

Using DNAME in the root for the delegation of special-use TLDs
draft-bortzmeyer-dname-root-01

Abstract

This documents asks IANA to add DNAME records in the DNS root for TLDs which are in the Special-Use Domain Names registry, in order to ensure they receive an appropriate reply (NXDOMAIN) and that the root is not too bothered by them.

REMOVE BEFORE PUBLICATION: there is no obvious place to discuss this document. May be the IETF DNSOP (DNS Operations) group, through its mailing list (the author reads it). Or may AS112 operators mailing lists? The source of the document, as well as a list of open issues, is currently kept at Github [[1](#)].

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[1.](#) Introduction and background

The DNS root receives a lot of requests for TLDs which do not exist. See for instance [[fujiwara-root-traffic](#)] or [[icann-l-root-stats](#)] or [[ssac-045](#)]. In the spirit of [[RFC7534](#)], it would be good if they could be redirected to a sink such as AS112, to save root's resources.

Some of these names, and specially one of the biggest offenders, .local ([[RFC6762](#)]), are registered in the Special-Use Domain Names registry [[2](#)] of [[RFC6761](#)]. They are obvious candidates for a delegation to the sink.

It is proposed to use the new AS112, the one described by [[RFC7535](#)] to implement this sink.

TODO: results of the discussion with AS112 people

[1.1.](#) Requirements Terminology

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 [[RFC2119](#)].

2. Rules

Every TLD ([\[RFC7719\]](#), [section 2](#)) which is in the Special-Use Domain Names registry [\[3\]](#) ([\[RFC6761\]](#)) SHOULD be delegated by IANA through a DNAME to empty.as112.arpa as described in [\[RFC7535\]](#) if and only if the registration of this TLD say that resolvers should not or must not look them up in the DNS.

It is important to notice that this document does not define a policy to decide if a TLD should be "delegated" or not. Instead, it relies on the existing Special-Use Domain Names registry and its rules.

RFC-EDITOR: remove before publication. As of today, with these rules, .local ([\[RFC6762\]](#)) or .onion ([\[RFC7686\]](#)) would be delegated but not .example (its registration in [\[RFC6761\]](#) does not define special handling for resolvers) or .home or .belkin (this last one generates a huge traffic at the root but is not in the Special-Use Domain Names registry).

3. Benefits

The main benefit is less load on the root and a better efficiency of the caches, therefore helping the entire DNS ecosystem.

4. Possible issues

Of course, the solution described in this document requires a good support of DNAME by the resolvers. [Appendix A of \[RFC7535\]](#) describes an experiment which was run in 2013 and which shows that, indeed, we can rely on DNAME (quoting the authors: "We conclude that there is no evidence of a consistent failure on the part of deployed DNS resolvers to correctly resolve a DNAME construct.").

Regarding DNSSEC, do note the future DNAMEs in the root will be signed, but the target, empty.as112.arpa, is not. See George Michaelson's message [\[4\]](#). So, it will not be possible to validate the answers. Not a problem since these requests should never have been sent to the root, anyway.

5. IANA Considerations

IANA is requested (TODO what is the appropriate wording?) to add a DNAME in the root for every TLD which fits the rules of [Section 2](#).

RFC-EDITOR: remove before publication. There is currently no DNAME in the root. It is expected that the creation of the first one will require a top-down, multi-stakeholder, long and complicated process with a lot of meetings, reports by consultants and design teams.

6. Security Considerations

The requests for the TLD in the Special-Use Domain Names registry are typically NOT supposed to leak to the authoritative public name servers such as the ones of the root. If they do, it means a misconfiguration somewhere. The leak is independant on whether the name is delegated to AS112 or not. See [section 8 of \[RFC7534\]](#) for an analysis. Some people believe there are added risks, because the queries will be seen by AS112 servers which, unlike the root, are managed by many "random people".

7. Acknowledgments

Thanks to Paul Hoffman to say that it may be a good idea and for Ted Lemon to give the final impulse, with his [[I-D.tldr-sutld-ps](#)].

8. References

8.1. Normative References

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[ssac-045]
ICANN, , "SAC 045 - Invalid Top Level Domain Queries at the Root Level of the Domain Name System", November 2010, <<https://www.icann.org/en/groups/ssac/documents/sac-045-en.pdf>>.

8.3. URIs

- [1] <https://github.com/bortzmeyer/ietf-dname-root>
- [2] <http://www.iana.org/assignments/special-use-domain-names/special-use-domain-names.xml>
- [3] <http://www.iana.org/assignments/special-use-domain-names/special-use-domain-names.xml>
- [4] https://mailarchive.ietf.org/arch/msg/dnsop/JsPNz66aQE3-r3toawCV_ajocNo

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