



A Privacy Measure Turned Upside Down?

Investigating the Use of HTTP Client Hints
on the Web

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swiefling.de & H-BRS University of Applied Sciences, Germany (*)

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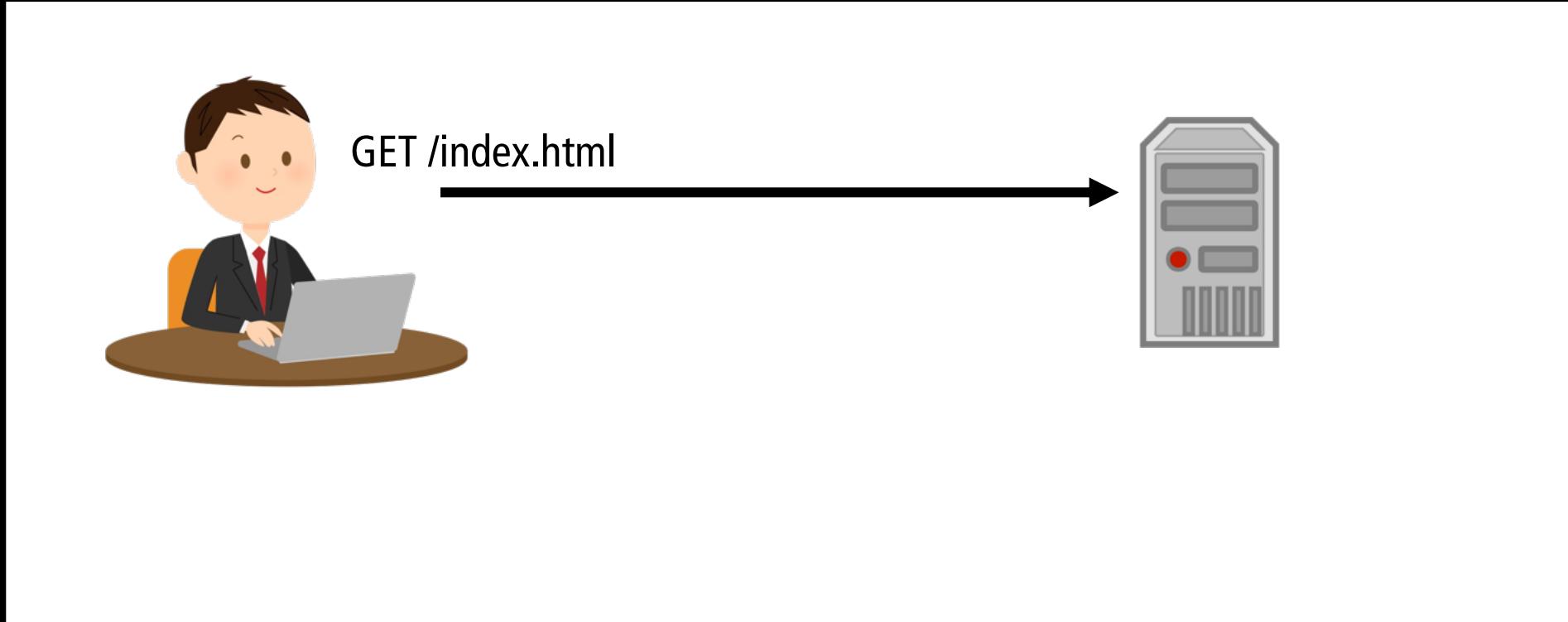


User Agent String



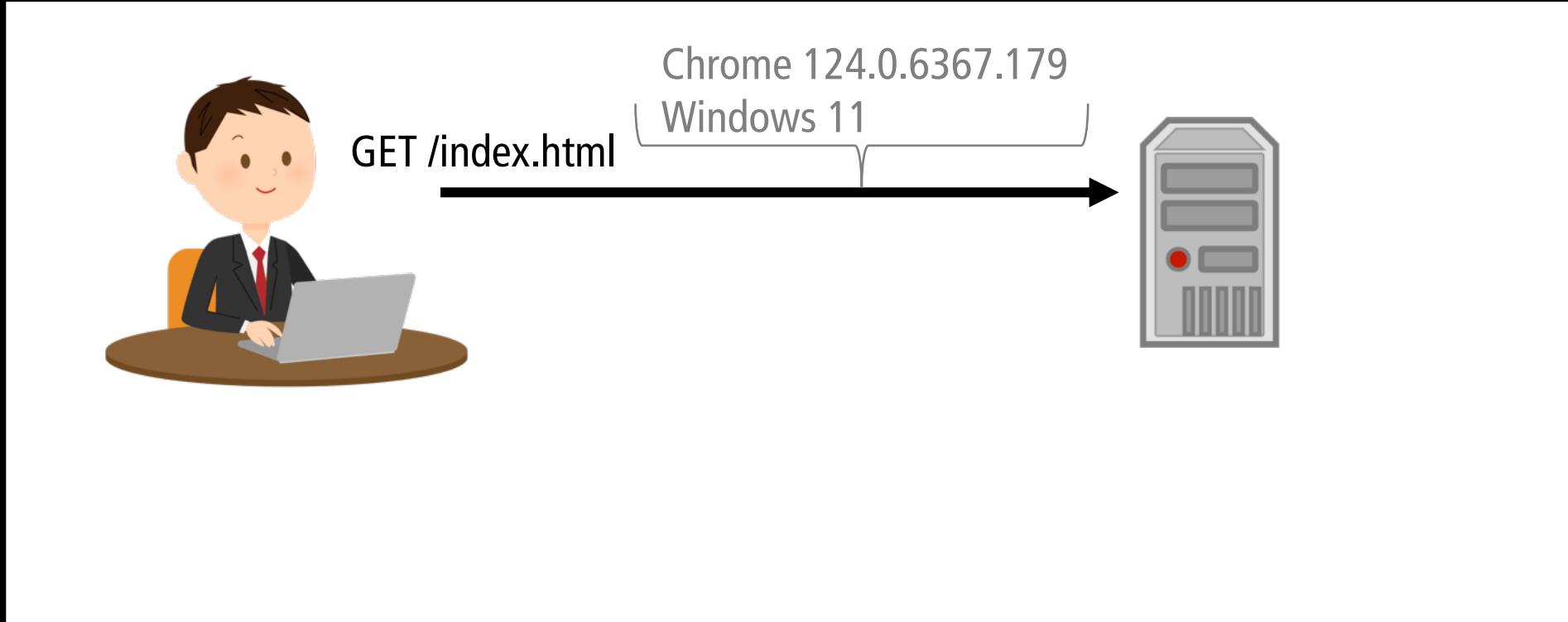
Nielsen et al. 1996. Hypertext Transfer Protocol – HTTP/1.0

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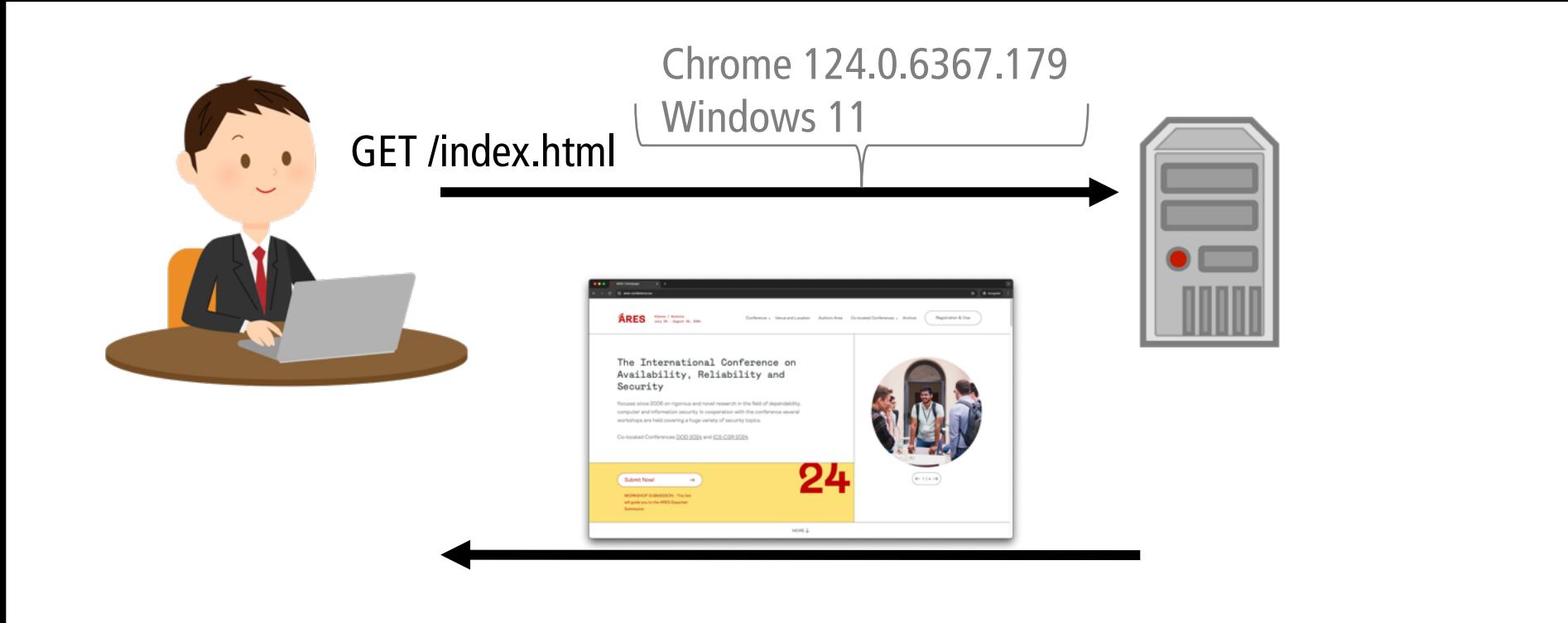
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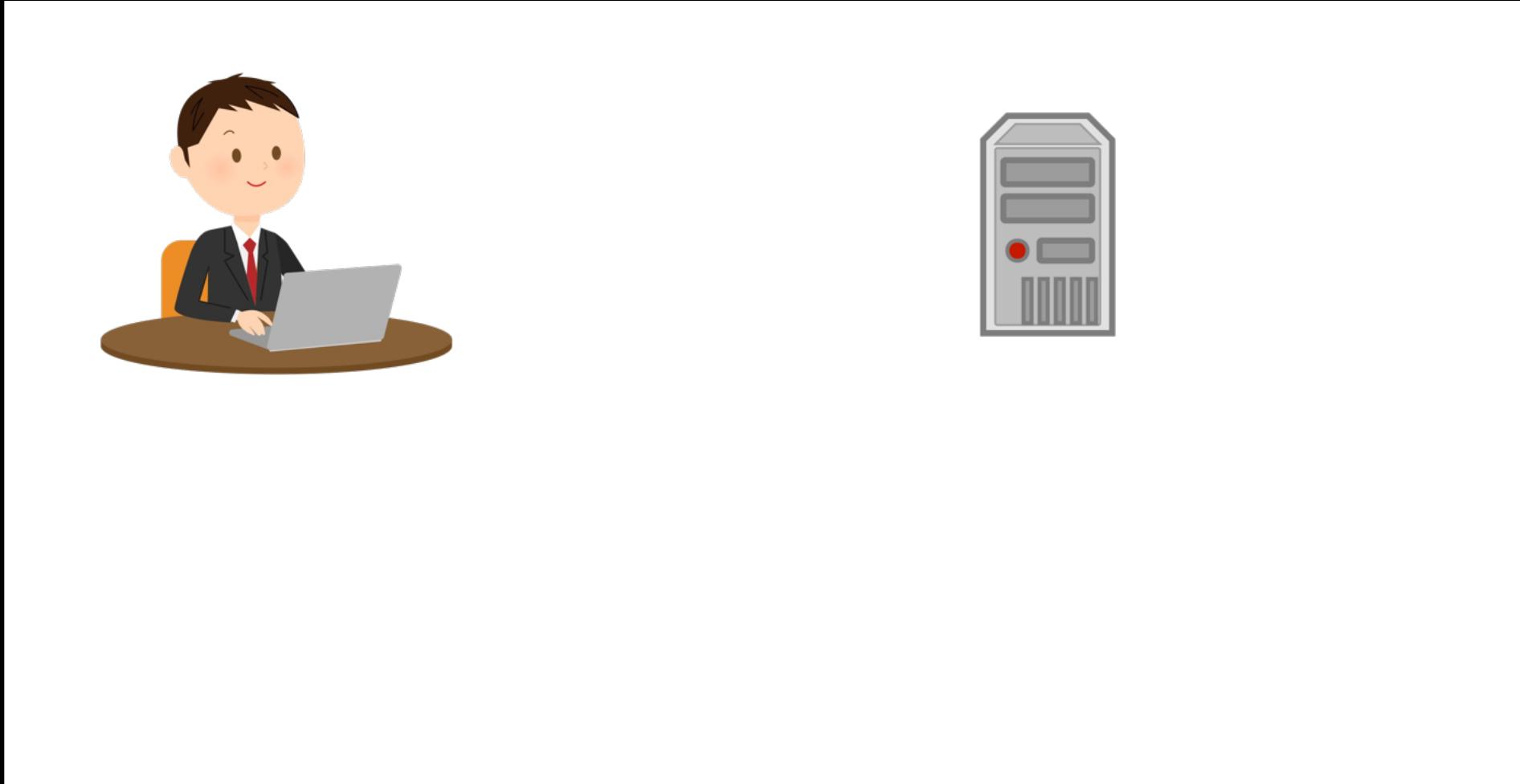
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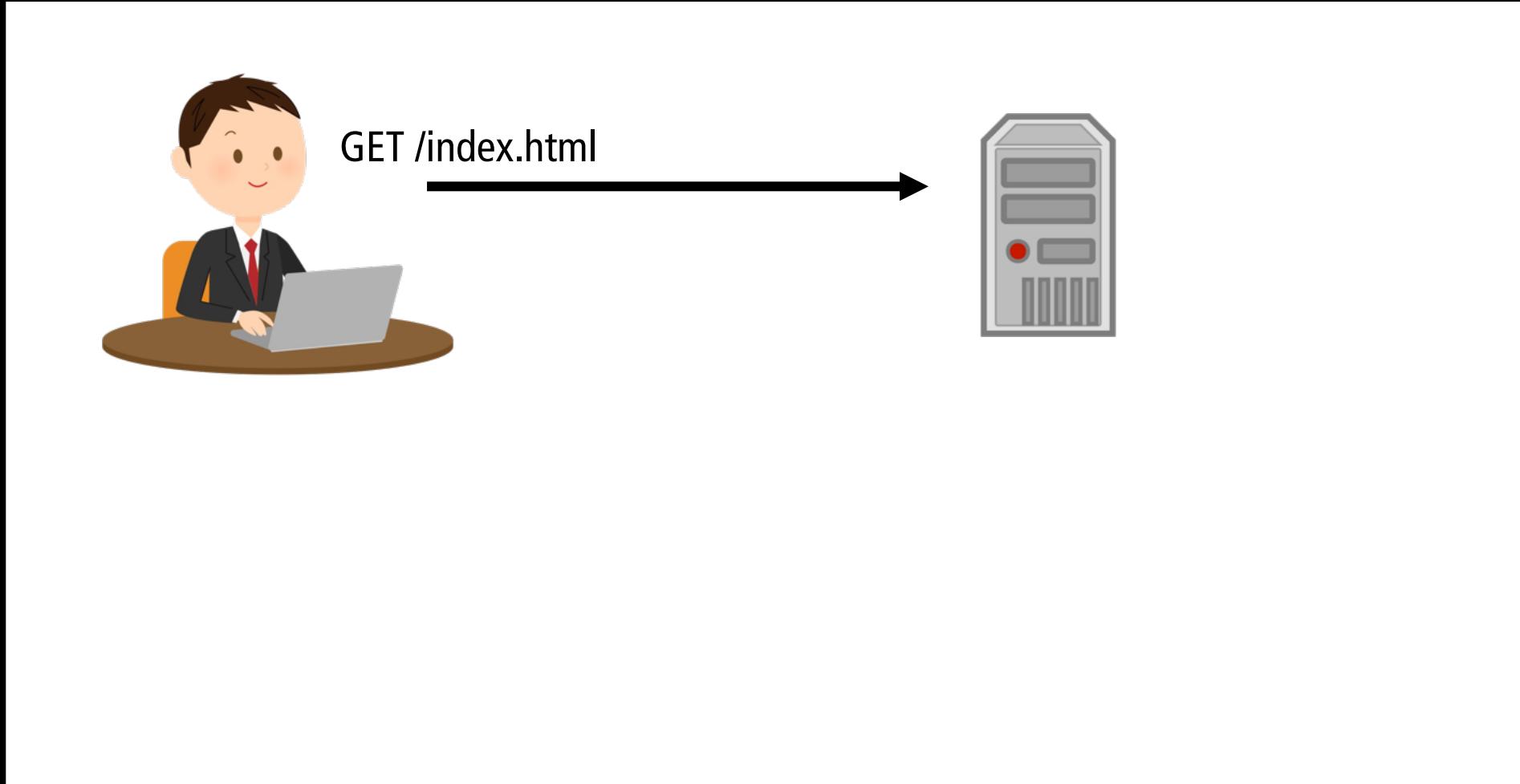
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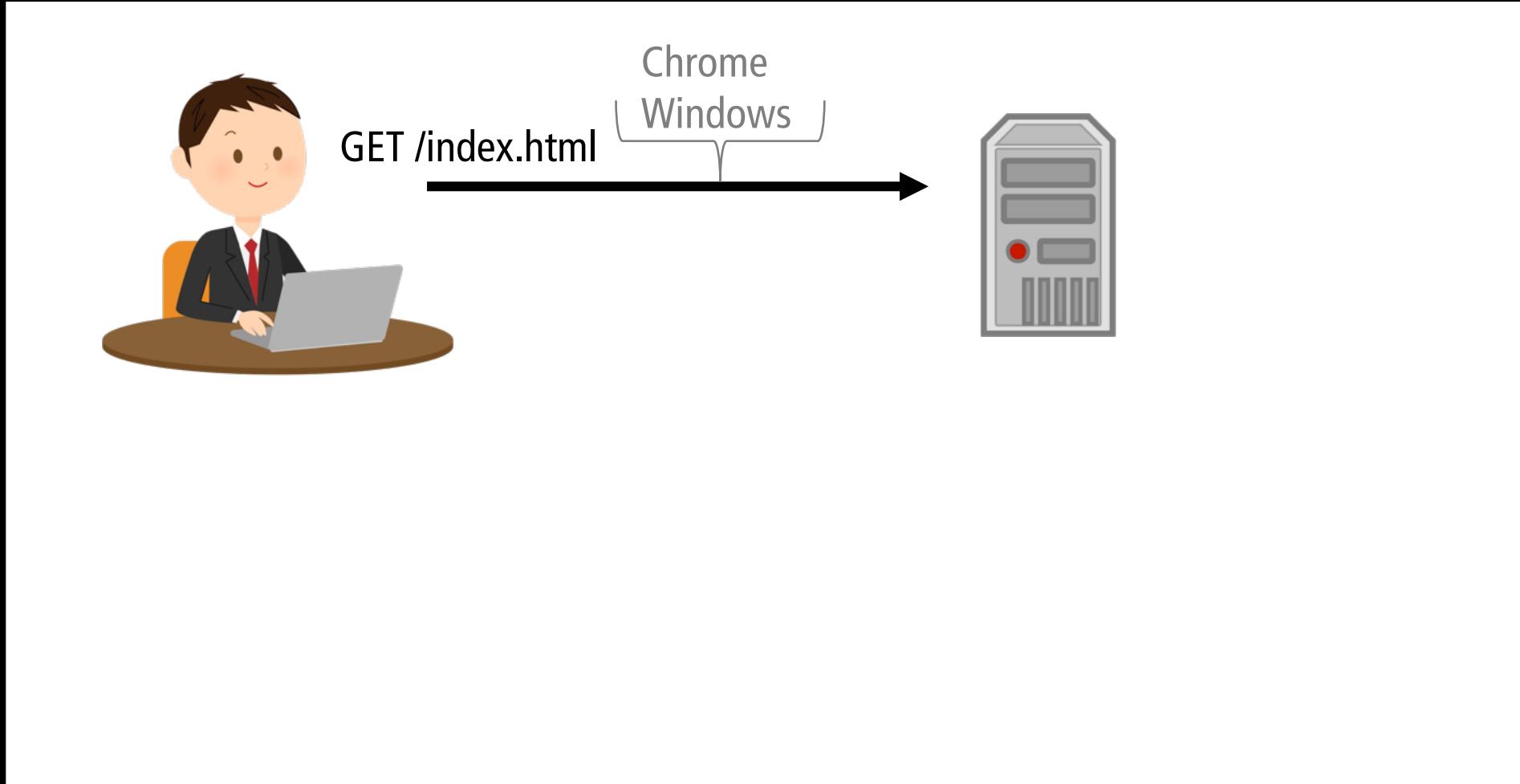
HTTP Client Hints (HTTP CHs)



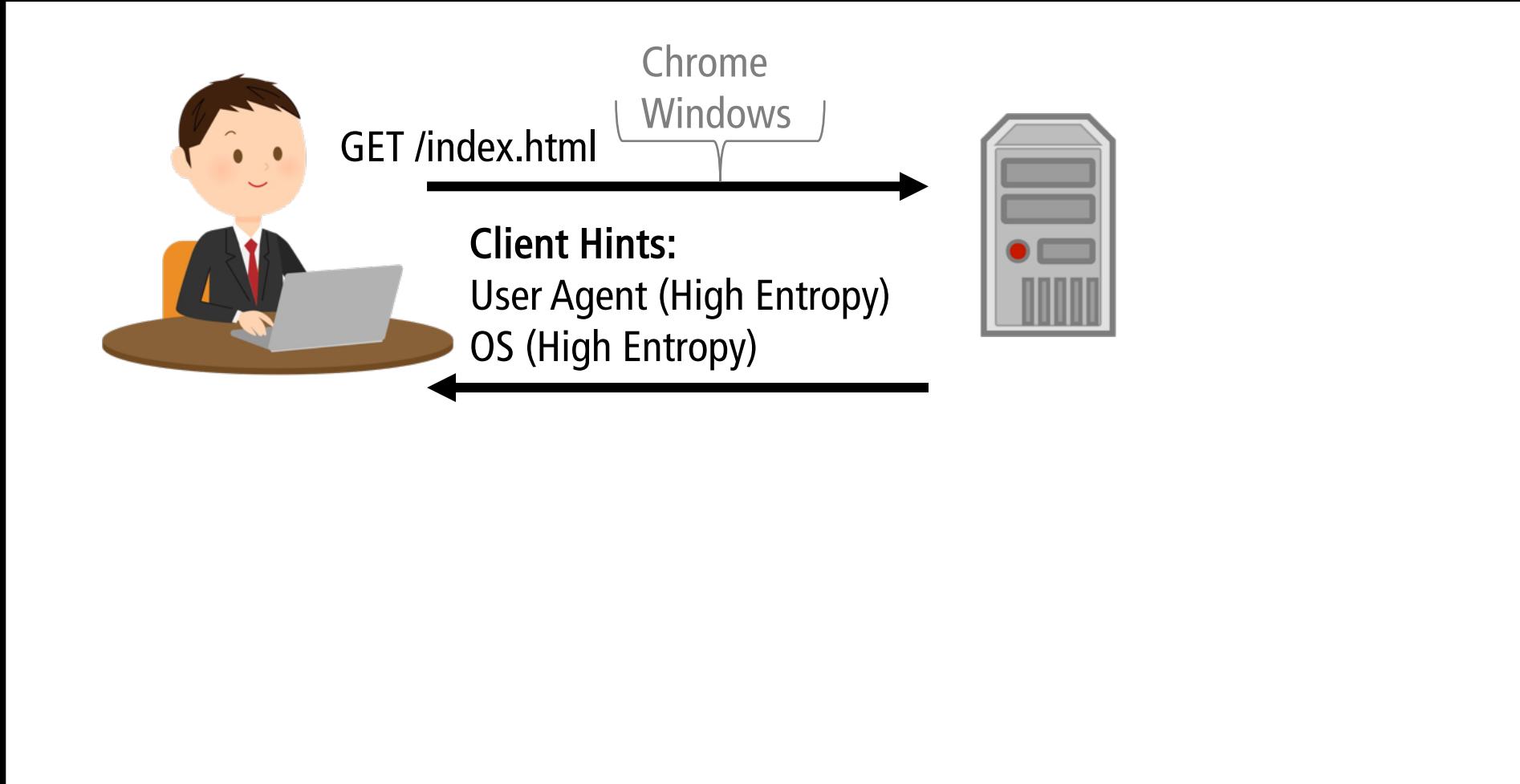
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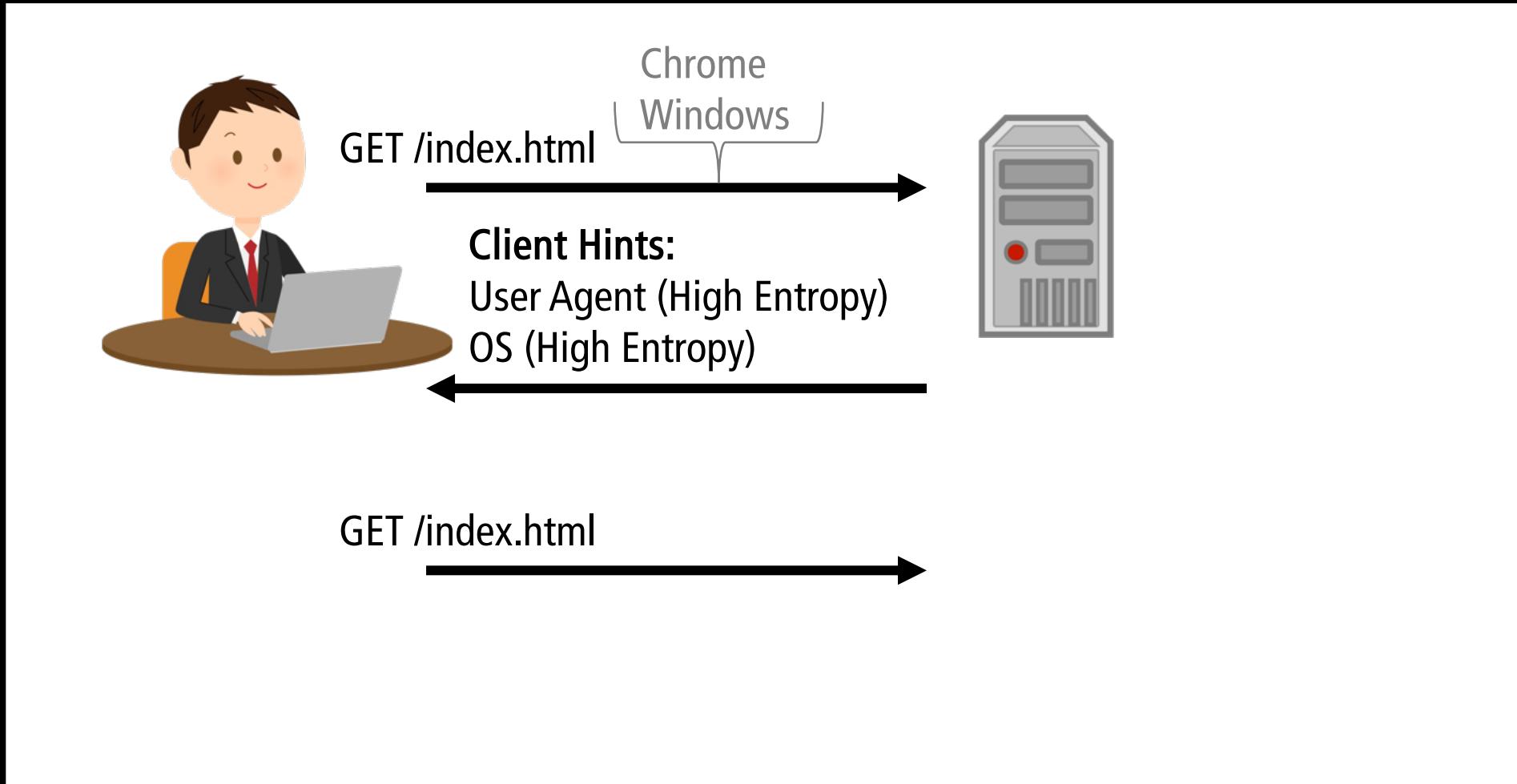
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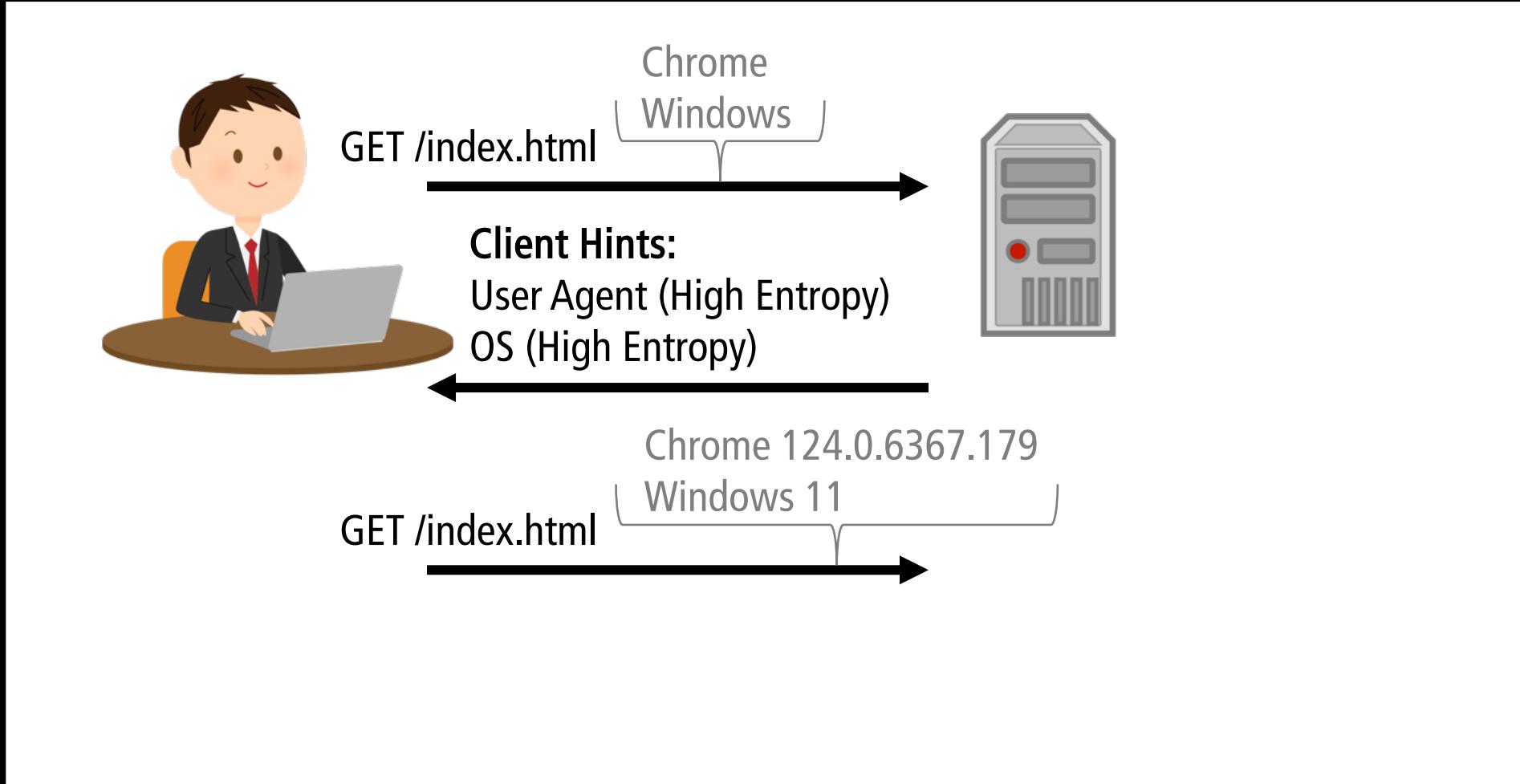
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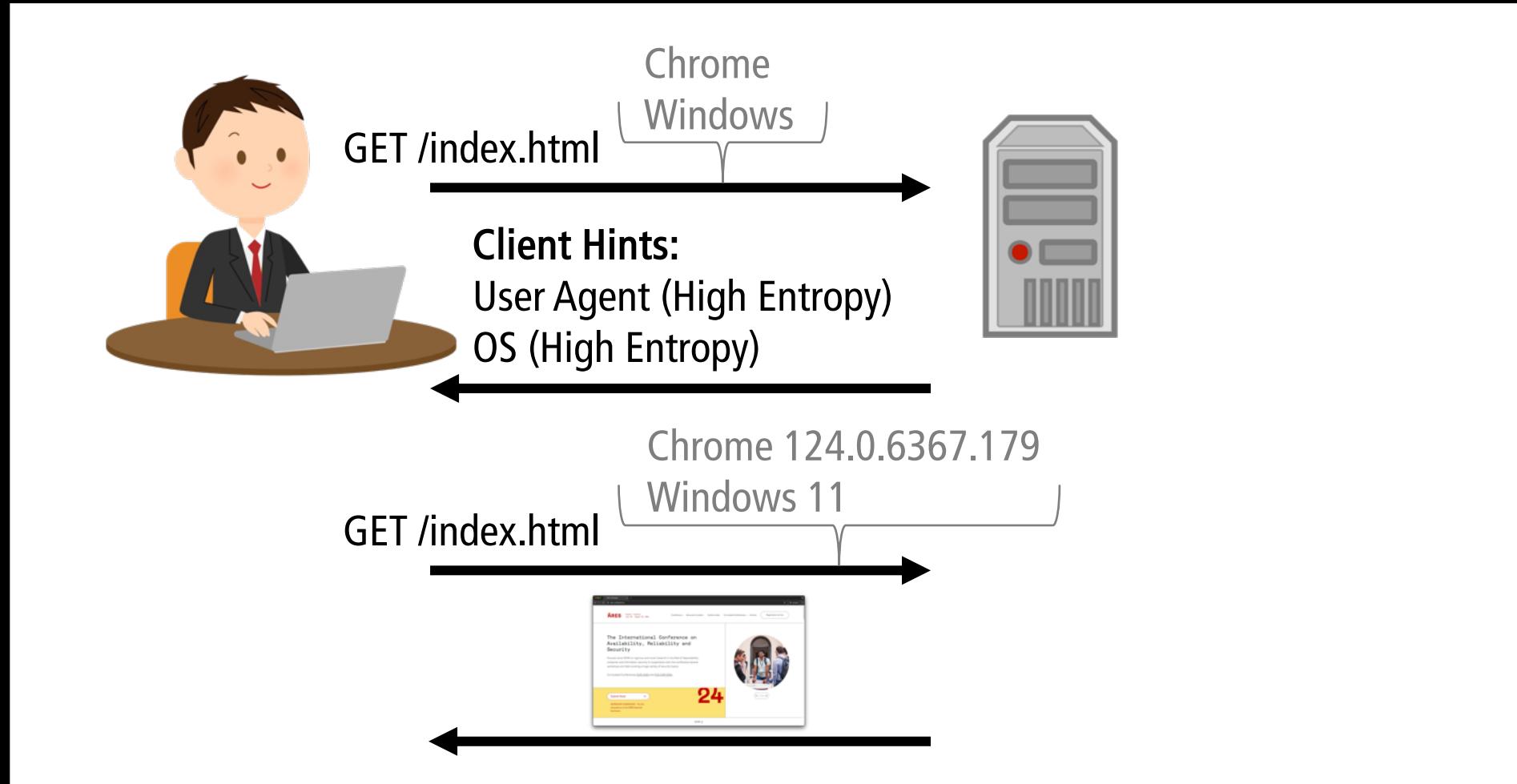
HTTP Client Hints (HTTP CHs)



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HTTP Client Hints (HTTP CHs)



User Agent

User Agent (High Entropy)

User Agent Brand List

OS (High Entropy)

Device Model

OS (Low Entropy)

User Agent (Low Entropy)

CPU Bitness

Device Form Factor

Is Windows64

Platform Architecture

Prefers Mobile UX

Level of Detail

High

Medium

Low

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User Preference Media	Level of Detail
Contrast Preference	Low
Forced Colors	
Light/Dark Mode	
Prefers Reduced Motion	
Reduced Transparency	

Device Information

Viewport Width
Width
Client Device Pixel Ratio
Client's RAM
Image Device Pixel Ratio

Level of Detail

High

Low

Network

Bandwidth

Network Profile

Round-Trip Time

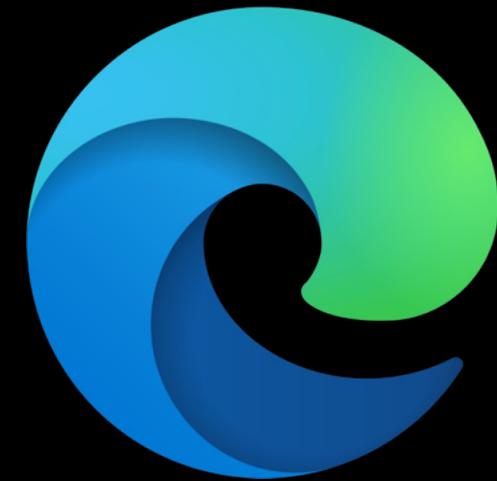
Prefers Reduced Data

Level of Detail

High

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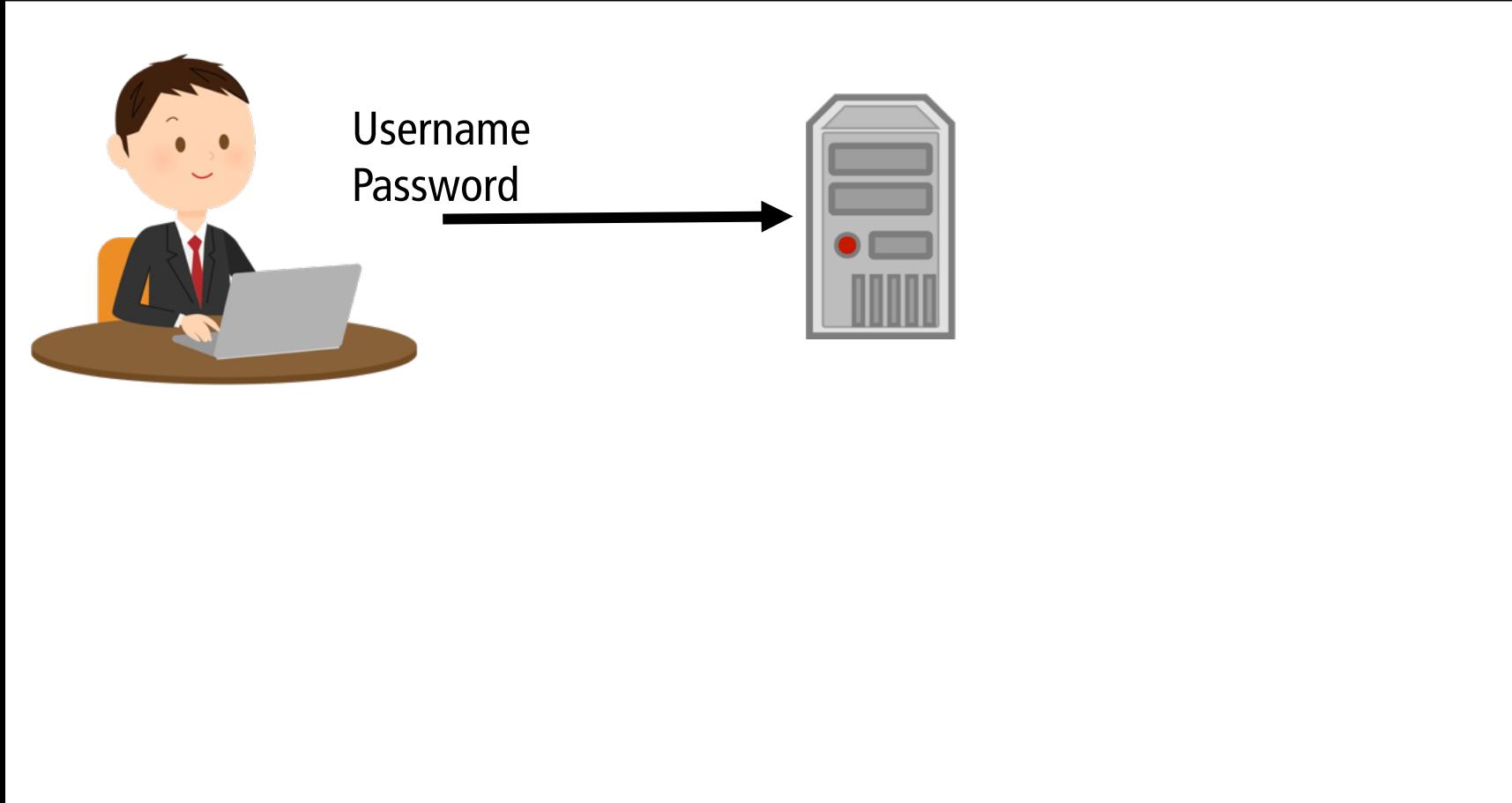
Affects 78% desktop
and 69% mobile users*



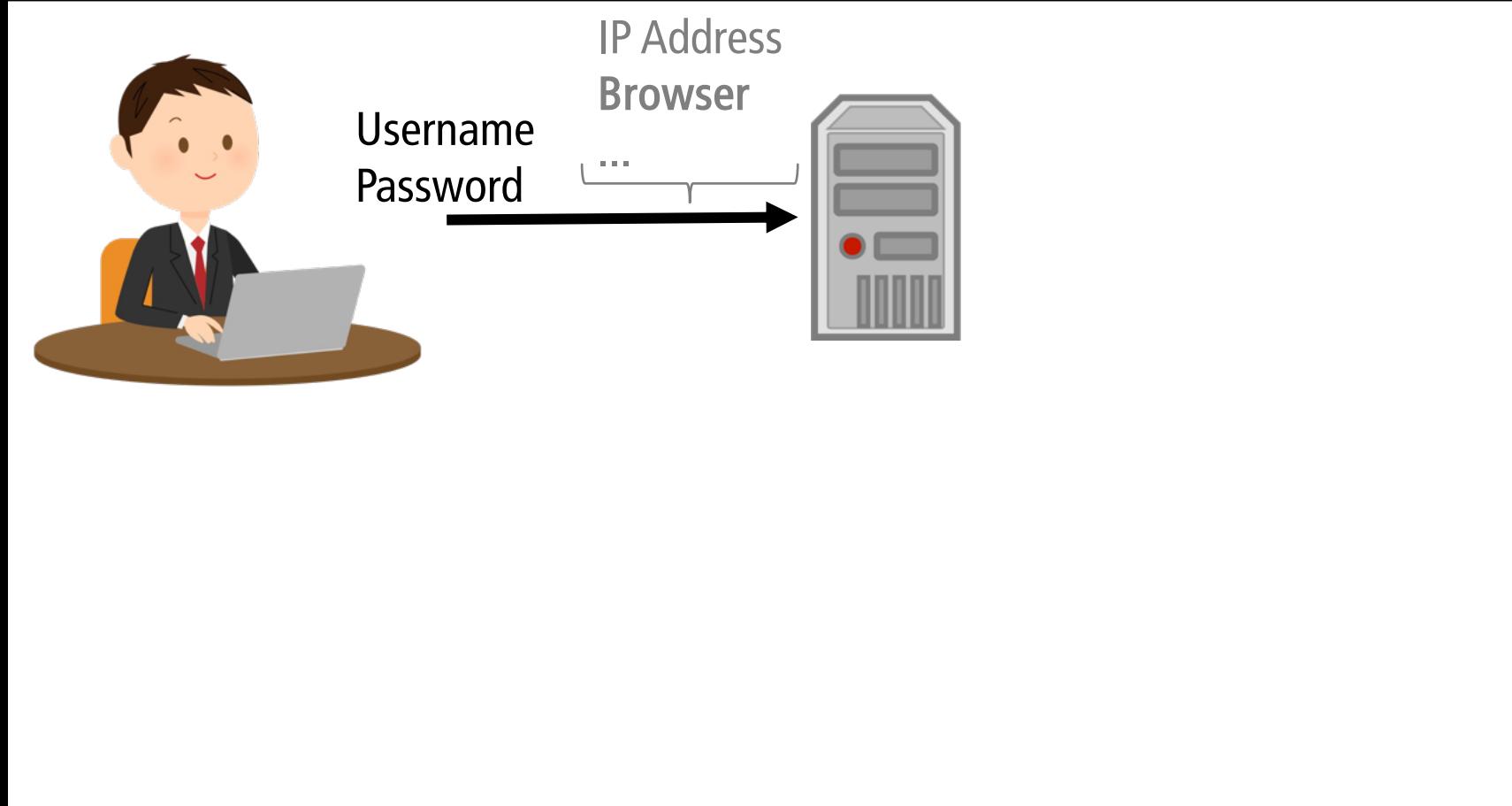
* Statscounter. 2024. Browser Market Share Worldwide.

Some Websites Depend on
Browser Information

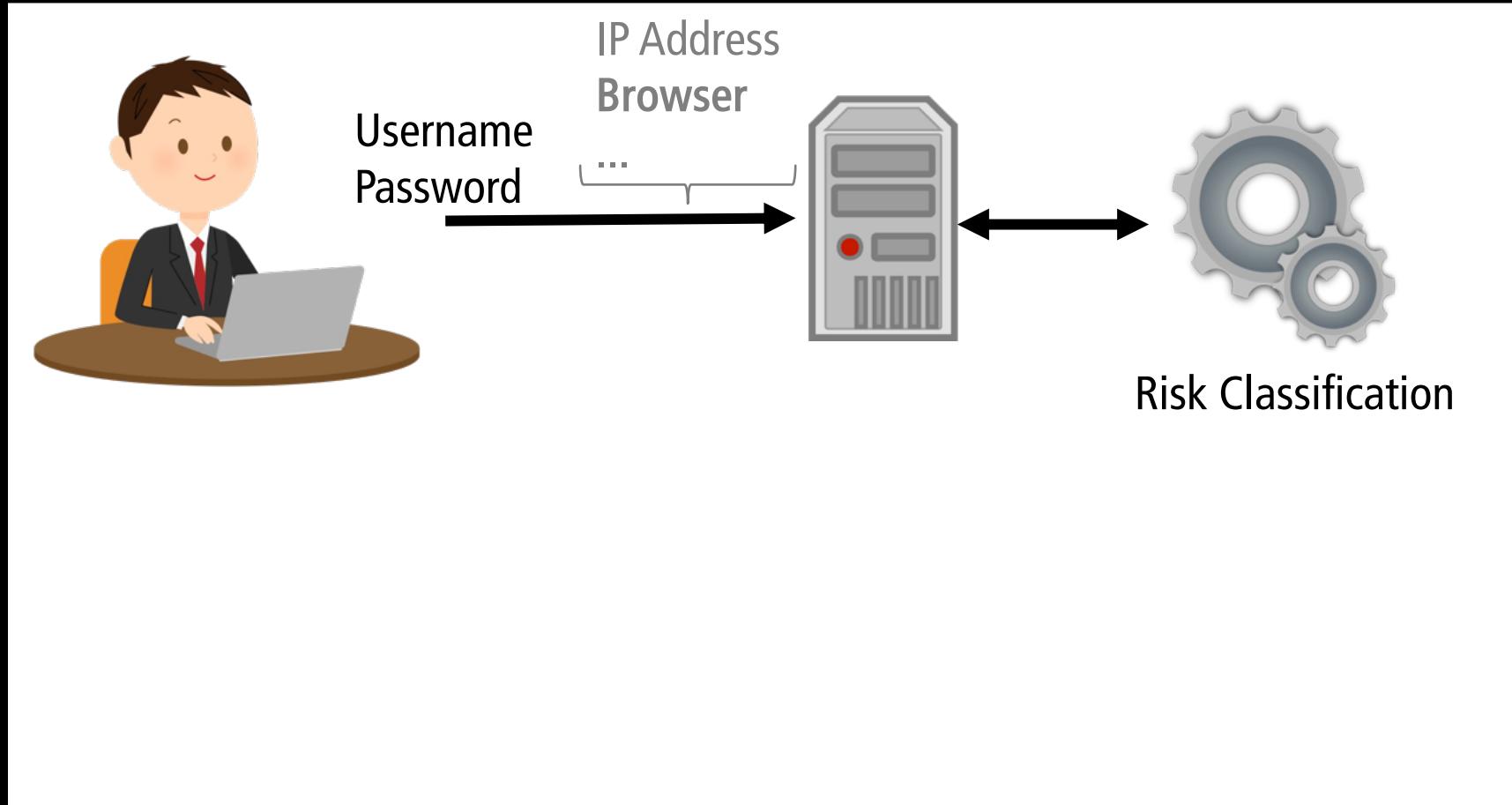
Risk-Based Authentication (RBA)



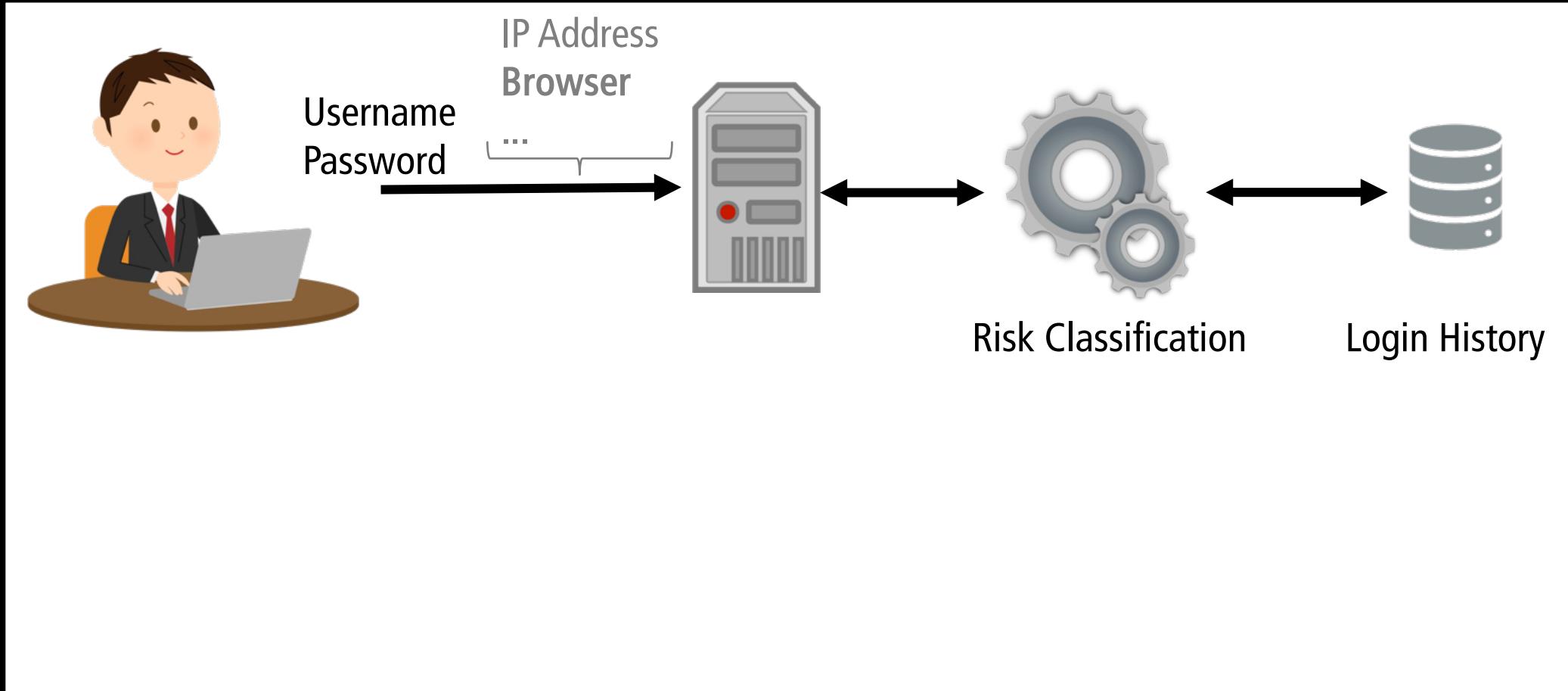
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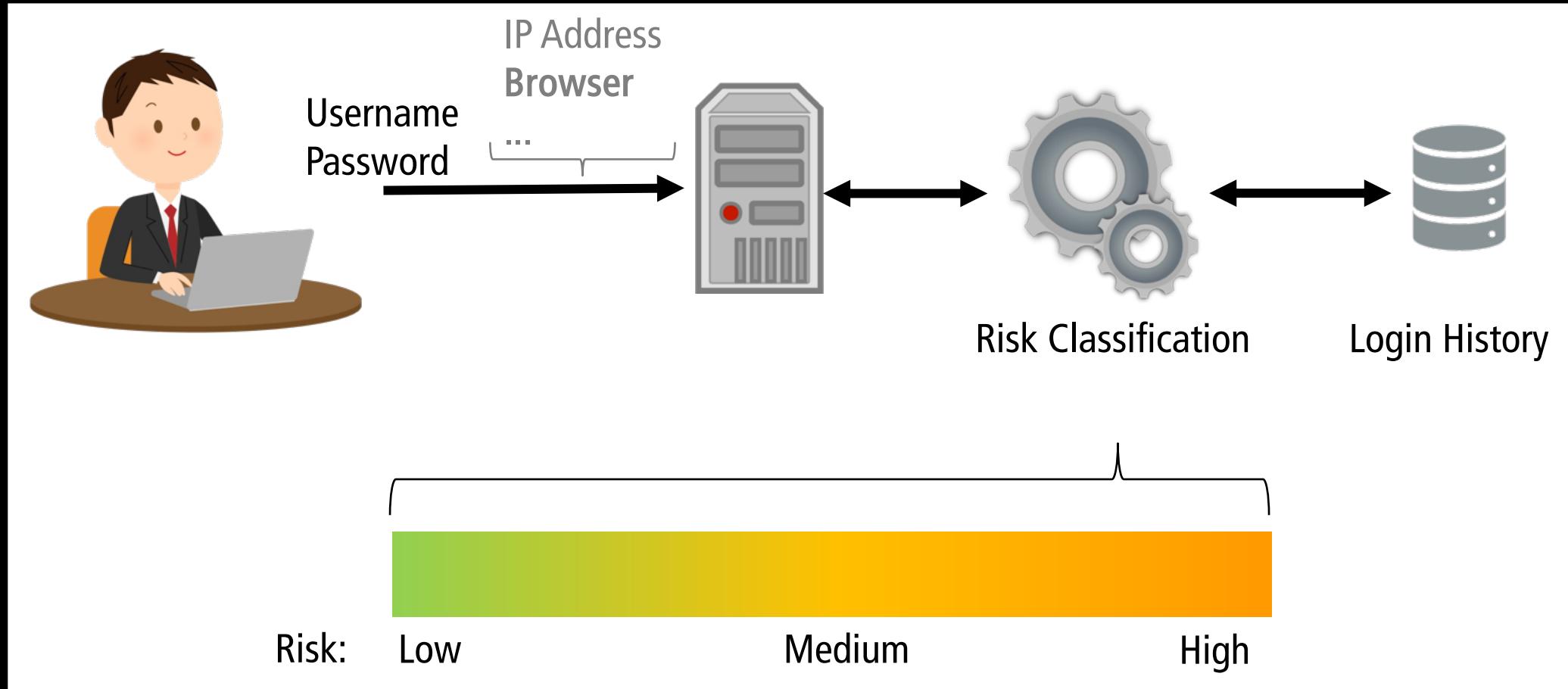
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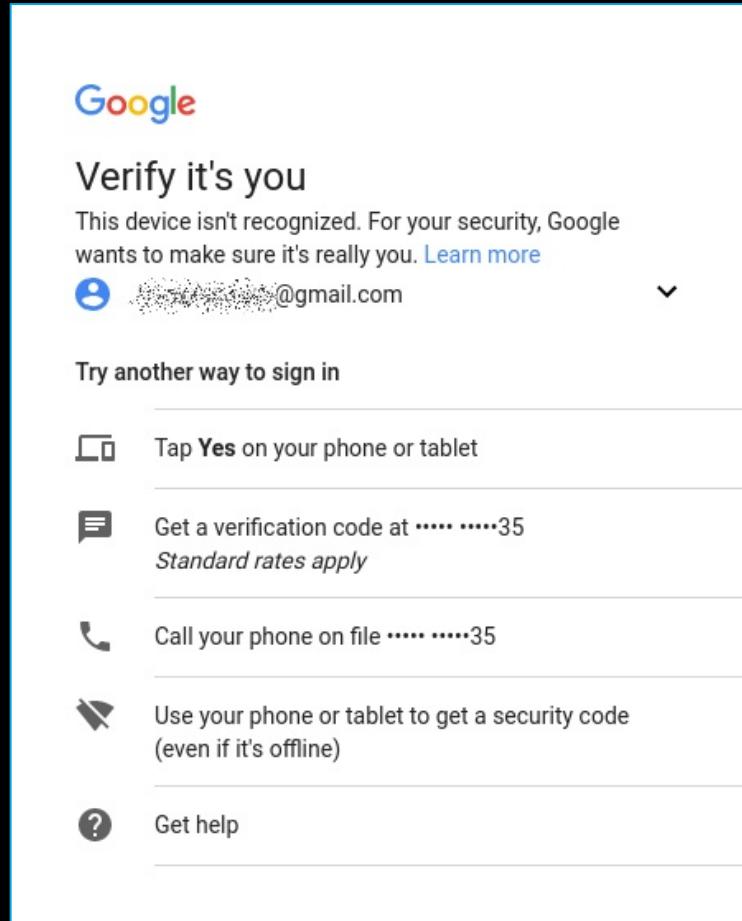
Risk-Based Authentication (RBA)



Risk-Based Authentication (RBA)



Risk-Based Authentication



User Tracking



How do Websites use HTTP CHs in Practice?

Overview

 Study Results Conclusion

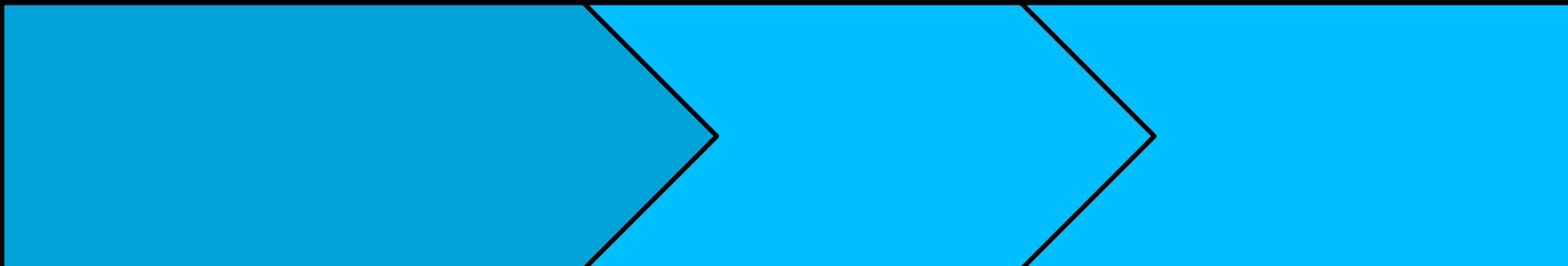


Overview

 Study

 Results

 Conclusion





Two Data Sources



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- Website Start Pages (~12M Websites*)

*12M websites from on Chrome UX Report



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#8M most popular websites based on the Tranco List

Le Pochat et al.: Tranco: A Research-Oriented Top Sites Ranking Hardened Against Manipulation. In: NDSS (2019). Internet Society

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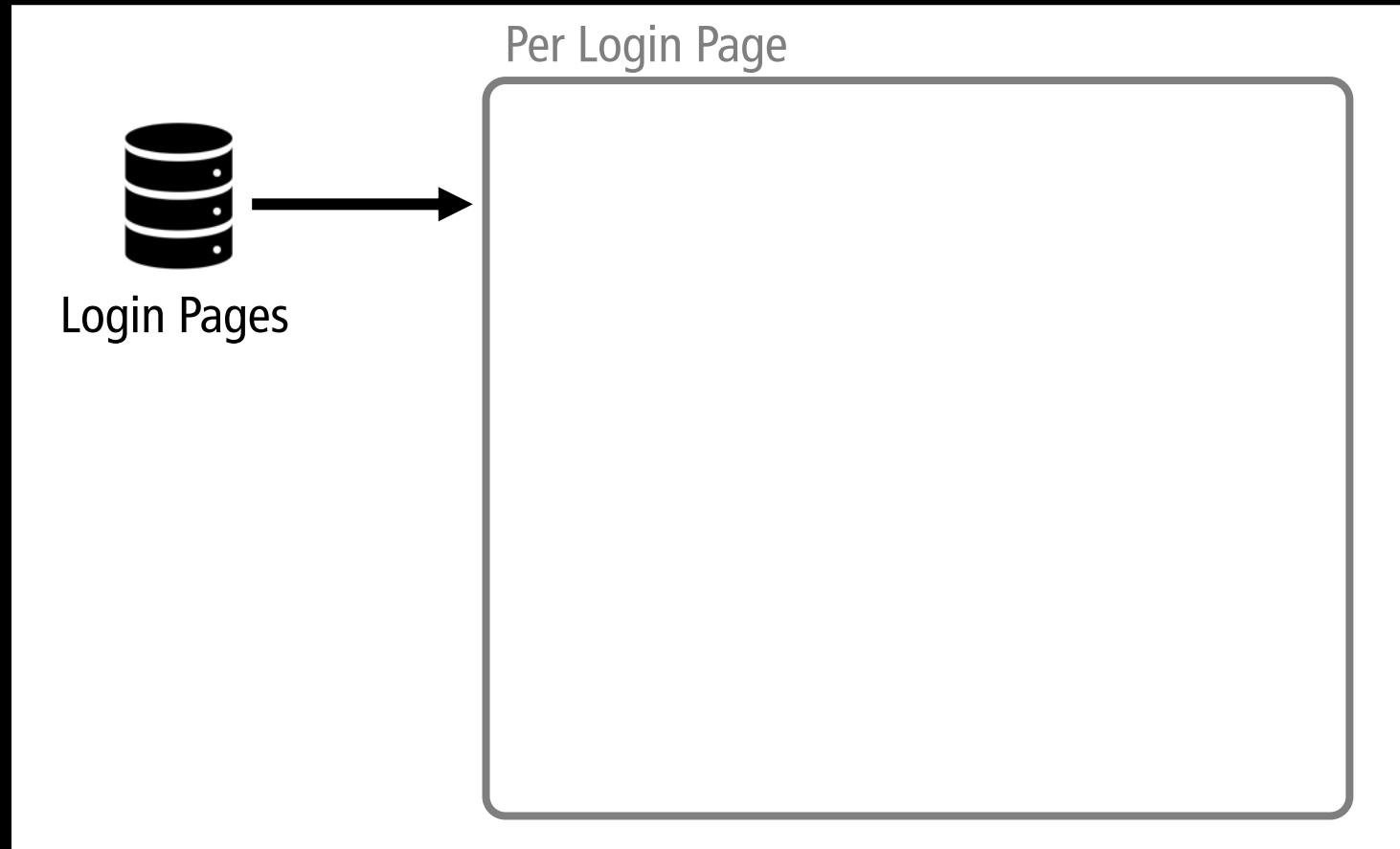
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Login Pages Crawling

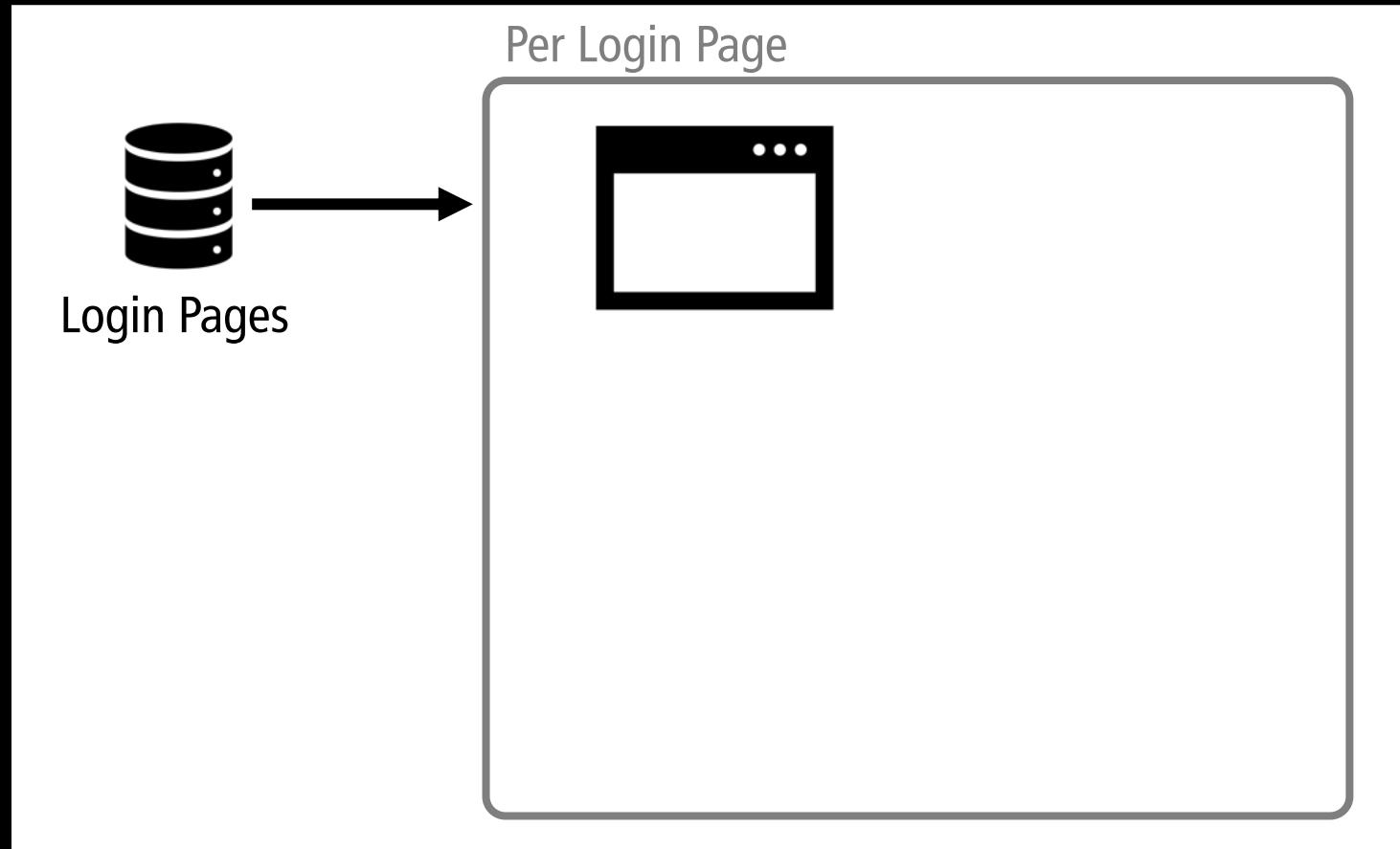


Login Pages

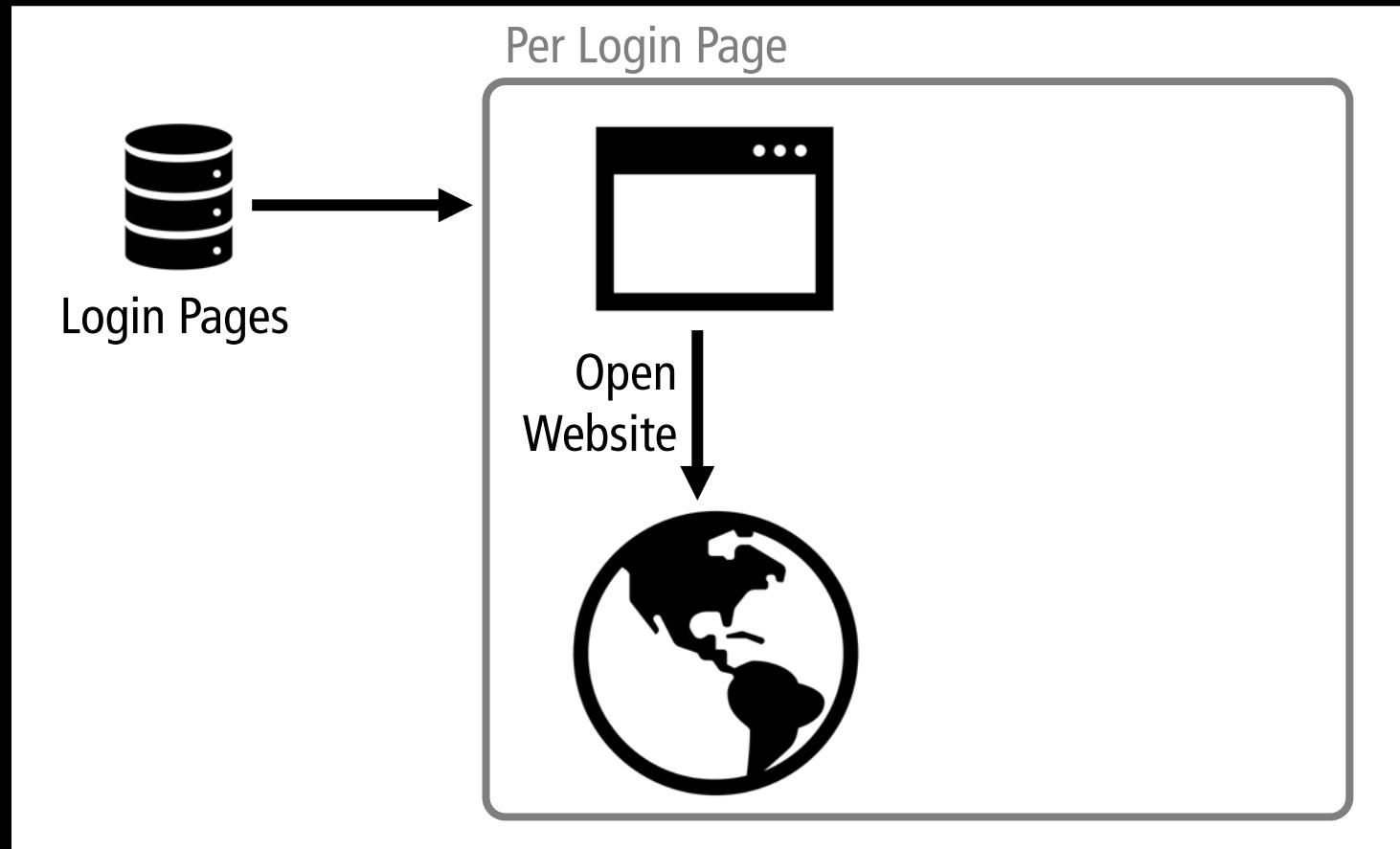
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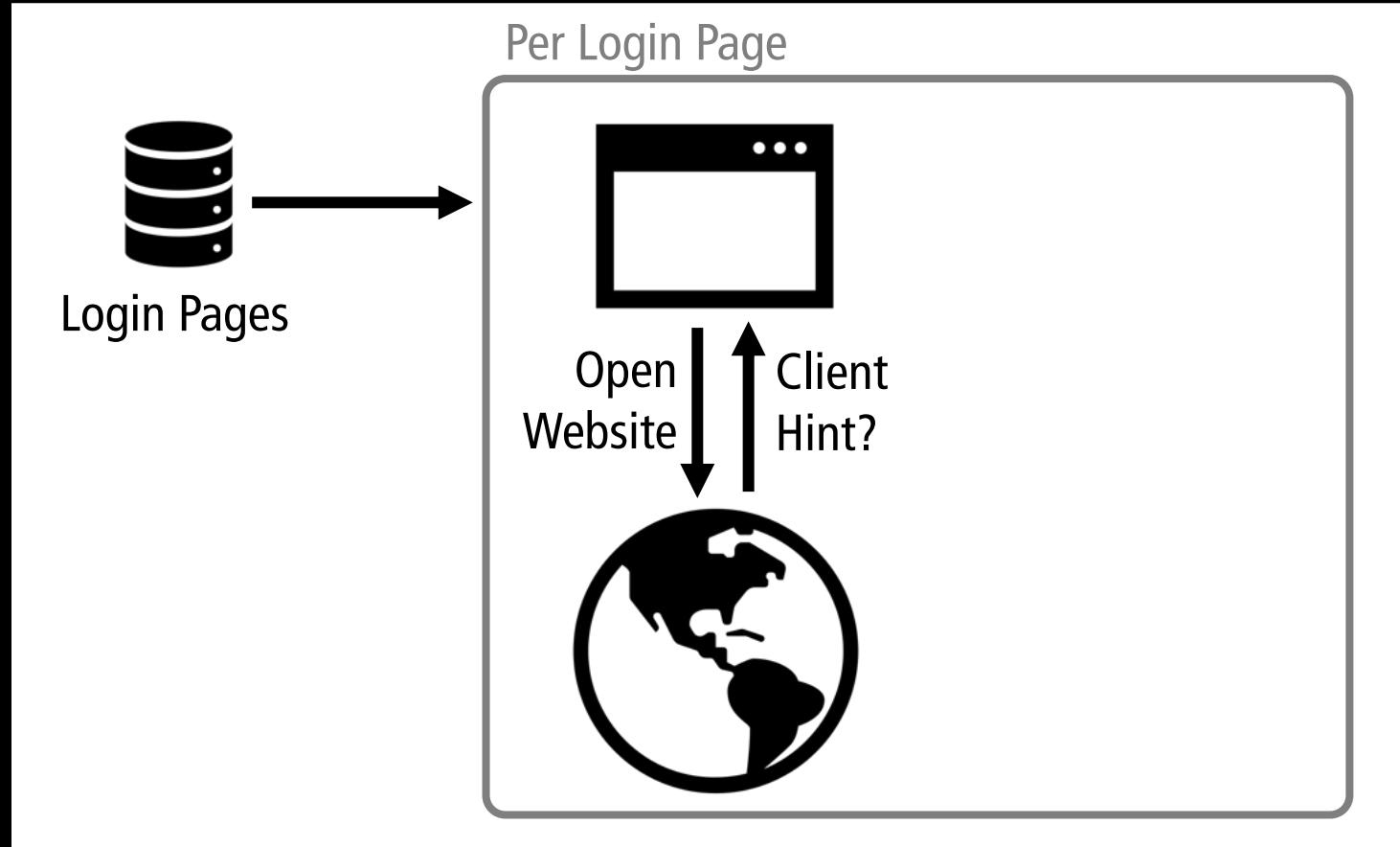
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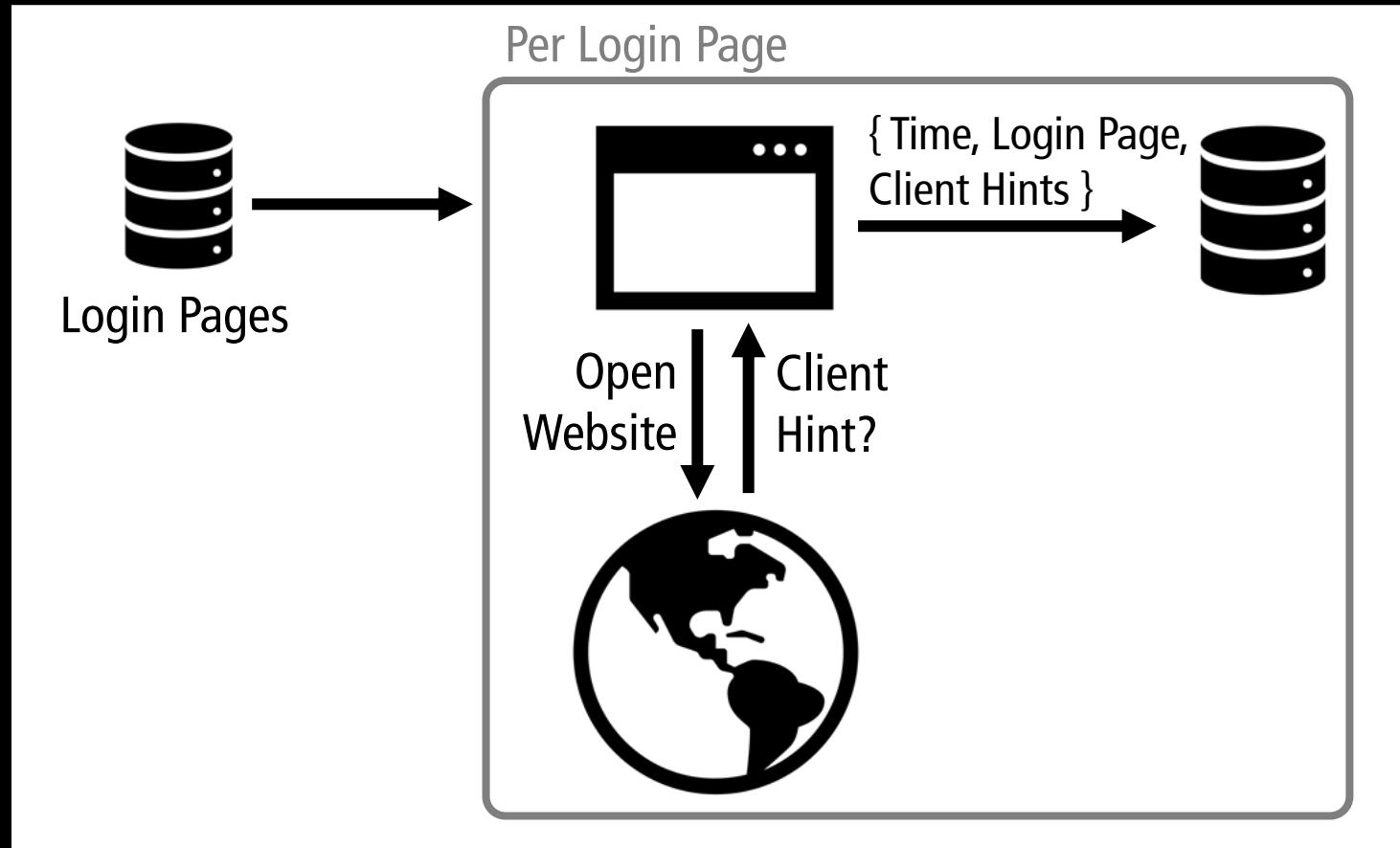
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Login Pages Crawling



Login Pages Crawling





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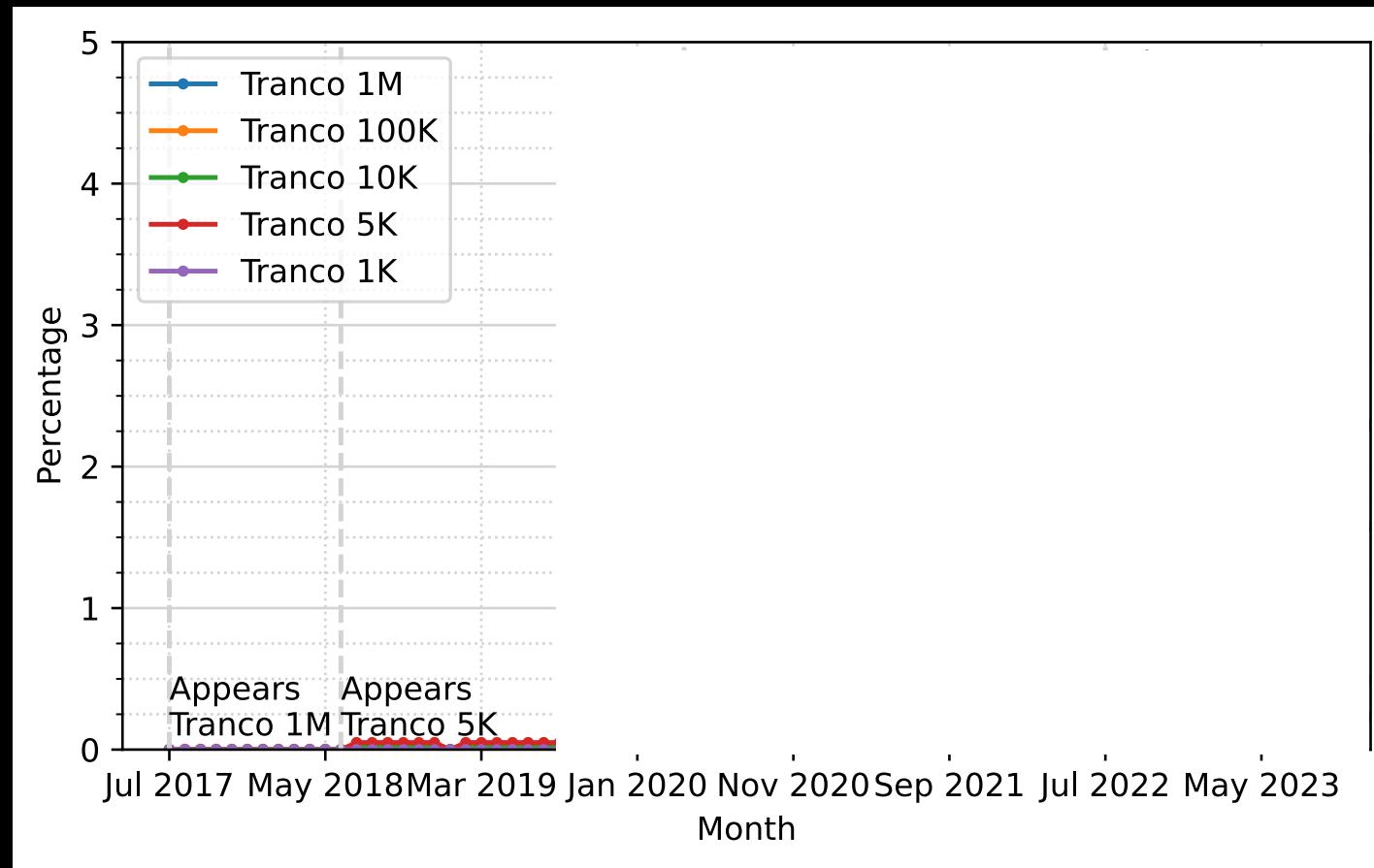
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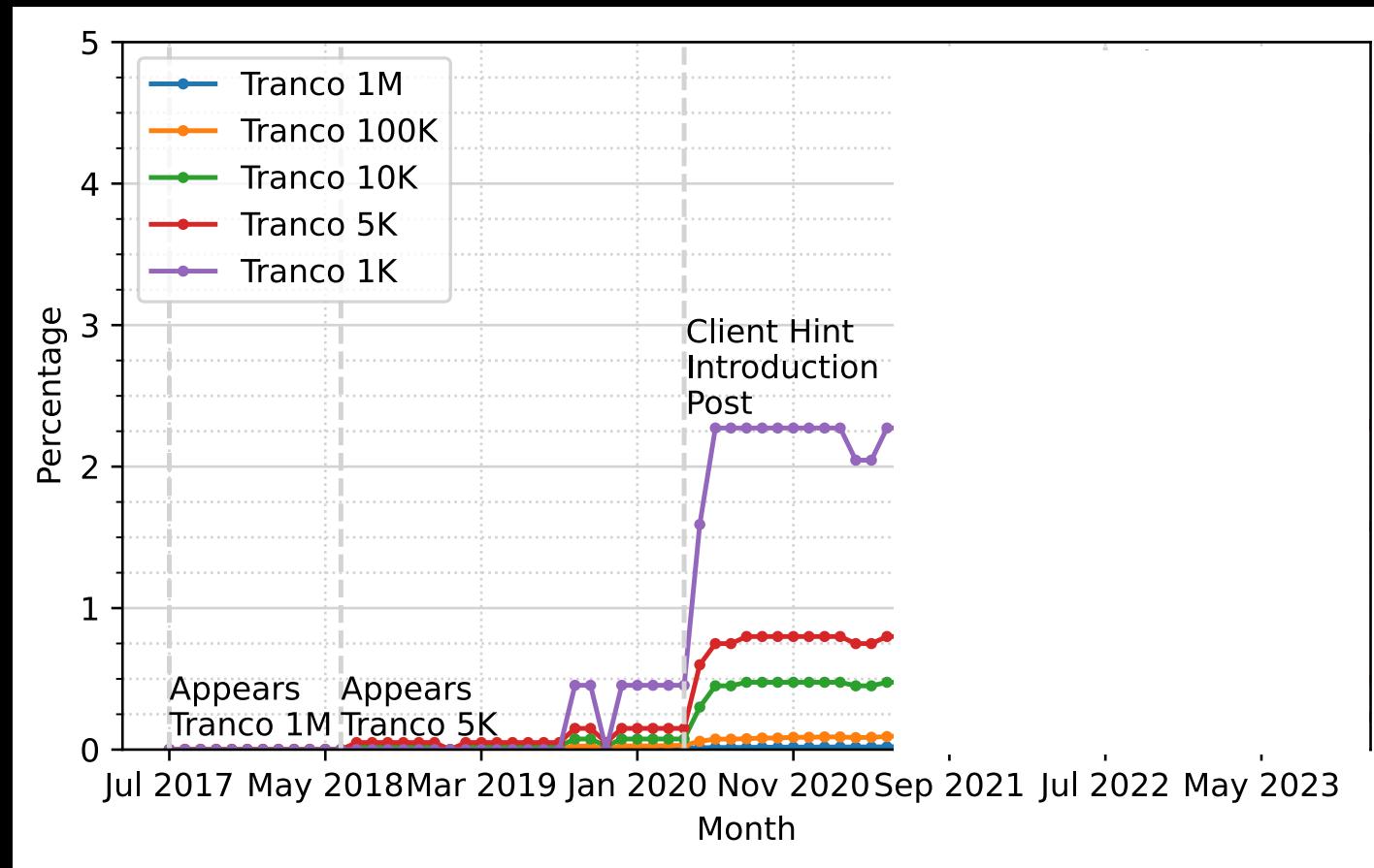
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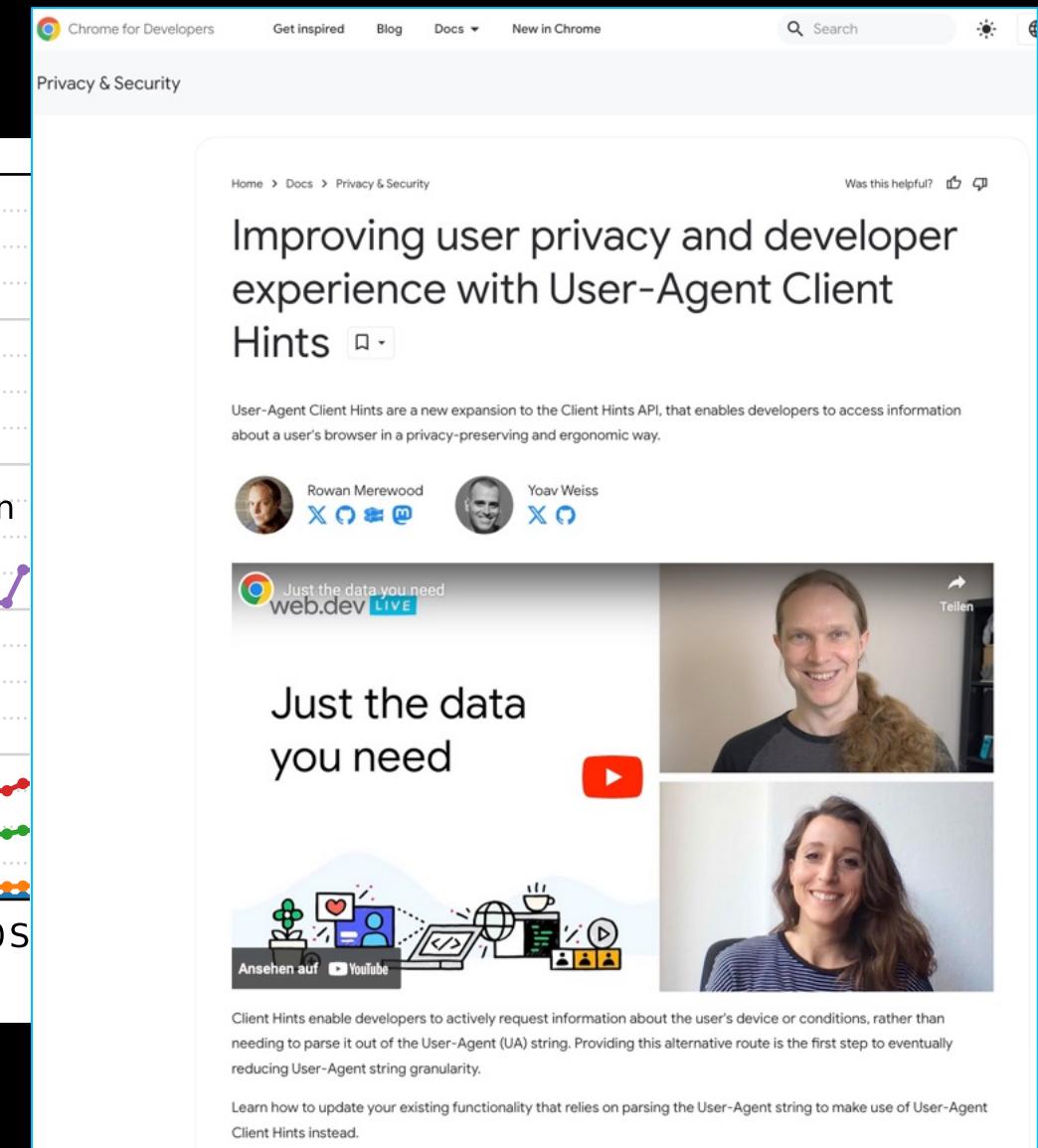
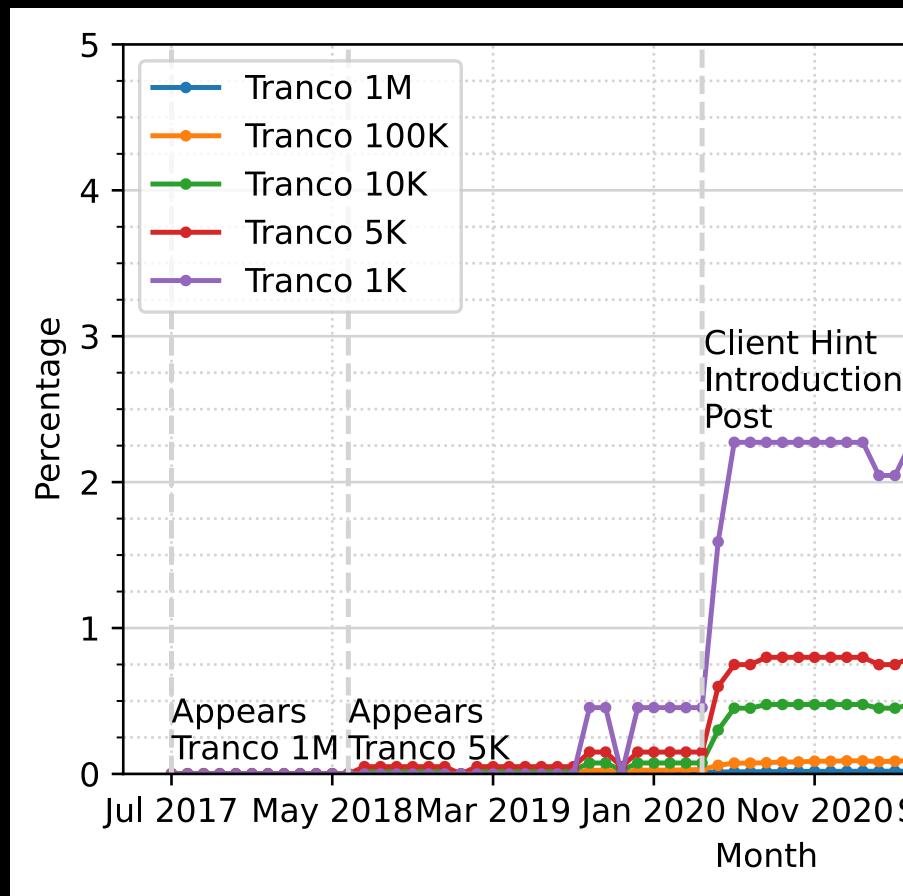
HTTP CHs Get More Popular



HTTP CHs Get More Popular



HTTP CHs Get More Popular



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Privacy & Security

Home > Docs > Privacy & Security Was this helpful?

Improving user privacy and developer experience with User-Agent Client Hints

User-Agent Client Hints are a new expansion to the Client Hints API, that enables developers to access information about a user's browser in a privacy-preserving and ergonomic way.

Rowan Merewood Yoav Weiss

Just the data you need Tellen

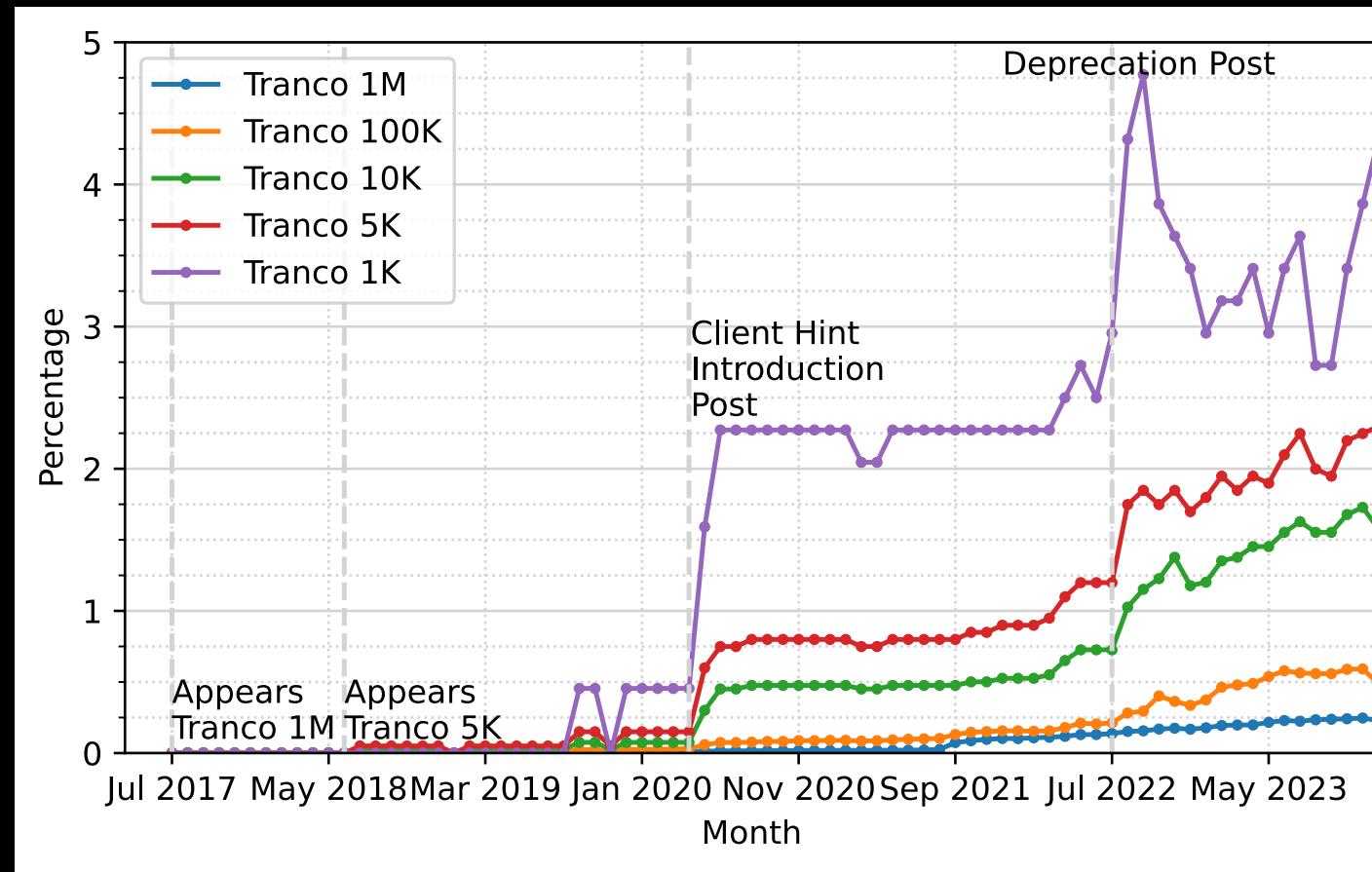
Ansehen auf YouTube

Client Hints enable developers to actively request information about the user's device or conditions, rather than needing to parse it out of the User-Agent (UA) string. Providing this alternative route is the first step to eventually reducing User-Agent string granularity.

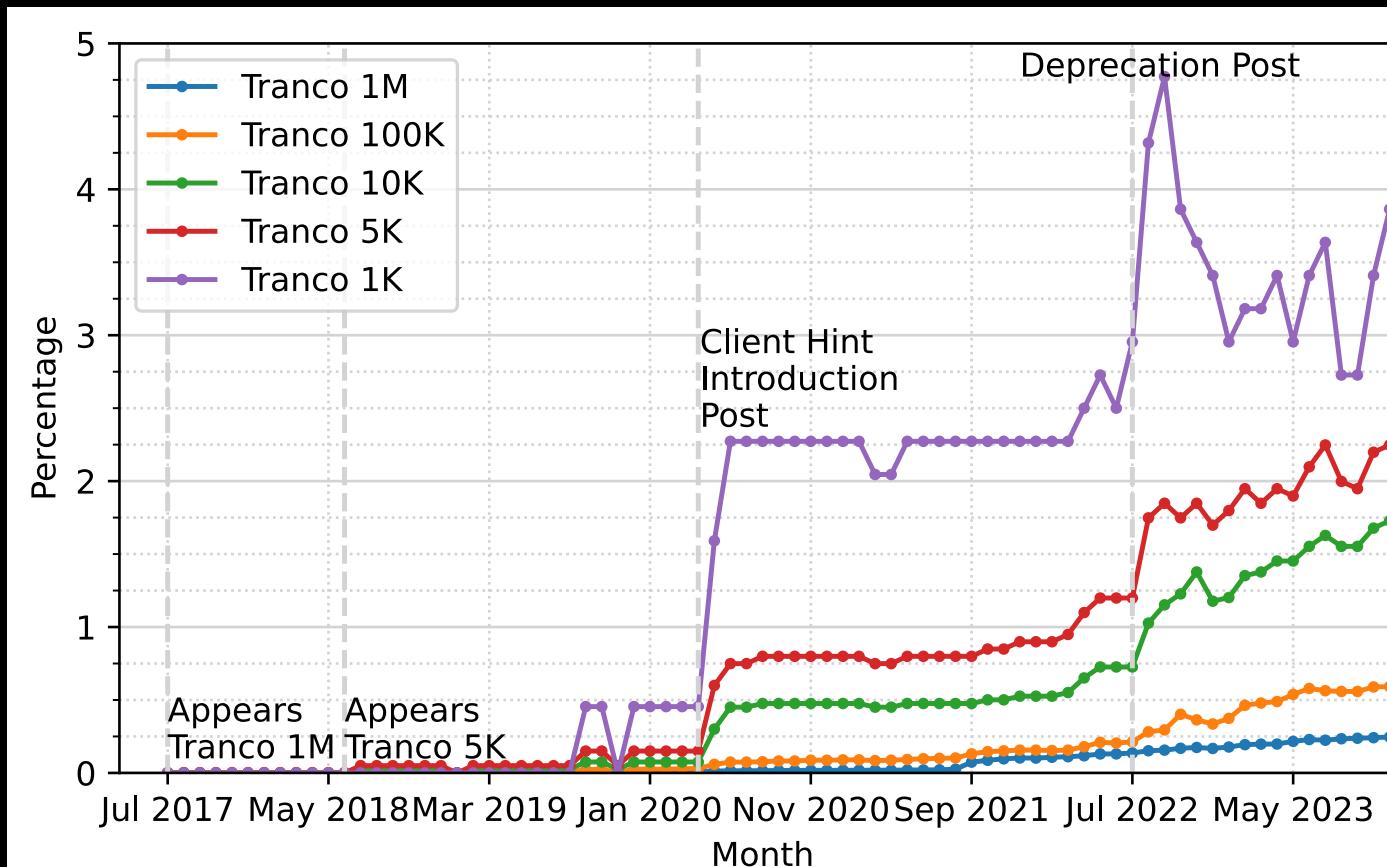
Learn how to update your existing functionality that relies on parsing the User-Agent string to make use of User-Agent Client Hints instead.

<https://developer.chrome.com/docs/privacy-security/user-agent-client-hints>

HTTP CHs Get More Popular



HTTP CHs Get More Popular



Mar '21 - May '23
Enable opt-in to legacy UA

M89 Mar '21 Rolled out User Agent Client Hints API

M95 Oct '21 Enable testing reduced UA at scale

six months for testing

M100 Mar '22 Apr '22 Minor Version

M101 Mar '22 Apr '22 Desktop

M110 Oct '22 Feb '23 Android

M113 May '23

Prepare for User-Agent Reduction changes in October

What's happening with the User-Agent string, why Chrome is making this change, and what you can do to prepare.

Published on Thursday, August 25, 2022

Translated to: 日本語

Jeremy Ney
Strategic Partner Development Manager, Google Chrome

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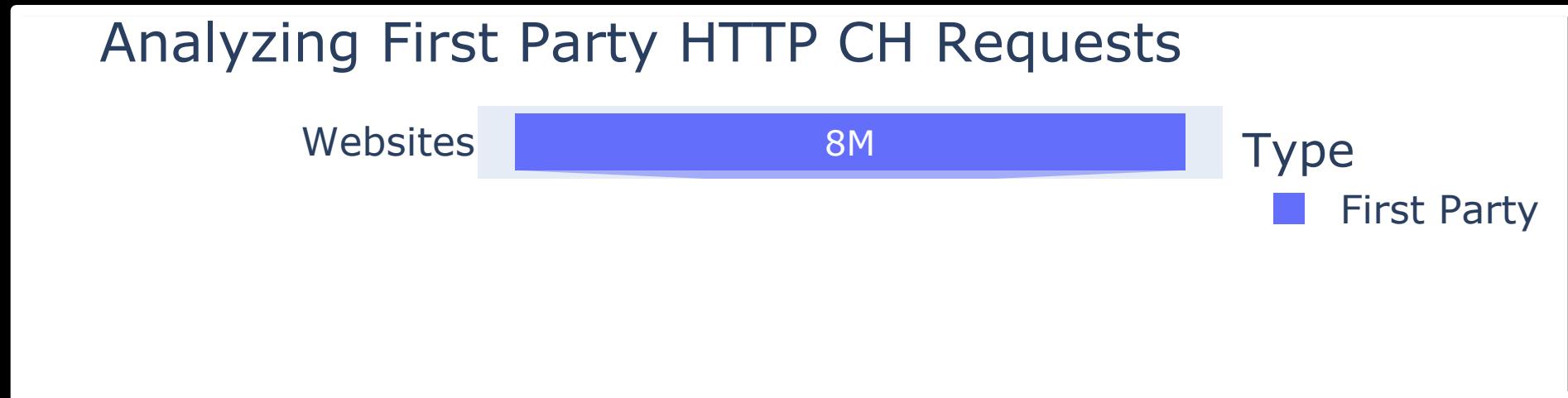
In October, Chrome will take the next step in reducing the information available in the browser's User-Agent (UA) string, to improve privacy for users. With this change, websites and services that rely on the User-Agent string for certain information may need to take action.

Here's some background on what's happening, why Chrome is making this change, and what you can do to prepare.

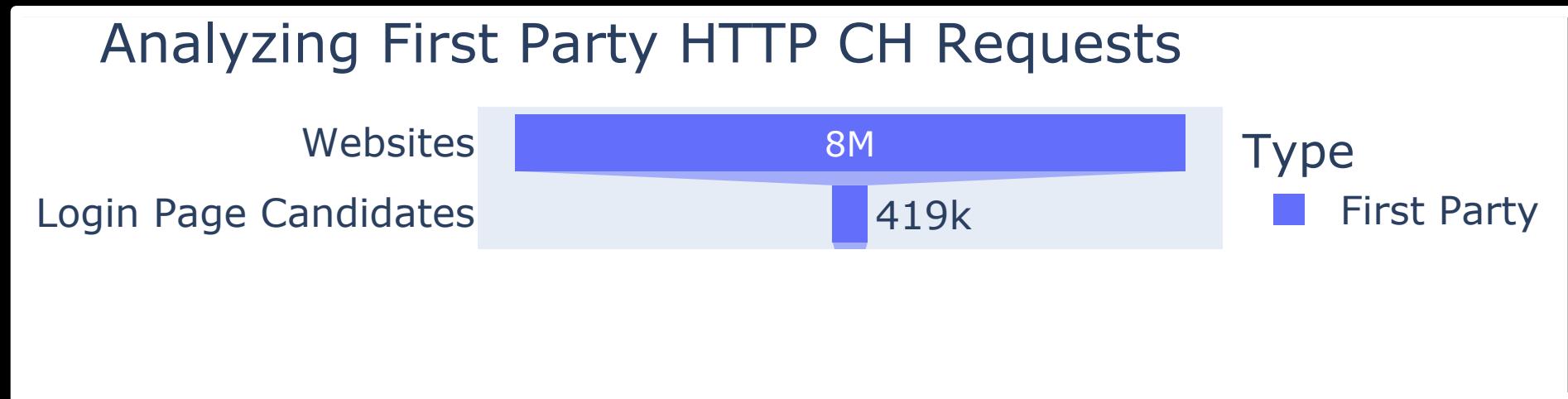
Why is the User-Agent string changing

<https://developer.chrome.com/blog/user-agent-reduction-oct-2022-updates/>

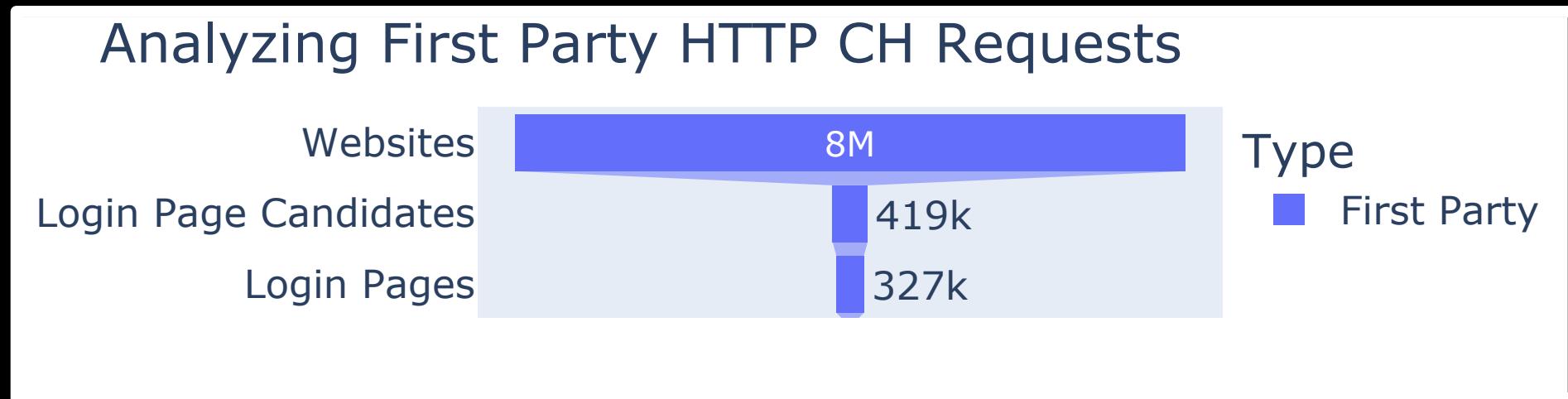
But Only Few Websites Use Them



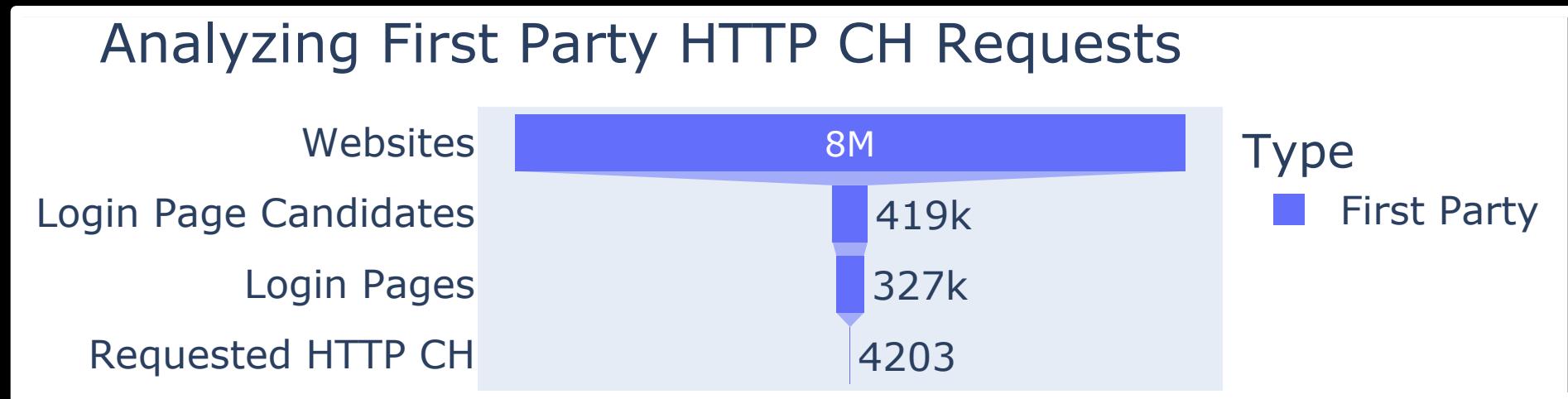
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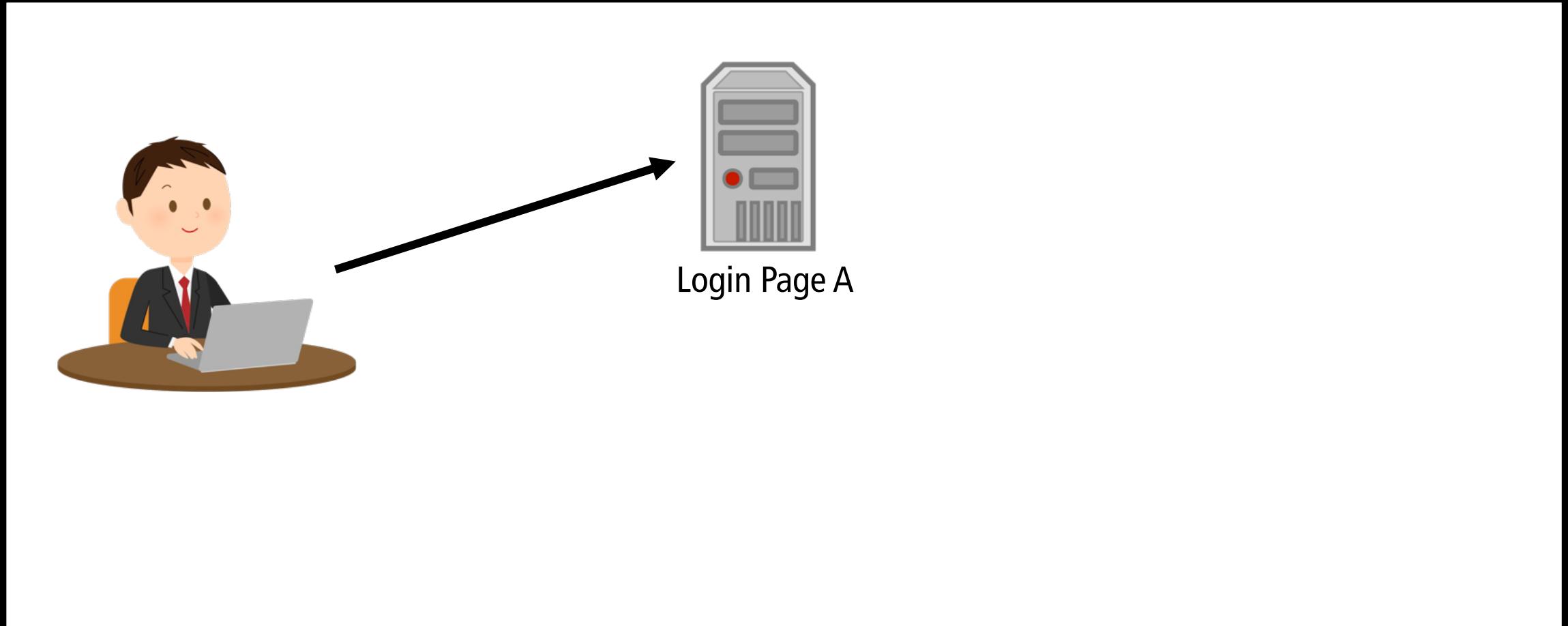
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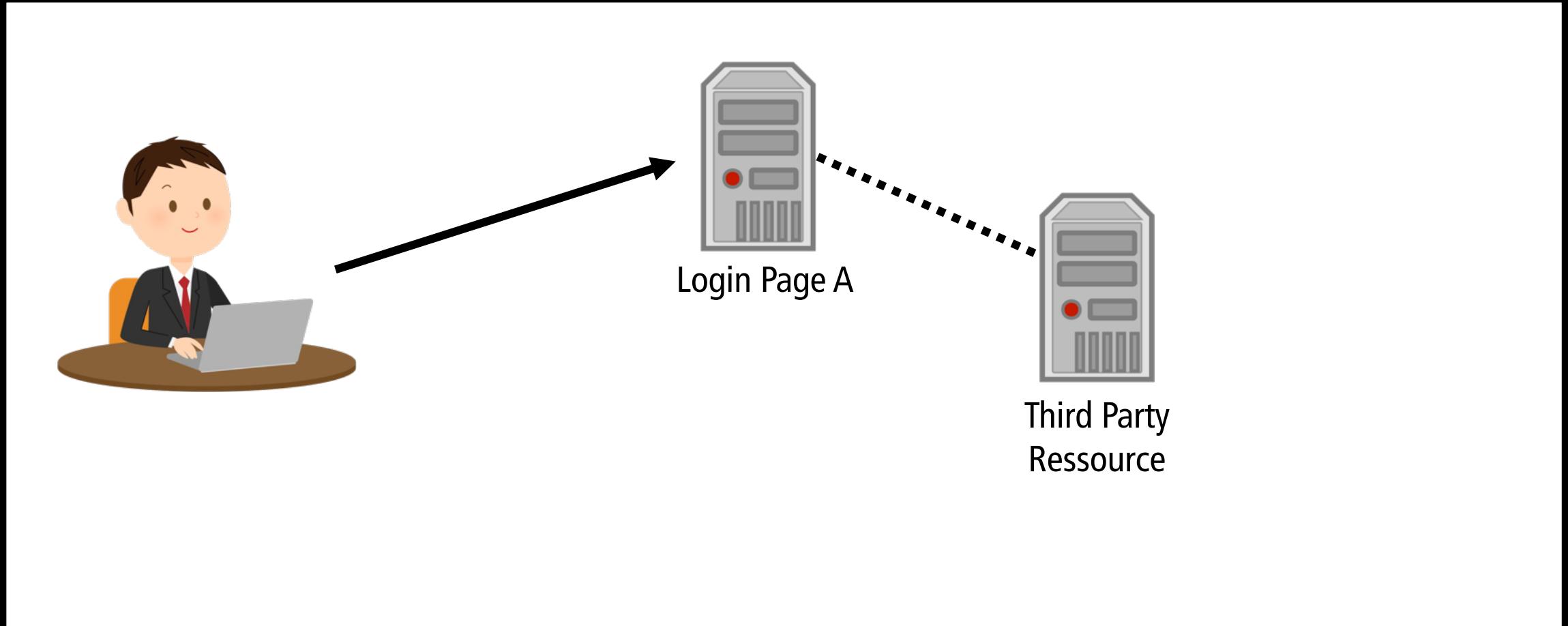
Except for Embedded Third Parties



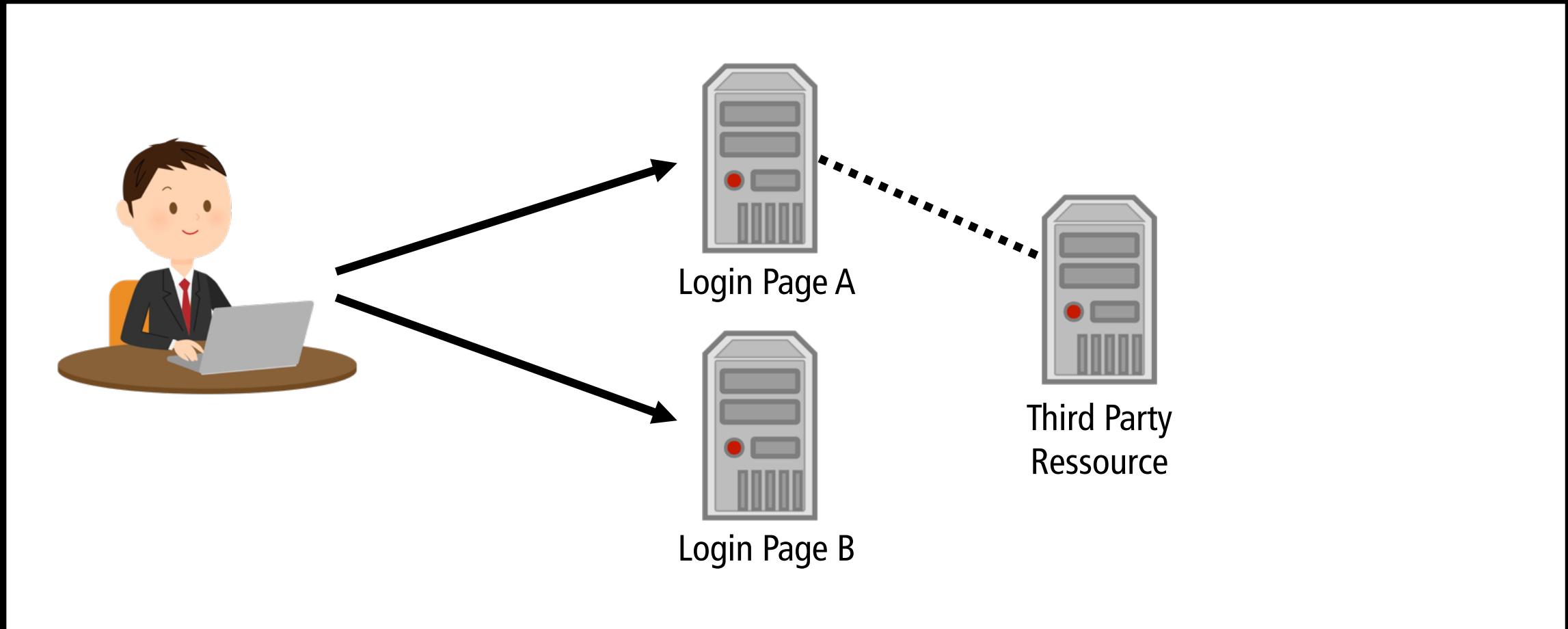
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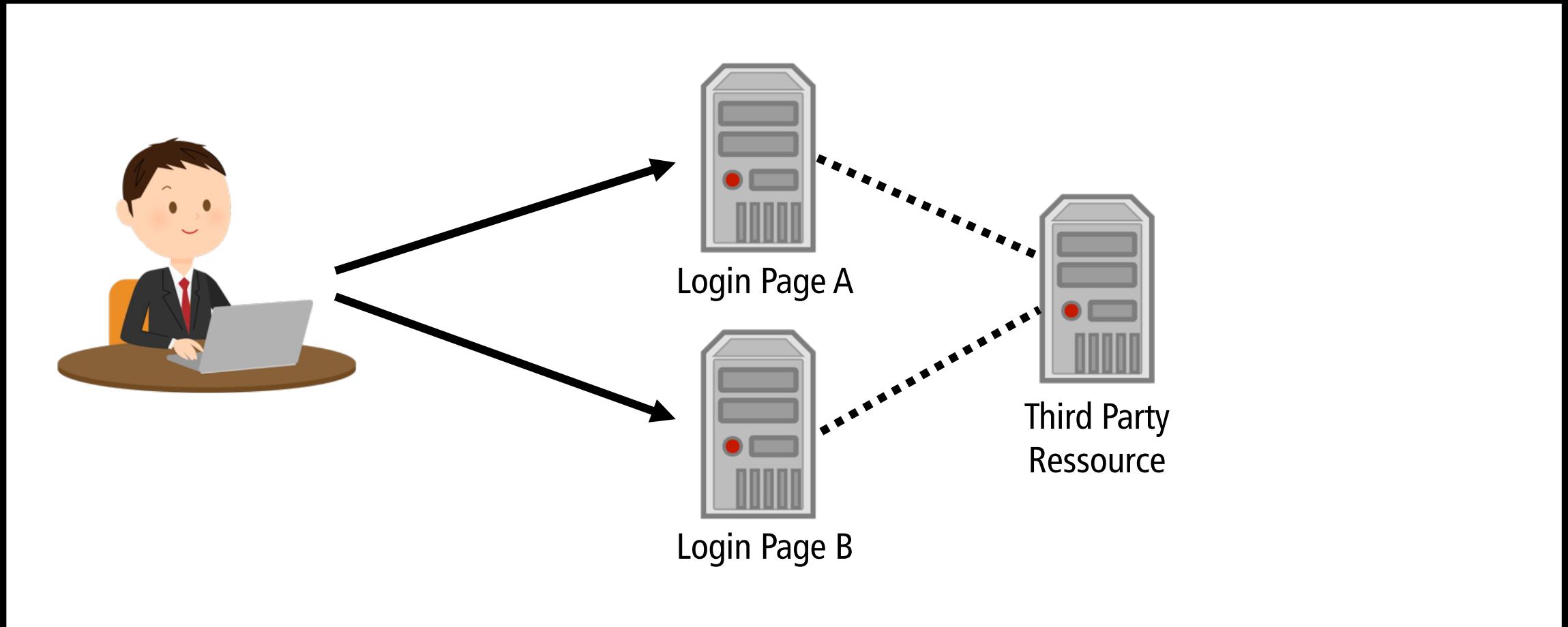
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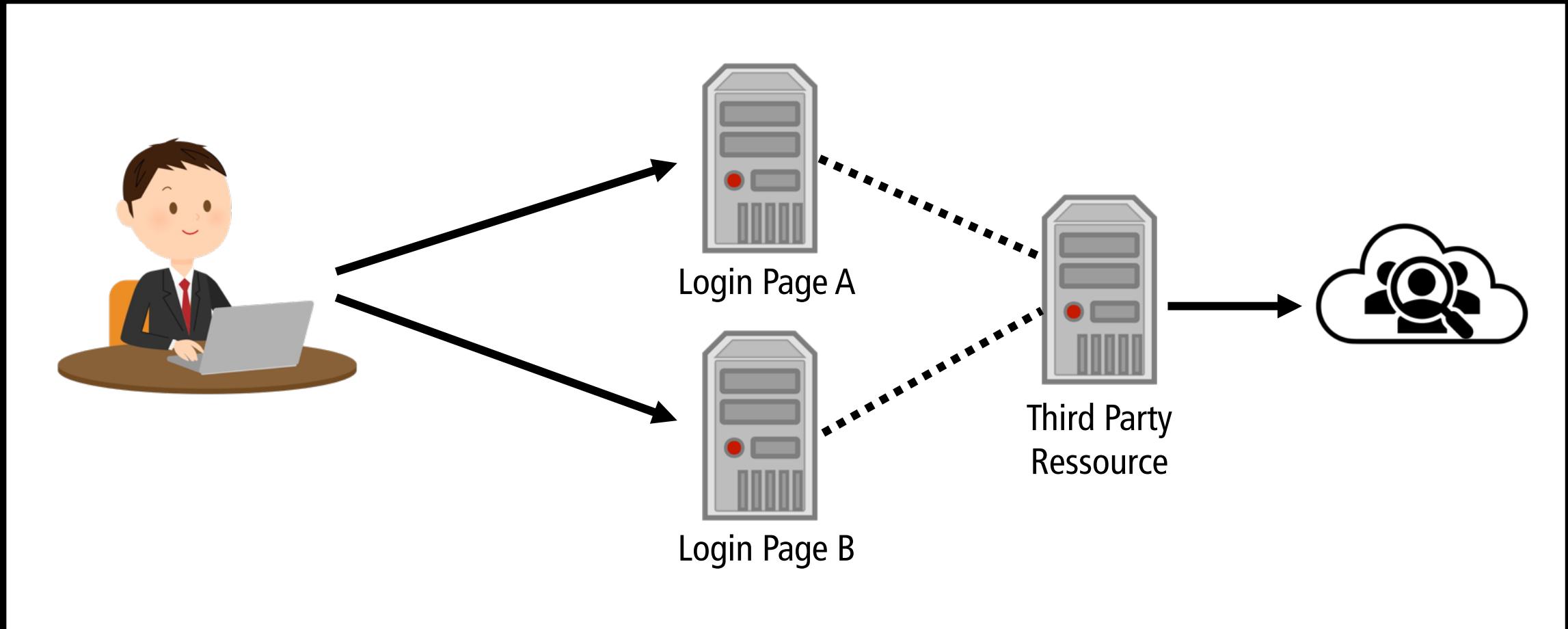
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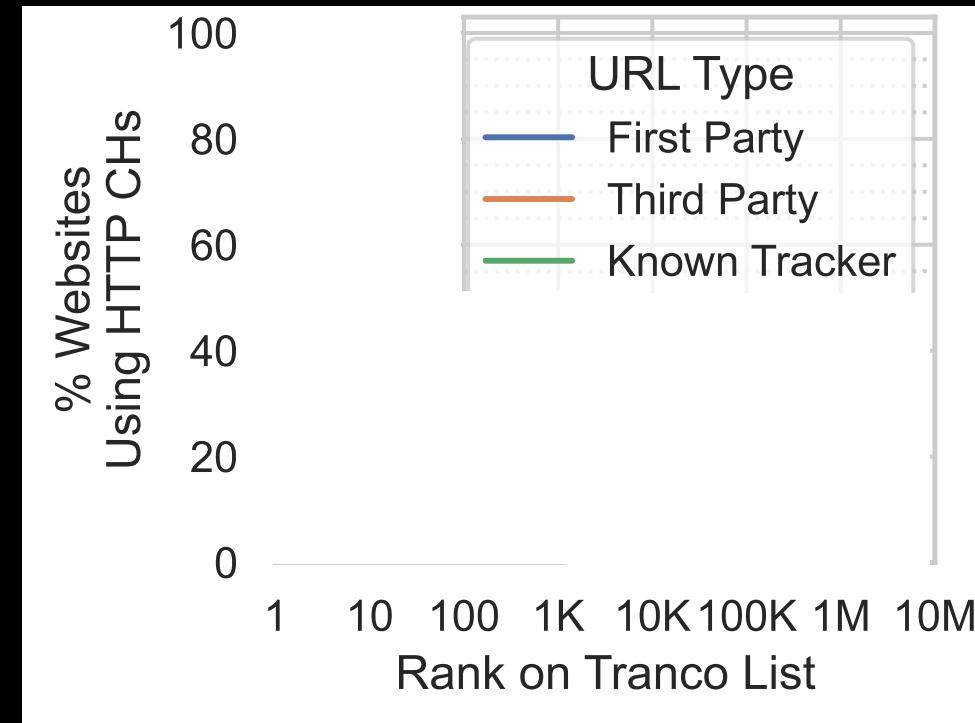
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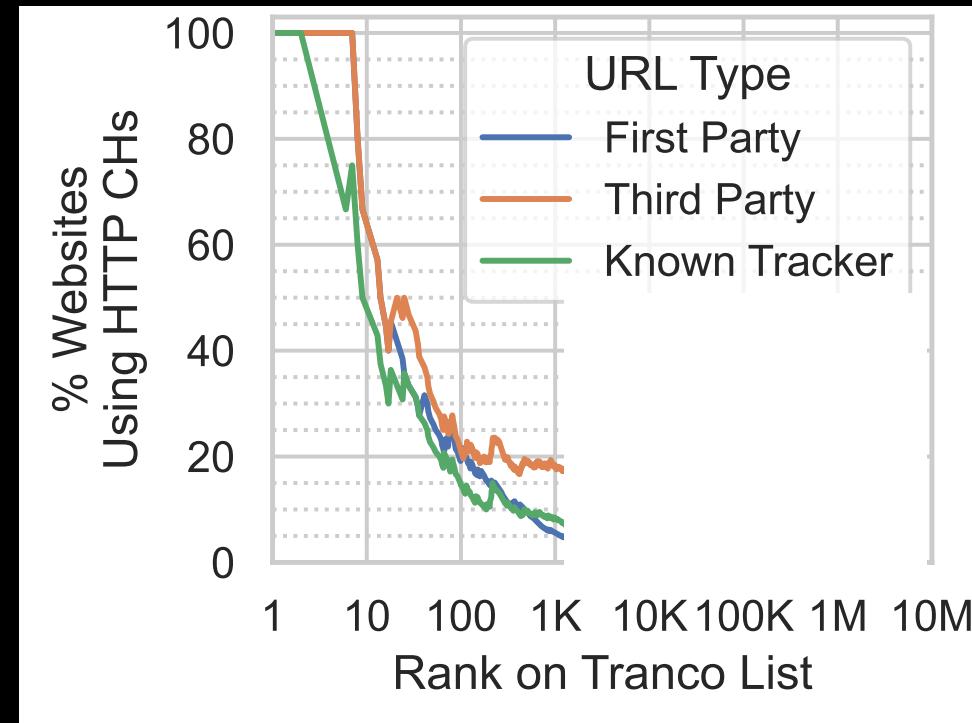
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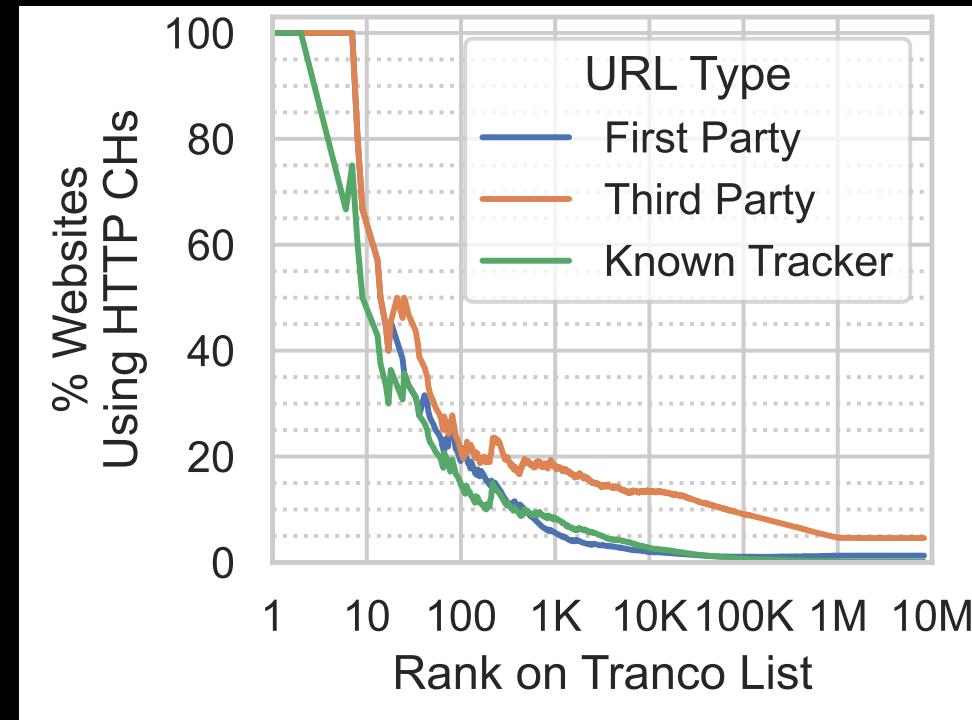
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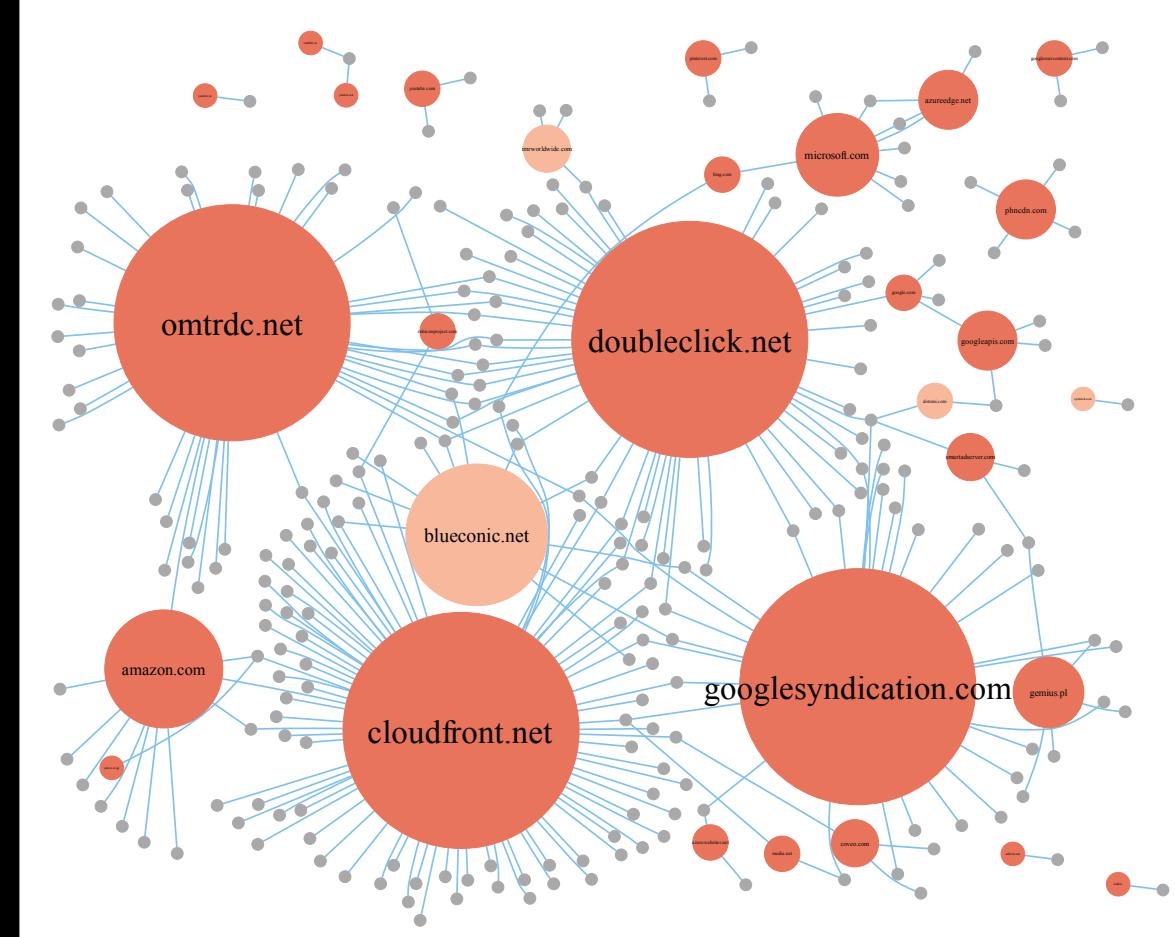
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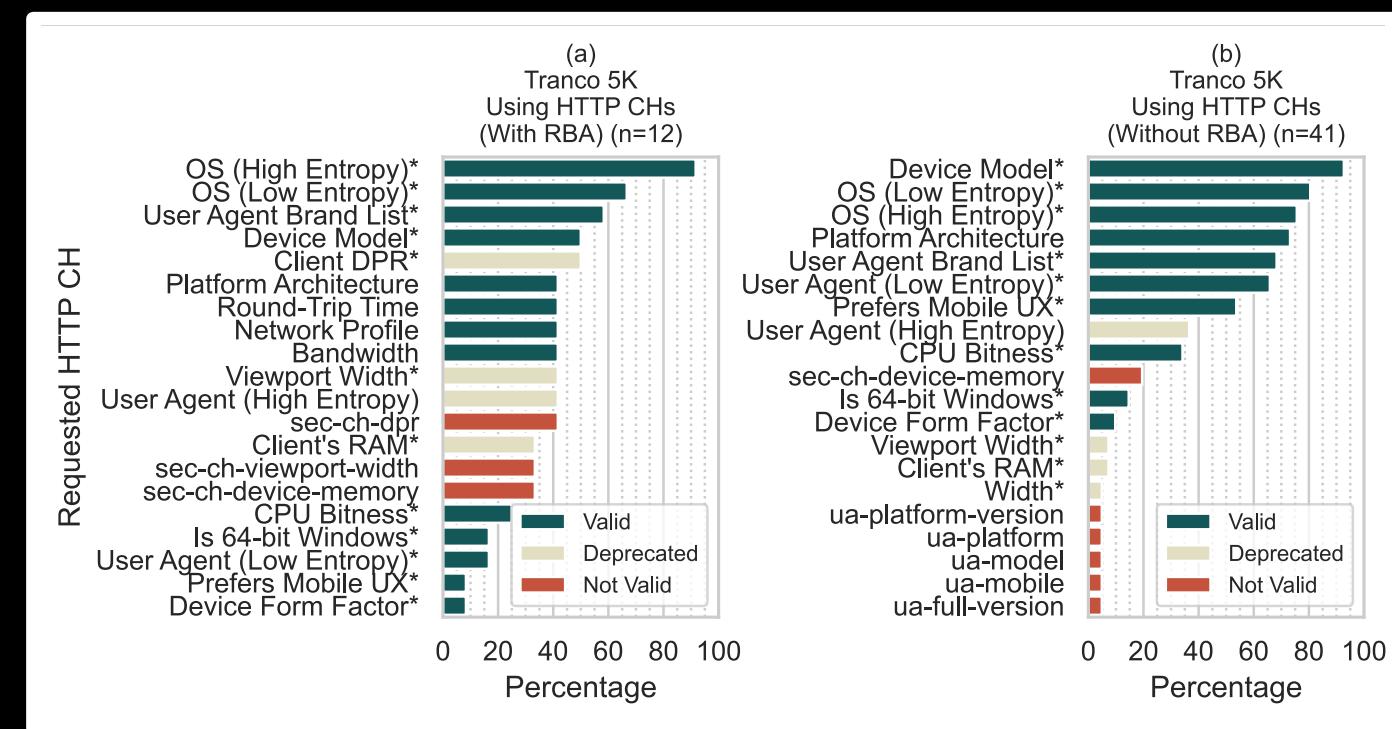


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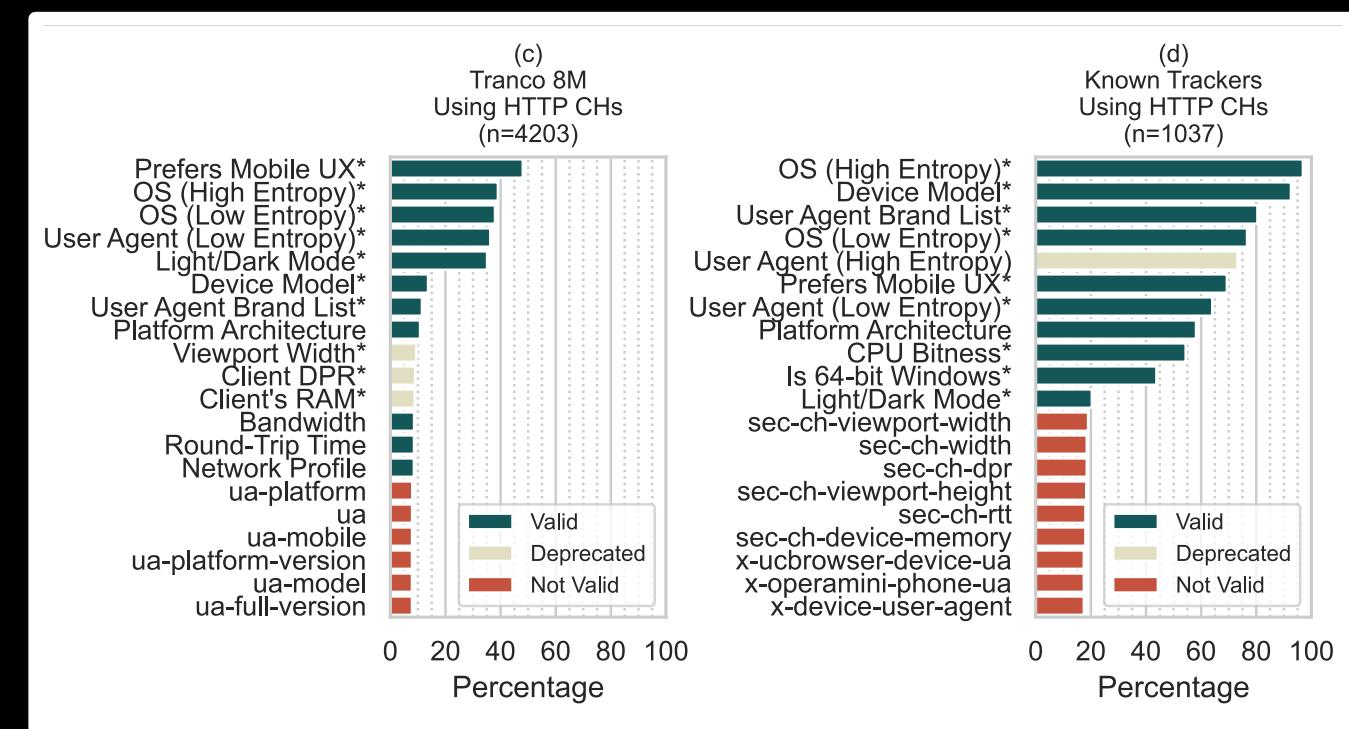
Collected Data Differs on Use Case

- Websites with risk-based authentication (RBA) request higher entropy data than those without

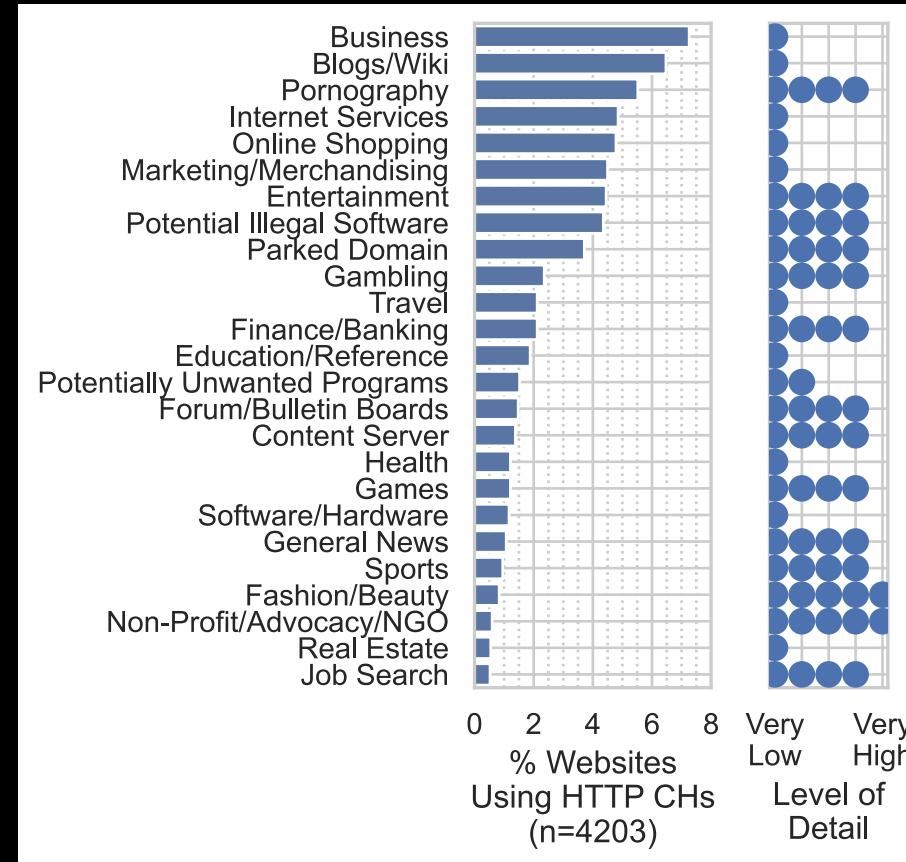


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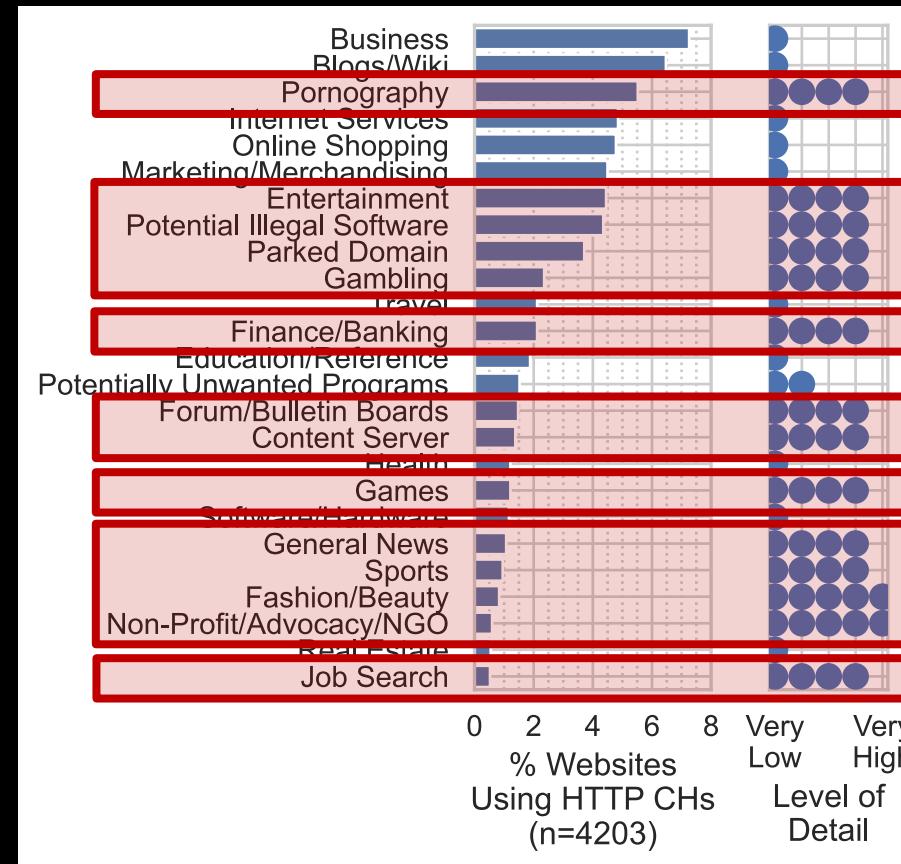
- Known trackers collect more high entropy data than general websites



Website Type Matters, Too



Website Type Matters, Too



Summary

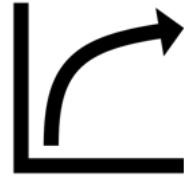
*rbainfo.org/clienthints

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Summary

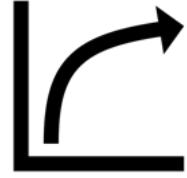


- HTTP CHs are not widespread on 8M top websites

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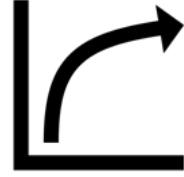
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- But: Highly adopted by third-party trackers

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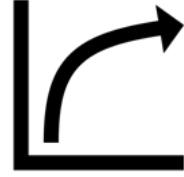
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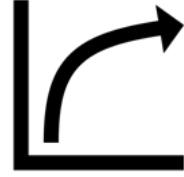
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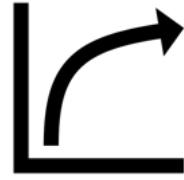
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- Crawling data provided as open data*

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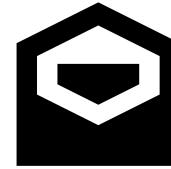
- Crawling data provided as open data*
- Login URLs provided to ethical researchers on request

*rbainfo.org/clienthints

Thank you



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