

Dynamic IPv4 Provisioning for Lightweight 4over6

draft-liu-softwire-lw4over6-dhcp-deployment-04

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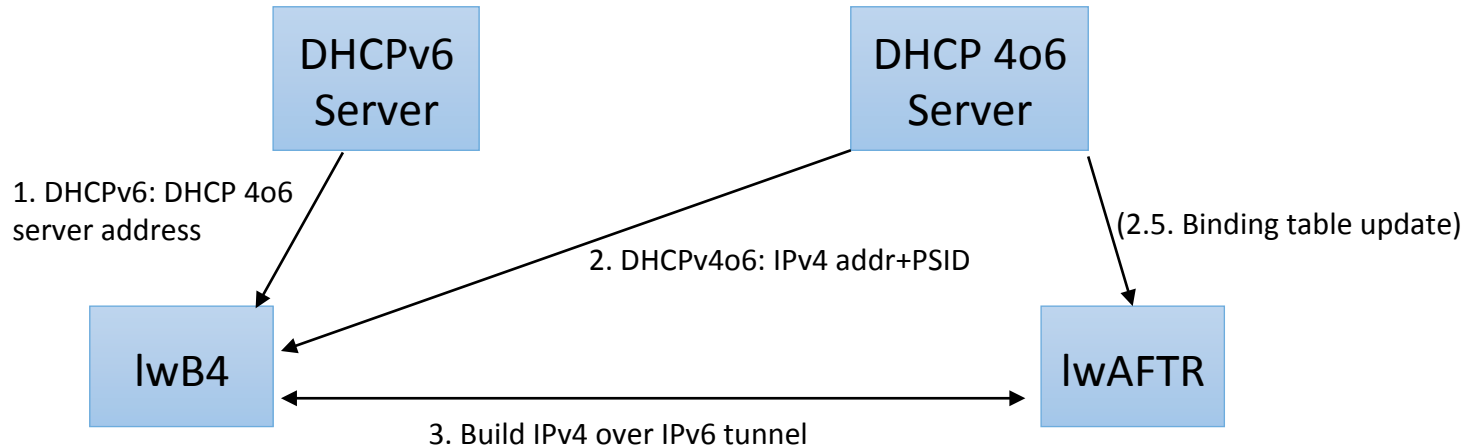
Motivation

- Lw4over6 base: deterministic IPv4 provisioning
 - Pointer to [I-D.ietf-softwire-map-dhcp]
 - IPv4 address pre-bind to IPv6 prefix in DHCPv6 server
- DHCPv4 over DHCPv6 based provisioning for Lw4over6: It's already there
 - IPv4 provisioning: I-D.ietf-dhc-dhcpv4-over-dhcpv6
 - Port set : I-D.ietf-dhc-dynamic-shared-v4allocation
 - Tunnel source address: I-D.fsc-softwire-dhcp4o6-saddr-opt
- This informational memo collects them into an alternative dynamic provisioning mode for Lw4over6

Advantage of dynamic IPv4 provisioning

- Support multiple lwB4 using the same IPv6 prefix
 - Each host with a unique /128 address can set up a tunnel, not only the gateway
- No restriction on IPv6 address provisioning
 - lwB4 can use arbitrarily IPv6 address, can be from DHCPv6, SLAAC, etc.

Architecture



- DHCPv4 over DHCPv6 requires a 2-step process
 - DHCPv6: get DHCP 4o6 server address
 - DHCPv4o6: get IPv4 address+PSID

1. DHCPv6 process

- Procedure:
 - 1. lwB4 runs DHCPv6 to request OPTION_DHCP4_O_DHCP6_SERVER
 - 2. DHCPv6 server replies OPTION_DHCP4_O_DHCP6_SERVER
 - 3. lwB4 enables DHCPv4 over DHCPv6 function
- DHCPv6 server processes OPTION_DHCP4_O_DHCP6_SERVER and OPTION_S46_CONT_LW independently
 - Preference between dynamic mode and deterministic mode: out of scope

2. DHCPv4 over DHCPv6 process

- DHCPv4 over DHCPv6 workflow defined in [I-D.fsc-software-dhcp4o6-saddr-opt]
 - Summary:
 - lwB4 gets IPv4 address and PSID
 - lwB4 gets lwAFTR's address through OPTION_S46_BR
 - lwB4 provides its IPv6 tunnel source address through OPTION_DHCP4O6_SADDR
- Use OPTION_V4_PORTPARAMS [I-D.ietf-dhc-dynamic-shared-v4allocation] to provide PSID in DHCPv4 over DHCPv6

3. lwAFTR Binding Table Maintenance

- lwAFTR binding table synchronized with DHCPv4 over DHCPv6 process:
 - DHCPACK: Generated by DHCP 4o6 server, add a new entry or modify an existing entry
 - DHCPRELEASE: Generated by lwB4, delete an existing entry
- lwAFTR co-locates with DHCP 4o6 server: directly update
- Otherwise: use other protocols for synchronization
 - Possible choices: DHCP lease query, NETCONF, ...
 - Not specified in current document

Next Step

- Comments?
- Adopt as WG item?