

# The Root Canary

Quantifying the Quality of DNSSEC Validation in the Wild



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# Canary in the virtual coalmine

- Goals:
  - **Track operational impact** of the root KSK rollover, act as a warning signal that validating resolvers are failing to validate with the new key
  - **Measure validation during the KSK rollover** from a global perspective **to learn from this type of event**

# Measurement methodology

- Use four perspectives:
  - Online perspectives:
    - RIPE Atlas
    - Luminati
    - APNIC DNSSEC measurement  
(current thinking: use data during evaluation)
  - “Offline” perspective (analysed after measuring)
    - Traffic to root name servers (multiple letters)

# Measurement methodology

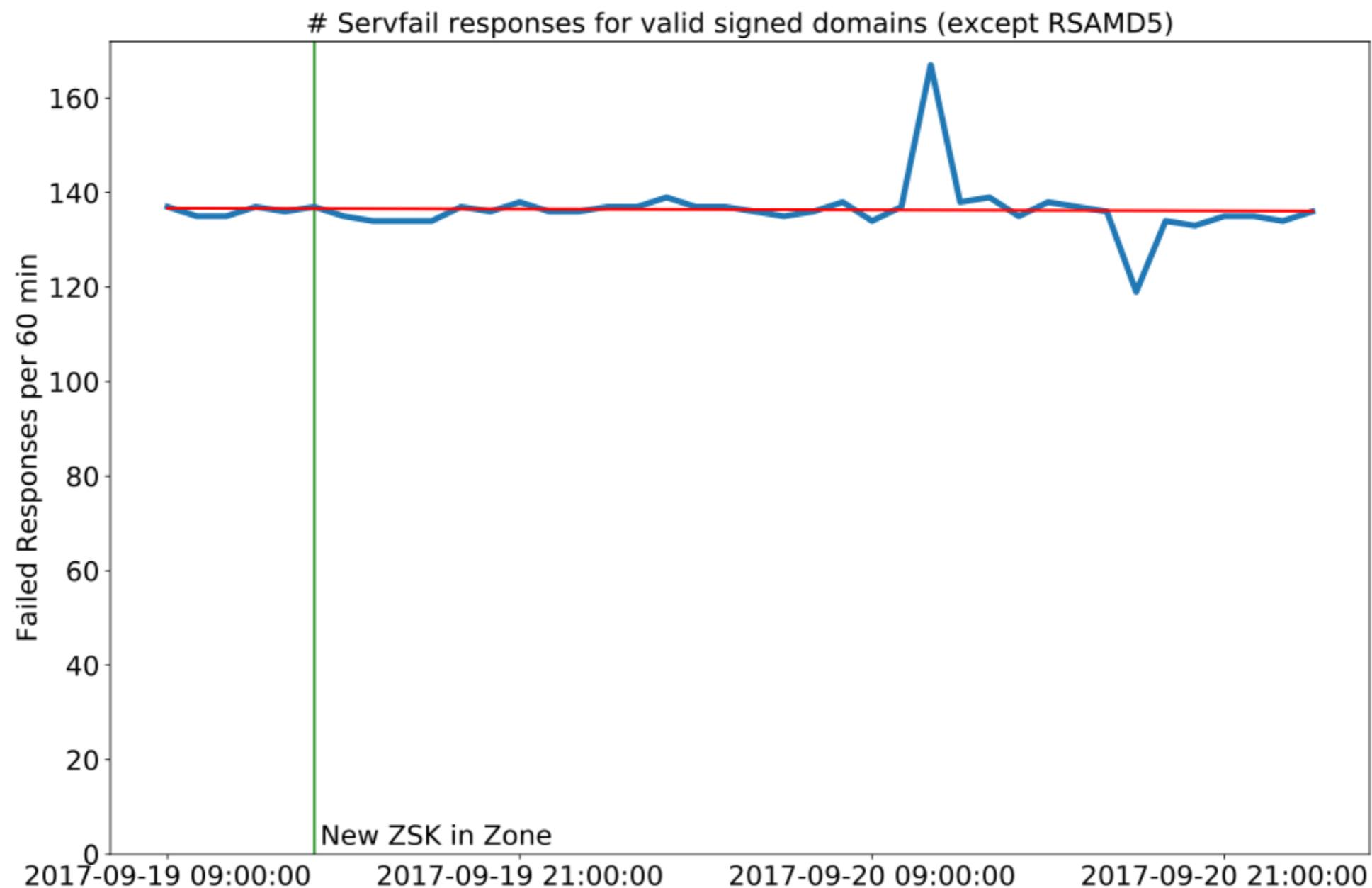
- We have **signed and bogus** records for **all algorithms** and **most DS algorithms**
- This gives us one of three outcomes:
  - Resolver **validates correctly**
  - Resolver **fails to validate** (SERVFAIL)
  - Resolver **does not validate**
  - (yes, there are **corner cases** probably **not covered** by these three options)
- **Side-effect:** measure support for algorithms

# Measurement methodology

- **Luminati:** HTTP(s) proxy service 
- 2.3 Million exit nodes - usually of residential users
  - Allows us to send HTTP(s) traffic via a central Luminati server through the exit nodes
  - This HTTP request triggers a DNS query
- Covers > 15,000 ASes
- Of which > 14,000 are not covered by RIPE Atlas

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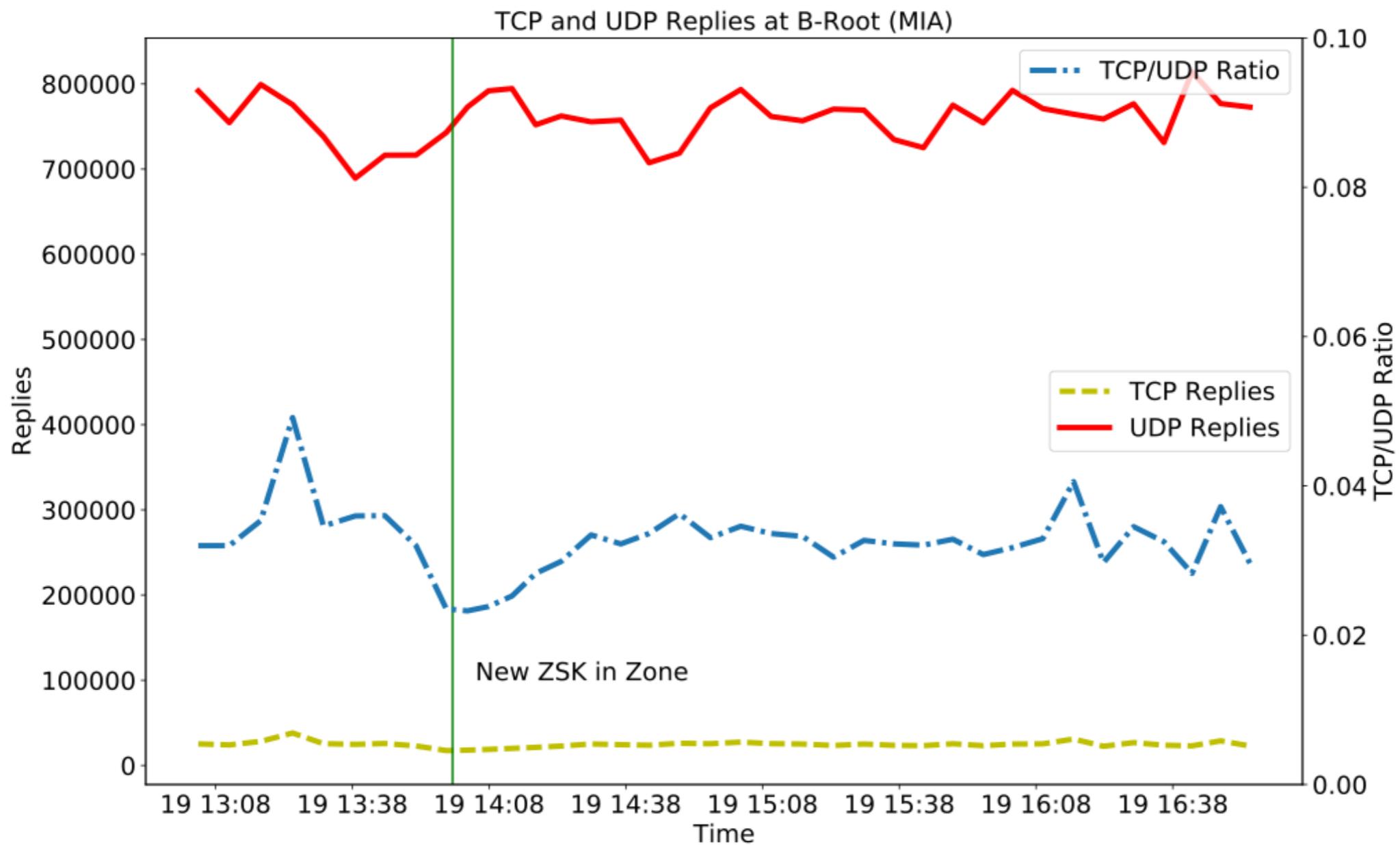
- Preliminary Findings after 2017-09-19:



<https://rootcanary.org/>

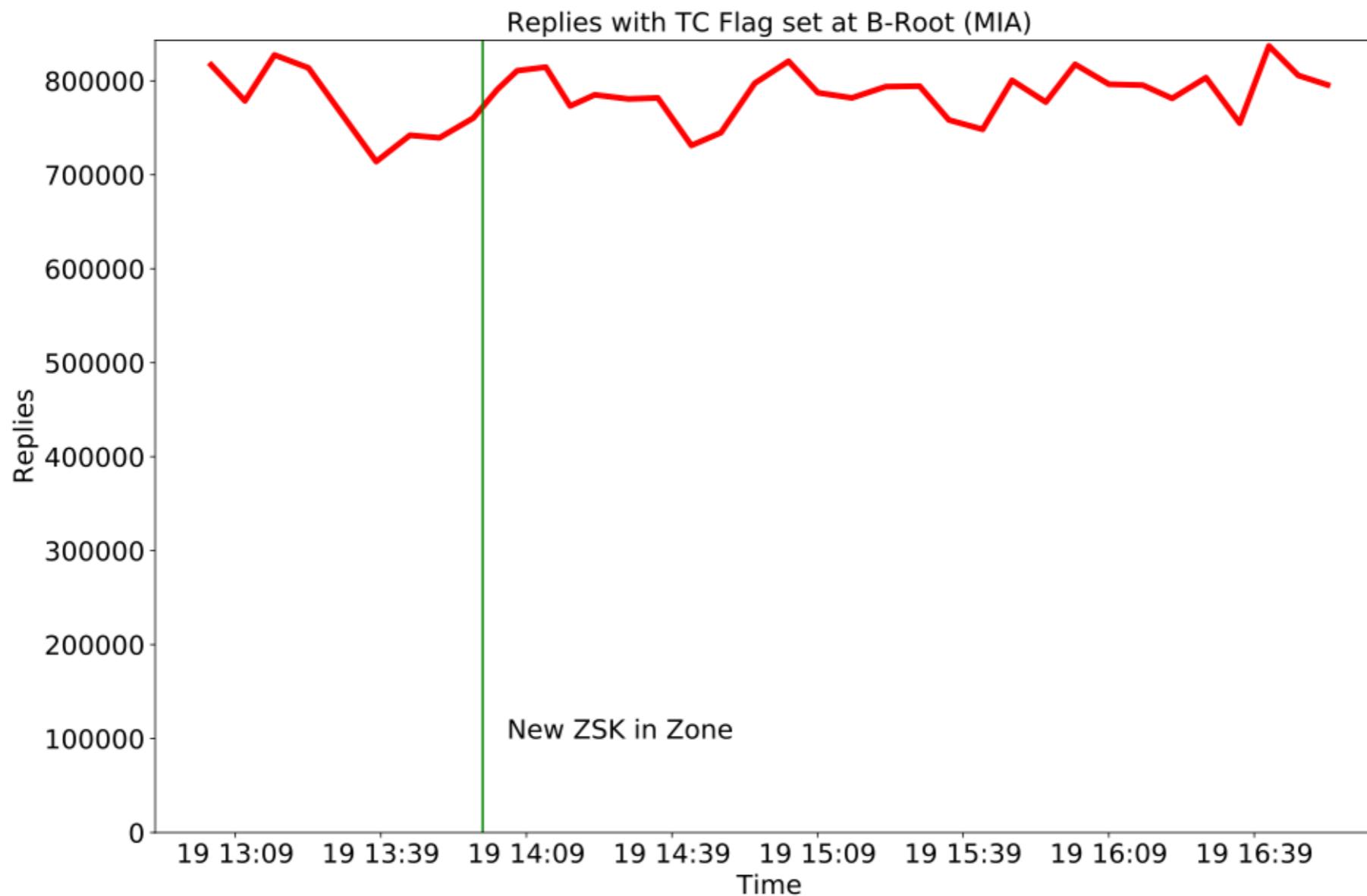
# Canary in the virtual coalmine

- Preliminary Findings after 2017-09-19: Root



# Canary in the virtual coalmine

- Preliminary Findings after 2017-09-19: Root



# Beyond the Root Canary Project

- **Tooling for key roll overs:** develop generic measurement methodology that can also be applied at TLD level or below
- **Know your resolvers:** measure use of DNSSEC algorithms and resolver implementations
- **But first:** the real root key roll over

# You can help!

- Run small shell script that uses *dig* to query our test domains from within your network
  - Using your default resolvers
  - Once every hour
- Please come talk to me if you're interested

# More info

- Project webpage:  
<https://rootcanary.org/>
- Online algorithm test:  
<https://rootcanary.org/test.html>
- Current results for RIPE Atlas-based measurement:  
<https://portal.rootcanary.org/rcmstats.html>
- Live feed for RIPE Atlas-based measurement:  
<https://monitor.rootcanary.org/live.html>

<https://rootcanary.org/>