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ISC
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EDNS X-Proxied-For
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Abstract

It is becoming more commonplace to install front end proxy devices in front of DNS servers to provide (for example) load balancing or to perform transport layer conversions.

This document defines an option within the EDNS(0) Extension Mechanism for DNS that allows a DNS server to receive the original client source IP address when supplied by trusted proxies.

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[1.](#) Introduction

It is becoming more commonplace to install front end proxy devices in front of DNS servers [[RFC1035](#)] to provide (for example) load balancing or to perform transport layer conversions.

This has the unfortunate side effect of hiding the clients' source IP addresses from the server, making it harder to employ server-side technologies that rely on knowing those address (e.g. ACLs, DNS Response Rate Limiting, etc).

This document defines an option within the EDNS(0) Extension Mechanism for DNS [[RFC6891](#)] that allows a DNS server to receive the original client source IP address when supplied by trusted proxies.

This specification is only intended for use on server-side proxy devices that are under the same administrative control as the DNS servers themselves. As such there is no change in the scope within which any private information might be shared.

[2.](#) Terminology

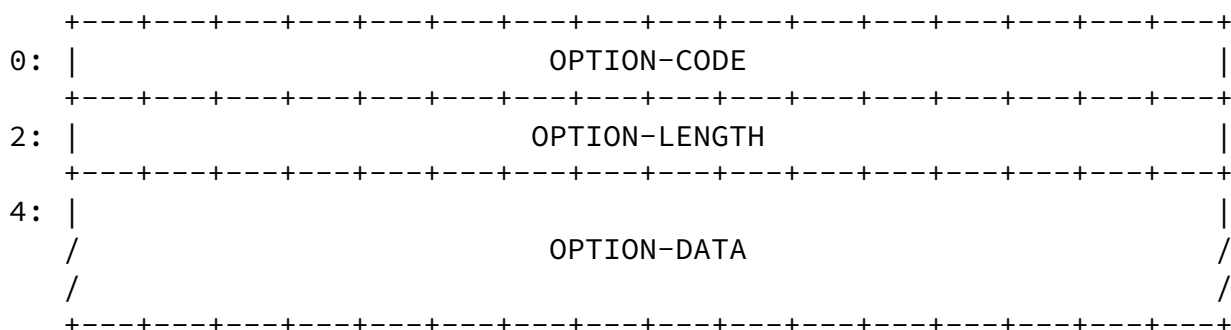
The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",

"SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in "Key words for use in RFCs to Indicate Requirement Levels" [[RFC2119](#)].

[3.](#) Description

[3.1.](#) EDNS Option Format

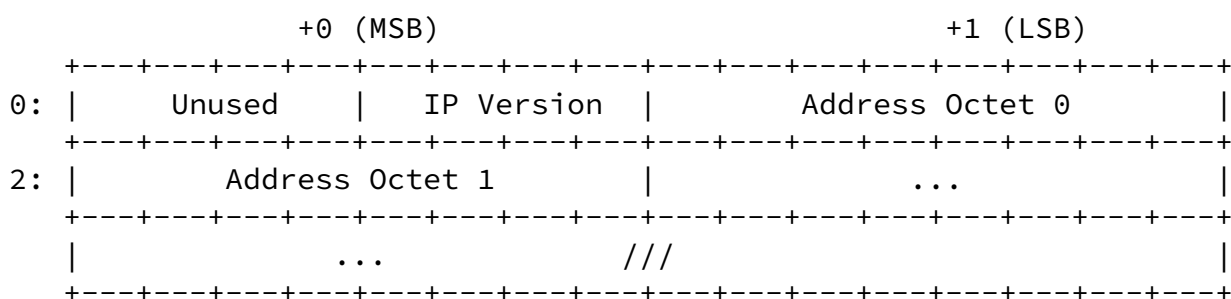
The overall format of an EDNS option is shown for reference below, per [[RFC6891](#)], followed by the option specific data:



OPTION-CODE: TBD, with mnemonic "XPF".

OPTION-LENGTH: Size (in octets) of OPTION-DATA.

OPTION-DATA: Option specific, as below:



Unused: Currently reserved. These MUST be zero unless redefined in a subsequent specification.

IP Version: The IP protocol version number used by the client.

Address: The source IP address of the client.

[3.2.](#) Proxy Processing

Proxies implementing this specification must append this option to each request packet received before forwarding it to the intended DNS server.

If the proxy has to create a new OPT RR (because none was present in the original request) it MUST strip any OPT RR subsequently seen in the response for conformance with [Section 7 of \[RFC6891\]](#).

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Author's note: what are the implications of that for TSIG
[Section 3.4](#)?

[3.3.](#) Server Processing

This option MUST be ignored by servers when received from a client that is not white-listed by the server.

When this option is received from a white-listed proxy, the DNS server MUST (SHOULD?) use the address contained therein in preference to the client's source IP address for any data processing logic that would otherwise depend on the latter.

If the length of the client IP address contained in the OPTION-DATA is not consistent with that expected for the given IP version then the server MUST return a FORMERR response.

Author's note: What response for unknown IP version numbers?

Servers MUST NOT send this option in DNS responses.

[3.4.](#) Secret Key Transaction Authentication for DNS (TSIG)

The considerations for TSIG [\[RFC2845\]](#) from [Section 4.5](#) of "DNS Proxy Implementation Guidelines" [\[RFC5625\]](#) apply here.

A TSIG-signed request MUST either:

1. be forwarded according to [RFC 5625](#) without addition of this

option, or

2. be verified using a secret shared between client and proxy, updated with this option, and then re-signed with a (potentially different) shared secret before sending to the server.

In the case of option 1, the server might still be able to uniquely identify and authenticate the client through its shared key, but not by its IP address.

If option 2 is used, there is an operational trade-off to be considered as to whether the two secrets (between client and proxy, and between proxy and server) are actually the same secret. A potential advantage of three-way sharing of the secret is that the server response (which per above **MUST NOT** be modified by adding this option) may be returned directly to the client without any further TSIG operations.

Author's note: A third alternative exists, which is to append an additional TSIG signature to the packet based on a secret shared only between the proxy and server. If end-to-end TSIG validation is required alongside TSIG validation between proxy and server, the server would have to 1) validate that second signature, 2) strip it, and then 3) perform further validation on the original signature. Feedback is sought on whether this is worth pursuing.

[3.5.](#) Multi-tier Proxies

TBD

[4.](#) Security Considerations

If the white-list of trusted proxies is implemented as a list of IP addresses, the server administrator **MUST** have the ability to selectively disable this feature for any transport where there is a possibility of the proxy's source address being spoofed.

This does not mean to imply that use over UDP is impossible - if for example the network architecture keeps all proxy-to-server traffic on a dedicated network and clients have no direct access to the servers

then the proxies' source addresses can be considered unspoofable.

5. Privacy Considerations

Used incorrectly, this option could expose internal network information, however it is not intended for use on proxy / forwarder devices that sit on the client-side of a DNS request.

6. IANA Considerations

IANA are directed to assign the value TBD for the XPF option in the DNS EDNS0 Option Codes Registry.

7. Acknowledgements

8. Normative References

- [RFC1035] Mockapetris, P., "Domain names - implementation and specification", STD 13, [RFC 1035](#), DOI 10.17487/RFC1035, November 1987, <<http://www.rfc-editor.org/info/rfc1035>>.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<http://www.rfc-editor.org/info/rfc2119>>.

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- [RFC5625] Bellis, R., "DNS Proxy Implementation Guidelines", [BCP 152](#), [RFC 5625](#), DOI 10.17487/RFC5625, August 2009, <<http://www.rfc-editor.org/info/rfc5625>>.
- [RFC6891] Damas, J., Graff, M., and P. Vixie, "Extension Mechanisms for DNS (EDNS(0))", STD 75, [RFC 6891](#), DOI 10.17487/RFC6891, April 2013, <<http://www.rfc-editor.org/info/rfc6891>>.

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