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**The DHCPv4 Relay Agent Identifier Suboption
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Abstract

This draft defines a new Relay Agent Identifier suboption for the Dynamic Host Configuration Protocol's (DHCP) Relay Agent Information option. The suboption carries a value that uniquely identifies the relay agent device within the administrative domain. The value is normally administratively-configured in the relay agent. The suboption allows a DHCP relay agent to include the identifier in the DHCP messages it sends.

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1. Introduction

The Dynamic Host Configuration Protocol for IPv4 (DHCPv4) [[RFC2131](#)] provides IP addresses and configuration information for IPv4 clients. It includes a relay agent capability, in which network elements receive broadcast messages from clients and forward them to DHCP servers as unicast messages. In many network environments, relay agents add information to the DHCP messages before forwarding them, using the Relay Agent Information option [[RFC3046](#)]. Servers that recognize the relay agent information option echo it back in their replies.

This specification introduces a Relay Agent Identifier suboption for the Relay Agent Information option. The Relay-Id suboption carries a sequence of octets that is intended to uniquely identify the relay agent within the administrative domain.

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 [[RFC2119](#)].

DHCPv4 terminology is defined in [[RFC2131](#)], and the DHCPv4 Relay Agent Information Option in [[RFC3046](#)].

3. Example Use-Cases

3.1. Bulk Leasequery

There has been quite a bit of recent interest in extending the DHCP Leasequery protocol [[RFC4388](#)] to accommodate some additional situations. There is a recent draft ([\[I-D.ietf-dhc-dhcpv4-bulk-leasequery\]](#)) proposing a variety of enhancements to the existing Leasequery protocol. The draft describes a use-case where a relay agent queries DHCP servers using the Relay Identifier to retrieve all the leases allocated through the relay agent.

3.2. Industrial Ethernet

DHCP typically identifies clients based on information in their DHCP messages - such as the Client-Identifier option, or the value of the chaddr field. In some networks, however, the location of a client - its point of attachment to the network - is a more useful identifier. In factory-floor networks (commonly called 'Industrial' networks),

for example, the role a device plays is often fixed and based on its location. Using manual address configuration is possible (and is common) but it would be beneficial if DHCP configuration could be applied to these networks.

One way to provide connection-based identifiers for industrial networks is to have the network elements acting as DHCP relay agents supply information that a DHCP server could use as a client identifier. A straightforward way to form identifier information is to combine something that is unique within the scope of the network element, such as a port/slot value, with something that uniquely identifies that network element, such as a Relay Agent Identifier.

4. Suboption Format

Format of the Relay Agent Identifier suboption:

```

      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
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|SUBOPT_RELAY_ID|   length   |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
.
.           identifier (variable)
.
+-----+-----+-----+-----+-----+-----+-----+-----+

```

Where:

SUBOPT_RELAY_ID [TBA]

length the number of octets in the suboption
 (excluding the suboption ID and length fields);
 the minimum length is one.

identifier the identifying data.

5. Identifier Stability

If the relay identifier is to be meaningful it has to be stable. A relay agent SHOULD use a single identifier value consistently. The identifier used by a relay device SHOULD be committed to stable storage, unless the relay device can regenerate the value upon

reboot.

Administrators **MUST** make sure that the relay-id configured in a relay agent is unique within their administrative domain. To aid this, relay agents **SHOULD** make their relay identifiers visible to their administrators via their user interface, through a log entry, or through some other mechanism.

Implementors should note that the identifier needs to be present in all DHCP message types where its value is being used by the DHCP server. The relay agent may not be able to add the Relay Agent Information option to all messages - such as RENEW messages sent as IP unicasts. In some deployments that might mean that the server has to be willing to continue to associate the relay identifier it has last seen with a lease that is being RENEWed. Other deployments may prefer to use the Server Identifier Override suboption [[RFC5107](#)] to permit the relay device to insert the Relay Agent Information option into all relayed messages.

Handling situations where a relay agent device is replaced is another aspect of "stability". One of the use-cases for the relay identifier is to permit a server to associate clients' lease bindings with the relay device connected to the clients. If the relay device is replaced, because it has failed or been upgraded, it may be desirable for the new device to continue to provide the same relay identifier as the old device. Implementors should be aware of this possibility, and consider making it possible for administrators to configure the identifier.

6. Security Considerations

Security issues with the Relay Agent Information option and its use by servers in address assignment are discussed in [[RFC3046](#)] and [[RFC4030](#)]. Relay agents who send the Relay Agent Identifier suboption **SHOULD** use the Relay Agent Authentication suboption [[RFC4030](#)] to provide integrity protection and to avoid duplication of relay identifiers by malicious entities.

7. IANA Considerations

We request that IANA assign a new suboption code from the registry of DHCP Agent Sub-Option Codes maintained in <http://www.iana.org/assignments/bootp-dhcp-parameters>.

Relay Agent Identifier Suboption [TBA]

8. Acknowledgments

Thanks to Bernie Volz, David W. Hankins, Pavan Kurapati and Ted Lemon for providing valuable suggestions.

9. References

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