

# APNIC Internet Resource Management (IRM) Tutorial

PACNOG 17  
Apia, Samoa  
13 – 17 July 2015

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Issue Date: 22 June 2015  
Revision: 2.0



## Agenda

- IP Resource Allocation Policies
- Requesting IP Addresses
- Requesting AS Numbers
- APNIC Whois Database
- Reverse DNS
- MyAPNIC Address Management Tool

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## Agenda

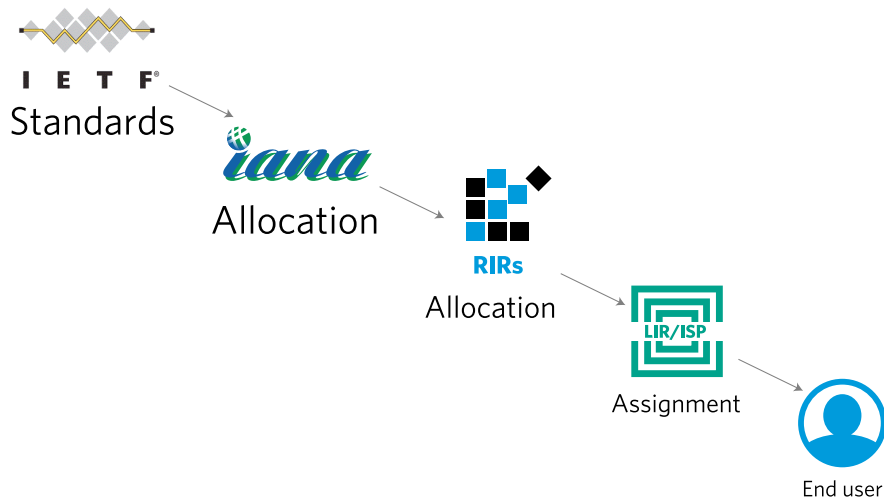
- **IP Resource Allocation Policies**
- Requesting IP Addresses
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- MyAPNIC Address Management Tool

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## Where do IP Addresses come from?

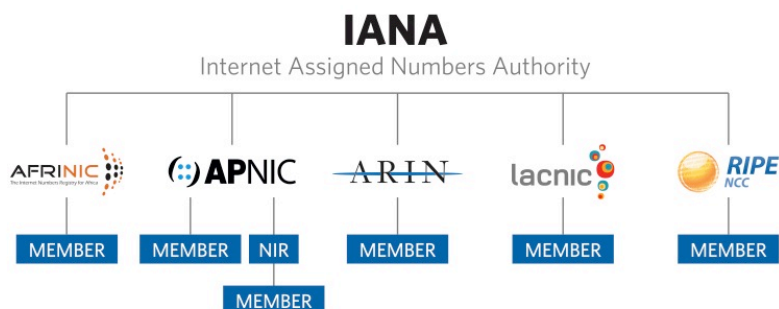


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## Internet Registry Structure



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- Asia-Pacific Network Information Centre
- One of five Regional Internet Registry (RIRs) charged with ensuring the fair **distribution and responsible management of IP addresses** and related resources
- A membership-based, not-for-profit organization
- Industry self-regulatory body
  - Open
  - Consensus-based
  - Transparent

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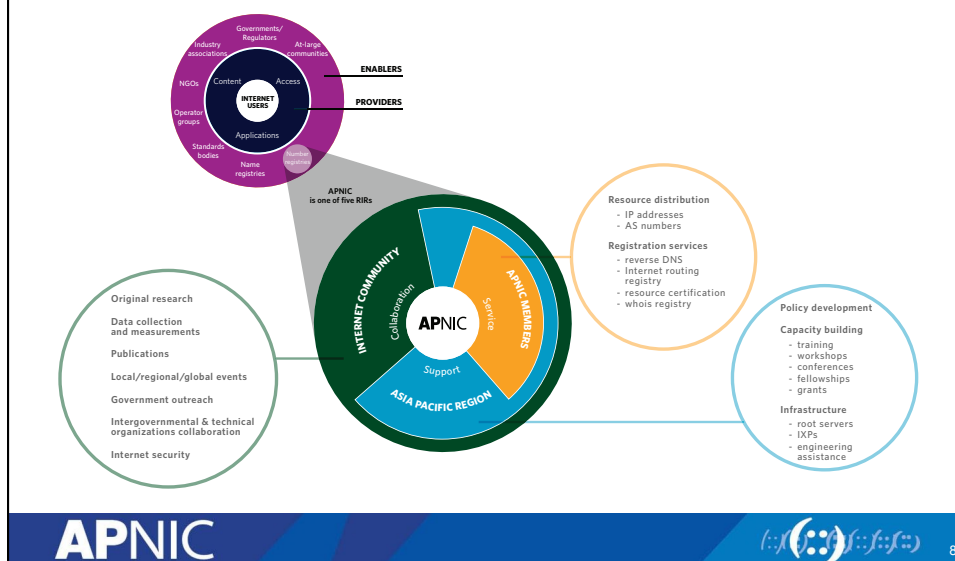


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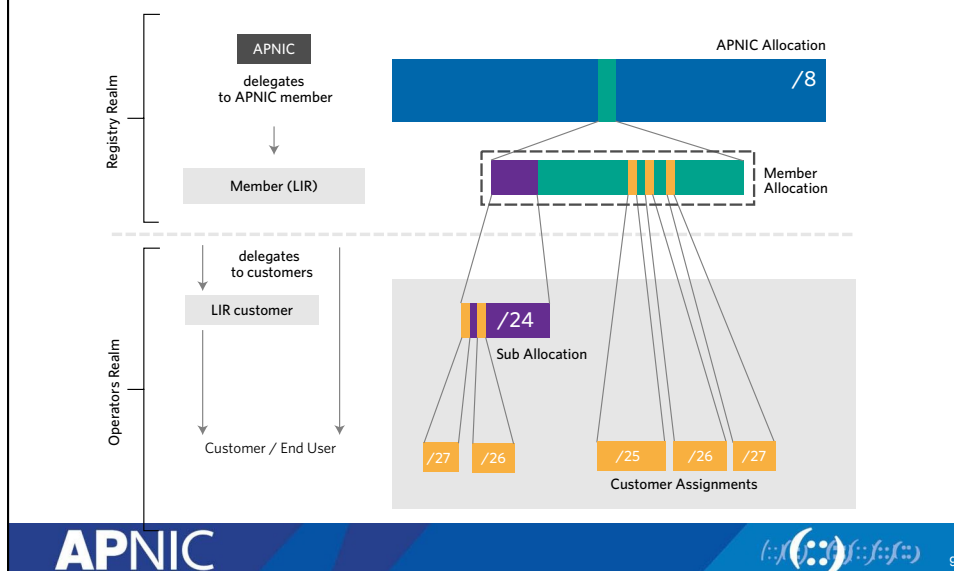
## Where is the APNIC Region?



## APNIC in the Internet Ecosystem

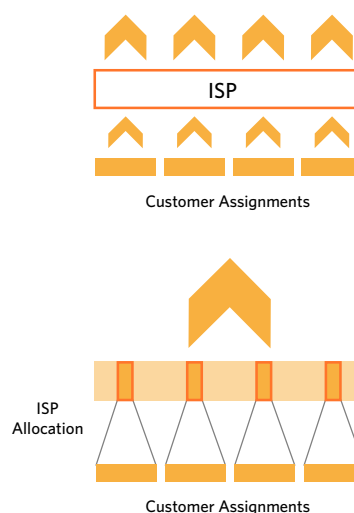


## How IP Addresses are Delegated

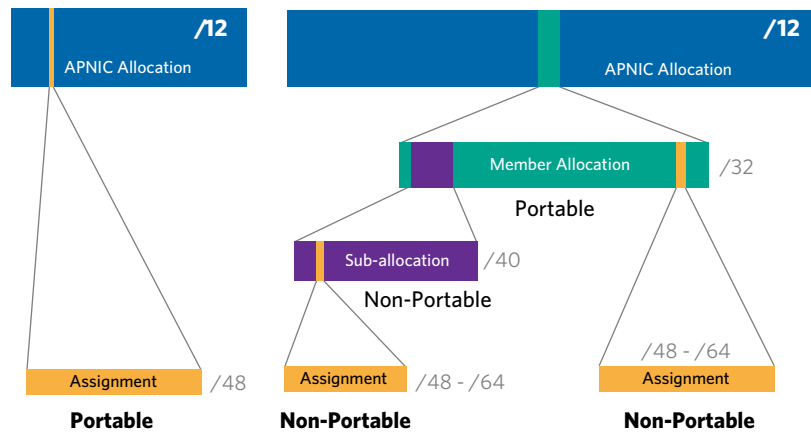


## Portable and Non-Portable

- **Portable Address**
  - Provider-Independent (PI)
  - Assigned by RIR to end-user
  - Keeps addresses when changing ISP
  - Increases the size of routing tables
- **Non-portable Address**
  - Provider-aggregatable (PA)
  - End-user gets address space from LIR
  - Must renumber if changing upstream provider
  - Can be aggregated for improved routing efficiency



## IPv6 Address Management Hierarchy



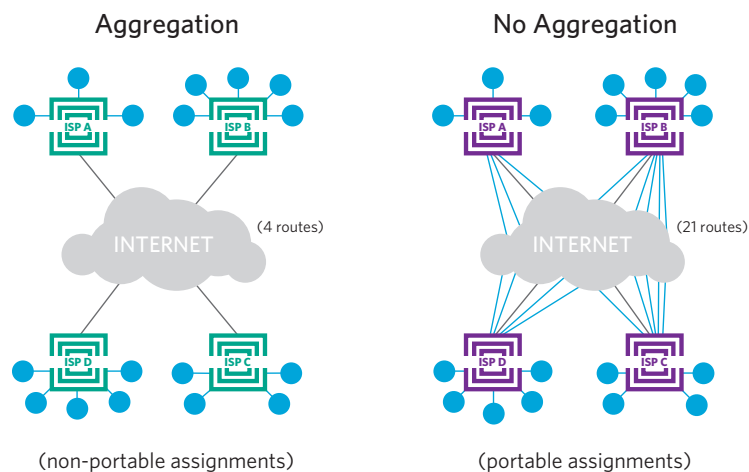
Describes “portability” of the address space

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## Aggregation and Portability

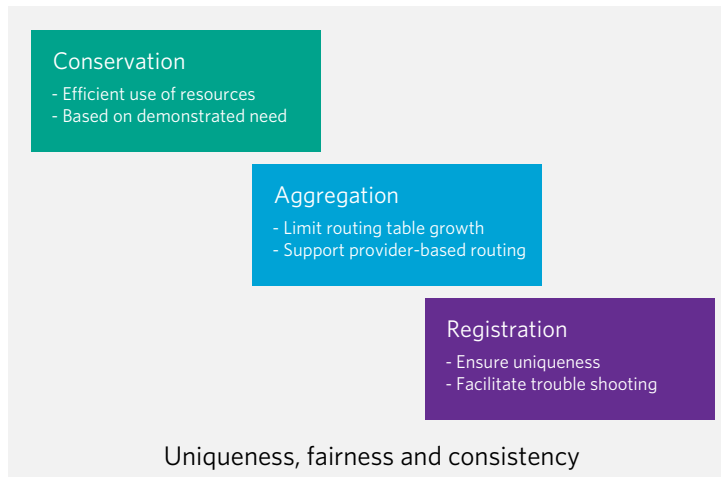


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## IRM Objectives

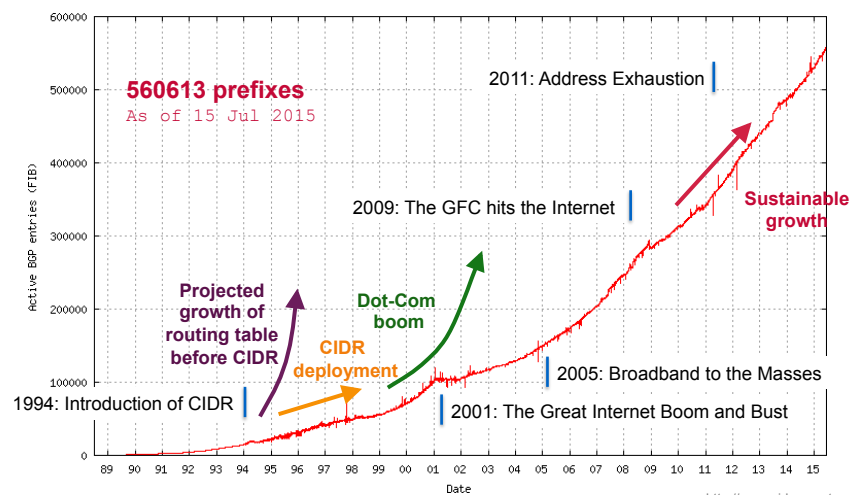


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## Growth of the Global Routing Table



<http://www.cidr-report.org/as2.0/>

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## APNIC Policy Environment

- Internet resources are delegated on a license basis
  - Limited duration (usually one year)
  - Renewable on the following conditions:
    - Original basis of delegation remains valid, and
    - Address space is properly registered at the time of renewal
- Security and confidentiality
  - APNIC to maintain systems and practices that protect the confidentiality of Members' information and their customers

<https://www.apnic.net/policy/policy-environment>

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## 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

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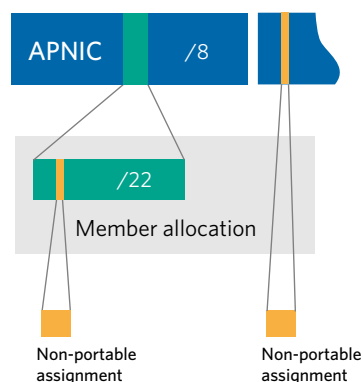


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## IPv4 Allocation Policies

- APNIC IPv4 allocation size per account holder
  - Minimum /24
  - Maximum /21
- According to current allocation from the final /8 block
  - Allocation is based on demonstrated need

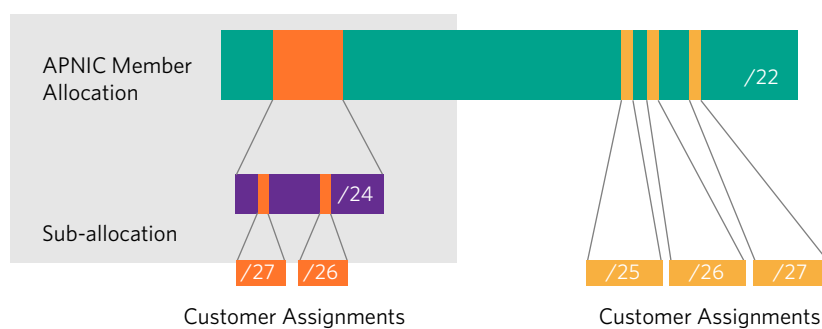


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## IPv4 Sub-allocation



- 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

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## What is an Assignment Window?

“The amount of address space a member may assign without a ‘second opinion’”

- All members have an Assignment Window
  - Starts at zero, increases as member gains experience in address management
- Second opinion process
  - Customer assignments require a ‘second-opinion’ when proposed assignment size is larger than member’s Assignment Window

## Assignment Window

- Size of Assignment Window
  - Evaluated after about three 2nd-opinion requests
  - Increased as member gains experience and demonstrates understanding of policies
    - Assignment Window may be reduced, in rare cases
- Why an Assignment Window?
  - Monitoring ongoing progress and adherence to policies
  - Mechanism for member education

## IPv6 Allocation Policies

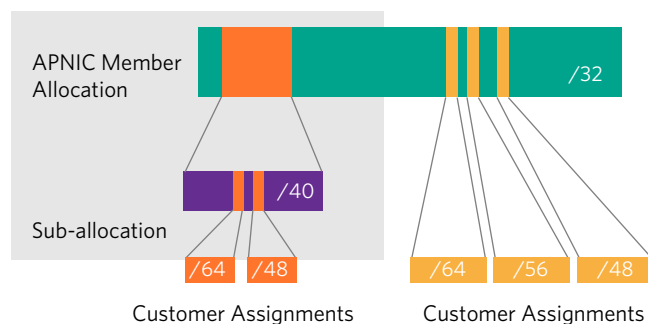
- Initial allocation criteria
  - Minimum of /32 IPv6 block
  - Larger than /32 may be justified
- For APNIC members with existing IPv4 space
  - One-click Policy (through MyAPNIC)
- Without existing IPv4 space
  - Must meet initial allocation criteria
- Subsequent allocation
  - Based on HD ratio (0.94)
  - Doubles the allocated address space

## IPv6 Utilisation (HD = 0.94)

IPv6 Prefix	Site Address Bits	Total site address in /56	Threshold (HD = 0.94)	Utilisation %
/42	14	16,384	9,153	55.9%
/36	20	1,048,576	456,419	43.5%
/35	21	2,097,152	875,653	41.8 %
/32	24	16,777,216	6,185,533	36.9%
/29	27	134,217,728	43,665,787	32.5 %
/24	32	4,294,967,296	1,134,964,479	26.4 %
/16	40	1,099,511,627,776	208,318,498,661	18.9 %

RFC 3194 "In a hierarchical address plan, as the size of the allocation increases, the density of assignments will decrease."

## IPv6 Sub-allocation



- All /48 assignments to end sites must be registered
- LIR must submit a second opinion request for assignments greater than /48

## IPv6 Assignment Policies

- Assignment address space size
  - Minimum of /64 (only 1 subnet)
  - Normal maximum of /48
- 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 Point-of-Presence of an IPv6 service operator

## Portable Assignments

- Small multi-homing assignment
  - For (small) organisations who require a portable assignment for multi-homing purposes
- Criteria
  - Currently multi-homed, or demonstrate a plan to multi-home within 1 month
  - Demonstrate need to use 25% of requested space immediately, and 50% within 1 year

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## IXP Assignments

- APNIC has a reserved block of space from which to make IXP assignments
- To be used exclusively to connect IXP participant devices to the exchange point
- Criteria:
  - 3 or more peers
  - Demonstrate “open peering policy”
- Assignment size:
  - IPv4: /24
  - IPv6: /48 minimum

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## Portable Critical Infrastructure

- What is Critical Internet Infrastructure?
  - Domain registry infrastructure
    - Root DNS operators, gTLD operators, ccTLD operators
  - Address Registry Infrastructure
    - RIRs & NIRs, IANA
- Why a specific policy?
  - To protect the stability of core Internet functions
- Assignment sizes:
  - IPv4: /24
  - IPv6: /32 (Maximum)

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## Sub-allocation Guidelines

- Sub-allocate cautiously
  - Seek APNIC advice if in doubt
  - If customer requirements meet min allocation criteria, customers can approach APNIC for portable allocation
- Efficient assignments
  - ISPs responsible for overall utilisation
- Database registration (WHOIS database)
  - Sub-allocations & assignments to be registered in the database

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## 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

## Historical Resources

- Internet resources registered under early registry policies without formal agreements and include:
  - Registrations transferred to APNIC as part of the AUNIC to APNIC migration
  - Registrations transferred as part of the Early Registration Transfer (ERX) project
  - Historical APNIC resources

## Historical Resource Transfer

- Bring historical resource registrations into the current policy framework
  - Allow 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"
- Address space subject to current policy framework





## Agenda

- IP Resource Allocation Policies
- **Requesting IP Addresses**
- Requesting AS Numbers
- APNIC Whois Database
- Reverse DNS
- MyAPNIC Address Management Tool

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## How do I get 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

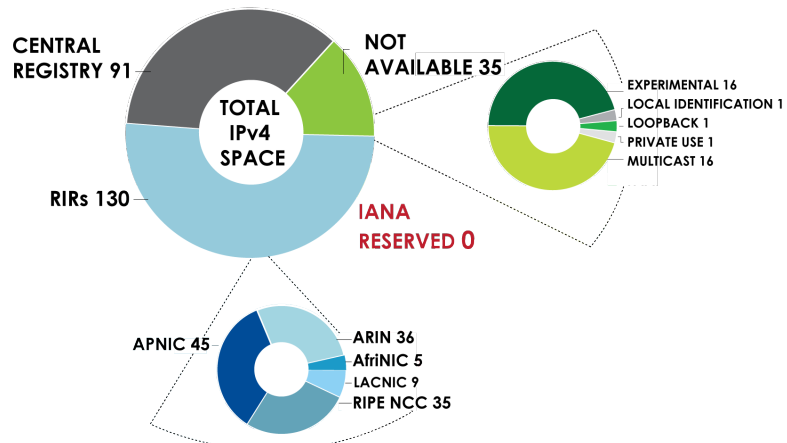
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## IPv4 Address Space

### STATUS OF 256 /8s IPv4 ADDRESS SPACE



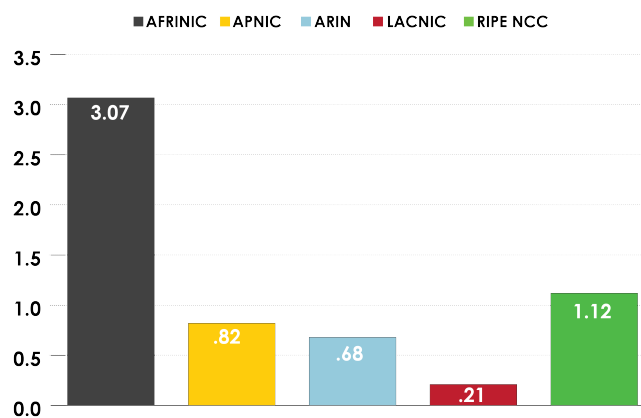
Source: NRO Q3 2014

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## Available IPv4 /8s in Each RIR



Source: NRO Q3 2014

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## Check for Eligibility – IPv4

- Initial LIR delegation:
  - Have used a /24 from their upstream provider or demonstrate an immediate need for a /24,
  - Have complied with applicable policies in managing all address space previously delegated to it (including historical delegations), and
  - Demonstrate a detailed plan for use of a /23 within a year
- Small multihoming delegation:
  - Currently multihomed with provider-based addresses, or demonstrates a plan to multihome within one month
  - Demonstrate that they are able to use 25% of the requested addresses immediately and 50% within one year

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## Check for Eligibility – IPv4

- Internet Exchange Points:
  - Eligible to receive a delegation from APNIC to be used exclusively to connect the IXP participant devices to the Exchange Point.
- Critical Infrastructure:
  - If operating in the Asia Pacific region, are eligible to receive a delegation
  - Available only to the actual operators of the network infrastructure performing such functions

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## Check for Eligibility – IPv6

- APNIC members with IPv4 but no IPv6 automatically qualify for an appropriately sized block of IPv6 addresses.
  - Members with an IPv4 allocation are eligible for a /32 of IPv6
  - Members with an IPv4 assignment are eligible for a /48 of IPv6
- Minimum initial allocation
  - Must be an LIR
  - Not be an end site
  - Plan to announce IPv6 within two years
  - Must meet one of these:
    - Have a plan for making at least 200 assignments to other organizations within two years
    - Be an existing LIR with IPv4 allocations from an APNIC or an NIR, which will make IPv6 assignments or sub-allocations within two years.

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## Initial IP Address Request

- You are required to be an APNIC member in order to initiate your IP address request.
- However, you can apply for membership and request an initial address allocation at the same time.
- <http://www.apnic.net/services/become-a-member>

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New Member Application Form

1

Applicant

2

Organization

3

IP / ASN

4

Confirmation

Applicant Contact Details

[Clear form and restart](#)

Privacy Collection Statement

APNIC is collecting personal information from you in order to process your application for APNIC membership. Without this information, APNIC may not be able to process your application.

APNIC may publish your organisation name, phone number and Abuse Contact email address in the public APNIC Whois database.

APNIC has a [privacy policy](#) that contains information about:

- How you may complain about a breach of the Australian Privacy Principles by APNIC, and how APNIC will deal with such a complaint.
- How you may access and seek the correction of the personal information held by APNIC about you.

Please note, while it is unlikely your personal information will be disclosed to any overseas recipient, some of your personal information may be stored by APNIC using computer servers located outside Australia.

Name: \*

Position: \*

Email: \*

Confirm Email: \*

I am the Corporate Contact: [What's this?](#)

☒ Yes
 ☐ No

The billing contact is the same as the Corporate Contact:

☒ Yes
 ☐ No

Where did you hear about APNIC? \*

Next

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## New Member Application Form

- More user-friendly, interactive, and informative
- Member receives quote after application. Invoice issued after approval
- Contacts Management
- Kickstart IPv6 integration
- Essential Whois objects will be created automatically

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## Applying for Resources - IP

APNIC New Member Application Form

1 Applicant 2 Organization 3 IP / ASN 4 Confirmation

### IP / ASN

The information you provide will be evaluated by APNIC to determine if this request meets the relevant policy criteria.

[Clear form and reset](#)

Do you have any approved resource transfer under the merger/acquisition or historical resource claim policies that will be transferred into this APNIC member account?

☐ No ☐ Yes

Do you want to apply for IP resources or ASN?

☐ No ☐ Yes

IP?

☐ No ☐ Yes

What type of IP?

IPv6 /32 Only

My organization is located in the Asia-Pacific region, or I plan to deploy this network in the Asia-Pacific region.

☐ No ☐ Yes

My organization meets the initial IPv6 allocation criteria.

☐ No ☐ Yes

ASN?

☐ No ☐ Yes

What are you using the Internet resources for? Select all that apply.

- ☐ Access services - fixed line
- ☐ Access services - fixed wireless
- ☐ Access services - mobile
- ☐ Building/Campus/Enterprise Network
- ☐ Communication services (text, voice, video etc.)
- ☐ Consumer services (ATM, Kiosk, vending, consumer equipment etc.)
- ☐ Data Center/Hosting/Cloud Services/Content Delivery Network
- ☐ Internet Exchange Point
- ☐ IP transit services (local, national, international)
- ☐ Online services (web portal, gaming, mobile apps etc.)
- ☐ Remote operation, monitoring and measurement
- ☐ Other

Select IPv4 or IPv6 and the block size. Make sure you meet the criteria.

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## Applying for Resources - ASN

ASN?

☐ No ☒ Yes

ASN implementation date: \*

2012-01-01

Please provide details of at least two peering networks.

### Peering Network #1

ASN: \*

ASN of peer network

Contact name: \*

Contact name

Email: \*

Contact email

Phone: \*

+12 1234 5678

### Peering Network #2

ASN: \*

Contact AS

Contact name: \*

Contact name

Email: \*

Contact email

Phone: \*

+12 1234 5678

Provide details of two peering networks,  
and whether you require 2-byte or 4-byte ASN

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## First Allocation

- APNIC IPv4 allocation size per account holder
  - Minimum of /24
  - Maximum of /21
    - /22 from final /8 block
    - /22 from the recovered block
- Initial IPv6 allocation criteria
  - Minimum of /32 IPv6 block
  - Larger than /32 may be justified

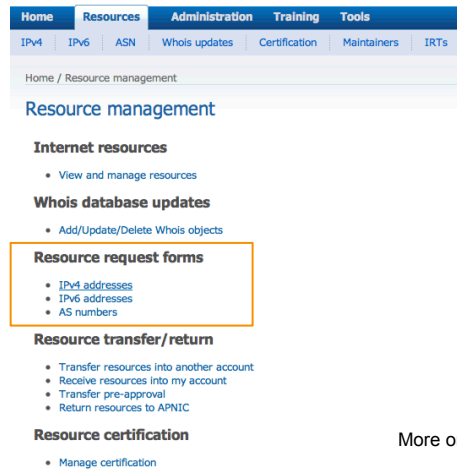
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## Requesting for Additional Resources



Home Resources Administration Training Tools

IPv4 IPv6 ASN Whois updates Certification Maintainers IRTs

Home / Resource management

### Resource management

**Internet resources**

- View and manage resources

**Whois database updates**

- Add/Update/Delete Whois objects

**Resource request forms**

- IPv4 addresses
- IPv6 addresses
- AS numbers

**Resource transfer/return**

- Transfer resources into another account
- Receive resources into my account
- Transfer pre-approval
- Return resources to APNIC

**Resource certification**

- Manage certification

More on how to use MyAPNIC  
in later sections

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## Agenda

- IP Resource Allocation Policies
- Requesting IP Addresses
- **Requesting AS Numbers**
- APNIC Whois Database
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## What is an AS Number?

- Autonomous System Number (ASN)
- Globally unique identifiers for IP networks
  - uniquely identifies each network on the Internet
- Allocated to each Autonomous System (AS) for use in BGP routing
- Used in the exchange of exterior routing information (between neighboring AS) and as an identifier of the AS itself

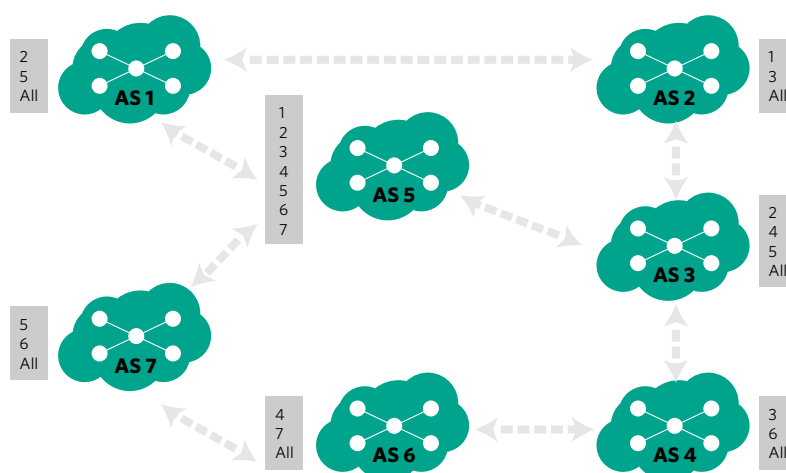
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## AS and AS numbers

- **Autonomous System (AS)** - group of IP-based networks with the same routing policy, usually under single ownership, trust or administrative control
- **Autonomous System Number (ASN)** - globally unique identifiers for IP networks, used in the exchange of exterior routing information (BGP)

## How do Autonomous Systems work?



## When do I need an ASN?

- ASN is needed if you have a
  - Multi-homed network to different providers, and
  - Routing policy different to external peers
- RFC1930: Guidelines for creation, selection and registration of an Autonomous System

## ASN Representation

ASN Range	Usage
0 - 65535	16-bit AS number
0 and 65535	Reserved
1 - 64495	Public Internet
64496 - 64511	Documentation and sample code (RFC5398)
64512 - 65534	Reserved for private use (RFC6996)
23456	AS_TRANS (RFC6793)
65536 - 4294967295	32-bit AS number
65536 - 65551	Documentation and sample code (RFC5398)
65552 - 131071	Reserved (RFC5398)
131072 - 4199999999	Public Internet
4200000000 - 4294967294	Reserved for private use (RFC6996)
4294967295	Reserved (RFC7300)

<http://www.iana.org/assignments/as-numbers/as-numbers.xhtml>

## 16-bit and 32-bit ASN

- With the introduction of the “new” 32-bit AS Numbers, and the continuation of use of “old” 16-bit AS Numbers, a method was needed to get them to work together
- The solution is known as **AS23456**, which allows BGP to either convert or truncate the AS number if it detects an “old” 16-bit number as part of the exchange

## Requesting an ASN

- Eligibility
  - Should be multihomed
  - Has a single, clearly defined routing policy that is different from its providers' routing policies
- Request Process: 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

## Requesting an ASN

- If a member requests an ASN for their own network
  - AS number is **portable**
  - Member responsible for registration
- If a member requests an ASN for its customer
  - AS number is **non-portable**
  - Customer must meet criteria
  - Member responsible for registration
  - AS number is returned if customer changes provider

## From 2-byte to 4-byte Delegation

- January 2007
  - 2-byte ASN by default, process 4-byte ASN as requested
- January 2009
  - 4-byte ASN by default, process 2-byte ASN as requested
- July 2009
  - 4-byte ASN by default, process requests for 2-byte through demonstrated need
- January 2010
  - No distinction between two-byte and four-byte only AS numbers
  - Will operate AS number assignments from an undifferentiated four-byte AS number pool

## ASN Transfers

- Transfers of ASNs
  - Within the APNIC region and
  - Between regions with compatible inter-regional ASN transfer policies

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## Aut-num Object Example

```

aut-num:      AS4777
as-name:      APNIC-NSPIX2-AS
Descr:        Asia Pacific Network Information Centre
descr:        AS for NSPIX2, remote facilities site
import:       from AS2500 action pref=100; accept ANY
import:       from AS2524 action pref=100; accept ANY
import:       from AS2514 action pref=100; accept ANY
export:       to AS2500 announce AS4777
export:       to AS2524 announce AS4777
export:       to AS2514 announce AS4777
default:      to AS2500 action pref=100; networks ANY
admin-c:      PW35-AP
tech-c:       NO4-AP
remarks:      Filtering prefixes longer than /24
mnt-by:       MAINT-APNIC-AP
changed:      paulg@apnic.net 19981028
source:       APNIC
  
```

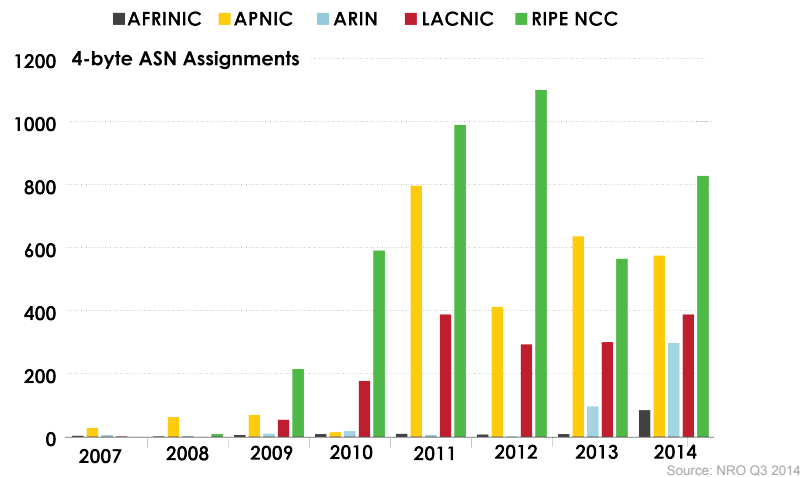
**POLICY  
RPSL**

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## Four-byte ASN Global Distribution



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## Agenda

- IP Resource Allocation Policies
- Requesting IP Addresses
- Requesting AS Numbers
- **APNIC Whois Database**
- Reverse DNS
- MyAPNIC Address Management Tool

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## What is the APNIC Database?

- Public network management database
  - Operated by Internet Registries
  - APNIC maintains the database of resources for the AP region
- Tracks network resources
  - IP addresses, ASNs, Reverse DNS delegations, Routing policies
- Records administrative information
  - Contact information (persons/roles) of relevant resource holders
  - Authorization for updating these info
  - Network abuse handling (IRT)

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## Resource Registration

As part of the membership agreement with APNIC, all members are required to register their resources in the APNIC database.

- Members must keep records up to date
  - ✓ When ever there is a change in contacts
  - ✓ When new resources are received
  - ✓ When resources are sub-allocated or assigned

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## Whois Object Types

OBJECT	PURPOSE
person	Technical or administrative contacts responsible for an object
role	Technical or administrative contacts represented by a role, performed by one or more people
inetnum	Allocation or assignment of IPv4 address space
inet6num	Allocation or assignment of IPv6 address space
aut-num	Registered holder of an AS number and corresponding routing policy
domain	in-addr.arpa (IPv4) or ip6.arpa (IPv6) reverse DNS delegations
route / route6	Single IPv4/IPv6 route injected into the Internet routing mesh
mntner	Authorized agent to make changes to an object
irt	Dedicated abuse handling team

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## Objects for New Members

- If you are receiving your first allocation or assignment, APNIC will create the following objects for you:
  - role object
  - inetnum or inet6num object
  - maintainer object (to protect your data)
  - aut-num object (if you received an ASN)
  - irt object
- Information is taken from your application for resources and membership

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## How to Use APNIC Whois

- Using a web browser
  - <http://www.apnic.net/whois>
- Whois client or query tool
  - whois.apnic.net
- Identify network contacts from the registration records
  - IRT (Incident Response Team) if present
  - Contact persons: “tech-c” or “admin-c”

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## What if Whois information is invalid?

- Members (LIRs) are responsible for reporting changes to APNIC
  - Under formal membership agreement
- Report invalid ISP contacts to APNIC
  - <http://www.apnic.net/invalidcontact>
  - APNIC will contact member and update registration details

APNIC



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## What if Whois information is invalid?

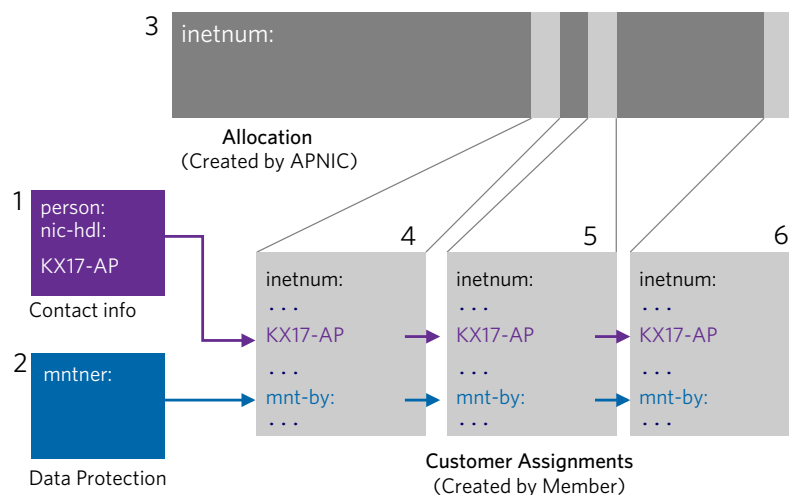
- Customer assignment information is the responsibility of the LIR
  - LIR must update their customer network registrations
- Tools such as *traceroute*, *looking glass* and RIS may be used to track the upstream provider if needed

APNIC



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## Using the Whois – Step by Step



APNIC



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## Inetnum / Inet6num Objects

- Contains IP delegation information
- APNIC creates an *inetnum* or *inet6num* object for each delegation they make to the Member
- All members must create *inetnum* or *inet6num* objects for each sub-allocation or assignment they make to customers

APNIC



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## Inet6num Object

```
inet6num:      2406:6400::/32
netname:       APNIC-TRAININGIPv6-Lab-AP
descr:         APNIC TRAINING Lab
descr:         LEVEL 1, 33 PARK RD
country:       AU
admin-c:       AT480-AP
tech-c:        AT480-AP
mnt-by:        APNIC-HM
mnt-lower:     MAINT-AU-APNICTRAINING
mnt-routes:    MAINT-AU-APNICTRAINING
status:        ALLOCATED PORTABLE
remarks:       -+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
remarks:       This object can only be updated by APNIC hostmasters.
remarks:       To update this object, please contact APNIC
remarks:       hostmasters and include your organisation's account
remarks:       name in the subject line.
remarks:       -+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
changed:       hm-changed@apnic.net 20100216
changed:       hm-changed@apnic.net 20100818
source:        APNIC
```

Role and mntner object reference

Status shows the type of delegation

APNIC



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## 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** – a unique identifier for a person or role object
  - Format: [A-Z][0-9]-AP

APNIC



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## Person Object

```

person:           Nurul Islam Roman
nic-hdl:           NR97-AP
e-mail:            nurul@apnic.net
address:           6 Cordelia Street
address:           South Brisbane
address:           QLD 4101
phone:             +61 7 3858 3100
fax-no:            +61 7 3858 3199
country:           AU
changed:           nurul@apnic.net 20061128
mnt-by:            MAINT-AU-APNICTRAINING
changed:           hm-changed@apnic.net 20100818
changed:           hm-changed@apnic.net 20110624
source:            APNIC
  
```

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## Role Object

- Contains details of technical or administrative contacts as represented by a role performed by one or more people within an organization
- Also has a nic-hdl
- Preferred over *person* object as reference in other objects
  - Eases administration

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## Role Object

**role:** **APNIC Training**  
**address:** 6 Cordelia Street  
**address:** South Brisbane  
**address:** QLD 4101  
**country:** AU  
**phone:** +61 7 3858 3100  
**fax-no:** +61 7 3858 3199  
**e-mail:** training@apnic.net  
**admin-c:** NR97-AP  
**tech-c:** NR97-AP **Points to a person object**  
**nic-hdl:** AT480-AP  
**mnt-by:** MAINT-AU-APNICTRAINING  
**changed:** hm-changed@apnic.net 20080424  
**changed:** hm-changed@apnic.net 20100818  
**changed:** hm-changed@apnic.net 20110624  
**source:** APNIC

## Replacing Contacts – Person Object

KX17-AP is the original contact  
Referenced by three (or more) objects

BW117-AP is replacing him  
Update all three (or more) objects  
with new contact one by one

Delete old contact KX17-AP

1

person:  
nic-hdl:  
KX17-AP

Contact info

2

person:  
nic-hdl:  
BW101-AP

Contact info

4

inetnum:  
...  
KX17-AP  
...  
mnt-by:  
...

5

inetnum:  
...  
KX17-AP  
...  
mnt-by:  
...

6

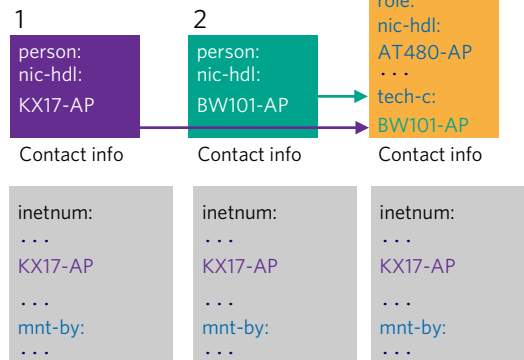
inetnum:  
...  
KX17-AP  
...  
mnt-by:  
...

Customer Assignments  
(Created by Member)



## Replacing Contacts – Role Object

Replace old contact with new contact  
in Role object



No change in inetnum objects

Customer Assignments  
(Created by Member)

APNIC



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## APNIC Whois Web Query

Search for  Search

**IP address lookups**

- ☐ -l 1st level less specific
- ☐ -L All less specific
- ☐ -m 1st level more specific
- ☐ -M All more specific
- ☐ -x Exact match only
- ☐ -d Associated reverse domain

**Miscellaneous queries**

- ☐ -i Inverse attributes
- ☐ -T Object types   
as-block  
as-set

**Query hints**

- Include "AS" in front of an AS number.  
Example: AS4808
- Include "-t" (template only) or "-v" (template and description) in front of an object name to view the template  
Example: -t inetnum

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## Whois Database Queries



- Flags used for inetnum queries

None one level less specific matches

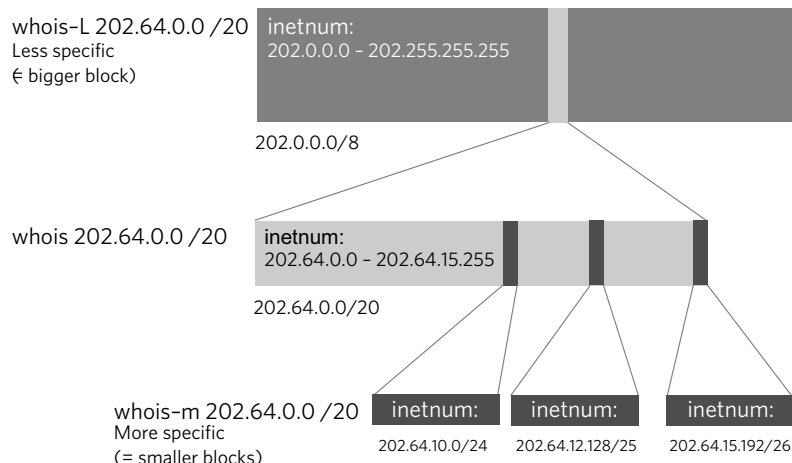
- L find all less specific matches
- m find first level more specific matches
- M find all More specific matches
- x find exact match (if no match, nothing)
- d enables use of flags for reverse domains
- r turn off recursive lookups

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## Whois Database Query - inetnum



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## Recursive Lookups

whois 202.12.29.0

inetnum

, route

&

person

*recursion enabled by default*

whois -r 202.12.29.0

inetnum

&

route

~~person~~

*recursion turned off*

whois -T inetnum 202.12.29.0

inetnum

&

person

*'type' of object specified*

whois -r -T inetnum 202.12.29.0

inetnum

*'type' of object specified & recursion turned off*

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## Inverse Queries

- Inverse queries are performed on inverse keys
  - See object template (*whois -t*)
- Returns all public objects that reference the object with the key specified as a query argument
  - Practical when searching for objects in which a particular value is referenced, such as your nic-hdl
- Syntax: `whois -i <attribute> <value>`

APNIC



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## Customer Privacy

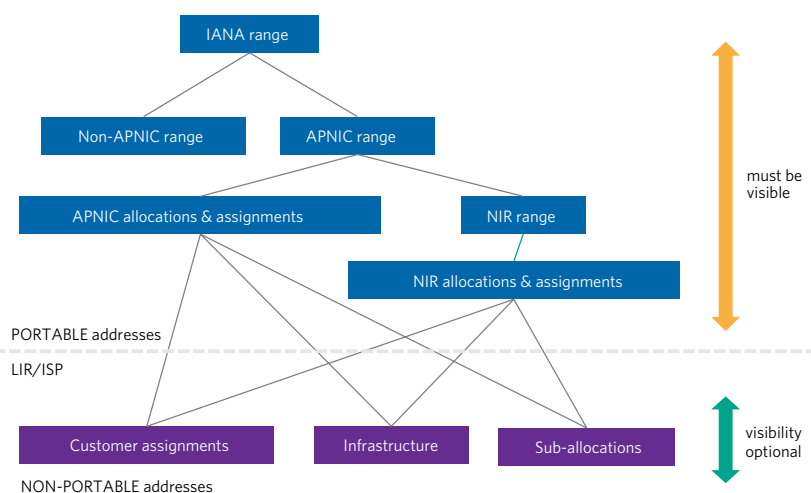
- Public data
  - Includes portable addresses (inetnum objects), and other objects e.g. route objects
  - must be visible
- Private data
  - Can include non-portable addresses (inetnum objects)
  - Members have the option to make private data visible
- Customer assignments
  - Can be changed to be public data (public data is an optional choice)

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## What needs to be visible?



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## What is a Maintainer?

- Protects objects in the APNIC Whois Database
- Applied to any object created directly below that maintainer object
- Why do we need Maintainer?
  - To prevent unauthorized persons from changing the details in the Whois DB
  - As parts of a block are sub-allocated or assigned, another layer of maintainers is often created to allow the new users to protect their (sub)set of addresses
- Authentication options: CRYPT-PW, MD5, PGPKEY

APNIC



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## Maintainer Object

```
mntner:      MAINT-AU-APNICTRAINING
descr:       APNIC Training
country:     AU
admin-c:     NR97-AP
tech-c:      NR97-AP
auth:        # Filtered
mnt-by:      MAINT-AU-APNICTRAINING
upd-to:      nurul@apnic.net
referral-by: APNIC-HM
changed:     hm-changed@apnic.net 20091111
changed:     hm-changed@apnic.net 20091217
changed:     hm-changed@apnic.net 20100528
changed:     hm-changed@apnic.net 20110124
changed:     hm-changed@apnic.net 20131129
source:      APNIC
```

APNIC



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## Mnt-by and Mnt-Lower Attributes

- Mnt-by
  - Can be used to protect any object
  - Changes to protected object must satisfy authentication rules of *mntner* object
- Mnt-lower
  - Also references *mnt-by* object
  - Hierarchical authorization for *inetnum* & *domain* objects
  - The creation of child objects must satisfy this maintainer
  - Protects against unauthorized updates to an allocated range - highly recommended!
- Mnt-routes

APNIC



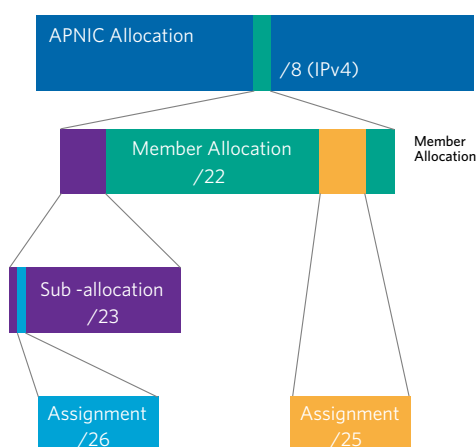
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## Maintainer Hierarchy Diagram

**Allocated to APNIC:**  
Maint-by can only be changed by IANA

**Allocated to Member:**  
Maint-by can only be changed by APNIC

**Sub-allocated to Customer:**  
Maint-by can only be changed by Member



APNIC



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## Authentication / Authorization

```
inetnum:          203.176.189.0 - 203.176.189.255
netname:          APNIC-TRAINING-IPv4-DATA-CENTRE
descr:           APNIC Training IPv4 Address for data centre
country:         AU
admin-c:         AT480-AP
tech-c:          AT480-AP
status:          ASSIGNED PORTABLE
mnt-by:          MAINT-AU-APNICTRAINING
mnt-routes:      MAINT-AU-APNICTRAINING
remarks:         -+-+-+
+-+--+
remarks:         This object can only be updated by APNIC
hostmasters:
remarks:         To update this object, please contact APNIC
remarks:         hostmasters and include your organisation's
account
remarks:         name in the subject line.
remarks:         -+-+-+
+-+--+
changed:         hm-changed@apnic.net 20080424
changed:         hm-changed@apnic.net 20100818
source:          APNIC
```

Only APNICTRAINING-AU can create assignments within this allocation  
Only APNIC can change this object

**APNIC**



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## Whois IRT Contact

- Incident Response Team (IRT)
  - Dedicated abuse handling teams (not netops)
- IRT objects are mandatory when creating *inetnum*, *inet6num* and *aut-num* objects
- Provide an abuse contact email
  - Dedicated team to resolve incidents
  - Efficient and accurate response
  - Stops the tech-c and admin-c from getting abuse reports

**APNIC**



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## IRT Object

```
irt:                IRT-MYAPNIC-TEST-AP
address:            6 Cordelia Street test
address:            South Brisbane
address:            QLD 4101
e-mail:             helpdesk@apnic.net
e-mail:             tamya@apnic.net
abuse-mailbox:      helpdesk@apnic.net
admin-c:            VN61-AP
tech-c:             VN61-AP
auth:              # Filtered
mnt-by:             MAINT-AU-VIVEK
changed:            helpdesk@apnic.net 20101108
changed:            hm-changed@apnic.net 20110624
source:             APNIC
```

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## Whois Database Geolocation

- A latitude/longitude coordinate indicating where users of this network are located. Provides a hint to content and geolocation service providers.

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## Whois Object with Geolocation

```
inetnum:        61.45.248.0 - 61.45.255.255
netname:        APNIC-SERVICES-V4
descr:          APNIC Pty Ltd
country:        AU
geoloc:         -27.473057 153.014199
language:       en
admin-c:        AMS11-AP
tech-c:         AH256-AP
status:         ALLOCATED PORTABLE
notify:         helpdesk@apnic.net
mnt-by:         APNIC-HM
mnt-lower:      MAINT-MYAPNIC-AP
mnt-lower:      MAINT-AU-VIVEK
mnt-routes:     MAINT-MYAPNIC-AP
mnt-irt:        IRT-MYAPNIC-TEST-AP
remarks:        -+-+-+
changed:        hm-changed@apnic.net 20140114
changed:        hm-changed@apnic.net 20150106
source:         APNIC
```

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## Agenda

- IP Resource Allocation Policies
- Requesting IP Addresses
- Requesting AS Numbers
- APNIC Whois Database
- **Reverse DNS**
- MyAPNIC Address Management Tool

**APNIC**



## What is Reverse DNS?

- **Forward DNS** maps names to numbers  
svc00.apnic.net → 202.12.28.131
- **Reverse DNS** maps numbers to names  
202.12.28.131 → svc00.apnic.net

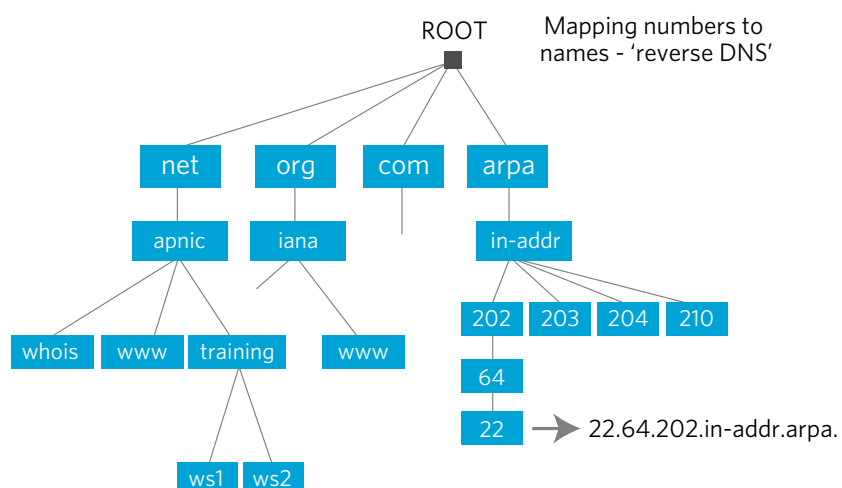
**APNIC**



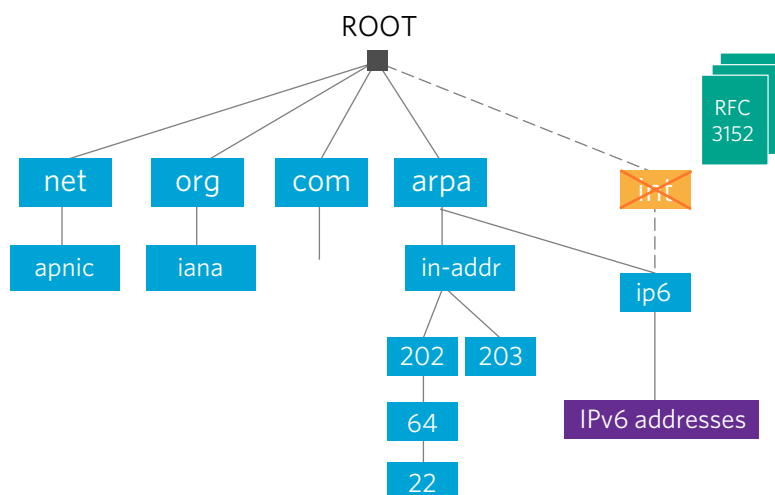
## Uses of Reverse DNS

- Service denial
  - That only allow access when fully reverse delegated eg. anonymous ftp
- Diagnostics
  - Assisting in network troubleshooting (ex: traceroute)
- Spam identifications
  - Reverse lookup to confirm the source of the email
  - Failed lookup adds to an email's spam score

## Reverse DNS Tree



## Reverse DNS Tree – with IPv6



APNIC

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## Reverse Zone Example

```

$ORIGIN 1.168.192.in-addr.arpa.
@      3600  IN SOA test.company.org. (
                                sys\.admin.company.org.
                                2002021301      ; serial
                                1h                ; refresh
                                30M               ; retry
                                1W                ; expiry
                                3600 )           ; neg. answ. ttl

NS      ns.company.org.
NS      ns2.company.org.

1 PTR   gw.company.org.
        router.company.org.

2 PTR   ns.company.org.
;auto generate:  65 PTR host65.company.org
$GENERATE 65-127 $ PTR host$.company.org.
  
```

APNIC

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## Managing Reverse DNS

- APNIC manages reverse delegation for both IPv4 and IPv6
- Before you register your domain objects, you need to ensure that your reverse zones have been configured and loaded in your DNS name servers.
- APNIC does not host your DNS name servers or configure your reverse zone files.
- APNIC only delegates the authority of your reverse zones to the DNS name servers you provide through your domain objects.

APNIC



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## Reverse Delegation Requirements

- /24 Delegations
  - Address blocks should be delegated
  - At least one name server
- /16 Delegations
  - Same as /24 delegations
  - APNIC delegates entire zone to member
- < /24 Delegations
  - Read “classless in-addr.arpa delegation”
  - Not supported



APNIC



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## APNIC & LIR Responsibilities

- APNIC
  - Manage reverse delegations of address block distributed by APNIC
  - Process organisations requests for reverse delegations of network allocations
- Organisations
  - Be familiar with APNIC procedures
  - Ensure that addresses are reverse-mapped
  - Maintain nameserver(s) for allocations
  - Keep accurate records in the database
  - Keep reverse DNS current with the Whois DB

**APNIC**



## Reverse Delegation Procedures

- Standard APNIC database object
  - Can be updated through myAPNIC
- Nameserver/domain set up verified before being submitting to the database.
- Protection by maintainer object
  - Current authentication options: CRYPT-PW, MD5

**APNIC**



# Reverse Delegation Procedures

[Home](#) / [Resource management](#) / [Reverse DNS](#)

## Add reverse DNS delegation

Important: The information you provide in the form below will be used to create your domain object in the APNIC Whois Database. Please make sure that your name servers are running and are authoritative for the zone, or your reverse DNS delegation might not function correctly.

Address range:

Use CIDR address prefix notation. Multiple range allowed, one range per line.

Example:

2001:dc0:2001::/48  
2001:rel30::/31

**Input your IP address block here**

Name servers:

List fully qualified domain name of at least one server.

Important: Do not list IP addresses or reverse DNS names.

Example:

ns1.example.com  
ns2.example.com

**At least one DNS server (FQDN)**

Maintainer:


Example:

MAINT-AU-EXAMPLE

**Maintainer password**

Next

APNIC

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# Whois Domain Object

```
domain:      28.12.202.in-addr.arpa
Descr:       in-addr.arpa zone for 28.12.202.in-addr.arpa
admin-c:     NO4-AP
tech-c:      AIC1-AP
zone-c:      NO4-AP
nserver:     cumin.apnic.net
nserver:     tinnie.apnic.net
nserver:     tinnie.arin.net
mnt-by:      MAINT-APNIC-AP
mnt-lower:   MAINT-AP-DNS
changed:     inaddr@apnic.net 20021023
changed:     inaddr@apnic.net 20040109
changed:     hm-changed@apnic.net 20091007
changed:     hm-changed@apnic.net 20111208
source:      APNIC
```


Reverse Zone

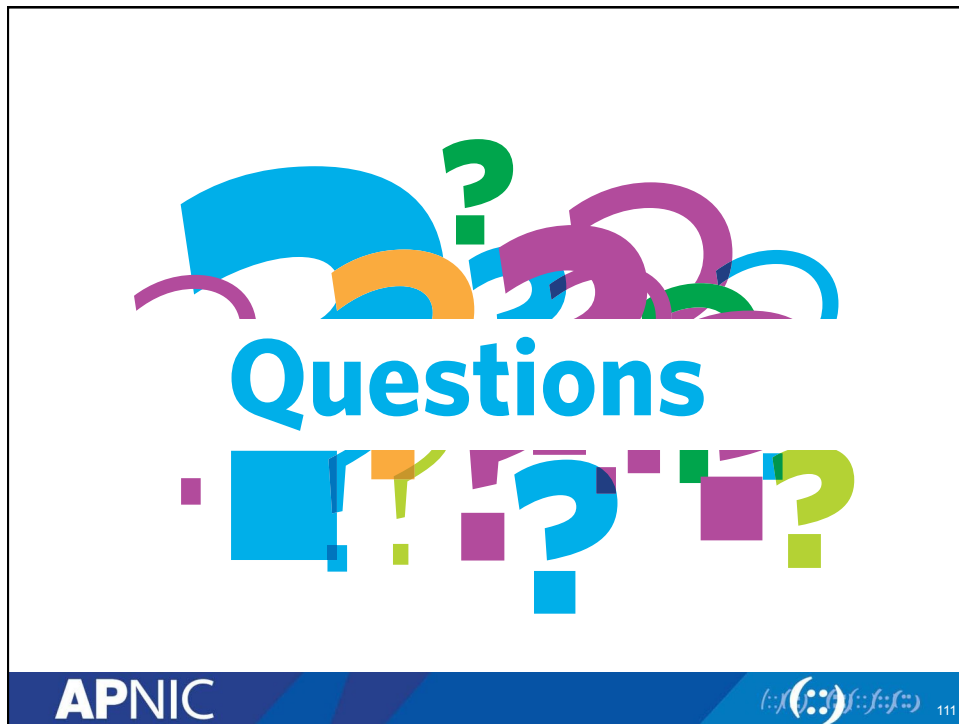
Contacts

Nameservers

Maintainers

APNIC

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## Agenda

- IP Resource Allocation Policies
- Requesting IP Addresses
- Requesting AS Numbers
- APNIC Whois Database
- Reverse DNS
- **MyAPNIC Address Management Tool**

**APNIC**

A large blue geometric graphic on the right side of the slide, consisting of several overlapping triangles and quadrilaterals in different shades of blue. At the bottom right is a small IPv6 logo with the number 112.

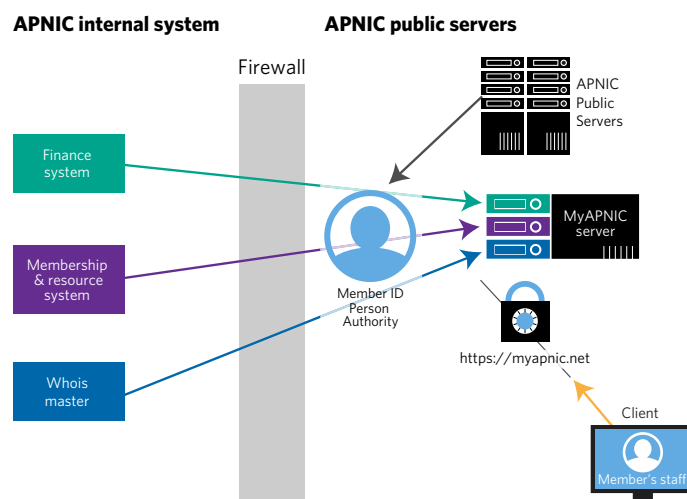


## What is MyAPNIC?

- A secure website that enables Members to manage Internet resources and account interactions with APNIC online
- <https://myapnic.net>



## How it Works



## Access to MyAPNIC

- Available to all authorized contacts of APNIC accounts by registering your username and password
- Corporate Contacts can register and get instant access  
[www.apnic.net/corporate\\_contacts](http://www.apnic.net/corporate_contacts)
- Other contacts need their registration approved by their Corporate Contact

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## MyAPNIC Registration

MyAPNIC / Register

Registration

**Your details**

Username	* viveknigam	Help
Password (at least 8 characters)	* .....	Help
Confirm password	* .....	Help
Full name	* Vivek Nigam	
Email address	* vivek@apnic.net	
Member account name	* MYAPNIC-TEST-AP	Help

**Register**

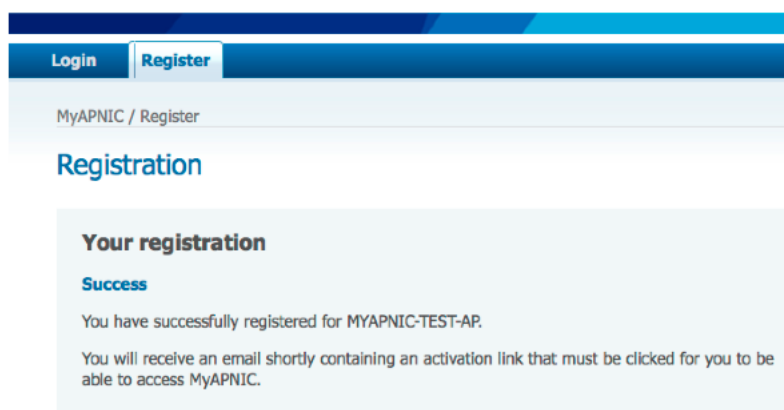
<https://myapnic.net/register>

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## Registration – Corporate Contact



The screenshot shows the MyAPNIC registration success page. At the top, there are 'Login' and 'Register' tabs. Below them is the text 'MyAPNIC / Register'. The main heading is 'Registration'. Underneath, there is a section titled 'Your registration' with a 'Success' status. The message states: 'You have successfully registered for MYAPNIC-TEST-AP. You will receive an email shortly containing an activation link that must be clicked for you to be able to access MyAPNIC.'

**APNIC**



## Registration – Corporate Contact

★ [helpdesk@apnic.net](mailto:helpdesk@apnic.net) to me

Dear Vivek Nigam,

This email confirms your registration to access MyAPNIC for the following account:

MYAPNIC-TEST-AP

Your details are as follows:

Name	= Vivek Nigam
Username	= vn1234
Email address	= <a href="mailto:viveknigam.au@gmail.com">viveknigam.au@gmail.com</a>

Before you can access MyAPNIC, you will need to click the following link:

[https://myapnic.net/auth/ccactivate.html?ctc\\_id=314773&uid=vn1234&token=6AF90522-3581-11DF-937C-156A37E08A02](https://myapnic.net/auth/ccactivate.html?ctc_id=314773&uid=vn1234&token=6AF90522-3581-11DF-937C-156A37E08A02)

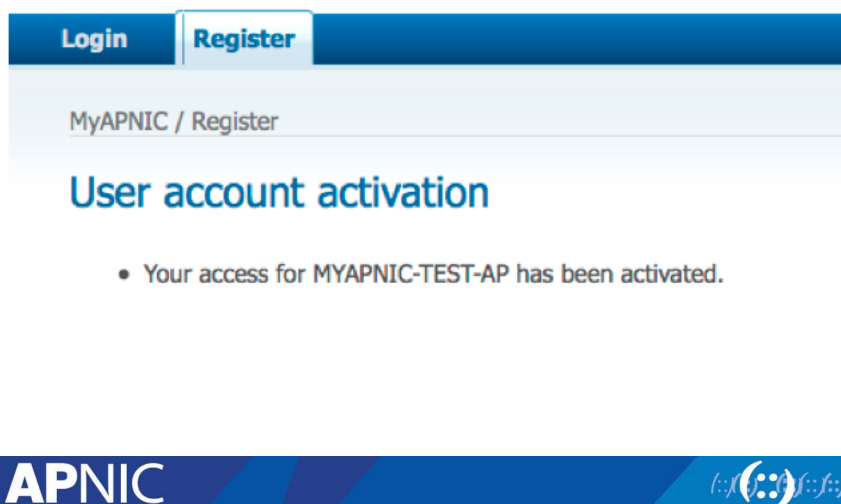
Kind regards,

MyAPNIC

**APNIC**



## Registration – Corporate Contact



The screenshot shows the 'MyAPNIC / Register' page. At the top, there are 'Login' and 'Register' tabs. Below the tabs, the page title is 'MyAPNIC / Register'. The main heading is 'User account activation'. A bullet point states: 'Your access for MYAPNIC-TEST-AP has been activated.' The footer features the APNIC logo and a small icon of a globe with a smiley face, followed by the number 119.

## Registration – Other Contacts

Subject: **MyAPNIC Registration**  
 From: [helpdesk@apnic.net](mailto:helpdesk@apnic.net)  
 Date: 9:11 AM  
 To: [vivek@apnic.net](mailto:vivek@apnic.net)

---

Dear Vivek Nigam,

This email confirms your security code to access MyAPNIC for the following account:

MYAPNIC-TEST-AP

Your details are as follows:

Name = Vivek Nigam  
 Username = viv4  
 Email address = [vivek@apnic.net](mailto:vivek@apnic.net)  
 Token = wZpmI9iC5P

Before you can access MyAPNIC, you will need to provide your token to one of the following corporate contact(s) to approve your access.

- \* Tom H
- \* George K

Kind regards,  
 MyAPNIC

## Registration – Other Contacts

Home

Resources

Administration

Training

Tools

Member details

Contact details

Access list

Billing history

Annual fee calculator

Correspondence

Home / Administration / Approve Access

Approve Access

Pending access

Date (UTC)	Username	Email address	Authorization code	Billing	Technical	Approve access	Reject access
2012-09-19 06:11:59	NonCorporate	vivek@apnic.net	<input type="text" value="No9jOwIAec"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="button" value="Approve"/>	<input type="button" value="Reject"/>
2011-10-21 05:09:32	Craigtest	george@apnic.net	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="Approve"/>	<input type="button" value="Reject"/>
2010-12-21 05:38:14	smarks	smarks@apnic.net	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="Approve"/>	<input type="button" value="Reject"/>
2010-08-16 23:33:50	flash007	wita@apnic.net	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="Approve"/>	<input type="button" value="Reject"/>

APNIC



## Registration – Other Contacts

Home

Resources

Administration

Training

Tools

Member details

Contact details

Access list

Billing history

Annual fee calculator

Correspondence

Home / Administration / Approve Access

Approve Access

• Access request successfully approved.

Pending access

Date (UTC)	Username	Email address	Authorization code	Billing	Technical	Approve access	Reject access
2011-10-21 05:09:32	Craigtest	george@apnic.net	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	Approve	Reject
2010-12-21 05:38:14	smarks	smarks@apnic.net	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	Approve	Reject
2010-08-16 23:33:50	flash007	wita@apnic.net	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	Approve	Reject

APNIC



## Multiple Account Access

Home / My Profile

### My Profile

Memberships Password reset Account permissions Digital certificates

**Active**

Account	Email address	Position	Corporate	Billing	Technical
APNICTRAINING-AU	<input type="text" value="vivek@apnic.net"/>	<input type="text"/>	✓	✓	✓
MYAPNIC-TEST-AP	<input type="text" value="vivek@apnic.net"/>	<input type="text"/>	✓		✓

[Save changes](#)

[Add another account](#)

**Add another account**

To access another account, add the account name and your email for the account below.

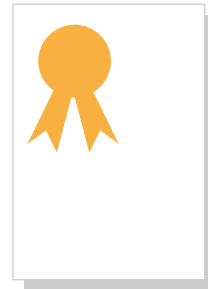
Account	Email address	Notifications?
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>

[Add](#)

## MyAPNIC Digital Certificate

### Required for:

- Online voting
- Resource certification
- Approve other contacts' certificate request



## Request Certificate

Home / My Profile

My Profile

Memberships | Password reset | Account permissions | **Digital certificates**

### Your certificates

An APNIC certificate is required to perform certain operations such as Resource Certification and Online Voting. It is also required for a Corporate Contact to approve certificate requests for other account contacts. A certificate is valid for 12 months from the date of issue.

For more information, please see [APNIC Digital Certificates](#).

You have been issued with the following certificate(s):

Serial number	Expiry date
286C896C96AFC29A	2011-02-25 03:53:37 (expired)
4ED4E607D85F497	2015-05-11 04:26:24
3F82DE46C7079C50	2015-05-11 04:26:24
777D7A688877F536	2015-05-11 04:26:24
538E0081E6EC27F5	2015-05-11 04:26:24

If you require an additional certificate, you are advised to use a backup copy of your current valid certificate.

Please only request an additional certificate when you are not able to recover your backup copy.

To request a digital certificate, click on "Request a certificate".

[Request a certificate](#)

### CA certificates

The APNIC Root CA Certificate is also provided for users that need a trusted authority in their email software, and the email software of correspondents that require secure communication.

[Download CA certificate](#)  
[Download root CA certificate](#)

If you have any other queries, please email [helpdesk@apnic.net](mailto:helpdesk@apnic.net) for assistance.

APNIC



## Administration Features

Vivek | Account: MYAPNIC-TEST-AP | Manage Contacts

Home | Resources | **Administration** | Training | Tools

Member details | Contact details | Access list | Billing history | Annual fee calculator

Home / Administration

### Administration

View your billing history and membership details:

- ➔
- [Member details](#)
  - [Contact details](#)
  - [Access list](#)
  - [Billing history](#)
  - [Annual membership fee calculator](#)
  - [Correspondence](#)

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## Contact Management

**Anna's MyAPNIC access privileges**

Resource management	View	Update
Resource certification	<input type="checkbox"/>	<input type="checkbox"/>
ASN, IPv4, IPv6 and AW	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Resource tickets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Whois database	View	Update
Private objects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Domain objects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Membership administration	View	Update
Membership details (address, phone)	<input type="checkbox"/>	<input type="checkbox"/>
View billing history, balance and invoice	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Admin tickets	<input type="checkbox"/>	<input type="checkbox"/>

Voting	View	Update
Vote	<input type="checkbox"/>	<input type="checkbox"/>

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## Resource Management

Home	Resources	Administration	Training	Tools
IPv4	IPv6	ASN	Whois updates	Certification
				Maintainers
				IRTs

Home / Resource management

### Resource management

**Internet resources**

- View and manage resources

**Whois database updates**

- Add/Update/Delete Whois objects

**Resource request forms**

- IPv4 addresses
- IPv6 addresses
- AS numbers

**Resource transfer/return**

- Transfer resources into another account
- Receive resources into my account
- Transfer pre-approval
- Return resources to APNIC

**Resource certification**

- Manage certification

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## Maintainer Page

Home / Resource management / Maintainer list

### Maintainer list

When using MyAPNIC to manage your Whois objects, MyAPNIC will retrieve the maintainer and its password from this list. You should ensure that all maintainers referenced by the Whois objects you manage are added to this list. To add a maintainer, please supply the maintainer name and its plain text password in the fields below. If you have reset the password, you must update the password saved in this list. If you do not know your maintainer name or password, please email [helpdesk@apnic.net](mailto:helpdesk@apnic.net).

Registered maintainers	Auth. method	Password	Delete
MAINT-AU-VIVEK	CRYPT-PW	Valid password	<a href="#">Delete</a>
MAINT-MYAPNIC-AP	CRYPT-PW	Valid password	<a href="#">Delete</a>
MAINT-NEW	CRYPT-PW	Valid password	<a href="#">Delete</a>

Maintainer	Password	Add
<input type="text"/>	<input type="text"/>	<a href="#">Add</a>

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## One-Click IPv6

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Home / Resource management

### Resource management

#### Internet resources

- [View and manage resources](#)

#### Whois database updates

- [Add/Update/Delete Whois objects](#)

#### Resource request forms

- [IPv4 addresses](#)
- [IPv6 addresses](#)
- [AS numbers](#)

#### Resource transfer/return

- [Transfer resources into another account](#)
- [Receive resources into my account](#)
- [Return resources to APNIC](#)

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## One-Click IPv6

Home / Resource management / One-Click IPv6

### One-Click IPv6

Based on your current IPv4 holdings, your membership account is eligible to receive a /32 IPv6 allocation or a /48 IPv6 assignment via this One-click IPv6 feature without having to lodge a separate resource request.

To request a different size of IPv6 resources, please use the IPv6 resource request form located under the "Resources" tab.

By receiving this /32 allocation or /48 assignment, you acknowledge that:

- you understand the [policy](#) implementation; and
- your membership fee will be reviewed at the next renewal as per the [Membership fee schedule](#).

To proceed, please click "Confirm" below to accept this allocation or assignment.

/32 allocation

[Confirm](#)

/48 assignment

[Confirm](#)

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## Manage Resources

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IPv4 IPv6 ASN Whois updates Certification Maintainers IRTs

Home / Resource management

### Resource management

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#### Whois database updates

- [Add/Update/Delete Whois objects](#)

#### Resource request forms

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#### Resource transfer/return

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#### Resource certification

- [Manage certification](#)

Home / Resource management / Summary

### Summary of all resources

IPv4 <a href="#">manage</a>		IPv6 <a href="#">manage</a>		ASN <a href="#">manage</a>
Address range	Length	Address Range	Length	Number
61.45.248.0	/24	2001:0DF0:000A::	/48	17821
61.45.249.0	/24	2406:6400::	/32	45192
61.45.251.0	/24			131107
61.45.253.0	/24			
203.176.189.0	/24			

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## Sub-allocation

Home / Resource management / IPv4

### IPv4 resources - all resources

Assignment window

Date last reviewed

Bulk reverse delegations

Add public assignment

Add private assignment

Request more IPv4 addresses

Start IP	Length	Date	Usage	Assignment status	Reverse DNS	Private	Public
61.45.248.0	/24	2010-09-27	100%	<div></div>	update	<input type="checkbox"/>	<input type="checkbox"/>
61.45.249.0	/24	2010-09-27	100%	<div></div>	update	<input type="checkbox"/>	<input type="checkbox"/>
61.45.251.0	/24	2010-04-07	100%	<div></div>	update	<input type="checkbox"/>	<input type="checkbox"/>
61.45.253.0	/24	2010-04-07	100%	<div></div>	update	<input type="checkbox"/>	<input type="checkbox"/>
203.176.189.0	/24	2008-04-24	100%	<div></div>	update	<input type="checkbox"/>	<input type="checkbox"/>

Select All

Select All

Download as .ZIP

Legend: ■ < 20% ■ = 20% ■ = 40% ■ = 60% ■ = 80% ■ > 80%

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## Updating Attributes in Parent Object

Home / Resource management / IPv4 assignments

### IPv4 assignments within/covering 61.45.248.0/24

#### Parent records

Network name	Start IP	End IP	Maintained by	Changed
APNIC-SERVICES-V4	61.45.248.0	61.45.255.255	APNIC-HM	hm-changed@apnic.net 20150106

#### Public records (shown in whois.apnic.net)

Make new public assignment | Upload | Download

Network name	Start IP	End IP	Maintained by	Changed	Mark all
--------------	----------	--------	---------------	---------	----------

Move to private

#### Private records

Make new private assignment | Upload | Download

Network name	Start IP	End IP	Maintained by	Changed	Mark all
MYAPNIC-TEST	61.45.248.0	61.45.248.255	MAINT-AP-WITA	wita@apnic.net 20100726	<input type="checkbox"/>

Move to public

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## Requesting Resources

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## Internet number resource request

The [current policy](#) for IPv4 address space management in the Asia Pacific region permits each new or existing APNIC account holder to receive delegations totalling a maximum of a /21 since 15 April 2011.

Maximum delegation limit	/21
Received resources	/24
Available resources	7 x /24

Next

## Whois Updates

[Home](#) / [Resource management](#) / [Whois update](#)

## MyAPNIC Whois Update

The information you register will be available publicly in the APNIC Whois database, unless the 'Private' option is available and specified.

[Add](#) [Update](#) [Delete](#) [Bulk Whois Updates](#)

Object type Please select

Please select

- as-set
- aut-num
- domain
- filter-set
- inet-rtr
- inet6num
- inetnum
- irt
- mntner
- peering-set
- person
- role
- route
- route-set
- route6
- rtr-set

## Adding Objects

**Add** Update Delete Bulk Whois Updates

Object type

The route object represents a single IPv4 route injected into the Internet routing mesh. The route attribute is the address prefix of the route and the origin attribute is the AS number of the AS that originates the route.

route	<input type="text"/>	T
descr	<input type="text"/>	T
origin	<input type="text"/>	T
mnt-lower	<input type="text" value="MAINT-MYAPNIC-AP"/>	X
mnt-routes	<input type="text" value="MAINT-MYAPNIC-AP"/>	X
mnt-by	<input type="text" value="MAINT-MYAPNIC-AP"/>	
changed	<input type="text"/>	T
source	<input type="text" value="APNIC"/>	

descr  Add field

Submit

APNIC



## Updating Objects

**Add** **Update** Delete Bulk Whois Updates

Object type

Search

Search

route	<input type="text" value="61.45.252.0/22"/>	T
descr	<input type="text" value="Test route object - Training in PK"/>	T
origin	<input type="text" value="AS131211"/>	T
mnt-lower	<input type="text" value="MAINT-MYAPNIC-AP"/>	X
mnt-routes	<input type="text" value="MAINT-MYAPNIC-AP"/>	X
mnt-by	<input type="text" value="MAINT-MYAPNIC-AP"/>	
changed	<input type="text" value="vivek@apni.net 20120717"/>	T
country	<input type="text"/>	T X
source	<input type="text" value="APNIC"/>	

descr  Add field

Submit

APNIC



## Deleting Objects

[Add](#)
[Update](#)
[Delete](#)
[Bulk Whois Updates](#)

Object type:

Search:

[Search](#)

route	61.45.252.0/22
descr	Test route object - Training in PK
origin	AS131211
mnt-lower	MAINT-MYAPNIC-AP
mnt-routes	MAINT-MYAPNIC-AP
mnt-by	MAINT-MYAPNIC-AP
changed	vivek@apni.net 20120717
source	APNIC

Delete message:

[Submit](#)

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## Bulk Updates

Home / Resource management / Bulk update

### Whois bulk update

Bulk update requests

#### ▼ All objects (text file upload)

Please attach a plain text file containing the object templates you wish to register, update, or delete.

Whois type:

Please select file to upload:  No file selected.

[Submit](#)

► [Single attribute update](#)

► [Domain objects \(zone file upload\)](#)

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# Resource Transfer / Return

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Home / Resource management

## Resource management

### Internet resources

- View and manage resources

### Whois database updates

- Add/Update/Delete Whois objects

### Resource request forms

- IPv4 addresses
- IPv6 addresses
- AS numbers

### Resource transfer/return

- [Transfer resources into another account](#)
- [Receive resources into my account](#)
- [Transfer pre-approval](#)
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#### Useful links

- [Resource management](#)
- [Assignment window](#)
- [FAQ](#)

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Home / Resource management / Transfer resources

## Resource management

### Transfer resources

Select the range and/or ASN to transfer and then click 'Add'. This will copy the value into the 'IPv4 block' and AS Number(s) field. If you only want to transfer part of the IP range, then the value can be adjusted at this point.

IPv4:

61.45.248.0/24  
61.45.249.0/24  
61.45.251.0/24  
61.45.253.0/24  
203.176.189.0/24

Add

ASN:

17821  
45192  
131107

Add

IPv4 block(s)
AS Number(s)

Example: 202.128.12.0/22

Reason for transfer

Recipient's account name \*

Next

## Receiving Resources

### Receive resources into my account

From account	Resources
<input type="checkbox"/> MYAPNIC-TEST-AP	202.125.97.0/24
<input type="button" value="Receive"/>	<input type="button" value="Reject"/>

Please note that this transfer is subject to APNIC's approval.

**APNIC**



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Home / Resource management / Transfer pre-approval

### Transfer pre-approval

This form is used by the recipient account before locating the source of the IPv4 transfer and to facilitate a smooth transfer when a source account is ready to relinquish their addresses.

Before you proceed, please read the following terms and conditions carefully.

#### Terms and conditions

1. APNIC policy requires that recipients of IPv4 address transfers justify their need for additional addresses. The pre-approval requests must meet the IPv4 transfer policy criteria.  
<http://www.apnic.net/policy/transfer-policy>
2. Pre-approvals are valid for 24 months from the date of approval. If another pre-approval is requested and approved within that period, it will replace the previous pre-approval.
3. The recipient account must remain "open" to receive any transfer.
4. The recipient account will be required to provide additional justification when the size of transfer to receive is larger than what has already been pre-approved.

☐ I agree to the terms and conditions.



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Home / Resource management / Transfer pre-approval

## Transfer pre-approval

Resource type


Resources required

\* fields are required

Select the type of IPv4 resources\* you require:

- ☐ IP allocation for service providers - for own network infrastructure and further delegations to customer networks
- ☐ IP assignment for own network use

**Save**

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## Transfer Pre-approval

Home / Resource management / Transfer pre-approval


### Transfer pre-approval

Your account already has a valid pre-approval:

- Approval date: 2011-11-20
- Expiry date: 2012-11-20
- Prefixes available: /17, /18, /19 and /20

Only complete this form if your IPv4 requirements have changed.

**Next**

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## MyAPNIC EC Submission

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EC Submission

Home / Contact / EC Submission

### EC Submission

Send a new submission or view your submissions that have not yet been resolved.

[New submission](#)

Ticket Number	Status	Subject	Requestor	Created
No submissions found.				

APNIC
( (:: ) ) ( :: ) ) ( :: ) )
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## Referral Application

### What can I do?

- Complete a [referral application](#) for a customer
- View and update your [resource information](#) for IPv4, IPv6, AS numbers and Whois updates
- Manage your [resource certificates](#)
- View your [Member details](#) and [Contact details](#).
- Use the [Events](#) section to view training and events history
- Use the [APNIC looking glass](#) or generate a prefix report

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( (:: ) ) ( :: ) ) ( :: ) )
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## Available Utilities

Home Resources Administration Training **Tools**

Home / Tools

### Tools

- IPv6 Sparse Assignment
- IPv6 Subnets
- IPv6 Reverse Domains
- APNIC Looking Glass
- Prefix Report
- MDS Hashing
- Reverse domain verification

The Reverse domain verification tool enables you to check that your zone has been configured correctly, in order to complete your delegation successfully. This includes verification of the required records for DNSSEC implementation.

Reverse domain

DNSSEC verification ☐

**Submit**

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## Tools – IPv6 Sparse Assignment

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### Tools

#### IPv6 Sparse Assignment

The IPv6 Sparse Assignment tool enables you to create assignments that are spaced apart from one another, ensuring assignments can grow as needed while maintaining route aggregation.

Enter an IPv6 address of a block where the assignments will come from (beginning address & prefix length), number of assignments you need to make, and the minimum size of the assignment (optional).

Beginning address \*  e.g. 32

Prefix length \*  e.g. 5

Number of assignments \*  e.g. 35

Minimum assignment size  e.g. 35

**Submit**

Prefix entered => 2406:6400::/32  
 Block count => 8  
 Required minimum block length => 128  
 Actual minimum block length => 35

#### Beginning address

2406:6400::  
 2406:6400:8000::  
 2406:6400:4000::  
 2406:6400:c000::  
 2406:6400:2000::  
 2406:6400:a000::  
 2406:6400:6000::  
 2406:6400:e000::

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## Tools – IPv6 Subnet

### IPv6 Subnets

The IPv6 subnet calculator allows you to subnet any given IPv6 prefix with a specified subnet length. Enter an IPv6 prefix and click on 'Submit' to view subnets based on the subnet length selected.

Address prefix \*  e.g. 2001::/32

Subnet length \*  e.g. 48

Prefix entered => 2406:6400::/32  
Subnet mask => FFFF:FFFF:FFFF::  
Subnet length => 48  
Number of subnets => 65,536

/48 prefixes

2406:6400::/48  
2406:6400:1::/48  
2406:6400:2::/48  
2406:6400:3::/48  
2406:6400:4::/48  
2406:6400:5::/48  
2406:6400:6::/48  
2406:6400:7::/48  
2406:6400:8::/48  
2406:6400:9::/48  
2406:6400:A::/48  
2406:6400:B::/48  
2406:6400:C::/48  
2406:6400:D::/48  
2406:6400:E::/48  
2406:6400:F::/48  
2406:6400:10::/48  
2406:6400:11::/48  
2406:6400:12::/48  
2406:6400:13::/48  
2406:6400:14::/48

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## Tools – Reverse Domain Verification

### Reverse domain verification

The Reverse domain verification tool enables you to check that your zone has been configured correctly, in order to complete your delegation successfully. This includes verification of the required records for DNSSEC implementation.

Reverse domain

DNSSEC verification ☐

IP address	Name	Accessible	SOA found	AA bit set	Zones match	SOA serial
202.12.29.59	cumin.apnic.net	Yes	Yes	Yes	Yes	2014051168
2001:dc0:2001:a:4608::59	cumin.apnic.net	Yes	Yes	Yes	Yes	2014051168
202.12.28.140	sec3.apnic.net	Yes	Yes	Yes	Yes	2014051168
2001:dc0:1:0:4777::140	sec3.apnic.net	Yes	Yes	Yes	Yes	2014051168
202.12.29.60	tinnie.apnic.net	Yes	Yes	Yes	Yes	2014051168
2001:dc0:2001:a:4608::64	tinnie.apnic.net	Yes	Yes	Yes	Yes	2014051168

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