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DHCP reconfigure extension

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Abstract

This draft defines extensions to DHCP [DHCP] to allow dynamic reconfiguration of a single host triggered by the DHCP server (eg. a new IP address). This is achieved by introducing a unicast FORCERENEW message which forces the client to the RENEW state. The behaviour for hosts using the DHCP INFORM message to obtain configuration information is also described.

1. Introduction

The procedures as described within this draft allow the dynamic reconfiguration of individual hosts.

1.1 Conventions

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 RFC 2119 [RFC2119].

2. DHCP force renew

This section describes the FORCERENEW message extension.

2.1 Terminology

DHCP client : host to be reconfigured using DHCP.

DHCP server : server which configured the DHCP client.

2.2 Force renew procedures

The DHCP server sends a unicast FORCERENEW message to the client. Upon receipt of the unicast FORCERENEW message, the client will change its state to the RENEW state, and will then try to renew its lease according to normal DHCP procedures. If the server wants to assign a new IP address to the client, it will reply to the DHCP REQUEST with a DHCP NAK. The client will then go back to the init state and broadcast a DHCP DISCOVER message. The server can now assign a new IP address to the client by replying with a DHCP OFFER. If the FORCERENEW message is lost, the DHCP server will not receive a DHCP REQUEST from the client and it should retransmit the FORCERENEW message using an exponential backoff algorithm. Depending on the bandwidth of the network between server and client, the server should choose a delay. This delay grows exponentially as retransmissions fail. The amount of retransmissions should be limited.

The procedures described above assume the server to send a unicast FORCERENEW message to the client. Receipt of a multicast FORCERENEW message by the client should be silently discarded.

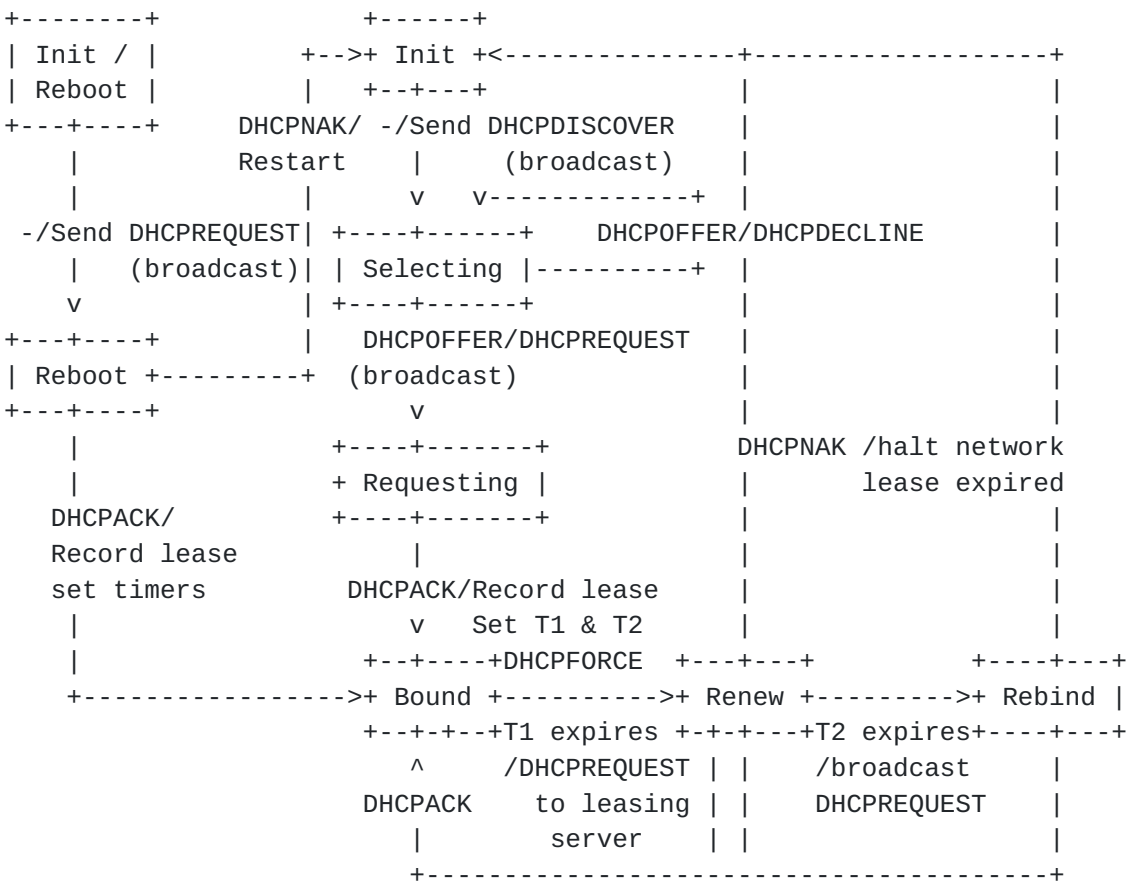
It can be that a client has obtained a network address through some other means (e.g., manual configuration) and has used a DHCP INFORM request to obtain other local configuration parameters. Such clients should respond to the receipt of a unicast FORCERENEW message with a new DHCP INFORM request so as to obtain a potential new set of local configuration parameters.

2.3 Rationale

This approach has a number of advantages. It does not require new states to be added to the DHCP client implementation. This minimizes

the amount of code to be changed. It also allows lease RENEWAL to be driven by the server, which can be used to optimize network usage or DHCP server load.

3. Extended DHCP state diagram



4. Message layout

The FORCERENEW message makes use of the normal DHCP message layout with the introduction of a new DHCP message type. DHCP option 53 (DHCP message type) is extended with a new value : DHCPFORCERENEW (TBD)

5. IANA Considerations

The new value for DHCP option 53 (DHCP message type) to indicate a DHCPFORCERENEW message is TBD.

6. Security Considerations

As in some network environments FORCERENEW can be used to snoop and

spoof traffic, the FORCERENEW message MUST be authenticated using the procedures as described in [DHCP-AUTH]. FORCERENEW messages failing the authentication should be silently discarded by the client.

7. References

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

[DHCP-AUTH] R. Droms et al., "Authentication for DHCP Messages", RFCxxxx, yyyy 2001.

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

8. Acknowledgements

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