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