Internet Engineering Task Force
Internet-Draft
Intended status: Informational
Expires: 4 January 2026

S. Bortzmeyer
Afnic

3 July 2025

Addition of Extended DNS Errors codes
draft-bortzmeyer-more-edes-03

Abstract

This document is the specification of three new EDE (Extended DNS Errors) codes, for minimal answers, local roots and tailoring based on the client IP address.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at https://datatracker.ietf.org/drafts/current/.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on 4 January 2026.

Copyright Notice

Table of Contents

1. Introduction

[RFC8914] created the EDE (Extended DNS Errors). Each error is identified by a code, and there is an IANA registry of these codes. This specification adds four codes:

* One to say that the response has been tailored from the IP address of the end-client, for instance through ECS (EDNS Client Subnet),

* One to say that the response was deliberately minimal,

* One to say that the response comes from a local root.

* One to say that the request was rejected because of rate-limiting.

1.1. Requirements Language

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 BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

2. Tailoring

This response code, TBD, means that the response has been tailored on the basis of the IP address of the client. It can be from its actual IP address in the query (DNS-based load balancing), or because of ECS (EDNS Client Subnet, [RFC7871]). It MAY be sent by authoritative servers or resolvers, for instance when they implement ECS. Note that the fact that the server accepts ECS can also be seen in the

EDNS part of the response, but it does not mean that ECS was actually used to tailor the answer. Also, this response code is more general than just ECS. To differentiate between the type of tailoring, the EXTRA-TEXT field MAY be used.

If a resolver receives this EDE from an authoritative server, it SHOULD copy it in the response sent to its client.

3. Minimal response

This response code, TBD, means that the response was deliberately minimal. It can be because the request was using the QTYPE ANY, as documented by [RFC8482]. Or it can be also for cases like "glue records not sent since I wanted to save bits". It MAY be sent by authoritative servers or resolvers.

4. Local root

This response code, TBD, means that the response comes from a local root, as documented in [RFC8806]. It MAY be sent by resolvers using a local root.

5. Rate-limiting

This response code, TBD, means that the request was rejected because the DNS client queries too much [RRL]. It MAY be sent by resolvers or authoritative name servers, probably together with a REFUSED response code.

6. IANA Considerations

IANA is requested to allocate codes to these four EDE and to add them to the "Extended DNS Error Codes", with a reference to this document.

Note that the policy for the registry "Extended DNS Error Codes" is just "First come, first served" so this document is not strictly necessary.

7. Security Considerations

The EDE are sent with EDNS and are not signed. They should be used with care (see [RFC8914], section 6).

8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <https://www.rfc-editor.org/info/rfc2119>.

[RFC7871] Contavalli, C., van der Gaast, W., Lawrence, D., and W. Kumari, "Client Subnet in DNS Queries", RFC 7871, DOI 10.17487/RFC7871, May 2016, <https://www.rfc-editor.org/info/rfc7871>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <https://www.rfc-editor.org/info/rfc8174>.

[RFC8482] Abley, J., Gudmundsson, O., Majkowski, M., and E. Hunt, "Providing Minimal-Sized Responses to DNS Queries That Have QTYPE=ANY", RFC 8482, DOI 10.17487/RFC8482, January 2019, <https://www.rfc-editor.org/info/rfc8482>.

[RFC8806] Kumari, W. and P. Hoffman, "Running a Root Server Local to a Resolver", RFC 8806, DOI 10.17487/RFC8806, June 2020, <https://www.rfc-editor.org/info/rfc8806>.

[RFC8914] Kumari, W., Hunt, E., Arends, R., Hardaker, W., and D. Lawrence, "Extended DNS Errors", RFC 8914, DOI 10.17487/RFC8914, October 2020, <https://www.rfc-editor.org/info/rfc8914>.

8.2. Informative references

[RRL] ISC, "A Quick Introduction to Response Rate Limiting", 2014, <https://kb.isc.org/docs/aa-01000>.

Surveys of implementors

This appendix lists the various issues open againt diverse DNS programs, to gather input from the implementors about these new EDE.

* Knot resolver (https://gitlab.nic.cz/knot/knot-resolver/-/issues/923)

* PowerDNS, PowerDNS recursor and dnsdist (https://github.com/PowerDNS/pdns/issues/14911)

* Knot (https://gitlab.nic.cz/knot/knot-dns/-/issues/945)

* BIND (https://gitlab.isc.org/isc-projects/bind9/-/issues/5073)

* Unbound (https://github.com/NLnetLabs/unbound/issues/1199)

Acknowledgements

Original idea by Marco Davids.

Author's Address

St迪phane Bortzmeyer
Afnic
7, avenue du 8 mai 1945
78280 Guyancourt
France
Email: bortzmeyer+ietf@nic.fr
URI: https://www.afnic.fr/