Asia Pacific Network Information Centre

APNIC

IPv6 Allocations to Organisations with Existing IPv4 Infrastructure

prop-016-v001.txt

Policy SIG
APNIC17 / APRICOT 2004
Feb 23-27 2004
KL, Malaysia

Background

- IPv6 policy allows IPv4 infrastructure to be considered during IPv6 request process
  - On assumption of eventual transition to IPv6
- APNIC-089

> *4.4 Consideration of IPv4 Infrastructure*
>
> *Where an existing IPv4 service provider requests IPv6 space for eventual transition of existing services to IPv6, the number of present IPv4 customers may be used to justify a larger request than would be justified if based solely on the IPv6 infrastructure.*

Background

- APNIC-089

5.1.2 Initial Allocation Size

Organizations that meet the initial allocation criteria are eligible to receive a minimum allocation of /32.

Organizations may qualify for an initial allocation greater than /32 by submitting documentation that reasonably justifies the request. If so, the allocation size will be based on the number of existing users and the extent of the organization's infrastructure.

Problems and Motivation

- Problems
  - This aspect of the policy is not well understood
  - Procedural framework is unclear
  - Therefore policy is not used in APNIC region
- Motivation
  - To clarify policy and procedures
  - To facilitate IPv6 network deployment and transition

Proposal

- Replace section 4.4

4.4 Consideration of IPv4 Infrastructure

Where an existing IPv4 service provider requests IPv6 space for provision of existing services via IPv6, the existing IPv4 infrastructure and customer base will be evaluated, and an IPv6 allocation will be made which is sufficient to allow the network to be addressed using IPv6.

Proposal

- Replace section 5.1.2

5.1.2 Initial Allocation Size
Organizations that meet the initial allocation criteria are eligible to receive a minimum allocation of /32.

Qualifying organizations may request an initial allocation greater than /32 by submitting additional documentation that reasonably justifies the request. …

Proposal

- Replace section 5.1.2 (cont)

… This may include comprehensive documentation of the planned infrastructure; or, in accordance with section 4.4, a description of an existing IPv4 network which is to receive IPv6 addresses. In either case, an allocation will be made which fulfills the calculated address requirement, in accordance with the HD-Ratio based utilisation policy.

Examples

IPv4 application	IPv6 requirement (/48s)
Customer network (any size*)	One /48 per network
Dial up customer requiring subnets	One /48 per customer
ISP POP (any size)	One /48 per POP
Individual device requiring /32	(*) According to RFC3177

Examples

- ISP network #1
  - 5,000 customer sites
  - 20,000 dialup users (requiring subnets)
  - 5 POPs
  - Total of 25,005 /48s required
  - Request justifies a /29
- ISP network #2
  - 25,000 customer sites
  - 500,000 dialup users (requiring subnets)
  - 50 POPs
  - Total of 525,050 /48s required
  - Request justifies a /24

IPv6 HD Ratio

Prefix	Site Address Bits	Total sites	Threshold HD = 0.80
32	16	65,536	7,132
31	17	131,072	12,417
30	18	262,144	21,619
29	19	524,288	37,641
28	20	1,048,576	65,536
27	21	2,097,152	114,105
26	22	4,194,304	198,668
25	23	8,388,608	345,901
24	24	16,777,216	602,249
23	25	33,554,432	1,048,576
22	26	67,108,864	1,825,677
21	27	134,217,728	3,178,688
20	28	268,435,456	5,534,417
19	29	536,870,912	9,635,980
18	30	1,073,741,824	16,777,216
17	31	2,147,483,648	29,210,830
16	32	4,294,967,296	50,859,008

RFC3177 “micro-assignments”

- Specific assignment guidelines
  - /48 in the general case, except for very large subscribers
  - /64 when it is known that one and only one subnet is needed by design
  - /128 when it is absolutely known that one and only one device is connecting.
- How to assess /48 requirements for /64 and /128 assignments?
  - Use HD ratio
  - i.e. /48 is utilised when 7,132 /64s are used

Examples – RFC3177

Application	IPv6 requirement (/48s)
Network requiring /64	#devices / 7132
Device requiring /128	*Let's assume these are not being connected to IPv4 yet!*

Mailing List Feedback

- Proposal
  - Posted Fri 23 Jan to '*sig-policy*'
- Feedback from one person only
  - Modify language to suggest use of this clause is optional when applying for IPv6 addresses
  - Clarify that the number of IPv4 customers is also counted
  - Request to modify language
    - 'no commitment to a complete transition to IPv6 at any time'

NIR Considerations

- If approved, policy should be applicable to all NIRs equally in APNIC region

Implementation

- After approval through APNIC policy process
  - EC approval, 2 month comment period
- Reasonable co-ordination efforts in other RIR communities
  - APNIC may go ahead even if proposal not accepted in other regions

Questions?

- Thank you