Functional Privacy

or Why Cookies are Better with Milk

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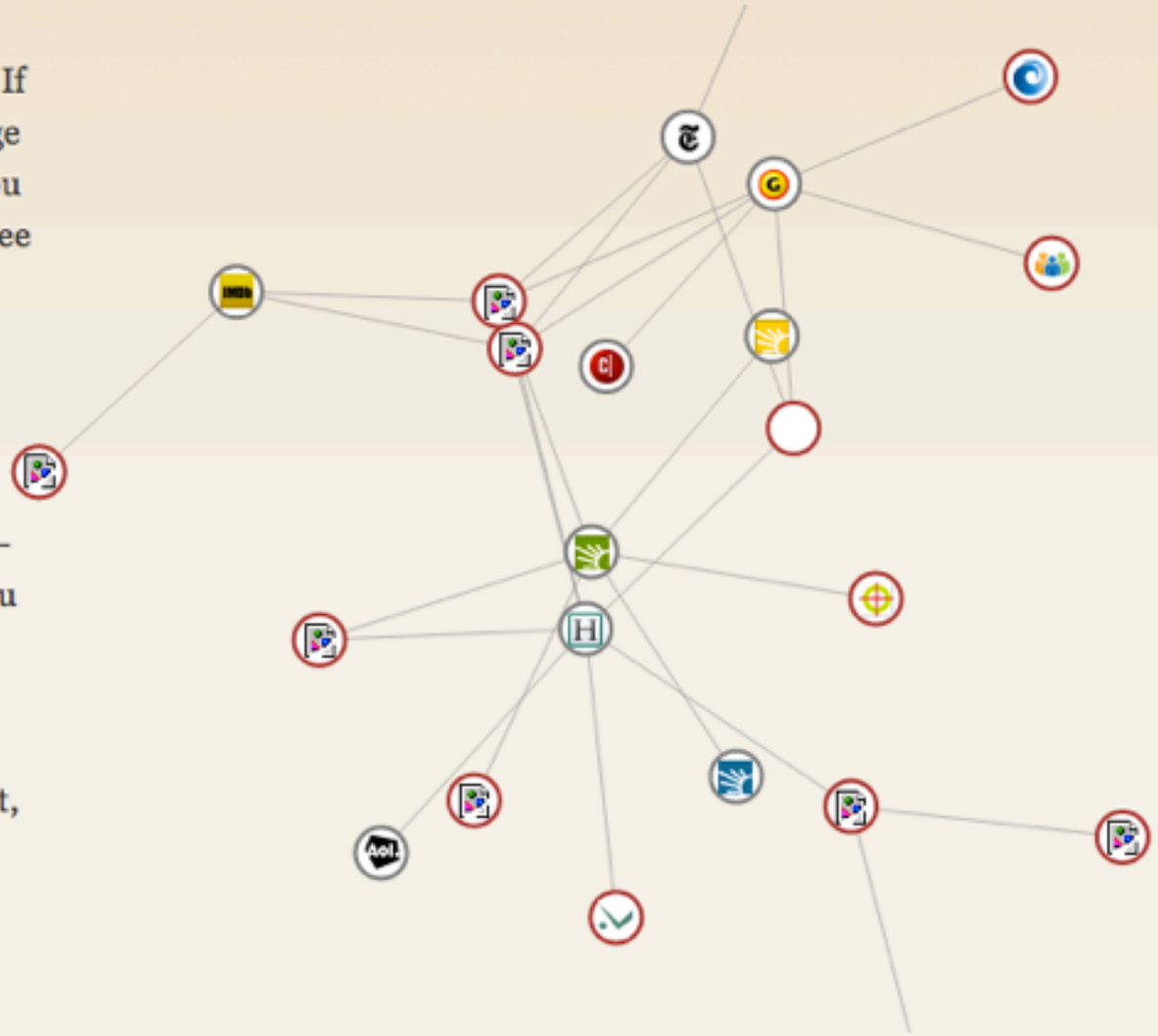
mozilla

Collusion Demo

Thanks for trying out this demo. If you'd like to see this graph change in real time based on the sites you visit in your own browser, feel free to try the Collusion Firefox add-on. Even visiting the sites mentioned in the demo will probably give you different visualizations, because some services you may be logged into—like Facebook—can also track you across sites.

If you want to block companies from tracking you on the internet, you can install TrackerBlock for Firefox and Internet Explorer.

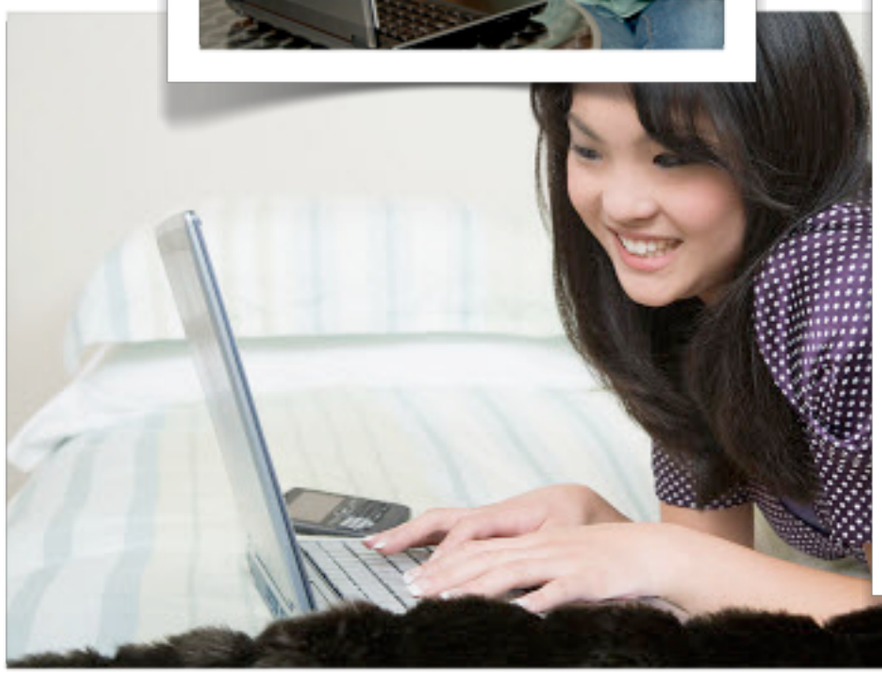
Collusion was created as a prototype by Atul Varma. For more information about the making of this demo, check out the

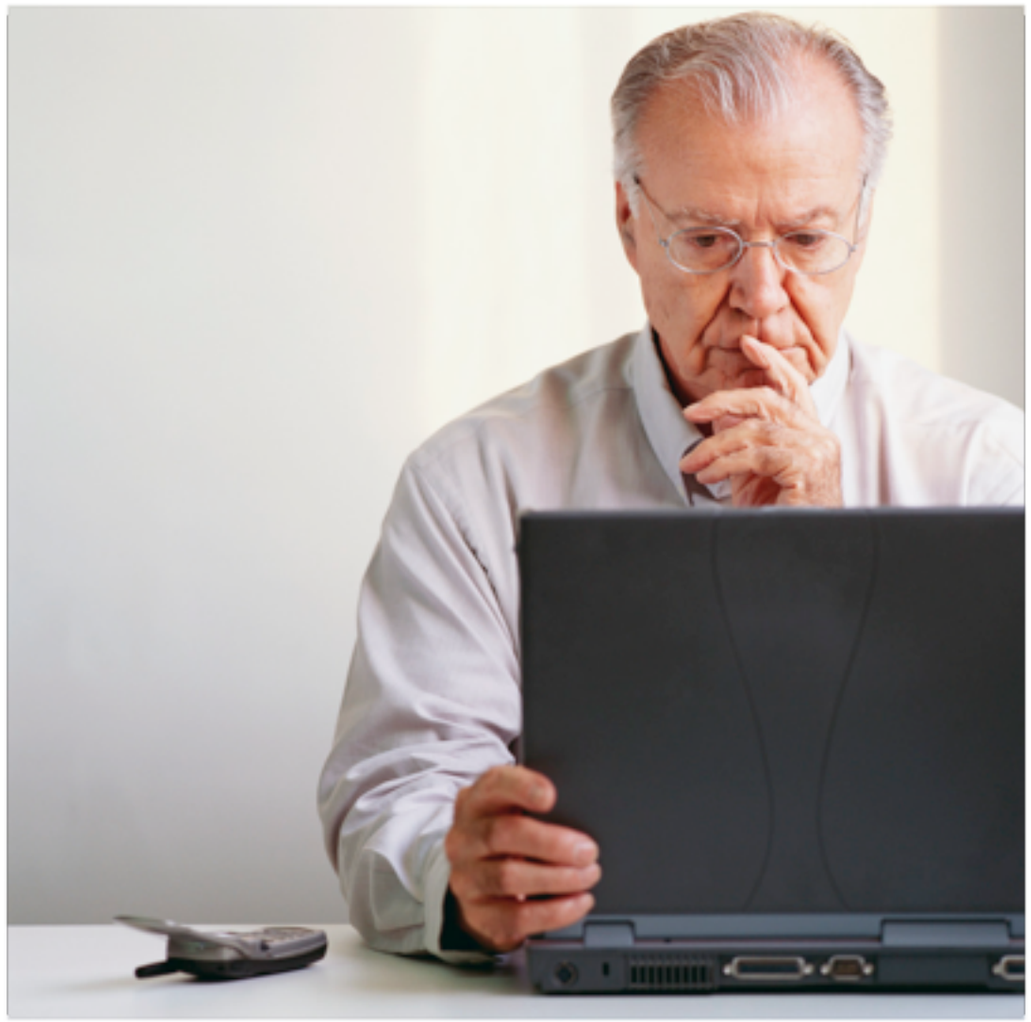


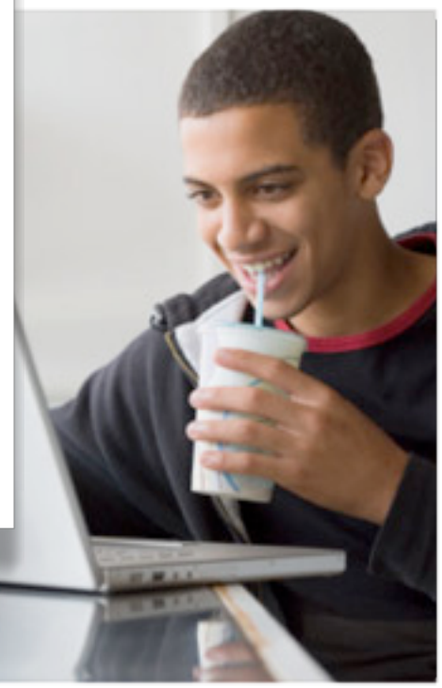
"If you are not paying for it, you're not the customer; you're the product being sold."

-Andrew Lewis

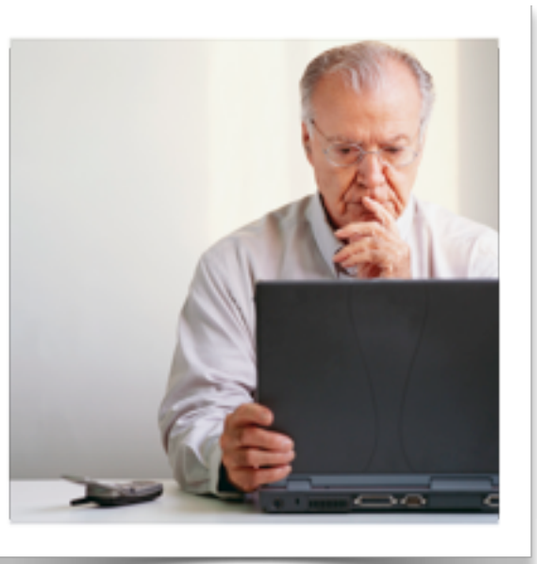








How do we help the common user?

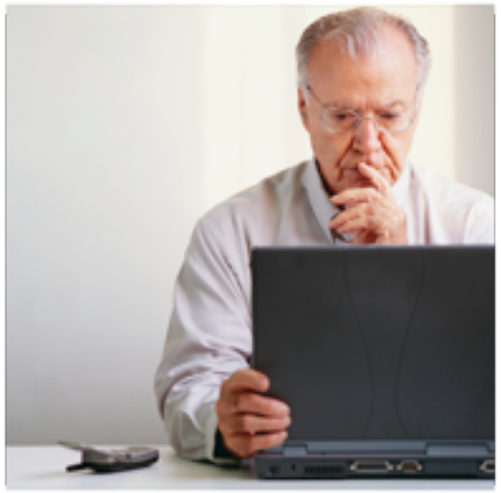


User's dilemma:

privacy with reduced functionality

versus

full functionality without privacy.



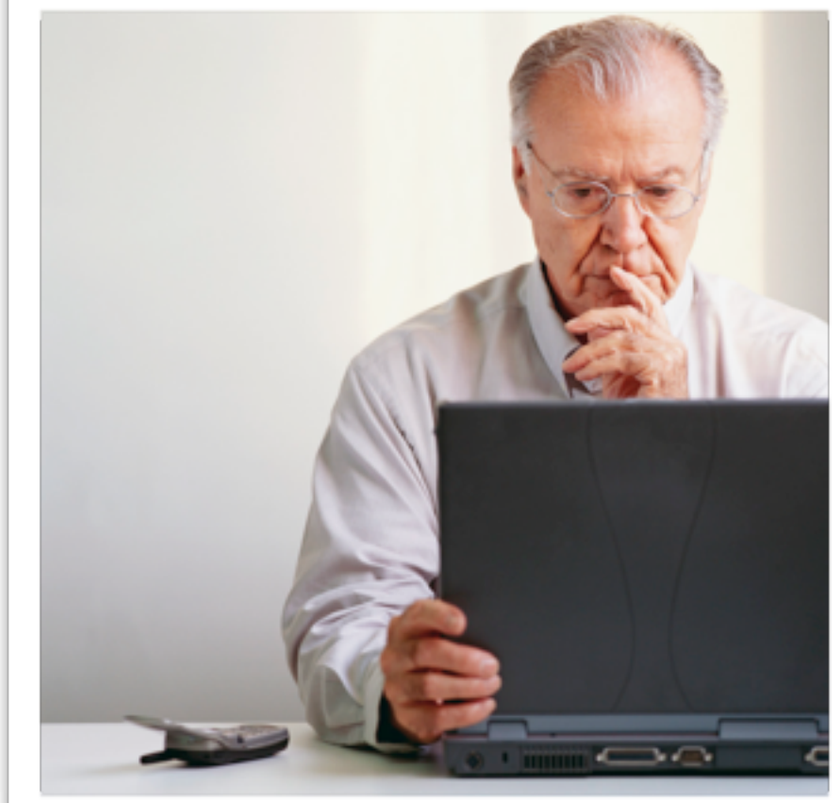
User's dilemma:

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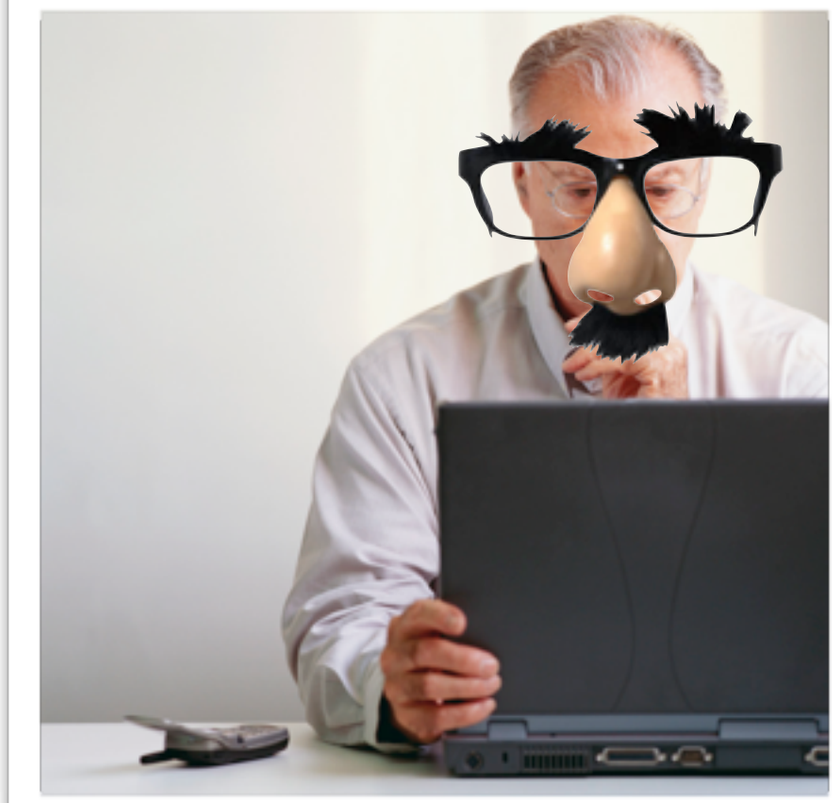
full functionality without privacy.

Intuition:When forced to choose, most users will pick functionality over privacy.



Functional privacy: The privacy that can be obtained without a reduction in service.

Privacy tools will often better serve the common user by adopting a functional privacy approach.



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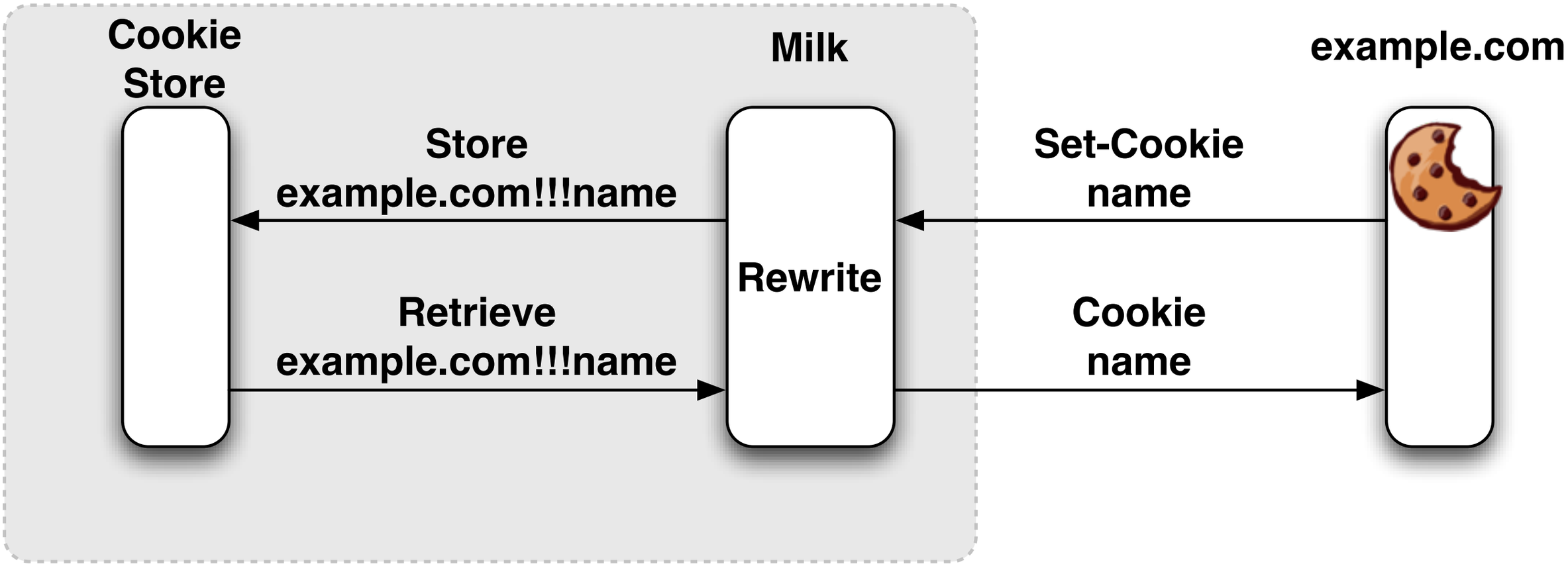
Milk:

A functional privacy approach for limiting consumer tracking on the web.

Implemented as a Chrome extension.



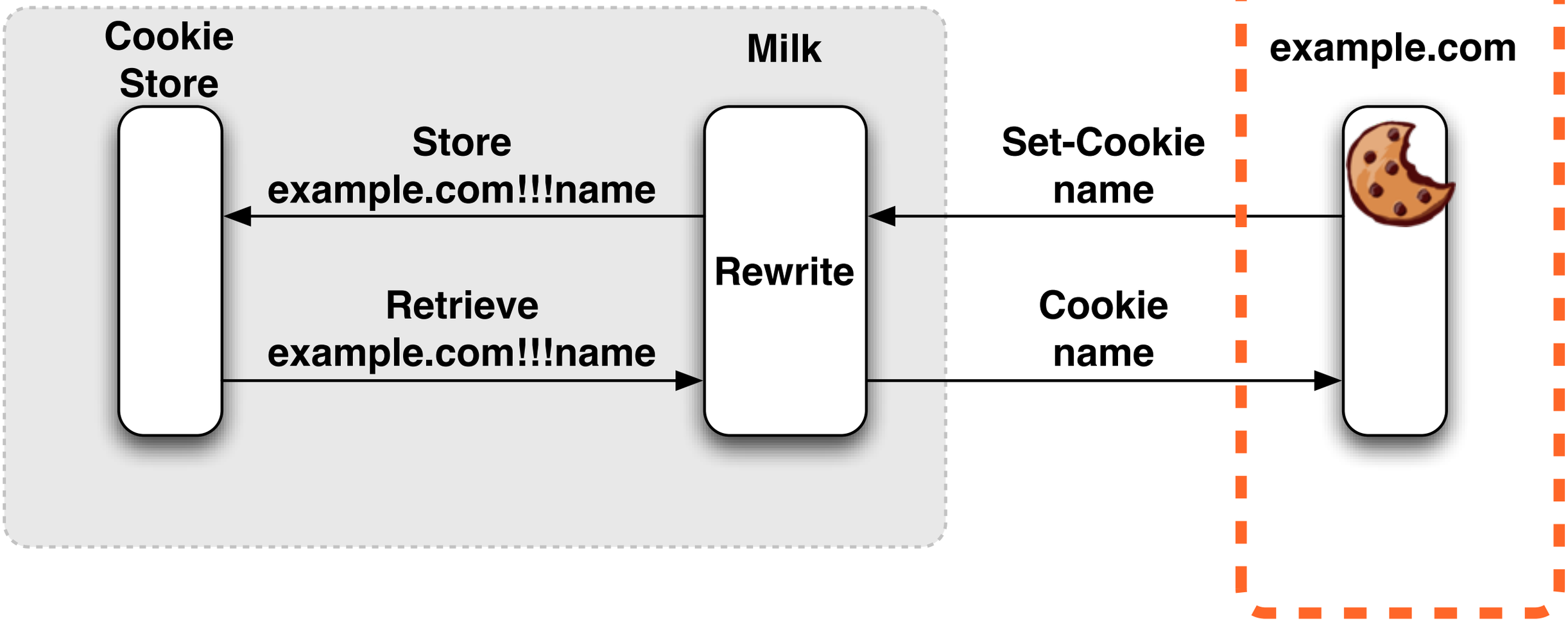
Cookie Binding



Key concept: bind each cookie to the domain that sets it.



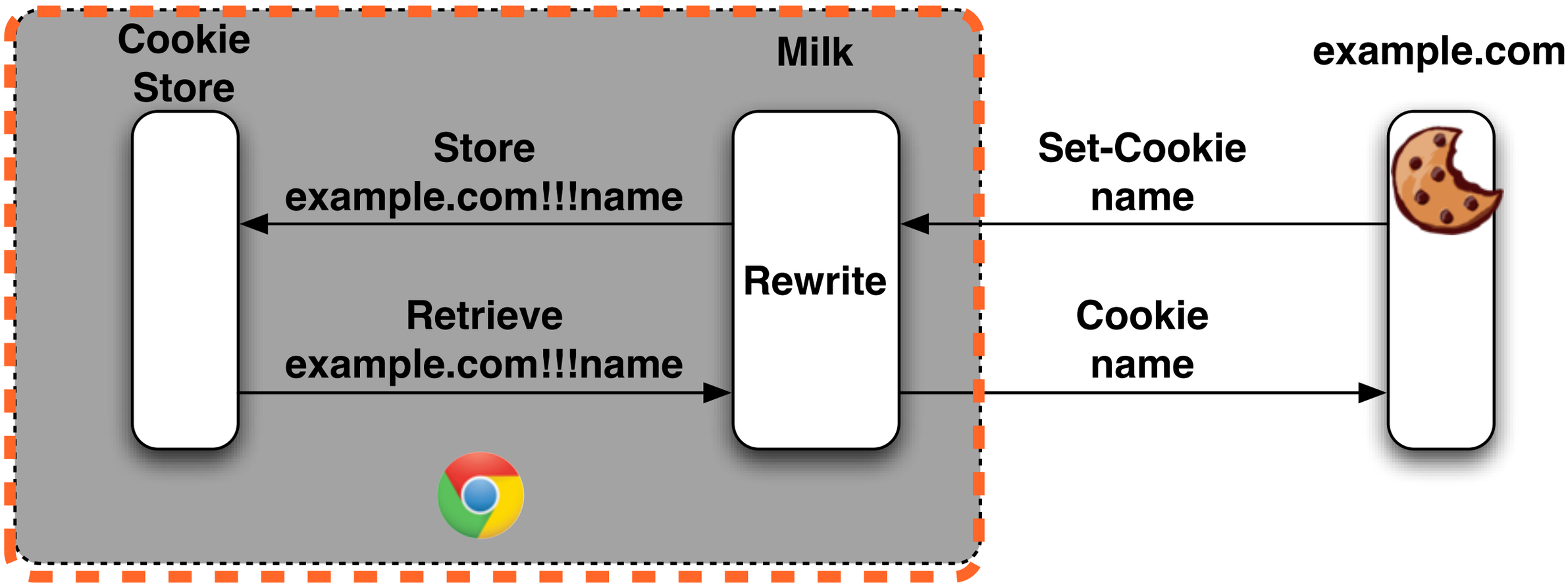
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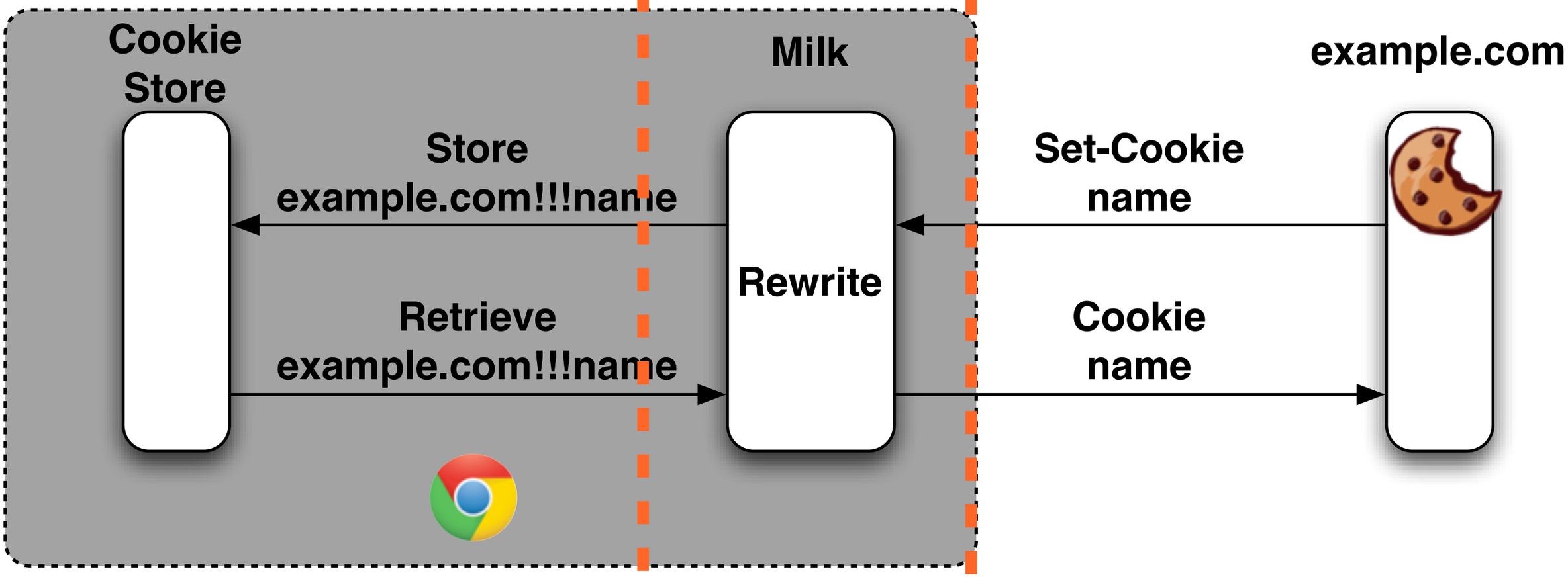
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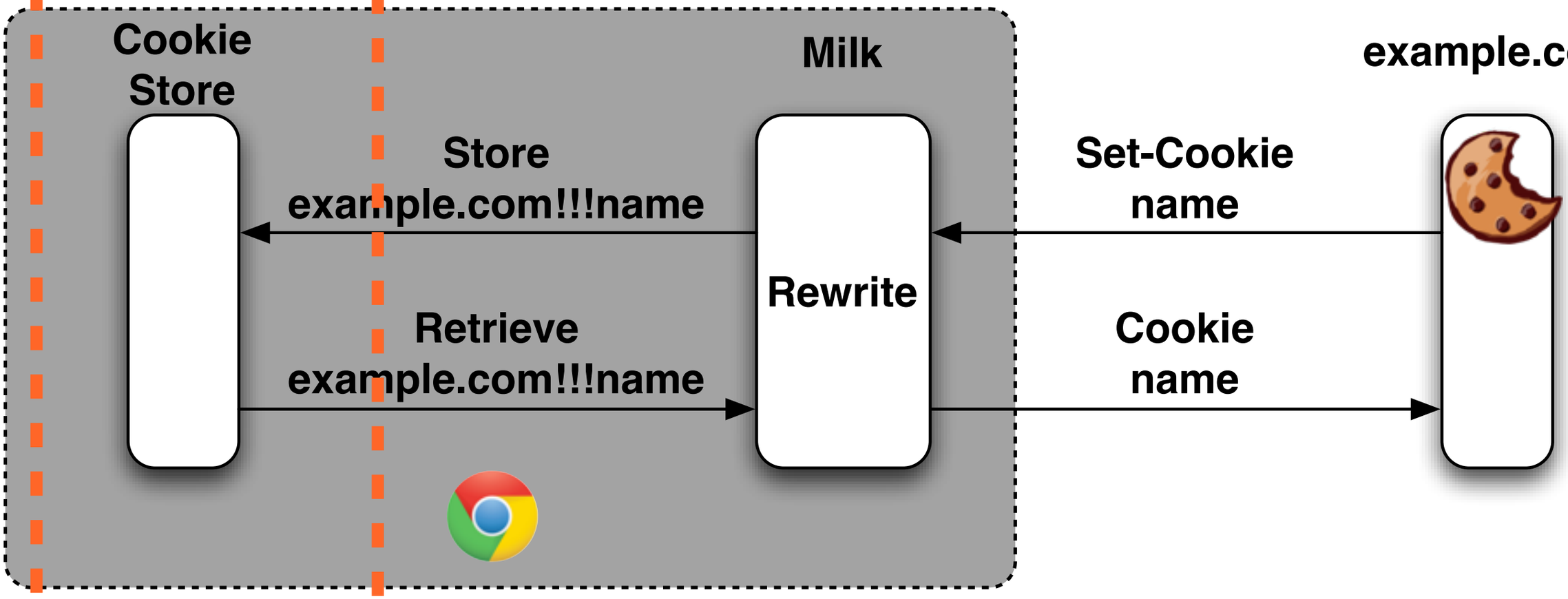


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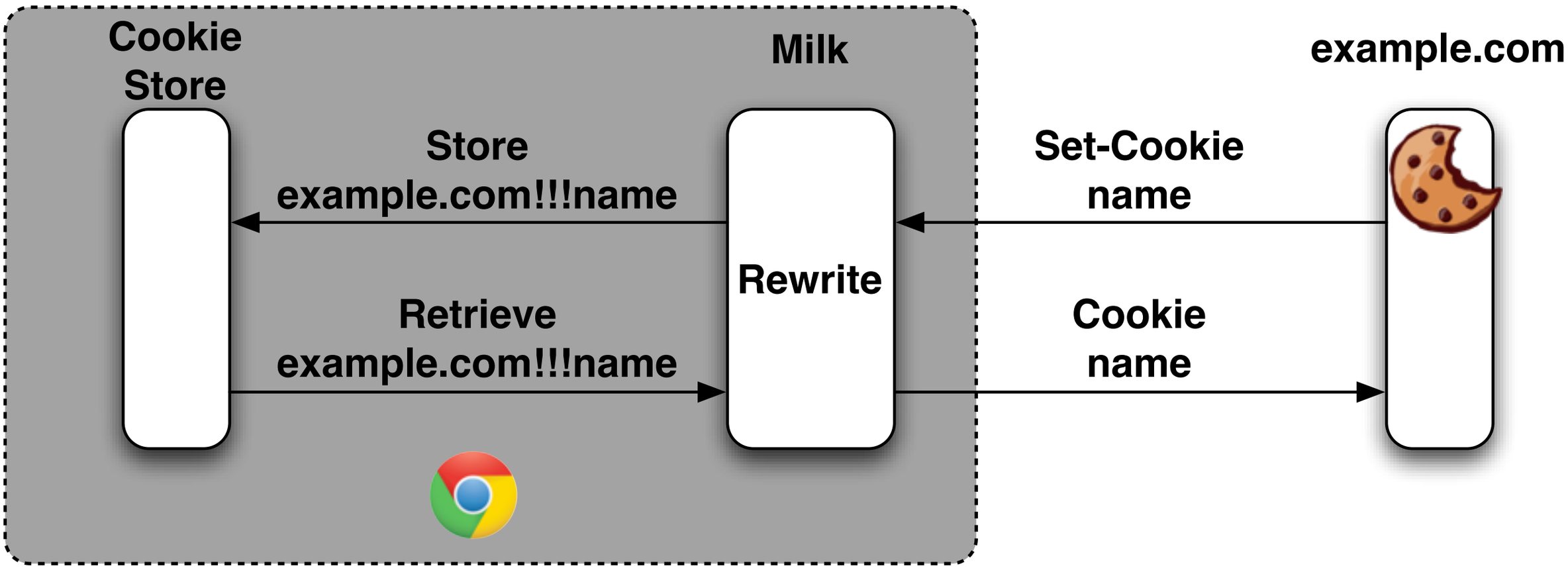
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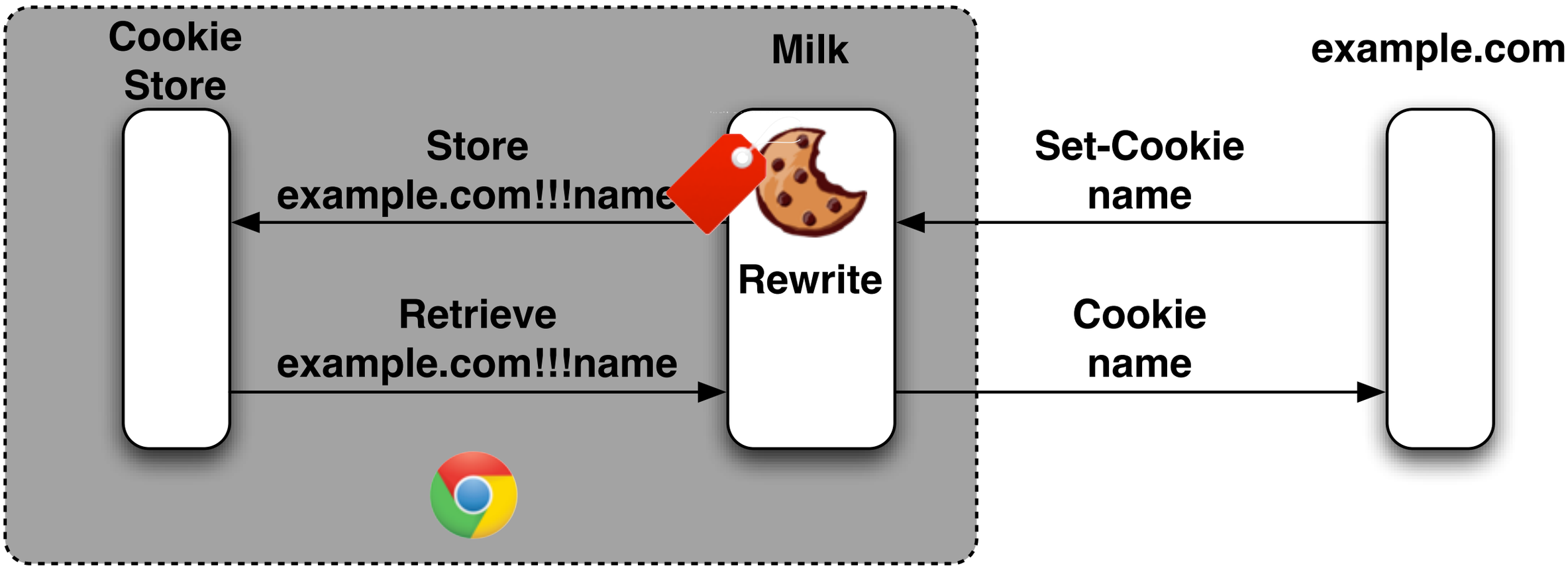
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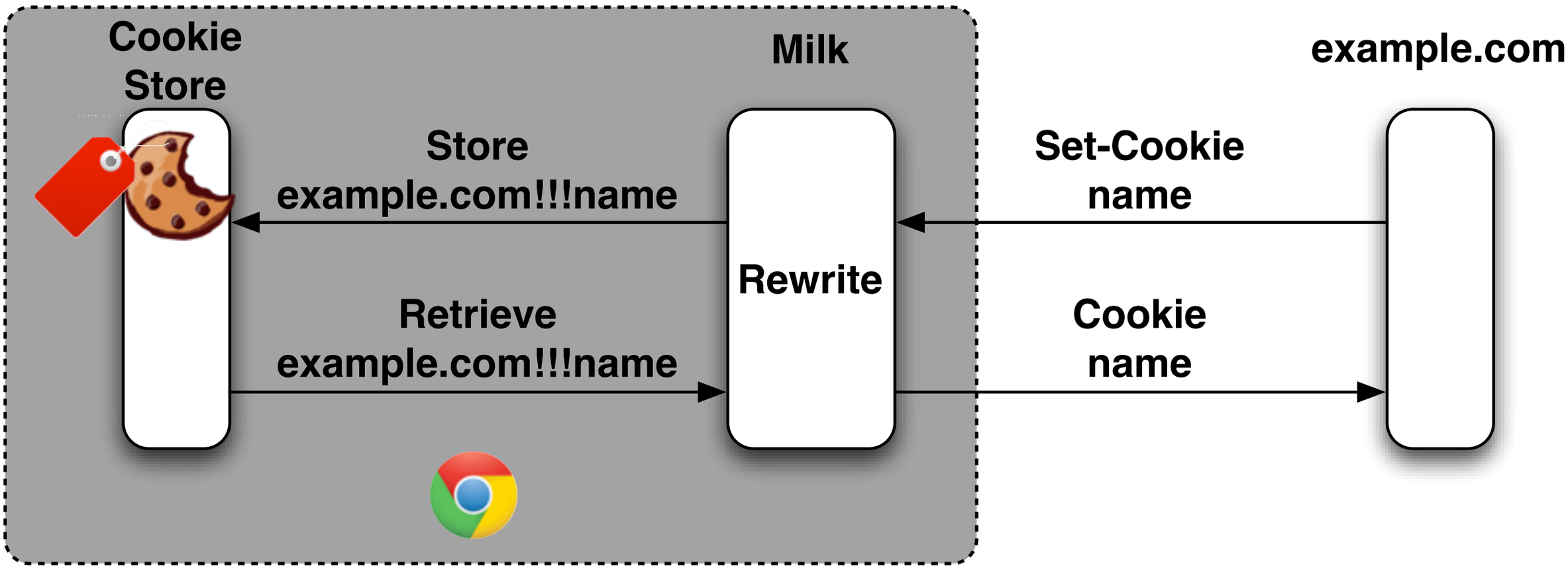
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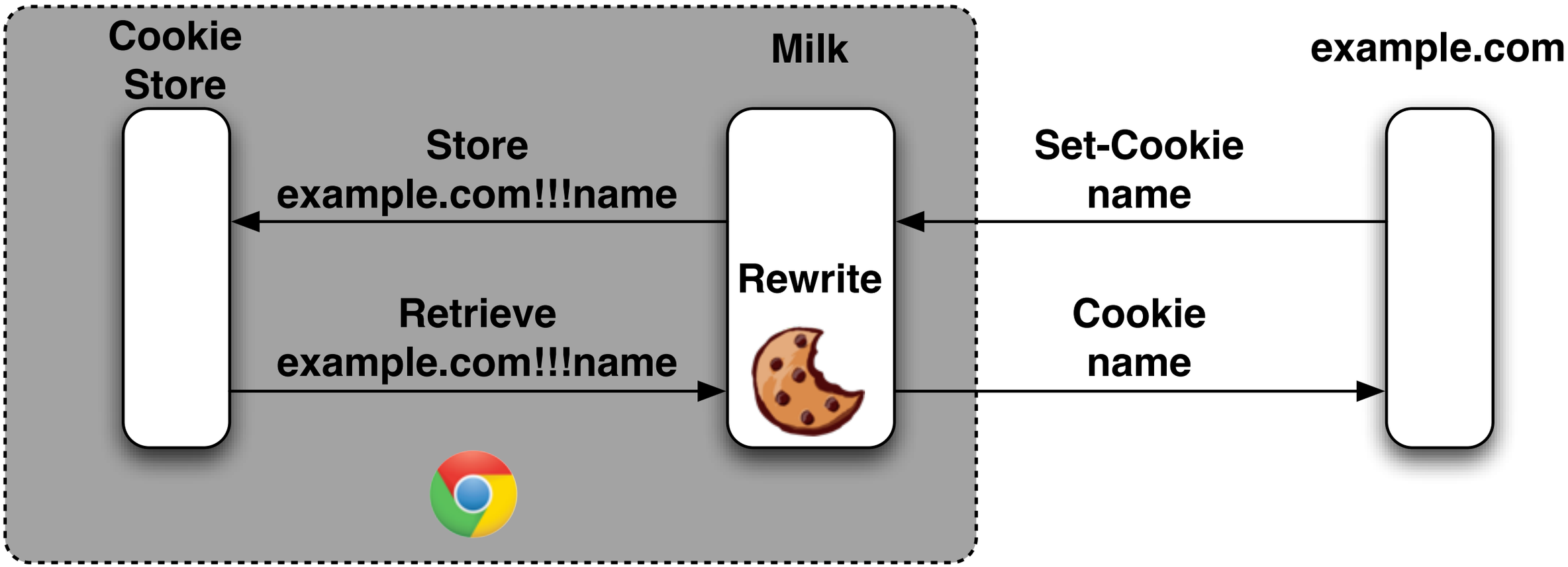
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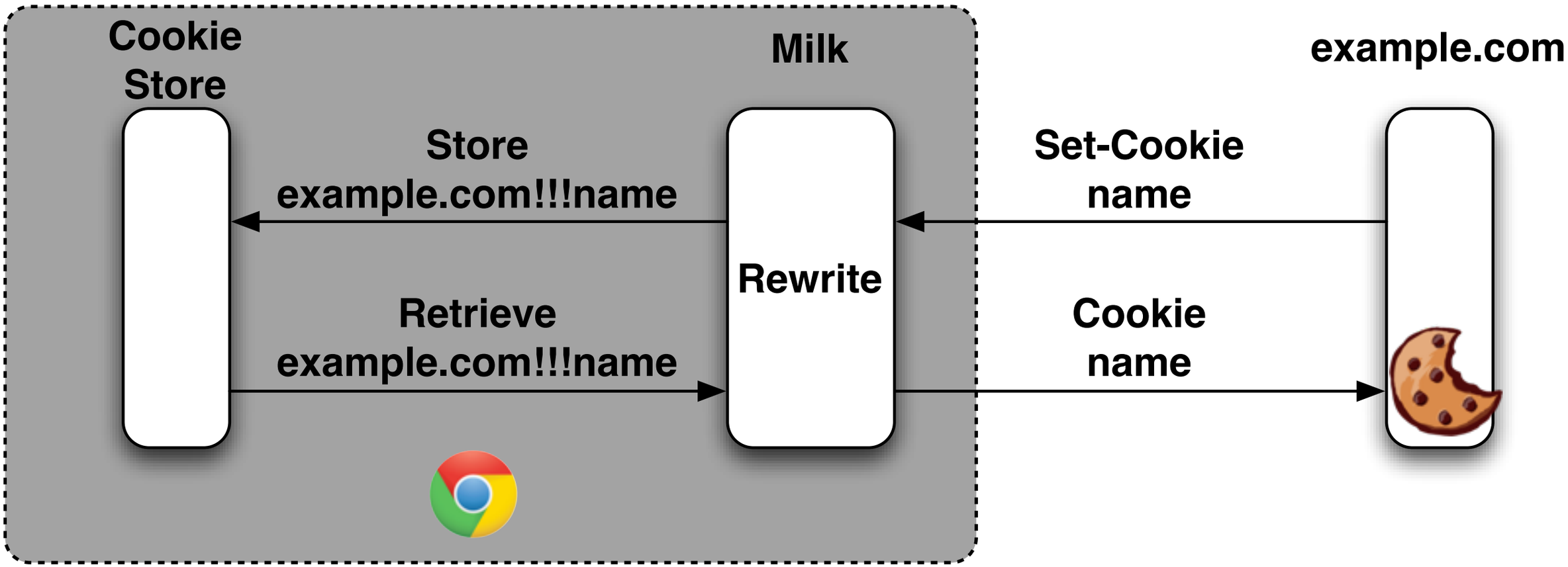
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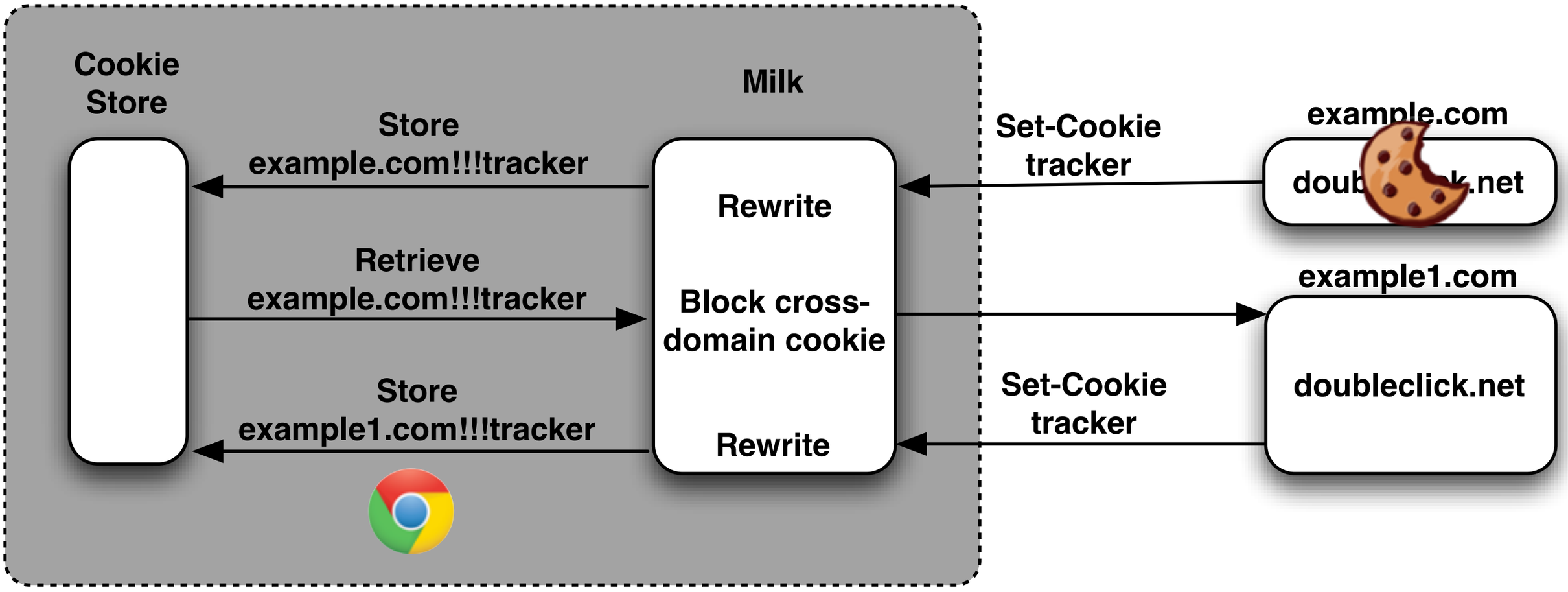
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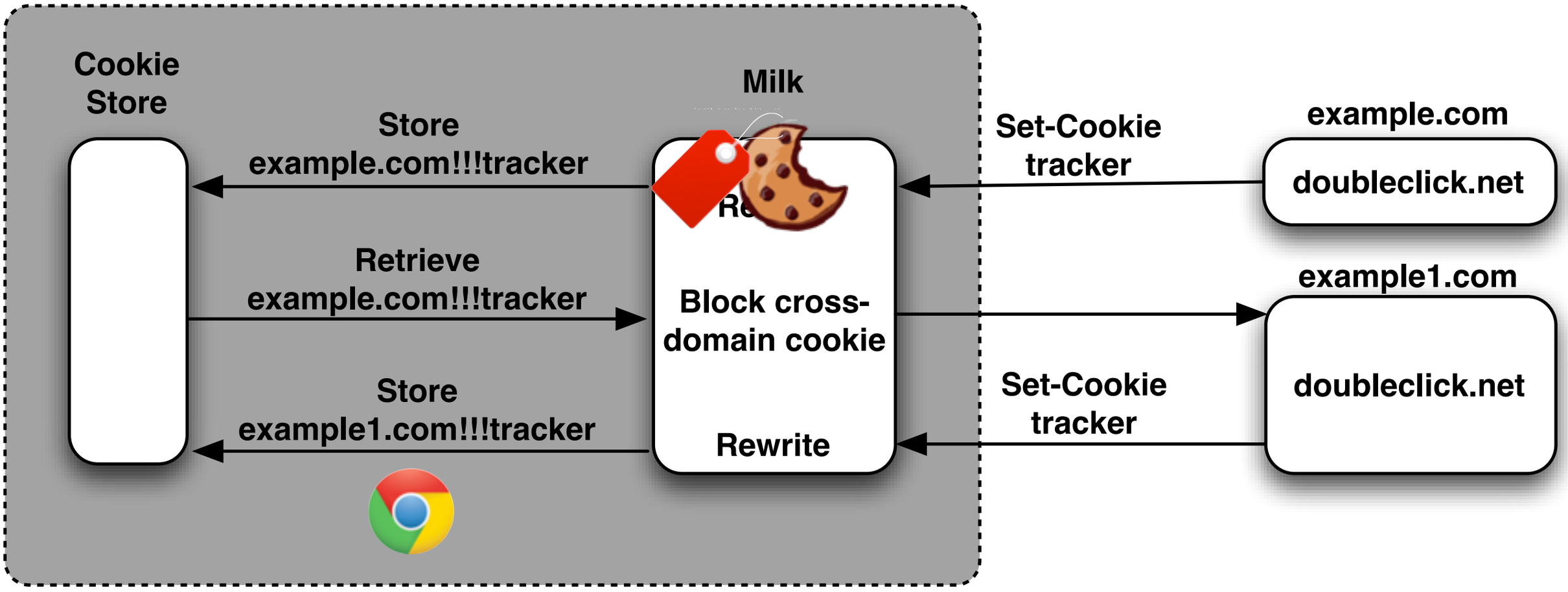
Milk Example



Key concept: third-party tracking cookies are not shared across domains.



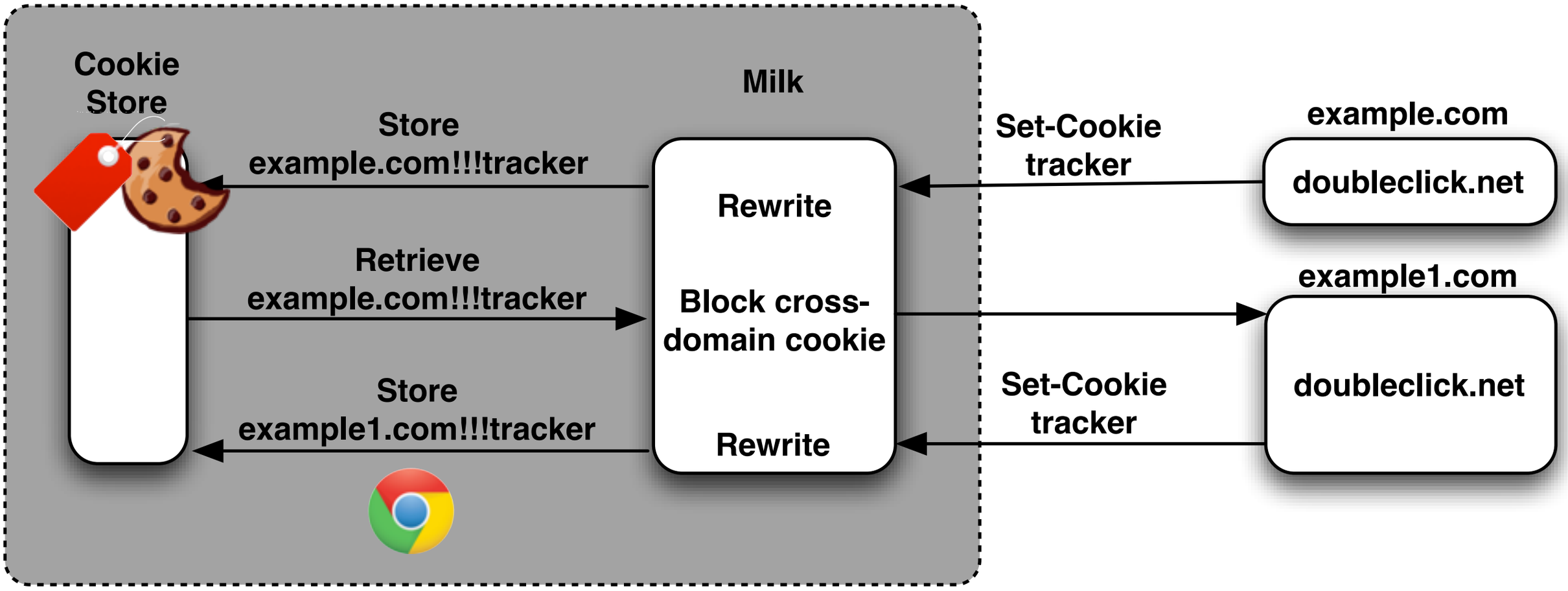
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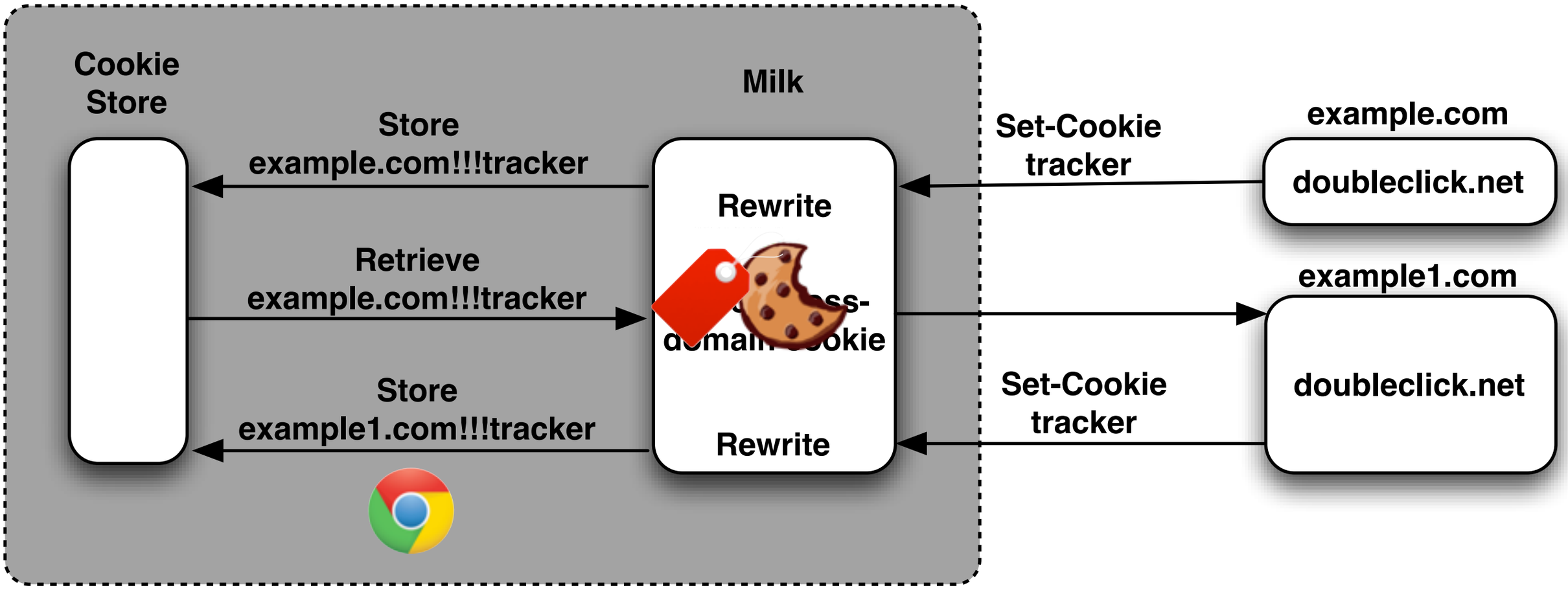
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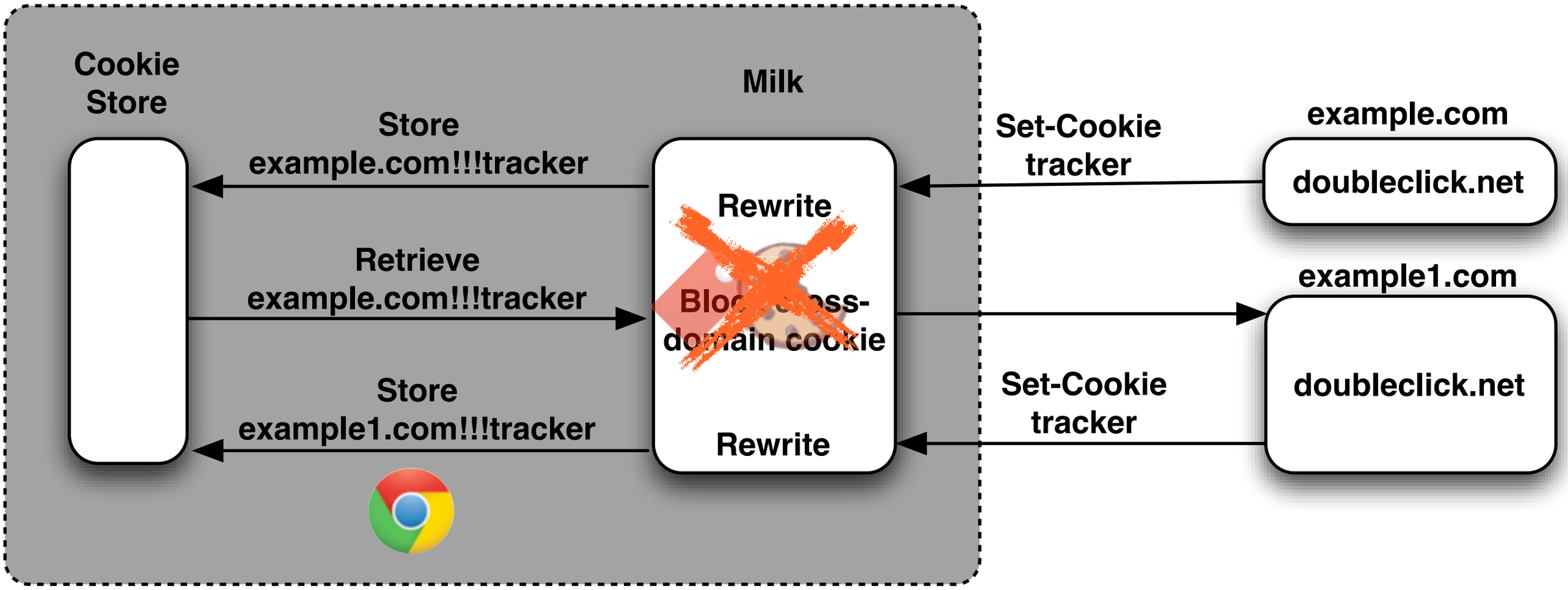
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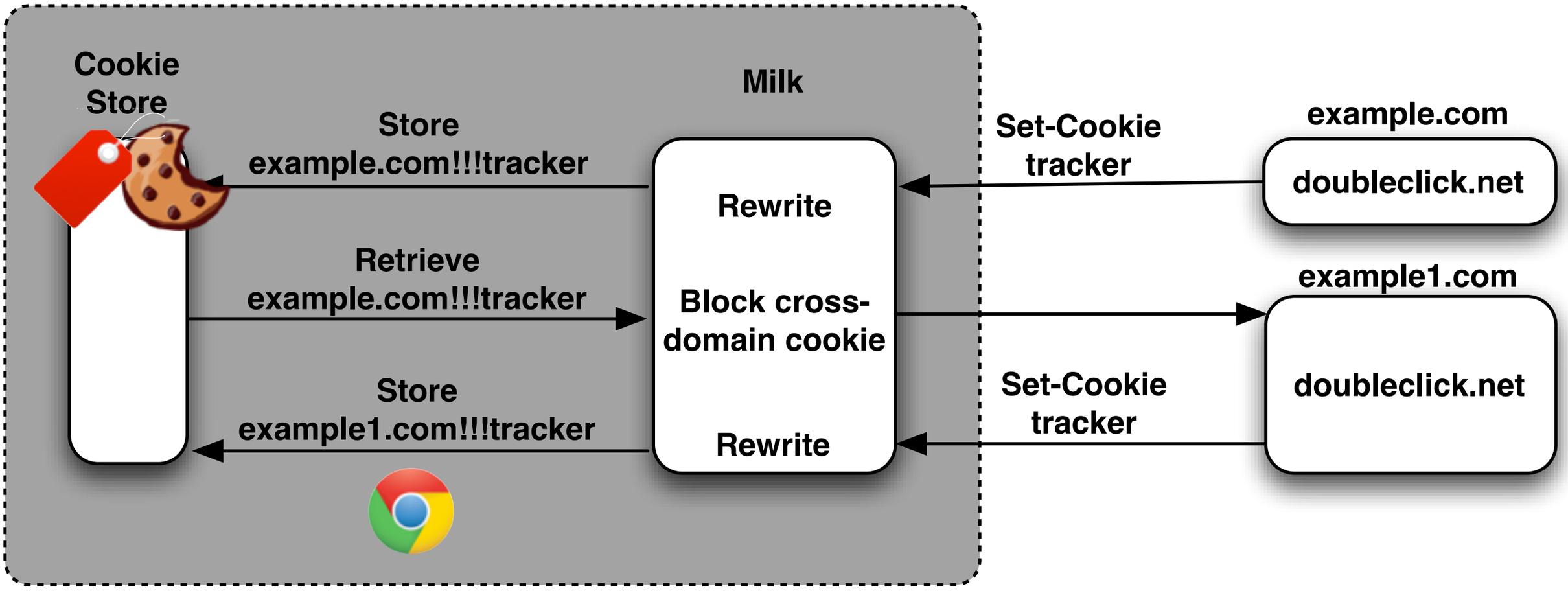
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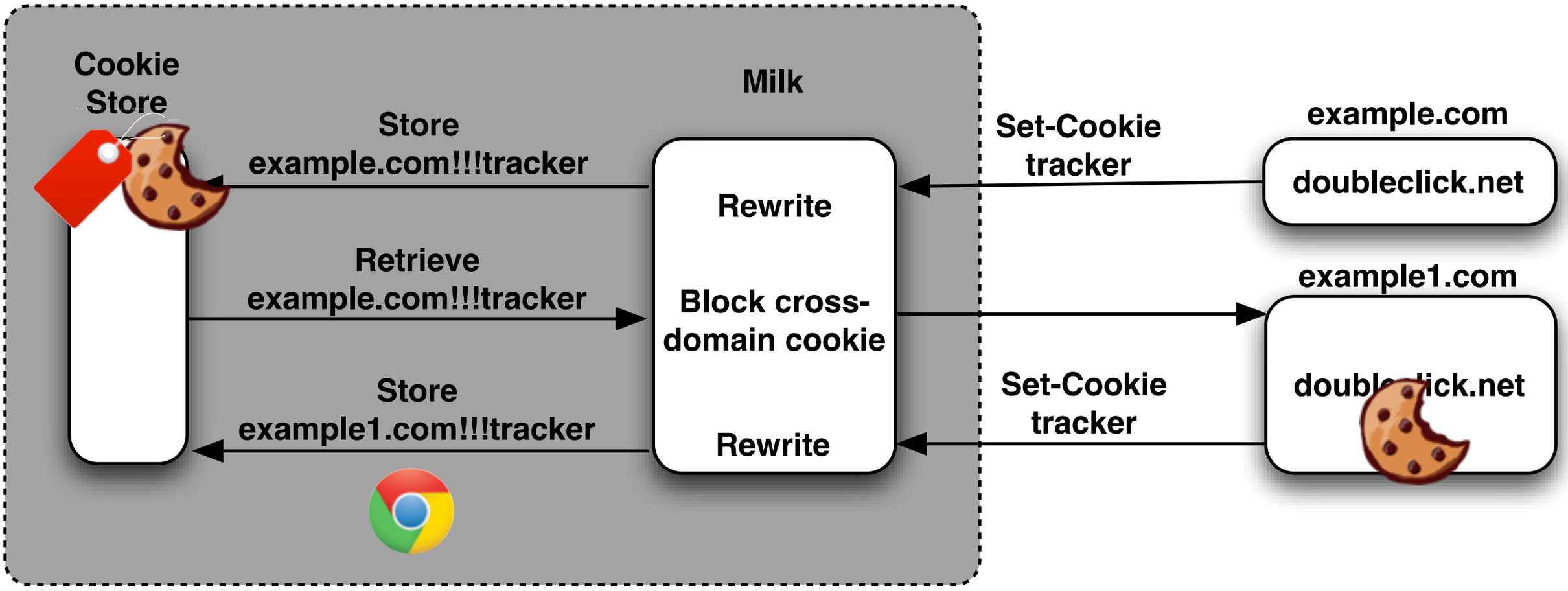
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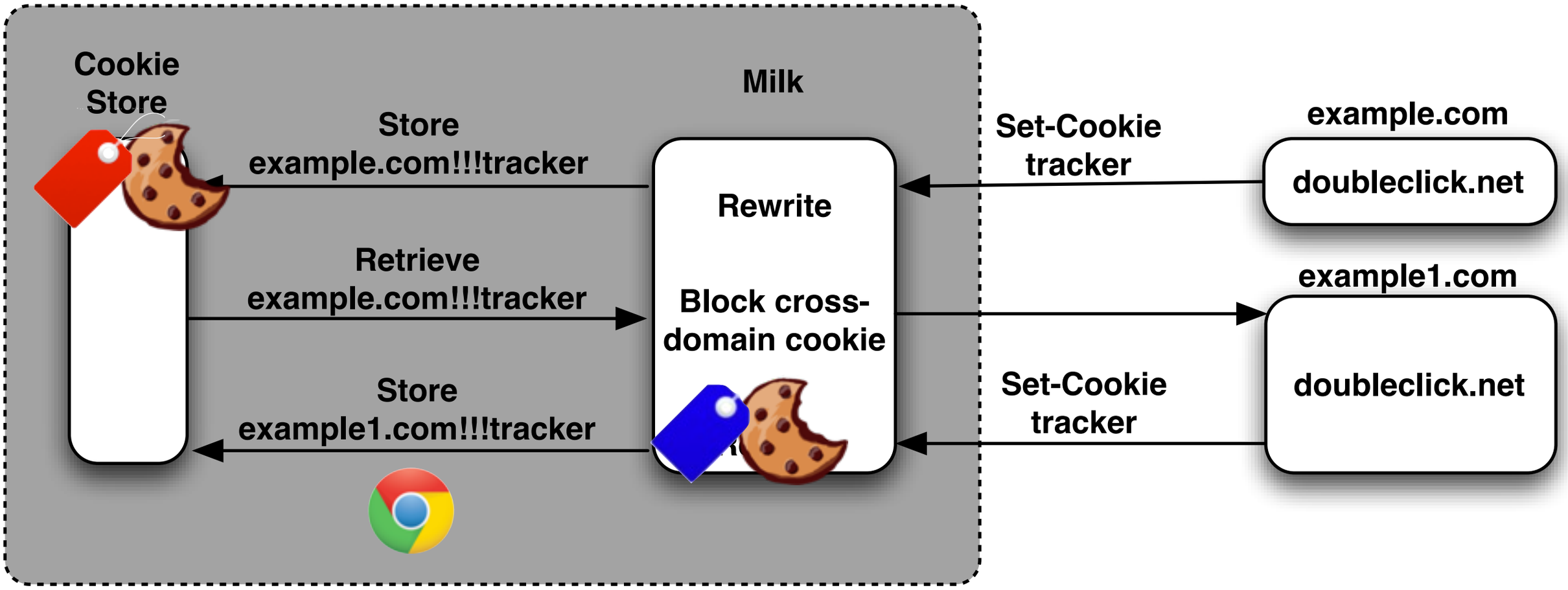
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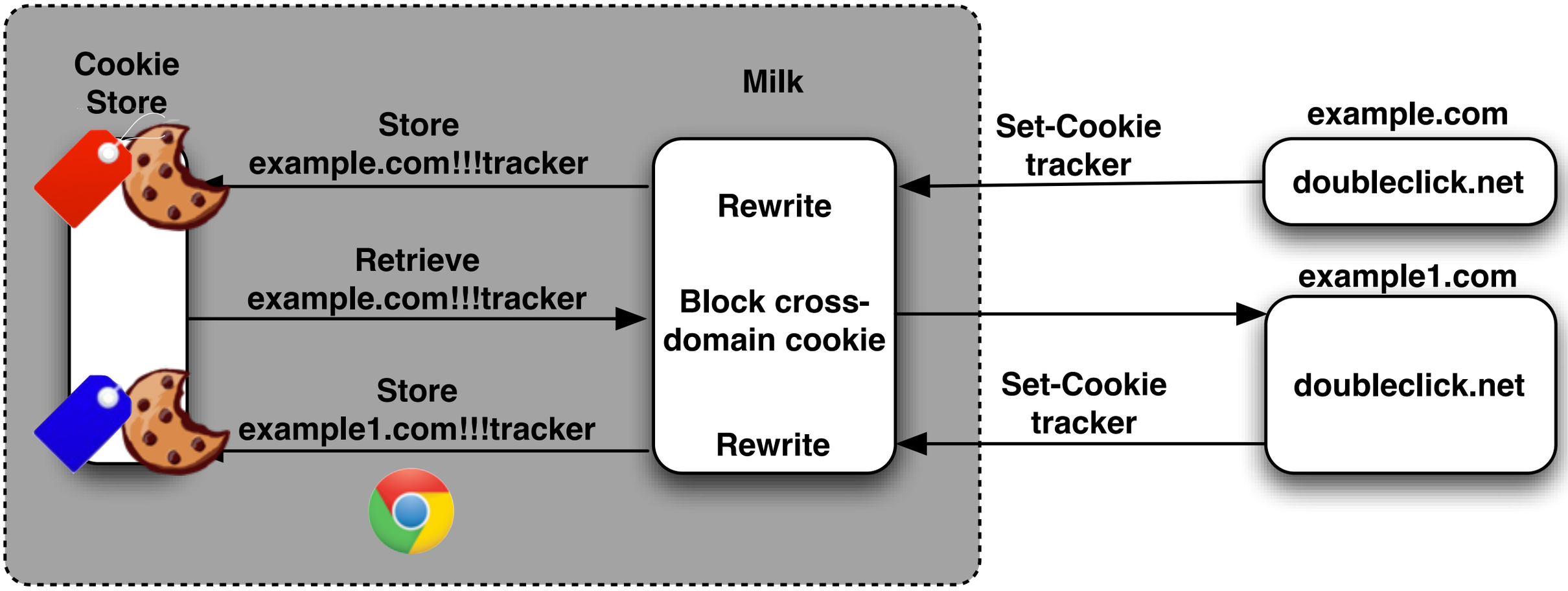
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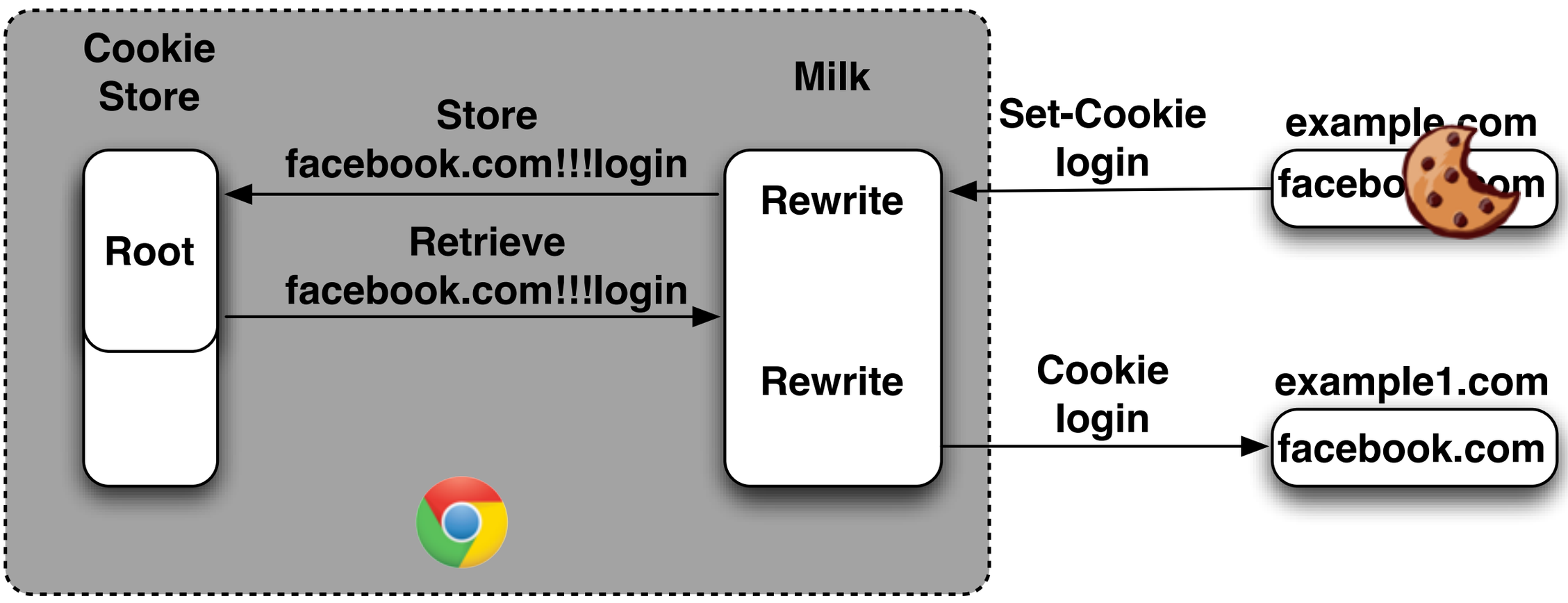


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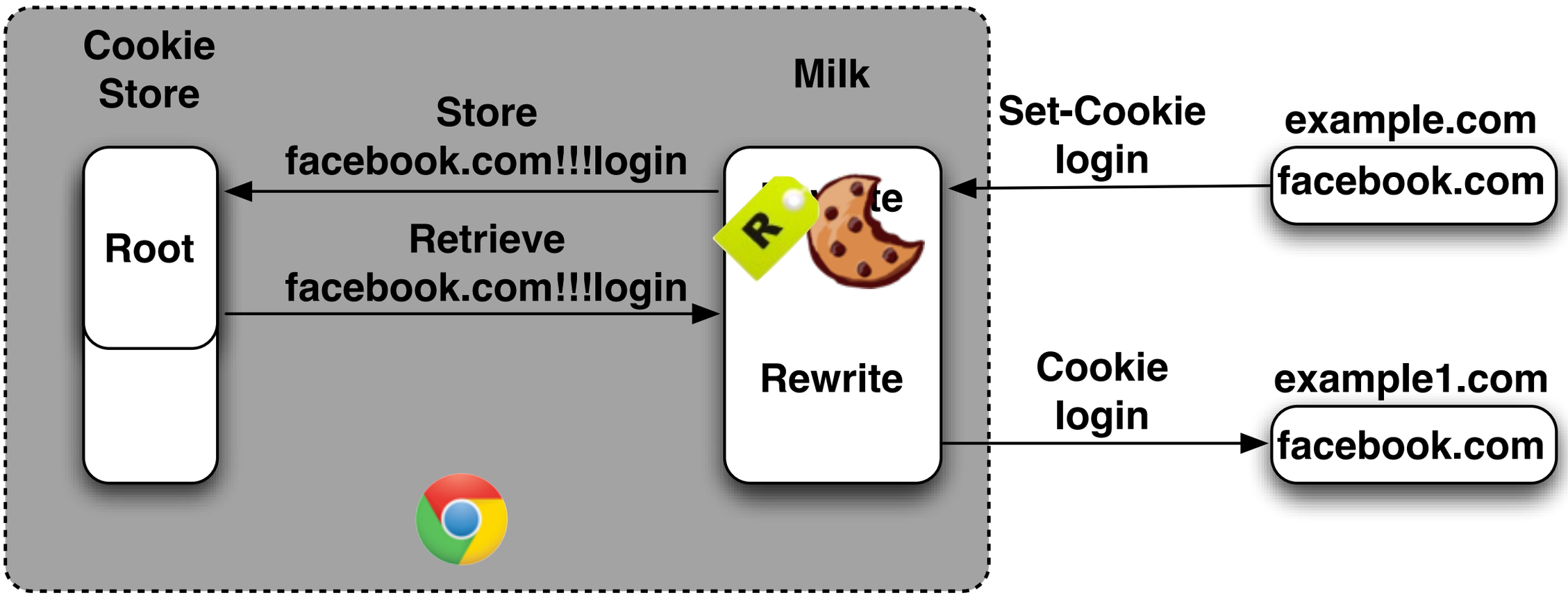
Milk Root Store



Key concept: root cookies are shared across domains.

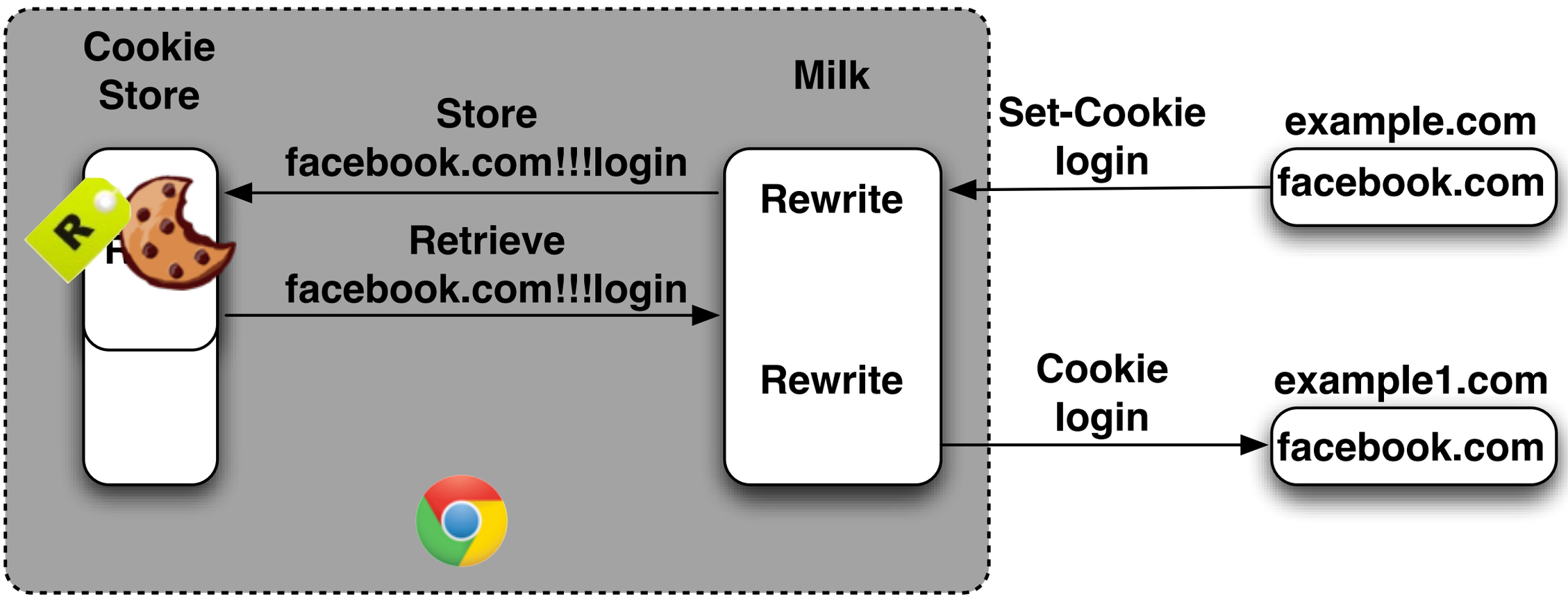


Milk Root Store



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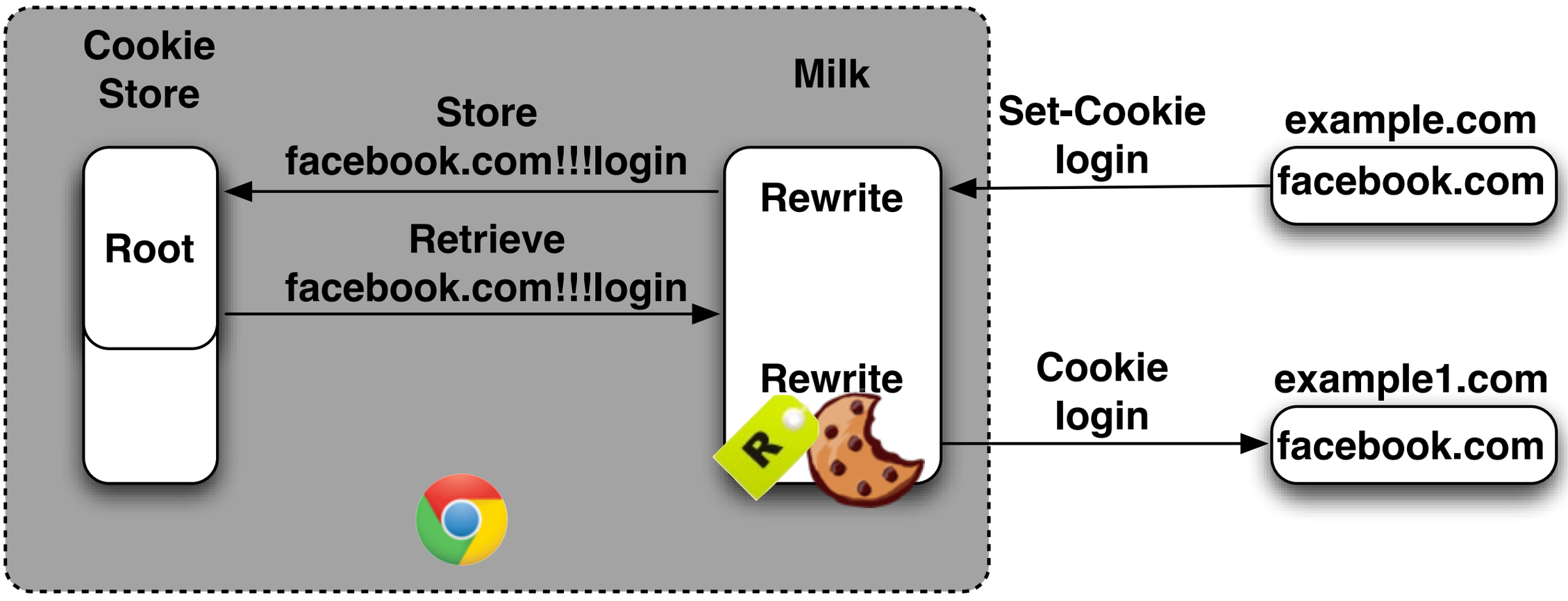
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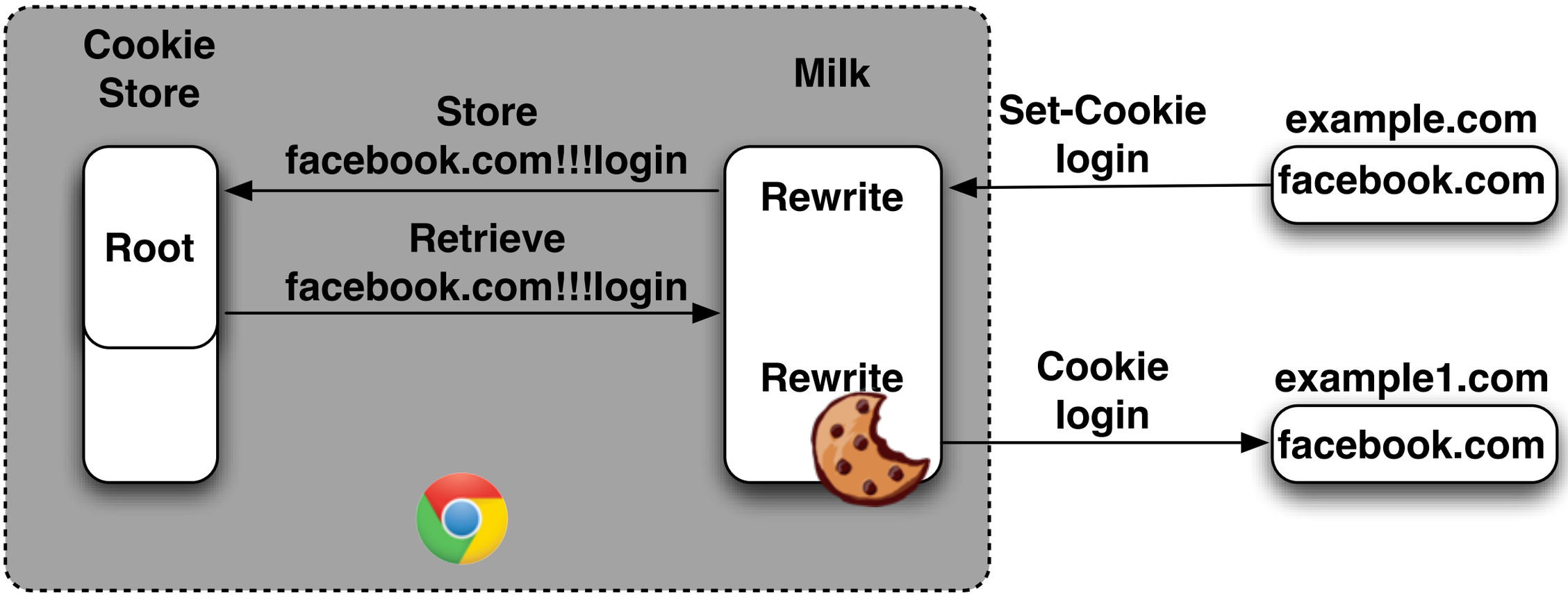
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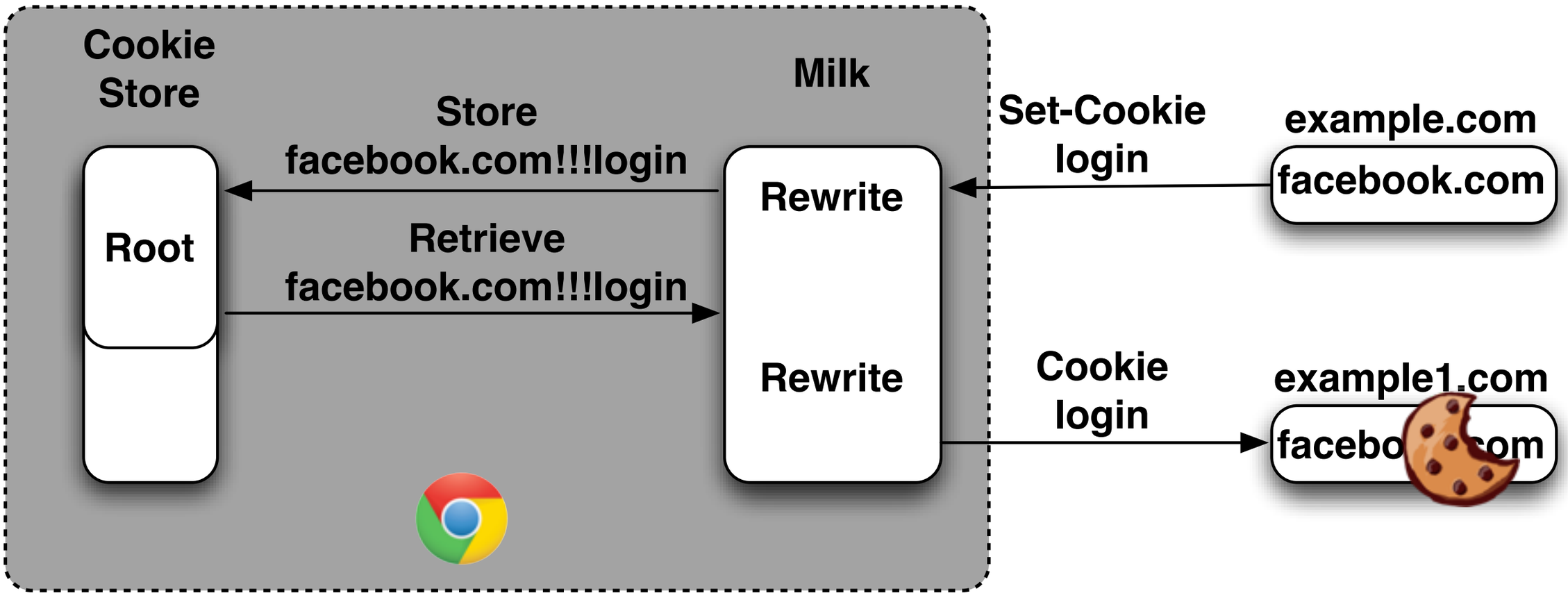
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Milk Root Store



Key concept: root cookies are shared across domains.



Milk Limitations

- Proof of concept, not a product.
- Other tracking methods besides cookies, e.g. IP address, HTML 5 local storage.
- Chrome lacks a synchronous Cookie API.



Functional Privacy
(in the wild)

Tools on the web:

- ShareMeNot [Roesner, NDSI 2012]
- HTTPS Everywhere
- User-Agent Entropy

Other domains:

- Privacy-preserving toll systems
- Location-based services
- Cell phone IMEI tracking

Not all functionally private solutions are effective.

- Informed consent
- Do Not Track headers

Informed Consent

- Idea: Give the user information about how their information is used.
- Problem: ???

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PANDORA

Pandora Terms of Use

Read Pandora's Privacy Policy

To make it a bit easier to digest our Terms of Use, we thought we'd start by highlighting in plain English some of the issues. This summary is not a legal document. Of course you'll want to read the complete Terms of Use, but here is what we think is important:

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Informed Consent

- Idea: Give the user information about how their information is used.
- Problem: Too much to read, too hard to understand, too little time --- about 200 hours worth of reading per year.

Do Not Track

- Idea: Header mechanism for opting out.
- Problem: ???

Conflict Over How Open 'Do

www.nytimes.com/2012/03/30/technology/debating-the-path-to-do-not-track.html?_r=2

Conflict Over How Open 'Do Not Track' Talks Will Be

By EDWARD WYATT and TANZINA VEGA
Published: March 29, 2012

WASHINGTON — Technology companies want to talk with the government about protecting privacy on the Internet. They just want those talks to be private.

Enlarge This Image



Win McNamee/Getty Images

Jon Leibowitz, chairman of the F.T.C., says the group takes Do Not Track to mean not collecting any data from consumers.

Representatives of advertising companies, Internet sites and technology companies told a House subcommittee on Thursday that they thought Internet privacy policies, including Do Not Track options, should be created through an "open and transparent" process, as two government agencies have recommended.

But openness is relative. "If this process takes the form of a public discussion, industry participants will be looking over their shoulders or sitting on their hands instead of offering bold ideas for workable solutions," said Jonathan Zuck, president of the Association for Competitive Technology, a trade association of software, hardware and technology consulting companies.

The Commerce Department and the Federal Trade Commission, which are encouraging companies to be more open with consumers about their privacy policies, say that any such talks should be accessible to, if not include, Internet users.

"We don't think there is any substitute for openness and transparency," Lawrence E. Strickling, assistant secretary for communication and information at the Commerce Department, told the subcommittee, a part of the House Energy and Commerce Committee

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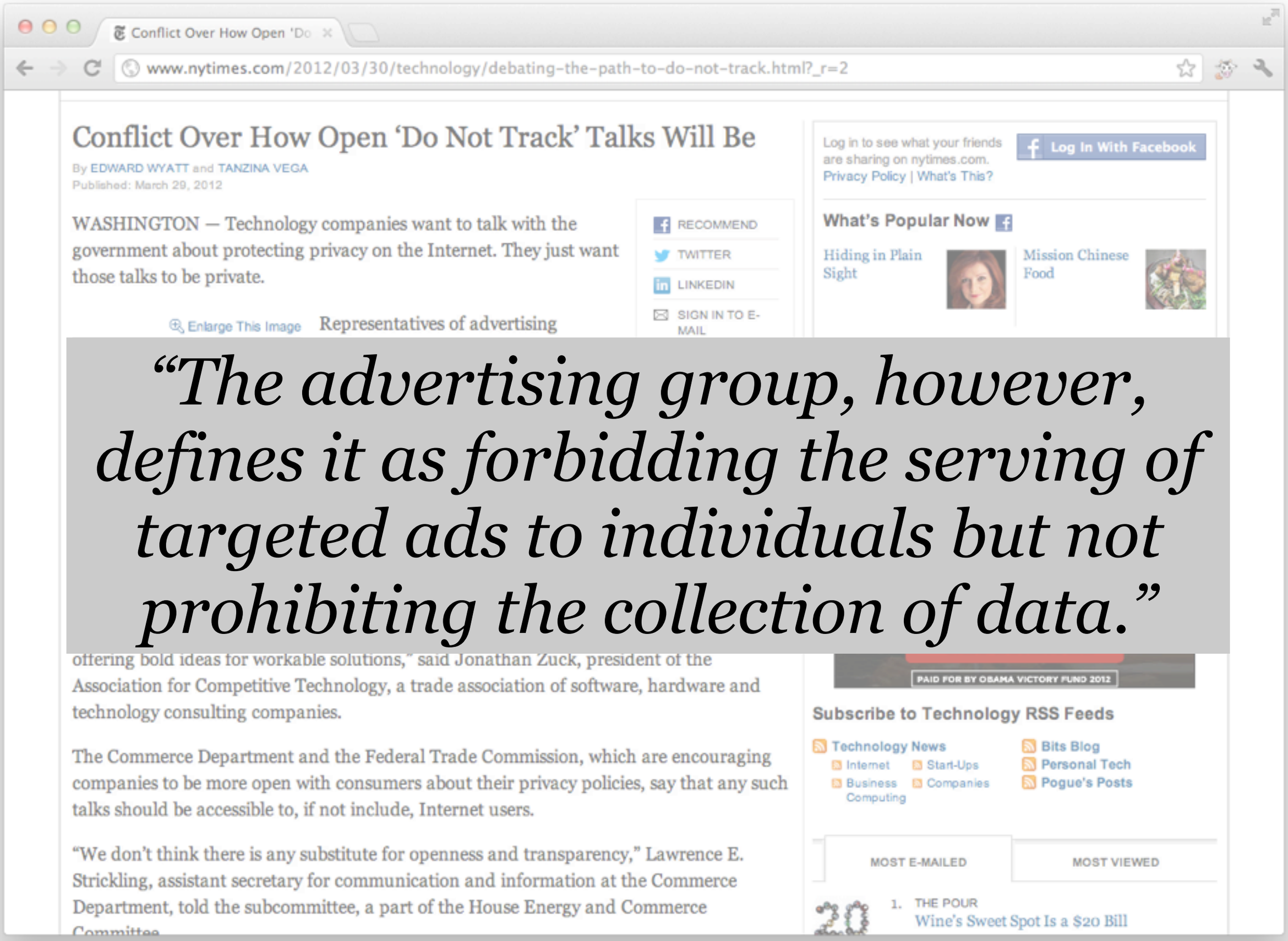


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1. THE POUR
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Conflict Over How Open 'Do
www.nytimes.com/2012/03/30/technology/debating-the-path-to-do-not-track.html?_r=2
Conflict Over How Open 'Do Not Track' Talks Will Be
By EDWARD WYATT and TANZINA VEGA
Published: March 29, 2012
WASHINGTON — Technology companies want to talk with the government about protecting privacy on the Internet. They just want those talks to be private.
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Representatives of advertising
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"We don't think there is any substitute for openness and transparency," Lawrence E. Strickling, assistant secretary for communication and information at the Commerce Department, told the subcommittee, a part of the House Energy and Commerce Committee
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"The advertising group, however, defines it as forbidding the serving of targeted ads to individuals but not prohibiting the collection of data."

Do Not Track

- Idea: Header mechanism for opting out.
- Problem: Little incentive for companies to provide privacy.

Conclusions

- Functional privacy is the privacy that can be obtained without a reduction in service.
- Privacy tools will often better serve the common user by adopting a functional privacy approach.

Milk is available at
http://forensics.umass.edu/milk.php

