Cross-addressed Nameservers

Peter Thomassen <peter@desec.io>

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What are we talking about?

- Typically:

```
example.com.        IN NS       ns1.desec.io.
example.com.        IN NS       ns2.desec.org.

ns1.desec.io.       IN A        45.54.76.1
ns2.desec.org.      IN A        157.53.224.1
```

- How about:

```
example.com.        IN NS       ns.desec.ch.
example.com.        IN NS       ns.desec.cz.

ns.desec.ch.        IN A        45.54.76.1
                                157.53.224.1
ns.desec.cz.        IN A        45.54.76.1
                                157.53.224.1
```

Why?

- Same set of authoritative IP addresses in both cases
- Allows resolver to obtain full set even when one hostname is not resolvable
  - Network issue, DNSSEC issue, other outage
- Many (most? all?) resolver don’t care which name an address is from
- 1:1 mapping artificial anyway

Why not?

- Some registries do not allow such delegations
  - Cloudflare Foundation DNS used this but pulled back for this reason
- Based on a misunderstanding:

  > *"the hosts must not resolve to the same IP address"*
  > *"The name servers must be in at least two topologically separate networks."*
  > https://www.iana.org/help/nameserver-requirements

- Resolvers that retry using different name (instead of different IP) might end up using the same unreachable server twice → delay or give-up
  - Is this real?

Data

- Chrome Top Million Websites (CrUX, April 2026)
- 1084 domains had such a configuration (0.1%)
- Notable:
  - ilbe.com (Korean 4chan alternative, NSFW)
  - wasmer.app (a WebAssembly runtime platform)
  - didiglobal.com (Chinese Uber alternative, runs "api" subdomain)
  - chinamobile.com / 10086.cn (both from the largest wireless carrier in China)
  - a number of .gov domains
- Another 202,644 domains with cross-addressed NS found via reverse mapping
  - Under 338 TLDs (61k in .com, 15k in .com, 21 in .de)
  - Includes 69 TLDs smaller than .de, but with more than 21 such delegations
  - Thanks to Tobias Fiebig

Conclusion

- 0.1% of ~actual web usage work like this
- We haven’t heard of any breakage → seems safe
- What does the community think?