Internet of Fails

When IoT has gone wrong

Talk by Barbara Wimmer

28.12.2017 @34C3 - Leipzig

Twitter: @shroombab

Contact: shroombab@gmail.com

Fail =

First Attempt In Learning

34C3:
tuwat!

Internet of Things

- Why do I talk about that topic?
- Background: IT-Journalist since more than 12 years
- Refridgerator that sent out spam mails (2014)

Structure of my #34C3 talk

- IoT numbers and examples
- Where is the problem?
- IoT examples of fails in terms of: security & privacy
- Solutions in terms of regulation, consumers, it-security and developers

Internet of Things

Category	2016	2017	2018	2020
Consumer	3,963.0*	5,244.3	7,035.3	12,863.0
Business (cross industry)	1,102.1	1,501.0	2,132,6	4,381,4
Business (vertical specific)	1,316.6	1,635.4	2,027.7	3,181.0
Grand-Total	**6,381,8**	**8,380.6**	**11,196,6**	**20,415.4**
Source: Gartner (January 2017)	*MILLIONS			

Internet of Things

International Data Corp. (IDC)
- DATA FROM JUNE 2017 -

Spending on IoT in 2017: grow 17% compared with the previous year,
reaching more than $800 billion.

By 2021 global IoT spending
is expected to reach about
$1.4 trillion.

What is the Internet of Things?

Connected Everything:

Toys, Sex Toys

Home Automation like

Light bulbs, surveillance cameras, thermostats

Digital Assistants, Wearables

Internet of Things

* Smart Coffee Maker

– can connect with other things

like fitness & sleeping trackers via IFTT

- e.g. little sleep – strong coffee

Medicated
Rust·eze
Bumper Ointment
Rear End Formula

Internet of Shit

* Toilet IoT Sensor

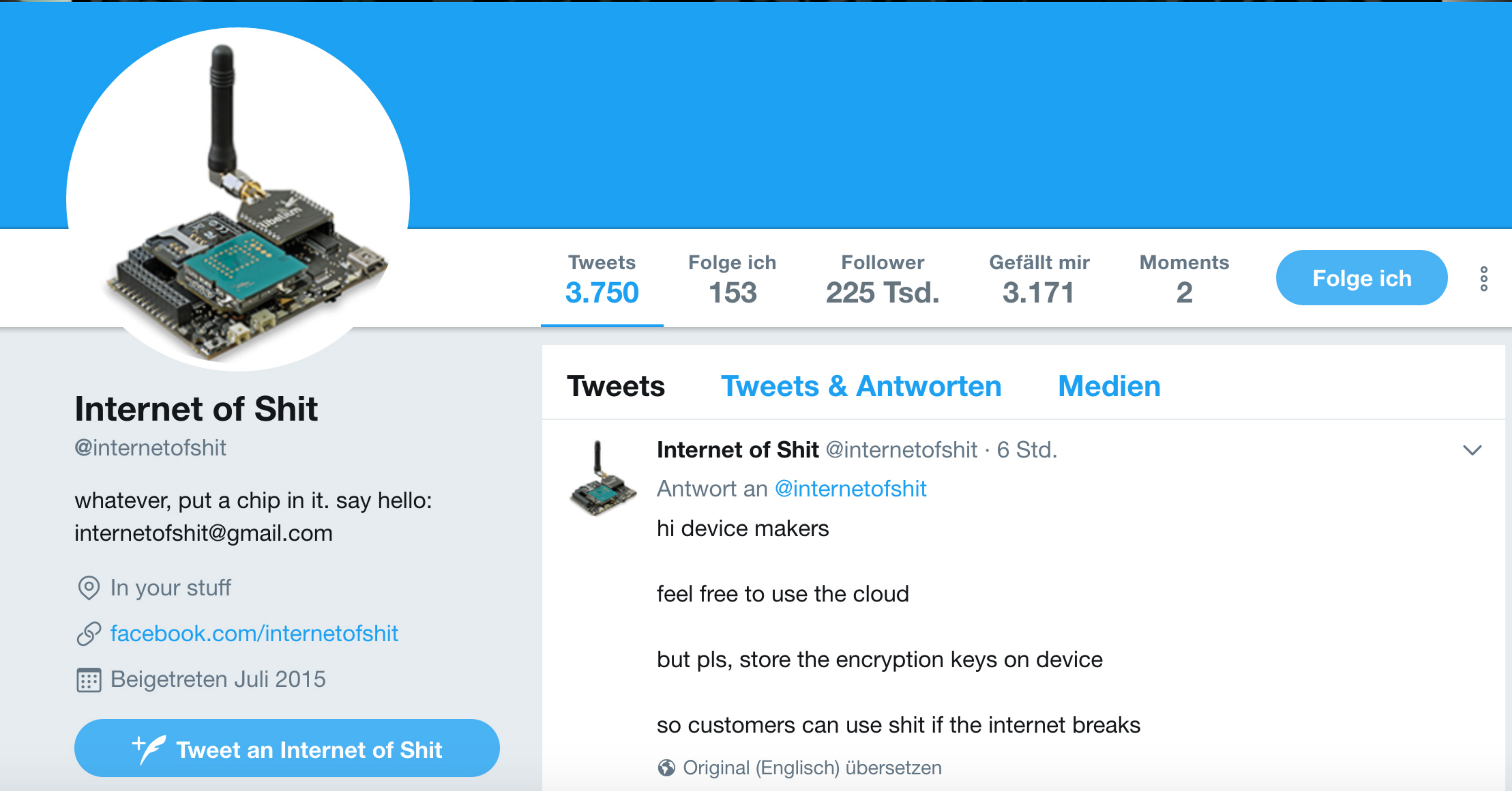
By an Israeli Start-up named

OutSense

Stool analysis

data sent to the cloud

Internet of Shit



Internet of Shit
@internetofshit

whatever, put a chip in it. say hello:
internetofshit@gmail.com

In your stuff
facebook.com/internetofshit
Beigetreten Juli 2015

Internet of Shit @internetofshit · 6 Std.
Antwort an @internetofshit

hi device makers

feel free to use the cloud

but pls, store the encryption keys on device

so customers can use shit if the internet breaks

Original (Englisch) übersetzen

Where is the problem?

Before vendors started to „connect everything“ they were creating “manually operated” devices without connectivity.

They had lots of knowledge in terms of materials, ergonomics, and mechanical engineering, but almost zero in the fields of IT-security.

Where is the problem?

Result: they are making the same sorts of security errors than the high-tech industry was dealing with 15 years ago

The early 2000s
web security called
and they want
their lack of security back.

Rick Holland, Digital Shadows

Where is the problem?

Hard-coded passwords

Unsecure bluetooth

Permanent cloud server connection

Where is the problem?

Unsecured Devices ——>

Botnet ——>

DDoS Attacks ——>

Internet Outage

Botnet =

a network of private computers infected with malicious software and controlled as a group without the owners' knowledge, e.g. to send spam.

Botnet owners

Can control the network of infected computers by issuing commands to perform malicious activities like DDoS attacks

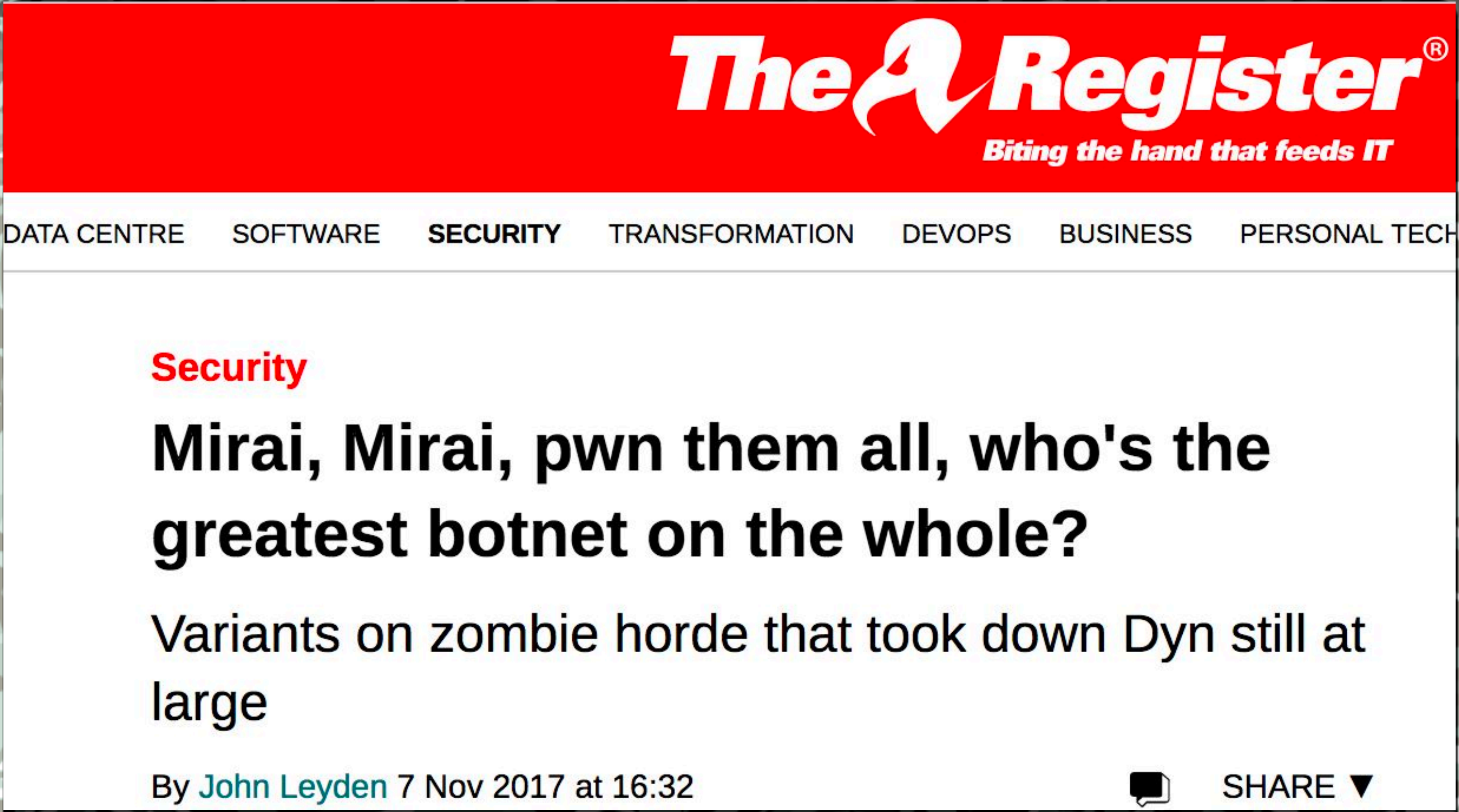
DDoS

Distributed Denial of Service Attacks
are an attempt to stop legitimate visitors from accessing the data normally available on the website. This can lead to completely shut down a service.

Mirai

* Mirai was responsible for one of the biggest internet outages in history.

* Knocking Twitter, Reddit, Spotify, PayPal and several other major services offline in 2016, because an integral Internet infrastructure provider (Dyn) was attacked via DDoS - by „zombie“ IoT devices.



Security

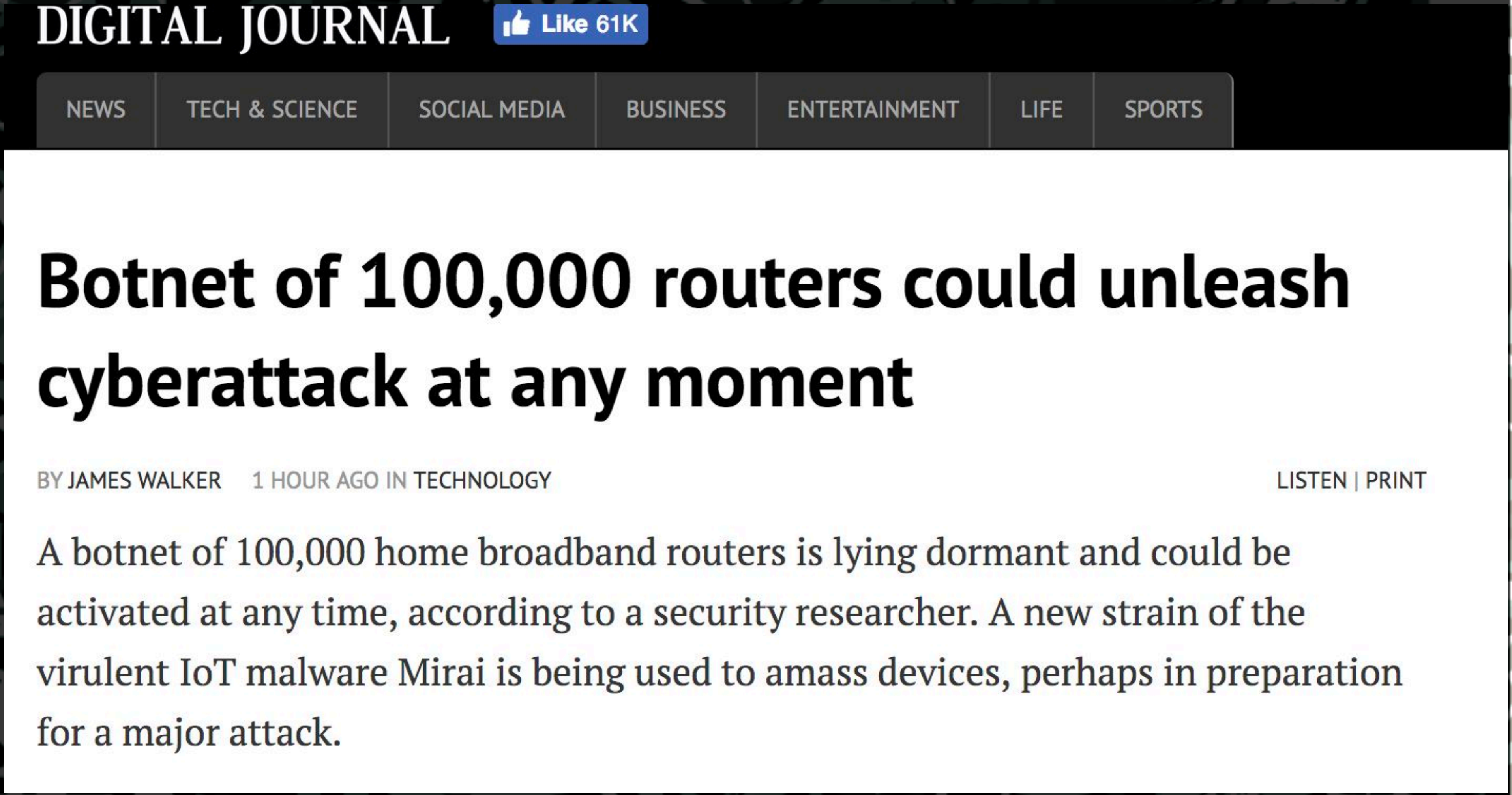
Mirai, Mirai, pwn them all, who's the greatest botnet on the whole?

Variants on zombie horde that took down Dyn still at large

By John Leyden 7 Nov 2017 at 16:32

Even a year after its initial release, Mirai botnet infections are still widespread.

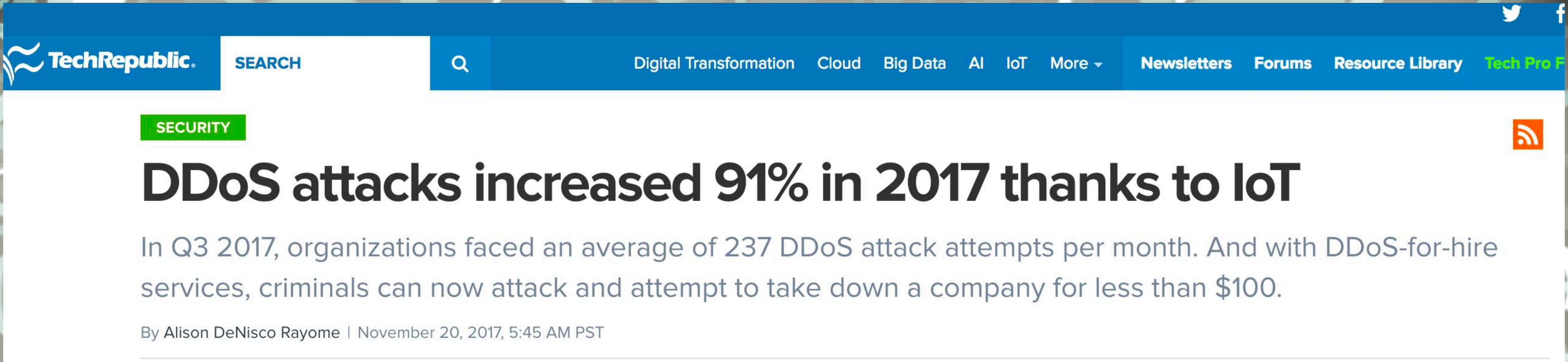
2017



Botnet of 100,000 routers could unleash cyberattack at any moment

BY JAMES WALKER 1 HOUR AGO IN TECHNOLOGY

A botnet of 100,000 home broadband routers is lying dormant and could be activated at any time, according to a security researcher. A new strain of the virulent IoT malware Mirai is being used to amass devices, perhaps in preparation for a major attack.



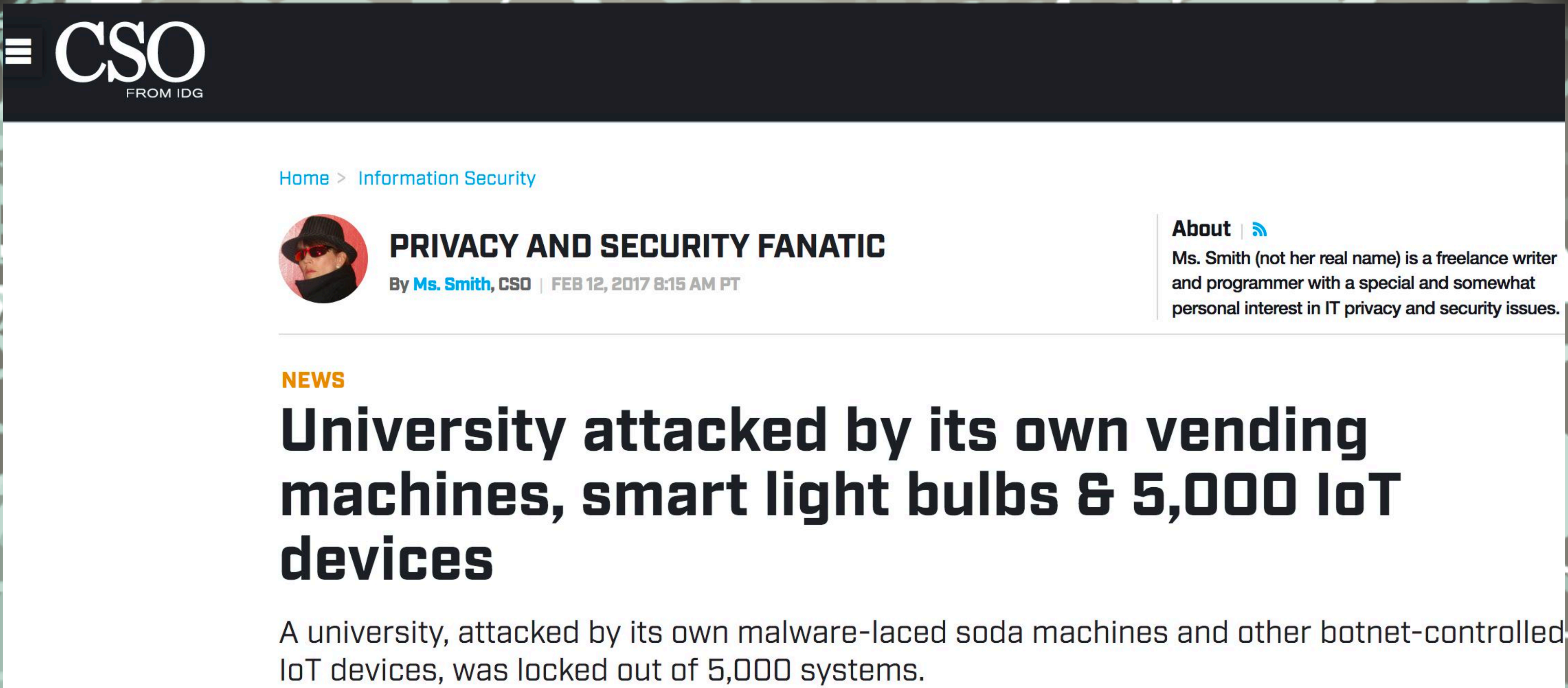
SECURITY

DDoS attacks increased 91% in 2017 thanks to IoT

In Q3 2017, organizations faced an average of 237 DDoS attack attempts per month. And with DDoS-for-hire services, criminals can now attack and attempt to take down a company for less than $100.

By Alison DeNisco Rayome | November 20, 2017, 5:45 AM PST

35 per cent increase in monthly attack attempts from Q2 to Q3,
91 per cent increase from Q1/2017
(Coreo Network Security Report)



CSO FROM IDG

Home > Information Security

PRIVACY AND SECURITY FANATIC

By Ms. Smith, CSO | FEB 12, 2017 8:15 AM PT

About

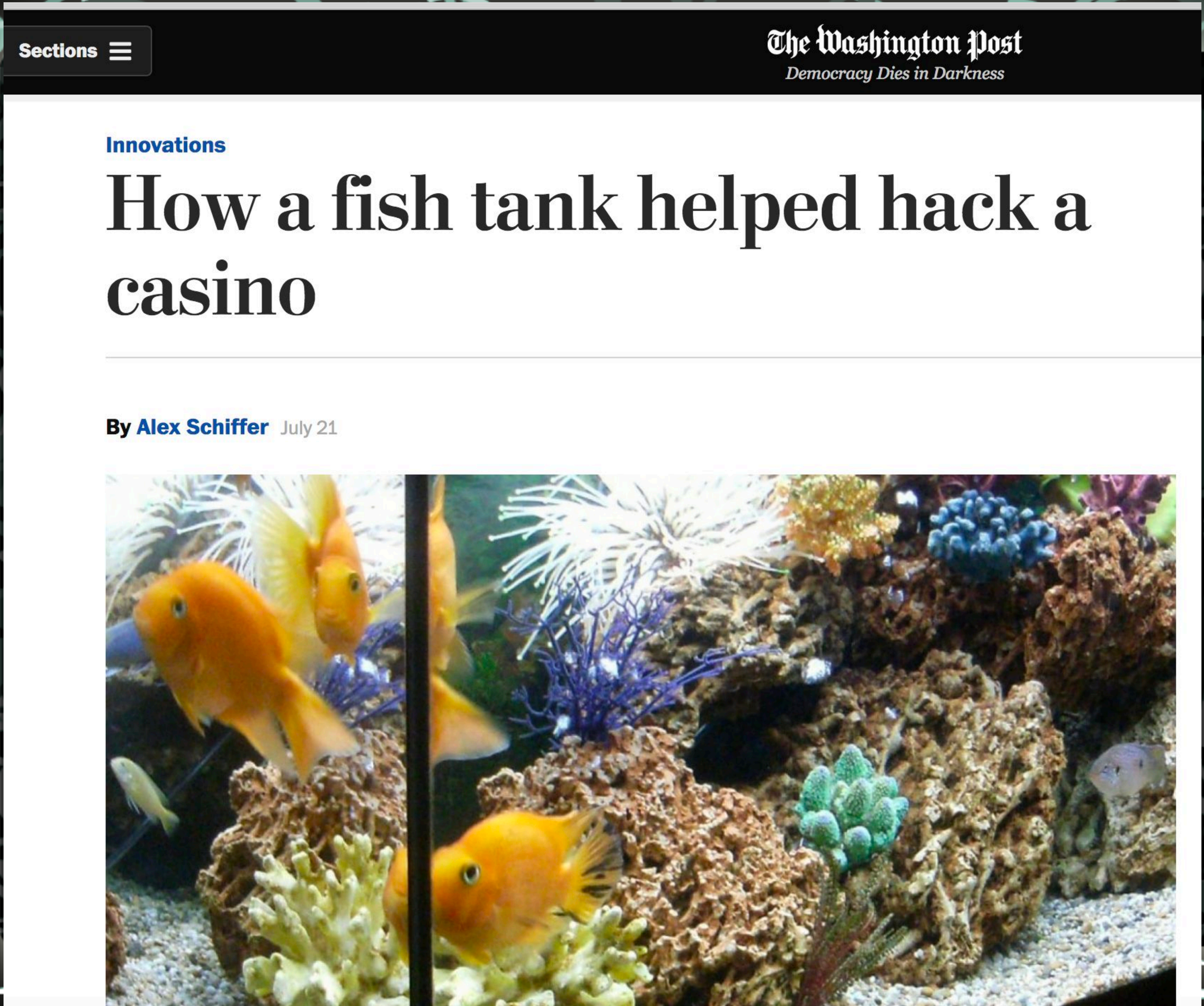
Ms. Smith (not her real name) is a freelance writer and programmer with a special and somewhat personal interest in IT privacy and security issues.

NEWS

University attacked by its own vending machines, smart light bulbs & 5,000 IoT devices

A university, attacked by its own malware-laced soda machines and other botnet-controlled IoT devices, was locked out of 5,000 systems.

Source: 2017 Data Breach Digest scenario report by Verizon

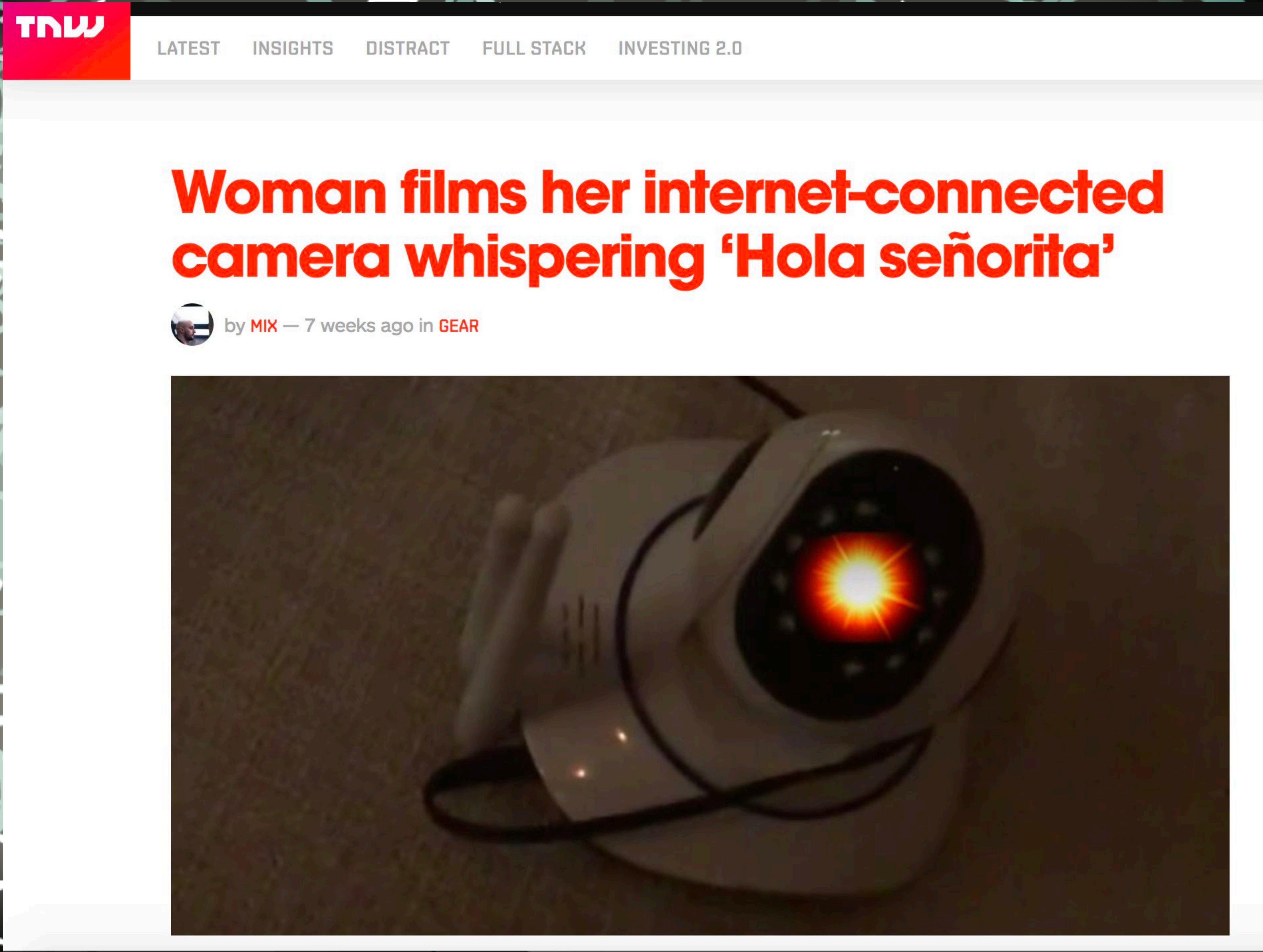


The Washington Post
Democracy Dies in Darkness

Innovations

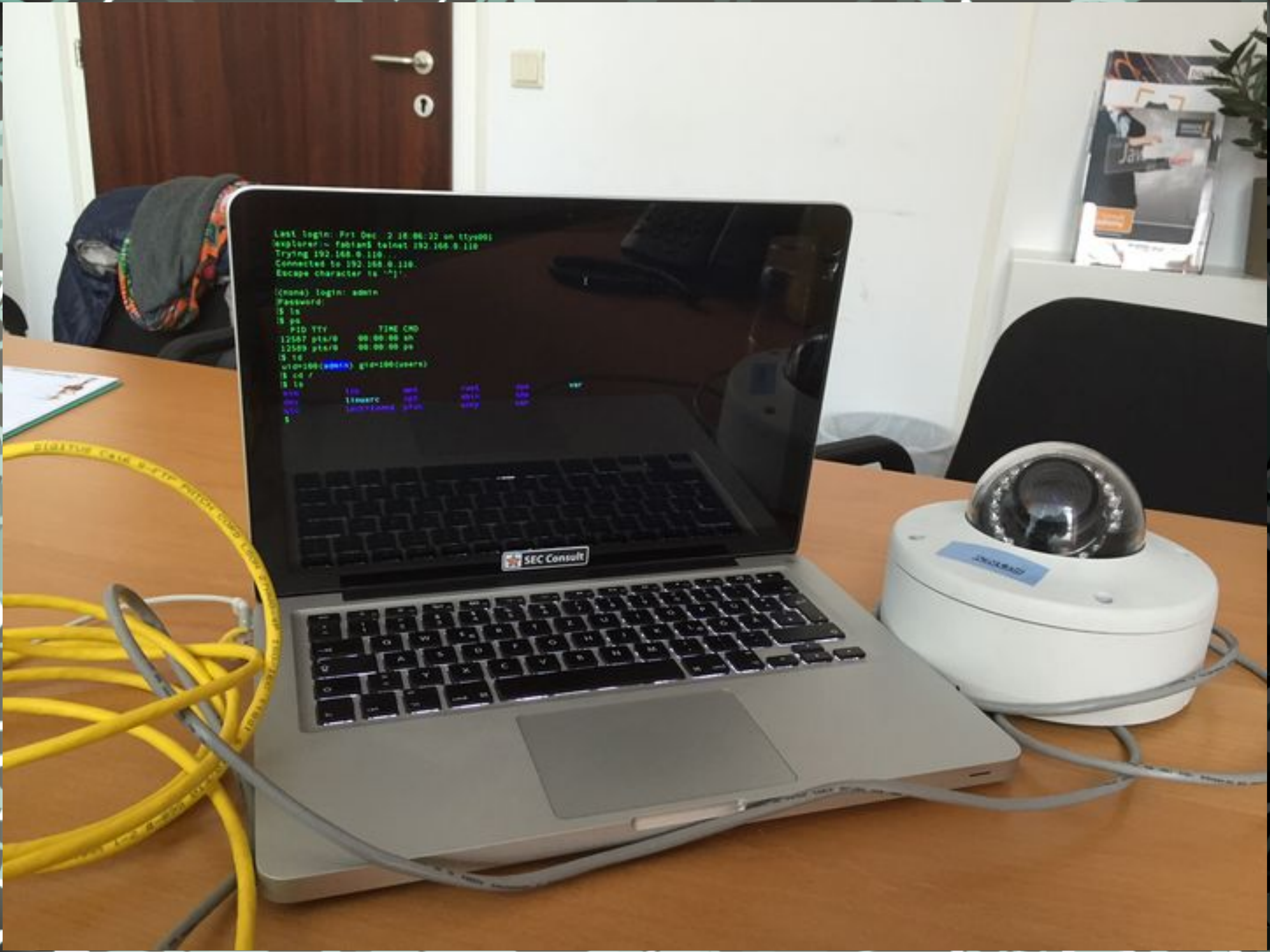
How a fish tank helped hack a casino

By Alex Schiffer July 21



Woman films her internet-connected camera whispering 'Hola señorita'

by MIX — 7 weeks ago in GEAR



```
Last login: Fri Dec  2 10:06:32 on ttys001
explorer:~ fabian$ telnet 192.168.0.110
Trying 192.168.0.110...
Connected to 192.168.0.110.
Escape character is '^]'.

(none) login: admin
Password:
$ ls
$ ps
  PID TTY          TIME CMD
12567 pts/0    00:00:00 sh
12589 pts/0    00:00:00 ps
$ id
uid=100(admin) gid=100(users)
$ cd /
$ ls
bin         lib          mnt       root      sys       var
dev         linuxrc      opt       sbin      tmp
etc         lost+found   proc      shm       usr
$
```

IP-based camera

„It’s like in a movie scene. With this flaw cybercriminals can exchange the images. The camera will show pictures from the same, empty room while the bank is actually just getting robbed.“

Camera as security = useless

„Extremly critical“ Toys

German „Stiftung Warentest“:
The people testing the toys ranked three out of seven connected toys extremly critical, the other ones as critical.

Among them:
Teddy bears, robot dogs and dolls.

Unsecure Bluetooth

Three out of the testet toys did not need a password or pin-code for their bluetooth-connection

Which means: Every smartphone-user close enough could connect with the toy to listen to the children, ask questions or threaten them.

Data-collecting Apps

Apps, that belong to and control the toys, record the device-ID and data of the users to third-party companies or put trackers to control the online-behaviour of the parents.

Advice

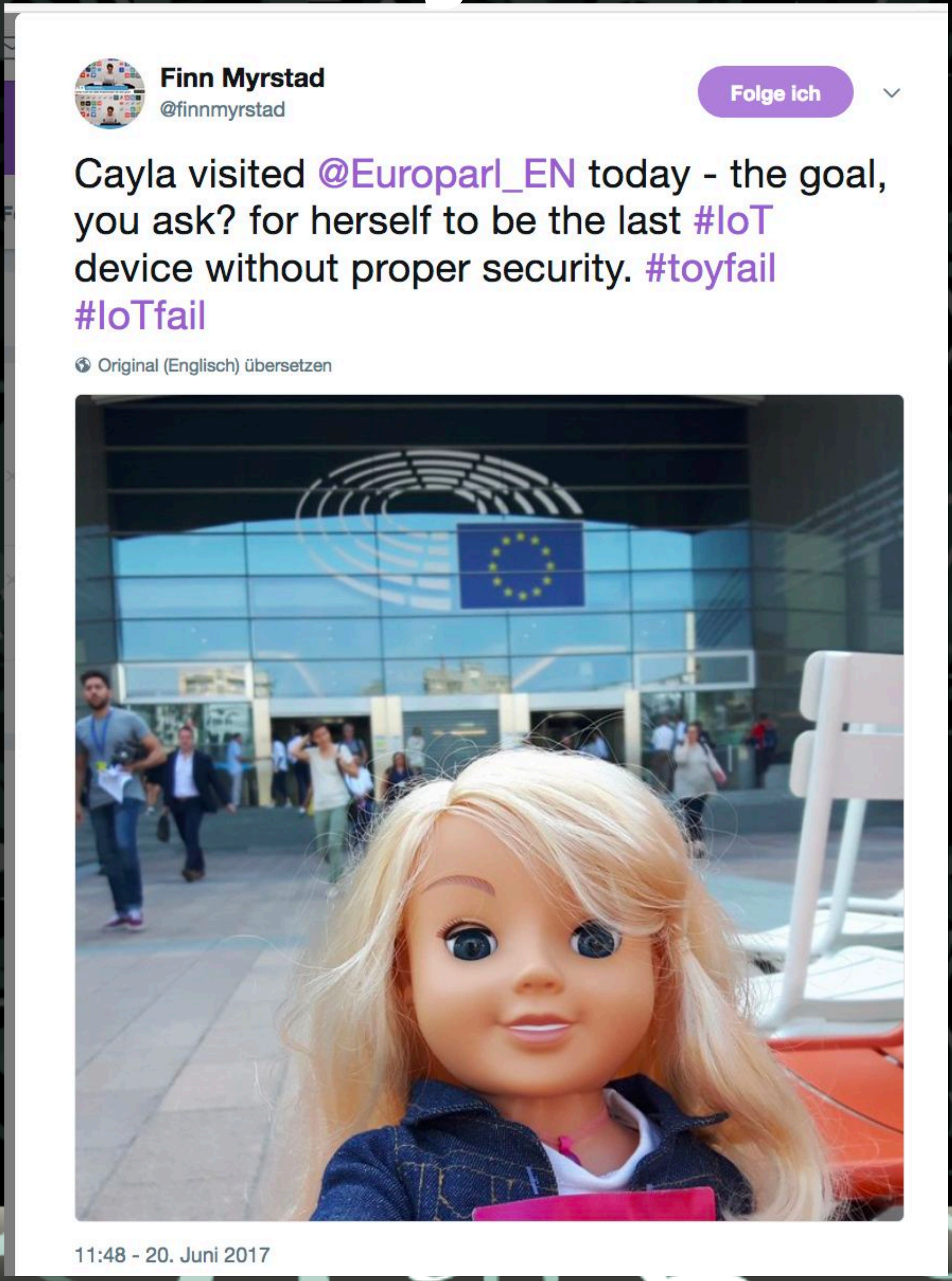
„A not-connectable
„dumb“ teddy
might be
the smarter choice
in the future.“

(Stiftung Warentest)

#toyfail

Smart doll „Cayla“ got forbidden in Germany by law. It is judged as a „prohibited broadcasting station“. Parents who do not destroy it will be fined.

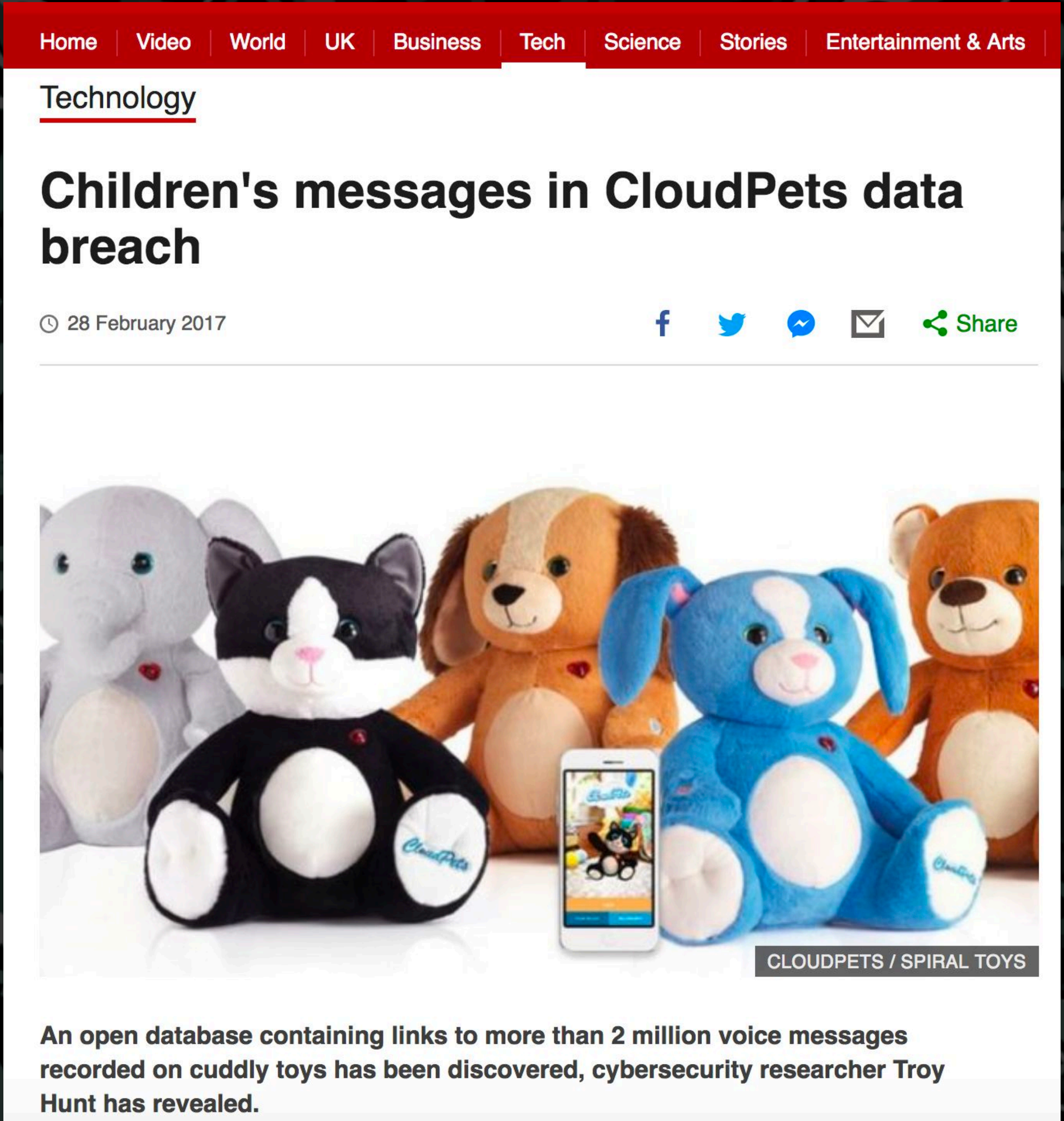
#toyfail



Finn Myrstad
@finnmyrstad

Cayla visited @Europarl_EN today - the goal, you ask? for herself to be the last #IoT device without proper security. #toyfail #IoTfail

11:48 - 20. Juni 2017



Technology

Children's messages in CloudPets data breach

28 February 2017

CLOUDPETS / SPIRAL TOYS

An open database containing links to more than 2 million voice messages recorded on cuddly toys has been discovered, cybersecurity researcher Troy Hunt has revealed.

#toyfail

List of institutions with warnings:

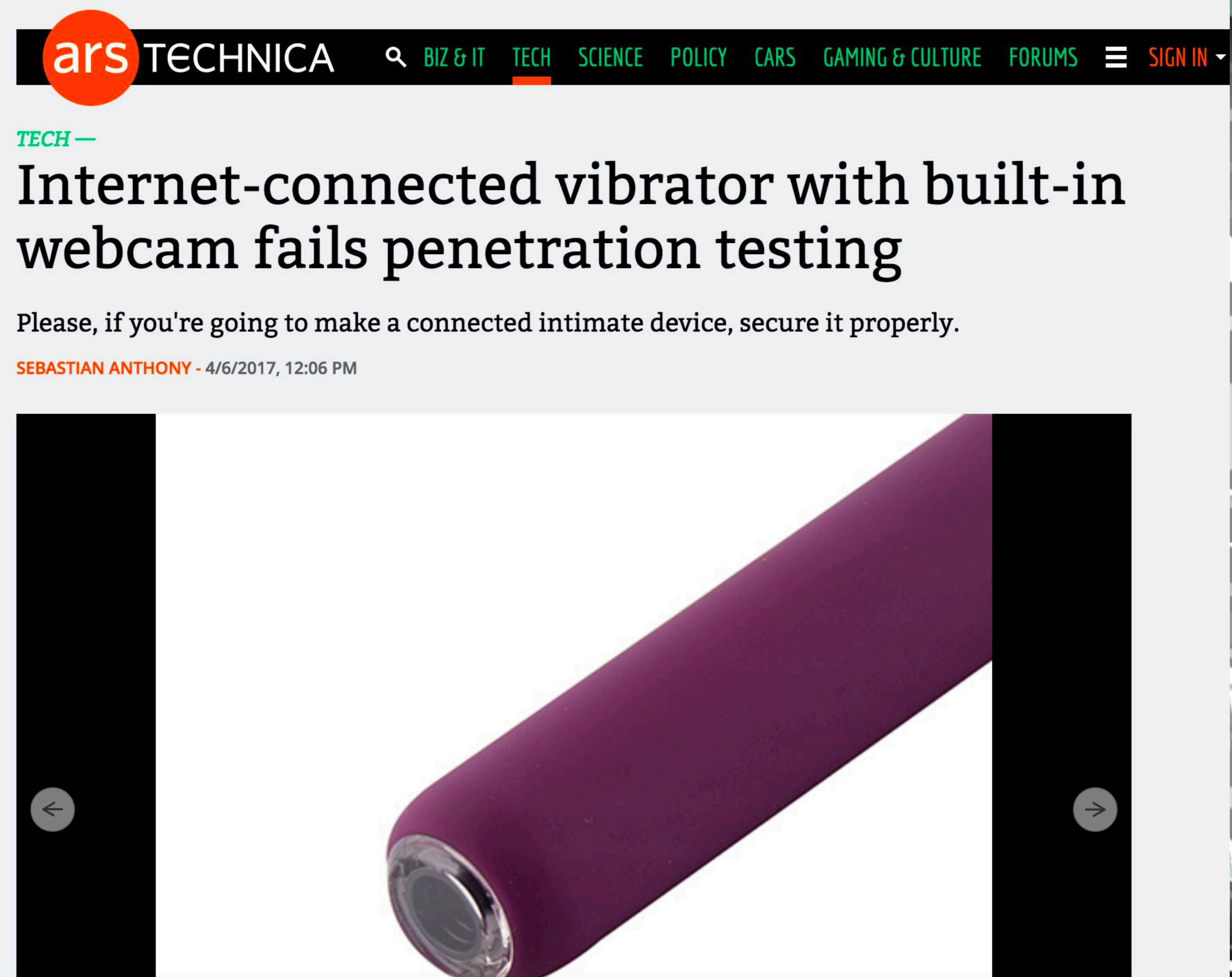
- UK consumer group Which?
- Germany Stiftung Warentest
- Austrian VKI
- Norwegian consumer council
- FBI
(to be continued)

Advice

Consider
if you really need
a connected toy
for your child -
((Or yourself…..))

Coming up next…

SEX TOYS



TECH —

Internet-connected vibrator with built-in webcam fails penetration testing

Please, if you're going to make a connected intimate device, secure it properly.

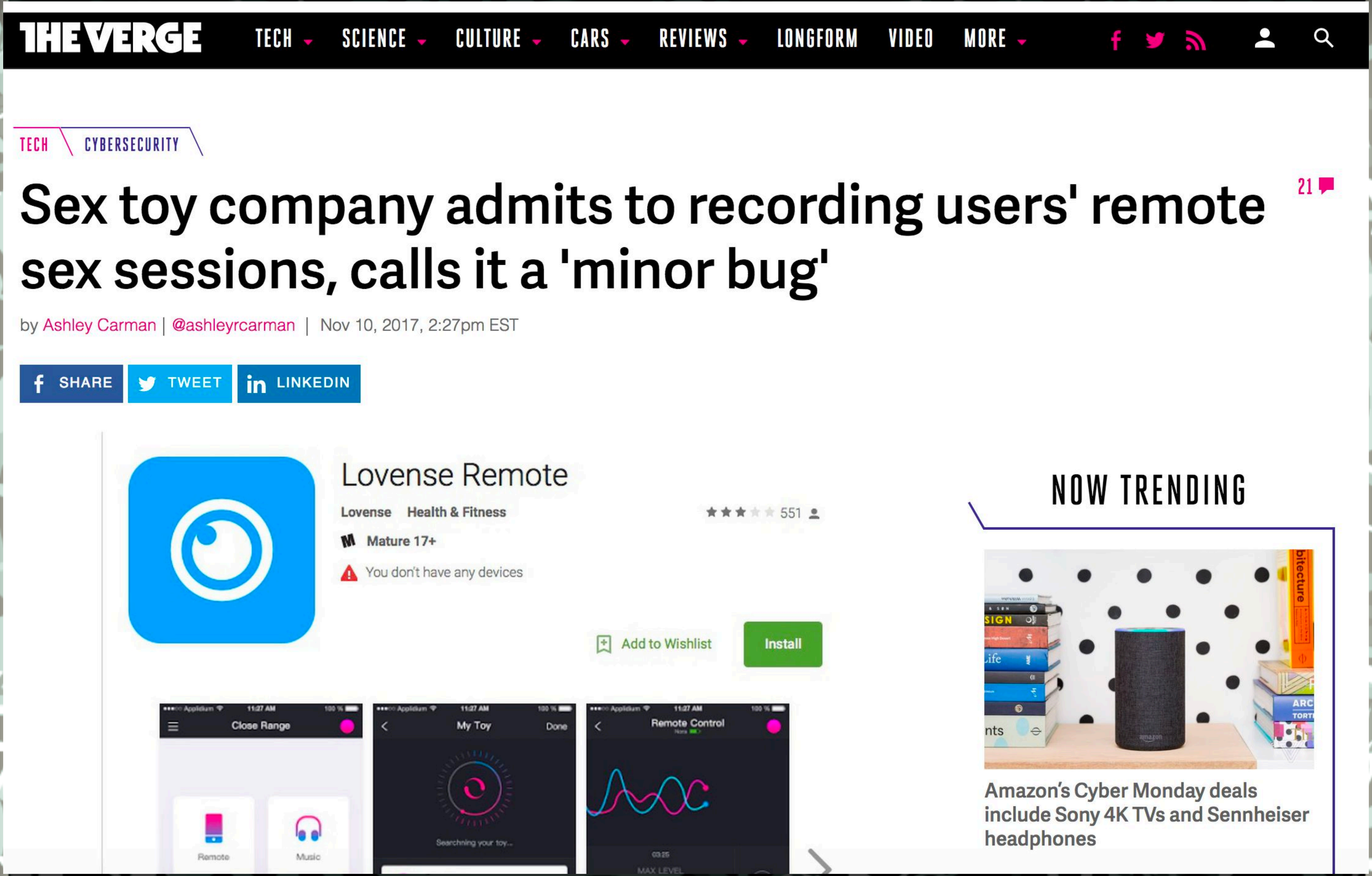
SEBASTIAN ANTHONY - 4/6/2017, 12:06 PM

Smart Dildo

A high-tech vibrator (Siime Eye, costs $250) with a built-in Web-connected endoscope has been penetration tested by a UK security outfit and found to be massively insecure.

Smart Dildo

The device’s default password is 88888888. If you forget to change it, a few more players than expected might be watching your newest video about your private sex adventure.



TECH \ CYBERSECURITY

Sex toy company admits to recording users' remote sex sessions, calls it a 'minor bug'

21

by Ashley Carman | @ashleyrcarman | Nov 10, 2017, 2:27pm EST

Lovense Remote

Lovense Health & Fitness

★★★☆☆ 551

Mature 17+

You don't have any devices

NOW TRENDING

Amazon's Cyber Monday deals include Sony 4K TVs and Sennheiser headphones

Vibrator & App

A vibrator-controlling app

that records all your sex sounds

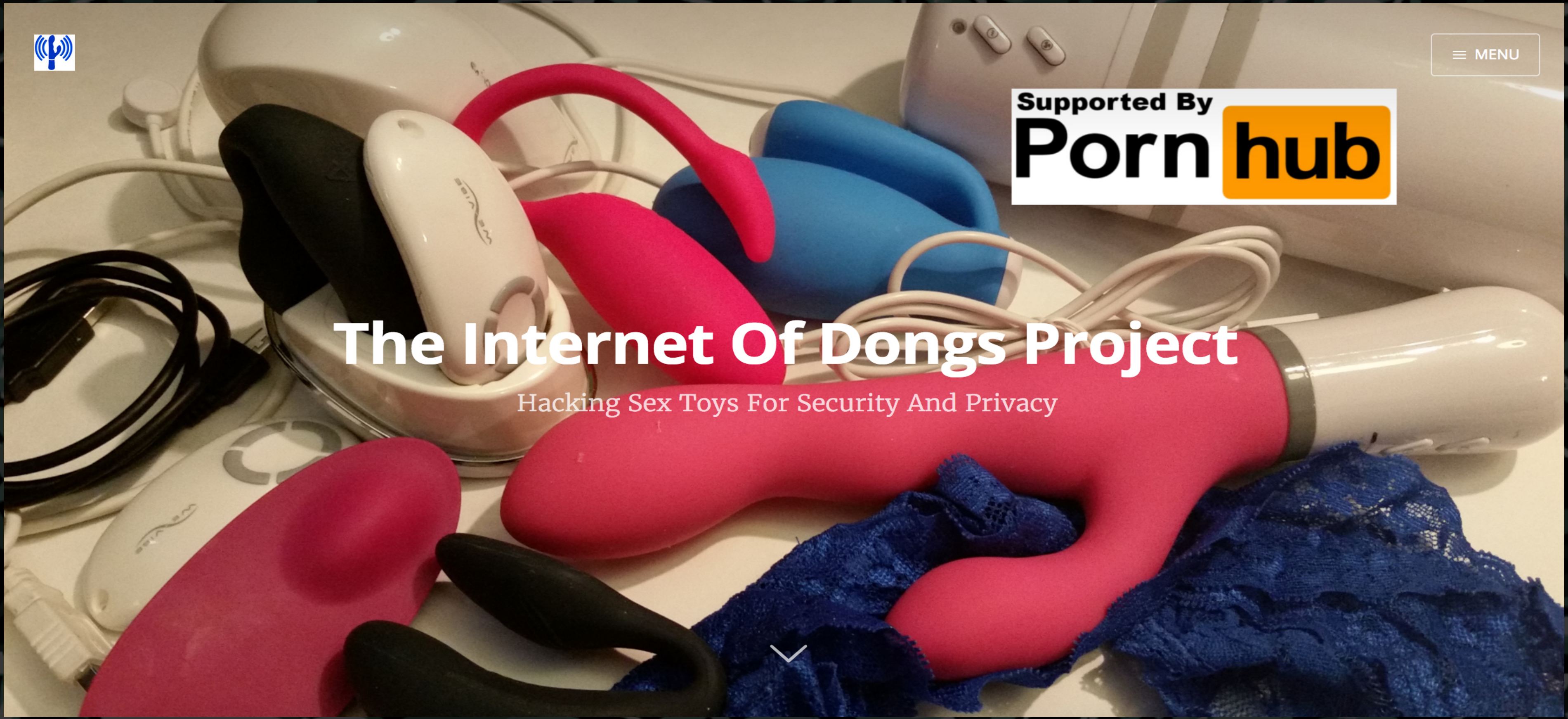
and stores them on your phone
without your knowledge

Vibrator & App

Lovense says:

No information or data was sent to the company's servers, and that this audio file exists only temporarily. An update issued fixed the bug.

Internet of Dongs



The Internet Of Dongs Project

Hacking Sex Toys For Security And Privacy

Internet of Dongs

(c) Eddie Mize

Internet of Dongs

* Project Hacks Sex Toys to Keep Your Intimate Life Private

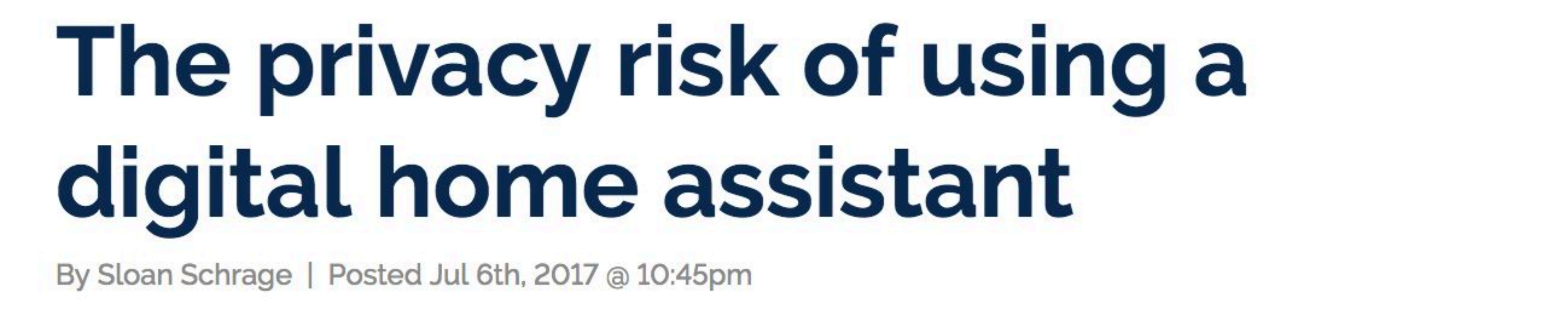
https://internetofdon.gs/

(c) Thomas Prenner
(Futurezone)

Privacy dangers

„Amazon Echo
can learn
a lot about their users,
their habits
and their personalities.“

Daniel Nesbitt,
Big Brother Watch, UK.



The privacy risk of using a digital home assistant

By Sloan Schrage | Posted Jul 6th, 2017 @ 10:45pm

***“The data that’s collected about you is an incredibly valuable asset for the companies that collect this information. And they turn around and use it, or sell it in various ways to monetize that information.”**

Cyber Security Expert Sean Laws at KSL.com

What happens with the data?

All digital assistants
send all voice controls that are made
after „Ok Google“ or „Alexa“
to their servers.
The data will be saved there.

Privacy dangers

„It is not easy for users to understand how, to what extent and where the information collected is processed. Also, it is not clear how long the data will be stored.“

German data privacy delegate,
Andrea Voßhoff.

Counter Measures

* Google Home and Amazon Echo both have a „Mute Button“

* Check the „Settings“ to control or delete the data that is collected

Yes, but…

Although Amazon and Google claim not to listen to conversations before the voice commands …

Both devices already got hacked.

WHAT CAN WE DO?

#tuwat against #iotfails

Status Quo

—> Information asymmetry between vendor & customer

Currently manufacturers do not need to provide essential information about the security of a device such as for how long it will receive security updates.

What we need

* A security star rating system for IoT products

* Vendors should be forced to close security holes instead of ignoring them

* Vendors should provide us at least with an e-mail-adress where we can easily report security flaws

What we need

* Mandatory offline-mode for electronical devices

* an airbag and seatbelt for the digital age

* product liability & clear update policy

Law: GDPR

Coming up in May 2018:

General Data Protection Regulation (GDPR)

with

* Privacy by Design

* Privacy by Default

* More possibilities for law enforcement

Max Schrems

„With every new technology we do experience a phase of craze. Everything that goes, will be done. If vendors won’t observe the law, we have to remind to do it.“

Max Schrems

What can consumers do?

„As a customer we can ask for a compensation when data breaches occur or any other violations of data privacy. If four million people sue a company, and ask for 1000 euro compensation, that could be ‚a bit expensive‘.“

Max Schrems

What can consumers do?

Support organizations that help you with fighting for your rights

((E.G. NOYB - noyb.eu))

What can customers do?

- * Ask: Does this product really need an internet connection?
- * Is it possible to turn it off - and is that product still working after that?

What can customers do?

* Read everything you can find on the product before buying it.

* If the vendor does not offer an option that you are happy with: don’t buy it!

* Write to the vendor to get more information.

What can customers do?

* Clicktivism sometimes helps to stop vendors making stupid decisions

* Online participation

What can customers do?

Follow the basics in IT-security

* Updates, Updates, Updates

* Separated network for IoT

* Safe Passwords

What can customers do?

* Support open hardware and open software
* Products where the data is stored locally are always a better option in terms of privacy
* Start building your own tools

What can developers do?

- Support privacy by design
- Support security by design
- Think about it from the beginning of your product development
- You can change things - take your responsibility

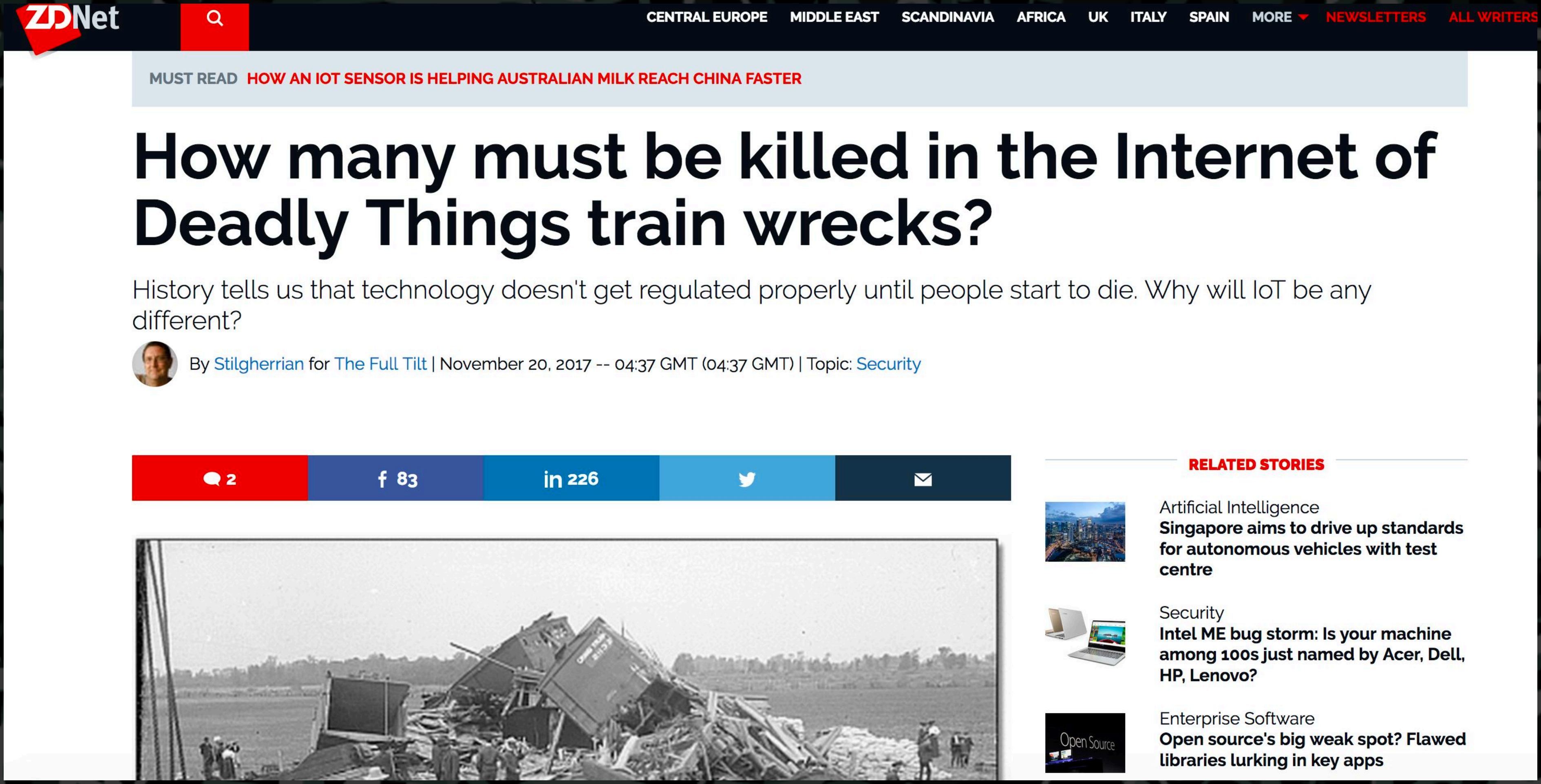
What can IT-Security do?

*Point the vendors to the problems
*Make help IoT Security stronger

*Keep reporting security flaws

*Publish your research (Open Science)
* Help develop IoT standards, labels and seatbeats
* Support each others work to get a stronger voice

Internet of Fails



MUST READ HOW AN IOT SENSOR IS HELPING AUSTRALIAN MILK REACH CHINA FASTER

How many must be killed in the Internet of Deadly Things train wrecks?

History tells us that technology doesn't get regulated properly until people start to die. Why will IoT be any different?

By Stilgherrian for The Full Tilt | November 20, 2017 -- 04:37 GMT (04:37 GMT) | Topic: Security

RELATED STORIES

Artificial Intelligence
Singapore aims to drive up standards for autonomous vehicles with test centre

Security
Intel ME bug storm: Is your machine among 100s just named by Acer, Dell, HP, Lenovo?

Enterprise Software
Open source's big weak spot? Flawed libraries lurking in key apps

Internet of Fails

„The great age of railway construction was likewise riddled with decades of disasters before the introduction of effective signalling and fail-safe brakes.“

Phil Kernick, founder of information security consultancy CQR.

Internet of Fails

Automotive Industry:

the mandatory fitting of seat belts, designing the bodies of cars to reduce injury to pedestrians, airbag and measures to reduce air pollution.

Internet of Fails

So do we need to kill a few people first?

"Unfortunately that's what will happen.“

Safety and security standards for the Internet of Things (IoT) can't come soon enough.

Your ideas?

Your input?

Thank you for your attention,

dear #34c3 crowd!

Now…. Let’s #tuwat!

Contact:

Twitter: @shroombab

shroombab@gmail.com