Not at the Zone Cut!

Frits Ahlefeldt

Willem Toorop

NLNETLABS

What is this about?

- Where to put the new extensible delegation info?
- **Fundamental design choice** -- with consequences
  - Affected software
  - Ease to deploy
  - May impact requirements

What design choice?

- At the parent side of the zone cut
- Elsewhere in the zone

- For the sake of example we reference

draft-wesplaap-deleg-00 | draft-homburg-deleg-incremental-deleg-00

- Both originate from IETF 118 Hackathon
- Both based on SVCB *(irrelevant for this talk)*

```
example.com.  3600  IN  NS     …
example.com.  3600  IN  DS     …
example.com.  3600  IN  DELEG  …
```

```
example.com.          3600  IN  NS    …
example.com.          3600  IN  DS    …
example._deleg.com.   3600  IN  SVCB  …
```

The zone cut makes child authoritative

- `example.com.  3600  IN  NS  …`
- Everything at or below `example.com.`
  is not authoritative in the `com.` zone *(except DS & NSEC)*
- It will not be signed by **unmodified signers**
- It will not be returned by **unmodified name servers**
  - Instead the delegation is returned
- If it is signed by `com. DNSKEY`, then
  unmodified validating resolvers will consider it BOGUS

… thus …

- `example.com.  3600  IN  DELEG  …`
- … new authoritative in the parent RRs require:
  - Modified DNSSEC signers
  - Modified name servers
    - For returning it in referral response
    - For returning it when queried for it
  - Modified DNSSEC validators
- Apart from new delegation mechanism (modified resolver)

… on the other hand

- `example._deleg.com.  3600  IN  SVCB  …`
- Semantics with respect to what is authoritative remain
- Is authoritative in the `com.` zone
- It will be signed by **unmodified signers**
- It will be returned by **unmodified name servers**
- **unmodified DNSSEC validators** will validate it
- implementation in the resolver only, already makes it work

… on the other hand

- Semantics with respect to what is authoritative remain
- The conventional methods to alias remain functional
  - Outsource delegation to one operator:
    ```
    example._deleg.com.  3600  IN  CNAME  _dns.operator.com.
    ```
  - Outsource the operation of delegations to an operator:
    ```
    _deleg.com.  3600  IN  DNAME  delegs4com.operator.com.
    ```

Downgrade protection

- New authoritative in the parent RRs
  will **not** be returned by **unmodified name servers**
- They cannot be queried for by the resolver
- draft-wesplaap-deleg-00 uses a DNSKEY flag to signal support by **all** authoritative servers serving the zone
  - No separation of concern

- Authoritatively provisioned extensible delegations supports incremental deployment on authoritative servers

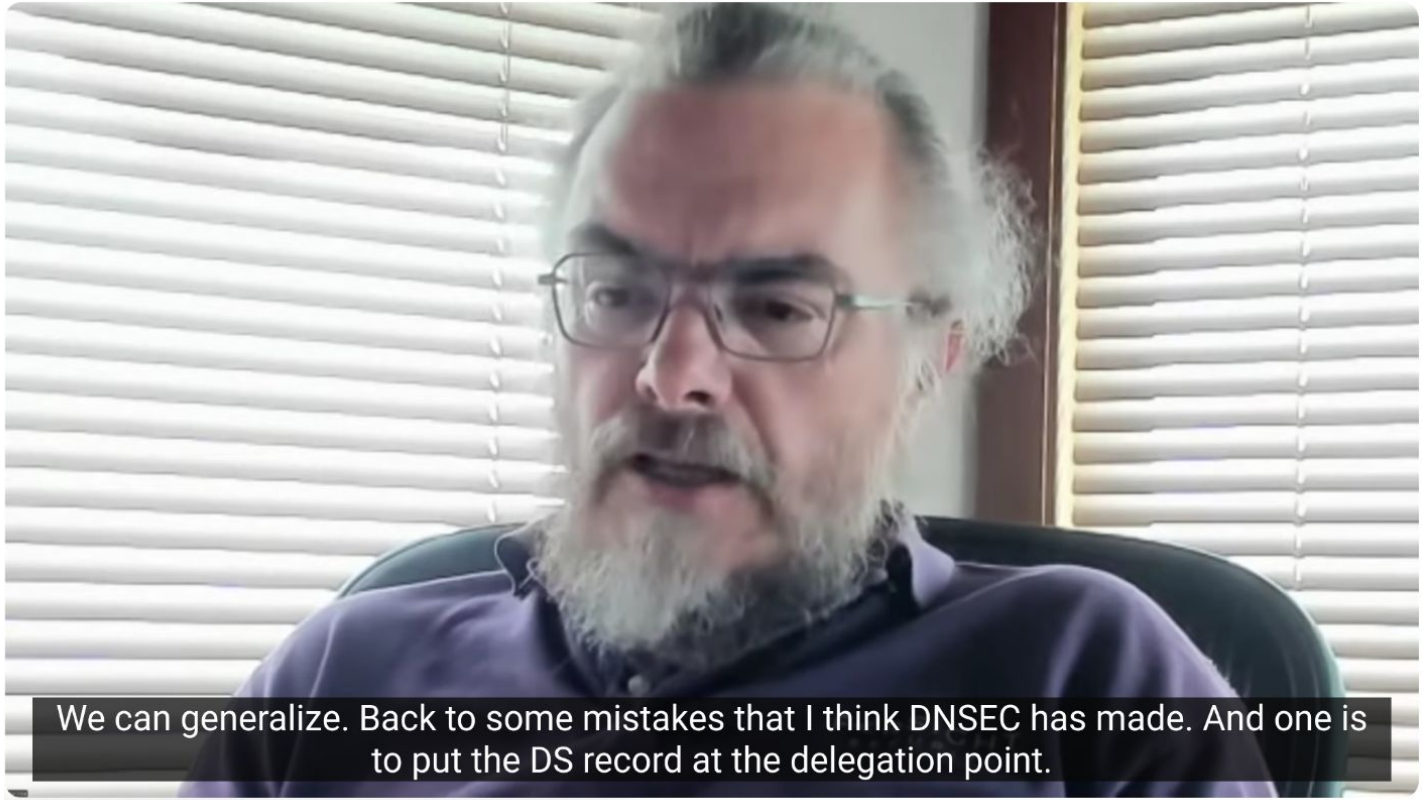
But, but, but,

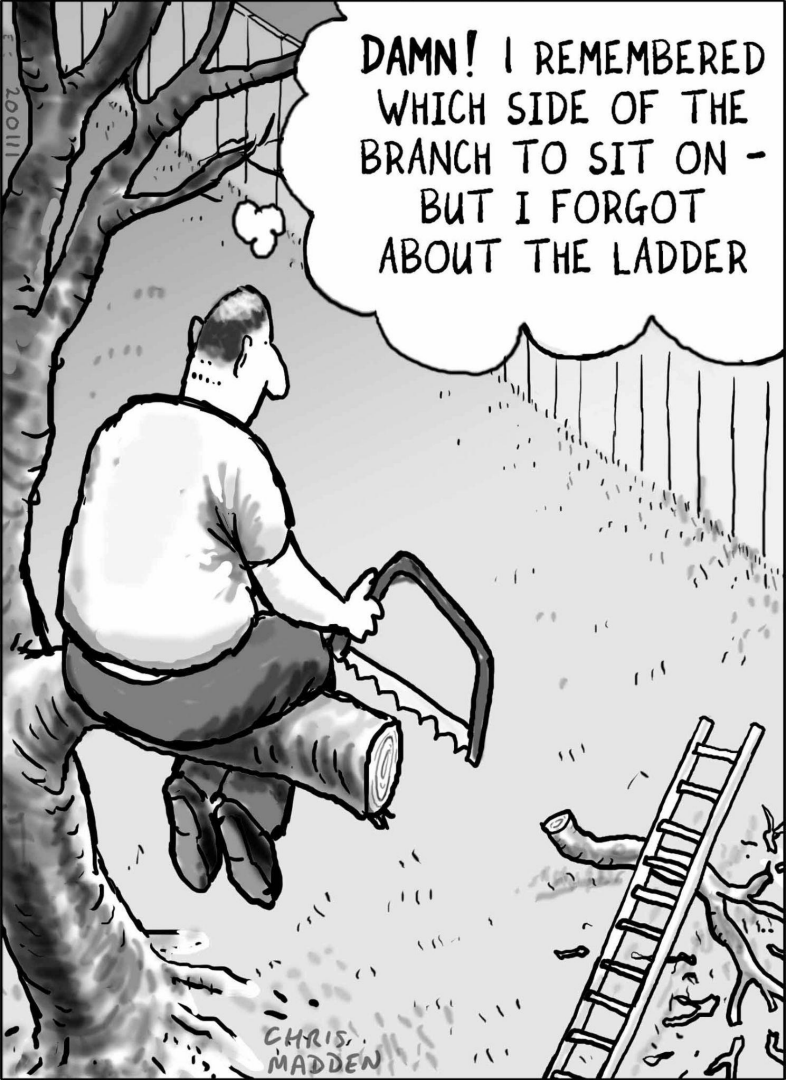
- Every non extensible delegation zone will get two queries!?
  - NSEC(3) RRs shows that **`_deleg.com.`** does not exist
  - Cost: 1 query per zone
  - *Or else require DNSKEY flag*
- What about unsigned zones?
  - Needs explicit **`_deleg.com.`** query
  - Cost: 1 more query per zone
  - *Or else require authoritative support for unsigned zones*

At the zone cut	*Not at the zone cut*
● Name servers, signers, resolvers all need to change	● Can work with resolver implementation only
● New aliasing mechanisms	● CNAME and DNAME
● All name servers serving a zone need to be upgraded	● None, mixed or full deployment on name servers all work fine
● 0 extra queries	● Can work with 0 extra queries

Not a new notion!

- DELEG Panel Discussion at https://419.consulting/encrypted-dns/f/deleg-the-hairy-dns-camel





- Questions
- Comments