Lightweight 4over6 deployment with DHCPv4 over DHCPv6

draft-liu-softwire-lw4over6-dhcp-deployment-00

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Motivation

- Lightweight 4over6
  - Support dynamic, on-demand IPv4-IPv6 address binding
  - IPv4-IPv6 decoupled
- DHCPv4 over DHCPv6
  - Provisioning IPv4 information over IPv6 networks
  - DHCPv4-based, dynamic IPv4 provisioning method
- Deploy Lightweight 4over6 with DHCPv4 over DHCPv6

DHCP Client
(on CPE)

DHCP
Relay Agent
(optional)
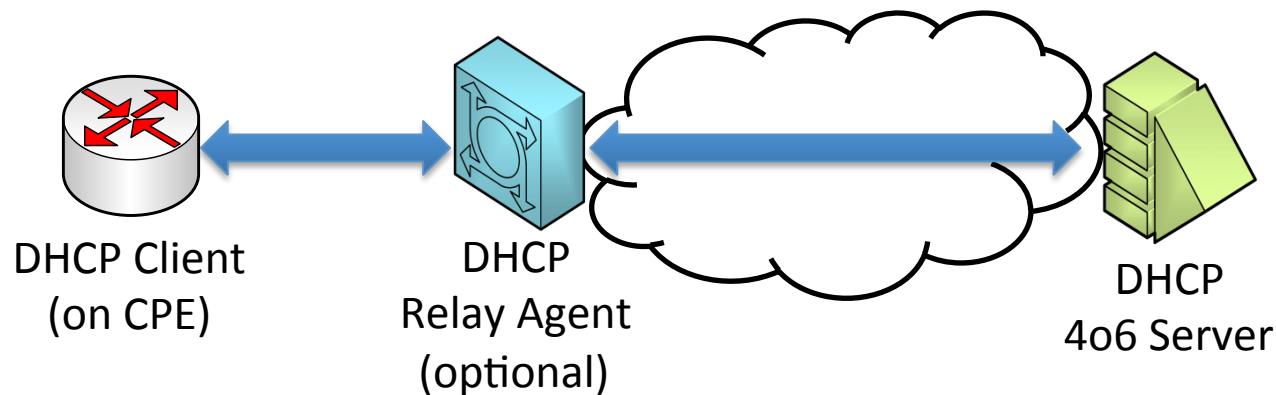
DHCP
4o6 Server

Considerations

- Lw4over6 in dynamic mode
  - Binding table is dynamically updated through DHCP process
- Location of lwAFTR
  - On the path of the DHCP process ✓
    - lwAFTR can be co-located with either DHCP 4o6 server or DHCPv6 relay
    - lwAFTR listens DHCPv4-over-DHCPv6 messages and uses DHCPv4 messages extracted to update the binding table
  - Not involved in DHCP process (out of scope)
    - A new defined/existing protocol to synchronize the binding table

Build the Binding Table

- 3-tuples of binding table on lwAFTR
  - IPv6 addr, IPv4 addr, port set
- lwB4's global source IPv6 address
  - May not be include in DHCPv4-over-DHCPv6 packet sent from lwB4 (when multicast)
  - Possible solutions:
    - (1) Unicast only, DO NOT use multicast
    - (2) Add a DHCPv6 option to carry lwB4's global IPv6 address
- lwB4's IPv4 address and port-set
  - Depending on the use case
- 3 use cases described in this draft

Use Case 1

- lwAFTR is co-located with DHCP 4o6 Server
- lwAFTR allocates IPv4 address & port sets
  - Update the binding table according to the DHCPv4 messages
   - DHCPACK, DHCPRELEASE, etc.
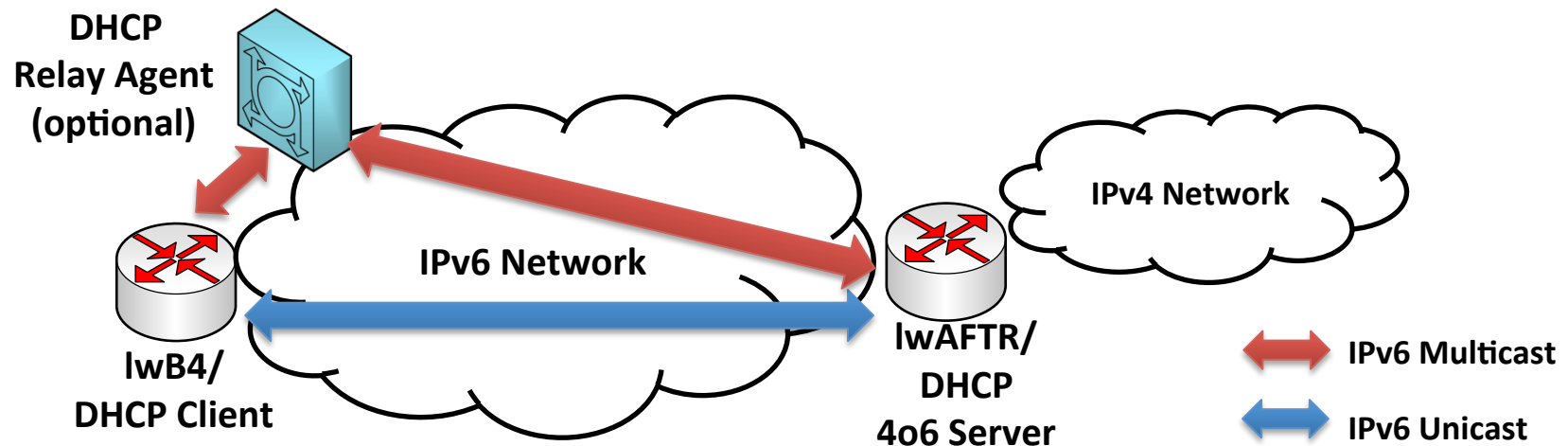
Use Case 2

- lwAFTR is co-located with DHCPv6 Relay
- lwAFTR listens for messages from sever/client
  - Use the content of the message to update binding table
    - DHCPACK, DHCPRELEASE, etc.
- DHCP 4o6 Server can be shared among multiple lwAFTRs
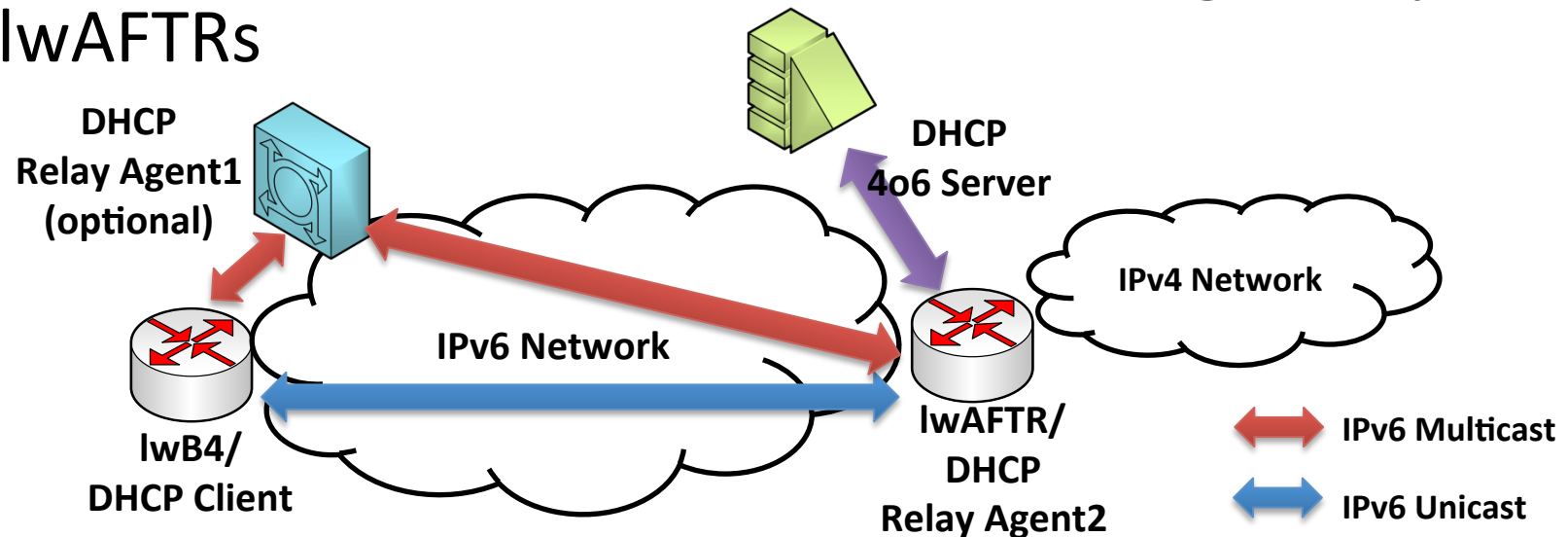
Use Case 3

- DHCP 4o6 Server is split into 2 parts
  - v6 part is co-located with lwAFTR
  - v4 part is a dedicated DHCPv4 server
- lwAFTR extracts and sends DHCPv4 messages to DHCPv4 Server
  - updates binding table according to replies from DHCPv4 Server
- DHCPv4 Server can be shared among multiple lwAFTR
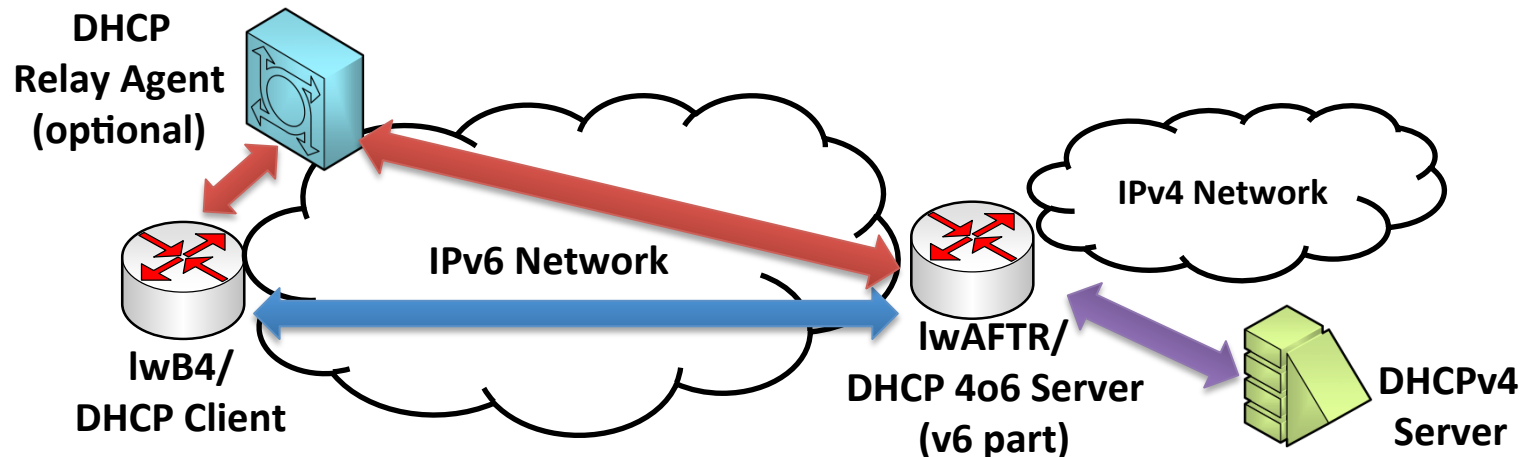
Next Steps

- Is this a useful topic?
- Comments are welcome