

Signalling DHCPv6 Prefix Delegation Availability to Hosts

[draft-collink-6man-pio-pflag-00](#)

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Problem statement

- Companion to draft [draft-collink-v6ops-ent64pd](#)
- IPv6 hosts almost always have multiple addresses
 - Link-local, stable, privacy, 464xlat, multiple prefixes/renumbering, ...
- On some networks, tracking all addresses is a scaling problem
 - Some enterprise APs drop packets after X (=6, 8, ...) addresses per host
 - Solution: /64 per host with DHCPv6 PD
- Other networks, (e.g., home network with a /60) have no problem with lots of addresses, but don't have enough prefixes for PD-per-host
- This draft defines a way to tell the host which prefix (PIO or PD) to use

Proposed solution

- Add a new P flag to the PIO
 - “If you understand this flag, please use DHCPv6 PD instead of SLAAC in this prefix”
- Why in the PIO?
 - Must be available to the host before it does SLAAC => must be in RA
 - Specific to the particular prefix
 - Might want to use SLAAC for ULA and PD for global space
 - In a multihoming situation, not different upstreams might support different mechanisms

Using the delegated prefix

- Host MAY use as many addresses as it wants
- Host MAY use prefix to assign IPv6 addresses to internal components such as VMs and containers
- If permitted by host policy, host MAY use prefix to extend the network
 - => host MUST use DHCPv6 PD hint for prefix size sufficient to use SLAAC
 - Note: this is already possible in IPv4 and in IPv6 via NAT44 / NAT66

Renumbering

- Host tracks every (unexpired) PIO with $P=1$
 - Keep DHCPv6 PD running as long as at least one such prefix exists
 - Start SOLICITs or RENEWs (to every server) when such a prefix appears or is deprecated
 - Should this be a REBIND instead, so that any potential new servers can reply?
- Why not RECONFIGURE?
 - Not widely implemented, difficult to use (requires authentication)

Multihoming

- If multiple PVDs on link, every packet's source address must match next-hop
- Host shall maintain the mapping between delegated prefixes and routers (relay) link-local addresses so Rule 5.5 can be used
 - (yet unclear) what if relay is not collocated with the router
- Why not PVD option in DHCPv6?
 - Previous work in this area was blocked by an IPR claim
- Why not ICMPv6 redirects?
 - Redirects not specific to source address

Next steps

- WG adoption?
 - ... assuming v6ops adopts [draft-collink-v6ops-ent64pd](#) (call will be issued shortly)

Questions?