     Nameservers for the Address and Routing Parameter Area ("arpa") Domain
              draft-iana-arpa-authoritative-servers-00

Abstract

   This document describes revisions to operational practices to
   separate function of the "arpa" top-level domain in the DNS from its
   historical operation alongside the DNS root zone.

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   This Internet-Draft will expire on August 10, 2020.

Table of Contents

1. Introduction

   The "arpa" top-level domain [RFC3172] is designated as an
   "infrastructure domain" to support techniques defined by Internet
   standards. Zones under the "arpa" domain provide various mappings,
   such as IP addresses to domain names, and E.164 numbers to URIs. It
   also contains special use names, such as "home", which is a non-
   unique name used in residential home networks.

   Historically, the "arpa" zone has been hosted on almost all of the
   root name servers, and [RFC3172] envisages the "arpa" domain to be
   "sufficiently critical that the operational requirements for the root
   servers apply to the operational requirements of the "arpa" servers".
   To date, this has been implemented by serving the "arpa" domain
   directly on a subset of the root server infrastructure.

   This bundling of root server and "arpa" server operations has
   entwined management of the zones contents and their infrastructure.
   As a result, some proposals under consideration by the IETF involving
   the "arpa" zone have been discarded due to the risk of conflict with
   root operations.

   The separation described in this document resolves operational
   impacts of synchronizing edits to the root zone and the "arpa" zone,
   eliminating the current dependency and allowing more tailored
   operations based on the unique requirements of each zone.

2. Requirements for the "arpa" zone

The "arpa" domain continues to play a role in critical Internet
operations, and this change does not propose weakening operational
requirements described in [RFC3172] for the domain. Future
operational requirements for the "arpa" domain shall consider strong
baseline requirements, such as those documented in [RFC7720].

3. Transition Process

The process will dedicate new hostnames to the servers authoritative
for the "arpa" zone, but will initially serve the "arpa" zone from
the same hosts.

Once completed, subsequent transitional phases would include using
new hosts to replace or augment the existing root server hosts, and
separation of the editing and distribution of the "arpa" zone from
necessarily being connected to the root zone. Any management
considerations regarding how such changes may be performed are beyond
the scope of this document.

3.1. Dedicated nameserver hostnames

Consistent with the use of the "arpa" namespace itself to host name
servers for other delegations in the "arpa" zone ([RFC5855]), this
document specifies a new namespace of "ns.arpa", with the nameserver
set to be labelled as follows:

```
a.ns.arpa
b.ns.arpa
c.ns.arpa
...
```

This eliminates a logical dependency that requires the coordinated
editing of the "arpa" zone and the root zone. This component of this
transition does not require the underlying hosts that provide "arpa"
name service (that is, the root servers) be altered. The "arpa" zone
will initially map the new hostnames to to the same IP addresses that
already provide service under the respective hostnames within root-
servers.net.

3.2. Separation of infrastructure

After initially migrating the "arpa" zone to use hostnames that are
not shared with the root zone, the underlying name service is
expected to evolve such that it no longer directly aligns to a subset
of root server instances. With no shared infrastructure between the

root servers and the "arpa" servers, future novel applications for
the "arpa" zone may be possible.

Any subsequent changes to the parties providing name service for the
zone is considered a normal management responsibility associated with
zone management, and would be performed in accordance with [RFC3172].

3.3. Zone administration

Publication of the "arpa" zone file to the authoritative "arpa" name
servers is currently undertaken alongside the root zone maintenance
functions. Upon the separation of the "arpa" infrastructure from the
root server infrastructure, publication of the "arpa" zone no longer
necessarily needs to be technically linked or inter-related to the
root zone publication mechanisms.

3.4. Conclusion of process

Full technical separation of "arpa" operations from root operations
minimally requires the following to be satisfied:

o The "arpa" zone no longer shares any hostnames in its NS-set with
   the root zone;

o The hosts that provide authoritative name service are not the same
   hosts as the root servers, do not share any IPv4 or IPv6 addresses
   with the root servers, and are sufficiently separately provisioned
   such that any unique "arpa" zone requirements can be deployed
   without affecting how root zone service is provided;

o The editorial and publication process for the "arpa" zone has any
   common dependencies with the root zone process removed, so that
   the "arpa" zone can be managed, edited and provisioned wholly
   independently of the root zone.

Such separation is ultimately sought to allow for novel uses of the
"arpa" zone without the risk of inadvertantly impacting root zone and
root server operations. It is recognized that achieving this state
requires a deliberative process involving significant coordination to
ensure impacts are minimized.

4. IANA Considerations

The IANA shall coordinate the creation of a new "ns.arpa" zone and
populate it with address records that reflect the IP addresses of the
contemporary root servers documented within "root-servers.net" as its
initial state.

The IANA will initially migrate the 12 NS records for the "arpa" zone
to point to their respective new entries in the "ns.arpa" zone.

Subsequently, the IAB and IANA will consult and coordinate with all
relevant parties on activity to reduce or eliminate reliance upon
root zone and root server infrastructure for serving the "arpa" zone.
Such changes will be performed in compliance with [RFC3172] and shall
be conducted with all due care and deliberation to mitigate potential
impacts on critical infrastructure.

5. References

5.1. Normative References

[RFC3172]   Huston, G., Ed., "Management Guidelines & Operational
            Requirements for the Address and Routing Parameter Area
            Domain ("arpa")", BCP 52, RFC 3172, DOI 10.17487/RFC3172,
            September 2001, <https://www.rfc-editor.org/info/rfc3172>.

5.2. Informative References

[RFC5855]   Abley, J. and T. Manderson, "Nameservers for IPv4 and IPv6
            Reverse Zones", BCP 155, RFC 5855, DOI 10.17487/RFC5855,
            May 2010, <https://www.rfc-editor.org/info/rfc5855>.

[RFC7720]   Blanchet, M. and L-J. Liman, "DNS Root Name Service
            Protocol and Deployment Requirements", BCP 40, RFC 7720,
            DOI 10.17487/RFC7720, December 2015,
            <https://www.rfc-editor.org/info/rfc7720>.

Appendix A. Open Issues

o A preference has been expressed for non-.arpa hostnames. Is it
   better that the nameserver hostnames are in-bailiwick in .arpa or
   does that provide no benefit?

o Should the name servers stick to the same letter-based
   nomenclature as the root zone? Some operators have expressed a
   strong desire to move away from the letters for the root zone.

o Should the hostname change be staggered or can it be done in one
   action?

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