

JAVASCRIPT & INTERNET OF THINGS

WHEN JS MEETS IOT ❤

<https://goo.gl/q8KkYG>

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Author: Learning Ionic

Blog: The Jackal of Javascript

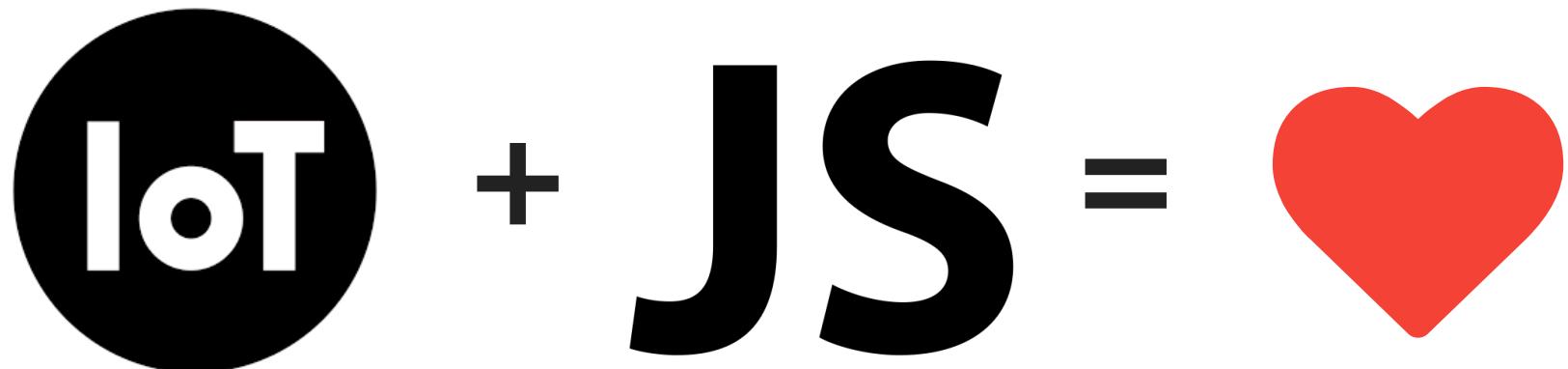
@work

Platform Architect / Co-Founder



the IoT suitcase

Agenda



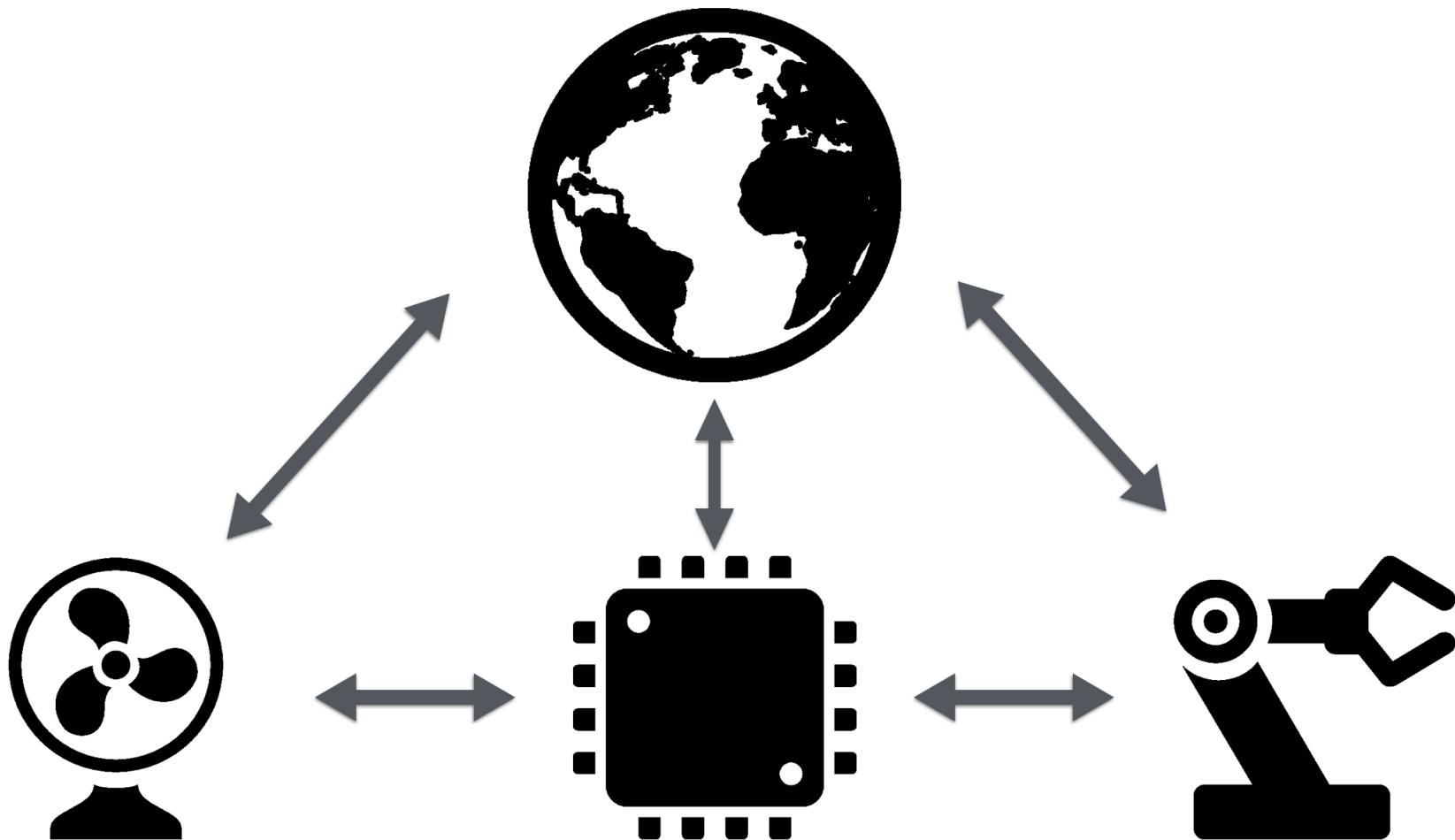


WHAT THE *IoT*?

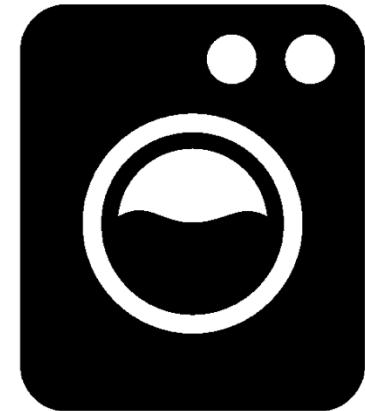
THE INTERNET OF EVERYTHING

I TOLD YOU TO PICK UP
MILK ON THE WAY HOME.
DON'T YOU LISTEN TO
ANYTHING I SAY??!





In Simpler Terms :



YO
Dude!!
I am
done!



Internet of Things is Quite *old*

Well... Nearly...
35 years old

The First IoT Device*



- A Coke Machine at Carnegie Mellon University, in **1982**
- By four exercise challenged but ingenious graduate students, *Mike Kazar, David Nichols, John Zsarnay, & Ivor Durham*
- So they could check from their desks if the machine was loaded with cold coke

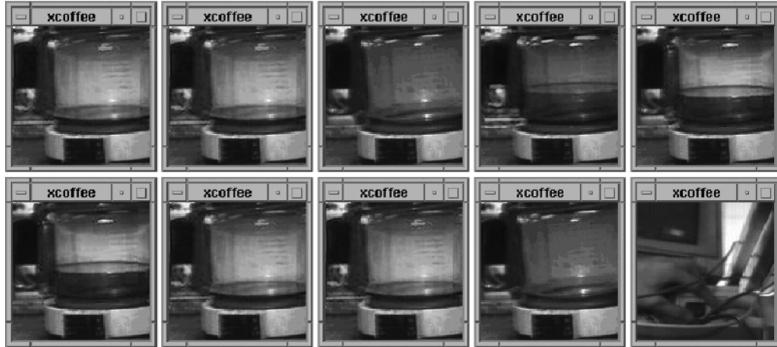
Did You Know :
The first webpage was created in 1991

Another Early IoT Device



- The Internet Toaster by *John Romkey* in 1989
- Connected to the internet with TCP/IP
- Controlled via Simple Networking Management Protocol Management Information Base (SNMP MIB)
- One control to turn on/off

The Trojan Room Coffee Pot

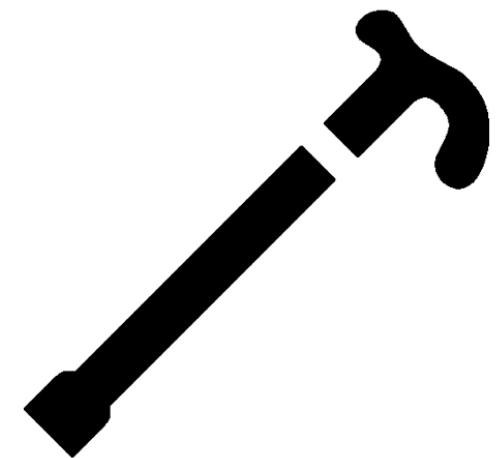


- Created by *Quentin Stafford-Fraser* and *Paul Jarretzky* in 1993
- It was located in the 'Trojan Room' within the Computer Laboratory of the University of Cambridge
- It used to monitor the pot levels with an image being updated about 3x a minute and sent to the buildings server

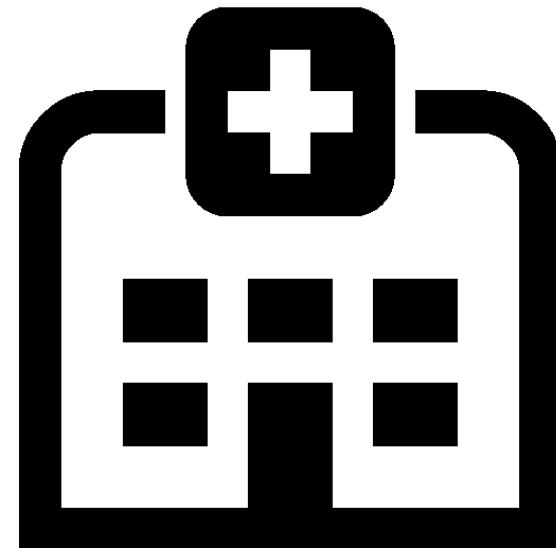
Laziness is the Mother of Invention!

IoT In the Real World

Healthcare



The Heart will notify The Hospital



Consumer IoT

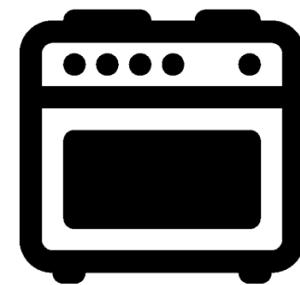
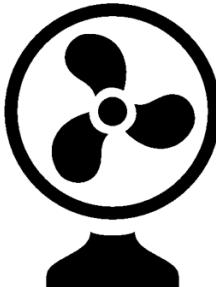
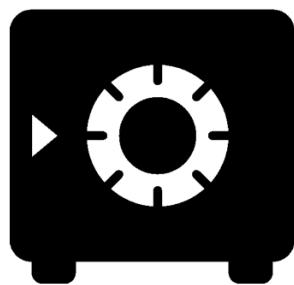
"IoT Helps us keep our plants hydrated

and our baby butts dry"

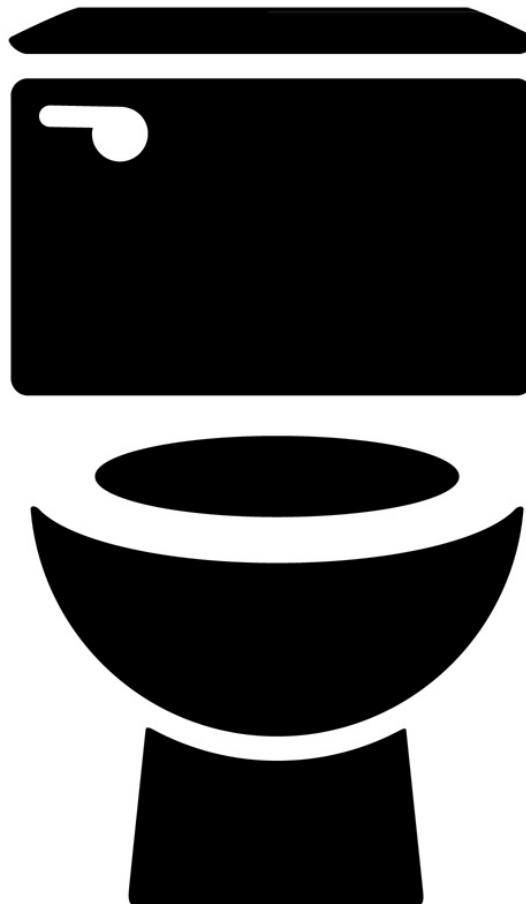
- Sudha Jamthe,
IoT Disruptions

Wearables





The Smart Toilet (*-*)





Internet of Shit
@internetofshit



Follow

SHIT, MY TOILET PAPER HOLDER JUST
TWEETED THAT I'M OUT OF PAPER



RETWEETS
137

FAVORITES
93



11:42 AM - 6 Jul 2015



ROOMBAH...!!!



GARAGE OPENERS... WHAT'S NEW?



IIIoT

The Toothpaste Factory (*~*)



Industrial IoT



**HOME
SECURITY**

**SMART
LOCKS**

**HOME
APPLIANCES**

**SMART
BED**

**SMART
LIGHTS**

**GARDENING
/ WATER**

TRACKERS

**SMART
PET**

**FITNESS
/ HEALTH**

**SMART
WATCHES**

**SMART
FASHION**

**HOME
AUTOMATION**

**CONNECTED
CAR**

**SMART
LOGISTICS**

**SMART
FACTORY**

**SMART
AGRI.**

**SMART
CITIES**

**SMART
GRID**

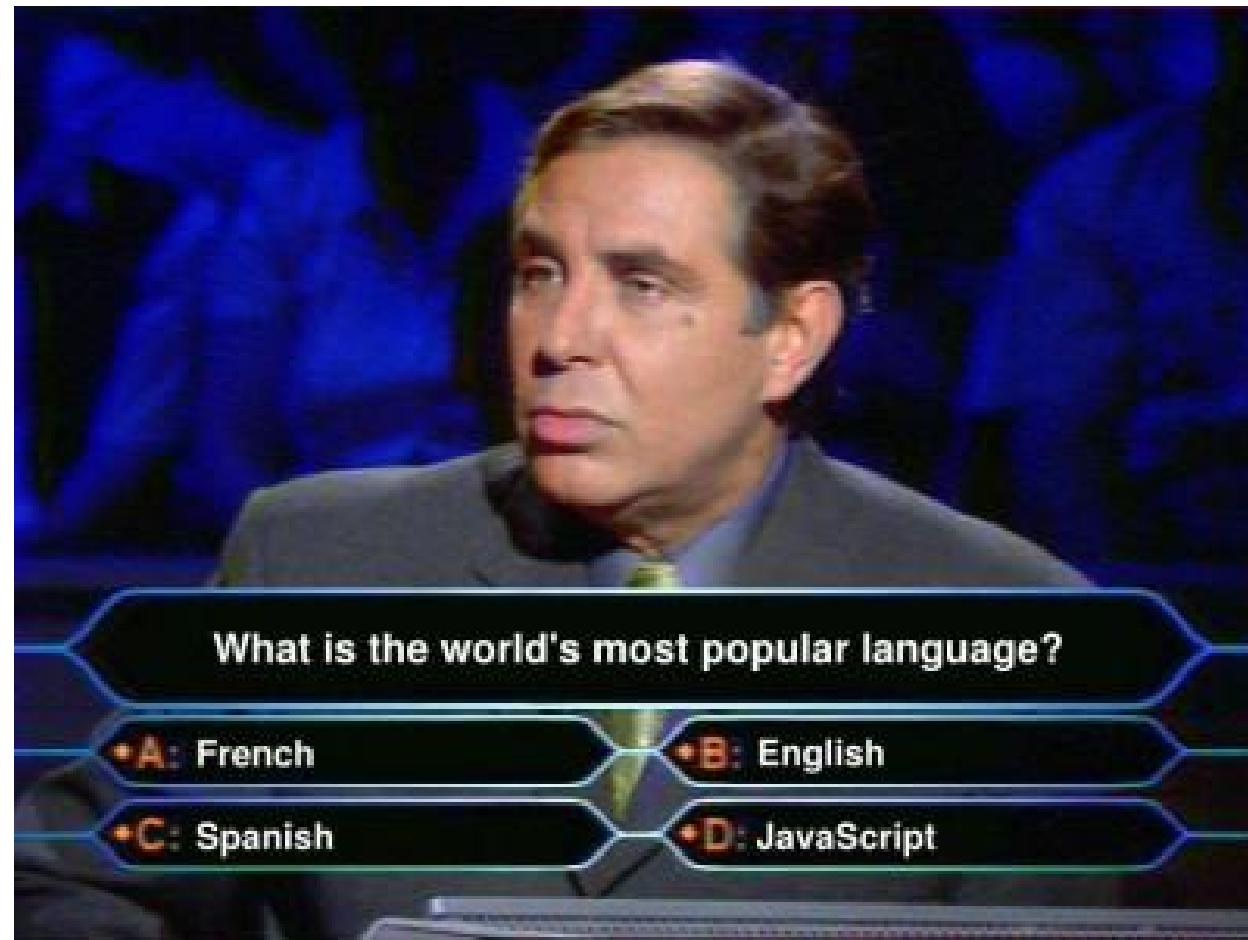
**SMART
RETAIL**

**SMART
HEALTHCARE**

JS

THE WORLD'S MOST
MISUNDERSTOOD
PROGRAMMING
LANGUAGE

OR



FEW REASONS!

MACHINE PRECISION

```
0.1 + 0.2 !== 0.3
```

undefined can be *defined*

```
var someVar;  
alert(someVar == undefined); //evaluates true
```

```
undefined = "I'm not undefined!";  
var someVar;  
alert(someVar == undefined); //evaluates false!
```

Scope can be faked

```
var animal = 'dog';

function getAnimal(adjective) {
    console.log(adjective + ' ' + this.animal);
};

var myObj = {
    animal: 'camel'
};

getAnimal.call(myObj, 'lovely'); //logs 'lovely camel'
```

null is an *object*

```
console.log(typeof null); //logs 'object'
```

nan is a number

```
console.log(typeof NaN); //logs 'Number'  
console.log(NaN === NaN); //evaluates false
```

Automatic globals

```
function f() { foo = 123 };
f();
console.log(foo); // logs 123
```

W.L.I.I.A.



Type Coercion

```
' ' == '0'          //false
0 == ''             //true
0 == '0'            //true
false == 'false'    //false
false == '0'         //true
false == undefined //false
false == null       //false
null == undefined  //false
"\t\r\n" == 0        //true
```

(;) optional?

Reasons to use a semicolon



What the...?

```
$ {} + [] // 0
```

```
$ {} + [] + '' // "0"
```

```
$ ({}) + () // "[object Object][object Object]"
```

```
$ ({}) + [] // "[object Object]"
```

```
$ Array(16).join() // ",,,,,,,,,,,,"
```

```
$ Array(16).join().length // 15
```

```
$ 'js' - 1 // NaN
```

Callback Hell

```
function register() {
    if (empty($_POST)) {
        $msg = '';
    } else {
        if (!$_POST['user_name']) {
            $msg = 'User Name is required';
        } else if (!$_POST['user_password_new']) {
            $msg = 'New Password is required';
        } else if (!$_POST['user_password_repeat']) {
            $msg = 'Repeat Password is required';
        } else if (!$_POST['user_email']) {
            $msg = 'Email is required';
        } else if (!$_POST['user_passmatch']) {
            $msg = 'Passwords do not match';
        } else if (!$_POST['user_name']) {
            $msg = 'User Name is required';
        } else if (!$_POST['user_email']) {
            $msg = 'Email is required';
        } else if (!$_POST['user_password_new']) {
            $msg = 'New Password is required';
        } else if (!$_POST['user_password_repeat']) {
            $msg = 'Repeat Password is required';
        } else if (!$_POST['user_passmatch']) {
            $msg = 'Passwords do not match';
        }
    }
    if ($msg) {
        $_SESSION['msg'] = $msg;
    }
    return register_form();
}
```



The illustration shows a person in a white karate gi and black belt performing a side kick or a similar dynamic pose. They are striking a circular target with their right hand. The target has a blue and white design, possibly representing a dragon or a similar motif. The background is plain white.

icompile.eladkarako.com

All these problems & JS?

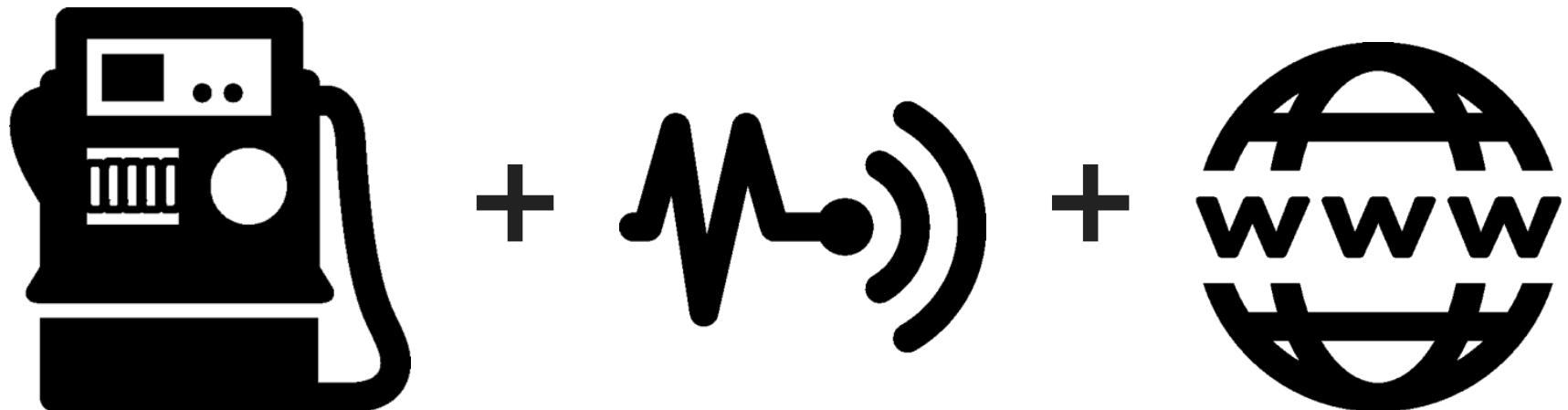
HERE IS WHY?

- JS JS everywhere..
- Event Driven nature
- One language all the way!
- HUGE set of libraries and frameworks
- ES6 is here!
- Amazing community
- It is free! :P

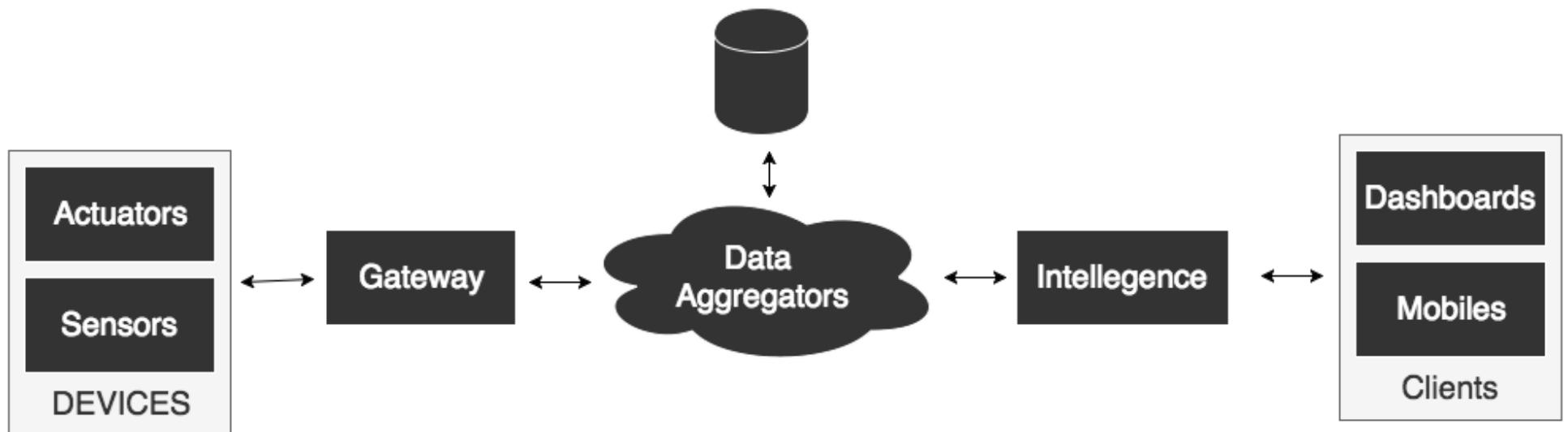


IoT + **JS**

How do we *IoTify*?



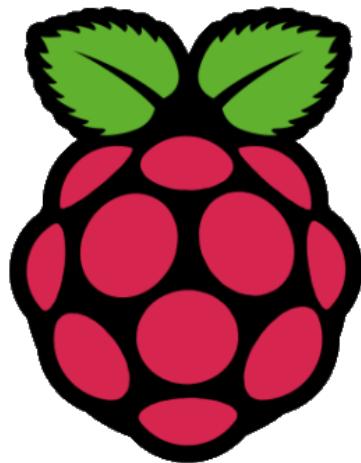
IoT Reference Architecture



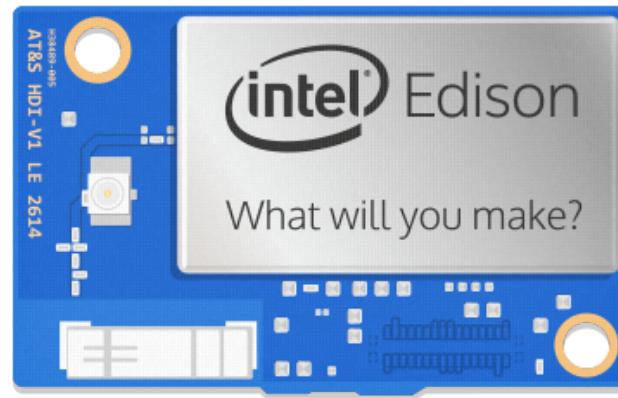
Where does JS fit in?

- Hardware
- Gateways - Hardware/Software
- Server/Data Aggregators
- Web Dashboards
- Mobile Apps
- Desktop Apps

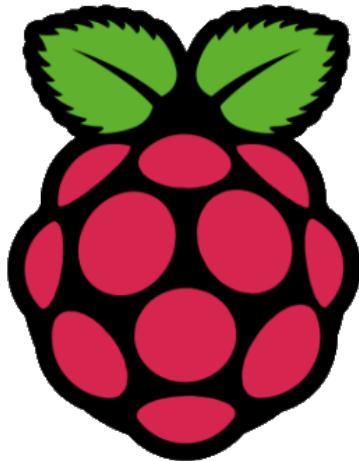
Hardware



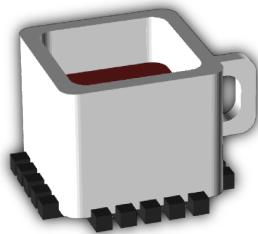
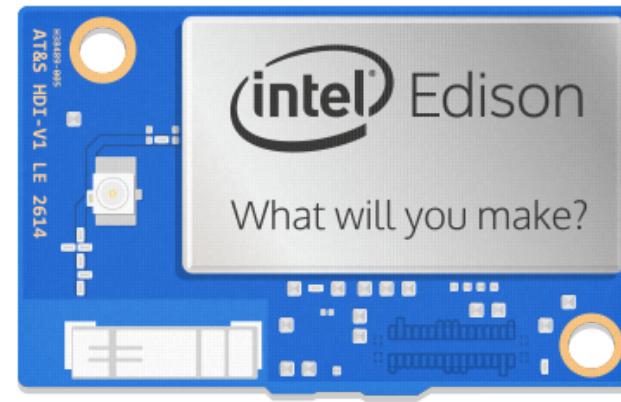
RaspberryPi



Gateways - Hardware



RaspberryPi



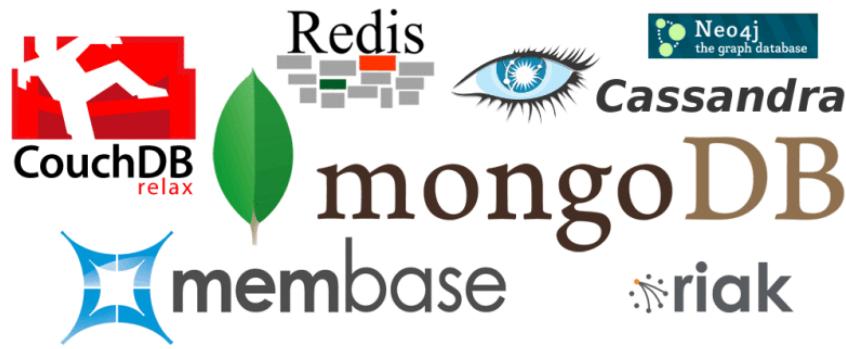
Espruino TESSEL



Gateways - Software



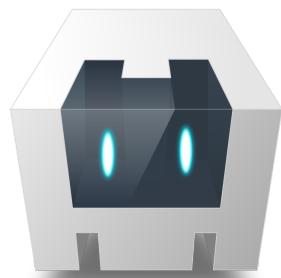
Server/Data Aggregators



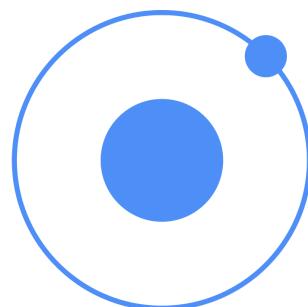
Web Dashboards



Mobile Apps

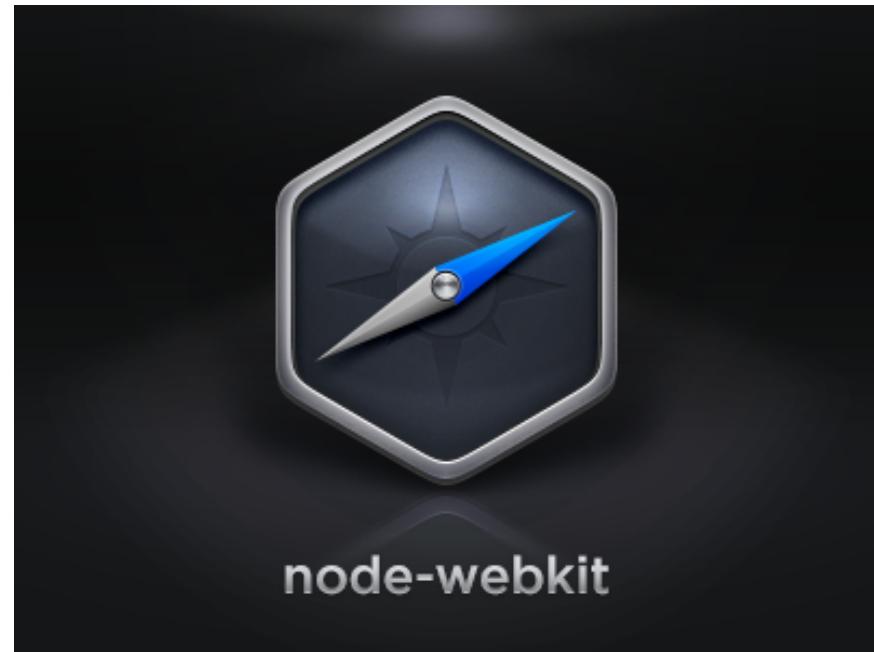


APACHE
CORDOVA™



ionic

Desktop Apps



Standards

HOW STANDARDS PROLIFERATE:
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC)

SITUATION:
THERE ARE
14 COMPETING
STANDARDS.

14?! RIDICULOUS!
WE NEED TO DEVELOP
ONE UNIVERSAL STANDARD
THAT COVERS EVERYONE'S
USE CASES.



SOON:

SITUATION:
THERE ARE
15 COMPETING
STANDARDS.

Demo



the **IoT**suitcase

arvind@theiotsuitcase.com

EAT - SLEEP - IOT - REPEAT