Security and the Internet of Things

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“A smart device is an electronic device, [snip], that can operate to some extent interactively and autonomously.”

This is GeniCan.
Como Huggies TweetPee funciona

Design ergonômico
O design busca o conforto e segurança do bebê. Fácil de instalar e retirar para utilizar na próxima fralda.

Sensor da fralda monitora a unidade e envia um sinal quando o bebê faz xixi.

Todos que têm a permissão para acompanhar a atividade do bebê são notificados.

Através do APP mamães e papais conseguem comprar fraldas sem sair de casa.

Pelo histórico de troca de fraldas do bebê, você acompanha a quantidade usada por dia.
What does i.Con do with its data? Can I use it anonymously?

“Absolutely! All data will be kept anonymous but users will have the option to share their recent data with friends, or, indeed the world. You will be able to anonymously access stats that you can compare with i.Con users worldwide.”
Welcome to U by Moen

Demo the Controller and learn how easy it is to precisely control temperature, select shower outlets, and save your perfect shower as a preset for later.

Demo the Smartphone App to see how the same easy controls are available in the palm of your hand, along with up to 10 additional presets.
SMALT with voice

Connect SMALT with Amazon Echo and simply say “Alexa, dispense half a teaspoon of salt”.

Bring the flavor

SMALT dispenses salt with a shake/pinch of your smartphone screen or simply turning the dial manually.
YOU GET CONNECTED!
AND YOU GET CONNECTED!
EVERYTHING GETS CONNECTED!
What is the IoT?

Wikipedia definition:

“The Internet of things (IoT) is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data.”
Global Standards Initiative definition:

“a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies“[3] and for these purposes a "thing" is "an object of the physical world (physical things) or the information world (virtual things), which is capable of being identified and integrated into communication networks"."
Towards a definition of the Internet of Things (IoT)

Revision 1 – Published 27 MAY 2015

IEEE Internet Initiative | iot.ieee.org
A simpler definition:

“Stuff that did not use to be networked”
An even simpler definition:

“One big mess”
The internet of insecure things: Thousands of internet-connected devices are a security disaster in the making
The “S” in IoT stands for SECURITY
Why?

- Security is hard
- Security is expensive
- In some cases: security is not ‘user-friendly’
- Security is not a feature that sells devices
  - But time to market and price are
- Security is invisible
A variant of the Mirai malware pummeled a U.S. college last month with a marathon 54-hour long attack. Researchers say this latest Mirai variant is a more potent version of the notorious Mirai malware that made headlines in October, targeting DNS provider Dyn and the Krebs on Security website.
Mirai vs Dyn

1.2 Tbps
From ‘only’ 100,000 devices
Computers will never be secure. To manage the risks, look to economics rather than technology.
“The market can't fix this because neither the buyer nor the seller cares.

The owners of the webcams and DVRs used in the denial-of-service attacks don't care. Their devices were cheap to buy, they still work, and they don't know any of the victims of the attacks.

The sellers of those devices don't care: They're now selling newer and better models, and the original buyers only cared about price and features.

There is no market solution, because the insecurity is what economists call an externality: It's an effect of the purchasing decision that affects other people. Think of it kind of like invisible pollution.”

https://www.schneier.com/blog/archives/2017/02/security_and_th.html
This guy's light bulb performed a DoS attack on his entire smart house
RISK ASSESSMENT —
BrickerBot, the permanent denial-of-service botnet, is back with a vengeance

New botnet squadrons wage fiercer, more intense attacks on unsecured IoT devices.

DAN GOODIN - 4/24/2017, 10:43 PM
Hacker hijacks wireless Foscam baby monitor, talks and freaks out nanny

This is the third time news has circulated about some jerk hijacking a wireless Foscam camera/baby monitor and made his virtual intrusion known by talking. Please change the default password!
What to do?

- Better practices for manufacturers?
- Free **secure** software stacks?
- International policy, regulation, certification?
- Clear up accountability issues?
- Generate market demand for secure products?
- Quarantine bad actors (e.g. at ISP)?
- Educate users?
- Empower users?

“Yes”

We need to do it all
.nl stats and data

This site provides current statistics and data about the use of the .nl domain, which is maintained by DNS.nl. With over 1.4 million registered domain names, .nl is the largest ccTLD that .nl.
Stichting Internet Domeinregistratie Nederland (SIDN)

Critical Internet services
- Lookup IP address of a domain name (almost every interaction)
- Domain name registration
- Manage fault-tolerant and distributed infrastructure

“Catalyst” of the Internet in the Netherlands
- Enable safe and novel use of the Internet
- Improve the security and resilience of the Internet itself

.nl = the Netherlands
17M inhabitants
5.8M domain names
2.8M DNSSEC-signed
1.3B DNS queries/day
Goal: thrust operational security and resilience of the Internet through world-class measurement-based research and technology development

Challenges: secure and resilient DNS, Internet evolution, collaborative security, AAA infrastructures

Daily work: help operational teams, write open source software, analyze vast amounts of data, run experiments, write academic papers, work with universities
Detect smoke and CO
Control lighting
Adjust climate
Monitor your home
Unlock and lock doors
Open and close garage doors
Control switches and outlets
Control shades and blinds
THE TECHNOLOGY DEMO

THE SOFTWARE ISN'T 100% COMPLETE.

IF IT HAD A USER INTERFACE YOU WOULD SEE SOMETHING HERE... HERE... AND SOMETIMES HERE.

AND THEN YOU'D BE SAYING, "I GOTTA GET ME SOME OF THAT."

ANY QUESTIONS?
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