DHCPv4 Extension for Port-set Allocation

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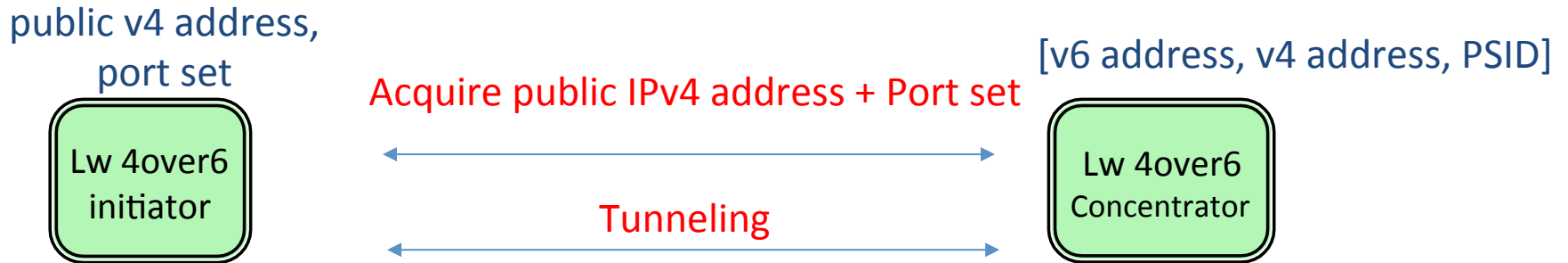
Our request for DHCP extension

- We have proposed "lightweight 4over6" in softwire WG.
    - draft-cui-softwire-b4-translated-ds-lite
    - draft-zhou-softwire-b4-nat

- The feedback from the WG
    - It is a good and reasonable approach
    - We will merge two I-Ds into a single one

- So, we need a extended DHCPv4 option for restricted IPv4 address allocation.

What is Lightweight 4over6 ?

- Lightweight 4over6 is an IPv4-over-IPv6 hub and spoke mechanism, which supports address sharing to deal with IPv4 address exhaustion, and places the IPv4 NAT on the initiator side.

- A simple extension for DS-Lite without NAT, and address sharing mode for public 4over6.

Overview

public v4 address,
port set

[v6 address, v4 address, PSID]

Acquire public IPv4 address + Port set

Lw 4over6
initiator

Lw 4over6
Concentrator

Tunneling

- NAT44 within restricted port set
- Tunnel encapsulation/de-capsulation.

- Subscriber-level binding record
- Tunnel encapsulation/de-capsulation.
- No NAT anymore

Non-continuous port set algorithms (e.g. GMA in the design team) can be introduced to further improve the security.

Restricted IPv4 address allocation

- Initiator would need to get restricted IPv4 address, including
  - Public IPv4 address:
    - draft-cui-dhc-dhcpv4-over-ipv6: WG item
    - the same with public 4over6.

  - Non-overlap port-set
    - We do not have it yet …

Considerations on Port-Set Extension

- DHCP or PCP
  - Since DHCP is more mature and has widely supported, we would prefer to have a extended DHCP option.

- DHCPv4 or DHCPv6
  - As we need to allocate public IPv4 address to initiator, it would be more reasonable to extend DHCPv4.

- Port-set algorithm
  - Adopt the port-set algorithm in softwire MAP design team.

We would like to propose…

- A DHCPv4 extension for port-set allocation
- It is used for lightweight 4over6 and can be deployed when necessary
- Coexistent with *draft-cui-dhc-dhcpv4-over-ipv6*

- We would like to ask DHC WG:
  - How do you think of this DHCPv4 extension?

Thank you ☺