

Measuring Web Cookies in Governmental Websites

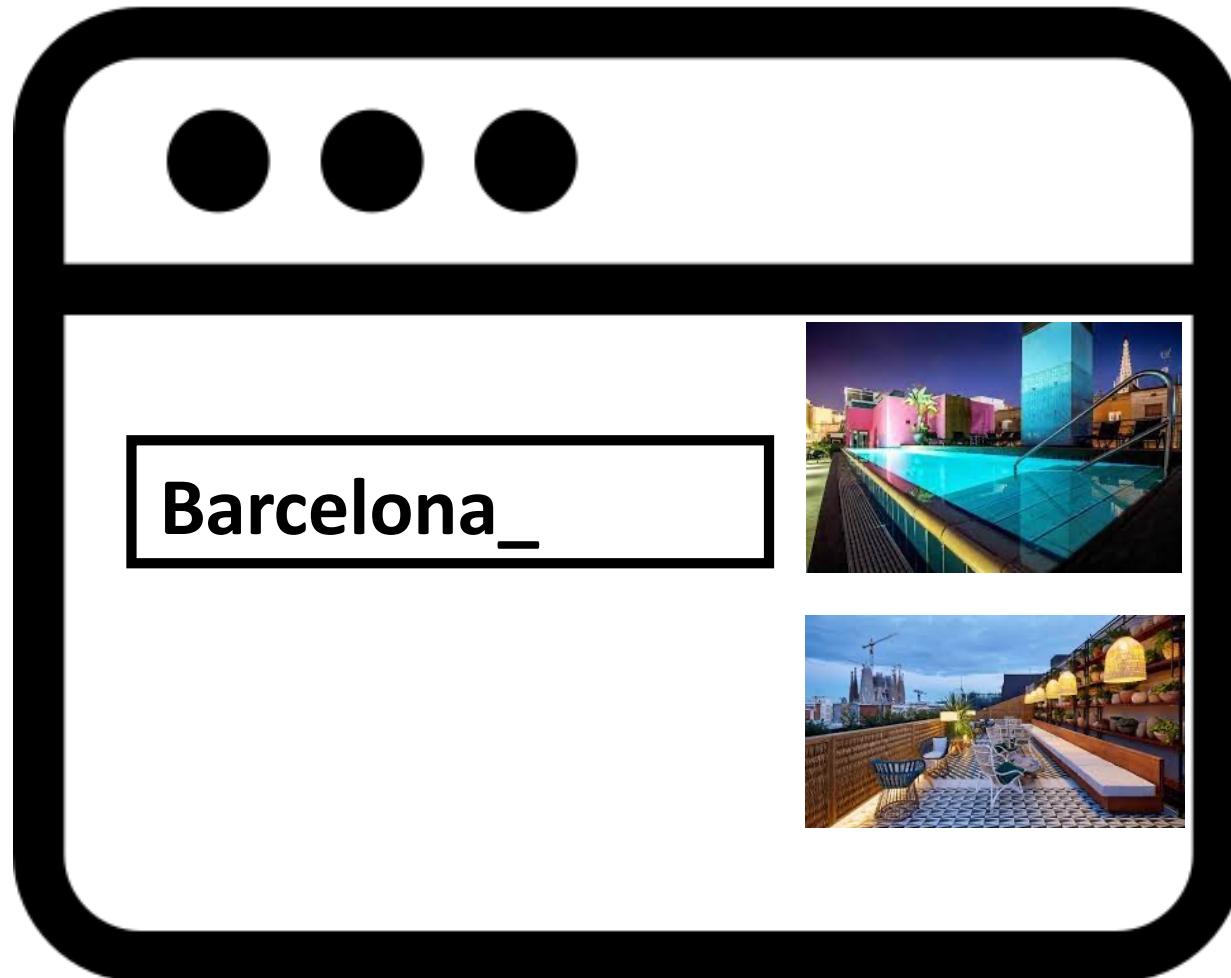
Matthias Götze, Srdjan Matic, Costas Iordanou,
Georgios Smaragdakis, and Nikolaos Laoutaris



Cyprus
University of
Technology

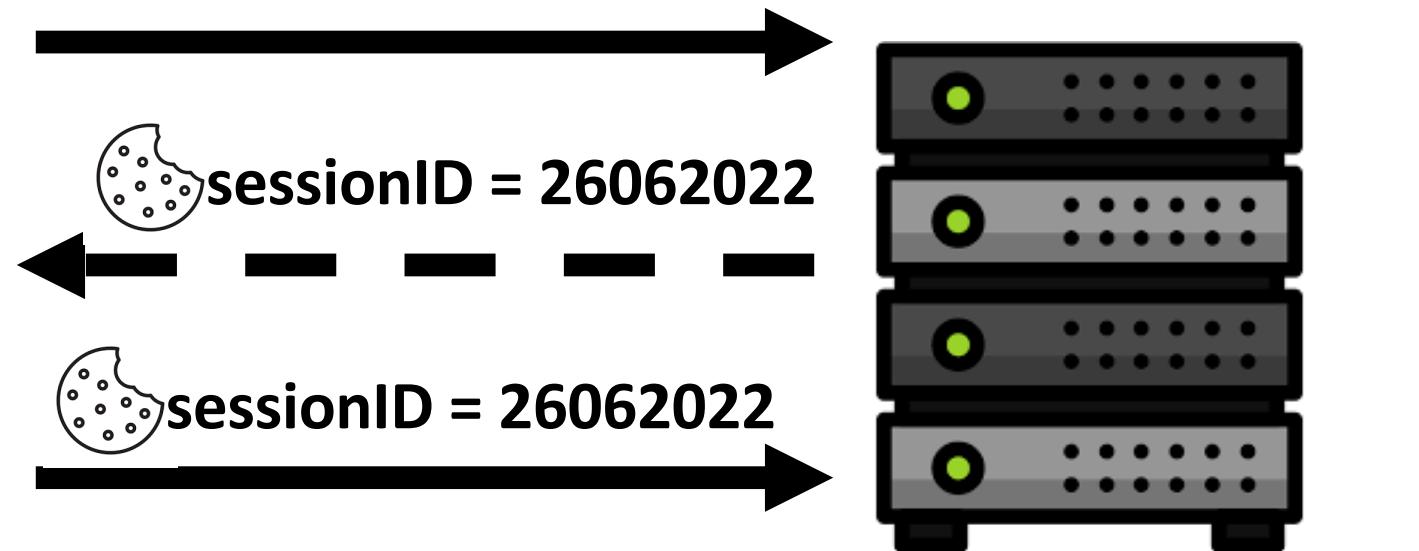
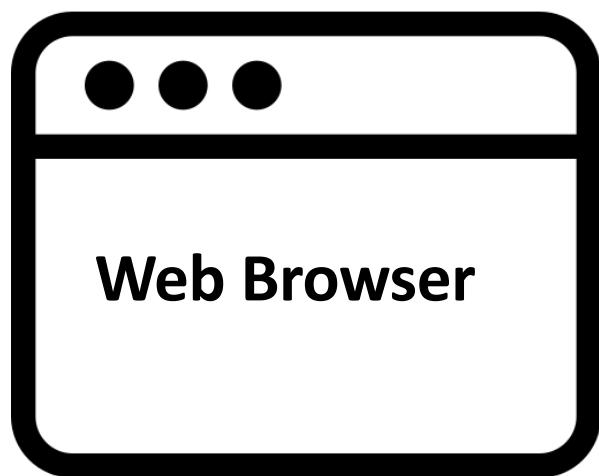


How many ads have you received today?



Web Cookies

Web Server
of www.Barcelona.com

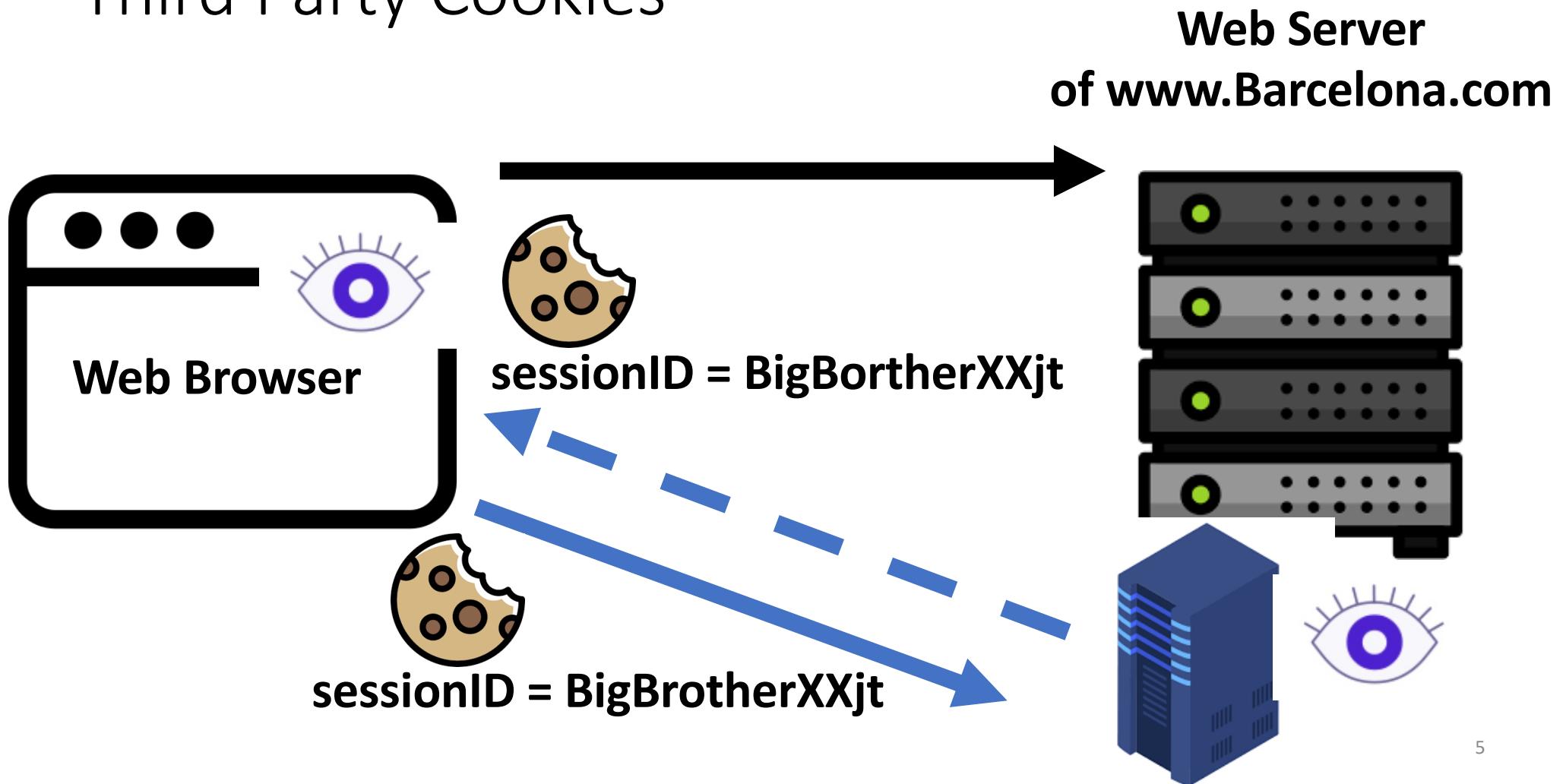


Web Cookies & Trackers

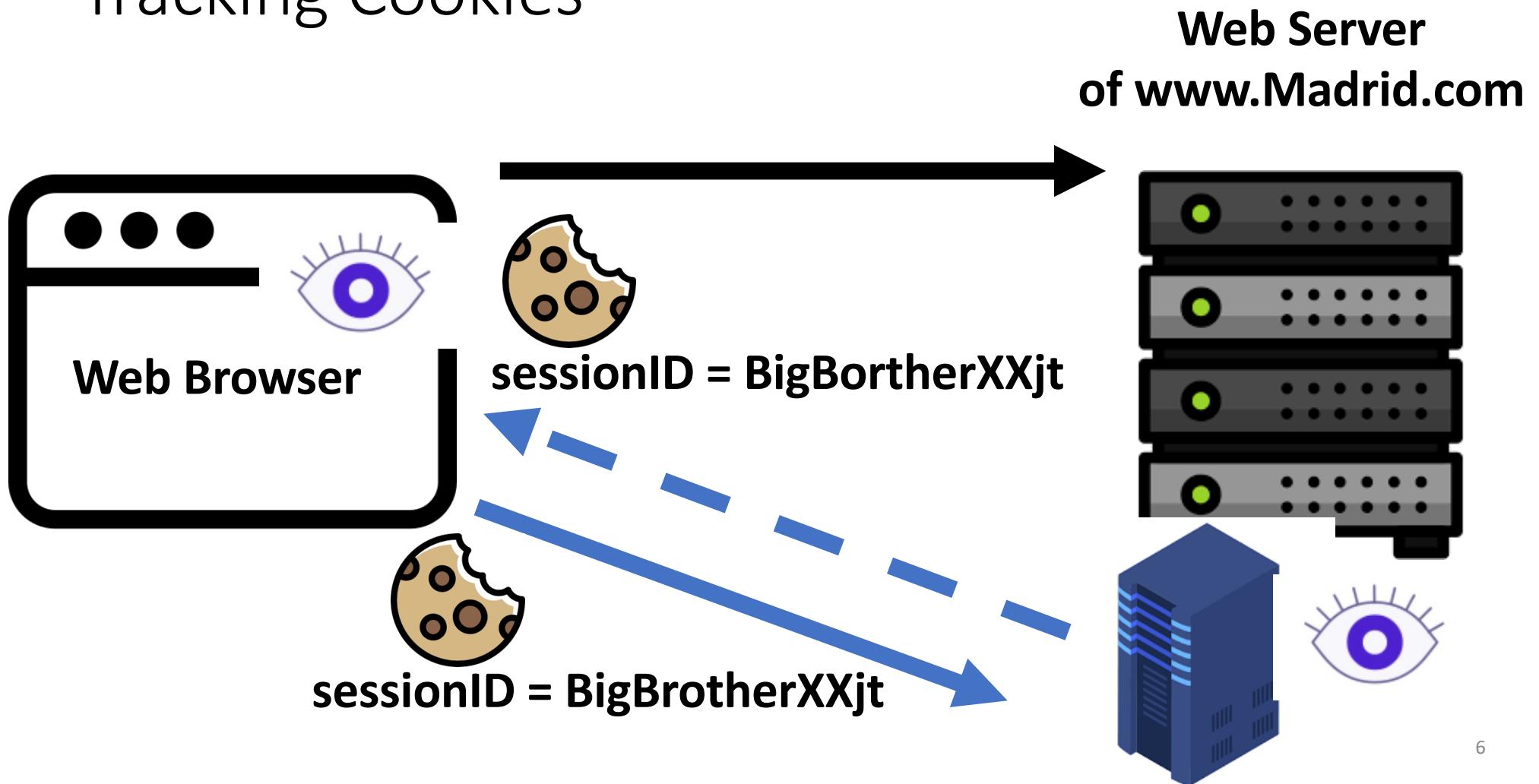
Web Server
of www.Barcelona.com



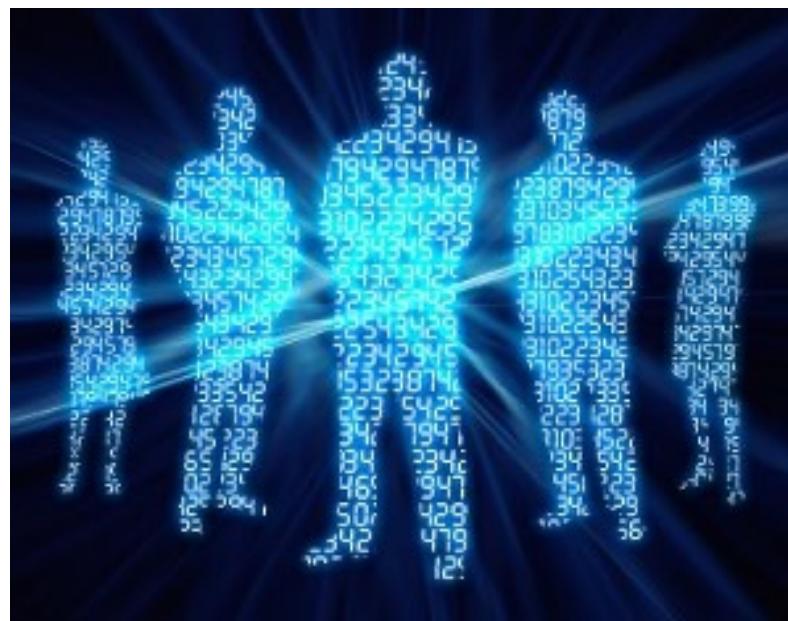
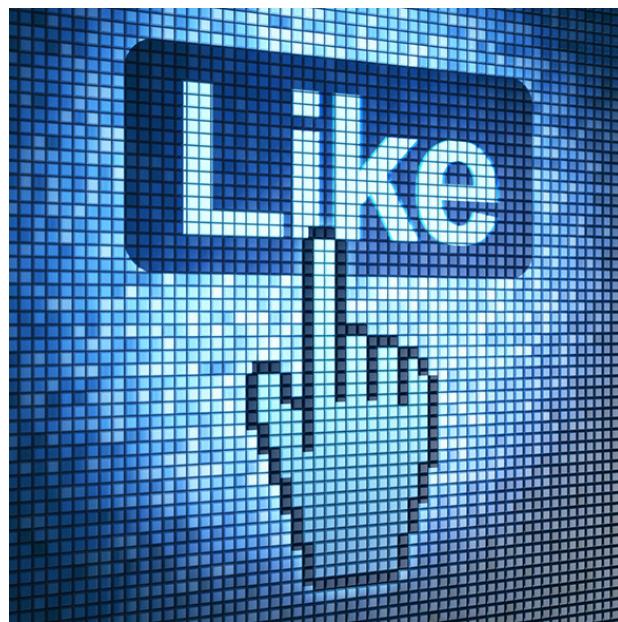
Third Party Cookies

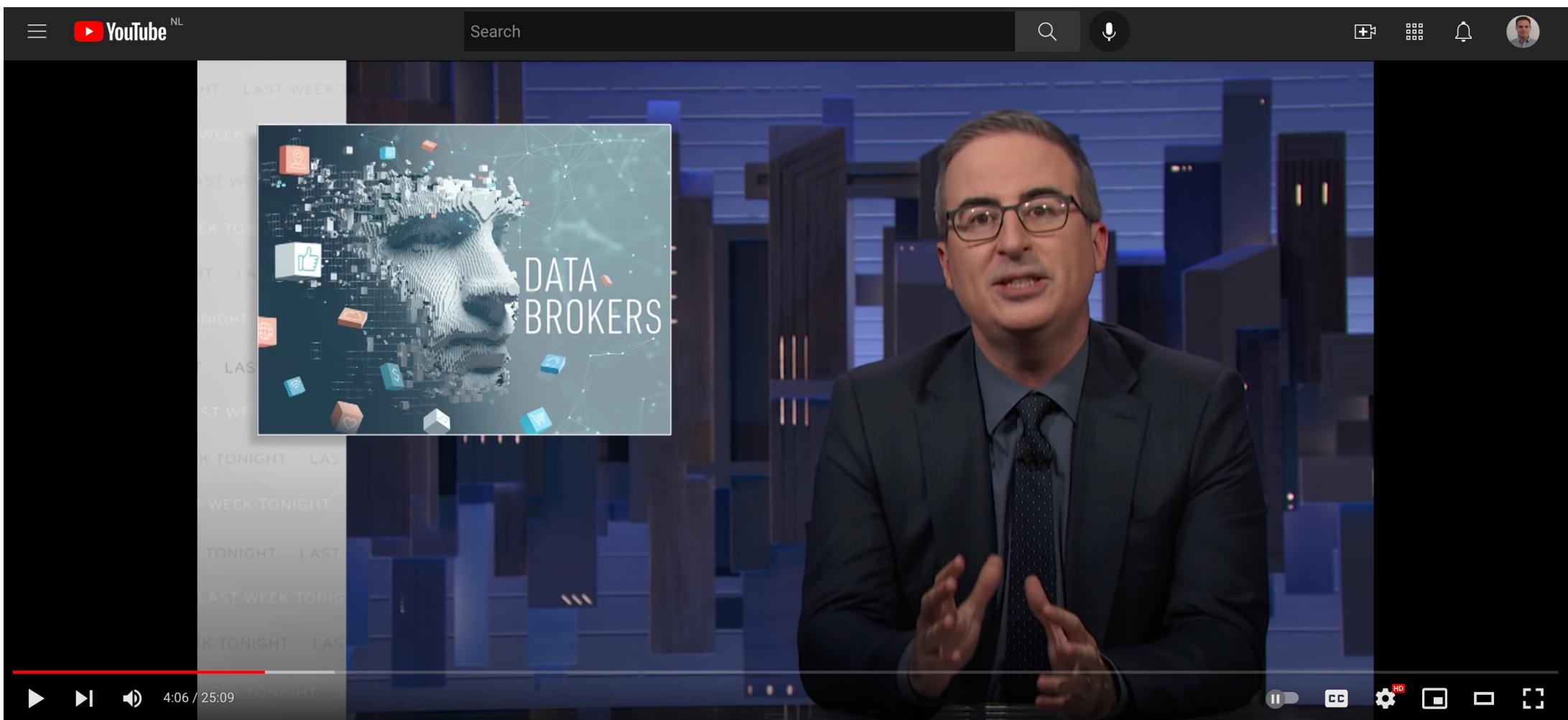


Tracking Cookies



Your Digital Soul





Data Brokers: Last Week Tonight with John Oliver (HBO)

6,688,599 views • Apr 11, 2022

180K

DISLIKE

SHARE

DOWNLOAD

CLIP

SAVE

...

All

John Oliver

Conversation

Related

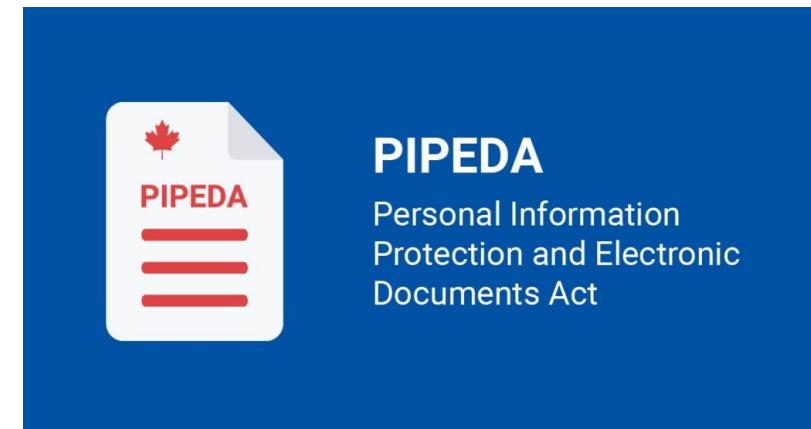
>



Police Interrogations: Last

Source: <https://www.youtube.com/watch?v=wqn3gR1WTcA>

Regulatory Intervention: GDPR (et al.)



GDPR (et al.) and Web Cookies

Under the EU's GDPR, cookies that are not strictly necessary for the basic function of your website must only be activated after **end-users have given their explicit consent** to the **specific purpose** of their **operation** and collection of personal data.

Did GDPR (et al.) make any Difference?

Yes, but the problem still exists!

We Value Your Privacy ... Now Take Some Cookies: Measuring the GDPR's Impact on Web Privacy

Martin Degeling*, Christine Utz*, Christopher Lentzsch*, Henry Hosseini*, Florian Schaub†, and Thorsten Holz*

*Ruhr-Universität Bochum, Germany

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†University of Michigan, Ann Arbor, MI, USA

Email: fschaub@umich.edu

Abstract—The European Union's General Data Protection Regulation (GDPR) went into effect on May 25, 2018. Its privacy regulations apply to any service and company collecting or processing personal data in Europe. Many companies had to adjust their data handling processes, consent forms, and privacy policies to comply with the GDPR's transparency requirements. We monitored this rare event by analyzing changes on popular websites in all 28 member states of the European Union. For each country, we periodically examined its 500 most popular websites – 6,579 in total – for the presence of and updates to their privacy policy between December 2017 and October 2018. While many websites already had privacy policies, we find that in some

data access, data deletion, and data portability. Even outside Europe, online services had to prepare for the GDPR because it not only applies to companies in Europe but any company that offers its service in Europe. As a result, the GDPR is expected to have a major impact on companies across the world.

Previous work has found that about 70 to 80 % of websites in the U.S. have privacy policies [26], [28]. But analysis of privacy policies has been focused on English-language policies, performing in-depth studies on their content [42], [18], [25], [39]. Cookie consent notices have just recently seen



Proceedings on Privacy Enhancing Technologies ; 2019 (2):126–145

Martino Trevisan*, Stefano Traverso, Eleonora Bassi, and Marco Mellia

4 Years of EU Cookie Law: Results and Lessons Learned

Abstract: Personalized advertisement has changed the web. It lets websites monetize the content they offer. The downside is the continuous collection of personal information with significant threats to personal privacy. In 2002, the European Union (EU) introduced a first set of regulations on the use of online tracking technologies. It aimed, among other things, to make online tracking mechanisms explicit to increase privacy awareness among users.

Amended in 2009, the EU Directive mandates websites to ask for informed consent *before* using any kind of profiling technology, e.g., cookies. Since 2013, the ePrivacy Directive became mandatory, and each EU Member State transposed it in national legislation. Since then, most of European websites embed a "Cookie Bar", the most visible effect of the regulation.

In this paper, we run a large-scale measurement campaign to check the current implementation status of the EU cookie directive. For this, we use CookieCheck, a simple tool to automatically verify legislation violations. Results depict a shady picture: 49 % of websites do not

1 Introduction

When browsing the web, users encounter the so-called "online trackers". They build their business on the massive collection and brokerage of personal data. Used by websites to monetize the content they offer via personalized advertisement, online tracking is perceived as a threat to users' privacy [43, 59]. To regulate the usage of tracking technologies in the web, the EU Commission issued already in 2002 the ePrivacy Directive. It includes one of the first and strictest regulations on the usage of online tracking mechanisms [21]. As amended in 2009 [22], it requires websites to ask "prior informed consent for storage or for access to information stored on a user's terminal equipment". In other words, a website must ask the visitor to authorize the storage and retrieval of data sent through cookies and similar tracking mechanisms *before* delivering and installing them. Since 2013, the so-called "Cookie Law" provided by the ePrivacy Directive has been adopted by EU Member States (EU MCA). Since then, its implementation has

👉 This paper:

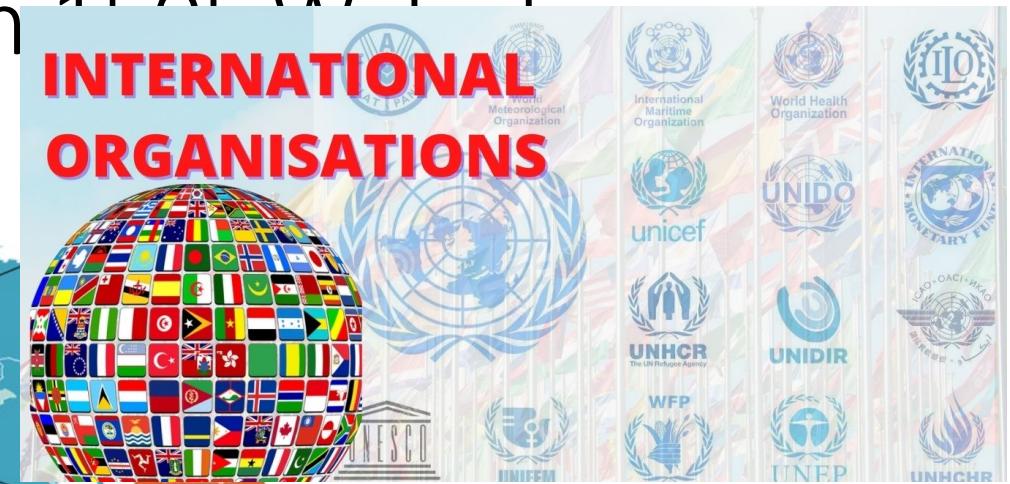
Have We Audited the Government Websites?

Why Bother?

1. Allows for large-scale surveillance
2. May be the only point of interaction
3. If legislators do not respect laws, it breaks the trust between citizens & authorities

Web Sources: more than 150 million

G20 COUNTRIES



An official EU website

EU official languages

- български
- español
- českina
- dansk

This site uses cookies to offer you a better browsing experience. Find out more on [how we use cookies.](#)

Accept all cookies

Accept only essential cookies

Application

Manifest

Service Workers

Storage

Storage

Local Storage

Session Storage

IndexedDB

Web SQL

Cookies

https://european-union.europa.eu

Trust Tokens

Interest Groups

Cache

Cache Storage

Back/forward cache

Background Services

Background Fetch

Background Sync

Notifications

Payment Handler

Periodic Background Sync

Push Messaging

Reporting API

Frames

top

Filter

Only show cookies with an issue

Name	Value	Domain	Path	Expires / Max...	S.	H.	Sec..	S	Sa...	Part..	Pr...
CFTOKEN	bc3215bf67dd...	ec.europa.eu	/	2051-01-01T...	59	✓					Me...
cck1	%7B%22cm...	.european-union.europa.eu	/	2022-12-22T...	72						Me...
CFID	48180973	ec.europa.eu	/	2051-01-01T...	12	✓					Me...
eu_cookie_consent	%7B%22a%2...	.europa.eu	/	Session	1...						Me...
cck1	%7B%22cm...	.ec.europa.eu	/	2022-12-16T...	70						Me...
_ga	GA1.2.167474...	.europa.eu	/	2024-06-22T...	30						Me...

Cookie Value Show URL decoded
bc3215bf67ddce38-D2429017-9BEE-27CA-5BE298D27654CC62

Console What's New Developer Resources Issues

An official EU website

EU official languages

- български
- español
- českina
- dansk

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CFTOKEN	bc3215bf67dd...	ec.europa.eu	/	2051-01-01T...	59	✓					Me...
cck1	%7B%22cm...	.european-union.europa.eu	/	2022-12-22T...	72						Me...
CFID	48180973	ec.europa.eu	/	2051-01-01T...	12	✓					Me...
eu_cookie_consent	%7B%22a%2...	.europa.eu	/	Session	1...						Me...
cck1	%7B%22cm...	.ec.europa.eu	/	2022-12-16T...	70						Me...
_ga	GA1.2.167474...	.europa.eu	/	2024-06-22T...	30						Me...

Cookie Value Show URL decoded
bc3215bf67ddce38-D2429017-9BEE-27CA-5BE298D27654CC62

We do NOT give consent

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CFTOKEN	bc3215bf67dce38-D2429017-9BEE-27CA-5BE298D27654CC62	ec.europa.eu	/	2051-01-01T...	59	✓					Me...
cck1	%7B%22cm...	.european-union.europa.eu	/	2022-12-22T...	72						Me...
CFID	48180973	ec.europa.eu	/	2051-01-01T...	12	✓					Me...
eu_cookie_consent	%7B%22a%22...	.europa.eu	Session	1...							Me...
cck1	%7B%22cm...	.ec.europa.eu	/	2022-12-16T...	70						Me...
_ga	GA1.2.167474...	.europa.eu	/	2024-06-22T...	30						Me...

Cookie Value Show URL decoded
bc3215bf67dce38-D2429017-9BEE-27CA-5BE298D27654CC62

Cookie Owner

https://european-union.europa.eu/

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Accept all cookies

Accept only essential cookies

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Storage

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- Session Storage
- IndexedDB
- Web SQL
- Cookies

https://european-union.europa.eu/

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CFTOKEN	bc3215bf67dd...	ec.europa.eu	/	2051-01-01T...	59	✓					Me...
cck1	%7B%22cm...	.european-union.europa.eu	/	2022-12-22T...	2						Me...
CFID	48180973	ec.europa.eu	/	2051-01-01T...	2	✓					Me...
eu_cookie_consent	%7B%22a%2...	.europa.eu	/	Session							Me...
cck1	%7B%22cm...	.ec.europa.eu	/	2022-12-16T...	70						Me...
_ga	GA1.2.167474...	.europa.eu	/	2024-06-22T...	30						Me...

Cookie Expiration Date

17

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The Russian Government

The Russian Government

Government of the Russian Federation

22 June 2022

Government of the Russian Federation

21 June 2022

24 June 2022

News

Andrey Tatarsky chairs a meeting of the Headquarters of the Eurasian Economic Commission

government.ru/en/news/45792/

Application Elements Console Recorder Performance insights Sources Network Performance Application

Filter Only show cookies with an issue

Name	Value	Domain	Path	Expires / Max...	S.	H.	Sec..	S.	Sa...	Part..	Pr...
yabs-sid	60267133165...	mc.yandex.ru	/	Session	26	✓	N..				Me...
ymex	1673172005.y...	.yandex.ru	/	2023-01-08T...	58	✓	N..				Me...
i	eZhit0k+f8VPc...	.yandex.ru	/	2031-06-23T...	93	✓	✓	N..			Me...
yandexuid	46508577615...	.yandex.ru	/	2023-01-08T...	28		✓	N..			Me...
_ym_isad	1	.government.ru	/	2022-06-26T...	9						Me...
_ym_d	1656180332	.government.ru	/	2023-06-25T...	15						Me...
yuidss	46508577615...	.yandex.ru	/	2023-01-08T...	25		✓	N..			Me...
_ym_uid	16159143249...	.government.ru	/	2023-06-25T...	26						Me...

Cookie Value Show URL decoded
1673172005.yrts.1641636005#1656182634.yrtsi.1624646634

Console What's New Developer Resources Issues

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The Russian Government



The Russian Government

Gover 22 June

22 June

http://government.ru

Trust Tokens

Interest Groups

Cache

Cache Storage

Back/forward cache

Background Services

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Background Sync

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yabs-sid	60267133165...	mc.yandex.ru	/	Session	26	✓	N..				Me...
ymex	1673172005.y...	yandex.ru	/	2023-01-08T...	58	✓	N..				Me...
i	eZhit0k+f8VPc...	.yandex.ru	/	2031-06-23T...	93	✓	✓	N..			Me...
_yandexuid	46508577615...	.yandex.ru	/	2023-01-08T...	28		✓	N..			Me...
_ym_isad		.government.ru	/	2022-06-26T...	9						Me...
_ym_d	1656180332	.government.ru	/	2023-06-25T...	15						Me...
yuidss	46508577615...	.yandex.ru	/	2023-01-08T...	25		✓	N..			Me...
_ym_uid	16159143249...	.government.ru	/	2023-06-25T...	26						Me...

Cookie Value Show URL decoded
1673172005.yrts.1641636005#1656182634.yrtsi.1624646634

News

24 June 2022

Andrei Belousov chairs a meeting of the Headquarters

government.ru/en/news/45792/

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Console What's New Developer Resources Issues

Third party Tracker

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The Russian Government



The Russian Government

Gover...
22 June



...
Expanded meeting of Eurasian
21 June 2022

News

24 June 2022

Andrei Belousov chairs a meeting of the Headquarters
government.ru/en/news/45792/

Application

Manifest

Service Workers

Storage

Storage

- Local Storage
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- http://government.ru
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Name	Value	Domain	Path	Expires / Max	S.	H.	Sec..	S.	Sa...	Part..	Pr...
yabs-sid	60267133165...	mc.yandex.ru	/	Session	21		✓	N..			Me...
ymex	1673172005.y...	yandex.ru	/	2023-01-08T...	58		✓	N..			Me...
i	eZhit0k+f8VPc...	.yandex.ru	/	2031-06-23T...	93		✓	N..			Me...
_yandexuid	46508577615...	.yandex.ru	/	2023-01-08T...	25		✓	N..			Me...
_ym_isad		.government.ru	/	2023-01-08T...	9						Me...
_ym_d	1656180332	.government.ru	/	2023-06-25T...	15						Me...
yuidss	46508577615...	.yandex.ru	/	2023-01-08T...	25		✓	N..			Me...
_ym_uid	16159143249...	.government.ru	/	2023-06-25T...	26						Me...

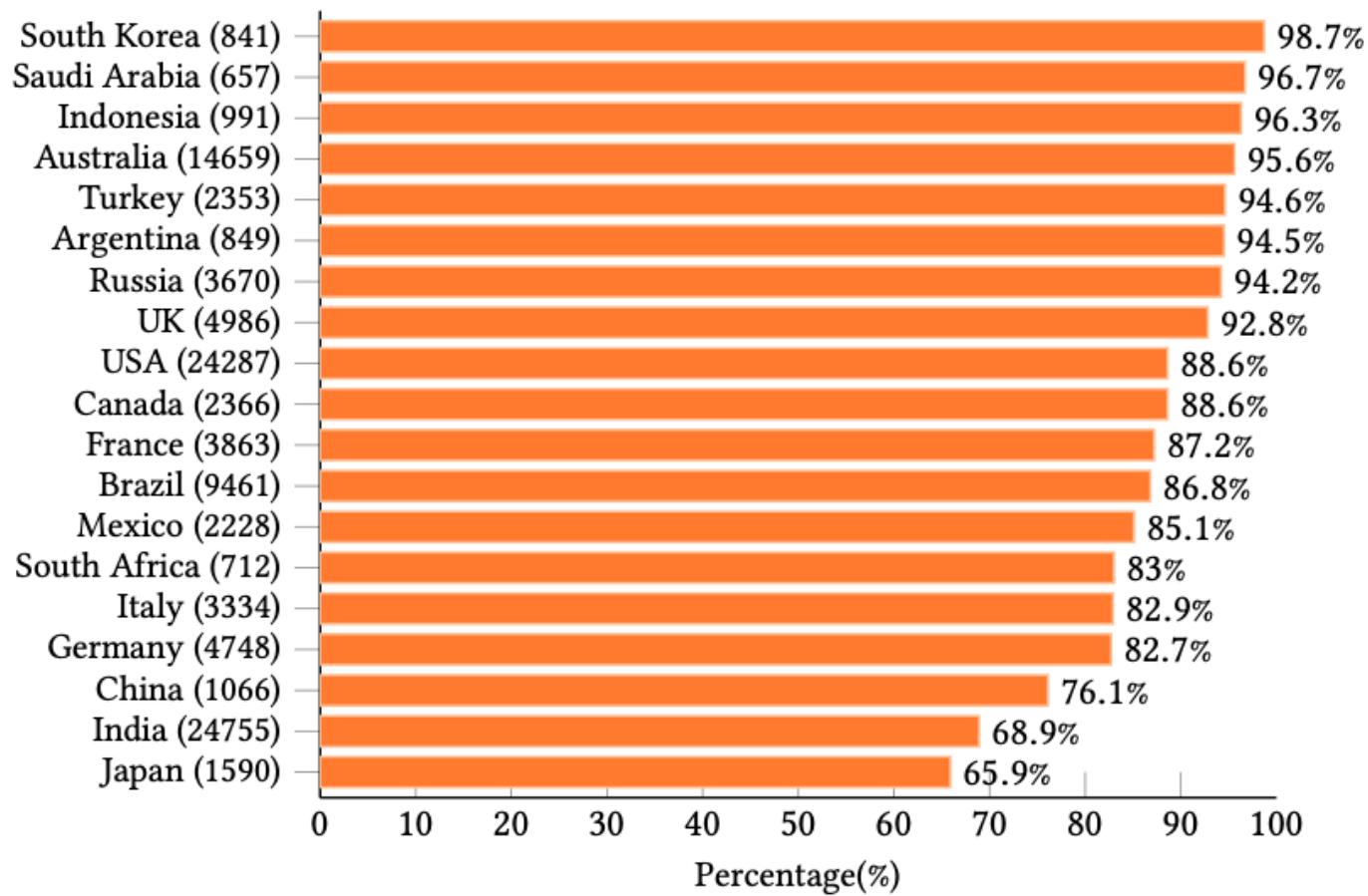
Cookie Value Show URL decoded
1673172005.yrts.1641636005#1656182634.yrtsi.1624646634

Tracker
With cookies
Expiring 1 to 9
years in the
future

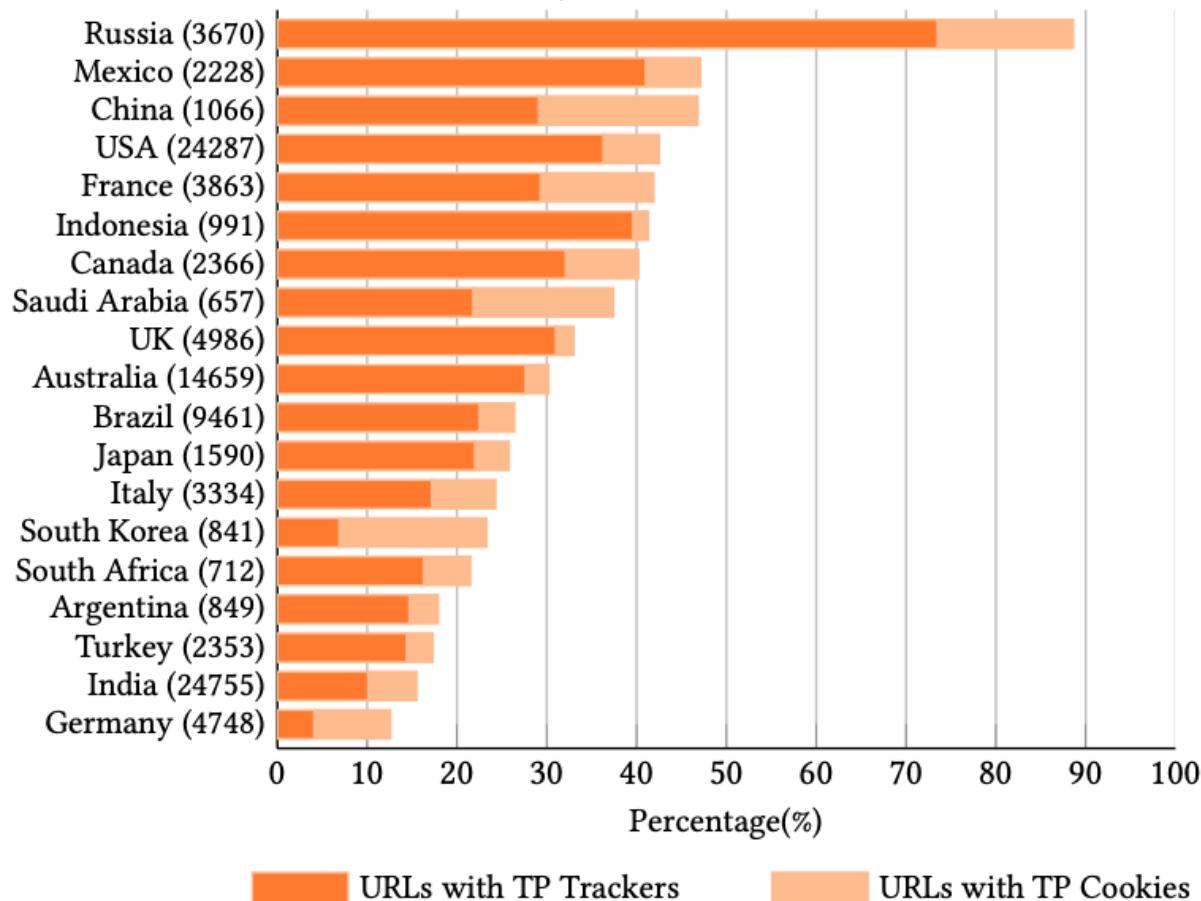
Console What's New Developer Resources Issues

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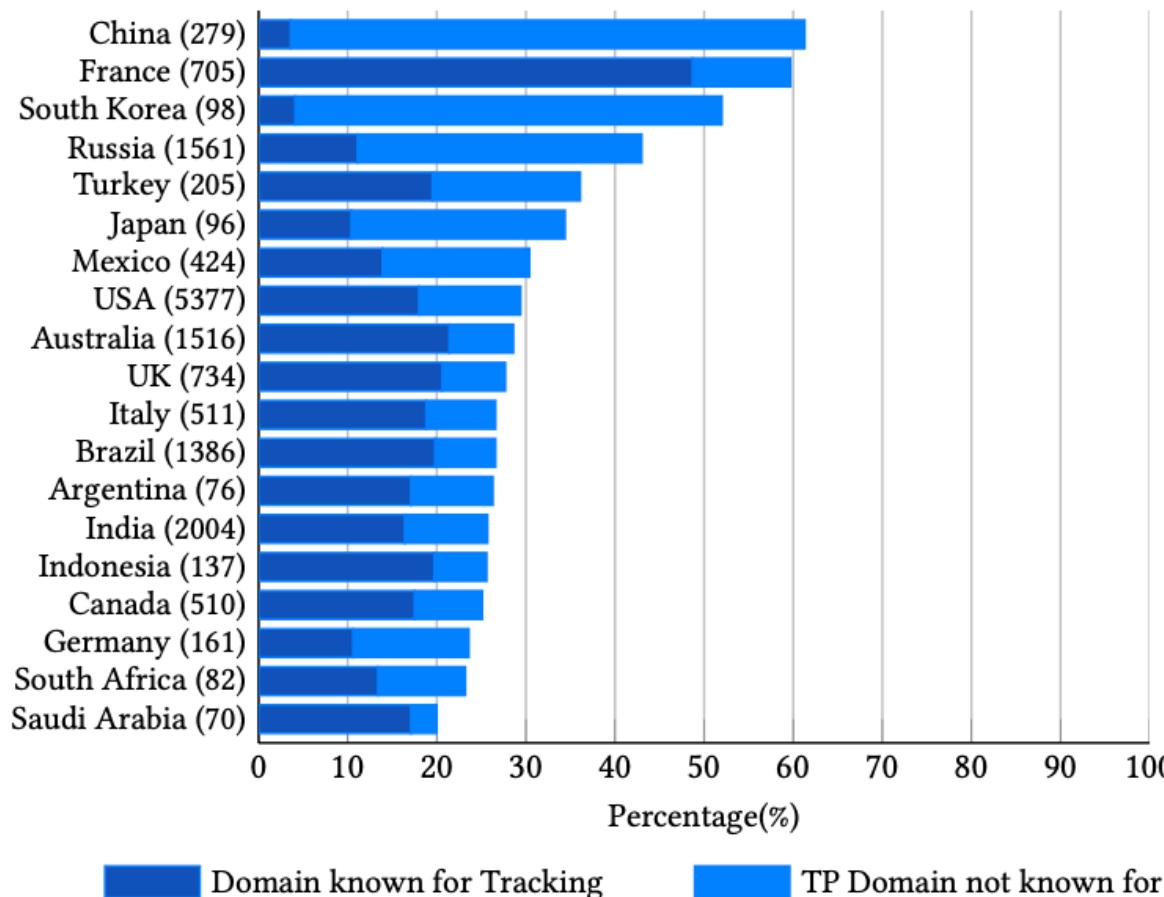
Gov Websites: Cookies are very common



Gov Websites: Third party and Tracker Cookies are also very common!

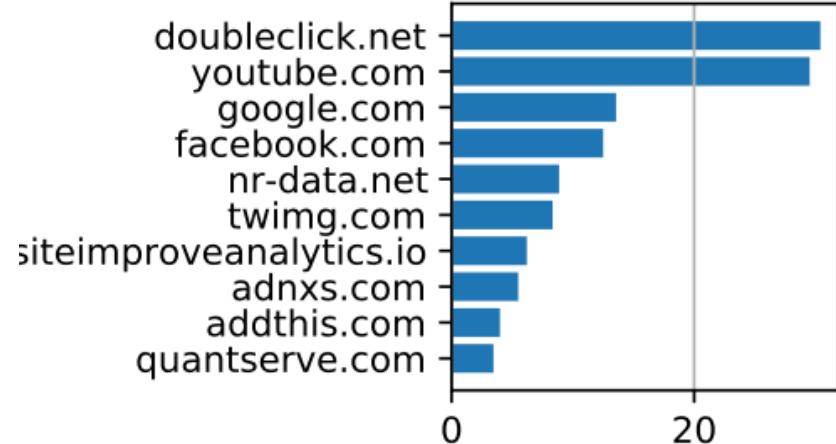


Gov Websites: Percentage of Cookies that expire after 1 year or more

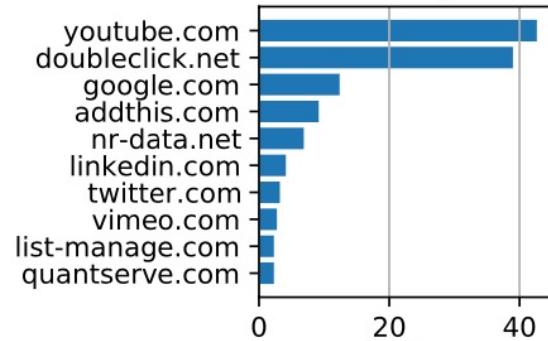


Popular & Regional Trackers

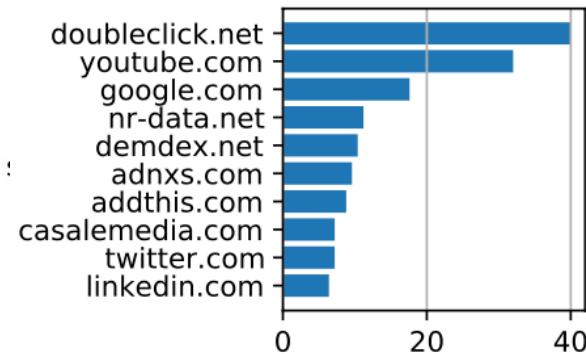
USA



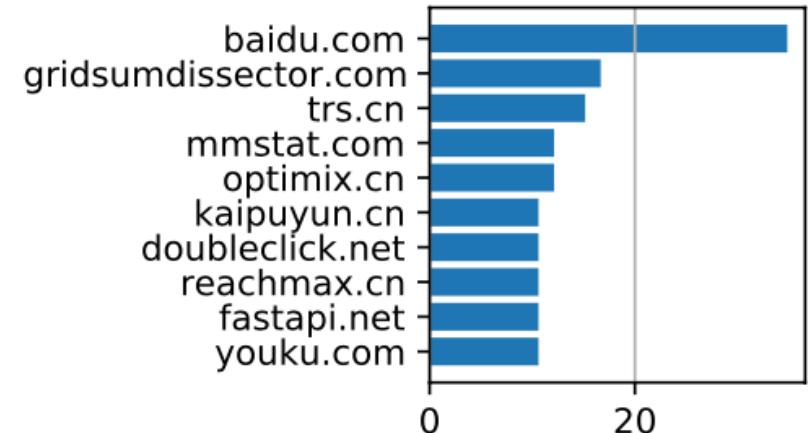
International-organizations



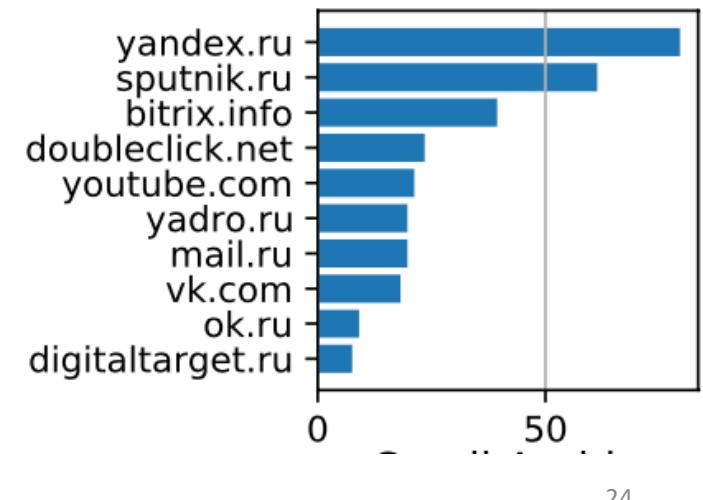
Covid19



China



Russia



Why the Trackers are there?

Unfortunately, no special care is taken for official websites; the stats resemble these of general websites!

Our manual investigation attributes that to:

1. Links to Social Networks
2. Links to Videos
3. Use of public Analytics Tools
4. Use of public Software Libraries

Recomendations

1. Responsible Gov Website Development
2. Gov Cloud
3. Gov Website Audits
4. Education about Web Tracking

Datasets

Will soon be available at:

<https://govcookies.github.io/>

Acknowledgements



European Research Council

Established by the European Commission

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