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**The Eternal Non-Existence of SINK.ARPA (and other stories)
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Abstract

This document specifies a fully-qualified domain name in the Domain Name System (DNS) that can be relied upon never to exist. The availability of a name in the DNS which is guaranteed not to exist has useful operational applications.

This document also provides a procedural framework for other names that have special characteristics to be reserved, and for those special characteristics to be codified as modifications to the normal ARPA administration process.

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1. Introduction

The Domain Name System (DNS) is described in [[RFC1034](#)] and [[RFC1035](#)]. This document has three purposes:

1. to create a new IANA registry called "ARPA Reserved Names" (see [Section 4](#));
2. to define the special considerations of a single name SINK.ARPA, a name which is defined never to exist (see [Section 2](#));
3. to allow the procedures by which the ARPA zone is maintained, as documented in [[RFC3172](#)], to be modified for names present in the ARPA Reserved Names registry according to the special characteristics of those names (see [Section 5](#)).

2. SINK.ARPA

The special considerations for the name SINK.ARPA are that the name SINK.ARPA shall be guaranteed never to have any resource records associated with it. That is, the domain does not exist and queries for it will result in name errors (NXDOMAIN). The reliable non-existence of a globally-consistent and formally-defined name has some operational utility (see [Section 3](#) for examples).

Various top-level domains are reserved by [[RFC2606](#)], including "INVALID". The use of "INVALID" as a codified, non-existent domain was considered. However:

- o INVALID is poorly characterised from a DNS perspective in [[RFC2606](#)]; that is, the specification that INVALID does not exist as a Top Level Domain (TLD) is imprecise given the various uses of the term TLD in policy forums;
- o the contents of the root zone are derived by interaction with many inter-related policy-making bodies, whereas the administrative and technical processes relating to the ARPA zone are much more clearly defined in an IETF context;
- o the use of ARPA for purposes of operational infrastructure (and, by inference, the explicit non-use of a particular name in ARPA) is consistent with the purpose of that zone, as described in [[RFC3172](#)].

This document specifies that any request which would cause the name SINK.ARPA to exist in the DNS should be denied.

Note that this document specifically does not recommend that the DNS name "SINK.ARPA" be treated differently from any other DNS name, operationally or in software.

3. Examples

It is expected that the guaranteed non-existence of SINK.ARPA has many general operational applications. What follows are two topical examples at the time of writing. Note that these are speculative applications of the non-existence of SINK.ARPA, and would require more rigorous operational specification before they could be recommended.

1. Mail Transfer Agents (MTAs) which deliver mail using the SMTP protocol ([\[RFC5321\]](#)) look up MX records in order to identify the host to which SMTP connection attempts should be made. For devices which do not support SMTP, it may be desirable to prevent MTAs from attempting any SMTP connection. Installing an MX record whose RDATA includes SINK.ARPA in the EXCHANGE field ([\[RFC1034\]](#)) should cause compliant MTAs to make no connection: SINK.ARPA does not exist, and A and AAAA records should not be used when an MX record is present.
2. DNS UPDATE clients which send dynamic updates to DNS master servers ([\[RFC2136\]](#)) identify the primary master server for a zone using the MNAME field of the zone's SOA record ([\[RFC1034\]](#)). The MNAME field is mandatory, but many zones intentionally do not accept dynamic updates. DNS UPDATE messages for such zones may constitute unwanted traffic, and can be suppressed by specifying the MNAME to be SINK.ARPA.

4. IANA Considerations

This document directs the IANA to create a registry as follows:

Parameter	Value
Registry Name	ARPA Reserved Names
Reference	This document (RFCXXXX) Section 5
Registration Procedures	IETF Standards Action and IAB approval

The initial registry contents should be as follows:

Name	Purpose	RRTypes	Reference
SINK.ARPA	Definitively non-existent name	NONE	This document (RFCXXXX) Section 2

5. Administration of the ARPA Domain

The management guidelines and operational requirements of the ARPA domain is described in [[RFC3172](#)]. Requests to modify the ARPA zone are specified in standards-track documents which, when approved by the IESG and the IAB are sent to the IANA for implementation. This document updates the procedures described in that document as follows:

5.1. Criteria for "arpa" Sub-domains

Names which are included in the IANA registry "ARPA Reserved Names" are reserved and require special consideration. The nature of that special consideration is specified by reference within the ARPA Reserved Names registry.

6. IAB Considerations

IAB review and approval of this document is required, given the IAB's technical and administrative function in the approval of changes to the ARPA zone.

7. Security Considerations

This document institutionalises a single name in the DNS to which unwanted traffic can be directed. This name, SINK.ARPA, is specified in this document not to exist in the DNS. If address records for SINK.ARPA were to be introduced by exploiting insecurities in the DNS, however, then those addresses would receive that unwanted traffic. This might provide a leak of private information to a third party, or have other unwelcome consequences.

The non-existence of SINK.ARPA will be cryptographically verifiable when the ARPA zone is signed.

8. References

8.1. Normative References

- [RFC1034] Mockapetris, P., "Domain names - concepts and facilities", STD 13, [RFC 1034](#), November 1987.
- [RFC1035] Mockapetris, P., "Domain names - implementation and specification", STD 13, [RFC 1035](#), November 1987.
- [RFC2606] Eastlake, D. and A. Panitz, "Reserved Top Level DNS Names", [BCP 32](#), [RFC 2606](#), June 1999.
- [RFC3172] Huston, G., "Management Guidelines & Operational Requirements for the Address and Routing Parameter Area Domain ("arpa")", [BCP 52](#), [RFC 3172](#), September 2001.

8.2. Informative References

- [RFC2136] Vixie, P., Thomson, S., Rekhter, Y., and J. Bound, "Dynamic Updates in the Domain Name System (DNS UPDATE)", [RFC 2136](#), April 1997.
- [RFC5321] Klensin, J., "Simple Mail Transfer Protocol", [RFC 5321](#), October 2008.

Appendix A. Editorial Notes

This section (and sub-sections) to be removed prior to publication.

A.1. On the name SINK.ARPA

The name SINK.ARPA has been chosen as an editorial convenience: having a name is more convenient than not having a name when discussing the general proposal. No doubt other names would do the job just as well.

A.2. Change History

00 Initial draft.

01 Updated following feedback from Alfred Hoenes.

02 Updated following feedback from Ralph Droms.

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