DNS Operator Role
in domain management

“a proposed model to improve the DNSSEC provisioning”

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Why? What's this all about?

- .ca has 104 signed delegations ☹
- 11 .ca Registrars support DNSSEC (out of ~150)
- Registrars are not interested in DNSSEC
  - Provides no value add & is a DNS Operator function
  - It is a cost, every request digs in margins
- Provisioning model was designed around the Registrant, Registrar and Registry model (RRR)
- Need to redesign around the **DNS Operator**

History, Legacy & Sacred Cows

- 2004 - NLnetlabs suggested a new SECREG-C contact to handle DNSSEC material with direct access to registries but failed due to pressure from the RRR model to not have Registry talk to Registrant.
  - https://nlnetlabs.nl/downloads/publications/dnssec/dnssecnl/secreg-report.pdf
  - Problem just got postponed until now…

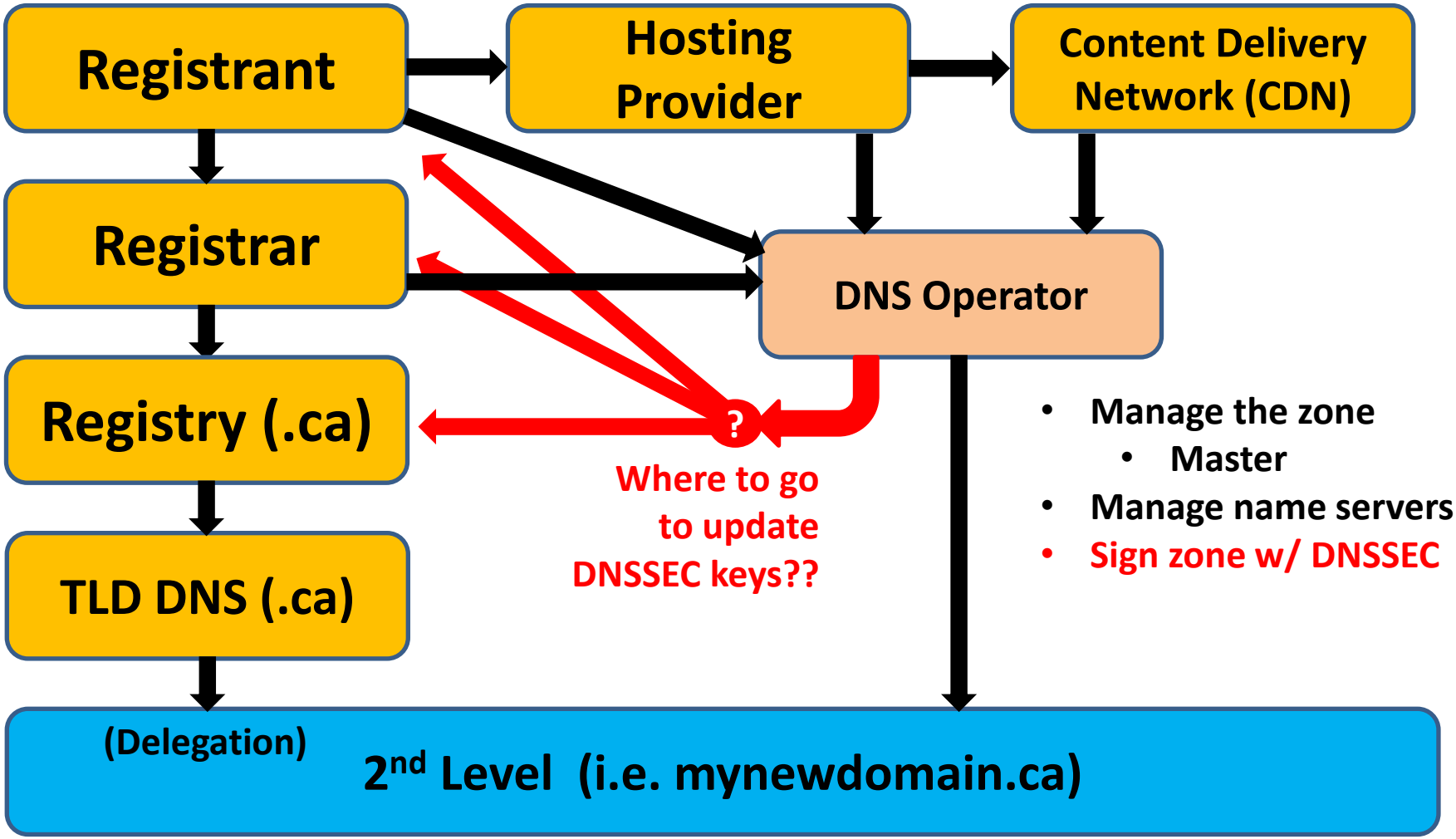
Food for thought

We have a **sacred cow**, conceptually, since the dawn of time, registrars have been granted full control of relaying & managing ***ALL*** registrant domain information to the registry.
No one stopped and asked when DNSSEC material was introduced if the registrar should manage this? Or ***WHO*** should manage this material? Or ***IF*** it should be the DNS Operator?
RFC5910 bingo, we all moved along and "assumed" it was the registrars responsibility and the registrars came back "hey!!! we don't want to manage this *#%&"

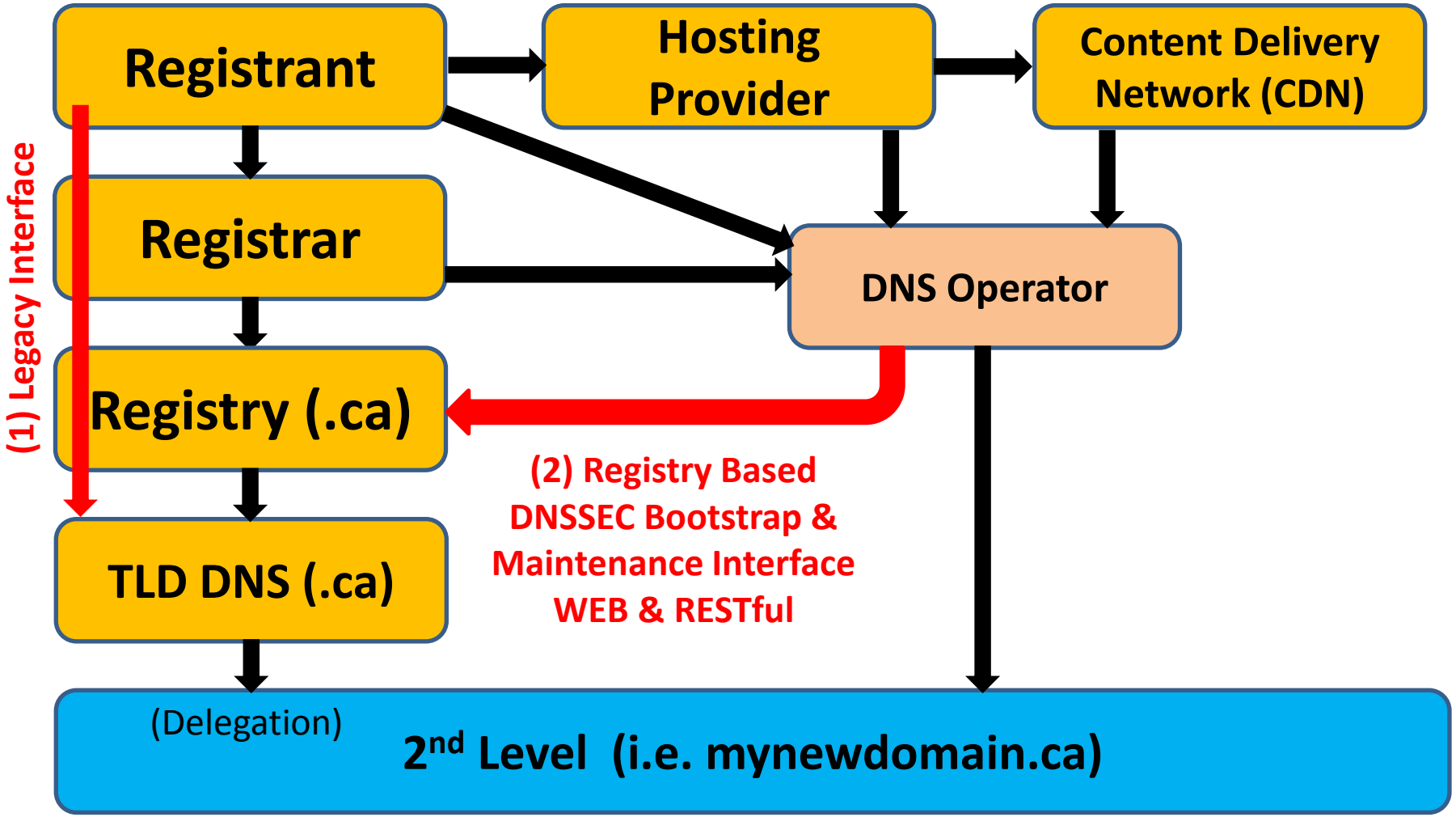
Then we had DS or DNSKEY religion war, Key Relay, CDS, CSYNC, etc…
⇒ *All symptoms of a root cause*.

We need to change the model to support different authorization/delegation model for NS/DS/Glue, and a protocol to manage up the food chain.

DNSSEC Provisioning Reality



DNSSEC Provisioning - Proposed



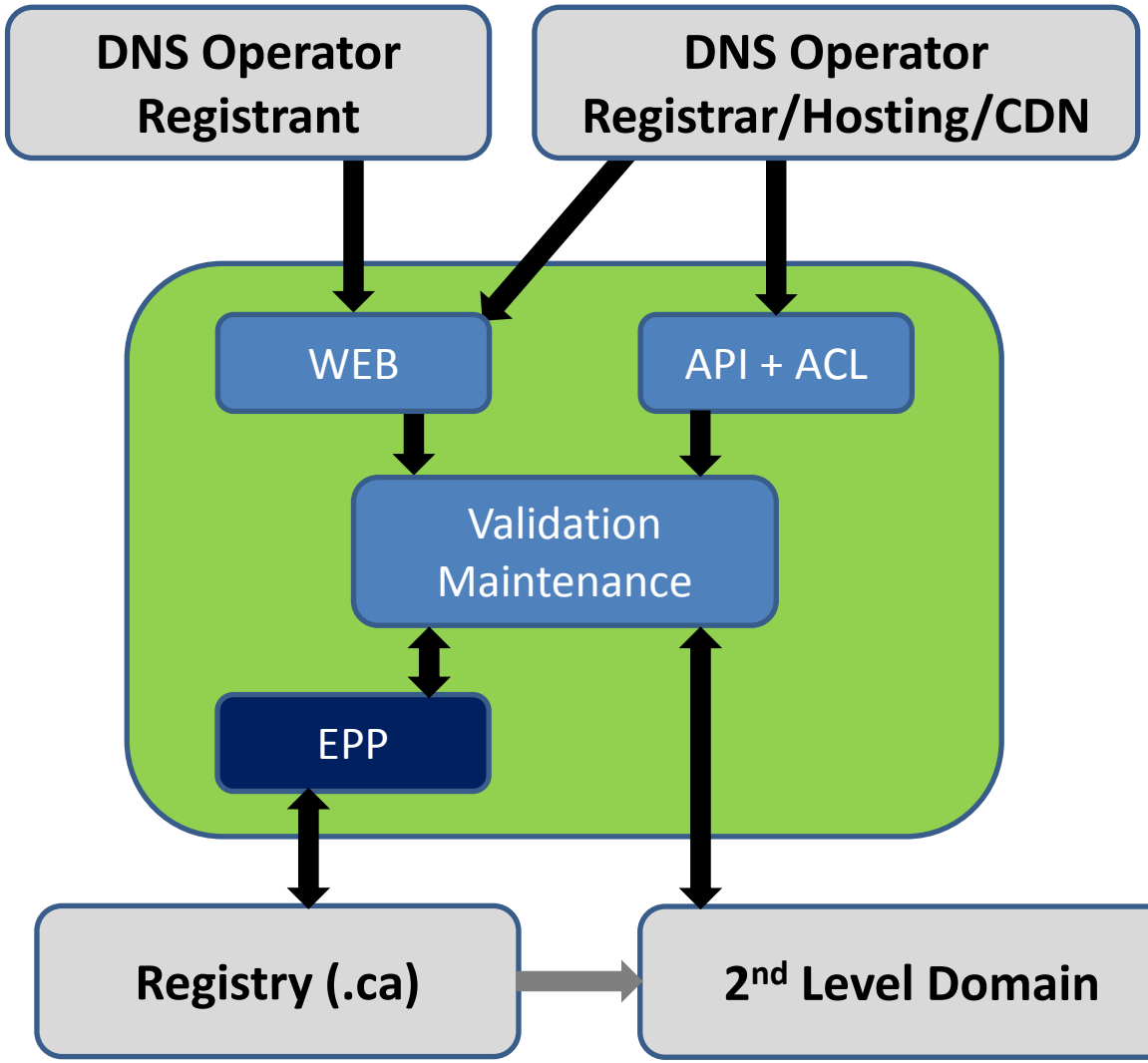
DNSSEC Bootstrap Process

- The DNS Operator needs to prove they control and operate the properly signed and delegated 2nd level zone.
  - Control is proven by adding _delegate TXT record(s) with KEYID(s) of DNSKEY to put in the registry
  - Operate is proven by submitting a request at the registry (.ca) via web gui or RESTful API to trigger the bootstrap process.

DNSSEC Validation Process

- The validation process ensures;
  - Over TCP
  - The RRsig signatures are valid
  - The NS RRset at parent and child are valid
  - _delegate TXT records matches DNSKEY
- The process is to make sure it's signed and delegated properly and ready
  - If already bootstrapped then ignore duplicate requests
  - If not signed properly, provide error dump why it failed

DNSSEC Provisioning - Proposed



DNS Operator to prove control of the SLD by publishing a _delegate TXT record with DNSKEY ID.

Validation via TCP will create a DS from DNSKEY if all signatures are good

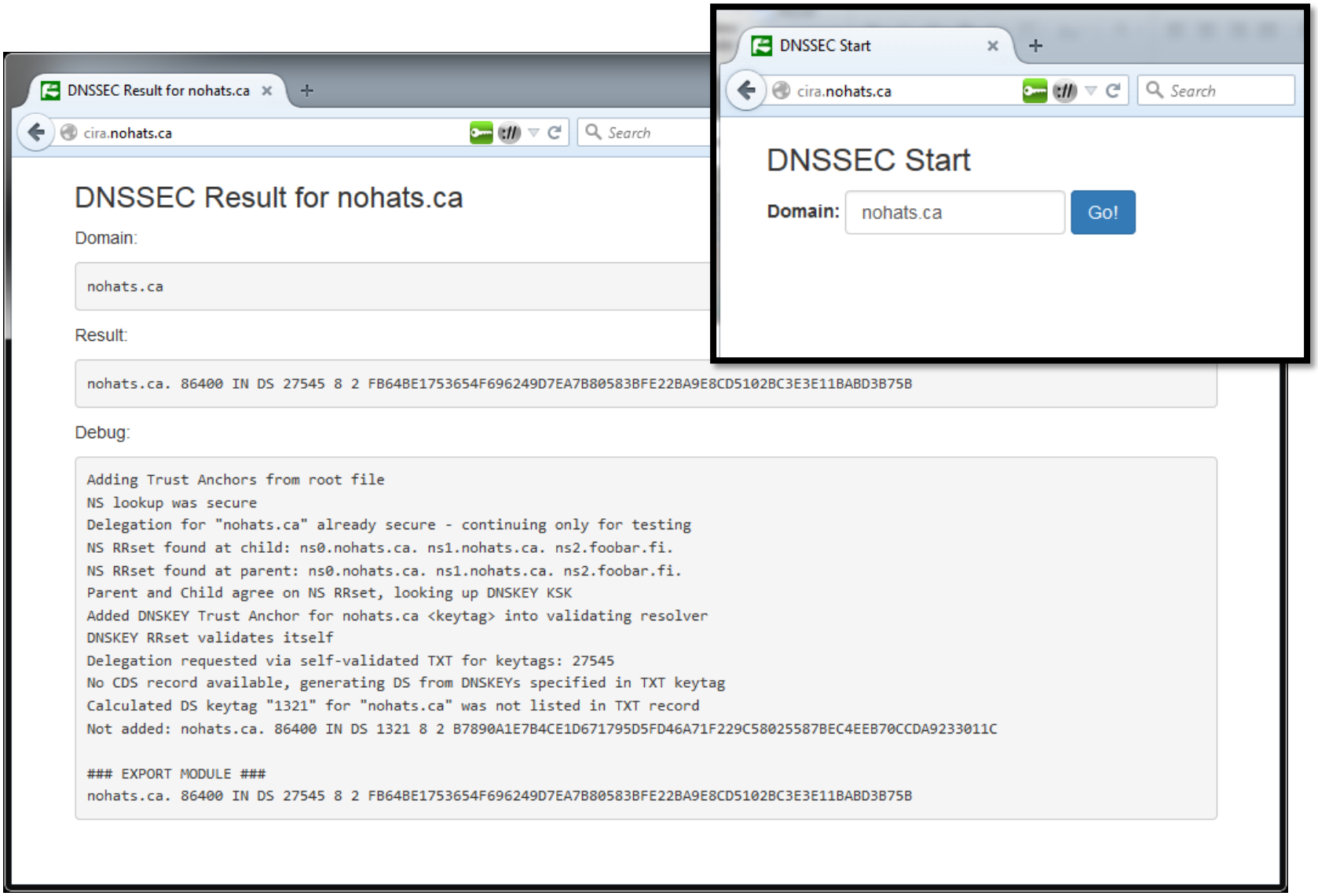
DS added to .ca zone file via EPP transaction

Maintenance done via polling CDS records

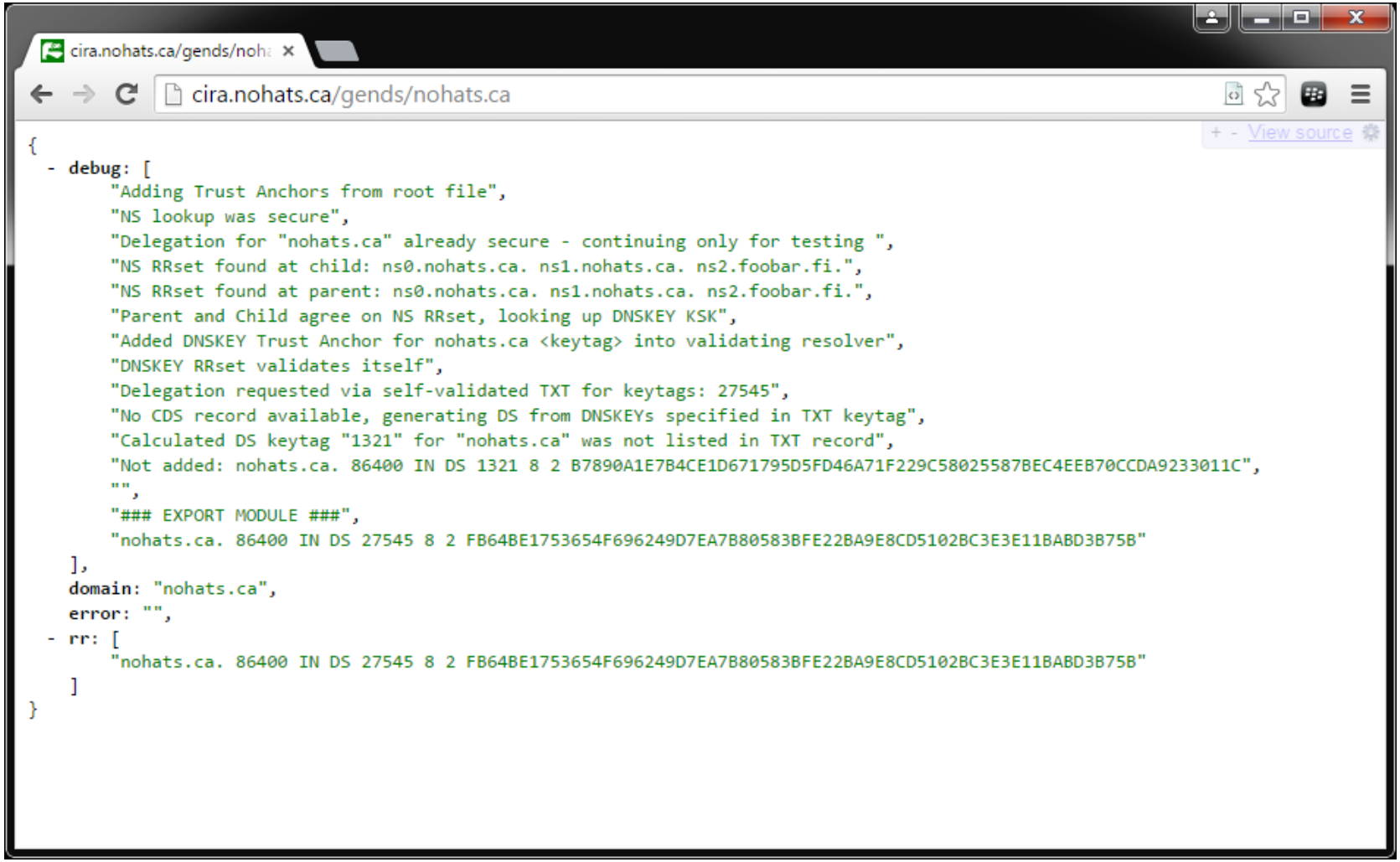
Now what? We Need Prototypes!!!

- The WEB interface is at:
  - http://cira.nohats.ca
- The RESTful API interface is at:
  - http://cira.nohats.ca/gends/
  - eg: http://cira.nohats.ca/gends/nohats.ca
- Yes, needs a bit of security & controls ☺

Web Based Prototype



RESTful API Prototype



Maintenance Approach - CDS Record?

- The .ca Registry will take care of performing on-going DNSSEC maintenance of signed domains.
  - Daily (or specific frequency) polling for new CDS RR
  - Manage as per .ca DNSSEC policy (# keys, DS, Algo, etc…)
  - TBD: 48 hours hold + notify admin/tech contacts?
  - .ca controls the DS format… Create new DS when value in CDS are not compliant
- Testing CDS records for on-going maintenance

```
[root@fedora ~]# dig cds demo.nohats.ca +short
58691 8 2 B5B99B5FBAA7565C49710DCF21137E69EF996C1FC04903BAB4B9397E 5D1BCB09
```

Strategy

- Continue framework development
  - How to maintain and un-sign a domain?
  - Gather & include feedback
- Looking to implement with .ca partners, DNS appliance, Registrars and CDN providers.
- Make code Open Source for all to use
- Standardize - develop new IETF RFC
- Separate DNSSEC from standard registration
  - Investigate registry lock integration/options/value
- Make the Internet a better place ☺

Thank you!

DNSSEC Coordination

<dnssec-coord@elists.isoc.org>