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**DHCPv6 Relay Agent Assignment Notification (RAAN) Option
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Abstract

The DHCP Relay Agent Assignment Notification (RAAN) option is sent from a DHCP server to a DHCP relay agent to inform the relay agent of IPv6 addresses that have been assigned or IPv6 prefixes that have been delegated to DHCP clients.

1. Introduction

The DHCP Relay Agent Assignment Notification (RAAN) option encapsulates address and prefix options to indicate that an address or prefix has been assigned. The option may also carry other information required by the network element for configuration related to the assigned address or prefix.

For example, a network administrator uses the RAAN option to inform a relay agent of a prefix that has been delegated through DHCP PD to a DHCP client. The relay agent notifies the network element on which it is implemented of the delegation information so the network element can add routing information about the delegated prefix into the appropriate routing protocols.

2. Terminology

The key words MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL in this document are to be interpreted as described in [RFC 2119](#) [1].

The term "DHCP" in this document refers to DHCP for IPv6, as defined in [RFC 3315](#) [2]. The terms "DHCP prefix delegation" and "DHCP PD" refer to DHCP for IPv6 prefix delegation, as defined in [RFC 3633](#) [3].

Additional terms used in the description of DHCP and DHCP prefix delegation are defined in [RFC 3315](#) and [RFC 3633](#). In this document "assigning" an IPv6 prefix is equivalent to "delegating" a prefix.

3. Option semantics

The RAANn option carries information about assigned IPv6 addresses and prefixes. It encapsulates an IA Address option ([RFC 3315](#)) or an IA Prefix option ([RFC 3633](#)), and possibly other options that carry other information related to the assigned IPv6 address or prefix.

The DHCP server MAY include this option in a Reply message sent to a client that includes assigned addresses and/or prefixes. If the DHCP server does include this option in a Reply message, it MUST include it in the option area of the Relay-reply message sent to the relay agent intended as the recipient of the option.

The DHCP server is responsible for synchronizing any state created by a node through the use of the RAAN option. For example, if a DHCP server receives a Release message for a delegated prefix, it causes the node to delete any state associated with that prefix by sending

The contents of options encapsulated in the RAAN option are interpreted according to the use of those options in the node on

which the relay agent is implemented. For the purposes of address and prefix assignment, the uses of the DHCP IA Address and IA Prefix options are defined in this document.

Note that the contents of these options are not necessarily the same as in the corresponding options sent to the DHCP client. For example, the node that receives the information from these options may be instructed to use the information for a shorter period of time than the client by setting a shorter valid-lifetime in the this option.

5.1. IA Address option

The fields in an IA Address option (OPTION_IAADDR, option code 5) are used as follows:

IPv6 address The IPv6 address assigned in this DHCP message

preferred-lifetime Not used at the time this document was published

valid-lifetime The expiration lifetime of the information carried in this IA Address option, expressed in units of seconds; the expiration-lifetime is a relative time, giving the duration relative to the current time of the information in this IA Address option; if the valid-lifetime is 0, the information is no longer valid.

IAAddr-options Not used

5.2. IA Prefix option

The fields in an IA Prefix option (OPTION_IAPREFIX, option code 28) are used as follows:

preferred-lifetime Not used

valid-lifetime The expiration lifetime of the information carried in this IA Prefix option, expressed in units of seconds; the expiration-lifetime is a relative time, giving the duration relative to the current time of the information in this IA Prefix option; if the valid-lifetime is 0, the information is no longer valid.

prefix-length length for this prefix in bits

IPv6-prefix The IPv6 prefix assigned in this DHCP message

IAPrefix-options Not used at the time this document was published

6. Requesting assignment information from the DHCP server

If a relay agent requires the DHCP server to provide information about assigned addresses and prefixes, it MUST include an Option Request option, requesting the Assignment Notification option, as described in [section 22.7 of RFC 3315](#).

7. Reordering received DHCP messages

The relay agent MUST use the Server Reply Sequence Number (SRSN) option [4] to detect and discard RAAN options contained in DHCP messages that are received out of order.

8. IANA considerations

IANA is requested to assign an option code from the "DHCPv6 and DHCPv6 options" registry <http://www.iana.org/assignments/dhcpv6-parameters> to OPTION_AGENT_NOTIFY.

9. Security considerations

Security issues related to DHCP are described in [RFC 3315](#) and [RFC 3633](#).

The RAAN option may be used to mount a denial of service attack by causing a node to incorrectly populate an ACL or incorrectly configure routing protocol information for a delegated prefix. This option may also be used to insert invalid prefixes into the routing infrastructure or add invalid IP addresses to ACLs in nodes. Communication between a server and a relay agent, and communication between relay agents, can be secured through the use of IPSec, as described in [section 21.1 of RFC 3315](#).

10. Changes in this revision

If this section is included in the document when it is submitted for publication, the RFC Editor is requested to remove it.

Changes in rev -01:

- o Added section describing use of "Server Reply Sequence Number" option to allow resequencing of out-of-order messages

11. Normative References

- [1] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [2] Droms, R., Bound, J., Volz, B., Lemon, T., Perkins, C., and M. Carney, "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", [RFC 3315](#), July 2003.
- [3] Troan, O. and R. Droms, "IPv6 Prefix Options for Dynamic Host Configuration Protocol (DHCP) version 6", [RFC 3633](#), December 2003.
- [4] Volz, B. and R. Droms, "DHCPv6 Server Reply Sequence Number Option", [draft-volz-dhc-dhcpv6-srsn-option-00](#) (work in progress), August 2006.

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