black hat EUROPE 2014

42 Calories ♥ 96 BPM
Location: AMS

QUANTIFIED SELF

Symantec.

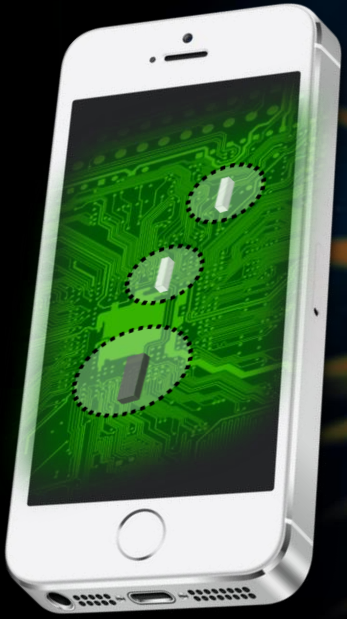
A Path to Self-Enlightenment or Just a Security Nightmare?

Candid Wüest
THREAT RESEARCHER

Thanks To: Mario Ballano & Hon Lau

WHAT IS QUANTIFIED SELF?

Recording everything about your life



Sports & Recreation

Internet Of Things

Wearable Tech

QUANTIFIED SELF

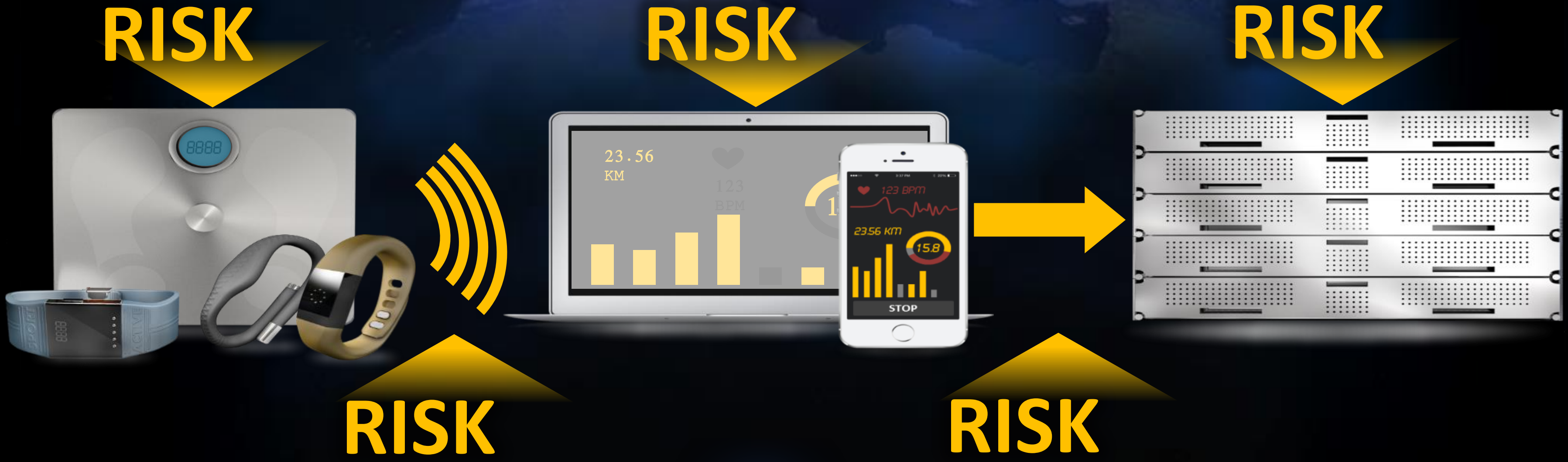
Health

Business

Culture

WHERE THE BITS FIT IN

More moving parts = more risks



RISK

RISK

RISK

RISK

RISK

UNINTENTIONAL DATA LEAKS

The secret life of mobile apps...

MAX DOMAINS CONTACTED

14

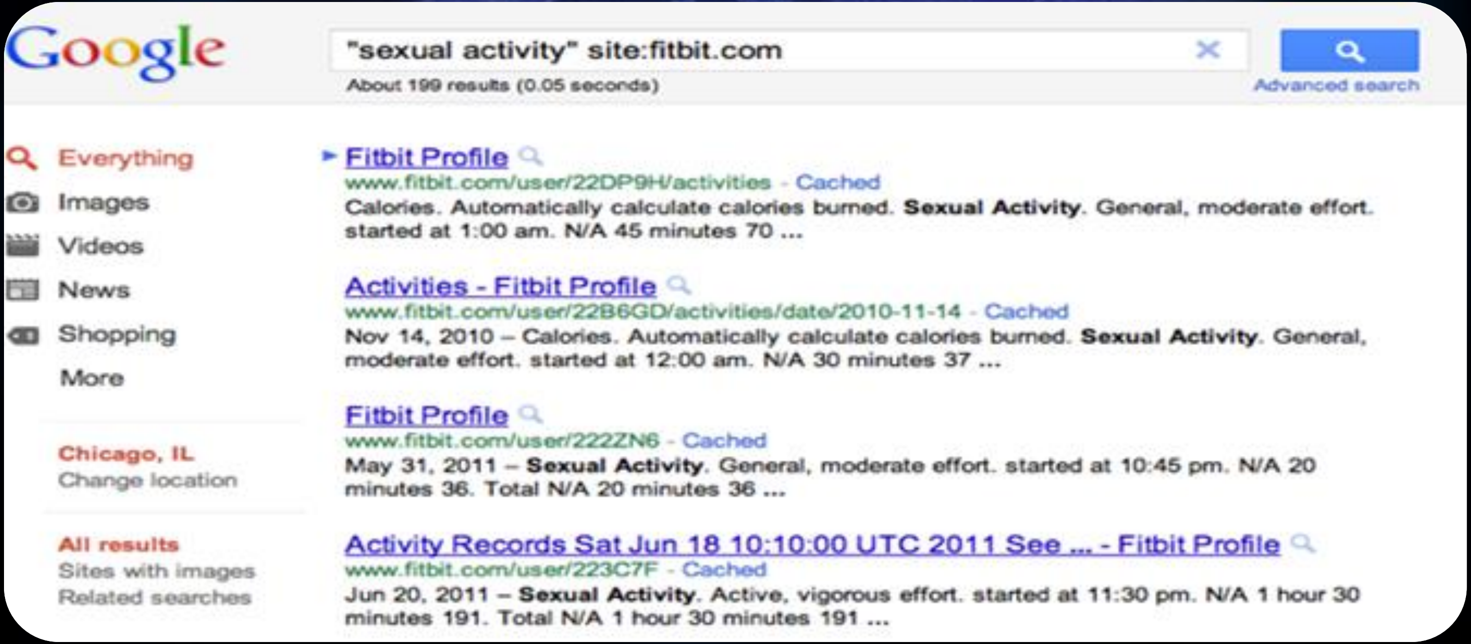
AVG DOMAINS CONTACTED

5

- APP ANALYTICS
- AD NETWORKS
- APP PROVIDER
- OS PROVIDER
- SOCIAL MEDIA
- APP FRAMEWORKS
- CRM/MARKETING
- UTILITY API

VERIFY THE DEFAULT SETTINGS!

Example: Fitbit once had the "sexual activity" visible to all by default



"sexual activity" site:fitbit.com

About 199 results (0.05 seconds)

Fitbit Profile
www.fitbit.com/user/22DP9H/activities - Cached
Calories. Automatically calculate calories burned. **Sexual Activity**. General, moderate effort. started at 1:00 am. N/A 45 minutes 70 ...

Activities - Fitbit Profile
www.fitbit.com/user/22B6GD/activities/date/2010-11-14 - Cached
Nov 14, 2010 – Calories. Automatically calculate calories burned. **Sexual Activity**. General, moderate effort. started at 12:00 am. N/A 30 minutes 37 ...

Fitbit Profile
www.fitbit.com/user/222ZN6 - Cached
May 31, 2011 – **Sexual Activity**. General, moderate effort. started at 10:45 pm. N/A 20 minutes 36. Total N/A 20 minutes 36 ...

Activity Records Sat Jun 18 10:10:00 UTC 2011 See ... - Fitbit Profile
www.fitbit.com/user/223C7F - Cached
Jun 20, 2011 – **Sexual Activity**. Active, vigorous effort. started at 11:30 pm. N/A 1 hour 30 minutes 191. Total N/A 1 hour 30 minutes 191 ...

DATA “CUSTODIANS”

It is personal identifiable information, but not as we know it

“Apps that access HealthKit are required to have a privacy policy,…”

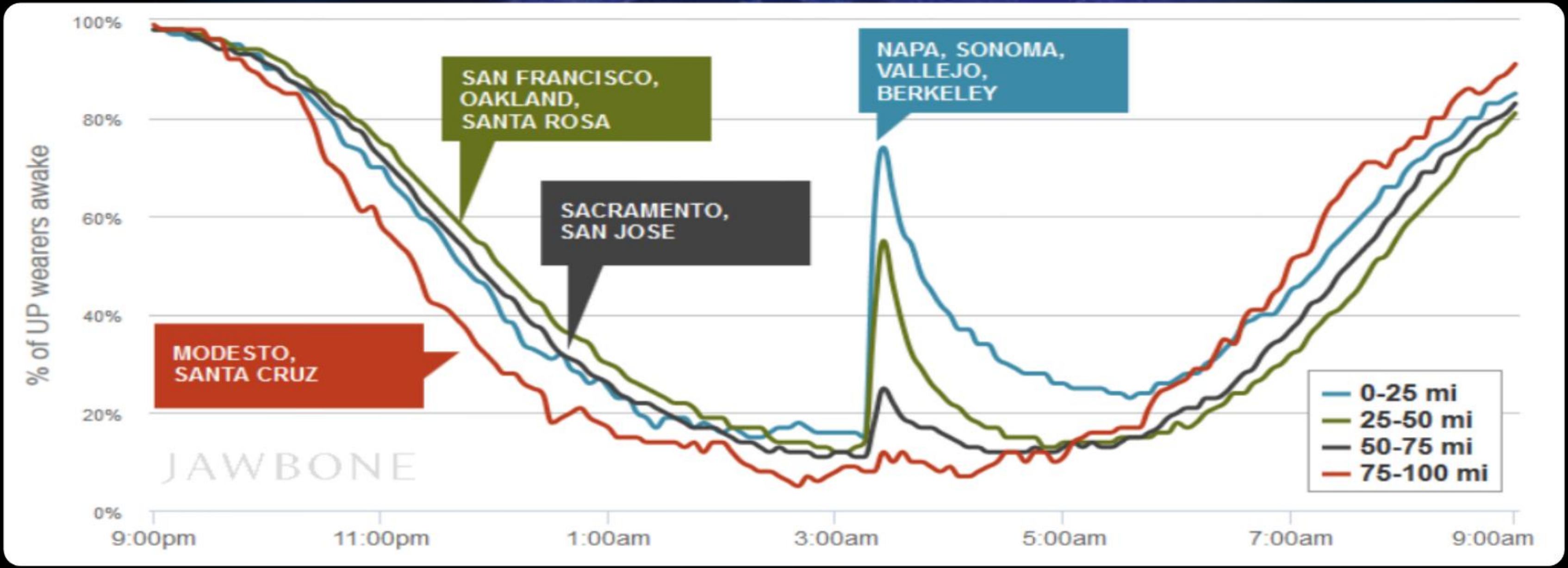
Apple.com

From the analyzed apps

52% had no privacy policy

YOUR DATA IS ALREADY BEING ANALYSED

Jawbone: Who’s asleep during San Francisco earthquake 2014?



20% SENT PASSWORDS IN CLEAR TEXT

Larger proportion of the top 100 health apps leaked activity data through HTTP

Some apps accepted self-signed certificates or don’t check revocation lists

```
POST http://api.******.com/Mobile/Functions.ashx?action=RegisterUser
    FName:        ken
    LName:        west
    GoalWeight:   68
    Email:        kenwest@this.tld
    Password:     P@SSw0rd
```

```
GET http://*****.***/api/createUser?
        username=KenWest
        email=kenwest@this.tld
        password=P@SSw0rd
```

```
POST http://******.*******.net/cgi-bin/account
    password:     8EEFB875DB938CEC08299BE7AA709EE0
    action:       create
    email:        kenwest@this.tld
    preflang:     de_CH
```

No need to crack simply pass the hash

ENUMERATE USER DATA FOR SPAMMERS

HTTP GET /api/getUser/877 [No authentication needed]

- Name
- Email
- Password
- Birthday
- Photo
- Nike_pwd
- Fitbit_token
- Withings_token
- Google_uid
- Facebook_access_token

<u>Ideal for spammers</u>

Email, context and Social media accounts

```
{[illegible]rue,"data":{"id":"877","name":"Kenw[illegible]st","email":"ken@this.tld",
"password":"705bf40d40cb2904b04294fbc355XXXX","role":"0","about":null,"salt":"XgDLkaenP1","sex":"
M[illegible]ge":null,"purpose":null,"coach_id":"1","heightfeet":null,"birthday":null,"heightinch":null,"startw
eight":null,"_currentweight":null,"targetweight":null,"_startbf":null,"_currentbf":null,"_targetbf":null,"_s
y[illegible]iastolic":null,"neck":null,"_hips":null,"_waist":null,"forearm":null,"wrist":null,"imageurl":
null,"photo":null,"thumbnail_65":null,"thumbnail_150":null,"nike_user":null,"nike_pwd":null,"nike_join":
"[illegible]":null,"provider":"0","timezone":"America\/Lo[illegible]","fitbit_secret":
null,"fitbit_join":"0","withings_token":null,"withings_secret":null,"withings_userid":"0","withings_join":"
0[illegible]e_uid":null,"google_join":"0",
"facebook_access_token":null,"face_join":"0","first_[illegible]":"0","metric":"0","last_entry":null,"face_cache_l
a[illegible]","uuid":"d53fe2973d3ad4276a8a[illegible]5aaae07[illegible]1a6XXXX",
"friendly":0,"follow":0,"currentweight":"190","sexnumber":"1","percent_to_lose":100,"percent_to_bf_lo
s[illegible]t":1650,"systolic_warning":"bar bar-warning", "diastolic_warning":"bar bar-
warning","systolic":null,"diastolic":null,
"[illegible]\/male\/male_110","avatar":"\/img\/male\/male_190","points":0,"avgcalories":"108
.712638854980[illegible]","avgminutes":"44.0000","avgweight":"190","sumweekcalories":"Still working on
w[illegible]","level":"Newbie",“xxxxscore":0.60394444444444}}
```

OPEN REMAILER SCRIPTS

```
POST http://www.***.com/members/community130204/sendmail.php
email:      kenwest@this.tld
subject:    Daily Activity
message:    Dear User,
            You have 1 new private message. Please go to …
```

```
POST http://www.***.com/members/community130204/sendmail.php
email:      kenwest@this.tld
subject:    Your Daily Spam
message:    Dear User,
            You have 1 new SPAM message. Please click here…
```

POSSIBLE IMPACT

Account hijack

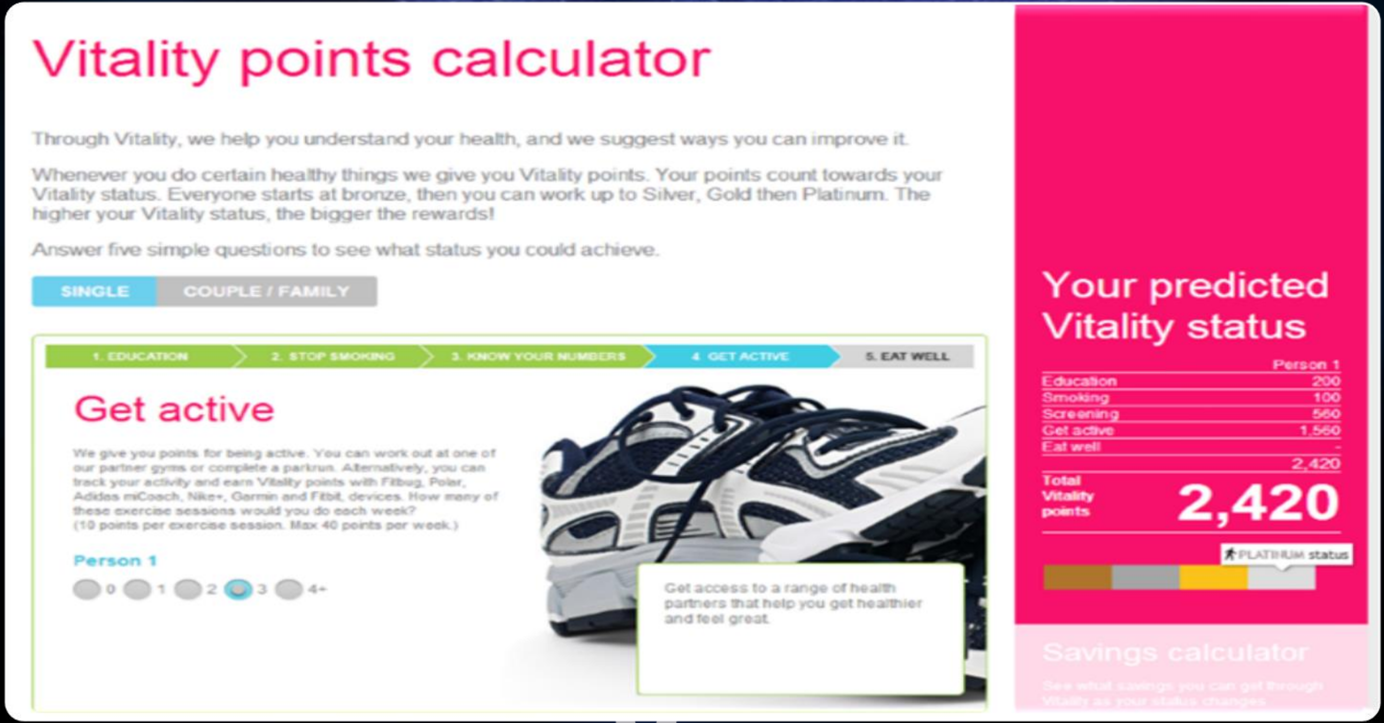
- The problem of password reuse
- Costs: Sign the user up for premium services, commitments, …
- Change the privacy settings

Spam

- Enumerate user data to send spam with context
- Create dummy accounts & use profile page as spam landing pages
- Use socal media accounts to find friends and spam them

GET REWARDED

Who said you have to run yourself? Dog-sitters?



Vitality points calculator

Through Vitality, we help you understand your health, and we suggest ways you can improve it.

Whenever you do certain healthy things we give you Vitality points. Your points count towards your Vitality status. Everyone starts at bronze, then you can work up to Silver, Gold then Platinum. The higher your Vitality status, the bigger the rewards!

Answer five simple questions to see what status you could achieve.

SINGLE | COUPLE / FAMILY

1. EDUCATION → 2. STOP SMOKING → 3. KNOW YOUR NUMBERS → 4. GET ACTIVE → 5. EAT WELL

Get active

We give you points for being active. You can work out at one of our partner gyms or complete a parkrun. Alternatively, you can track your activity and earn Vitality points with Fitbug, Polar, Adidas miCoach, Nike+, Garmin and Fitbit, devices. How many of these exercise sessions would you do each week?
(10 points per exercise session. Max 40 points per week.)

Person 1

○ 0 ○ 1 ○ 2 ● 3 ○ 4+

Get access to a range of health partners that help you get healthier and feel great.

Your predicted Vitality status

	Person 1
Education	200
Smoking	100
Screening	560
Get active	1,560
Eat well	-
	2,420

Total Vitality points **2,420**

PLATINUM status

Savings calculator

See what savings you can get through Vitality as your status changes.

POSSIBLE IMPACT Cont.

Loss of privacy

- Reveal personal details: Identity theft, profiling, extortion, …
- Reveal Location: Stalking, burglar, kidnapping, corporate misuse, …

Loss of integrity

- Modify/inject data: Gain rewards, high scores, frustrate other people ;-)
- Delete the account and history
- Brick the device through firmware updates

BLUETOOTH LOW ENERGY

aka Bluetooth SMART and BTLE part of BT 4.0 (2010)

- Different from classic Bluetooth
- Does frequency hopping but can still be sniffed
- Pairing has been broken (Mike Ryan)

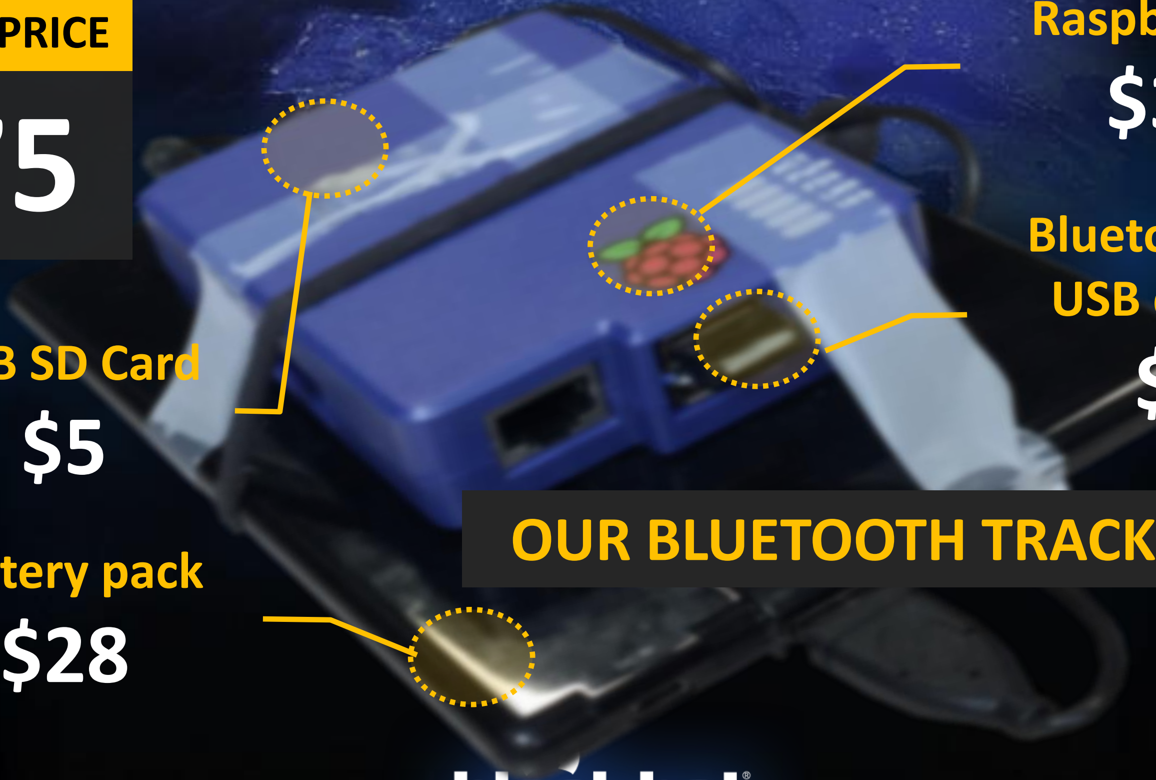
”Bluetooth Smart (low energy) technology supports a feature that reduces the ability to track a Bluetooth device over a period of time by changing the address on a frequent basis.”

Bluetooth.org

SCANNING WITH A BLUEBERRY PI

TOTAL PRICE

$75



Raspberry pi

$35

Bluetooth 4.0 USB dongle

$7

4GB SD Card

$5

Battery pack

$28

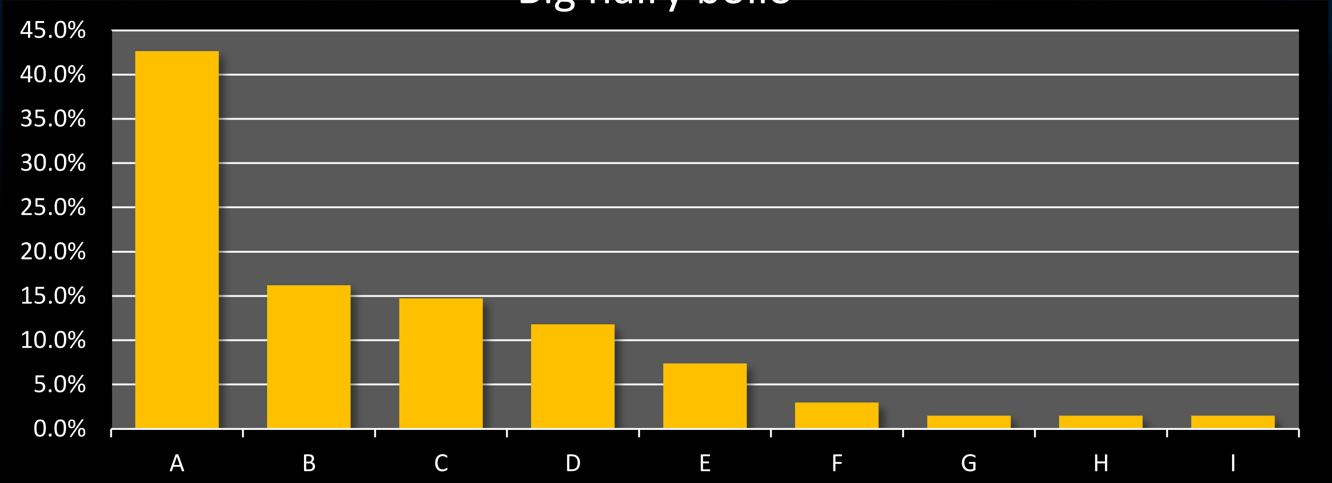
OUR BLUETOOTH TRACKER

SCAN RESULTS FOR MINI MARATHON

The phone may reveal the real name associated with the device

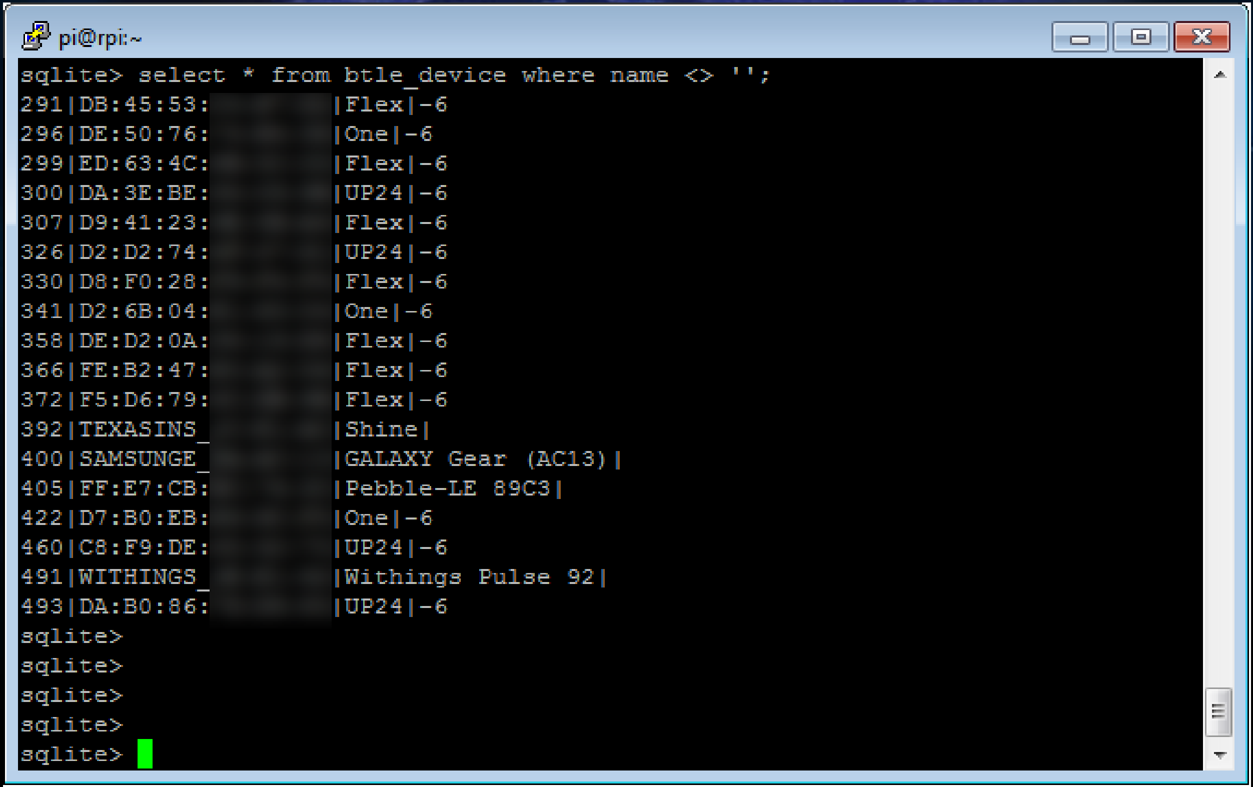
30 from 563 devices had something like a person’s name

- Rita :))
- Darren!
- Franks phone
- Erica
- Dawson
- Alieen's mobile!!:)
- Garret rip xxx
- Big hairy bollo



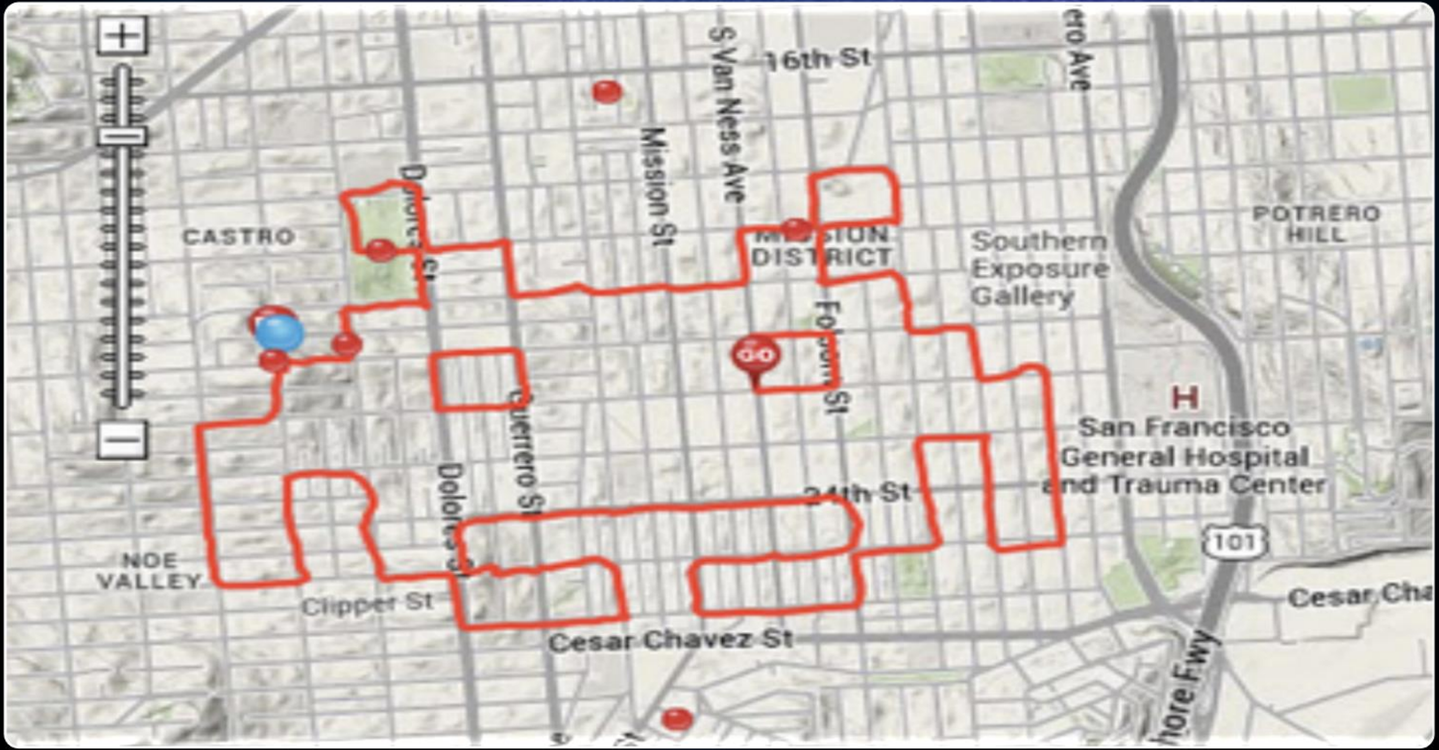
SCAN RESULTS FOR BLACKHAT EU 2014

203 BTLE devices and 21 wearable fitness trackers seen



```
sqlite> select * from btle_device where name <> '';
291|DB:45:53:[redacted]|Flex|-6
296|DE:50:76:[redacted]|One|-6
299|ED:63:4C:[redacted]|Flex|-6
300|DA:3E:BE:[redacted]|UP24|-6
307|D9:41:23:[redacted]|Flex|-6
326|D2:D2:74:[redacted]|UP24|-6
330|D8:F0:28:[redacted]|Flex|-6
341|D2:6B:04:[redacted]|One|-6
358|DE:D2:0A:[redacted]|Flex|-6
366|FE:B2:47:[redacted]|Flex|-6
372|F5:D6:79:[redacted]|Flex|-6
392|TEXASINS_[redacted]|Shine|
400|SAMSUNGE_[redacted]|GALAXY Gear (AC13)|
405|FF:E7:CB:[redacted]|Pebble-LE 89C3|
422|D7:B0:EB:[redacted]|One|-6
460|C8:F9:DE:[redacted]|UP24|-6
491|WITHINGS_[redacted]|Withings Pulse 92|
493|DA:B0:86:[redacted]|UP24|-6
sqlite>
sqlite>
sqlite>
sqlite>
sqlite>
```

SOME WANT THE DATA TO BE SEEN



Source: blog.everytrail.com

SELF-TRACKING CAN BE RISKY FOR USERS

Your digital footprint will be everywhere!

TRACEABLE!
23.56
KM
123
BPM
123 BPM
23.56 km
15.8
STOP

52%

Do not have a privacy policy

20%

Login credentials in clear text

14

Domains contacted by apps

WHAT CAN USERS DO?

TURN OFF BLUETOOTH IF NOT REQUIRED

KEEP DEVICE/SOFTWARE/OS UPDATED

DON'T REUSE USERNAME/PASSWORDS

USE STRONG PASSWORDS

LOOK FOR A PRIVACY POLICY

EXCESSIVE INFORMATION GATHERING

SCREEN LOCK

DEVICE ENCRYPTION

SECURITY SOFTWARE

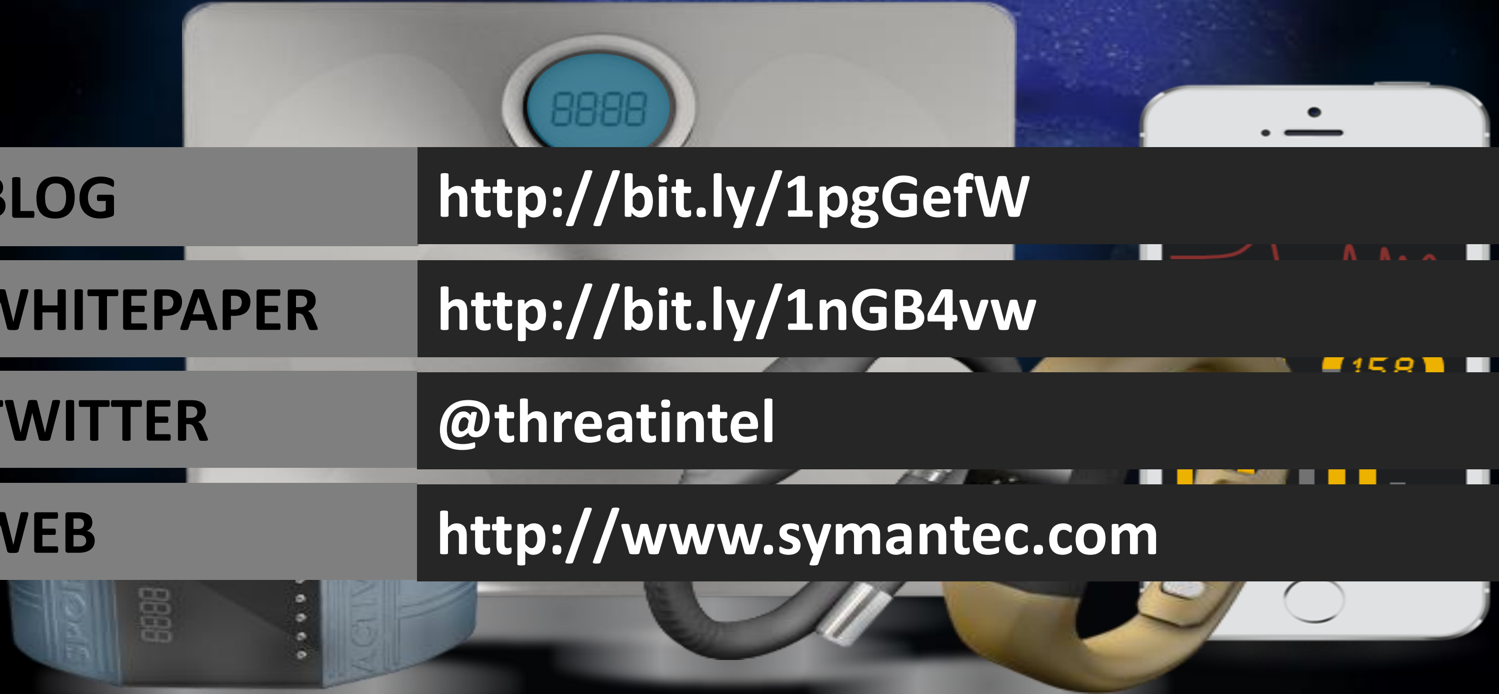
I Am The Cavalry

23.5
6 KM
123 BPM
23.56 km
15.8
STOP

QUESTIONS ?

BLOG	http://bit.ly/1pgGefW
WHITEPAPER	http://bit.ly/1nGB4vw
TWITTER	@threatintel
WEB	http://www.symantec.com

THANK YOU !



BLOG	http://bit.ly/1pgGefW
WHITEPAPER	http://bit.ly/1nGB4vw
TWITTER	@threatintel
WEB	http://www.symantec.com