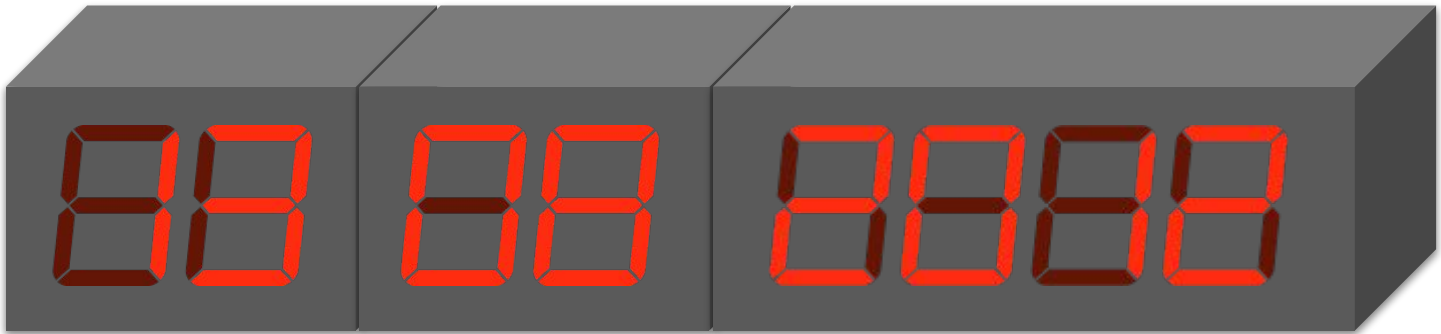




The Physical Space *is* the Interface

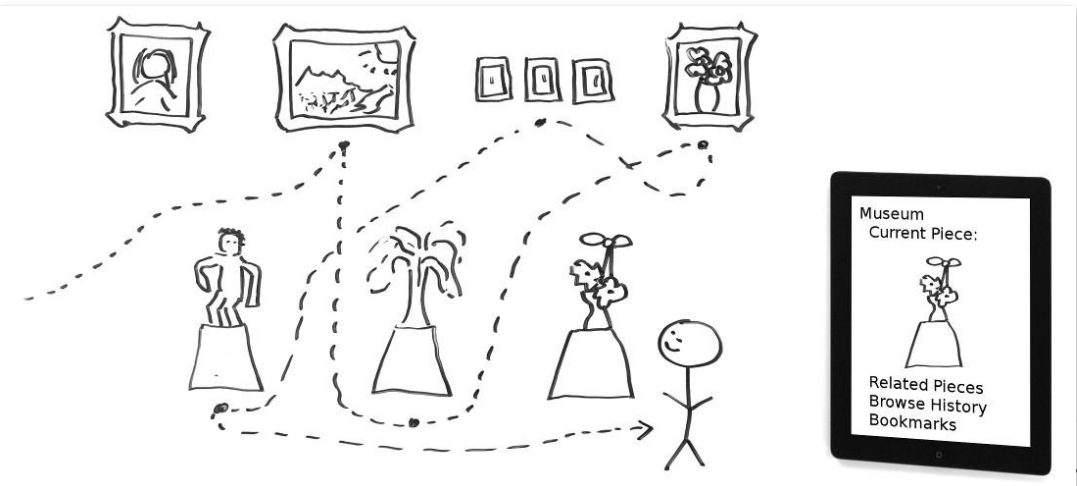
Presented by Jeffrey Dungen





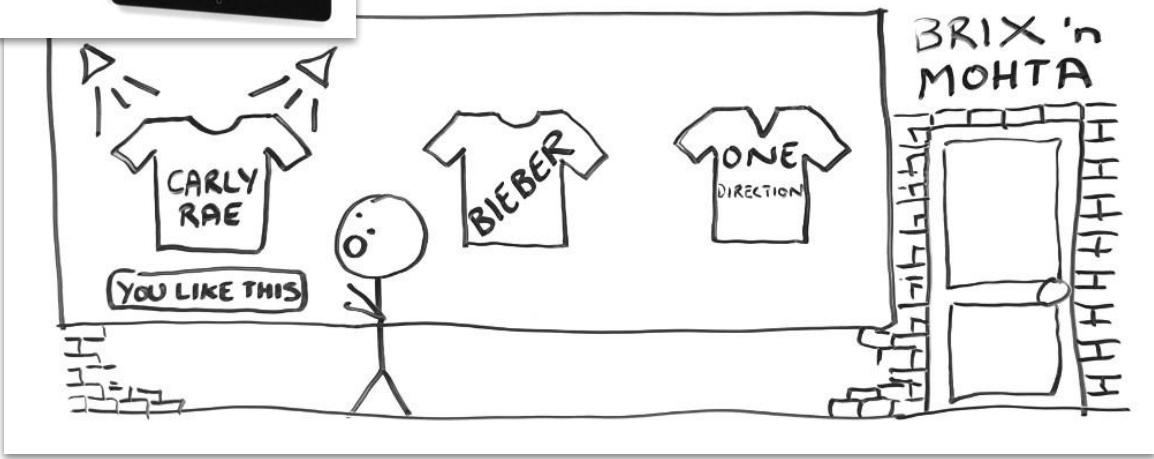
Back to reelyActive's first ever pitch...





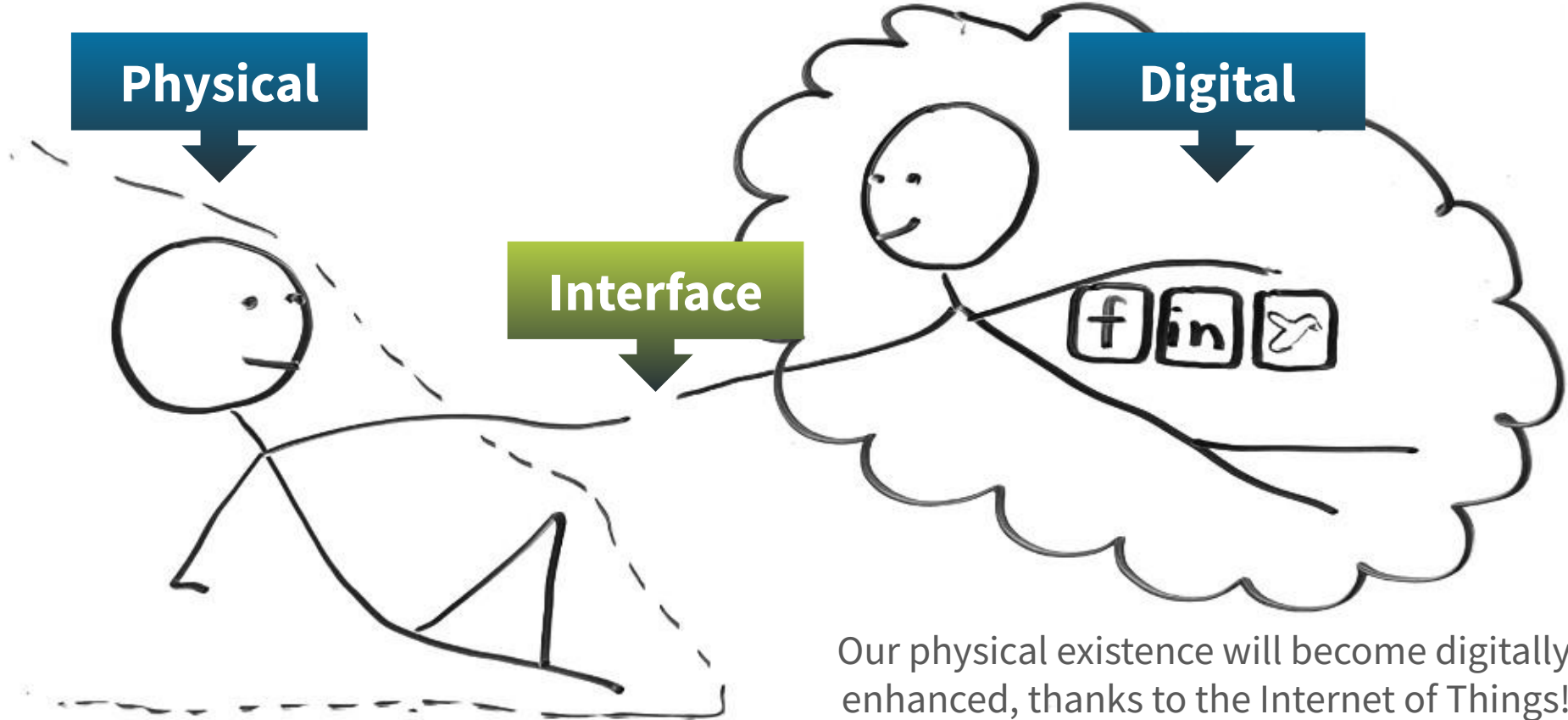
What if you could explore a museum like you do Wikipedia, complete with browse history?

What if "likes" were highlighted for you in real life and you could "like" real world discoveries?

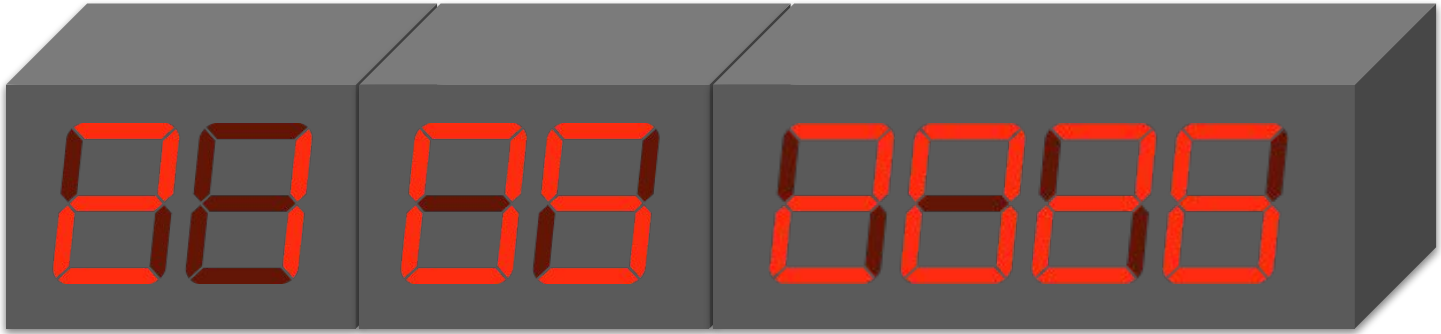


What if walking into a space meant logging into that space?





Our physical existence will become digitally enhanced, thanks to the Internet of Things!



Back to the Future!



I walk into *this* space as
cyber-physical Jeff, and...



Icons are Font Awesome 5.15.4 (Free)

EVERYTHING IS AWESOME

The resounding triumph of human-centric technologies ushering in an era of collective prosperity and well-being

What a joy it is to be alive during the cyber-physical enlightenment!

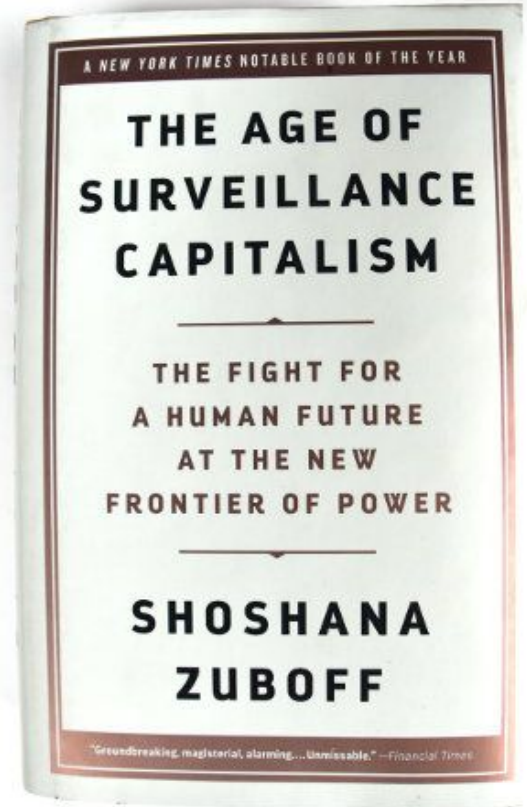


The future we imagined



The future we got*

* for now...



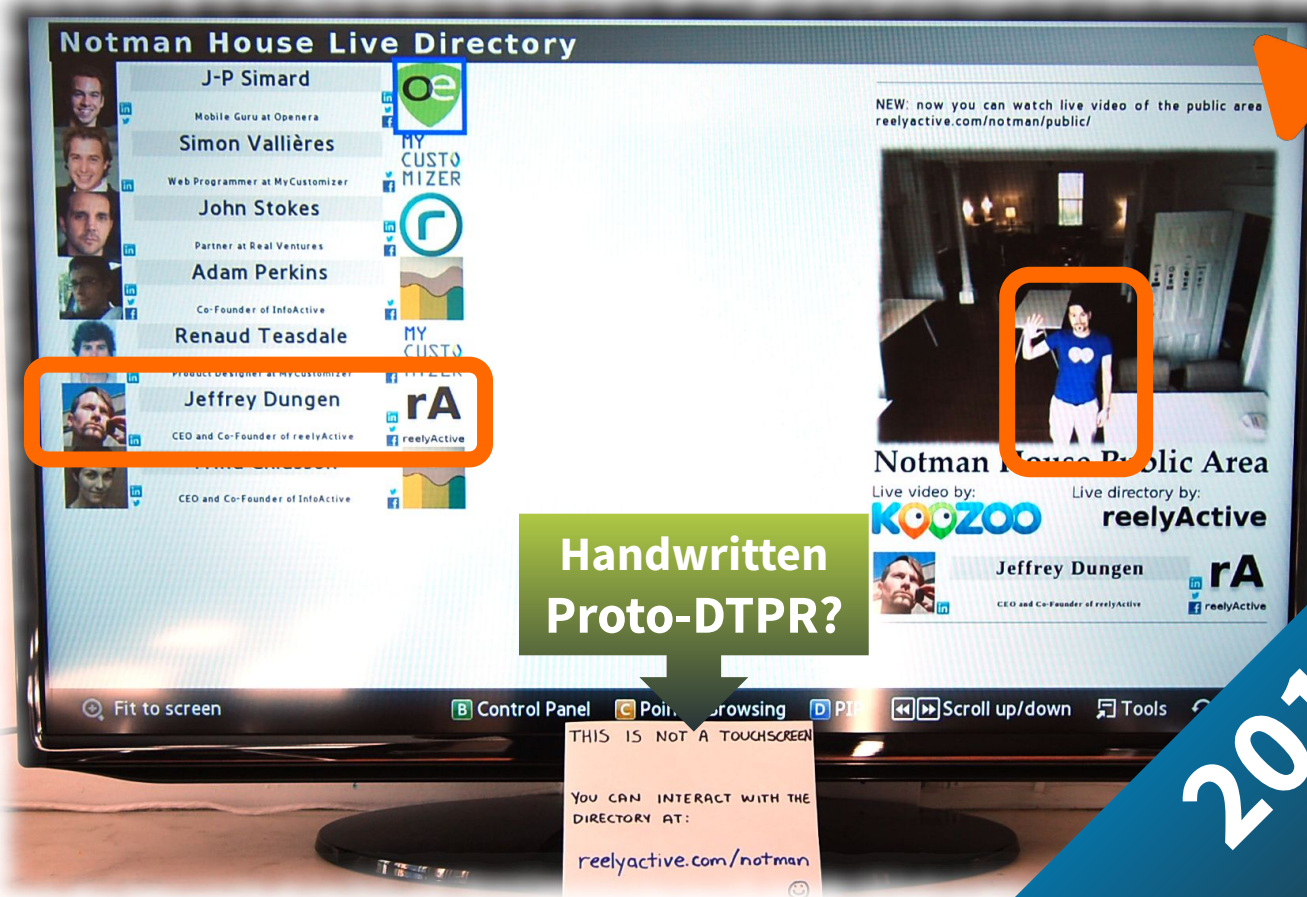
At least the future we imagined in 2012
is *technically* possible today.

Actually, it has been for many years. 🧐

Let's continue the journey in time!

Back to the Past!





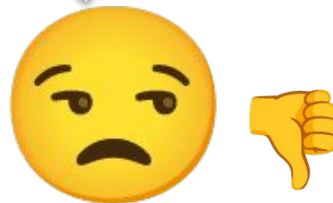
How did occupants feel about the **Live Directory**?



I love the *visibility* it gives me when I carry my **active RFID tag** into Notman House!*



I hate *feeling watched* by the **camera** even if the feed is available to everyone.



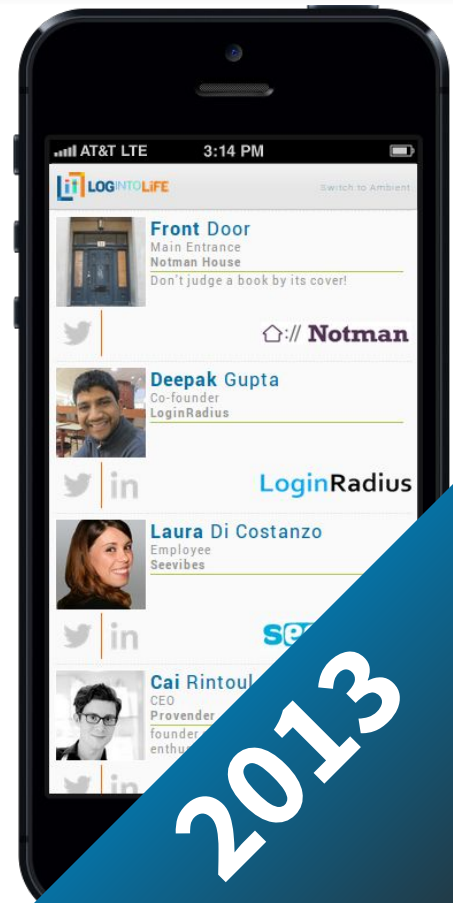
* carrying a tag was opt-in, which many occupants chose to do.

2012



Social Media Integration*

DTPRish?

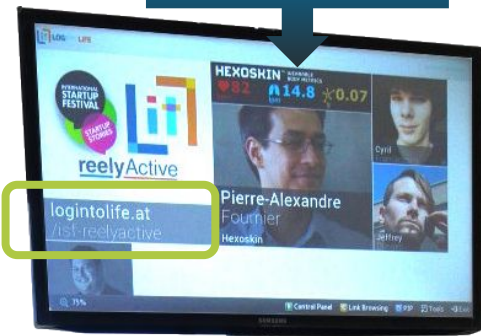


2013

* the interfaces were all web-based, and publicly accessible.



Live biometrics!



Where is?

You can find **Chris Arsenault** at the **Media Tent**.

2013



Mobile devices!



GIGAOM



Become a Client

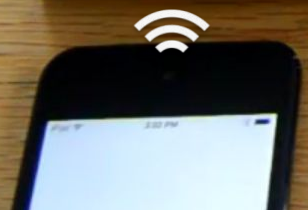
Search

Loophole in iBeacon could let iPhones guard your likes instead of bombard you with coupons

STACEY HIGGINBOTHAM | SEP 17, 2013 - 3:02 PM CDT

TOPICS: APPLE MOBILE TECHNOLOGY

www.reelyactive.com/press

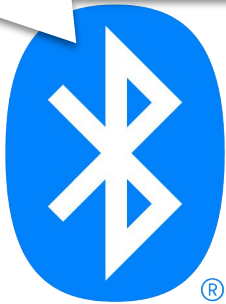


blog.reelyactive.com/2013/09/15/beyond-the-beacon-ble-just-got-reel/

2013

Global standards for radio-identification & representation emerge!

I help make **people** discoverable in physical spaces.



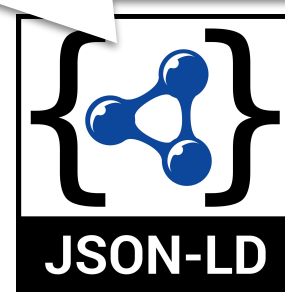
*Billions of **Bluetooth Low Energy** devices ship annually today.*

I help make **things** discoverable in physical spaces.



*Tens of billions of **RAIN RFID** devices ship annually today.*

I link structured data about **people, places** and **things**.



2014

Welcome! Notman House is a reelyActive smart space.

Who's here?

Soline Massot
Seevibes

David Germain
Seevibes

Grant Yim
Hypejar

Laura Di Costanzo
Seevibes

Noah Redler
Notman House

Emma Williams
FoundrFuel

Laurent Maisonnave
Seevibes

Visit logintolife.at/notman to learn more.

Welcome! Notman House is a reelyActive smart space.

SOCIAL SCENE

Recent tweets and photos from people who spend time here.

NEWS FEED

Official updates from Notman House.

NOTICE BOARD

Announcements posted by visitors.

Donuts in the break room. Please help yourself!

[Post a notice](#)

https://www.youtube.com/watch?v=MGZm6rUU6_g

Working with an interaction designer. 😊



2014

smartspac.es


Sonification
of physical presence!



2014

<https://www.youtube.com/playlist?list=PL11WqaPQMvNMT66MVxi-XqIQld6zY3tx>

Welcome! reelyActive is a reelyActive smart space.

Who's here?



Startup World Award
reelyActive



Laureé Montréal inc.
reelyActive



Caroline Guay-Chénard
reelyActive



Startup World Award
reelyActive



PARchemins / museMYway
MuseomixMTL



Jeffrey Dungen
reelyActive



JSON-LD



d9:01:4f:6b:a8:b2



Choose a view: **Who's Here?** What's Here? Social Sc...

2015

“reelyActive Unveils Sniffypedia, Openly Connects IoT and Semantic Web”

Sniffypedia

An open, collaborative repository of radio-identifiable, or "sniffable", things, represented as structured data.

Search by identifier:

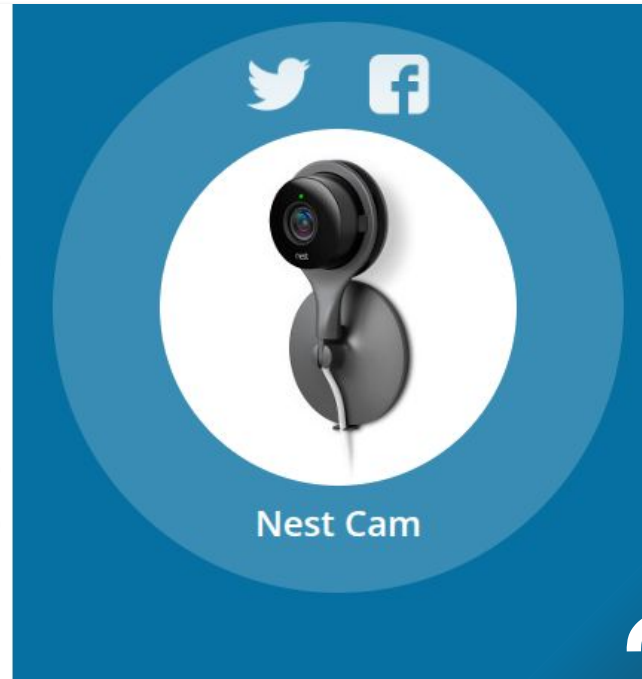
ble ▾ uuid128 ▾ d2d3f8ef9c994d9ca2b391c85d44326c ▾

Search by name:

Product/Nest_Cam/

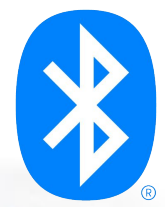
The Sniffypedia source is available [via GitHub](#) and the index is available [via npmjs](#).

[Contribute](#) [About](#)



2016

Make *any* space a Smart Space with a **Raspberry Pi 3B!**



MSRP:
\$35



2016

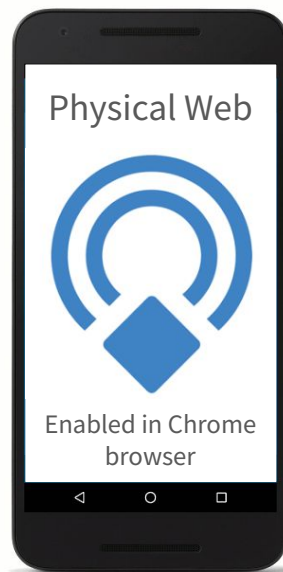
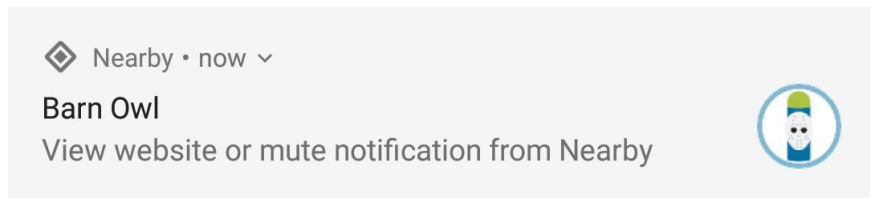
<https://reelyactive.github.io/diy/pi-suite/>

“Advertise yourself” on mobile with the Physical Web!




myjson.info/s/barnowl

Eddystone-URL packet
advertises *your* digital twin
to places/people nearby.



2017

www.reelyactive.com/reelyapp/

🙋 Google discontinues The Physical Web...

WEB RIP
OCTOBER 2017



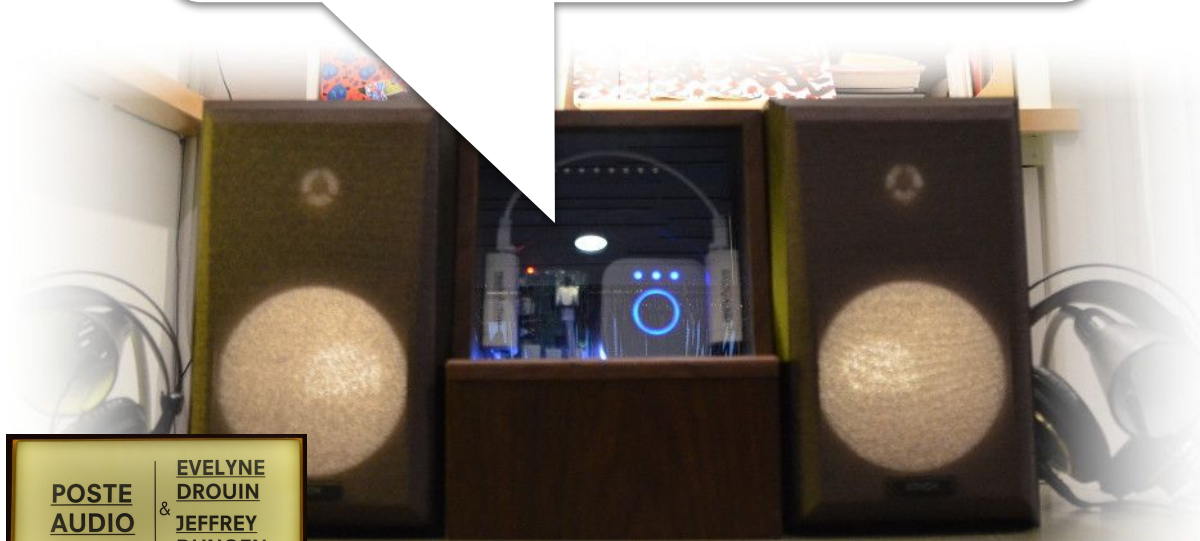
MOBILE RIP
DECEMBER 2018



2018

Présences Périphériques art installation

I create **soundscapes** and light sequences from the ambient wireless traffic of personal devices in the physical space.



POSTE
AUDIO

EVELYNE
DROUIN
& JEFFREY
DUNGEN

<https://reelyactive.github.io/experience-generative-art.html>

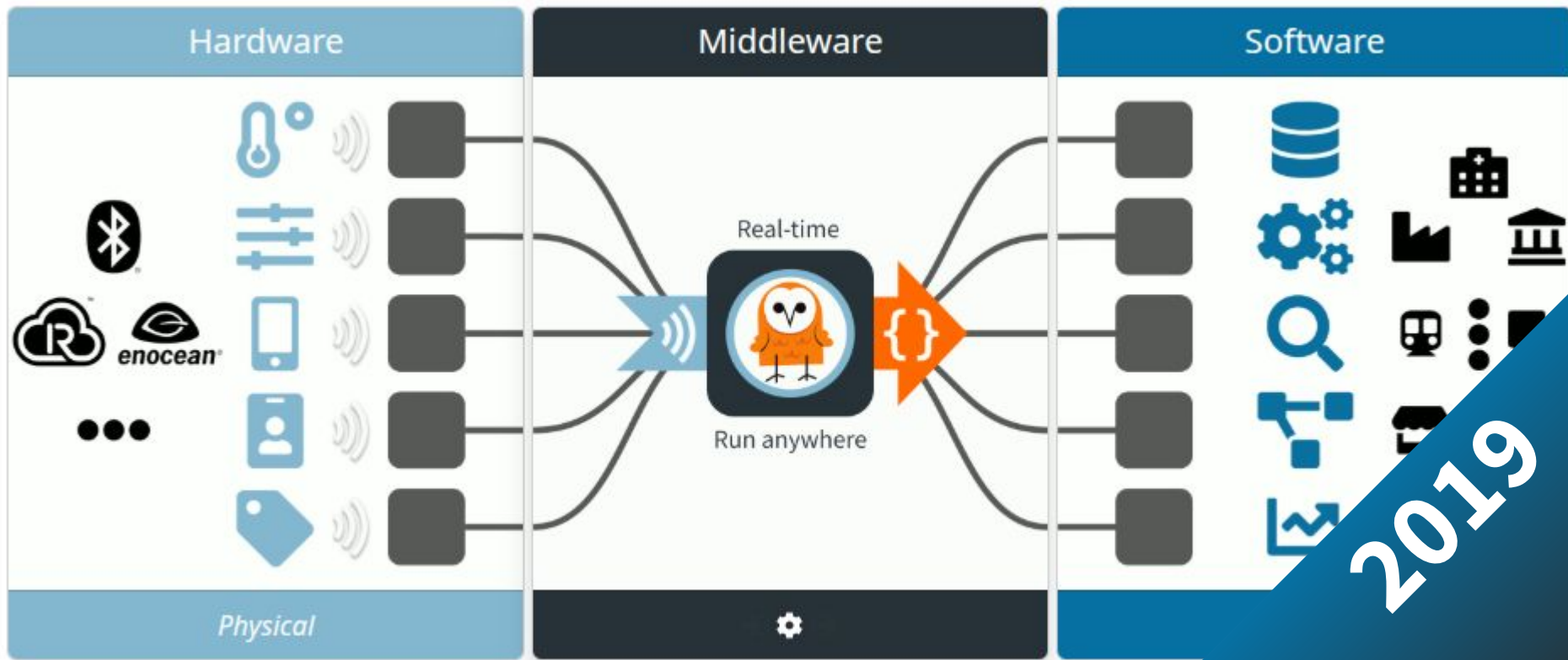
& in NYC



THE CIRCLE OF
HOPE
A HACKER'S DOZEN
2014 2016 2018 2018
NEW YORK CITY

2018

Pragmatic focus shift to **open source IoT middleware**



2019



reelyActive

Parc

We finally got a living lab:
Parc Avenue Research Centre

<https://www.reelyactive.com/parc/>
<https://github.com/reelyactive/cavabienaller>



Pandemic activity: integrate presence-adaptive lighting. 

2020

Integration with **ubiquitous WiFi** infrastructure (which supports BLE!)

Got commercial WiFi?

Your physical space can wirelessly detect, locate and sense all the Bluetooth Low Energy devices present at any given moment!



HPE aruba
networking



<https://www.reelyactive.com/pareto/anywhere/infrastructure/aruba/>

We discover **DTPR**, presented by Jackie, at an online conference!

DTPR

Making the Invisible Visible with DTPR

Enabling greater transparency and civic dialogue on the use of digital technologies in the built environment

Digital is invisible in the built environment

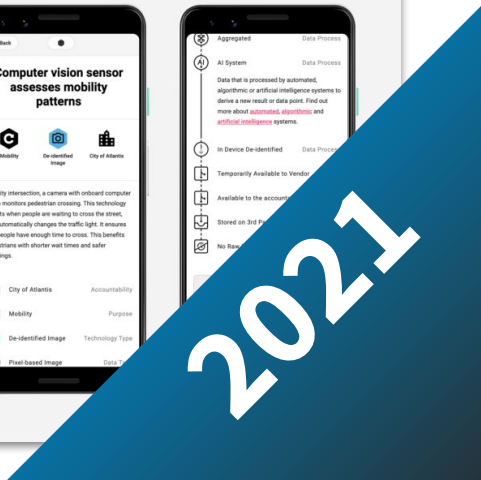
An emerging coalition to refine DTPR through real-world implementation

Learn more! <https://dtp.helplifespaces.com>

Questions? jackie@helplifespaces.com

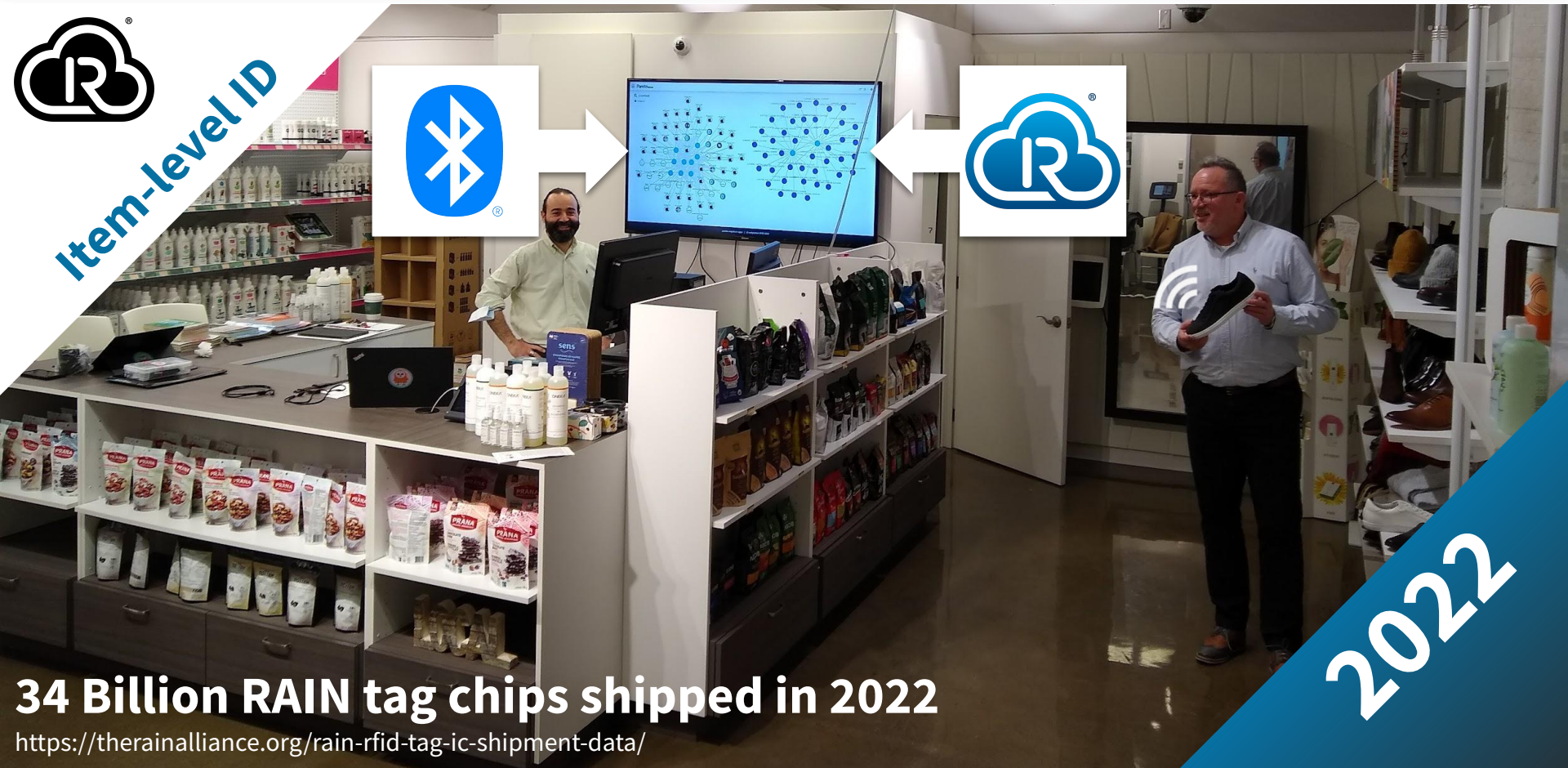
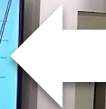
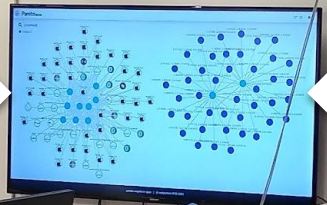
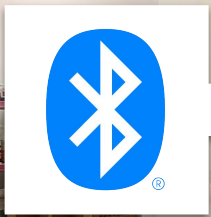
The Icons, Design Guide and Taxonomy for DTPR are licensed by the Digital Transparency in the Public Realm contributors under the Creative Commons Attribution 4.0 International (CC BY 4.0).

The open-source taxonomy supports a visual language, signage + a digital channel and can be a catalyst for community-building and conversation





Item-level ID



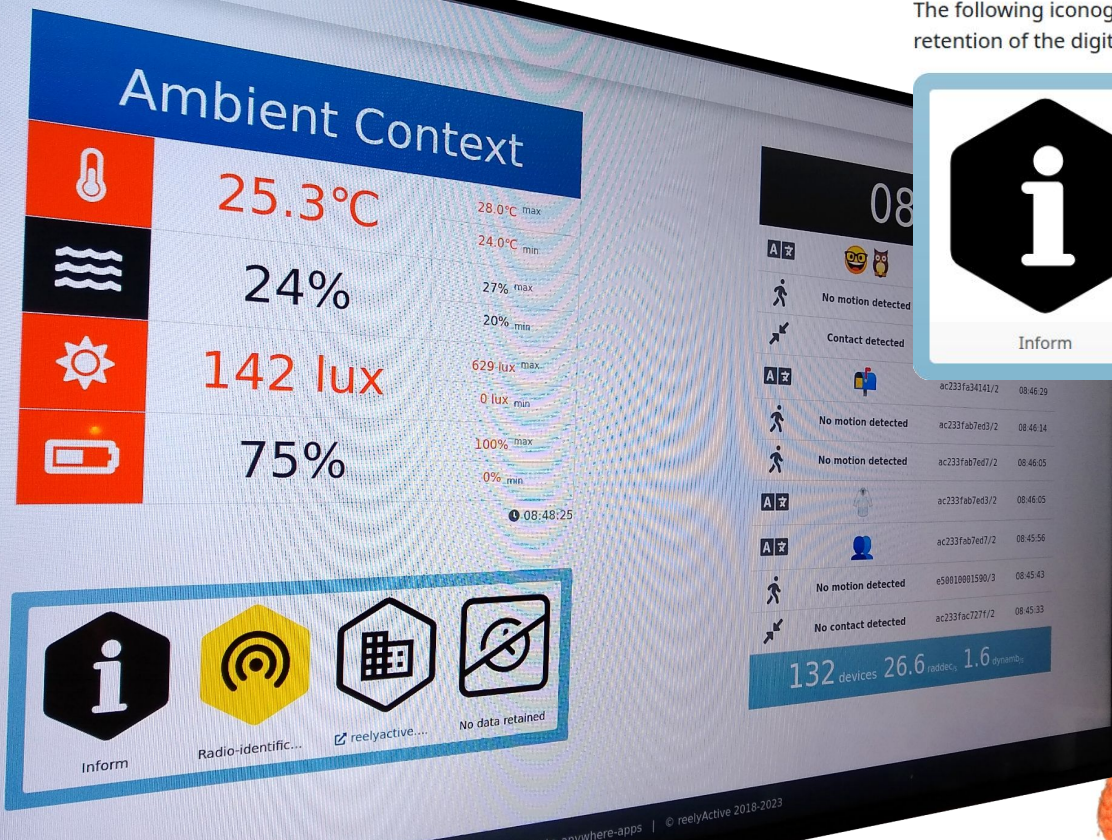
2022

34 Billion RAIN tag chips shipped in 2022

<https://therainalliance.org/rain-rfid-tag-ic-shipment-data/>

Digital Trust for Places & Routines

The following iconography informs about the purpose, technology, accountability and data retention of the digital systems present in the physical space.



Inform



Radio-identification



reelyactive.com



No data retained

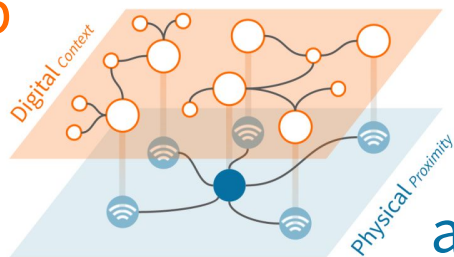
Are we the first to adapt DTPR to digital signage?



2023

Context-aware physical spaces—*with free WiFi!*

Imagine the
Web



at a
human scale

reelyActive

Human interaction evolution?

I discovered pareto.local

WiFi

GET /context

POST /context

Perhaps I'll POST a digital twin...

Web Bluetooth Scanning

Pareto

DIGITAL GRAFFITI?

IEEE RFID 2023

Context-aware physical spaces

IEEE RFID 2023

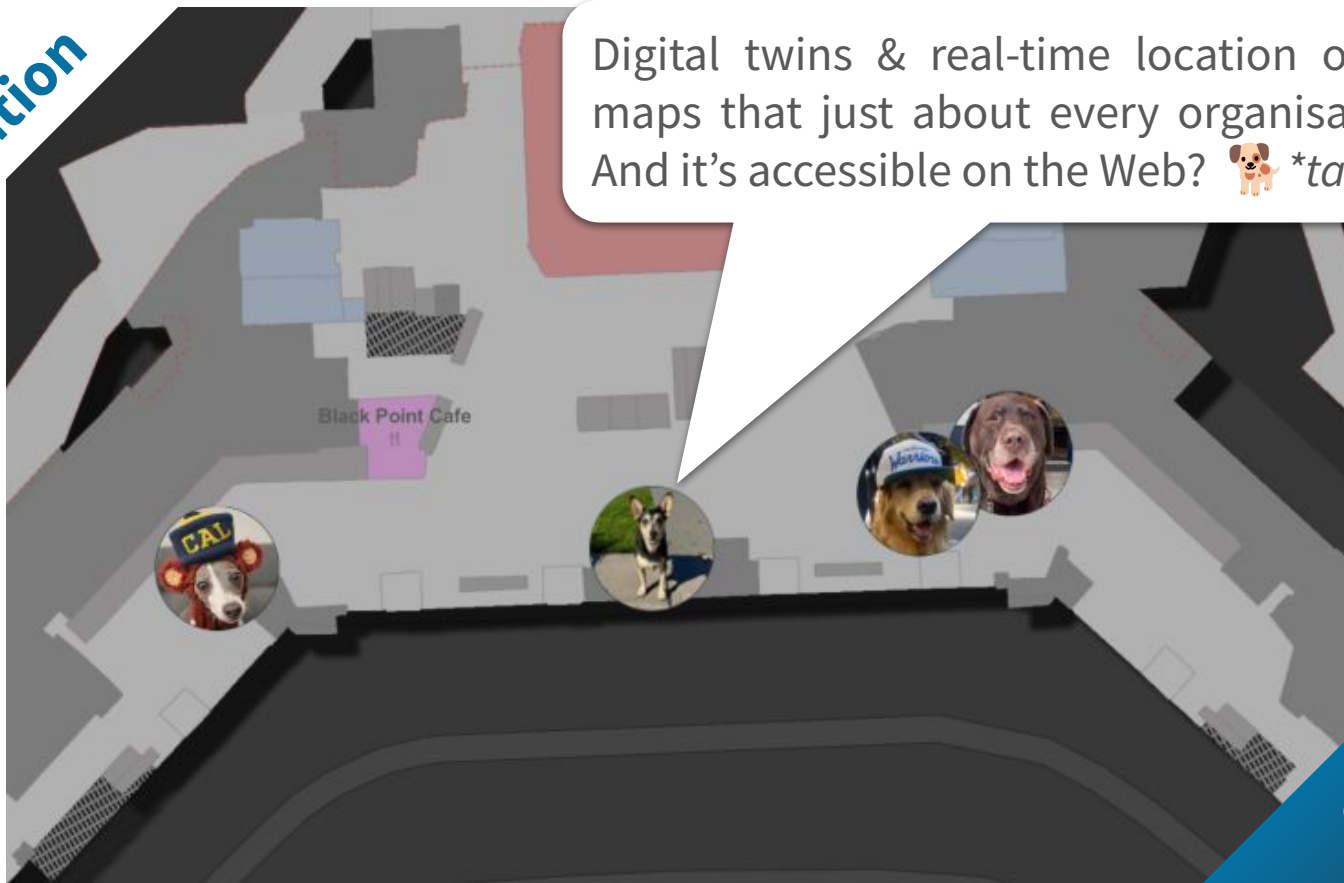
Tutorial: Context-aware physical spaces
Jeffrey Dungen
reelyActive
June 13th, 2023

<https://www.reelyactive.com/context-aware-physical-spaces/>
<https://reelyactive.github.io/diy/capspace-pi/>
<https://www.reelyactive.com/science/ieeerfid/reelyActive-ContextAwarePhysicalSpaces-230613.pdf>

2023



GIS integration



Digital twins & real-time location on the GIS maps that just about every organisation uses? And it's accessible on the Web? 🐕 *tail wags*

2025

<https://reelyactive.github.io/diy/arcgis-velocity-prep/>

Is the Physical Space *finally* the Interface?

We're back again!



Now, with all that we saw in our time travels:

Can a **physical space** simply tell you about the technologies present, their purpose, and what happens with the data?

Can **anyone** choose to receive this information through their preferred medium, any time they enter a physical space?



Device classification *may* reveal implicit/explicit **purpose**



Identifiable BLE



Motion Detector



IP Camera?

0xfeed
(UUID)



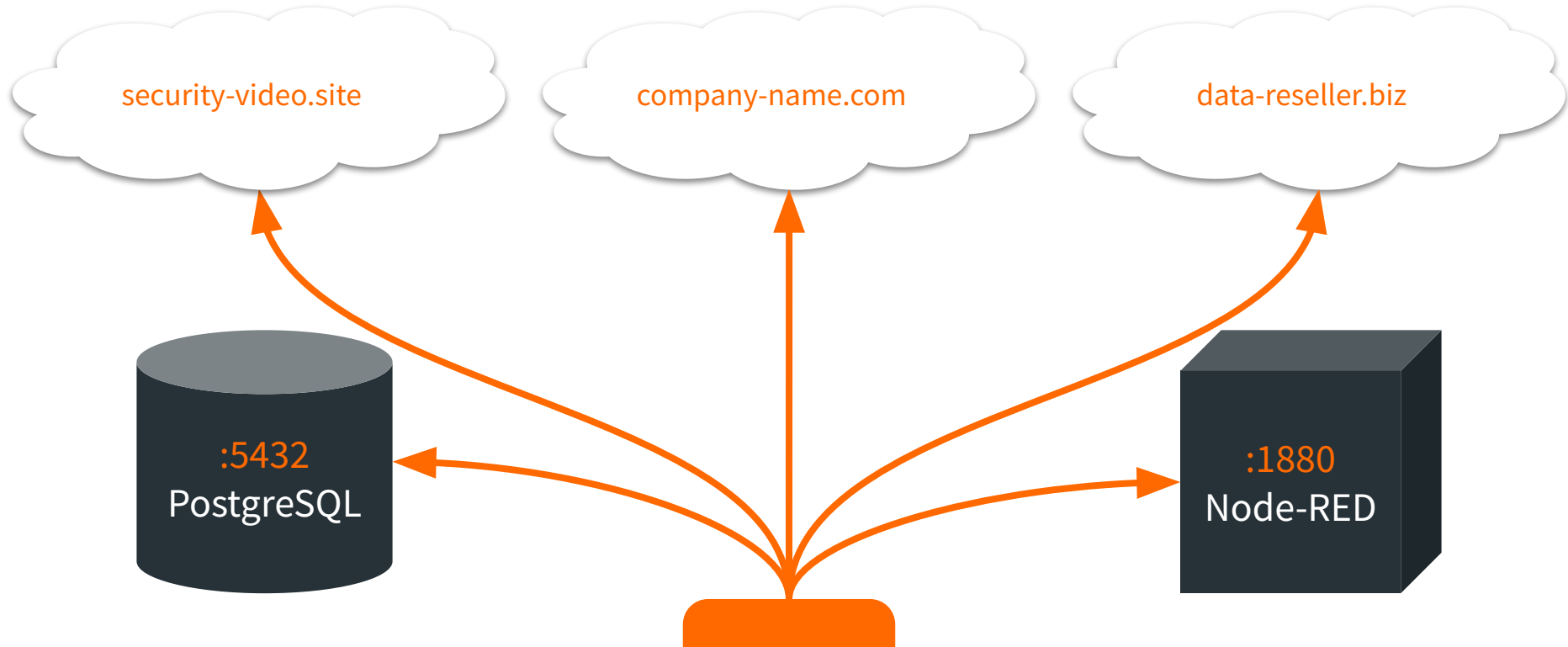
0x0639
(Mfr. data)



ac:cc:8e:xx:xx:xx
(OUI)



IP traffic destination *may* reveal **what happens with the data**

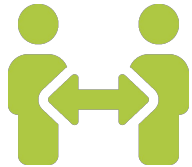


Mediums of communication to visitors and occupants

Some of the options we've explored:

- Printed icons (ex: DTPR)
- Digital signage (incl. DTPR)
- Personal devices (ex: mobile)
- Dynamic audible cues
- Dynamic lighting cues

Human-to-human is always an option too!



What's *technically* possible today?
Can the Physical Space
be the Interface?



1: Discovery



2: Sharing

Visit <http://context.local>

Connect to **free WiFi** via captive portal



I walk into this space and
get me some **free WiFi**...



SSID: SVA-open

Welcome to SVA!

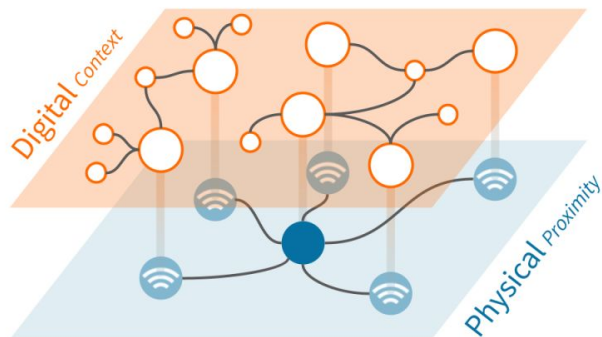
By signing in to **free WiFi**,
you agree to...

By **walking in to this space**,
you are interacting with the
following technologies for
the following purposes:



At the end of the day, it's just a **graph**, represented as **JSON**

How “things” are linked to data on the (semantic?) Web.



What “things” are present, how, and nearest to what?

```

{
  "@context": { "schema": "http://schema.org/" },
  "@graph": [
    { "@type": "schema:Product",
      "schema:name": "Assistance bracelet" },
    { "schema:dtp": "https://dtp.io/..." },
    { "@type": "schema:Person",
      "schema:givenName": "Jeffrey",
      "schema:knowsLanguage": "fr-CA" } ]
}

"devices": {
  "{id}": {
    "nearest": [ ... ],
    "dynamb": { "isButtonPressed": [true] },
    "uri": "https://me.info"
  },
  ...
  "{id}": { ... }
}
    
```

Computers can *interpret* this, rendering web pages and other interactions, triggering alerts.

Occupants can *contribute* to this via the devices they choose to carry and use.

DTPR as Linked Data?

Perhaps we can discuss:

- Should “things” be linked to DTPR?
- Would this likely be adopted in practice?
- What would motivate adoption?
- Is there a killer use case to serve as catalyst?
- What would the operators / occupants gain?



Could/should reelyActive implement this in Sniffypedia, which is celebrating its first decade in August, and is (over)due for a refresh? 🤔

The TL;DTPR

- **Physical spaces** are brimming with technology.
- Much of that tech can be **automatically identified**.
- That includes tech that **occupants choose** to carry.
- What's present—*and why*—can be **communicated back**.
- Occupants can absorb this info in myriad ways.
- **DTPR** can **guide & standardise** this practice.
- **DTPR** can **evolve** into new forms, such as linked data.



The Physical Space *is* the Interface

Presented by Jeffrey Dungen | jeff@reelyactive.com

