

Provisioning IPv4 Configuration over IPv6 Only Networks

draft-ietf-dhc-v4configuration-02

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Updates in -02

- From discussions in Berlin (and mailing list):
 - Added DHCPv4 over Softwire (draft-troan-dhc-dhcpv4osw-00) as another evaluated solution
 - Old ‘DHCPv4oSW’ renamed to ‘DHCPv4 + DHCPv6oSW’)
 - Added new evaluation criteria: [solution must not be] ‘Not restricted to specific IPv4 over IPv6 transport mechanisms or architectures.’
 - Conclusion remains unchanged, recommending DHCPv4 over DHCPv6 as the preferred solution

Softwire Provisioning Architecture

- RFC1958: “Modularity is good. If you can keep things separate, do so.
- RFC5505: Lower-layer independence.
 - Configuration should be independent of link-layer (!(IPv4CP || IKEv2). MAP algorithmically derived IPv4 configuration.
 - Ships in the night between v4 and v6 provisioning
 - **DHCPv6 is provisioning the link-layer DHCPv4 the payload protocol.**
 - Port restricted addresses are not assigned to the interface on the link.
- RFC3456: Dynamic Host Configuration Protocol (DHCPv4)
Configuration of IPsec Tunnel Mode

DHCPv4 over SW Overview

- Full DHCPv4 configuration over A+P softwires (draft-troan-dhc-dhcpv4osw-00)
- Describes running full DHCPv4:
 - Link-layer supports broadcast. The unspecified address is not port restricted (SA: 0.0.0.0, DA: 255.255.255.255)
 - IPv4 address and ports also learnt
 - All message types (not just DHCPINFORM)
 - Requires the concentrator to be a DHCPv4 server or relay (insert option 82 with CE's IPv6 tunnel endpoint address)
 - *DHCPv4 client (port aware) and server need to be updated for client messages sourced from ports other than 68*

OR

- *RFC5107: DHCP Server Identifier Override Suboption to force all traffic through relay. Then port awareness isn't needed.*

Solution Requirements

1. Minimize the amount of work necessary to implement the solution through re-use of existing standards and implementations as much as possible.
2. Provide a method of supporting all existing DHCPv4 options so that they can be utilized without the need for further standardization.
3. Allow for the dynamic leasing of IPv4 addresses to clients. This allows for more efficient use of limited IPv4 resources.
4. Enable the separation of IPv4 and IPv6 host configuration infrastructure, i.e. independent DHCPv4 and DHCPv6 servers.
5. Avoid leaving legacy IPv4 options in DHCPv6.
6. Provide a flexible architecture to give operators the option of only deploying the functional elements necessary for their specific requirements.
7. Not restricted to specific IPv4 over IPv6 transport mechanisms or architectures.

Solution Comparison

Req. No.	DHCPv4o6	DHCPv6	DHCPv6+ DHCPv4oSW	DHCPv4oSW	DHCPv4oDHCPv6
1	No	Yes	No	Yes	Yes
2	Yes	No	Yes	Yes	Yes
3	Yes	No	No	Yes	Yes
4	Yes	No	Yes	Yes	Yes
5	Yes	No	Yes	Yes	Yes
6	No	No	Yes	Yes	Yes
7	Yes	Yes	No	No	Yes

New items added since v01

New Eval Criteria?

- Suggested on ML by Ole Troan
- Fate sharing. The provisioning of IPv4 addressing and other configuration information should be logically tied to the data-link layer that is used to provide IPv4 connectivity.
 - Intended to bring v4 over v6 provisioning inline with current v4 provisions (no link layer, no config)

Req. No.	DHCPv4o6	DHCPv6	DHCPv6+ DHCPv4oSW	DHCPv4oSW	DHCPv4oDHCPv6
8	No	No	No	Yes	No

- **Should this be included?**
- **If so, does it affect the conclusion?**

Alignment with draft-ietf-softwire-map-dhcp-05

- softwire-map-dhcp describes a way of configuring softwire clients over DHCPv6 (MAP-E, MAP-T) lw4o6)
 - Only for ‘static’ v4 addresses and port sets
 - No additional DHCPv4 options carried
- The v4-configuration describes how to deal with dynamic v4 leasing + carrying ALL DHCPv4 options
- **Propose that cross-references (inform.) are added into both drafts with description on which approach to use**

Current Status and Next Steps

- Next version
 - Further updates from ML discussions
 - Outcome of today's discussions
- Ready for WGLC?