Dmap: Automating Domain Name Ecosystem Measurements and Applications

Maarten Wullink, **Giovane C. M. Moura**,
and Cristian Hesselman
SIDN Labs
Arnhem, the Netherlands
giovane.moura@sidn.nl
giovane.moura@tudelft.nl

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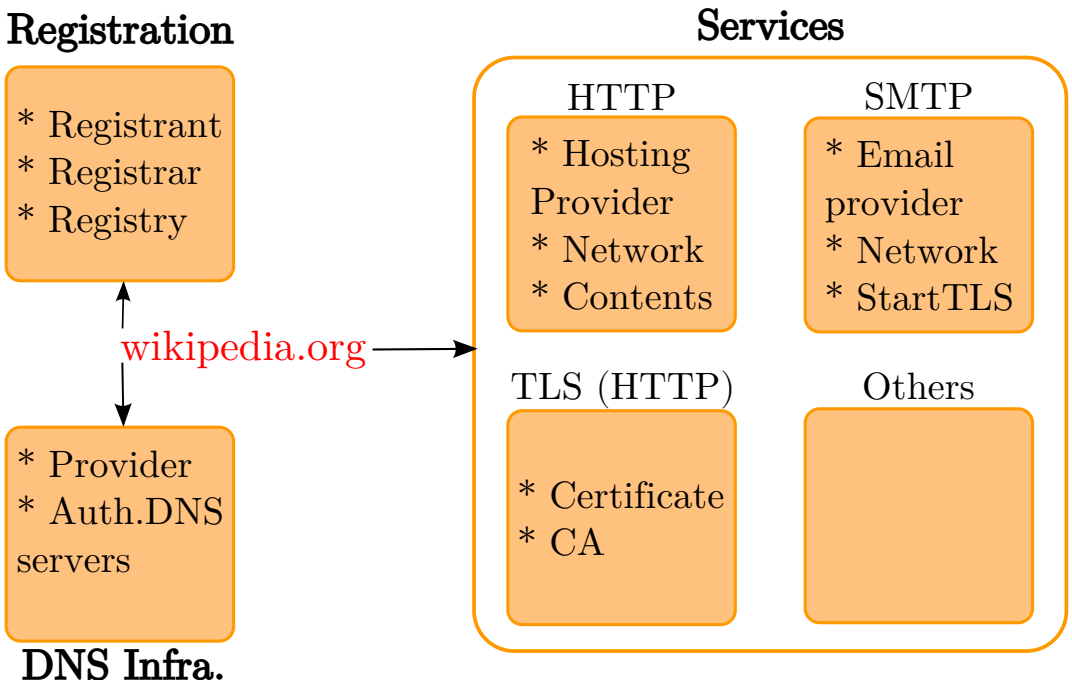
The *situation*

- **Question:** how to measure all these properties with current measurement tools?



The *situation*

- **Answer:** `zmap + dig + masscan + ... + ad gustum`

you can do it, but it ain't pretty...

The *situation*

The problem:

1. **wasted time** spent on repetitive tasks
2. **heterogeneous data formats** per tool
3. **more complexity** $\rightarrow$ **more errors**
4. **hard to reproduce studies**

Can we do better than this?

We decided to build a new tool: `Dmap`

- `Dmap`: **Domain** name ecosystem **map**per
- It **automates** measurements of 5 protocols (HTTP, HTTPs, DNS, TLS, SMTP) and screenshot
- Produces a unified data model (SQL interface)

We open it for researchers:

- `https://dmap.sidnlabs.nl`
- Paper presented at TMA 2018

Applications

Profiling Alexa 1 million

- **Try it** ! dataset and SQL code available at `https://dmap.sidnlabs.nl`
- Each result here obtained with SQL
- Hypothesis tests within seconds

Applications : Alexa profiling

77% support HTTPS, 1 in 5 are Let's Encrypt

	IPv4	IPv6	IPv6/IPv4
DNS			
# Domains (OK)	972,155	153,485	0.16
# Unique NSes	289,014	26,127	0.09
# Unique IP	210,650	19,754	0.09
# Unique ASes	18,418	3,178	0.17
# CDN Cloudflare	117,538	115,396	0.98
HTTP			
# Domains (OK)	968,338	153,485	0.16
# HTML 5	681,757	116,066	0.17
Bytes (median)	53,889	64,735	1.20
External links (median)	7	8	1.14
Internal links (median)	67	75	1.12
Cookies (median)	1	1	1.00
TLS			
# Domains (OK)	772,455	129,443	0.17
# Let's Encrypt	165,526	10,466	0.06
SMTP			
# Domains (OK)	843,126	190,736	0.23
# Unique SMTP	501,848	24,311	0.05
# Unique IP	286,504	10,113	0.04
# Unique StartTLS	302,871	8,016	0.03

Questions?

Download it!

- https://dmap.sidnlabs.nl
- contact: giovane.moura@sidn.nl
- Paper at https://dmap.sidnlabs.nl/paper.pdf

Bibliography I

[1] V. Paxson, “Strategies for Sound Internet Measurement,” in *Proceedings of the 4th ACM SIGCOMM Conference on Internet Measurement*, ser. IMC ’04. New York, NY, USA: ACM, 2004, pp. 263–271. [Online]. Available: http://doi.acm.org/10.1145/1028788.1028824

[2] Spring, “Spring Boot,” Feb. 2018, https://projects.spring.io/spring-boot/.