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N. Swamy
Nokia
G. Halwasia
P. Jhingran
Cisco Systems
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Client Identifier Option in DHCP Server Replies
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Abstract

This document updates RFC2131 [RFC2131]. The changes to [RFC2131] defined in this draft clarifies the use of 'client identifier' option by the DHCP servers. The clarification addresses the issues arising out of the point specified by [RFC2131] that the server 'MUST NOT' return client identifier' option to the client.

Requirements

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].

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1. Introduction

The Dynamic Host Configuration Protocol (DHCP) defined in [RFC2131] provides configuration parameters to hosts on a TCP/IP based network. DHCP is built on a client-server model, where designated DHCP server allocate network addresses and deliver configuration parameters to dynamically configured hosts.

The changes to [RFC2131] defined in this document clarifies the use of 'client identifier' option by the DHCP servers. The clarification addresses the issues arising out of the point specified by [RFC2131] that the server 'MUST NOT' return client identifier' option to the client and thus facilitates DHCP relay agents and hosts to process downstream DHCP messages (DHCP OFFER, DHCP ACK and DHCP NAK) when a DHCP client sets the 'chaddr' field as zero in DHCP request messages.

2. Problem Statement

[RFC2131] specifies that a combination of 'client identifier' or 'chaddr' and assigned network address constitute a unique identifier for the client's lease and are used by both the client and server to identify a lease referred in any DHCP messages. [RFC2131] also specifies that the server "MUST NOT" return 'client identifier' in DHCP OFFER and DHCP ACK messages. DHCP relay agents and servers, following these recommendations MAY drop the DHCP packets in the absence of both 'client identifier' and 'chaddr'.

In some cases, client may not be having valid hardware address value to be filled in 'chaddr' field of the packet and hence may set this field as zero. One such example is when DHCP is used to assign IP address to a mobile phone or a tablet and where the 'chaddr' field is set to zero in DHCP request packets. In such cases, client usually sets the 'client identifier' option field (to a value as permitted in [RFC2131]), and both client and server use this field to uniquely identify the client within a subnet.

Note that due to above mentioned recommendations in [RFC2131], valid downstream DHCP packets (DHCP OFFER, DHCP ACK and DHCP NAK) from the server MAY get dropped at the DHCP relay agent in the absence of 'client identifier' option when 'chaddr' field is set as zero.

The problem may get aggravated when a client receives a response from the server without 'client identifier' and with 'chaddr' value set to zero, as it cannot guarantee that the response is intended for it. This is because even though the 'xid' field is present to map responses with requests, this field alone cannot guarantee that a particular response is for a particular client, as 'xid' values

generated by multiple clients within a subnet need not be unique.

This document attempts to address these problems faced by DHCP relay agent and client by proposing modification to DHCP server behavior. The proposed solution is in line with DHCPv6 [RFC3315] where the server always includes the Client Identifier option in the Reply messages.

3. Proposed Modification To [RFC2131]

If the 'client identifier' option is set in a message received from a client, the server MUST return the 'client identifier' option, unaltered, in its response message.

Following table is extracted from section 4.3.1 of [RFC2131] and relevant fields are modified accordingly to overcome the problems mentioned in this document.

Option -----	DHCPOFFER -----	DHCPACK -----	DHCPNAK -----
Client identifier (if sent by client)	MUST	MUST	MUST
Client identifier (if not sent by client)	MUST NOT	MUST NOT	MUST NOT

4. IANA Considerations

This memo asks the IANA for no new parameters.

5. Security Considerations

No known security considerations.

6. Acknowledgements

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7. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC2131] Droms, R., "Dynamic Host Configuration Protocol", RFC 2131, March 1997.
- [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.

Authors' Addresses

Narasimha Swamy Nelakuditi
Nokia
Visiokatu 3
Tampere, 33720
Finland

Phone: +358 50487 2126
Email: narasimha.nelakuditi@nokia.com

Gaurav Halwasia
Cisco Systems
SEZ Unit, Cessna Business Park
Sarjapur Marathalli Outer Ring Road
Bangalore, 560103
India

Phone: +91 80 4426 1321
Email: ghalwasi@cisco.com

Prashant Jhingran
Cisco Systems
SEZ Unit, Cessna Business Park
Sarjapur Marathalli Outer Ring Road
Bangalore, 560103
India

Phone: +91 80 4426 1800
Email: pjhingra@cisco.com

