# KSK Sentinel

draft-ietf-dnsop-kskroll-sentinel

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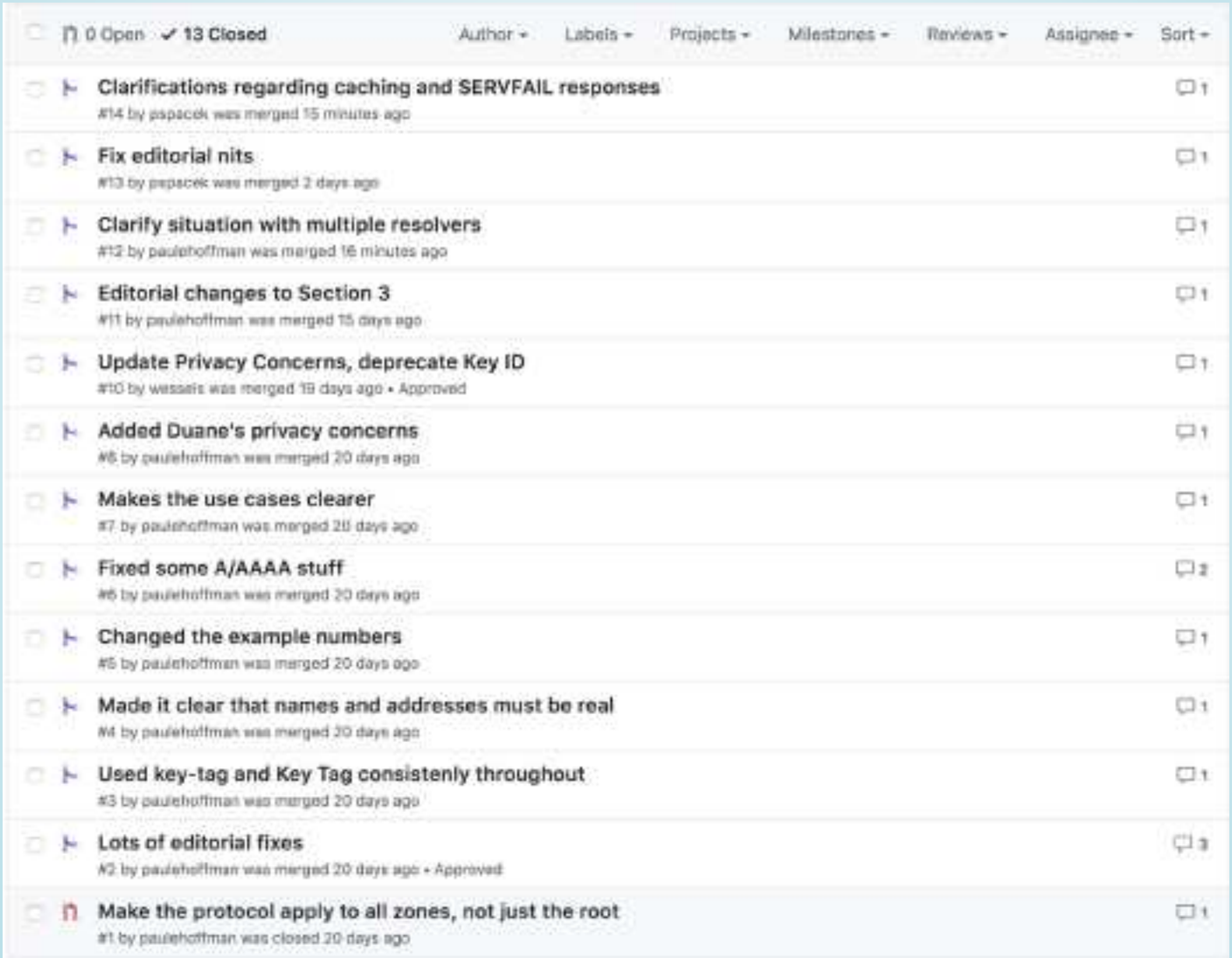
# Major changes



# Major changes

- Conversational description of how this works.
- This is for the **active** root TA.
- Many many readability fixes (thanks all!)
- Make examples FQDN.
- Some privacy clarifications.
- SERVFAIL vs NXDOMAIN...

# Major changes

## Names!

- _is-ta-<key-tag>
- kskroll-sentinel-is-ta-<hex key-tag>
- kskroll-sentinel-is-ta-<dec key-tag>

# Demo

## Demo: http://www.ksk-test.net:

### Sentinel KSK Test

**tl;dr: You are using a legacy resolver, we cannot determine your fate!**

This page uses the methods described in A Sentinel for Detecting Trusted Keys in DNSSEC to determine if the resolvers that you are using will survive the upcoming **KSK** roll. You should really read the document, but the 50'000ft view is that it attempts to load resources from 3 names:

- "http://invalid.ksk-test.net/invalid.gif"
- "http://kskroll-sentinel-is-ta-20236.ksk-test.net/is-ta.gif"
- "http://kskroll-sentinel-not-ta-20236.ksk-test.net/not-ta.gif"

It then uses some simple logic to tell what your fate will be after the KSK roll:

1. If you are **not** using a validating resolver, you will be able to load the *invalid* record.
2. If you are using a validating resolver which **does not** understand this new mechanism you will be able to load both of the sentinel records: *kskroll-sentinel-is-ta-20236* and *kskroll-sentinel-not-ta-20236*.
3. If you are using a resolver that supports this mechanism you will only be able to load one of the two sentinel records - which one tells you how you will fare in the rollover.

When running the above test, you:

- were **NOT** able to fetch the 'invalid' record
- were able to fetch the "kskroll-sentinel-is-ta-20236" record
- were able to fetch the "kskroll-sentinel-not-ta-20236" record

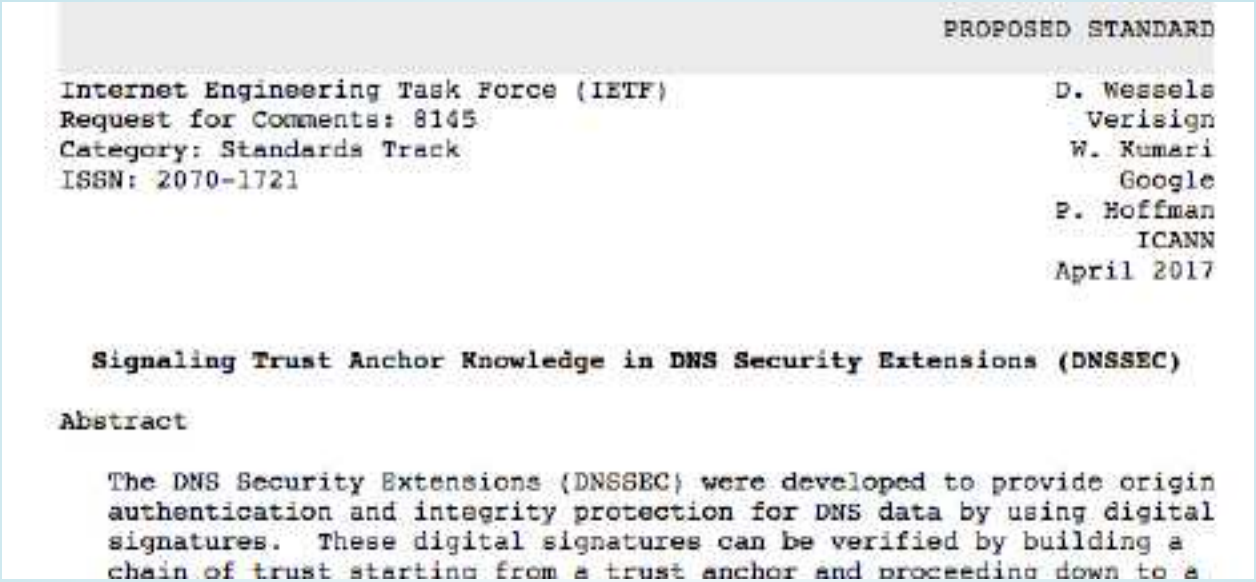
# Questions?

# Backup Slides

# What's the problem?

- We ~~need~~ want to roll the DNSSEC trust-anchor (KSK)
- Have no way to measure the impact.

# RFC8145!



PROPOSED STANDARD

Internet Engineering Task Force (IETF)
Request for Comments: 8145
Category: Standards Track
ISSN: 2070-1721

D. Wessels
Verisign
W. Kumari
Google
P. Hoffman
ICANN
April 2017

**Signaling Trust Anchor Knowledge in DNS Security Extensions (DNSSEC)**

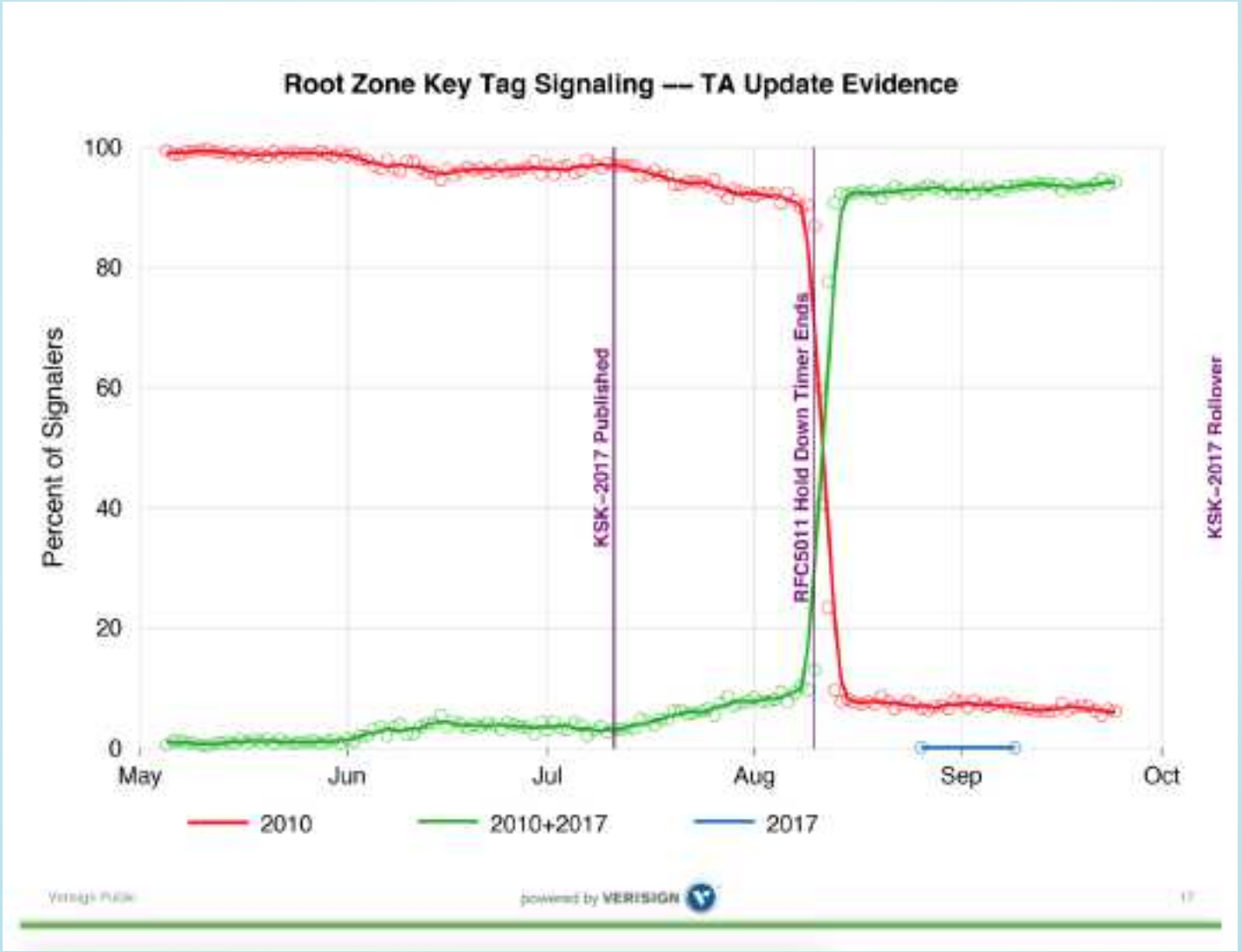
Abstract

The DNS Security Extensions (DNSSEC) were developed to provide origin authentication and integrity protection for DNS data by using digital signatures. These digital signatures can be verified by building a chain of trust starting from a trust anchor and proceeding down to a

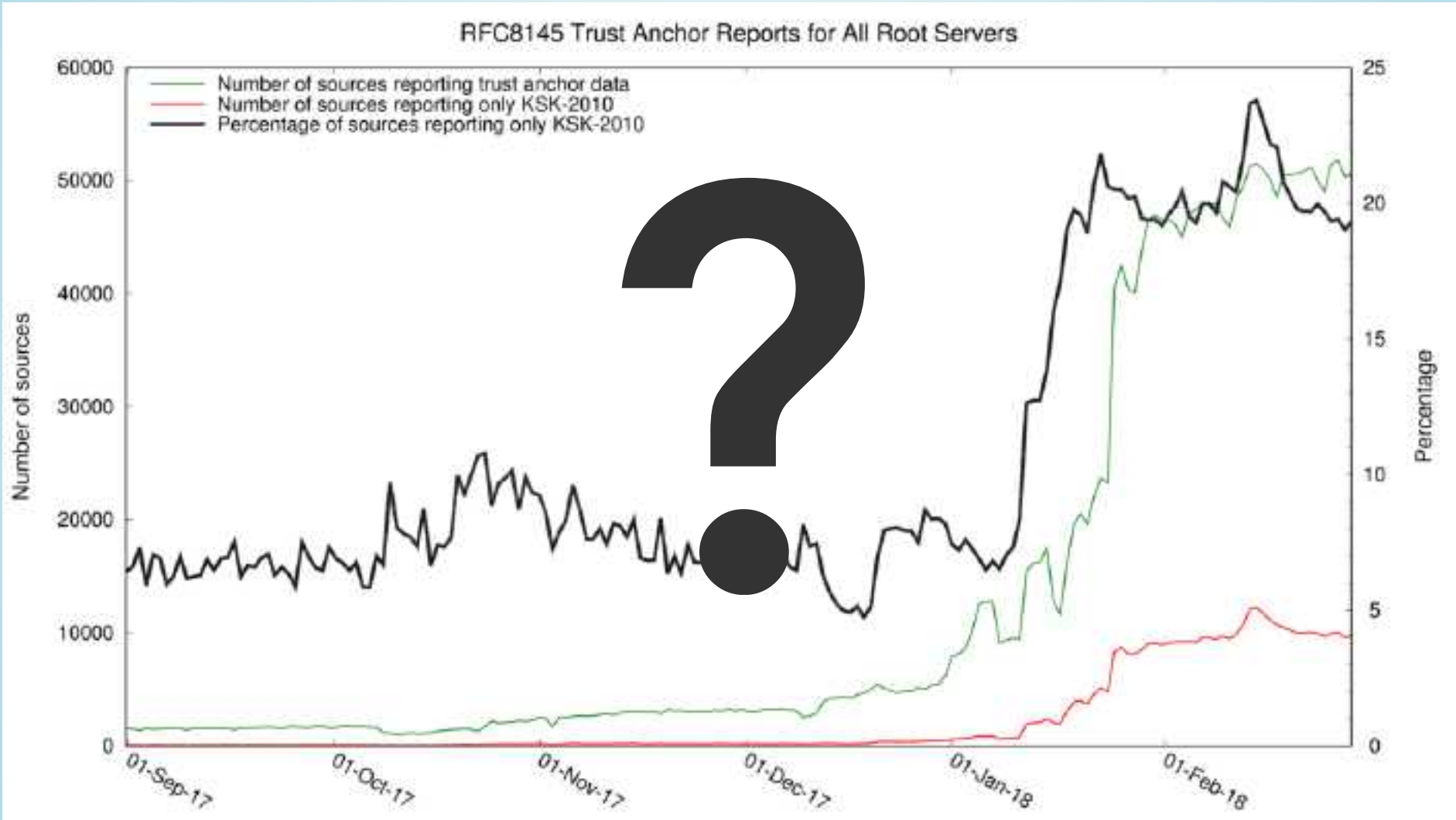
Solved!

Nope.

# Pretty graphs!



# Prettier graphs!



# Sentinel

1. Requires a (simple) resolver update
2. Allows anyone to set up a measurement service
3. Exposes the result to the users

# The change

Just before sending the **response** (after resolution, validation):

- `kskroll-sentinel-is-ta-[key].something?`
  - If have the key, reply normally, else SERVFAIL
- `kskroll-sentinel-not-ta-[key].something?`
  - If do NOT have the key, reply normally, else SERVFAIL

# Example

- I'm a validating resolver. I support sentinel.
- I have the new KSK (20326)
- I get a query for invalid.example.com
  - It fails DNSSEC validation - SERVFAIL
- I get a query for

  `kskroll-sentinel-is-ta-20326.example.com`
-
  - I resolve it and get 192.0.2.23
  - I have (and am using) KeyID 20326
    - answer with 192.0.2.23
- I get a query for

  `kskroll-sentinel-not-ta-20326.exam`
  - I do have (and am using) KeyID 20326
    - send SERVFAIL

# Yawn. So what?!

```
1  <html>
2    <body>
3      <h1>KSK Roll Test</h1>
4      <p>
5      Fish: <img src="invalid.example.com/fish.jpg">
6      Kitten: <img src="kskroll-sentinel-is-ta-20326.example.com/kitten.jpg">
7      Puppy: <img src="kskroll-sentinel-not-ta-20326.example.com/puppy.jpg">
8      </p>
9    </body>
10 </html>
```

Do you see:

- Fish? Not validating, key-roll doesn't affect you.
- Kitten and Puppy? Legacy, we cannot tell.
- Kitten? You have the new key, you'll be fine.
- Puppy? **DANGER**! You only have the old key.

# Srsly? Kittens?!

Sadly, no...

```
<html>
<head>
  <script type="text/javascript"
   src="https://ajax.googleapis.com/ajax/libs/jquery/1.12.4/jquery.min.js"></script>
</head>
<body>
  <h1>Sentinel KSK Test</h1>
  <p hidden>
    <img id="img_invalid" src="http://invalid.ksk-test.net/invalid.gif"/>
    <img id="img_is_ta" src="http://kskroll-sentinel-is-ta-20236.ksk-test.net/is-ta.gif"/>
    <img id="img_not_ta" src="http://kskroll-sentinel-is-ta-20236.ksk-test.net/not-ta.gif"/>
  </p>

  <p>
    <span id="sentinel"></span>
  </p>

  <script type="text/javascript">
    var invalid=true, is_ta=true, not_ta=true, result="Testing failed...";

    $('#img_invalid').error(function(){invalid=false});
    $('#img_is_ta').error(function(){is_ta=false});
    $('#img_not_ta').error(function(){not_ta=false});

    window.addEventListener('load', function(){
      switch (true) {
      case invalid===true:
        result='No DNSSEC validation, you will be fine...'; break;
      case (is_ta===true && not_ta===true):
        result='Legacy resolver, cannot determine your fate!'; break;
      case (is_ta===true):
        result='WARNING!: You do not have the new KSK.'; break;
      case (not_ta===true):
        result='Congratulations, you have the new key. You will be fine.'; break;
      }
      $('#sentinel').text(result);
    });
  </script>
</body>
</html>
```

# ...but kittens!!!

Sorry, still no... :-(

**Demo: http://www.ksk-test.net:**

## Sentinel KSK Test

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