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P. Hoffman
ICANN
P. van Dijk
PowerDNS

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The Additional Section and Glue in DNS Responses
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Abstract

Implementers have recently expressed different views on what can appear in the Additional section in DNS responses. Proposals for adding functionality to the DNS protocol that rely on non-glue records in the Additional section rely on having a common understanding of the semantics of the Additional section.

This document restates what has been said in other DNS standards, and does not update any of them.

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1. Introduction

RFC 1034 [DNS-CONCEPTS], RFC 1035 [DNS-BASE], and RFC 2181 [DNS-CLARIFICATIONS] are the basis for understanding the DNS protocol and message format. One important part of the message format is what record types can appear in each section of DNS responses, and the semantics of the presence or absence of those record types in each section. This document focuses on the contents of the Additional section in DNS responses.

This document explicitly does not update [DNS-CONCEPTS], [DNS-BASE], [DNS-CLARIFICATIONS], or any other document.

2. Purpose of the Additional Section

When describing what each section holds, Section 3.7 of [DNS-CONCEPTS] says:

> Additional - Carries RRs which may be helpful in using the RRs in the other sections.

When describing the algorithm for putting together a DNS response, Section 4.3.2 of [DNS-CONCEPTS] says:

> 6. Using local data only, attempt to add other RRs which may be useful to the additional section of the query.

When describing what each section holds, Section 4.1 of [DNS-BASE] says:

> Additional - RRs holding additional information

and that it:

> contains RRs which relate to the query, but are not strictly answers for the question.

3. Glue

Section 4.2.1 of [DNS-CONCEPTS] says:

> Data that allows access to name servers for subzones (sometimes called "glue" data).

and

> To fix this problem, a zone contains "glue" RRs which are not part of the authoritative data, and are address RRs for the servers. These RRs are only necessary if the name server's name is "below" the cut, and are only used as part of a referral response.

Section 5.4.1 of [DNS-CLARIFICATIONS] says:

> "Glue" above includes any record in a zone file that is not properly part of that zone, including nameserver records of delegated sub- zones (NS records), address records that accompany those NS records (A, AAAA, etc), and any other stray data that might appear.

4. DNSSEC

RFC 4035 [DNSSEC] discusses the inclusion of DNSSEC signatures on data in the Additional section. Section 3.3.1 says:

> When placing a signed RRset in the Additional section, the name server MUST also place its RRSIG RRs in the Additional section. If space does not permit inclusion of both the RRset and its associated RRSIG RRs, the name server MAY retain the RRset while dropping the RRSIG RRs. If this happens, the name server MUST NOT set the TC bit solely because these RRSIG RRs didn't fit.

5. Conclusions

The foundational documents for the DNS did not place any restriction on what additional information might appear in the Additional section of DNS replies. If they had, the widely used extension mechanism in RFC 6891 [DNS-EXTENSIONS] would not be possible.

Glue records are addresses for name servers. These records can (and almost always do) appear in the Additional section of responses that are delegations. Non-address records that appear in the Additional section are not considered glue as that term is used in existing RFCs.

It is both acceptable and common for RRSIG RRs to appear in the Additional section of responses.

New protocols can specify that non-address resource records can appear in the Additional section of responses. They can define the semantics of the presence or absence of those non-address records.

6. IANA Considerations

This document does not create any new IANA considerations.

7. Security Considerations

This document does not create any new security considerations.

8. Informative References

[DNS-BASE] Mockapetris, P., "Domain names - implementation and specification", STD 13, RFC 1035, DOI 10.17487/RFC1035, November 1987, <https://www.rfc-editor.org/info/rfc1035>.

[DNS-CLARIFICATIONS] Elz, R. and R. Bush, "Clarifications to the DNS Specification", RFC 2181, DOI 10.17487/RFC2181, July 1997, <https://www.rfc-editor.org/info/rfc2181>.

[DNS-CONCEPTS] Mockapetris, P., "Domain names - concepts and facilities", STD 13, RFC 1034, DOI 10.17487/RFC1034, November 1987, <https://www.rfc-editor.org/info/rfc1034>.

[DNS-EXTENSIONS] Damas, J., Graff, M., and P. Vixie, "Extension Mechanisms for DNS (EDNS(0))", STD 75, RFC 6891, DOI 10.17487/RFC6891, April 2013, <https://www.rfc-editor.org/info/rfc6891>.

[DNSSEC] Arends, R., Austein, R., Larson, M., Massey, D., and S. Rose, "Protocol Modifications for the DNS Security Extensions", RFC 4035, DOI 10.17487/RFC4035, March 2005, <https://www.rfc-editor.org/info/rfc4035>.

Authors' Addresses

Paul Hoffman
ICANN

Email: paul.hoffman@icann.org

Peter van Dijk
PowerDNS

Email: peter.van.dijk@powerdns.com