DHCPv6/SLAAC Address Configuration Interaction Problems

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Relevant Drafts

- ietf-v6ops-dhcpv6-slaac-problems
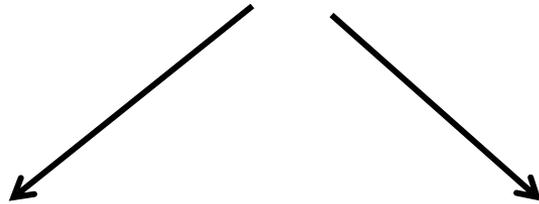
- liu-v6ops-dhcpv6-slaac-guidance (Today's main topic)
  - ✓ operational guidance to reduce the impact.
  - ✓ should belong to v6ops

- liu-6man-dhcpv6-slaac-implementation-guide
  - ✓ guidance to promote unified behaviors in implementations
  - ✓ should belong to 6man

Problems summary

- In one sentence: ambiguities in the standards

#1 Dependency between DHCPv6 and ND	➢RAs are needed to initial DHCPv6; ➢DHCPv6-only is not applicable (it is acceptable for current operation practice)
#2 Advisory VS Prescriptive	➢Some platforms interpret the flags as advisory while others interpret them as prescriptive; ➢Might cause renumbering operation gaps
#3 "Address Configuring Method" VS "Address Lifetime"	➢When method changes, should the hosts immediately release the addresses or just wait them expired? ➢Might cause unexpected behavior (e.g. address release)
#4 Dependencies between the flags	➢When A=0 & M=0 & O=1, should the host initiate a stand-alone stateless DHCPv6 session? ➢If not, there will be an operational gap

Basic Guidelines

- **Always Turn RAs On**
- **SLAAC be the bottom Line for Address Provisioning**
  - Administrators need to make sure every node could at least get one advertised prefix, in the case DHCPv6 is not supported
  - A flag should be always on to allow the hosts do SLAAC
- **Avoid Flags Transition as Possible**
  - the behavior would be unpredictable/un-controlled when flags are in transition
  - the administrators need to carefully plan the network and try to avoid host address configuration method switch as possible

Guidance for DHCPv6-only Deployment

- RAs are still needed
- Set M=1 and A=0 (or not including PIO in the RAs)
- Installing DHCPv6 servers or relays on all links
- be sure that every node in their intended management scope supports DHCPv6
- Note
  - Might not be able to switch the DHCPv6-only hosts to SLAAC-only

Guidance for SLAAC-only deployment

- Must set A=1
- Should set M=0
- Note
  - Some hosts might still initial DHCPv6 sessions even M=0
  - Might not be able to add another DHCPv6 configuration
  - Might not be able to switch the SLAAC-only hosts to DHCPv6-only

Guidance for co-exist deployment

- Recommend to set A=M=1 to make sure every node could be configured
- Note
  - If the two mechanisms would bring two prefixes for the nodes respectively, then the administrators need to make sure M=1 before nodes get online, since once the nodes were configured with one prefix, later they might not care about the other newly added prefix.
  - when administrators want to deprecate a SLAAC/DHCPv6 prefix/address, it's better NOT simply turning the A/M flag off since some platforms might immediately release the addresses.

Regarding the implementation guide draft

- take into account the cases that RAs are absent. E.g. the DHCPv6 protocol state machine should support DHCPv6 be initiated after a timeslot of RAs absent.

- interpret the flags as prescriptive rather than advisory

- not recommended that the program immediately release the address or information when configuration method change is detected.

- when M=0 and O=1, regardless A=1 or A=0, the host should try to get information configuration through a stateless DHCPv6 procedure.

(Note: not today's topic, but welcome you to discuss in 6man mailing list)

Comments?

Adopt the operational guidance draft
(draft-liu-v6ops-dhcpv6-slaac-guidance)?

Thank you!

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