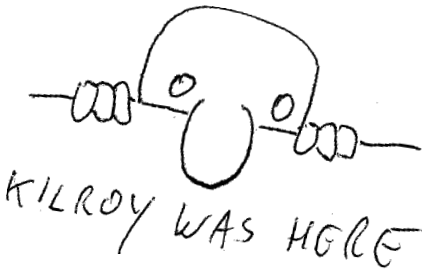
No-one here?

Watch the slides to see what we do at SIDN labs.

23 August 2022



SIDN Labs research areas

1. Network security
   - Research the security of core internet components (DNS(SEC), BGP, NTP)

2. Domain name security
   - Domain name abuse detection, fake webshops, measurement studies

3. Secure future internet infrastructures
   - Trusted networking, SCION, P4, transparent networks

sidnlabs.nl/en/about-sidnlabs

SIDN Labs way of working

sidnlabs.nl/en/about-sidnlabs

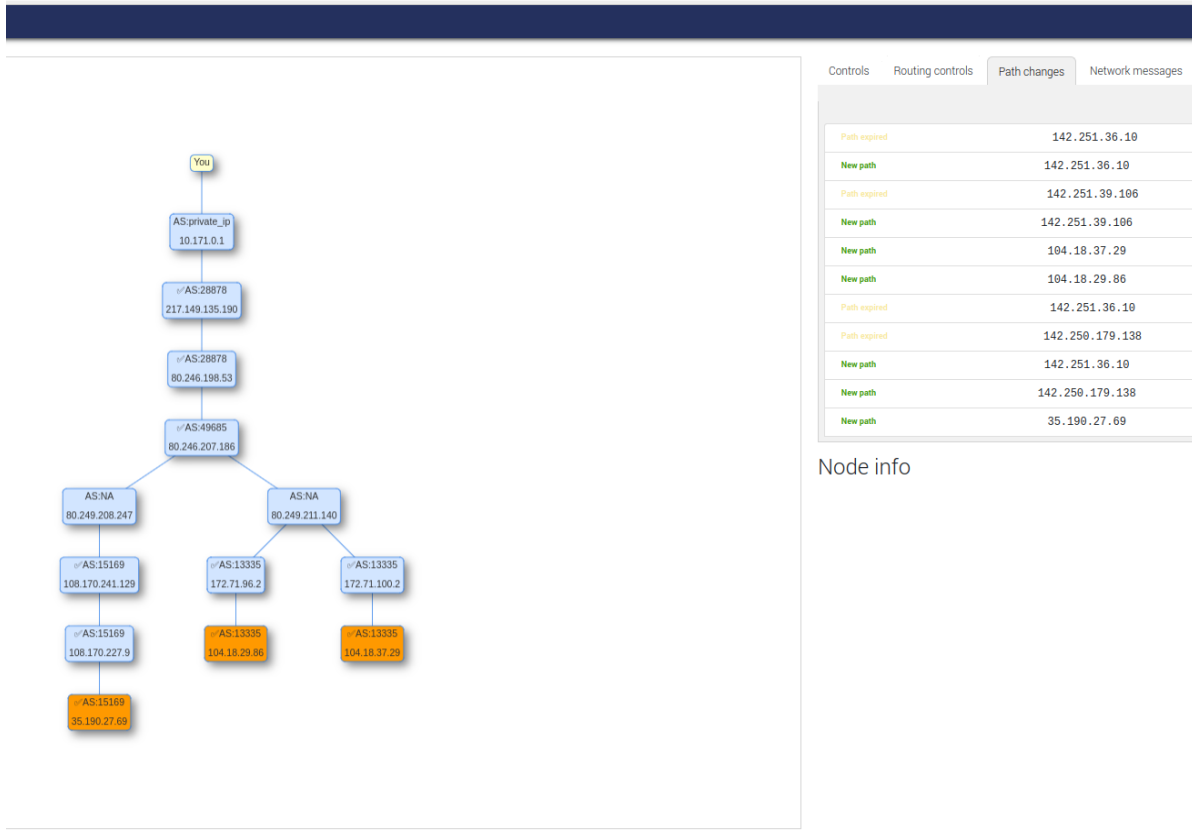
- Bridge worlds of academia and industry
- Measurement- and design-based research
- Results publicly available (publications, code, data)

PathVis

Ever wondered how your internet traffic traverses the internet?

PathVis --->

- Shows the entire to endpoints for established connections.
- Alerts on changes in the path.
- Increases transparency of Internet infrastructure using path tracing.



Live demo during coffee breaks.

TimeNL: public NTP service

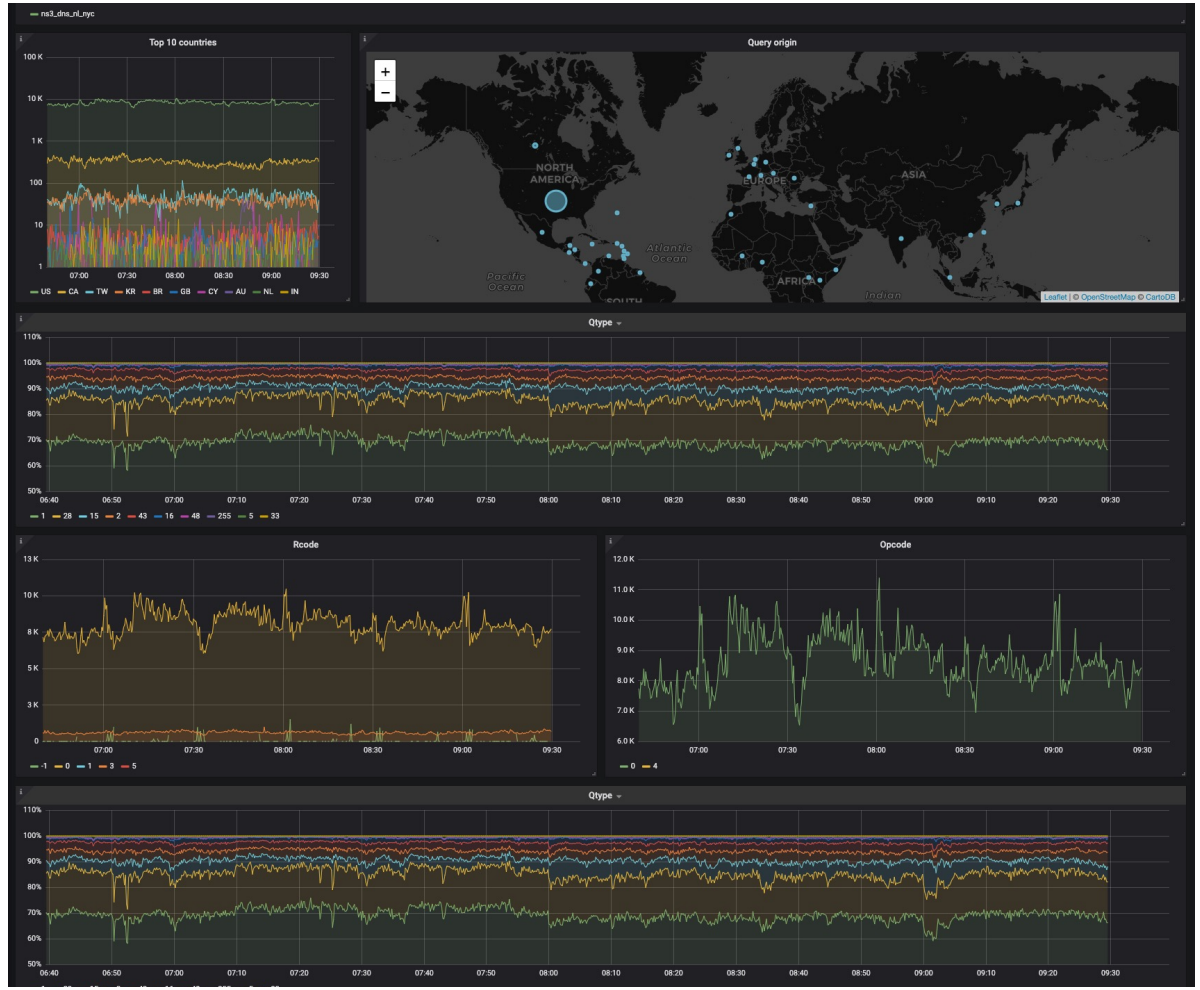
- Transparent: e.g., publicly document used time sources
- Multiple reference clocks: Galileo and GPS as primary clocks, DCF77 signal as a secondary clock, good stratum-1 NTP servers as fallbacks
- `ntp.time.nl` (located in Arnhem, NL)
- `any.time.nl` (anycast)

GPS/Galileo and DCF77 antennas on the roof of the SIDN building

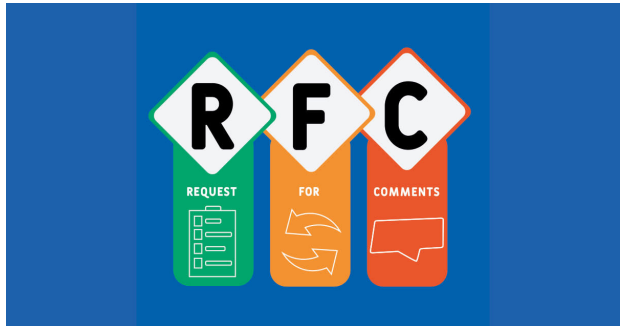
sidnlabs.nl/en/news-and-blogs/timenl-comes-of-age

DNS data analytics

- ENTRADA: platform for analyzing very large amounts of DNS data
- Key enabler for our DNS research: results include RFC 9199, DNS security and many papers
- Also used in production, such as for optimizing the resilience of the .nl nameserver infrastructure

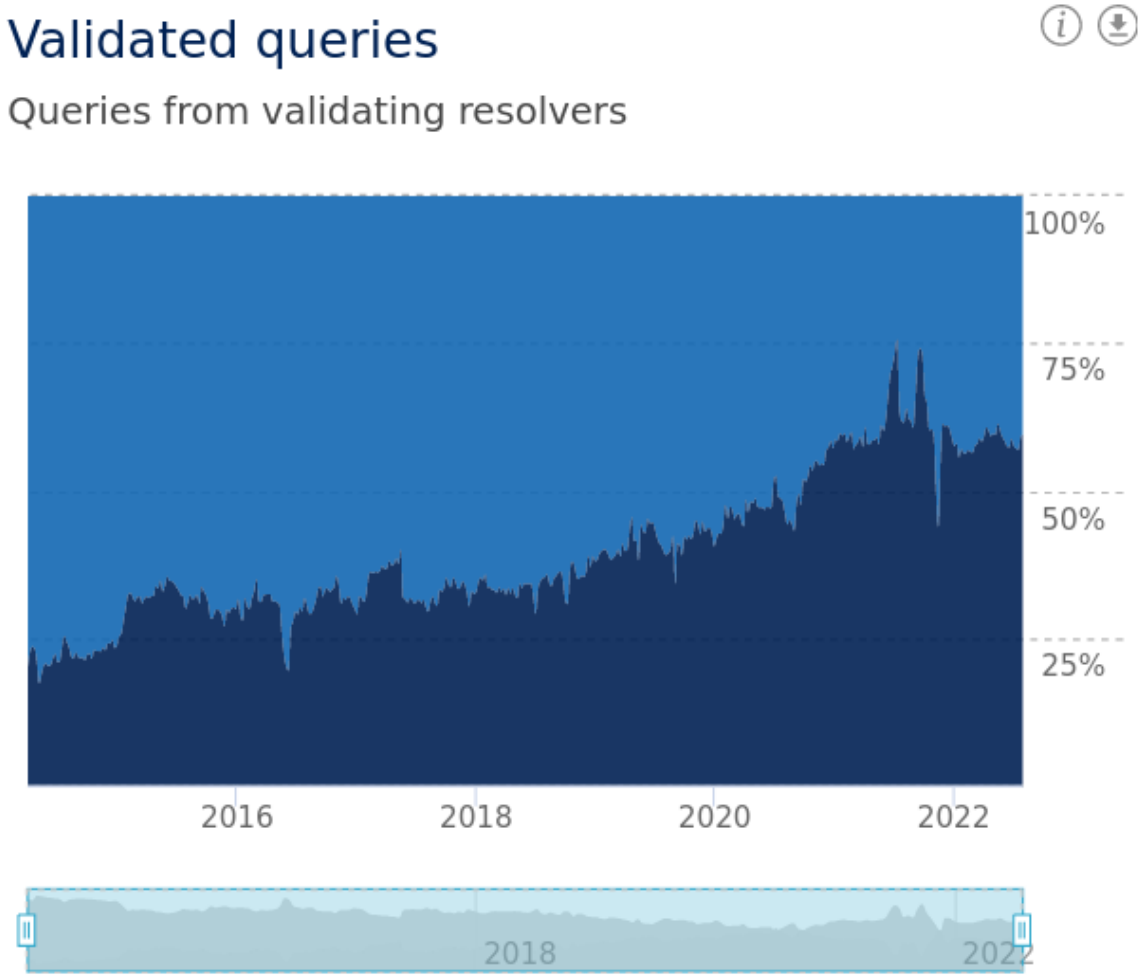


entrada.sidnlabs.nl



stats.sidnlabs.nl

- Near-real time graphs and stats about the .nl TLD
- Datasets freely available!
- Categories include registration, DNS, DNSSEC, network, security

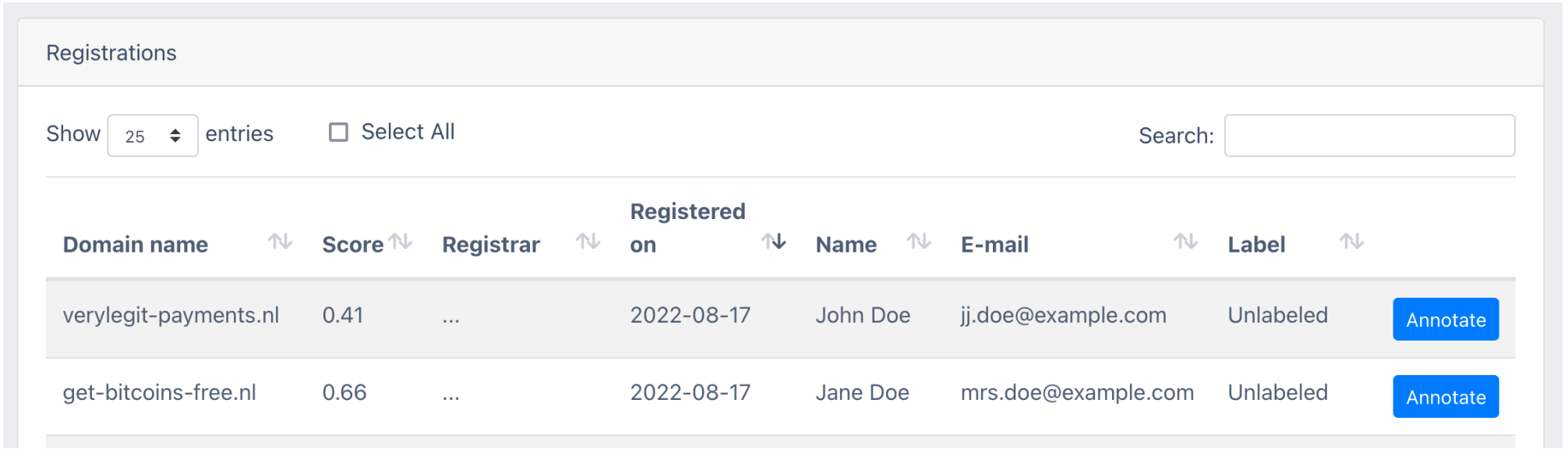


stats.sidnlabs.nl/en/

RegCheck: detecting suspicious domains at registration

- Allows abuse analysts at SIDN to quickly inspect suspicious domain name registrations
- Tested various machine learning models based on abuse reports (phishing, fake webshops, etc.), as well as rule-based models
- Follow-up research project with DNS Belgium (.be registry)

sidnlabs.nl/en/news-and-blogs/feasibility-study-of-automated-detection-of-malicious-nl-registrations

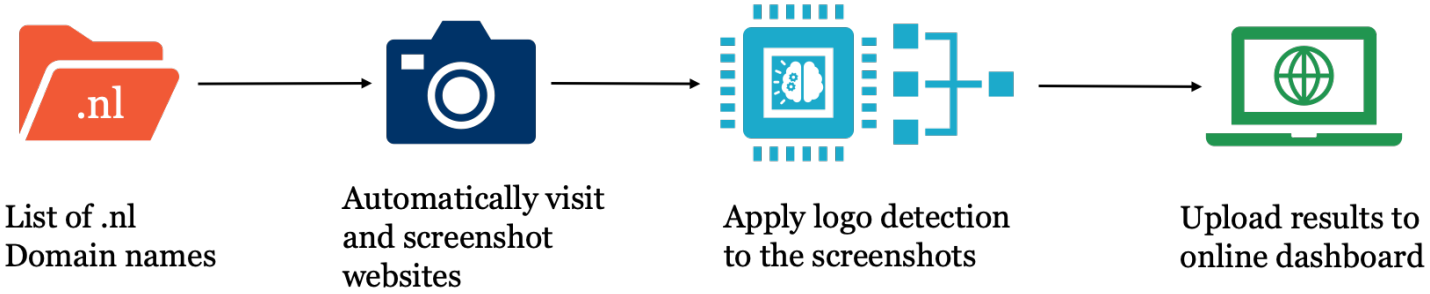


LogoMotive: detection of malicious .nl websites

- Logo detection to automatically find malicious sites in 6.2M .nl domain names
- Human-in-the-loop decision making
- Two pilot studies proved its added value, which formed the basis of our peer-reviewed paper in PAM2022

Paper & more info:

logomotive.sidnlabs.nl



Anycast testbed

- 30 sites across the world, dynamically add/remove nodes
- Serves `any.time.nl`, amongst others
- Valuable for running the .nl production anycast infrastructure

Locations of our anycast nodes.

sidnlabs.nl/en/news-and-blogs/inside-line-on-our-anycast-testbed

Preparing DNSSEC for quantum computing

- Deploying quantum-safe cryptography algorithms in existing protocols is a challenge
- Assessed quantum-safe algorithms for use in DNSSEC (see requirements in table below)
- Involved parties: NLnet Labs, SIDN Labs, University of Twente, TNO

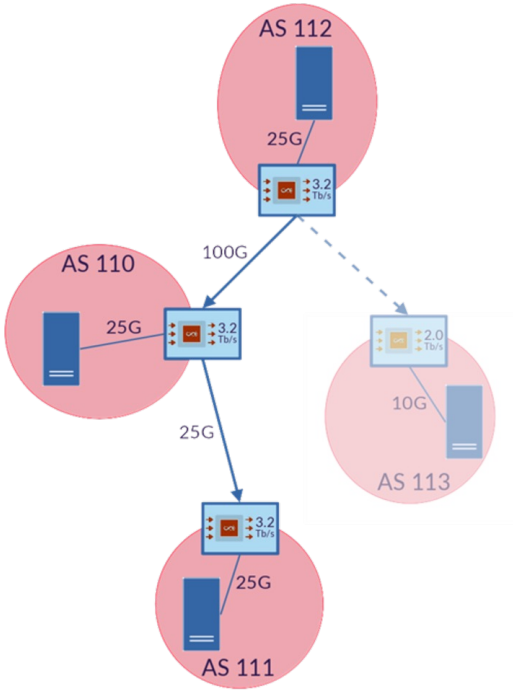
Prio	Requirement	Good	Accepted Conditionally
#1	Signature Size	≤ 1,232 bytes	–
#2	Validation Speed	≥ 1,000 sig/s	–
#3	Key Size	≤ 64 kilobytes	> 64 kilobytes
#4	Signing Speed	≥ 100 sig/s	–

Table 2: Requirements for quantum-safe algorithms.

sidnlabs.nl/en/news-and-blogs/preparing-dnssec-for-quantum-computing

SCION for the Intel Tofino

- Goal: determine feasibility of running a new internet architecture (SCION) on switch hardware and evaluate performance
- Challenges: support for cryptographic operations; protocol design
- Testbed: couple of switches with Tofino ASIC (32x 100Gbit/sec ports)
- Provided feedback to SCION team at ETH Zurich regarding design SCION protocol



sidnlabs.nl/en/news-and-blogs/future-internet-at-terabit-speeds-scion-in-p4

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