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The DHCPv4 Relay Agent Identifier Suboption
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Status of this Memo

Abstract

This memo 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. The value may be administratively-configured or may be generated by 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 information option echo it back in their replies.

This specification introduces a Relay Agent Identifier suboption for the Relay Information option. The Relay-Id suboption carries an sequence of octets that is intended to identify the relay agent uniquely within the administrative domain. The identifier may be administratively configured: in some networks it may be adequate to assign ASCII strings such as "switch1" and "switch2". Alternatively, the identifier may be generated by the relay agent itself, and we specify use of [RFC3315] DUIDs for this purpose.

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]. DUID terminology is in [RFC3315].

3. Example Use-Cases

3.1. 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

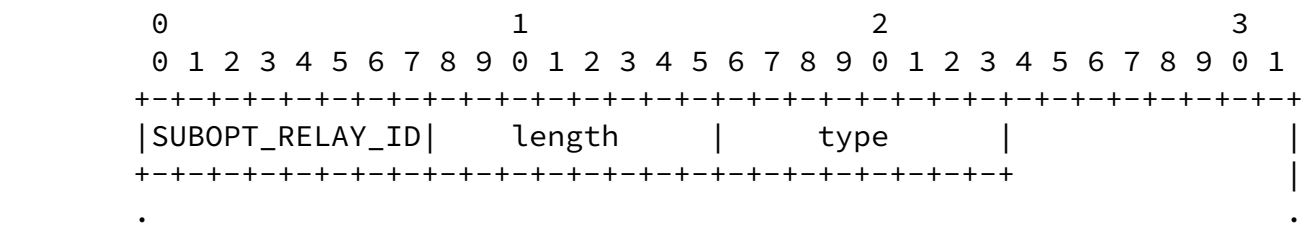
supply information that a DHCP server could use as a client identifier. A straightforward way to form identifier information is to combine something that is unique within the scope of the network element, such as a port/slot value, with something that uniquely identifies that network element, such as a unique identifier.

3.2. Bulk Leasequery

There has been quite a bit of recent interest in extending the DHCP Leasequery protocol [RFC4388] to accomodate some additional situations. There are two recent drafts ([draft-kinnear] and [draft-dtv]) proposing a variety of enhancements to the existing Leasequery protocol. Both describe cases where identifying the DHCP relay agent would be helpful in restoring binding information associated with the client downstream from the device acting as a relay.

4. Suboption Format

Format of the Relay Agent Identifier suboption:



```
.                       identifier (variable)                   .
.                                                               .
+---------------------------------------------------------------+
```

Where:

SUBOPT_RELAY_ID	[TBD]
length	the number of octets in the suboption; the minimum length is one.
type	a single octet describing the type of identifier that is present.
identifier	the identifying data.

5. Relay Identifier Types

For clarity, the suboption specified here includes a type octet that describes the data used in the identifier field. The type value zero is reserved and MUST NOT be used. Two type values are defined here: RELAY_IDENTIFIER_DUID and RELAY_IDENTIFIER_ASCII. RELAY_IDENTIFIER_DUID is used when the identifier field contains an [RFC3315] DUID. Administrators may want to assign human-friendly ASCII identifiers: RELAY_IDENTIFIER_ASCII is used when the identifier field contains an ASCII string.

6. Generating a Relay Identifier

As described in Section 1, in some situations it may be useful for network devices to generate identifiers themselves. Relay agents who send the Relay Agent Identifier suboption using identifiers that are not administratively-configured MUST be generated following the procedures in the DUID section of [RFC3315]. Relay agents who use generated identifiers SHOULD make the generated value visible to their administrators via their user-interface, through a log entry, or through some other mechanism.

7. 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.

8. 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 [TBD]

We request that IANA establish a new registry of DHCP Relay Agent Identifier Sub-Option Types, to be maintained in http://www.iana.org/assignments/bootp-dhcp-parameters. The Identifier Type is a single octet. The initial values assigned in this document are:

RELAY_IDENTIFIER_NULL 0
RELAY_IDENTIFIER_DUID 1
RELAY_IDENTIFIER_ASCII 2

Additional Identifier Type values will be allocated and assigned through IETF consensus, as defined in [RFC2434].

9. References

9.1. Normative References

[RFC2131] Droms, R., "Dynamic Host Configuration Protocol", RFC 2131, March 1997.

[RFC2434] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 2434, October 1998.

[RFC3046] Patrick, M., "DHCP Relay Agent Information Option", RFC 3046, January 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.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC4030] Stapp, M. and T. Lemon, "The Authentication Suboption for the Dynamic Host Configuration Protocol (DHCP) Relay Agent Option", RFC 4030, March 2005.

9.2. Informative References

[RFC4388] Woundy, R. and K. Kinnear, "Dynamic Host Configuration Protocol (DHCP) Leasequery", RFC 4388, February 2006.

[draft-kinnear] Kinnear, K., Volz, B., Russell, N., and M. Stapp, "Bulk DHCPv4 Lease Query (draft-kinnear-dhc-dhcpv4-bulk-leasequery-*)", July 2008.

[draft-dtv] Rao, D., Joshi, B., and P. Kurapati, "DHCPv4 bulk lease query (draft-dtv-dhc-dhcpv4-bulk-leasequery-*)", July 2008.

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