Prefix Pool Option for DHCPv6 Relay Agents on Provider Edge Routers

draft-yeh-dhc-dhcpv6-prefix-pool-opt-05

IETF 81 – DHC

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Follow up after IETF 80 @ Prague - 1

- Concerns on the aspects of routing (cont..)
  - To ensure reachability, DHCPv6-PD itself requests route on PE for each customer network, which already got text support in section 6.2 of BBF TR-177;

    - R-25 When the BNG, acting as a DHCPv6 Relay Agent, receives a downstream Relay- Reply message containing a Reply message including an IA_PD option, it MUST add a route (allocated IPv6 prefix contained in the IA_PD, next hop contained in the peer address field) to the relevant BNG routing table.
    - R-26 When the DHCPv6 Relay Agent implemented in a BNG receives an upstream Release message (or a Relay-Forward message containing a Release message) including an IA_PD option, it MUST delete the route corresponding to the delegated prefix(es) indicated in this option.
    - R-27 When the lease related to a delegated prefix expires, the BNG MUST remove the corresponding route from the BNG routing table.

Follow up after IETF 80 @ Prague - 2

- Concerns on the aspects of routing
  - Discussed with Adrian Farrel (AD of Routing Area, IETF) in Prague Hilton
    - He supports the idea that using DHCPv6 to update the routing table on the Edge Router per the oral words in our conversation ;
- Solution comparison with draft-Joshi on the aggregate route (cont..)
  - No much discussion on the draft-Joshi in the mailing list yet
  - Sounds the solution on the draft-Joshi has not completely done yet

Follow up after IETF 80 @ Prague - 3

- Solution comparison with draft-Joshi on the aggregate route
  - Draft-Joshi proposed to use information-request message initiated by the relay to retrieve the aggregated routes from the DHCPv6 server
    - A new communication mechanism between relay and server;
    - Both relay & server need the additional resources for handling the new kind of messages including information-request, renew, rebind and reconfigure between both of them; and maintain the new state machine for the aggregation route;
    - Much more complicated than the solution through option in draft-yeh;
    - An independent process with DHCPv6-PD, which need the additional sync between relay and server;
    - On the contrary, piggyback method through option in draft-yeh make the sync between client, relay and server more easier and on the real-time;

Updates from Ver.-03 to Ver.-05

- Rev. -05
  - Editorial revision to improve readability and make some clarification.
- Rev. -04
  - a. Re-titled the draft to emphasize that the new mechanism with DHCPv6-PD is only designed for the Edge router.
  - b. Re-write the abstract and the words in the introduction.

Proposal

- Call for adoption as WG item again?

Acknowledgement

- Thanks to the co-authors,
  - Mohamed Boucadair
  - Juergen Schoenwaelder

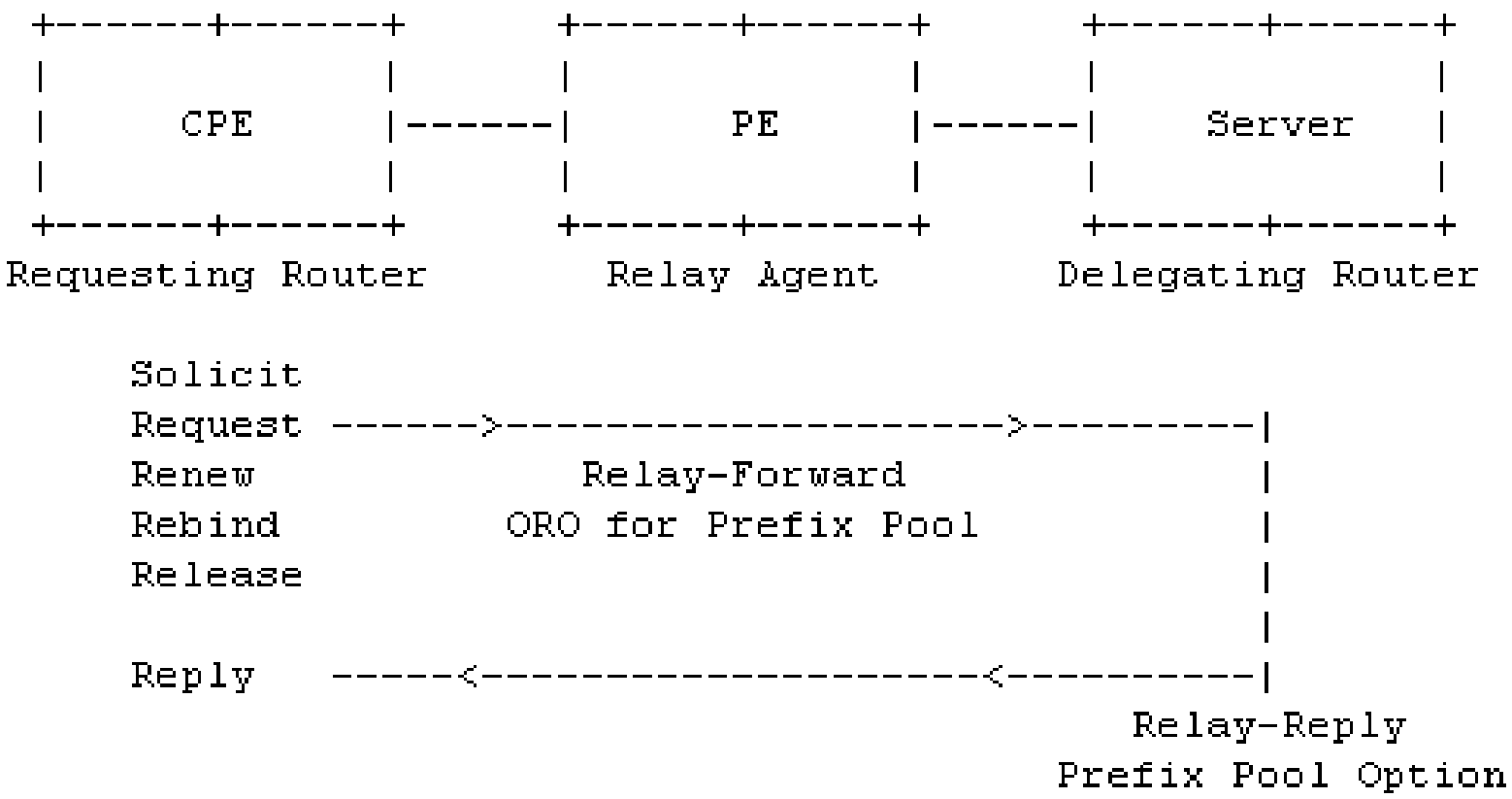
  for their contributions on this draft from ver.-03 to ver.-05.

Basic Idea of Prefix Pool Option

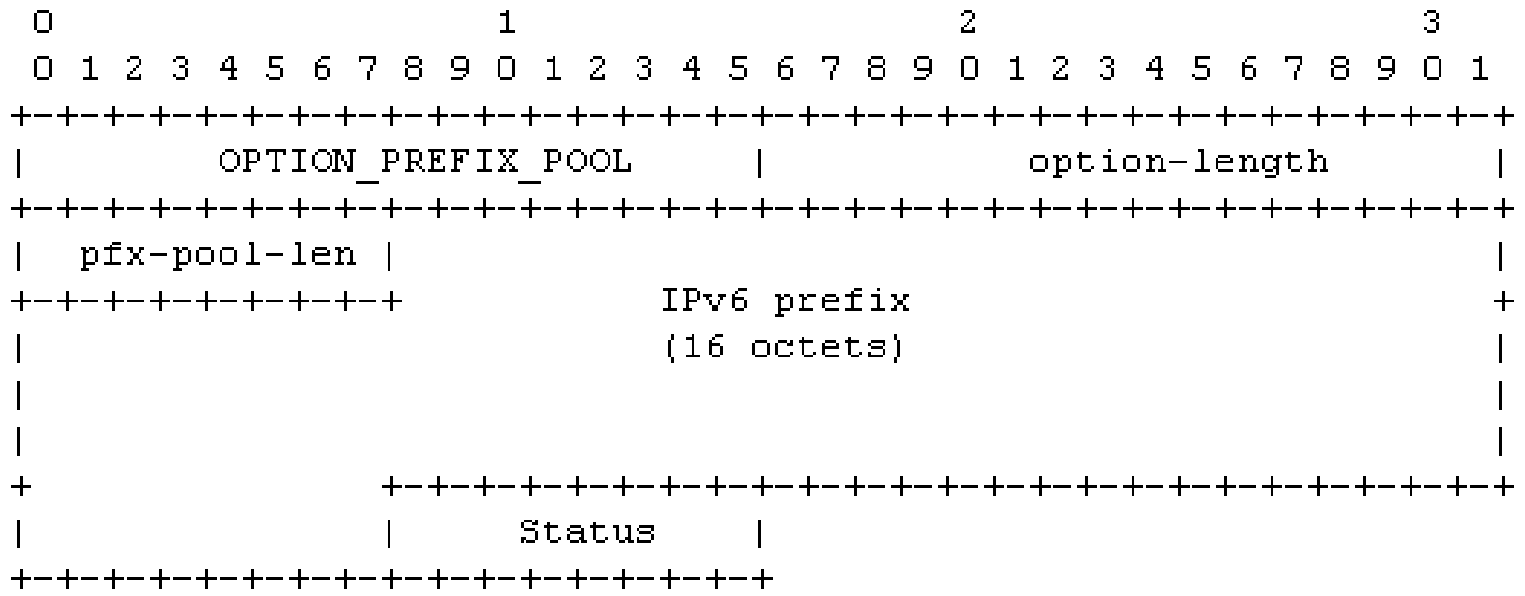
- Retrieve the Prefix Pools through options between Relay & Server based on the existing mechanism of DHCPv6 (RFC3315) and PD (RFC3633).

- Works closely with the PD process
  - Delegating Router Solicitation (Section 11 of RFC3633)
    - Solicit-Reply exchange
  - Requesting Router initiated PD (Section 12 of RFC3633)
    - Request-Reply exchange
    - Renew-Reply exchange
    - Release-Reply exchange
    - Rebind-Reply exchange
  - PD Reconfiguration (Section 13 of RFC3633)
    - Renew-Reply exchange

Message Exchange – Piggyback Option



Prefix Pool Option



option-code: OPTION_PREFIX_POOL (TBD)
option-length: 18
pfx-pool-len: Length for the prefix pool in bits
IPv6 prefix: IPv6 prefix of the prefix pool

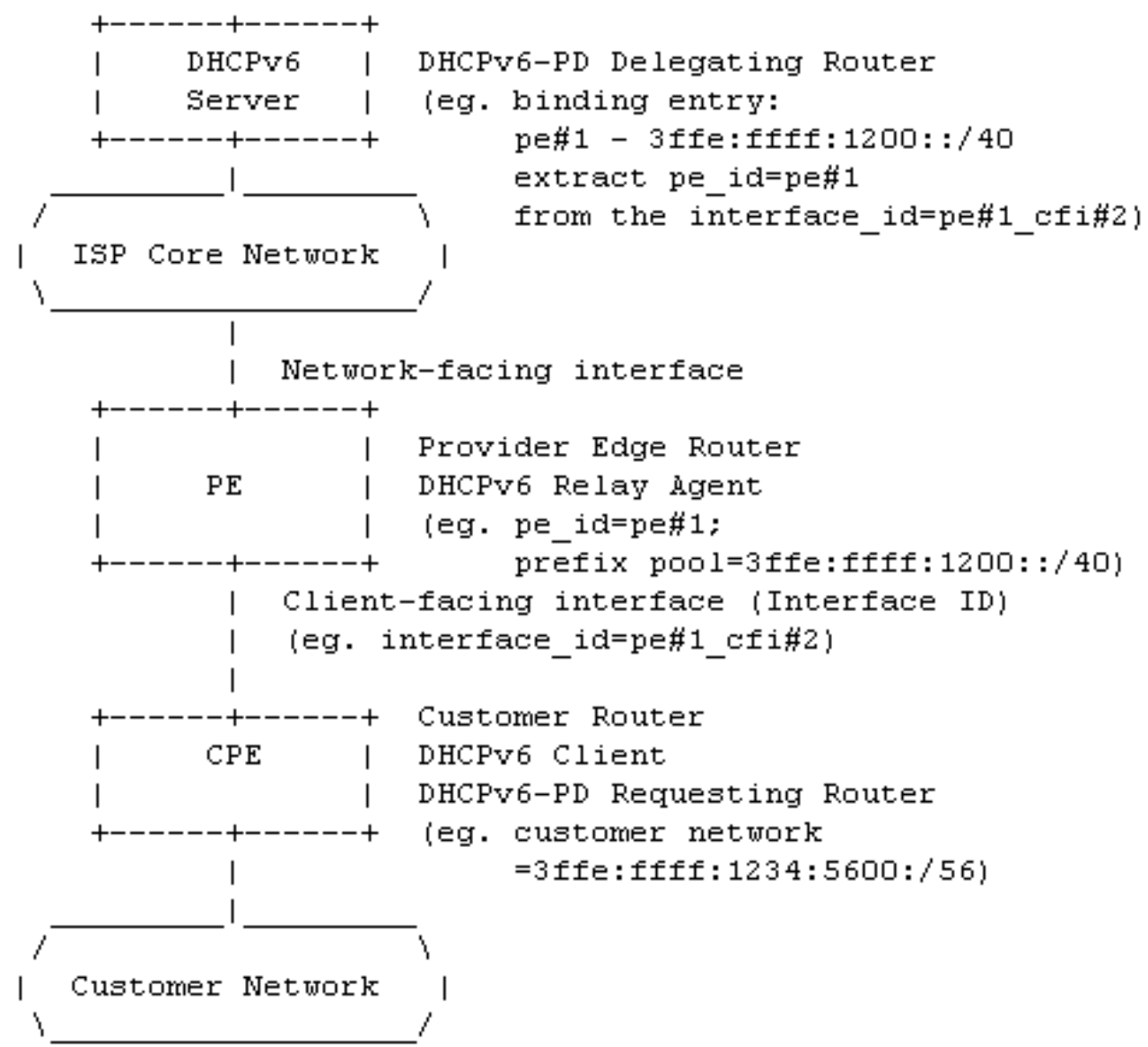
Status: Status of the prefix pool

Name	Code
Valid	0
Released	1

Status of the Prefix Pool Option

- If the administrator of the server intend to support the route aggregation on the relay,
  - the status of prefix pool automatically determined by the delegated prefixes within the associated prefix pool.
    - If there is one delegated prefix within the pool that has valid lease, the status of prefix pool will be 'Valid‘,
    - Otherwise, the status of prefix pool is 'Released'.
- If the administrator of server doesn't want the route aggregation on the relay,
    - the status of prefix pool will always be 'Released'.

Use Case 1 – CPE connected to PE directly



Use Case 2 – CPE connected to PE through access network