Solution approaches for address-selection problems

draft-ietf-6man-addr-select-sol-00.txt

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Status of addr-select docs

- **@v6ops**
  - PS: Problem Statement draft
    - at IESG Evaluation
    - lists up address selection related problems.
  - REQ: REQUIREments draft
    - at IESG Evaluation
    - lists up requirements for solutions.

- **@6man**
  - SOL: SOLution analysis draft
    - became WG item at Vancouver
    - outlines and evaluates 4 kinds of approaches
Scope of the problem

- **What kind of problem?**
  - Problems due to the RFC 3484 default address selection rules
    - The rules aren’t universal or all-purpose
    - The best address selection depends on network topology, and link quality, ...

- **When/where the problems occur?**
  - Hosts that are not directly tweaked by a site admin need address selection
  - A site admin has to tweak too many hosts’ address selection
Replacing a NAT box:
- NAT lies everywhere in IPv4 network
- How do we deploy IPv6 in these sites?

Beautiful! But, we cannot always merge NW1 and NW2.

IPv4 Site

We decided not to NAT, so we need an alternative way.
Problem Example: ULA

- **ULA and Global**
  - The existing rules select ULA to connect 8000::/1

- **ULA and IPv4**
  - ULA is prior to IPv4 anytime
Problem Summary

- PS doc lists 10 problem cases
- What is common to all the cases:
  - The best address selection differs in each network environment.
  - However, we have no choice but to obey the universal rule in reality.
- So, we need a means to implement our own rules in our site.
  - Let’s narrow down the solution space
Two possible approaches

a) A host tries every possible dst-src address pairs for oneself
   - E.g. Shim6, rfc3484-update
   - Pro: only hosts need change
   - Con: not always end up with the best addr, host’s stack and api need shakeup

b) A host utilizes addr-select policy from an entity in the site
   - E.g. policy delivery, routing protocol mod.
   - Pro: selects the best addr. intended by admin
   - Con: a site needs the entity, host needs change
Analysis of mechanisms in approach b)

- **i) Policy table distribution by DHCP**
  - Implementable in the existing framework
  - Suitable for non-dynamically changing policy

- **ii) Routing info and next-hop addr based**
  - The host/router needs fundamental changes
    - Next-hop address has to be not link-local but global
  - Supports dynamically changing policy
    - Scalability: routing protocol at PE and CPE is un-realistic

- **iii) Question and answer style addr-select**
  - The stack needs a fundamental change
    - QA can piggyback on DNS, but appl. not always use DNS
  - Supports dynamically changing policy
    - But, scalability matters when using at PE and CPE
Conclusion & Next Step

- From the viewpoint of implementation and deployment,
  - Policy Table Distribution seems to be the only possible approach.

- Dhcwg is waiting to start discussion until it is supported by IPv6 people.

- Questions or Comments?