DHCPv4 and DHCPv6 Access-Network-Identifier Options
(draft-bhandari-dhc-access-network-identifier-00)

IETF 84, July 2012

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Motivation/Use Case

• In many deployments there is a need to provide services based on the access network attachment.

• For example:

  Endpoint ------- AP ------- Access Gateway

  – The service treatment can also be different based on the configured SSID in case of IEEE 802.11 based access networks.
  – Shared access networks i.e. radio access & access points owned and possibly operated by other entity than the owner of a access gateway.

Need DHCP options to relay this information from access towards the gateway and server.
Carrying Access Network Information (ANI) in DHCP

• Primary Access Network Information
  – Access-Network-Type – 802.11, ethernet etc
  – Network-Identifier – e.g. SSID, Access Point name
  – Operator-Identifier – e.g. FQDN of the access network operator
Access Network Information in DHCP

• The draft defines new option in DHCPv4:
  – To carry access network information
  – Sub options to carry - Access-Network-Type, Network-Identifier, Operator-Identifier

• New options in DHCPv6
  – To carry access network information
  – Options within access network information option for - Access-Network-Type, Network-Identifier, Operator-Identifier
Next Steps

- WG draft?
- Request detailed review of the options defined
DHCPv6 class based prefix
(draft-bhandari-dhc-class-based-prefix-01)

IETF 84, July 2012

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Motivation: WLAN-EPC Integrated Architecture

- For supporting offload function for certain traffic in chained mobility scenario, the UE needs to use the right source address for the right application flows, based on the offload requirements. The obtained address configuration can be from EPC or from the local domains.
IPv6 Address from multiple APNs – PD1, PD2, PD3

WLAN Access Network

Mobile Packet Core

Motivation – Multiple APN Support

IPv6 Address from multiple APNs – PD1, PD2, PD3

S2a(PMIPv6 or GTP)

PDN Connection (MN: PD1)

PDN Connection (MN: PD2)

PDN Connection (MN: PD3)

SIP Services

HTTP

Default

App-1

App-1 Data

PGW

PGW

PGW

App-2

App-2 Data

App-3

App-3 Data

App-3

MN

MAG

IPv6 Address from multiple APNs – PD1, PD2, PD3

WLAN Access Network

Mobile Packet Core

Motivation – Multiple APN Support
Requirement

• Prefix property to be expressed as an option in DHCPv6
• Prefix property requested by client and requesting router in IA_NA/IA_PD requests
• Prefix property offered in IA_NA/IA_PD response associated with prefixes.
Feedback from IETF83

• Have a stricter format to specify property
• Overlap with option specified in draft-liu-dhc-3gpp-option-01
New Option

- New DHCPv6 option to associate Prefix with its properties:

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----------------+-----------------+-----------------+-----------------+
| OPTION_USAGE_CLASS | option-length(2) |
| +-----------------+-----------------+-----------------+-----------------+
| Class            |
| +-----------------+-----------------+-----------------+-----------------+
~ Vendor Class Data (Optional, variable length) ~
+-----------------+-----------------+-----------------+-----------------+
```

option-code: OPTION_USAGE_CLASS (TBD)
option-length: 2 + Length of Vendor class information if present
Class: 16 bit numeric value maintained as OPTION_USAGE_CLASS enumeration in IANA registered namespace
Vendor Class Data: If the value of Class (3) indicates it is vendor specified additional vendor specified data of variable length will be attached in the form specified below:
New Option

- Vendor specified USAGE_CLASS

<table>
<thead>
<tr>
<th></th>
<th>0123456789012345678901</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPTION_USAGE_CLASS</td>
<td>option-length(2)</td>
</tr>
<tr>
<td>Class</td>
<td>Enterprise ID</td>
</tr>
<tr>
<td>Enterprise ID(4)</td>
<td>Vendor Class length(2)</td>
</tr>
</tbody>
</table>
| ~ Vendor Class Data (Variable length) ~

Enterprise ID: The vendor's 32-bit Enterprise Number as registered with IANA [IANAEnterprise]

Vendor Class Length: 2, length of vendor class data that follows

Vendor Class Data: Binary data as defined by the vendor.
For e.g. 3gpp can specify this data to be Application providers network domain string
Related Work

- IPv6 Prefix Coloring Approach:

- Prefix Property extension to Prefix Information Option in IPv6 Neighbor Discovery messages
  - draft-korhonen-dmm-prefix-properties-02
Next Steps

• Authors appreciate feedback from the WG
• WG draft?
Client Hardware Address Option in DHCPv6
(draft-ietf-dhc-dhcpv6-client-link-layer-addr-opt)

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Problem Statement/Motivation

• **DHCPv4 to DHCPv6 transition**
  – Client hardware address is used as one of the keys to build DHCP client lease database and for accountability
  – Registration database built with MAC address of primary interface (e.g. CPE WAN interface in ISP scenario)

• **Dual stack clients – Correlating DHCPv4 and DHCPv6 messages**
  – DUID in DHCPv4 messages needs modification of DHCPv4 stack (RFC 4361)
  – Chaddr in DHCPv4 correlation with an option in DHCPv6

Learning the link layer address of the actual interface being configured using DHCPv6 not in scope of this draft.
Open issues

WG agrees on first hop relay adding this option learnt from the link layer address of the frame received in Relay forward message.

• Should client add this option too?
  – NO
  – As a Top level option (As Each DHCPv6 exchange by a client is for ONE interface)
  – Within IA_PD or IA_NA option (above is moot)
Approach

1. Go with only Relay adding this option, for the current scope (correlation of v4 and v6)

2. Expand the scope to go beyond just DHCPv4 & DHCPv6 correlation, that will demand Client adding the option too.
Next Steps

• Vote on Approach (1) or (2)?