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Time Configuration Options for DHCPv6
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Abstract

This document describes the options for Time related configuration information in DHCPv6: NTP Servers and IEEE 1003.1 POSIX Timezone specifier.

1. Introduction

This document describes the options for time related configuration information in DHCPv6 [[4](#)].

2. Requirements

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

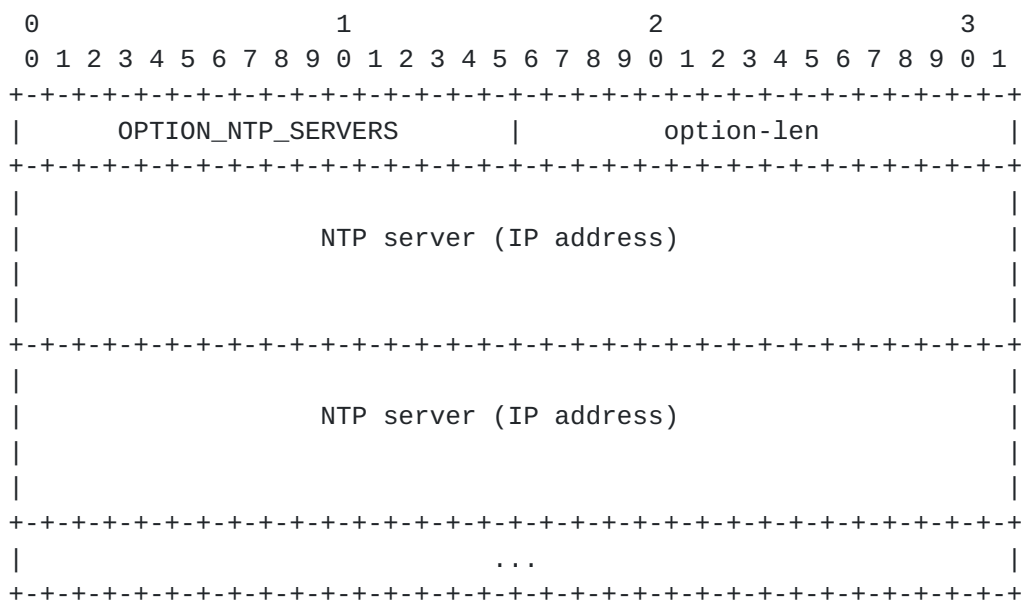
3. Terminology

This document uses terminology specific to IPv6 and DHCPv6 as defined in section "Terminology" of the DHCP specification.

4. Network Time Protocol (NTP) Servers option

The Network Time Protocol Servers option provides a list of one or more IP addresses of NTP [2] servers available to the client. The NTP servers SHOULD be listed in the order of preference.

The format of the Network Time Protocol Servers option is as shown below:



option-code: OPTION_NTP_SERVERS (tbd)

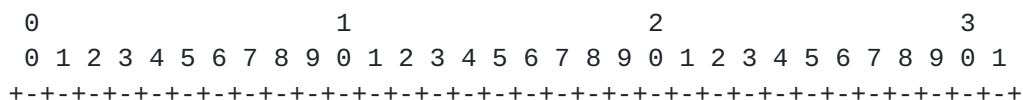
option-len: Length of the 'NTP server' fields in octets; It must be a multiple of 16

NTP server: IP address of NTP server

5. IEEE 1003.1 POSIX Timezone option

The IEEE 1003.1 POSIX Timezone option is used by the server to convey client's timezone information to the client.

The format of the IEEE 1003.1 POSIX Timezone option is:



OPTION_TIME_ZONE	option-len
time-zone	
...	

option-code: OPTION_TIME_ZONE (tbd)

option-len: Length of the 'time-zone' field in octets

time-zone: Time zone of the client in IEEE 1003.1 POSIX Timezone format [3].

The format of the IEEE 1003.1 POSIX timezone string is specified as follows:

StdOffset[Dst[Offset],[Start[/Time],End[/Time]]]

where '[' and ']' enclose optional fields, '|' indicates choice of exactly one of the alternatives, ',' and '/' represent literal characters present in the string.

Std Three or more octets for the standard timezone (Std). Any character (or case) except a leading colon, digits, comma, minus or plus sign is allowed.

Offset Indicates the value one must add to local time to arrive at UTC, of the form: [+|-]hh[:mm[:ss]]. Offset following Std is required. Digits are always interpreted as decimal number. If preceded by a '-', the timezone is east of the Prime Meridian, otherwise it is west ('+' is optional) The permissible values for hh[:mm[:ss]] are as follows:

hh 0 <= hh <= 23

mm 0 <= mm <= 60

ss 0 <= ss <= 60

Offset has no default value.

Dst Three or more octets for the daylight savings timezone. If Dst is missing, then daylight savings time does not apply in this locale. If no Offset follows Dst, then Dst is assumed to be one hour ahead of standard time. Any character (or case) except a leading colon, digits, comma, minus or plus sign is allowed.

Start Indicates the day of the year, in one of the formats indicated below, when to change to daylight savings time. The ``Time'' field (which follows immediately after a ``/'' character, if present) indicates when the change is made, in local time.

End Indicates the day of the year, in one of the formats indicated below, when to change back from daylight savings time. The ``Time'' field (which follows immediately after a ``/' ' character, if present) indicates when the change is made, in local time.

Time Time has the same format as Offset, except that no leading ``-'' or ``+' is permitted. The default is 02:00:00.

The day of the year needs to be given in any of the following formats:

Jn The julian day *n*, ($1 \leq n \leq 365$). Leap days are not counted.

n Zero-based julian day, ($0 \leq n \leq 365$). Leap days are counted so it is possible to refer to Feb 29.

Mm.n.d The ``d''th day, ($0 \leq d \leq 6$) of week ``n'' of month ``m'' of the year ($1 \leq n \leq 5$, $1 \leq m \leq 12$, where week 5 means last ``d'' day in month ``m'' which may occur in either the fourth or the fifth week. Week ``1'' is the first week in which the ``d'' day occurs.

An Example:

For Eastern USA time zone, 1986, the Posix timezone string is as shown below:

```
EST5EDT4,116/02:00:00,298/02:00:00
```

In this case, ``5'' is the Offset for Std, and ``4'' is the Offset for Dst. Start is the 116th day at 2am, and End is 298th day at 2am.

6. Appearance of these option

The NTP servers and IEEE 1003.1 POSIX Timezone options MUST appear only in the following messages: Solicit, Advertise, Request, Confirm, Renew, Rebind, Information-Request, Reply.

7. Security Considerations

The NTP servers option may be used by an intruder DHCP server to cause DHCP clients to contact an intruder NTP server, resulting in invalid synchronization of time in client and finally leading to time critical applications running inaccurately in client machine.

The IEEE 1003.1 POSIX Timezone option may be used by an intruder DHCP server to assign invalid time zones, leading to timing issues for the applications running on the client machine.

To avoid attacks through these options, the DHCP client SHOULD use authenticated DHCP (see section "Authentication of DHCP messages" in the DHCPv6 specification [4]).

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8. IANA Considerations

IANA is requested to assign an option code to these options from the option-code space defined in section "DHCPv6 Options" of the DHCPv6 specification [4].

References

- [1] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [2] D. Mills. Simple Network Time Protocol (SNTP) Version 4 for IPv4, IPv6 and OSI. Request for Comments (Informational) [2030](#), Internet Engineering Task Force, October 1996.
- [3] IEEE, "1003.1 POSIX Timezone Specification", 1988.
- [4] Bound, J., Carney, M., Perkins, C., Lemon, T., Volz, B. and R. Droms (ed.), "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", [draft-ietf-dhc-dhcpv6-23](#) (work in progress), February 2002.

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