CLOUDFLARE®

AAAA4free & Black Lies

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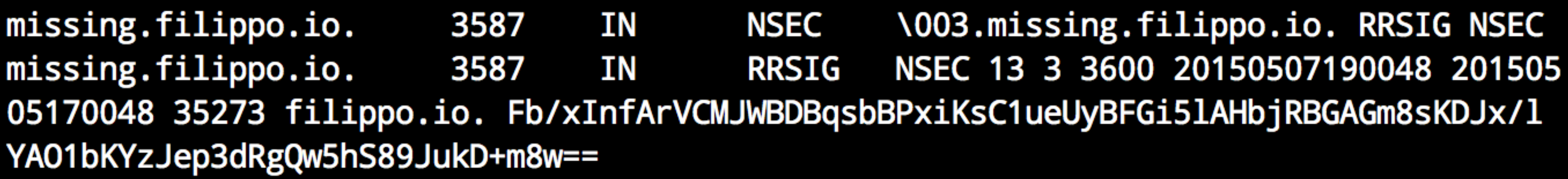
Black Lies: negative answer with one NSEC record

- Precondition: On-line signing
- Action: generate NSEC, for NXDOMAIN answer, on the fly that matches the QNAME with only RRSIG and NSEC bits set in NSEC record
- Side effect: RCODE == NOERROR
- Result: looks like name exists in cache

“Black Lies” in action



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missing.filippo.io.     3587    IN      NSEC    \003.missing.filippo.io. RRSIG NSEC
missing.filippo.io.     3587    IN      RRSIG   NSEC 13 3 3600 20150507190048 201505
05170048 35273 filippo.io. Fb/xInfArVCMJWBDBqsbBPxiKsC1ueUyBFGi5lAHbjRBGAGm8sKDJx/l
YAO1bKYzJep3dRgQw5hS89JukD+m8w==
```

Walking Black lies

- Every name exists => walking is impractical

- Detection: simple walkers are easy to spot

Implementation experience

- All CF signed domains use this
- In use since early last year
- No reports of problems
- Updates RFC4770 ?

Documenting practice

- Issues?
- Requesting review and publication
  - Standards track ?
  - BCP
  - Informational

AAAA4free == A + AAAA

- Simple idea just add AAAA to queries for A if AAAA exists.
- open questions:
  - what section
  - Q: when ? DO =1 or at least OPT
  - Q: explicit signalling?
- Do we need to prove if AAAA (or A) does not exist
  - If DNSSEC validated ==> save to add

Questions:

- What Section?
- Will resolvers accept this ?
  - Drop answer == Bad
  - Ignore == Harmless ==> will improve over time
  - Accept == Great
- Is signaling needed ?
  - Only if current resolvers drop answers

Next steps

- Experiment
    - Writing a special purpose server(s) to give out traceable answers
        - unique answer based on QNAME + QTYPE when retrieved from cache
        - Based on APNIC testing framework
- Help us test when ready
- Report on experiments
- Select path forward