

Do Not Track: Universal Web Tracking Opt-out

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I. Problem

Web tracking is pervasive. The average popular website incorporates 64 independent mechanisms for tracking visitors over time and across other websites.¹ Advertising networks that span the web account for the preponderance of tracking; these firms compile user records that can include estimates of age, gender, location, income, interests, browsing habits, and more.²

Web tracking is also unpopular. A 2009 national survey found over 80% of Americans believe websites should not track their behavior for advertising.³ And over 90% believe advertisers should be required by law to stop tracking on request.⁴

Cookies, local storage, and other web technologies provide myriad means of tracking users;⁵ a purely technical barrier to web tracking is out of reach. While many web tracking services are receptive to users opting out, they each require setting – and not deleting – an opt-out cookie. This approach has proven unmanageable; Google, for example, now provides a browser extension just to ensure its opt-out cookie is properly set.⁶ A registry of web tracking domain names, as proposed by privacy advocates,⁷ is similarly burdensome and unworkable in practice.⁸

¹ Julia Angwin, *The Web's New Gold Mine: Your Secrets*, WALL ST. J., July 30, 2010.

² Jennifer Valentino-Devries, *What They Know About You*, WALL ST. J., July 31, 2010.

³ Joseph Turow et al., *Americans Reject Tailored Advertising*, at 15, available at <http://ssrn.com/abstract=1478214>.

⁴ *Id.* at 23.

⁵ Gaurav Aggarwal et al., *An Analysis of Private Browsing Modes in Modern Browsers*, in PROCEEDINGS OF THE 19TH USENIX SECURITY SYMPOSIUM (2010); Peter Eckersley, *How Unique Is Your Web Browser?*, in PROCEEDINGS OF THE 10TH PRIVACY ENHANCING TECHNOLOGIES SYMPOSIUM (2010); Samy Kamkar, *Evercookie - Virtually Irrevocable Persistent Cookies*, <http://samy.pl/evercookie/>; Jonathan Mayer, “Any person... a pamphleteer”: *Internet Anonymity in the Age of Web 2.0*, Princeton University Senior Thesis (2009).

⁶ Google Advertising Cookie Opt-out Plugin, <http://www.google.com/ads/preferences/plugin/>.

⁷ Letter to the Federal Trade Commission, Oct. 31, 2007, available at <http://www.cdt.org/privacy/20071031consumerprotectionsbehavioral.pdf>.

⁸ Arvind Narayanan, “Do Not Track” Explained, 33 BITS OF ENTROPY (Sept. 20, 2010), <http://33bits.org/2010/09/20/do-not-track-explained/>.

II. Solution

Do Not Track⁹ is a user-friendly and universal mechanism for opting out of web tracking. A user simply accompanies her web browser's HTTP requests with a header specifying she wishes to opt out of tracking, such as "X-Do-Not-Track: 1." Advertising networks and other web tracking services are then responsible for honoring the user's preference – and may be required to if Do Not Track is enforced by industry self-regulation or law. To verify compliance with user preferences we envision a distributed monitoring system that both detects browser API calls associated with tracking and examines advertisement distributions for signs of behavioral targeting.

III. Implementation

We have implemented Do Not Track as a Python HTTP proxy¹⁰ and reusable Firefox XPCOM component;¹¹ others have developed a Firefox add-on.¹² We do not believe the Internet Explorer, Chrome, and Safari extension architectures presently support the HTTP header modification required to implement Do Not Track.¹³ The built-in web browsers in Android, iOS, and Blackberry OS likewise do not yet support header modification.

IV. Broader Principle

Experience with behavioral advertising and other web tracking suggests that accommodating technically rigorous privacy in complex systems may be impracticable owing to conflicting functionality and diverse actors and incentives. But technology *can* enable users to express their privacy preferences and detect when those preferences are not being honored.

⁹ Do Not Track: Universal Web Tracking Opt-out, <http://donottrack.us>.

¹⁰ Do Not Track Proxy, <https://github.com/jonathanmayer/Do-Not-Track/tree/master/proxy/>.

¹¹ Do Not Track XPCOM Component <https://github.com/jonathanmayer/Do-Not-Track/tree/master/xpcom/>.

¹² Universal Behavioral Advertising Opt-out, <https://addons.mozilla.org/af/firefox/addon/12765/>.

¹³ Do Not Track: Web Browser Support, <http://donottrack.us/support.html>.