The "RRSERIAL" EDNS option for the SOA serial of a RR’s zone
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Abstract

The "RRSERIAL" EDNS option allows a DNS querier to ask a DNS authoritative server to add a EDNS option in the answer of such query with the SOA serial number field of the origin zone which contains the answered resource record.

This "RRSERIAL" data allows to debug problems and diagnosis by helping to recognize the origin of an answer, associating this answer with a respective zone version.

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1. Introduction

The "RRSERIAL" EDNS option [RFC6891] allows a DNS querier to ask a DNS authoritative server to add an EDNS option in the answer of such query with the SOA serial number field of the zone which contains the answered resource record.

This "RRSERIAL" data allows to debugging helping to recognize the origin of an answer, associating this answer with a respective zone version.

The DNS data is of loose coherent nature, meaning that a record obtained by a response could be out-of-sync with other authoritative sources of the same data. This makes it difficult to debug the responses because you’d need to couple an answer with the version of the zone used to obtain such data. Even when you could use a separate question to ask for the SOA RR of the zone to ask for its serial, this separate question is in another time and could even arrive to another authoritative source, so it’s not directly correlated with another query.

This EDNS option is aimed only to authoritative servers for a zone. Resolvers and forwarders should ignore the option. It’s only intended for hop-to-hop communication (not transitive).
1.1. Requirements Language

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. The RRSERIAL Option

The OPTION-CODE for the RRSERIAL option is <TBD>.

The OPTION-DATA for the RRSERIAL option is an unsigned 32 bit version number as defined in the SERIAL field of the "SOA RDATA Format" section (3.3.13) of "DOMAIN NAMES - IMPLEMENTATION AND SPECIFICATION" (RFC 1035 [RFC1035]) specification.

3. RRSERIAL Processing

3.1. Querier

The EDNS RRSERIAL option MAY be included on any QUERY, by adding a zero-length EDNS RRSERIAL option to the options field of the OPT record when the query is made.

3.2. Responder

If an EDNS RRSERIAL option is sent to a server that is authoritative for the zone queried, and the RCODE for the answer is NOERROR, the OPTION-DATA MUST be a copy of the serial field of the SOA resource record of the zone which contains the resource record of the ANSWER section.

Otherwise, the answer MUST NOT add an EDNS RRSERIAL option to the response.

4. Example usage
$ dig @auth_server www.example.com AAAA +rrserial +norec +nocmd

; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 16429
;; flags: qr aa; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; RRSERIAL: 2019073001
;; QUESTION SECTION:
www.example.com.                    IN      AAAA

;; ANSWER SECTION:
www.example.com.             900     IN      AAAA

;; Query time: 53 msec
;; SERVER: authoritative#53(2001:DB8::53)
;; WHEN: Tue Aug 07 16:54:05 -04 2018
;; MSG SIZE  rcvd: 71

5. Acknowledgements

This document was made by his author in its entirety, so there’re no acknowledgements yet.

6. IANA Considerations

6.1. DNS EDNS0 Option Code Registration

Ask to IANA for a code point registration for "RRSERIAL" option.

7. Security Considerations

There’s no risk on disclosure of private information, as the SERIAL of the SOA record is already publicly available.

8. Normative References

Appendix A. Implementation References

There’s a patched NSD server 4.1.23 with support for RRSERIAL with the experimental opcode 65024 maintained in github https://github.com/huguei/nsd/tree/rrserial, and installed for live testing in 200.1.122.30 address with configured zones dateserial.example.com and incserial.example.com; with MX, TXT and AAAA apex records.

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