Personal FREEDOM in digital millenium

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INTRO

Contact info

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- Sources and examples are available at `https://github.com/RerumNovarum/vsu.en`

Figure 1: available on github

Github

- Again, sources and examples are available at `https://github.com/RerumNovarum/vsu.en`
- Feel free to Fork, report an Issue and send a Pull-Request

Subject

FREEDOM in digital millenium

- Threats and threat models
- Protection

Threats and threat models

WHY?

It's always about money and influence
And sometimes just about hostility

Privacy. Opensource information

> *Privacy is completely and utterly dead, and we killed it*
> *(c) Steven Rambam*

All the personal info is now opensource

- Name, bd, home address
- Political views, sexual orientation
- Photos, geotags

These are contributed by people themselves
This information makes you and your neighbourhood vulnerable to social engineering attacks
Also, hope you're not used to specify your real city or birthdate as an answer to these "secure questions", like some people in Voronezh like to do?

Privacy. Recording

> *Privacy is completely and utterly dead, and we killed it*
> *(c) Steven Rambam*

Every single movement of a person is recorded in some database

- Medical records
- Criminal records
- Border crossings
- Employment history
- Bank records
- 24/7 tracking via goddamn mobile phone

And ALL of these are cross-linked

Privacy. Recording

All these things you or somebody has contributed into public domain will NEVER EVER be deleted
Think of it before you post in the blog

Proliferated malicious services, soft and hardware

Malicious soft and hardware nowadays is extremely widespread. It is often proprietary products, enforced by governments and multiple monopolies. People are usually chained in
Closed standards (forcing ppl to use malicious software from e.g. Microsoft)

Proliferated malicious services, soft and hardware

- Document circulation (e.g. proprietary MS .doc)
- Correspondence
  - Proprietary mail/chat services with surveillance enabled by-default
  - Even worser, services, that require to execute malicious code on your machine, with backdoors included, e.g. Skype
- Mobile telephony, all these CDMA, &c
  - Almost no encryption, vulnerable to everyone who got hardware
  - Just a blackbox living it's own life
    - You cannot disable this module even by unplugging battery
    - Probably these modules have access to host
  - 24/7 tracking, while you're walking among cells

Proliferated malicious services, soft and hardware

NSA has been recording all the text messages passing through cellphone networks, and recording arbitrary citizens w/o judgement
Also they've deployed massive sigint system

Proliferated malicious services, soft and hardware

Figure 2: Upgrade from Windows

Proliferated malicious services, soft and hardware

Hardware backdoors

- Intel ME
  - Full access to RAM
  - Screen monitoring
  - Access to peripherals
  - Can NOT be disabled (except for extremely old chips)
- Reported backdoors in WD hard drives' firmwares
- Mobile phones. Just a goddamn uncontrollable blackbox which spies on you
- Secure boot and other digital restriction means
  - Supposed to be a security feature, but used instead to restrict user's freedom

Proliferated malicious services, soft and hardware

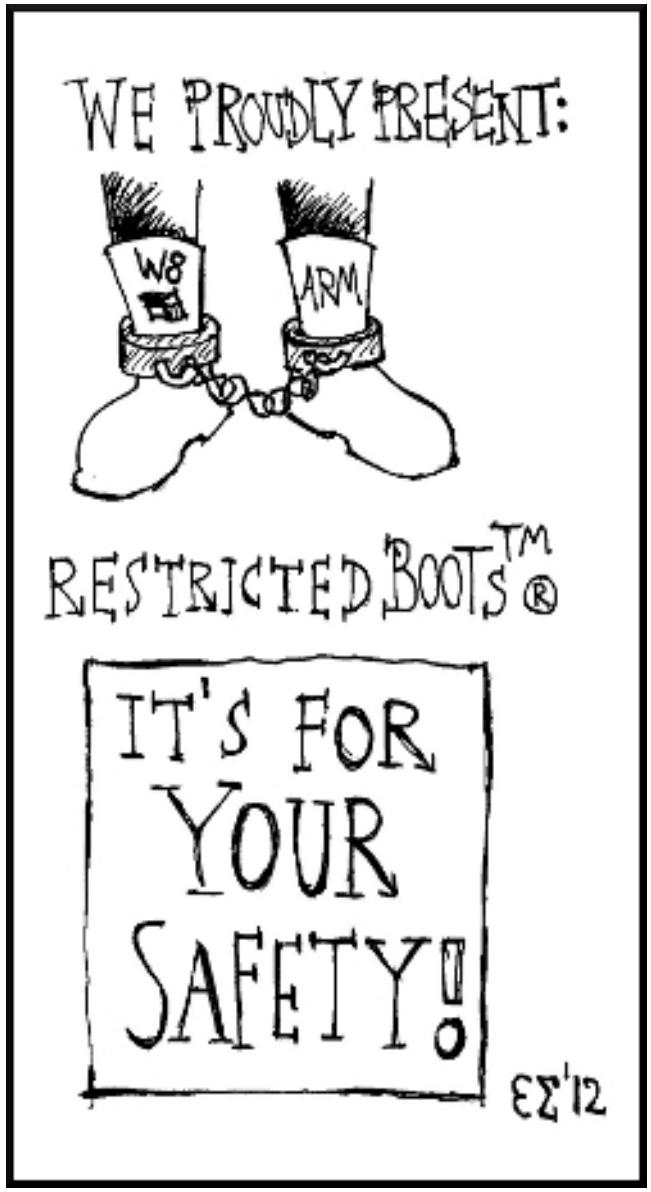


Figure 4: restricted boots

Proliferated malicious services, soft and hardware

Proprietary services

- Put you in a jail of legal traps
- In 2009 Amazon massively ERASED copies of Orwell's 1984 from ebooks of it's users
- Apple uploads to the cloud and deletes local copies of audio files w/o user's permission. And you'll never get exact copies back, only lossy versions
- Microsoft got killswitch to delete arbitrary program from your machine
- All of these – compliant with their EULA. In particular, Apple is not responsible for any bogus behaviour of it's service

Proliferated malicious services, soft and hardware

Proprietary operating systems

- Have throughout control over user's computer
  - Automatic installation or "upgrading" w/o user intervention
- Full access to file system
  - Didn't you disable Skydirve?
  - Your whole "Documents" folder has been legally uploaded to MS servers
- Remote code execution
- Installations log, keylogging, whatever
- Licensing traps
  - MS (Apple, Amazon, all of them, you can read) can LEGALLY delete any of your files or programs

All of these are MALWARE

Proliferated malicious services, soft and hardware

Figure 5: Apple watch is defective by design

Digital Restrictions Management (DRM)

- Technical means to restrict user's freedom to use it's media (and not only media)
- Based on legal enforcement of manufacturers (and users) to include malicious code blobs to the software
- Based on infamous "Security through obscurity" approach
- Main ideas:
  - Money of out the air, never let the user own content, instead license temporarily to stream

Digital Restrictions Management (DRM)

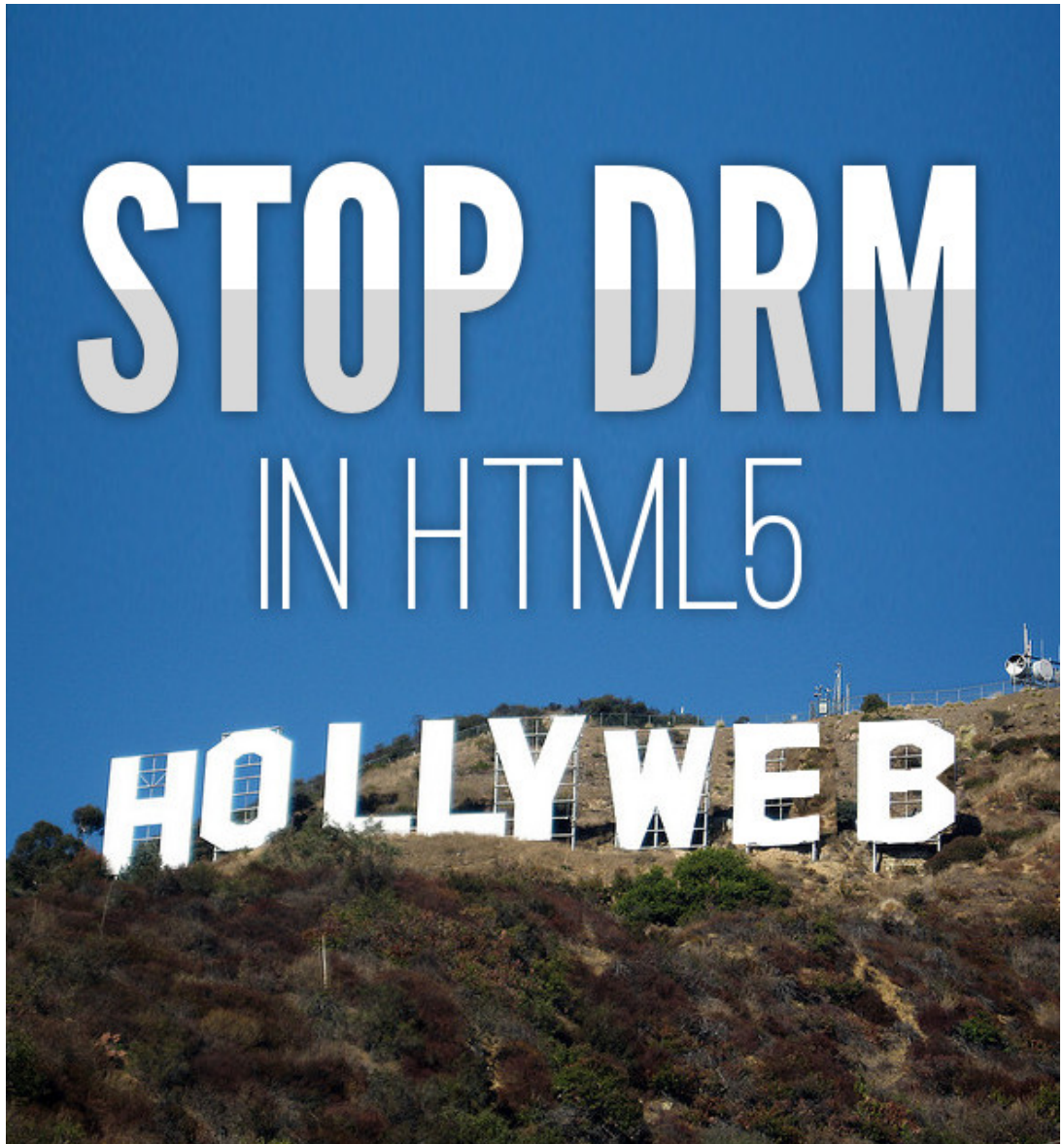
It's certainly easier to implement bad security and make it illegal for anyone to notice than it is to implement good security. (c) Bruce Schneier

Digital Restrictions Management (DRM)

DRM (also patents, partially copytight, &c) actually reduces to the following:
Corporation is trying to establish a monopoly and to restrict people to use only it's service and only in the way Corp. wants to. Via lobbyists Corp. makes government to support and protect Corp.'s intention to threat people
In the result, to protect an ill-meaning minority, gov-t forces entire Majority to install and use proprietary and closed malicious hard and software, that potentially (i.e. almost always) contains backdoors &c
Such a nonsense

Digital Restrictions Management (DRM)

Nowadays multiple Evil-corps, including e.g. Microsoft, Netflix, others are trying hard to make DRM part of HTML5 standard



Vulnerable services

Whoever you are i'm sure there is in your chat logs some evidence of criminal offence you've had commited, some "pirate" content, or some private photos
Most of the services you use aren't secured
Vast majority of them tightly cooperate with special services
And almost all of them collect statistics and sell info about you to whoever gonna pay

Vulnerable services

And most of them weren't developed with security in mind
Most of the android applications ignore certificate checking, which makes them vulnerable to MiTM attacks
Fundamental technologies themselves like SSL are defective, they're based on centralised CA's, which makes special services able to perform MiTM transparently

Vulnerable services

BTW, these “special services” cannot cope with community via technical means. So governments are trying to restrict community legally
For example 5Eyes countries are up to legally forbid end-to-end encryption
And in Russia e.g. Hardware Security modules were prohibited a while ago
Also Russian gov-t prohibited any open wireless stations, which also means more secured and robust networking solutions like meshnetworking are prohibited

Vulnerable services

Services advertised as security concerned can be vulnerable
E.g. widely-advertised Telegram messenger is flawe by-default since it depends on mobile network operator and gives access to your account to anyone in the company who can e.g produce new sim card
Also it is technically possible to intercept the SMS

Vulnerable services

All the widespread desktop operating system have totally broken security system
E.g.

- the concept of “superuser”, i.e. elevating program’s rights to do whatever it wants
- lack of isolation
- &c

Poisoned in foundation

Most of contemporary communications and computing systems are extremely vulnerable and fragile
Mainly because of centralisation

Poisoned in foundation. IP

1. Global routing table is so huge for a single router
2. Centralisation; a few registered organisation control entire internet

   2.1 Political influence: governments are already using centralisation to build up an iron maiden

   E.g. when egyptians risen up, egyptian government just had the Internet shut down, to prevent events coverage

   2.2 Fragility: you only need to destroy a few objectives to start an apocalypse

Poisoned in foundation. DNS

(for technical limitations) there are only 13 DNS clusters serving ENTIRE internet
Again vulnerable to both political repressions and all the kinds of denial of service attacks

Poisoned in foundation. SSL

Uses multiple Central Authorities for verification
These are ruled by corporations and governments, you by definition cannot trust them

Star topology

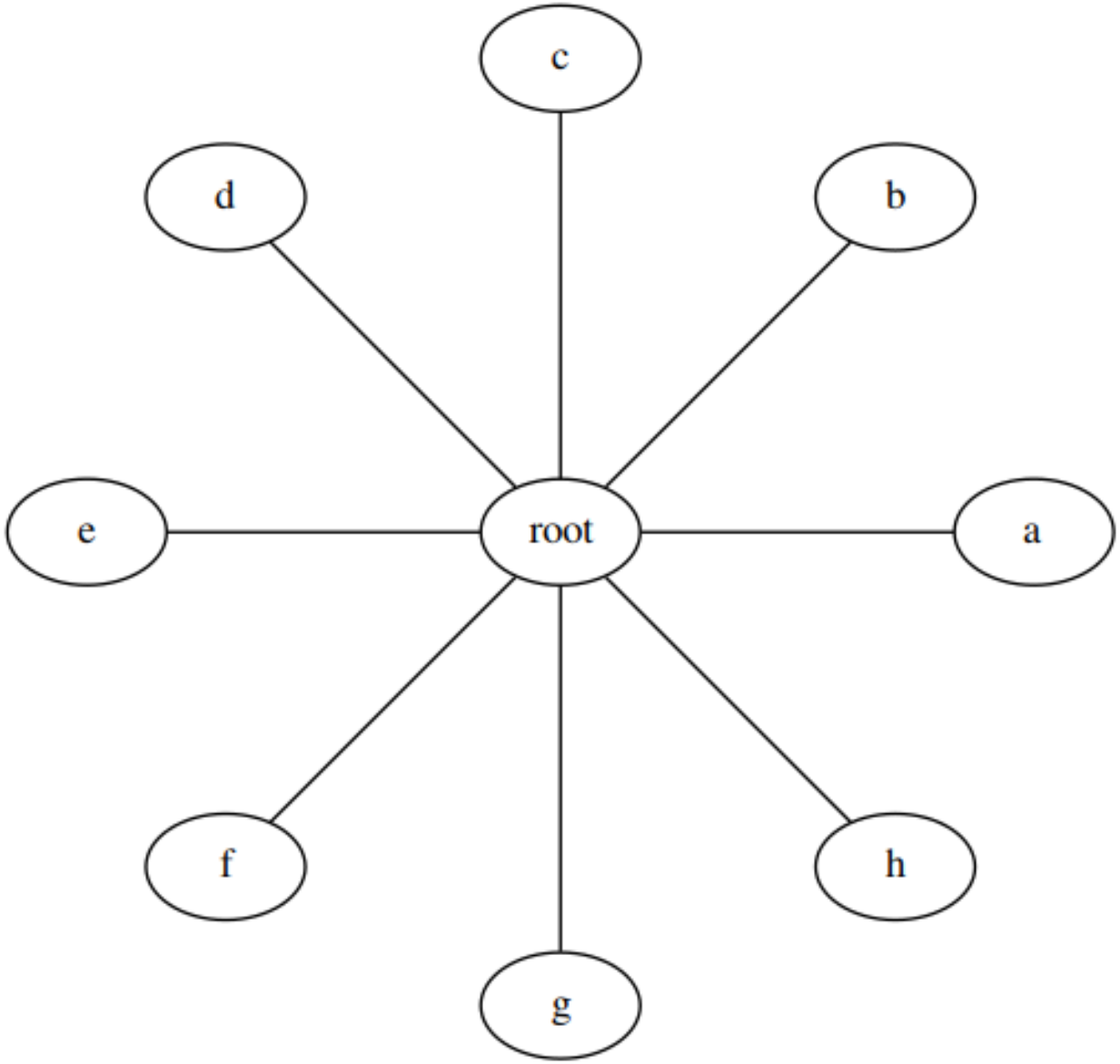


Figure 7: star connected

Star topology

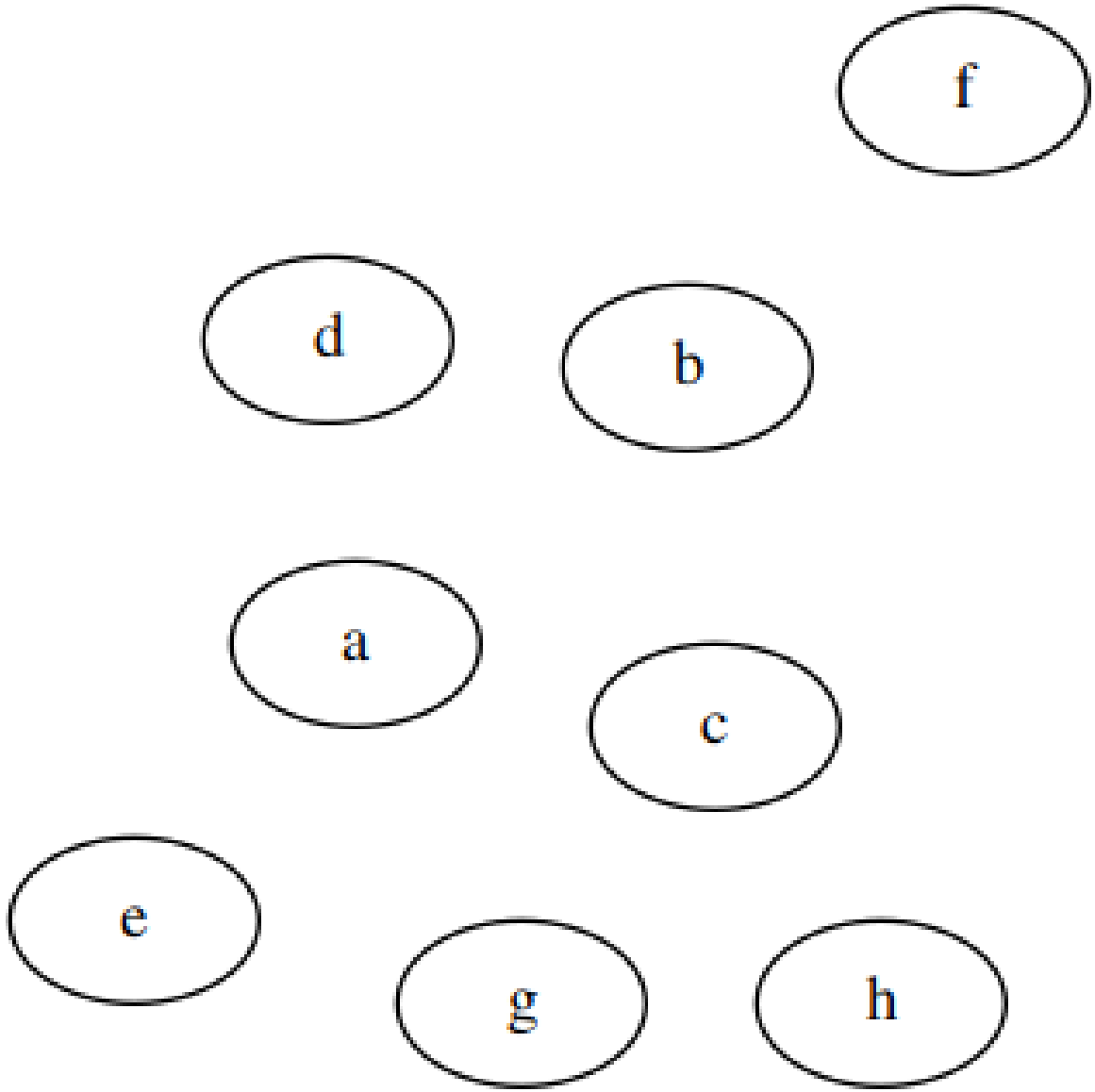


Figure 8: single (root) node destroyed

Protection

Free software

First of all, REJECT all the software and hardware that restricts your freedom
In eighties RMS started GNU movement, for developing GNU system, which would respect four main user' freedoms

0. Freedom to run program as you wish
1. Freedom to study program and to change it so it does what you wish
2. Freedom to redistribute exact copies
3. Freedom to distribute modified versions

Free software

It is mandatory to use only free software, with publicly audited source code

For end-user closed-source program and any service that uses "security-through-obscurity" is insecure by-definition

Secure communications

Bulk surveillance can be outweighted if the Majority of people will start to use end-to-end encryption
It will reduce amount of info collected about us and also throughout usage of E2EE will make it impossible to distinguish between private data and regular things

- GPG for email
- OTR and OMEMO for instant messaging
- ZRTP for VoIP
- TOX for instant messaging and audio/video conferences

Delete your facebook, instagram, vkontakte profiles
Use mediagoblin instead of youtube, pump.io instead of twitter

Secure communications

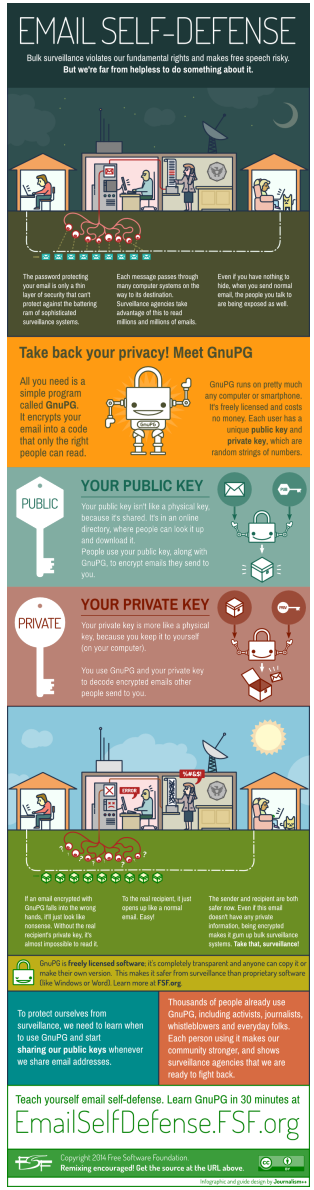


Figure 9: Email selfdefence guide by EFF

Web of trust

One of the main concepts of computer security is the one of Web of Trust
Istead of using central authorities, the people themselves use their own keys to sign others' keys, i.e. acknowledge the binding between authenticity and the public key
This system is decentralised and if used correctly, there is always exact persons responsible

OTR

Off-the-record messaging
Easily established, public-key based
Provides:

- E2E encryption
- Authentication
- Deniability
- Perfect forward secrecy

otr.cypherpunks.ca

OMEMO

Multi-end to multi-end message and object encryption

- Future and forward secrecy
- Message synchronization
- Offline delivery
- Multi-end encryption
- Multiple devices
- File transfer
- Verifiability
- Deniability
- Easy to setup and use

Already implemented in Conversations android app

Anonymious browsing

There are solutions to communicate and browse the internet anonymiously

- The Onion Routing

Idea is to use network, in which you can "plan" the route of the packet you send and to wrap messages via several levels of encryption
Every node carrying your message will only know adjacent nodes, but it will never know source and destination
The simplest usage is to use Tor Browser Bundle

- Invisible Internet Project (I2P)

Another overlay network, in which every message is sent pseudonymously and securely
Comprises E2E encryption for everything by-default
Allows for anonymious bittorrent, irc, email, &c
Multiple useful web services, e.g. an0nymious markets like Silk Road (discredited by govt ostensibly for occasional usage by drug-dillers)

Bitcoin, the only secure currency ——————————————
Based on cryptography, instead of lies of politicians and bankers
Maintains publicly Huge database of all the transactions

Go harder: safe environment. Tails and friends

There are special distributions designed to setup one-time identity
You boot from live-usb, connect to the net (e.g. tor) and there is no metadata this system may accidentaly leak

Go harder: safe environment. Whonix

And still there is possibility, that some application will ocassionally connect without proxy to the host you supposed to connect to anonymiously, thus revealing your real IP addres
One of the solutions is Whonix

Go harder: safe environment. Whonix

The idea is simple:

- Run a separate virtual machine to establish tor connection (Gateway)
- Run a separate machine for browsing with the only network interface which is a bridge to Gateway that redirects EVERYTHING into tor

Security-by-isolation... That works

Secure environment. SE Linux

Security-enhanced linux
Introduces mandatory access control, roles, contexts, &c instead of unix' stupid discretionary control (rwx)
Multiple benefits
E.g.

- When a program needs to read a specific (protected) file, you don't elevate it'a privileges to the root level, you allow to read a specific file
- &c

Same concept, everything is prohibited, until user explicitly permits specific action

Secure environment. Android 6.0

Android dev-team made a big deal to adopt SE Linux for Android
Since 6.0 every single domain
More info

Secure environment. Qubes

Security cannot be an extension, a system should be designed with security in mind
Qubes OS is based on concept of security-by-isolation
It runs every separate task in isolated domain, i.e. in virtual machines
http://qubes-os.org/

Secure environment. Qubes

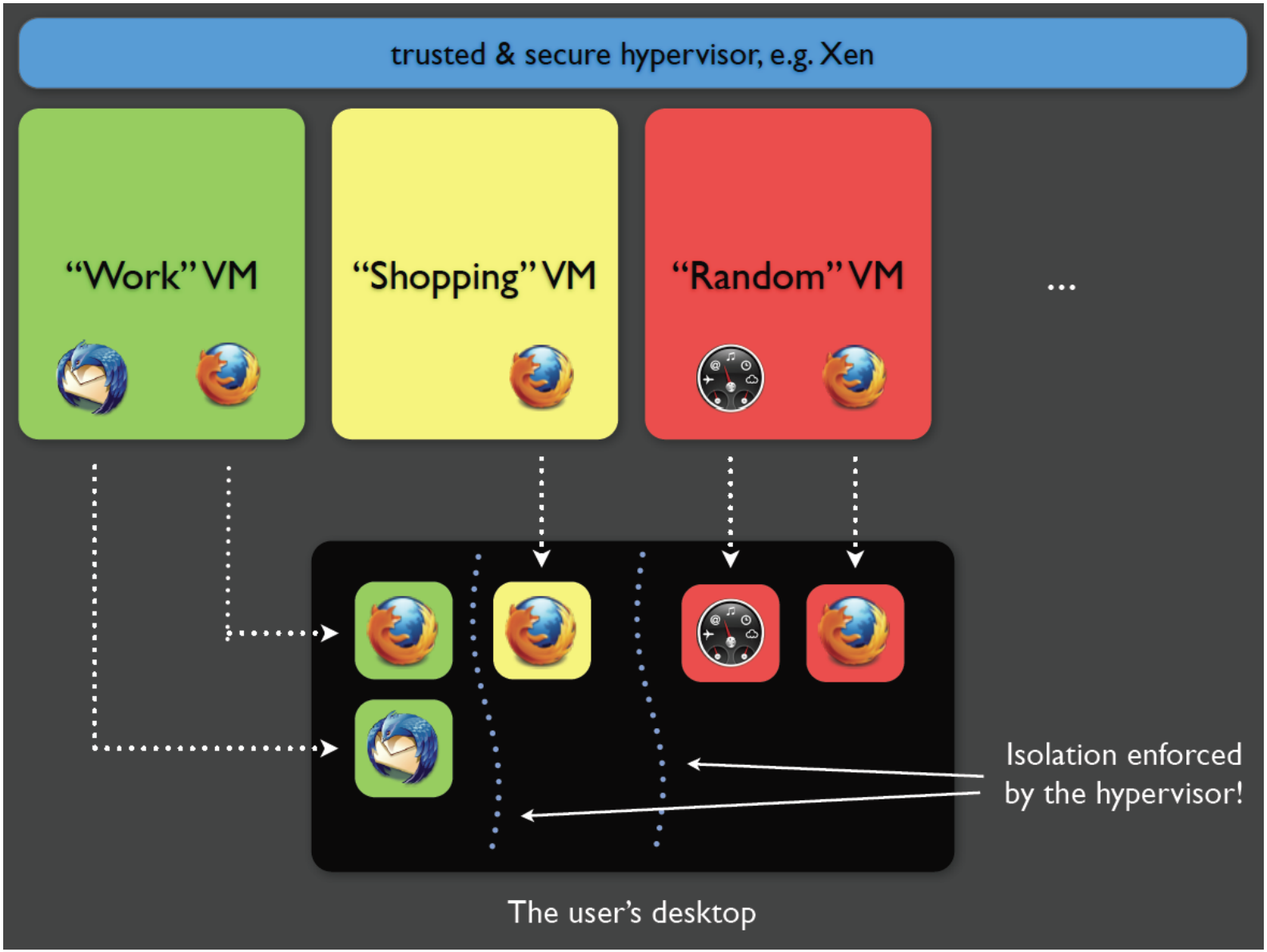


Figure 10: qubes security domains

Prepare to detention

Use full-disk encryption via LUKS
It is quite easy to follow e.g. archlinux' guide Also LUKS recently introduced nuke-passphrase feature, which once entered makes kernel module to literally Nuke entire cryptcontainer, which means it's almost impossible to force user to give up private data during ingerrogation (but probably bloody KGB has the means)
More on archwiki

Robust networking

Instead of centralized Internet, enjoy decentralized meshnetworks
Start a meshlocal
Read about cjdns and hyperboria

Contact info

- Sergey Kozlukov <rerumnovarum@openmailbox.org>
- GPG: **B986D856**
- Sources and examples are available at `https://github.com/RerumNovarum/vsu.en`

Figure 11: Fork me