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S. Venaas  
UNINETT

T. Chown  
University of Southampton

B. Volz  
Cisco Systems, Inc.

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## **Information Refresh Time Option for DHCPv6**

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## Abstract

This document describes a DHCPv6 option for specifying an upper bound for how long a client should wait before refreshing information retrieved from DHCPv6. It is used with stateless DHCPv6 as there are no addresses or other entities with lifetimes that can tell the client when to contact the DHCPv6 server to refresh 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, see [[RFC 3736](#)]. This other configuration data will typically have no associated lifetime, hence there may be no information telling a host when to refresh its DHCPv6 configuration data. Therefore, an option that can be used from server to client to inform the client when it should refresh the other configuration data is needed.

This option is useful in many situations:



- Unstable environments where unexpected changes are likely to occur.
- For planned changes, including renumbering. An administrator can gradually decrease the time as the event nears.
- Limit the amount of time before new services or servers are available to the client, such as the addition of a new NTP server or a change of address of a DNS server. See [\[RENUMREQS\]](#).

## **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. Information refresh time option definition**

The information refresh time option specifies an upper bound for how long a client should wait before refreshing information retrieved from DHCPv6. It is only used in Reply messages in response to Information-Request messages. In other messages there will usually be other options that indicate when the client should contact the server, e.g. addresses with lifetimes.

Note that it is only an upper bound. If the client has any reason to make a DHCPv6 request before the refresh time expires, it should attempt to refresh all the data.

A client may contact the server before the refresh time expires. Reasons it may do this include the need for additional configuration parameters (such as by an application), a new IPv6 prefix announced by a router, or that it has an indication it may have moved to a new link.

The refresh time option specifies a common refresh time for all the data. It doesn't make sense to have different refresh time values for different data, since when the client has reason to refresh some of its data, it should also refresh the remaining data. Because of this, the option must only appear in the options area of the Reply message.

The expiry of the refresh time in itself does not in any way mean that the client should remove the data. The client should keep its



current data while attempting to refresh it. The client is however free to fall back to other mechanisms if it cannot refresh the data within a reasonable amount of time.

When a client receives a Reply to an Information-Request that contains configuration information (i.e., does not contain a Status Code option), it should install that new configuration information after removing any previously received configuration information. It should also remove information that is missing from the new information set, e.g. an option might be left out or contain only a subset of what it did previously.

### **3.1. Constants**

We define two constants for use by the protocol. How they are used is specified in the sections below.

IRT\_DEFAULT 86400

In some cases the client uses a default refresh time IRT\_DEFAULT. The recommended value for IRT\_DEFAULT is 86400 (24 hours). The client implementation should allow for this value to be configurable.

IRT\_MINIMUM 600

This defines a minimum value for the refresh time.

### **3.2. Client behaviour**

A client MUST include this option in the Option Request Option (ORO) when sending Information-Request messages to the DHCPv6 server. A client MUST NOT include this option in the ORO in any other messages.

If the Reply to an Information-Request message does not contain this option, the client MUST behave as if the option with value IRT\_DEFAULT was provided.

A client MUST use the refresh time IRT\_MINIMUM if it receives the option with a value less than IRT\_MINIMUM.

As per [section 5.6 of \[RFC 3315\]](#), the value 0xffffffff is taken to mean "infinity" and implies that the client should not refresh its configuration data without some other trigger (such as detecting movement to a new link).

If a client contacts the server to obtain new data or refresh some existing data before the refresh time expires, then it SHOULD also



refresh all data covered by this option.

When the client detects that the refresh time has expired, it SHOULD try to update its configuration data by sending an Information-Request as specified in [section 18.1.5 of \[RFC 3315\]](#), except that the client MUST delay sending the first Information-Request by a random amount of time between 0 and INF\_MAX\_DELAY.

### **3.3. Server behaviour**

A server sending a Reply to an Information-Request message SHOULD include this option if it is included in the ORO of the Information-Request.

The option value MUST NOT be smaller than IRT\_MINIMUM. The server SHOULD give a warning if it is configured with a smaller value.

The option MUST only appear in the options area of Reply messages.

### **3.4. Option format**

The format of the information refresh time option is:

```

      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-code               |               option-len       |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|               information-refresh-time   |                               |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

option-code

OPTION\_INFORMATION\_REFRESH\_TIME (to be decided)

option-len

4

information-refresh-time

Time duration relative to the current time, expressed in units of seconds





#### **4. IANA Considerations**

IANA is requested to assign an option code for the information refresh time option from the DHCPv6 option-code space [[RFC 3315](#)].

#### **5. Acknowledgements**

The authors thank Mat Ford, Tatuya Jinmei, Ted Lemon, Thomas Narten, Joe Quanaime and A.K. Vijayabhaskar for valuable discussions and comments.

#### **6. Security Considerations**

[Section 23 of \[RFC 3315\]](#) outlines the DHCPv6 security considerations. This option does not change these in any significant way. An attacker could send faked Reply messages with a low information refresh time value, which would trigger use of IRT\_MINIMUM to minimize this threat, or with a large or infinite value which would be no worse than a client that does not make use of this option.

#### **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.
- [RFC 3736] R. Droms, "Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6", [RFC 3736](#), April 2004.

##### **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-01](#), March 2004.



## Authors' Addresses

Stig Venaas  
UNINETT  
NO-7465 Trondheim  
Norway  
EMail: venaas@uninett.no

Tim Chown  
University of Southampton  
School of Electronics and Computer Science  
Southampton, Hampshire S017 1BJ  
United Kingdom  
EMail: tjc@ecs.soton.ac.uk

Bernard Volz  
Cisco Systems, Inc.  
1414 Massachusetts Ave.  
Boxborough, MA 01719  
USA  
EMail: volz@cisco.com

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