DHCPv4 over DHCPv6 Transport

draft-ietf-dhc-dhcpv4-over-dhcpv6-01

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Motivation

- Configure IPv4 over IPv6-only networks
  - IPv4 addresses
  - Other IPv4 configuration parameters
    - DNS update, NTP server, etc.
- Dynamic provisioning of IPv4 over IPv6-only network
- Reuse DHCPv6 infrastructure, as well as preserve DHCPv4 infrastructure
- Phase out with IPv4 sunsetting process
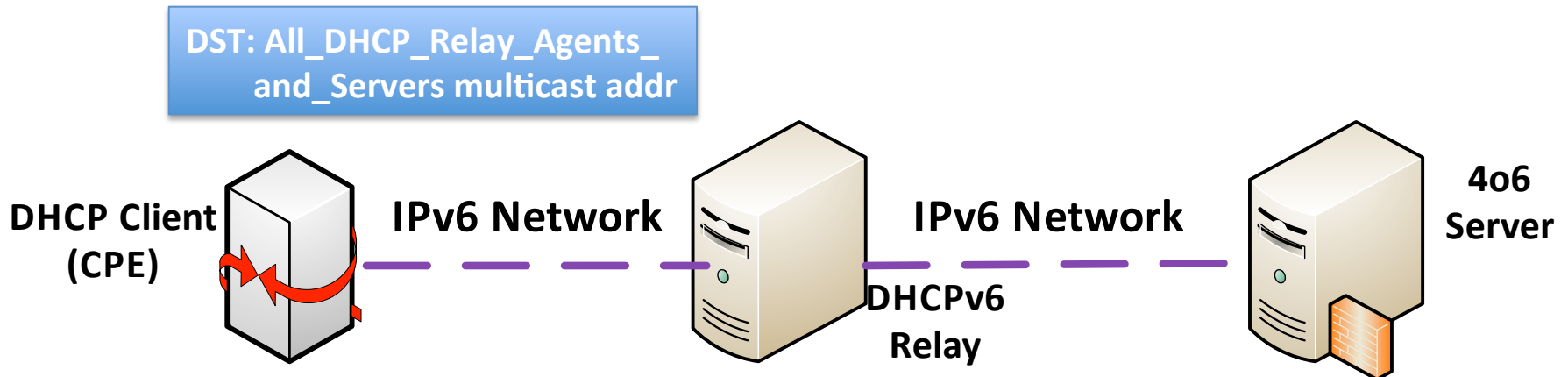- Convey DHCPv4 messages over DHCPv6 transport

Protocol Architecture

- Both DHCP client and 4o6 Server consist of DHCPv4 part and DHCPv6 part
  - 4o6 Server: co-located with a DHCPv6-only server; or be separate server
- Two new DHCPv6 msgs for conveying DHCPv4 msgs
- DHCPv6 relay: relay BOOTREQUESTV6 to the server
  - For future work: draft-ietf-dhc-dhcpv6-unknown-msg
- Communication patterns: IPv6 multicast / IPv6 unicast

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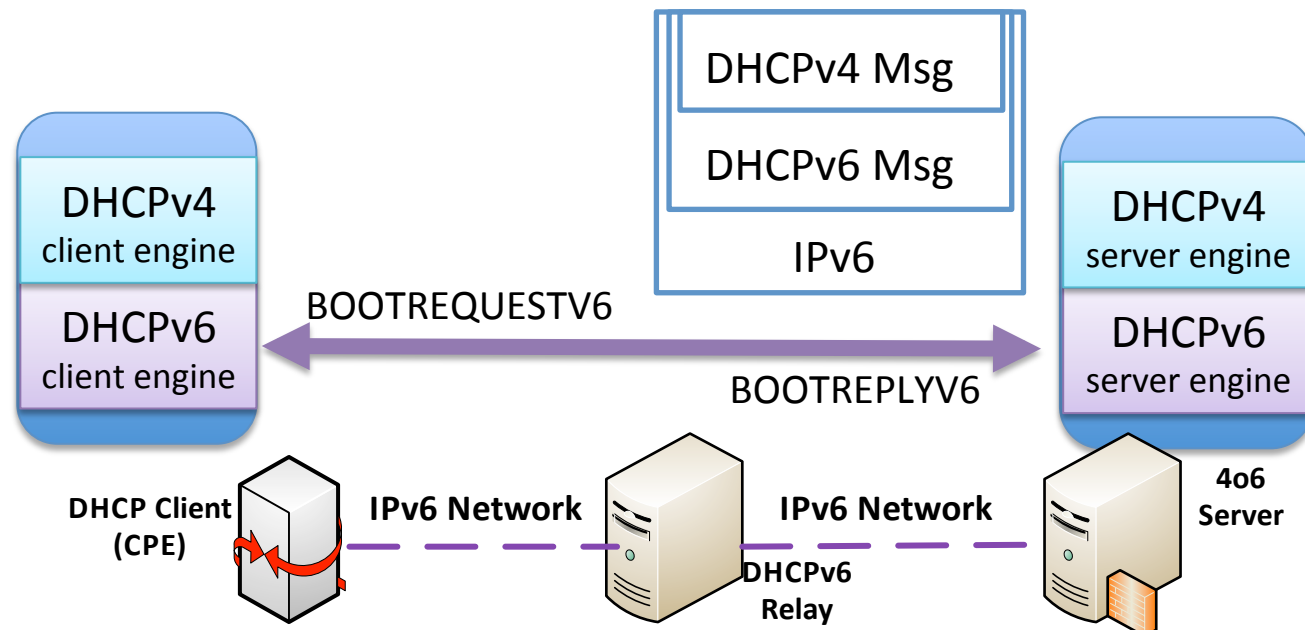
Using IPv6 Multicast

- DHCP client
  - IPv6 configuration first (e.g. using DHCPv6)
  - DHCPv4-over-DHCPv6 function is default OFF
  - ONLY provisioned with DHCPv4-over-DHCPv6 Enable Option: turn it ON, and use IPv6 multicast

DST: All_DHCP_Relay_Agents_ and_Servers multicast addr

DHCP Client (CPE)   **IPv6 Network**   **IPv6 Network**   **4o6 Server**

DHCPv6 Relay

Using IPv6 unicast

- DHCP client
  - IPv6 configuration first (e.g. using DHCPv6)
  - Provisioned with DHCPv4-over-DHCPv6 Enable Option AND 4o6 Servers Addresses Option
  - Send requests to all IPv6 unicast addresses conveyed by 4o6 Servers Addresses Option

DST: Address(es) in 4o6 Servers Addresses Option

DHCP Client (CPE)

IPv6 Network
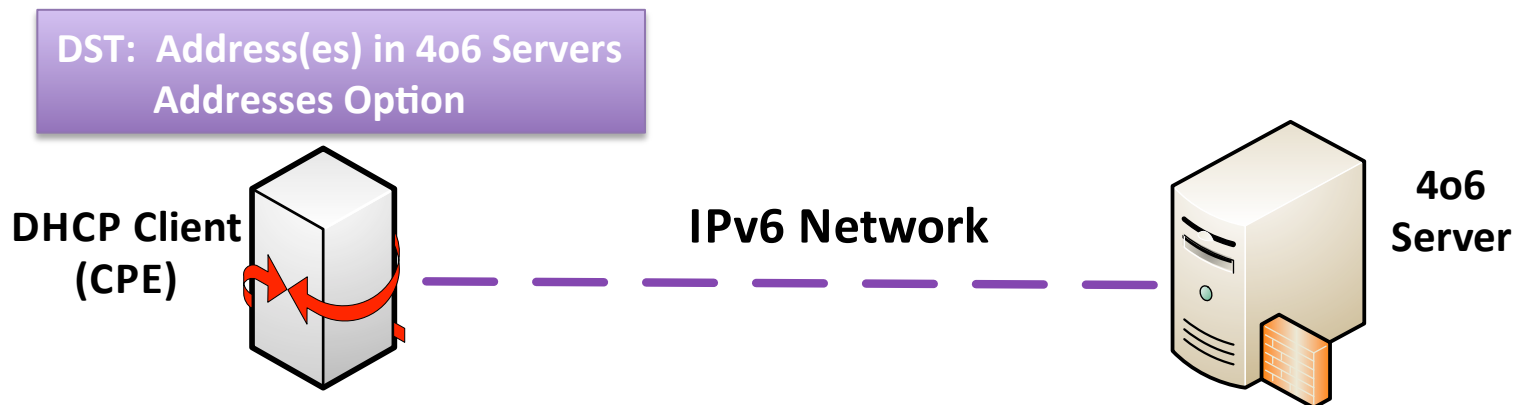
4o6 Server

Support to Separate DHCPv4/DHCPv6 processes

- Client/Server side
  - Use 4o6 Servers Addresses Option
- Relay side
  - Configure different dest IPv6 addresses of 4o6 Server and DHCPv6 only server
    - BOOTREQUESTV6 message, sent to 4o6 Server
    - Other DHCPv6 messages, normal DHCPv6 forwarding
    - On the relay agent closest to the client

Summary

- One infrastructure able to deliver both DHCPv4 and DHCPv6 messages
- Default OFF on the client
  - DHCPv4 over DHCPv6 Enable Option to enable it
- Normal DHCPv6 transport: No prevent IPv6-only operation
- Comments?