

# Measuring Web Cookies in Governmental Websites

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

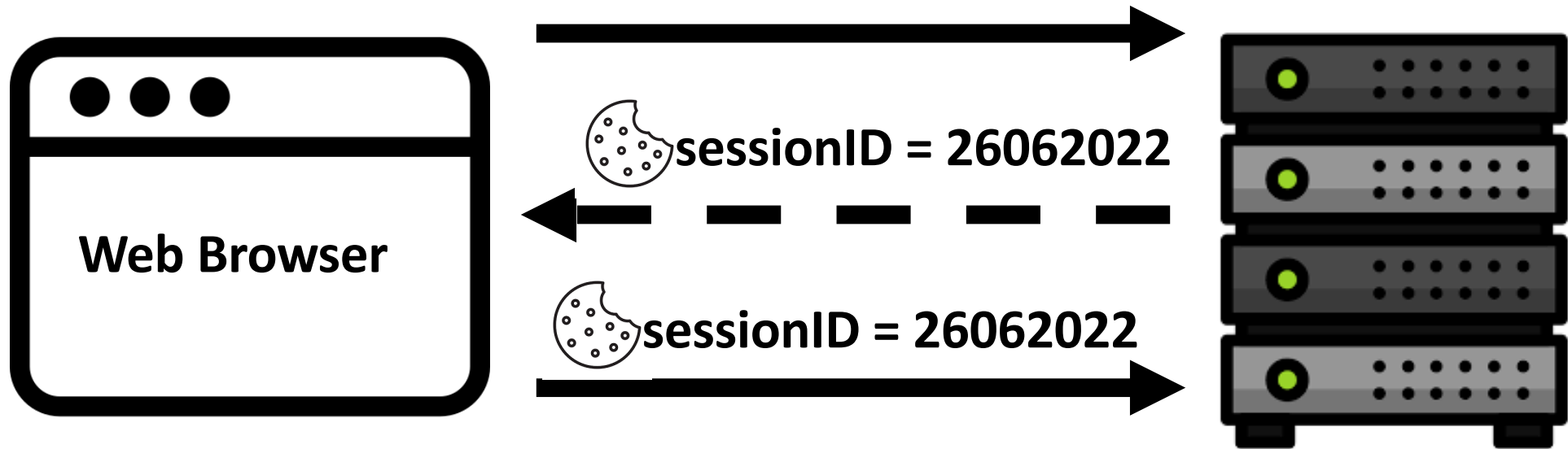


How many ads have you received today?



# Web Cookies

**Web Server  
of [www.Barcelona.com](http://www.Barcelona.com)**

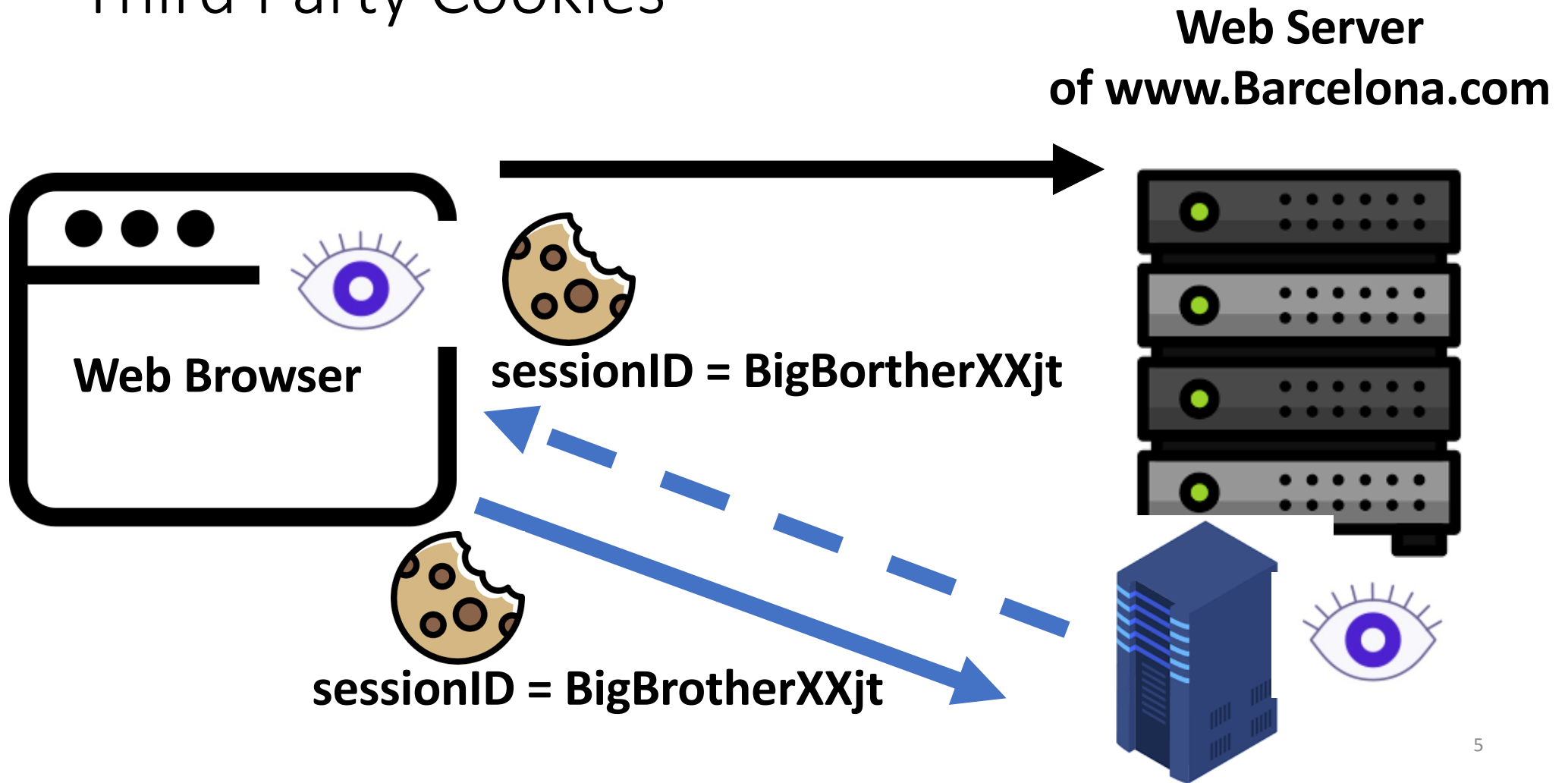


# Web Cookies & Trackers

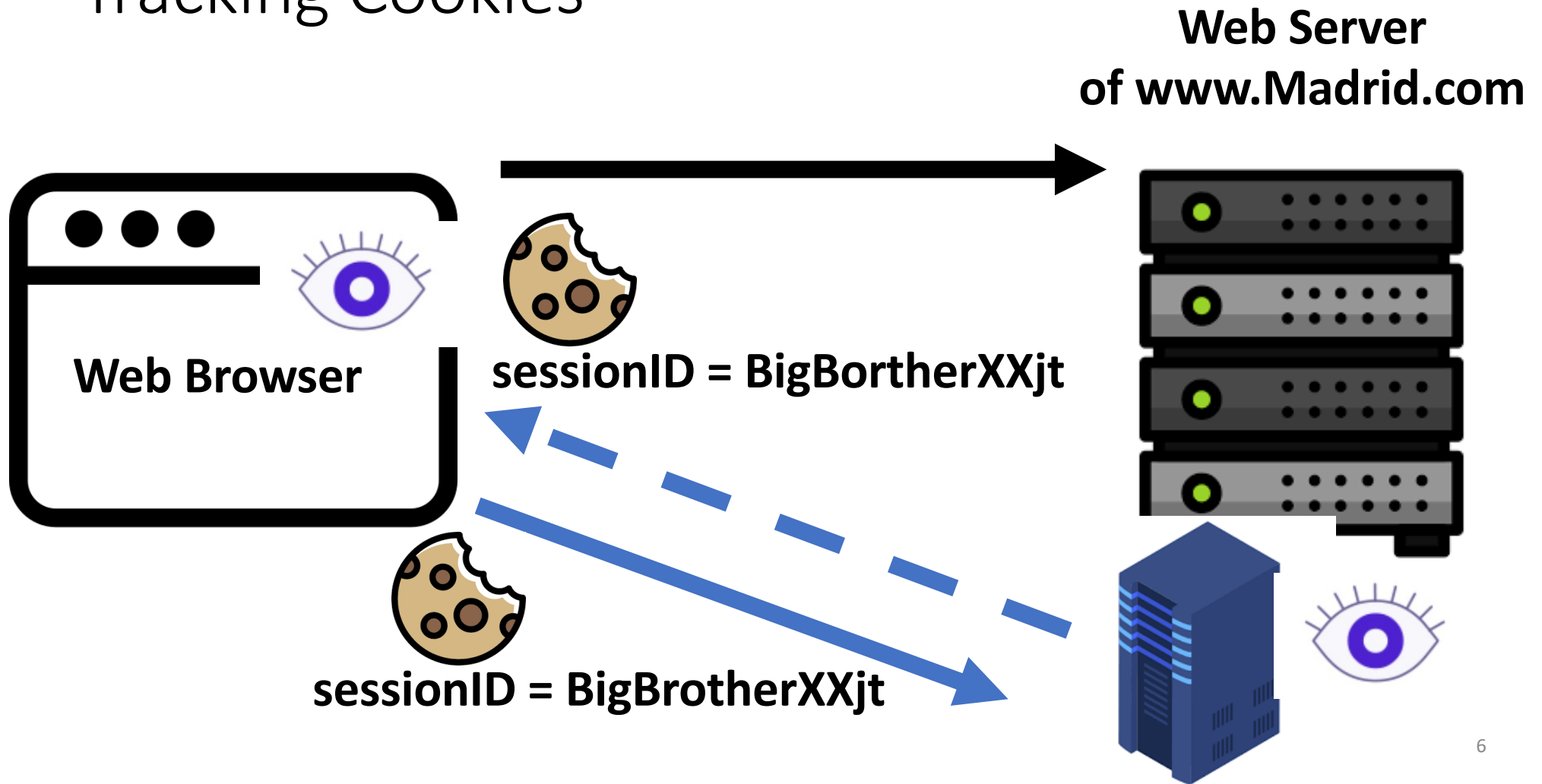
**Web Server  
of [www.Barcelona.com](http://www.Barcelona.com)**



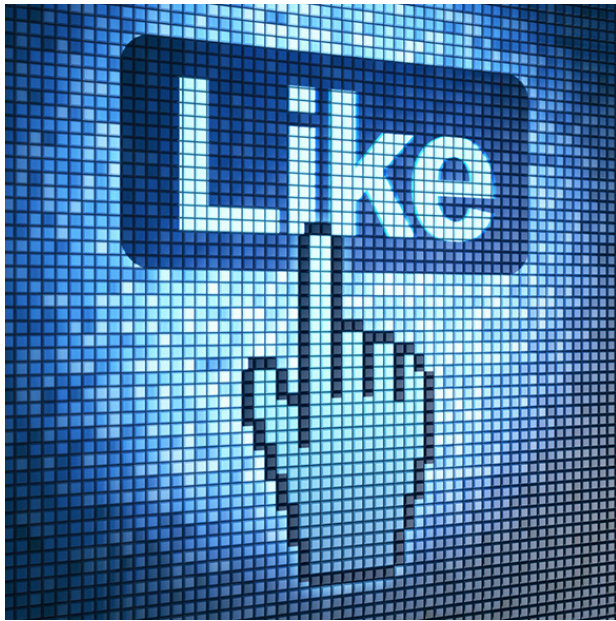
# Third Party Cookies



# Tracking Cookies



# Your Digital Soul





4:06 / 25:09 [Play] [Next] [Volume] [Pause] [CC] [Settings] [Full Screen] [Maximize]

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

6,688,599 views • Apr 11, 2022

180K [Dislike] [Share] [Download] [Clip] [Save] ...

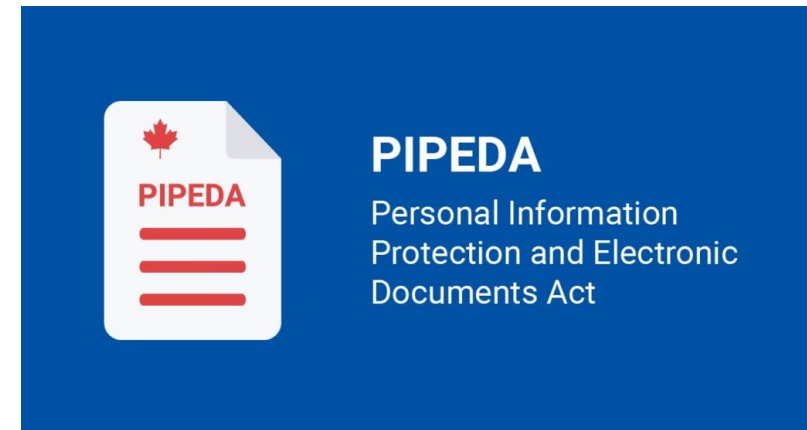
All John Oliver Conversation Related >

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\*

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**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

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 MSs). Since then, its implementation has

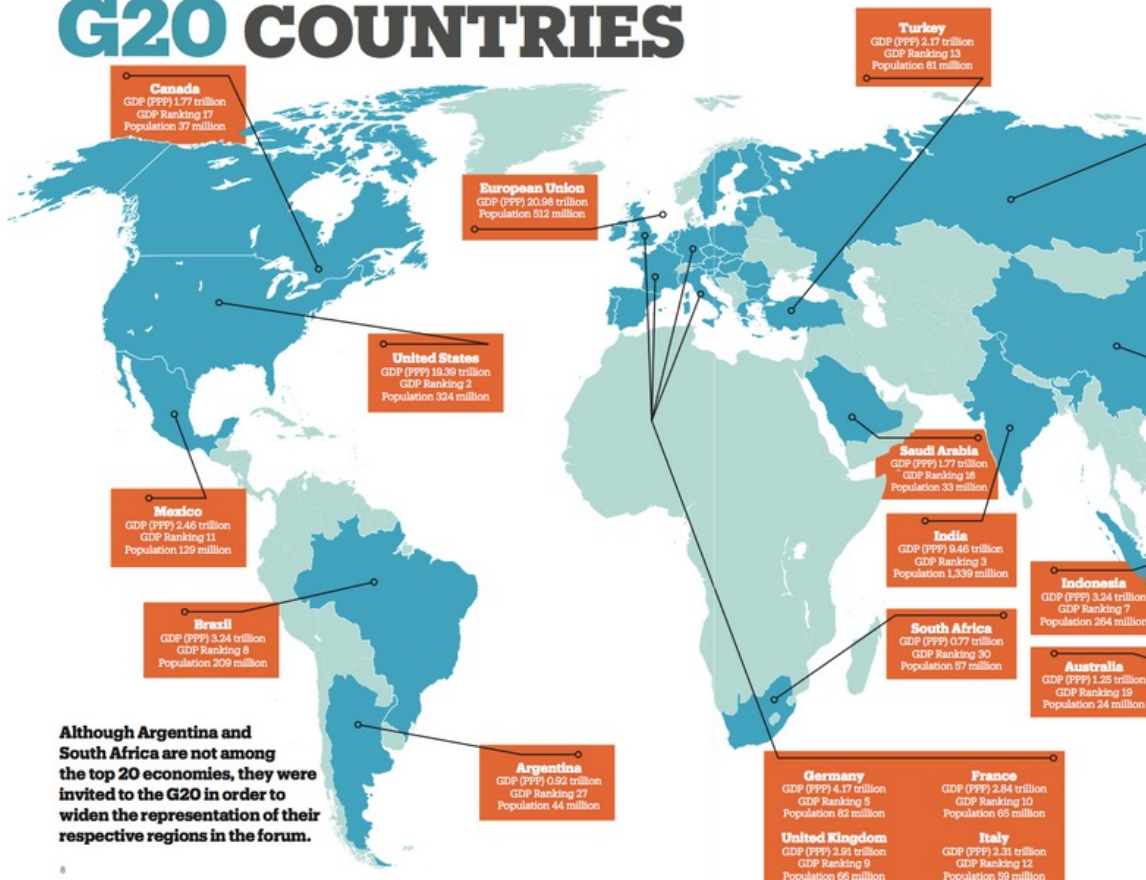
👉 This paper:  
Have We Audited the Government Websites?


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 1501 Web Sites


## G20 COUNTRIES



An official EU website 

### EU official languages

- български**
- español**
- čeština**
- dansk**

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**Accept all cookies**

**Accept only essential cookies**

Application | Elements | Console | Recorder | Performance insights | Sources | Network | Performance | Application >> | 1 | ⚙️ | ✖️

Application

- Manifest
- Service Workers
- Storage

Storage

- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies
- 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 | 14 | ✖️



EU official languages

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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



EU official languages

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español

čeština

dansk

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

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Accept only essential cookies

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CFTOKEN	bc3215bf67d...	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

Cookie Owner



An official EU website



**EU official languages**

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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**

Cookie Value  Show URL decoded

bc3215bf67ddce38-D2429017-9BEE-27CA-5BE298D27654CC62

17

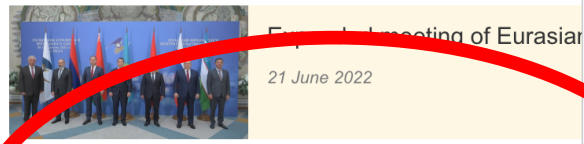
- Application
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Name	Value	Domain	Path	Expires / Max...	S	H	Sec..	S	Sa...	Part..	Pr...
yabs-sid	60267133165...	mc.yandex.ru	/	Session	26		✓	N..			Me...
<b>ymex</b>	<b>1673172005.y...</b>	<b>.yandex.ru</b>	<b>/</b>	<b>2023-01-08T...</b>	<b>58</b>		✓	<b>N..</b>			<b>Me...</b>
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...
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**Cookie Value**  Show URL decoded  
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# The Russian Government



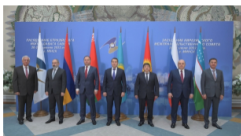
**Does not ask for consent**



# The Russian Government



Gove  
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/

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<b>ymex</b>	<b>1673172005.y...</b>	<b>.yandex.ru</b>	<b>/</b>	<b>2023-01-08T...</b>	<b>58</b>		✓	<b>N..</b>			<b>Me...</b>
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...


**Third party Tracker**

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


Console What's New Developer Resources Issues

← → ↻ 🏠 ⚠️ Not Secure | government.ru/en/ [🔖] [☆] [📄] [🔴 ABP] [🗨️] [🔍] [🔧] [🗑️] [👤] [☰]

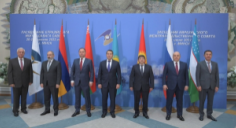
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yaos-sid	60267133165...	mc.yandex.ru	/	Session			✓	N..			Me...
ymex	1673172005.y...	.yandex.ru	/	2023-01-08T...	58		✓	N..			Me...
i	eZhit0k+f8VPc...	.yandex.ru	/	2031-06-23T...	93	✓	✓	N..			Me...
yandexuid	46508577615...	.yandex.ru	/	2023-01-08T...	2		✓	N..			Me...
_ym_isad		.government.ru	/	2023-06-25T...	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

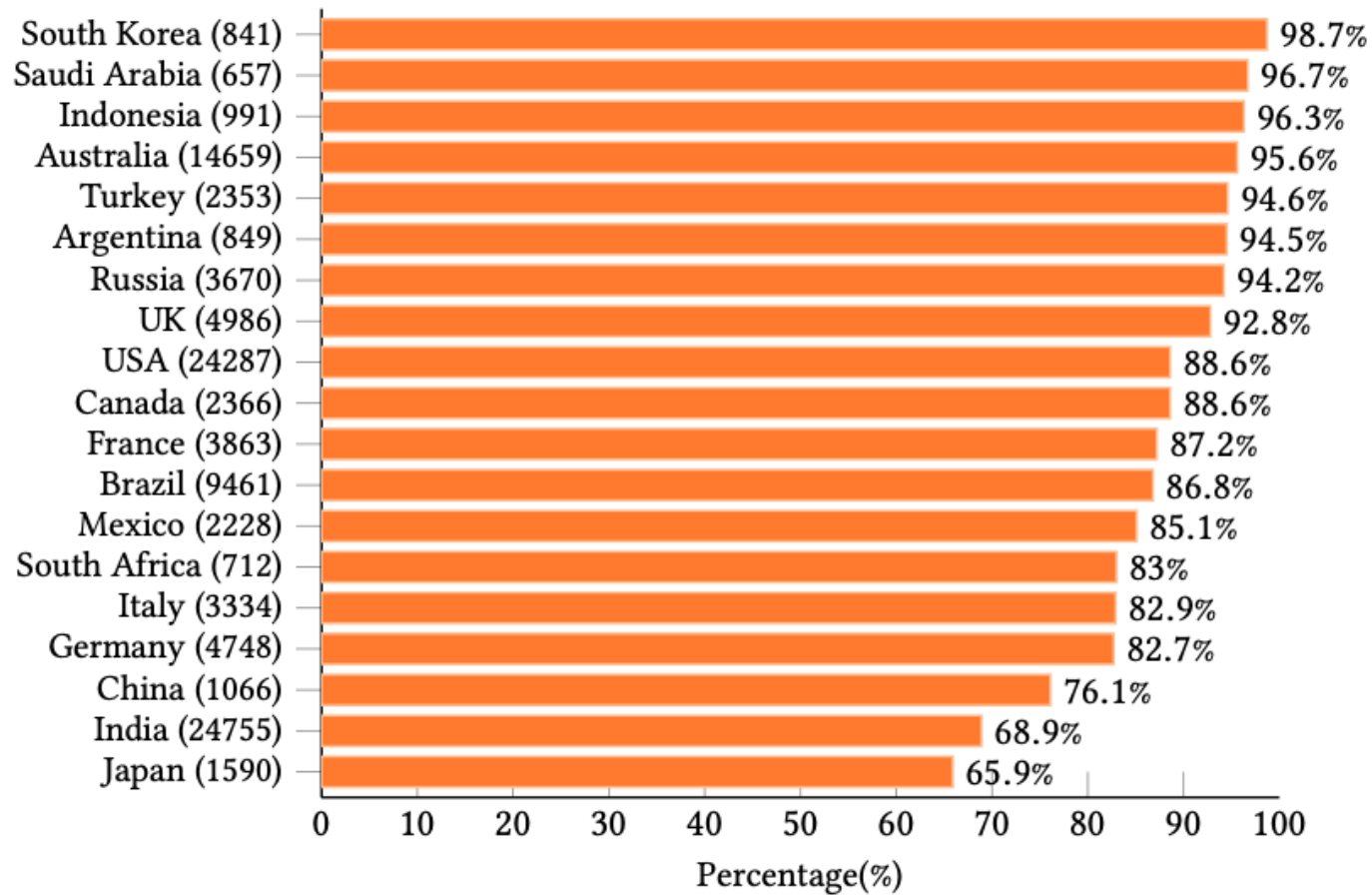
1673172005.yrts.1641636005#1656182634.yrtsi.1624646634

Tracker  
With cookies  
Expiring 1 to 9  
years in the  
future

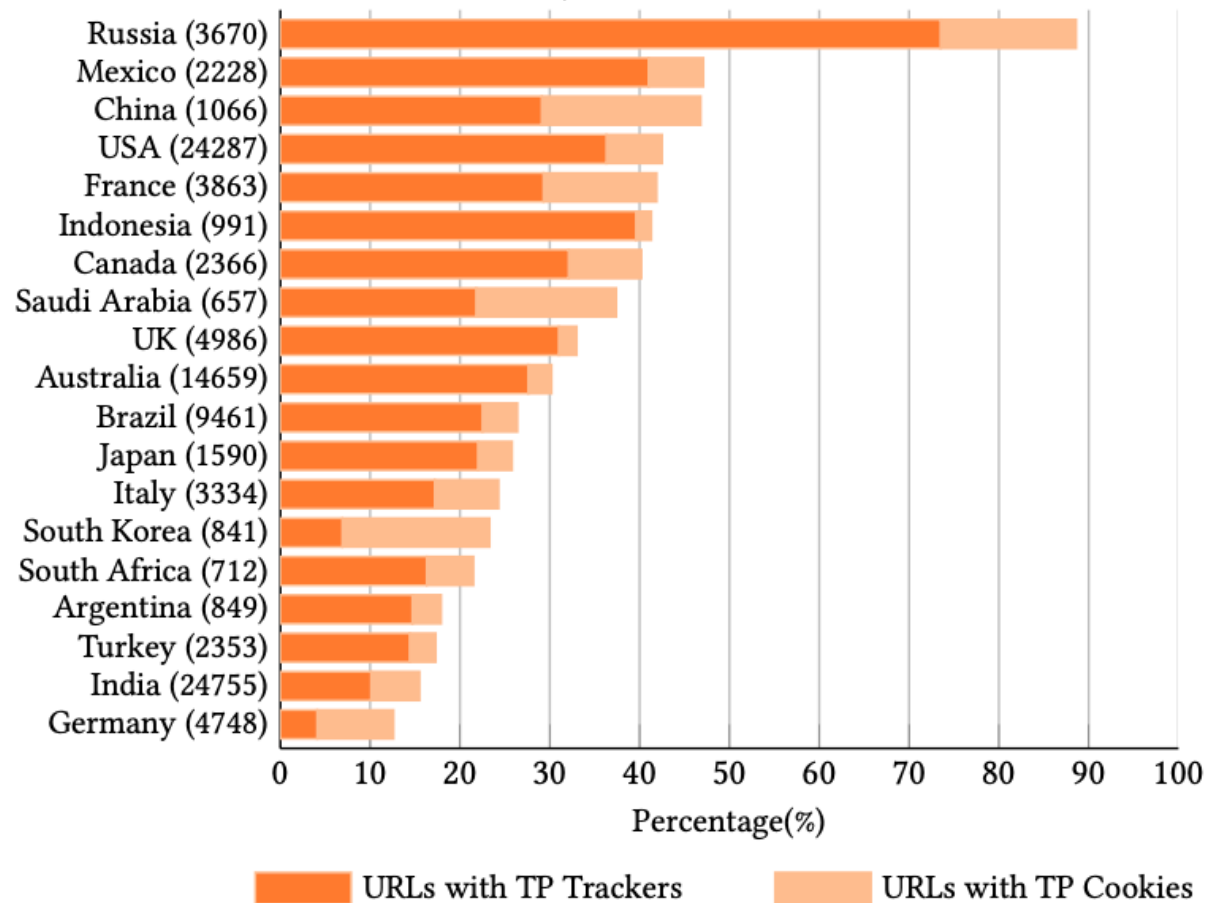
20

Console What's New Developer Resources Issues

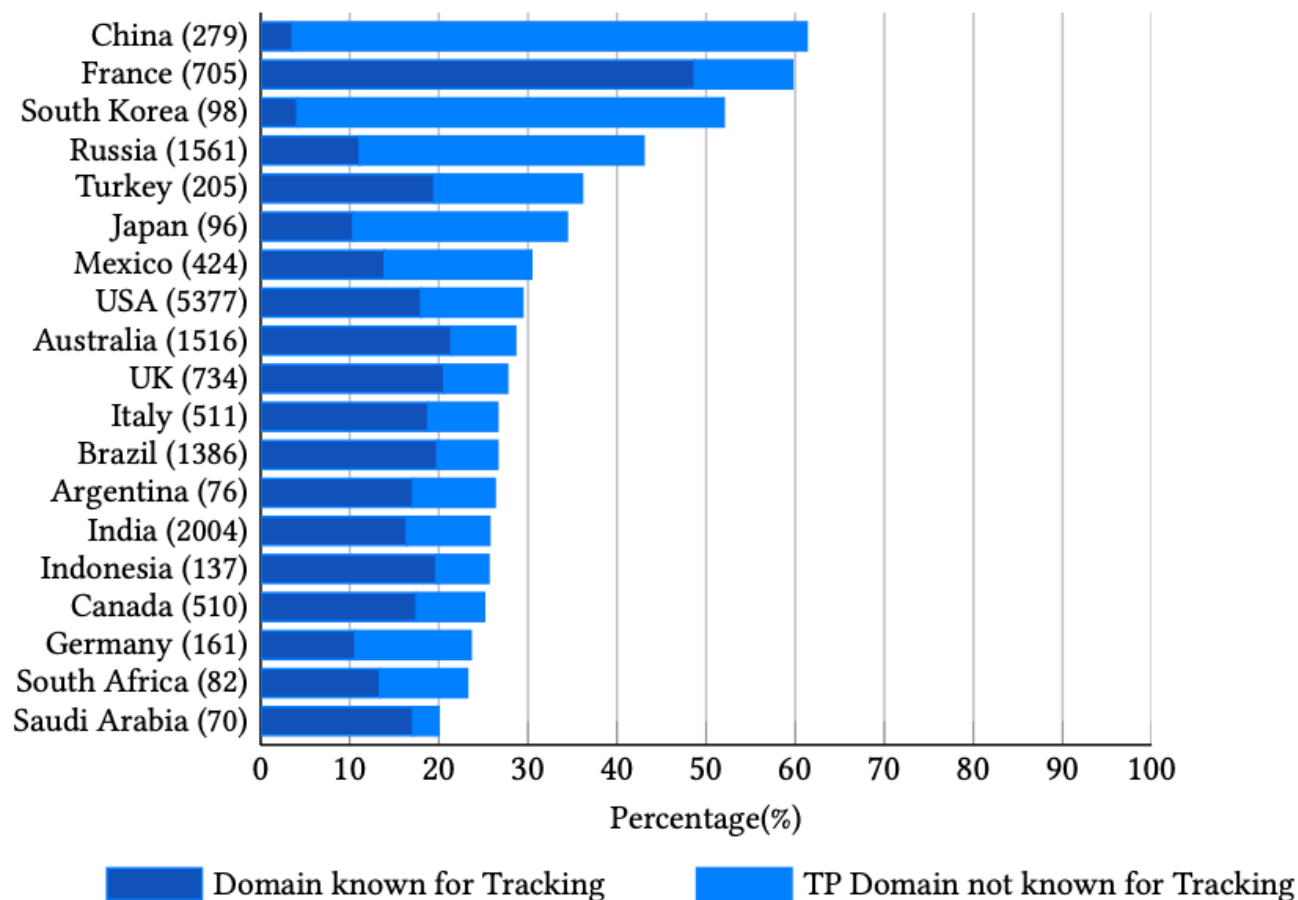
# Gov Websites: Cookies are very common



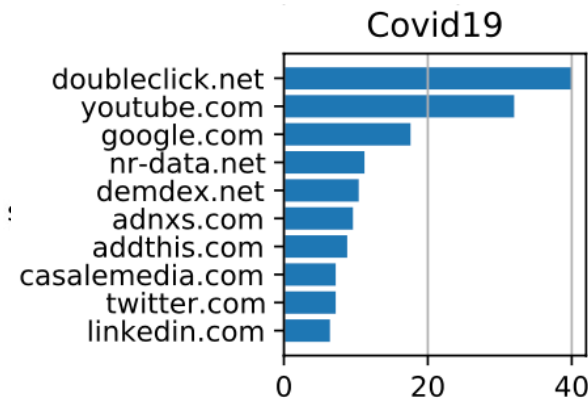
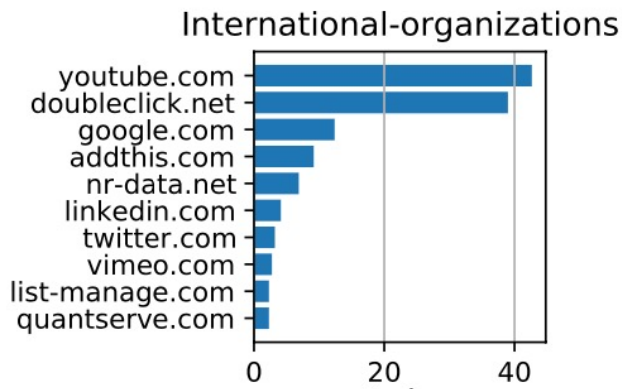
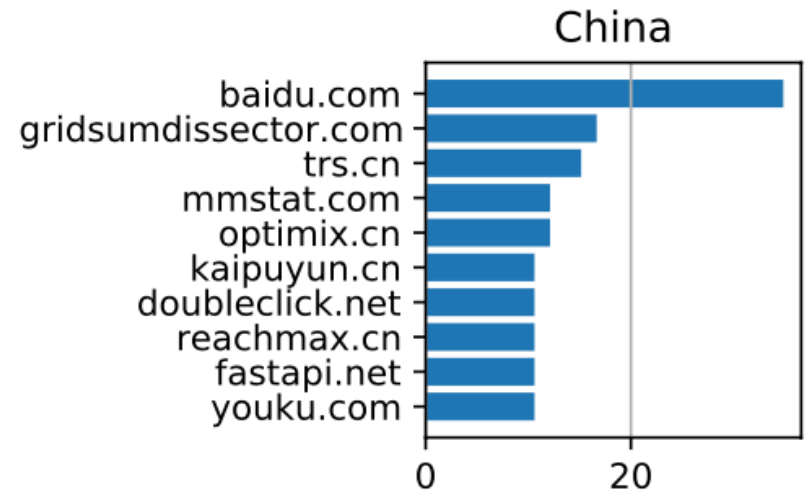
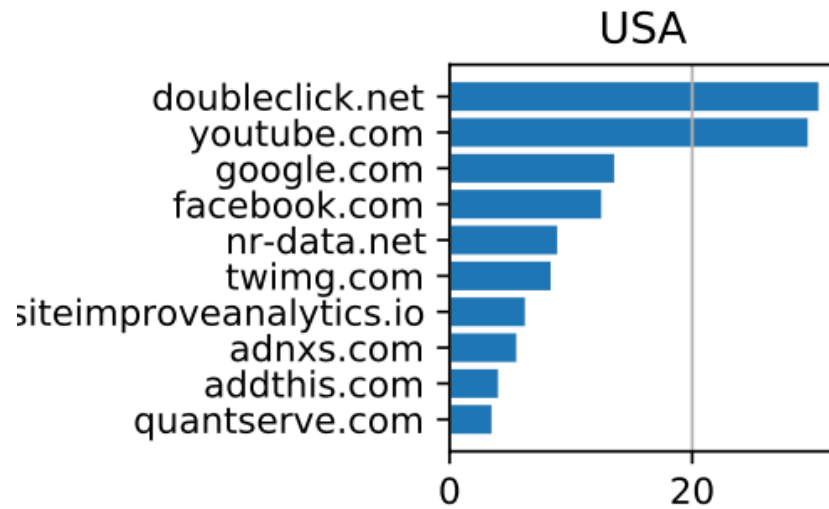
# Gov Websites: Third party and Tracker Cookies are also very common!



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



# Popular & Regional Trackers





## 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

This work was supported in part by the Atracción de Talento grant (Ref. 2020-T2/TIC-20184) funded by Madrid regional government the TV-HGGs project (OPPORTUNITY/0916/ERC-CoG/0003) co-funded by the European Regional Development Fund and the Re-public of Cyprus through the Research and Innovation Foundation, the European Research Council (ERC) Starting Grant ResolutioNet; “Resolving the Tussle in the Internet: Mapping, Architecture, and Policy Making” (ERC-StG-679158), and the EU H2020 Research and Innovation programme under grant agreements No. 871370 (Pimcity).