DHCPv4 over DHCPv6 Transport

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

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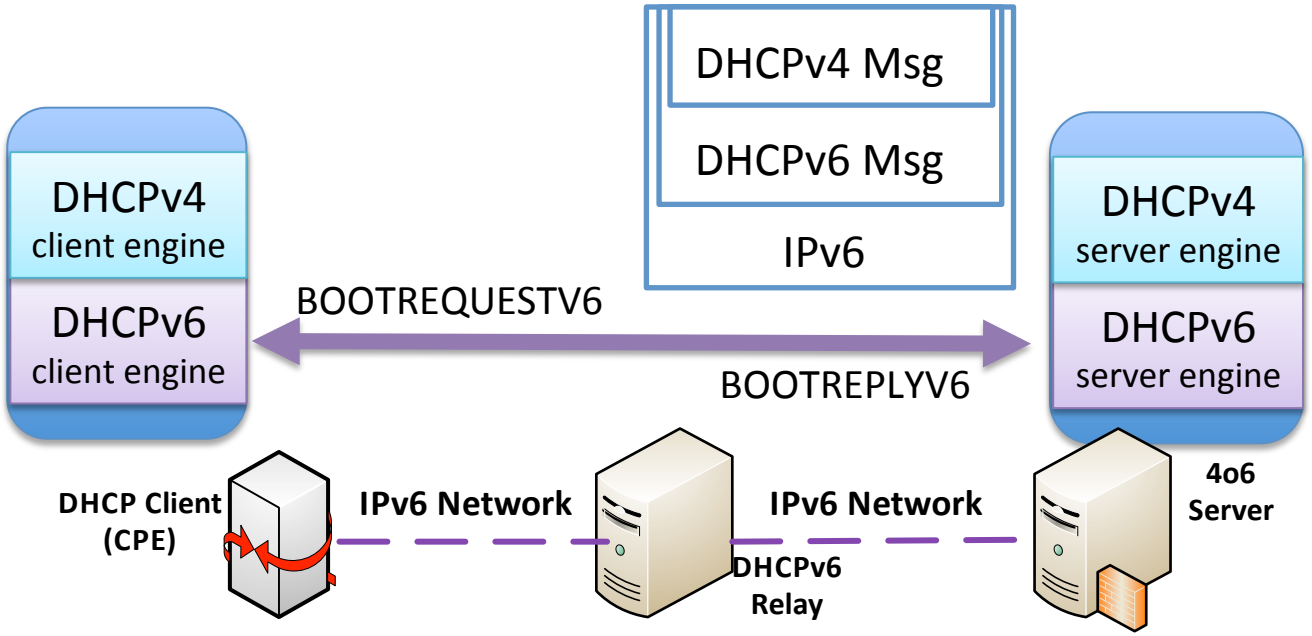
Motivation

- 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

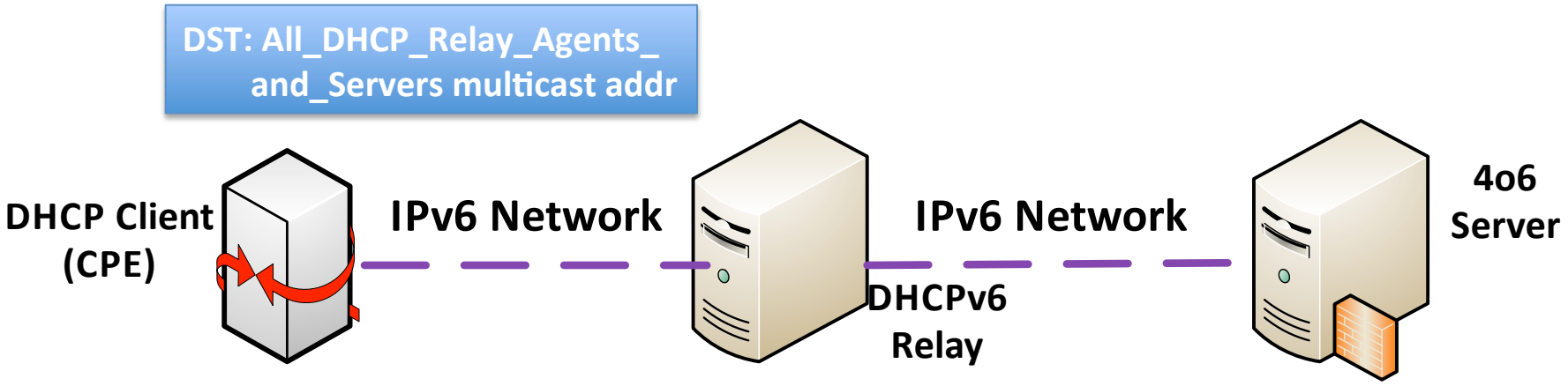
Protocol Architecture

- 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



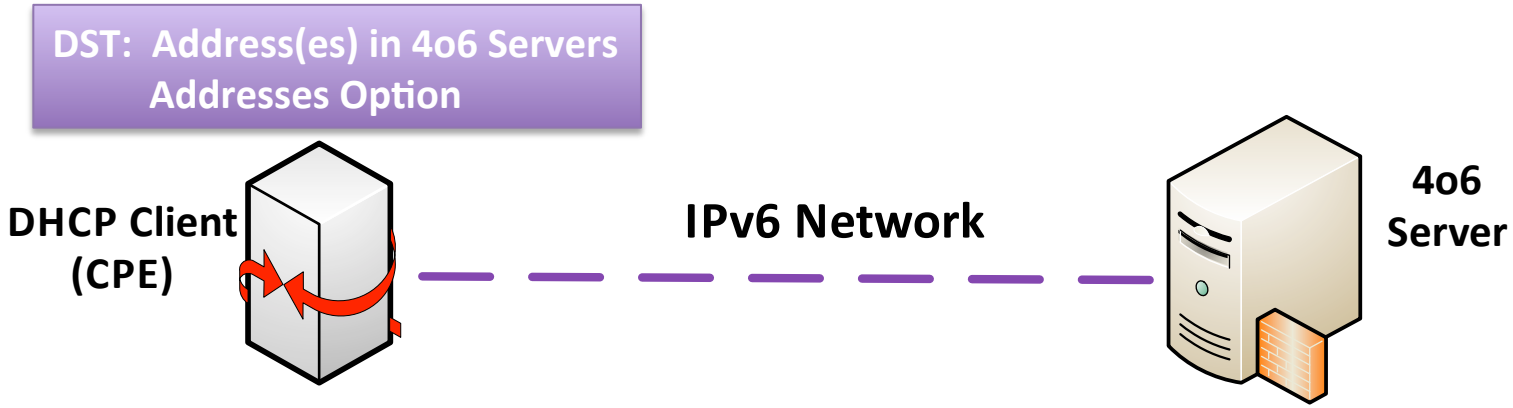
Using IPv6 Multicast

- 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



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



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

Issue: unicast / broadcast Info Loss

- How a server could distinguish a unicast or broadcast DHCPv4 msg?
  - E.g. RENEW vs. REBIND
- Same reason with RFC 5010
  - Add a Flags Suboption to indicate the information to the server

⇒Use one bit as flag in the new DHCPv6 messages

  - 1 for unicast, 0 for broadcast
  - Transaction ID in the new DHCPv6 msgs is not used by 4o6 Server, because the 'real' transaction ID should be in the DHCPv4 messages

Summary

- One infrastructure can be used to convey both DHCPv4 and DHCPv6 messages
- Dynamic IPv4 configuration over IPv6 network
- Both IPv6 multicast and unicast can be used
- Support DHCPv4/DHCPv6 process separation
- Keep information from original DHCPv4 message

Next Step

- Any other issues?
- The new version will resolve the issue accordingly
- Ready for WGLC?