



Discovering databrokers

Bringing to light hidden companies

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Universitat Politècnica de Catalunya (UPC)
ESNOG 32 – 25 Oct. 2024

Third-party trackers

GOBIERNO DE COALICIÓN >

El PSOE y Sumar alcanzan un acuerdo de Gobierno que incluye la semana laboral de 37,5 horas

El pacto para la legislatura contempla también los impuestos a la banca y las grandes energéticas, el aumento del parque público de vivienda y la ampliación de permisos retribuidos por nacimiento



Pedro Sánchez y Yolanda Díaz, durante la firma del acuerdo, este martes.
Foto: SAMUEL SÁNCHEZ | Video: EPV

PAULA CHOUZA | CARLOS E. CUÉ | JOSÉ MARCOS
Madrid - 24 oct 2023 - 08:43 | Actualizado: 24 OCT 2023 - 21:50 CEST

274

La coalición da un paso decisivo para la investidura de Pedro Sánchez, a la espera de cerrar un pacto con los demás aliados de la mayoría. El PSOE y Sumar han sellado su acuerdo de

POLÍTICA

La intrahistoria del pacto PSOE-Sumar: "matices de matices" hasta la madrugada y sin concreciones para otros pactos "en cascada"

RAÚL PIÑA
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Madrid

Actualizado Miércoles, 25 octubre 2023 - 09:26

f t e



Pedro Sánchez y Yolanda Díaz, en la presentación del pacto de Gobierno PSOE-Sumar. ALBERTO DI LOLLI

Coalición PSOE y Sumar sellan en su pacto de

Sánchez y Díaz sellan un acuerdo sin mención a la amnistía ni a Cataluña

Suele decirse que lo que no se nombra no existe. Quizás sea eso lo que explique que el pacto de Gobierno entre el PSOE y

Third-party trackers

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+ Select personalised content	Disagree	Agree
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+ Measure content performance	Disagree	Agree
+ Apply market research to generate audience insights	Disagree	Agree
+ Develop and improve products	Disagree	Agree
+ Sharing data and profiles for analysis and personalised advertising from advertisers for our advertising campaigns	Disagree	Agree
+ Actively scan device characteristics for identification	Disagree	Agree
+ Sharing data and profiles for analysis and personalised advertising for advertisers and advertising companies on the Internet	Disagree	Agree
+ Use precise geolocation data	Disagree	Agree

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+ 33Across IAB TCF	Block	Authorize
+ 3Q GmbH IAB TCF	Block	Authorize
+ 42 Ads GmbH IAB TCF	Block	Authorize
+ 6Sense Insights, Inc. IAB TCF	Block	Authorize
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All partners	Block	Authorize
#		
+ 152 Media LLC IAB TCF	Block	Authorize
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+ 33Across IAB TCF	Block	Authorize
+ 3Q GmbH IAB TCF	Block	Authorize
+ 42 Ads GmbH IAB TCF	Block	Authorize

+ View user information

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1033 “partners”



1128 “partners”

"Partners" (starting with A: 150+)

+A Million AdsIAB TCF	+Aderize, Inc.IAB TCF	+Adnami ApsIAB TCF	+ADSTOURS SASIAB TCF	TCF	TCF	+Audience Trading Platform Ltd.IAB TCF
+A.MobIAB TCF	+Adevinta Spain S.L.U.IAB TCF	+adnanny.com SLUIAB TCF	+AdsWizz Inc.IAB TCF	+agof - daily campaign factsIAB TCF	+Apester LtdIAB TCF	+AudienceProject ApsIAB TCF
+AA INTERNET-MEDIA LtdIAB TCF	+Adex (Virtual Minds GmbH)IAB TCF	+ADNOW I RENODO MEDIA LTDIAB TCF	+Adsyield IncIAB TCF	+agof studiesIAB TCF	+Appier PTE LtdIAB TCF	+AudienceProject Measurement AmzIAB TCF
+Aarki, Inc.IAB TCF	+ADFI MEDIA SLIAB TCF	+Adnuntius ASIAB TCF	+Adtarget Teknoloji A.S.IAB TCF	+AiCreo S.r.l.IAB TCF	+Appstock LTD.IAB TCF	+Audiencecerate LTDIAB TCF
+AAX LLCIAB TCF	+Adform A/SIAB TCF	+Adobe Advertising CloudIAB TCF	+ADTARGET.ME UABIAB TCF	+AIDEM Technologies LTDIAB TCF	+appTV Ltd.IAB TCF	+AudienceRun corpIAB TCF
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+Active Agent (Virtual Minds GmbH)IAB TCF	+adhood.comIAB TCF	+AdomikIAB TCF	+ADTRIBUTION IncIAB TCF	+AlgoriX Technology Pte. Ltd.,IAB TCF	+AragoIAB TCF	+AuDigentIAB TCF
+ACTV8, Inc.IAB TCF	+AdikteeVIAB TCF	+Adpone SLIAB TCF	+ADUXIAB TCF	+AlkimiIAB TCF	+Arbeitsgemeinschaft Media-AnalyseIAB TCF	+audio content & control GmbHIAB TCF
+AcuityAds Inc.IAB TCF	+AdInMo LTDIAB TCF	+adQueryIAB TCF	+advanced store GmbHIAB TCF	+Allegro sp. z o.o.IAB TCF	+Arcanor Bilgi Teknolojileri ve Hizmetleri A.Ş.IAB TCF	+Audiohook CorporationIAB TCF
+AcxiomIAB TCF	+ADITION (Virtual Minds GmbH)IAB TCF	+AdQuiver Media SLIAB TCF	+ADventori SASIAB TCF	+Alphonso Inc. IAB TCF	+Arcspire LimitedIAB TCF	+AUDIOMOB LTDIAB TCF
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+ad6mediaIAB TCF	+Adjust GmbHIAB TCF	+Adkernel LLCIAB TCF	+Adrino Mobile Sp. z o.o.IAB TCF	+AdverlineIAB TCF	+ArkeeroIAB TCF	+Automattic AdsIAB TCF
+Adacado Technologies Inc. (DBA Adacado)IAB TCF	+Adkernell LLCIAB TCF	+Adlane LTDIAB TCF	+adrule mobile GmbHIAB TCF	+Amazon Ad ServerIAB TCF	+ARKHEUSIAB TCF	+Avantis Video LtdIAB TCF
+adality GmbHIAB TCF	+Adloox SAIAB TCF	+Adlase LTDIAB TCF	+Advertising.Tech FZ-LLCIAB TCF	+Amazon AdvertisingIAB TCF	+ARMIS SASIAB TCF	+Avocet Systems LimitedIAB TCF
+Adasta Media S.r.l.IAB TCF	+Adloox SAIAB TCF	+Adrule mobile GmbHIAB TCF	+Adverticum cPlc.IAB TCF	+Amnet GmbHIAB TCF	+Arpeely Ltd.IAB TCF	+AWIN AGIAB TCF
+adbalancer Werbeagentur GmbHIAB TCF	+Adludio Ltd.IAB TCF	+Ads Interactive Ltd.IAB TCF	+Advertising.Tech FZ-LLCIAB TCF	+Amobee Inc.IAB TCF	+Arrivalist Co.IAB TCF	+Axel Springer Teaser Ad GmbHIAB TCF
+adbility media GmbHIAB TCF	+ADMAN - Phaistros Networks, S.A.IAB TCF	+Adserve.zone / Artworx ASIAB TCF	+Adverty AB (publ)IAB TCF	+Amplified IntelligenceTechnologiesIAB TCF	+ArtChaos s.r.o.IAB TCF	+Axiom Media ConnectIAB TCF
+AdClear GmbHIAB TCF	+ADman Interactive SLUIAB TCF	+AdServing Factory srlIAB TCF	+Advisible ABIAB TCF	+Anviso SASIAB TCF	+Artefact Deutschland GmbHIAB TCF	+AXIS CORP LTDIAB TCF
+AdColony, Inc.IAB TCF	+adMarketplace, Inc.IAB TCF	+Adsmovil España S.LIAB TCF	+Adwatch	+ANINPRO-CREATIVE, S.L.IAB TCF	+Aryel s.r.lIAB TCF	+Axonix LTDIAB TCF
+AddApptr GmbHIAB TCF	+ADMAXIAB TCF	+ADSOCYIAB TCF	+ADWAYS SASIAB TCF	+Aniview LTDIAB TCF	+Ask LocalIAB TCF	+Azerion Holding B.V.IAB TCF
+AdDefend GmbHIAB TCF	+AdMaxim LimitedIAB TCF	+Adsolutions BVIAB TCF	+adWMGIAB TCF	+AnonymisedIAB TCF	+AttributyIAB TCF	+>850 more partners!!
+AddrelevanceIAB TCF	+admetrics GmbHIAB TCF	+AdsonicaIAB TCF	+Adxperience SASIAB TCF	+Anteriad, LLCIAB TCF	+Audience NetworkIAB TCF	
+Adelaide Metrics IncIAB TCF	+Admixer EU GmbHIAB TCF	+AdSpirit GmbHIAB TCF	+ADYOU LIKE SAIAB TCF	+AntVoiceIAB TCF	+Audience Solutions S.A.IAB TCF	
+AdElement Media Solutions Pvt LtdIAB TCF	+Admo.tv (Clickon)IAB TCF	+adsquare GmbHIAB TCF	+Adzymic Pte LtdIAB TCF	+Anzu Virtual Reality LTDIAB	+Anzu Virtual Reality LTDIAB	

Data brokers

- Companies or business units whose primary source of revenue is selling user personal information in data market places [1]
- Dangers for the user
 - Profiles may be (most surely) incorrect
 - There is no easy way to discover and correct it (despite GDPR)
 - There is no easy way to know to whom our info was sold to [2,3]
 - There is no easy way to know how this is impacting us!!

Privacy

The government can't seize your data — but it can buy it

Adam Kovacevich @adamkovac 2:00 PM UTC • May 21, 2023

Comment



[1] A. Rieke, H. Yu, D. Robinson, and J. van Hoboken, "Data Brokers in an Open Society", Open Society Foundations 2016

[2] <https://nrkbeta.no/2020/12/03/my-phone-was-spying-on-me-so-i-tracked-down-the-surveillants/>

[3] <https://techcrunch.com/2023/05/21/the-government-can-t-seize-your-data-but-it-can-buy-it/>

Cybercrime



The Conti Leaks: A Case of Cybercrime's Commercialization

99%

of over 1,000 studied executive members have their personal information available on more than three dozen online data broker websites, with a large percentage listed on more than 100

Tracking purposes

- Purposes and implications
 - Targeted advertising
 - Price discrimination [4]
 - Insurance coverage [5]
 - Credit rating [6]
 - Phishing/identity theft (e.g. Conti Leaks)
 - Political interests (e.g. Cambridge Analytica)



Issue: September 21, 2021

IMF report suggests credit scores could soon be based on web browsing history

Dystopian future.

[4] J. Mikians, L. Gyarmati, V. Erramilli, and N. Laoutaris, "Crowd-assisted search for price discrimination in e-commerce: first results," in Proceedings of the ninth ACM conference on Emerging networking experiments and technologies, ser. CoNEXT '13

[5] The Economist, "Insurance data: Very personal finance," 2012. [Online]. Available: <http://www.economist.com/node/21556263>

[6] Reclaim the Net, [Online] <https://reclaimthenet.org/imf-report-suggests-credit-score-browsing-history>

Tracking methods

- Stateful methods
 - Cookies
 - HTML5 storage [7]
 - Web cache [8], DNS cache [9], Redirect cache [10]
- Stateless methods (fingerprinting)
 - Combine device properties to form a unique identifier
 - Canvas fingerprinting [11]
 - Audio fingerprinting [12]
 - 3D rendering fingerprinting [13]
 - Mouse fingerprinting [14]

[7] G. Acar, C. Eubank, S. Englehardt, M. Juarez, A. Narayanan, and C. Diaz, "The Web Never Forgets: Persistent Tracking Mechanisms in the Wild," in ACM CCS, 2014.

[8] G. Fleischer, "Implementing Web Tracking," Proc. Black Hat USA Conf. Briefings, pp. 1–37, Jul. 2002.

[9] A. Klein and B. Pinkas, "DNS Cache-Based User Tracking." [Online]. Available: <https://www.ndss-symposium.org/ndss-paper/dns-cache-based-user-tracking/>

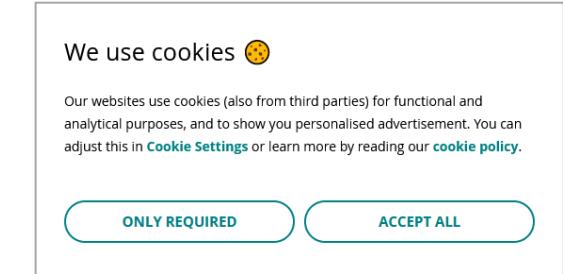
[10] E. Bursztein, "Tracking users that block cookies with a http redirect," Jul. 2011.

[11] K. Mowery and H. Shacham, "Pixel Perfect : Fingerprinting Canvas in HTML 5," in Proceedings of Web 2.0 Security and Privacy (W2SP), 2012

[12] S. Englehardt and A. Narayanan, "Online Tracking: A 1-million-site Measurement and Analysis," in ACM CCS, 2016

[13] Y. Cao, S. Li, and E. Wijmans, "(Cross-)Browser Fingerprinting via OS and Hardware Level Features," NDSS Symposium, 2017

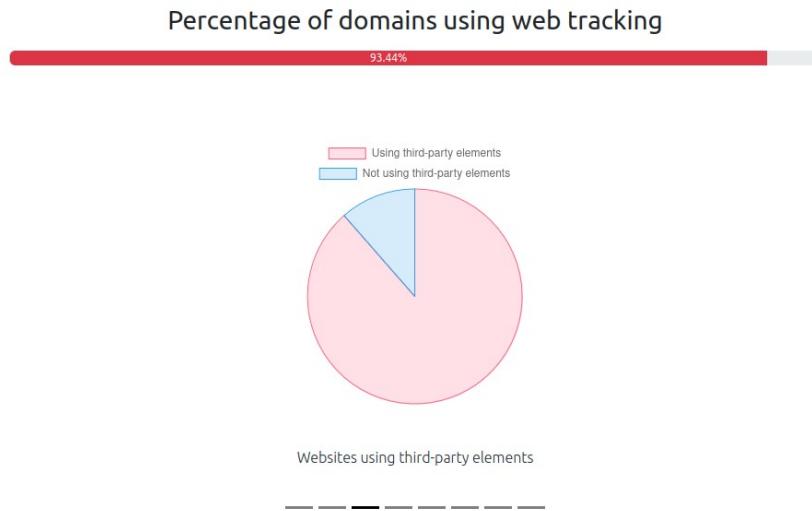
[14] M. Urpí, I. Castell and P. Barlet. "Detecting and Analyzing Mouse Tracking in the Wild," IEEE EuroS&PW, 2023



	Device Fingerprinting	OS Fingerprinting	Browser Fingerprinting
IP Address	✓		
Geolocation	✓		
OS version	✓	✓	
Screen resolution	✓	✓	
Timezone	✓		
Fonts	✓		✓
Browser version	✓		✓
Browser language	✓		✓
Multitouch capabilities	✓		
Pointer capabilities	✓		
Keyboard layout	✓		
Microphone	✓		
Camera	✓		
TCP timestamp	✓		
OS architecture			✓
System language		✓	
Color depth		✓	
Audio capabilities	✓		
CPU brand	✓		
GPU brand	✓		
System drivers	✓		
Browser instance			✓
Browser plugins			✓
Accepted media formats			✓
Cookies enabled			✓
Supercookies limitations			✓

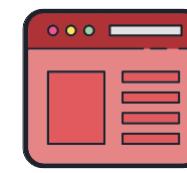
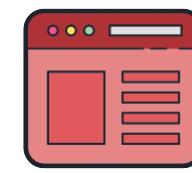
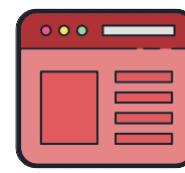
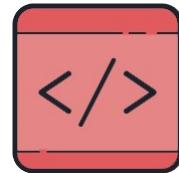
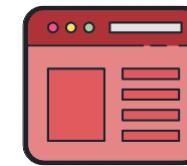
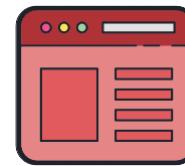
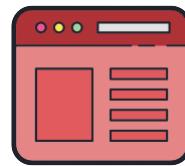
Web tracking

- Third-party trackers are present in >90% of the websites
- They can track us even if we delete cookies, use private mode, VPN, etc.



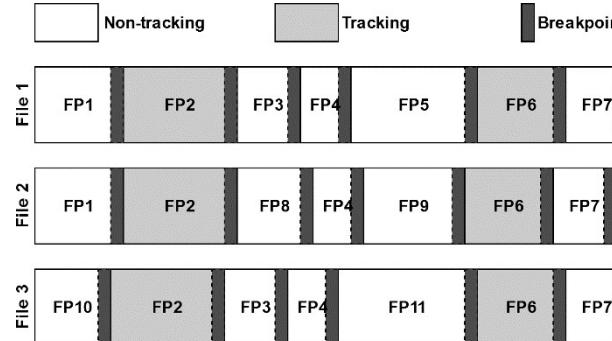
Research: Web tracking detection

- Automatic web tracking discovery

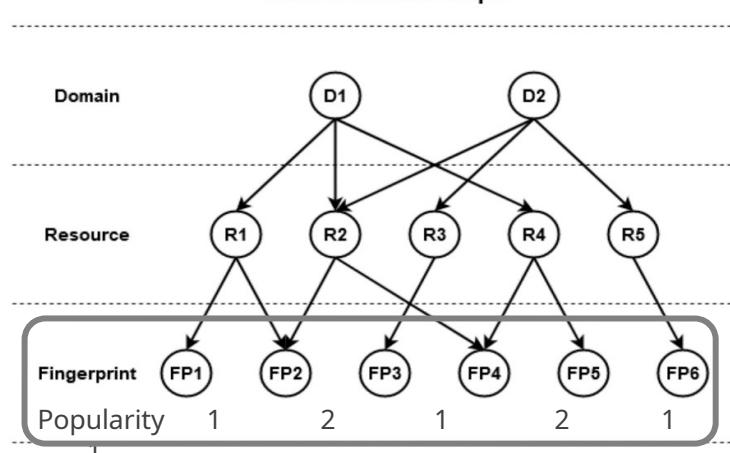


TrackSign & ASTrack

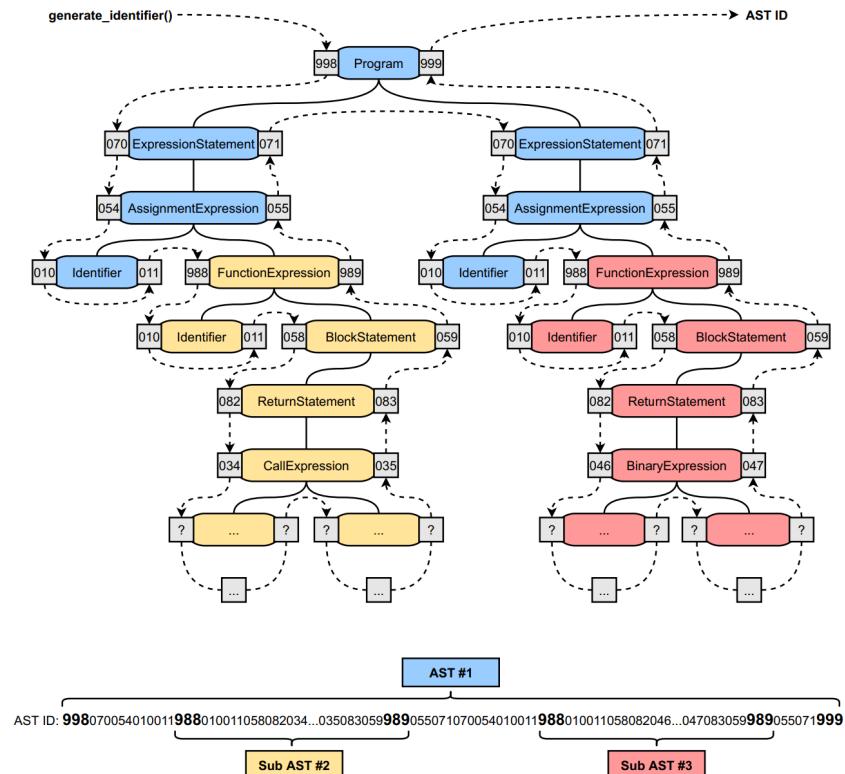
- TrackSign



3-Mode Website Graph

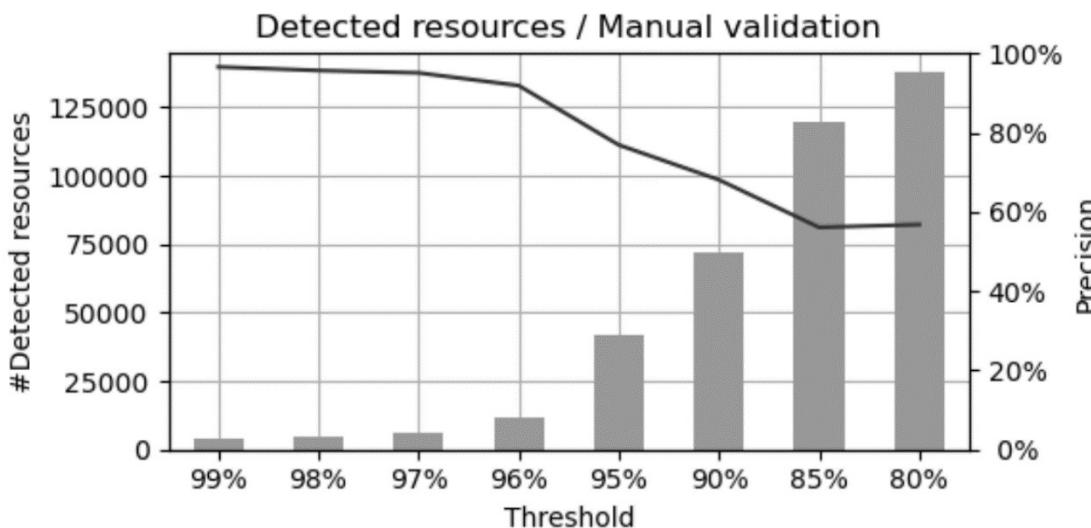


- ASTRack



Evaluation

- TrackSign



- ASTrack

	Static evaluation	Dynamic evaluation
Domains	8,179	
URLs	615,780	
JavaScript URLs	161,593	
Tracking URLs	41,274	
Unique ASTs	7,015,542	
Shared ASTs	2,683,586	
New tracking URLs	3,409	2,183
New tracking JavaScript files	3,109	2,093
Tracking ASTs	49,453	41,114
Precision	98.52%	98.47%

<https://eprivo.eu>

ePrivo Search History trackers Research About



Welcome to ePrivo Observatory

Search a domain to analyze with ePrivo

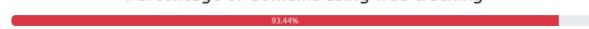
ePrivo is a tool designed to explore the privacy-friendliness of any given website. ePrivo explores all the internal URLs and resources, looking for web tracking systems running in the background. The detection is based in a state-of-the-art algorithm called TrackSign which is able to heuristically detect web tracking code inside JavaScript and HTML files.

Introduce a domain...

Why is data privacy important?

Data privacy is crucial to protect individuals' personal information and prevent it from being misused. With the increasing amount of personal data being collected and shared online, it's essential to ensure that this information is kept secure and only used for its intended purposes.

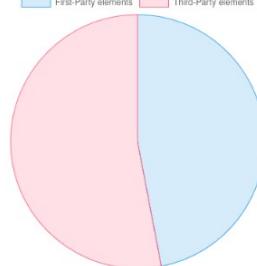
Percentage of domains using web tracking



Website	Percentage
Google LLC	1,000,000
Amazon Technologies Inc.	200,000
Meta Platforms Inc.	150,000
Facebook Inc.	150,000
YANDEX LLC	100,000
Adobe Inc.	50,000
Twitter Inc.	50,000
Microsoft Corporation	50,000
New Relic Inc.	50,000
Huawei Ltd.	50,000
Pinterest Inc.	50,000
Alibaba Holdings Ltd.	50,000
Huawei Corp INC.	50,000
LinkedIn Corporation	50,000
Quantcast Corporation	50,000

< >

First-Party vs Third-Party



First-Party elements
Third-Party elements

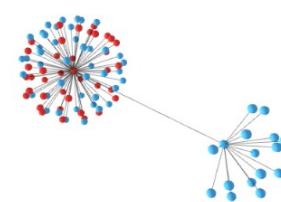
Website tracking



Session cookies
Long living cookies
Very long living cookies
Javascript cookies
Third party cookies
Font fingerprinting
Canvas fingerprinting big
Mouse fingerprinting
Webf fingerprinting
Other tracking

Domain info

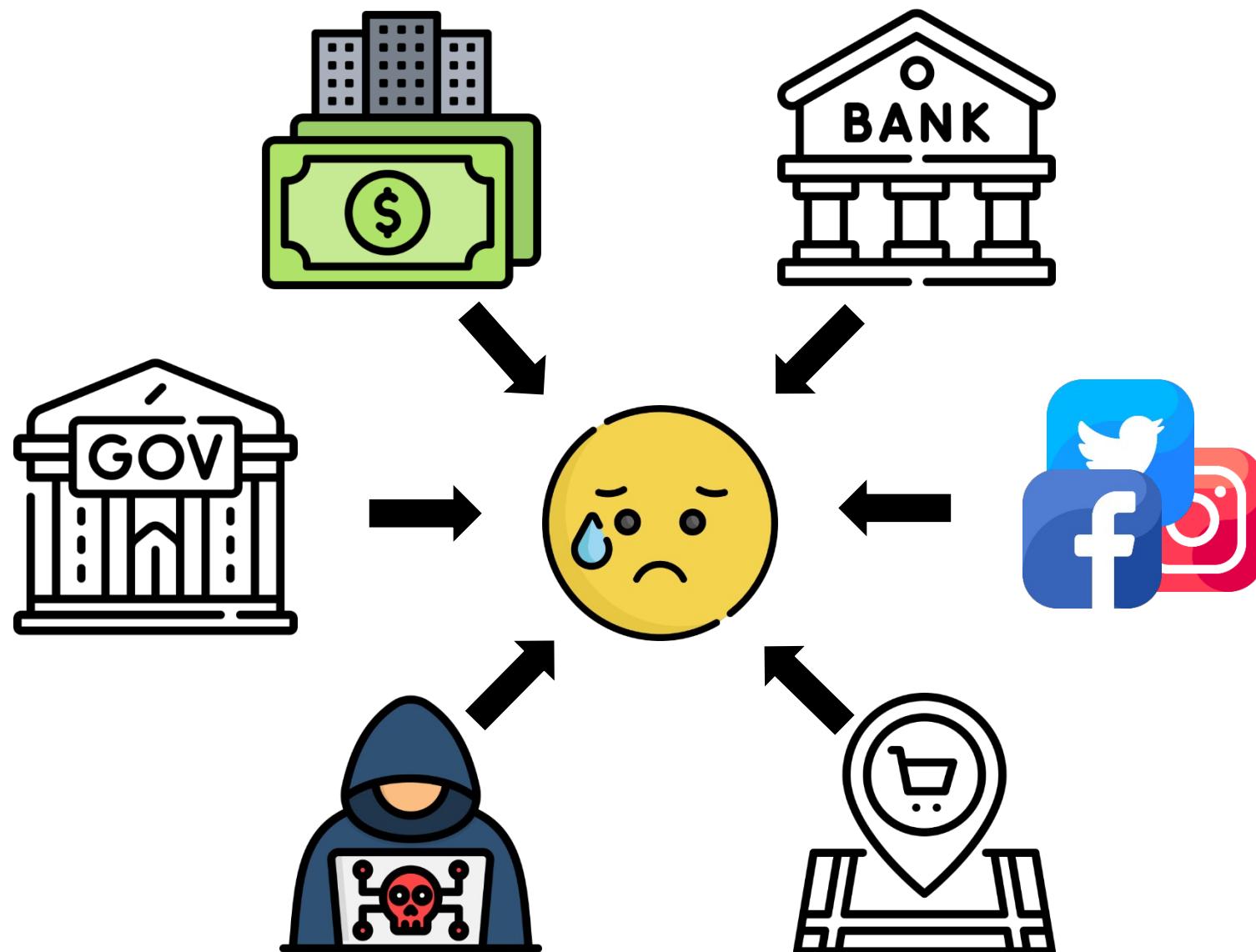
Domain name	elpais.com
Elements	100
Intrusion level	100%
First-Party elements	47
Third-Party elements	53



Left-click: rotate, Mouse-wheel/middle-click: zoom, Right-click: pan

● Not-Tracking ● Tracking

Privacy vs. Profit



Privacy regulations

	GDPR	CCPA	PIPL
Year	2018	2020	2021
Under protection	People living in Europe	People born in California	People living in China
Target	For-profit and non-profit national or private	For-profit companies (with conditions)	For-profit and non-profit national or private
Area of effect	World	State of California	World
Restricted collection scenarios	Yes (6)	No	Yes (7)
Required consent	Yes	No	Yes
Forces service without consent	Yes	No	Yes
Opt-out available	Yes	Partially (data selling processes)	Yes
Access right	Yes	Yes	Yes
Amendment right	Yes	Yes	Yes
Deletion right	Yes	Partially	Yes
Right to be forgotten	Yes	No	Yes
Exemptions for national agencies	No	Yes	Yes
Limits data retention	Yes	No	Yes
Policies on automated algorithms	Yes	No	Yes

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Based on a survey of 1,000 U.S. adults.

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+Desarrollo y mejora de los servicios

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Rechazar Aceptar

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+Sobre el almacenamiento de sus elecciones

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PRIVACY MANAGEMENT
BY DIDOMI

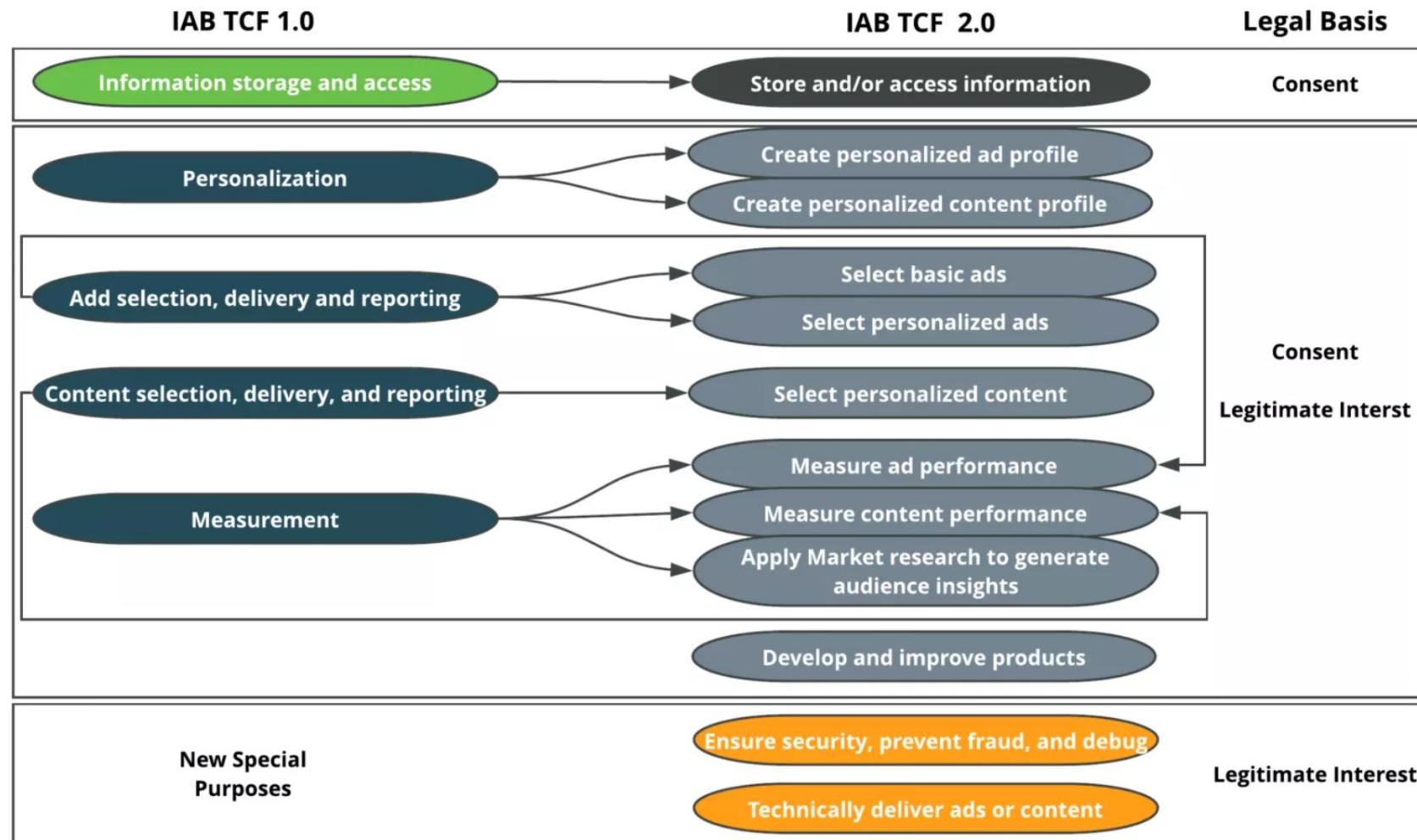
Rechazar todo Aceptar todo

CMP Standardization

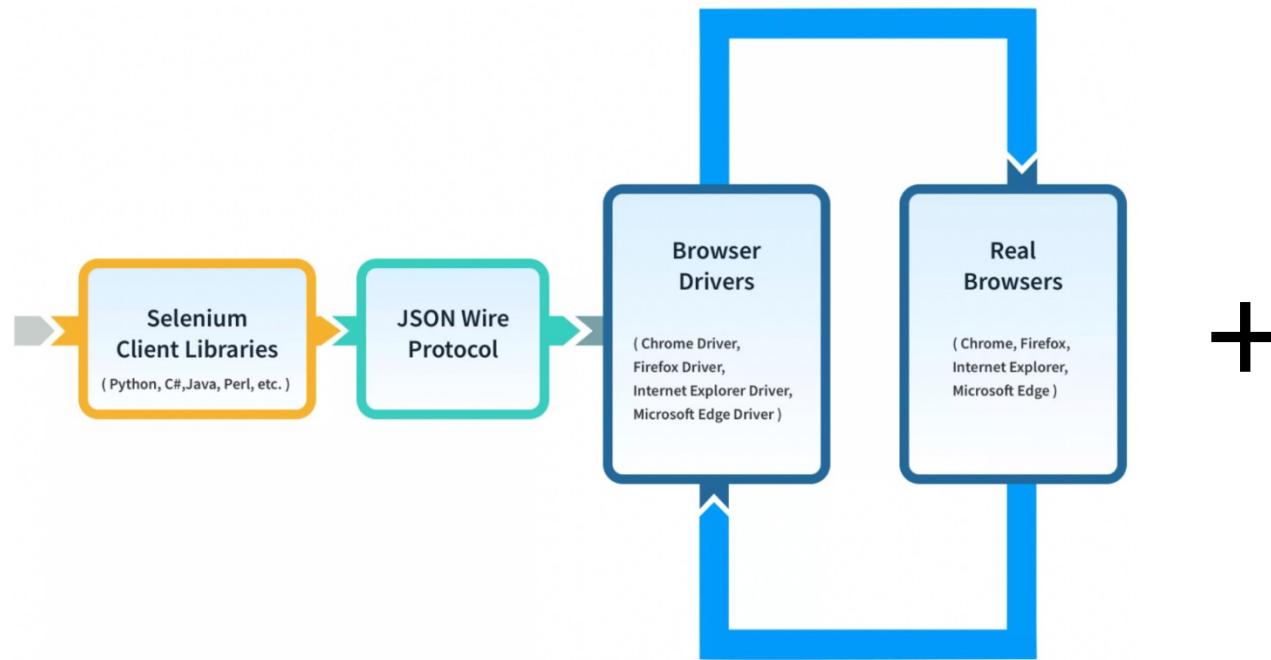


interactive
advertising
bureau

Transparency and Consent Framework

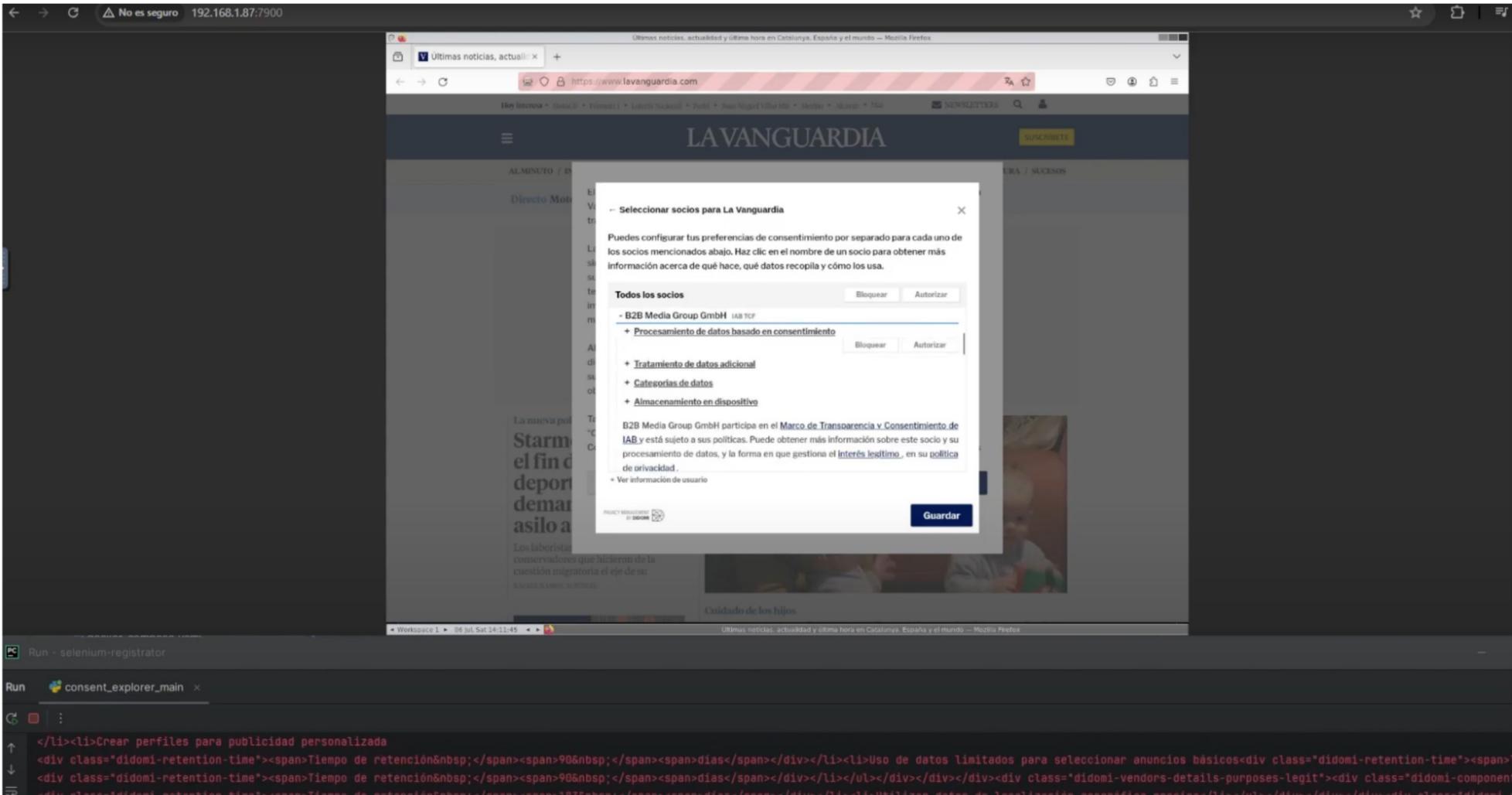


CMP Explorer



XPath expression	Search result
<code>//div[@id='lw-banner']</code>	A div element whose id attribute is equal to 'lw-banner'
<code>//iframe</code>	Any iframe
<code>//li/button/div/*</code>	Any element preceded by a li, button and div elements
<code>//h4[contains(@class, 'consentableItemTitle')]</code>	An h4 element whose class attribute contains the text 'consentableItemTitle'
<code>//div[@class='cmpTitle']</code>	A div with a class named 'cmpTitle'

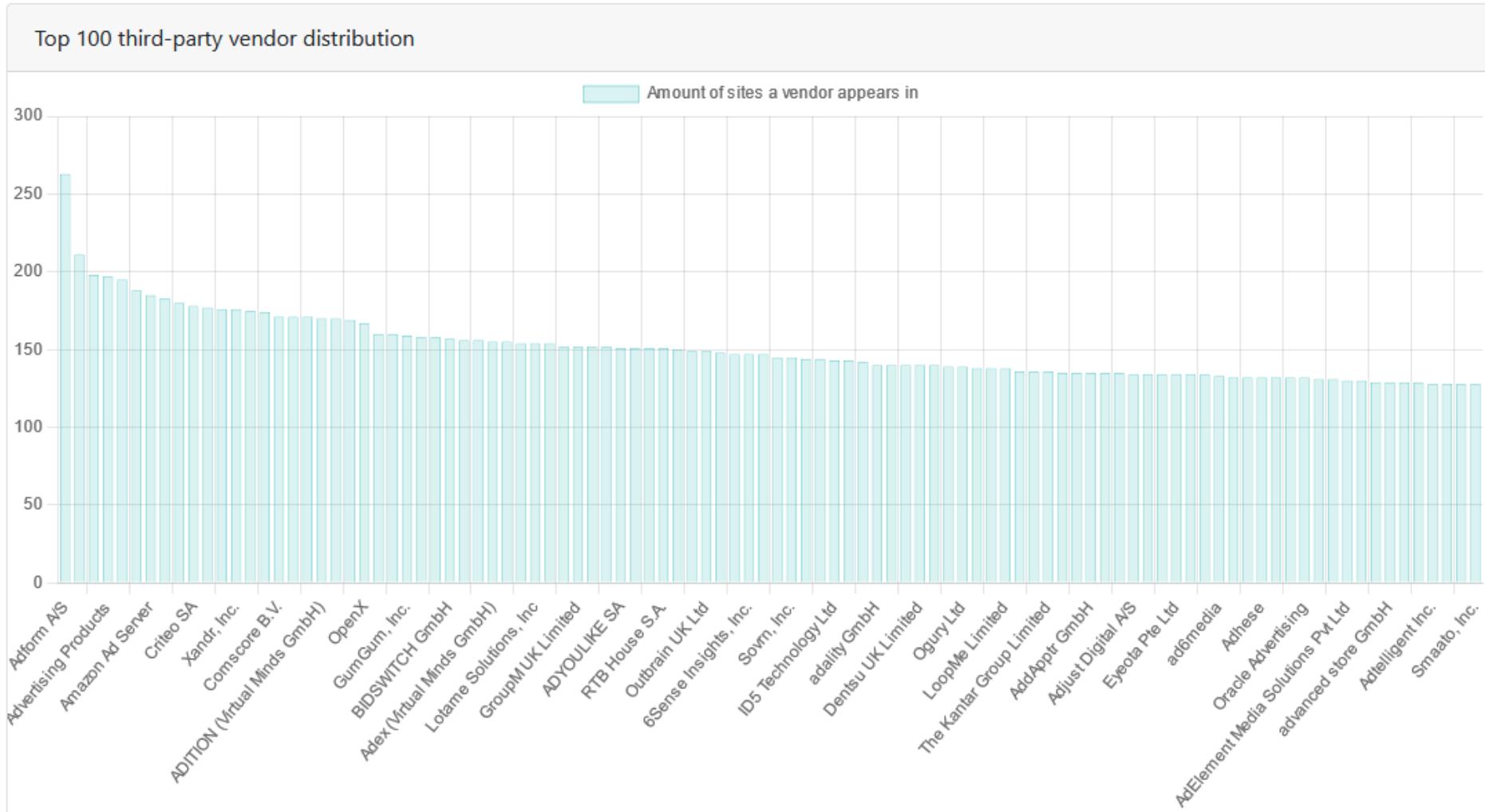
CMP Explorer



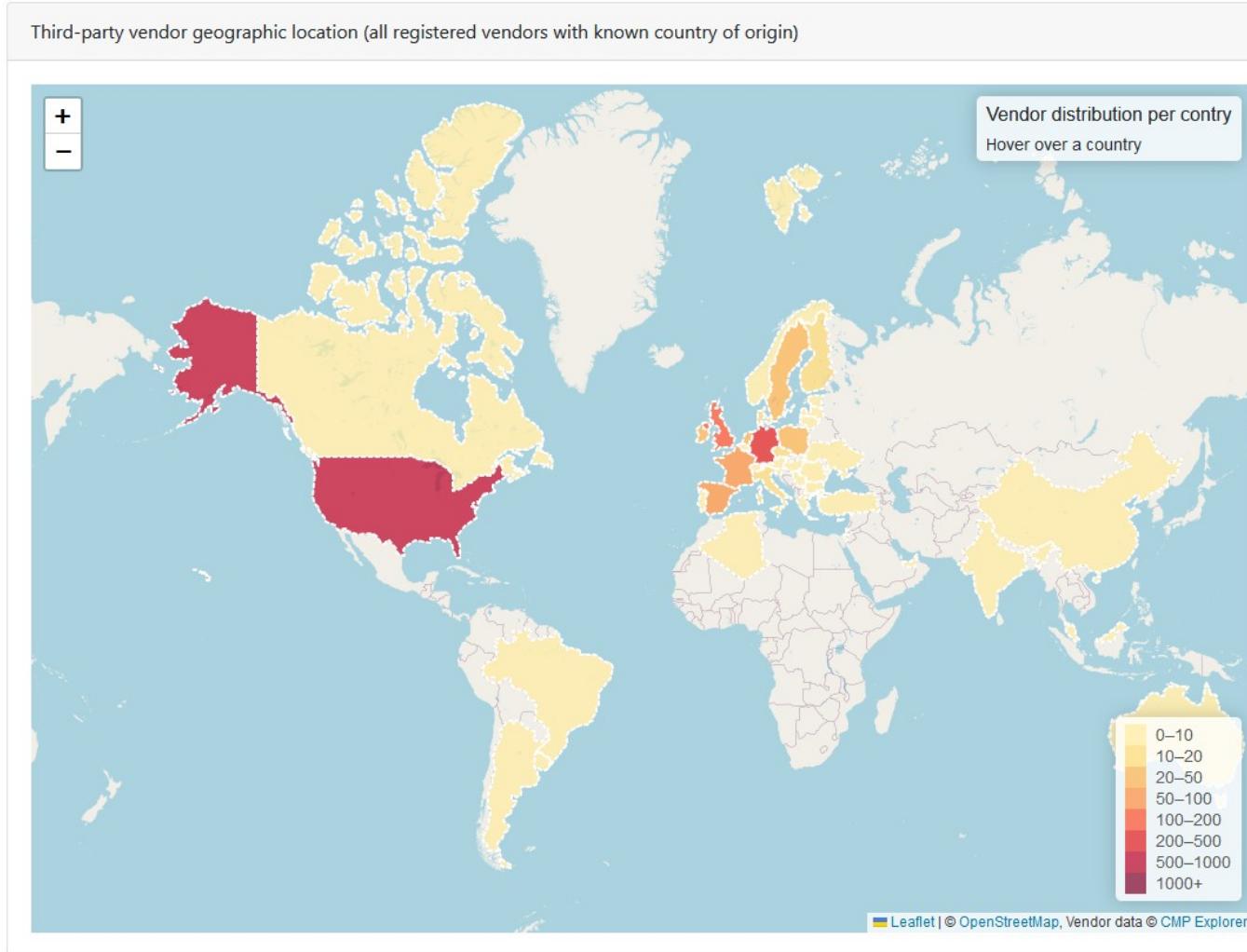
CMP Explorer

- Validation:
 - Top 10K most popular webs
 - 55 Supported CMPs
 - 1762 scraped sites compliant with GDPR as per iab (400 completely scraped)
- Results
 - 4703 vendors found
 - 1536 vendors with known country of origin
 - Approximately 310 vendors per site

CMP Explorer: Top third-parties

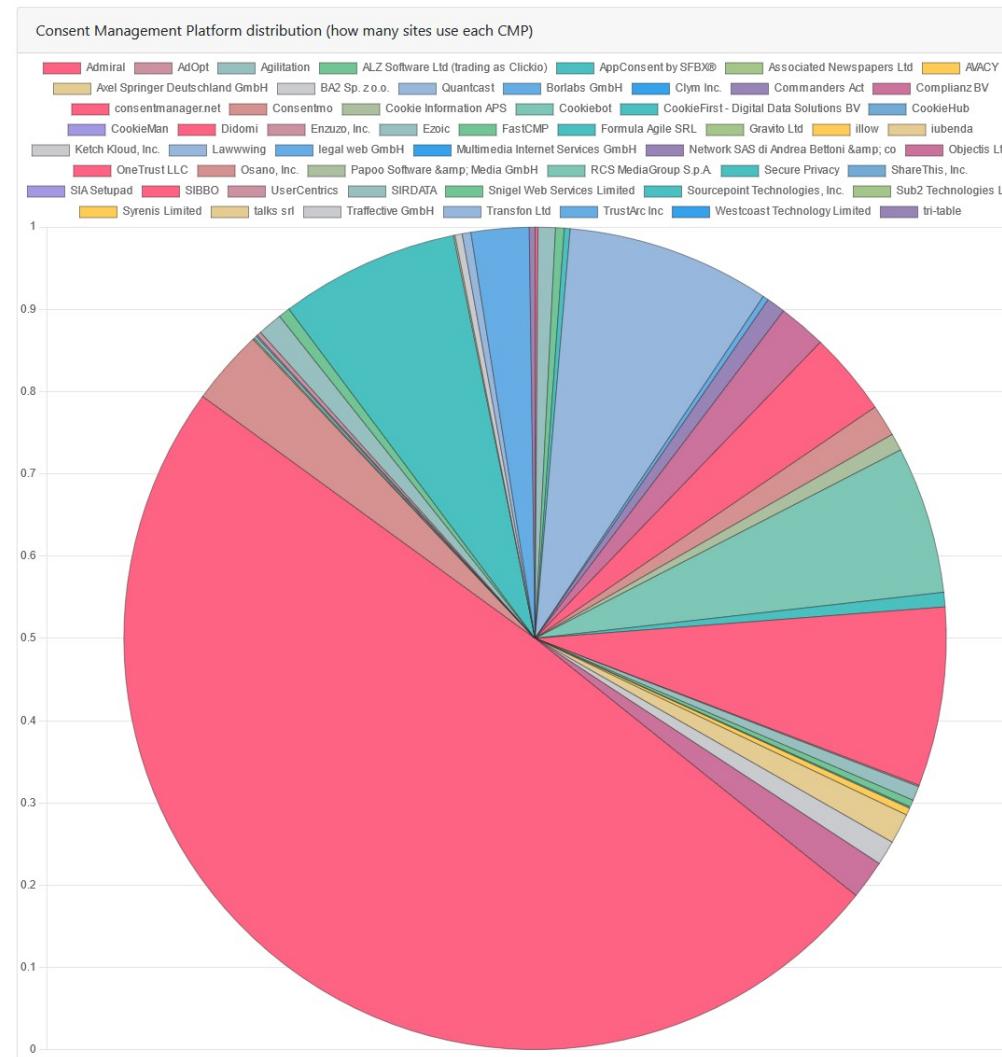


CMP Explorer: Geographic location

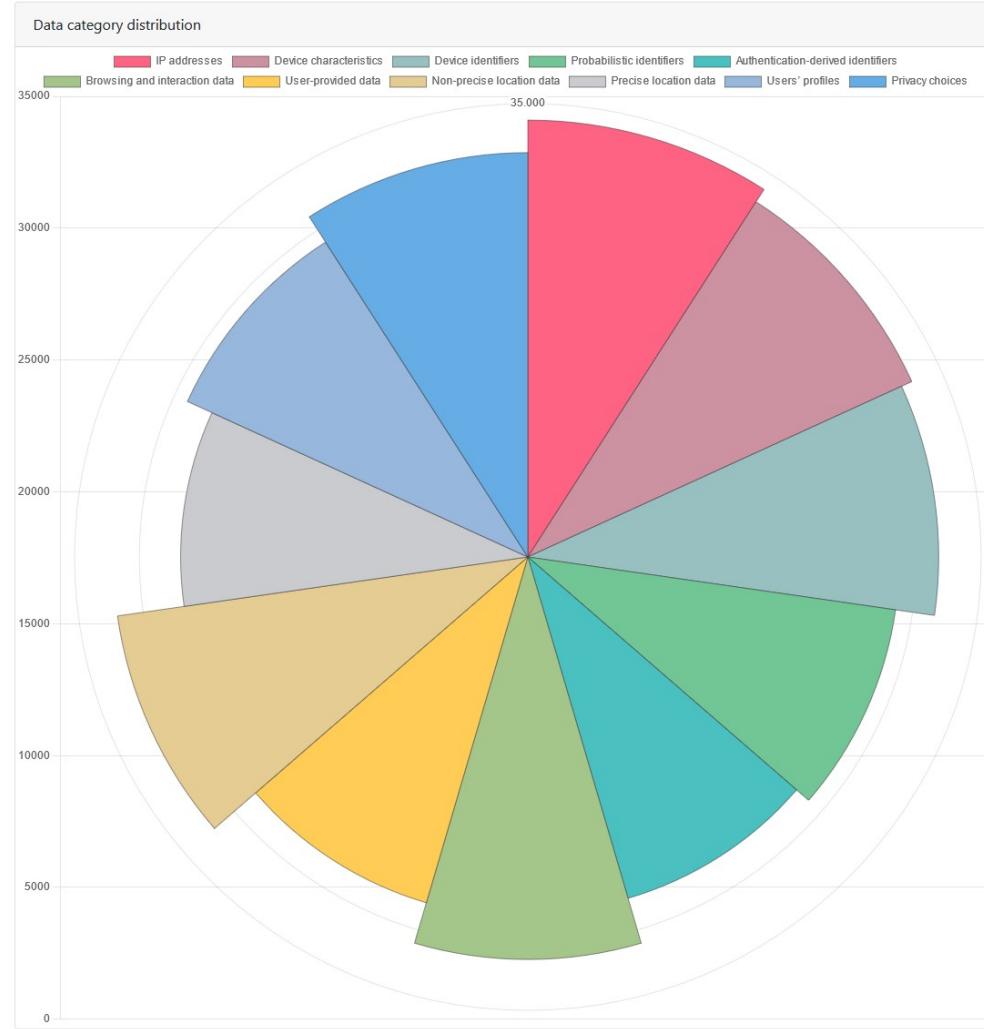


Country	Amount of third-party vendors
United States of America	523
Germany	393
United Kingdom	185
France	94
Spain	70
Netherlands	43
Poland	30
Ireland	24
Sweden	23
Finland	17

CMP Explorer: CMP distribution



CMP Explorer: Data distribution



CMP Explorer: Website statistics

Results for [lavanguardia.com](#)

CMP used	Third-party vendors	Purposes leveraged	Collected data
Didomi	943 vendors	15 purposes	11 types

List of employed purposes

- Store and/or access information on a device.
- Use limited data to select advertising.
- Create profiles for personalised advertising.
- Use profiles to select personalised advertising.
- Create profiles to personalise content.
- Use profiles to select personalised content.
- Measure advertising performance.
- Measure content performance.
- Understand audiences through statistics or combinations of data from different sources.
- Develop and improve services.
- Use limited data to select content.
- Ensure security, prevent and detect fraud, and fix errors.
- Deliver and present advertising and content.
- Ensure security, prevent and detect fraud, and fix errors.
- Deliver and present advertising and content.

Quick thought: Out of 401 sites registered, for the page you have searched ([lavanguardia.com](#)), the third party vendor named '**Adform A/S**' is the one that appears in most sites. It is present in 263 sites, roughly a **66%** of the registered sites.

And what does this mean?
This vendor could potentially know at least a **66%** of your browsing history (you would have to visit the other sites where the vendor is present, but you get the idea).

List of vendors
(marked as [Low presence](#) / [Medium presence](#) / [High presence](#))

152 Media LLC IAB TCF in 131 more sites	1plusX AGI AB TCF in 32 more sites	2KDirect, Inc. (dba iPromote) IAB TCF in 32 more sites
33Across IAB TCF in 33 more sites : Tappx IAB TCF in 34 more sites	3Q GmbH IAB TCF in 28 more sites	6Sense Insights, Inc. IAB TCF in 32 more sites
AA INTERNET-MEDIA Ltd IAB TCF in 27 more sites	A Million Ads IAB TCF in 32 more sites	A.MobIAB TCF in 33 more sites
Accengage in 0 more sites	Aarki, Inc. IAB TCF in 32 more sites	ABCs INSIGHTS IAB TCF in 21 more sites
Accurat IAB TCF in 22 more sites	Accorp Sp. z o.o. IAB TCF in 28 more sites	AccountInsight Ltd IAB TCF in 26 more sites
AcuityAds Inc IAB TCF in 23 more sites	Active Agent (Virtual Minds GmbH) IAB TCF in 31 more sites	ACTV8, Inc. IAB TCF in 27 more sites
Ad Alliance GmbH IAB TCF in 33 more sites	Ad.com Interactive Media, Inc IAB TCF	Ad.com Interactive Media, Inc IAB TCF



Conclusions

- Summary
 - CMP Explorer can help to collect web privacy information by looking at CMPs
 - It discovers hidden data brokers collecting data in multiple non-related websites (browsing history trackers)
- Future work
 - Improve data collection to detect not only iab-compliant CMPs
 - Integrate into browser plugin
- What do we need?
 - It has proven very hard to find funding for this project...
 - We could only develop it as a side project ☺



Discovering databrokers

Bringing to light hidden companies

Ismael Castell & Pere Barlet
Universitat Politècnica de Catalunya (UPC)
ESNOG 32 – 25 Oct. 2024

Backup slides

Third-party trackers

NHS data breach: trusts shared patient details with Facebook without consent



The screenshot shows a webpage from Alder Hey Children's NHS Foundation Trust. The header includes the NHS logo, the trust's name, and social media links. The main navigation menu has options like 'Your Stay', 'Our Services' (which is highlighted in green), 'A Healthier Future', 'Our People', and 'Join Us'. Below the menu, there's a large image of a modern building with glass walls. A sub-menu for 'Disorders of Sex Development' is open, showing a definition of DSD and a list of conditions including Androgen insensitivity, Congenital adrenal hyperplasia, Complete/partial/mixed gonadal dysgenesis, Cloaca, Hypospadias, and MRKH. To the right of the sub-menu is a cartoon illustration of a child with various thought bubbles containing icons related to health and gender.

A page about sexual development disorders on Alder Hey Children's Hospital's website, which shared details of the browsing with Facebook via the Meta Pixel.

Observer investigation reveals Meta Pixel tool passed on private details of web browsing on medical sites

NHS trusts are sharing intimate details about patients' medical conditions, appointments and treatments with [Facebook](#) without consent and despite promising never to do so.

An *Observer* investigation has uncovered a covert tracking tool in the websites of 20 [NHS](#) trusts which has for years collected browsing information and shared it with the tech giant in a major breach of privacy.

The data includes granular details of pages viewed, buttons clicked and keywords searched. It is matched to the user's IP address - an identifier linked to an individual or household - and in many cases details of their Facebook account.

Information extracted by [Meta Pixel](#) can be used by Facebook's parent company, Meta, for its own business purposes - including improving its targeted advertising services.

Records of information sent to the firm by NHS websites reveal it includes data which - when linked to an individual - could reveal personal medical details.

It was collected from patients who visited hundreds of NHS webpages about HIV, self-harm, gender identity services, sexual health, cancer, children's treatment and more.

It also includes details of when web users clicked buttons to book an appointment, order a repeat prescription, request a referral or to complete an online counselling course. Millions of patients are potentially affected.

Top third-parties

Company	Sites with presence	Presence rate
Adform A/S	219 sites	64.79%
Adobe Advertising Cloud	175 sites	51.77%
Adobe Audience Manager, Adobe Experience Platform	164 sites	48.52%
Google Advertising Products	159 sites	47.04%
Amazon Advertising	154 sites	45.56%
33Across	149 sites	44.08%
Index Exchange Inc.	147 sites	43.49%
Amazon Ad Server	144 sites	42.6%
Criteo SA	141 sites	41.71%
Magnite, Inc.	141 sites	41.71%

Dependency between CMP and vendors

Site	Consent Management Platform	Amount of third-party vendors
marvel.com	OneTrust LLC	1438
indiewire.com	OneTrust LLC	1438
tvline.com	OneTrust LLC	1438
hunker.com	OneTrust LLC	1438
espnccricinfo.com	OneTrust LLC	1437
investing.com	OneTrust LLC	1437
gameswfu.net	Ezoic	842
euro-muenzen.tv	Ezoic	842
gamesradar.com	Sourcepoint Technologies, Inc.	192
techradar.com	Sourcepoint Technologies, Inc.	192
laptopmag.com	Sourcepoint Technologies, Inc.	192
whathifi.com	Sourcepoint Technologies, Inc.	192

Vendors per most used CMPs

Consent Management Platform	Amount of related third-party vendors
OneTrust LLC	523
Sourcepoint Technologies, Inc.	1255
Didomi	1100
tri-table	849
Ezoic	842
Quantcast	378
Cookiebot	297
SIRDATA	221
Osano, Inc.	216
Traffective GmbH	174

Connection between websites

