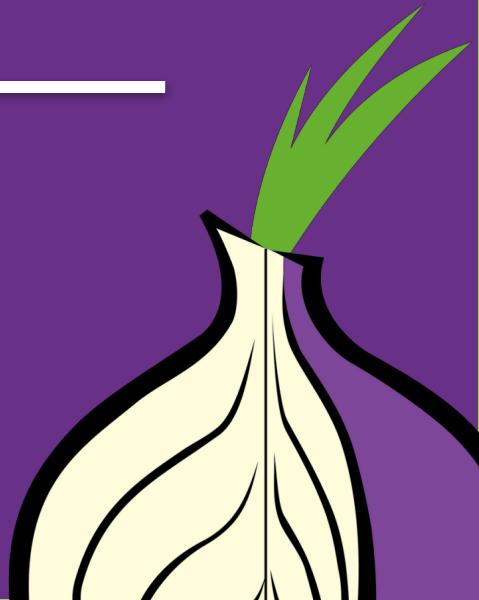
UX at Tor: an open approach

FOSDEM 19



0. Intro

1. Methodology

2. In Practice: Tor Browser 8 UX Improvements

3. How to Contribute

Applications

Community

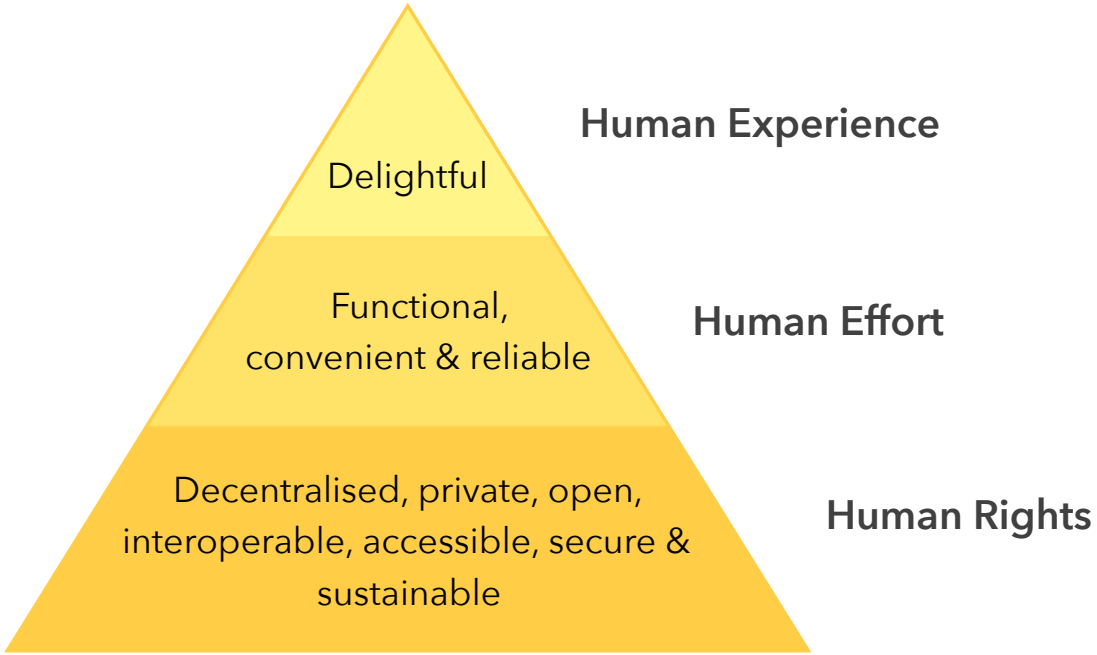
Communications

Metrics

Network

Users

Ethical Design



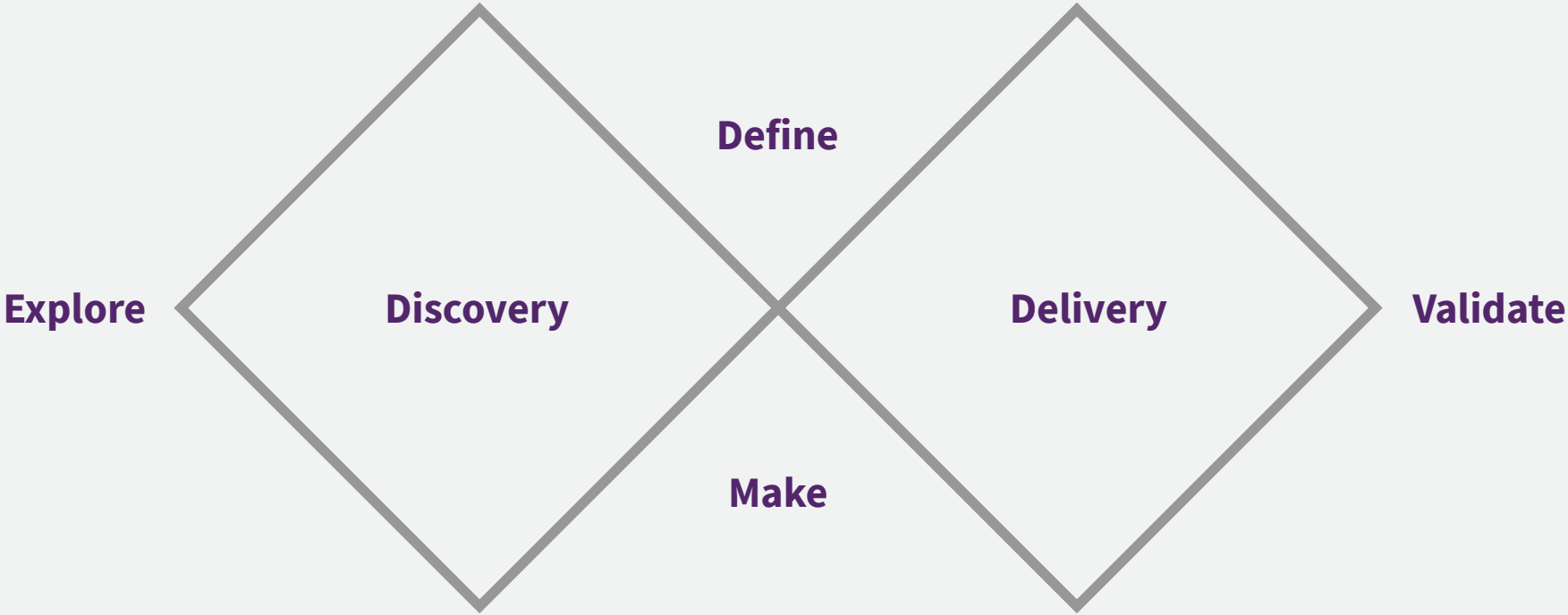
The 'Ethical Hierarchy of Needs'- Source: https://2017.ind.ie/ethical-design/

Technology that respects

Open Design

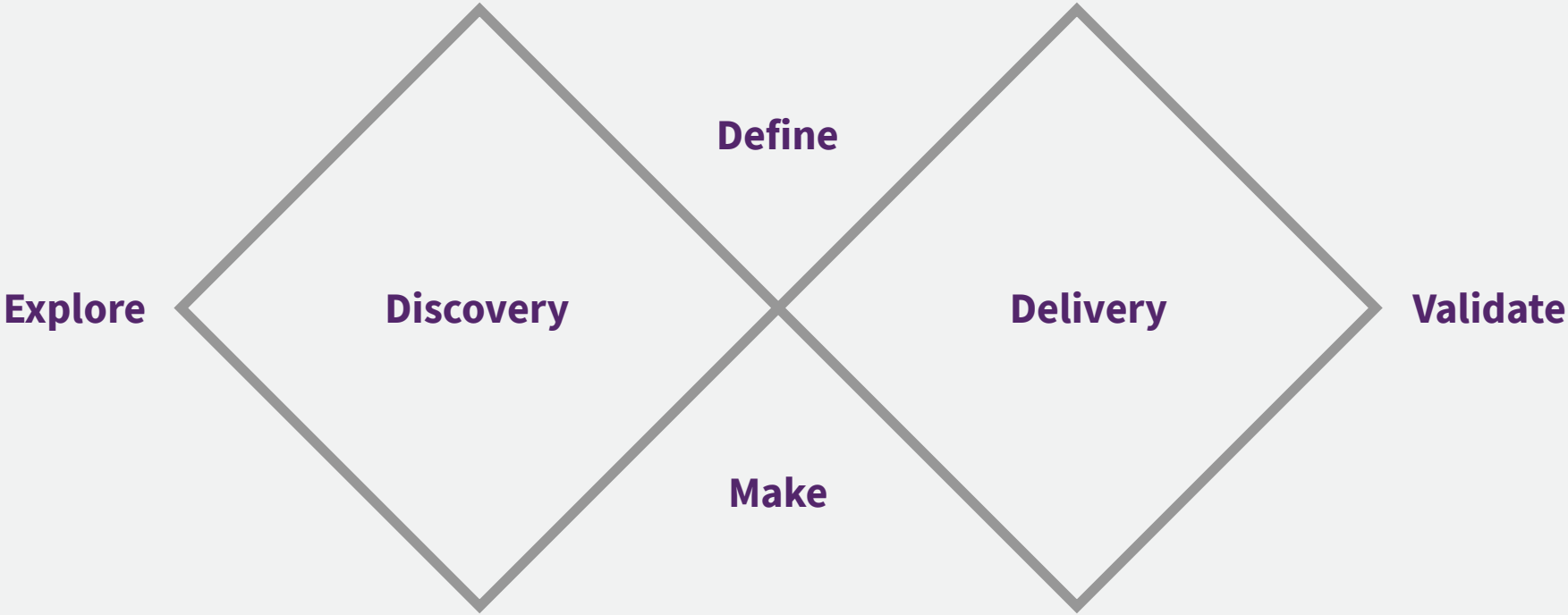
Open Design

Open Design



http://opendesignkit.org/process/

Photo by Mark Asthoff on Unsplash



http://opendesignkit.org/process/

Validate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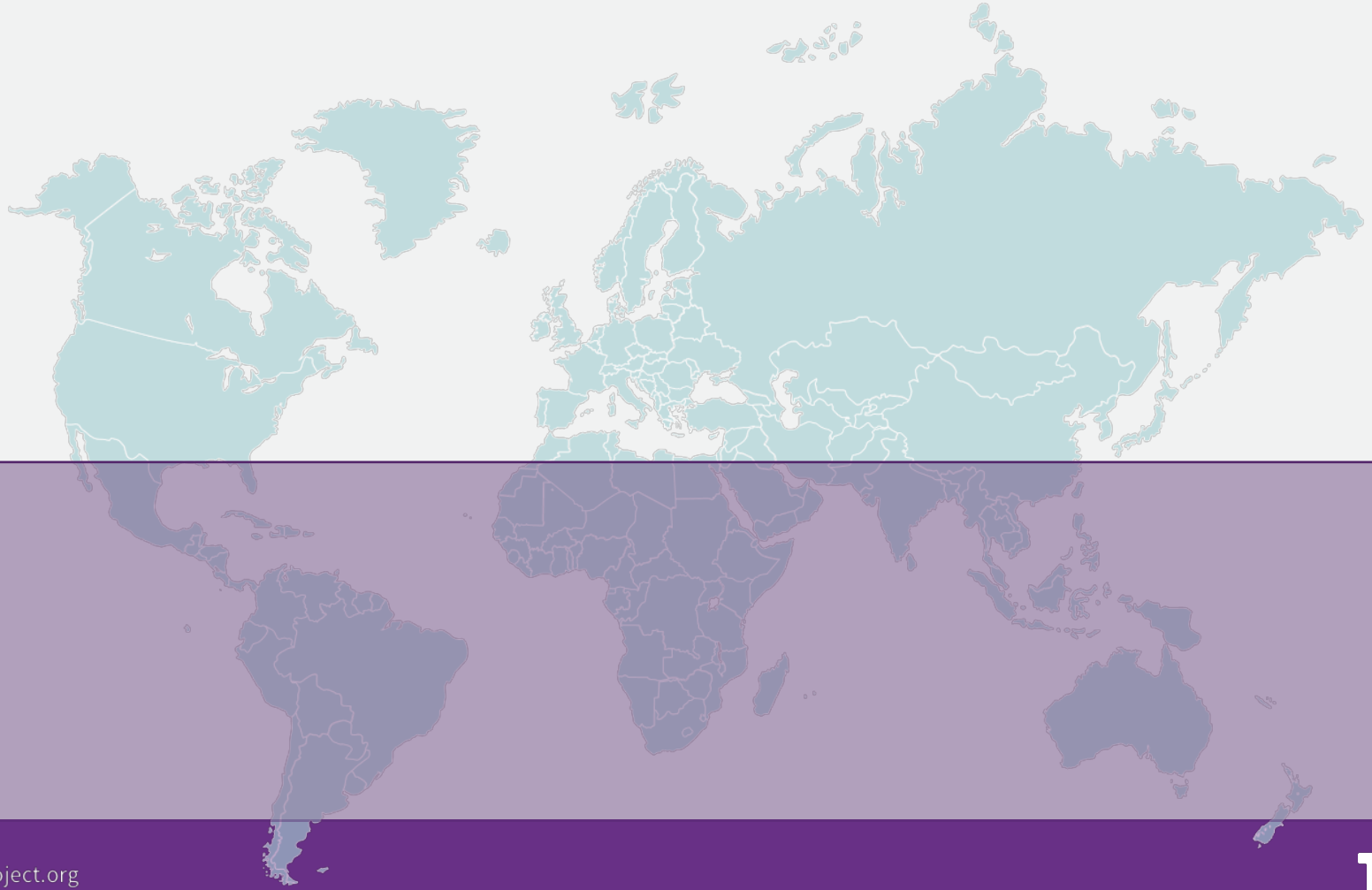


India
Uganda
Kenya
Colombia

Academic Research

Peeling the Onion's User Experience Layer: Examining Naturalistic Use of the Tor Browser

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ABSTRACT

The strength of an anonymity system depends on the number of users. Therefore, User eXperience (UX) and usability of these systems is of critical importance for boosting adoption and use. To this end, we carried out a study with 19 non-expert participants to investigate how users experience routine Web browsing via the Tor Browser, focusing particularly on encountered problems and frustrations. Using a mixed-methods quantitative and qualitative approach to study one week of naturalistic use of the Tor Browser, we uncovered a variety of UX issues, such as broken Web sites, latency, lack of common browsing conveniences, differential treatment of Tor traffic, incorrect geolocation, operational opacity, etc. We applied this insight to suggest a number of UX improvements that could mitigate the issues and reduce user frustration when using the Tor Browser.

CCS CONCEPTS

• **Security and privacy → Usability in security and privacy**;

KEYWORDS

Tor; Tor Browser; User Experience; UX; Usability; Privacy; Anonymity

ACM Reference Format:
Kevin Gallagher, Sameer Patil, Brendan Dolan-Gavitt, Damon McCoy, and Nasir Memon. 2018. Peeling the Onion's User Experience Layer: Examining Naturalistic Use of the Tor Browser. In *2018 ACM SIGSAC Conference on Computer and Communications Security (CCS '18), October 15–19, 2018, Toronto, ON, Canada.* ACM, New York, NY, USA, 16 pages. https://doi.org/10.1145/3243734.3243803

CCS '18, October 15–19, 2018, Toronto, ON, Canada

ACM ISBN 978-1-4503-5693-0/18/10. . . $15.00
https://doi.org/10.1145/3243734.3243803

1 INTRODUCTION

Anonymity plays a vital role in modern societies. Using the protective cloak of anonymity, whistleblowers are able to inform the public of malicious behaviors of governments and corporations, journalists are able to contact sources and perform research on subjects of interest, immigrants, abuse victims, and other at-risk individuals are able to seek help and information, and citizens are able to maintain privacy and express ideas without fear. Anonymity helps many people protect their rights or keep themselves safe from embarrassment, physical danger, or in some cases, even death. Achieving anonymity in the Internet age is becoming increasingly difficult due to the prevalence of tracking mechanisms and metadata collection and requires more advanced tools [31]. One such tool is Tor [9], an overlay network that provides metadata obfuscation by routing Internet traffic through randomly selected, volunteer-run relays, with each relay providing a layer of encryption.

The strength of an anonymity system such as Tor depends on the number of indistinguishable users, called its anonymity set [8]. In an effort to strengthen the network and expand the set of indistinguishable Tor users, the Tor Project provides the Tor Browser that makes users less distinguishable by countering some application-layer tracking techniques, such as cookies, `User-agent` strings, or browser fingerprinting mechanisms. Since the extent of anonymity is dependent on the number of indistinguishable users, it is important to provide user-centered security [44] by paying attention to the User eXperience (UX) of the Tor Browser. Poor UX tends to drive users away, thus negatively impacting the strength and quality of anonymity provided by the Tor network. Further, the more diverse the Tor user base, the less an adversary may infer about any individual user. Those whose anonymity needs may not be strict enough to tolerate UX frustrations and inconveniences may still be willing to use the Tor Browser if the UX is improved, thus diversifying the Tor user base.

Yet, there has been little research on the Tor Browser UX. Existing work related to the topic is outdated [5], narrow in focus [28], or limited to lab settings and specific tasks [32, 33], thus limiting the utility and impact of the findings. We aim to fill this gap via the following research question:
How do users experience routine Web browsing when using the Tor Browser?

$ sciendo

Proceedings on Privacy Enhancing Technologies ; 2018 (4):5–32

Maggie Oates*, Yama Ahmadullah, Abigail Marsh, Chelse Swoopes, Shikun Zhang, Rebecca Balebako, and Lorrie Faith Cranor

Turtles, Locks, and Bathrooms: Understanding Mental Models of Privacy Through Illustration

Abstract: Are the many formal definitions and frameworks of privacy consistent with a layperson's understanding of privacy? We explored this question and identified mental models and metaphors of privacy, conceptual tools that can be used to improve privacy tools, communication, and design for everyday users. Our investigation focused on a qualitative analysis of 366 drawings of privacy from laypeople, privacy experts, children, and adults. Illustrators all responded to the prompt "What does privacy mean to you?" We coded each image for content, identifying themes from established privacy frameworks and defining the visual and conceptual metaphors illustrators used to model privacy. We found that many non-expert drawings illustrated a strong divide between public and private physical spaces, while experts were more likely to draw nuanced data privacy spaces. Young children's drawings focused on bedrooms, bathrooms, or cheating on schoolwork, and seldom addressed data privacy. The metaphors, themes, and symbols identified by these findings can be used for improving privacy communication, education, and design by inspiring and informing visual and conceptual strategies for reaching laypeople.

Keywords: privacy, mental models, metphor, illustration, drawing, user, qualitative

DOI 10.1515/popets-2018-0029
Received 2018-02-28; revised 2018-06-15; accepted 2018-06-16.

1 Introduction

Though many philosophical theories of privacy have been proposed, there has been little focus on laypeople's conceptions of privacy. A formal lay theory of privacy could help privacy researchers better understand and model behaviors of everyday people. We performed an exploratory analysis of a set of 366 open-data drawings solicited from both children and adults responding to the prompt, "What does privacy mean to you?" We explored how both privacy experts (i.e., privacy scholars, students, and professionals) and non-experts conceptualize and visualize privacy with the hope of informing risk communication, privacy tools design, and iconography. Our process of qualitative coding is discussed at length, and constitutes a productive contribution to privacy fields in and of itself by defining a framework to codify the visual language of privacy.

Privacy scholars have wrestled with the challenge of defining and conceptualizing privacy. Dozens of theories and models of privacy have been formed, from the seminal "right to be let alone" [57] to the common notion of privacy as control over information [39]. To allow nuance and flexibility, Solove's "A Taxonomy of Privacy" [53] rejects the need for a single definition and compellingly defines a taxonomy of privacy concepts that encompass key elements of previous definitions.

Despite so many philosophical and legal perspectives, there has never been a comprehensive study of laypeople's conceptions or mental models of privacy in general. A mental models approach has been used in several fields where it is vital to understand how laypeople conceptualize a term, process, or technology. While these models are not "ground truth" and often implicitly or explicitly include misunderstandings or misplaced focus, they still may influence individual behavior. These models have been used across disciplines, including medicine, education, and environmental studies, for developing more effective risk communication strategies, improving usability, shaping policy to protect against likely harms, and to allow a better grasp on everyday understandings of abstract phenomena [27, 40].

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How Do Tor Users Interact With Onion Services?

Philipp Winter, Anne Edmundson, and Laura M. Roberts, *Princeton University;*
Agnieszka Dutkowska-Żuk, *Independent;*
Marshini Chetty and Nick Feamster, *Princeton University*

https://www.usenix.org/conference/usenixsecurity18/presentation/winter

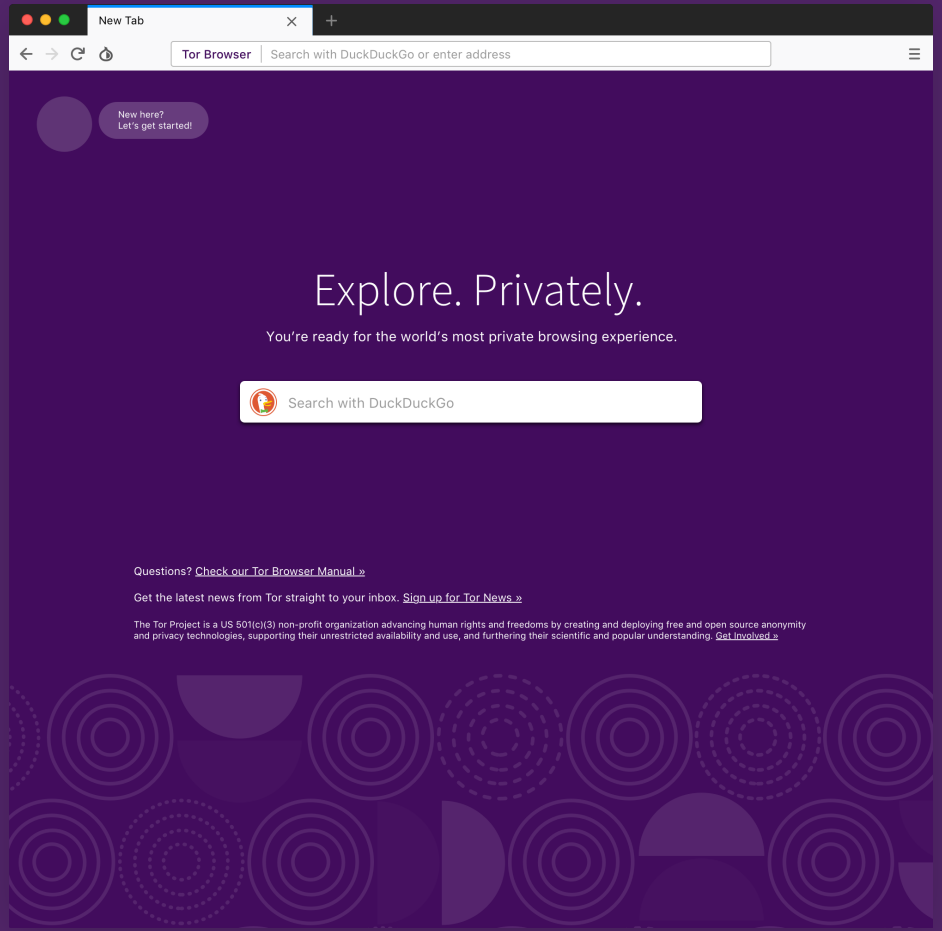
This paper is included in the Proceedings of the 27th USENIX Security Symposium.

August 15–17, 2018 • Baltimore, MD, USA

ISBN 978-1-931971-46-1

Open access to the Proceedings of the 27th USENIX Security Symposium is sponsored by USENIX.

In Practice: TB8 UX Improvements


New Tab
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New here?
Let's get started!
Explore. Privately.
You're ready for the world's most private browsing experience.
Search with DuckDuckGo
Questions? Check our Tor Browser Manual »
Get the latest news from Tor straight to your inbox. Sign up for Tor News »
The Tor Project is a US 501(c)(3) non-profit organization advancing human rights and freedoms by creating and deploying free and open source anonymity and privacy technologies, supporting their unrestricted availability and use, and furthering their scientific and popular understanding. Get involved »

Security expectations for .onion services

https://trac.torproject.org/23247

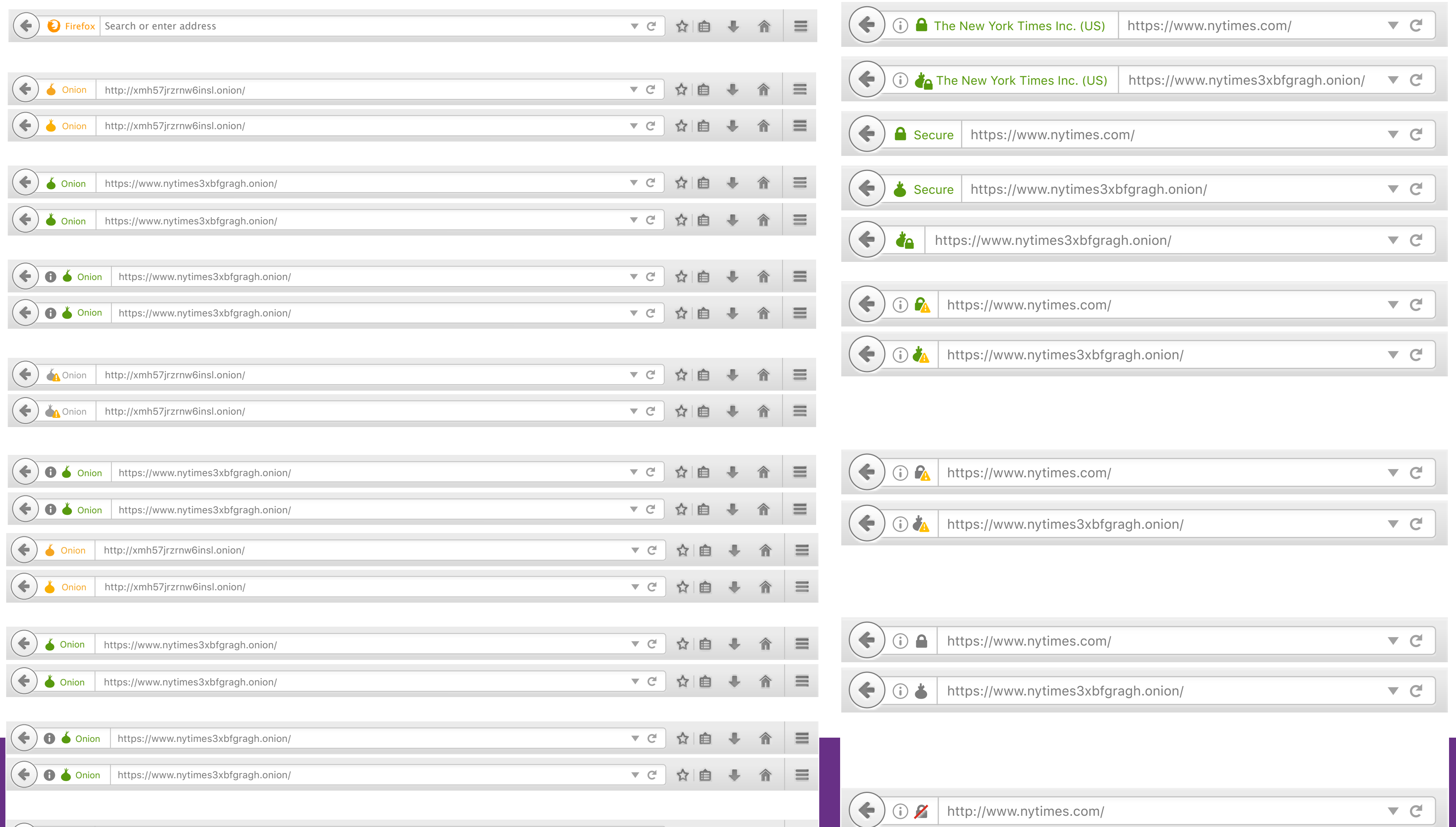
Problem

Tor Browser **doesn't communicate ideally to users that visit onion sites**--i.e. http + onion looks scary with lots of warnings.

Hypothesis

Adding an onion icon will help users to identify onion services.

Keeping our **security indicator icons close to default indicators** will help users to react accordingly to their past experiences.



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Security expectations for .onion services

https://trac.torproject.org/23247

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b Cloudflare, Inc. (US) https://dns4torpnlfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion

Security expectations for .onion services

https://trac.torproject.org/23247

Onion over HTTP - Onion with Self-Signed HTTPS

Onion with CA-Issused DV Cert - Onion with CA-Issused EV Cert

HTTPS Onion with HTTPS Subresources

CA-HTTPS Onion with HTTP Subresources - HTTPS Self Signed Onion with HTTP Subresources

Circuit Display

https://trac.torproject.org/24309

Problems

Users don't know if **circuits works per tab or globally** (Tor Browser has first party isolation by default)**.**

Many users **expect the guard node to change** when asking for a new circuit.

There is nothing **on circuit display that tells the user the first node is a guard,** what guards are, and how it works when Tor creates new circuits for the user.

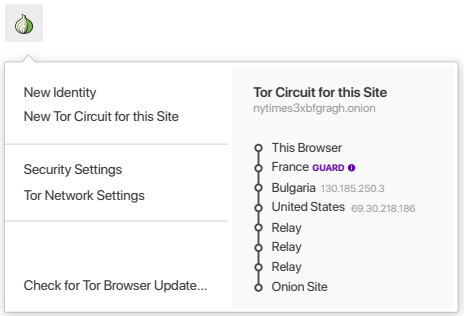
Hypothesis

If we **highlight the Guard node** label at the UI, users will be able to identify it easier and faster.

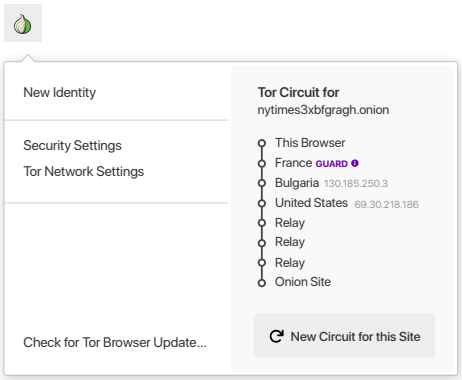
Updating Tor Browser Manual with more information about Guard nodes for users who want to [Learn More].

We are **moving site specific settings into the URL bar**. Moving the circuit display to the URL bar area will help users to relate the circuit and the domain. Improve the comprehension of how Tor has been building the circuit is also part of it project scope.

Version 1



Version 2



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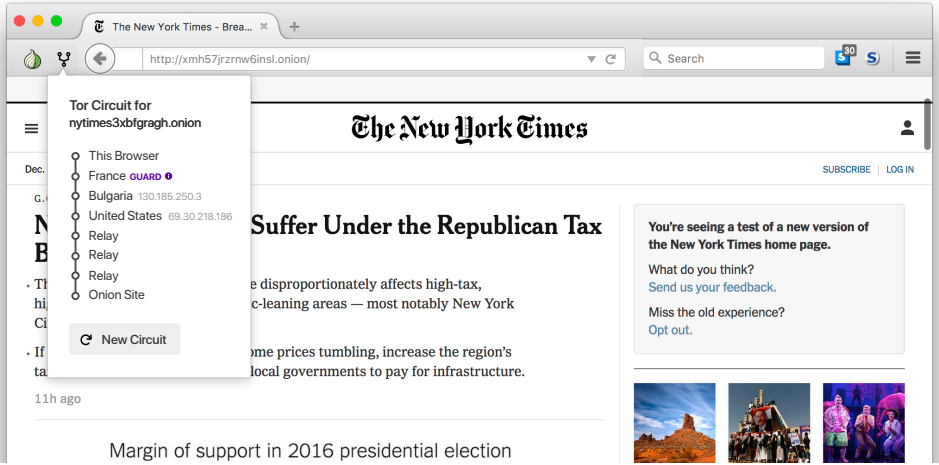
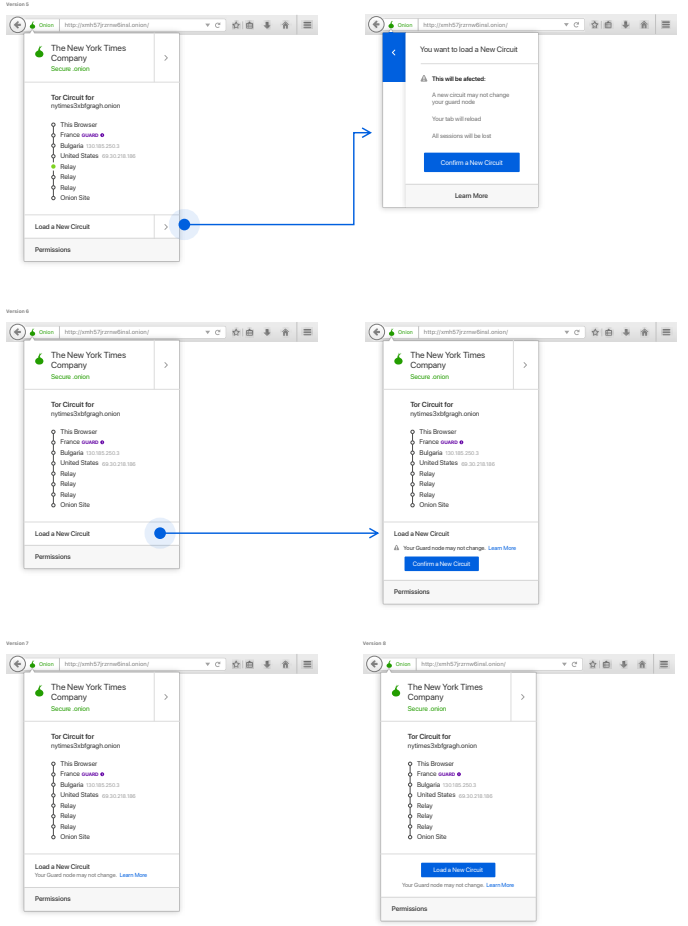
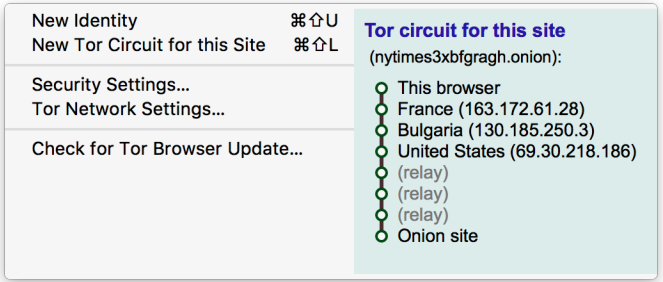




Circuit Display

https://trac.torproject.org/24309

7.5



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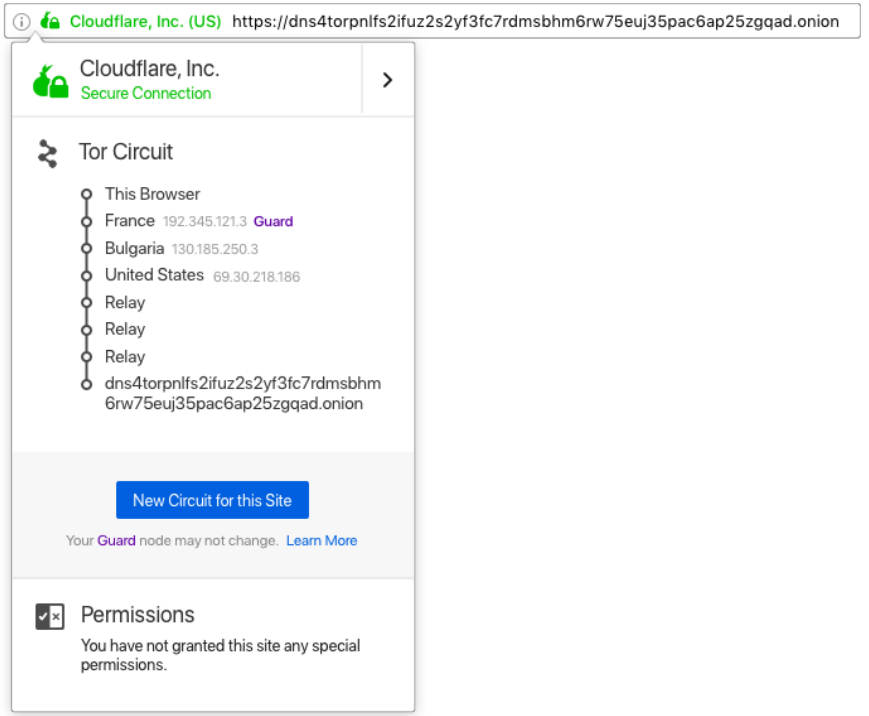

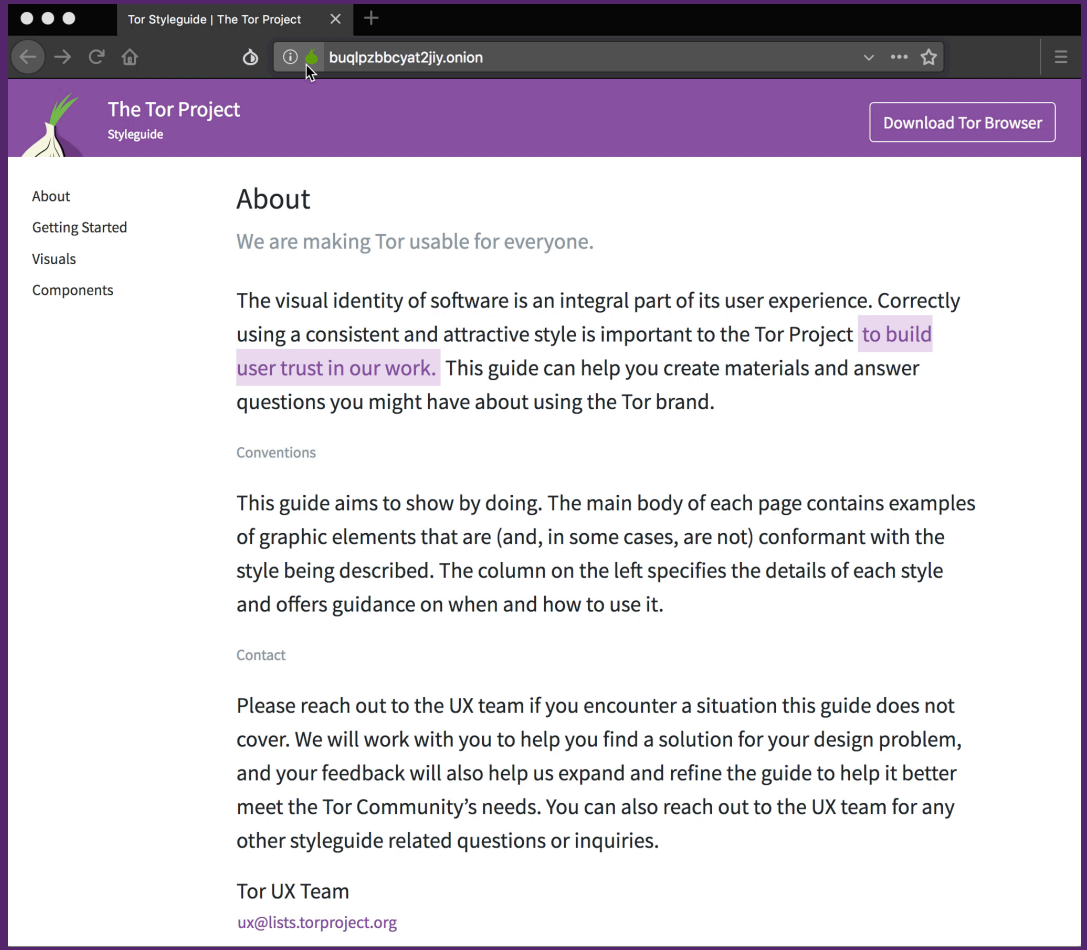
Tor Styleguide | The Tor Project
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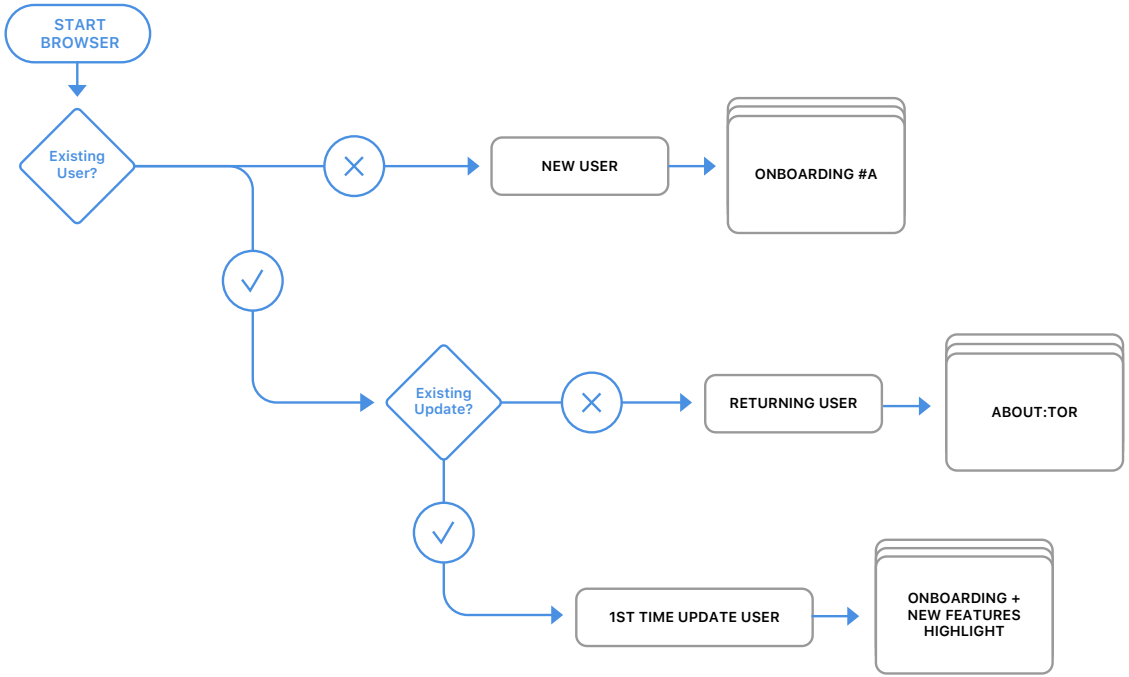
The Tor Project
Styleguide
Download Tor Browser
About
Getting Started
Visuals
Components
About
We are making Tor usable for everyone.
The visual identity of software is an integral part of its user experience. Correctly using a consistent and attractive style is important to the Tor Project to build user trust in our work. This guide can help you create materials and answer questions you might have about using the Tor brand.
Conventions
This guide aims to show by doing. The main body of each page contains examples of graphic elements that are (and, in some cases, are not) conformant with the style being described. The column on the left specifies the details of each style and offers guidance on when and how to use it.
Contact
Please reach out to the UX team if you encounter a situation this guide does not cover. We will work with you to help you find a solution for your design problem, and your feedback will also help us expand and refine the guide to help it better meet the Tor Community's needs. You can also reach out to the UX team for any other styleguide related questions or inquiries.
Tor UX Team
ux@lists.torproject.org

about:tor - Onboarding

https://trac.torproject.org/25695



about:tor - Onboarding

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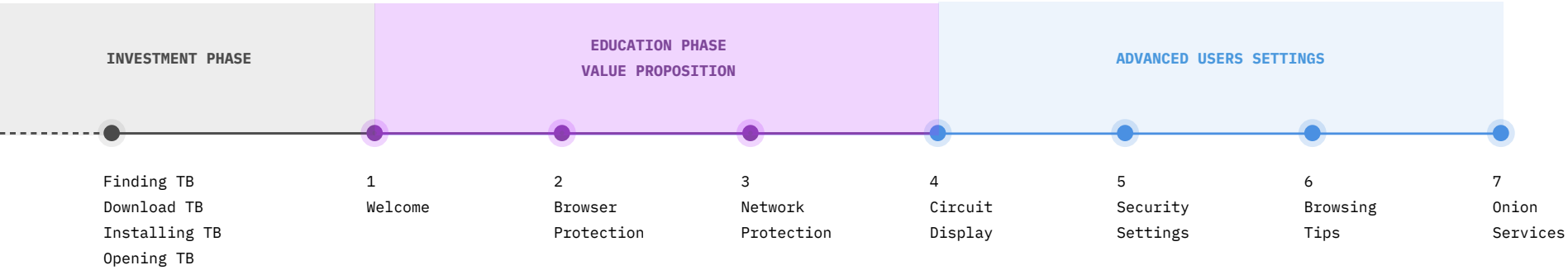
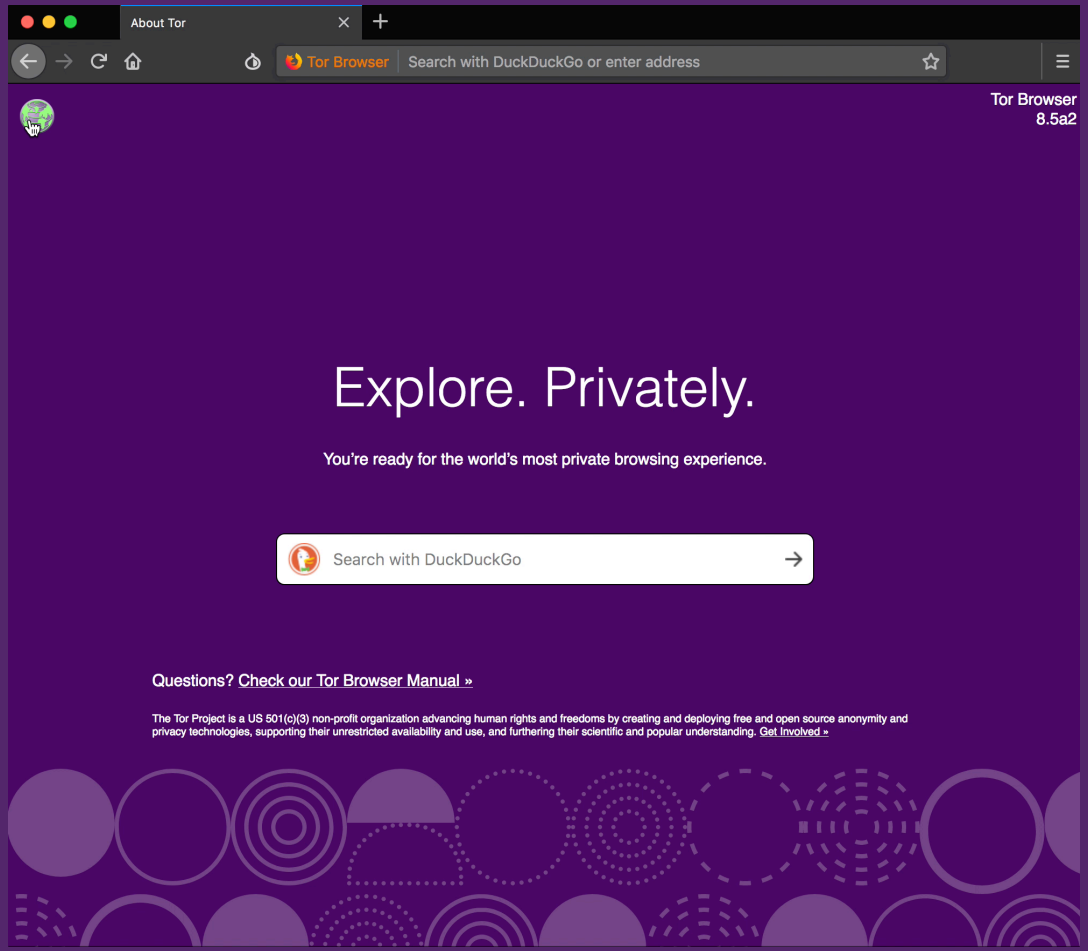
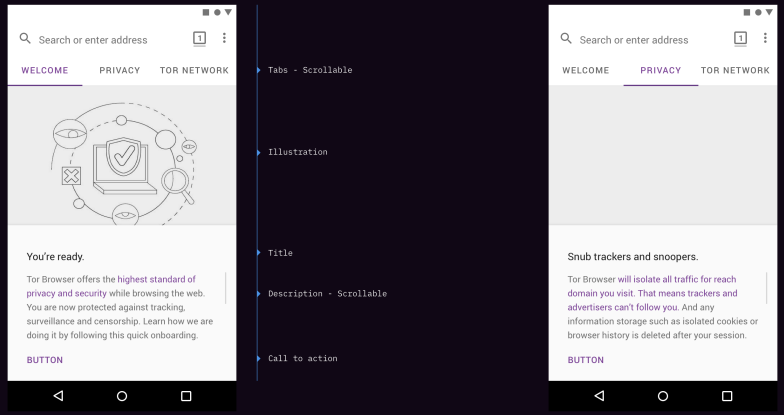
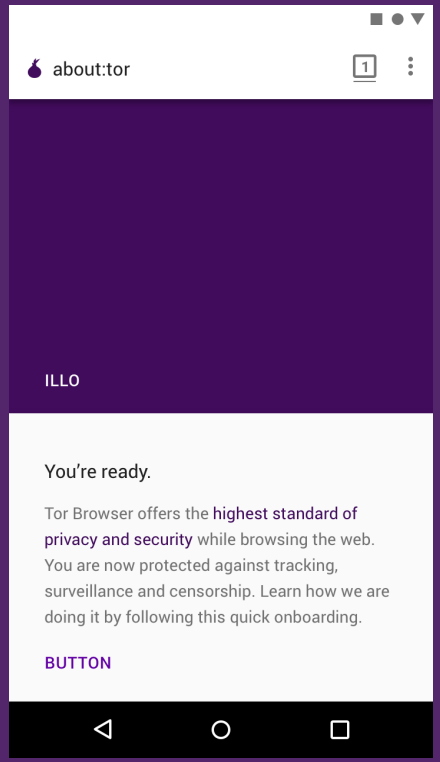


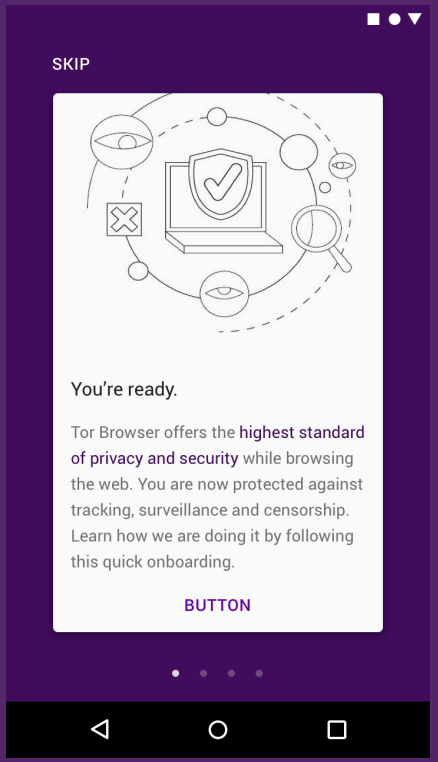

About Tor
Tor Browser
Search with DuckDuckGo or enter address
Tor Browser
8.5a2
Explore. Privately.
You're ready for the world's most private browsing experience.
Search with DuckDuckGo
Questions? Check our Tor Browser Manual »
The Tor Project is a US 501(c)(3) non-profit organization advancing human rights and freedoms by creating and deploying free and open source anonymity and privacy technologies, supporting their unrestricted availability and use, and furthering their scientific and popular understanding. Get Involved »

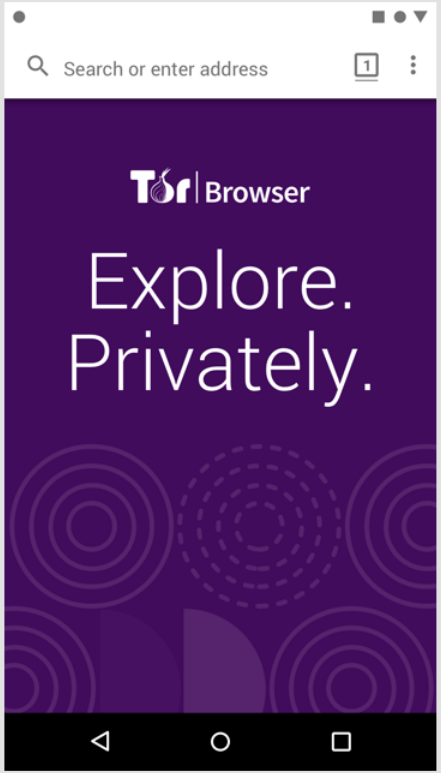
Tor Browser - Android
Activity 5.1: Redesign Tor Browser homepage ("about:tor") - Create an onboarding

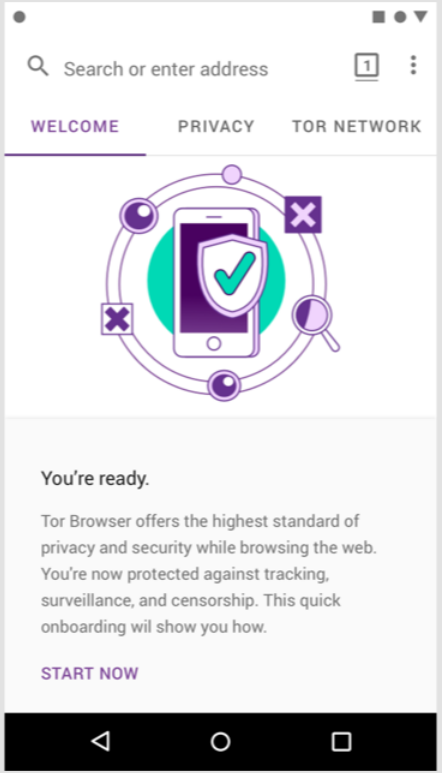
Apr 18
TBA
v1

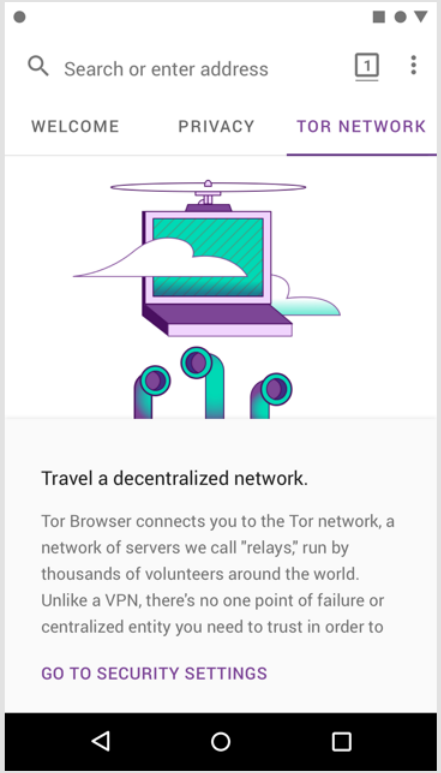


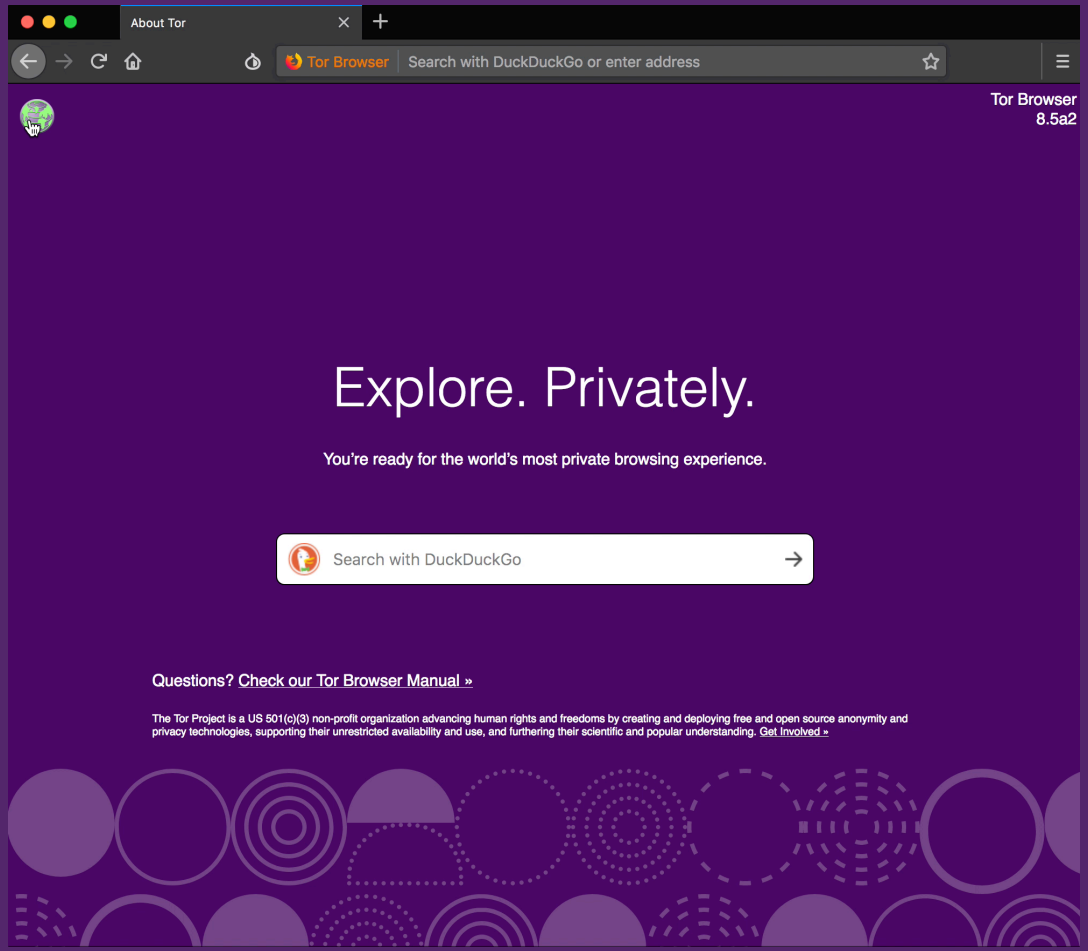





Search or enter address
Tor Browser
Explore.
Privately.


Search or enter address
WELCOME
PRIVACY
TOR NETWORK
You're ready.
Tor Browser offers the highest standard of privacy and security while browsing the web. You're now protected against tracking, surveillance, and censorship. This quick onboarding wil show you how.
START NOW


Search or enter address
WELCOME
PRIVACY
TOR NETWORK
Travel a decentralized network.
Tor Browser connects you to the Tor network, a network of servers we call "relays," run by thousands of volunteers around the world. Unlike a VPN, there's no one point of failure or centralized entity you need to trust in order to
GO TO SECURITY SETTINGS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Tor Browser
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Tor Browser
8.5a2
Explore. Privately.
You're ready for the world's most private browsing experience.
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Questions? Check our Tor Browser Manual »
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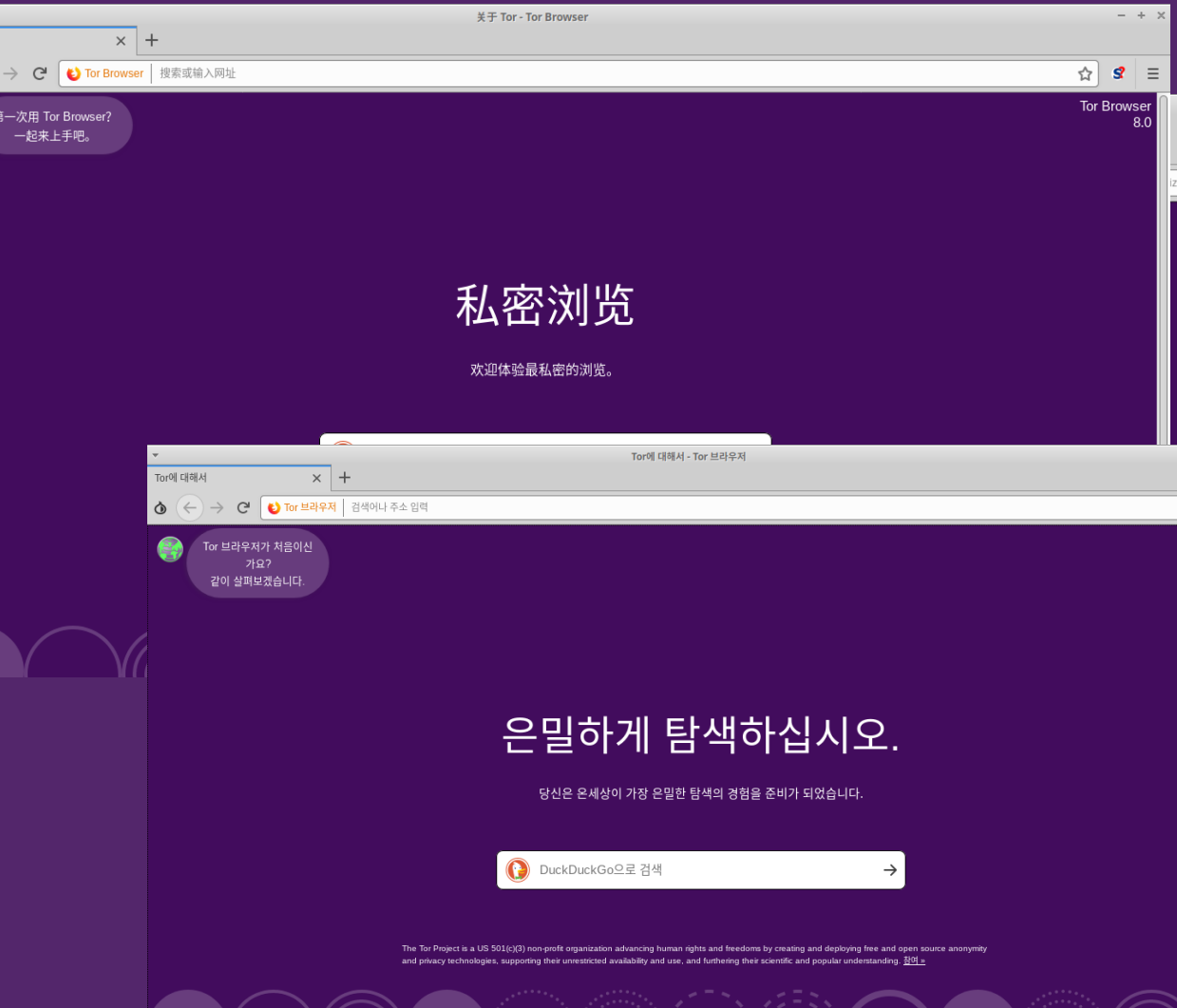

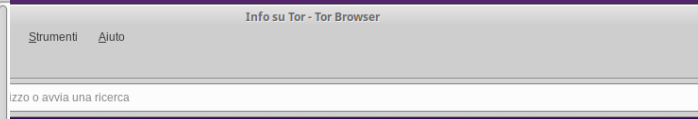

Naviga. Privatamente.

Sei pronto per l'esperienza di navigazione più privata al mondo.

Cerca con DuckDuckGo

zione non-profit allo scopo di avanzare i diritti e le libertà umane creando e distribuendo software libero con tecnologie per la
ando la loro disponibilità e utilizzo senza restrizioni e avanzandone la loro comprensione scientifica e popolare. Uniscitii a noi »

How to contribute

Gracias

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