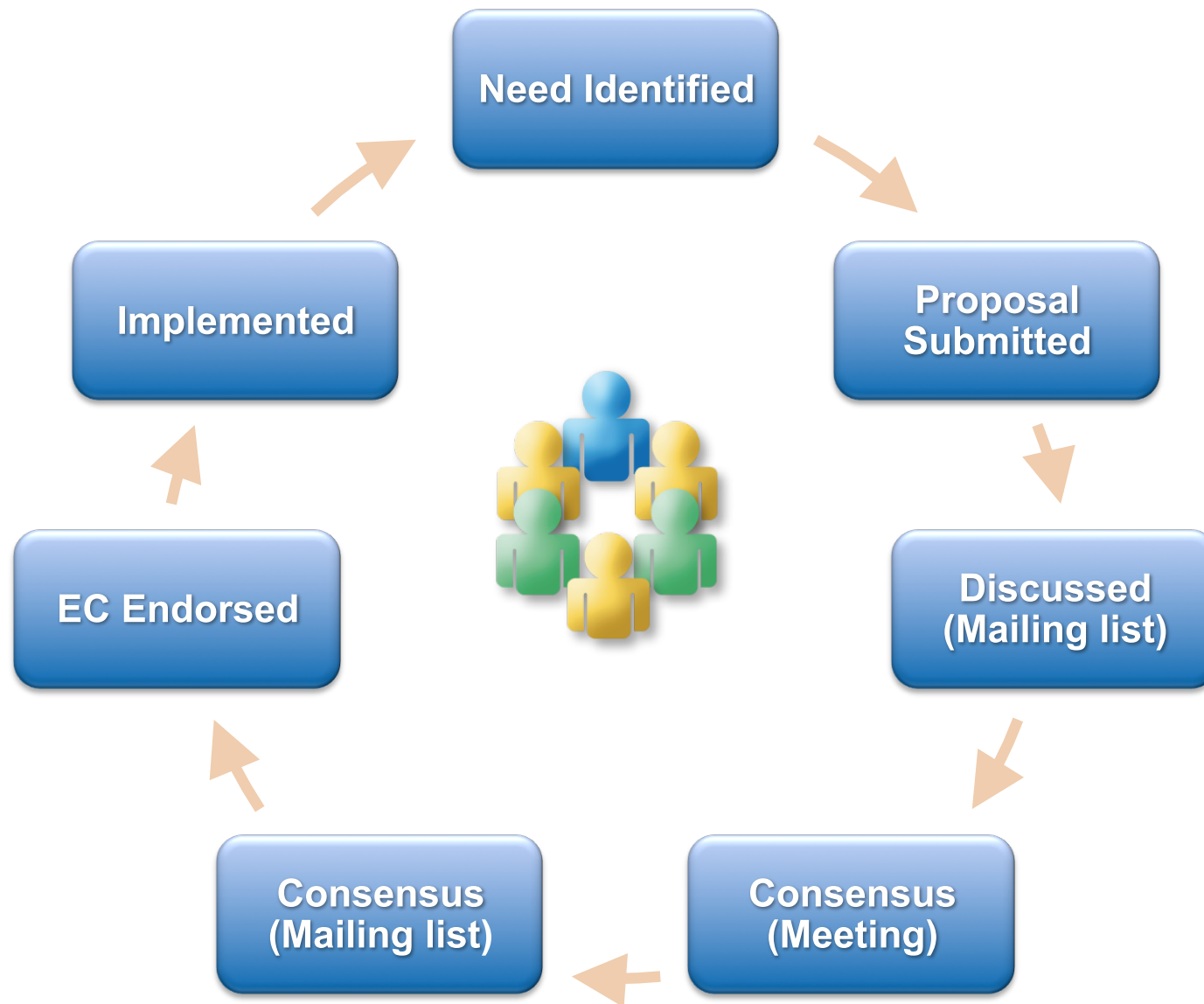
Example: Prop 50 Rationale

- Amends APNIC policy restrictions on the transfer of registration of IPv4 addresses between current APNIC account holders

- Allows APNIC to recognize and register the transfer between APNIC members

- Keeps the registry database accurate

Policy Development is a Cycle

- Proposal 50 – IPv4 Address Transfers
  - This proposal went through parts of the cycle multiple times before achieving consensus
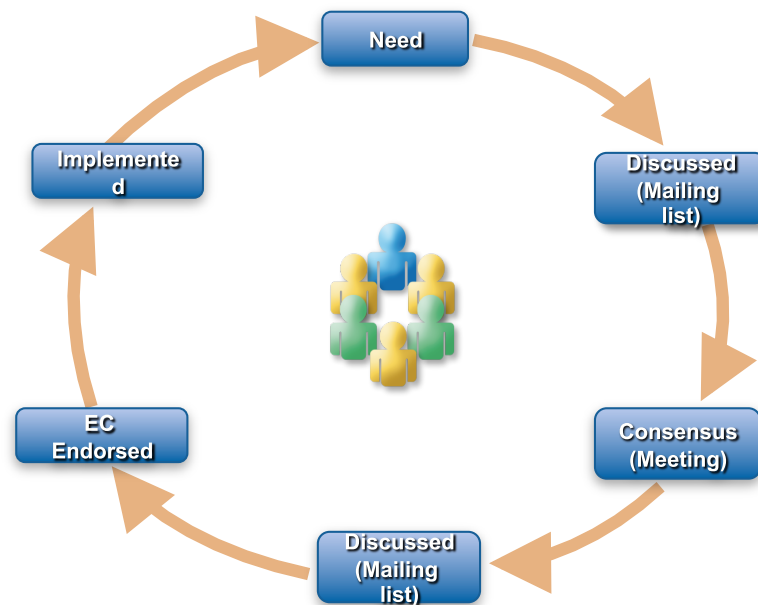
* See appendix for proposal details.

From Regional to Global Policies

• While RIRs and their respective communities are responsible for policies specific to their regions, there are times when a policy needs to be global.

Some Global Policies

- Examples
  - Global Policy for Allocation of ASN Blocks to Regional Internet Registries
  - Global Policy for the Allocation of the Remaining IPv4 Address Space
  - Allocation of IPv6 Address Space by the Internet Assigned Numbers Authority (IANA) Policy to Regional Internet Registries

Global Policy Coordination

Number Resource Organization

- The purpose of the NRO is to undertake joint activities of the RIRs including:
    - joint technical projects
    - liaison activities
    - policy co-ordination

ASO

- The purpose of the Address Supporting Organization (ASO) is to:
  - review and develop recommendations on Internet Protocol (IP) address policy
  - to advise the ICANN Board
  - act as an intermediary between the NRO and ICANN
  - It is one of ICANN's three supporting organizations (the other two being the DNSO and the PSO)

Recent APNIC Policy Implementations

- prop-080: Removal of IPv4 prefix exchange policy

  - The policy that previously permitted resource holders to return three or more non-contiguous IPv4 address blocks and have the prefixes replaced with a single, larger, contiguous block will be removed.

Recent APNIC Policy Implementations

- prop-082: Removing aggregation criteria for IPv6 initial allocations

    - The initial allocation criteria that required an ISP to advertise its IPv6 connectivity as a single aggregated address allocation will be removed and replaced by a stronger recommendation in regard to the aggregation of IPv6 routes.

Upcoming APNIC Policy Implementations

- prop-079-v002: Abuse contact information (IRT)

  - Requires a mandatory reference to IRT objects in the inetnum, inet6num and aut-num objects in the APNIC Whois Database to provide a more efficient way for abuse reports to reach the correct network contact.
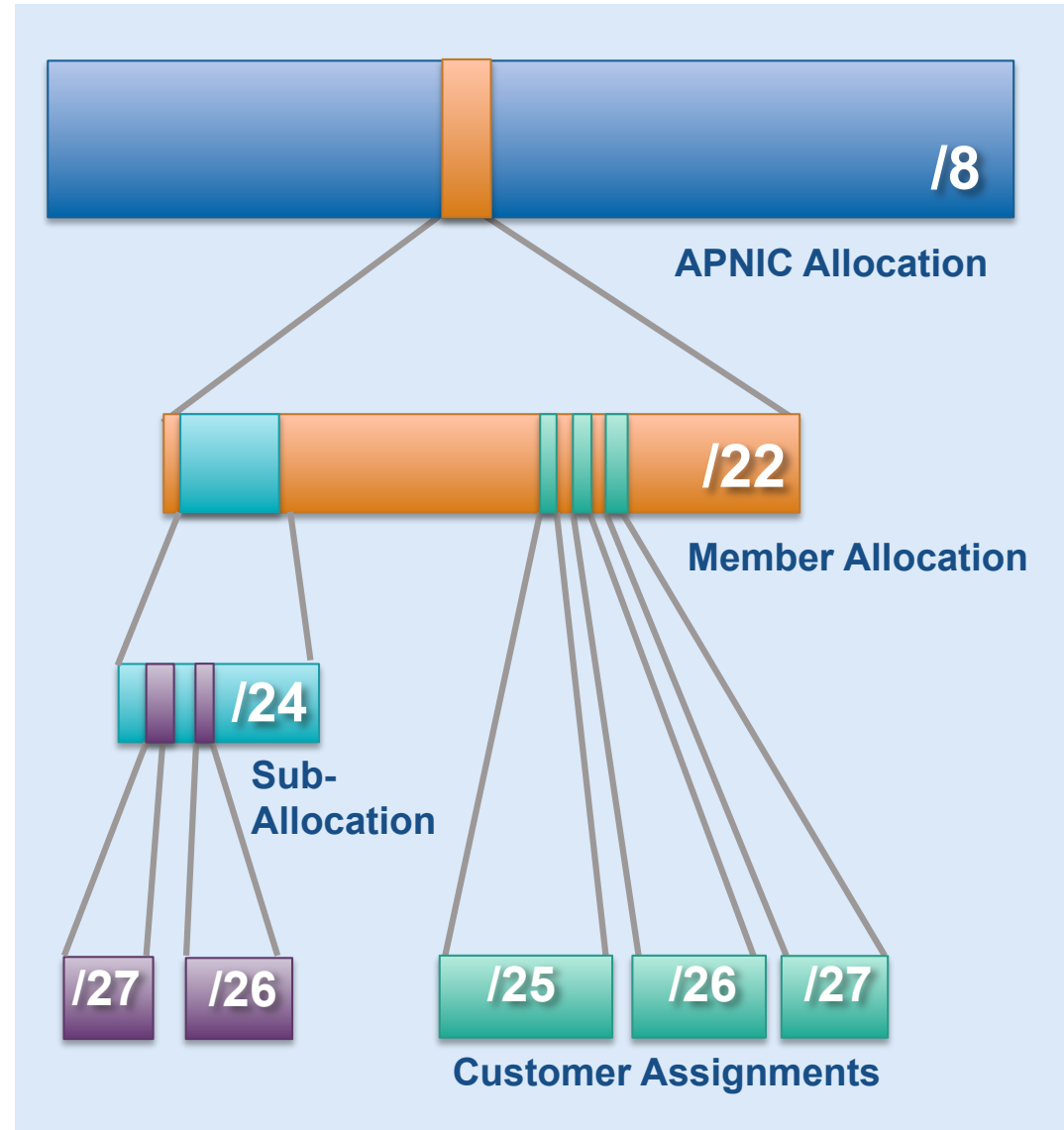
28

APNIC POLICIES

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 ISP customers, or used for an ISP's infrastructure ('self-assignment')

Allocation And Assignment

APNIC
Allocates
to APNIC Member

APNIC Member

Allocates
to downstream

Assigns
to end-user

Downstream

Assigns
to end-user

Customer / End User

/8
APNIC Allocation

/22
Member Allocation

/24
Sub-
Allocation

/27 /26

/25 /26 /27
Customer Assignments
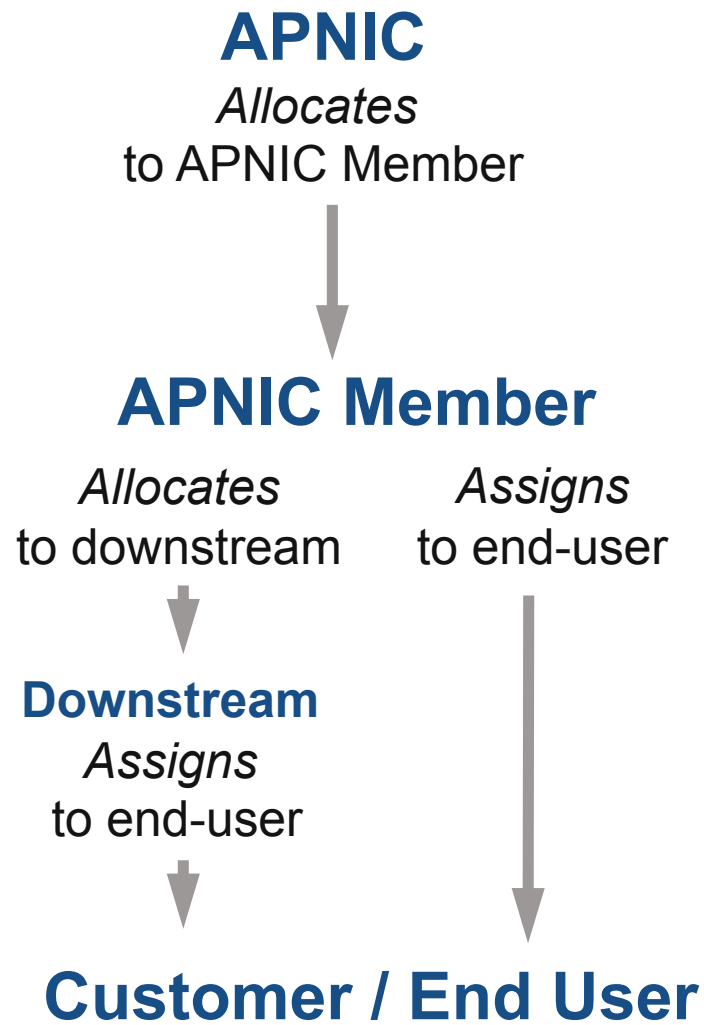
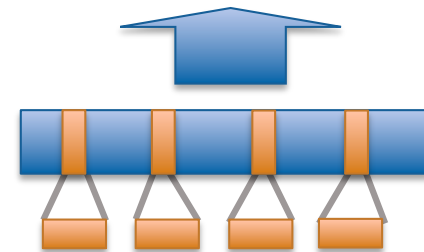# Portable And Non-portable

Portable Assignments

- Customer addresses independent from ISP
  - Keeps addresses when changing ISP
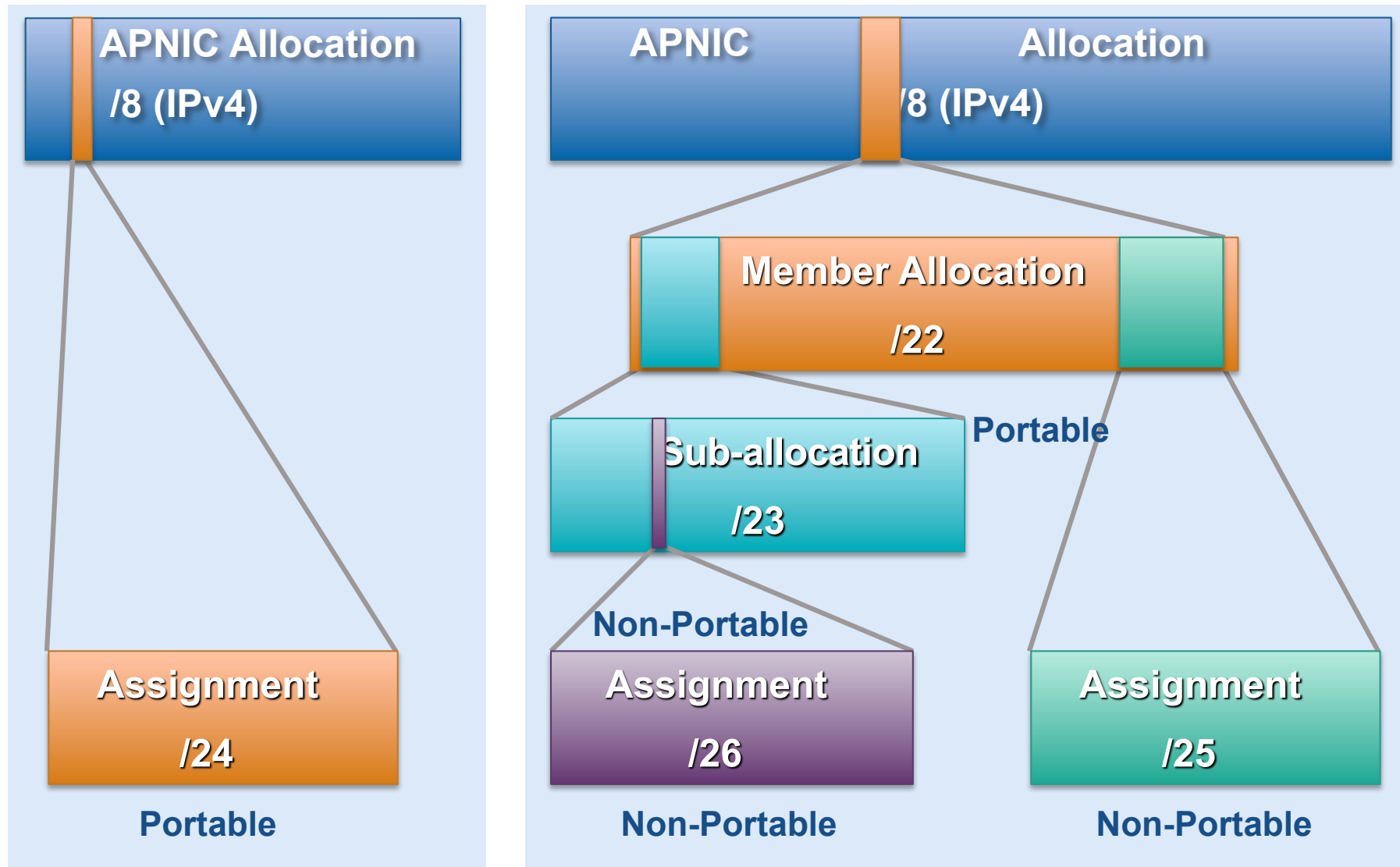- Bad for size of routing tables

Non-portable Assignments

- Customer uses ISP's address space
  - Must renumber if changing ISP
- Only way to effectively scale the Internet

Address Management Hierarchy

APNIC Allocation /8 (IPv4)

Assignment /24

Portable

APNIC Allocation /8 (IPv4)

Member Allocation /22

Portable

Sub-allocation /23

Non-Portable

Assignment /26

Non-Portable

Assignment /25

Non-Portable

- Describes "portability" of the address space

33

Sub-allocations

APNIC Member Allocation — /22 (IPv4)

Sub-allocation — /24

Customer Assignments — /27, /26

Customer Assignments — /25, /26, /27
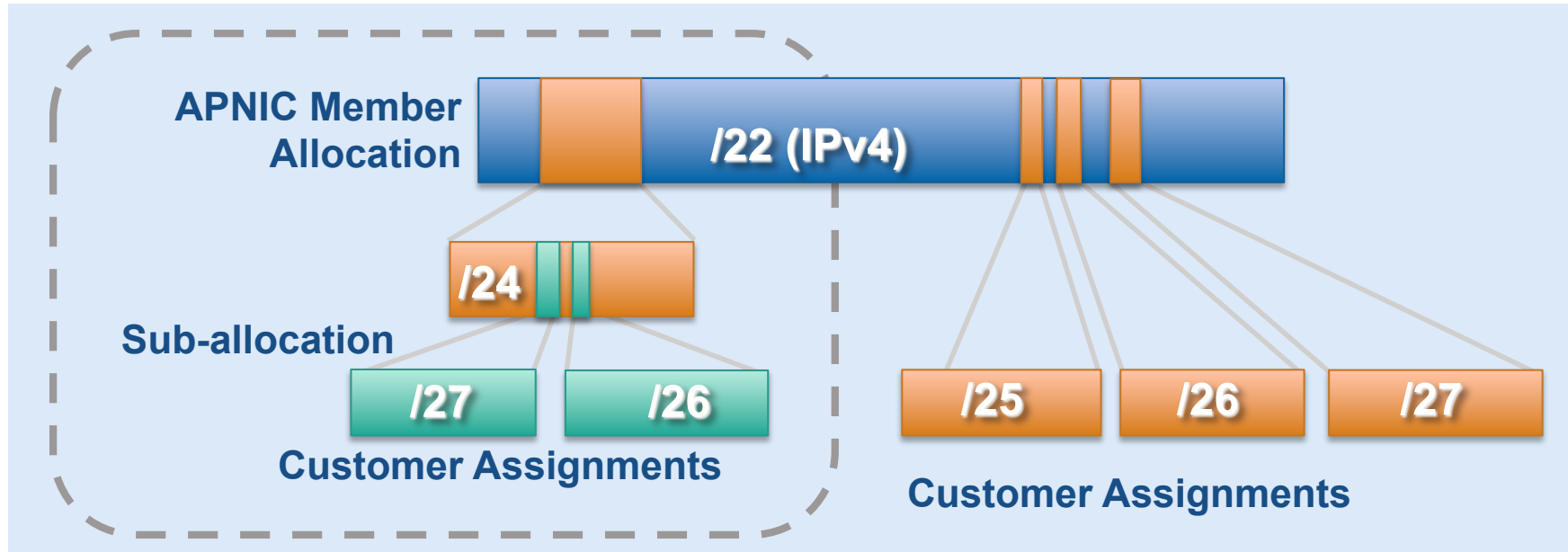
- **No max or min size**
  - Max 1 year requirement
- **Assignment Window & 2nd Opinion applies**
  - to both sub-allocation & assignments
    - Sub-allocation holders don't need to send in 2nd opinions

Address Management Hierarchy

APNIC Allocation /32 (IPv6)

APNIC Allocation /12 (IPv6)

Member Allocation /32

Portable

Sub-allocation /48

Non-Portable

Assignment /48

Portable

Assignment /64

Non-Portable
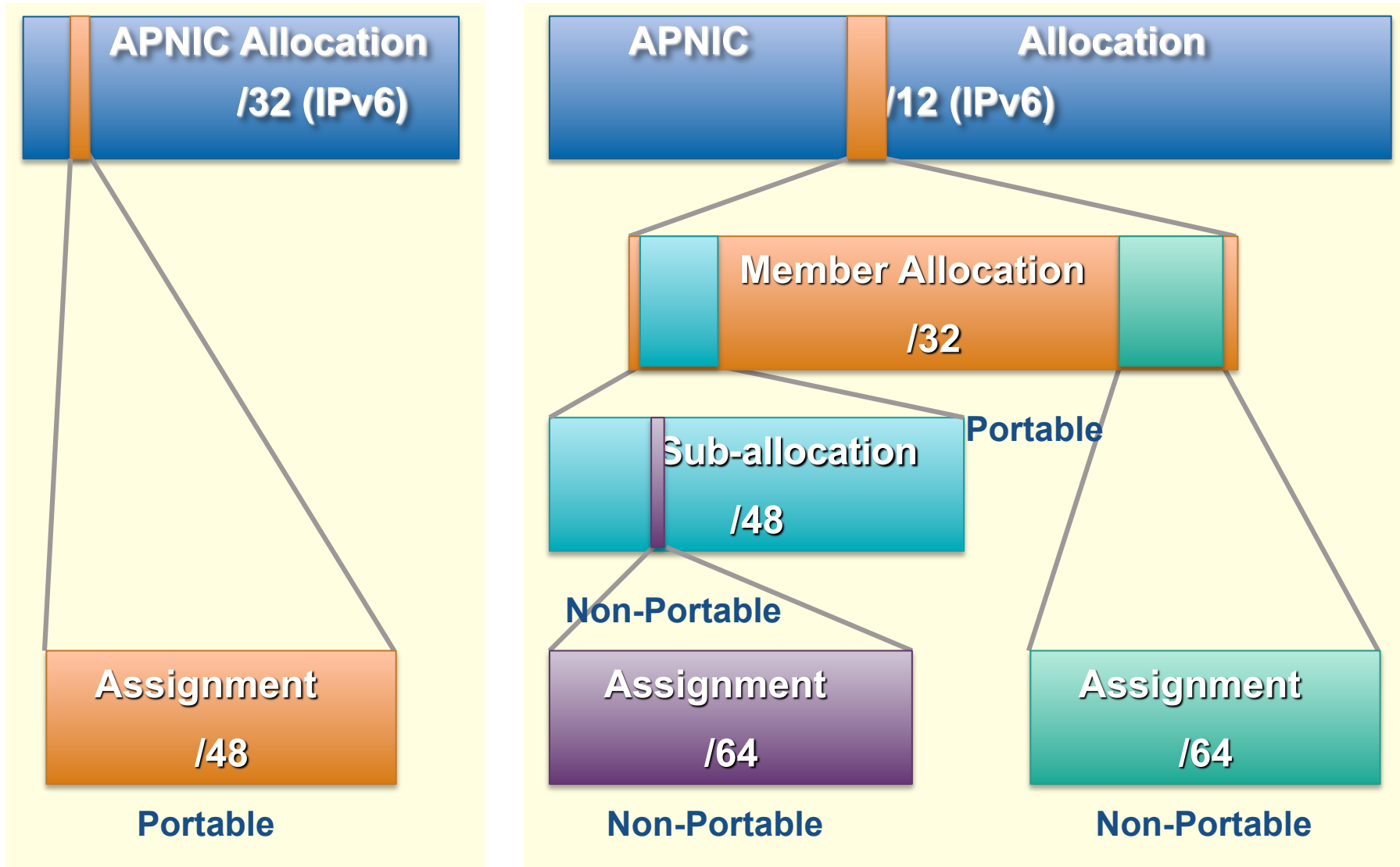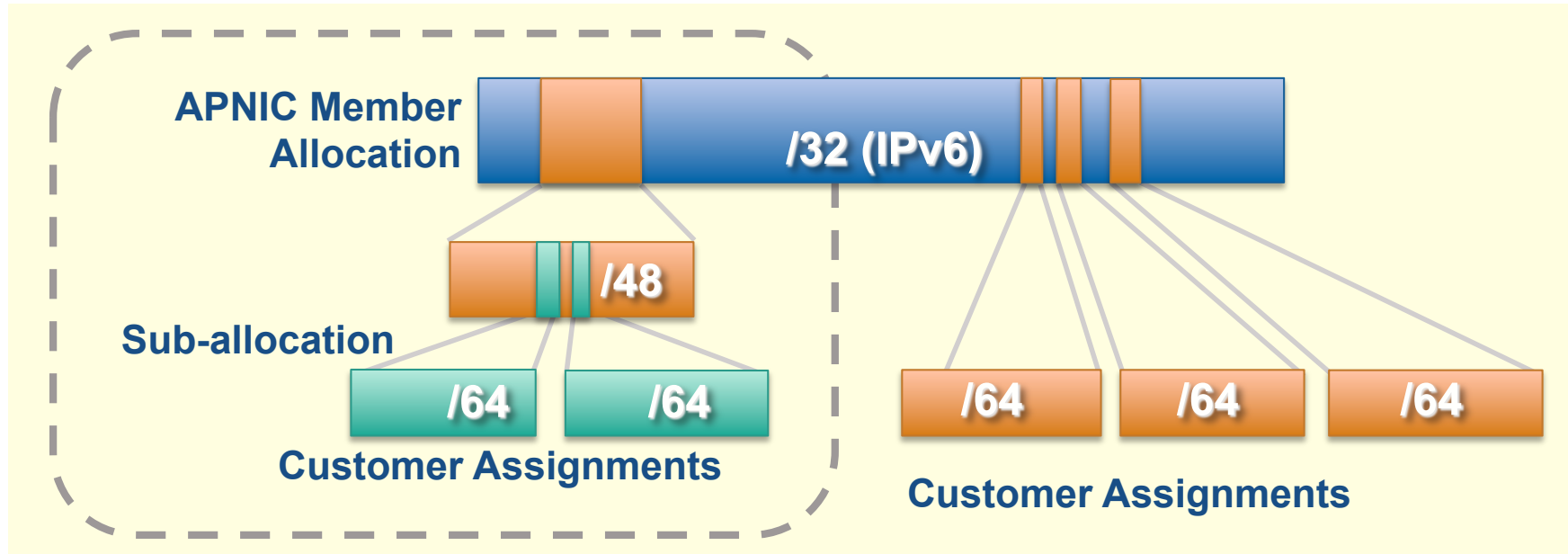
Assignment /64

Non-Portable

• Describes "portability" of the address space

35

Sub-allocations

- ## No max or min size
  - Max 2 year requirement

- ## Assignment Window & 2nd Opinion applies
  - to both sub-allocation & assignments
    - Sub-allocation holders don't need to send in 2nd opinions

Sub-allocation Guidelines

- Sub-allocate cautiously
  - Only allocate or assign what the customer has demonstrated a need for
  - Seek APNIC advice if in doubt
- Efficient assignments
  - Member is responsible for overall utilisation
- Database registration (WHOIS Db)
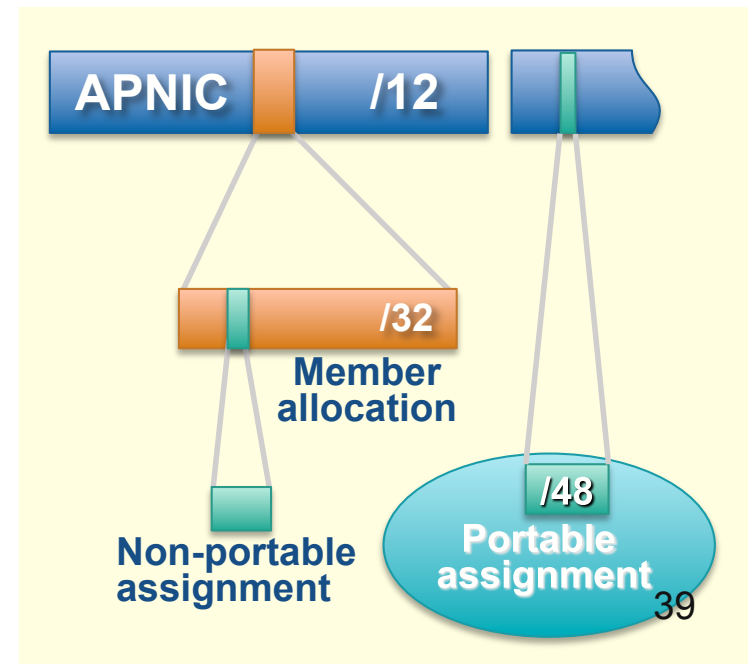 - Sub-allocations & assignments must be registered in the whois db

Portable Assignments for IPv4

- For (small) organizations who require a portable assignment for multihoming purposes
  - Applicants currently multihomed OR demonstrate a plan to multihome within 1 month
  - Agree to renumber out of previously assigned space
  - Demonstrate need to use 25% of requested space immediately and 50% within 1 year
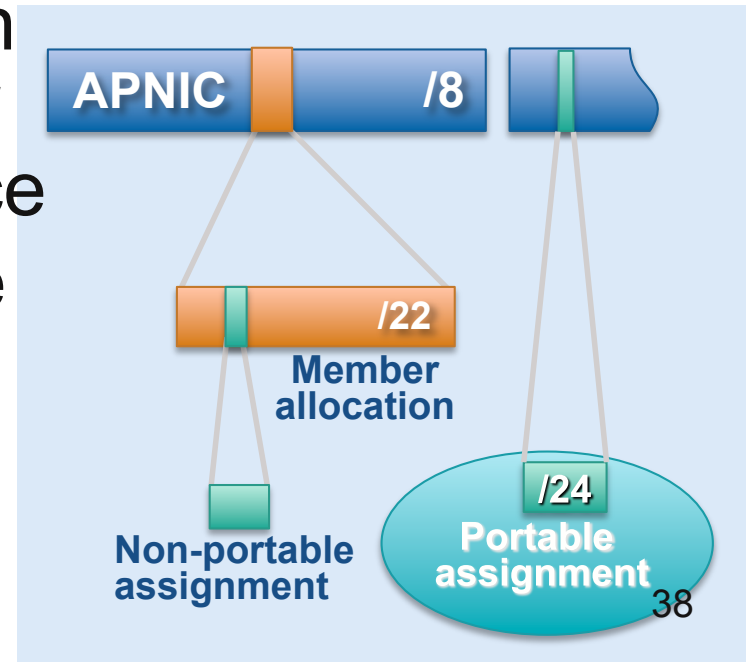
Portable Assignments for IPv6

- For (small) organizations who require a portable assignment for multihoming purposes
  - The current policy allows for IPv6 portable assignment to end-sites
  - Size: /48, or a shorter prefix if the end site can justify it
  - To be multihomed within 3 months

APNIC   /12

/32
Member allocation

Non-portable assignment

/48
Portable assignment

APNIC Allocation Policies

- Aggregation of allocation
  - Provider responsible for aggregation
  - Customer assignments /sub-allocations 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

IXP IPv4 Assignments Policy

- Criteria
  - 3 or more peers
  - Demonstrate "open peering policy"
- APNIC has reserved blocks of space from which to make IXP assignments

IXP IPv6 Assignment Policy

- Criteria
  - Demonstrate 'open peering policy'
  - 3 or more peers

- Portable assignment size: /48
  - All other needs should be met through normal processes
  - /64 holders can "upgrade" to /48
    - Through NIRs/ APNIC
    - Need to return /64

Portable Critical Infrastructure Assignments

- What is Critical Internet Infrastructure?
    - Domain Registry Infrastructure
        - Operators of Root DNS, gTLD, and ccTLD
    - Address Registry Infrastructure
        - IANA, RIRs & NIRs
- Why a specific policy ?
    - Protect stability of core Internet function
- Assignment sizes:
    - IPv4: /24 or IPv6: /48

Supporting Historical IPv4 Resource Transfer

- Bring historical resource registrations into the current policy framework

  - Allows transfers of historical resources to APNIC members

    - The recipient of the transfer must be an APNIC member

    - No technical review or approval

    - Historical resource holder must be verified

    - Resources will then be considered "current"

    - Resources must be registered in WHOIS DB

APNIC30 Policy Proposals

- prop-083: Alternative criteria for subsequent IPv6 allocations
- prop-084: Frequent whois information update request
- prop-085: Eligibility for critical infrastructure assignments from the final /8
- prop-086: Global policy for IPv4 allocations by the IANA post-exhaustion
- prop-087: IPv6 address allocation for deployment purposes

Questions?

Thank You! ☺