



Universal Configuration Information Option

draft-troan-6man-universal-ra-option-04

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IETF 109, 6man WG

<https://github.com/ietf-6man/universal-ra>

Changes since IETF 104

- s/Experimental/Proposed Standard/g
- Added DHCPv6 support
- New co-author: Tim Winters

Problem

- Working group spends an inordinate amount of time arguing over proposed new RA (or DHCPv6) options. Some arguments go "since I don't need it, let's not standardize it."
- Does the working group add value to the set of problems where an RA is used as a general carrier?
- Every new option requires implementation changes both in router OS / management system and in host's RA processing engine

Contributions

- **Technical:** A self-describing option format. JSON objects modelled in CDDL, encoded in CBOR.

Allows new options to be added *without* implementation changes in router OS or kernel.

- **Process:** This option space is not a constrained resource. Options can be specified directly in IANA registry with expert review.

No 6MAN WG involvement required for defining new objects. This is how DHC options are handled now.

Router Advertisement / DHCPv6 as a generic carrier

- A general mechanism to publish information objects from network (routers) to hosts. Without requiring specific RA/DHCPv6 sending and processing implementation changes for new objects. (e.g. userland application registers for interest in a "key" and gets notified by RA processing.)
- Useful for 1:N communication, but can be modified with 1:1 with unicast RA / RS Option request option. (DHCPv6 is always 1:1)
- Uses a self-describing encoding format (CBOR) modelled in CDDL (Concise Data Definition language). I.e. a JSON object modelled in CDDL encoded in CBOR.

Universal RA/DHCPv6 format

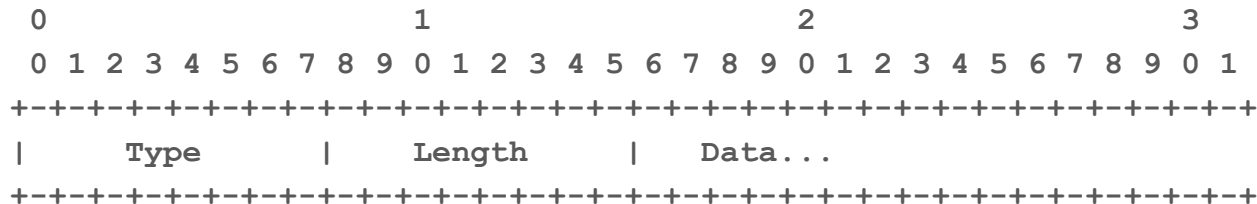


Figure 1: Universal RA Option Format

Fields:

- Type 42 for Universal RA Option
- Length The length of the option (including the type and length fields) in units of 8 octets.
- Data CBOR encoded JSON padded to the nearest 8 octet boundary.

Can be distributed across multiple packets. Single option size is limited to $2^8 \times 8 = 2048 - 2$ bytes.

Only allowed in RA.
Obsolete RFC4833? ;-)

JSON object:

```
{
  "ietf": {
    "dns": {
      "dnssl": ["example.com"],
      "rdnss": ["2001:db8::1", "2001:db8::2"]
    },
    "nat64": {
      "prefix": "64:ff9b::/96"
    }
  }
}
```

```
ietf = {
  ? dns : dns
  ? nat64: nat64
  ? ipv6-only: bool
  ? pvd : pvd
  ? mtu : uint .size 4
  ? rio : rio
}
pio = {
  prefix : tstr
  ? preferred-lifetime : uint
  ? valid-lifetime : uint
  ? a-flag : bool
  ? l-flag : bool
}
rio_route = {
  prefix : tstr
  ? preference : (0..3)
  ? lifetime : uint
  ? mtu : uint .size 4
}
```


IANA

- New IANA registry for the universal CI option.
- CDDL described objects
- Self contained in IANA registry (or a stable reference)
- Expert review
 - Expert should have the option to punt to WG if IETF document required.

Implementations / Candidates

- Implementations

- VPP

- <https://github.com/vpp-dev/vpp/commit/156db316565e77de30890f6e9b2630bd97b0d61d>

- Tomek's hackathon work

- <https://gitlab.isc.org/isc-projects/kea/wikis/hackathon/slaac>

- Candidate CI options

- PvDs: *draft-ietf-intarea-provisioning-domains*

- Network boot option: *draft-qin-6man-nb-option*

- Pref64

- 64sharev2

- OMNI draft-templin-6man-omni-option

- Equivalent Encrypted DNS resolvers draft-paully-add-deer-00

- draft-li-6man-6hosts-detection

Discussion

- Process: What's the consequences of "letting go"?
 - IANA considerations
 - Requirements for Expert Review
 - Would this result in a plethora of non-interoperable options?
- Technical track:
 - Message size
 - Encoding improvements, Modelling language
 - Dealing with conflicting information
- Next steps:
 - **Adoption**