Preference for ULAs over IPv4 addresses in RFC 6724

draft-ietf-6man-rfc6724-update-03

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Original motivation for the draft

- RFC 6724 is now over 10 years old
- Operational experience with IPv6 is rapidly growing
- That experience has shown examples where having configurability of the address selection policy is very important
- This draft focuses on a specific problem that has arisen involving preference for IPv4 over ULA addresses
  - Caused by low precedence for fc00::/7
  - Which means RFC1918 (and all IPv4) is chosen over ULAs
  - Inconsistent with GUA policy, and suboptimal for **removing IPv4**
- Our goal here is to make ULAs work for their original use case
- [Noting there are STILL some RFC 3484 implementations out there!]

Changes since IETF117

- The feedback at 117 was to streamline the draft
  - Removed detailed text about configurability
  - Removed next-hop router heuristic text (but more on this later… :))
  - Removed gai.conf example
  - Changed the precedence of 6to4 prefix to match Teredo from 1 to 5
  - Removed author’s notes and 6man WG discussion notes
- Clarified preference for ULAs over all IPv4 addresses (not just RFC1918)
- Updated notes on relationship to RFC 5220, RFC 4193 and Happy Eyeballs
- Added note on potential for nodes to have implemented 3484, 6724 or 6724-update (or none of these!)

Proposed default policy table

- Promotes ULA precedence (fc00::/7) and relegates 6to4 (2002::/16)
- The RFC 6724 default policy table would be changed as follows:

Prefix	Precedence	Label
::1/128	50	0
::/0	40	1
::ffff:0:0/96	35	4
2002::/16	30	2
2001::/32	5	5
fc00::/7	3	13
::/96	1	3
fec0::/10	1	11
3ffe::/16	1	12

to

Prefix	Precedence	Label
::1/128	50	0
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Note on preference of IPv4 over NAT66/NPT66

As Kyle, David, and probably others pointed out on the list, a ULA source with GUA destination will not be preferred over IPv4 to IPv4 under the default policy table because of the label mismatch between ULA and GUA in Rule 5 of the destination address selection algorithm.

The update **will** prefer ULA-ULA over IPv4 to IPv4. For sites using ULA locally, this will help them remove use of IPv4.

Next-hop heuristic - Rule 5.5

OK, we said we'd drop this, but will ask one final time, should we change this text?

RFC 6724 text (under Rule 5.5, in Section 5):
Discussion: An IPv6 implementation is not required to remember which next-hops advertised which prefixes. The conceptual models of IPv6 hosts in Section 5 of [RFC4861] and Section 3 of [RFC4191] have no such requirement. Hence, Rule 5.5 is only applicable to implementations that track this information.

NEW?
An IPv6 implementation is therefore REQUIRED to remember which next-hops advertised which prefixes, although the conceptual models of IPv6 hosts in Section 5 of [RFC4861] and Section 3 of [RFC4191] have no such requirement.

Related list discussion (a few hundred messages)

- Automatically inserting “observed” /48 ULA prefixes into the policy table
- Adding a new Label for private IPv4 address space (3 or 4 lines)
- A suggestion for get_addr_pairs() to replace getaddrinfo() (and RFC 6724!)
- Asides into NAT66/(signalling presence or not of) NPT66/new TUAs,…
  - Including WG chair tales of ULA-only NPT66 home network)
- Making RFC 5158 Historic (6to4 reverse DNS)
- Wider changes to RFC 6724 to make SAS/DAS work better with MH/HE

- And other diversions not repeated here

Discussion

- Is this 6724-update document now well-focused and ready for WGLC?
- If so, do we have agreement for the chairs to initiate that?

- What other address selection-related topics do we want to progress?
- If so, what, and who will write new draft(s)?