



Technologies of Tracking

CYBR 4400 / 5400: Principles of Internet Policy, Lecture 5-2

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Today's Lecture

- ❖ Administrative stuff
- ❖ Technologies of Tracking Lecture
- ❖ Finish GDPR Lecture

Course Syllabus Reminders

- ❖ Appreciate everyone's effort at timely communications!
 - ❖ Also will be very flexible on any assignment due dates, just let me know
 - ❖ Still considering best option for final exam...
- ❖ Key project dates:
 - ❖ Presentations on 4/27 (CYBR 4400), 4/29 & 5/1 (CYBR 5400)
 - ❖ 15 minute presentations (due 4/27 for 4400, 4/29 for 5400)
 - ❖ Distance students - possible to present live on Zoom? Please let me know
 - ❖ Paper due Sunday, 4/26 at midnight

Tracking Technologies



Results of Tracking Study

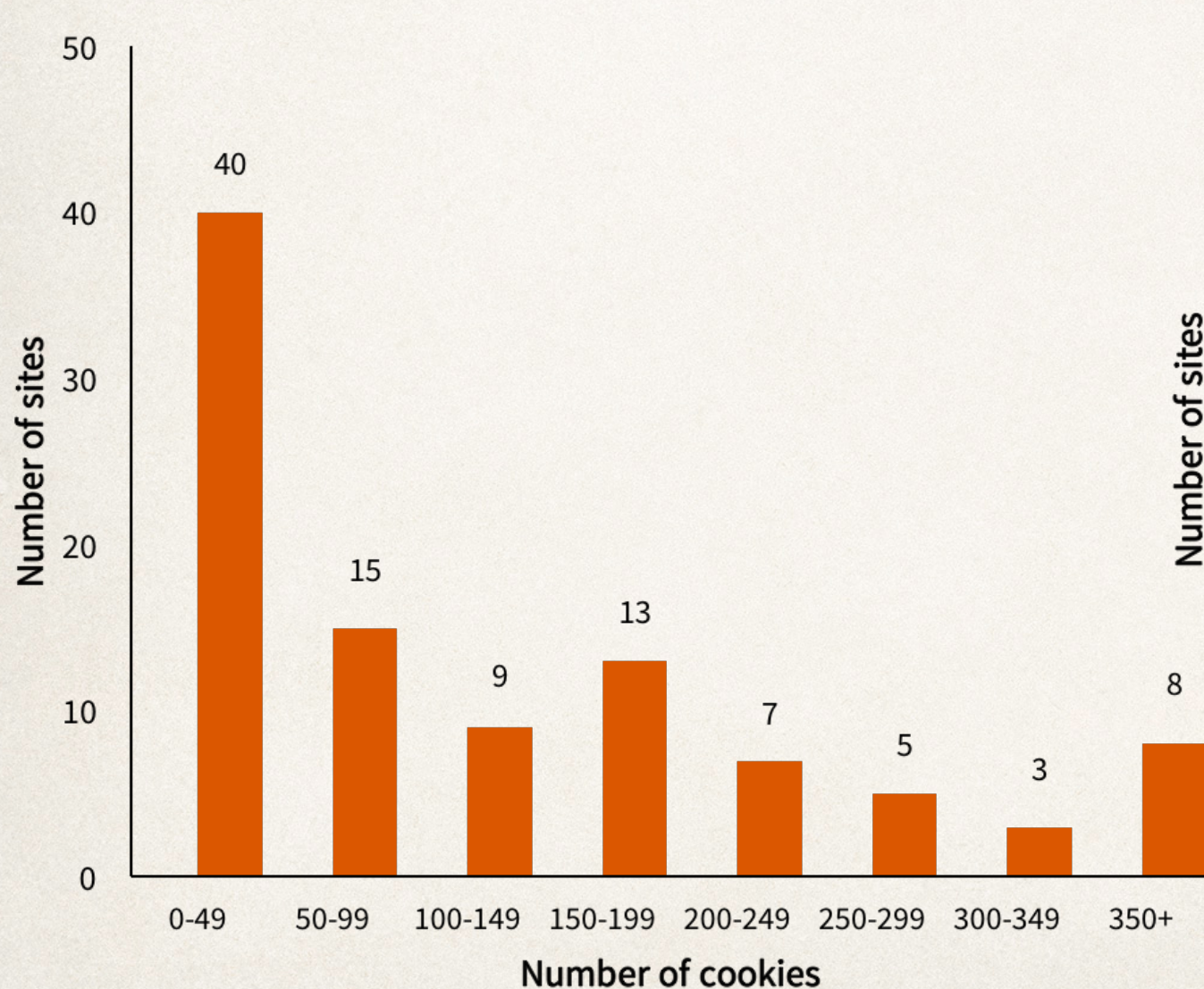
(<https://techscience.org/a/2015121502/>)

Table 1: Key Characteristics of HTTP Cookies, Flash Cookies, and HTML5 Storage

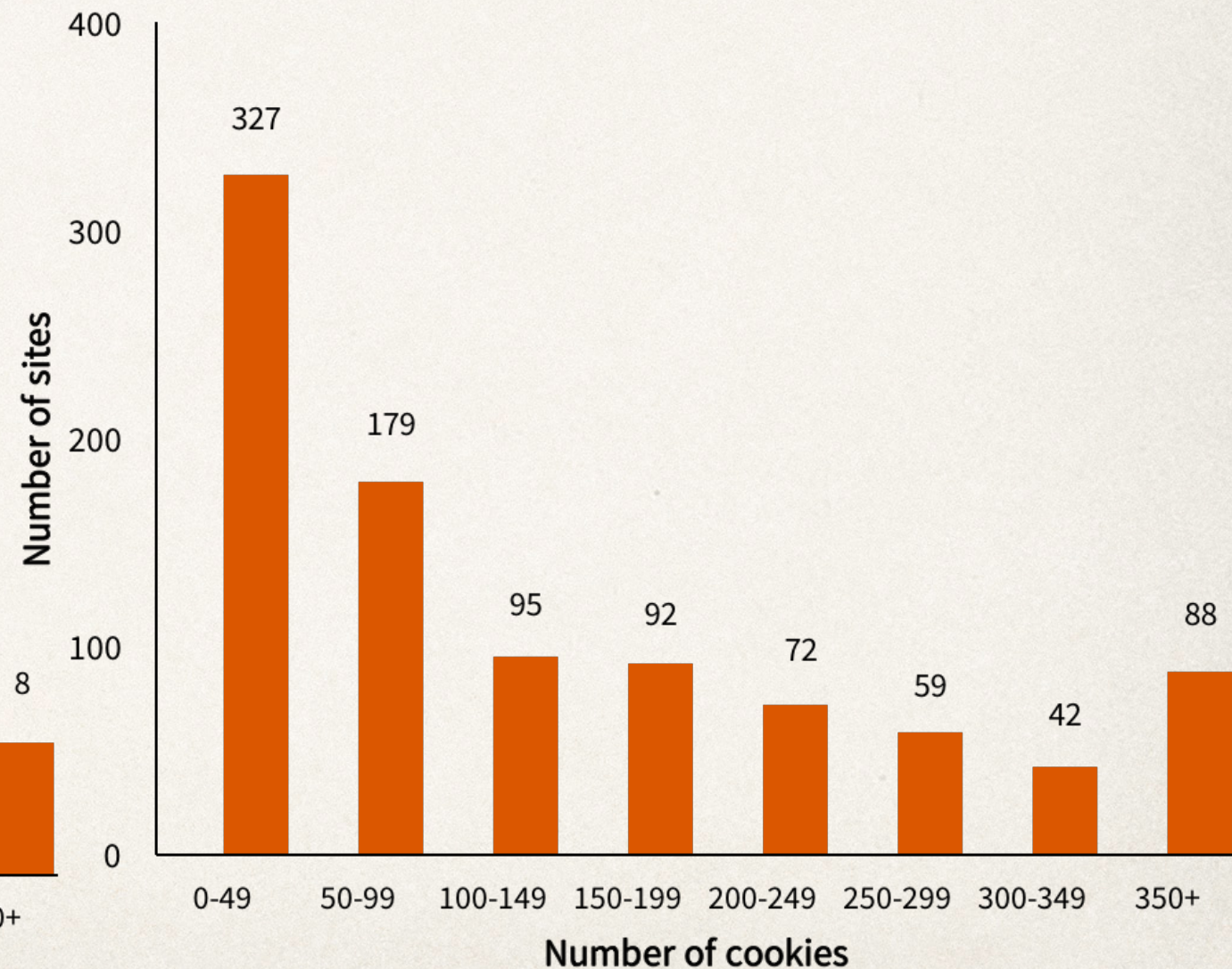
	HTTP Cookies	Flash cookies	HTML5 storage
Storage	4 KB limit	100 KB by default	5 Mb by default
Expiration	Deleted by default when the browser is closed	Permanent by default	Permanent by default
Access	Only by one browser	By multiple browsers on same machine	Only by one browser

Results of 2015 Study* on Tracking

In 2015, detected over 12,857
HTTP Cookies in top 100 Websites



In 2015, detected over 134,769
HTTP Cookies in top 1000 Websites



*Go to [Web Privacy Census](#), published 2015

Results of Tracking Study (cont'd)

(<https://techscience.org/a/2015121502/>)

Crawl Date	October 2012	October 2015	Trend
Do all popular sites have cookies	Yes	Yes	--
Sites with 100 or more cookies	21	45	up
Sites with 150 or more cookies	11	36	up
Percentage of cookies set by a third party host	84.7%	93.5%	up
Number of third party hosts	457	322	down
Number of top websites with a Google presence	74	92	up
Number of sites with flash cookies	11	10	down
Number of sites with html5 storage	38	76	up
Number of sites without third party cookies	5	6	up

Results of Tracking Study (cont'd)

(<https://techscience.org/a/2015121502/>)

Top Trackers

Top Sites	Type	Top 10 Trackers	Number of Sites
100	shallow	quantserve.com	33
		agkn.com	28
		bluekai.com	25
		doubleclick.net	25
		rubiconproject.com	24
		rlcdn.com	24
		advertising.com	23
		google.com	22
		scorecardresearch.com	21
		krxn.net	20
1,000	Shallow	google.com	224
		doubleclick.net	214
		quantserve.com	208
		rlcdn.com	187
		agkn.com	185
		facebook.com	185
		scorecardresearch.com	182
		rubiconproject.com	175
		bluekai.com	169
		pubmatic.com	166

Results of Tracking Study (cont'd)

(<https://techscience.org/a/2015121502/>)

- ❖ Discussion points:

- ❖ Visiting 3 links per site, found Google tracking infrastructure on 92 of top 100 most popular websites, and on 923 of top 1,000 websites
 - ❖ Google's ability to track on popular websites approaches level of surveillance only an ISP can achieve
- ❖ “hundreds of third-party hosts also track users, and under the current self-regulatory regime, it is up to users to investigate these companies' privacy policies and decide whether to use the websites”

Privacy and Tracking in a Post-Cookie World

White Paper Author: Future of the Cookie Working Group of the Internet Ad Bureau (iab)

Industry White Paper Setting

- ❖ Cookie = “fundamental infrastructure component of the Internet”, but there are concerns the “cookie may be crumbling”!
 - ❖ cause excessive Internet traffic
 - ❖ “Internet bloat” (web beacons and pixels that deploy cookies slow down load times)
 - ❖ regulatory threats
 - ❖ anxiety among consumers and publishers

State Management

- ❖ Method and ability for systems to remember information
- ❖ Cookies used to personalize services and remember preferences for future services
- ❖ Consumer attitudes favor personalized content, advertising, and services

Guiding Principles for Consumers

- ❖ Single privacy dashboard or place to view state information
- ❖ Universal privacy view or single place to opt in or out
- ❖ Comprehensive privacy controls across all parties
- ❖ Persistent, universal preferences across all devices
- ❖ Detection of non-compliant actors
- ❖ Free online service