

# **Nástroje a možnosti internetu**

Hlubší vrstvy Internetu I.

11. 11. 2022



decentralizovaný web

protokoly

P2P

hluboký web

splinternet

Které z těchto  
**zkratk a služeb**  
znáte a dokázali  
byste vysvětlit,  
o co jde?

[muni.cz/go/nami22](https://muni.cz/go/nami22)



# Deep web

- *hluboký web*
- tam jsme všichni
- 90 % webu



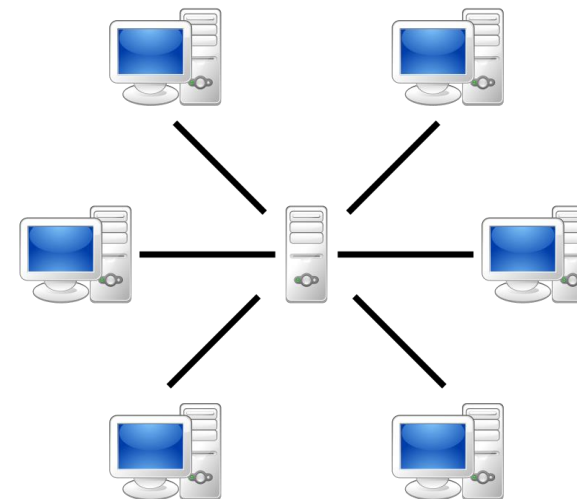
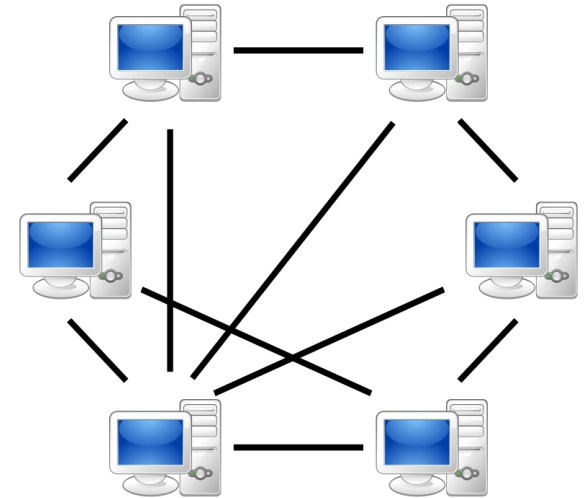
# Dark web

- *proč ten název?*
- legitimní využití?
- *anonymita*
- *decentralizace*
- překryvné vrstvy



# P2P

- peer-2-peer, klient-klient
- architektura sítě, opak *klient-server*
- uzly sítě rovnocenné
- žádný server (*až na výjimky*)
- proč není celý web P2P?



# P2P | Protokoly

- *Napster (1999)* vs. uloz.to
- Gnutella – více decentralizovaná
- Direct Connect (DC++ atp.)
- ed2k (eMule)
- BitTorrent

- různá využití, některé míří hlavně na anonymitu

## souvislosti

síťová neutralita

autorské právo

sociální rozměr

*(freeloading)*

bezpečnostní rozměr

politický rozměr

*(DDoS)*

BBC Sign in Home News Sport Reel Worklife Travel Future Culture More Search

**NEWS**

Home Coronavirus Video World UK Business Tech Science Stories Entertainment & Arts Health More

Tech

# Turkey's Wikipedia ban ends after almost three years

16 January



Turkey is restoring access to Wikipedia after a ban that lasted almost three years.

The country's Constitutional Court ruled that the ban violated freedom of expression, the pro-government newspaper Milliyet reported.

The online encyclopaedia was blocked in Turkey in April 2017, after it refused to delete articles critical of the country's government.

The ban lasted 991 days, said internet-monitoring organisation NetBlocks.org.

The Wikimedia Foundation, which runs the service, had refused to remove articles that said Turkey's government had conspired with the so-called

**Top Stories**

**US hits record Covid cases and hospitalisations**  
Two records are reached on Wednesday, amid fears the pace will not slow leading up to Christmas.  
5 hours ago

**Dr Fauci: The UK 'was not as careful' with vaccine**  
29 minutes ago

**Brexit trade deal talks down to the wire**  
12 minutes ago

**Features**



Penalties, equalisers & yoghurts - Van-Tam's best analogies



Wikipedia = vědění

Wikipedia @Wikipedia

The best present we got for Wikipedia's 19th birthday was being unblocked in Turkey. 🇹🇷 (thread)



Access to Wikipedia restored in Turkey after more than two and a half ye...  
Today, on Wikipedia's 19th birthday, the Wikimedia Foundation has received reports that access to Wikipedia in Turkey is actively being ...  
[wikimediafoundation.org](https://wikimediafoundation.org)

2:22 AM · Jan 16, 2020

11.1K 1.3K people are Tweeting about this



# IPFS

- <https://ipfs.tech/>
- Interplanetary File System (2015)
- distribuovaná P2P síť
- odolné vůči cenzuře
- content-based adresování
- dokáže [hostovat web](#)



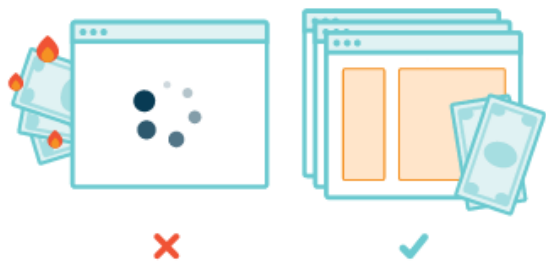
 **Turkey Blocks** ✓  
@TurkeyBlocks

Confirmed: All editions of the #Wikipedia online encyclopedia blocked in #Turkey as of 8:00AM local time  
[turkeyblocks.org/2017/04/29/wik...](https://turkeyblocks.org/2017/04/29/wik...)

```
Sat Apr 29 2017 08:02:55 GMT+0300 (+03)
https://en.wikipedia.org 5005 DOWN
https://tr.wikipedia.org 5009 DOWN
https://az.wikipedia.org 5009 DOWN
https://fr.wikipedia.org 5007 DOWN
https://www.wikipedia.org 5007 DOWN
```

7:22 AM · Apr 29, 2017

♥ 896    💬 2.5K people are Tweeting about this



### Today's web is inefficient and expensive

HTTP downloads files from one server at a time — but peer-to-peer IPFS retrieves pieces from multiple nodes at once, enabling substantial bandwidth savings. With **up to 60% savings for video**, IPFS makes it possible to efficiently distribute high volumes of data without duplication.



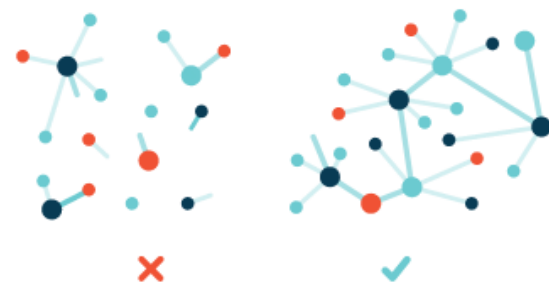
### Today's web can't preserve humanity's history

**The average lifespan of a web page is 100 days** before it's gone forever. The medium of our era shouldn't be this fragile. IPFS makes it simple to set up resilient networks for mirroring data, and thanks to content addressing, files stored using IPFS are automatically versioned.



### Today's web is centralized, limiting opportunity

The Internet has turbocharged innovation by being one of the great equalizers in human history — but increasing consolidation of control threatens that progress. IPFS stays true to the original vision of an open, flat web by delivering technology to make that vision a reality.



### Today's web is addicted to the backbone

IPFS powers the creation of diversely resilient networks that enable persistent availability — with or without internet backbone connectivity. This means better connectivity for the developing world, during natural disasters, or just when you're on flaky coffee shop wi-fi.



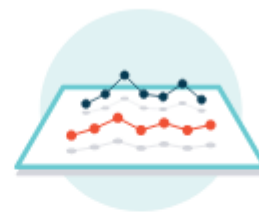
### Archivists

IPFS provides deduplication, high performance, and clustered persistence – empowering you to store the world’s information for future generations.



### Service providers

Providing large amounts of data to users? IPFS offers secure, peer-to-peer content delivery – an approach that could save you millions in bandwidth costs.



### Researchers

If you’re working with or distributing large data sets, IPFS can help provide fast performance and decentralized archiving.



### Developing world

High-latency networks are a big barrier for those with poor internet infrastructure. IPFS provides resilient access to data independent of latency or backbone connectivity.



### Blockchains

With IPFS, you can address large amounts of data and put immutable, permanent links in transactions – timestamping and securing content without having to put the data itself on-chain.



### Content creators

IPFS brings the freedom and independent spirit of the web in full force – and can help you deliver your content at a much lower cost.



IPFS



STAV



SOUBORY



PROZKOUMAT



UZLY



NASTAVENÍ

QmHash/bafyHash

Procházet

Qmdm\_RgQm



Protobuf UnixFS [Zobrazit na IPFS bráně](#)

CID QmdmQXB2mzChmMeKY47C43LxUdg1NDJ5MwckMKxDu7RgQm

SIZE 107 MB

LINKS 1864

DATA

► Object {type: "directory", data: null, blockSizes: Array[0]}

	PATH	CID
11	1008 - Suckville	QmNPAnHoz87yw7mMoYNkaiQLqHVxVDFxwF5Y7FUckVbXd
12	1009 - Sigh	QmU34D1oaLEgiE53vvEsFm1kFJaHcGDUEk4cuBvmlmezDso
13	101 - Laser Scope	Qmdp4pcmePccsVHedMC4CsSnkEtXLXT2N3go7S8qeLg3RY
14	1010 - Etymology-Man	QmZisEoKhaVaU3N7r7ppjsv38tXoswetfwEgEHS3ytUi92
15	1011 - Baby Names	QmQpeWBN97QtwjpyLfvnrKw75jEnDlw7sxiKYMyGfVi4US
16	1012 - Wrong Superhero	QmNXV9m9zw3voRLjhkiKpSjrPfqeBPmz9Wj2H2PQT3ekf4
17	1013 - Wake Up Sheeple	QmZAFvuHxARV2zCeM2M2NxAjMYV8w7VhqpK1CuFSh23W3o
18	1014 - Car Problems	QmQSQYNn2K6xTDLhfNcoTjBEExz5Q5gpHBTqZZKdxsPR89
19	1015 - Kerning	QmZSDn6aaPxtavkReci6xu7jZThkdhBJw2Eds5uxmiVgrx
20	1016 - Valentine Dilemma	QmRSkGhwZ1jmemzsk2xNXeBwzqLba1MCgwdAYfQUXmXZhx
21	1017 - Backward in Time	QmUmHJwADn1M1fm1MX8x6g1NGZiEkazb3x8Pzs9RN38Hou

### CID INFO

QmdmQXB2mzChmMeKY47C43LxUdg1NDJ5MwckMKxDu7RgQm

base58btc - cidv0 - dag-pb - sha2-256-256-e536c7...

ZÁKLAD - VERZE - KODEK - MULTIHASH

### MULTIHASH

0x1220e536c7f88d731f374dcc568aff6f56e  
838a19382e488039b1ca8ad2599e82fe  
HASH DIGEST

0x12 = sha2-256

0x20 = 256 bits

# IPFS

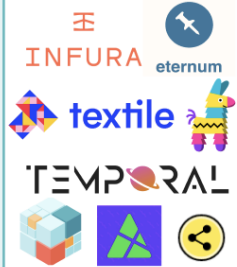
## Data



## Identity



## Persistence



## Marketplace



## NFT



## Content



## Other



## Social Media



## Governance



## Exchange



## Integrations & Collaborations



## Prediction



## Finance



# GNUnet

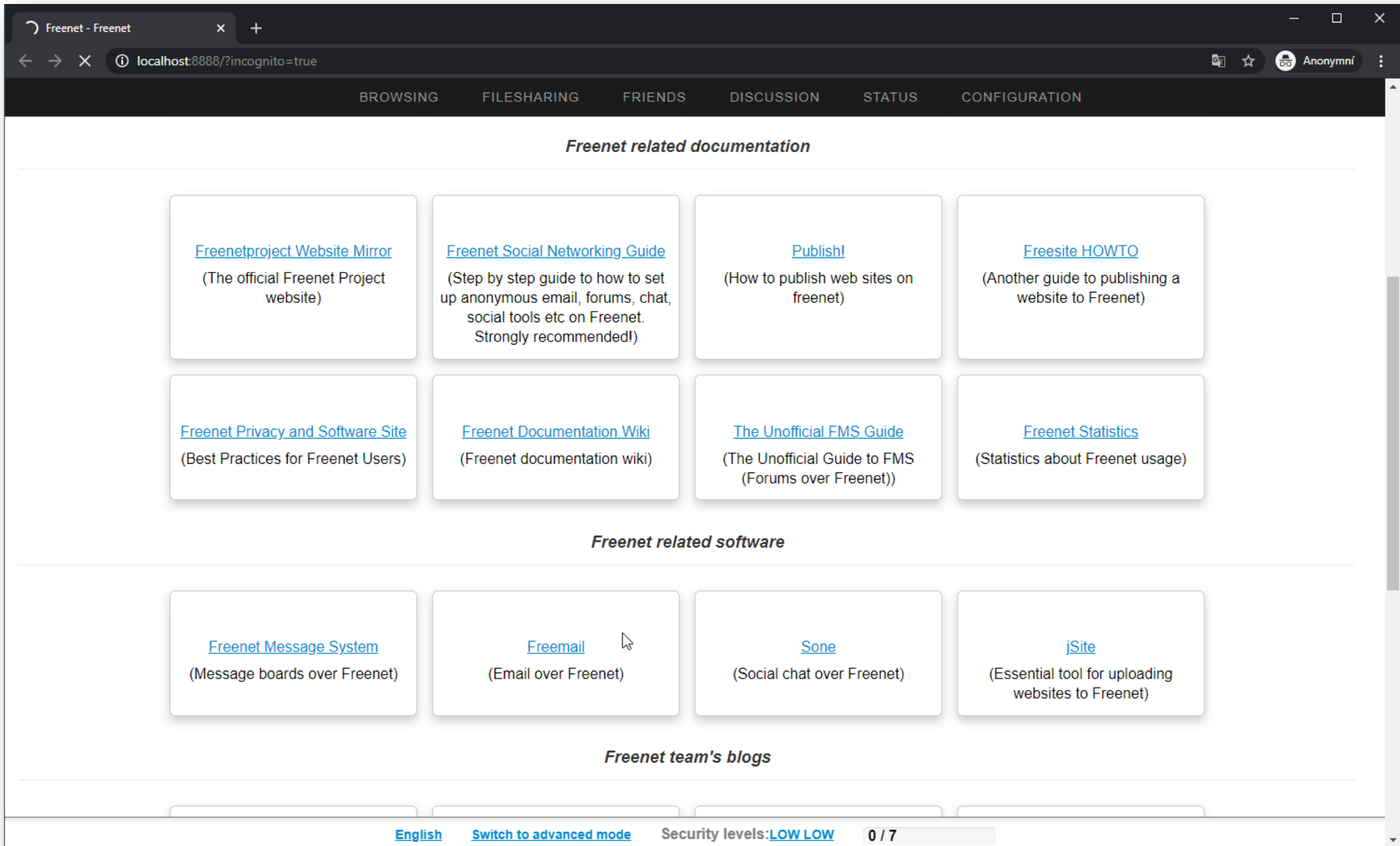
- <https://gnunet.org/>
- framework
- podpora pro vznik dalších aplikací
- *re:claimID*
- *pretty Easy privacy (p≡p)*



# Freenet



- <https://freenetproject.org/> (2000)
- anonymní sdílení souborů a *freesites*
- každý poskytuje provoz a úložiště
- soubory šifrovány, nevyužívané mizí
- *volba úrovně bezpečnosti – limity úložiště*



**Freenet related documentation**

[Freenetproject Website Mirror](#)  
(The official Freenet Project website)

[Freenet Social Networking Guide](#)  
(Step by step guide to how to set up anonymous email, forums, chat, social tools etc on Freenet. Strongly recommended!)

[Publish!](#)  
(How to publish web sites on freenet)

[Freesite HOWTO](#)  
(Another guide to publishing a website to Freenet)

[Freenet Privacy and Software Site](#)  
(Best Practices for Freenet Users)

[Freenet Documentation Wiki](#)  
(Freenet documentation wiki)

[The Unofficial FMS Guide](#)  
(The Unofficial Guide to FMS (Forums over Freenet))

[Freenet Statistics](#)  
(Statistics about Freenet usage)

**Freenet related software**

[Freenet Message System](#)  
(Message boards over Freenet)

[Freemail](#)  
(Email over Freenet)

[Sone](#)  
(Social chat over Freenet)

[jSite](#)  
(Essential tool for uploading websites to Freenet)

**Freenet team's blogs**





*Freenet is downloading the page you requested*

Filename: [cz-sk-kniznica-21](#)

Time elapsed: 2s

Last refresh was 0s ago

Your computer is downloading this page or file from Freenet. This could take seconds or minutes depending on how big and how popular the page or file is - the more often something is accessed in Freenet, the better is its availability and download speed.

The progress bar will jump around until we have downloaded enough blocks to determine the size of the file.

1 (50%??)

Aktuality

Časté otázky



Pridať do záložiek



Zoznam kníh

- A
- B
- C
- D
- E
- F
- G
- H
- CH
- I,J
- K



## Česká a Slovenská knižnica na Freenete

Česká a Slovenská knižnica na Freenete je projekt, ktorý si kladie za cieľ sprístupniť čo najviac beletrie v Českom alebo Slovenskom jazyku (väčšina kníh je však v češtine). Celá knižnica má po rozbalení 2,8 GB a obsahuje 7814 položiek. Ak by ste dokázali prečítať jednu knihu denne, na celý archív by ste potrebovali 21 rokov.

Ak máte akúkoľvek otázku alebo ma chcete kontaktovať, prečítajte si prosím Časté otázky.

This is Czech and Slovak ebook library. For contact, please read Časté otázky/FAQ

## Zoznam kľúčov

Návod na sťahovanie z Freenetu nájdete v Častých otázkach - [Ako sťahovať](#)

toto není *clearnet*

web3

# Decentralizovaný internet

- *běžný stav*: data na serveru
- *decentralizace*: každý kousek dat u sebe
- data nevlastní centrální bod
- v šifrované podobě
- je to budoucnost?

# Decentralizovaný cloud

- *cooperative storage cloud*
- decentralizované cloudové úložiště
- např. STORJ a mnoho dalších experimentů...

Real-time Distribution of TardigradeExplainerVideo.m4v on Tardigrade



Status: Ready for download

File Size: 38.09 MB

File Pieces: 70

# ZeroNet

- <https://zeronet.io/>
- Tamas Kocsis (2015)
- *zites* (10MB)
- blockchain + torrent (+Tor)
- *zites* - nelze je zničit, dokud se sdílí
- velmi jednoduchá instalace a zprovoznění
- dynamické webové stránky



RECENTLY DOWNLOADED:

ZeroTalk UPDATING: 3884 LEFT 13 MINUTES AGO 86

ZeroMail UPDATING: 5680 LEFT 48 MINUTES AGO 52

ZeroUp UPDATING: 17 LEFT 2 DAYS AGO 44

GIF Time UPDATING: 3272 LEFT 17 HOURS AGO 32

CONNECTED SITES:

ZeroSites 59 MINUTES AGO 140

ZeroHello ON NOV 03, 2020 135

ZeroName ON NOV 28, 2020 91

ZeroBlog 2 DAYS AGO 77

ZeroMe ON OCT 07, 2020 77

ZeroWiki ON NOV 10, 2020 59

Wikileaks Torrents ON NOV 05, 2017 7

127.0.0.1:43110/1HeLLo4uzjaLetFx6NH3PMwFP3qbRbTf3D



When you lose another service during a major outage

ON SEP 22, 2016

8 Likes



Job freezes with unexpected input

ON SEP 21, 2016

11 Likes



# Politics

## Analytical marxism

Books

## How Trump Brainwashed the Right

How Trump Brainwashed the Right

## Revolution Pirate Radio

Exposing Corruption, Lies & Censorship within Governments and Media.

## The Civil War in France by Karl Marx

A pamphlet written by Karl Marx in praise of the world's first proletarian revolution

## The Russian Revolution by Rosa Luxemburg

Rosa Luxemburg's pamphlet supporting the revolution while harshly condemning the authoritarianism and dictatorial methods of the Bolsheviks.

## The State and Revolution by V.I. Lenin

Lenin's single greatest political work

## A Cypherpunk's Manifesto

The iconic Cypherpunk's Manifesto by the late Eric Hughes, founder of the Cypherpunks movement.

## Universal Declaration of Human Rights

The historic document adopted by the United Nations General Assembly at its 183rd session on 10 December 1948.

## An Anarchist FAQ

This site holds an anarchist FAQ. Its aim is to present what anarchism really stands for and indicate why you should become an anarchist.

## Mercuric Tao: The interface of technology, politics and the self

A Blog on the interface of technology and politics and the will to create it

### *An Anarchist FAQ Webpage*

Version 15.0

This Zite holds an anarchist FAQ. Its aim is to present what anarchism really stands for and indicate why you should become an anarchist.

**[Volumes 1 and 2](#) of *An Anarchist FAQ* have been published!**

Freenet users please [Bookmark](#) this Freesite!

Because it is well over the 2MB limit, we need people to bookmark this Freesite to keep it alive! Thank you!

[What Anarchists Say about \*An Anarchist FAQ\*](#)

[An Anarchist FAQ blog](#)

[www.anarchistfaq.org](http://www.anarchistfaq.org)  
[www.anarchyfaq.org](http://www.anarchyfaq.org)

[www.anarchistfaq.org](http://www.anarchistfaq.org)  
[www.anarchistfaq.org.uk](http://www.anarchistfaq.org.uk)

IP: [newanarchistfaq.zite.org](http://newanarchistfaq.zite.org) (b32) (mirror not managed by us)

ZeroNet: <http://127.0.0.1:43110/15svGCBYesS8QbwsZpaSeLvff6Ar2sk4RB/>

Freenet: [USK@k7BcKShQv6pOT64uzZalopUJfPZl-ndASpbuzUSU--tbl-aP--EnBCTOHCPfHBLjP0DWQ0kMibFmOuRPvaEAdL9A4YAOACAAE/AnarchistFAQ-!/](http://USK@k7BcKShQv6pOT64uzZalopUJfPZl-ndASpbuzUSU--tbl-aP--EnBCTOHCPfHBLjP0DWQ0kMibFmOuRPvaEAdL9A4YAOACAAE/AnarchistFAQ-!/)

[What's New in the FAQ?](#)

### An Anarchist FAQ

Version 15.0 -- 18-MAR-2014

[Introduction](#)

Section A - [What is anarchism?](#)

Section B - [Why do anarchists oppose the current system?](#)

## České fórum › Klimatická změna / Globální oteplování



### Klimatická změna / Globální oteplování

Upozornit na nové komentáře

<https://faktaoklimatu.cz>

1 ssdifnskdjfnsdjk přidal on Dec 20, 2019

Please sign in – nový komentář

Přihlásit jako...

Odeslat

peerco – on Apr 10, 2020 0

ssdifnskdjfnsdjk: Tropické lesy absorbují méně CO2 a během desetiletí by mohly naopak ke globálnímu oteplování přispívat ale co je skutecnym problemem a co by bylo zapotřebi se resit nebude, znacne snizeni odparovani vody do atmosfery a klesani teplotni kapacity atmosfery na zaklade znečisteni atmosfery a na tomto znečisteni jeste i navíc dalsi kondenzujici vode, by se melo podporit odparniky vody do atmesfery aby se takto chybejici voda v atmosfere a tim padem chybejici teplotni kapacita atmosfery opet doplnila

ssdifnskdjfnsdjk – on Apr 04, 2020 0

ea0000ffff: A kdo by se tomu divil, při součané mediální masáži.  
pravda, v tomto směru je dobře že média plní svou funkci a na ten problém upozorňují. Kdyby to nedělali tak by si toho lidi nevšimli a pak by bylo pozdě ... no ono i tak je nejvyšší čas na změny, jelikož to klima má setrvačnost desítky let.

ea0000ffff – on Apr 04, 2020 0

ssdifnskdjfnsdjk: "přibývá lidí, kteří se obávají zhoršování životního prostředí. Nyní je to 19 procent, loni 11 procent a v roce 2016 pouhá dvě procenta." CVVM (Centrum pro výzkum veřejného mínění), 2019  
A kdo by se tomu divil, při součané mediální masáži.





### Why are you here?

Follow in Newsfeed

Why are you reading this message here on Zeronet? Why aren't you browsing and I2P eepsite or a TOR onion site? Or a <insert-random-network-here>?

I'm digging this test run of Zeronet that I'm participating in but hate that I have to have JS enabled to use this thing as intended.

5 [nxm9c2wjbjlhjsrc](#) posted 8 hours ago

Please sign in – new comment

Sign in as...

Submit comment

[kapec](#) – 17 minutes ago 1

Coz I have bunch of hard drives and no idea what to do with them.  
Ultimately I want to run it on non-internet-dependant meshnetwork. But It needs to get more popular first.

[dv1](#) – 2 hours ago 1

[geck4bee](#): I'm here because the coverage of the presidential election has revealed the censorship of major SNS.As far as I know, Zeronet is the most useful decentralized network right now.

Rigged elections are a factin every (US democracy like) country since Kennedy assassination.

toto už jsou podoby  
deep/dark webu



CONNECTING...

TRACKERS ANNOUNCING: 2, ERROR: 2, DONE: 10

NO PEERS FOUND



*monetizace?*

*tokeny?*

*filecoin na IPFS?*

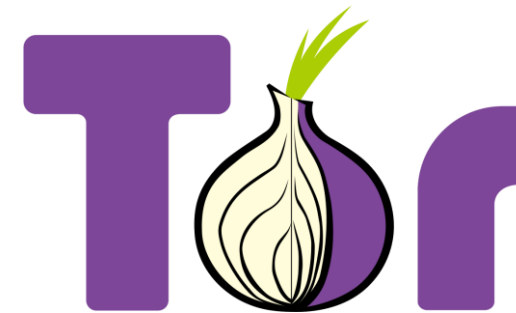
skryté služby

# Onion routing



- původ v armádním výzkumu
- vytvořit spojení, které neprozradí kdo s kým mluví
- nosnou myšlenkou byl **onion routing**
- MIT (2000) – výzkumy *Tor* (The Onion Routing)
- fungování založeno na decentralizované síti

# Tor



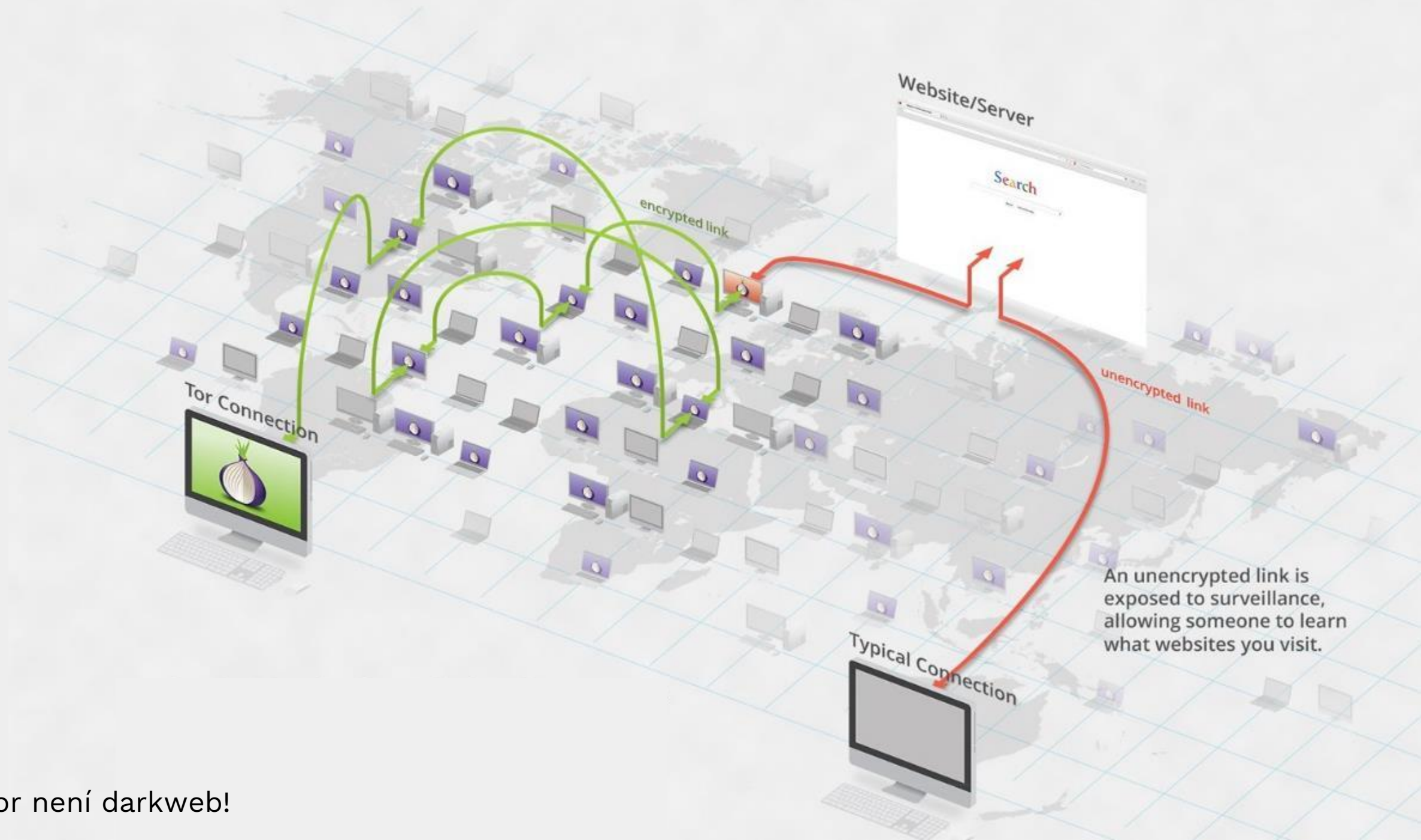
- *proč je vojenská technologie dostupná všem?*
- potřeba uzlů: otevřeno (2002)
- 2004 – podpora EFF
- ALE: technologická náročnost
- **Tor Browser** (2008)
- 2010 – Arabské jaro (*ochrana identity, přístup*)
- 2013 – kauza Snowden

# Tor

- zajišťuje anonymita na Internetu
- klientský SW a dobrovolnická síť Tor uzlů
- čím více uzlů, tím rychlejší a bezpečnější
- IP -> *exit relay* IP

# Tor | Jak to funguje?

- Tor relay / router / node
- typy relay: middle relay / exit relay / bridge
- minimálně 3 relays na cestě
- *middle* je bezpečné provozovat
- *bridge* překonává cenzuru
- *onion routing a šifrování*



tor není darkweb!



Napadá Vás, jaké  
**legitimní** využití  
Tor může mít?



# Tor | Využití pro smrtelníky

- k ochraně před marketéry a sledováním
- ochrana dat, která mohou uniknout
- ochrana před vyzrazením lokace skrze IP
- zkoumání a vyhledávání o citlivých tématech  
(zkuste si v Číně vyhledat něco o kultuře Tibetu; nemoci...)
- obcházení cenzury pro běžnou funkcionalitu Internetu

# Tor | Využití pro smrtelníky

„Does being in the public spotlight shut you off from having a private life, forever, online? A rural lawyer in a New England state keeps an anonymous blog because, with the diverse clientele at his prestigious law firm, his political beliefs are bound to offend someone. Yet, he doesn't want to remain silent on issues he cares about.“

„People living in poverty often don't participate fully in civil society - not out of ignorance or apathy, but out of fear. If something you write were to get back to your boss, would you lose your job? If your social worker read about your opinion of the system, would she treat you differently?“

# Tor | Využití pro novináře

- mnozí novináři nemají jak publikovat
- občanská žurnalistika
  
- [SecureDrop](#)
- [SecureDrop Directory](#)
- [SecureDrop serveru Investigace.cz](#)
- [GlobaLeaks](#)

# **Tor** | Policejní orgány, armáda...

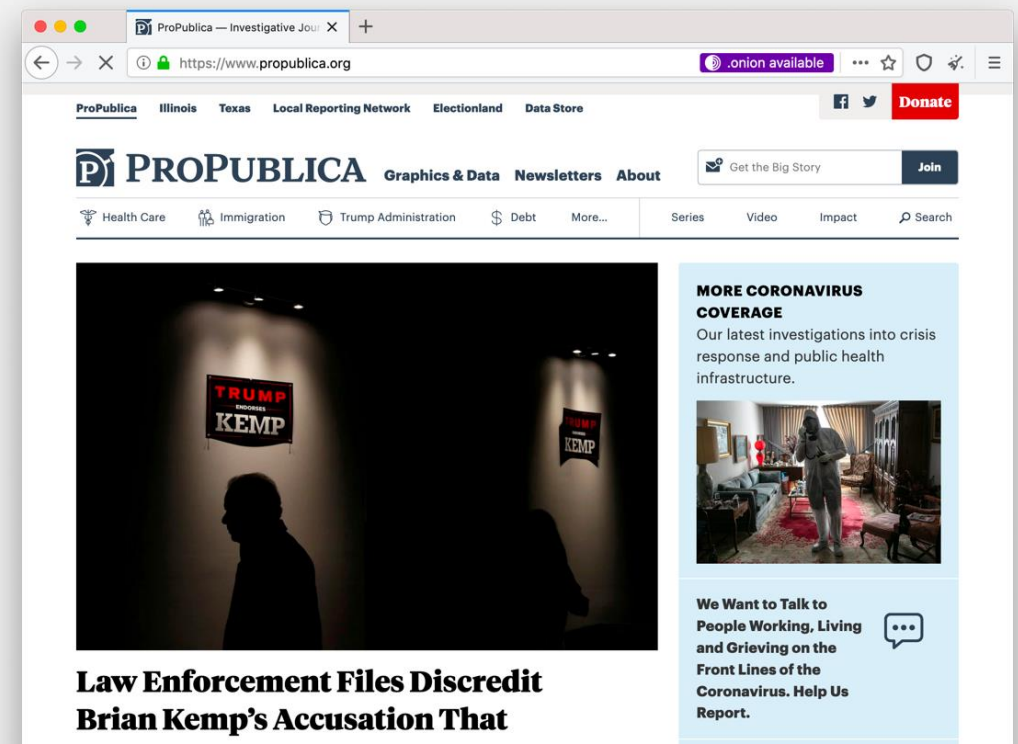
- kontroly nelegálních webů (*krytí vládních IP*)
- vyšetřování, aktivity v utajení
- zpravodajské služby
- reportování zpravodajců z terénu

# **Tor** | Aktivistické skupiny

- obcházení cenzury k reportování z terénu
- whistleblowing

# Tor Browser

- <https://www.torproject.org/download/>
- varianta i pro Android / Orbot
- jednoduchost, přístupnost
- *dříve mnohem náročnější*



Our tests indicate that you have **you have strong protection against Web tracking.**

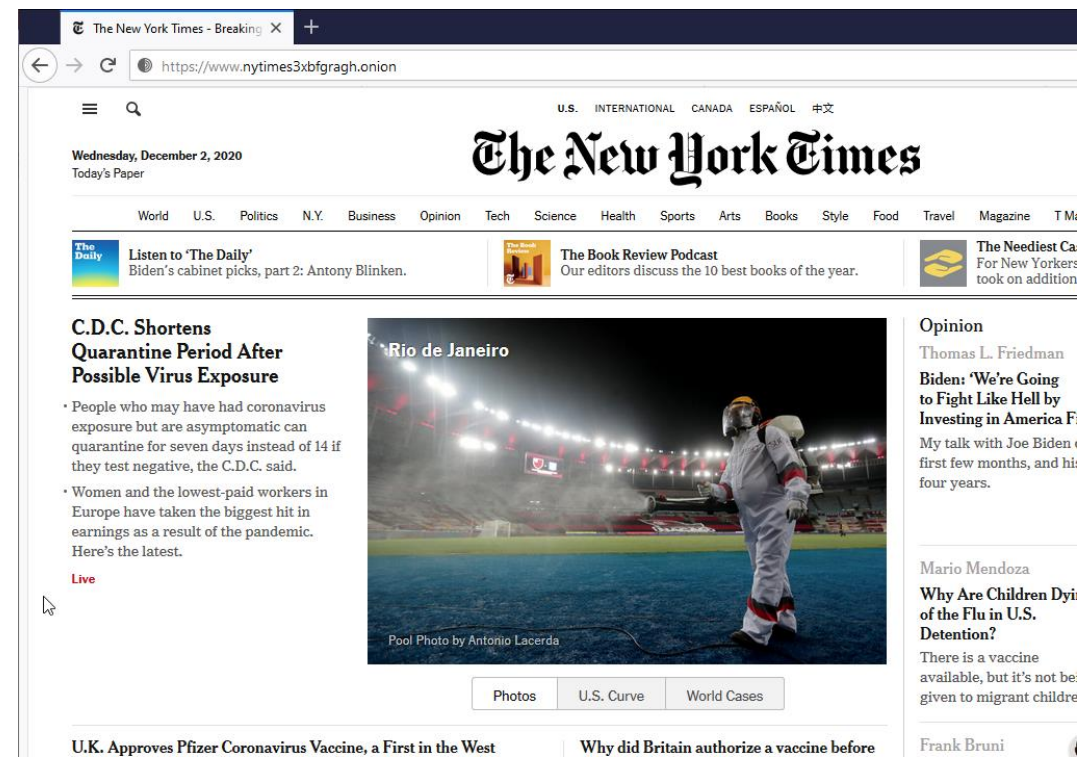
**IS YOUR BROWSER:**

Blocking tracking ads?	<u>Yes</u>
Blocking invisible trackers?	<u>Yes</u>
Protecting you from <u>fingerprinting</u> ?	<u>Your browser has a non-unique fingerprint</u>



# Hidden services

- .onion doména
- speciální doména pro onion služby
- dostupné pouze skrze Tor
- existují *www2onion* brány, ale to ztrácí smysl



eseje?



sdílení!

P2P setkání!

praskání bublin!

# předvánoční NaMI barcamp

spolupráce!

decentralizovaná přednáška!

Jaké služby vám pomáhají v každodenní práci?  
Na jaké (legální) weby chodíte a chcete je ukázat  
i ostatním? Jak vám Internet změnil život?  
Co nejvtipnějšího jste s Internetem zažili?  
Co nejhoršího se Vám na Internetu stalo? Jaké  
tipy a triky používáte na webu a chcete je  
naučit i ostatní? Pojdte to sdílet!

About Guardian Project - Guardian X +

https://guardianproject.info

ABOUT APPS CODE ARCHIVE CONTACT

CHECKEY

CÍRCULO

**HAVEN**

LOCATIONPRIVACY

OBSCURACAM

OBSCURACAM: SECURE SMART CAMERA

ORBOT: PROXY WITH TOR

ORFOX

PIXELKNOT

PROOFMODE: VERIFIED WITNESSING

RIPPLE

SAVE

TOR BROWSER FOR ANDROID

TOR BROWSER FOR ANDROID (ALPHA)

# Guardian Pro

While smartphones have been heralded as the coming of the new communication and collaboration, they are a step backwards when it comes to personal security, anonymity and privacy.

**Guardian Project** creates [easy to use secure apps](#), open-source and [customized solutions](#) that can be used around the world by individuals and organizations to protect their communications and personal data from unjust interception and monitoring.

Whether you are an average person looking to affirm your rights as a journalist or humanitarian organization looking to safeguard your communications in a perilous global communication, we can help address the threats.

GUARDIAN PROJECT

<https://guardianproject.info/apps/org.havenapp.main/>

