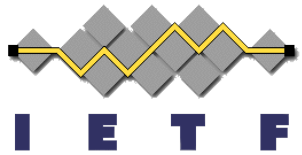
DHC WG
IETF 78

Prefix Exclude Option for DHCPv6-based Prefix Delegation

`draft-korhonen-dhc-pd-exclude-00`



Thursday, July 29, 2010

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Background

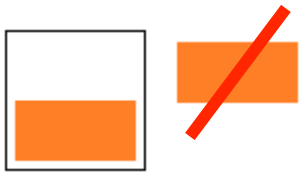
- RFC 3633 prohibits assignment of any of the delegated prefixes to the upstream interface of the requesting router
- This is an issue for deployments where:
  - Unnumbered model is not used
  - Delegated prefixes must be aggregatable with the prefix used in requesting router's upstream interface:
    - Routing efficiency
    - Policy control easier if single prefix / client
  - "Wasting" prefixes is a concern

Rel-10

Existing Solutions

1. Delegating prefixes in small blocks
   - Lots of prefix sets, but very little waste

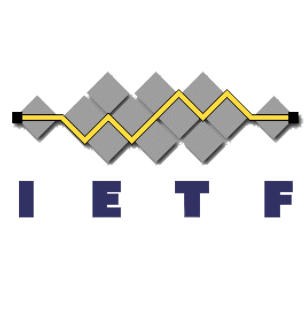
2. DR delegates only half of the reserved prefix to the requesting router
   - Wasting ~half of the addresses



3. Non-aggregatable prefixes
   - Increased complexity (e.g. double routes)

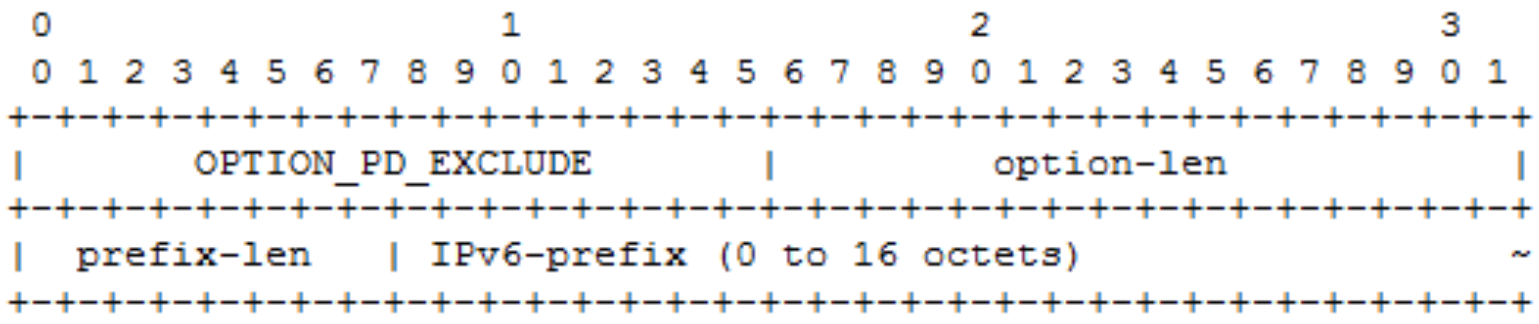
4. Unnumbered model
   - Strong no go in some architectures

Proposed Solution – Exclude specific prefix(es)

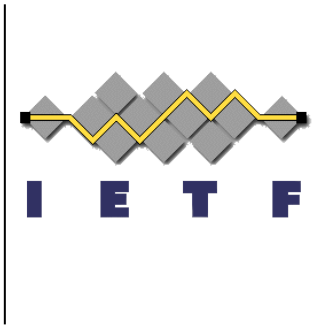


- New IAprefix option for OPTION_IAPREFIX (RFC3633):
  - OPTION_PD_EXCLUDE
  - Defines a hole in the delegated prefix

- Modified RR indicates support for the new option
- Modified DR uses optimization when possible
  - Otherwise may use e.g. the ”waste half” approach

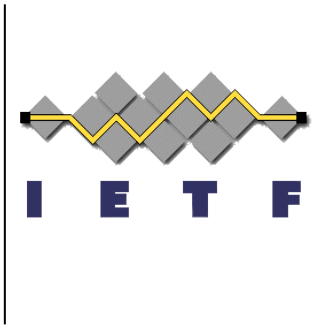


Example (3GPP minded)



- Requesting Router (e.g. a mobile device) is first allocated /64 for its uplink interface with SLAAC
- Requesting Router informs Delegating Router about support for OPTION_PD_EXCLUDE and includes the /64 obtained from SLAAC (may help DR in its decision making, also for reliability)
- DR replies with delegated prefix & cuts a piece away
  - Ensures the prefix told by RR is not part of delegated prefix
  - May cut larger piece than single /64

Summary



- Optional optimization for prefix delegation for certain network architectures
  - Other SDOs / deployments may mandate support
- Feature introduced as an option for OPTION_IAPREFIX
- Backwards compatible for both RR and DR

DHC WG to adopt this piece of work?

Feedback?