

Measuring Web Cookies in Governmental Websites

Georgios Smaragdakis

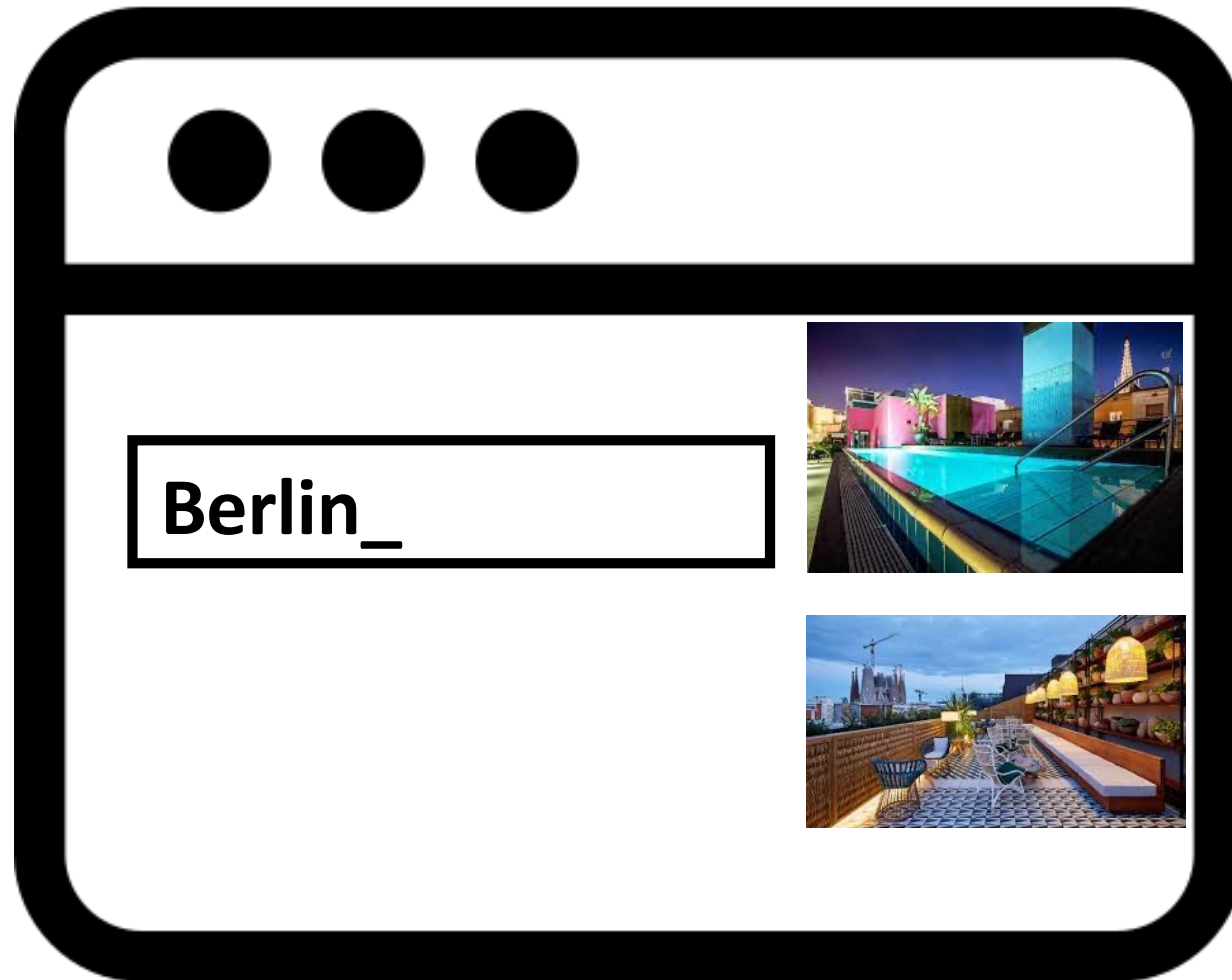
Joint work with Matthias Götze, Srdjan Matic,
Costas Iordanou, and Nikolaos Laoutaris

Appeared in the proceedings of ACM WebSci'22

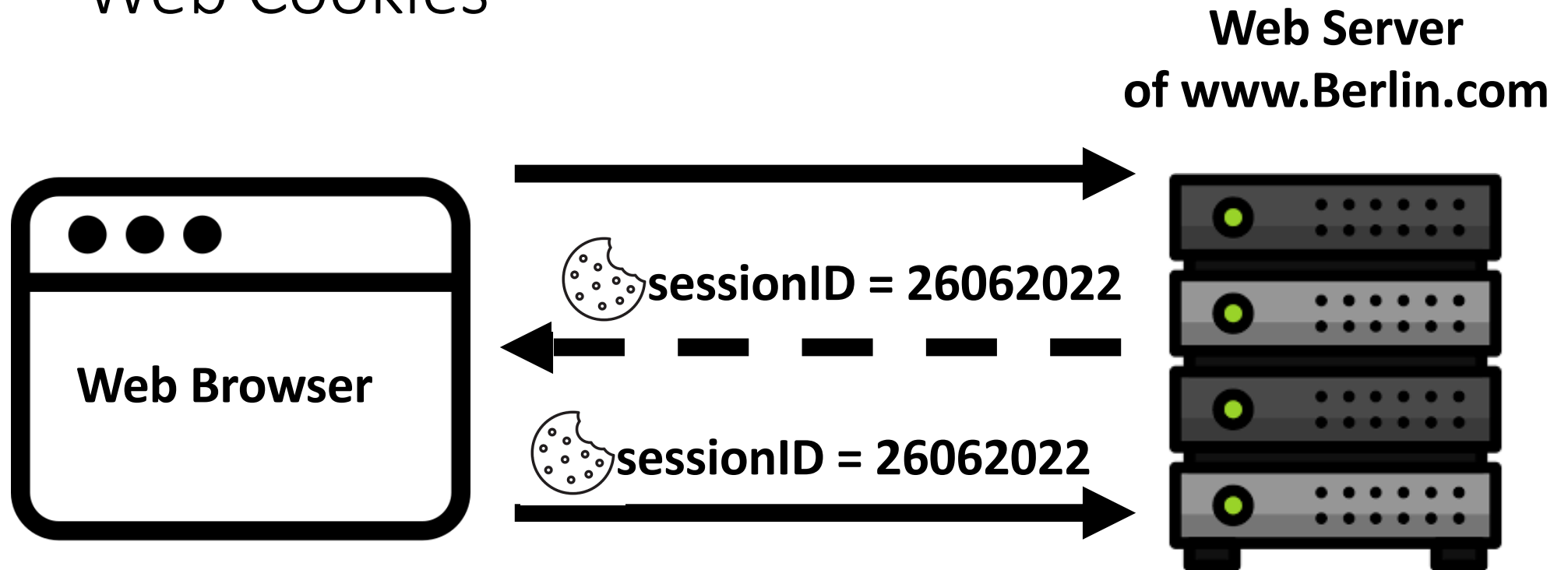


European Research Council
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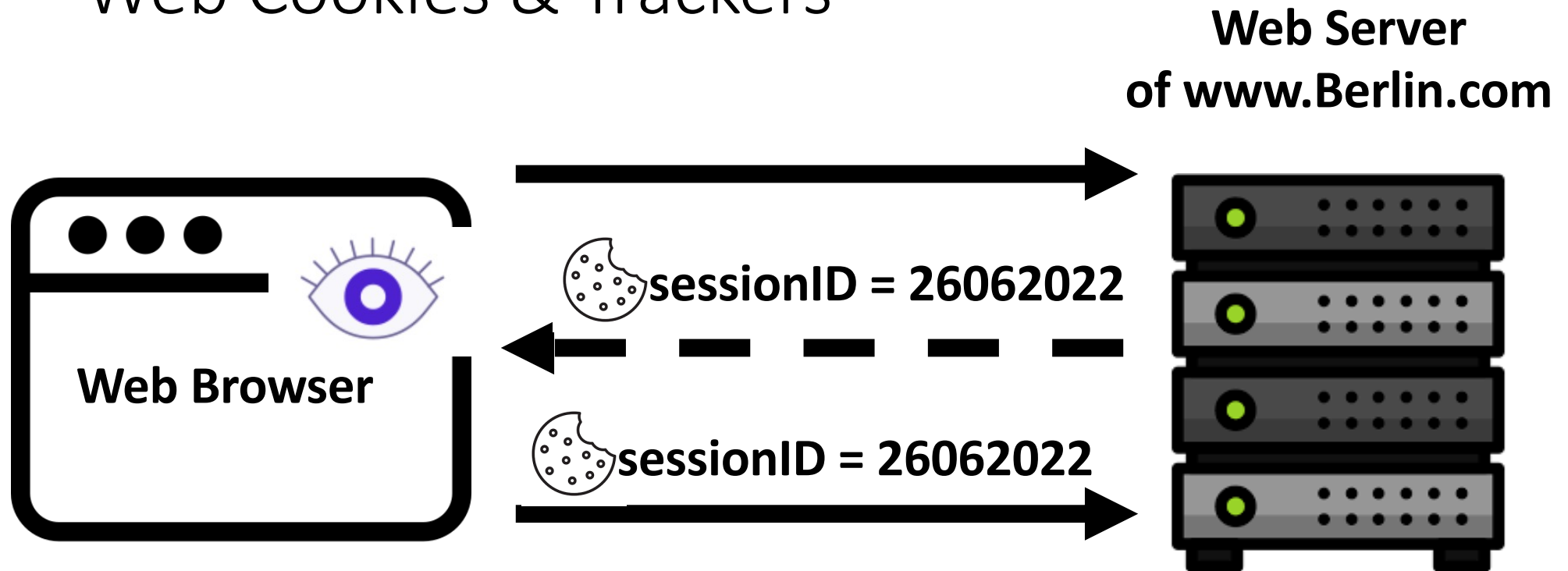
How many ads have you received today?



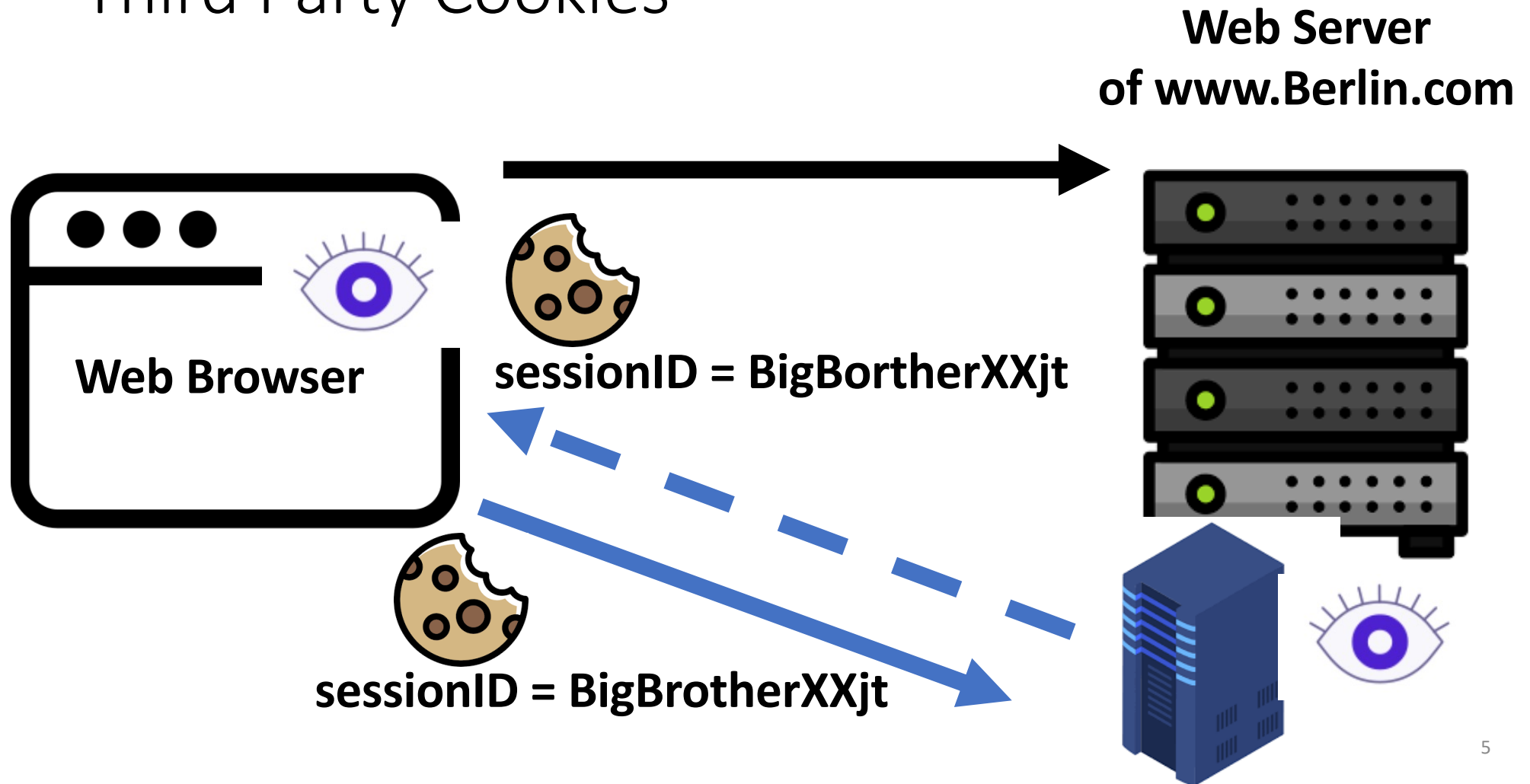
Web Cookies



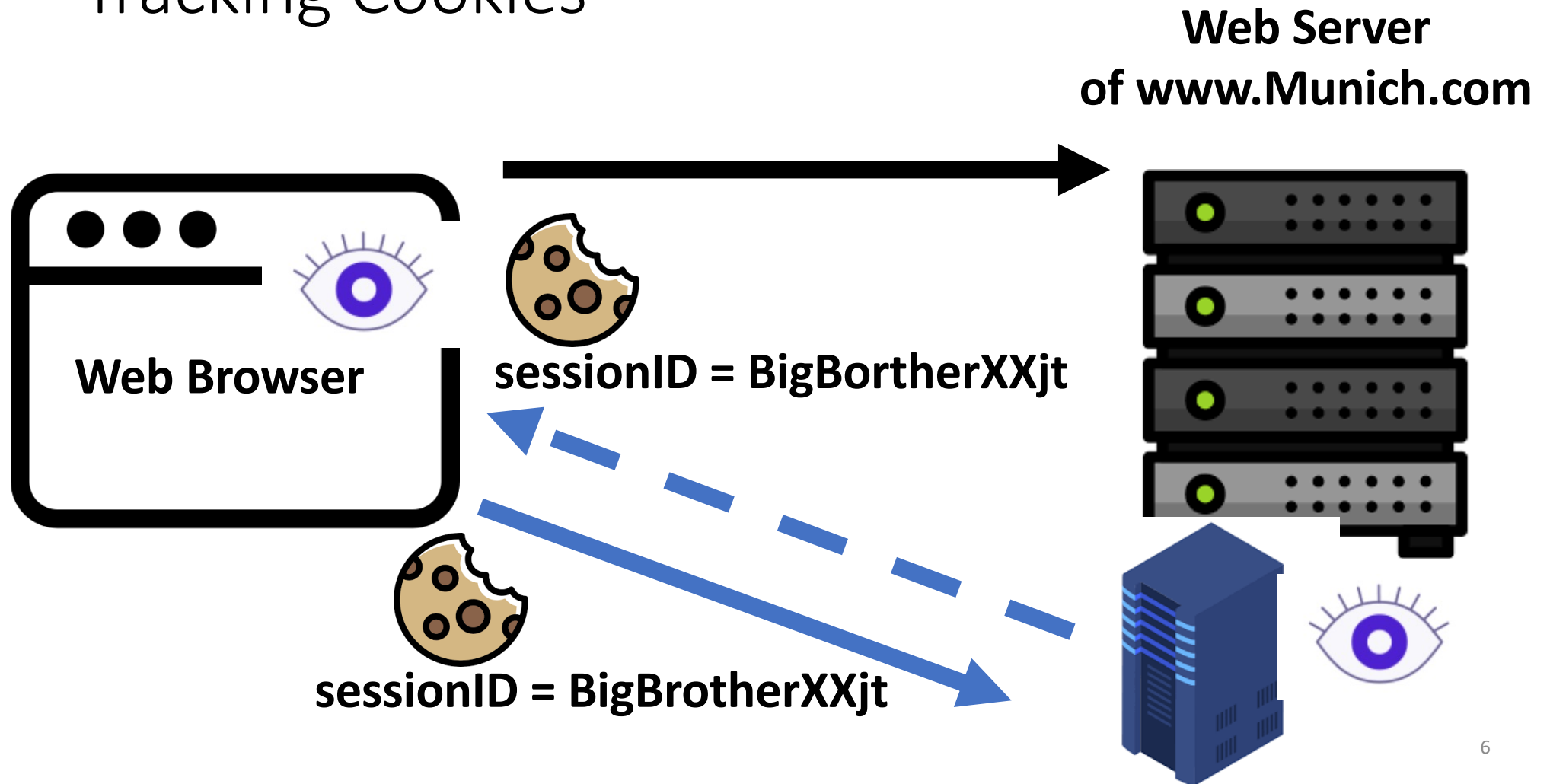
Web Cookies & Trackers



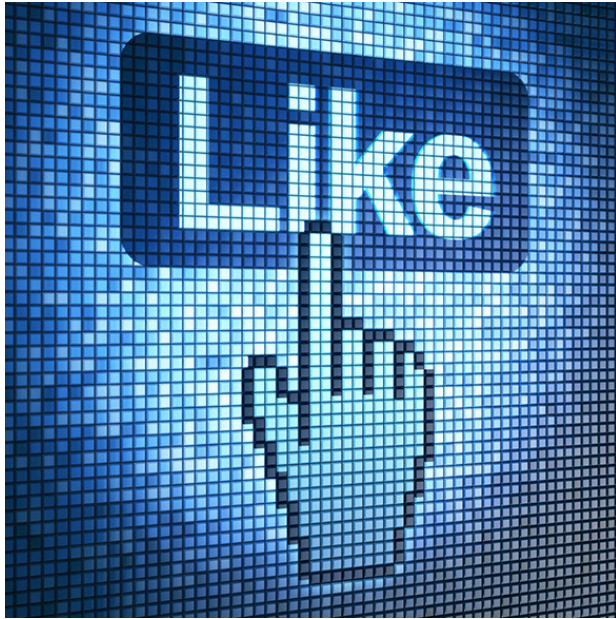
Third Party Cookies



Tracking Cookies



Your Digital Soul



YouTube NL

Search

DATA BROKERS

John Oliver

4:06 / 25:09

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

6,688,599 views • Apr 11, 2022

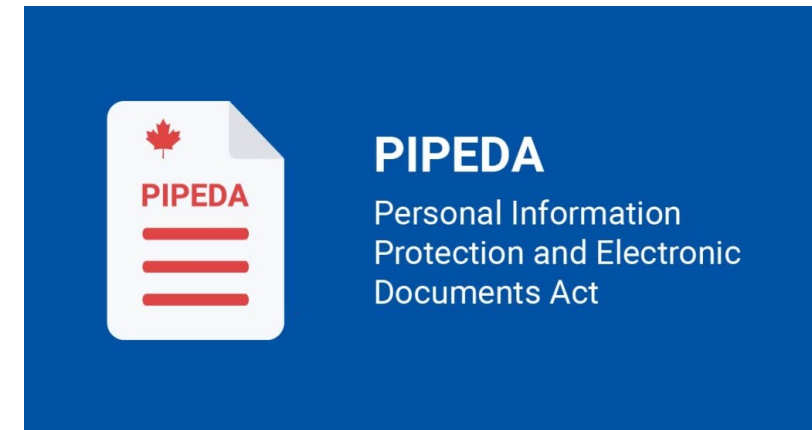
180K DISLIKE SHARE DOWNLOAD CLIP SAVE ...

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

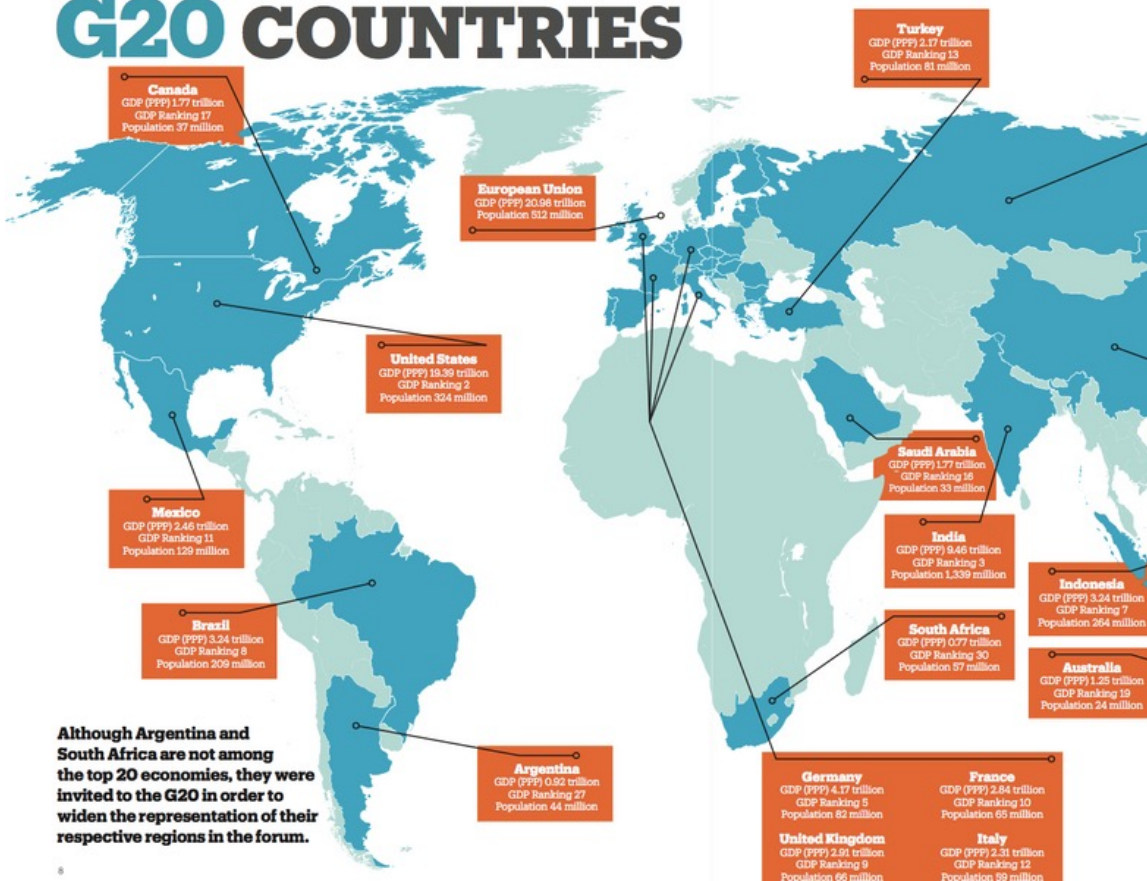
When browsing the web, users encounter the so-called “online trackers”. They build their business on the massive collection and brokerage of personal data. Used by websites to monetize the content they offer via personalized advertisement, online tracking is perceived as a threat to users’ privacy [43, 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?

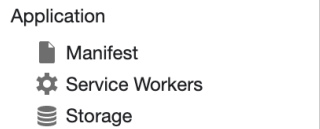
1. Allows for large-scale surveillance
2. May be the only point of interaction
3. If legislators do not respect laws, it breaks the trust between citizens & authorities

Web Sources: more than 150 websites



Although Argentina and South Africa are not among the top 20 economies, they were invited to the G20 in order to widen the representation of their respective regions in the forum.





Storage

- ▶ Local Storage
- ▶ Session Storage
 - IndexedDB
 - Web SQL
- ▼ Cookies
 - https://european-union.euro
 - Trust Tokens
 - Interest Groups

- 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

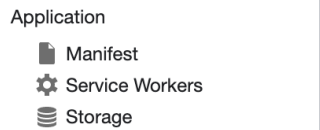
This site uses cookies to offer you a better browsing experience. Find out more on [how we use cookies.](#)

Accept only essential cookies

Filter

</

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



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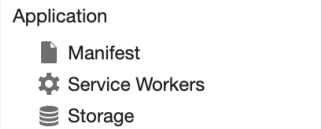
Frames

► ☐ top

We do

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

15



Storage

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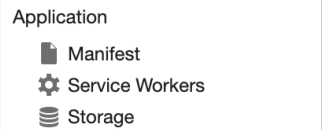
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Accept only essential cookies

Cookie Owner

Cookie Value ☐ Show URL decoded
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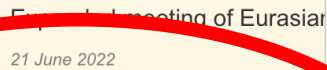
Frames

►  top

⋮ Console What's New Developer Resources Issues

Cookie Expiration Date

Cookie Value ☐ Show URL decoded
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~~24 June 2022~~

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

Does not ask for consent


 <http://government.ru>

Cookie Value ☐ Show URL decoded


1673172005.yrts.1641636005#1656182634.yrtsi.1624646634

← → ↻ 🏠 ⚠ Not Secure | government.ru/en/ 🔒 ☆ 📄 🛑 ABP 🗨 🌐 🖨 ⚙ ⋮

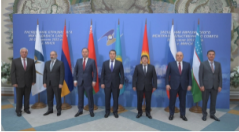
The Russian Government About the Government News



The Russian Government



Expanded meeting of Eurasian
21 June 2022



News

24 June 2022

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government.ru/en/news/45792/

Application

- Manifest
- Service Workers
- Storage

Storage

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- Session Storage
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- Interest Groups

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Frames

- top

Filter

Name	Value	Domain	Path	Expires / Max-Age	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		.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


19

← → ↻ 🏠 ⚠ Not Secure | government.ru/en/ 🔒 ☆ 📄 ⚙ ABP 🗨 📶 🖨 ⚙

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Name	Value	Domain	Path	Expires / Max	S	H	Sec..	S	Sa...	Part..	Pr...
yabs-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...

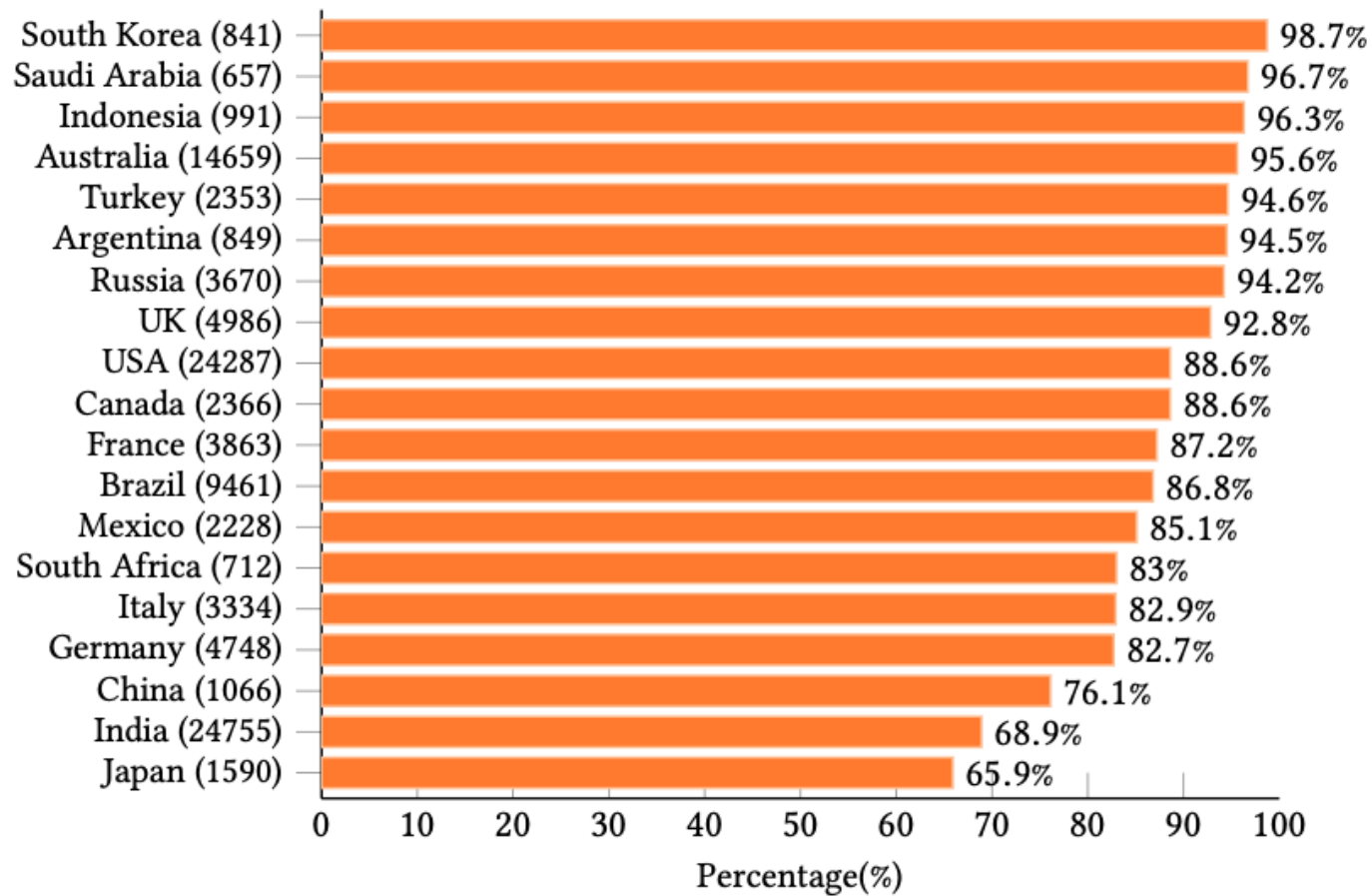
Tracker
With cookies
Expiring 1 to 9
years in the
future

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

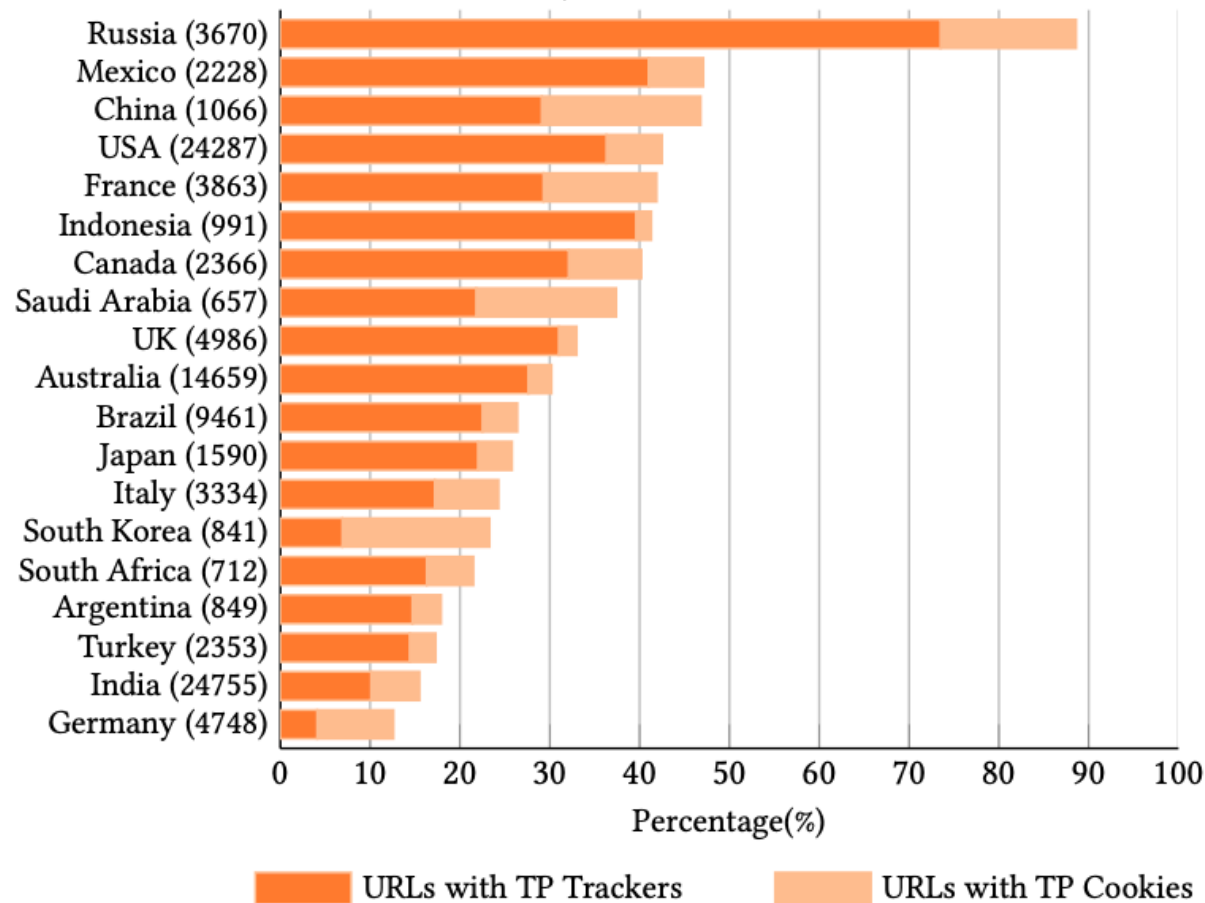
20

Console What's New Developer Resources Issues

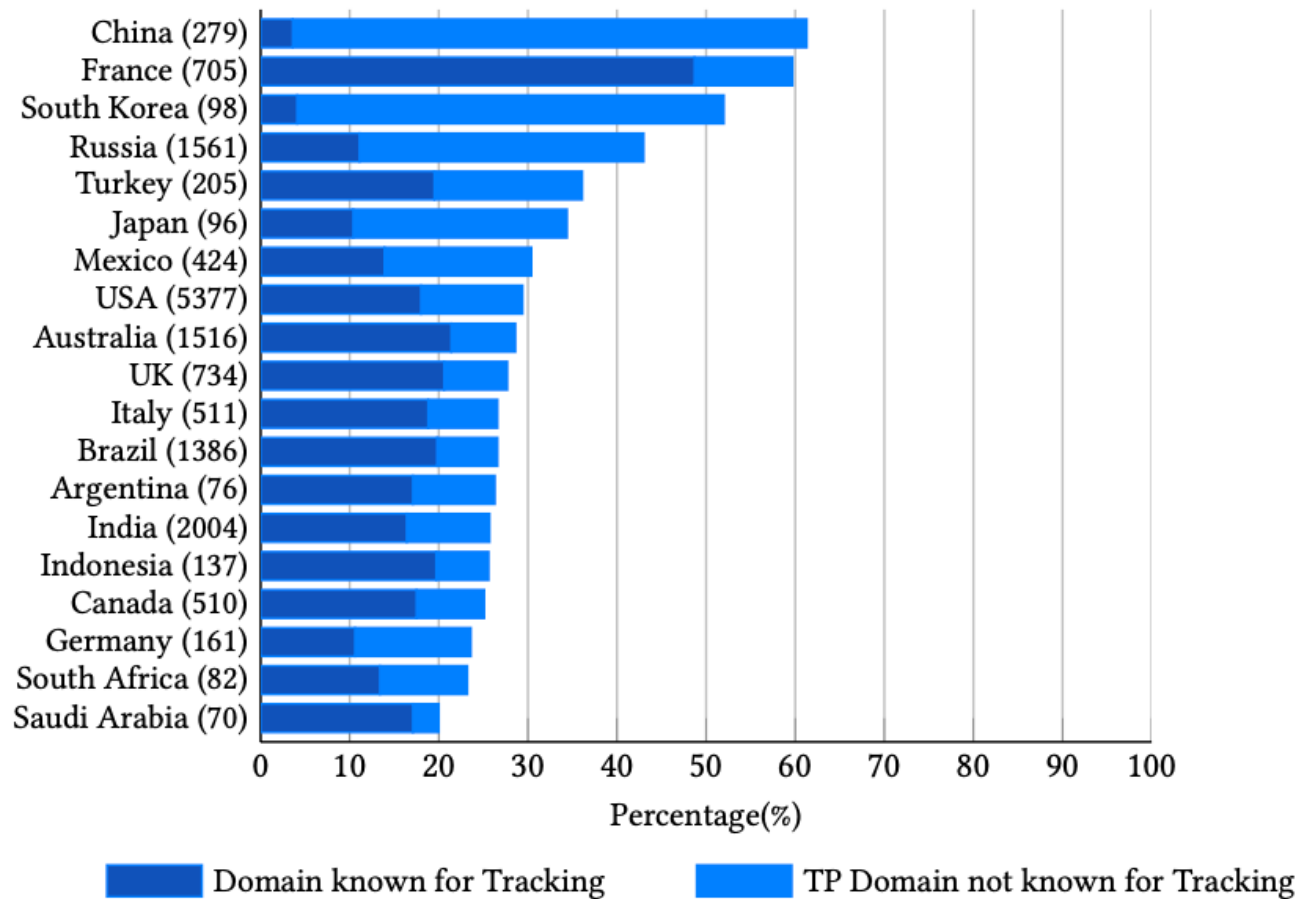
Gov Websites: Cookies are very common



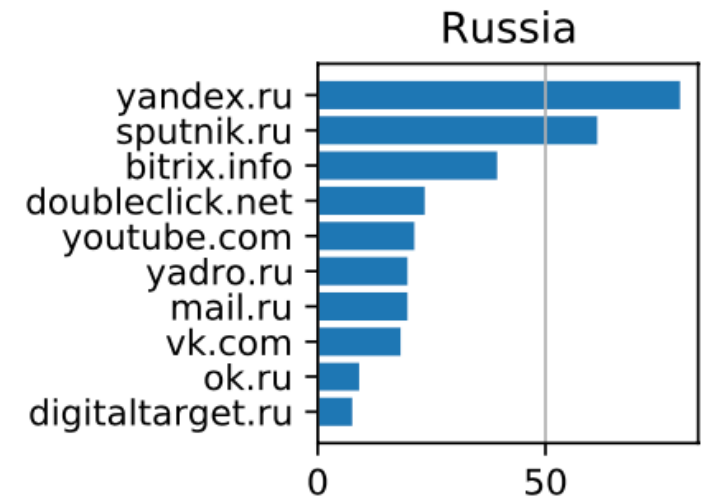
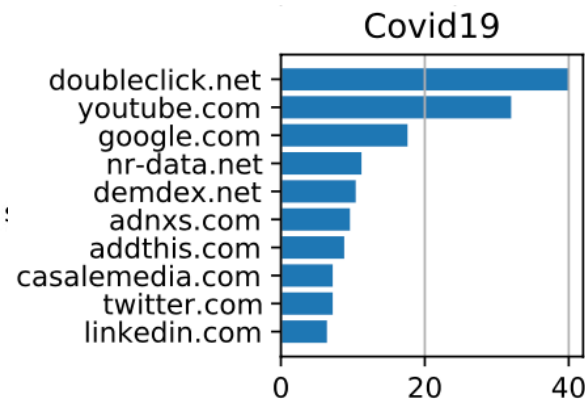
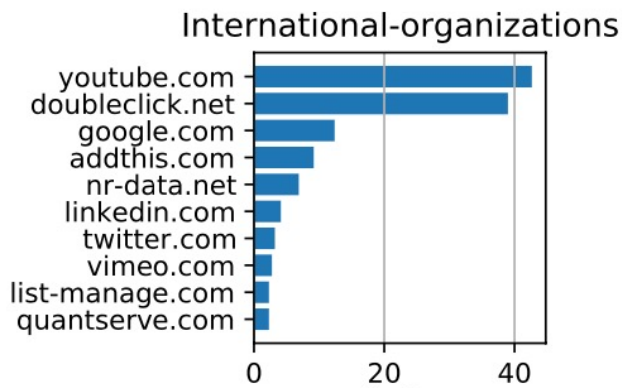
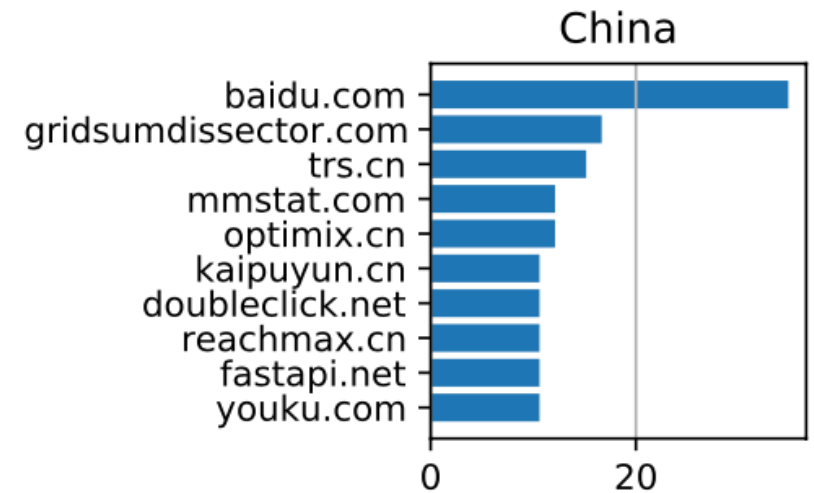
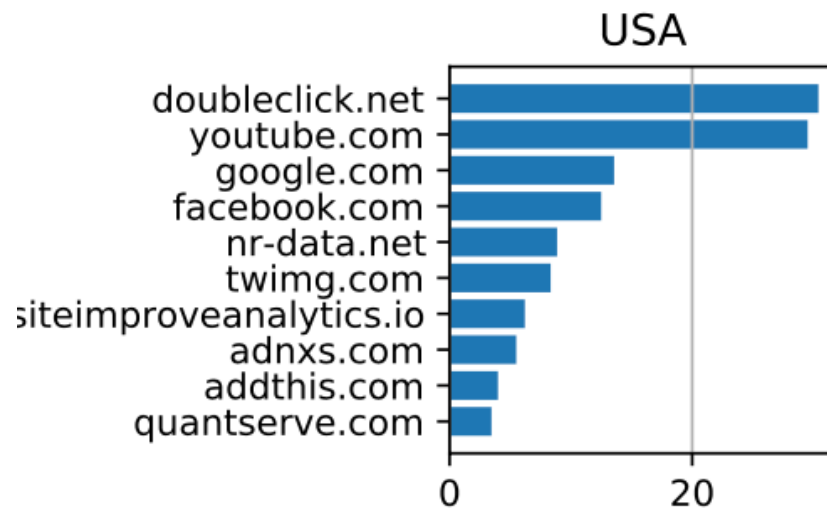
Gov Websites: Third party and Tracker Cookies are also very common!



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).