

# **Freedom in a Box: Using FreedomBox to Protect Your Freedom**

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# About me

A developer working on digital privacy products  
for the past 4 years



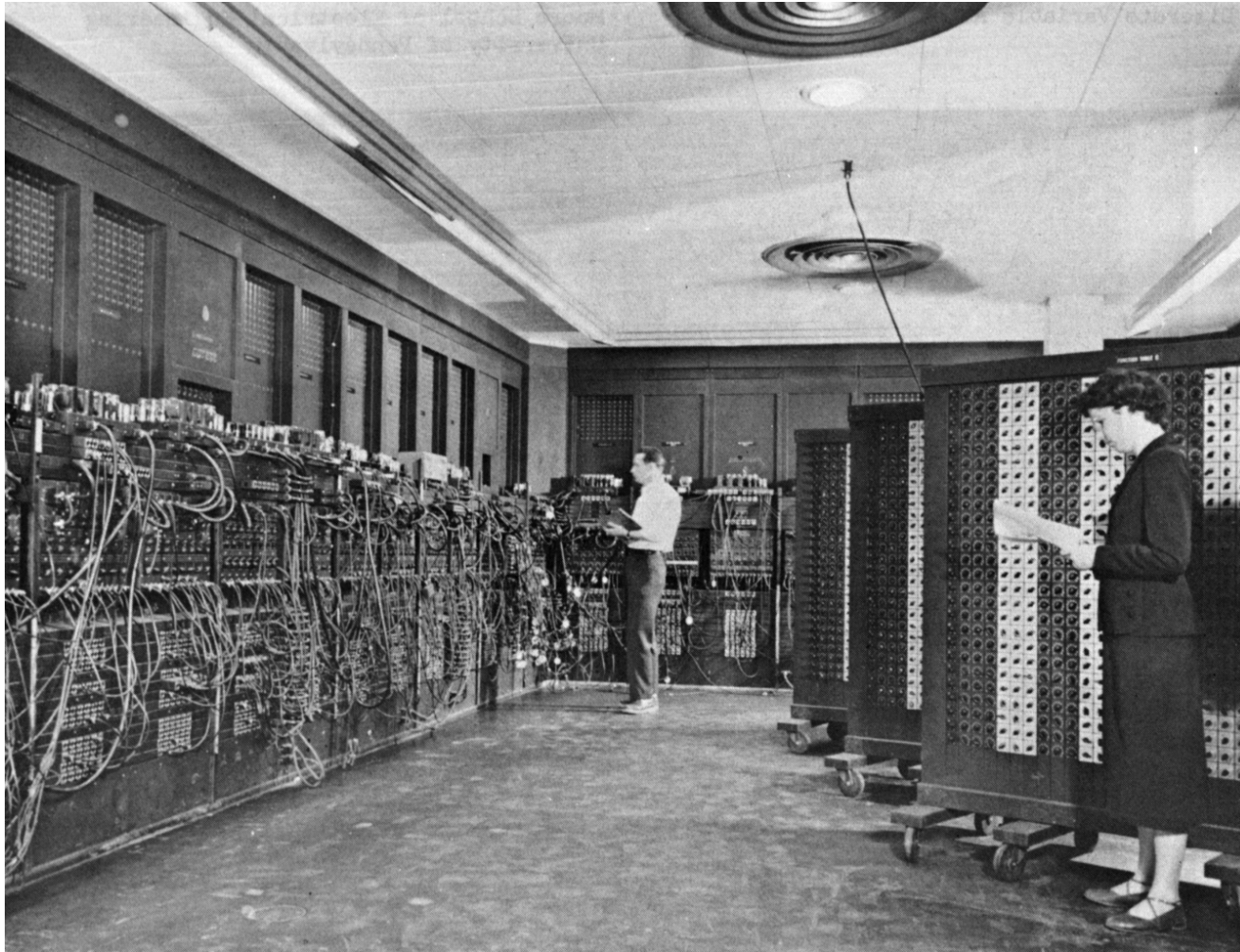
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A quick walk through the computer history



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# Early computers



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# Personal Computers



# Computer Networks & Internet

- Early computer networks were small and localized
- The most notable one is a US defense project called ARPANET
- These networks started connecting to each other forming the internet



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# World Wide Web

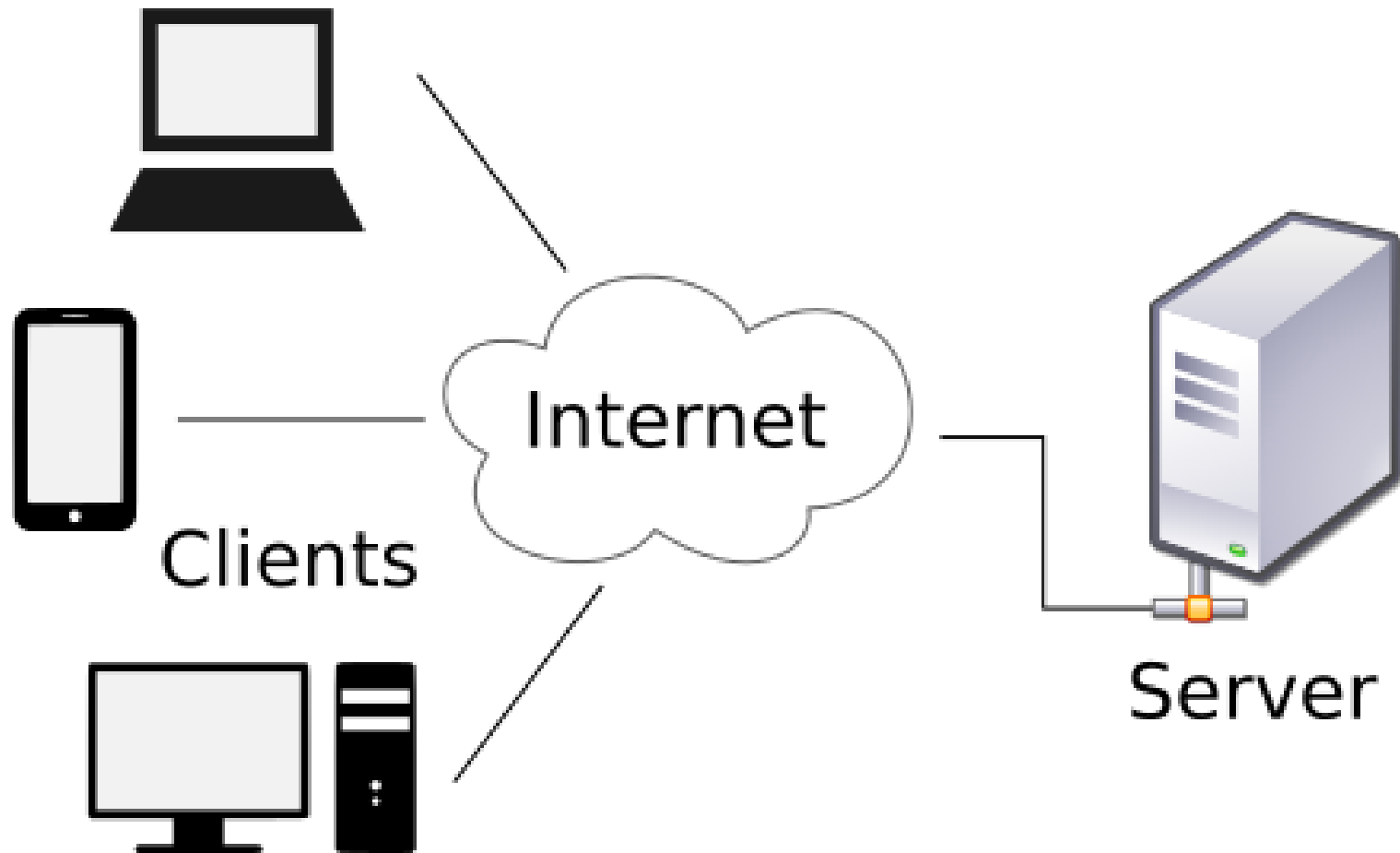


By Coolcaesar at the English language Wikipedia, CC BY-SA 3.0,  
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# Client-Server Model



Gnome-fs-server.svg: David Vignoni derivative work: Calimo (Gnome-fs-client.svg Gnome-fs-server.svg) [LGPL  
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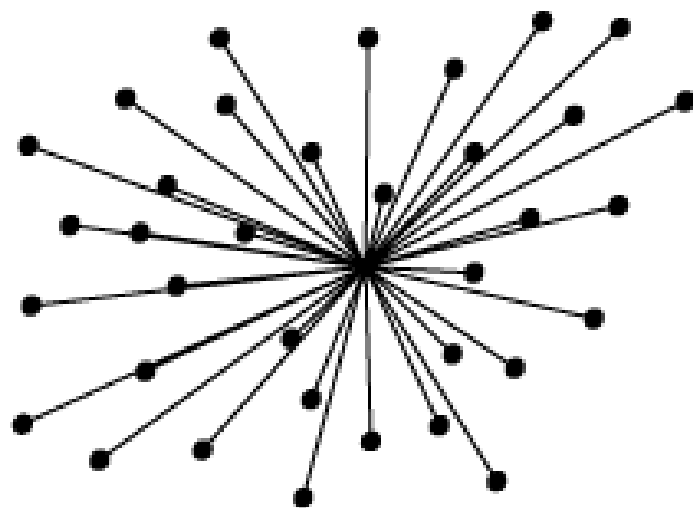
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# Client-Server Model

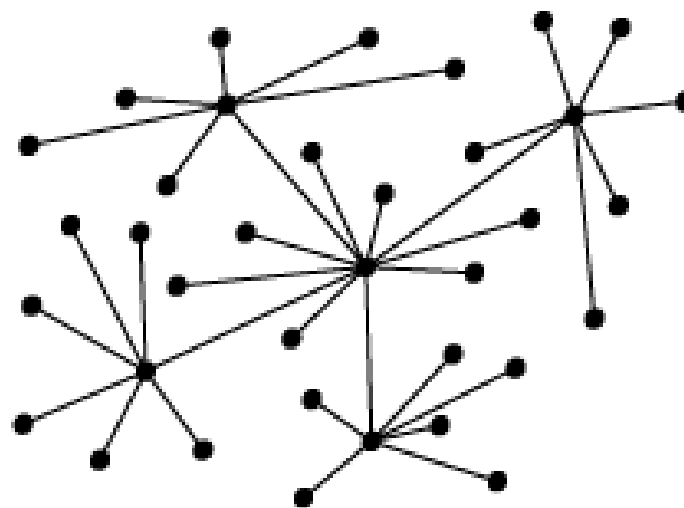
- Solved many technical problems
  - Convenience for clients
  - Scalability and centralized maintenance for servers



# Centralized Network Infrastructure



centralised



decentralised



# Client-Server Model

- Created new social problems
  - Centralization of data and logs
  - Power imbalance between clients and servers
  - Loss of personal data ownership
  - Created big Internet monopolies



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# More data, more power!

- Tracking, profiling and targeting for advertising
- Data Mining for business insights

Everybody wants to collect as much data as they can!!!



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# Data Breaches

- Personal Data from Social Networks
- Patient Records
- Insurance Data
- Citizen Identity Systems



Centralized data is a honeypot for cyber criminals



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# Cambridge Analytica scandal

- Influenced election results using Facebook data
- Targeted manipulation of people at a large scale
- Influenced the outcome of
  - Brexit
  - Trump's election



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# Rohingya Crisis

## Revealed: Facebook hate speech exploded in Myanmar during Rohingya crisis

**Analyst says: 'I really don't know how Zuckerberg and co sleep at night' after evidence emerges of a spike in posts inciting violence**



▲ Nearly 700,000 Rohingya Muslims fled into Bangladesh after a government 'clearance operation' in their villages in the second half of 2017. Photograph: Dibyangshu Sarkar/AFP/Getty Images



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# Powered by Free Basics

- Hate speech
  - No human moderators in the local language
- Fake news
  - Facebook became the primary news channel
  - No way to cross-reference news
  - People treated Facebook posts like official news
  - Algorithms optimized for engagement



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# Government Surveillance

- Mass surveillance systems
- Monitoring of all centralized service providers
- Anti-encryption laws
  - CLOUD Act (USA)
  - SESTA/FOSTA (USA)
  - AA bill (Australia)



# Privacy and Freedom

- Freedom of Speech
- Ubiquitous surveillance causes a chilling effect
- Suppression of activists and journalists
- Mass manipulation by the powerful erodes democracy



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# Your data must be with you!

- Not corporations
  - Your favorite startup might get acquired by a surveillance capitalist
- Not governments
  - A fascist government or a dictator might come into power



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The PC revolution only gave us clients  
We need Personal Servers



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# Self-Hosting

- Excuses
  - I cannot afford a commercial rack server
  - I don't have system administration skills
  - I just don't have the time
  - It will cost too much electricity and bandwidth
  - I cannot afford all the software licenses



# FreedomBox

Originally envisioned by Eben Moglen in 2010

- A small device that fits in your palm
- Electricity consumption equivalent to a smartphone
- Cheaper than smartphones - \$35 to \$100
- No system administration skills required



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# FreedomBox: A Simple Machine



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# What is FreedomBox?

- A multipurpose privacy appliance
- Independent node in the network
- Two parts: Software system + Hardware
- Four main functions (but not only four):
  - Private server
  - Communications hub
  - Browsing tool
  - Wi-Fi Router
- Design philosophy:
  - Simple
  - Customizable
  - Multi-functional
- Vision: integrate privacy technology into one system that is easy to use.



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# Our Free Software: Debian



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# How to make a FreedomBox: Hardware

Single-board  
computer

~\$35\*



SD Card

~\$10



SD-USB  
adapter

~\$5

(optional)



Ethernet  
cord

~\$5



Power  
cord

~\$5



\*Raspberry Pi 2 + case,  
others supported



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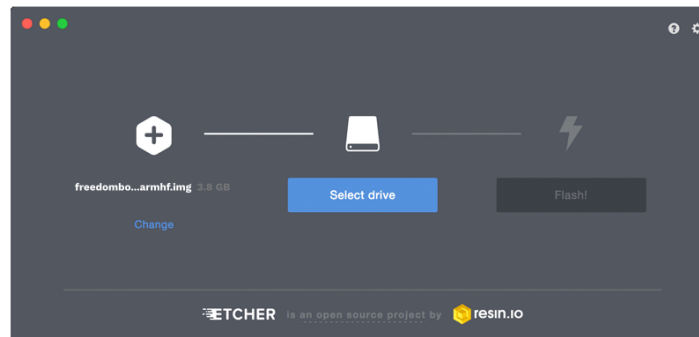
# How to make a FreedomBox: Software

1. Download

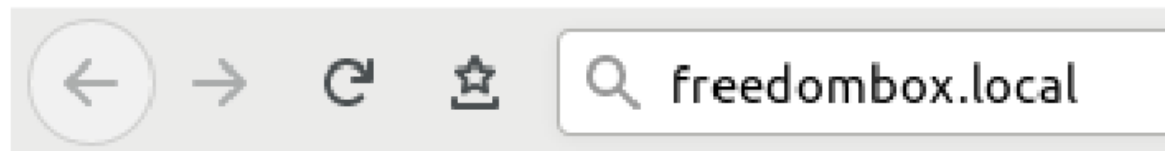


*freedombox.org*

2. Burn image to SD card



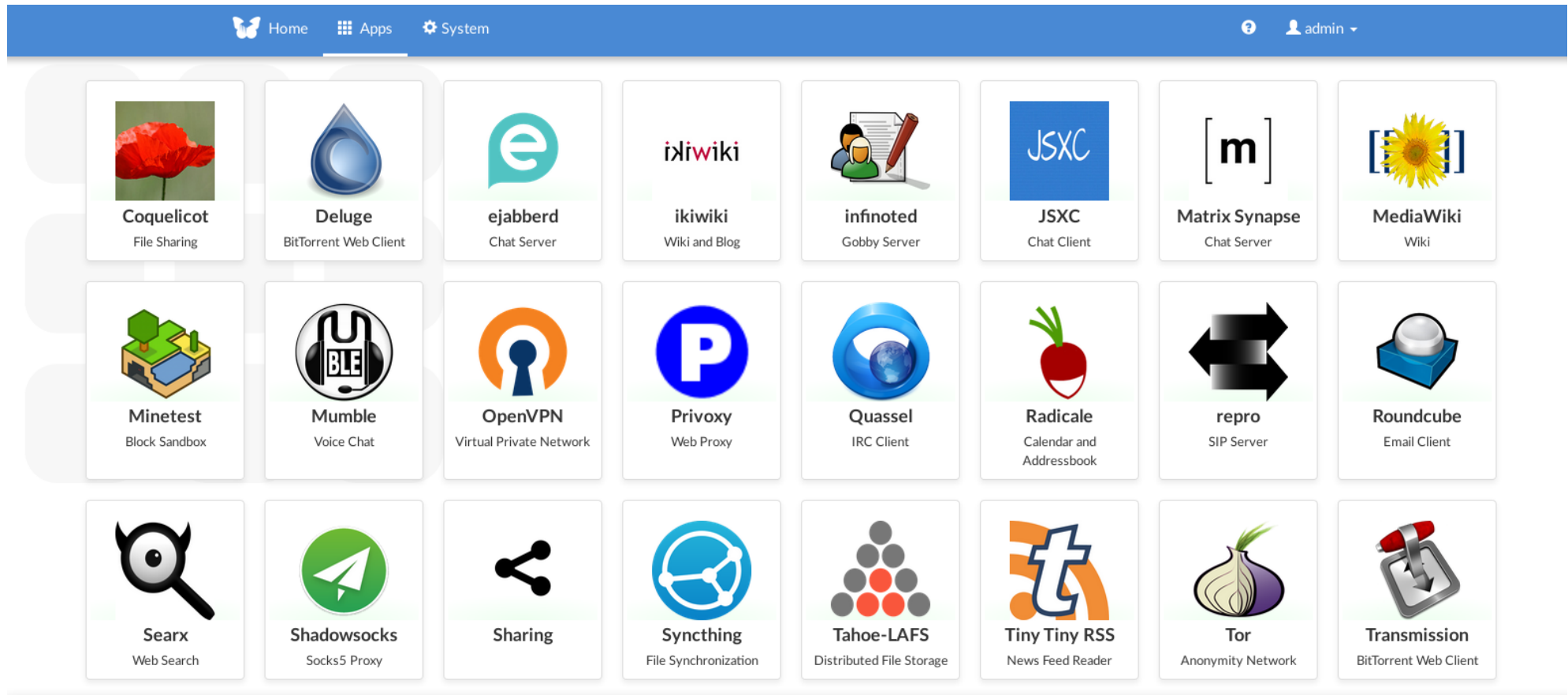
3. Insert SD and log in



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# FreedomBox: The Interface



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# How to Install an App: One Click!

[Home](#)[Apps](#)[System](#)[admin](#)

## Installation: Chat Server (Matrix Synapse)

[Matrix](#) is an new ecosystem for open, federated instant messaging and VoIP. Synapse is a server implementing the Matrix protocol. It provides chat groups, audio/video calls, end-to-end encryption, multiple device synchronization and does not require phone numbers to work. Users on a given Matrix server can converse with users on all other Matrix servers via federation.

To communicate, you can use the [available clients](#) for mobile, desktop and the web. [Riot](#) client is recommended.

[Learn more...](#)[Client Apps](#)

Installing matrix-synapse, matrix-synapse-ldap3: downloading



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# What can you do with FreedomBox?

- Private Browsing
  - No tracking, no data-mining, no censorship
- Secure Communications
  - No surveillance, no third parties, no storage of past communications without consent
- Safe Activism
  - No monitoring, no collection of location data, no data-mining



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# Private Browsing

- Protection against “traffic analysis” and tracking (Tor, Dynamic DNS, PageKite)
- Protection against censorship (OpenVPN)
- Anti-tracking ad blocker (Privoxy)
- Anti-tracking, anonymous search (Searx)



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# Secure Communications

- Self-hosted chat applications with no intermediary (XMPP, Quassel, Matrix)
- Medium for secure file transfers (Coquelicot)
- Private voice communications with no eavesdropping (Mumble VoIP)
- Email (RoundCube)
- Social media network owned by you and your friends (Diaspora)



# Safe Activism

- A publishing platform that resists oppression and censorship (Ikiwiki)
- Mesh routing when the Internet is shut down
- Safe social networking that cannot be monitored and data-mined (Diaspora)



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# Who is FreedomBox?

- FreedomBox community
  - Global community of developers (60+)
  - Global community of translators (60+) working in 21 languages
- FreedomBox Foundation
  - Supporting 501(c)3 non-profit organization based in New York



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# Connect with us!

- Download: [freedombox.org](https://freedombox.org)
- Learn more: [freedomboxfoundation.org](https://freedomboxfoundation.org)
- Mastodon/GNU Social/Twitter:  
@FreedomBoxFndn
- Community support:  
[wiki.debian.org/FreedomBox/Support](https://wiki.debian.org/FreedomBox/Support)
- Contact me:  
[njoseph@thoughtworks.com](mailto:njoseph@thoughtworks.com)



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# Questions?



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