SLAAC's Reaction to Renumbering Events
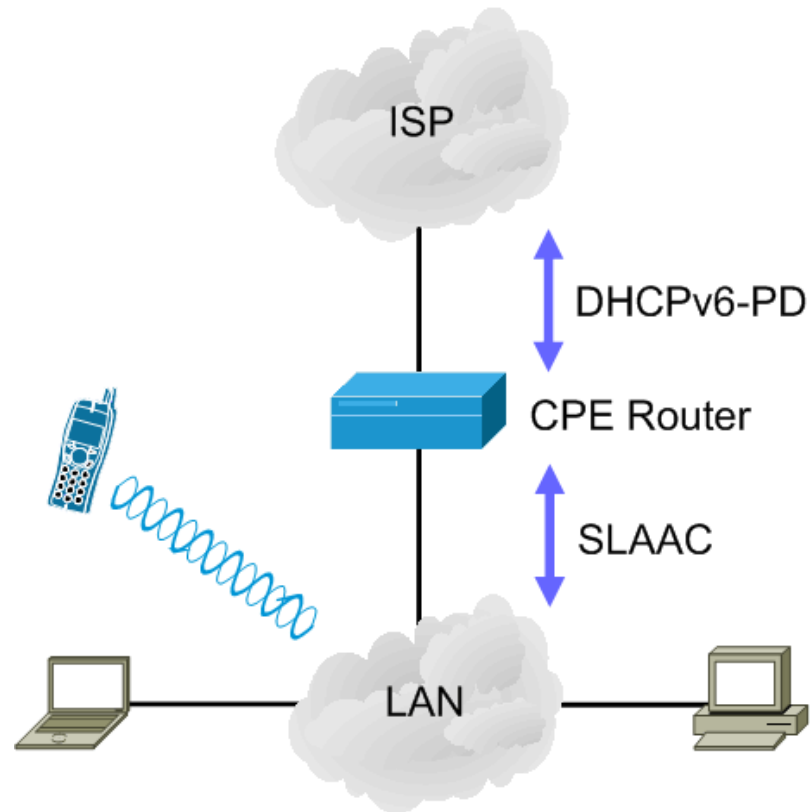
draft-gont-6man-slaac-renum

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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 of configured addresses on hosts

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

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

Moving forward

- Adopt document as wg item to work on topic?
    - not necessarily to keep all proposed workarounds