Solution approaches for address-selection problems

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

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Status of addr-select docs

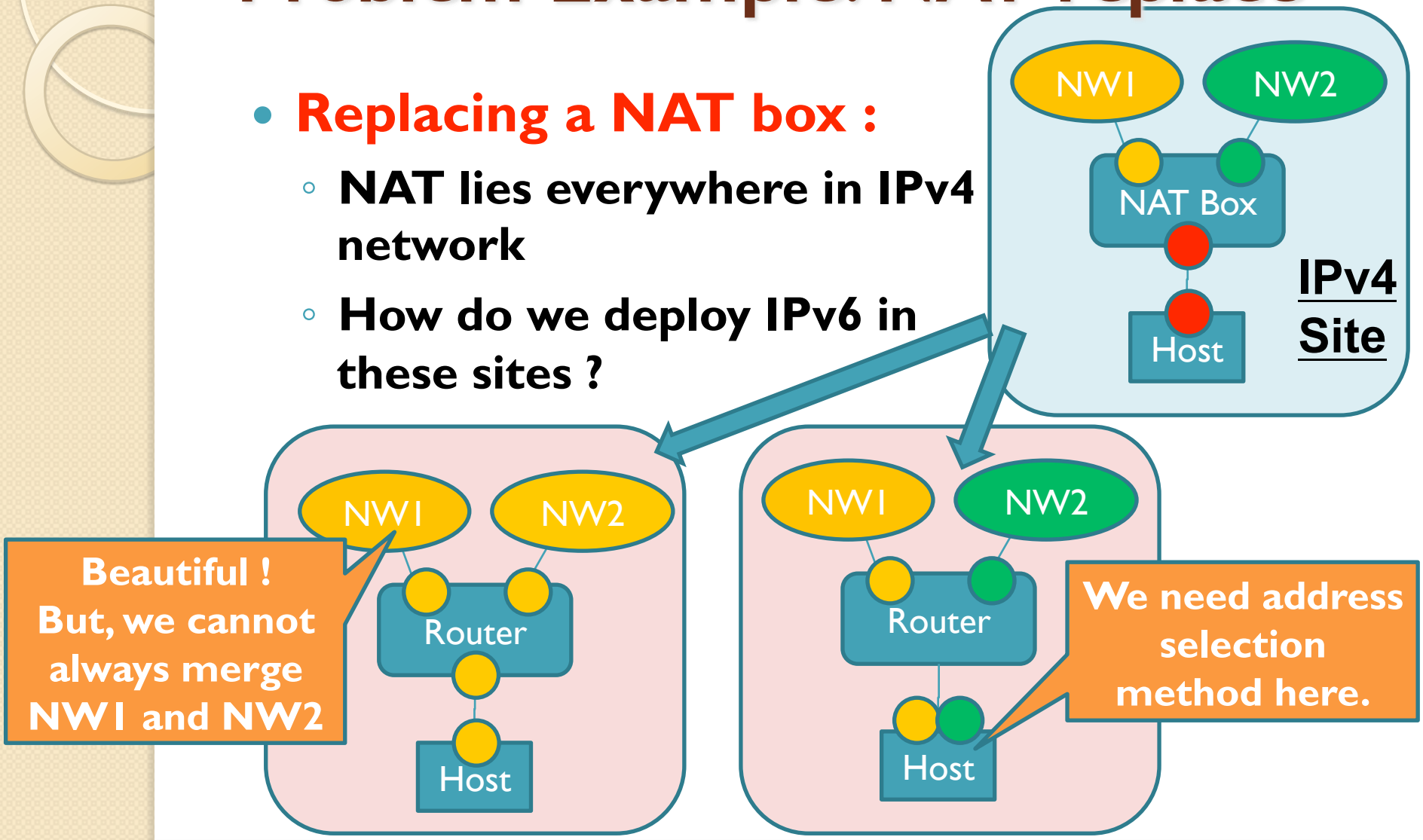
- @v6ops
  - PS: Problem Statement draft
    - at IESG Evaluation
    - lists up address selection related problems.
  - REQ: REQuirements draft
    - at IESG Evaluation
    - lists up requirements for solutions.
- @6man
  - SOL: SOLution analysis draft
    - became WG item at Vancouver
    - outlines 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**

Problem Example: NAT replace

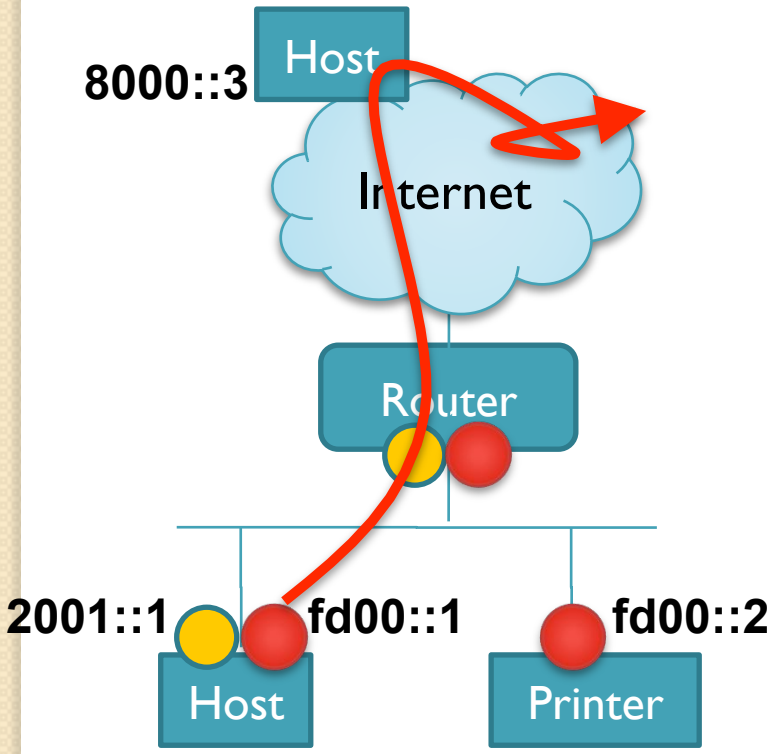
- **Replacing a NAT box :**
  - **NAT lies everywhere in IPv4 network**
  - **How do we deploy IPv6 in these sites ?**



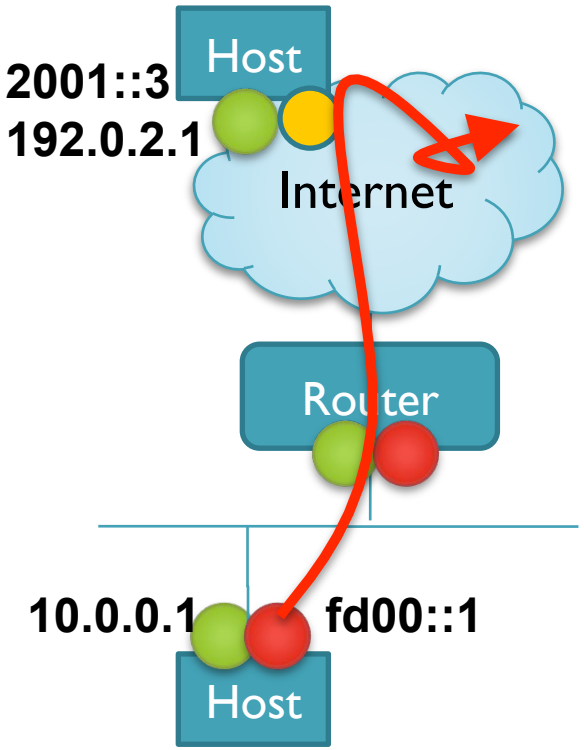
We decided not to NAT, so we need an alternative way

Problem Example: ULA

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



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

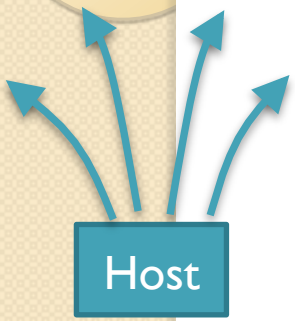


Problem Summary

- **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.**

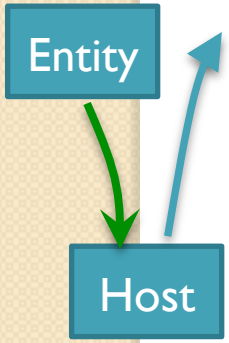
  - **Let's narrow down the solution space**

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

Doesn't fulfill the goal.



- 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 implemention 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 ?