Configuring CGA using DHCPv6

draft-jiang-dhc-cga-config-02

Requirements for Addresses Registration

draft-jiang-6man-addr-registration-req-01

IETF 80 DHC WG

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Configuring CGA using DHCPv6
draft-jiang-dhc-cga-config-02

- The requirements & motivation was supported by IETF 79 attendants
- The DHC option has been modified according to comments in IETF 79
  - DHCPv6 CGA Sec Option and DHCPv6 Address Grant Option has been integrated into CGA Grant Option (v01->v02)
  - Only indicate the recommended CGA Sec when request CGA is refused
- Suresh suggested generic address registration mechanism might be better
  - Sheng: also like generic address registration, see draft-jiang-6man-addr-registration-req
  - Sheng: even if generic address registration mechanism exists, we need CGA-specific option, either a CGA Sec Option or a CGA Grant Option (DHCP server needs to indicate host recommended CGA Sec)
Requirements for Addresses Registration
draft-jiang-6man-addr-registration-req-01

- **Was presented in IETF 79 6man WG**
- **Internet ADs (Jari & Ralph) did not sure about the requirements**
  - Jari: the requirements may not be necessary
  - Ralph: the current DHC protocol can fulfill these requirements
- **6man WG made the choice**
  - Question: if we need such mechanism, do we extend DHCPv6 or RA, or both, or a new protocol
  - 6man WG: DHCPv6 is suitable
Problems and Requirements

- Host self-generated addresses notionally conflict with the network managed address architecture
  - Addresses in IPv6 Stateless Address Auto-Configuration [RFC4862, RFC4941] scenario
  - Cryptographically Generated Addresses (CGA, [RFC3972])
- Many operators of enterprise networks and similarly tightly administered networks have expressed the desire to hold on to network managed address model when moving to IPv6
  - Networks may reject the access request from host-generated addr
  - Disable host-generated addresses, also SLAAC and CGA
- Ideal scenario: if the self-generated IPv6 addresses are used, they may need to be registered in and granted by the networking management plate
Generic Address Registration Procedure

The server checks the acceptance of addresses, including verifying uniqueness, holds all registered addresses, and may interact with other network functions, such as DNS or ACL.

May need to propagate the default/enforced address registration server.

Step 1 needs to extend DHC (or RA)
Step 3 may be able to (to be discussed) reuse IA Address Option with IA_NA or IA_TA.
• Questions, clarifications?

• Adopted as WG document?
Backup Slides

Configuring Cryptographically Generated Addresses (CGA) using DHCPv6

draft-jiang-dhc-cga-config

IETF 79, DHC WG
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Requirements & Motivation

- CGAs may be used in DHCPv6-managed networks
  - Designed for SeND, also used in Shim6, Mobile IPv6, etc.
- Network administrators may want to configure parameters used to generate CGAs and manage the use of CGAs
  - CGAs are normally generated by hosts
  - Network management configures/enforces CGA relevant parameters to hosts
  - DHCPv6 server approves or rejects the usage of CGAs
- New DHCPv6 options are needed to be able to fulfill the functions
CGA Configure Process Using DHCPv6

- **Configuration of the parameters required for the generation of CGA**
  - Parameters may be configured by network management
  - Prefix (RA or DHCP prefix assignment)
  - **Sec value** (new DHCPv6 option in this draft)
  - Public Key (not suitable for network transmission for security reasons)
  - Extension Fields (no use yet)

- **DHCPv6 server approves or rejects the usage of CGAs**
  - Hosts send Option Request option, which requests Address Grant Option (new DHCPv6 option, defined in this draft)
  - CGAs are carried in the IA Address Options
  - Servers reply a Address Grant Option
  - Upon reception of the ack, hosts use approved CGA or generate new one
  - Interaction procedure is described in details
New DHCPv6 Options

- DHCPv6 CGA Sec Option is used to carry a Sec value

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

On receiving the CGA Sec Option, the client SHOULD generate a CGA using a Sec value that is not lower than the option indicated; the client MAY choose to generate a CGA using a lower sec value.

- DHCPv6 Address Grant Option to indicate the DHCPv6 client whether the requested address is granted or not

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----------------------------------------------
| OPTION ADDR GRANT | option-len |
+-----------------------------------------------
| Addr Grant |
+-----------------------------------------------
```
Integrated CGA Grant Option
(changed according to IETF 79 comments)

- The CGA_Grant field sets all 1 (FFx) when a client requests granting from server
- It sets F0x to indicate that the requested CGA is granted; it sets 00x to indicate that the requested Address is declined without any recommended Sec value
- It sets 01x~07x to indicate that requested Address is declined and the recommended Sec value (value from 1~7)
• Change Log
  - Removed CGA generation delegation

Comments are welcomed!
Should the WG work on this?

Thank You!