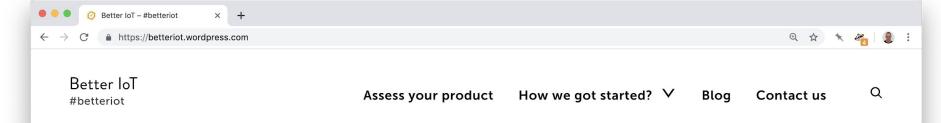
Netzwerke, Security, Hard- & Software Vortrag Einstieg

## Was macht "gute" IoT Produkte aus?

Thomas Amberg

Beginn um • 17:00 Uhr im Raum • Erkerzimmer (1. OG), Dauer: • 30min

Der IoT Hype hat den Höhepunkt längst überschritten, aktuelle News sind vor allem negativ: Geräte spionieren, Firmen verlieren Daten, Produkte passen nicht zusammen. Mit betteriot.org, initiiert von Alexandra Deschamps Sonsino und Usman Haque von IoT London, versucht eine internationale Gruppe zu definieren, was "gute", vertrauenswürdige Internet-verbundene Produkte ausmacht. Thomas Amberg von IoT Zürich gibt als Core Contributor einen Einblick in diese bottom-up Community-Initiative.



## Making good design actionable.



Better IoT (formerly known as The Open Internet of Things Certification Mark) is a community-led effort to help startups and SMEs <u>design better</u> connected products.





## **Internet of Things London**

ocation

London, United Kingdom

Members **12,412** 



Organizers

Alexandra Deschamps-Sonsino

You're a member 🗸



**Next Meetup** 

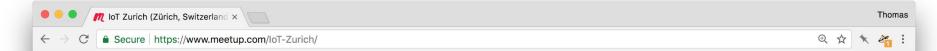
See all

**24** APR

Tuesday, April 24, 2018, 7:00 PM

**London Internet of Things Meetup 77: Spring** 

Attend





Create a Meetup



### **IoT Zurich**

Location

Zürich, Switzerland

Members

1,896

Organizers

Thomas Amberg and 1 other

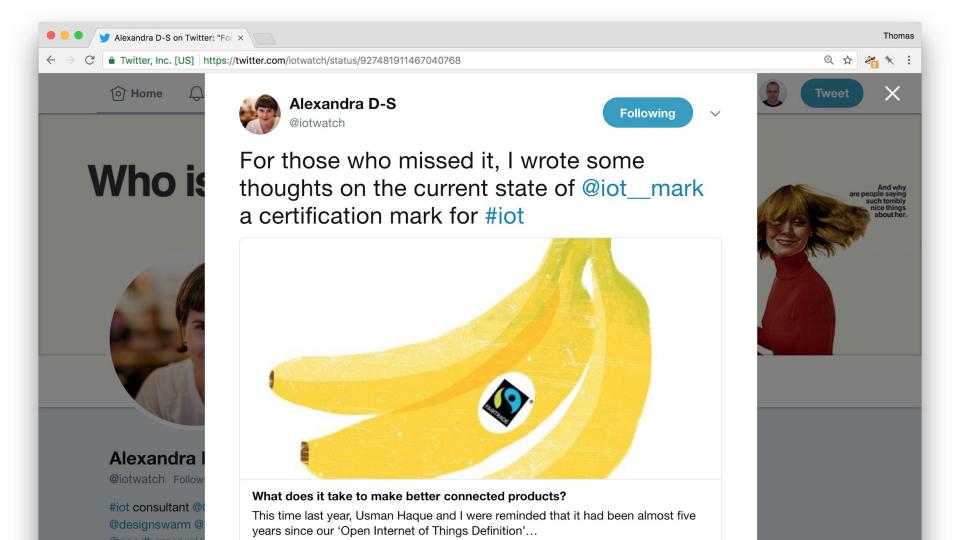
Next Meetup See all

**19** MAR

Monday, March 19, 2018, 6:30 PM

**Open #iotmark for connected products** 

Organizer tools 🔻









Curious about the impact of emerging tech, IoT, Al. @thewavingcat: Strategy, research & foresight. @ThingsCon: Advocate for a responsible #IoT. @ZephyrBerlin: 1

Peter Bihr 🚀 💿 @peterbihr Follows you

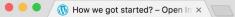
buff.ly/2n2gCJ2 \*A simple looking #iot label designed after nutritional labels. (A solid approach, I believe, but the devil is in the details.)

### **IoT Facts**

Overall Thing Rating ☆☆☆☆☆					
Expiration Date	MM/DD/YYYY				
	Rating Breakdown				
Security	***				
Privacy	***				
Connectivity	***				
Interoperability	***				
Standards	***				



© 2018 Twitter About Help Center Terms





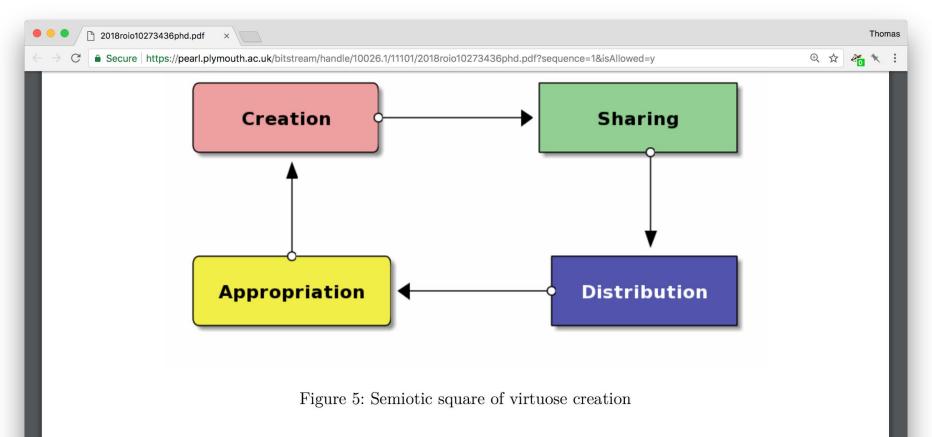
← → C 🗎 Secure https://iotmark.wordpress.com/history/





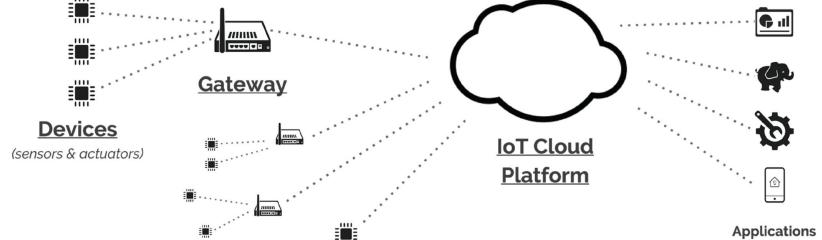






The first striking difference I observed here is that the direction is inverted. The circularity suggests that any moment represented can be a starting point for agencies that focus on the process rather than a final result. The ideal starting point is Sharing which, in the semiotic square formulation is the node furthest from Appropriation.







### Connected product

The entirety of one or more devices, gateways, backend, apps and the services they represent.

E.g.

Philips Hue, "smart lighting" Kindle, "never be without a book" Good Night Lamp, "share your presence" Alexa, "control your home, using just your voice." <u>Safecast</u>, "crowd-sourced radiation ground truth"

### Device / Thing / Product

A physical device with connectivity, an embedded computer, sensors and actuators.

(Some devices are "product + connectivity", others are rather "service avatars". The term product becomes ambiguous given the above definition, so the term device is preferred.)

# Principles

Privacy

Interoperability

**Openness** 

**Data Governance** 

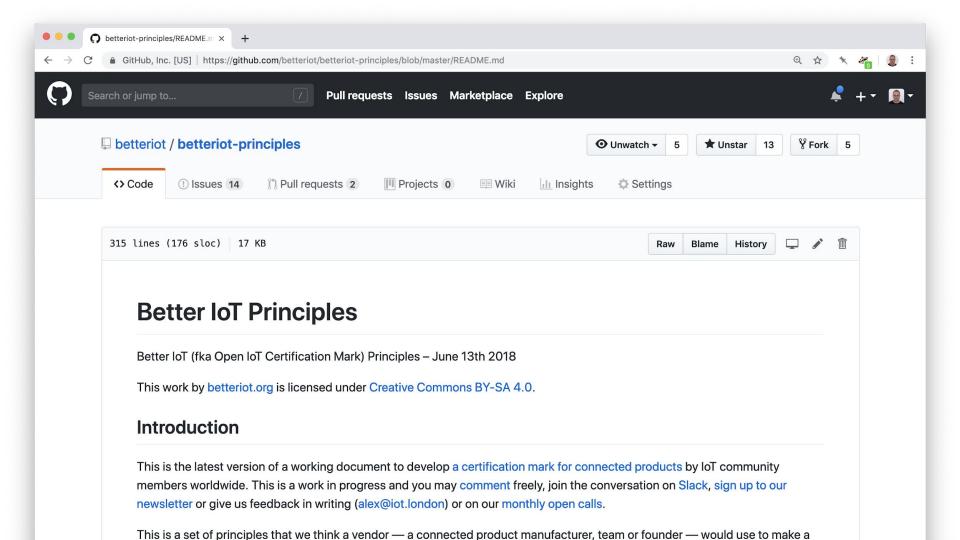
Permissions & Ownership

Transparency

Security

Lifecycle





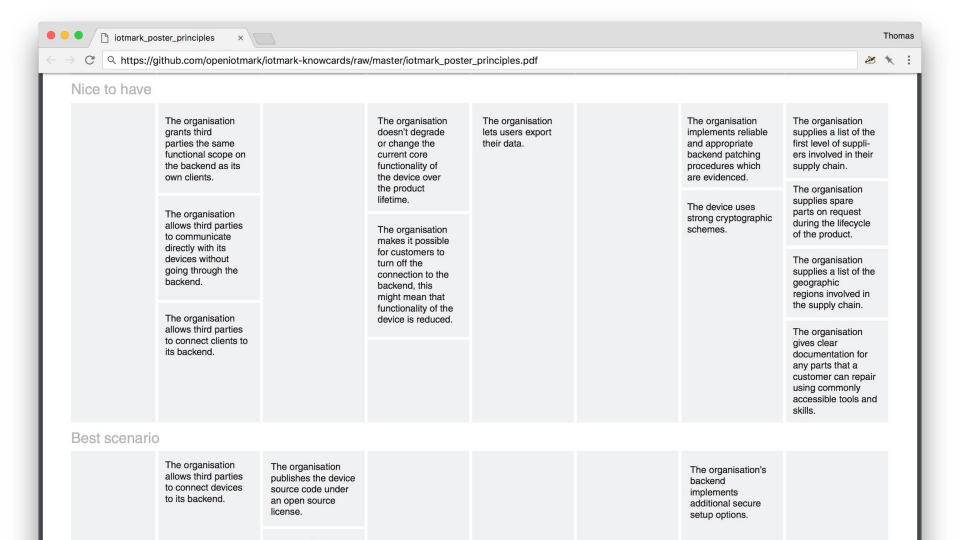


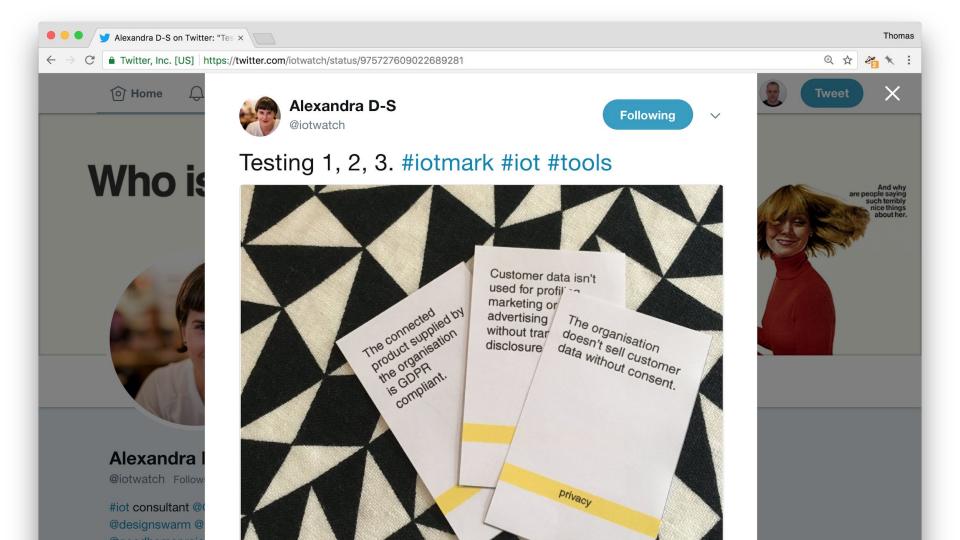
## Better IoT Principles

### March 9th 2018

#### Must have

Privacy	Interoperability	Openness	Data governance	Permissons	Transparency	Security	Lifecycle
The connected product supplied by the organisation			The organisation gives users the ability to transfer ownership of the	The organisation makes it explicit to the user what the implications of	The organisation enforces a strong user identity policy.	The organisation lets a user do a factory reset on the device.	
is GDPR compliant.				device.	substantially changing usage of the device	The organisation has clear admin user management policies.	The organisation is clear about the expected lifetime of the service provided by the device and backend.
				When ownership of a device is transferred, the new user doesn't have access  are.  The organisation makes explicit the expected duration the terms of serv	are.		
The organisation doesn't sell customer data without consent.					The organisation makes explicit the expected duration of the terms of service.		
Customer data isn't used for profiling, marketing or			to the previous user's data.	The organisation asks the explicit permission of the customer when it wants to change the	n security on its backend & secure configuration.	The organisation is clear about the levels of customer support that are provided	
advertising without transpar- ent disclosure.					length of the terms of service.	The device firmware is compliant with industry security standards.	during the lifetime of the product.
					The organisation informs the user about firmware upgrades.		



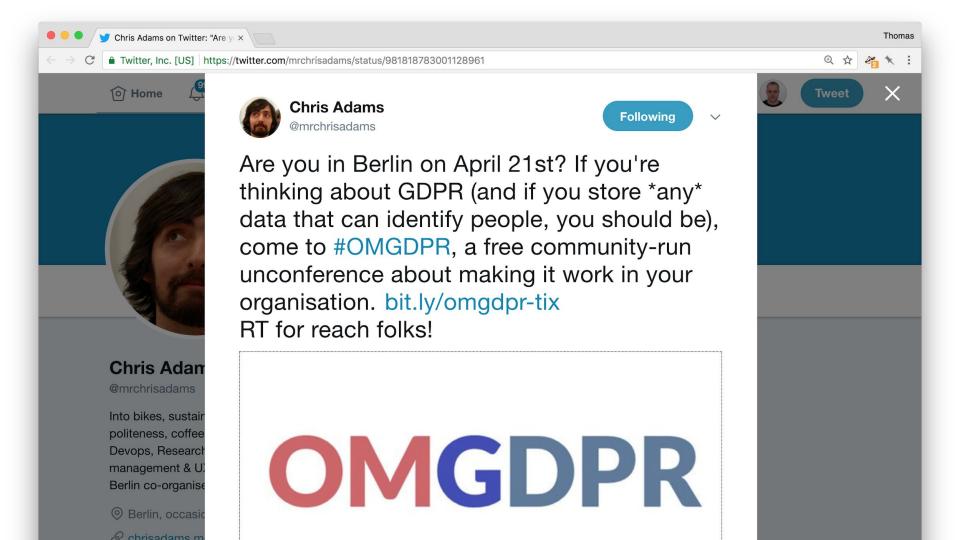




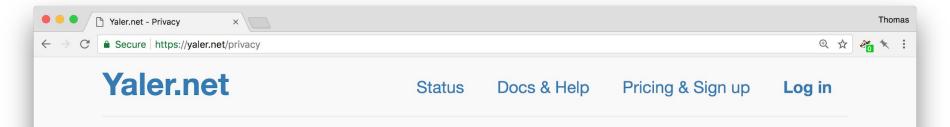
# Privacy

Build GDPR compliant connected products.









## **Privacy**

v1.0, 2018-01-03. For updates, follow @yaler.

#### In general

We do not use any third party tracking services.

We try our best to minimize the data we collect.

We keep access logs to our servers for 10 days.

#### **Analytics**

Our site www.yaler.net logs the time, IP address, user agent, path and status for 10 days.

The status.yaler.net subdomain is served by a third party with their own privacy policy.

The \*.\*.yaler.io subdomains accessible via our relays are served by third parties, too.

# Interoperability

Document the API of your device and backend.



egister Logir

Home

Getting started

Application Design Guidance

#### Philips hue API

Terms of use

Find Answers

Philips hue developers & apps

Job Vacancies

Forum

## Philips hue API

#### Full API Documentation

The full API documentation is only available to registered users. Please login or register to view the full API documentation and become a member of our exciting hue community. It only takes a few seconds.

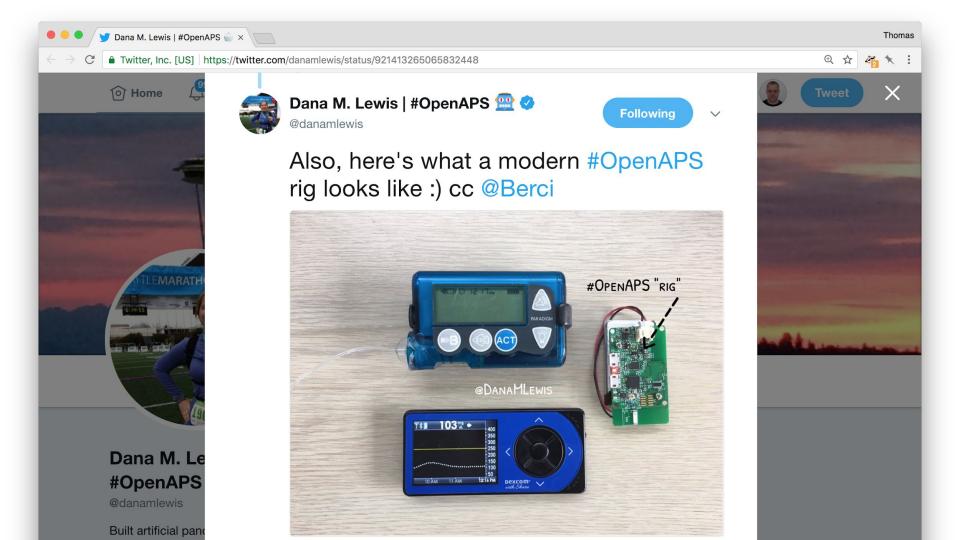
### See what you can do

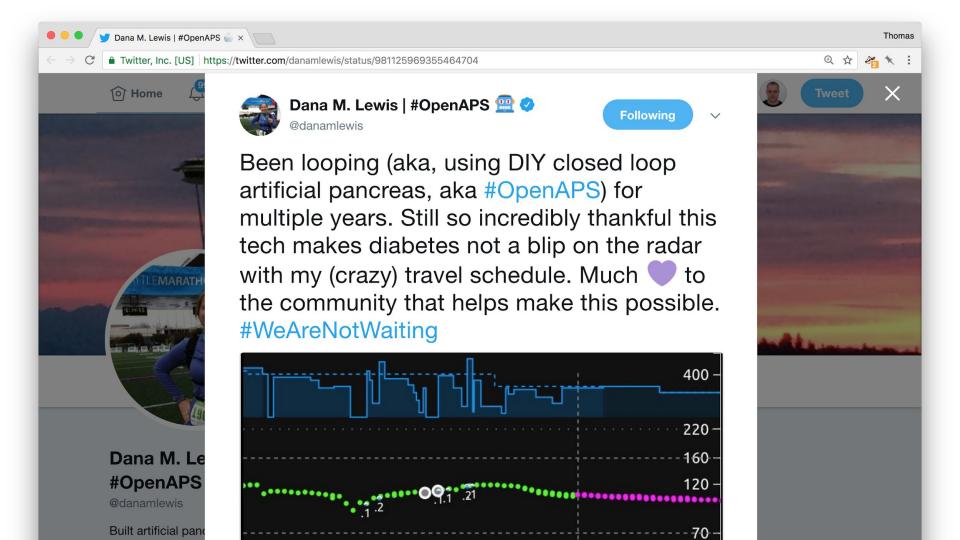
Your feedback following our hue launch was clear. You want to use light as you want it. Here we provide you some material to do so. The hue bridge has a powerful RESTful interface, which behaves like a simple web service. Use it as your tool. We hope this will help you to truly use light as you want it, by making new apps, websites and digital installations; integrating hue into something else or just playing around.

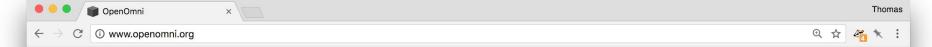
### Getting started

We've started off by releasing the core parts of our bridge interface along with some easy to follow examples for how to use them. This should be enough to get you up and running controlling lights from your applications.

Learn how hue works







# OpenOmni

PLUGIN FOR THE OPENAPS PROJECT

Understanding that the Open Source world is based on scratching your own itch, here's some scratch. We have placed a bounty on a working, accepted plug-in for the <u>Insulet OmniPod</u> into the <u>OpenAPS</u> Project.

To be complete, this means that the project would use COTS hardware and <u>Open Source</u> software to communicate with the OmniPOD device placed on a T1 patient, controlling temporary basal rates to control blood glucose levels. This work will be delivered open source and will be shared and reviewed by existing members of the OpenAPS community. If multiple people are part of the submittal, they can agree on a split, or on a charity to receive the funds.

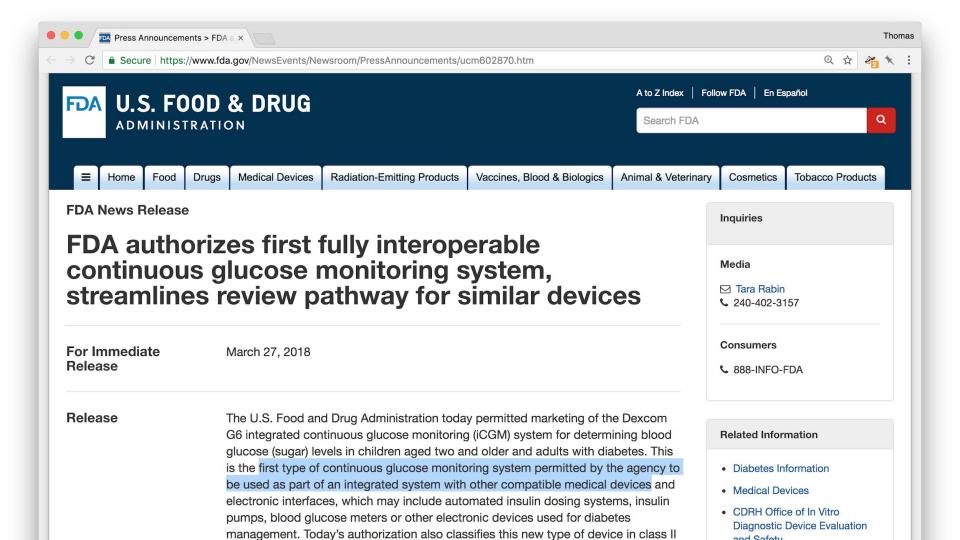


## JDRF Announces New Initiative to Pave Way for Open Protocol Automated Insulin Delivery Systems

—Initiative encourages manufacturers to give users greater control over insulin devices;
JDRF to provide funding, support with regulatory, liability hurdles—

**NEW YORK, October 18, 2017** —JDRF, the leading global organization funding type 1 diabetes (T1D) research, is announcing a new initiative that will support the development of open protocols for artificial pancreas (AP) technology.

For more than a decade, JDRF has played a leadership role in accelerating the development and commercialization of AP systems that automate insulin delivery, defining a roadmap for increasingly sophisticated systems that would, with each generation, improve outcomes and reduce burden for people with T1D. Now, the first commercial system, which has been shown to provide significant benefit to people with diabetes, is on the market, and other systems are in development.



# Openness

Consider open sourcing your device hardware, software and backend.



## The Things Network

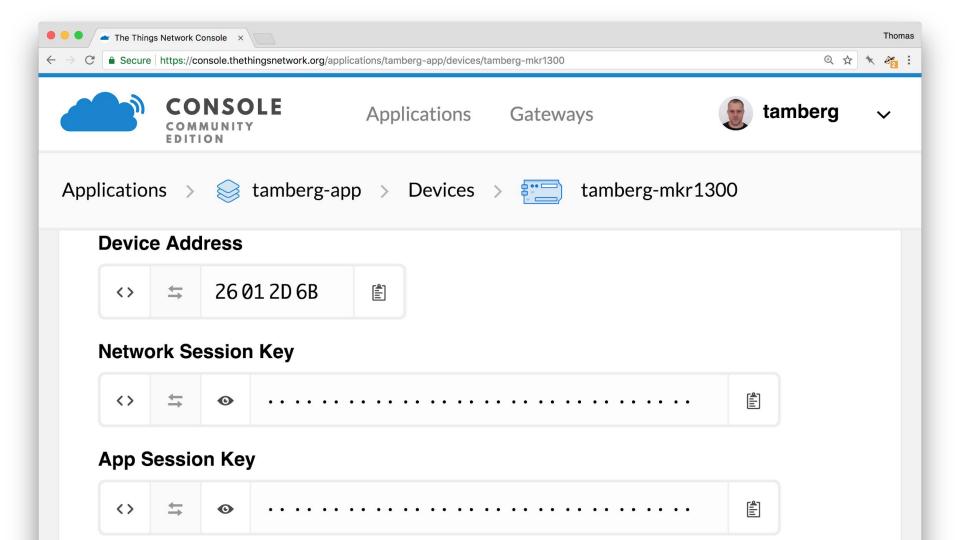


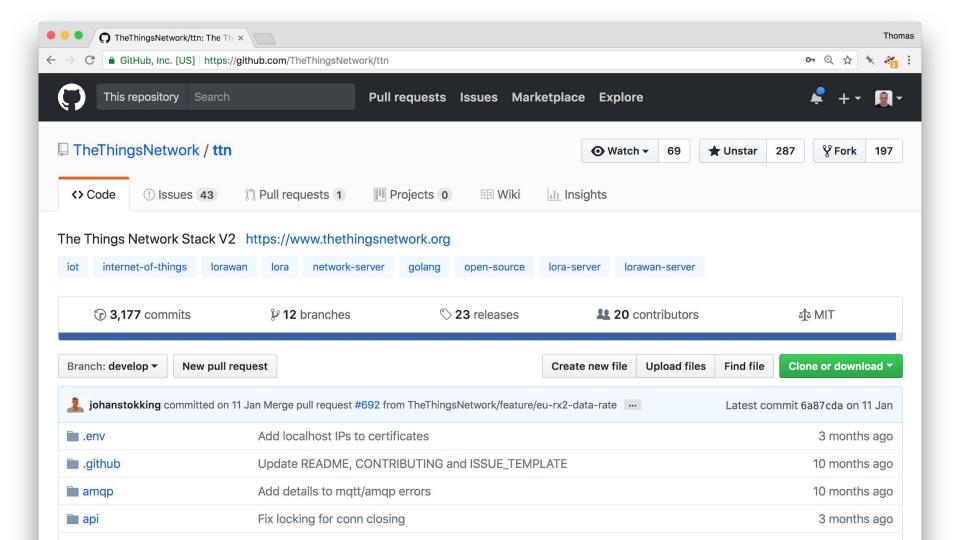
The Things Network is a global, crowdsourced, open, free and decentralized internet of things network.

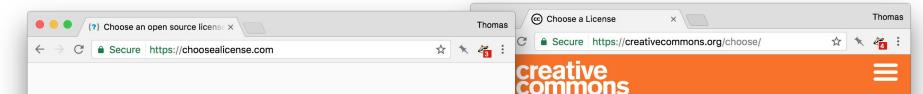
Created by

Wienke Giezeman

**934 backers** pledged €295,331 to help bring this project to life.







# Choose an open source license

Which of the following best describes your situation?



## I want it simple and permissive.

The MIT License is a permissive license that is short and to the point. It lets people do anything they want with your code as long as they provide attribution back to you and don't hold you liable.



## I'm concerned about patents.

The Apache License 2.0 is a permissive license similar to the MIT License, but also provides an express grant of patent rights from contributors to users.

Android, Apache, and Swift use the Apache License 2.0.



## I care about sharing improvements.

The GNU GPLv3 is a copyleft license that requires anyone who distributes your code or a derivative work to make the source available under the same terms, and also provides an express grant of patent rights from

## **License Features**

Your choices on this panel will update the other panels on this page.

Allow adaptations of your work to be shared?

Yes No Yes, as long as others share alike

Allow commercial uses of your work?

YesN

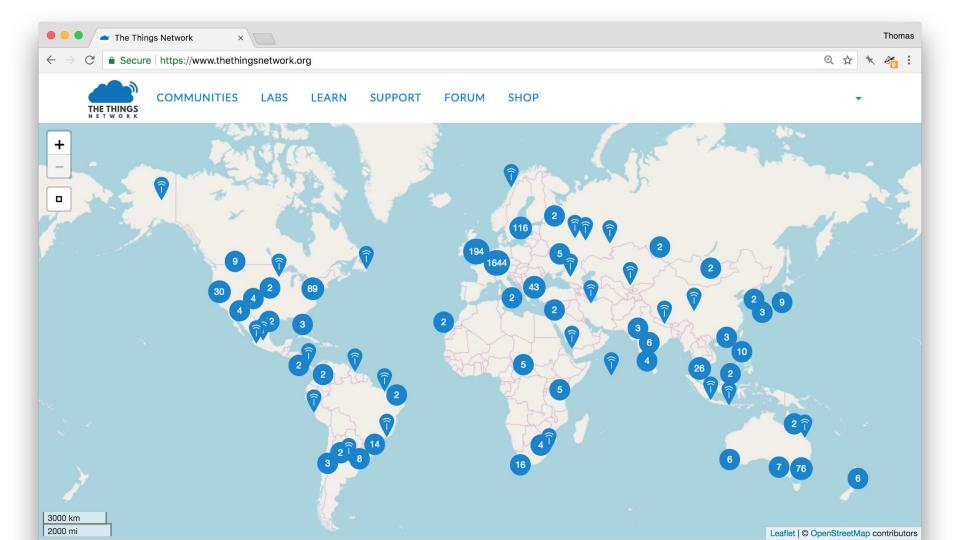
## **Selected License**

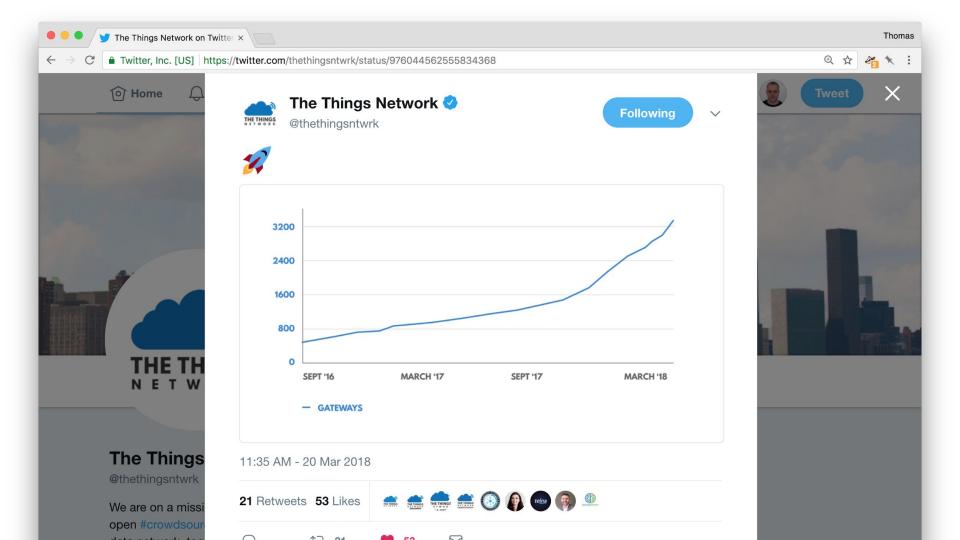
Attribution-ShareAlike 4.0 International



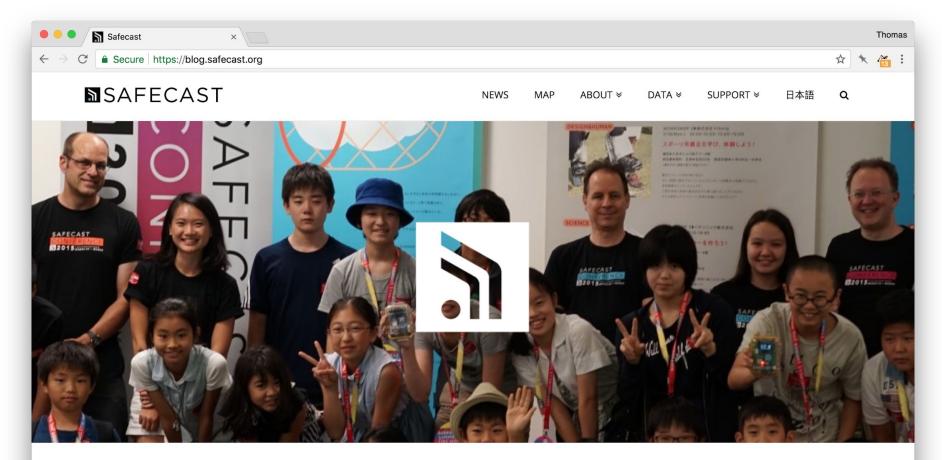






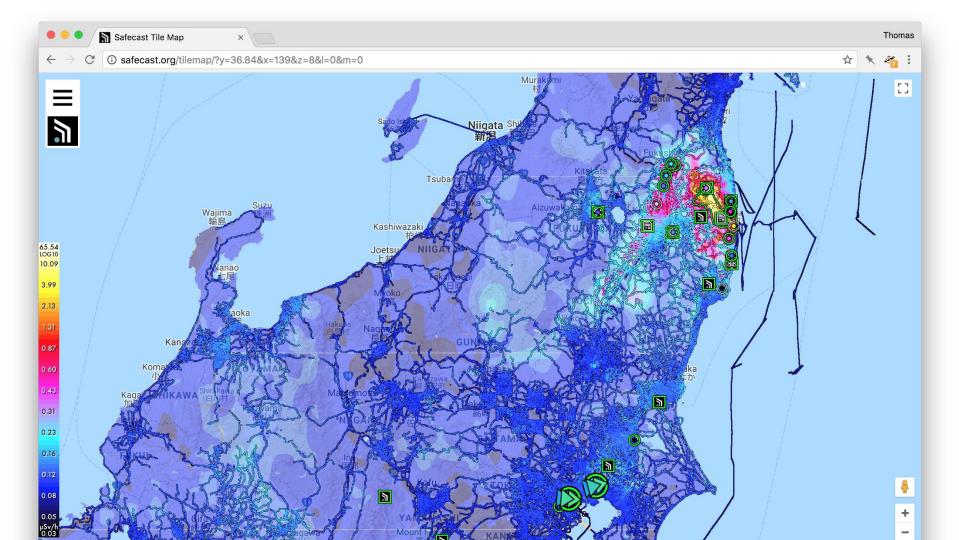






#### OPEN ENVIRONMENTAL DATA FOR EVERYONE

Safecast is a global volunter-centered citizen science project working to empower people with data about their environments. We believe that having more freely available open data is better for everyone. Everything we do is aimed at putting data and data collection know-how in the hands of people





# DATA

### Safecast data is published under a CC0 designation

This is a public domain designation and means the data is free and open for anyone to use under any circumstance. We have done this to enable to most flexibility in it's use by others. While you are not legally required to attribute the data back to us, it's a nice thing to do – collecting the data was a lot of hard work. (Joi Ito has written more about this here.) To learn more about the other licenses we use please go here.

# Data Governance

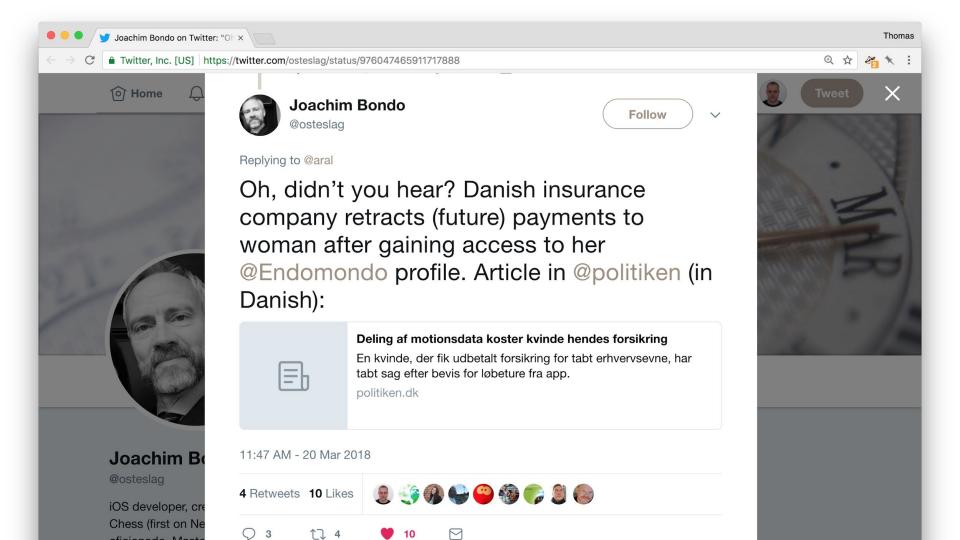
Let users export data.

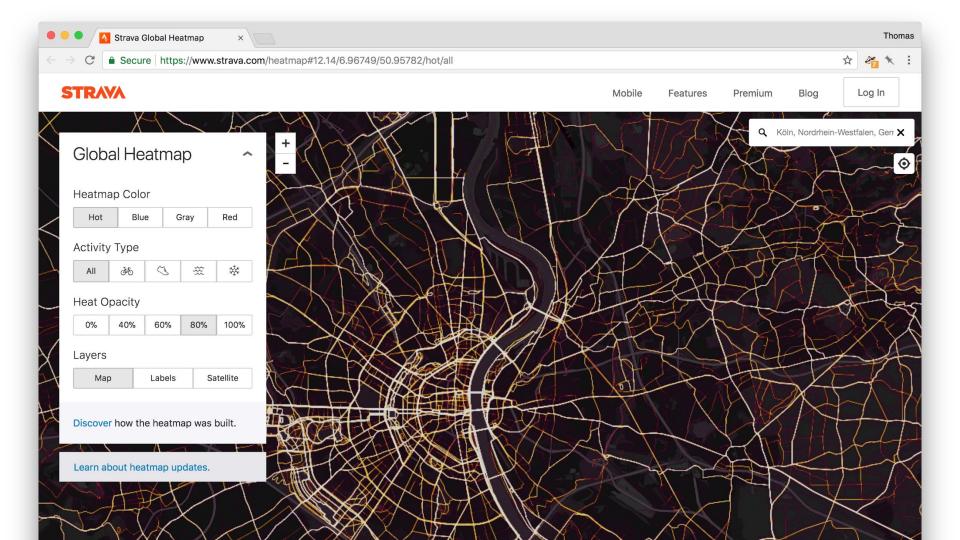
Provide an "offline" switch, explain the consequences.

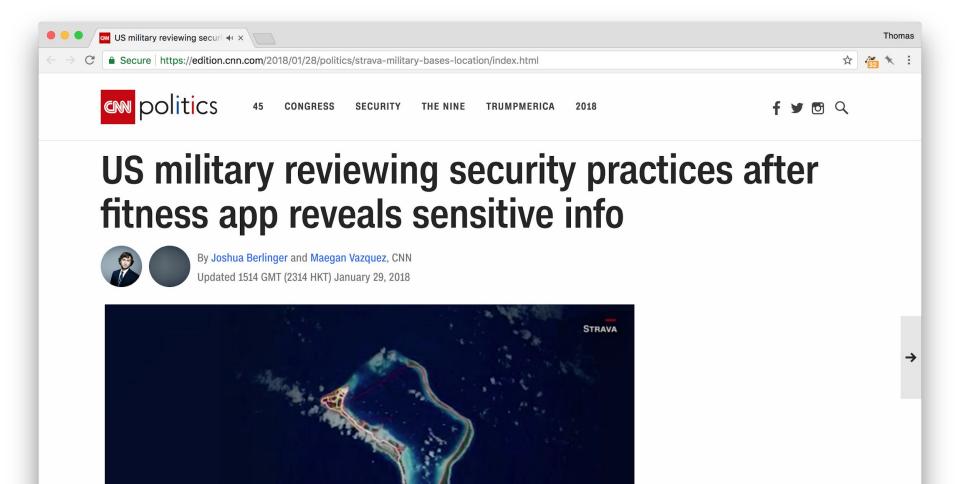
Never change core functionality.









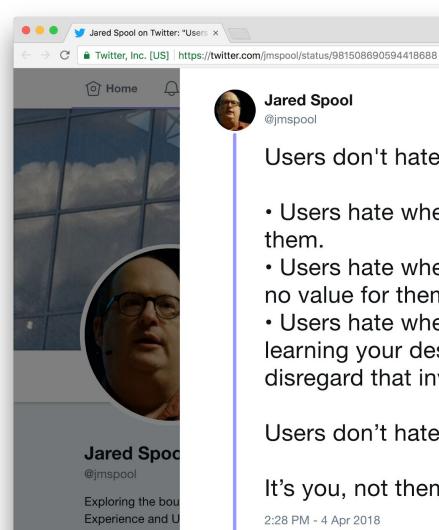


wake word?

Or take the case this week of Sonos updating its terms of service to gather more data from users ahead of building out integrations with smart home products like the Amazon Echo. Sonos changed some of its privacy practices to ensure it could gather certain data from its connected speakers. Users could opt out, but it meant that in the future their Sonos devices, which could have been purchased years ago, may one day "cease to function."

Sonos customers are outraged. The idea that a company could break a device that you purchased years before simply by updating its terms of service was not something consumers have ever considered.

And therein lies the problem. At this moment, we're turning our hardware into a platform for software and services, but we still have a mindset that because we own a physical object, we own the functionality associated with it. The Tesla and Sonos





Users don't hate change.

 Users hate when you take control from them.

**Follow** 

- Users hate when your change shows no value for them.
- Users hate when they've invested in learning your design, only for you to disregard that investment.

Users don't hate change.

It's you, not them.

2:28 PM - 4 Apr 2018

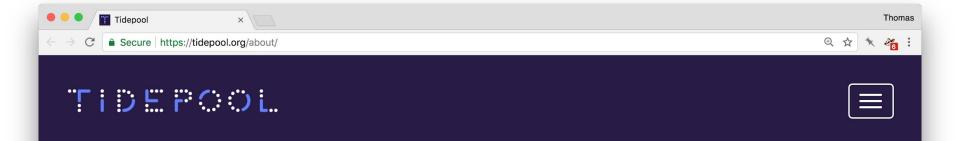


**Thomas** 

# Permissions & Ownership

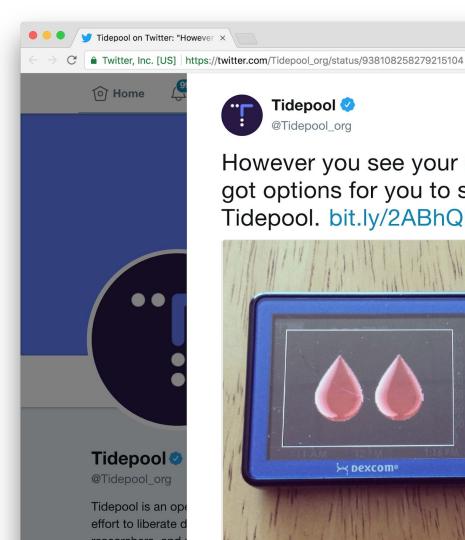
Allow users to switch service providers.





# **About Tidepool**

Tidepool is an open source, not-for-profit company focused on liberating data from diabetes devices, supporting researchers, and providing great, free software to people with diabetes and their care teams.





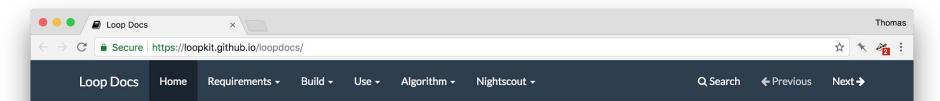
**Following** 

However you see your #Dexcom data, we've got options for you to see your data in Tidepool. bit.ly/2ABhQUn





**Thomas** 



Welcome to Loop

Introduction

**Development History** 

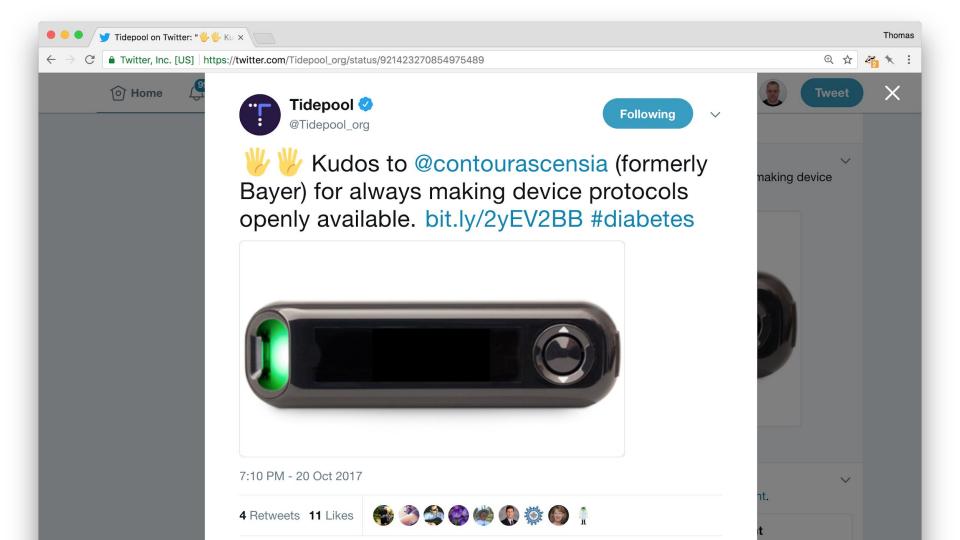
Stay in the Loop!

Contribute









# Transparency

Make legal implications of product usage clear.

State how long you will support the product for.





## EU Roaming Regulations

To comply with EU regulations BT have introduced the following changes that impact mobile usage and associated charges when travelling within the EU (excluding the UK).

#### 1) A welcome SMS will be sent to all customers within the EU

This will notify customers of the EU charges that will be incurred when:

- making or receiving voice calls
- sending or receiving texts (SMS)
- sending or receiving picture messages (MMS)
- sending or receiving data (mobile internet)
- 2) Price reduction introduced for roamed calls and SMS originating and terminating within the EU.



The Good Night Lamp works in the following countries (even when you move!)

### **Africa**

Benin

Cape Verde

Democratic Republic of Congo

Egypt

Gambia

Kenya

Ghana



### Koubachi will retire

After the acquisition by Husqvarna Group and the availability of the GARDENA smart system, Koubachi discontinues selling own products. The Koubachi servers will go through a sunset period of 3 years. You have our guarantee that we will not shutdown our systems before end of 2018.

### A journey ends and a new one begins

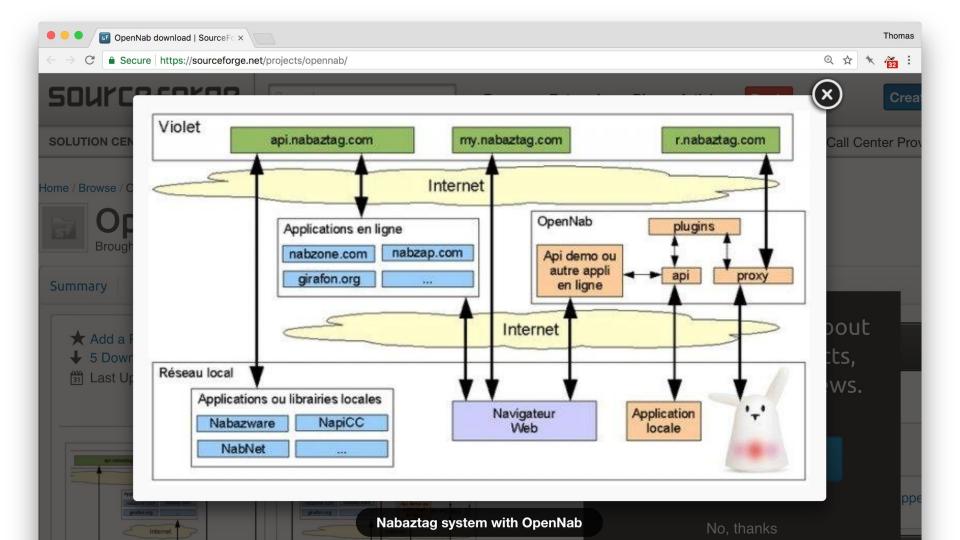
After being acquired by the Husqvarna Group, Koubachi is now part of the GARDENA smart system team. Koubachi will continue to innovate and shape the gardening of the future.

The last six years have been the ride of our lives. We love doing what we do and are very happy to now be part of the Husqvarna family. I'm looking forward to bringing our excitement for excellent smart products to GARDENA customers world wide.

- Dr. Philipp Bolliger, CEO & Co-Founder

### **Continued Support & 3-year Sunset** Period

Koubachi will be offering support until the end of the sunset period. If you have purchased a product you can contact our support at support@koubachi.com or via our support portal. The Koubachi Server will be operated until the end of the sunset period and then will be shutdown permanently.



The older units can currently be connected to a user-driven restoration

**Thomas** 

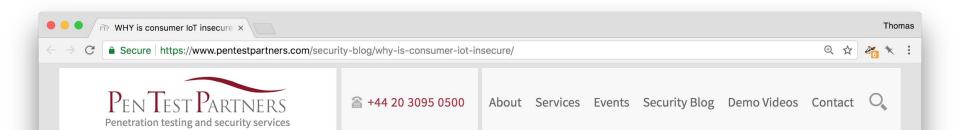
# Security

Adopt good practices across hardware, firmware, user identity management, admin functions and backend services.

Offer factory reset.





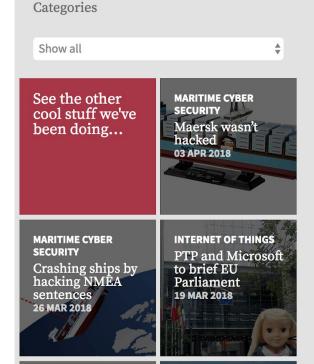


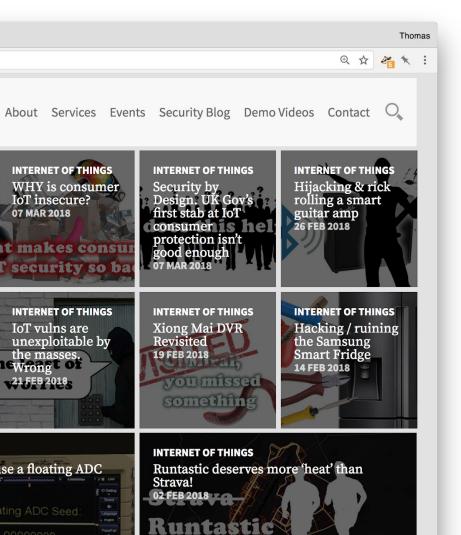


We all know that the majority of consumer smart IoT products are insecure, but I wanted to investigate **WHY security of these devices is so bad**.

What are the underlying causes? Why and how does insecure product get to market?

I've spoken to numerous IoT vendors, hardware manufacturers, IoT integrators and platform







Internet Of Things | Pen Test P X

â +44 20 3095 0500

Penetration testing and security services

### **Security Blog Internet Of Things**

Internet Of Things (117)

INTERNET OF THINGS PTP and Microsoft to brief EU **Parliament** 19 MAR 2018

INTERNET OF THINGS WHY is consumer IoT insecure? 07 MAR 2018 t makes consu security so ba

The Pen Test Partners Security Blog brings you the latest news and trends in penetration testing and the internet security industry.

More about our security blog »

#### **INTERNET OF THINGS**

Reverse **Engineering BLE** from Android apps with Frida 23 FEB 2018

INTERNET OF THINGS IoT vulns are unexploitable by the masses. 21 FEB 2018

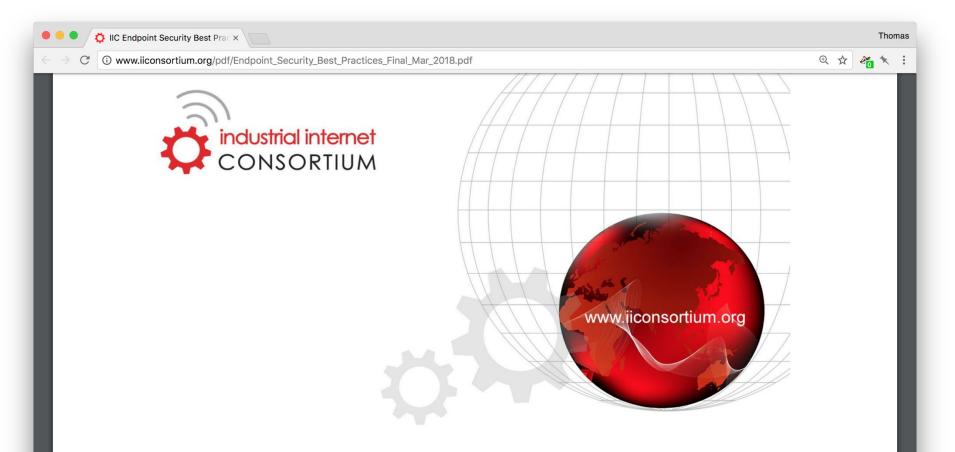
#### INTERNET OF THINGS

A smart sex toy that pings your employer? 12 FEB 2018 You're

Fired!

#### **INTERNET OF THINGS**

Want entropy? Don't use a floating ADC input 06 FEB 2018



# **IIC Endpoint Security Best Practices**

IIC:WHT:IN17:V1.0:PB:20180312

# **Application Note:** Mapping the IoT Security Foundation's Compliance Framework to the DCMS proposed Code of Practice for Security in Consumer IoT

March 7

Applying technical controls from the IoT Security Compliance Framework to meet the DCMS proposed Code of Practice for Security in Consumer IoT Products and Associated Services

IoTSF Working Group Document

# Internet of Things security best practices

3 01/17/2018 • ○ 6 minutes to read • Contributors ● ●



### In this article

Secure an IoT infrastructure

IoT hardware manufacturer/integrator

IoT solution developer

IoT solution deployer

IoT solution operator

See also

Securing an Internet of Things (IoT) infrastructure requires a rigorous security-in-depth strategy. This strategy requires you to secure data in the cloud, protect data integrity while in transit over the public internet, and securely provision devices. Each layer builds greater FEEDBACK security assurance in the overall infrastructure.



## Meet [ORWL].

[ORWL] is a tamper proof open source physically secure by design endpoint (embedding a workstation computer) that allows its user to operate work with sensitive and/or valuable data within a potentially hostile environment.

This physically protected device will instantly destroy all (hardware encrypted) data it contains at the first physical attempt to tamper with it.

# Lifecycle

Help users repair things.

Offer spare parts for the lifetime of your product.

Be transparent about production processes and who you buy from.





■ Secure https://www.ifixit.com/Teardown/Fairphone+2+Teardown/52523







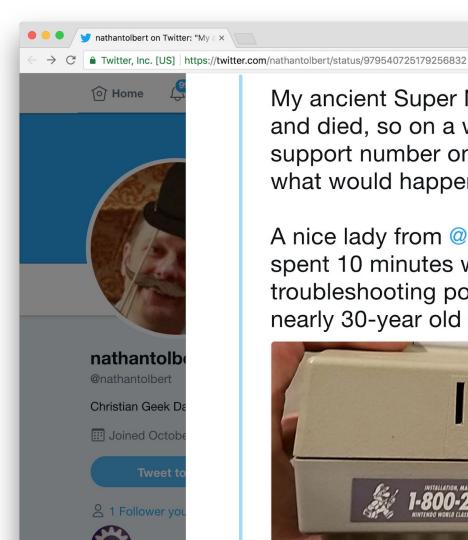






- Fairphone 2 Repairability Score: 10 out of 10 (10 is easiest to repair)
- The LCD and cover glass are fused, simplifying removal, but significantly increasing the cost of replacement.
- The most commonly failing components, battery and display, can be replaced without tools.
- Internal modules are secured with Phillips #0 screws and simple spring connectors.
- Individual modules can be opened, and many components can be individually replaced.
- All buttons and cables are easily accessible.
   Spring contacts allow for future upgrades and easy component swaps.

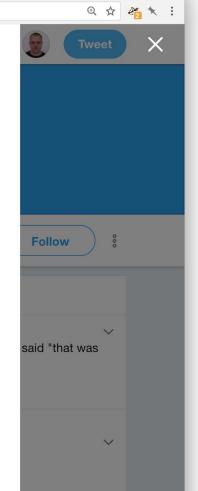




My ancient Super Nintendo went POP and died, so on a whim I called the support number on the back just to see what would happen.

A nice lady from @NintendoAmerica spent 10 minutes with me troubleshooting possible causes. On a nearly 30-year old system.





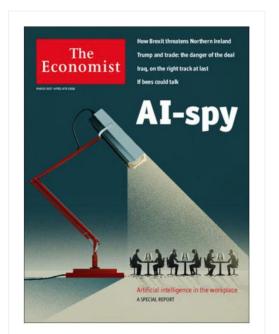
**Thomas** 

# Similar initiatives

The time is right.











Date, new to old

Sort by

## ##

â GitHub, Inc. [US] https://github.com/openiotmark/iotmark-principles/wiki





#### Similar initiatives

http://www.consumersinternational.org/media/154809/iot-principles\_v2.pdf

Securing consumer trust in the IoT, Principles and Recommendations 2017 - Connectivity and inclusion; Information and transparency; Ownership and use; Security and safety; Liability; Data protection and privacy online; Complaints handling and redress; Competition and choice; Lifecycle

https://harper.wirelessink.com/2006/02/15/everyware-the-dawning-age-of-ubiquitouscomputing/

Everyware Principles - Do no harm; Default to harmlessnes; Be self-disclosing; Be conservative of face; Be conservative of time; Be deniable

https://www.thewavingcat.com/iot-trustmark/

A Trustmark for IoT - Good data practices; Good security practices; Openness; Lifecycle management; Establishing that the producing organization is trustworthy

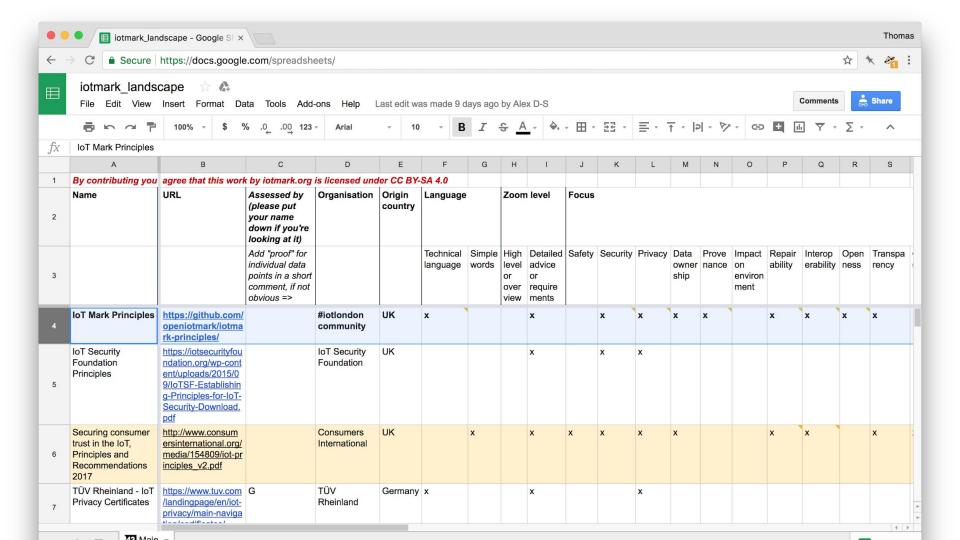
https://www.crowdsupply.com/about

Proclamation of user rights - Curiosity; Independence; Association; Longevity; Transfer; Discourse; Privacy; Security

https://docs.google.com/spreadsheets/d/1u-4g1XjtdYNaLhil1fSPzsw1v6OuTiTM3Mu0jaFEl1Q

IoT Mark Landscape of 30+ similar initiatives

https://docs.google.com/document/d/1SN6hYeKe3eRK6x9D0Sr7GpCA4nirpyo3u68xG1A6NDs







# **IOT DESIGN MANIFESTO 1.0**

Guidelines for responsible design in a connected world

**ABOUT • DOWNLOAD • SIGN** 



Better things is a standard and a certification system for connected products.



Context

How well this product integrates in the lives of the persons using it.

Interusability

The operation of the product in the larger ecosystem of connected things.

Privacy

The application of privacy measures in the product, ecosystem and company.

\* Meaning & Purpose

The function, contribution and significance of the product.

Health & Safety

The product's effect on the health and safety of those who use it.

community :

The effect of the product on the community in which it resides.

- Cost & Access

  Availability and cost-effectiveness
- Sustainability

  Design for maintenance, upgradeability and eco-friendliness.



© www.consumersinternational.org/media/154809/iot-principles\_v2.pdf









# SECURING CONSUMER TRUST IN THE INTERNET OF THINGS

PRINCIPLES AND RECOMMENDATIONS 2017

# **Future**

Spread the word.

Make, learn, share.

Automate assessment?



### **Understanding Terms and Conditions**

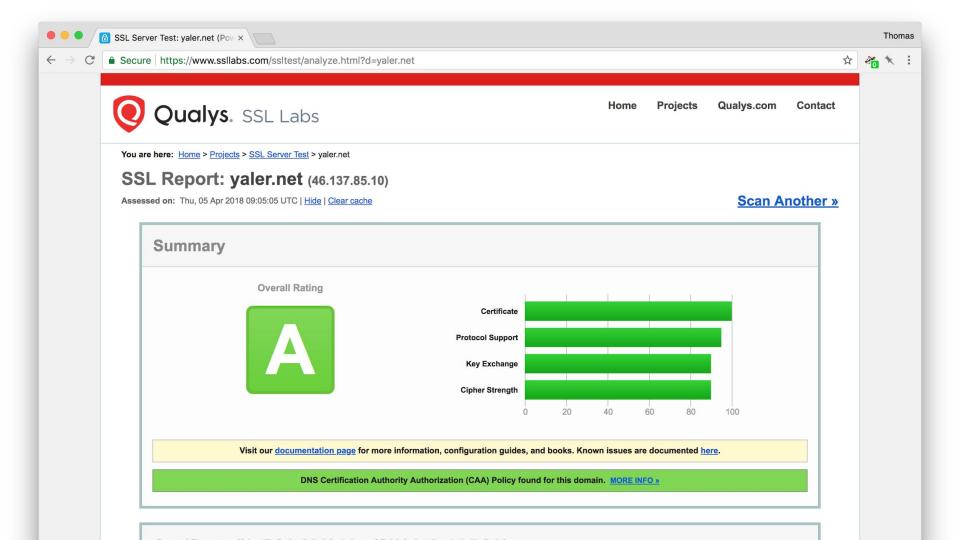
Terms and conditions are broken — people don't have time to read them and some companies use them for permissions people would find surprising. Unreadable T&Cs aren't a meaningful, two-way agreement between a person and a company. They likely won't meet GDPR's high standard for getting consent. What's more, they can be harmful to a company's bottom line.

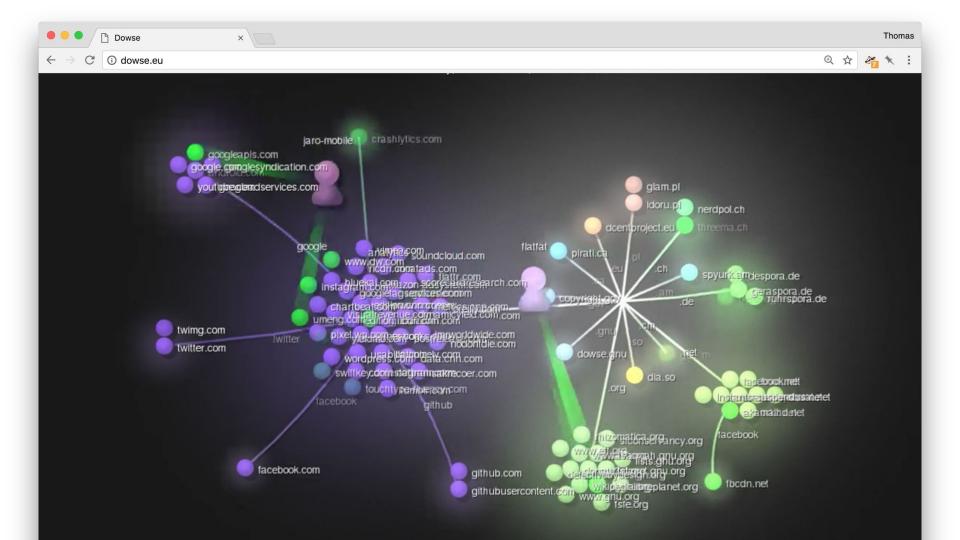
Over the last few weeks we've been thinking about improving terms and conditions. We've been learning by making and talking to experts.

### We started out with a tool to parse and display terms

The first thing we did was build a <u>prototype</u> to test making it easier for people to read terms and conditions by highlighting certain words and phrases, for example 'personal information'.

This was a simple starting point that could lead to more sophisticated <u>natural language</u> processing and automatic analysis of terms.





# Thank you.

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I'm @tamberg

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