A quick review of DNSSEC Validation in today's Internet

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June 2016
What is being measured?

• Clients who will perform DNSSEC validation of a domain name
  – Using RSA/SHA-1 as the crypto algorithm
  – Who will not resolve a badly-signed domain name

• We are NOT measuring:
  – Validating resolvers
  – Signed domains
What is not being measured?

We are NOT measuring:

- Validating resolvers
  - It's actually quite a challenge to isolate the DNSSEC validation behaviour of a recursive resolver from query logs.
  - And if the aim is to measure the user impact here, then it makes more sense to measure the number of users who use DNSSEC validating resolvers rather than the resolvers themselves

- Signed domains
  - This has its own challenges relating to zone enumeration in the DNS, and we are not undertaking that here!
The Global Validation Picture

http://stats.labs.apnic.net/dnssec
The Global Validation Picture

Nordic concentration of DNSSEC!

Use of Google’s PDNS

÷ of users in a country that use DNSSEC validating resolvers

http://stats.labs.apnic.net/dnssec
The Global Picture

Use of DNSSEC Validation for World (XA)
The Global Picture

Use of DNSSEC Validation for World (XA)

2014  2015  2016
Some have been Validating for many years

Use of DNSSEC Validation for Sweden (SE)

Sweden – 80 %

Use of DNSSEC Validation for Estonia (EE)

Estonia – 60 %

DNSSEC Per-Country Deployment for AS7922: COMCAST-7922 - Comcast Cable Communications, Inc., United States of America (US)

Comcast – 90%

Use of DNSSEC Validation for Romania (RO)

Romania – 45 %
Recent DNSSEC Validation

DNSSEC Per-Country Deployment for AS28573: CLARO S.A., Brazil (BR)

Claro, BR – 90%

DNSSEC Per-Country Deployment for AS6677: ICENET-AS1 Siminn hf, Iceland (IS)

ICENET, IS – 90%

Use of DNSSEC Validation for Faroe Islands (FO)

Faroe Islands - 90%

Use of DNSSEC Validation for New Zealand (NZ)

New Zealand - 50%
Finland

Use of DNSSEC Validation for Finland (FI)
## Finland - Top 10 ISPs

<table>
<thead>
<tr>
<th>ASN</th>
<th>AS Name</th>
<th>DNSSEC Validates</th>
<th>Uses Google PDNS</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS16086</td>
<td>DNA DNA Oy</td>
<td>0.86%</td>
<td>1.47%</td>
<td>315,616</td>
</tr>
<tr>
<td>AS719</td>
<td>ELISA-AS Elisa Oyj</td>
<td>0.61%</td>
<td>0.59%</td>
<td>271,716</td>
</tr>
<tr>
<td>AS1759</td>
<td>TSF-IP-CORE TeliaSonera Finland Oyj</td>
<td>95.40%</td>
<td>3.57%</td>
<td>246,397</td>
</tr>
<tr>
<td>AS790</td>
<td>EUNETFI Elisa Oyj</td>
<td>0.12%</td>
<td>0.21%</td>
<td>121,194</td>
</tr>
<tr>
<td>AS15527</td>
<td>ANVIA Anvia Oyj</td>
<td>23.06%</td>
<td>23.80%</td>
<td>12,730</td>
</tr>
<tr>
<td>AS1741</td>
<td>FUNET AS CSC - Tietoelektroniikan keskus Oy</td>
<td>31.17%</td>
<td>7.32%</td>
<td>8,581</td>
</tr>
<tr>
<td>AS29422</td>
<td>NBLNETWORKS-AS Nebula Oy</td>
<td>86.33%</td>
<td>14.27%</td>
<td>4,967</td>
</tr>
<tr>
<td>AS39699</td>
<td>SSPOT-AS Louna Palvelut Oy</td>
<td>2.98%</td>
<td>4.26%</td>
<td>4,934</td>
</tr>
<tr>
<td>AS24751</td>
<td>MULTIFI-AS Jakobstadsnejdens Telefon Ab</td>
<td>85.11%</td>
<td>23.11%</td>
<td>4,400</td>
</tr>
<tr>
<td>AS3238</td>
<td>ALCOM Alands Datakommunikation Ab</td>
<td>37.23%</td>
<td>59.65%</td>
<td>4,392</td>
</tr>
</tbody>
</table>
The Bigger Picture

- Much of the African continent and parts of Asia still show high DNSSEC validation rates due to their use of Google’s Public DNS service (which currently receives 12% of the Internet’s query load)
- Comcast resolvers are a major validation system in North America and this resolver collection performs the second highest volume of validation
- Recent areas of switching on DNSSEC validation in DNS resolvers are in Iceland, Norway, Brazil, Nepal, New Zealand and Papua New Guinea
But

• Growth of validation deployment has slowed
  – 80% of all current queries request DNSSEC credentials
  – 26% of all current queries perform DNSSEC validation
  – 11% of current queries turn to a non-validating resolver upon SERVFAIL
  – 15% of current queries will perform validation and live with the outcome
Thanks!

**DNSSEC Reports:**  http://stats.labs.apnic.net/dnssec