DHCPv6 - Route Option

Basic Scenario – Multi-homed Client

(Access-network not shown)

- Dual links (physical or logical) from RG1 to Router A and B
- It is desired that RG1 client uses Router B as its default gateway (0/0)
- It is desired that RG1 uses Router A as its primary gateway for destination subnet X/Y. More specific route to X/Y via RouterA is thus required.
- It is required to operate in an environment where per client configuration on the Router is not possible
Background

- DHCPv6 may be used to provision all parameters to hosts except routing information
- This is about configuring static routes in a convenient manner, on demand, not if static routes should exist
- Other methods exist (CLI, SNMP, Web Interfaces, …)
- Not suitable for networks that do dynamic routing (clearly stated in section 4.6 “Limitations”)
DHCPv6 Route Option
Motivation

- Today’s IGPs solve the problem but are often not feasible for large scale deployment
  - Not supported on many CPEs
  - Added operational complexity for the SP to manage on 1000s of devices
  - Challenging to scale (an IP Edge may interface with 1000s of CPEs)
- ICMPv6 (rfc4191) presents an RA based solution however:
  - Does not differentiate between clients that know what to do with the info and those that don’t.
  - Does not easily deal with per host configuration
  - It requires provisioning of the edge router (not always possible, on a per host basis)
  - Doesn’t line up operationally when DHCPv4 RFC3442 is already used
Use-cases

- Key problems being addressed:
  - Deal with cases of multiple interfaces
  - Ability to configure individual hosts on multi-host segments
  - Difficulty or impossibility of managing per host configuration on each edge router
- These are real operational problems & pain points
  - The 14 use-cases all have one or more of the above ingredients. Contributed by:
    - Cellular Network Operators (3GPP)
    - Broadband Operators (BBF)
    - CPE Vendors
    - Individuals
    - ...
Thank you
### Alternative ways forward

<table>
<thead>
<tr>
<th>Vendor Specific Option</th>
<th>Stripped down option</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Define route option under BBF or 3GPP Enterprise code</td>
<td>• Remove from draft default route</td>
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<tr>
<td>• Complicated by both BBF and 3GPP having interest</td>
<td>• Clarify that use with RAs is expected</td>
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<tr>
<td>• IETF Enterprise code?</td>
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