                  Top-Level Domains That Are Already Dotless

Abstract

   Recent statements from the Internet Architecture Board (IAB) and the
   Internet Corporation of Assigned Names and Numbers (ICANN) Security
   and Stability Advisory Committee have focused on the problems that
   the DNS is likely to experience with top-level domains (TLDs) that
   contain address records (so-called "dotless domains"). In order to
   help researchers determine the extent of the issues with dotless
   domains, this document lists the current dotless TLDs and gives a
   script for finding them. This document lists data about dotless TLDs
   but does not address the policy and technology issues other than to
   point to the statements of others.

Status of This Memo

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1. Introduction

   In the past few years, well-respected groups have issued documents
   about top-level domains in the DNS that contain address records
   (so-called "dotless domains"). The Security and Stability Advisory
   Committee (SSAC) of the Internet Corporation for Assigned Names and
   Numbers (ICANN) issued a report called "Report on Dotless Domains"
   [SAC053] in February 2012. The Internet Architecture Board (IAB)
   issued a statement called "Dotless Domains Considered Harmful"
   [IAB-DOTLESS] in July 2013. The New gTLD Program Committee of the
   ICANN Board of Directors (NGPC) approved a resolution on dotless
   domains [NGPC-DOTLESS] in August 2013. (The authors of this document
   note that they are not on the SSAC, the IAB, or the ICANN Board.)

   All of these documents consider the effects of dotless domains
   without describing the extent of their current deployment. In order
   to help researchers determine the extent of the problems with dotless
   domains, this document lists the known dotless domains at the time of
   publication and shows how researchers can find them in the future.
   In this document, we consider any TLD with an A, AAAA, and/or MX
   record at the apex to be dotless. This document is meant to provide
   current data to the Internet community but does not give advice.

Many people have expressed a belief that ICANN prohibits all TLDs
from being dotless. That belief is not true; ICANN's policies apply
only to their contracted TLDs. This document shows the extent to
which dotless domains exist today.

2. Current Dotless Domains

This section shows the dotless domains we found on September 3, 2013,
using the script in Appendix A. The data was nearly constant for
many months, with very few additions or deletions of records.

We checked every TLD in the root zone to see which ones had A, AAAA,
or MX records. We found that about 5% of the TLDs did, and all of
the TLDs that do are two-letter TLDs or country code TLDs (which are
also known as ccTLDs).

2.1. TLDs with A Records

At the time this document is published, the following TLDs have A
records.

AC has address 193.223.78.210
AI has address 209.59.119.34
CM has address 195.24.205.60
DK has address 193.163.102.24
GG has address 87.117.196.80
IO has address 193.223.78.212
je has address 87.117.196.80
KH has address 203.223.32.21
PN has address 80.68.93.100
SH has address 193.223.78.211
TK has address 217.119.57.22
TM has address 193.223.78.213
TO has address 216.74.32.107
UZ has address 91.212.89.8
VI has address 193.0.0.198
WS has address 64.70.19.33

2.2. TLDs with AAAA Records

At the time this document is published, the following TLD has an AAAA
record.

DK has IPv6 address 2a01:630:0:40:b1a:b1a:2011:1

2.3. TLDs with MX Records

   At the time this document is published, the following TLDs have MX
   records. The SSAC report implies, but does not explicitly say, that
   MX records would cause a TLD to be considered dotless; the IAB report
   does not mention MX records at all.

   AI mail is handled by 10 mail.offshore.AI.
   AX mail is handled by 5 mail.aland.net.
   CF mail is handled by 0 mail.intnet.CF.
   DM mail is handled by 10 mail.nic.DM.
   GP mail is handled by 10 ns1.worldsatelliteservices.com.
   GP mail is handled by 5 ns1.nic.GP.
   GT mail is handled by 10 ASPMX.L.GOOGLE.COM.
   GT mail is handled by 20 ALT1.ASPMX.L.GOOGLE.COM.
   GT mail is handled by 20 ALT2.ASPMX.L.GOOGLE.COM.
   GT mail is handled by 30 ASPMX2.GOOGLEMAIL.COM.
   GT mail is handled by 30 ASPMX3.GOOGLEMAIL.COM.
   GT mail is handled by 30 ASPMX4.GOOGLEMAIL.COM.
   GT mail is handled by 30 ASPMX5.GOOGLEMAIL.COM.
   HR mail is handled by 5 alpha.carnet.HR.
   IO mail is handled by 10 mailer2.IO.
   KH mail is handled by 10 ns1.dns.net.KH.
   KM mail is handled by 100 mail1.comorestelecom.KM.
   LK mail is handled by 10 malithi-slt.nic.LK.
   LK mail is handled by 20 malithi-lc.nic.LK.
   MQ mail is handled by 10 mx1-mq.mediaserv.net.
   PA mail is handled by 5 ns.PA.
   TT mail is handled by 10 ALT1.ASPMX.L.GOOGLE.COM.
   TT mail is handled by 1 ASPMX.L.GOOGLE.COM.
   UA mail is handled by 10 mr.kolo.net.
   VA mail is handled by 100 raphaelmx3.posta.VA.
   VA mail is handled by 10 raphaelmx1.posta.VA.
   VA mail is handled by 10 raphaelmx2.posta.VA.
   WS mail is handled by 10 mail.worldsite.WS.
   YE mail is handled by 10 mail.yemen.net.YE.

3. IANA Considerations

   The script in Appendix A relies on IANA continuing to publish a copy
   of the TLDs in the root zone at
   <http://data.iana.org/TLD/tlds-alpha-by-domain.txt>.

4. Security Considerations

This document lists the known dotless domains; it does not express an opinion whether or not there are security considerations with the existence of dotless domains. The referenced IAB and SSAC reports discuss the opinions of the respective bodies on the security and stability considerations of dotless domains.

5. Acknowledgements

Andrew Sullivan and Marc Blanchet gave helpful comments on this document.

6. Informative References

[IAB-DOTLESS]
          Internet Architecture Board, "Dotless Domains Considered
          Harmful", July 2013, <https://www.iab.org/2013/07/10/
          iab-statement-dotless-domains-considered-harmful/>.

[NGPC-DOTLESS]
          New gTLD Program Committee of the ICANN Board, "Approved
          Resolution on Dotless Domains", September 2013,
          <http://www.icann.org/en/groups/board/documents/
          resolutions-new-gtld-13aug13-en.htm>.

[SAC053]   ICANN Security and Stability Advisory Committee, "SSAC
          Report on Dotless Domains", February 2012,
          <http://www.icann.org/en/groups/ssac/documents/
          sac-053-en.pdf>.

Appendix A. Script for Finding Dotless Domains

   The following Bourne shell script was used for finding the data in
   this document. The authors believe that this script will work
   correctly on a wide variety of operating systems and will continue to
   do so in the foreseeable future. As is customary in the current
   legal environment, the authors make no assurance that the script is
   correct or that the script will not cause damage on a system where it
   is run.

   The script checks each nameserver for each TLD instead of just doing
   a simple query because the nameservers for some of the TLDs have
   inconsistent data in them with respect to the records shown here.

```
#! /bin/sh
# Get the current list of TLDs from IANA
wget -O orig.txt http://data.iana.org/TLD/tlds-alpha-by-domain.txt
# Remove the comment at the top of the file
grep -v '^#' orig.txt > TLDs.txt
# Get all the nameservers
while read tld; do host -t NS $tld; done < TLDs.txt > TLD-servers.txt
# Do queries for each record type, and do them on each nameserver
for rec in A AAAA MX; do
  while read tld ignorea ignoreb ns; do
    host -t $rec $tld. $ns;
  done < TLD-servers.txt;
done > all-out.txt
# Print the results
grep "has address" all-out.txt | sort -uf
grep "has IPv6" all-out.txt | sort -uf
grep "mail is handled" all-out.txt | sort -uf
```

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