SLAAC's Reaction to Renumbering Events

draft-gont-6man-slaac-renum

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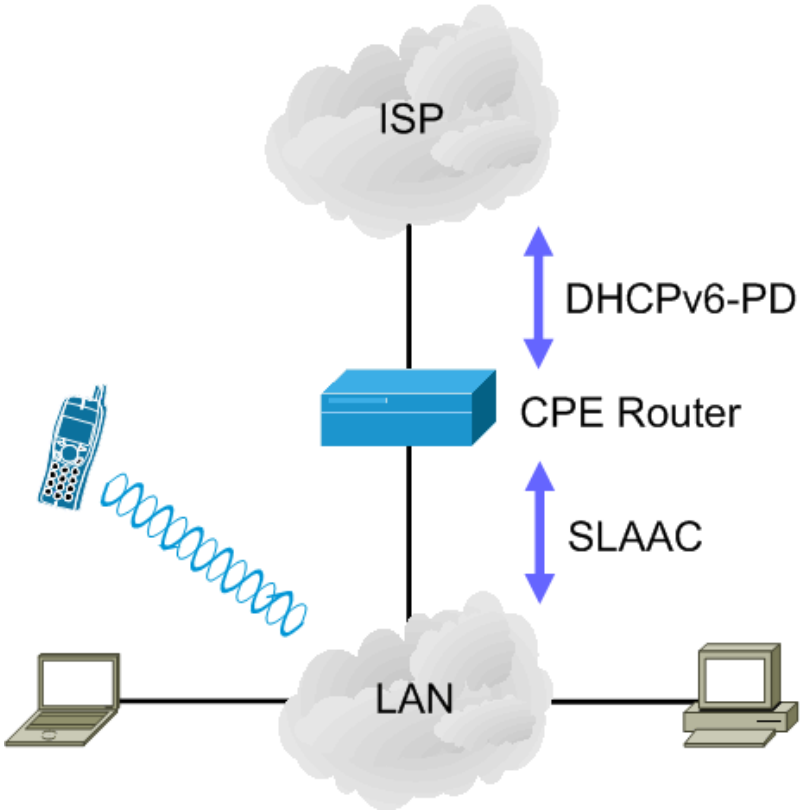
Common scenario

- Sample scenario:



Problem statement

- Problem scenario
  - CPE router is hard-rebooted
  - CPE router crashes and reboots
- What happens when the CPE router comes back to life?
  - Quite frequently it has no state of previously-leased prefix
  - It thus request a new prefix via DHCPv6-PD
  - The new prefix is announced on the LAN
- What about the previous prefix?
  - It is still there!
  - Announced lifetimes allow continued use for days to months

Problem statement (II)

- Result:
  - Old addresses are maintained
  - Quite frequently, such addresses are preferred
  - Old routes are maintained
- What does this mean?
  - Connectivity with new owner of prefix not possible
  - IPv6 connectivity may fail
  - In dual-stack scenarios, it may mean more IPv4 traffic
    - Due to Happy Eyeballs

Deployments that avoid the problem

- **Sites that use stable prefixes**
  - Some provisioning systems reportedly don't support this
  - Bad for user privacy – **RFC4941 mostly useless with stable prefixes!**
  - Some ISPs want to charge extra for stable prefixes – ala IPv4
  - **There are IPv6 deployments that employ dynamic prefixes**
- **CPEs that record leased prefixes on stable storage**
  - They may have to be able to record many prefixes
  - Lease times of days/months, and reboots may be frequent
  - Still cannot invalidate the stale prefix -- as per RFC4861
  - May hit implementation-specific limit on number of configured addresses

How we think it should be solved

- **Get rid of stale addresses and routes in a timelier manner**
- If the same router advertises a new prefix (but not the previous one), assume the prefix has become stale
- Count number of consecutive RAs from same router with PIOs that do not include the previous prefix:
  - After two such RAs, unprefer the addresses
  - After two additional ones, remove the addresses and routes
  - or, e.g., have this trigger BFD

This solves the problem at the hosts themselves

Additional bits that may help

- Allow routers to invalidate prefixes
  - i.e., update RFC4861 to honor PIOs with Valid Lifetime < 2 hours
- Reduce PIOs lifetimes
  - cap to Router Lifetime
- Our draft also suggest more frequent RAs
  - But there seems to be consensus against this

Comments?

- Document the problem here in v6ops?