A Proposal for DNR Theory of Operation

https://tools.ietf.org/html/draft-ietf-add-dnr

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Proposal

- If DNSSEC is supported by the client
  - The client uses {ADN+IP Address List}
  - Then, issues SVCB queries to that list to resolve discovered ADN(s)

- If DNSSEC is not supported
  - The client uses {ADN+IP Address List+Port+Encrypted DNS Flags} returned in DNR option(s)

To avoid probing

  - If the client supports both DoT and DoH (or both DoQ and DoH), the client established a DoT (or DoQ) connection and uses SVCB to retrieve the URI Templates *assuming the resolver supports DoT or DoQ*

  - If DoH-only, the client MUST add “URI Templates” to the list of requested information
    - To avoid external attacks, including SVCB blocking

Simplified Proposal

- **DoH implementations MUST support DoT**
- If DNSSEC is supported by the client
  - The client uses {ADN+IP Address List}
  - Then, issues SVCB queries to that list to resolve discovered ADN

- If DNSSEC is not supported
  - The client uses {ADN+IP Address List+Port+Encrypted DNS Flags} returned in DNR option(s)

  - ~~If the client supports both DoT and DoH (or both DoQ and DoH),~~ the client established a DoT (or DoQ) connection and uses SVCB to retrieve the URI Templates ~~*assuming the resolver supports DoT or DoQ*~~

  - ~~If DoH-only, the client MUST add "URI Templates" to the list of requested information~~
    - ~~To avoid external attacks, including SVCB blocking~~

Simplified Proposal: Is it an Option?

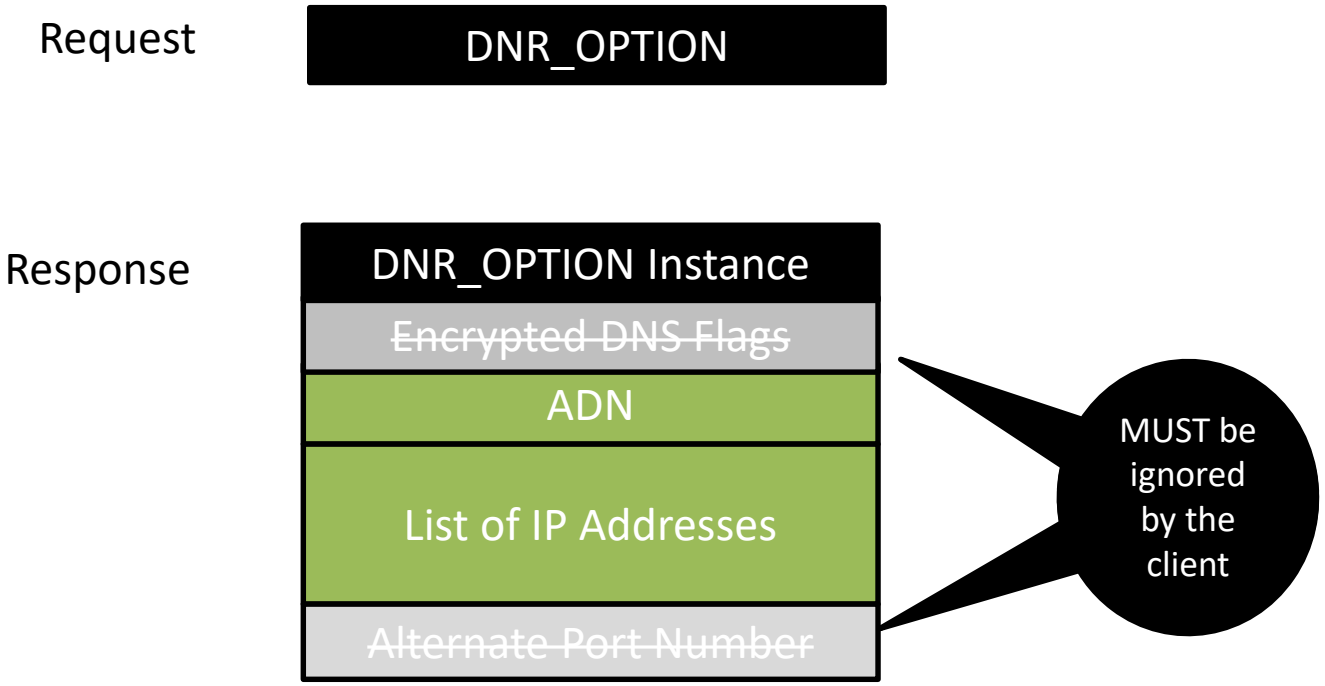
- **DoH implementations MUST support DoT**

This updates RFC8484

This is beyond the WG charter that is about discovery not about imposing capabilities of discovered servers

How To Achieve the Intended Behavior with the Same Option(s)?

The client supports DNSSEC

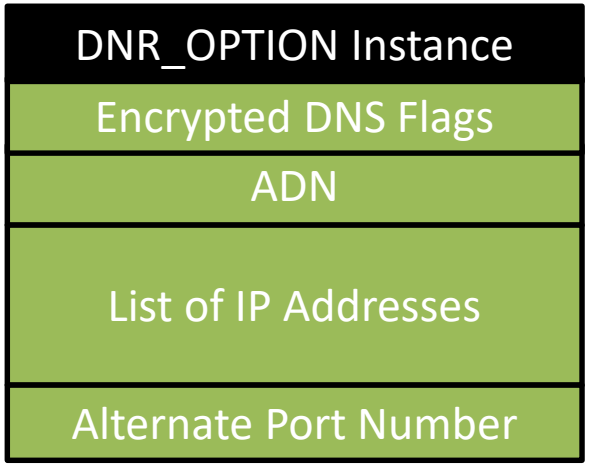


How To Achieve the Intended Behavior with the Same Option(s)?

The client does not support DNSSEC but at least DoT or DoQ are supported:

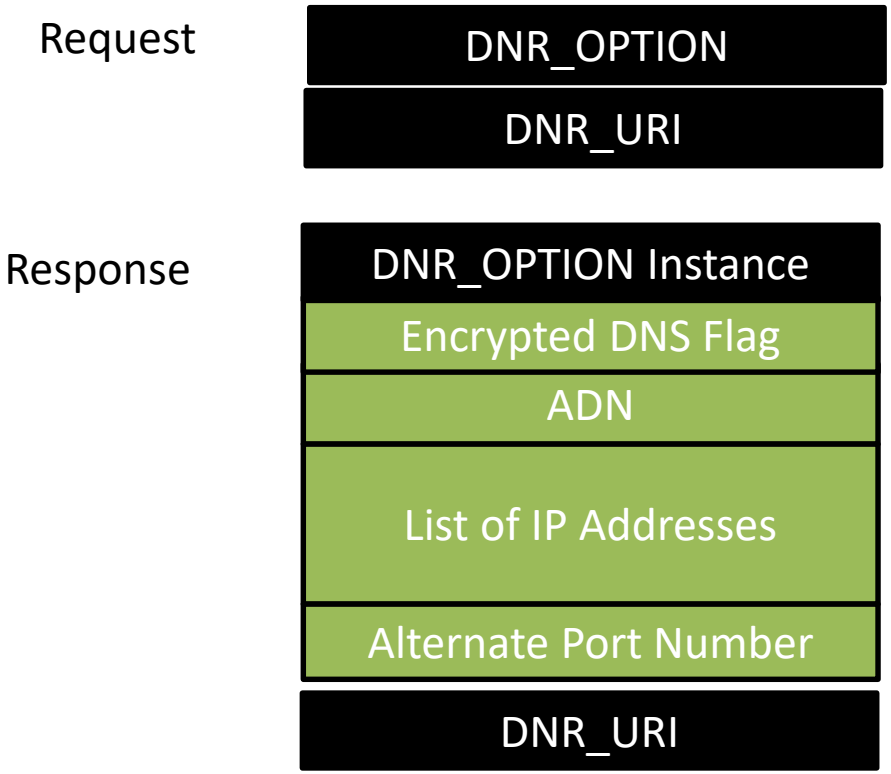
Request

Response



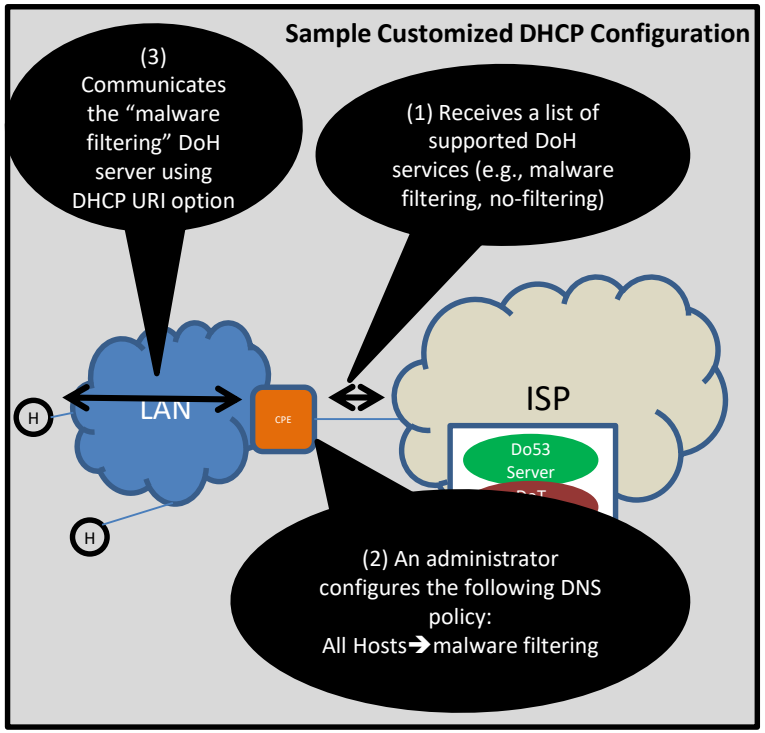
How To Achieve the Intended Behavior with the Same Option(s)?

The client does not support DNSSEC + DoH-only (client):



Issue: Customized Local URI Templates

- Why?
  - Provide a customized DNS configuration within a local network
- Advantage
  - Does ***not interfere*** with DNS exchanges to "customize" the available services
  - If the CPE is not acting as a forwarder for the encrypted DNS, it has no means to enforce the policy



Suggestions:

- Define RA/DHCP options to convey URI Templates
- These options, when available, take precedence over DDR

Next Steps

- Implement the outcome of the discussion
- Edits and clarification to take into account Michael and Yan's comments
  - https://github.com/ietf-wg-add/draft-ietf-add-dnr/issues/
- Please review and share comments

Backup

Sync DDR and DNR

- DHCP servers can issue SVCB queries and cache the results
- That cache can be used to populate the DHCP options

- See, for example, **RFC 7969**

" Depending on the server capability and configuration, it may cache resolved responses for a specific period of time, repeat queries every time, or even keep the response until reconfiguration or shutdown. For more detailed discussion, see Section 7 of [RFC7227].”