

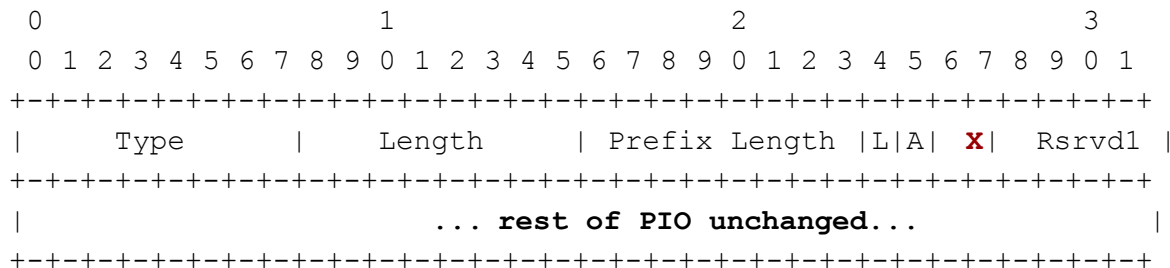
# PIO eXclusive bit

**ID draft-pioxfolks-6man-pio-exclusive-bit  
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# Motivation

- ID-draft-ietf-v6ops-unique-ipv6-prefix-per-host proposes /64 per host
  - Same as 3GPP, actually
- Advantages:
  - link-layer client isolation (security)
  - solves {link-layer, IP} pair state explosion (better scaling)
- But: if the client knew about this deployment model then:
  - DAD/ND is not necessary (saves power, time)
    - draft-yourtchenko-colitti-nd-reduce-multicast
    - draft-desmouceaux-ipv6-mcast-wifi-power-usage
  - could creatively use all  $2^{64}$  addresses (vis. RFC 7934)

# Proposal



- Allocate new bit in the PIO header to indicate to host that it has exclusive use of the prefix
  - “X bit”, “PIO-X” abbreviation used throughout the document
- Backwards compatible with non PIO-X aware hosts
  - they will perform DAD and ND, but nobody will answer

# Host changes

- X bit overrides L and A bits in the RA:
  - L=0
  - A=1
- DAD and ND for addresses within this prefix not performed
- Any (almost) use of the prefix is permitted
  - subject to valid use times
  - MUST NOT send RAs for subprefixes via the receiving interface
- Other behavior unchanged:
  - source address selection
  - next hop router determination

# Router behavior

- MUST maintain {PIO-X, client} binding state
  - similar state maintenance requirements as DHCPv6 PD
- MUST NOT advertise the same or overlapping prefixes to multiple clients
- Deployment model best with assistance from the link-layer:
  - that client isolation is being enforced
  - timely detection of loss of client

# Raised issues

- Persistent state in the router (what to do after reboot)
  - similar to DHCPv6 PD state issues
- What to do if device changes MAC address (perhaps for privacy reasons)
- Is the state machine correct as described in the draft?
- Considerations:
  - SAVI (Source Address Verification Improvements) devices?
  - DNA (Detecting Network Attachment) for IPv6

# Future work

- Create PoC implementations in router and host
- Test state machine in router, try to find corner cases
- Test common host implementations: how do they react to X bit set?
- Guidance based on operational experience, once accumulated

Questions?