

# DHCPv4 over IPv6 Transport

draft-ietf-dhc-dhcpv4-over-ipv6

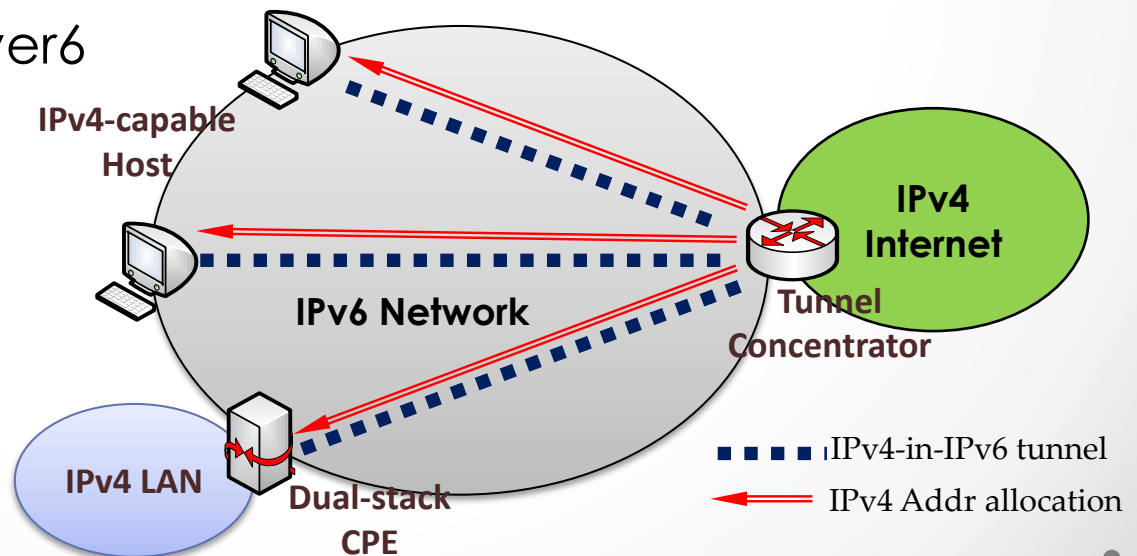
For IETF83

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# Background

- ISP provide Residual IPv4 service to in IPv6 network
- =>Allocate IPv4 addresses to user devices
- =>Enable DHCPv4 over IPv6 network
- Typical scenario: IPv4-over-IPv6 tunneling mechanism
  - Public 4over6
  - Lightweight 4over6
  - SD-NAT
  - ...

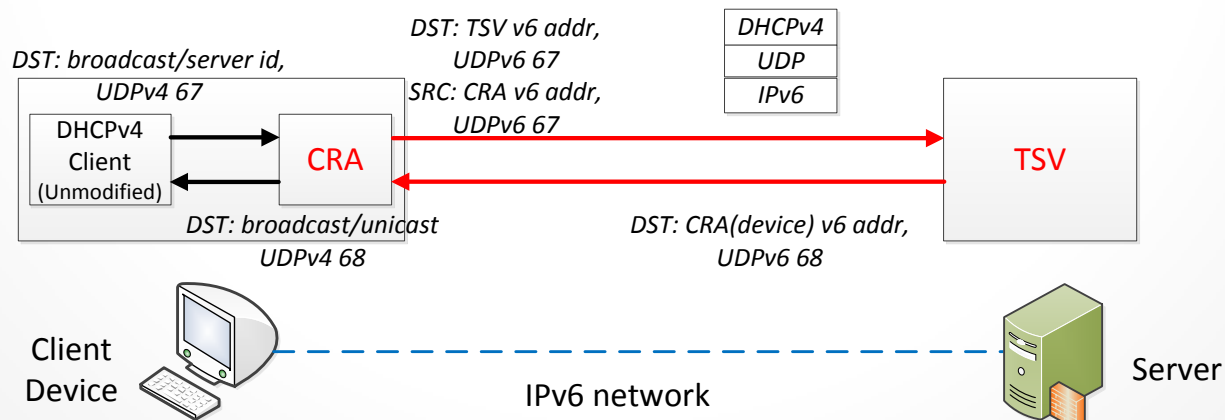


# Draft History

- Motivated from Public 4over6 Mechanism, July 2010
  - draft-ietf-softwire-public-4over6
- DHCP part extracted to be a dedicate draft, Jun 2011
  - draft-cui-softwire-dhcp-over-tunnel
- Protocol re-construction
  - DHCPv4 over IPv4-in-IPv6 tunnel=> DHCPv4 over IPv6
  - draft-cui-dhc-dhcpv4-over-ipv6
- Presented in Softwire & DHC in IETF 80 & 81
- Accepted by DHC WG in IETF 81
  - draft-ietf-dhc-dhcpv4-over-ipv6-00
- ietf-01 version in Mar 12<sup>th</sup>, 2012
- Now, the ietf-02 version

# Protocol Summary: Client-v6 net-Server

- CRA(Client Relay Agent)
  - Logical relay agent, co-located with DHCPv4 client on user device
  - Configured with TSV IPv6 addr before DHCPv4 process
  - Listens on UDPv4 67& UDPv6 68, relay DHCPv4 messages between client(Inside host) and TSV(IPv6). No option82 or giaddr
- TSV(IPv6-Transport Server)
  - Capable of receive and send DHCPv4 message through IPv6
  - When receiving a message from IPv6, record the source addr (CRA) and retain it as returning addr. (Similar to DHCPv6)

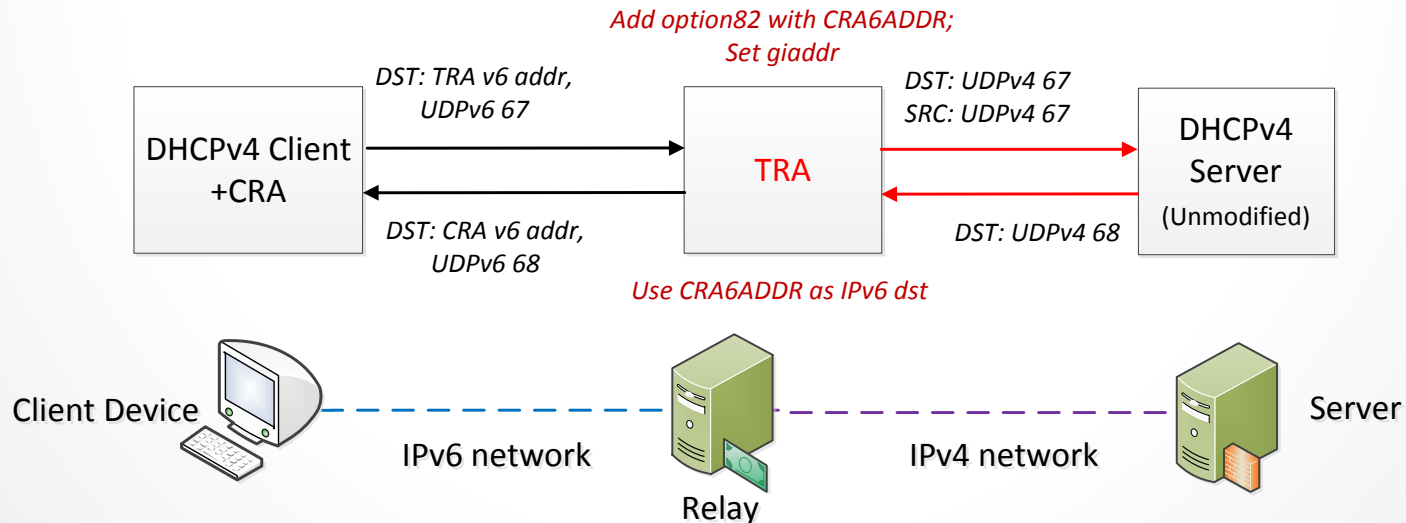


# Protocol Summary: Client-v6-Relay-v4-Server

- TRA (IPv6-Transport Relay Agent)
  - Listens on UDPv6 67 & UDPv4 68, relay between CRAs (IPv6) and regular DHCPv4 server (IPv4)
  - Add Option82 with CRA6ADDR when 6->4 and use CRA6ADDR as destination address when 4->6

- CRA6ADDR sub-option in Option82

0	1	2	18 octets
CRA6ADDR Sub-option code	16	128bit CRA IPv6 address	



# Updates from -ietf-00 to -01

- Improve the preciseness of protocol specification
  - State explicitly in section 8 that TRA processes option82 as required by [RFC3046], no special requirements;
  - State in section 8 that TRA SHOULD drop DHCPv4-over-IPv6 traffic which is not originated from configured server address;
- Rename the Client Relay Agent IPv6 Address Sub-option
  - 6ADDR -> CRA6ADDR
- List the security risks in security consideration section
  - DHCP protocol attack with DHCPv4-in-IPv6 messages
    - No extra damage introduced by DHCPv4-in-IPv6 format
  - DHCPv4 filtering may fail in existing firewalls
    - Easy to adapt
- Substantial edits

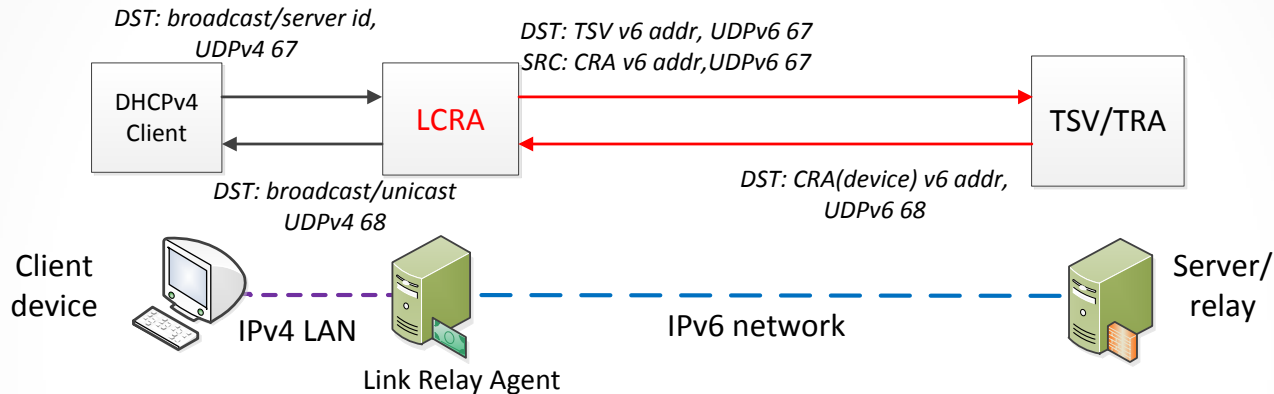
# Updates from -ietf-01 to -02

Solve the technical issues raised on the mailing list

- Surviving Server id option
  - Just following RFC2131
    - Use one of the server's IPv4 addresses which is reachable from the client
  - For server identification
    - it works
  - For DHCP Request Unicast (during DHCP Renew)
    - This address will be reachable through **IPv4**, from CRAs in **IPv6**, as the IPv4 residual service would have been set up by then

# Updates from -ietf-01 to -02 (cont')

- Include the case of CRA on the link (LCRA)



- LCRA should not set giaddr & option82 by default
  - If it has to, refer to draft-ietf-dhc-dhcpv4-relay-encapsulation-01
- LCRA doesn't necessary need an IPv4 address
- CRA vs. LCRA
  - Similar functionality
  - CRA should only serve the client inside the same host, while LCRA serves any client on the link
  - When the IPv6 address of TSV/TRA is provisioned (e.g., through DHCPv6 option RFC6334), the DHCP client uses CRA;
  - else the client uses to LRA



# Moving forward...

- The mechanism is simple and effective
  - -02 version solves all the issues raised
- Working implementation support
  - Both Tsinghua Univ. & ISC has experimental implementation
- The timeline from Software is tight
- Next step
  - Last Call?