# dry-run DNSSEC

**draft-yorgos-dnsop-dry-run-dnssec**

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IETF 114

# Origin story

- Extended DNS Errors (RFC8914)
  - nice
- DNS Error Reporting (draft-ietf-dnsop-dns-error-reporting)
  - very nice

# Origin story

Random lunch discussion

- “DNS Error Reports can’t help me if I want to adopt DNSSEC”
- *Hmmm…*
- *Hmmm…*
- “DMARC!”

# Enter dry-run DNSSEC

From:


*Gunshow*, by KC Green

# Enter dry-run DNSSEC

To:


*u/GameNCode* on reddit

# Enter dry-run DNSSEC - How it works

- Zone is signed and published
- A dry-run DS record is published in the parent
- Resolver is signaled (dry-run DS) that zone is dry-run signed
- If validation fails generate DNS Error Report; fallback to non-dry-run DS record
  - *Let's pretend that never happened*
- If validation succeeds return AD bit (opportunistic security)

# Use cases - DNSSEC adoption

- Main goal of the proposal
- In the wild testing
- Provide confidence to operators that the newly signed zone is not breaking DNS
- Turn-key action to deploy: replace the dry-run DS with the real DS; no need to touch the zone

# Use cases - DNSSEC experimentation

- You can experimentally sign your zone in the wild!
- See what validating resolvers have to say about it

# Use cases - Test key rollovers

- Real DS also as dry-run DS
- Sign and introduce the new key with a dry-run DS
- *… do key rollover stuff …*
- If everything worked, great! Repeat with real DSes this time.

# Break it! (AKA end-to-end testing)

- Clients can opt-in (with new EDNS0) to receive dry-run DNSSEC errors (if any)
- Easier debugging from the client side
- Test how an application will behave in case of errors

# Break it! (AKA end-to-end testing)

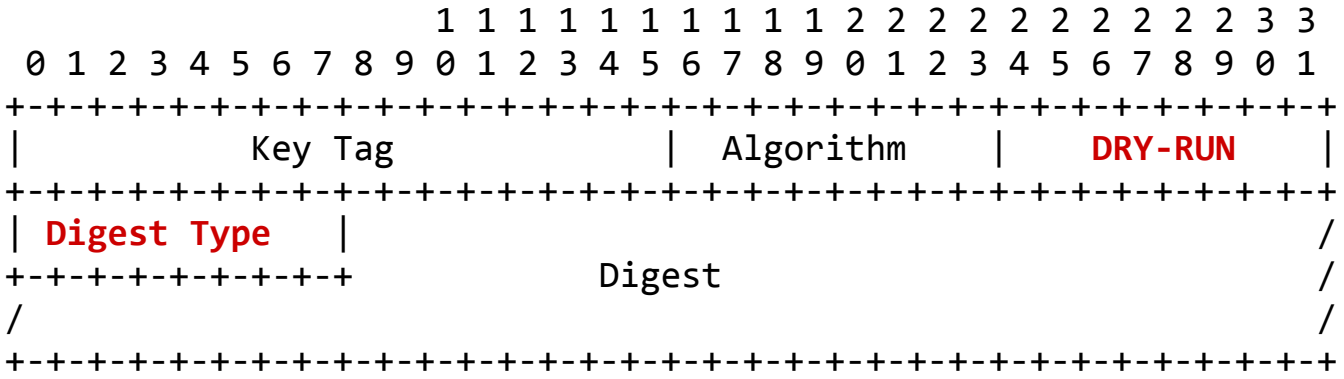

*u/leolambertini* on reddit

# Signaling - IETF 113 Feedback

- Use flags in DNSKEY instead of DS-hack
  - DNSKEY RRset needs to change when done testing; no turn-key action
- General purpose DS-hack for all the DS-hacks
  - Maybe, but we perceive dry-run DNSSEC as integral part of DNSSEC if adopted, not a DS-hack
- Normalize the different DS-hacks with delegation RR types on the parent (like DS)
  - Yes please! But this is another draft…
  - btw, this could work like DDS (new type) identical DS data

# Signaling - Two timelines

## Single timeline




- Variable length digest
  - Q: How bad is this?

# Signaling - Two timelines

Multiple timeline

- Equivalent dry-run DS algorithm for each real DS algorithm
- Essentially burning a bit of the DS digest field (4 currently assigned)
- Q: Can we afford this?

# Signaling - Backwards compatibility

Yes

In all timelines, resolvers that do not support dry-run DNSSEC and have no knowledge of the introduced DS Digest Type Algorithms ignore it as per RFC6840, section5.2

# Provisioning

- Parent accepts DS? Great
- Parent accepts only DNSKEY?
  - Get the dry-run intent
  - Either with accompanying DS
  - Or other means (e.g., UI)
- CDS works
- CDNSKEY needs accompanying CDS

# Security caveat

- No data integrity for the DNSSEC adoption use case!
- In case of DNSSEC errors (spoofing attacks) the resolver will fallback to insecure
  - *Feature not a bug*
- Warning that dry-run DNSSEC is a temporarily intermediate step of a zone going secure

# Implementation

DNS Error Reporting in Unbound (Hackathon 114; early stage) and this could be the next step

# dry-run DNSSEC

Feedback / Questions / (Answers) ?