Presenters

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Agenda

• Introduction to APNIC
• Policy Development Process
• Internet Registry Policies
• Requesting IP Addresses and ASN
• Whois Database and MyAPNIC
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• Introduction to APNIC
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What is APNIC?

• Regional Internet Registry (RIR) for the Asia Pacific region
  – One of five RIRs currently operating around the world
  – Non-profit, membership organisation

• Industry self-regulatory body
  – Open
  – Consensus-based
  – Transparent

• Meetings and mailing lists
  – http://meetings.apnic.net
  – http://www.apnic.net/mailing-lists
# What does APNIC do?

<table>
<thead>
<tr>
<th>Resource service</th>
<th>Policy development</th>
</tr>
</thead>
<tbody>
<tr>
<td>• IPv4, IPv6, ASNs</td>
<td>• Facilitating the policy development process</td>
</tr>
<tr>
<td>• Reverse DNS delegation</td>
<td>• Implementing policy changes</td>
</tr>
<tr>
<td>• Resource registration</td>
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<tr>
<td>• Authoritative registration server</td>
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<tr>
<td>• Whois</td>
<td></td>
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<tr>
<td>• IRR</td>
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</table>

<table>
<thead>
<tr>
<th>Information dissemination</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>• APNIC meetings</td>
<td>• Face to Face</td>
</tr>
<tr>
<td>• Web and ftp site</td>
<td>• Via eLearning</td>
</tr>
<tr>
<td>• Publications, mailing lists</td>
<td>- Subsidised for members</td>
</tr>
<tr>
<td>• Outreach seminars</td>
<td>Schedule:</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.apnic.net/training">http://www.apnic.net/training</a></td>
</tr>
</tbody>
</table>

http://www.apnic.net/community/participate/join-discussions/sigs
Where is the APNIC Region?
APNIC is NOT

• A network operator
  – Does not provide networking services
    • Works closely with APRICOT forum

• A standards body
  – Does not develop technical standards
    • Works within IETF in relevant areas (IPv6 etc)

• A domain name registry or registrar
  • Will refer queries to relevant parties
APNIC from a Global Perspective
APNIC in the Asia Pacific
Internet Registry Structure
Global Policy Coordination

- The main aims of the NRO:
  - To protect the unallocated number resource pool
  - To promote and protect the bottom-up policy development process
  - To facilitate the joint coordination of activities e.g., engineering projects
  - To act as a focal point for Internet community input into the RIR system
Global Policy Coordination

• The main function of ASO:
  – receives global policies and policy process details from the NRO
  – forwards global policies and policy process details to ICANN board
Where do IP Addresses come from?

1. **IETF Standards**
2. **Allocation**
3. **RIRs**
4. **Allocation**
5. **ISP**
6. **Assignment**
7. **End user**
Questions?
Agenda

- Introduction to APNIC
- Policy Development Process
- Internet Registry Policies
- Requesting IP Addresses and ASN
- Whois Database and MyAPNIC
You are Part of the APNIC Community!

Open forum in the Asia Pacific

A voice in regional Internet operations through participation in APNIC
Policy Development Process

Anyone can participate

Internet community proposes and approves policy

All decisions & policies documented & freely available to anyone
# Policy Development Process

**Need**
- 4 weeks
- Before meeting
  - Submit proposed policy or amendment to APNIC Secretariat
  - SIG Chair posts proposal to SIG mailing list
  - Community discusses proposal on SIG mailing list

**Discuss**
- 1 week
- At APNIC meeting
  - Face to face discussion in SIG sessions
  - Consensus?
    - No
    - Report of SIG decision to AMM
    - Consensus?
      - No

**Consensus**
- Minimum 3 months
- After meeting
  - Final call for public comments announced on SIG mailing list
  - Community discusses proposal on SIG mailing list
  - SIG Chair posts outcome of SIG mailing list discussions
  - Consensus?
    - No
    - Implementation

**Implement**
- 8 weeks

---

**You can participate!**

More information about policy development can be found at:

[http://www.apnic.net/policy](http://www.apnic.net/policy)
How to Make Your Voice Heard

• Contribute on the public mailing lists
  – http://www.apnic.net/mailing-lists
  – Attend APNIC conferences
  – Or send a representative
  – Watch webcast (video streaming) from the conference web site
  – Read live transcripts from APNIC web site
  – And express your opinion via Jabber chat

• Give feedback
  – Training or seminar events
Questions?
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• Introduction to APNIC
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• Internet Registry Policies
• Requesting IP Addresses
• Whois Database and MyAPNIC
• Autonomous System Numbers
• Reverse DNS
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

APNIC Allocation

/8 (IPv4) /12 (IPv6)

Member Allocation

/22 (IPv4) /32 (IPv6)

Sub-Allocation

/24 (IPv4) /40 (IPv6)

Customer Assignments

/27 /26

/25, /48

/26, /56

/27, /64
Portable and Non-Portable

- **Portable Assignments**
  - Customer addresses independent from ISP
  - Keeps addresses when changing ISP
  - Bad for size of routing tables
  - Bad for QoS: routes may be filtered, flap-dampened

- **Non-portable Assignments**
  - Customer uses ISP’s address space
  - Must renumber if changing ISP
  - Only way to effectively scale the Internet

- **Portable allocations**
  - Allocations made by APNIC/NIRs
Internet Resource 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
Growth of the Global Routing Table

407549 prefixes
As of 09 Apr 2012

http://bgp.potaroo.net/as1221/bgp-active.html

Sustainable growth?

Projected routing table growth without CIDR

Dot-Com boom

CIDR deployment
Growth of the Global Routing Table – IPv6

Source: http://bgp.potaroo.net/v6/as2.0/
IPv4 Allocation Policies

• Allocations based on demonstrated need
  – Detailed documentation required

• APNIC IPv4 allocation size per account holder
  – Minimum /24
  – Maximum /22

• Aggregation of allocation
  – Provider responsible for aggregation
  – Customer assignments /sub-allocations must be non-portable
IPv6 Allocation Policies

• Initial allocation criteria
  – Minimum of /32 IPv6 block
  – larger than /32 may be justified

• For APNIC members with existing IPv4 space
  – One-click Policy (through MyAPNIC)

• Without existing IPv4 space
  – Must meet initial allocation criteria

• Subsequent allocation
  – Based on HD ratio (0.94)
  – Doubles the allocated address space
IPv6 Sub-allocations

- No specific policy for LIRs to allocate space to subordinate ISPs
- All /48 assignments to end sites must be registered
- Second opinion
  - LIRs do not need to submit second opinion request before making sub-allocations to downstream ISPs
  - Must submit a second opinion request for assignments more than /48
IPv6 Assignment Policy

- Assignment address space size
  - Minimum of /64 (only 1 subnet), Normal maximum of /48, Larger end-site assignment can be justified

- In typical deployments today
  - Several ISPs give small customers a /56 or a /60 and single LAN end sites a /64, e.g.,
    - /64 if end-site will ever only be a LAN
    - /60 for small end-sites (e.g. consumer)
    - /56 for medium end-sites (e.g. small business)
    - /48 for large end-sites

- Assignment of multiple /48s to a single end site
  - Documentation must be provided
  - Will be reviewed at the RIR/NIR level

- Assignment to operator’s infrastructure
  - /48 per PoP as the service infrastructure of an IPv6 service operator
IPv4 Transfer Policies

• Between APNIC members
  – Minimum transfer size of /24
  – source entity must be the currently registered holder of the IPv4 resources
  – recipient entity will be subject to current APNIC policies

• Inter-RIR IPv4 Transfers
  – Minimum transfer size of /24
  – Conditions on the source and recipient RIR will apply
Mergers, Acquisitions, and Takeovers

• LIR should advise APNIC of any changes in ownership (due to merger, sale or takeover)
• APNIC membership is not transferable
• APNIC will review the status of any allocations held by the new entity.
• Full disclosure of all address space held by all of the entities in question is required
Questions?
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How Do I Get IP Addresses?

• Decide what kind of number resources you need
  – IPv4, IPv6

• Check your eligibility
  – On the website [www.apnic.net](http://www.apnic.net)
  – Contact the helpdesk [helpdesk@apnic.net](mailto:helpdesk@apnic.net)

• Become familiar with the policies
  – [www.apnic.net/policy](http://www.apnic.net/policy)

• Apply for membership and resources
  - [www.apnic.net/member](http://www.apnic.net/member)
Requesting an ASN

• Complete the request form
  – Check with peers if they can handle 4 byte ASN
  – Existing members send the request from MyAPNIC
  – New Members can send AS request along with membership application

• Criteria to receive ASN
  - Demonstrate your network is multihomed
  - or plan to multihome in the near future
• If a member requests an ASN from APNIC for own network infrastructure
  – AS number is “portable”

• If a member requests an ASN from APNIC for its downstream customer network
  – ASN is “non-portable”
  – ASN is returned if the customer changes provider
Complete the Client First Form

1. Agreement
2. Type organisation’s and billing details
3. Type applicant’s billing & public contact details
4. Type account name & select membership tier
5. Select type of resources required or membership only
6. Confirm details

Agreement
Organisation details
Organisation contacts
Account details
Resource request

Resource type
Existing resources
Network plan
Understand AW

Confirm
Questions?
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What is the APNIC Database?

• Public network management database
  – Operated by Internet Registries
    • Public data only (For private data, please see “Privacy of customer assignment” module)

• Tracks network resources
  – IP addresses, ASNs, Reverse Domains, Routing policies

• Records administrative information
  – Contact information (persons/roles)
  – Authorization
# Object Types

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>PURPOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>person</td>
<td>contact persons</td>
</tr>
<tr>
<td>role</td>
<td>contact groups/roles</td>
</tr>
<tr>
<td>inetnum</td>
<td>IPv4 addresses</td>
</tr>
<tr>
<td>Inet6num</td>
<td>IPv6 addresses</td>
</tr>
<tr>
<td>aut-num</td>
<td>Autonomous System number</td>
</tr>
<tr>
<td>domain</td>
<td>reverse domains</td>
</tr>
<tr>
<td>route</td>
<td>prefixes being announced</td>
</tr>
<tr>
<td>mntner</td>
<td>(maintainer) data protection</td>
</tr>
<tr>
<td>mnt-irt</td>
<td>Incident Response Team</td>
</tr>
</tbody>
</table>

http://www.apnic.net/db/
Person Object

• Represents a contact person for an organization
  – Every Member must have at least one contact person registered
  – Large organizations often have several contacts for different purposes

• Is referenced in other objects

• Has a nic-hdl
  – Eg. EC17-AP
Person Object

```
whois -h whois.apnic.net Vivek Nigam
% [whois.apnic.net node-1]
% Whois data copyright terms  http://www.apnic.net/db/dbcopyright.html

class:     autonomous-system
creation-date: 20040128

type:        person

person:     Vivek Nigam
nic-hdl:    VN61-AP

e-mail:     vivek@apnic.net

address:    6 Cordelia Street
            South Brisbane 4101

phone:      +61 7 3858 3180
fax-no:      +61 7 3858 3199

country:    AU

changed:    vivek@apnic.net 20080219
changed:    vivek@apnic.net 20090317
changed:    vivek@apnic.net 20111219

mnt-by:     MAINT-AU-VIVEK
source:     APNIC
```
Maintainers

- WHAT: protects other objects in the APNIC Whois Database
- WHY: Maintainers are used to prevent unauthorized persons from changing the details in whois
- Multiple levels of maintainers exist in a hierarchical manner
  - Maint-by
  - Maint-lower
- Applied to any object created directly below that maintainer object
### Database Protection - Maintainer Object

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mntner</td>
<td>MAINT-AU-APNICTRAINING</td>
</tr>
<tr>
<td>descr</td>
<td>APNIC Training</td>
</tr>
<tr>
<td>country</td>
<td>AU</td>
</tr>
<tr>
<td>admin-c</td>
<td>AA196-AP</td>
</tr>
<tr>
<td>tech-c</td>
<td>AA196-AP</td>
</tr>
<tr>
<td>auth</td>
<td>MD5-PW $1$FUrnnj.4g$sIyzbkZj2XJoDanL/ndXN0</td>
</tr>
<tr>
<td>mnt-by</td>
<td>MAINT-AU-APNICTRAINING</td>
</tr>
<tr>
<td>upd-to</td>
<td><a href="mailto:amante@apnic.net">amante@apnic.net</a></td>
</tr>
<tr>
<td>referral-by</td>
<td>APNIC-HM</td>
</tr>
<tr>
<td>changed</td>
<td><a href="mailto:hm-changed@apnic.net">hm-changed@apnic.net</a> 20080424</td>
</tr>
<tr>
<td>changed</td>
<td><a href="mailto:hm-changed@apnic.net">hm-changed@apnic.net</a> 20090325</td>
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<tr>
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<tr>
<td>changed</td>
<td><a href="mailto:hm-changed@apnic.net">hm-changed@apnic.net</a> 20100528</td>
</tr>
<tr>
<td>source</td>
<td>APNIC</td>
</tr>
</tbody>
</table>
Inetnum / Inet6num Objects

• Contains IP allocation and assignment information
• APNIC creates an inetnum (or inet6num) object for each allocation or assignment they make to the Member
• All members must create inetnum (or inet6num) objects for each sub-allocation or assignment they make to customers
Whois – Inet6num Example

inet6num: 2001:0DF0:000A::/48
netname: APNICTRAININGIPv6-20080424
descr: APNIC Training IPv6 Address
country: AU
admin-c: AA196-AP
tech-c: AA196-AP
status: ASSIGNED PORTABLE
mnt-by: MAINT-AU-APNICTRAINING
mnt-routes: MAINT-AU-APNICTRAINING
remarks: This object can only be updated by APNIC hostmasters.
remarks: To update this object, please contact APNIC hostmasters and include your organisation's account name in the subject line.
remarks: 
changed: hm-changed@apnic.net 20080424
source: APNIC
What is MyAPNIC?

- A secure services website that enables Members to manage Internet resources and account interactions with APNIC online
- Uses 128-bit SSL
- https://myapnic.net
**Member Services Helpdesk**

- One point of contact for all member enquiries
- Online chat services

**Helpdesk hours**

9:00 am - 9:00 pm (AU EST, UTC + 10 hrs)

ph: +61 7 3858 3188  
fax: 61 7 3858 3199

- **More personalised service**
  - Range of languages:  
    Bahasa Indonesia, Bengali, Cantonese, English, Hindi, Mandarin, Thai, etc.

- **Faster response and resolution of queries**
  - IP resource applications, status of requests, obtaining help in completing application forms, membership enquiries, billing issues & database enquiries
Thank you!