Provisioning IPv4 Configuration over IPv6 Only Networks

draft-rajtar-dhc-v4configuration-01

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Motivation

- From discussions at IETF85, there was an agreement to align the provisioning of IPv4 configuration parameters over IPv6 only networks
- Main ‘customers’ for this are softwires (MAP-E, lw4o6) using DHCP based configuration
- Currently, multiple possible approaches have been proposed using both DHCPv6 and DHCPv4 over IPv6, some implemented, but none standardized
- The draft describes the proposed approaches listing their advantages and disadvantages
- Aim is to have a single DHCP transport approach for all v4 over IPv6 networks

DHCPv4o6 Based Provisioning

- DHCPv4 messages are transported in UDP6/IPv6
- Pros:
  - Once implemented, all DHCPv4 parameters available without further development
  - IPv4 and IPv6 provisioning can be separated
  - Only minor adaptation to existing DHCPv4 flows
  - If the address is leased, then the lifetime mechanism is built-in
- Cons:
  - New functional elements needed
  - New DHCPv6 option is necessary (IPv6 address of the DHCPv4 server)
  - DHCPv4 client and server must be updated to support the new function

DHCPv6 Based Provisioning

- DHCPv6 options are used to deliver all IPv4 config parameters
- Pros:
  - Simpler, in that no additional functional elements needed
  - Single protocol used for all parameters
  - Single provisioning point
- Cons:
  - All DHCPv4 options must be ported to DHCPv6 – re-development work is required
  - All clients/servers need to be updated each time a DHCPv4 option is ported to DHCPv6
  - In the future, 'legacy' IPv4 options will be kept in DHCPv6
  - IPv4 and IPv6 domains not separated
  - If the address is leased, then the lifetime mechanism needs to be brought into DHCPv6 as well

DHCPv4 over Softwire Based Provisioning

- IPv4 address is configured with DHCPv6. Other DHCPv4 messages are transported within an IPv6 tunnel in the same manner as any other IPv4 traffic
- Pros:
  - Once implemented, all DHCPv4 parameters available without further development
  - Existing DHCPv4 and DHCPv6 architectures are used
  - DHCPv4 and DHCPv6 can be separated for network flexibility if required
- Cons:
  - New functional elements needed
  - Requires significant rework on existing softwire implementations
  - DHCPINFORM not suitable for use over softwire
  - Binds the deployment of IPv4 parameters with softwire implementations
  - A new mechanism for configuring the client with the IPv4 unicast address of the DHCPv4 server is necessary

Current Status

- v00 published (with a CFA) with the conclusion that the DHCPv4 over IPv6 approach would be most suitable
- This conclusion was the subject of some discussion on the mailing list
- v01 was then issued with an empty conclusion section TBC with the overall view of the WG

Next steps

- Call for WG adoption
- Agree the conclusion across the WG
- Update other effected I-Ds (mainly softwire provisioning) in line with the outcome