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Neighbor Discovery Information over DHCP
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Abstract

Neighbor discovery options, in addition to being used for Neighbor Discovery, are used to convey some forms of network configuration information to the hosts attached to a network. Some centrally managed networks, that do not wish to configure their routers to advertise these pieces of information, might use a DHCP server to configure there parameters. This document defines a generic DHCP option for carrying these parameters.

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1. Requirements notation

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 [[RFC2119](#)].

2. Introduction

Router Advertisements (RAs) as defined in [[RFC2461](#)] are used to deliver configuration information that is common to several nodes in the same network. The router advertisements are usually multicasted to all nodes in a given network in order to be scalable. The configuration information is contained in Neighbor Discovery (ND) options. DHCP [[RFC3315](#)] is used for delivering addressing information and other related configuration information to single clients when they request it. Since there are two mechanisms for delivering configuration information to a given node, configuration parameters need to be defined under two varying option formats. This leads to duplication of work needed to standardize these options and additional implementation complexity on hosts in order to process these option variants. In order to prevent this duplication, this document proposes a DHCP option that can be used to directly carry any neighbor discovery option.

[3.](#) Applicability

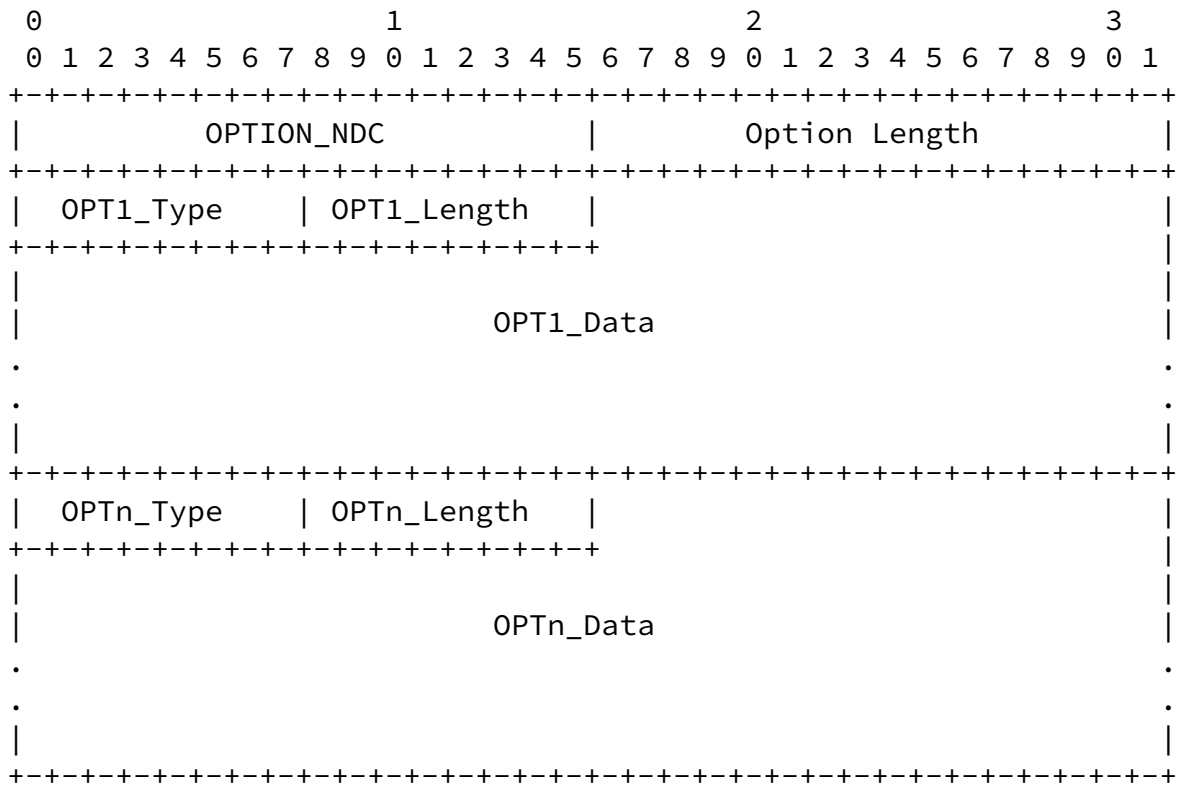
It is possible to carry any neighbor discovery option using the NDC option. This does not always make sense since there are neighbor discovery options that are not related to configuration. The NDC option SHOULD NOT be used to carry neighbor discovery options that are not related to configuration. e.g. Source Link-layer Address, Target Link-layer Address etc.

[4.](#) Operation

After a DHCP client receives a message that contains a NDC option it needs to verify if the NDC option length is at least 8 octets. If it is not, the client **MUST NOT** process the NDC option any further and **SHOULD** log an error message locally. Otherwise it needs to process the embedded Neighbor Discovery options one at a time as it would if it had received them through a Router Advertisement. It is entirely possible that the code for processing these options is shared between the RA based delivery and DHCP based delivery of these options.

[5.](#) Neighbor Discovery Container(NDC) Option

The DHCP NDC option is used to carry complete neighbor discovery options. There can be more than one neighbor discovery option that is contained in a NDC. The number of contained options is not explicitly mentioned in the NDC. The receiving node needs to process all the contained options



OPTION_NDC

DHCP Option code allocated for the NDC option. To be allocated by IANA out of the dhcpv6 parameters for option codes.

Option Length

Length of the NDC option in octets not including the Option Code and the Option Length fields. i.e. Combined length of the included neighbor discovery options.

OPT1_Type

The neighbor discovery option type of the first included option.

OPT1_Length

The length of the first included option (including the

OPT1_Type and OPT1_Length fields) in units of 8 octets. The value 0 is invalid.

OPT1_Data

The data field of the first included neighbor discovery option. The contents of this field are determined by the type of the option.

OPTn_Type

The neighbor discovery option type of the nth included option.

OPTn_Length

The length of the nth included option (including the OPT1_Type and OPT1_Length fields) in units of 8 octets. The value 0 is invalid.

OPTn_Data

The data field of the nth included neighbor discovery option. The contents of this field are determined by the type of the option.

Figure 1: NDC layout

6. IANA Considerations

This document defines a new DHCPv6 option code for carrying neighbor discovery options. IANA is requested to assign the following new DHCPv6 Option Code in the registry maintained at

<http://www.iana.org/assignments/dhcpv6-parameters>:

OPTION_NDC

7. Security Considerations

The mechanism described in this document provides a method by which one or more neighbor discovery options can be carried using DHCP messages. The DHCP messages containing the NDC option may be intercepted, modified or replayed in order to communicate false configuration data to the client hosts. In order to prevent these kinds of attacks, it is recommended that authenticated DHCP [[RFC3118](#)] be used.

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8. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2461] Narten, T., Nordmark, E., and W. Simpson, "Neighbor Discovery for IP Version 6 (IPv6)", [RFC 2461](#), December 1998.
- [RFC3118] Droms, R. and W. Arbaugh, "Authentication for DHCP Messages", [RFC 3118](#), June 2001.
- [RFC3315] Droms, R., Bound, J., Volz, B., Lemon, T., Perkins, C., and M. Carney, "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", [RFC 3315](#), July 2003.

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