Preference for ULAs over RFC1918 addresses in RFC6724

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Background

- 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 example involving ULAs and RFC 1918 addresses
- STILL some RFC 3484 implementations out there

The problem(s)

- In some scenarios the current policy table results in preference for the use of RFC 1918 addresses over IPv6 ULAs
  - This is caused by the low precedence for fc00::/7
  - Detailed in draft-ietf-v6ops-ula
- The emphasis on configurability in RFC 6724 is not high enough
  - Making it hard or even impossible to implement required changes
- We propose progressing solution(s) as a document that updates RFC 6724 (no full -bis)

Proposed fix #1 - default policy table

Promote ULAs (fc00::/7) and relegate 6to4 (2002::/16)

The RFC 6724 default 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
::/0	40	1
fc00::/7	30	13
::ffff:0:0/96	20	4
2001::/32	5	5
2002::/16	1	2
::/96	1	3
fec0::/10	1	11
3ffe::/16	1	12

Proposed fix #2 - configurabiity

We propose elevating the SHOULD in Rule 2.1 of RFC 6724 to a MUST

“IPv6 implementations SHOULD support configurable address selection via a mechanism at least as powerful as the policy tables defined here.”

to

“IPv6 implementations MUST support configurable address selection via a mechanism at least as powerful as the policy tables defined here.”

Proposed fix #3 - next-hop router heuristic

The heuristic for address selection defined in Section 5.5 of RFC 6724 to prefer addresses in a prefix advertised by a next-hop router has proven to be very useful.

RFC 6724 is however silent on SHOULD or MUST for applying the heuristic

We propose making it a MUST:

“Rule 5.5: Hosts MUST prefer addresses in a prefix advertised by the next-hop.“

List discussion

- There have been ~300 messages on the list which have led to this draft being authored and submitted
- Other suggestions from the discussion currently noted in the draft include:
  - To what extent we cover “corner cases”; is some explicit configuration inevitable for some cases? **The thrust of this draft is to make common cases behave better.**
  - Automatically inserting “observed” /48 ULA prefixes into the policy table, as hinted at in Section 2.1 (“MAY add”) and Section 10.6 (“might add”) of RFC 6724
  - A suggestion to use an RA PIO with A=0 and L=0, based on an interpretation of Section 2.1 of RFC 8028; this is a “stretch” but may be an idea to build upon

Discussion

- Are we agreed the problem needs fixing?
- Comments on the proposed fixes?
  - Default policy table changes
  - Configurability requirement changes
  - Next hop heuristic changes
- Is there a consensus on WG adoption?
  - If so, we probably need a better draft title…