Mai. 29 2024

afnic
Internet
made in France

Sustainability for registries – the DNS perspective

Sandoche BALAKRICHENAN

Problem Statement

- As known to us - No prior studies focussing on measuring the energy impact of DNS infrastructure & protocol

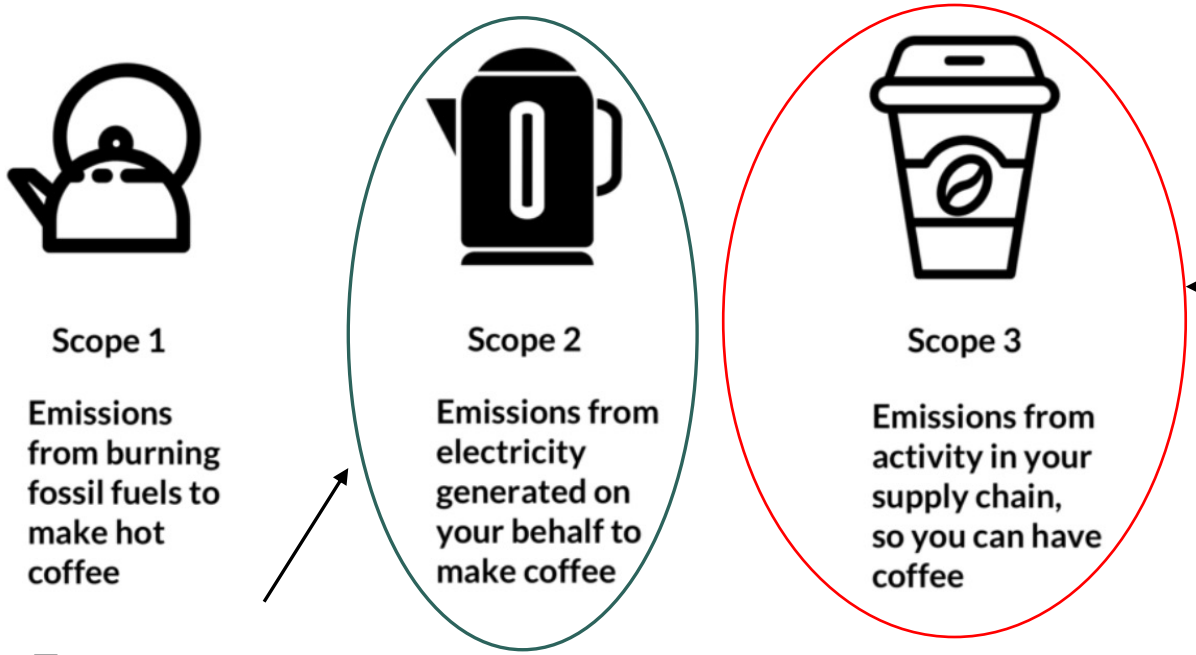
- Why such a study is getting important now?
  - Encrypted DNS traffic ≈ 22.5%[1]
  - Cost of transition from UDP to encrypted communication does increase energy consumption[2]
  - Corporate Social Responsibility – We would like to improve our understanding of the environmental impact of our “core business” technology - the DNS

[1] https://stats.labs.apnic.net/ed
[2] https://www.locationaware.usf.edu/ongoing-research/technology/laisyc/

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Afnic's work as its CSR effort

	Total Emission	Emission/DUM
2018	867 tCO2e	252 gCO2e
2022	690 tCO2e	153 gCO2e
2023	625 tCO2e	147 gCO2e ≈ 0.6 Km by Car

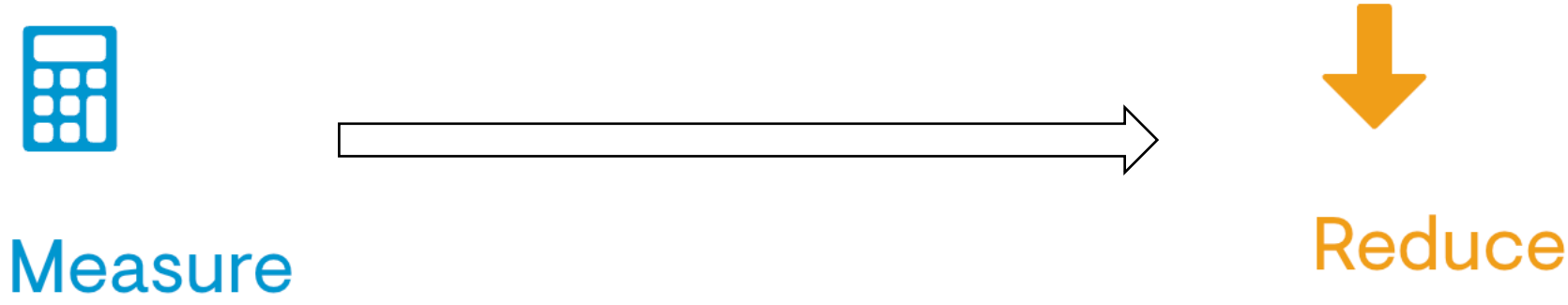


≈ 70% of the Carbon Footprint

Focus area

Source: The Greenweb foundation

Objective of this study



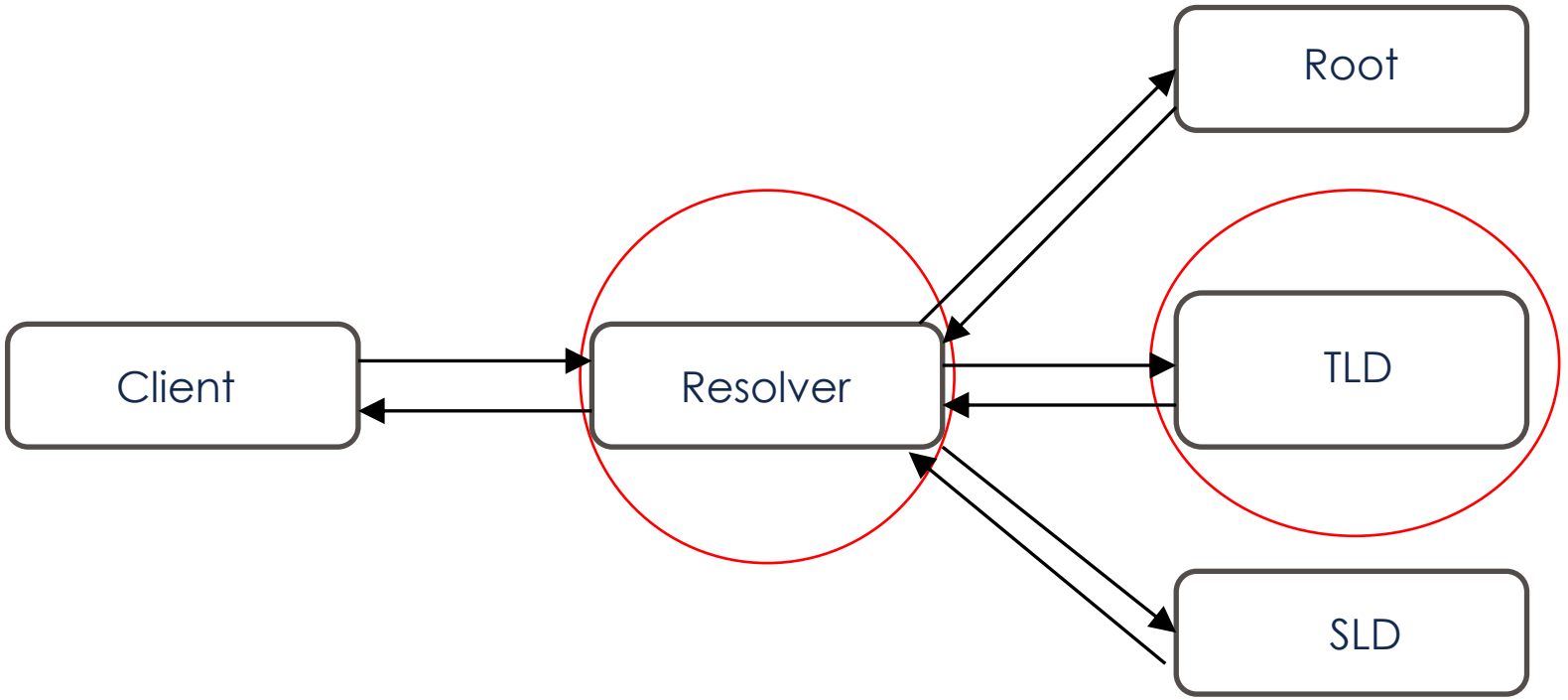
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What to measure?

- HW Energy utilisation
- Metric to measure
  - Watts, KW, KWh

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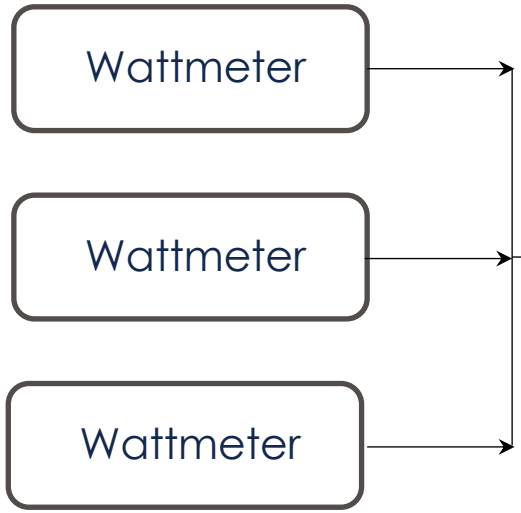
Where to measure?



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Authoritative Server measurements

At Two of Afnic's Data Canters, the Authoritative Servers are attached with Wattmeter's



Grafana



Resolver measurements

Generate dns traffic

Options

Resolver Url :

https://doh.rd.nic.fr

Workers 1

QPS 1

Delais (ms) 1000

0 requêtes OK

0 requêtes en erreur

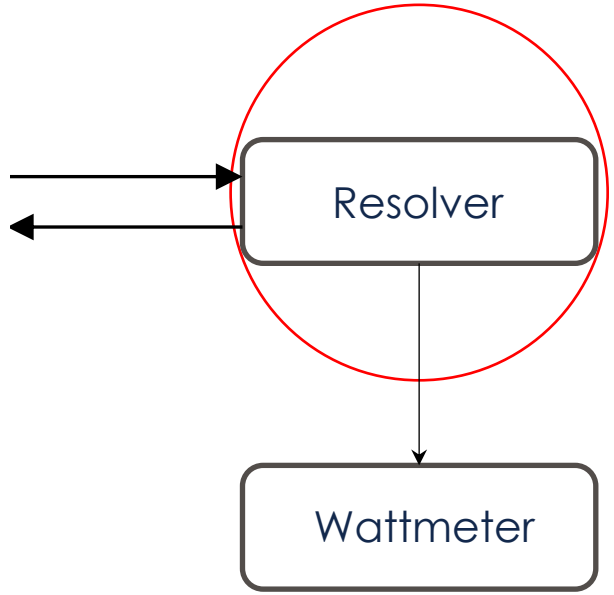
0 QPS Réelles

Choose file No file chosen

10 sites chargés

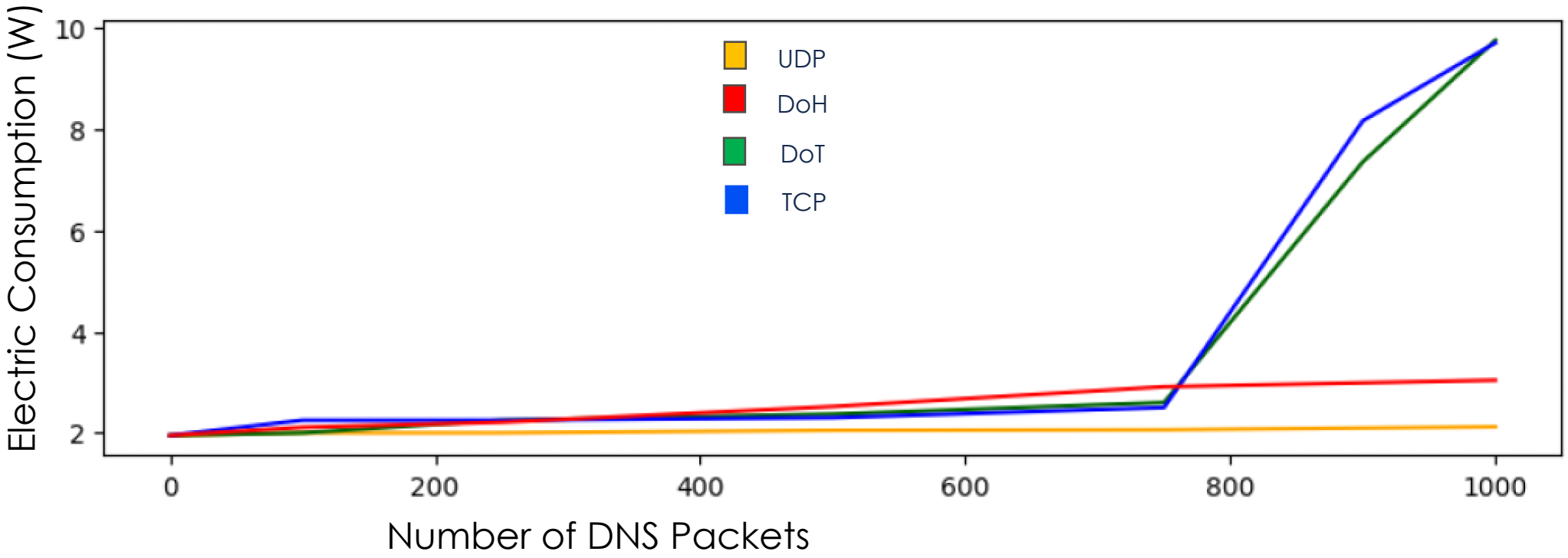
Type :

- [x] A
- [x] AAAA
- [x] TYPE65
- [ ] MX
- [ ] NS
- [ ] TXT
- [ ] SOA
- [ ] SRV
- [ ] CNAME
- [ ] CAA



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Resolver energy consumption



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Fulfilling the CSR Role

- Forthcoming PhD program with IRT SystemX and a collaboration with Télécom Sud Paris on measuring and optimising DNS energy consumption
- We would like to collaborate with interested parties
    - Who operate DNS resolver
    - Researchers for mathematical modelling and measurements
    - Expertise in Energy measurements
    - DNS community
    - *Sandoche.balakrichenan@afnic.fr*
    - *sustainability@centrlists.org*