IPv6 Allocation to End Sites

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Note: these slides are mine, but the work is effectively joint with Geoff Huston, Lea Roberts and others.

History

- Dec. 1998, IAB directs IANA to delegate IPv6 "sub TLAs" to RIRs

- 1999 - /35 allocations to ISPs

- 2001:

  – RIRs develop globally-coordinated "IPv6 Address Allocation and Assignment Policy"

  – RFC 3177 "IAB/IESG Recommendations on IPv6 Address Allocation to End Sites"

- Since then: many IPv6 allocations

- Today: sense that it is time to revisit/revise based on experience

Roles & Boundaries

- /64 boundary is architectural

  - Changes impact implementations, IETF standards, etc.

  - IETF would need to approve any changes

  - "Cost" of changes is relatively high

- Bits to left of /64 are for routing, RIRs manage this space through their policy-development processes

- /48 is a policy boundary; changes made through RIR policy development process

Motivation for Revisiting

- Current RIR IPv6 policy:

    - HD ratio of .8 used measures "utilization"

    - /48 to end sites is used

    - RIRs making "very large" allocations to ISPs (/19!)

- Question: How much IPv6 space do we really have?

- What is projected lifetime for IPv6?

    - IPng analysis focused on 50 years

    - For public infrastructure, better to assume (minimum of) 100 years?

Address Consumption Projections

- With current RIR polices:

  - in year 2050, /48 for every person implies $1/128^{th}$ of entire space used

  - other projections show even more usage (fully ½)

- Long-term projections inherently uncertain; maybe just "guesses"

- Original RIR policies were a starting point, we now have more experience and understanding; time to revisit

- Being "liberal" early, "conservative" later has downsides

Recent RIR Activities

- ARIN:

  - April "roundtable" discussion on IPv6 raised issues

  - May: Policy proposal 2005-5: raise HD ratio to .94

  - Expect proposal to change /48 to /56 for SOHO for Oct 26 meeting

- RIPE: May discussion, no formal proposals (yet); next meeting Oct 10

- APNIC: Next meeting Sept. 6-9; policy proposals expected

- LACNIC: Discussed during June meeting

- AFRINIC: Next meeting in December.

Purpose of 3177bis

- RFC 3177 made recommendations, some of which should be revisited:

  - DNS A6 no longer in favor

  - GSE "hooks" superceded by multi6/shim6

- RIR community views 3177 as IETF position on /48, would welcome IETF comment that /56 causes no architectural/technical issues

- Purpose: to articulate the **technical** and **architectural** issues with /48 vs. /56.

Summary of draft itself

- No architectural issue in using /56

    - ipv6-addr-arch-v4 states no boundaries other than IID

- Read the ID for details

- Need to revise in response to comments, all comments so far seem reasonable.

Next Steps

- Discussion about whether to adopt /56 are being held in RIRs (not IETF!)

- 3177bis needs to document all the relevant technical issues with /56 vs. /48

- Would like this to become an IPv6 WG document

- Believe it should become an IETF BCP (or info?)

- Believe it should be completed and formally obsolete RFC 3177

Questions/Discussion

Resources

- draft-narten-ipv6-3177bis-48boundary-00.txt ("IPv6 Address Allocation to End Sites")

- draft-narten-iana-rir-ipv6-considerations.txt ("Issues Related to the Management of IPv6 Address Space)

- http://www.ripe.net/ripe/meetings/ripe-50/presentations/ripe50-plenary-wed-ipv6-roundtable-report.pdf (Good summary of the RIPE and ARIN presentations.

Resource (cont.)

- http://www.apnic.net/mailing-lists/global-v6/index.shtml

- ARIN policy discussions:

  – http://lists.arin.net/mailman/listinfo/ppml

- RIPE address policy discussions:

  – http://www.ripe.net/mailman/listinfo/address-policy-wg

- APNIC address policy discussions:

  – http://www.apnic.net/mailing-lists/sig-policy

  – http://www.apnic.net/mailing-lists/sig-ipv6