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Lifetime Option for DHCPv6

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Abstract

This document describes an option for specifying a lifetime for other DHCPv6 configuration options. It's mainly intended for the stateless DHCPv6, but is also useful when there are no addresses or other entities with lifetimes that can tell the client when to contact the DHCP server to update its configuration.

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1. Introduction

DHCPv6 [RFC 3315] specifies stateful autoconfiguration for IPv6 hosts. However, many hosts will use stateless autoconfiguration as specified in [RFC 2462] for address assignment, and use DHCPv6 only for other configuration data. This other configuration data will typically have no associated lifetime, hence there may be no information telling a host when to update its DHCP configuration data.

This option may be useful in unstable environments where unexpected changes are likely to occur, or for planned changes, including renumbering where an administrator can gradually decrease the value as the event nears.

It may also be useful to allow the client to detect within an appropriate time when a specific service change has been made, e.g. the addition of a new NTP server, or a change of address of a DNS server within the local network. See [RENUMREQS] for further details.

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 BCP 14, RFC 2119 [RFC 2119].

3. Lifetime option definition

The lifetime option specifies a lifetime for all configuration data contained in other options in an advertise or reply message that have no associated lifetime. This means that it does not effect e.g. the IA Address option which contains a lifetime.

3.1. Client behaviour

A client supporting this option MAY include it in the Option Request Option (ORO) when sending messages to the DHCP server that allows ORO to be included.

A client MUST ignore this option if the lifetime is set to zero.

If client has received a lifetime with this option, and contacts server to receive new or update any existing data prior to its expiration, it SHOULD also update data covered by this option. If no new lifetime is received, it MUST behave as if no value was ever provided.

When the client detects that the lifetime has expired, it SHOULD try to update its configuration data by making a new DHCP request as follows.

Before making the request it MUST wait for a random amount of time between 0 and INF_MAX_DELAY. INF_MAX_DELAY is defined in [RFC 3315].

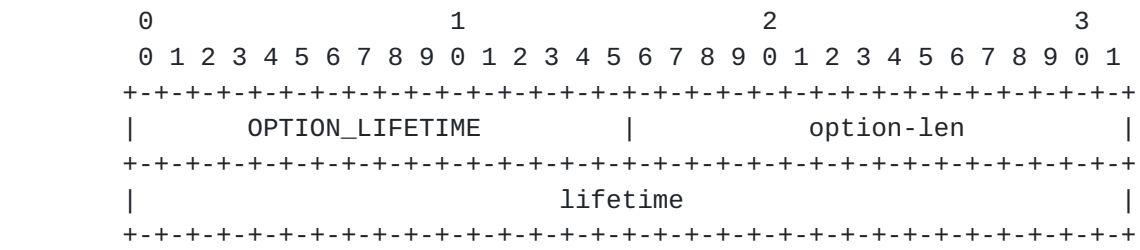
Then it can make the DHCP request to update the configuration. The message MUST be created and transmitted according to [RFC 3315]. E.g. for an Information-request message it must be done according to the rules for creation and transmission of Information-request messages in section 18.1.5 of [RFC 3315].

3.2. Server behaviour

A server sending an Advertise or Reply message containing options, SHOULD include this option if requested by client, or if none of the options contained in the message have associated lifetimes. The option MAY also be used in other cases when server sends Advertise or Reply messages. It MUST not be used when server sends other types of messages. The lifetime MUST be non-zero.

3.3. Option format

The format of the Lifetime option is:



option-code: OPTION_LIFETIME (to be decided)

option-len: 4

lifetime: lifetime in seconds

4. IANA Considerations

IANA is requested to assign an option code to the lifetime option from the DHCP option-code space defined in section "IANA Considerations" of RFC 3315.

5. Acknowledgements

The authors thank Mat Ford, Ted Lemon, Thomas Narten, A.K. Vijayabhaskar and Bernie Volz for valuable discussions and comments.

6. Security Considerations

An attacker may be able to send a fake DHCP reply with a very low lifetime value. This could make a client request new data almost immediately. The client will however quickly back off.

7. References

7.1. Normative References

[RFC 2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC 2462] S. Thomson, T. Narten, "IPv6 Stateless Address Autoconfiguration", RFC 2462, December 1998.

[RFC 3315] R. Droms, Ed., J. Bound, B. Volz, T. Lemon, C. Perkins, M. Carney, "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", RFC 3315, July 2003.

7.2. Informative References

[RENUMREQS] T. Chown, S. Venaas, A.K. Vijayabhaskar, "Renumbering Requirements for Stateless DHCPv6", work-in-progress, draft-ietf-dhc-stateless-dhcpv6-renumbering-00, March 2004.

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