November 6, 2017

To
Shri Arvind Kumar,
Advisor (BB&PA),
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhawan,
Jawaharlal Nehru Marg,
New Delhi - 110002.

Subject: Access Now comments to TRAI consultation paper on 'Privacy, Security, and Ownership of the Data in the Telecom Sector'

Shri Kumar,

We write to you in connection with the consultation paper on this subject which the Telecom Regulatory Authority of India (TRAI) published in August seeking public comments. This letter contains Access Now's initial comments in response to the consultation paper.

Access Now is an international non-profit organisation which works to defend and extend the digital rights of users at risk globally. Through presence in 10 countries around the world, Access Now provides thought leadership and policy recommendations to the public and private sectors to ensure the internet's continued openness and the protection of fundamental rights. Access Now also engages with its global community of nearly half a million users from over 185 countries, in addition to operating a 24/7 digital security helpline that provides real-time, direct technical assistance to users around the world. We coordinate as part of CiviCERT (Computer Incident Response Center for Civil Society) a Trusted Introducer accredited CERT. We also have special consultative status at the United Nations.[1]

We previously filed comments towards TRAI's consultation paper on cloud computing,[2] as well as the pre-consultation paper on net neutrality in July 2016.[3] Prior to that, we provided inputs to TRAI on issues relating to net neutrality via the joint comments we filed with nine other organisations in January 2016 on the consultation paper on differential pricing for data services.[4] We have also actively engaged with many key policy and regulatory discussions in this area across the world. That includes comments to the United States FCC NPRM process

[1] Access Now, *About us*, https://www.accessnow.org/about-us/.
[2] http://www.trai.gov.in/sites/default/files/Access%20Now_10_06_2016.pdf
[3] Access Now, Comments to TRAI Pre-consultation Paper on Net Neutrality, 5 July 2016, http://www.trai.gov.in/sites/default/files/AccessNow_30_05_2016.pdf
[4] Access Now, Centre for Communication Governance and Ors., *Joint Letter and Counter-Comments on the TRAI's Consultation Paper on Differential Pricing for Data Services*, 14 Jan 2016, http://trai.gov.in/WriteReadData/ConsultationPaper/Document/20160118032704242093 8Access_Now_n_Ors.pdf

on consumer privacy which resulted in the FCC's erstwhile broadband privacy rules,[5] and the ongoing policy process in the European Union on created an updated and improved ePrivacy Regulation.[6] Access Now also recently published a policy guide entitled "Proposals for regulating internet apps and services: Understanding the digital rights impact of the 'Over-the-Top' debate", analyzing the implications for fundamental rights of proposals to regulate internet applications and services and providing principles to help policymakers, regulators, and civil society understand and engage in the debate.[7]

We welcome TRAI's desire to consult with stakeholders on the critically important issue of furthering protection of the privacy of users and the security and legal position of their data when it comes to telecommunications. As the world's second largest internet user base and with its history of seeking to advance strong, positive standards in favour of the rights of users as demonstrated by the February 2016 differential data pricing regulations, we believe India will play a crucial role in determining whether user privacy in their communications and data will be secured on our global internet. TRAI must act so as to help further this potential and the need to protect the rights of its millions of users online today, and the next billion soon joining.

We hope that TRAI's consultation in this area is well integrated with its regulatory powers under the Telegraph and TRAI Acts, and coordinated with the work of the Ministry of Electronics and Information Technology's Committee of Experts on Data Protection chaired by Justice B.N. Srikrishna. The current consultation paper contains several issues and questions that would be better placed in an open pre-legislative process for a horizontally applicable privacy and data protection law. We recommend that the TRAI focus on understanding the immediate issues at play with the information privacy concerns of users with regards to telecom services offered by licenses service providers falling under its own jurisdiction and that of the Department of Telecom.

Telecom company practices with regards to user data have a direct impact on privacy and form an area where the regulator and government can take direct action even as a horizontally applicable privacy and data protection bill is advanced and sent to Parliament for enactment. Research already indicates that the practices of the Indian telecom sector are impacting the privacy and data rights of users. The Centre for Internet and Society India published findings from a study of the privacy policies of Indian telecom service providers in January 2015 that

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[5] Access Now, *U.S. broadband privacy rules grant users control, meaningful rights protections*, 7 November 2016, https://www.accessnow.org/u-s-broadband-privacy-rules-grant-users-control-meaningful-rights-protections

[6] Access Now, *In vote on ePrivacy, EU civil liberties committee makes improvements for users' rights*, 19 October 2017, https://www.accessnow.org/vote-eprivacy-eu-civil-liberties-committee-makes-improvements-users-rights/, and Access Now, *The EU's e-Privacy directive: more than just a 'cookie law'*, 20 July 2016, https://www.accessnow.org/eus-e-privacy-directive-just-cookie-law/.

[7] Access Now, Position paper: Protecting digital rights in the "OTT" debate, 28 August 2017, https://www.accessnow.org/access-now-position-paper-protecting-digital-rights-ott-debate/

noted corporate practices greatly varied across different providers.[8] Globally, security researchers have increasingly begun uncovering insights into how telecom companies are using the data flowing through their networks to secretly monitor the web browsing habits of their users, by using so-called "supercookies" - special tracking headers that the carriers inject beyond the control of the user - into their network traffic. In October 2014, Access Now launched a tool at **Amibeingtracked.com** that allows users to test their devices to see if they are being tracked via such tracking headers inserted by telecom providers. More than 200,000 people from around the world used the tool, and based on nearly 180,000 tests conducted over six months, Access Now launched a report in August 2015 presenting our major findings about the use of tracking headers worldwide, with recommendations for governments, carriers, websites, intergovernmental bodies, and researchers. Crucially, our findings indicated that outside the United States, **India was one of the 10 countries where telecom companies appeared to be using such tracking header technology**.[9] A copy of our AmIBeingTracked report is attached as an annexure to these comments.

We believe therefore, that the TRAI must focus on the following summarised priorities in this ongoing consultation and sharpen the focus of its proposed next comprehensive consultation on data protection in the telecom sector:

1. Ensure its recommendations are fed into the Justice Srikrishna chaired committee of experts process under the Ministry of Electronics and Information Technology, and support the creation of a horizontally applicable Privacy and Data Protection Law which includes the establishment of a Privacy Commission with data protection enforcement powers.
2. In the interim stage while a Privacy and Data Protection Law is being crafted, TRAI could consider acting to protect the fundamental right of privacy of telecom users and issue further directions - or regulations if required - on strengthening the user rights on their data collected by telecom services providers;
    2.1. TRAI should ensure that the regulatory regime for telecom service providers furthers the data protection rights of users with particular reference to consent, access to data, erasure of data, limitation on the objects and purposes of data collection and processing, a clear and effective data breach notification system, and effective remedy
    2.2. TRAI should encourage telecom service providers to invest further in their data security practices and in securing their responsibilities to safeguarding user data
    2.3. TRAI should require telecom service providers to make more information easily available on their privacy policies and data security practices

[8] CIS India, *A Study of the Privacy Policies of Indian Service Providers and the 43A Rules*, 12 January 2015, https://cis-india.org/internet-governance/blog/a-study-of-the-privacy-policies-of-indian-service-providers-and-the-43a-rules

[9] Access Now, *Am I Being Tracked?*, https://www.accessnow.org/aibt/

3. TRAI should ensure that the digital security of users over telecom networks in strengthened by calling on the Department of Telecom to support secure communications made possible by the use of strong encryption by service providers, and oppose practices or proposals favouring increased data retention or the establishment of “backdoors” or other vulnerabilities in telecom service provider networks. TRAI should seek to further the release of more data by calling upon the Department of Telecom to encourage all telecom service providers in India to publish “transparency reports” with respect to their policies and practices with regards to requests for the disclosure of user data.

Overleaf, we provide specific initial recommendations in response to the 12 questions posed for comment in this current consultation paper. We hope our inputs are of aid to TRAI in its deliberations and next steps on this important subject.

Thanking you,

Yours sincerely,

Raman Jit Singh Chima
Director of Public Policy,
Access Now

Maansi Verma
South Asia Public Policy
Access Now

Inputs to the specific questions listed in the consultation paper:

Q.1 Are the data protection requirements currently applicable to all the players in the eco-system in India sufficient to protect the interests of telecom subscribers? What are the additional measures, if any, that need to be considered in this regard?	Access Now strongly encourages further development of Indian privacy and data protection law to supplement / amend existing provisions specifically providing for the following key illustrative pillars :- ● Enact a horizontally applicable law, establishing a Data Privacy Commission:- 1. An overarching binding law laying down the data privacy principles, rights of users and responsibility of data collectors / processors. 2. An independent and expert body comprising of Privacy Commissioners to look into grievances in the nature of breach of data privacy and to oversee, provide remedies for state practices impacting informational privacy. 3. The enforcement of privacy law must be entrusted to such a Privacy Commission, rather scattered across different regulators. 4. The law should seek to further the data protection rights of users with particular reference to consent, access to data, erasure of data, limitation on the objects and purposes of data collection and processing, a clear and effective data breach notification system, and effective remedy. ● Ensure that updates in privacy law connect with corporate and state practices impact informational privacy:- 1. which could mean any activity intended to capture, read, listen to, scan, store or understand the communication of a person. 2. It must also include interception during conveyance as well as when stored. 3. It must further include interception of associated metadata for purposes other than exchange of communications. 4. It must also include third party monitoring of websites visited to capture browsing habits, timing of visits, interaction with others etc. without the consent of the end-user. 5. Any regulation related to interception needs to be technology neutral as advancement of technology will

	create more ways to intercept. 6. Government interception requests to be tested against a framework of necessity and proportionality, and overseen by 7. There shall be a duty to inform the person whose communication has been intercepted after the purpose has been achieved and provide for effective remedy in cases of abuse. ● Amendments to the Unified License Agreement:- 1. Requiring the telecom service providers to submit Transparency Reports on requests they receive from the government on and other third parties for user information; on takedown or restriction of content or accounts, and on network disruptions, along with clear explanation of corporate processes and policies responding to these requests and incidents. 2. Requiring every Licensed Service Provider (SP) to appoint a Chief Privacy Officer (who could be the Chief Security Officer as well) to handle complaints from consumers, to educate consumers about their rights and the companies policies, to submit transparency reports etc. Access Now encourages the **telecom regulator to take a lead in recommending guidelines or potential regulations for telecom service providers, which may later inform the formulation of a general data protection law**.
Q. 2 In light of recent advances in technology, what changes, if any, are recommended to the definition of personal data? Should the User's consent be taken before sharing his/her personal data for commercial purposes? What are the measures that should be considered in order to empower users to own and take control of his/her personal data? In particular, what are the new capabilities	Access Now **recommends use of the term 'User' in place of 'Consumer' as a user may not be a subscriber of a particular SP, but his data may still be implicated**. Further, a user must include a current or former, paying or non-paying subscriber as well as an applicant for the service. With respect to telecommunication data, a TSP acquires in connection to its provision of telecommunication services, the following kinds of data:- ● Personally Identifiable Information:- Any information that is linked or linkable to the user. Must include:- 1. Time and location of communication that it originated from; 2. Information about device that sent or made the communication;

that must be granted to consumers over the use of their Personal data?	3. Recipient of the communication and their location and device, and time received; 4. Length of a communication or the size of a message; 5. Location during social media updates, application updates or any similar automated 6. checks on connected smartphones ● <u>Information arising out of User's use of the service</u>:- 1. That relates to the quantity, technical configuration, type, destination, location, and amount of use of a telecommunications service, made available to the SP solely by virtue of customer-service provider relationship; 2. Information contained in bills; 3. Other categories of data which need to be protected-geo-location, device identifier data, destination of web traffic as tracked by domain names and URLs, traffic data, port, application header, application usage; 4. Any definition of data should be technology neutral and broad, as technology changes quickly and business models continually seek new ways to monetize and market user data. We recommend that **both types of data must be protected and any use of any of this data by SP, except for the purpose of providing / marketing the telecommunication service, must be based on consent of the user.** **It is also recommended that 'Opt-In' instead of 'Opt-Out' must be preferred.** A TSP must obtain user approval before using their data or sharing their data with affiliates / third parties, except if it is being collected for the purpose of marketing its telecommunication service. **Opt-in must be affirmative, express, and adequately informed, and must require explicit consent specific to the data and the purposes.** A user must receive sufficient information to be able to understand the consequences before he or she can give their consent to the processing and use of their data. **In practice, data controllers should not be able to use "pre-ticked boxes" to gain users' consent, nor imply their consent from other actions.** Historical data must not be used prior to "opt in," meaning a SP must not be able to build a profile of a consumer before approval is obtained, and then

	monetize that information if the user later "opts in." **To be clear, opt-out is not an appropriate mechanism to obtain user approval. Opt-out mechanisms typically suffer from cumbersome processes, offer little notice or explanation on the nature of the use, and often even deliberately hide the methods and purposes of corporate programs that track users**. Moreover, opt-out is useless in situations where customers have no context to understand the program or service at issue, how it impacts their privacy, or that it even exists in the first place. Use of a service must not be contingent on consumer approval for the sharing of personal information with third parties or for the use of information for other purposes than the one it was originally collected. **A user must have the right to object to the creation of their profile.** To begin to meaningfully exercise their rights to privacy, a fundamental right that must be better protected in the digital age, i**ndividuals require notice of where threats to their privacy lie. It must be ensured that SPs afford all possible opportunities for notice and remedy.** The costs to providers in the digital age should lower as more users take advantage of 'paperless' delivery options and electronic delivery becomes the norm. Small providers should be allowed to resort to electronic notice delivery mechanisms where reasonable to reduce costs. **The cost of lost trust and damaged reputation, not to mention legal fees that can result from breach, far outweigh any notice costs to prevent such situations from occurring.** **As an element of privacy, every user should have the ability to easily access their data by simple request to their SPs.** The information should be provided to the consumer in electronic form or paper based on the consumer preference and free of charge. The provider should also inform the user as to which information about them has been collected and used, for which purposes, whether it has been shared with other parties and where to lodge a complaint in case of disagreement with any of these practices. Specifically, consumers should be able to seek remedy if their SP refuses to provide them with such information. **Consumers should**

	further have a right to correct their information if inaccurate or out of date. Beyond access and correction, **consumers control over their information should extend to the ability to object, to erasure, and to data portability.** The ability to object enables consumers to refuse the collection and use of specific types of information. This right goes hand in hand with right to erasure, which allows consumers to request that their data be erased as they end use of a service. Finally, information portability gives users the enforceable right to get a copy of their data in usable format enabling transfer to other providers.
Q.3 What should be the Rights and Responsibilities of the Data Controllers? Can the Rights of Data Controller supersede the Rights of an Individual over his/her Personal Data? Suggest a mechanism for regulating and governing the Data Controllers.	**Legally binding responsibility must be created on data collectors / processors** to put in place practices like privacy policies and mechanisms like technical tools to safeguard the data from any possible breach and to maintain confidentiality of data. ● Collection of personal data to only take place after obtaining consent and to the extent necessary to achieve stated purpose; collected data to be destroyed if consent is withdrawn. ● Storage of data should only be allowed for the duration necessary and the manner in which it is to be stored and / or destroyed. ● Processing of data must be linked to the purpose for which it was collected, exceptional circumstances in which may be processed for other purposes also. ● Duty of security and confidentiality, requiring the establishment of measures to ensure confidentiality, secrecy, integrity and safety of personal data on every person who collects, receives, stores, processes or otherwise handles any personal data. ● Transfer or Disclosing personal data - a general bar on disclosing data except to the person to whom it pertains, can be disclosed to another person only after obtaining consent. Transfer to be permitted for processing data for the purpose for which it was collected.

	• Quality and accuracy of data - data subject to have access to her own data at all times so that she may check and update the same. **Use or sharing, including with affiliates, of the content of user communications is a clear violation of the right to privacy, and should therefore be prohibited. Mechanisms to actively monitor communications - outside of those specifically ordered under legal provisions meeting the constitutional test of necessity and proportionality - put in place by SPs have the potential to make indiscriminate surveillance easier** and cheaper for anyone able to intercept those communications, thus undermining confidentiality of communication and free speech. **Information about detected security risks In the case of a particular risk that may compromise the security of networks and communication services**, the provider of a service shall inform end-users concerning such risk and, where the risk lies outside the scope of the measures to be taken by the service provider, inform end-users of any possible remedies, including an indication of the likely costs involved. **Data breach notification is essential to the development of strong privacy standards.** It encourages data holders to properly protect data and provides users with knowledge when their data has been or is at risk of misuse. However, **in order to ensure notification is effective, it should be timely, easy to understand, comprehensive, and remediation options should be clearly indicated and accessible.** There should be an easy to navigate system to allow individuals to issue complaints when providers fail to abide by notification requirements. A SP may be required to hand over information about breach to relevant government agencies like the investigating authority, but **no personal information should be included in breach notification submitted to the governmental authorities**. **Personal information should only be handed over to governmental entities under a proper request made pursuant to adequate legal process.** Once law enforcement has been notified of the breach, they may pursue a warrant to access personal information. Further,

	there should be no default requirement to notify police prior to notifying individuals, but the decision should be decided based on the context of the breach. SPs often need to retain specific information about their consumers, for instance for billing purposes. **When determining data retention limits, the essential principles of necessity, proportionality, data minimisation and purpose limitations must be respected.** Data minimisation establishes that information collected and processed should not be retained or further used unless this is necessary for clearly indicated purposes.
Q. 4 Given the fears related to abuse of this data, is it advisable to create a technology enabled architecture to audit the use of personal data, and associated consent? Will an audit-based mechanism provide sufficient visibility for the government or its authorized authority to prevent harm? Can the industry create a sufficiently capable workforce of auditors who can take on these responsibilities?	**Access Now strongly recommends against a technology enabled architecture** as it will be vulnerable to misuse, especially if designed by the industry to audit its own practices of data handling. **Any measure for privacy protection must be technology neutral and focused on addressing the impact of intrusive technology rather than regulating or prescribing development of specific applications.** As a viable alternative, setting up an independent body to implement the law through participation of the users and service providers is a model which has been followed in most countries. **TRAI should work together with the departments of the Union Government to ensure the creation of a Data Privacy Commission, to provide users with a single point of contact to file complaints, lodge appeals, access remedy for potential violations of their privacy.** Participation by users in this complaint system should not prejudice their rights to pursue remedy through other legal and regulatory fora. It would instead aim to distribute information and resolve disputes before they become situations where user trust and certainty is threatened. **The Commission should require each SP to designate a Privacy Office to handle complaints, in a regulated, predictable, and rights respecting process that aligns with principles for operational level grievance mechanisms.** Such

	mechanisms, so long as they do not supplant or prejudice more formal forums for remedy, can help resolve conflicts efficiently and prevent escalation in some cases. The Commission can convene the Privacy Offices to share best practices and receive training. **Each Privacy Office participating in the Commission's work should issue an annual report to the Chief Privacy Commissioner, who should then issue a report aggregating results of the complaints process with recommendations to improve overall efficiency and effectiveness.**
Q.5 What, if any, are the measures that must be taken to encourage the creation of new data based businesses consistent with the overall framework of data protection?	Any business, existing or new, needs to adhere to the data protection principles. **Access Now strongly recommends against any relaxation in the rules or any prejudiced application of the regulations in order to promote new businesses monetizing users data.** TRAI should not be seeking to promote certain types of businesses - particularly so when the same may have a harmful impact on its mission of securing the rights and interests of users. In particular, we highlight the following concerns: ● Users expect their SPs to protect their private information, including metadata like URLs visited, timestamps, and session data, as well as the content viewed, uploaded, and downloaded. For these reasons, any business seeking to monetize private data including metadata must be treated similar to SPs for the purpose of requiring opt-in consent from users for any use or processing. ● Businesses willing to get competitive advantage from collecting / monitoring the content of communications could decide to throttle encrypted communications, rendering it effectively unusable. The failure to prohibit such measures can also have a chilling effect on the adoption and deployment of encryption technologies. Access to encryption is essential to the ability of users to exercise their rights to privacy and expression.
Q.6 Should government or its authorized authority setup a	**Access Now strongly recommends that any processing of metadata must be contingent on user's consent.**

data sandbox, which allows the regulated companies to create anonymized data sets which can be used for the development of newer services?	In the EU, the e-Privacy Directive authorises the use of traffic or location data if it is for a clear purpose, if the user has given his or her consent, and if the information will be anonymised. The Open Rights Group, a UK-based NGO, recently published a report on how phone companies use personal data after anonymizing them. **Findings indicate that in the UK, implementing the e-Privacy Directive's provision on data anonymisation has not provided sufficient safeguards for users, as in many cases personal attributes such as names were replaced by a code that still enabled identification of individual users.** Stewart Baker, former general counsel of the United States National Security Agency (NSA), confirmed the relevance of metadata when he declared, "metadata absolutely tells you everything about somebody's life. If you have enough metadata, you don't really need content." The processing of metadata, including traffic and location data, should always be contingent on the user's consent. Exceptions can be made for billing and interconnection payments where processing for these specific purposes can be authorised through explicit mention in the user's contract, and if the processing lasts only for the period during which the bill may be lawfully challenged. **There should be a prohibition on storage of metadata communications, unless consent has been taken for the same**, but it is not intended to prohibit any automatic, intermediate and transient storage of this information insofar as this takes place for the sole purpose of carrying out the transmission in the electronic communications network. It should also not prohibit either the processing of electronic communications data to ensure the security and continuity of the electronic communications services, including checking security threats such as the presence of malware or the processing of metadata to ensure the necessary quality of service requirements, such as latency, jitter etc. **It is important to make the distinction between de-identified information that is either "re-identifiable," when most identifiers are replaced by artificial**

	placeholders, or "anonymous", where all identifiers have been stripped. Unfortunately, even "anonymous" information does not fully ensure the confidentiality of individual users. Anonymous data can also be cross-referenced with other data sources to re-identify the consumer. SPs should take all possible steps to ensure confidentiality of users. This includes measures taken for protection of anonymised information. There must be a limit to the retention period of this information to what is strictly necessary for a defined purposes and data security measures must be put in place to protect data integrity and prevent breach. However, on top of this anonymisation, providers should ensure to the greatest extent practicable that data is not reasonably linkable.
Q. 7 How can the government or its authorized authority setup a technology solution that can assist it in monitoring the ecosystem for compliance? What are the attributes of such a solution that allow the regulations to keep pace with a changing technology ecosystem?	**As already mentioned, a technology solution for audit and monitoring of the ecosystem could in effect undermine the security of the ecosystem. Access Now strongly recommends against any such technological intervention.** An EU Parliamentary Committee reviewing the draft e-privacy guidelines brought out by EU in 2016, specifically recommends prohibiting such measures which are "weakening the security and encryption of their networks and services," and in effect this was interpreted as prohibiting backdoors to allow government data access. **Any technological solution designed to monitor an ecosystem runs the risk of becoming a backdoor access into data.** Instead, the government must look to encourage and promote use of encryption to help ensure secure communications. The regulatory framework must promote and protect the confidentiality of communications. Privacy-by-design tools, such as encryption, are ways to guarantee this right. To further advance safeguards for the confidentiality of communications - both content and metadata - the regulations must promote the general use of privacy-enhancing technologies. **Any regulations must be technologically neutral and not request the industry or users to use a specific standards, as such criteria would make it easier for external actors to undermine the selected tools and trump their potential benefits. To that end, government should not erode the security of devices or applications, either by introducing a legal requirement for vulnerabilities or by mandating backdoors into products or services.** They should not pressure companies

	into keeping private data, allow law enforcement to access to it, or retain encryption keys to decrypt the data.
Q. 8 What are the measures that should be considered in order to strengthen and preserve the safety and security of telecommunications infrastructure and the digital ecosystem as a whole?	Please refer to our inputs to the previous question. We would also recommend that the TRAI - itself or in conjunction with the Department of Telecom - also provide additional information on current coordination and capacity building efforts with the NCIIPC, CERT-In, and Cybersecurity Coordinator's Office on the issue of cybersecurity in telecommunications networks. It would be instructive to have more information on the experience government has had with the telecommunications related aspects of the existing Indian National Cybersecurity Policy. Additionally, we would recommend learning from the experience in the framing and operation of the key elements of the US National Institute for Standards and Technology (NIST) Framework for Improving Critical Infrastructure Cybersecurity published on Feb. 12, 2014.
Q. 9 What are the key issues of data protection pertaining to the collection and use of data by various other stakeholders in the digital ecosystem, including content and application service providers, device manufacturers, operating systems, browsers, etc? What mechanisms need to be put in place in order to address these issues?	**Access Now strongly recommends that as per the principle of horizontal application of data protection principles, any data in the control of any stakeholder of the digital ecosystem must enjoy equal protection.** A general purpose, horizontally applicable data privacy law would applicable to every entity which, for any purpose and through any means, acquires that data - including the several illustrated stakeholders flagged by TRAI in this question. We provide a few additional recommendations with respect to this section: ● Globally, security researchers have increasingly begun uncovering insights into how telecom companies are using the data flowing through their networks to secretly monitor the web browsing habits of their users, by using so-called "supercookies" - special tracking headers that the carriers inject beyond the control of the user - into their network traffic. In October 2014, Access Now launched a tool at Amibeingtracked.com that allows users to test their devices to see if they are being tracked via such tracking headers inserted by telecom providers. More

	than 200,000 people from around the world used the tool, and based on nearly 180,000 tests conducted over six months, Access Now launched a report in August 2015 presenting our major findings about the use of tracking headers worldwide, with recommendations for governments, carriers, websites, intergovernmental bodies, and researchers. Crucially, our findings indicated that outside the United States, India was one of the 10 countries where a telecom company (Bharti Airtel) appeared to be using such tracking header technology. ● It is important to distinguish between different types of online tracking, because enforcement has largely been focused on the use of cookies. **Current practices indicate that tracking goes far beyond cookies and can happen across websites, applications, and even devices. These shortcomings should be addressed and focus should be on creating technologically neutral obligations and safeguards around the use of tracking tools and techniques in general**, rather than targeting a specific technology. ● The development of fast and efficient wireless technologies has fostered the increasing availability for the public of internet access via wireless networks accessible by anyone in public and semi-private spaces such as 'hotspots' and situated at different places within a city, such as department stores, shopping malls and hospitals etc, as well as Wi-Fi access offered to visitors and guests at airports, hotels, restaurants. These hotspots and Wi-Fi might require to login or provide a password and may be provided by public administrations. **To the extent that those communications networks are provided to an undefined group of end-users, the confidentiality of the communications transmitted through such networks should be protected.** Therefore, regulation should apply to communications data using electronic communications services and public communications networks.

Q. 10 Is there a need for bringing about greater parity in the data protection norms applicable to TSPs and other communication service providers offering comparable services (such as Internet based voice and messaging services). What are the various options that may be considered in this regard?	**As we have indicated previously, we believe that the TRAI should focus its regulatory ambit first on the subject matter directly subject to its statutory regulation, i.e. protecting the privacy and data protection interests of users with respect to telecom services offered by TSPs. Any broader recommendations should be fed into the wider, horizontally applicable privacy and data protection law being developed by the Union Government.** The ultimate goal should be to ensure that via a law passed by Parliament, we have a horizontally applicable regulatory regime enforced by a Privacy Commission/Data Protection Authority which is applicable to all data collected by entities in India pertaining to the informational privacy interests of citizens. **Access Now strongly recommends that as per the principle of horizontal application of data protection principles, any data in the control of any provider of comparable services must enjoy equal protection.** A regulation covering communication data would be applicable to every entity which, for any purpose and through any means, acquires that data. We therefore have reservations at the focus of ensuring "greater parity" which TRAI indicates here. We have previously noted in out inputs that we believe much more needs to be done with respect to the privacy and data protection practices of TSPs in India. Additionally, we noted in our July 2017 policy paper on 'Proposals for Regulating Internet Apps and Services: Understanding the Digital Rights Impact of the Over the Top Debate' that regulators and policymakers should be cautious about unclear, overbroad calls for parity in telecom regulation design for TSPs and internet services: "Regulatory regimes should be fit-for-purpose. We ought not to apply telecom-style licensing regulations to internet services or mobile apps — even those offering online communication services — if they are not being launched or commercially offered as telecom services (which are precisely defined in most national telecommunications legal frameworks). This would subject them to licensing requirements or

	pre-government authorisations specific to the telecom or broadcast sector, and this can harm free expression and the open … We must be skeptical of arguments that telecom services and internet applications or services are perfect substitutes for one another. While they can offer similar functionality, they are based in different technologies that relate to state-level interests in a different manner."
Q. 11 What should be the legitimate exceptions to the data protection requirements imposed on TSPs and other providers in the digital ecosystem and how should these be designed? In particular, what are the checks and balances that need to be considered in the context of lawful surveillance and law enforcement requirements?	**Access Now strongly recommends that there should not be any 'legitimate interest' exception to undermine the responsibility to seek user's consent before processing their data.** **We would also strongly object to the use or disclosure of user data for cybersecurity purposes without specific protections for user privacy and security.** Any exception should only permit the sharing of user data to the extent that any Personally Identifiable Information or other private data is scrubbed and only "whenever reasonably necessary to prevent future cyber security threats or risk of vulnerabilities." Further, the language should only permit the sharing of information for cybersecurity attacks or risk of vulnerabilities only to the extent it does not risk user privacy or security. We understand the need for exceptions to allow access to user data without customer notice or approval, in specific, targeted circumstances. However, **robust and regular transparency and oversight is needed to ensure these exceptions are not abused or their scope enlarged beyond the strict letter and intent of the law.** Regular audits and transparency provisions must be implemented fully to ensure proper attention to these excepted uses and disclosures. The Privacy Commission should require SPs to twice annually report to the Commission aggregate statistics on all instances when user data is used or disclosed pursuant to these exceptions. This report should be made public by the Commission. In addition, the Commission should annually audit each provider's use of these exceptions, including spot checks on specific instances of such excepted use or disclosure, in order to prevent abuse of the provisions.

	We recommend that TRAI - in coordination with the Dept of Telecom if needed - work to ensure the publication of transparency reports from all Indian TSPs on requests they receive from government agencies across India and other third parties for user information and content restriction; their response processes and user notification policies; compliance rates; reasons for compliance or rejection of the requests; and other categories of information to be decided in conjunction with civil society and public comment processes. Requiring reporting on these categories of information should be seen as a floor rather than a ceiling, allowing companies to continue innovating new ways to provide users and other stakeholders with essential information with regard to the privacy of their data. With respect to any calls for increased 'data retention' mandates, we would submit the following concerns which TRAI should keep in mind: ● The retention of vast amount of data requires massive storage capacity and related infrastructure investments, security protections, and more. ● The costs of data retention have been demonstrated but the necessity and proportionality of such measures on the protection of user data has yet to be assessed and duly demonstrated. On the contrary, the Court of Justice of the EU has established in Joined Cases 15 C-293/12 and C-594/12 that data retention schemes have a severe impact on the user's right to privacy.
Q.12 What are the measures that can be considered in order to address the potential issues arising from cross border flow of information and jurisdictional challenges in the digital ecosystem?	We believe that much of the discussion of this subject, while important, should lie outside the focus of this current consultation from TRAI. As we have mentioned previously, TRAI's immediate regulatory focus should be on the data collected and/or processed by TSPs - any broader measures should be included in a horizontally applicable comprehensive privacy law and the Privacy Commissioner's office it would establish. Such a framework may include mechanisms known in data protection law with respect to ensuring the transfer of personal data outside a country should be allowed only if the principle of "adequacy" is satisfied.

	More broadly on the issue of cross-border jurisdictional issues, we have published specific policy information and guidance on the issues of the Mutual Legal Assistance Treaty (MLAT) system in the form of an online portal with information on such arrangements at MLAT.info and a policy summary document on proposals to further reform the global MLAT system which may be of use to TRAI.

August 2015

The Rise of Mobile Tracking Headers: How Telcos Around the World Are Threatening Your Privacy

A publication of

access

accessnow.org

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Visual design by Anqi Li and Olivia Martin.

Access is an international organization that defends and extends the digital rights of users at risk around the world. By combining innovative policy, user engagement, and direct technical support, we fight for open and secure communications for all.

www.accessnow.org

For more information or assistance, please contact info@accessnow.org. For media inquiries, contact press@accessnow.org.

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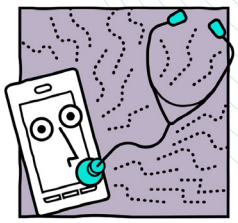
Executive Summary

Mobile broadband serves as a crucial means of accessing the internet for hundreds of millions of people around the globe. And for many users, mobile devices provide the only way of going online. Their devices serve as gateways to information, resources, and innovation, but they can also leak intimate details about the users themselves. In 2014, security researchers provided a key insight into how companies were using these data when they revealed that mobile carriers in the U.S. were secretly monitoring the web browsing habits of their users.[1] The researchers found Verizon Wireless and AT&T using so-called supercookies — special tracking headers that the carriers inject beyond the control of the user. These revelations led to an investigation by the U.S. Federal Communications Commission,[2] action by legislators in the U.S. Congress,[3] and several lawsuits.[4] Despite these small victories, tracking headers are still being used around the world, and important questions remain. How extensive is the use of these tracking headers? What kind of information have carriers been collecting with them? Does their use violate users' privacy? And what should be done about them, if anything?



Amibeingtracked.com

To call attention to the practice and to better understand tracking headers, Access built a tool at **Amibeingtracked.com** that allows users to test their devices to see if they are being tracked. Since its launch in October 2014, more than 200,000 people from around the world have used the tool, and the results are startling. This report presents results of nearly 180,000 tests conducted in the first six months, along with our major findings about the use of tracking headers worldwide, and it provides our recommendations for governments, carriers, websites, intergovernmental bodies, and researchers.

(1) McMillan, R. (2014, October 27). Verizon's Perma-cookie is a 'privacy killing' machine. *Wired*. Retrieved from http://www.wired.com/2014/10/verizons-perma-cookie/

(2) Goldstein, P. (2015, April 15). FCC is probing Verizon's 'super cookie' used to track mobile browsing. *Fierce Wireless*. Retrieved from http://www.fiercewireless.com/story/fcc-probing-verizons-super-cookie-used-track-mobile-browsing/2015-04-10

(3) Hojek, H. (2015, February 6). Senators urge FCC to investigate Verizon Wireless 'super cookies'. *NBC 2*. Retrieved from http://www.fiercewireless.com/story/fcc-probing-verizons-super-cookie-used-track-mobile-browsing/2015-04-10

(4) Davis, W. (2015, June 8). Verizon Should Stay Out Of 'Supercookie' Lawsuit, Consumers Say. *MediaPost*. Retrieved from http://www.mediapost.com/publications/article/251503/verizon-should-stay-out-of-supercookie-lawsuit.html

Key Findings

Evidence of widespread deployment	Carriers in 10 countries around the world, including Canada, China, India, Mexico, Morocco, Peru, the Netherlands, Spain, the United States, and Venezuela, are using tracking headers
	The following mobile carriers are using tracking headers: AT&T, Bell Canada, Bharti Airtel, Cricket, Telefonica de España, Verizon, Viettel Peru S.a.c., Vodafone NL, and Vodafone Spain
	15.3% of those who used our tool were being tracked by tracking headers
	Carriers around the world are using multiple types of tracking headers, all of which have distinct structures
Correlative evidence exists that tracking headers may have been used by carriers for more than a decade	We found information indicating the use of tracking headers dating back 15 years
Users cannot block tracking headers because they are injected by carriers beyond their control	Users cannot block tracking headers, because they are injected by carriers out of reach at the network level
	"Do not track" tools in web browsers do not block the tracking headers
	Tracking headers can attach to the user even when roaming across international borders
	Even if tracking headers are not used by the carrier itself to sell advertising, other firms can independently identify and use the tracking headers for advertising purposes
Encrypted connections to websites stop tracking headers from functioning	Tracking headers do not work when users visit websites that encrypt connections using Secure Socket Layer (SSL) or Transport Layer Security (TLS) (demarcated by "HTTPS" in a web address)
	Tracking headers depend upon an HTTP, or unencrypted connection, to function, and may lead to fewer websites offering HTTPS
Tracking headers leak private information about users and make them vulnerable to criminal attacks or even government surveillance	Certain tracking headers leak important private information about the user in clear text, including phone numbers
	Although we do not have evidence that criminal attacks have occurred, clear text leaks of phone numbers and other identifying information make tracking headers ripe for exploitation by criminals
	Although we do not have evidence that government surveillance has taken place, the rich data profiles about users that tracking headers create make them prime targets for government legal requests or surveillance
Tracking headers raise troubling questions about privacy as new technologies are developed	Carriers have changed their behavior because of public pressure or because of changes in technology
	Current trends suggest that tracking headers will grow in use or will be replaced by a new tracking technology

Recommendations

Government authorities	Appropriate authorities, including data protection and consumer rights regulators, should investigate the use of tracking headers in every country
	Authorities should hold carriers accountable for false or misleading statements or practices regarding tracking headers
	Authorities should require carriers to provide affected users with an adequate remedy, and to make guarantees of non-repetition
Carriers	All carriers should publicly disclose their use of tracking headers and not enroll users by default for any reason, such as advertising
	Any use of tracking headers or similar tracking technology should require users to clearly, specifically, and explicitly opt-in, after being fully informed of the potential risks
	Carriers must provide a clear, easy-to-use opt out mechanism for users, regardless of whether they previously opted in.
	Carriers that commit to stopping the use of tracking headers in one country or region should commit to stop using them in other countries or regions where they have operations
	Industry associations like the GSM Association should study the harms that tracking headers present, and advise members to strictly circumscribe their use
	Carriers should utilize Access' **Telco Action Plan** for further guidance on how to respect the privacy of users[5]
	Carriers should consider joining multistakeholder groups, such as the Global Network Initiative, that assess progress in meeting privacy and freedom of expression benchmarks based on international human rights laws and standards
Websites and Apps	Websites and apps should use encrypted HTTPS connections by default
	Companies should sign on to Access' **Digital Security Action Plan** to support basic steps to protect users against unauthorized access[6]
Intergovernmental bodies	United Nations experts, including special procedures mandate holders, should investigate the use of tracking headers as a threat to user rights
	Governments in the Freedom Online Coalition should take steps to ensure that carriers in their countries do not inject tracking headers
	Technical standards bodies should ensure that existing and future standards do not enable tracking headers or similar technologies that may threaten user privacy
Researchers	To identify more carriers using tracking headers, larger data samples are needed from around the world
	Researchers should consider means of collecting data other than a standalone site, such as developing code for individual website owners to install, with appropriate privacy and anonymity protections built in
	Researchers should seek to uncover the form and structure of new tracking mechanisms that may replace tracking headers

(5) Access. Telco Action Plan. (2012, March). Retrieved from https://s3.amazonaws.com/access.3cdn.net/1f9ab2891a86f3f081_uom6iil1w.pdf

(6) Access. Digital Security Action Plan. (2015). Retrieved from https://encryptallthethings.net/docs/EATT.pdf

Mobile broadband serves as a crucial means of accessing the internet for hundreds of millions of people around the globe. Sixty-four percent of adults in the U.S. owned smartphones in 2015.[7] Many mobile phone users do not realize that when they access the internet through their devices they are sharing copious amounts of information with carriers or third parties. As a result, this kind of connectivity raises important concerns about privacy.

In October 2014, security researchers exposed a special code used by Verizon Wireless to track its users. Labeled by the media as "supercookies," the code was special tracking headers that Verizon injected into every single HTTP web request that users made through their mobile devices. It was not immediately clear how Verizon was using the tracking headers, and the revelations raised important questions about their structure and deployment.

Access is an international organization that defends and extends the digital rights of users at risk around the world, and our work with telecoms began during the Arab Spring uprisings in 2011. What happened during that tumultuous period exposed the integral role that these corporations and their regulators play in connecting us to the internet, a tool that is now essential to the exercise of human rights in the 21st Century.

Governments struggle to maintain sufficient regulatory oversight in the face of rapidly adopted and fast-changing technology. But carriers must recognize that people are increasingly aware of and concerned about privacy and security issues. The legal, financial, and public relations fallout from invading privacy is growing, and movements to hold corporations accountable for infringing human rights are gaining steam around the world. It is in the best interest of carriers, both in the short and long term, to stop tracking and exploiting people's information without their knowledge or consent, whether or not current regulations ban the practice. There are more ethical ways to gather information, such as giving customers a true opt-in after informed consent.

Using tracking headers also raises concerns related to data retention. When "honey pots" of sensitive information, such as data on browsing, location, and phone numbers, are collected and stored, they attract malicious hacking and government surveillance. This kind of collection and retention of user data is unsustainable and unwise, and creates unmanageable risks for businesses and customers alike.

In response to the revelations about the use of tracking headers by Verizon Wireless, Access developed an online tool called Amibeingtracked.com that lets people test whether their mobile carrier is using tracking headers to log their internet activity. We collected the results of nearly 180,000 tests over a six-month period from people around the world.

(7) Smith, A. (2015, April). U.S. Smartphone Use in 2015. Pew Research Center. Retrieved from http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/

What is a tracking header?

Tracking headers are *not* cookies

Although tracking headers are popularly called "supercookies," "zombie cookies," or "perma-cookies," these terms are inaccurate. Cookies are injected locally and can be manipulated by end users in a web browser. Tracking headers are in fact not cookies at all because they are injected at the network level, out of the reach of the user. A more accurate term would be Carrier-Injected HTTP Header. For the sake of simplicity, and to avoid creating yet another acronym, we will refer to "Carrier-Injected HTTP Headers" as simply "tracking headers" throughout this report.

How they work: users cannot block tracking headers because they are injected by carriers beyond their control

Headers are an essential part of internet communications. When you use the internet on a mobile device, you normally transmit one or more unique identifiers — including IMEI, [8] IMSI, [9] and ICCID[10] identities — that include information about who you are and where you are located. But tracking headers go beyond such normal data sharing. To explain how they function, we'll use the example of a hypothetical character named Kavita:

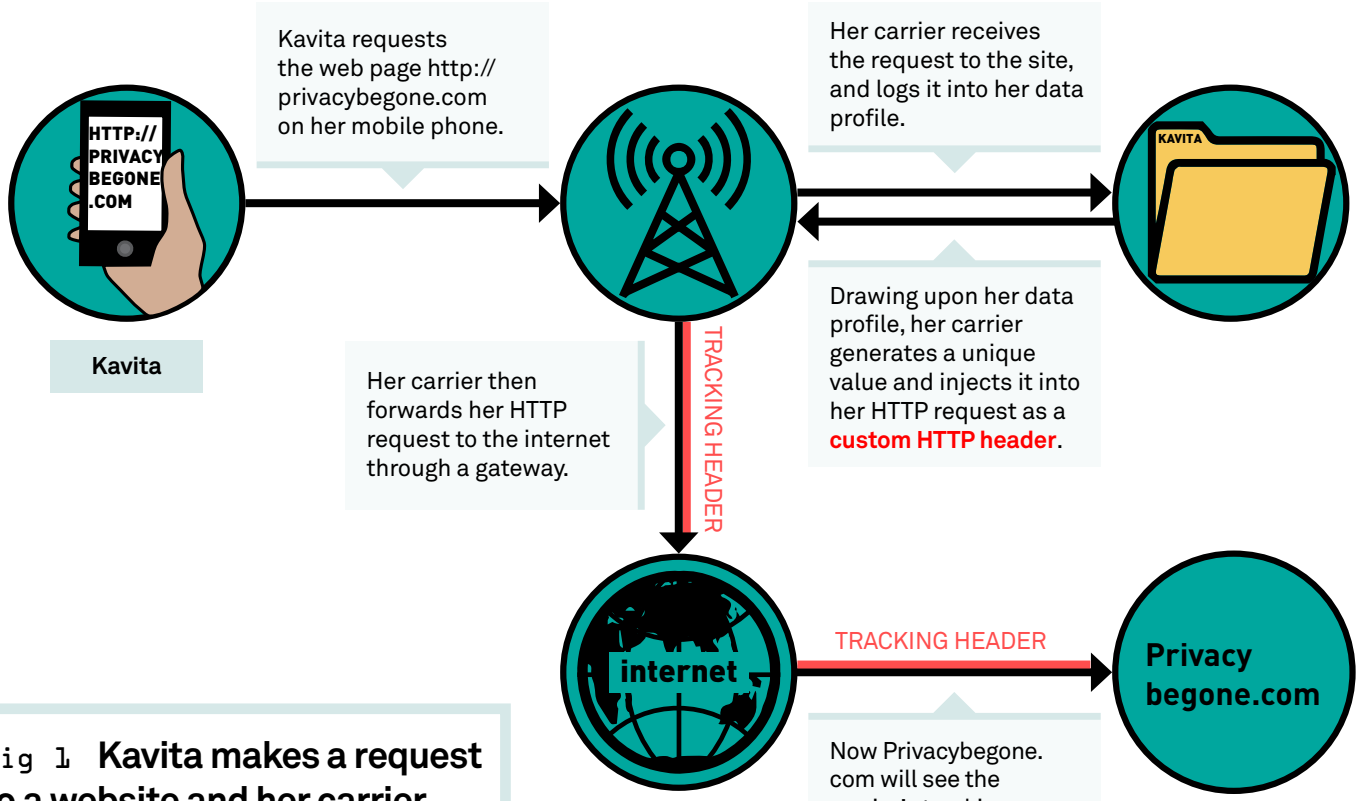
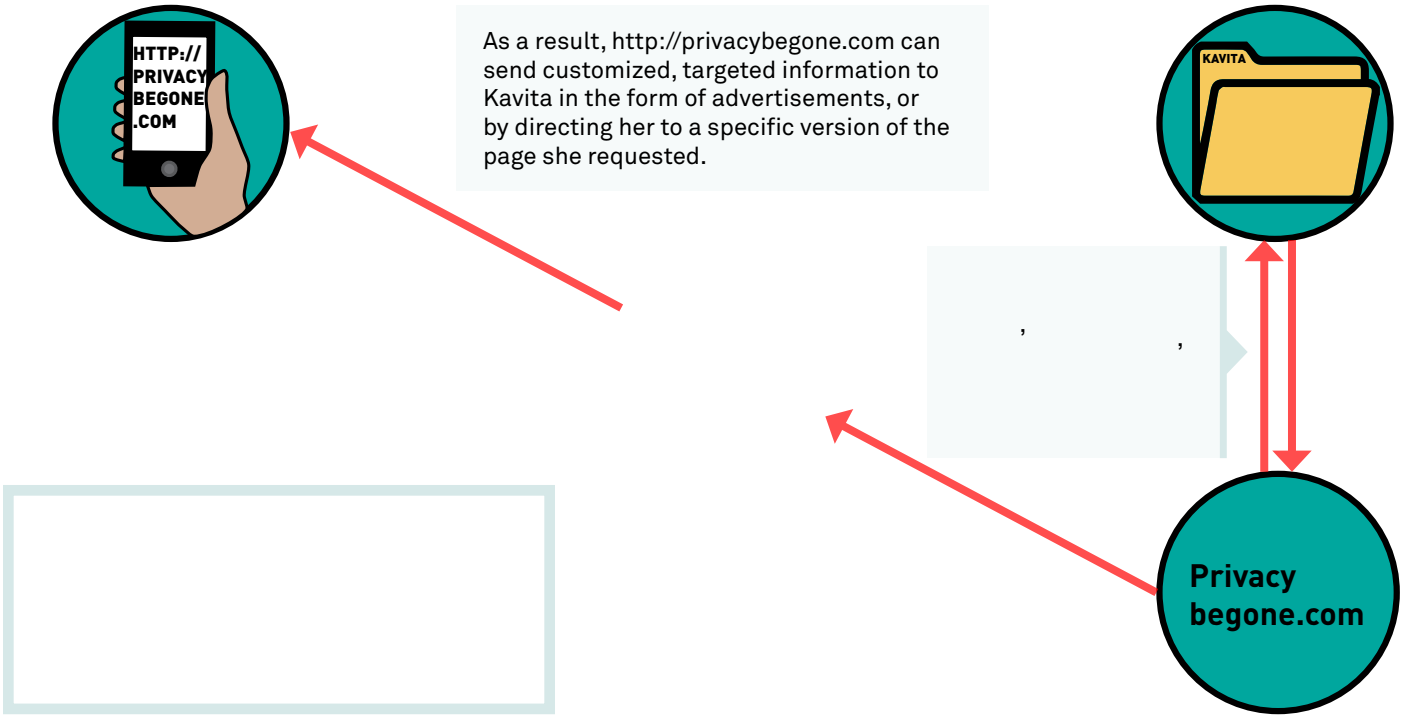


Fig 1 **Kavita makes a request to a website and her carrier injects an HTTP header.**

(8) International Mobile Station Equipment Identity.

(9) International Mobile Subscriber Identity.

(10) Integrated Circuit Card Identifier.



Evidence of tracking headers dates back to 2000

Our research conducted online confirms the existence and use of tracking headers as early as 2000. Our research shows that tracking headers were associated with Sprint[11] in February of 2000, and discussions[12] at the time indicate that they were also used by the carrier O2 in the United Kingdom. In 2006, there was discussion about x-up-subno, a particular type of tracking header that is used by Bell Canada. Four years later, in March 2010, the researcher Collin Mulliner discussed his research on tracking headers in a paper[13] announced at the CanSecWest conference in Vancouver, Canada. However, as we mentioned earlier, tracking headers began drawing widespread popular attention only after an article published in *Wired* in October 2014 revealed that Verizon Wireless had begun to use Unique Identifier Headers (UIDH).[14]

Access' response

After Verizon Wireless's use of tracking headers was revealed in 2014, Access mobilized its members, urging them to sign a petition asking both the U.S. Federal Communications Commission (FCC) and Federal Trade Commission (FTC) to investigate how tracking headers are being used. In February of 2015, we delivered nearly 3,000 signatures to both agencies, along with a formal letter detailing our concerns (see Appendix 1). In addition, our technology team built a tool that lets people quickly test to see if their carriers are tracking them (see Amibeingtracked.com). At the same time, public officials began to express their concerns. In February, U.S. Senators Bill Nelson, Edward Markey, and Richard Blumenthal sent a joint letter asking the FTC and FCC to investigate the practices.[15] In April 2015, the FCC confirmed that it has launched an investigation of Verizon's use of tracking headers.[16]

(11) Fu, K. (n.d.). Wireless Web Privacy - Test Your Phone. Retrieved from https://web.eecs.umich.edu/~kevinfu/news/hdmlprivacy.html

(12) X-up-subno uniqueness. (2006, April 6). Retrieved from http://developerboards.att.lithium.com/t5/Technical-Questions-Discussion/X-Up-Subno-uniqueness/td-p/23475

(13) Mulliner, C. (2010). Privacy Leaks in Mobile Phone Internet Access. Retrieved from https://www.mulliner.org/collin/academic/publications/mobile_web_privacy_icin10_mulliner.pdf

(14) McMillan, R. (2014, October 27). Verizon's Perma-cookie is a 'privacy killing' machine. *Wired*. Retrieved from http://www.wired.com/2014/10/verizons-perma-cookie/

(15) Gross, G. (2015, February 6). Senators call for investigation of Verizon's nearly unstoppable supercookies. *PC World*. Retrieved from http://www.pcworld.com/article/2881252/lawmakers-call-for-investigation-of-verizon-supercookies.html

(16) Max, M. (2015, April 15). FCC Investigating Verizon over 'supercookies'. *TechRaptor*. Retrieved from http://techraptor.net/content/fcc-investigating-verizon-over-supercookies

How Amibeingtracked.com works

The Am I Being Tracked website performs several simple tests to determine whether users are being tracked. The site first determines whether the device making the request is a mobile device operating on a 3G, 4G, or LTE carrier network. If the device is operating on a carrier network, the test extracts the user's IP address from the normal HTTP header (not the injected header) and looks up the IP address in an IP geolocation database,[17] matching the IP address with publicly available information about where the IP range is located. The system then looks for any unusual or custom headers in the HTTP request and, if found, it logs them. Finally, the site returns the results of the test to the user stating whether the user is being tracked or not. *We never disclose the personally identifying information of people who take our test.*

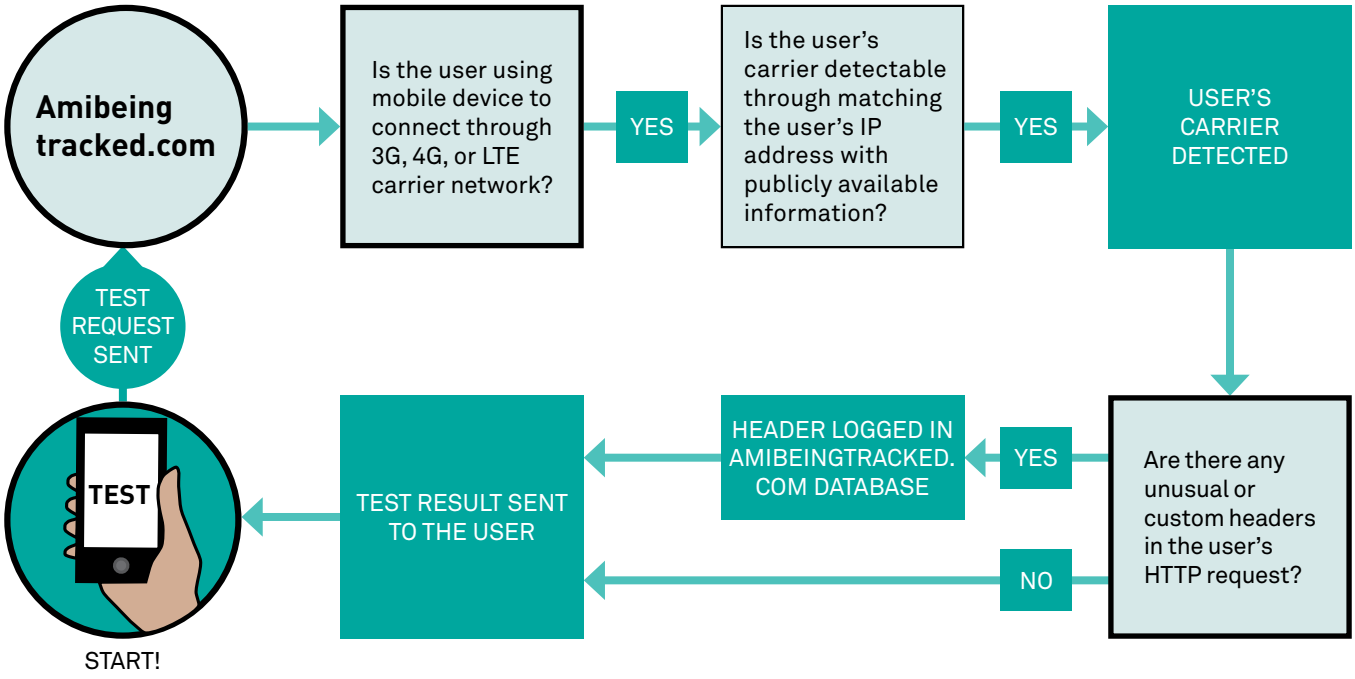


Fig 3 How Amibeingtracked.com works

The Amibeingtracked.com tool not only allows users to test for known tracking headers, but also allows us to learn from the results, specifically enabling us to identify new headers and make the test more robust. This has allowed us to improve the test's reporting accuracy over time. We have also improved accuracy by scrubbing inaccurate data, including tests run by malicious attackers (attackers typically have used Denial of Service attacks, attempted code injections, or automated scripts).

To encourage more people to take the test, we have shared links to Ambeingtracked.com in our newsletter, as well as in several email petitions. In addition, we have promoted the tool using our social media accounts. Media coverage and discussions in online fora such as Reddit.com have also generated attention and garnered further test results for analysis.

(17) Wikipedia. Geolocation software. Retrieved 2015 from https://en.wikipedia.org/wiki/Geolocation_software

Test Results

Research methodology

In the first six months, our Amibeingtracked.com tool returned nearly 180,000 results. This included 93,941 conclusive results and 80,156 inconclusive results. "Conclusive" means that our tool accurately identified the type of connection being used (3G, 4G, or LTE) and the carrier. "Inconclusive" means that our tool could not identify the carrier or the type of connection.[18] We separate the two types of results below for accuracy and transparency. Users who took the test have different demographic profiles and came through multiple referral sites, meaning that this is not a random statistical sample.

Evidence of widespread deployment

People from

164

different countries took the test with the tool at Amibeingtracked.com.

Among all the testers

26,726

received test results that showed the presence of tracking headers.

A further

67,215

did not have tracking headers present in their results.

Out of all test results

15.3%

showed the presence of tracking headers.

RESULTS BY COUNTRY

Tracked	Not Tracked	Inconclusive	Country
23123	46044	20443	USA
3344	12483	22222	SPAIN
125	434	980	NETHERLANDS
49	815	5616	CANADA
17	493	824	PERU
4	280	418	INDIA
3	93	256	CHINA

Among the people who took our test, the most tracking occurred in the USA, Spain, and the Netherlands. It is interesting to compare the Netherlands to Canada, because while more people in Canada tested their phones at Amibeingtracked.com, more people had tracking headers in the Netherlands. (We also detected tracking in Mexico, Venezuela, and Morocco. However, in each of these countries we had only one conclusive case of tracking.)

(18) This may have been because the user was accessing the test through WiFi, the test did not support a particular browser, the user was using a 2G connection, or the user had a new tracking header that had not previously been identified.

RESULTS BY CARRIER

Tracked	Not Tracked	Inconclusive	Carrier	Country
18868	8619	1282	Verizon	USA
5703	9854	1406	AT&T	USA
3335	4461	569	Telefonica de España	SPAIN
130	34	8	Vodafone NL	NETHERLANDS
48	264	779	Bell Canada	CANADA
17	0	322	Viettel Peru	PERU
11	5629	467	Vodafone Spain	SPAIN

Verizon had the most number of users with tracking headers amongst the people who took our test, followed by AT&T.[19] AT&T vowed to stop using heading trackers in November of 2014,[20] and we found that the number of users being tracked by AT&T dwindled to near zero after 17 weeks of running our test. Viettel Peru, which recently began operating in Peru, is also tracking users. The carrier is a subsidiary of Viettel, a Vietnamese carrier wholly owned by the government of Vietnam and operated by the Vietnamese military. We do not have tests from Vietnamese users to determine whether Viettel uses tracking headers in Vietnam, but it is worth further investigation to understand why a military operator would wish to use tracking headers. Results from two Vodafone subsidiaries varied greatly. A high percentage of Vodafone NL users were tracked, while Vodafone Spain tracked very few users overall, despite a higher number of tests. This demonstrates the need for more testing and investigation on a country-by-country basis, and for greater oversight and governance by senior-level corporate directors over national-level entities.

We also found conclusive results of tracking headers by people using Chinanet (China),[21] Bharti Airtel (India), Cricket (USA), Iusacell (Mexico), Rogers (Canada), and Telcel (Venezuela). However, we had less than ten conclusive results of tracking for each of these carriers.

HIGHEST PERCENTAGE OF TRACKING BY CARRIER*

Users tracked (%)	Carrier	Country
75.6	Vodafone NL	NETHERLANDS
65.6	Verizon	USA
39.9	Telefonica de España	SPAIN
33.6	AT&T	USA
5.0	Viettel Peru	PERU
4.4	Bell Canada	CANADA

* The percentage was calculated by dividing the number of users tracked by the total of conclusive results plus inconclusive results. This provides the most conservative estimate of the percentage of tracking. It is possible that the real figure is higher.

(19) Each of these companies used to be part of AT&T, as Verizon was created out of Bell Atlantic, a former company in the Bell system. See Wu, T. (2011). *The Master Switch: the Rise and Fall of Information Empires.* Vintage.

(20) Albanesius, C. (2014, November 16). AT&T drops 'supercookie' mobile tracking. *PC Mag*. Retrieved from http://www.pcmag.com/article2/0,2817,2472230,00.asp

(21) We are investigating this result, because Chinanet is not one of the three major mobile carriers in China. The result may have occurred because of the unique nature of mobile WiFi hotspots. A mobile carrier owns a list of IP addresses that it can allocate to users when they connect to the internet, typically by a 3G or 4G connection. Occasionally, the carrier does not allocate the IP address to a mobile connection and instead allocates it to a WiFi hotspot. The reverse also occurs, when an IP address allocated for a WiFi hotspot is instead allocated to a 3G or 4G connection. In our results, Chinanet may have received WiFi hotspot allocations from carriers that had injected tracking headers. The reverse may have also occurred, so Chinanet may have allocated an IP address to a mobile carrier, and injected the header.

DIFFERENT TYPES OF HEADERS

They leak private information about users and make them vulnerable to criminal attacks or government surveillance

Tracking header		Carrier	Characteristics
Encrypted	TM_user-id	Telefonica	Always paired with the header x-up-subno. It is possible the two headers are used for two different purposes.
	x-acr	AT&T	Remains active even when "do not track" option is turned on in a web browser. Can remain with the user even when roaming on other carriers in other countries.
	x-amobee-1	Bharti Airtel	Remains active even when "do not track" option is turned on in a web browser.
	x-uidh	Verizon, AT&T	Base64 encrypted. Binary data combines with null-terminated nine-digit number.
	x-vf-acr	Vodafone	Contains two parts: a constant string and base64 binary string. Remains active even when "do not track" option is turned on in a web browser.
New version: encrypted Old version: clear text	x-up-subno	Vodafone España, Telefonica de España, Bell Canada, Sprint, AT&T, Iusacell PCS, Jazz Telecom	Dates back to 2000. Different versions used by different carriers.
Not encrypted	x-msisdn	Bharti Airtel	Contains phone number in clear text.
	x-nokia-msisdn	Iusacell PCS de Mexico	Contains phone number in clear text.
	x-piper-id	Verizon, Chinanet	Contains random 10-digit number affixed to another header.

The various tracking headers raise several interrelated issues. First, encrypted headers make it impossible to know what types of data are being collected or how the data are being used. Conversely, headers sent in clear text raise privacy concerns. Such headers compromise user security and make users vulnerable to exploitation by criminals, who can take advantage of an individual user based on the header (although we found no evidence of this occurring to date). Governments could, in theory, surveil users by following individual headers or by requesting data from carriers that use the headers to assemble profiles.[22]

(22) We did not uncover evidence that government authorities are using these headers to monitor communications, but leaks about the NSA's Operation Auroragold and the British and Canadian BADASS program, which infiltrate mobile phone usage through sophisticated methods, suggest that the NSA, GCHQ, and other intelligence agencies may be capable of using tracking headers to monitor users. See more at Gallagher, Ryan. (2014, December 4). Operation Auroragold: How the NSA Hacks Cellphone Networks Worldwide. *The Intercept*. Retrieved from https://firstlook.org/theintercept/2014/12/04/nsa-auroragold-hack-cellphones/ See also Marquis-Boire, M. et al. (2015, July 1). XKEYSCORE: NSA's Google for the World's Private Communications. *The Intercept*. Retrieved from https://firstlook.org/theintercept/2015/07/01/nsas-google-worlds-private-communications/ For more BADASS information, see document hosted by *Der Spiegel* at http://www.spiegel.de/media/media-35670.pdf.

ENCRYPTED CONNECTIONS THWART TRACKING HEADERS

Websites with Secure Socket Layer (SSL) and Transport Layer Security (TLS) encryption prevent carriers from being able to insert tracking headers into users web browsing. Such sites are identifiable because the web address contains "HTTPS" instead of "HTTP." HTTPS stops carriers from identifying the exact resource requested by the user from a website. Although the carrier can view the base domain, such as Amibeingtracked.com, the carrier cannot identify the path to a particular page or resource on the site. Encrypted connections therefore improve privacy.

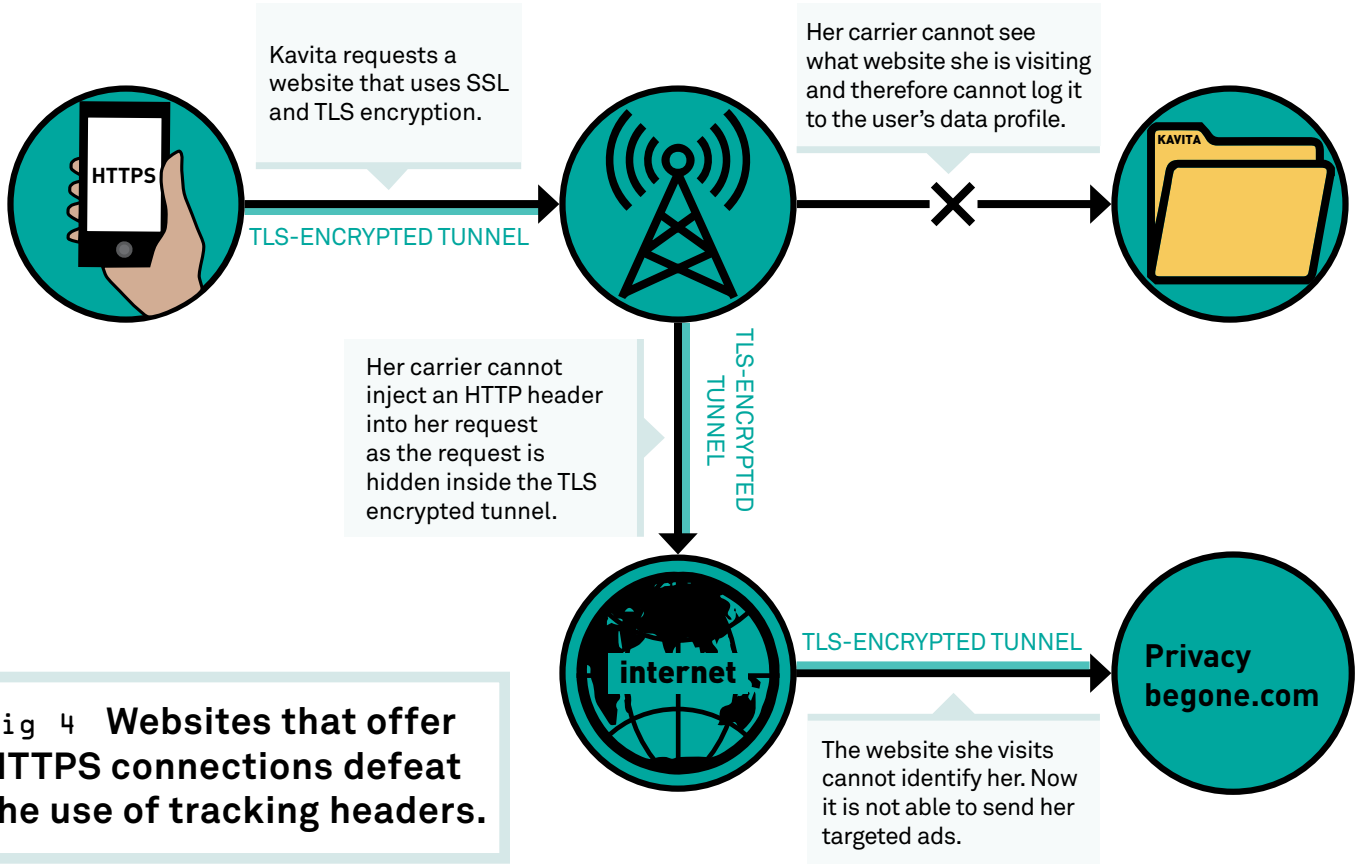


Fig 4 Websites that offer HTTPS connections defeat the use of tracking headers.

Unfortunately, the ability of HTTPS to block tracking headers may discourage websites from offering HTTPS connections. Carriers make money by selling user profiles, and websites make money from ad sales targeted at users.[23] It may be worth further investigation to see whether apps or services on a carrier tend to favor one type of connection over another. There are competing incentives for websites that could drive them to make different choices. Suffice it to say, a secure HTTPS website could not use a carrier's profiling service if it relies upon tracking headers.

TROUBLING QUESTIONS ABOUT PRIVACY AND NEW TECHNOLOGY

Since various groups began applying public pressure to carriers utilizing tracking headers, two have changed their practices: AT&T and Verizon. AT&T pledged to end its use of tracking headers in November 2014, and our tests suggest that the tracking has indeed stopped. Verizon Wireless allowed a user to opt out of its Relevant Advertising prior to press coverage in October 2014, and opting out meant that Verizon would stop populating

(23) We do not take issue with carriers as to their relationships with websites on advertising. Our concern here is that a lack of HTTPS can negatively impact user security.

profiles about the user's web browsing.[24] But opting out did not seem to stop Verizon Wireless from injecting the tracking headers — they just weren't used by Verizon for advertising. Third parties could still track the headers and use them for their own purposes. Indeed, the advertiser Turn appears to have accomplished this very feat, using Verizon's tracking header to create local cookies stored in users' web browsers.[25] In March of 2015, Verizon Wireless promised to allow a true-opt out for users so that Verizon would stop injecting tracking headers entirely.[26] In response to media coverage, Turn stated that it would suspend the use of Verizon's specific tracking headers to sell advertisements, pending further review.[27] Both Turn and Verizon Wireless are embroiled in litigation related to tracking headers at the time of this writing.[28][29]

Thus far, carriers have in general not been transparent or demonstrated accountability with regard to their use of tracking headers. In addition, government investigation of the practice has been inadequate to date.

The public policy implications of this practice demand greater attention. The tracking activity revealed in this report takes place within a context of massively increased government surveillance capabilities that span the globe. International human rights experts have extolled anonymity as an important facilitator of the rights to freedom of expression and privacy online,[30] yet users who wish to express themselves and receive and impart information without revealing their identity can face extreme difficulty. Intelligence agencies, malicious users, and other actors can exploit this power imbalance to unlawfully collect personal data, build profiles, and monitor marginalized communities. Far from hypothetical, recent reports about a secret British and Canadian surveillance program show that it "mines as much valuable information from leaky smartphone apps as possible," including unique tracking identifiers.[31]

TRACKING HEADERS MAY BE JUST THE BEGINNING

The promised changes by AT&T and Verizon Wireless around the use of tracking headers are positive steps, but this does not mean that all tracking will stop. Carriers may simply have more effective tracking mechanisms waiting in the wings. AT&T has already demonstrated that it intends to use advertising programs in its roll-out of new broadband fiber in the U.S. The company charges a premium for people who do not wish to be tracked.[32] When Verizon announced[33] its purchase of AOL in May of 2015, tech journalists trumpeted AOL's ability to deliver new forms of mobile advertising to Verizon customers.[34] These advertising mechanisms may utilize new tracking technologies instead of tracking headers.

(24) McMillan, R. (2014, October 27). Verizon's Perma-cookie is a 'privacy killing' machine. *Wired*. Retrieved from http://www.wired.com/2014/10/verizons-perma-cookie/

(25) Angwin, J. and Tiga, M. (2015, January 14). Zombie Cookie: the tracking cookie that you can't kill. *ProPublica*. Retrieved from http://www.propublica.org/article/zombie-cookie-the-tracking-cookie-that-you-cant-kill

(26) Graziano, D. (2015, March 31). How to opt out of Verizon's 'supercookie program'. *CNET*. Retrieved from http://www.cnet.com/how-to/how-to-opt-out-of-verizon-supercookie-tracking-program/#!

(27) In a January 2015 blog post, Turn said that it would stop using tracking headers "pending revaluation." The post specifically refers to the use of UIDH headers by Verizon and there is no mention of whether Turn uses other headers or would suspend their use. There have been no further announcements about Turn's review, and no indication of whether it has resumed using Verizon's tracking headers. See more at Ochoa, M. (2015, January 17). 'Zombie' Cookie ID to be suspended pending re-evaluation [blog post]. Retrieved from http://www.turn.com/blog/zombie-cookie-id-to-be-suspended-pending-re-evaluation

(28) Davis, W. (2015, April 9). Turn hit with new lawsuit over 'zombie' cookies. *Media Post*. Retrieved from http://www.mediapost.com/publications/article/247463/turn-hit-with-new-lawsuit-over-zombie-cookies.html

(29) Coren, C. (2015, February 12). Verizon hit with privacy class action over 'supercookies'. *Top Class Actions*. Retrieved from http://topclassactions.com/lawsuit-settlements/lawsuit-news/49503-verizon-hit-privacy-class-action-supercookies/

(30) Kaye, D. (2015, May 22). Report on encryption, anonymity, and the human rights framework. *United Nations Office of the High Commissioner for Human Right*s. Retrieved from http://www.ohchr.org/EN/Issues/FreedomOpinion/Pages/CallForSubmission.aspx

(31) Marquis-Boire, et al. (2015, July 1).

(32) Brodkin, J. (2015, February 16). AT&T charges $29 more for gigabit fiber that doesn't watch your web browsing. *ArsTechnica*. Retrieved from http://arstechnica.com/business/2015/02/att-charges-29-more-for-gigabit-fiber-that-doesnt-watch-your-web-browsing/

(33) Shields, M. and Gryta, T. (2015, May 12). Verizon to Buy AOL for $4.4 billion. *The Wall Street Journal*. Retrieved from https://secure.marketwatch.com/story/verizon-to-buy-aol-for-44-billion-2015-05-12-81032958

(34) Manjoo, F. For Verizon and AOL, Mobile is a Magic Word. *The New York Times*. Retrieved from http://www.nytimes.com/2015/05/13/technology/verizons-data-trove-could-help-aol-score-with-ads.html?ref=technology&_r=0

CONCLUSION

Tracking headers are a global phenomenon — we have determined that they are being used in numerous countries in various formats among a variety of carriers. But not all carriers track their users, and those that respect user privacy deserve our support. Telecommunications companies occupy a central role in providing access to the internet, enhancing the communications capabilities of billions of people. By delivering open access, networks, and services, telcos can serve not just as internet service providers, but also as "freedom providers." Our Telco Action Plan offers proactive steps for any carrier to better respect human rights in policy and practice, and provides guidelines for safeguarding users' right to privacy.[35]

Injecting tracking headers out of the control of users, without their informed consent, may abuse the privileged position that telcos occupy. End User License Agreements are typically complex and most people do not read them when purchasing a mobile internet plan.[36] The use of tracking headers dates back to at least 2000, which means that it took 15 years for U.S. regulatory agencies to investigate how they are being used. And it is entirely possible that new, undiscovered tracking mechanisms are already being deployed.

In many ways, our research raises more questions about the use of tracking headers than it answers. We believe that further research is necessary to uncover what is happening so that we can develop policy and practices to address the privacy issues that are implicated by this form of tracking.

We offer the following recommendations to address the use of tracking headers and take action to respect user privacy. Although we present specific responses, any regulatory action should address the problem as we know it today while also considering the privacy-invading technologies of the future. *See next page for recommendations.*

(35) Access. Telco Action Plan. (2012, March). Retrieved from https://s3.amazonaws.com/access.3cdn.net/1f9ab2891a86f3f081_uom6iil1w.pdf

(36) Masnick, Mike. (2012, April 23). To Read All Of The Privacy Policies You Encounter, You'd Need To Take A Month Off From Work Each Year. *Techdirt*. Retrieved from https://www.techdirt.com/articles/20120420/10560418585/to-read-all-privacy-policies-you-encounter-youd-need-to-take-month-off-work-each-year.shtml

Recommendations

Government authorities	Appropriate authorities, including data protection and consumer rights regulators, should investigate the use of tracking headers in every country
	Authorities should hold carriers accountable for false or misleading statements or practices regarding tracking headers
	Authorities should require carriers to provide affected users with an adequate remedy, and to make guarantees of non-repetition
Carriers	All carriers should publicly disclose their use of tracking headers and not enroll users by default for any reason, such as advertising
	Any use of tracking headers or similar tracking technology should require users to clearly, specifically, and explicitly opt-in, after being fully informed of the potential risks
	Carriers must provide a clear, easy-to-use opt out mechanism for users, regardless of whether they previously opted in.
	Carriers that commit to stopping the use of tracking headers in one country or region should commit to stop using them in other countries or regions where they have operations
	Industry associations like the GSM Association should study the harms that tracking headers present, and advise members to strictly circumscribe their use
	Carriers should utilize Access' **Telco Action Plan** for further guidance on how to respect the privacy of users[5]
	Carriers should consider joining multistakeholder groups, such as the Global Network Initiative, that assess progress in meeting privacy and freedom of expression benchmarks based on international human rights laws and standards
Websites and Apps	Websites and apps should use encrypted HTTPS connections by default
	Companies should sign on to Access' **Digital Security Action Plan** to support basic steps to protect users against unauthorized access[6]
Intergovernmental bodies	United Nations experts, including special procedures mandate holders, should investigate the use of tracking headers as a threat to user rights
	Governments in the Freedom Online Coalition should take steps to ensure that carriers in their countries do not inject tracking headers
	Technical standards bodies should ensure that existing and future standards do not enable tracking headers or similar technologies that may threaten user privacy
Researchers	To identify more carriers using tracking headers, larger data samples are needed from around the world
	Researchers should consider means of collecting data other than a standalone site, such as developing code for individual website owners to install, with appropriate privacy and anonymity protections built in
	Researchers should seek to uncover the form and structure of new tracking mechanisms that may replace tracking headers

(37) Access. Telco Action Plan. (2012, March). Retrieved from https://s3.amazonaws.com/access.3cdn.net/1f9ab2891a86f3f081_uom6iil1w.pdf

(38) Access. Digital Security Action Plan. (2015). Retrieved from https://encryptallthethings.net/docs/EATT.pdf

APPENDIX 1

Letter to Federal Communications Commission and Federal Trade Commission Urging Agencies to Investigate Use of Tracking Headers

February 17, 2015

Dear FCC Commissioners,

We respectfully urge you to investigate the use of persistent cookies that were recently found to be injected by U.S. cellular network operators into the HTTP requests of mobile users.

More users access the internet on mobile networks, and unknowingly reveal sensitive data, including real-time location information, to operators, apps, and third parties. Their trust in the companies that enable their internet access and services must be matched by vigilant regulation to prevent abuse.

Today, we are delivering an Access petition that drew 3,000 signatures calling for the FCC and FTC to investigate the use of UIDH and to take immediate action to protect user rights. The fact that AT&T and Verizon both deployed a pernicious form of persistent cookie — a UIDH or "Unique Identifier Header" — led to public outcry and spurred our community into action. While both companies have now responded to our voices and suspended the UIDH injection, all action by the companies has been voluntary, and recent revelations about the use of the service operated by Turn suggest that companies will continue to utilize such tracking mechanisms whenever they can get away with it.

Spoofing and surveillance

In addition to consumer-related privacy problems, we believe that these cookies can make users vulnerable to spoofing by criminals. They could also potentially enable authorities to surveil users without their knowledge. Even without this type of third-party abuse, though, the very existence of these cookies violates our privacy rights if users cannot truly opt out.

FCC Authority

The FCC is empowered to investigate and set clear rules banning the use of persistent cookies in mobile internet traffic. The FCC already established precedent in the matter of Terracom, Inc. and YourTel America, Inc. in 2014. In that important proceeding, your agency found that the companies had collected data about their customers, willfully misled the customers about how that data was stored and used, and failed to provide reasonable security measures.

The cookie technology at issue here also thrives on the web traffic of unsecured http communications that do not use SSL or TLS security to encrypt their connection. Exploiting the mobile browsing of users to track them for advertising purposes is misleading and may expose the users to security risks. Furthermore, Verizon and other carriers have been shown to track users over time and across websites, even when they opt out.

The FCC should investigate and end this unfair practice that exploits the trust of mobile internet users.

Global precedent for privacy

Your actions will not only protect users in the U.S., but set a precedent around the world: Access has already found mobile operators in several countries injecting these pernicious cookies and enabling tracking of their users. By striking out against UIDH and its use, U.S. regulators will begin building an international norm banning this insidious tracking technology.

In holding Verizon and others accountable for their actions, the FCC can set an important precedent that opting in should be the new normal, and not opting out.

Best regards,
Access

APPENDIX 2

Glossary of Terms

Cookie
- A small piece of data sent from a website and stored in a user's web browser that is designed to track web browsing sessions.

Encryption
- Encryption is the process of encoding messages or information in such a way that only authorized parties can read it.

FCC
- Federal Communications Commission

FTC
- Federal Trade Commission

HTTP
- Hypertext Transfer Protocol, a foundational protocol for the World Wide Web.

HTTPS
- A communications protocol for secure communication over a computer network.

Header
- Introductory lines of text at the beginning of a web request that negotiate how a web browser and web server communicate.

IMEI
- International Mobile Station Equipment Identity. Transmitted to a carrier when placing a call or browsing the web.

IMSI
- International Mobile Subscriber Identity. Transmitted to a carrier when placing a call or browsing the web.

ICCID
- Integrated Circuit Card Identifier. Transmitted to a carrier when placing a call or browsing the web.

IP
- Internet Protocol

IP geolocation database
- A database that matches an IP address with publicly available information about the location where the associated IP range is located.

Perma-cookie
- Popularly used to refer to tracking headers. However, a cookie is stored within a users' web browser, and tracking headers are injected by the carrier out of the control of the user, making this term inaccurate.

Supercookie
- Popularly used to refer to tracking headers. However, a cookie is stored within a users' web browser, and tracking headers are injected by the carrier out of the control of the user, making this term inaccurate.

Tracking header
- A header injected by a carrier out of the control of the user.

Zombie cookie
- Popularly used to refer to tracking headers. However, a cookie is stored within a users' web browser, and tracking headers are injected by the carrier out of the control of the user, making this term inaccurate.