                   Negative Caching of DNS Queries (DNS NCACHE)

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Abstract

        When [RFC1034] was written there were no DNS servers that imple-
        mented negative caching [RFC1034 Section 4.3.4]. This document
        replaces [RFC1034 Section 4.3.4] in the light of experience.

        Negative caching is a optional part of the DNS specification and
        deals with the caching of the non-existence of a RRset or
        domainname.

1 - Negative Caching

A server MAY add a SOA RR to the additional section of a response. The
SOA record is that of the containing zone, or a cached RR. If it is from
the containing zone on a authoritative server the TTL is initialised to
the MINIMUM field otherwise it is the cached TTL value decremented by

the time in the cache.

This SOA record MAY NOT be used to answer a SOA query.

A negative response MAY be cached if there is a SOA record in the
authority section of the the response. When the SOA record is cached it
must be cached such that it can only be retrieved by reference to the
<query name, QTYPE, QCLASS> tuple or <query name, QCLASS> in the case of
a name error. The query name is either the name given in the query sec-
tion or the last connonical name when there are CNAMEs in the answer
section.

Negative responses without SOA records SHOULD NOT be cached as there is
no way to reliably purge them from the cache.

When caching a negative response a server MUST store the contents of the
received SOA in the authority section such that it can be restored in
the answer's additional section. The TTL of this stored record decre-
ments with time.

2 - Changes from RFC 1034

Non-authoritative negative answers MAY be cached.

The SOA record from the authority section MUST be cached so that it is
retrievable by reference to the <query name, QTYPE, QCLASS> tuple. Name
error indications need only match <query name, QCLASS>.

A cached SOA record MAY be added to the response. This was explicitly
NOT allowed.

References

[RFC1034]P. Mockapetris, ``DOMAIN NAMES - CONCEPTS AND FACILITIES,'' RFC
        1034, ISI, November 1987.

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