

DS in the Wild

Lessons from a Campaign to configure DS Records

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A free DNS hosting service, designed with security in mind.

deSEC is a **non-profit** doing the same thing as Let's Encrypt, but for DNSSEC.

- all automatic DNSSEC
- fancy API and GUI
- support for modern stuff (e.g. DANE)
- dynDNS service (under *dedyn.io*)

Status

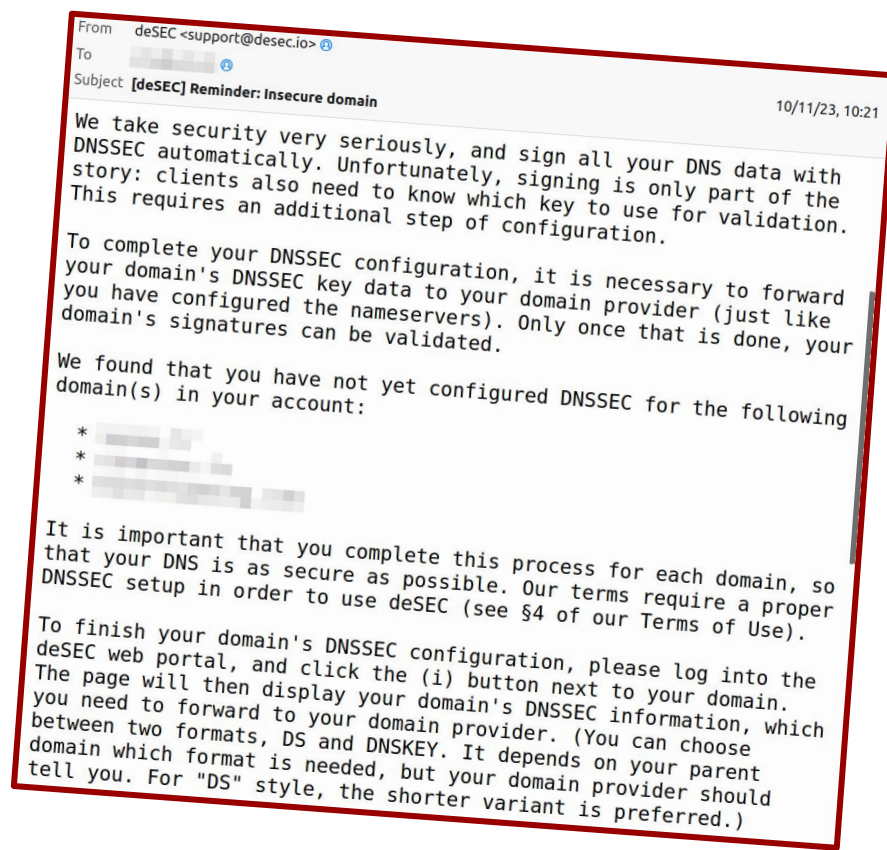
- **Launched in April 2020**
Now hosting **several 10,000 zones**;
~4B q/mo (annual growth ~3-4x)
- **Active community member**
 - RIPE member, ICANN community
 - protocol development
- **Costs**
 - server operations
 - anycast networks
 - development
- **Looking for partners**
deSEC is interested in **sites to host**,
development partners, **sponsors**

7% of domains use DNSSEC

- Up from 4% in 2018/2019/2020 (+20% p.a. since then)
- That's **23M domains**
 - including 4M email domains protected with [DANE](#) (email transport security)
- Fraction of **signed** zones is higher!
- But **~50%** don't have **DS records** ...

The Experiment

- Reached out to users on Oct 4, informing about insecure domains
 - Delegations considered secure when DS record with hash digest type 2 present
 - Sent reminder after 1 week
 - After 2 weeks, collected results
- Suggested some sense of urgency
 - Referenced terms, which require DNSSEC
 - (We did not really shut down anyone)
- Global Encryption Day 2023 was a great occasion for this exercise
 - [Read the statement](#) from Oct 19, 2023



Analysis

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- Excluded 21k domains for which we are the registry (.dedyn.io, automatic DS)
- Restricted to about 6k managed domains delegated to deSEC throughout full measurement period (from 2,318 customers)

	Sample size	Insecure	Secure	Secure rate
Oct 4, 2023	5,974	2,595	3,379	56.6 %
Oct 11, 2023	5,974	2,271	3,703	62.0 % (+5.4%)
Oct 18, 2023	5,974	2,014	3,960	66.3 % (+4.3%)

- Of initially 2,595 insecure delegations, 581 got secured (22.4%)! 🎉
 - Secure delegation rate up by ~10%

How it went

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- **581 delegations from 325 users** got secured (1.8 domains per user)
 - 508 of those with no assistance from customer support
 - 6 users reported believing to have done it before
- **73 delegations from 43 users** required customer support to get secured
 - 4 users (5 domains) had encountered bugs in the registrar's/reseller's interface (which got fixed)
- **Customer support for another 60 users, without success** (still no DS record)
 - 106 domains (42 users): lack of support at the registrar → 5 users transferred
 - 14 domains (6 users): lack of support at TLD (excluding registrars' wrongful claims, e.g., for .eu)
 - 19 domains (8 users): lack of support at non-TLD parent (3rd level or lower)
 - 3 domains (3 users): no access to registrant's portal (e.g., "I'm just the technical contact")
 - 5 domains (1 user): "this is too complicated for me"
- 1 user reported a use case for an insecure delegation (runs a stale copy locally)

Customer Support Insights

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- Basics:
 - 43 of 325 successful customers needed support (13.2%)
 - 60 more customers requested support, but to no avail

→ **Less than half of customer support interactions were fruitful**
- 180 customer support responses in total
 - **14–16h of work**
 - ~5min per message (includes delegation inspection, registrar interaction, etc.)
- Of 43 successful tickets: 4 due to upstream bugs, **39 due to lack of knowledge**
 - Plus 1 person who gave up

→ **1 in 8 reported being unable to perform task** (note: technical user base!)

Scaling Exercise

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- 581 delegations secured and 148 attempted w/o success; ~15 support hours
- No reaction for 1,866 insecure delegations (71.9%)

Naive extrapolation: If all had reacted similarly, how would support load look like?

- overall 3.6× effort, 2068 secure delegations expected (at best?)
 - 153 fruitful interactions
 - 214 interactions without result
- Even with 50% efficiency increase → ~27 hours, ~1350 USD
 - ~0.65 USD / secure delegation

Takeaways & Conclusions

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- Customers appreciated the campaign, were positive about DNSSEC
- Good success in increasing secure delegation rate (57% → 66%), but:
 - **Low reaction rate** (28.1%) → conduct survey amongst non-respondents
 - Manual provisioning: **high failure rate**, unless assisted (30.2%)
 - **High support load/cost**, but can't help with lack of registrar support/access/initiative (78%)

→ **manual setup does not appear fit for purpose**

- **Automated DS maintenance** would have avoided **78%** of support tickets
 - In fact, **100% secure delegations** at deSEC for domains with supporting TLDs
 - But, only available for a few TLDs (.ch/.cz/.li/.nu/.se) → 4% at deSEC

Thank you!

... also to our sponsors:



Questions?