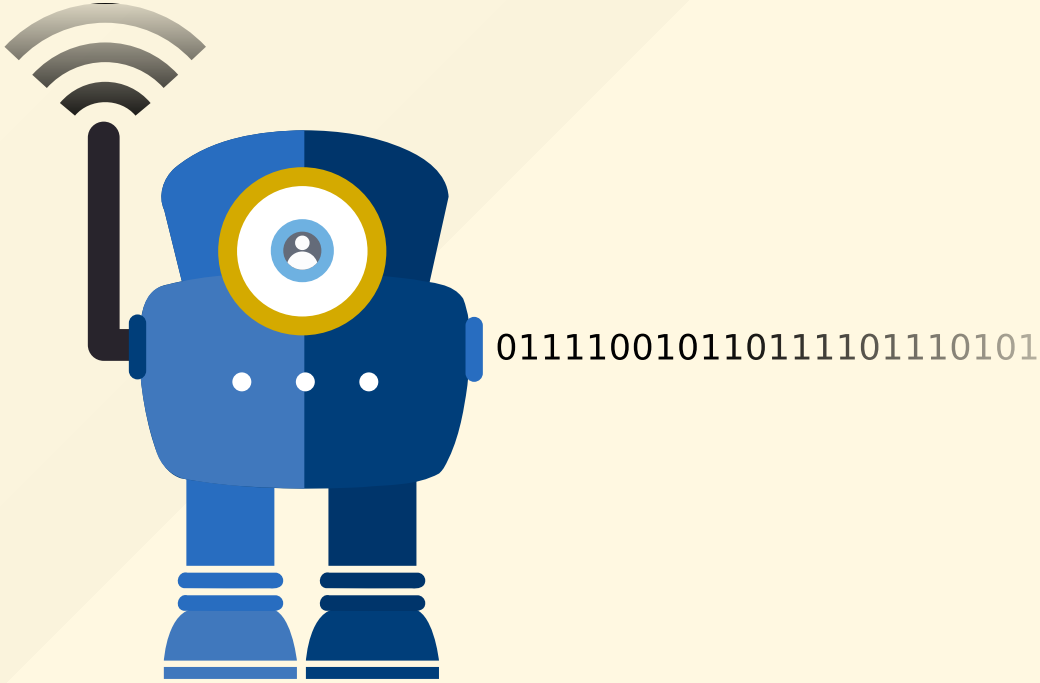
Citizen FOSS

Snowden's toolkit — for the Rest of Us.



A Presentation & Guide by Sean O'Brien

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Citizen Four (2014):

Film following **Edward Snowden** as he shares NSA spy documents and attempts to flee Hong Kong. "Citizenfour" was one of Snowden's pseudonyms.

FOSS (English, acronym):

Free and Open Source Software. "Open Source" is often a business term for **Free Software**. The "free" means "freedom" but, usually, it also costs nothing. *Synonyms:* Software libre, FLOSS.

> …many people forget – maybe people haven't seen *Citizen Four*, for example… but if you watch closely in credits, they thank a number of **FOSS** projects, including Debian, Tails, Tor, GnuPG, and so on and so forth.
>
> And that's because what happened in 2013 **would not have been possible without Free Software**. I did not use Windows machines when I was in my operational phase because I couldn't trust them.
>
> — Edward Snowden, *keynote at LibrePlanet 2016*

These Slides are Detailed

Grab a copy of the presentation:
github.com/seandiggity/citizen-foss

Refer back to it later, read it slowly, & click the links.

- If you don't do everything in the demonstrations or fall behind, that's okay. **Learn 5 new things**.
- If you don't have a computer/phone, or it's acting up, make a friend in the room and follow along.

Sharing is Caring: Please copy, share, and remix!

TL;DR - Shorter, DIY Version

- Watch these three videos on privacy, Free Software, and Tor.
- Try Jitsi Meet, DuckDuckGo or StartPage, and Up1.
- Use Cryptocat, Ricochet, or Tor Messenger.
- Install uBlock or Adblock Plus and HTTPS Everywhere.
- Browse with Tor Browser and use OnionShare.
- Try Wire on iOS and Android.
- **Android only:** Install F-Droid. Use Orfox, orWall, Silence.
- E-mail via Tutanota or Protonmail, or set up GPG+Enigmail.

Etherpad for Live Q & A

Let's name a new pad at pad.riseup.net

...this pad will self-destruct in 30 days.

- This is "Security by Obscurity".
  Do not type info in the pad you wish to remain private.
  If the pad name is guessed or shared, anyone can view it.
- Riseup.net hosts awesome services.
  Donate if you can, they almost had to shut down in 2016.

Other options: Riseup .onion Etherpad (Tor only)
Mozilla's public Etherpad | Try Ethersheet for spreadsheets

Why Privacy Matters

It's not about "having something to hide"

Watch on YouTube ➡️

Snowden Documents

Major takeaways:

1. **The Bad News:**
All popular communication services have been compromised by government and corporate surveillance. Mass data collection, software backdoors & exploits, government information requests, data breaches.

2. **The Good News:**
Snowden was able to communicate extremely sensitive information despite this, using a combination of FOSS and Operations Security (OPSEC) training.

Bad News

Many services still compromised

Say 'Hi' to the NSA in Your Next Email

Sources say Yahoo let government malware scan the contents of all emails sent to Yahoo accounts. And why would the feds stop with Yahoo?

Andrea Castillo | October 11, 2016

EMAIL | SHARE | PRINT

It's been a rough month for Yahoo. Within a few weeks, the struggling tech-company was accused of undermining its customers' security *and* privacy, after a massive hack of user-data from 2014 was followed-up this fall with allegations of involvement in an unprecedented government surveillance program. The question now is whether more tech companies are secretly complying with federal orders to spy on us.

Dominic Lipinski/ZUMA Press/Newscom

RELATED ARTICLES

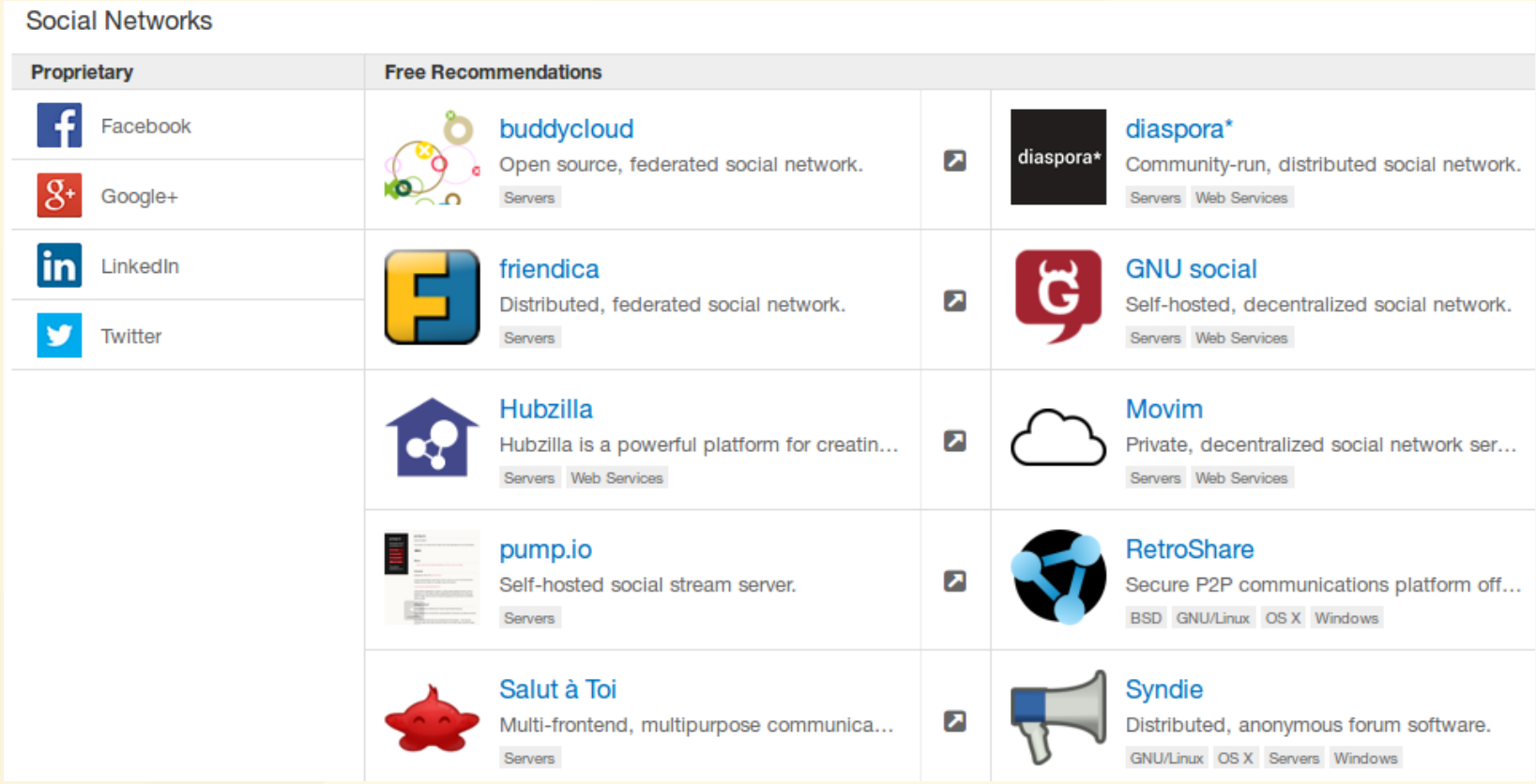
DOJ USES VAGUE COURT REQUEST TO TRY TO DEMAND

For Yahoo, the woes started in late September, when chief information security officer (CISO) Bob Lord delivered some harsh news on the firm's official Tumblr account: Yahoo

In 2016, we learned Yahoo! had new spy software for the NSA. At least 1.5 billion accounts were also breached in separate incidents.

Good News

More privacy software, easier to use than in 2013



Social Networks

Proprietary	Free Recommendations		
Facebook	buddycloud Open source, federated social network. Servers		diaspora* Community-run, distributed social network. Servers Web Services
Google+			
LinkedIn	friendica Distributed, federated social network. Servers		GNU social Self-hosted, decentralized social network. Servers Web Services
Twitter	Hubzilla Hubzilla is a powerful platform for creatin... Servers Web Services		Movim Private, decentralized social network ser... Servers Web Services
	pump.io Self-hosted social stream server. Servers		RetroShare Secure P2P communications platform off... BSD GNU/Linux OS X Windows
	Salut à Toi Multi-frontend, multipurpose communica... Servers		Syndie Distributed, anonymous forum software. GNU/Linux OS X Servers Windows

A list of alternative social networks from [PRISM Break](#).

Guiding Principles:

1. Trust is earned. Not bought, decreed, or promised.

2. Free and Open Source Software (FOSS) is an essential security requirement (not a guarantee).

3. Solutions must be both *libre* & *gratis* to reduce friction, encourage sharing, avoid discrimination.

4. Advertisements & surveillance go hand-in-glove.

5. Data is a toxic asset.

6. Centralization is dangerous.

What about iPhones, WhatsApp, Facebook?

Some U.S. corporations now encrypt some communication, making mass surveillance like PRISM difficult.

- Why trust these companies?
  Fool me twice, shame on me.
- On Facebook & WhatsApp, your **metadata** and **social graph** are stored & studied. WhatsApp may have a spy backdoor.
- Apple knows **who** you talk to, even when they don't know **what** you say to them.

This data can be used for targeted surveillance by police and intelligence agencies.

Demonstration:

Hands-on with

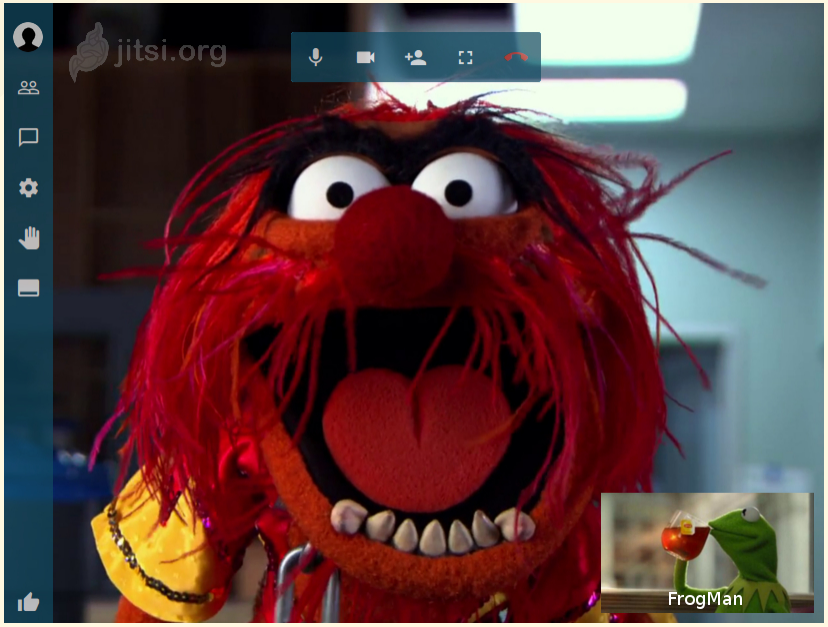
Jitsi Meet

Secure Audio/Video Chat

Let's name a new room at https://meet.jit.si

...this chat room will self-destruct when everyone leaves.

- Peer-to-Peer and End-to-End Encryption
- Password-protected rooms, no user limit, screen sharing
- Built-in Etherpad, text chat, optional YouTube streaming



Other WebRTC options: appear.in | Talky

Making First Contact

Establishing a trusted connection

Privacy tools require trust and a shared secret. That secret could be a username, a URL, a passphrase, or an encryption key.

- Share a secret using tools you learn about today.
- Meeting in person may be the best method.
- Etherpads, pastebins/imagebins like Up1, and "burner" temporary e-mail accounts are good options.

Try to use Tor Browser or Orfox for first contact *(we'll cover this later)*.

Demonstration:

Chatting with

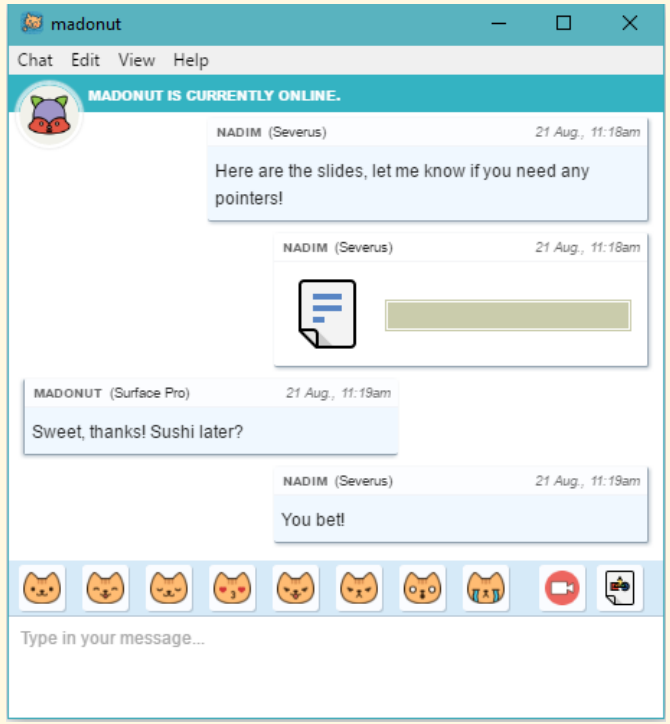
Cryptocat

Secure Instant Messaging

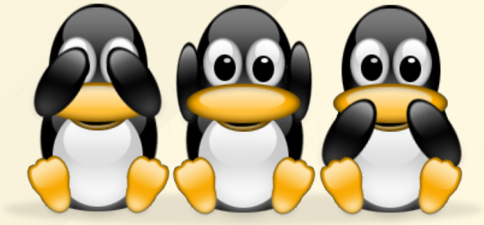
Download & install from https://crypto.cat

Choose a (non-identifying) username. Share it with the person to your left, add them as a buddy.

- End-to-End Encryption and Forward Secrecy
- File sharing, including video and large files (though it may be slow).
- Longer history than many private chat apps. Actively responds to audits, vulns, criticism.



Off The Record (OTR)



Text chat/IM is very safe, **if configured correctly.**

Jabber (XMPP) is the basis for most IM (Google Chat etc.) but you need a trusted service provider. Try DuckDuckGo XMPP, or join Riseup, MayFirst, or the Free Software Foundation.

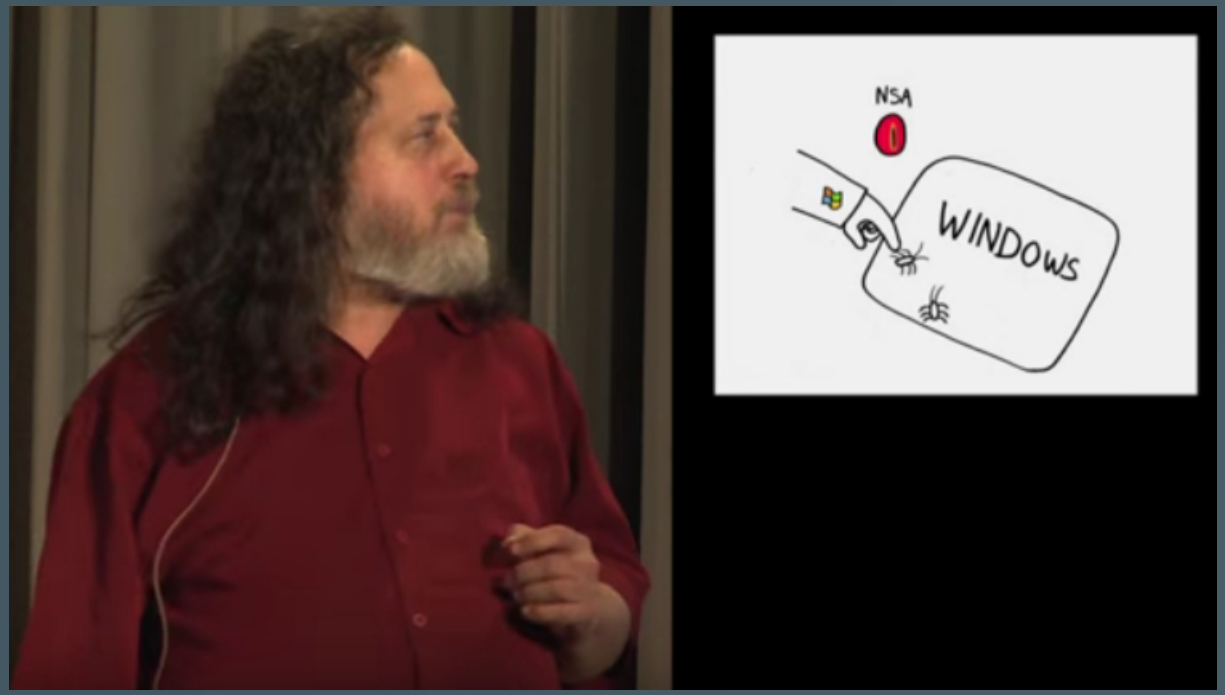
Use **Pidgin** (Windows & Linux) and **Adium** (Mac) with XMPP. Check the settings and make sure you're not logging chats.

Set up OTR for truly private XMPP. Follow this OTR guide

Too complicated? Try Ricochet or Tor Messenger.

Free Software in context

Digital security requires software freedom.



Watch on YouTube ➡️

Picking Ain't Easy

Start by eliminating proprietary software and services with advertisements.

- Ads are not only obnoxious, they may inject malware, even **if** developers try to avoid it.
- Favor GNU GPL and other Free Software licenses.
- Read the EFF messaging scorecard, Wikipedia, FOSS community reviews, & online forums.
- Look for warrant canaries & transparency reports.
- Browse Tactical Tech & resources listed later.

Demonstration:

Focus on

Better Browsing

Browser Warning!

We'll focus on Firefox (Iceweasel/IceCat).
Mozilla values privacy & has a solid track record.

Why not Google Chrome? Most of the following tips will also work on Chrome & Chromium (100% FOSS version). Chrome contains **proprietary** code, has serious privacy issues, and reports back to Google several ways even if you try to opt out.

Can I trust Chromium? Maybe. Webcam/microphone spyware has been included with Chromium (not just Chrome) in the past, but it has since been removed. You will have to turn off the Google defaults and avoid Google services, however.

Breaking Ads

Try these addons & tweak the settings.
How to install | How to remove addons

- **Essential:** uBlock or Adblock Plus, HTTPS Everywhere
- **Recommended:** DuckDuckGo Plus, Decentraleyes
- **YourMileageMayVary:** Privacy Badger, Disconnect, LibreJS
- **For the Adventurous:** NoScript (turns off all JavaScript)
- **Facebook users:** FacebookBlocker, Facebook Disconnect
  Warning: Facebook is a surveillance network and even casual communication is carefully studied.

Better Search w/ DuckDuckGo

DontTrack.us: problems with Google, contrasted with DDG.
DontBubble.us: filter bubbles, which DDG doesn't create.

!bangs: Allow you to search other sites. These searches originate from DDG's servers, masking your identity.

`edward snowden !g`	Google
`chelsea manning !w`	Wikipedia
`richard stallman !yt`	YouTube
`debian gnu linux !gi`	Google Images

Other search engines: Startpage | Disconnect

Mo Passwords, Mo Problems

Here are some password strength, storage, and retention strategies.

Passphrases: Can be a favorite song lyric, movie quote, or joke. I would also add numbers and special characters: `Cecil+Harambe4ever`

Strength: General guidelines | Diceware method

KeePass (Windows/Linux) or **KeePassX** (Mac): Organize your passwords in an encrypted database.

Browser Password Manager: In Firefox | In Chromium

Onion Routing via Tor

Be truly anonymous on the Internet.

[Watch on YouTube ➡️]

Demonstration:

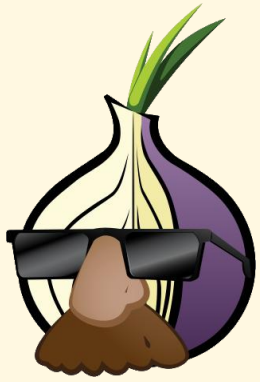
Try out

Tor Browser Bundle

Anonymous Web Browsing

Download Tor Browser Bundle

It's Firefox, but anonymous! Security plugins pre-installed.



Tor is the standard for anonymity.

The Tor network thwarts the NSA's best efforts to break it (we know this thanks to Snowden).

- **However:** Using Tor is not a magic bullet. Vulnerabilities may occur over time, so **update often** (TBB will nag you!)
- **TBB Settings:** Go with the defaults. Customization makes you more susceptible to browser fingerprinting.
- **Bridges:** Use if Tor is blocked or you need extra protection.

Rolling in the Deep

Wikileaks submissions and other anonymous .onion services run on the Tor network.

Use TBB for the "normal" Web **and** the Deep Web.

Onion Sites That Don't Suck

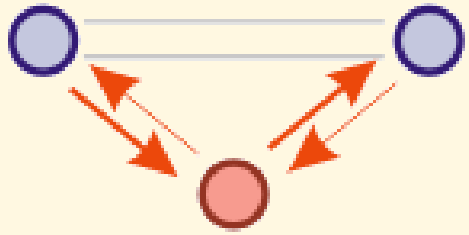
Onionshare: Easy way to share files via .onion URLs.

Other Deep Web networks: I2P & Freenet

Remember: True security and anonymity requires hard work and careful actions to get right (OPSEC).

"Forget Tor. Just use a VPN"

VPNs route traffic through a (trusted?) computer but do not provide the anonymity & security of Tor. Free (gratis) VPNs may be malicious. Most reputable VPN accounts cost money.



- What is a VPN good for?
- Look for a warrant canary!
- You can use Tor over a VPN

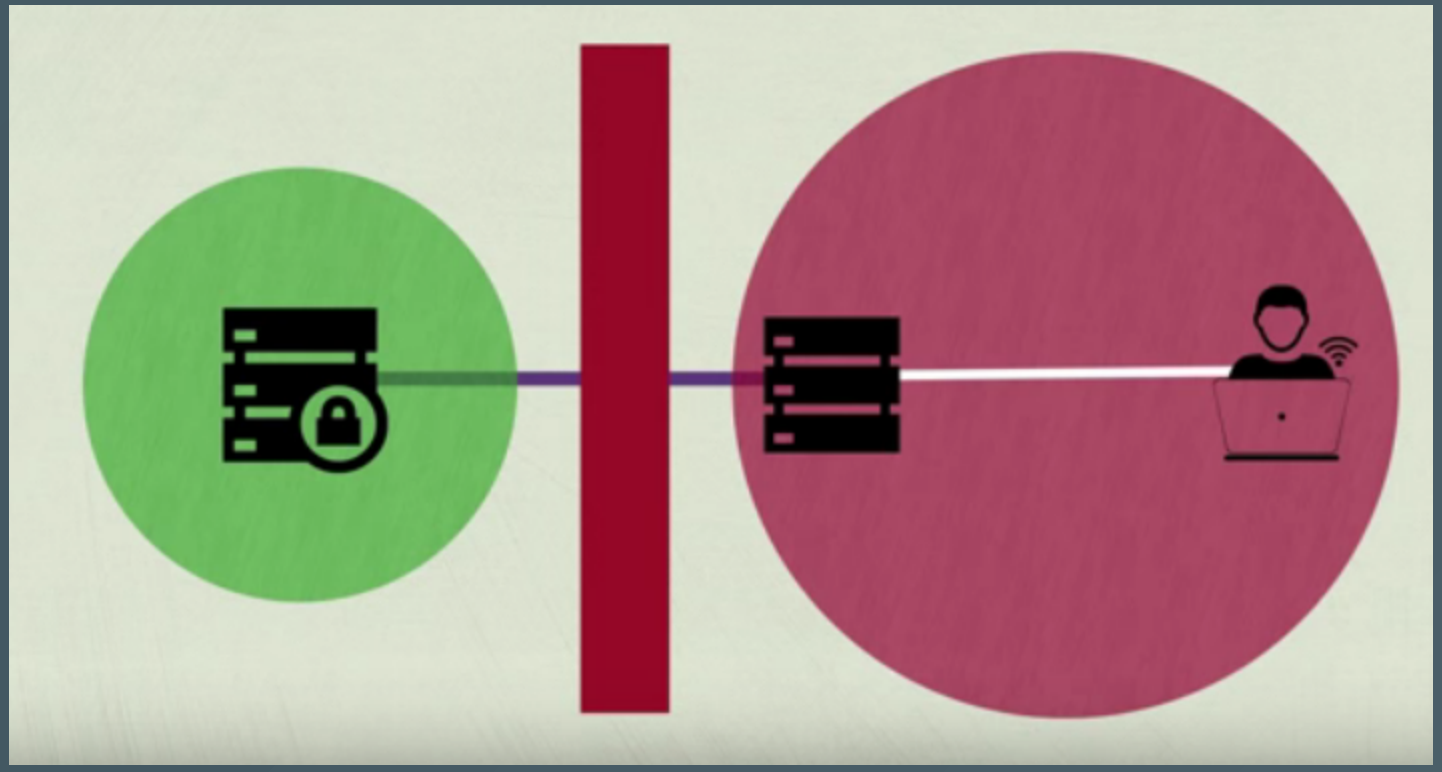
Do your homework before trusting any service. Choices:

Riseup Red (legacy) | Riseup Black

PIA | VPN.ht | Doublehop | AceVPN | CyberGhost | SumRando

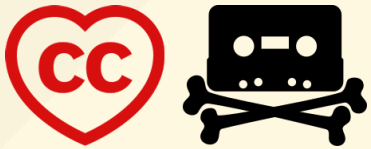
How a VPN Works

Watch this before you try any VPN.



[Watch on YouTube ➡️]

Sharing Is Caring



...but love is a battlefield. Practice safe sharing.

Use OnionShare for single files. P2P / Bittorrent requires trade-offs: speed, anonymity, ease-of-use, size of network.

Tox | RetroShare | GNUnet | Tribler

Remember: Sharing may run contrary to copyright law in your country.

- Share copyleft, Creative Commons ShareAlike & Free Culture works.
- Bittorrent over Tor is a bad idea & may de-anonymize you.
- Set up blocklists to block potentially-malicious peers.

Dropbox-like solutions:

SparkleShare | SpiderOak *(some parts proprietary)*

Demonstration:

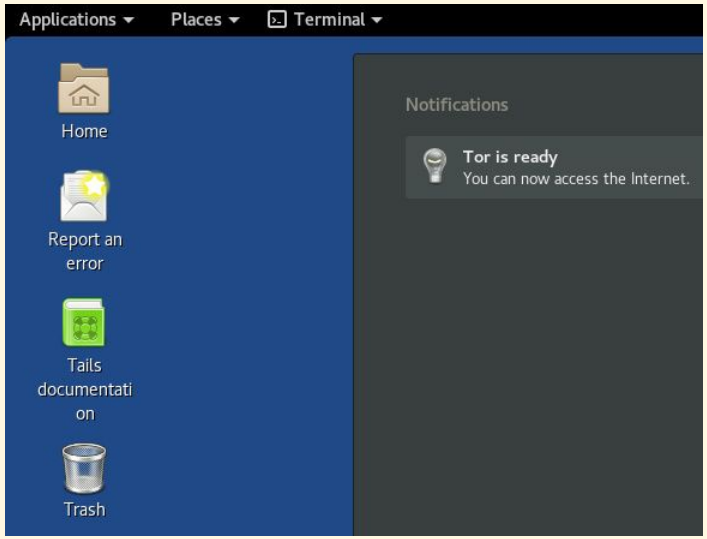
"The Amnesiac Incognito Live System"

Tails

Tails is the Tor operating system

Follow the Tails Installation Assistant

- Tails **does not use your hard drive**, or require any hard drive at all.
- Tails boots from USB stick, CD/DVD, or virtual machine.
- You may optionally set up persistent storage for Tails. Otherwise, all files go ***poof*** when you shut down.



Not working? Try Whonix.

In contrast to Tails...

Windows can't be trusted.

- Surveillance is difficult or impossible to turn off.
- Long history of spy backdoors & special U.S. military access.
- Microsoft gathers metrics on every Windows user (what users type, how long they browse, use apps, play games...)
- Bitlocker & SecureBoot: Microsoft stores your encryption key after the first time you use Windows Update, and there is a "skeleton key" backdoor in SecureBoot leaked in 2016.

Macs also contain proprietary software and have spying, control mechanisms, & DRM malware.

Security Is Not Proprietary

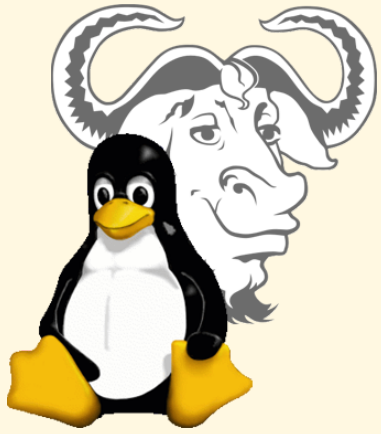
Recall Richard Stallman's TED Talk.

- Proprietary code is secret, often buggy and/or malicious.
- FOSS is a basic requirement for security. Even then it requires "many eyeballs".

Fortunately, there is a lot of high-quality FOSS available, and many users, developers, & security experts worldwide.

What Can the "Average User" Do?

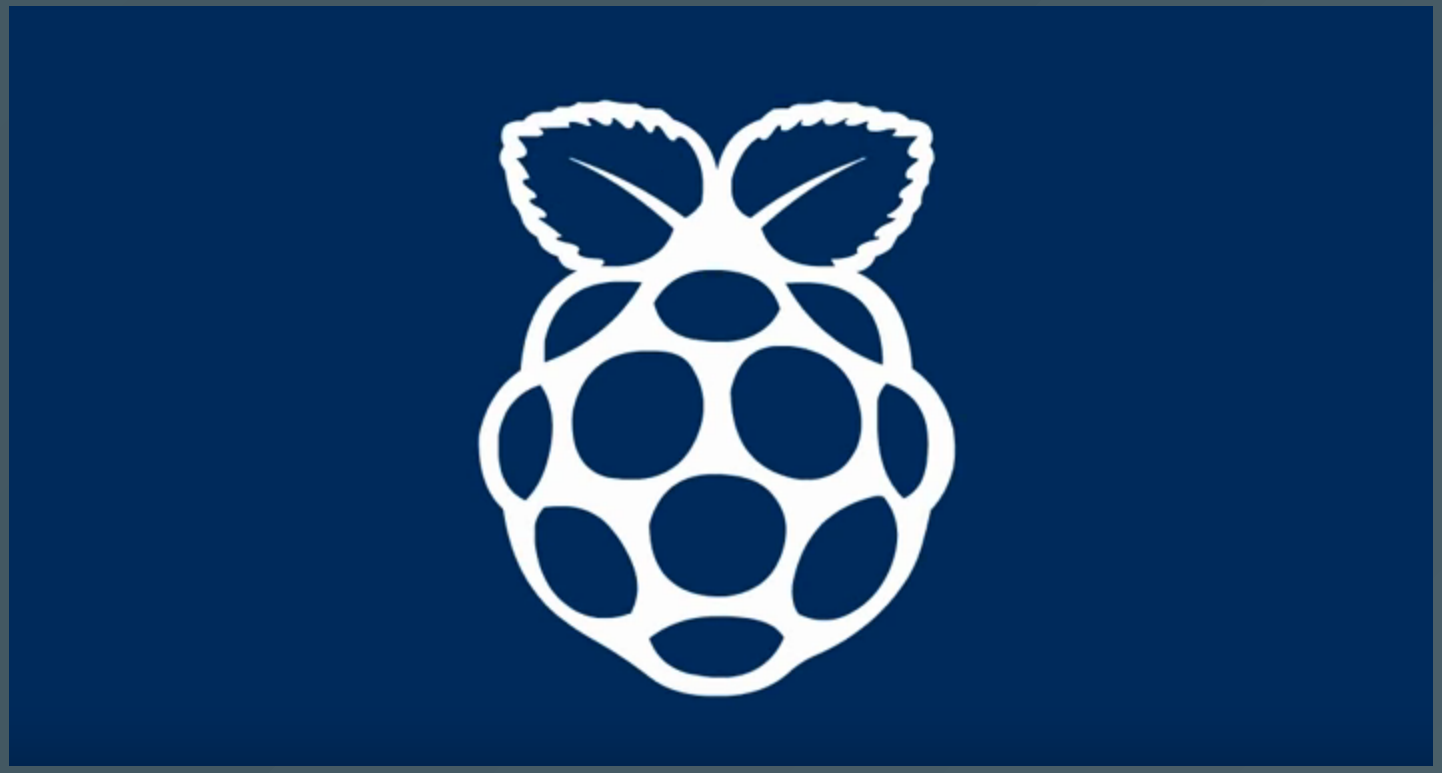
Try GNU/Linux, a popular & friendly family of FOSS operating systems. Tails is only one member of this family, and may not fit your threat model.



- GNU/Linux is installed on billions of Web servers, IoT devices, supercomputers, TVs, media centers, phones, tablets, & gadgets.
- Not only for hackers or bearded white men. Many millions worldwide use a GNU/Linux Desktop.
- Similar features as Mac OSX due to its Unix-like design.

What is "Linux"?

"Linux" explained, in four minutes.



Watch on YouTube ➡️

The GNU/Linux Distro For You

Most libre (no proprietary drivers, codecs, etc.)

Trisquel | gNewSense | Guix | FSF list

Most popular (big community == good support)

Linux Mint | Ubuntu | Debian | Fedora

Some "favorites" (list changes frequently)

Xubuntu | Korora | Manjaro | Elementary

Lightweight (for aging computers) wattOS | Bunsenlabs

Very secure (not for n00bs) Qubes | Subgraph

DistroWatch | FSF common systems list (mainly Unix-like)

What about my phone/tablet?

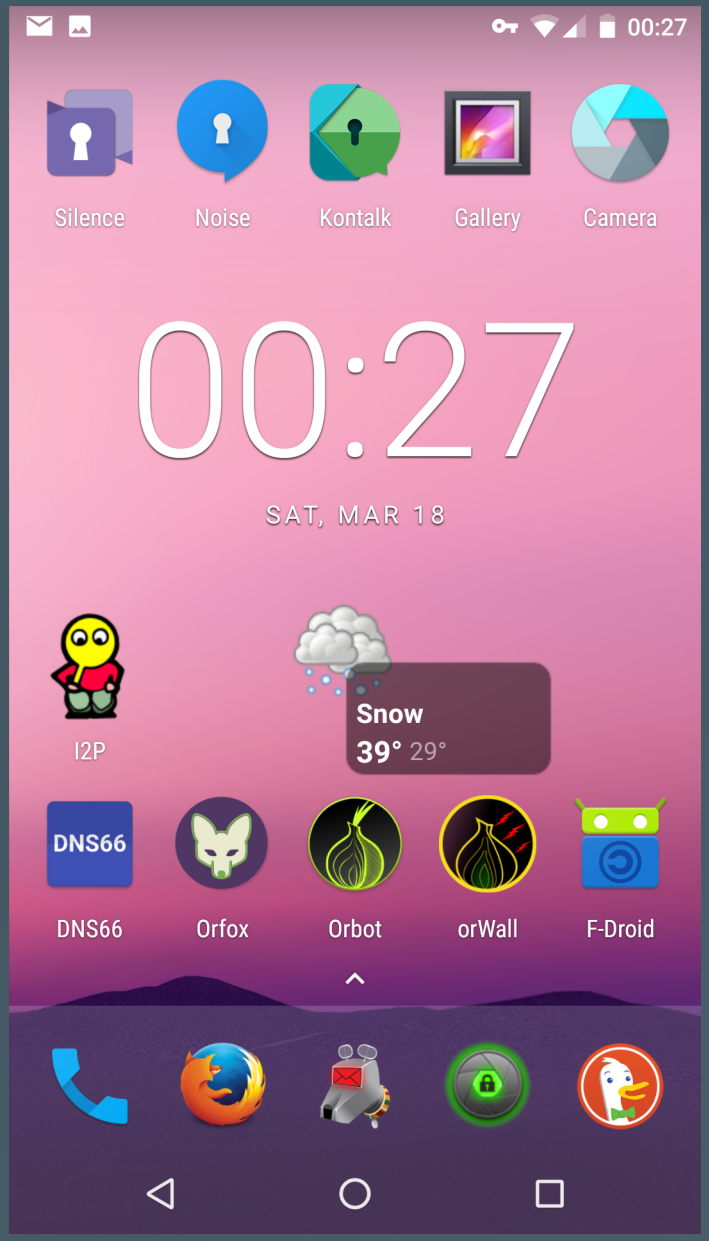
Let's concentrate on Android variants, which are based upon GNU/Linux.

Stock Android is insecure. It has dodgy proprietary apps from Google, the vendor (e.g. Samsung), & ISP (e.g. AT&T). It may have backdoors for spies.

Some Android devices are restrictive. Your current device may not allow you to "free" it. If so, keep freedom in mind for your next device.

iPhone/iPads are restrictive, with many pitfalls for security & freedom. If you must use one, jailbreak.

There is a world beyond Google.



Finding a ROM

ROMs in the modding community are loosely equivalent to distros / firmware.

- **Copperhead OS** - Security is the priority. Only for Nexus phones. Tor Prototype available.
- **Lineage or OmniROM** - Installs on many devices.
- **XDA-Developers Forum** - More alternatives.

Got r00t?

rooting a device means getting superuser / sysadmin access. It's a Unix-y term for full control of a system.

With Great Power Comes Great Responsibility. Root **may** be needed **temporarily** to free your device. ROMs usually allow you to turn it on and off.

Unlocked Bootloader: If this is a step in the ROM installation process, you should lock it afterward.

It's all part of the fun! Back up your files, follow instructions, and use a "test device" if possible.

Demonstration:

Getting started with

Apps

1. Install **F-Droid**, the FOSS app store for Android. You may have to "allow unknown sources".

2. Add the **Guardian Project** repository in F-Droid. GP offers privacy apps like ObscuraCam.

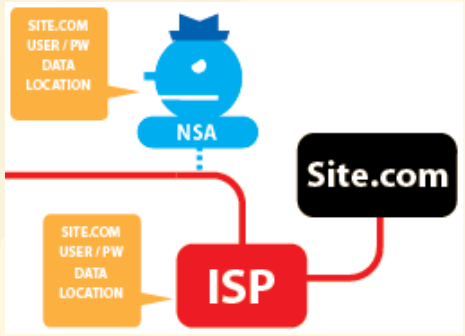
3. Install **orWall** & **Orfox**, Tor and Tor Browser for Android.

4. Try **Silence** & **Wire**. Silence enables encrypted SMS/text. Wire is a full-featured text and voice chat app like Signal.

5. Search for other **FOSS apps**, like ad blockers.

What about Signal? Noise is available through an F-Droid repo and doesn't require proprietary Google services like Signal does.

What about my Router?



Your gateway to the Internet may be insecure. Default router / modem firmware has many vulnerabilities and is often under attack.

- **DD-WRT** - FOSS firmware for many routers.
- **Tomato** - A family of FOSS firmware mods.
- **OpenWRT** - More like a distro for your router.

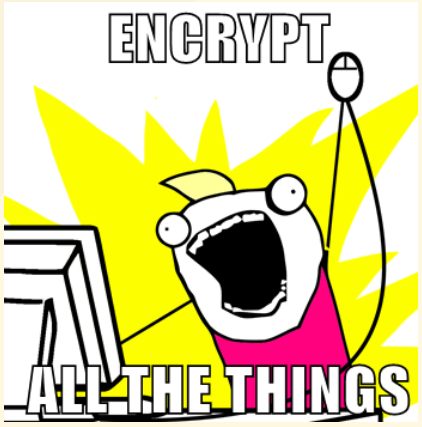
DNS vulnerabilities - OpenNic is an alternative DNS provider that routes around censorship and protects your network from DNS hijacking.

Intro to Encryption

How math can keep us secure.

Watch on YouTube ➡️

Encrypt Your Storage

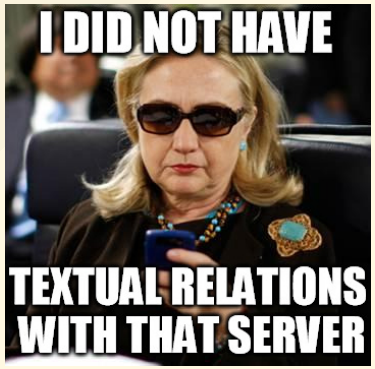


Encryption works, but is only as good as the implementation. FBI had a hard time getting into that iPhone. If they tried, Apple could get in more easily.

- Android & variants also have full-disk encryption.
- VeraCrypt is great for Desktop OS's and USB flash drives.
- Full-disk & home directory encryption are easy checkbox choices when installing all major GNU/Linux distros.
- More GNU/Linux options. Use Cryptkeeper for folders.

Above all, **don't trust cloud storage like Dropbox.**

Plugging the E-mail hole



Expect large, consistent data breaches.

Major e-mail providers can't be trusted.

Even years after the Snowden disclosures, Yahoo! created new NSA wiretaps and leaked 500 million accounts. Google actively studies e-mails, even spying as you type.

E-mail is a two-way street.

Messages have to be private on both ends. Your buddy @gmail.com is giving the conversation to Google.

E-mail is an easy target

```
jpodesta
p@ssw0rd
```

- E-mail is often sent and received insecurely, yet users treat it as a secure channel.
- Inboxes are utilized for personal data storage.
- Weak passwords & password sharing is common, especially under work pressure.
- Junk/spam filters play a cat-and-mouse game.
- Phishing scams are increasingly-sophisticated.

Don't assume spies are too cool for phishing.
Malware sent via e-mail is a common tactic.

Demonstration:

Up and running with

Encrypted E-mail

The Road to Private Webmail

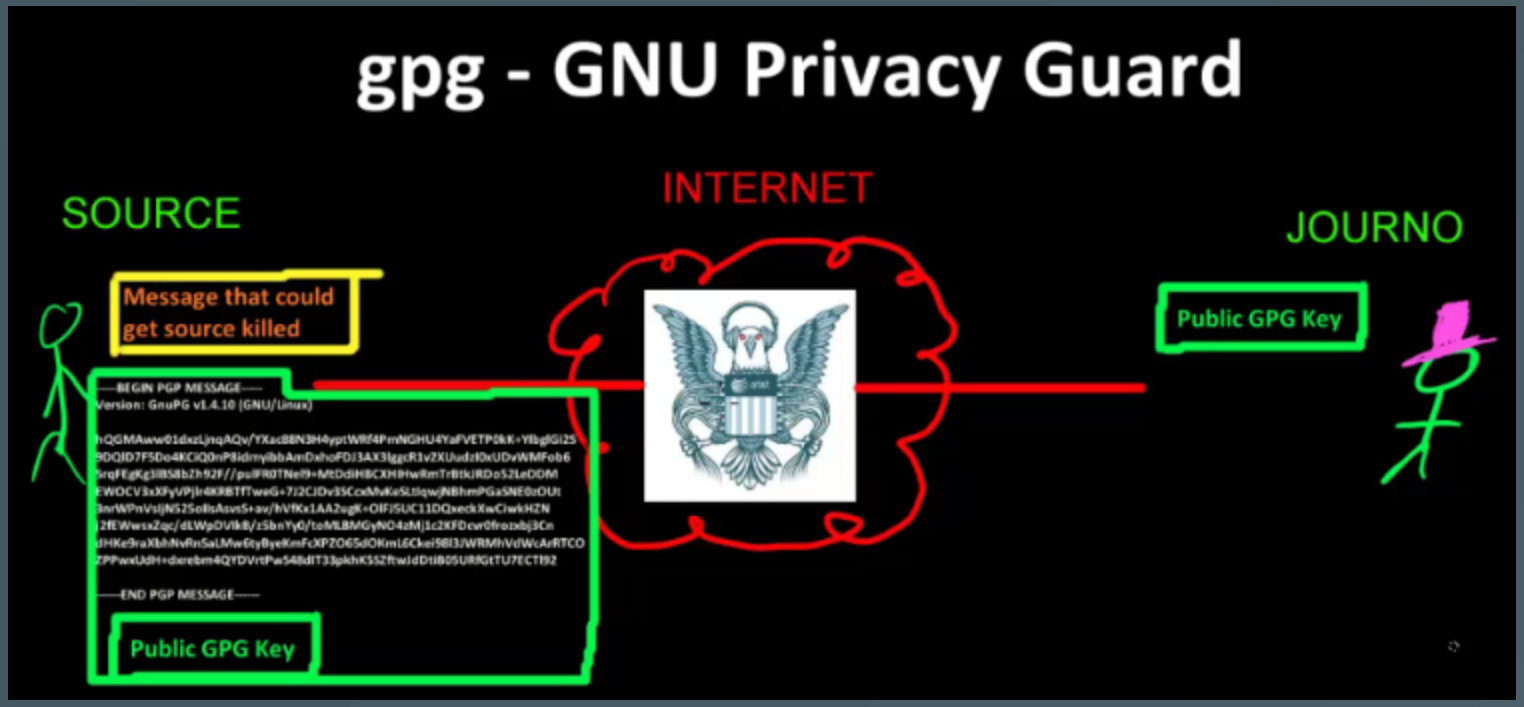
Create a Tutanota account. Use Tor Browser if you can.

- **Pros:** Very easy to use, encrypts metadata (subject, sender, recipient) as well as message content. Android & iOS apps.
- **Cons:** Encryption only to other Tutanota addresses. Can't download your mail locally via POP or IMAP.
- Protonmail is a similar service, with encrypted, password-protected e-mail to non-Protonmail users.

Tutanota & Protonmail are **not as flexible or popular as GPG**. They work best if everyone uses the same webmail provider.

GPG guide by anon108

Uploaded Jan. 6, 2013. Can you name the voice?



[Watch on Vimeo ➡️]

You Down with PGP? *Yeah, GnuPG!*

We say "GPG" because we're using the **G**NU **P**rivacy **G**uard implementation of **P**retty **G**ood **P**rivacy.

Download Thunderbird ➡️

Follow the EFF's guide for your operating system:

GNU/Linux | **MacOS** | **Windows**

E-mail Hosts: Try Riseup or Mailfence, or browse this list. Mailfence has easy Gmail, Yahoo!, & Office365 import, quick GPG setup, and has calendar / document sharing. Some features require paid account.

Avoid Web Publishing Traps

Sharing isn't just about conversations.
The Web is for publishing *World Wide*.

Social networks like Facebook are walled gardens with total surveillance. Try federated social networks.

Find trustworthy hosting for **Websites**, **Blogs**, & **Wikis**.

- MayFirst is great for activists and has defense from DDoS.
- Whitelist Tor visitors if you use CloudFlare.
- Set up SSL/TLS via Let's Encrypt to protect your users.
- Don't force users into ad networks just to view & comment.

Secure Comms Strategy

Make a plan and stick to it.

- The **What**: Choose a few crypto, sharing, & publishing tools.
- The **How**: Try these tools, figure out how they work.
- The **Where**: Find safe places to share secrets, on & offline.
- The **When**: Describe scenarios when you will use each tool.
- The **Why**: State clear reasons to use each tool.
- The **Who**: Identify "experts" who can help & teach others.

The Only Constant Is Change! Try new software, keep up on tech news & potential threats, and re-evaluate over time.

Resources

- Free Software Foundation: fsf.org
- Tor Project: torproject.org
- Electronic Frontier Foundation: eff.org
- Digital Security For Journalists

  Cryptoparty | Riseup | Tactical Tech | PRISM Break

  MayFirst | Encryption Works | Reset The Net

  Digital First Aid | H-Node | DRM-Free

Digital Security Helpline: 24/7 multilingual support

Xnet: grandes recursos en español

Sources

- Privacy Lab icon, Sean O'Brien, CC BY-SA 4.0. Inspired by Blue Robot Vector, 1001Vectors, "Free for personal use". Includes Wifi, SimpleIcon, CC BY 3.0 & Eye, Prosymbols, Flaticon Basic
- Rick McCallum describing *Star Wars: Episode I*
- "All the Things" meme, based on Allie Brosh comic
- Screenshot from "Why Privacy Matters" video, CyberSec101
- Edward Snowden and Glenn Greenwald from *Citizenfour*

Sources (continued)

- Story on Yahoo! data breach, Reason.com
- Screenshot of PRISM Break, GNU GPLv3
- Confused student & WhatsApp icon, Freepik, Flaticon Basic
- Facebook Messenger icon, Madebyoliver, Flaticon Basic
- Apple icon, Pixel Buddha, Flaticon Basic
- Screenshot of Jitsi Meet with Animal and Kermit from *The Muppets*
- Spider-Man meme, based on 60's animated series
- Screenshot of Cryptocat, Nadim Kobeissi, public domain

Sources (continued)

- "See no, Hear no, Speak no" penguins, Crystal Icons by Everaldo Coelho, GNU LGPLv2 or later
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- Mugshot of Bill Gates, public domain
- Randy Marsh and "member berries" from *South Park*
- Sketch of "Heisenberg" from *Breaking Bad*
- DDG logo, DuckDuckGo, Inc., GNU GPLv1 or later or Artistic License
- John C. Reilly from *Check It Out! with Dr. Steve Brule*

Sources (continued)

- Screenshot from "Tor Animation" video, Tor Project, CC BY 3.0 US
- Pluggable Transports icon, Tor Project, CC BY 3.0 US
- "A Dell Rolling in the Deep" meme
- Man-in-the-Middle diagram, public domain
- Screenshot from "How a VPN Works" video, Codemy School
- Creative Commons heart, Creative Commons, CC 0
- Logo from "Home Taping Is Killing Music" campaign

Sources (continued)

- Tails screenshot, Sean O'Brien, CC BY-SA 4.0 or GNU GPLv3 or later
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- Tux the Linux mascot, Larry Ewing and GIMP
- Screenshot from "What Is Linux" video, The Linux Gamer
- Trisquel logo, Rubén Rodríguez Pérez, GNU GPLv2 or later

Sources (continued)

- Tux the penguin as Neo from *The Matrix*, Crystal Icons by Everaldo Coelho, GNU LGPLv2 or later
- Android plus F-Droid screenshot, Sean O'Brien, CC BY-SA 4.0 or GNU GPLv3 or later
- Cover of *ROM Spaceknight #1*, Sal Buscema for Marvel
- Screenshot from *Walt Disney's Alice in Wonderland*
- F-Droid logo, William Theaker, Robert Martinez, and Andrew Nayenko, CC BY-SA 3.0 or GNU GPLv3 or later
- "Tor and HTTPS" diagram, Electronic Frontier Foundation, CC BY 3.0

Sources (continued)

- Screenshot from "The Internet: Encryption" video, Code.org
- "Encrypt All the Things" meme, based on Allie Brosh comic
- "Texts from Hillary" meme, based on 2011 photo of Hillary Clinton
- jpodesta p@ssw0rd, Wikileaks *Podesta Emails* archive
- Tutanota logo, Tutao GmbH, GNU GPLv2 or later
- Screenshot from "The Internet: Encryption" video, Code.org
- Screenshot from Edward Snowden (anon108) GPG tutorial

Sources (continued)

- Mozilla Thunderbird logo, Mozilla Foundation, CC BY 3.0 or MPL 2
- "Evil Kermit" meme, based on *Muppets Most Wanted* screenshot
- The "portable cone of silence" from *Get Smart*
- apt-get install anarchism, Chen-Da and Patrick, CC BY-SA 3.0 or GNU LGPLv3 or later
- Meditating Gnu, Nevrax Design, GNU GPLv3 or later or GNU FDL