

Right to Repair and Digital Ownership

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About Me

- Naval Academy, Subs, Afghanistan
- BeagleBone for Secret Agents
- CryptoCape with SparkFun
- DEF CON 22 and 25
- Owner of Cryptotronix, LLC
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Why am I giving this talk?

- Because I have conflicting ideas and needed to force myself to think about them :-/
 - How do you secure things?
 - How do you also let people hack things they own?
 - Why do we have laws telling us we can't fix things we own?
- Examples:
 - 1920s Typewriter
 - OSHW Webcam with SaaS

Consider the typewriter

- Does one thing
- Has a responsive UX
- Has an after-market for parts
- Easy to mod
- User is in control
- It can be repaired
- But, a malicious typewriter doesn't
break the Internet

Consider the OSHW webcam

- Schematics available
- BOM available
- Firmware available
- Nice debug headers
- OSS Drivers
- But, it could take down the Internet

IOT Problems

- How do you provide firmware updates?
- How do you authenticate devices?
- How do you prevent trivial tampering?
- How do you prove that you own something?

We don't own our things

- Owned: Property, Privacy, and the New Digital Serfdom by Joshua Fairfield
- If it's broken, you can't fix it.
Economist, Sept. 30th - Oct 6th 2017.
- The End of Ownership by Aaron Perzanowski and Jason Schultz

Examples

- Books vs eBooks
- John Deere Tractors
- Apple phones
- Teslas can't be used for Uber
- In the future:
 - IoT, smart phone, smart watch, smart thing, red thing, blue thing

Why don't we own our things?

- Buy the hardware, lease the software
- Digital Millennium Copyright Act
- Breaking any technological lock on copyrighted material is verboten
- It's ok, just click "I agree"

Problem for companies

- They want connected devices, they need to secure them, but the current method is security-by-law.
- Can you have a secure, repairable, resilient device that is Open Source Hardware and Software that works outside the consumer model, like IIoT?

Property Ledgers

- Who owns a thing?
- Where did this thing come from?
- Alice sold a thing to Bob, took his money, but then said she didn't sell it. WTF?

blockchain

- It's a digital property ledger.
- Solves the questions in the previous slide.
- Lots of technical nuance, so let's geek out afterwards
- and much hype - roll with me

Digital Ownership

- Bob bought software upgrade X for his smart shoe, wants to sell it to Charlie.
- Was "developer mode" ever enabled on this car's ECU?
- Alice wants the repair manual for the tractor that Alice bought.

Blockchain HW

- Public address - RFID, NFC, EEPROM?
- Private Key - ARM MCU like TREZOR
- Would be nice: module with a standard interface over SPI or I2C

OSHW + Blockchain

- Irony:
 - Cloning of HW has become easy.
 - Cloning of digital assets has become hard.
- Allows OSHW OEMs way to validate authentic devices through tokens
- ICOs as crowdfunding for devices?
 - 1 Token = 1 pcs

Wrap up

- R2R is pushback against abuse of copyright law
- Digital ownership needs to be fixed so consumers are owners not licensees.
- Blockchain tech + HW has potential to enable the shift.