

STAYING (AS)
SAFE
(AS YOU CAN)

Dorothea Salo

Some caveats, first

- We can't stop all surveillance efforts.
 - It's not like we're going to deep-sea-dive to prevent data from being lifted off overseas fiber!
 - Interdependence is the nature of the Internet; we don't have much choice but to trust some possibly-untrustworthy actors.
 - It's NOT YOUR FAULT security is hard and sometimes fails.
- We can't always stop one another from compromising our own privacy and security, sometimes in really amazingly thoughtless ways.
 - You have my blessing not to fix all the things!
- I don't think that's license to throw up our hands and do nothing. I hope you agree. We don't have to make it EASY!

Questions to ask about available strategies

- What/whom does this protect against?
- How much will this disrupt your experience?
 - The ideal: you don't even notice, but everybody is safer.
- How much care and feeding does this take?
 - Installation and upgrading
 - Support
 - For some strategies, bandwidth
- Can you turn this off if you need to?
 - The correct answer is ideally "yes, but you won't want to."

A word about risks

- For some people, the NSA or a data-broker like Acxiom seems like a really remote risk.
 - This damages motivation to improve personal privacy and security.
- If it helps, imagine non-remote risks!
 - Me (I don't mind!), and other UW-Madison authority figures
 - Bosses
 - Family members, "friends," coworkers who are either generally nosy/gossipy, or who dislike you and would enjoy getting you in trouble
 - Ex-significant-others
- What protects you against these will usually also help protect you against the more remote risks.

EMAIL IS NEVER SECURE.

- Repeat after me, three times: EMAIL IS NEVER SECURE. EMAIL IS NEVER PRIVATE. EMAIL IS NEITHER SECURE NOR PRIVATE.
 - Not legally, not technologically
- Watch what you email. Avoid email altogether for private communication, gossip, anything that could come back to haunt you.
 - Workplace tip: Your boss can read your email. So can company IT. IT'S NOT EVEN HARD, okay?
- Google is data-mining your GMail. If you can get off GMail, do.
 - GMail is also a Big Fat Target for the likes of the NSA.
 - Other options: your webhost, Lavabit, ProtonMail

Stay away from the Internet of Things.

- It is HOPELESSLY insecure and unprivate.
- Avoid Siri, Alexa, Echo, Nest, “smart” lightbulbs and appliances, fitness trackers, toys, all of it.
 - Fitness trackers: Bosses and universities are already trying to use these to mess with your (and everybody’s) health insurance. Don’t share.
- One Thing you will have to deal with: your router/gateway
 - Change its default administrative password!!!!!!!!!!
 - Turn off PING, Telnet, SSH, UPnP, HNAP, Wi-Fi Protected Setup; turn off “cloud management” and “remote administrative access” if you can.
 - Keep its firmware updated.

If you're at serious risk...

- (and it's quite likely someone in this class is!)
- What I'm about to show you is useful but insufficient. You need to go hardcore.
- Resources that can help you do that:
 - EFF, Surveillance Self-Defense: <https://ssd.eff.org/>
 - Zen and the art of making tech work for you: https://gendersec.tacticaltech.org/wiki/index.php/Complete_manual
 - The Smart Girl's Guide to Privacy (book by Violet Blue; the iSchool library has it)

Start good habits now.

- You won't suddenly have to change your behavior in a stressful situation.
- You'll be less likely to end up in a stressful situation to begin with, and if you do, it's likely to be less severe.
- You'll be in better shape to help friends and family be more secure.
 - Not least because you can say "I use X and it's great!"

Thanks!
And be careful out there.

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PASSIVE STRATEGIES

no special software required

Software minimization

- If you don't use an application, get rid of it.
- Nobody can hack you via software your computer doesn't even have. Plus, more disk space!

Patching and upgrades

- I know it's annoying. I know it's expensive. I know it's time-consuming, including the time to learn the new version.
- Do it anyway. Including for any browser plugins you install.
- Black hats love to hack older software.
- So do spooks.
- People who don't like you rely on techniques from black hats and spooks to get you in trouble.
- **Red alert:** if you're using any software that's gone past its last support date. This is hideously dangerous. Don't do it!

Operating systems

- You don't have to upgrade to the latest MAJOR version (e.g. Win8 to Win10, or El Capitan to Sierra) right away.
 - I skip major OS X versions myself.
- You DO have to upgrade when the major version you're on STOPS GETTING SECURITY UPDATES.
- You DO have to upgrade to new MINOR versions ("service packs" on Windows, .1 to .2 on Mac) RIGHT AWAY.

Other software

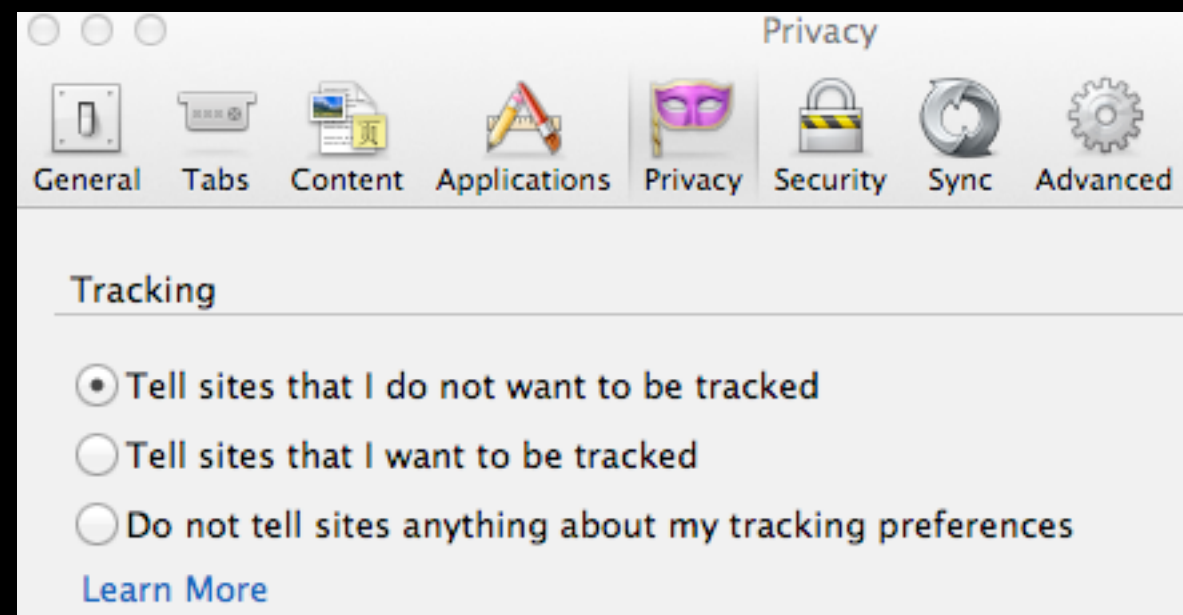
- Microsoft Office: treat like your operating system
- Anything else (especially your web browser!!!!!!!!!!):
UPGRADE. JUST DO IT.
 - Firefox tip: If it should be updating and it's not, go to the About Firefox... screen. That should trigger the update.

Settings

- Go into your gadget's main settings/preferences.
- Turn off everything you can!
 - If you're worried something will break, turn things off one at a time, use the gadget for a few days, rinse, repeat.
- Turnoff candidates:
 - Bluetooth
 - WiFi
 - Location services
 - "Sharing" (e.g. file sharing, connection sharing)
 - Anything that turns your gadget into a hotspot or server
- Most of this stuff is checkboxes. If you need it, you can turn it back on, no big deal.
 - When I rent a car, I turn Bluetooth on just to play music. Done? Bluetooth goes back off.

“Do Not Track” browser setting

- It's pretty much useless.
- Set it in your default/neutral browser configuration anyway.



Other browser settings

- Do not let the browser keep passwords.
 - Use a password manager instead (hold that thought).
- Turn off third-party cookies.
- Do not let your browser share location information (geotagging!) without telling you about it.
 - When it tells you, tell it “no” unless something will break. No, Home Depot, you do not need to know where I live!
- Consider not letting the browser keep history or cache pages.
 - Wiping at the end of a session is fine.

“Private” or “incognito” mode does not make you private!

- It only prevents your browser from storing information about your browsing.
- It DOESN'T prevent websites you visit from storing information about your browsing.
- It DOESN'T prevent third-party trackers on websites from storing information about your browsing.
- It DOESN'T prevent your Internet Service Provider (ISP) from storing information about your browsing.
- Long story short: it helps a little, but really not much. You need to do more to protect yourself.

Change default search engine

- Google tracks everything. Don't default to it!
 - Browser preferences let you change the default site searched with the browser search bar, or via the URL bar.
- Better option: DuckDuckGo
- Better option: Ixquick
- Results no good? You can always pop over to Google for that one quick search.
 - I find that DDG has improved a lot!
- Bonus: you don't get filter-bubbled, overly-ad-influenced, or geographically-limited (all this is what search engines call "personalized") results.

If you **MUST** use Google...

- You can turn off a boatload of tracking.
- While logged in, go to myaccount.google.com.
 - Go through **EVERY SINGLE LINK** and do what will maximize your security and minimize Google tracking you. Usually that's pretty obvious.
 - Turn off ad personalization.

On mobile

- Leave WiFi off unless you're actively using it.
 - Yes, this means ditching push notifications. I'm guessing you won't miss them as much as you think you might.
 - The process of seeking a wifi connection leaks ridiculous amounts of information. If your mobile device's wifi is turned on, it is constantly seeking a connection!
 - Bonus: turning wifi off helps conserve battery.
- Turn geolocation of photos off.
 - This adds location metadata into your photos. Bad idea.
- Leave location services off unless you need them.
 - I only turn them on when I'm traveling...
- Prefer iOS to Android, if possible.
- Stay in "airplane mode" as much as you can.

Mobile apps

- Check their permissions—what other data on your device they have access to.
- Turn off everything you can.
- Android apps are absolutely notorious for over-harvesting data. Google doesn't police this.

Password manager: get one!

- Makes and stores strong passwords that you don't have to remember. You just have to remember your password manager's password!
- Some let you store your password cache (encrypted, of course) in the cloud to use it across devices (including mobile).
 - I don't, but... you might?
- Solid choices:
 - LastPass (Win, Mac, Linux, iOS, WinMobile, Android, BlackBerry)
 - 1Password (Win, Mac, iOS, Android)
 - KeePass Password Safe (open-source, cross-platform)

Passwords and secret questions

- Use your password manager as much as you can. If you're like me, though, a few passwords you'll want to create yourself.
- There's lots of guidance for this (some of it contradictory). Here's what I do:
 - Come up with a **NONSENSE PHRASE**, 3-5 words long. Not in English if possible.
 - Put a couple of special characters and a number in it.
 - Need a new unique memorable password? Add part of the website name to the phrase!
- Secret questions
 - Do not give correct answers, **ESPECIALLY** if the answer is researchable. (Mother's maiden name? High school? Street you grew up on? Come on. And yes, lots of people have had accounts hacked this way.)
 - Make another nonsense catchphrase. Use it every time. (Special characters less important here.)
- In password or secret-question hints, put a word you're adding to the catchphrase. Bonus points if it misleads an attacker!

Online accounts, including social media

- Turn two-factor authentication on, for any site that offers it.
- Turn geolocation OFF for social-media sites.
- Do not let websites save your credit-card info, if you can avoid that. Type it every time.
- Don't give sites your real birth date when you can avoid it.
- Avoid social-media add-in "apps" (like games and such). Most track you. Some are actual malware.
- Avoid social-media mobile apps. They overharvest personal data.
- Get off Facebook if you can.

Social media

- Check your default visibility/sharing settings. Be conscious of who can see what you post.
 - “Friend of a friend” (as on Facebook) is a LOT OF PEOPLE.
 - If you have a private or semi-private account, check who has access every once in a while.
- Keep an eye on the news for platforms you use. Whenever they announce new functionality, **RECHECK YOUR SETTINGS.**
 - Both Facebook and Twitter are notorious for using new features as an excuse to damage users’ privacy.
- Consider periodically deleting old stuff.
 - I do this on Twitter. Platforms don’t always make this easy, but it can usually be done, somehow or other.
- Don’t stay logged in all the time.

Thanks!
And be careful out there.

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BLOCKING STRATEGIES

...in rough order
from least intrusive to most

Tracker-blocking browser plugins

- Typically block trackers, tracking cookies, marketing/social media “web bugs”
 - They do not block ads just because they’re ads!
 - They do help keep ads from damaging privacy. Sometimes this does mean blocking the ad.
- Several available, but the one I recommend for desktop/laptop browsers is Privacy Badger (yes!) from the Electronic Frontier Foundation.
 - Learn how to tweak and disable it, just in case.
- Mobile: no equivalent that I’m aware; you’ll have to go to an ad blocker.

Ad blockers

- Adblock is popular, and fine if it's what you have.
 - Add EasyList for automatic blocking of many ads.
 - Dig into the preferences to disable Adblock's payola-based unblocker.
- If you don't have one yet, try UBlock Origin instead.
- Suggest installing an adblocker in the browser of an Internet-naïve or otherwise scam-vulnerable person.
- Ads are carrying malware these days. This is another fine reason to install an ad blocker!

Other browser add-ons

- Be REALLY CAREFUL about these in Chrome.
- Google isn't assessing Chrome add-ons for whether they track you unnecessarily. A lot of them do, it turns out.
- Whatever browser you use, it's wise to go through your extensions once or twice a year to disable unneeded ones and update all of them.

Flash

- Major malware and tracking vector.
- Change your browser settings (or add a browser plugin) to make you click on Flash objects for them to work.
 - Firefox: type `about:addons` in your URL bar, go to Plugins tab, pick “Ask to Activate” for Shockwave Flash.
- You will be **AMAZED** and **HORRIFIED** at how much Flash there is that doesn’t do anything useful.
 - (A lot of it is **ONLY THERE TO TRACK YOU.**)



Shockwave Flash

Shockwave Flash 20.0 r0 [More](#)

Ask to Activate



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ENCRYPTION STRATEGIES

Consider...

- ... encrypting your hard drive. Your operating system makes this an option.
- ... encrypting your PHONE, especially since you're so much more likely to lose it or have it stolen.
 - Security apps are a good idea too.
- ... phone passcodes! Use them, even if you have TouchID or similar. Make them as long as the system allows!
 - Legal weirdness: law enforcement can compel you to use your finger more easily than it can compel you to reveal a password or passcode.

Backups: a security must

- Not just for computer breakdowns any more!
- “Ransomware:” when somebody ELSE encrypts (locks up) the data on your computer, then demands money to decrypt (unlock) it.
- If you have a good backup, you can flip the criminals off, wipe your computer clean, and restore your data.
- If you don’t have a backup... you’re hosed.
- That raises a question, though: secure backups?

(More) secure backups

- A hard drive in your home or office, kept offline, is pretty secure as these things go.
 - Risk: you're connected while malware/ransomware ends up on your hard drive, such that it too is backed up, and it reinfects your computer. This isn't super-common, though.
 - Risk: you don't back up often enough. THIS is VERY common. Make your computer back itself up on a schedule if at all possible!
- Cloud storage: mostly not terribly secure, sorry.

Encrypted cloud storage

- Cloud storage: Look for the phrase “zero knowledge” or “no knowledge.” Just saying “encrypted” is NOT GOOD ENOUGH.
 - (The question is who’s holding the encryption key: you or them.)
 - Providers worth looking at: SpiderOak, Tresorit
- DROPBOX IS NOT SECURE. DO NOT USE IT AS THOUGH IT WERE.
 - Documented cases of employees snooping, mass account hacks, spooks allowed behind the scenes.
 - If you must: encrypt files first, then send to Dropbox.
 - I think it’s way easier to use a zero-knowledge provider to begin with.
- GOOGLE APPS/DRIVE ARE NOT SECURE plus Google surveils everything anyway.

HTTPS Everywhere

- EVERYONE SHOULD INSTALL THIS EVERYWHERE IT WILL WORK.
- Browser plugin (Firefox, Chrome, Opera, Firefox/Android) that automatically sends you to the secure (encrypted) version of any website that has one
- Almost entirely unobtrusive; you won't even know it's there.
 - Like, once or twice a YEAR I run into a site that this breaks?
- <https://www.eff.org/https-everywhere>

Off the Record (OTR)

- Encryption for instant messaging/chat.
- Works with quite a few chat protocols.
- You may need to use a different chat client. It's worth it!
- Alternately...

Signal

- Signal is the most private chat/messaging service available today.
 - They even scrub metadata! We know this because they've been NSAed!
- Move yourself, move your friends.
- <https://whispersystems.org/>

Wired computer connections

- Whenever possible, use an Ethernet cable instead of wifi.
- All else being equal, wired is more secure than wireless.
- Mobile: keep your wifi turned OFF until you actually need it.

Wireless encryption

- Snooping unencrypted wireless traffic is TRIVIAL.
- **ENCRYPT YOUR HOME WIRELESS.** Talk to your nerds about this.
- WPA2 is better than WPA, which is better than WEP, which is (marginally) better than nothing.
 - ... they're all kind of bad, honestly. But it's what we have.

Virtual Private Networks (VPNs)

- Like a wired connection, only over wireless.
 - The initial setup is annoying, but once it's set up, it's easy to turn on.
- UW-Madison has "WiscVPN" that you may use.
 - You may have to install some software and/or fiddle with networking connections... but once that's all set, connecting to the VPN is easy.
 - Interested? Go to <http://kb.wisc.edu> and search for "WiscVPN" then find installation instructions for your operating system. Or go to one of the DoIT helpdesks, and they'll help you!
 - Works on mobile too!
- You can also pay for a VPN provider.
- ESPECIALLY useful if you use airport or coffeehouse wifi.

Will any VPN do?

- No, unfortunately.
- Using a VPN moves your trackable browsing habits from your (probably untrustworthy) ISP to your VPN...
- ... but that assumes your VPN can be trusted not to log you and/or sell you out! Not all VPNs are trustworthy!
- As yet there's no way to prove (or even test) a VPN's privacy assertions. I hope and believe this will change.
- Look for VPNs recommended by technical folks.

The Onion Router (TOR)

- Foils attacks based on analyzing network traffic
- Routes bits and bytes through a labyrinth
- Hides your physical location
- Will slow down browsing appreciably!
- Does help create “herd immunity” to surveillance, however.
- Not quite the nuclear option, but... rocket-launcher option, maybe?

TOR options

- TOR Browser (Firefox + Tor)
- Orbot (TOR for Android; highly recommended!)
- The completely nuclear option: Tails operating system
 - An OS-on-a-stick that you can boot your computer from.
 - Designed to remember absolutely nothing.
- If you're nerdy and you know it: please consider running a TOR exit node.

“OPSEC”

“operational security”

Things not to do

- Do not EVER EVER EVER click on a link in an email. DO NOT DO THIS. EVER.
 - Copy-and-paste if you must.
 - Scrutinize the URL really carefully first, though!
- Don't log in to a non-Facebook site via Facebook. Same for Google, GitHub, Twitter. Separate your accounts!
 - If you don't, somebody who hacks your Facebook has access to lots more.
- DON'T GIVE ANYONE YOUR PASSWORDS.
 - Never ASK anyone for them either. Ask to have them reset, instead.
- Don't let your computer or phone auto-login. Type your username and password or passcode every time.

Thanks!
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