MassBrowser
Unblocking the Censored Web for the Masses, by the Masses

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Internet Censorship

How the Iranian Government Shut Off the Internet

Syria tightens control over internet

After years of...

Free-speech watchdog says Syrian authorities are tightening their control over internet usage in the country.
Censorship Circumvention Tools

ExpressVPN

NordVPN
Shortcomings of Current Designs

- Easy to Block
- Costly
- Poor QoS
- No User-Control
- Hard to Deploy
Key Reason: They Bundle Properties

Circumvention

Anonymity

Privacy
Our Observation: The Mass of Users Just Want Circumvention

Shadowsocks Free Servers Lists

- http://shadow.tunnelz.online/
- https://free-ss.site/
- https://us.ishadowx.net/
- https://free.gyteng.com/
- https://go.freess.org/
- https://www.ssrtool.com/tool/free_ssr
- https://get.ss8.fun/
Our Approach

Design a System Optimized for Circumvention

Privacy/Anonymity provided optional
MassBrowser
Key Design Principles

- Optimizing load on proxies
- Volunteer based proxies
- Clients help other clients
- User-adjustable privacy/anonymity
- Incentivizing volunteers
- Cost optimization
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Optimizing only on circumvention
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Proxy-based Systems
CacheBrowsing

Contents on CDN
Optimizing Load on Proxies

41% of Top 1000 Alexa website contents are cache browsable
Key Design Principles

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Clients Helping Each Other!

About 90% of political and news censored contents are country specific.

More than 60% of censored contents are country specific.

Cumulative Fraction

About 90% of political and news censored contents are country specific.

More than 60% of censored contents are country specific.
An Example!

Only 18 websites are blocked in all three

*Top 1M websites
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Incentivizing Volunteer Proxies

Buddies can whitelist!

Buddies can control usage!
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Users Can Trade off QoS vs. Privacy

- **Cost:**
  - MassBrowser is about 200 times cheaper than Tor’s meek

- **Performance:**

<table>
<thead>
<tr>
<th>Website</th>
<th>Tor (s)</th>
<th>MassBrowser + Tor (s)</th>
<th>MassBrowser (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google.com</td>
<td>19.6</td>
<td>20.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Youtube.com</td>
<td>27.3</td>
<td>25.6</td>
<td>6.3</td>
</tr>
<tr>
<td>Facebook.com</td>
<td>27.4</td>
<td>30.4</td>
<td>6.6</td>
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<tr>
<td>Baidu.com</td>
<td>7.5</td>
<td>10.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Wikipedia.com</td>
<td>29.5</td>
<td>22.3</td>
<td>1.1</td>
</tr>
</tbody>
</table>

*experiments done in Iran*
The Current State of The Project
Development Status

• Near three years of active development!
• 100K lines of code
• More than 10 people helped in the development
• Undergoing code review and security audit by a third-party
• Internationalization is undergoing
Working Client and Buddy

You can close this window now!
MassBuddy will continue running in the background.
You can also change your Settings give us Feedback or Stop MassBuddy.

Connection with server working
MassBuddy is reachable by clients

MassClient当前正在运行
您可以关闭此窗口，它将继续在后台运行。如果您喜欢MassBrowser，请花一点时间给我们反馈。您也可以在网站标签中选择要浏览的网站。

打开MassBrowser

Coming Soon!
Currently Invitation-based Only
We Need Your Help!

• If you are in an uncensored region:
  • **Become a Buddy!**

• Become an **early adopter**
• Get involved with the **development**
Thanks to so many people who helped in the testing and development of MassBrowser

• “It's very good to use!!!!!!”
• “It's very very interesting and amazing~”
• “Hello, I am in China. I am using mass browser and tor browser now. Now I can use the websites blocked by the Chinese government, and the speed is very good. Thank you very much.”
• “Great relaying capability!”
• “Great, works really well!”
• …
Computing for the Common Good

MassBrowser.cs.umass.edu
@massbrowser
Join us!

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https://people.cs.umass.edu/~milad/ | @srxzr
Domain Fronting

[Diagram showing the concept of domain fronting with Cloudflare and a destination]