



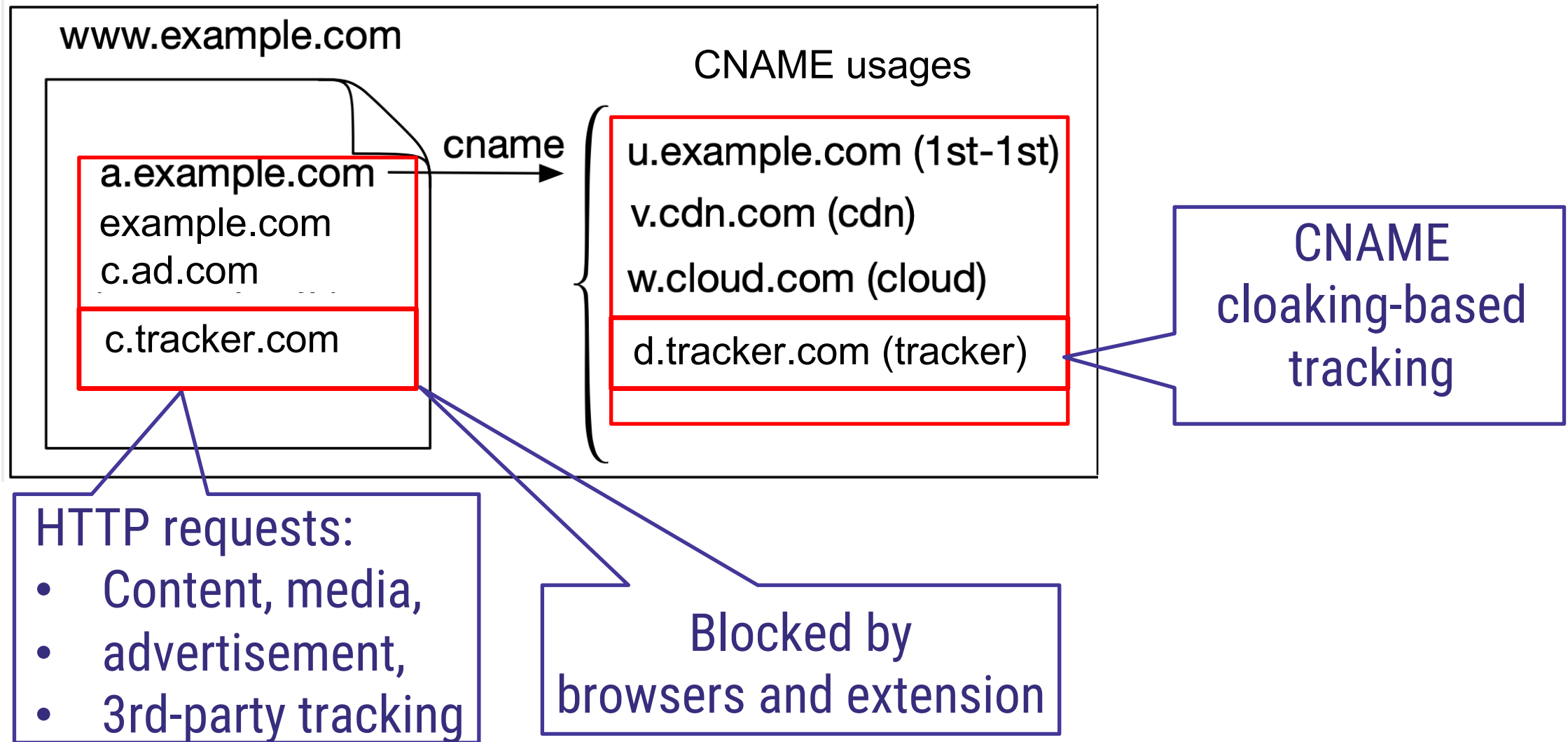
# CHARACTERIZING CNAME CLOAKING-BASED TRACKING ON THE WEB

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# CNAME CLOAKING-BASED TRACKING



# CNAME CLOAKING-BASED TRACKING

liberation.fr

f7ds.liberation.fr

Tracking provider  
Eulerian Tech.

The screenshot shows a browser window with the URL `https://www.liberation.fr`. The page content includes a header with the Liberation logo, social media icons, and several news articles. A terminal window in the foreground shows the command `dig f7ds.liberation.fr` and its output:

```
;; <<>> DiG 9.11.3-1ubuntu1.12-Ubuntu <<>> f7ds.liberation.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 57479
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 7, ADDITIONAL: 2

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;; f7ds.liberation.fr.                IN      A

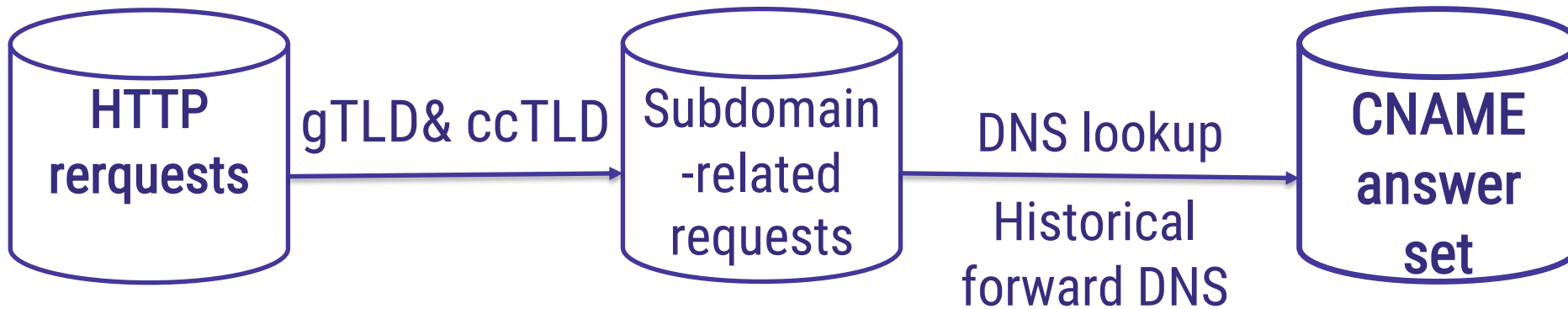
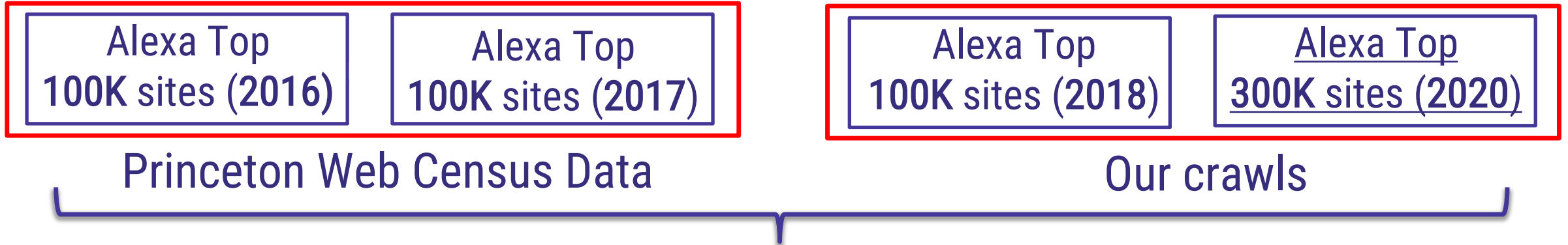
;; ANSWER SECTION:
f7ds.liberation.fr.        3599    IN      CNAME   liberation.eulerian.net.
liberation.eulerian.net.  7199    IN      CNAME   atc.eulerian.net.
atc.eulerian.net.         7199    IN      A       109.232.197.179
```

Disguise third-party tracking requests as first-party ones  
using first-party subdomain

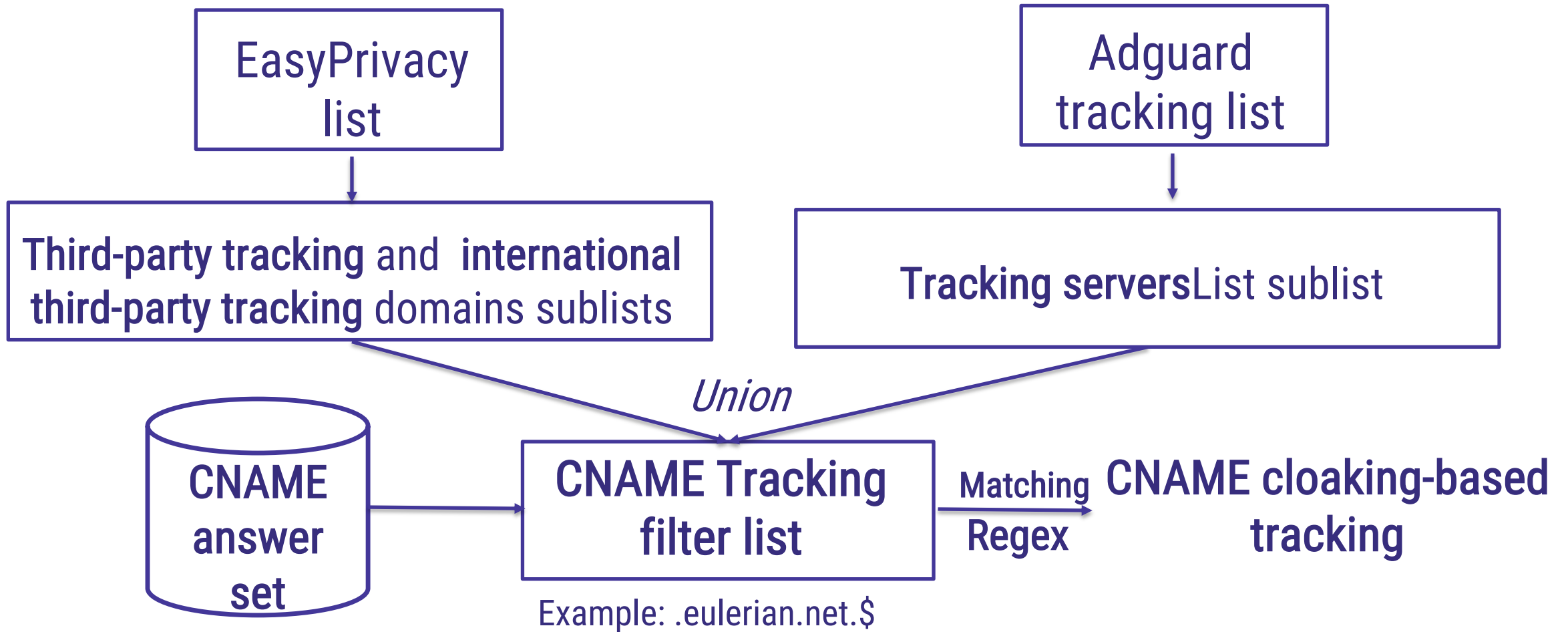
# GOALS

- 📌 Characterize CNAME cloaking-based tracking :
    - ❖ **Websites and tracking providers**
    - ❖ **Longitudinal evolution**
    - ❖ **Privacy protection (e.g., browsers and extensions)**
- evaluation

# DATASETS



# CNAME CLOAKING-BASED TRACKING DETECTION



# GENERAL RESULTS

## 📌 Alexa Top 300K sites (2020)

Metric	1st-1st	Tracker	CDN, cloud, and others
HTTP requests	57.99 %	0.14 %	41.87 %
Subdomains	39.47 %	1.55 %	58.98 %

- ❖ 1,762 websites contain CNAME cloaking-based tracking
- ❖ 56 tracking providers use CNAME cloaking-based tracking

# WEBSITE CHARACTERISTICS



Ranking



30% top 20K  
website

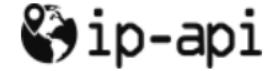


Website category



Business, Shopping,  
Information Technology

tld



freegeoip.app

MAXMIND

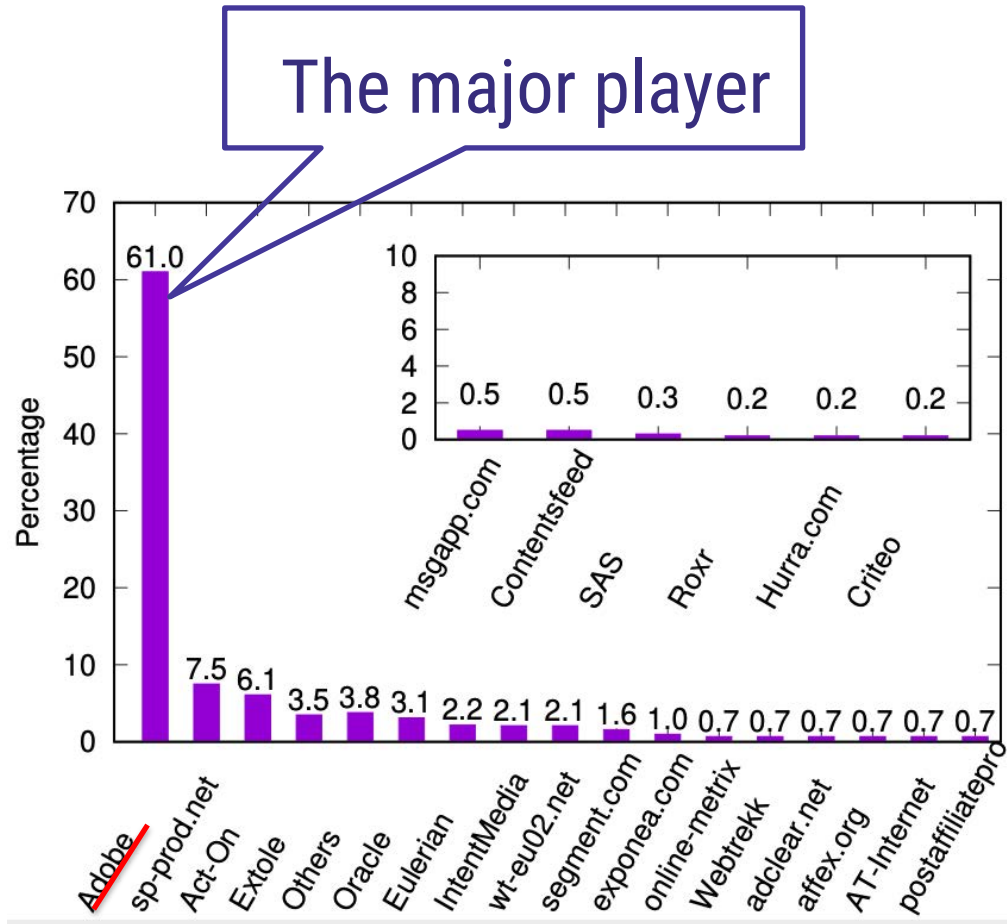
Website country



48.8% in  
the United States

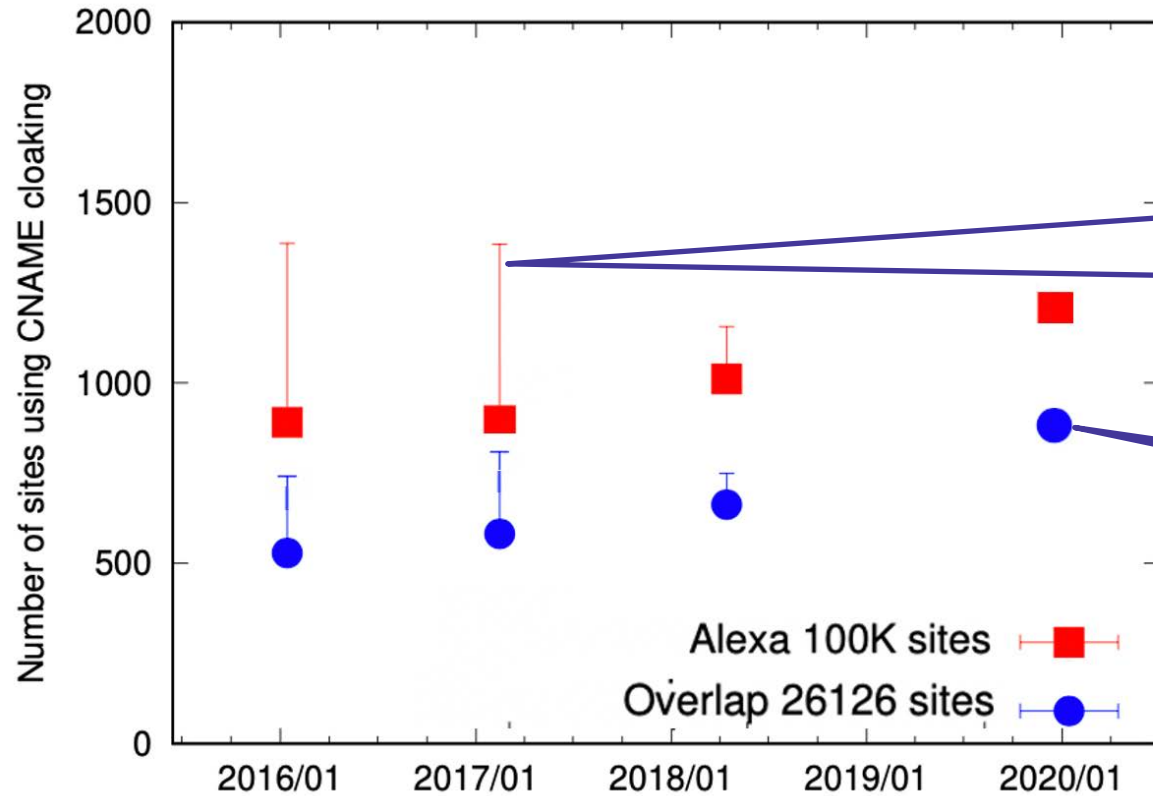


# TRACKING PROVIDERS



- ❖ Specific categories: Act-on for Business, Eulerian for Shopping, and Intent Media for Travel.
- ❖ Specific countries: Eulerian in France, Intent Media in Germany.

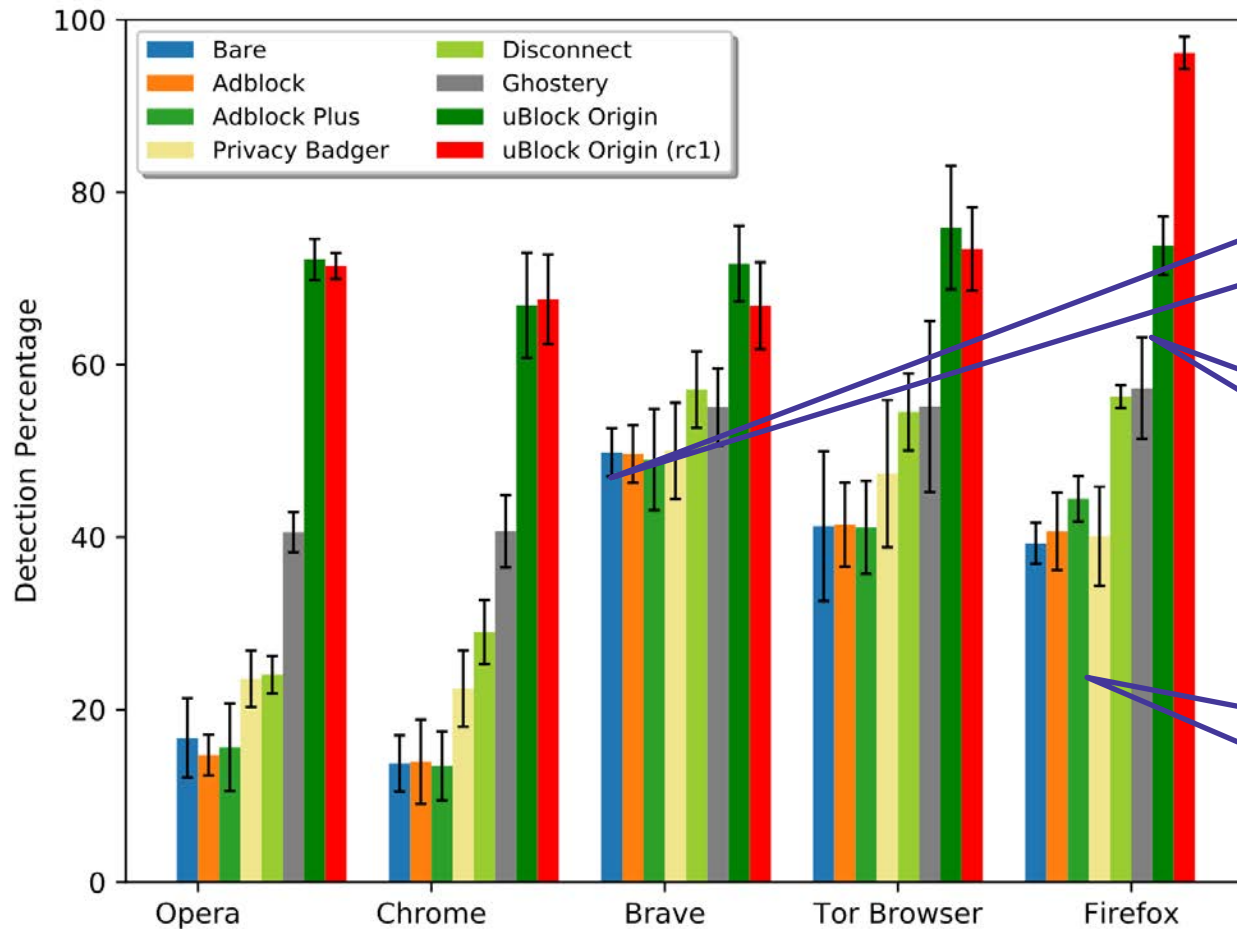
# LONGITUDINAL ANALYSIS (2016-2020)



Error bar: The imperfect coverage of the historical data in CNAME data

Slightly increasing

# PROTECTION TECHNIQUES EVALUATION



Best browser performance  
**Brave**

Best extension performance  
**Ublock Origin**

Best unreleased (Feb 2020) extension  
**uBlock Origin developer's version**

# CONCLUSION

- 📍 1,762 websites in the Alexa Top 300K sites in January 2020 contain CNAME cloaking-based tracking.
- 📍 Primarily on website in **the United States**, within the **Business and Shopping** websites.
- 📍 Diversity of tracking providers: **56** providers and **Adobe** is the major one.
- 📍 CNAME cloaking-based tracking is **not a new phenomenon** (deployed for at least four years).
- 📍 Browsers and privacy protection extensions are largely ineffective to deal with CNAME cloaking-based tracking

Thank you