Autonomic IPv6 Edge Prefix Management in Large-scale Networks

draft-ietf-anima-prefix-management-00

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Reminder – Motivation

- To validate the application and reusability of Anima components.

- In large networks, prefix management still depends on human planning. Management of IPv6 prefixes is rigid and static after initial planning.

- The autonomic networking mechanism is to dynamically and autonomically manage IPv6 address space in large-scale networks.

- Ideally, administrators just configure a single IPv6 prefix for the whole network and the initial prefix length for each device role.

Reminder – Overview

- A prefix requesting device needs more address space.

  - ➢ Discovers peer devices that may be able to provide extra address space by GRASP Discovery message for the `PrefixManager` objective.

  - ➢ Then negotiates with a discovered peer for the needed address space using GRASP messages.

- In a single administrative domain, the network operator manages all `PrefixManager` devices with the same Intent rules, flooded using GRASP.

- Discovery, negotiation & flooding messages go through the secure Autonomic Control Plane (ACP).

Main Changes in WG –00 draft

- Focus is on prefix management at the network edge (i.e. assume that core is already numbered).

  ➢ But the solution is not restrictive.

- The description is now much more specific about the usage of GRASP.

- The mechanism is now intended to be "PD friendly".

  ➢ If nodes support DHCPv6 Prefix Delegation, it will be used.

  ➢ If not, the GRASP negotiation itself will delegate a prefix.

GRASP objectives (1)
in CDDL notation

```
objective = ["PrefixManager", objective-flags,
   loop-count, PD-support, length, ?prefix]

loop-count = 0..255              ; see GRASP spec

objective-flags /=               ; see GRASP spec

PD-support = true / false    ; indicates if sender
                                   supports PD

length = 0..128                  ; requested/offered
                                     prefix length

prefix = bytes .size 16      ; offered prefix in
                                     binary
```

GRASP objectives (2)
in CDDL notation

```
objective = ["Intent.PrefixManager",
    objective-flags, loop-count, text]



loop-count = 0..255              ; see GRASP spec

objective-flags /=               ; see GRASP spec



; The text object would be the relevant intent
    statements (format TBD) transmitted as a
    single string. Alternatively, we would use the
    proposed CBOR encoding for yang.
```

Next Steps

- Reviews and comments wanted, of course.

- We also want a volunteer to try writing a prototype PrefixManager ASA.

  ➢ Easiest would be to write in Python 3 since there is a prototype GRASP implementation and API.