

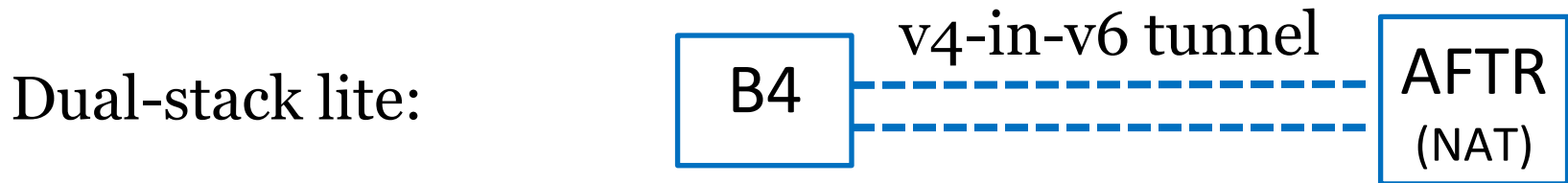
DHCPv4 over IPv6 transport

Will be: draft-ietf-dhc-dhcpv4-over-ipv6-00

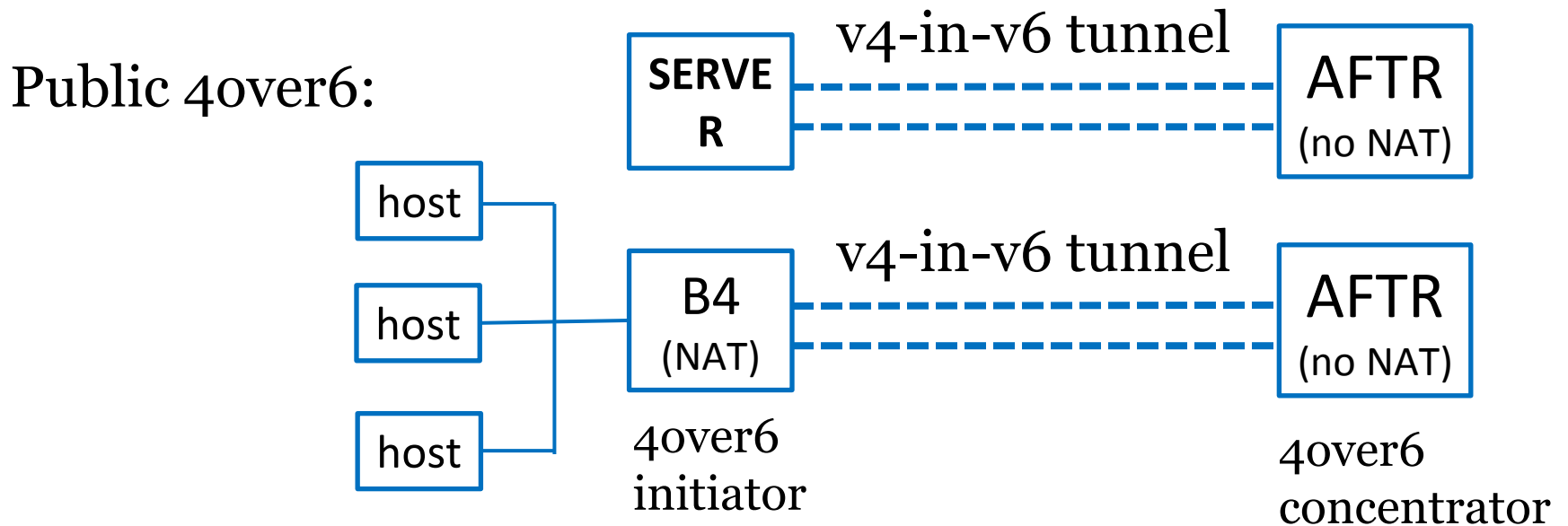
Y. Cui, J. Wu, P. Wu
T. Lemon

Tsinghua Univ.
Nominum

Original use case: public 4over6

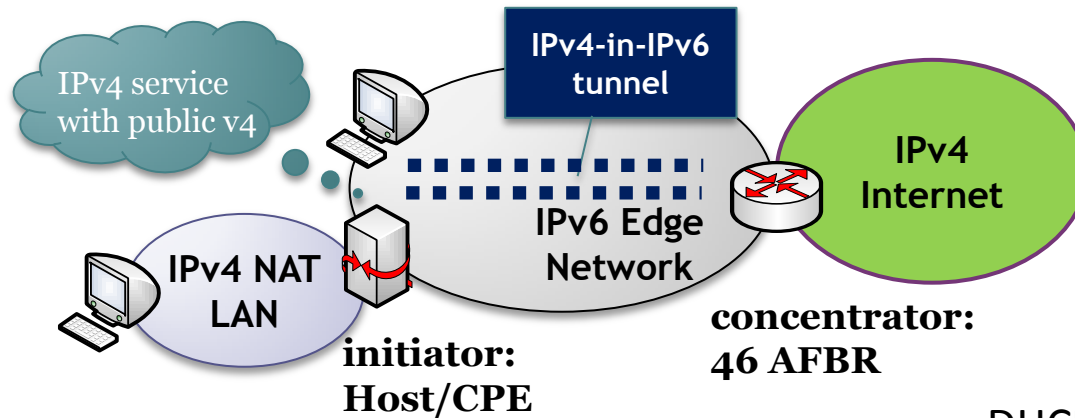


If we can allocate public address to B4...

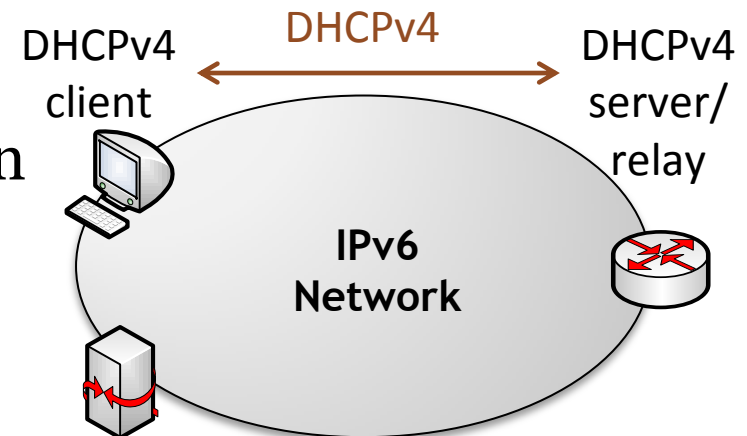


Public 4over6

- draft-cui-software-host-4over6-06
- WG has adopted it as WG item



- Key issue: IPv4 address allocation (**DHCPv4**) from concentrator to initiators, **over IPv6 network**



Tunneling DHCPv4 by IPv4-in-IPv6?

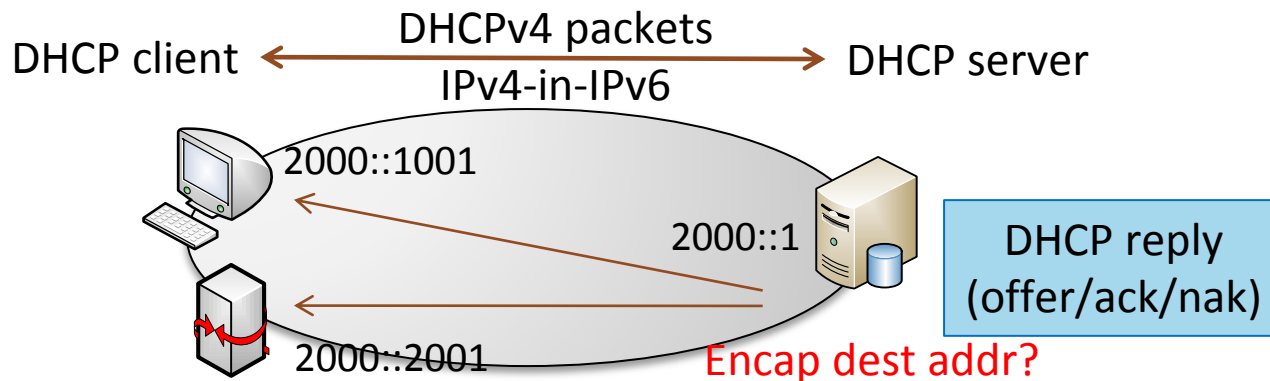
- Tunnel all DHCP packets between clients and server

- Main issue

- Encapsulation destination of DHCP packets

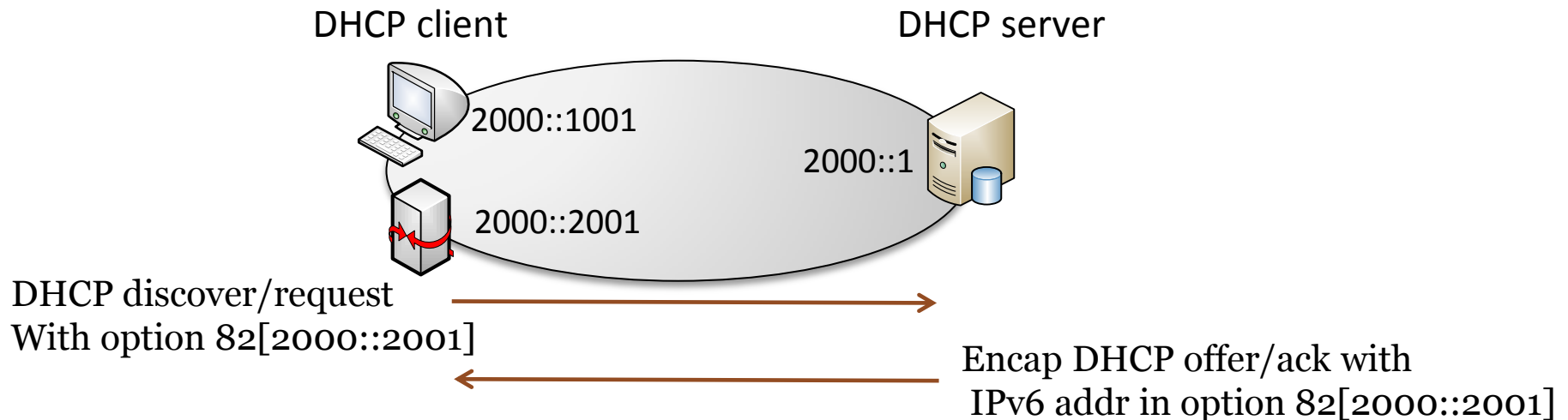
- Client side: static, IPv6 server address
 - Server side: Must know IPv6 encapsulation destination addresses for different clients

| |
|--------|
| DHCPv4 |
| UDP |
| IPv4 |
| IPv6 |



Server-side encapsulation

- Leveraging Relay Agent option to carry the IPv6 encapsulation address
 - Client includes its IPv6 address in Option 82 (new suboption)
 - Server uses it as destination address when perform encapsulation

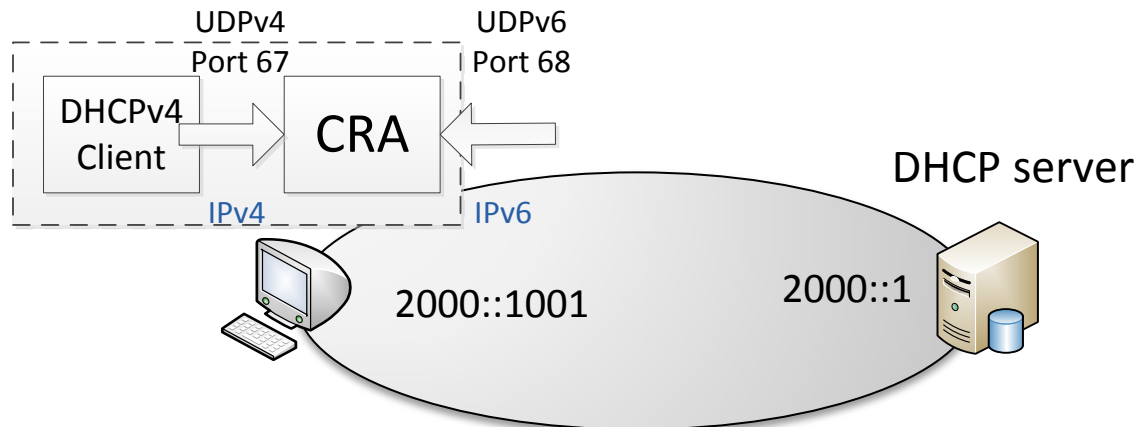


- **Enforce a tunnel**
- **Misuse of option 82: define a new option that server can not modify?**

Transport DHCPv4 with IPv6

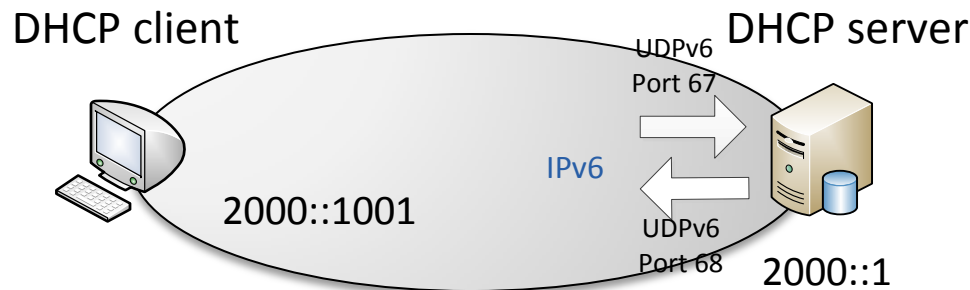
- Enable DHCPv4 to be transported by IPv6
- A “Client Relay Agent” sites on client machine
 - Client->server: listens on IPv4 UDP port 67 and forwards packet over UDPv6, without option 82
 - Server->client: listens on IPv6 UDP port 68 and forwards packet over UDPv4

| |
|--------|
| DHCPv4 |
| UDP |
| IPv6 |



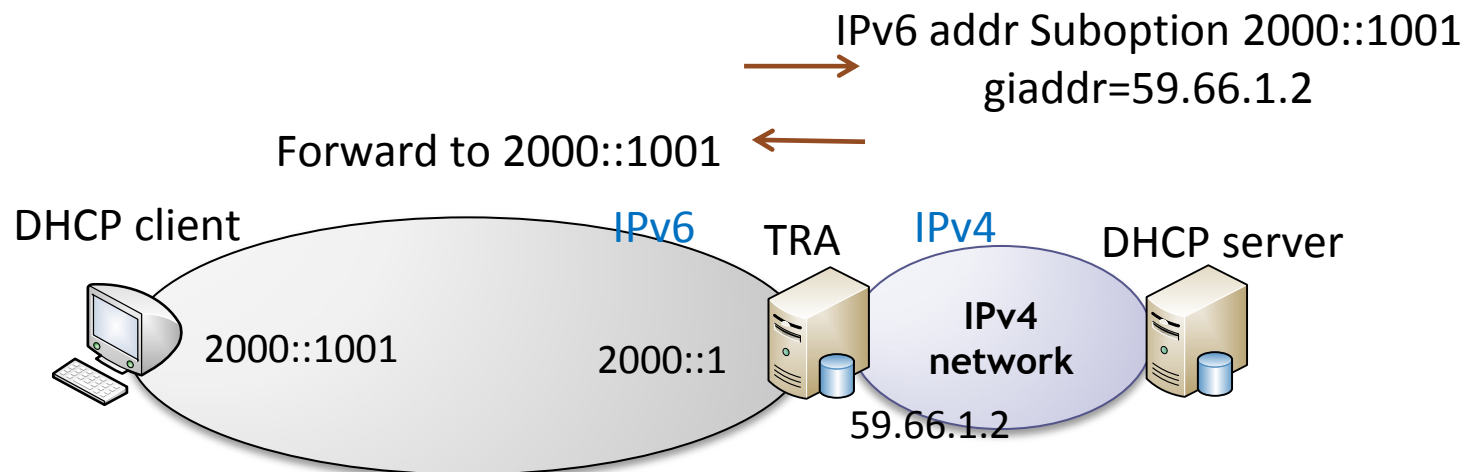
Server behavior

- listening on IPv6 UDP port 67
- Record the IPv6 source address when receives a DHCP packet from IPv6
- Send DHCP replies to **the recorded IPv6 address of the client**, if it received DHCP packet from that client by IPv6 earlier
- Same style as DHCPv6 server



Relay case: IPv6-transport Relay Agent

- CRA->TRA->server
 - Receives DHCP packets from CRA
 - Adds option 82 with *Client Relay Agent IPv6 Address* suboption and set giaddr field
- Server->TRA->CRA
 - forwards the packet to the IPv6 address in Client Relay Agent IPv6 Address suboption.



Achievement & Protocol extensions

- Achievement
 - DHCPv4 over IPv6 transport
- Extensions
 - Define CRA behavior
 - Define TRA behavior
 - Define a new Client Relay Agent IPv6 Address suboption in option 82

Document Status

- Originally submitted to Softwire as part of public 4over6 mechanism(IETF 79, 80, 81)
- Presented in DHC meeting, IETF 80 & 81
- In IETF 81, Softwire WG decided to move this work to DHC because it is a general DHCP problem
- Accept by DHC WG in IETF 81
- A WG -00 version coming out soon

Discussion

- Tunneling vs. Transport over IPv6
 - Tunnel
 - Take tunnel support(Virtual interface) for granted
 - Easier to implement
 - Transport over IPv6
 - difficult to implement CRA which can cooperate with today's DHCP client implementation
 - More generic
- Is it also attractive to stateless solutions in Prefix Delegation scenario?