A Generic IPv6 Addresses Registration Solution Using DHCPv6

draft-jiang-dhc-addr-registration-02

IETF 81 DHC WG

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History

- **"The Requirements for Addresses Registration"**
  - draft-jiang-6man-addr-registration-req
  - Was presented in IETF 79 6man WG & IETF 80 DHC WG
- **Reached the consensus**
  - Requirement to registering host-generated address is needed
  - DHCPv6 is suitable for Addresses Registration

- **The requirement description is also integrated as part of this solution draft**

Generic Address Registration Procedure

```
+----------+                      +------------+        +-------------+
|  Host    |                      |Local Router|        |DHCPv6 Server|
+----------+                      +------------+        +-------------+
     |                                  |                      |
     |Addr Register Solicitation(1a)|                          |
     |<-----------------------------|                          |
     |            Addr Register Solicitation(1b)               |
     |<-------------------------------------------------------|
     |                                                         |
     |Send self-generation addr registration request(2)|      |
     |------------------------------------------------------->|
     |                                                  |Register
     |                                                  |the addr
     |   Reply granting or rejected acknowledgment (3)  |
     |<------------------------------------------------------|
```
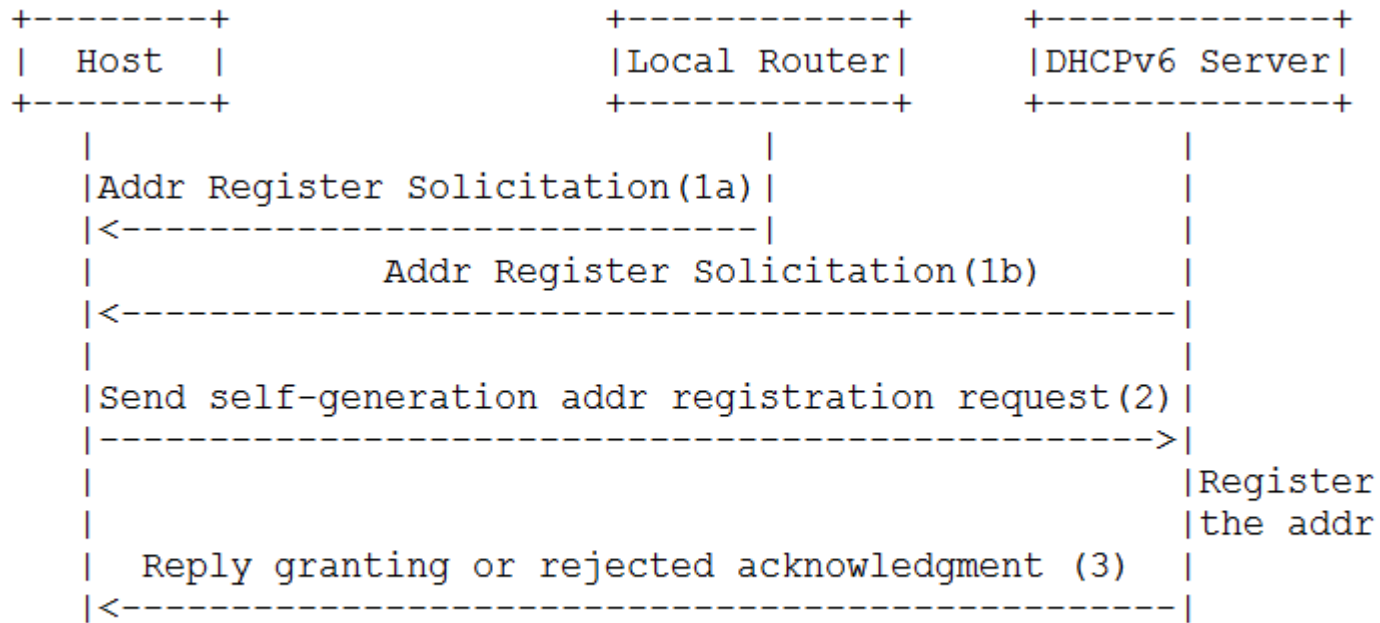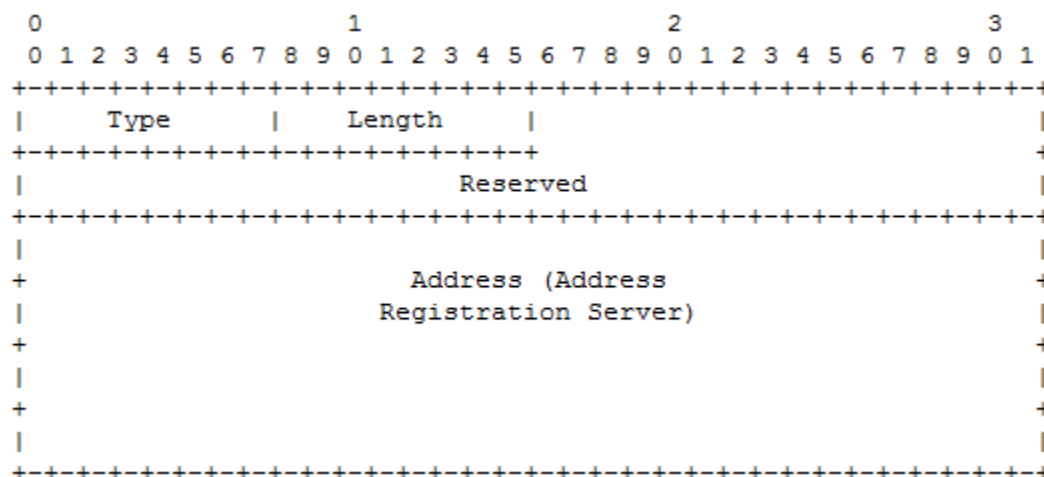
Figure 1: address registration procedure

- **The network management plate firstly propagates the solicitations of registering self-generated addresses, by messages from either local router (step 1a) or DHCPv6 server (step 1b)**
- **Host using the self-generated address SHOULD send an address registration request message to the network management (step 2)**
- **The network management MAY check whether the requested address is accepted**
- **An acknowledgement is sent to the host, granting the usage of this address or reject it (step 3)**

Propagating the Address Registration Solicitation

- **In principle, hosts must receive a prefix from network either by RA message or DHCPv6 so that they can generate an IPv6 address by themselves. The Address Registration Solicitation options could be propagated together with prefix assignment information.**

- ## ND Address Registration Solicitation

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Type       |     Length      |                           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+                           +
|                            Reserved                           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
+                      Address (Address                         +
|                    Registration Server)                       |
+                                                               +
|                                                               |
+                                                               +
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
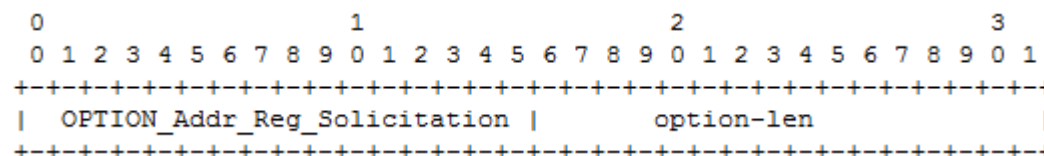
[Open Question to WG] Should the new ND option carry IPv6 address of the default address registration server? Or this can be discovered by DHCPv6 discovery mechanism?

Should we use FQDN instead of Address?

Multiple address registration servers?

- ## DHCPv6 Address Registration Solicitation

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   OPTION_Addr_Reg_Solicitation  |          option-len         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

[Open Question to WG] is length 0 allowed?

DHCPv6 Address Registration Procedure

- **Identity Association for Non-temporary Addresses (IA_NA) is reused**
- **The host with self-generated address(es) sends a DHCPv6 Request message to the DHCPv6 server**
    - The DHCPv6 Request message SHOULD contain at least one IA_NA option.
    - The IA_NA option SHOULD contain at least one IA Address option.
    - T1 and T2 fields in any IA_NA options, and the preferred-lifetime and valid-lifetime fields in the IA Address options SHOULD be set to 0.
- **The DHCPv6 server sends a Reply message as the response to registration requests**
    - The DHCPv6 Reply message SHOULD contain at least one IA_NA option.
    - The IA_NA option SHOULD contain at least one IA Address option.
    - A Status Code option SHOULD be contained in the IA_NA-options field in order to indicate the successful or failure of the registration operations involving this IA_NA. As defined in [RFC3315], Code 0 means 'Success', Code 1 stands 'Failure'. [Open Question to WG] In the rejected scenarios, should we also give the different reasons by different value? [Current definition in this draft does NOT]
    - In the success scenarios, T1, T2, preferred-lifetime and valid-lifetime SHOULD follow the rules defined in [RFC3315]. In the failure scenarios, T1, T2, preferred-lifetime and valid-lifetime fields SHOULD be set to 0.

Comments are welcomed!

Adopt as WG document?

Thank You!