Serverless DNS Analytics using ENTRADA 2.0

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Remember ENTRADA?

- Open source tool that handles large amounts of DNS traffic
  - It processes, converts and enriches PCAP data
  - It stores the data
  - It provides interfaces for data analytics
- Deployed by multiple TLDs

Photo by Sharon McCutcheon on Unsplash

What can you do with DNS traffic?

A First Look at QNAME Minimization in the Domain Name System

Wouter B. de Vries[1], Quirin Scheitle[2], Moritz Müller[1,3], Willem Toorop[4], Ralph Dolmans[4], Roland van Rijswijk-Deij[1,4]

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Abstract. The Domain Name System (DNS) is a critical part of network and Internet infrastructure; DNS lookups precede almost any user request. DNS lookups may contain private information about the sites and services a user contacts, which has spawned efforts to protect privacy of users, such as transport encryption through DNS-over-TLS or DNS-over-HTTPS.
In this work, we provide a first look on the resolver-side technique of query

What can you do with DNS traffic?

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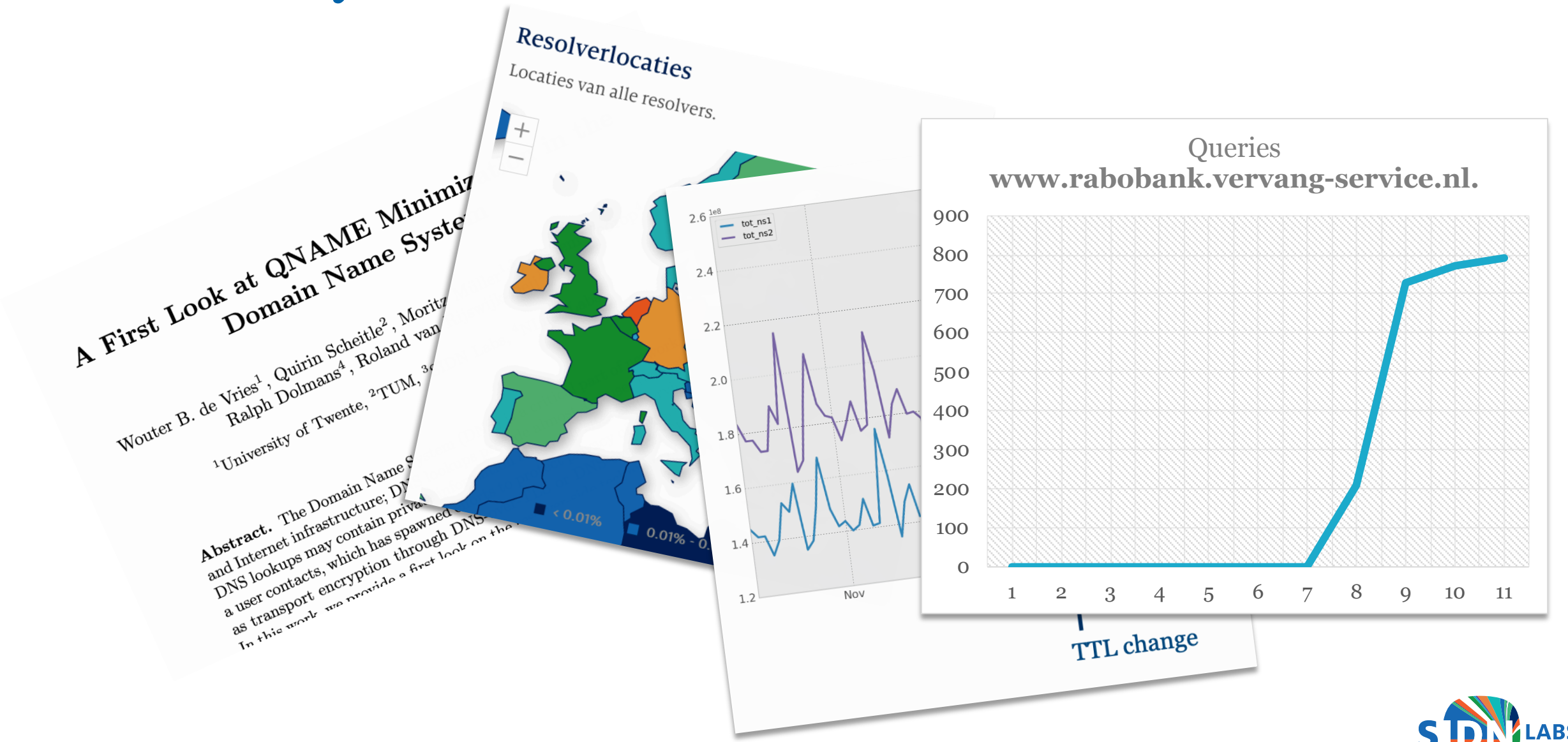

Drawbacks of ENTRADA 1.0

ENTRADA 1.0 runs on Hadoop

- Setup and maintenance costs time and money
- Requires knowledge of Hadoop
- Requires hardware or software cluster

This is why we introduce: ENTRADA 2.0

New Features

- Serverless DNS analytics
- Support for multiple SQL query engines
- Quality of Services Monitoring, round-trip time (RTT) analysis
- Easier deployment using Docker

Serverless DNS analytics

~~Serverless DNS analytics~~

DNS analytics on the computer of someone else

~~Serverless DNS analytics~~
DNS analytics on the computer of someone else

- No need to deploy any server
- No hardware/network maintenance cost
- Only pay for amount of data analysed

ENTRADA will:

- Create database schema
- Convert, upload and optimize data

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DNS analytics on the computers of Amazon

Support for Amazon Web Services (AWS)

- S3 storage
- Athena SQL-query engine
- Pricing; $5 per TB of scanned data

Quality of Service Monitoring

- Understanding how clients perceive your DNS service is crucial for measuring reliability, e.g.:
  - are there issues with my uplink?
  - are there issues with my routing/anycast?
  - are there issues with my client?

Photo by Icons8 Team on Unsplash

Quality of Service Monitoring

- External monitoring platforms exist, but:
  - they often cost money
  - they don’t reflect your real clients
  - they don’t provide easy to interpret interfaces

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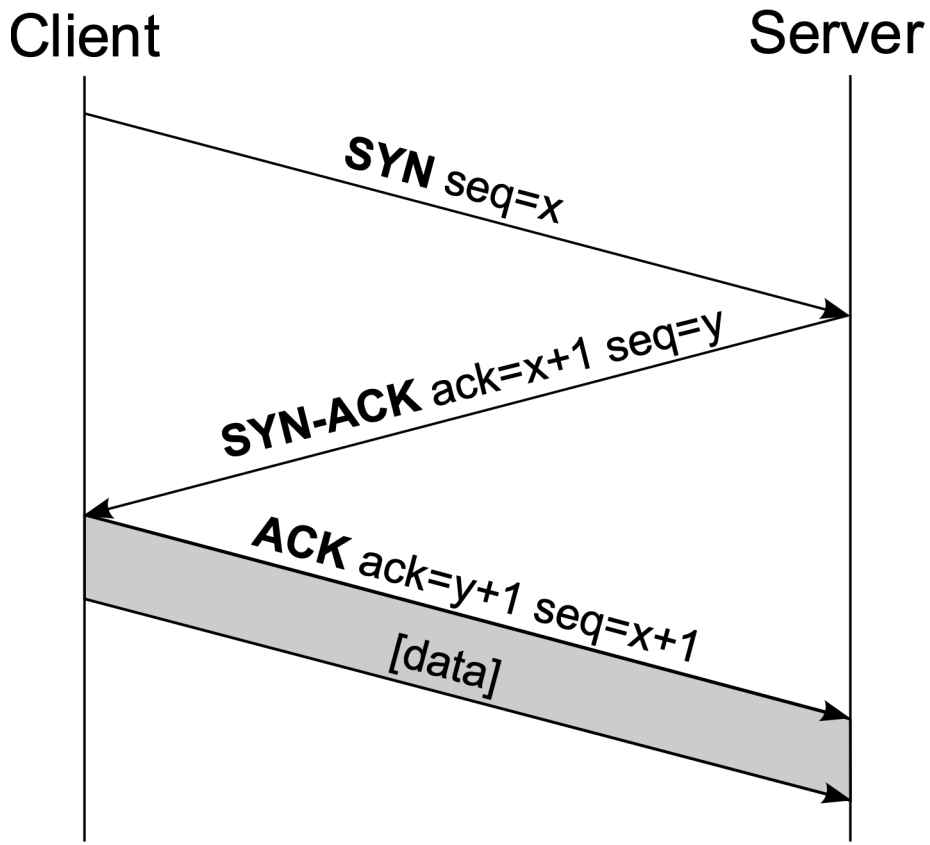
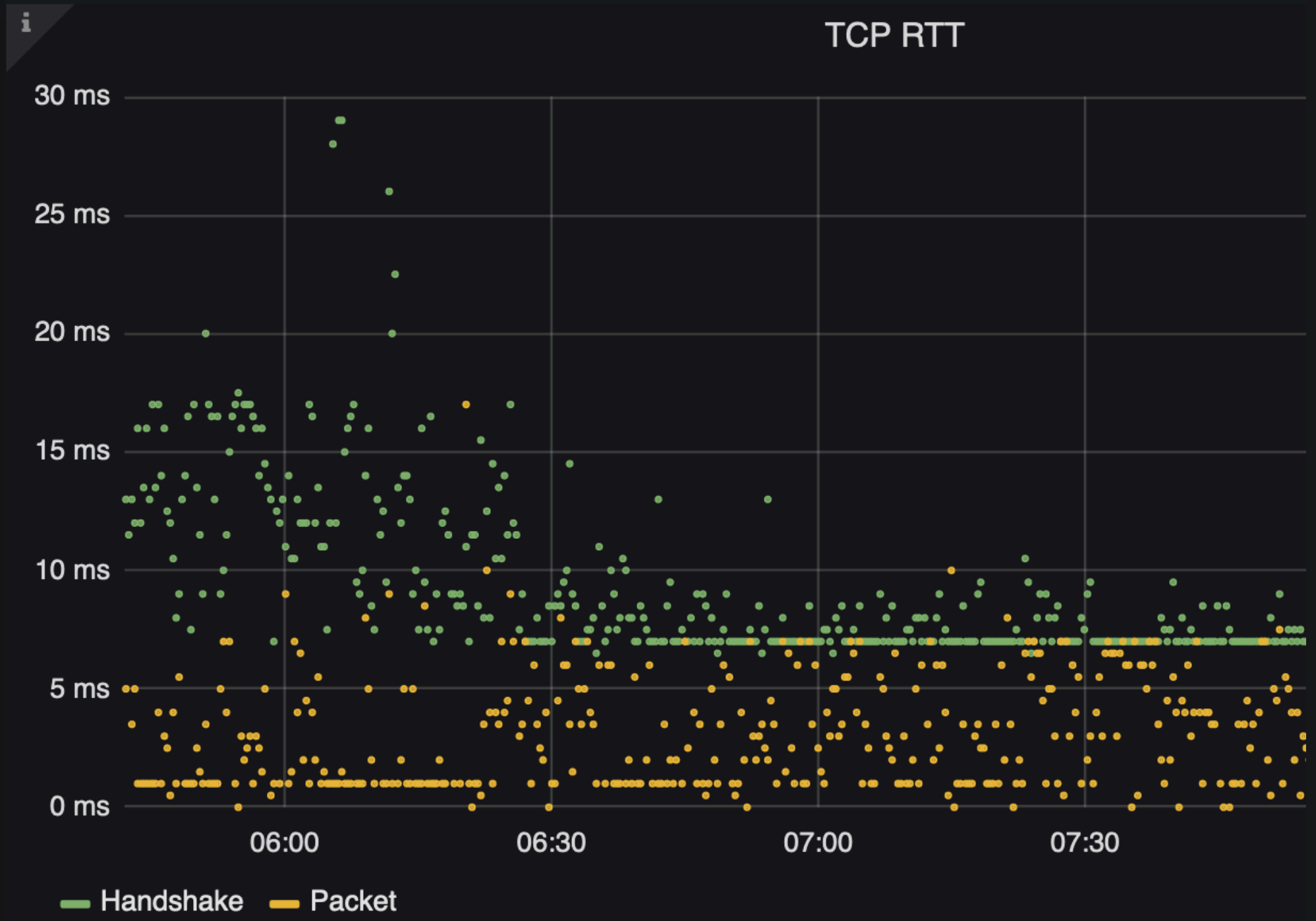
Quality of Service Monitoring with TCP



dif(SYN ACK – ACK) = RTT


TCP RTT
30 ms
25 ms
20 ms
15 ms
10 ms
5 ms
0 ms
06:00
06:30
07:00
07:30
Handshake
Packet

Links

- Introduction: https://www.sidnlabs.nl/nieuws-en-blogs/tijd-voor-entrada-2-0
- Documentation: https://entrada.sidnlabs.nl/
- Source Code: https://github.com/SIDN/entrada

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