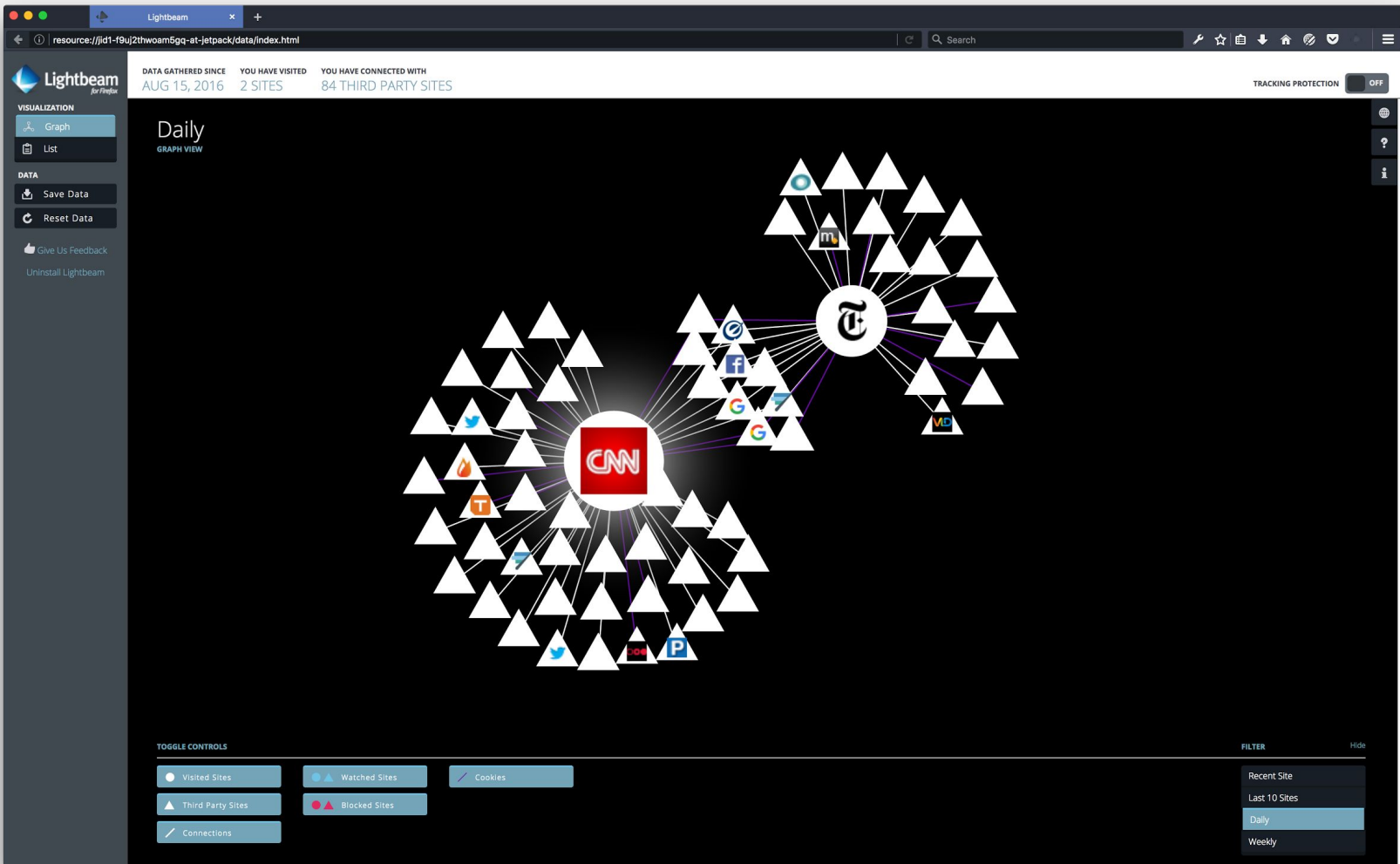


Sandboxing Trackers with Tracking Protection

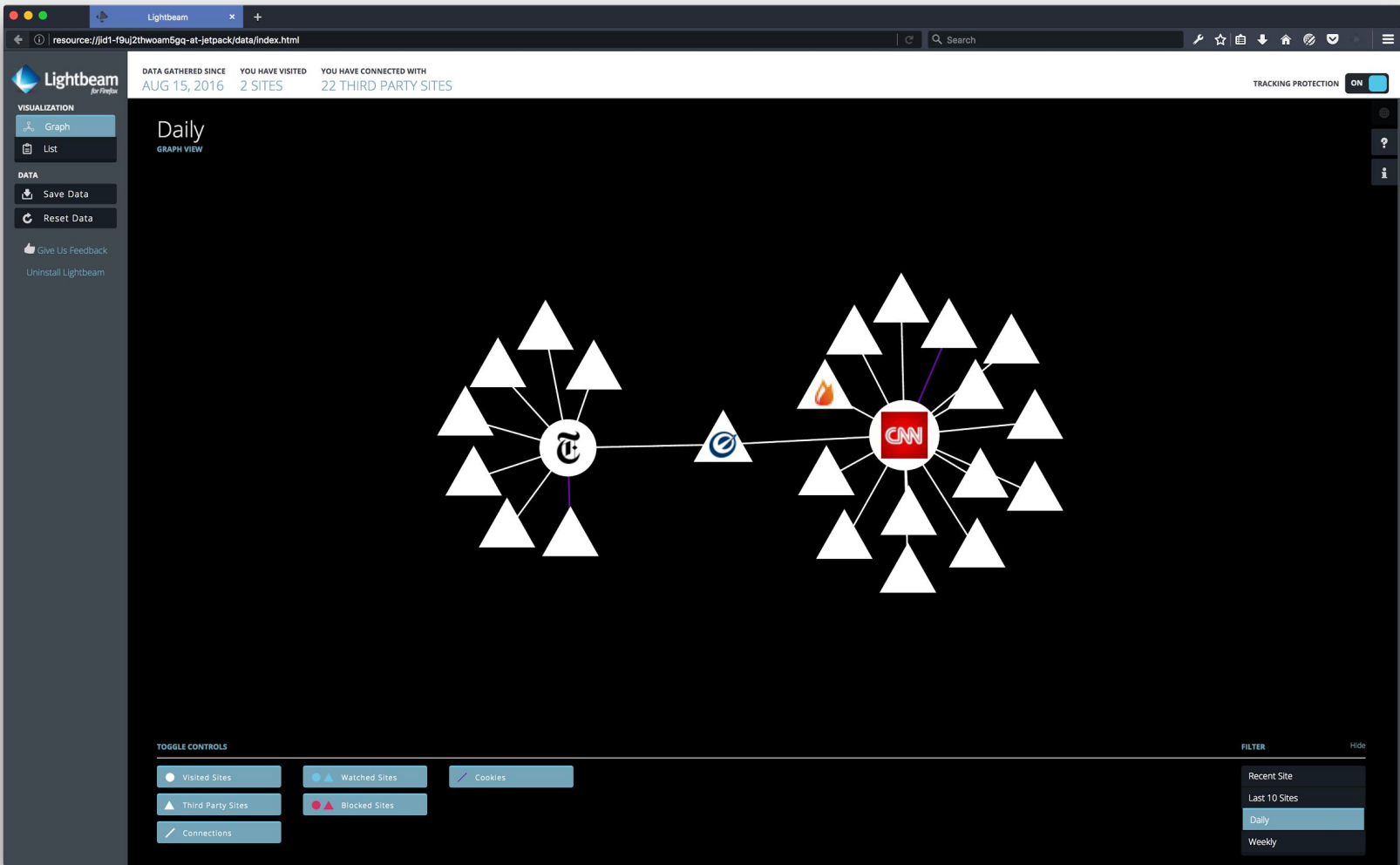
Steven Englehardt
@s_englehardt





Tracking Protection






Manchester City 2-1 Sunde...

www.dailymail.co.uk/sport/football/article-3739115/Manchester-City-2-1-Sunderland-Former-Manchester-United-midfielder-Paddy-McNair-scores-late-goal-gift-Premier-League-victory-P

FeedbackDaily MailSaturday, Aug 13th 2016 5PM 86°F 8PM 69°F5-Day Forecast

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Manchester City 2-1 Sunderland: Former Manchester United defender Paddy McNair scores late own goal to gift first Premier League victory to Pep Guardiola

- Late Paddy McNair own goal handed Manchester City a win in Pep Guardiola's first match in charge
- An equaliser from Jermain Defoe had looked like denying Guardiola in the Premier League opener
- Sub McNair, signed from Manchester United this week, headed into his own net after 87 minutes
- New City boss had made an immediate impact at City by dropping Joe Hart and Yaya Toure

By **ROB DRAPER FOR THE MAIL ON SUNDAY** 
PUBLISHED: 13:21 EST, 13 August 2016 | UPDATED: 15:41 EST, 13 August 2016

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At the end, the Etihad Stadium roared with the kind of enthusiasm you might expect when greeting one of the world's finest and most iconic coaches. Poor Paddy McNair, brought on to safeguard the score, had just headed into his own goal within four minutes of his debut, and City finally had their breakthrough.

Jesus Navas crossed the ball, Vito Mannone flicked it away from the feet of Kelechi Iheanacho and McNair simply could not react quick enough to avoid nodding home from close range. The clock read 87 minutes and City fans sang with gusto, as though they finally believed a Messianic figure was about to lead them to the promised land. And so it will be recorded that the Pep Guardiola era began with a win

And, after the years of anticipation, it was really Guardiola on the touchline, finally overseeing a Premier League

<

>

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Forbes QUOTE OF THE DAY

"The rewards in business go to the man who does something with an idea."

- William Benton

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Facebook will start bypassing adblockers on desktop browsers

- Users of mobile adblockers will continue to experience an ad-free version
- Decision 'takes a dark path against user choice', Adblock Plus warns



Can sandbox trackers instead
of block them?

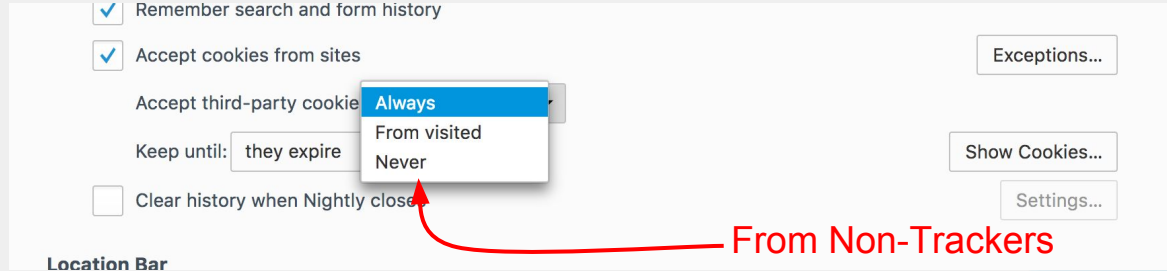


Can sandbox trackers instead
of block them?

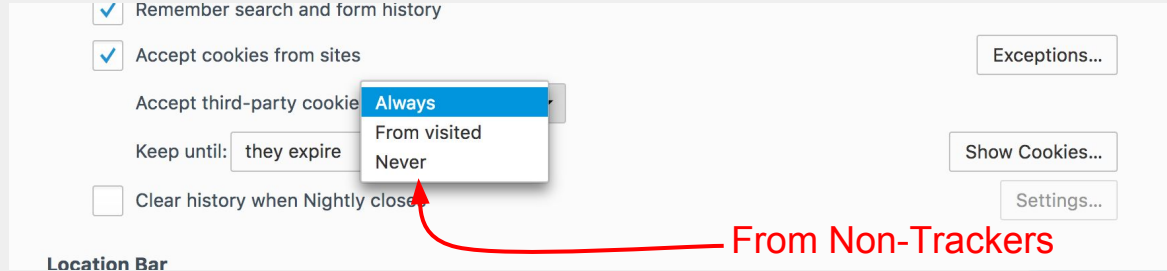
No :(



1. Make a new third-party cookie blocking mode

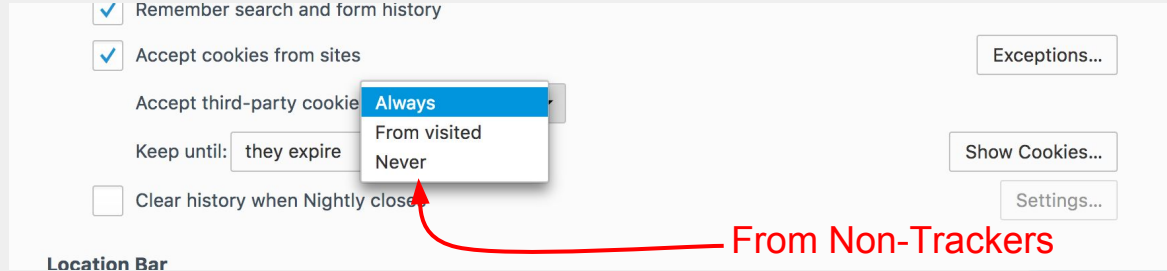


1. Make a new third-party cookie blocking mode



+ No stateful tracking in 3rd party iframes

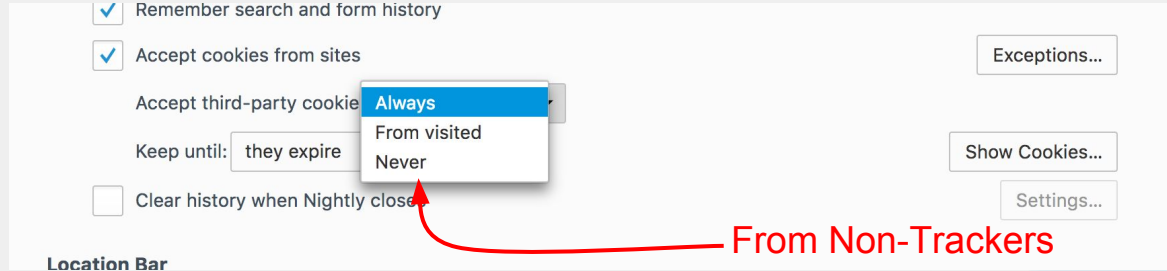
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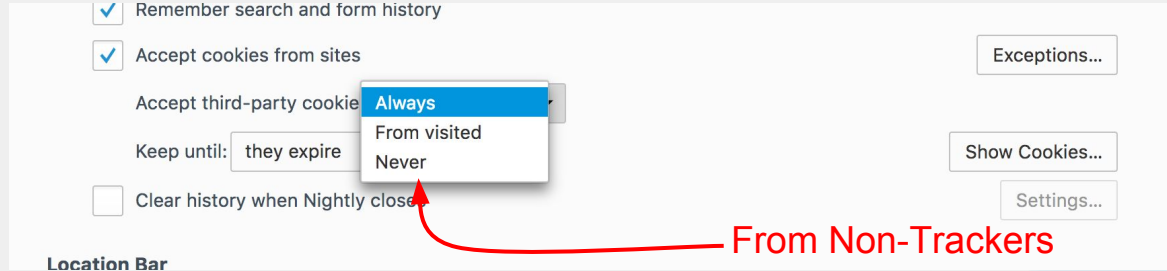
+ No cookies with `<script src...>` embeds

1. Make a new third-party cookie blocking mode



- + No stateful tracking in 3rd party iframes
- + No cookies with `<script src...>` embeds
- + Less breakage than other cookie blocking

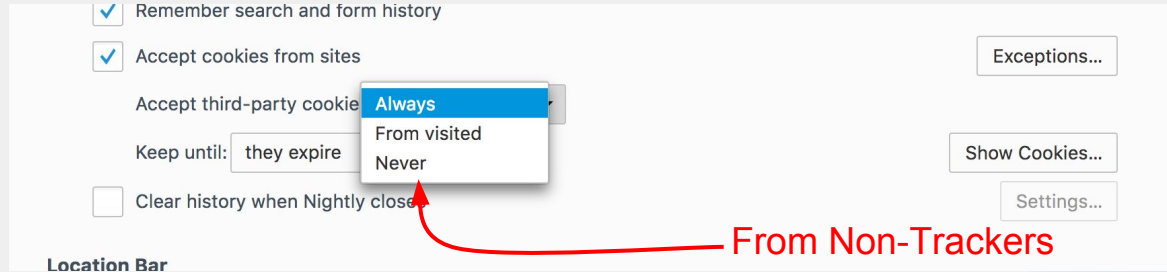
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- `<script src...>` DOM access

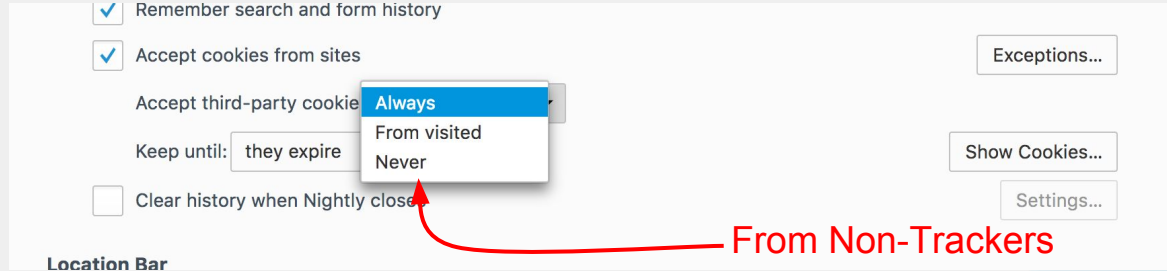
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- + No stateful tracking in 3rd party iframes
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- `<script src...>` DOM access
- Active content can still fingerprint

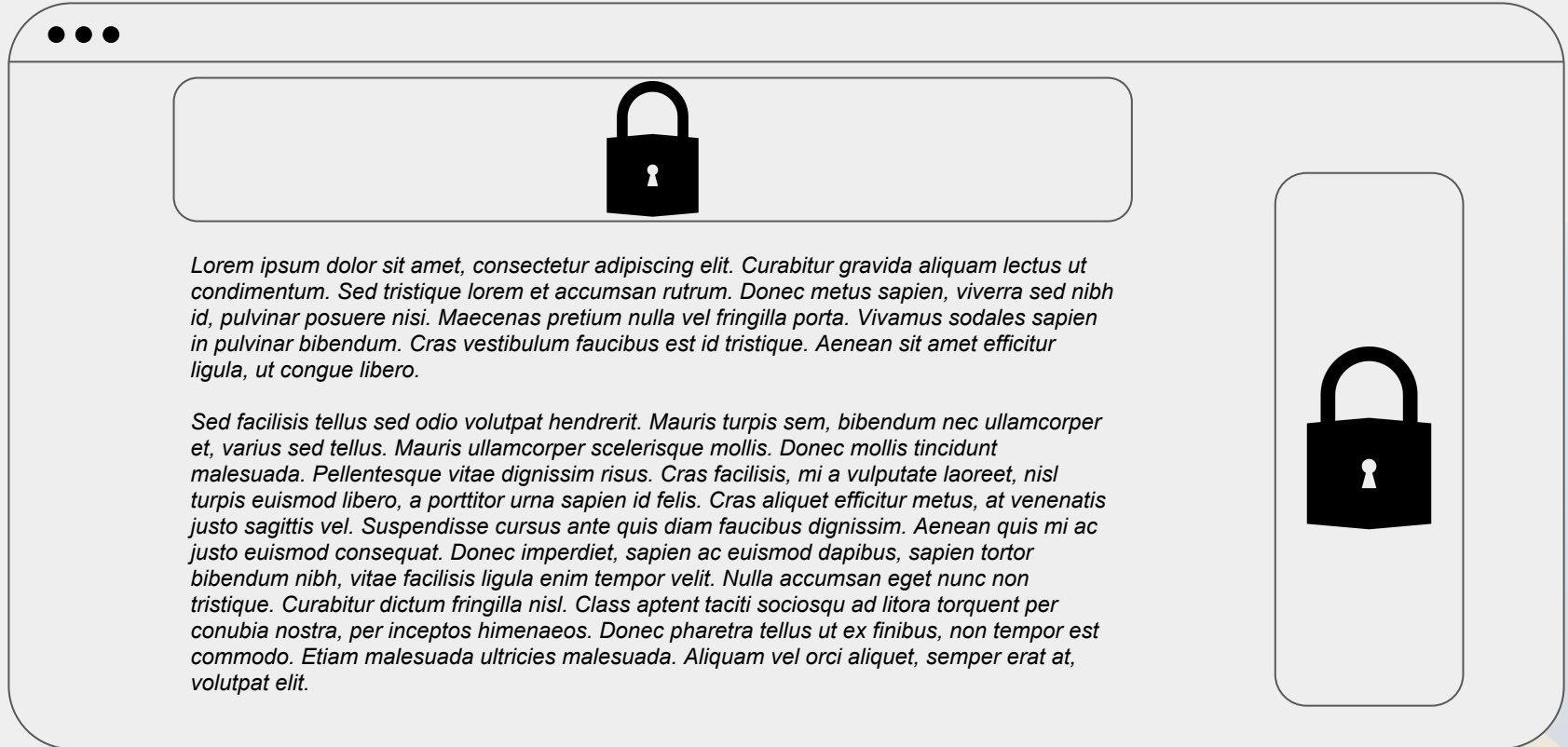
1. Make a new third-party cookie blocking mode



- + No stateful tracking in 3rd party iframes
- + No cookies with `<script src...>` embeds
- + Less breakage than other cookie blocking

- `<script src...>` DOM access
- Active content can still fingerprint
- Will encourage fingerprinting

2. Block cookies and use iframe sandbox



2. Block cookies and use iframe sandbox

- + No fingerprinting in iframes
- + Restrict plugin use, modal dialogs, top-level navigation, etc



2. Block cookies and use iframe sandbox

- + No fingerprinting in iframes
- + Restrict plugin use, modal dialogs, top-level navigation, etc

Not enough trackers are embedded in iframes.



3. Block active content and sandbox iframes

Built a prototype to test this...

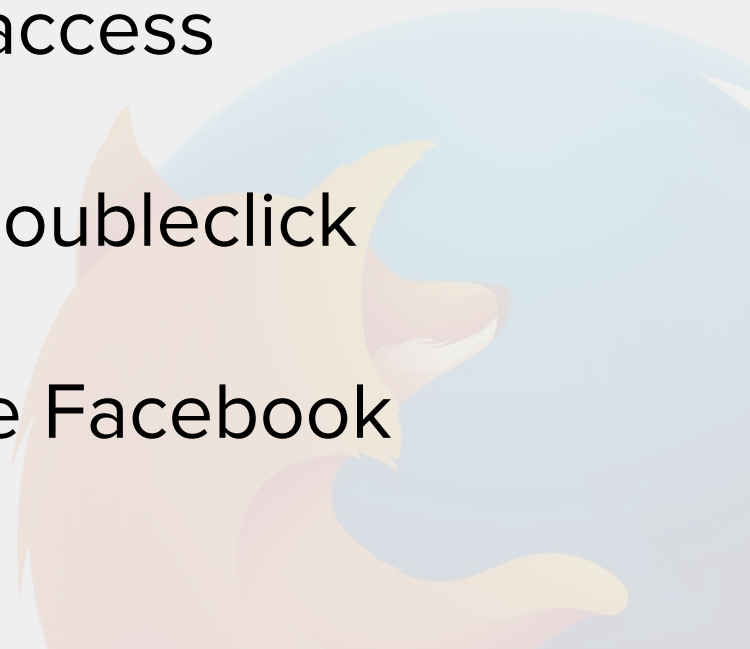


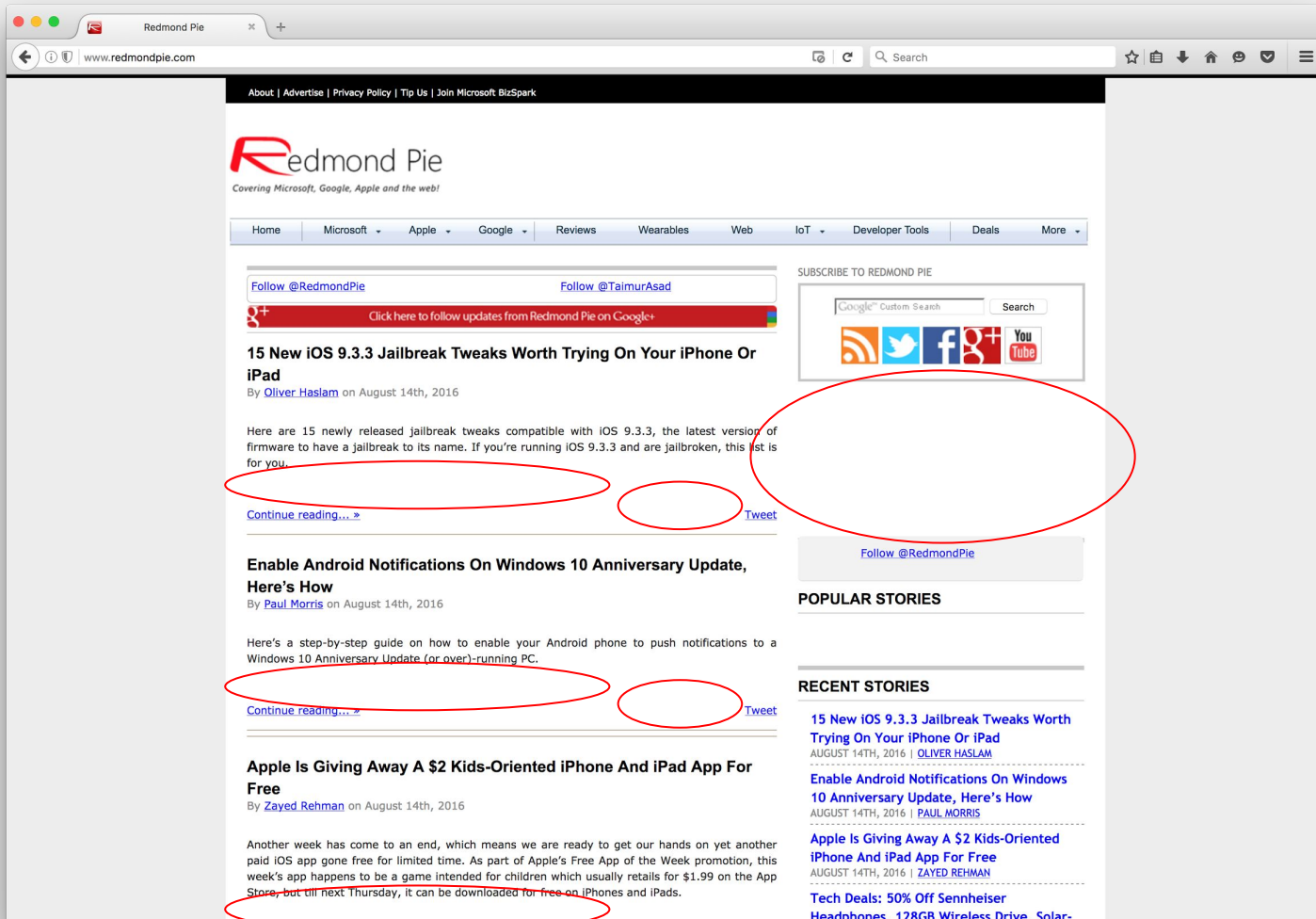
3. Block active content and sandbox iframes

Built a prototype to test this...
breakage is still too high!



3. Block scripts and sandbox iframes

- Google, Facebook, Twitter all require or recommend first-party script access
 - 2 out of 10,000 sites iframe Doubleclick
 - 209 out of 10,000 sites iframe Facebook
- 



Blocking with Tracking Protection

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15 New iOS 9.3.3 Jailbreak Tweaks Worth Trying On Your iPhone Or iPad

By [Oliver Haslam](#) on August 14th, 2016

Here are 15 newly released jailbreak tweaks compatible with iOS 9.3.3, the latest version of firmware to have a jailbreak to its name. If you're running iOS 9.3.3 and are jailbroken, this list is for you.

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Enable Android Notifications On Windows 10 Anniversary Update, Here's How

By [Paul Morris](#) on August 14th, 2016

Here's a step-by-step guide on how to enable your Android phone to push notifications to a Windows 10 Anniversary Update (or over)-running PC.

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Apple Is Giving Away A \$2 Kids-Oriented iPhone And iPad App For Free

By [Zayed Rehman](#) on August 14th, 2016

Another week has come to an end, which means we are ready to get our hands on yet another paid iOS app gone free for limited time. As part of Apple's Free App of the Week promotion, this week's app happens to be a game intended for children which usually retails for \$1.99 on the App Store, but till next Thursday, it can be downloaded for free on iPhones and iPads.

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Sandboxing with Tracking Protection

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Berlin
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leicht bewölkt

Zur Tagesvorhersage →

Aussichten
Heute ist es im Norden und zum Teil auch in der Mitte teilweise bewölkt und vor allem in Richtung Küste sind einzelne Schauer möglich. In der Südhälfte scheint hingegen häufiger die Sonne und es wird sehr warm. Abgesehen von einzelnen gewittrigen Schauern an den Alpen bleibt es meist trocken.

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Aktuelle Themen
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Grillfreunde aufgepasst!
Belastung durch Beifuß-Pollen

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-10° -5° 0° 5° 10° 15° 20° 25° 30° 35° 40°

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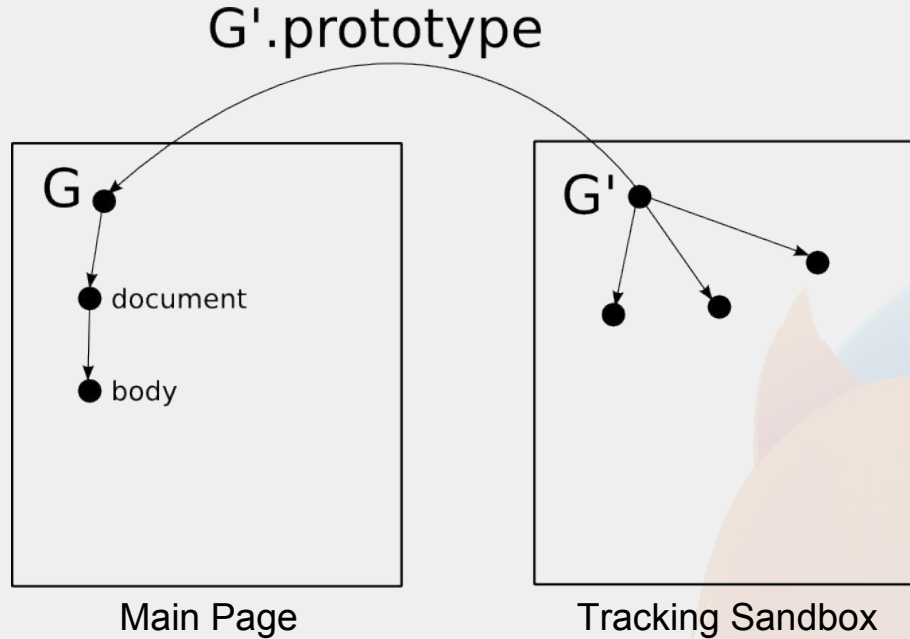
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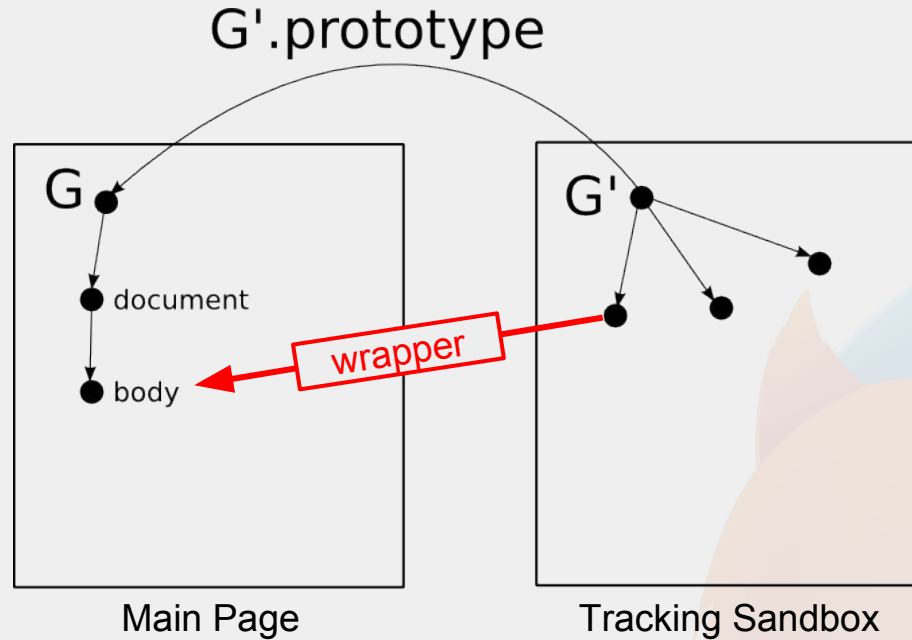
Nach oben

Sandboxing with Tracking Protection

4. Sandbox active content and sandbox iframes



4. Sandbox active content and sandbox iframes



Define *tracking wrappers* for interactions across the sandbox boundary

What do Google scripts do?



What do Google scripts do?

```
<iframe  
  onload = ...  
  id = "aswift_0"  
  width = "300"  
  height = "250"  
>< /iframe>
```



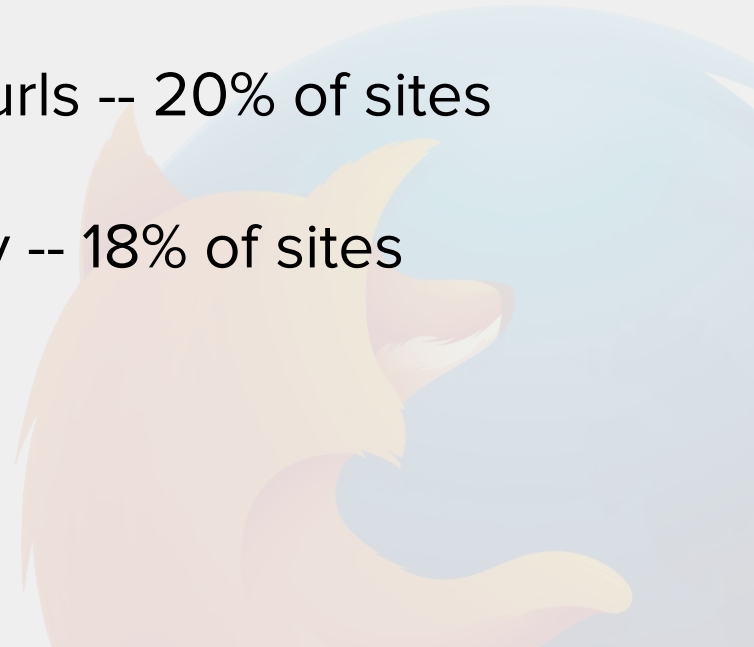
What do Google scripts do?

```
<iframe
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  id = "aswift_0"
  width = "300"
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>< /iframe>
```

```
var i = this.id,
    s = window.google_iframe_oncopy,
    h = s & amp; & amp;
s.handlers, h = h & amp; & amp;
h[i], w = this.contentwindow, d;
d = w.document
if (h & amp; & amp; d & amp; & amp;
`
    ...
    w.location.replace(h)
}
}
```

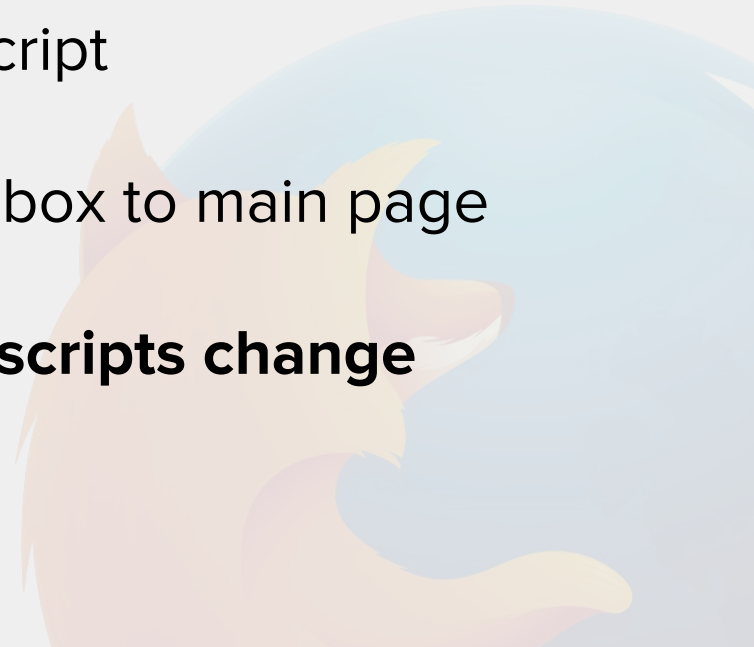
Tracking scripts require inline javascript access

- Google iframes with `onload` -- 10% of sites
- Iframes with `javascript: src` urls -- 20% of sites
- Insert inline scripts into first-party -- 18% of sites



Sandboxing Javascript is infeasible

- Breakage still too high
- Requires support for inline javascript
 - Inline function rewriting
 - Function reflection from sandbox to main page
- **Sandbox design will change as scripts change**



Tracking Protection



Thank you!

Joint work with Tanvi Vyas (my mentor!) and Eric Rescorla

Thanks to my manager Steve Workman, the Security Engineering team, and the University team!

Contact me:

senglehardt.com

@s_englehardt

