Problem & Motivation

Third-party Services
- Websites and mobile applications rely on third-party services, like advertisements, analytics, social integration widgets, or CDN-residing JavaScript libraries.
- Benefits for developers are clear, but can have impact on users:
  - Increased tracking of users (third-parties are included in lots of different pages)
  - Direct attacks (like malware distribution through services)

Third-party Service Distribution

Figure 1: Distribution of the most popular third-party domains (TLD=1) in Alexa Top 200,000 websites in 10,000 intervals.

Third-party Services in 100 Requests to 3rd party domains in %

![Graph](image)

Third-party Blocking Analysis
- Various extensions exist to block third-party content
- Several Questions are still left open, e.g.:
  - What do they block?
  - What are their limits?

Content-Blocking Capabilities

Figure 2: Common browser extensions to block online trackers, installations, and underlying filter rules (Aug. 2016).

Figure 4: Sum of included third-party domains with 2-20/20-200/200-10,000 inclusions which are not blocked by a specific browser extension in relation to the plain profile. In all graphs: the lower an extension is on the y-axis, the better (i.e., less third-parties remaining).

Third-Party Reach

Webscrapes with Third-Party Inclusions per Company

![Graph](image)

Third-Party Inclusions not Blocked per Plugin

![Graph](image)

Content Blocking Capabilities

![Graph](image)

Conclusion
- A lot of traffic is still distributed through insecure channels (HTTP instead of HTTPS).
- Blocking tools differ greatly in performance and can have blind spots (e.g., not blocking smaller third parties).
- Third-party inclusions pose unique challenges on mobile devices (e.g., rooting of devices needed for blocking).

This work was carried out within the scope of “u’smile,” the Josef Ressel Center for User-Friendly Secure Mobile Solutions, funded by the Christian Doppler Research Centre, the Bundesministerium für Wissenschaft und Forschung, as well as the state of Vienna. The u’smile Programme is managed by FFG. This work was supported by the Austrian Research Promotion Agency under grant 839720-IT/FFG (DASH), a joint project of Media werke GmbH and the St. Pölten University of Applied Sciences. For Stbury (Broad Group), this research was supported by the National Science Foundation (NSF) under grants 1437757 and 1340749.