

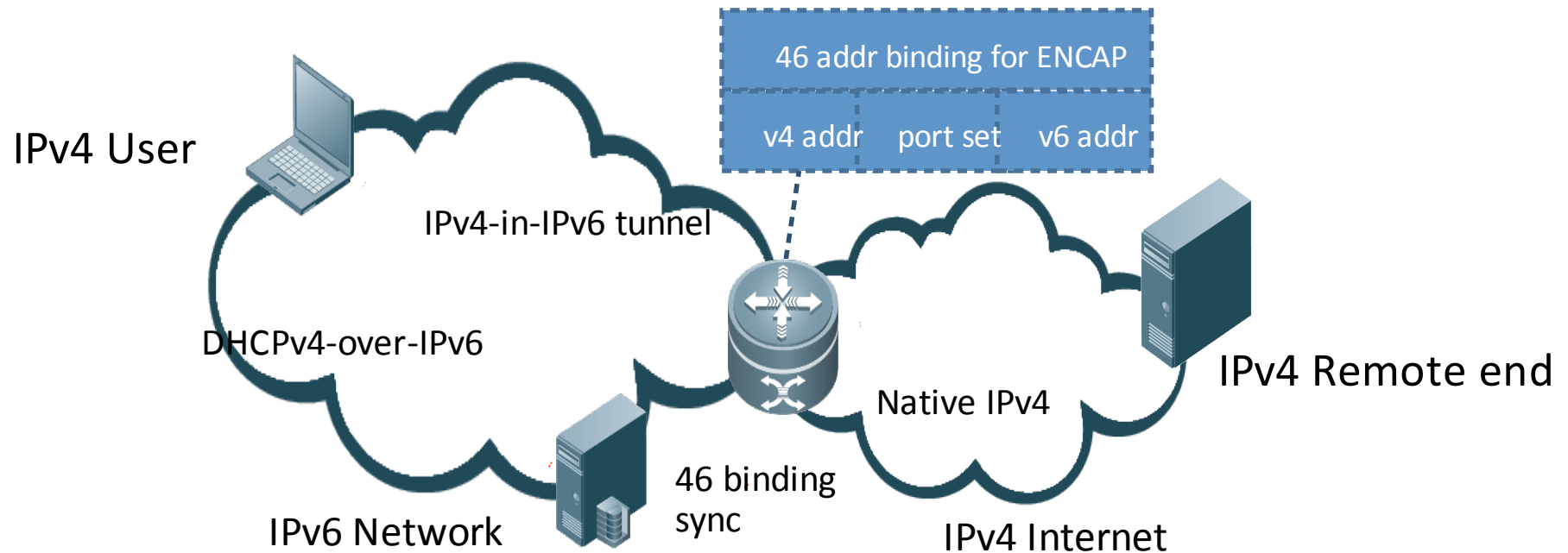
DHCPv4 Option for Port-Set Assignment

draft-sun-dhc-port-set-option-00

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Use Case

- Provide IPv4 address in IPv6 access network
- IPv4 address sharing among end users
- IPv4 resources allocation over IPv6 network

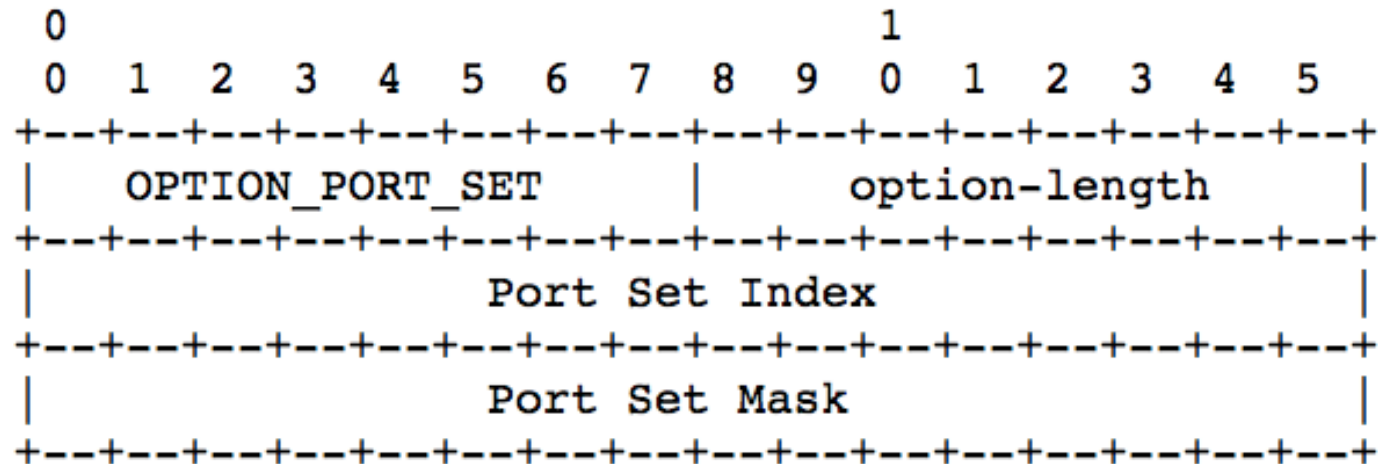


Requirements

- Public IPv4 address
 - DHCPv4-over-IPv6 for IPv4 assignment in IPv6 net
 - draft-ietf-dhc-dhcpv4-over-ipv6-05
- IPv4 SIP server, IPv4 NTP server, ...
 - Leverage existing DHCPv4 options over IPv6
- Port-set assignment in DHCPv4
 - To be defined

DHCPv4 Port Set Option

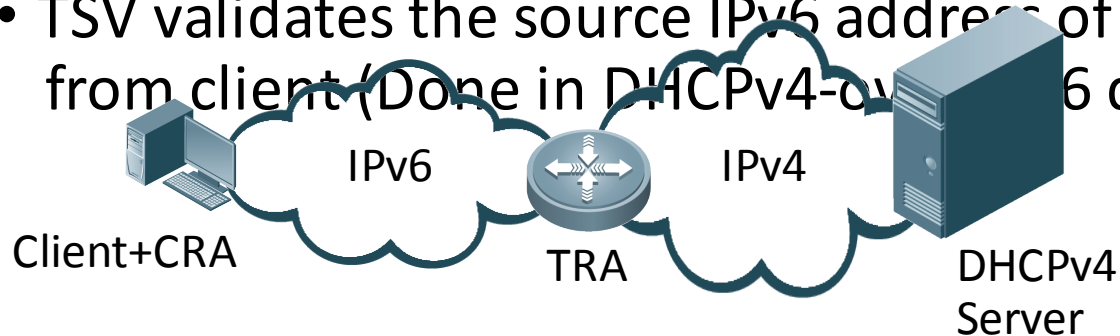
- Assign a contiguous port set
- Port set determined by 16-bit mask and index
- Format



- Example:
 - Port Set Index: 0001 0100 0000 0000 (5120)
 - Port Set Mask: 1111 1100 0000 0000 (64512)
 - One contiguous port set: 5120 - 6143

Preventing incorrect address sharing

- DHCPv4 server prevents configuring a shared addr to a client over IPv4
 - With relay agent in the middle
 - TRA validates the source IPv6 address of DHCP message from client (Done in DHCPv4-over-IPv6 draft)
 - DHCPv4 server validates the RA's address (Current practice)
 - TSV (DHCPv4 over IPv6 Server)
 - TSV validates the source IPv6 address of DHCP message from client (Done in DHCPv4-over-IPv6 draft)



Preventing incorrect address sharing

- DHCPv4 server prevents configuring a port set to a port-set incapable client
 - A port-set incapable client MUST NOT request a port set in PRL
 - DHCPv4 server MUST NOT return port set option if client doesn't request it

Changes since Vancouver IETF

- Merged two drafts
 - draft-bajko-pripaddrassign-04
 - draft-wu-dhc-port-set-option-00
- Four options/sub-options -> ONE option
 - Port mask for allocating ONE contiguous port set to each user
- Major Points
 - Port mask is easy for implementation
 - Non-Contiguous port set doesn't increase security compared to contiguous port set
 - Port Randomization: A contiguous port set + port randomization on client side (RFC6269)

Implementation Efforts

- Tsinghua, Huawei, China Telecom and GreenNet
- DHCPv4-over-IPv6 with port-set option
- Implementations of DHCP server, relay and client
- Easy to implement:
 - It takes two weeks for GreenNet to realize relay and client
- Interop test in Tsinghua
 - 2 DHCPv4 servers, 1 TSV, 3 DHCP relays, 3 DHCP clients
 - About 20 combinations and over 1400 test cases
 - Testing result shows the mechanism works well

Summary

- Consensus among authors of two drafts
 - draft-bajko-pripaddrassign-04
 - draft-wu-dhc-port-set-option-00
- Simple and clean
- Use DHCPv4 for allocating IPv4 related resources
 - Leverage existing DHCPv4 options for v4 clients
 - Phase out IPv4 and DHCPv4 after transition
 - No side effect for DHCPv6 server/client after IPv4/IPv6 transition is completed
- Implementations from multiple vendors
 - Inter operation goes well

Next Step

- Adopt it as a WG item?