The End of Web Development

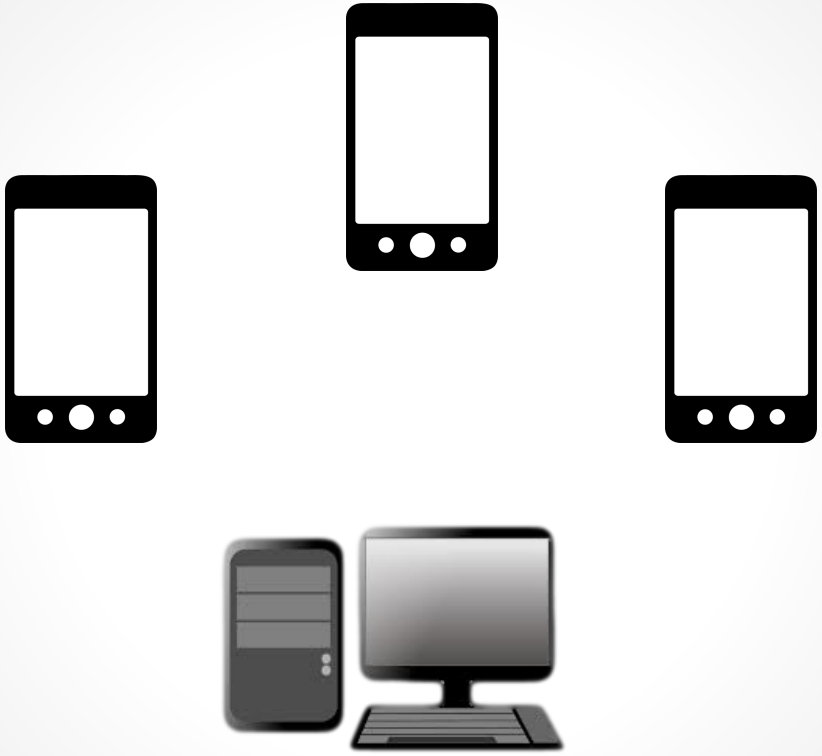
(as we know it)

Jon McKay

Kelsey Breseman

The internet is really big

(8.1 billion devices)



It's about to get much bigger

(est. 40 billion "devices" by 2020)

Increased Awareness (sensing)

Environment Cities Self Home

Retail Industry Product

Unparalleled Control (actuating)

Ambient Intelligence
Pervasive Computing
Internet of Things

Ambient Intelligence

Pervasive Computing

~~Internet of Things~~

Internet of Everything

Cisco


7129

0.78

1094



nest
68
Auto
AWAY


August

But hasn't this idea been around for 15 years?

electrical engineering tools really suck

X11 Applications Edit Window Help

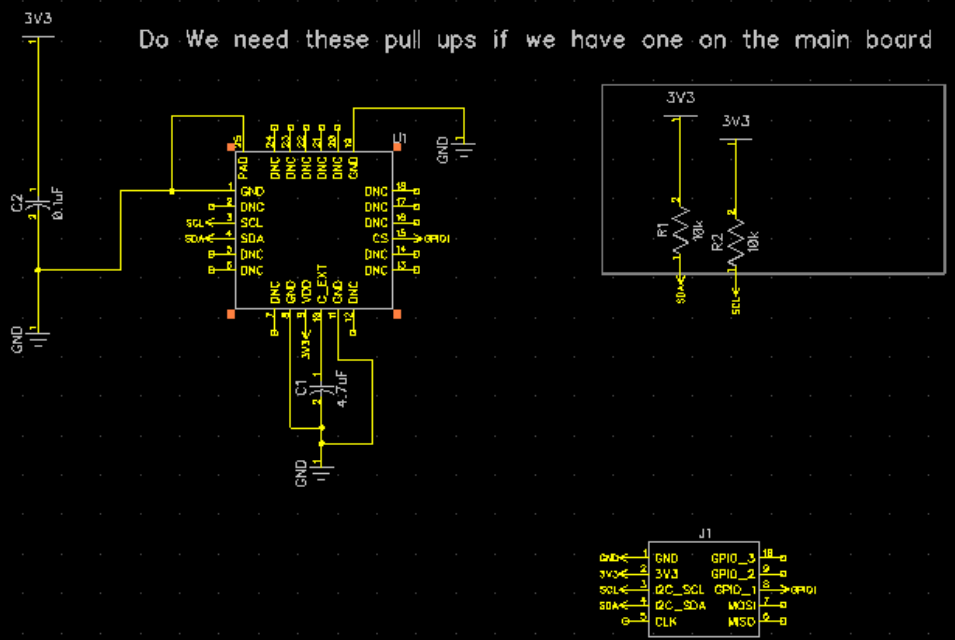
Schematics - [Z:\Users\Jon\Dropbox\Technical Machine\ScriptStick\Hardware\Adaptors and Modules\Temp_Humidity Module\schematic\Temp_Humidity Module.dch]

File Edit View Objects Verification Library Tools Help

Disc_Sch Disc_SMD Discrete EuroSym BAT Buzzers Cap_Nets Conn_Jack Conn_PWR Coaxial, RF

RES
POT
VARRES
RES4SIPISOL
RES5SIPISOL
CAP
VARCAP
POLCAP
IND
INDI
VARIND
VARINDI
DIODE
TUNNEL
LED
TZ
TRANZORB
SCR

All Parts
Place All Parts
Auto PWR/GND
Pattern: N/A



SRSLY

Sheet 1

Connecting to the internet is expensive

Hardware doesn't have much open sourcery

But those problems are

tiny

compared to this

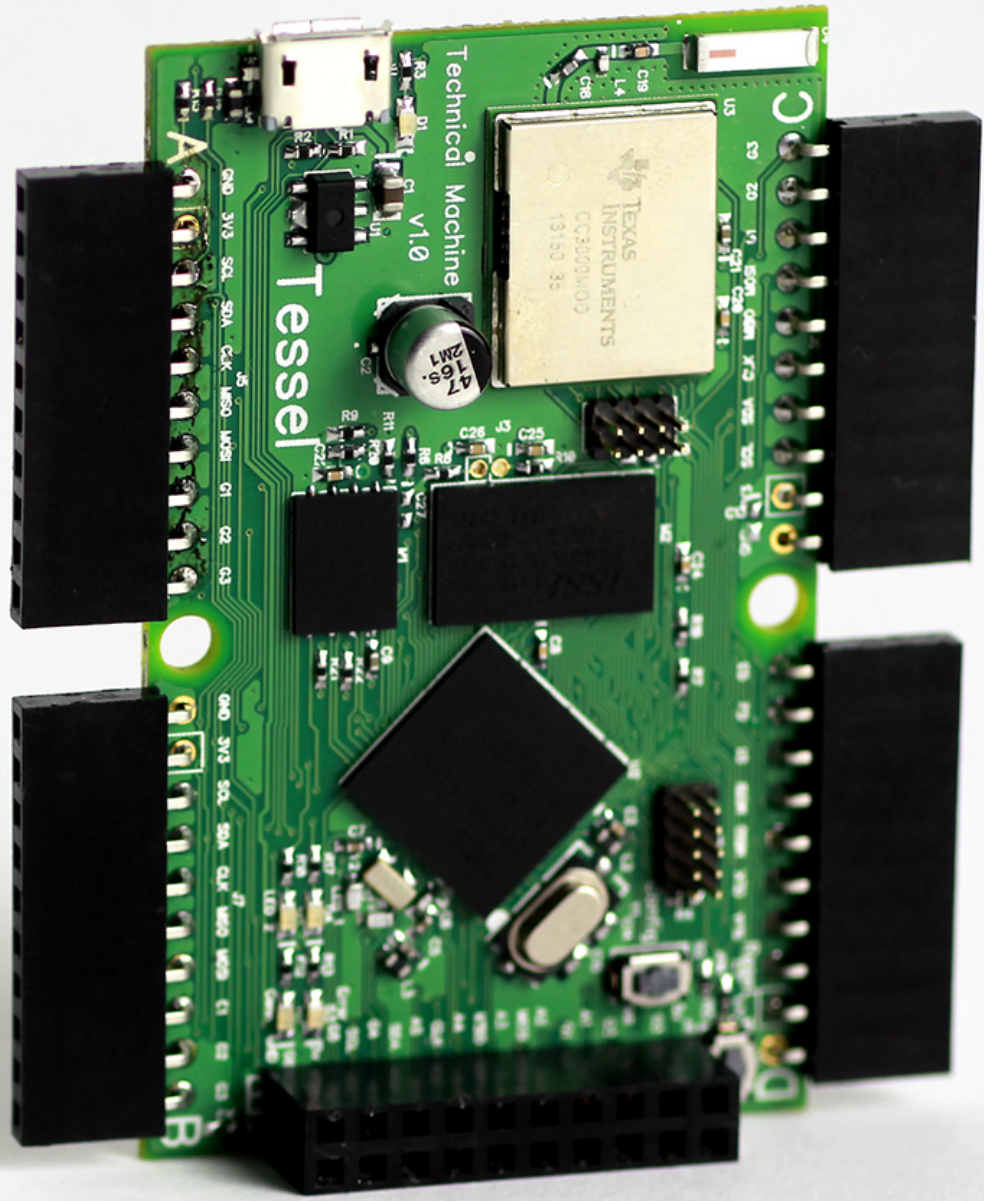
behemoth:

The Internet of Things will be created by the people who know the Internet best.

that's you

entrepreneurial. open. innovative.
lean. hungry.

TESSEL




Jon
Jia
Tim
TESSEL
TESSEL
TESSEL


Lifegraphlabs.com


Kelsey
Eric
TESSEL

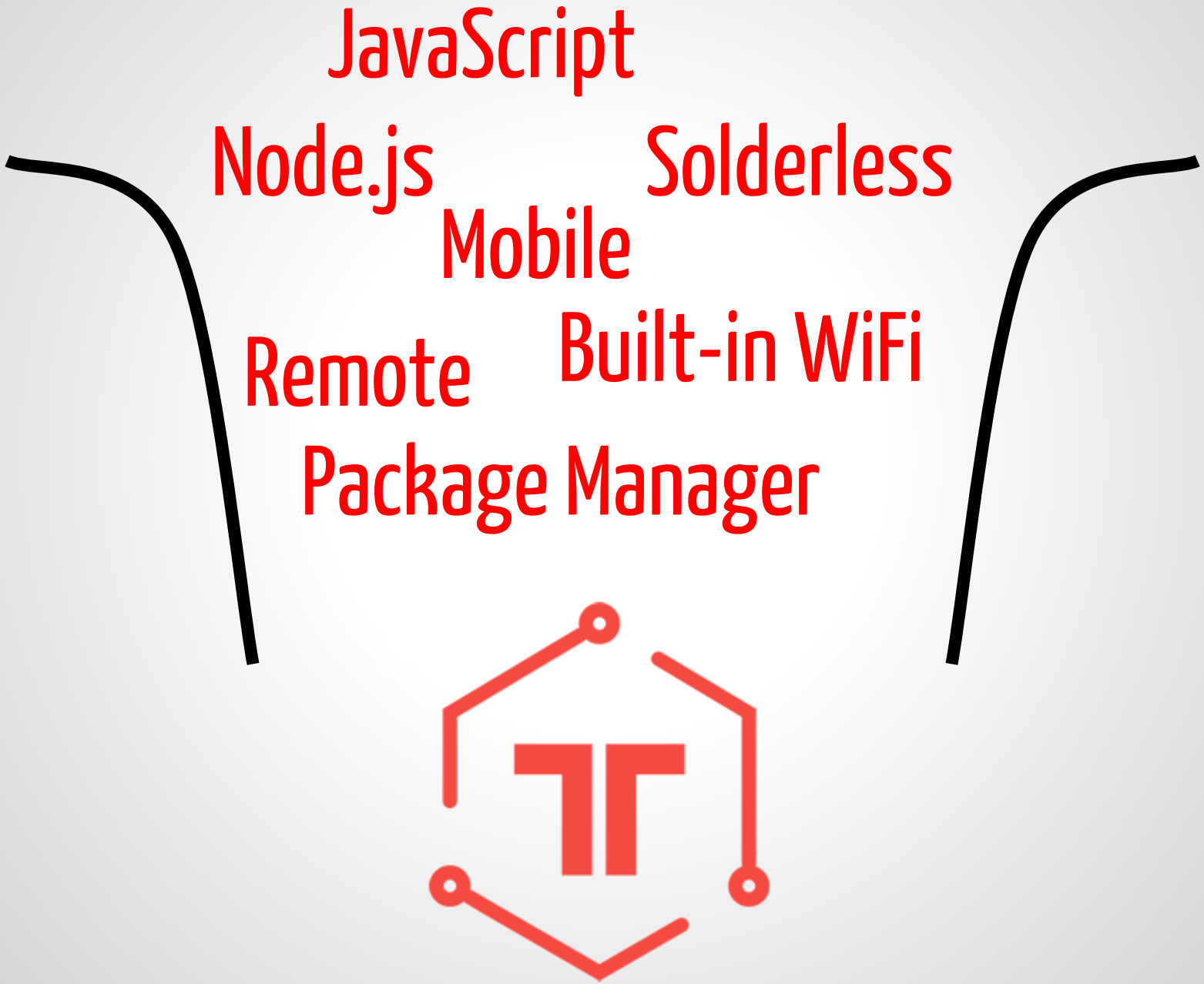
Q: How do you teach web developers about hardware?

A: You don't.

You teach hardware about web developers.

> git **push** heroku master

> tessel **push** tessel.js


JavaScript
Node.js
Solderless
Mobile
Remote
Built-in WiFi
Package Manager

"So how do we make a low-power, credit card-sized Node.js server?"

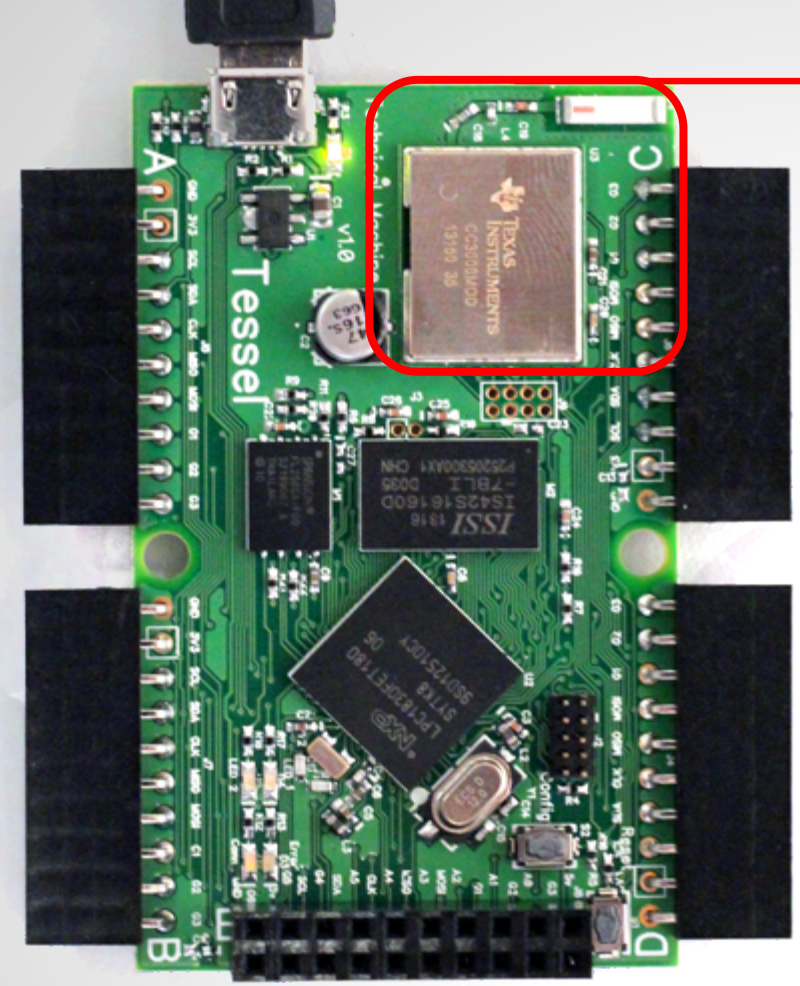
June 2013

"...In 100 days... ...with $20k"

web-optimized hardware

+

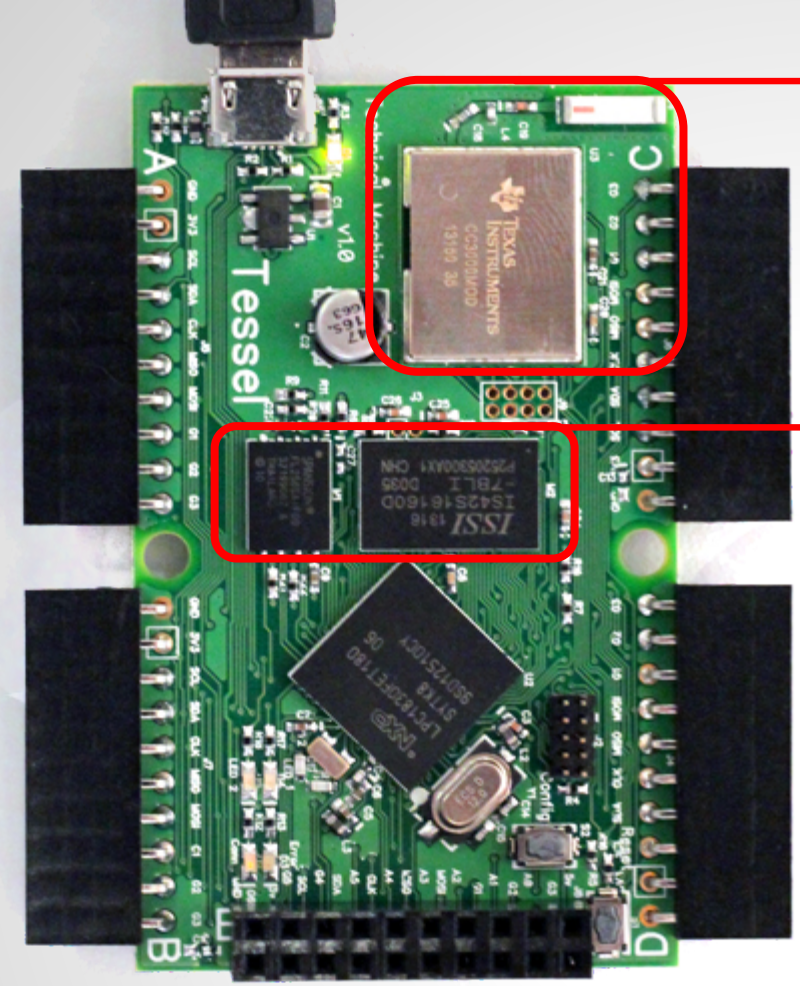
code Tim wrote 2 years ago



CC3000 WiFi Chip

Constant Connection
Remote Deployment
Mobile Friendly

Hardware



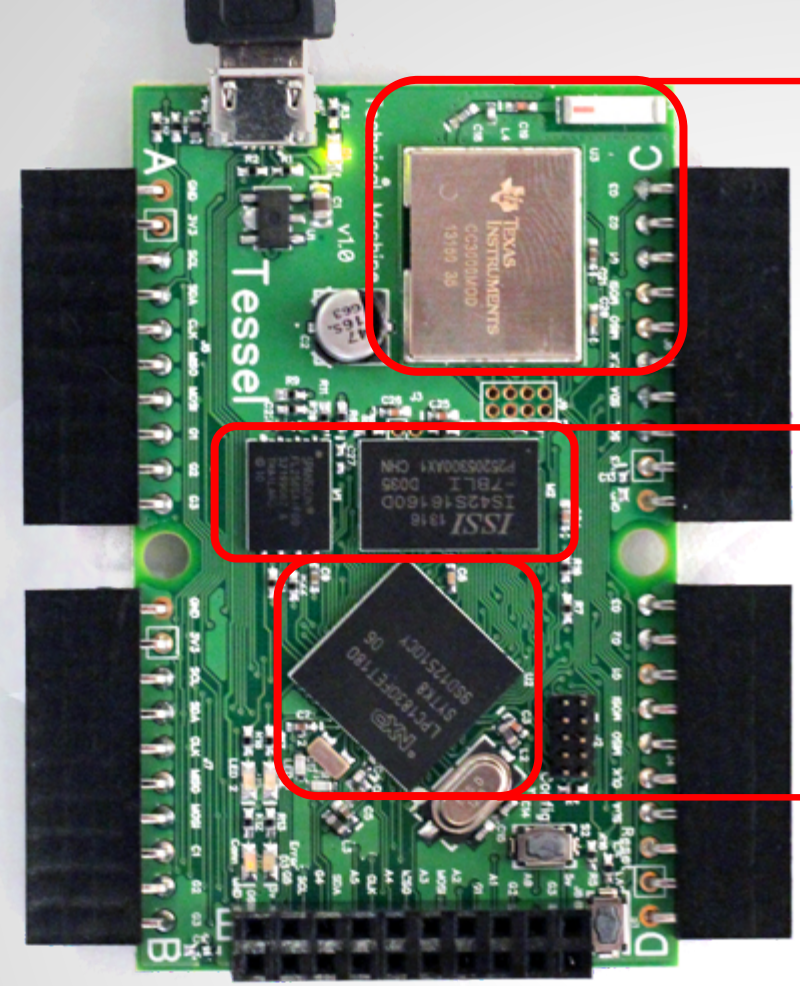
CC3000 WiFi Chip

Constant Connection
Remote Deployment
Mobile Friendly

32MB of Flash & RAM

JavaScript-powered
Node.js compatible

Hardware



CC3000 WiFi Chip

Constant Connection
Remote Deployment
Mobile Friendly

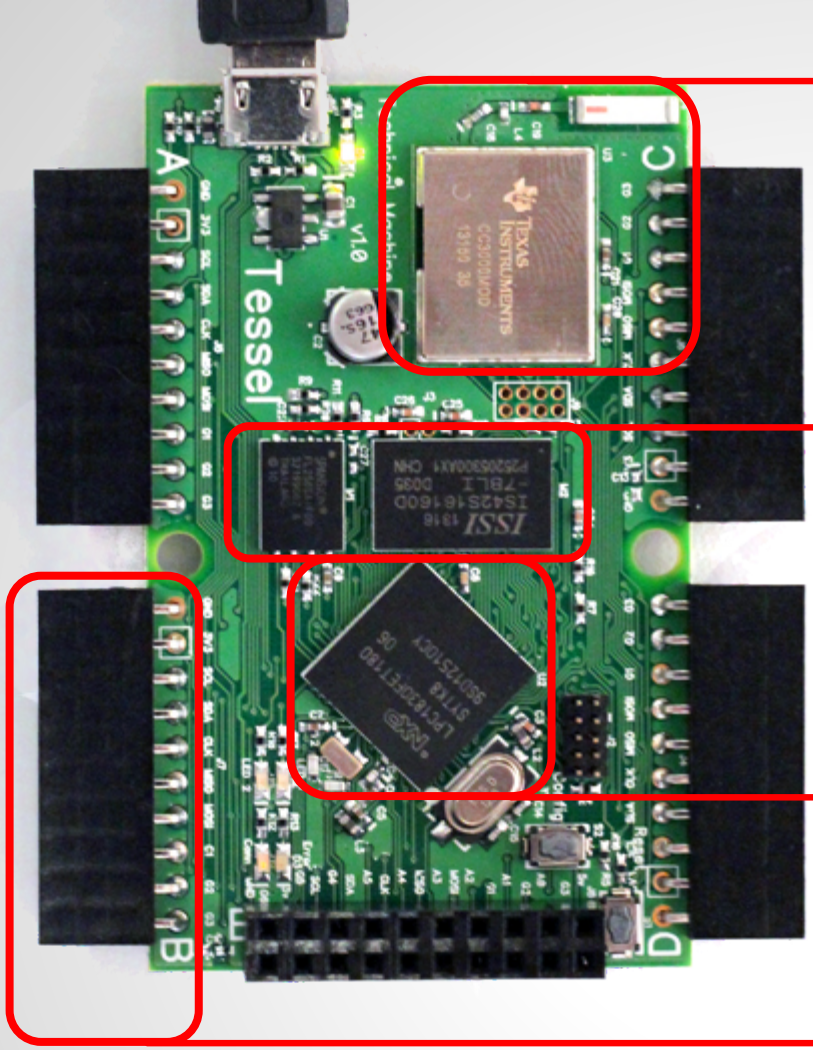
32MB of Flash & RAM

JavaScript-powered
Node.js compatible

Cortex M Processor

Because computer

Hardware



CC3000 WiFi Chip

Constant Connection
Remote Deployment
Mobile Friendly

32MB of Flash & RAM

JavaScript-powered
Node.js compatible

Cortex M Processor

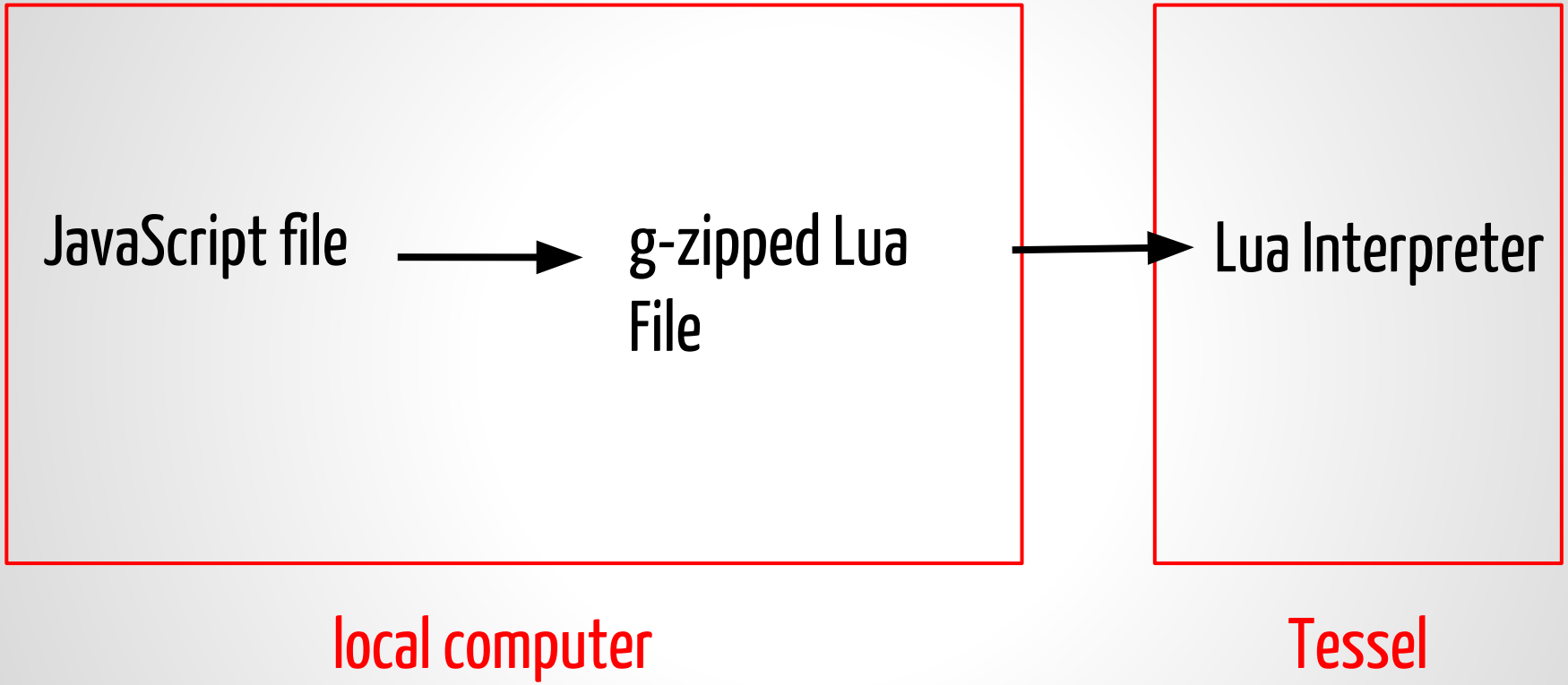
Because computer

Horizontal Module Header

Plug n Play Capabilities

Hardware

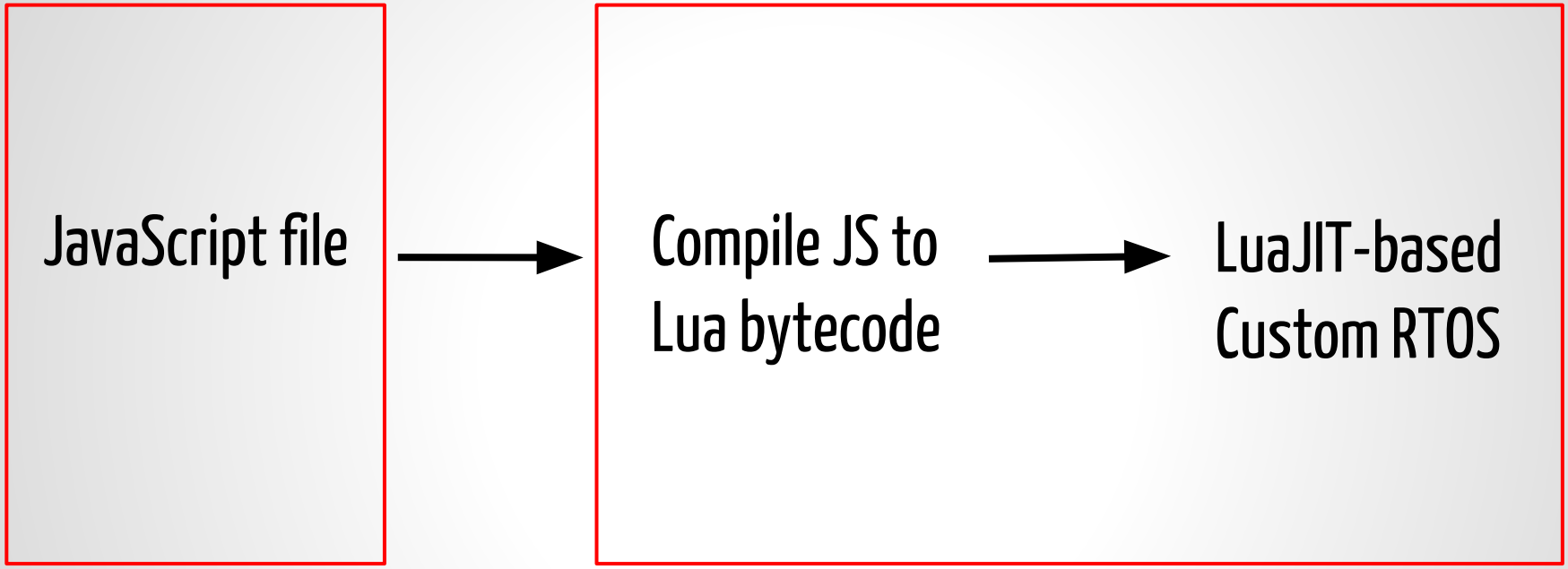
Current Design



Software

Oh So Slow.

Fancy, New Design!



Software

No Installing Linux
No Reinstalling Linux
No Configuring Linux
No Managing Dependencies

Just Writing Code

```
>npm install tessel -g
```


>npm install tessel -g
^hardware

Demo Time!
(fingers crossed)

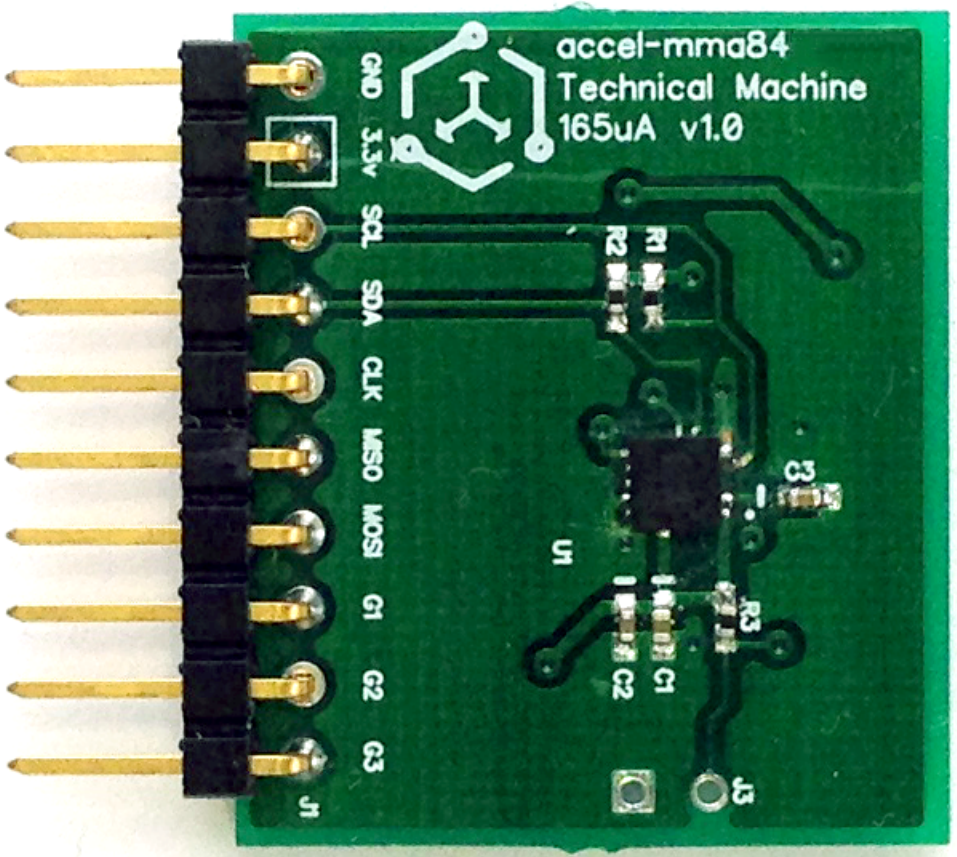
If the demo failed:

tessel.js

```
1 var tessel = require('tessel');
2
3 setInterval(function() {
4     tessel.led(1).toggle();
5 }, 1000);
```

obligatory blinky light

node package name



plug & chug

accelerometer.js

```
1  var accel = require('accel-mma84').connect("A");
2
3  // Initialize the accelerometer.
4  accel.on('connected', function () {
5    // Loop forever.
6    setInterval(function () {
7      accel.getAcceleration(function (err, xyz) {
8        console.log("x:", xyz.x.toFixed(2),
9          "y:", xyz.y.toFixed(2),
10         "z:", xyz.z.toFixed(2));
11     });
12   }, 100);
13 });
```

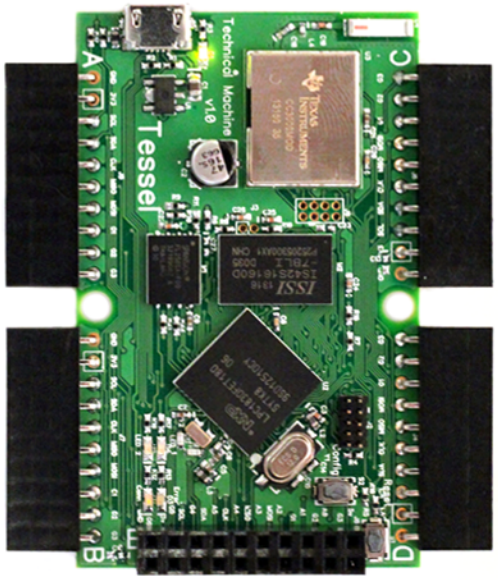
event driven acceleration

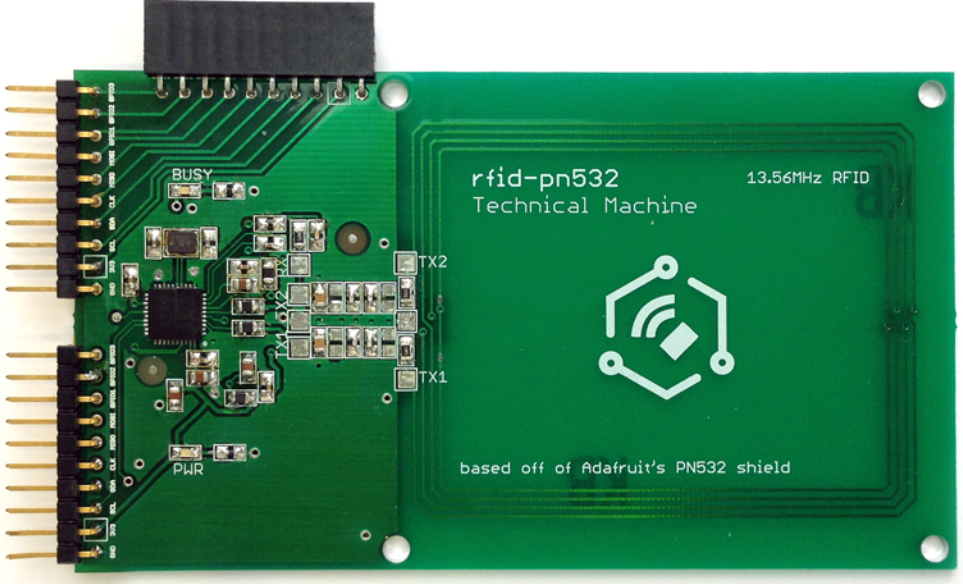
accelerometer.js

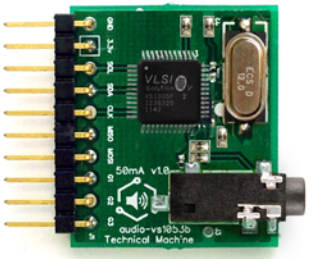
```
var accel = require('accel-mma84').connect("A");
var request = require('request');

// Initialize the accelerometer.
accel.on('connected', function () {
  // Loop forever.
  setInterval(function () {
    // Get the acceleration
    accel.getAcceleration(function (err, xyz) {
        // Post it to a website
        request.post(
            "www.accelerometer.com/data",
            // The data to be posted
            {x_data:xyz.x, y_data:xyz.y, z_data:xyz.z},
            // Handle the response
            function(error, response, body) {
                console.log(body);
            }
        )
    });
  }, 1000);
});
```

use existing http libs

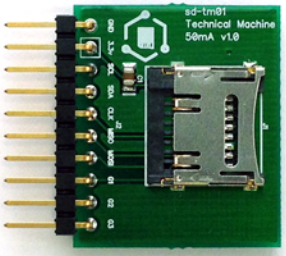

Technical Machine
v1.0
Tesser

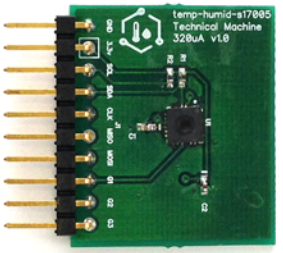

BUSY
rfid-pn532
13.56MHz RFID
Technical Machine
TX2
TX1
PWR
based off of Adafruit's PN532 shield


50mA v1.0
Technical Machine

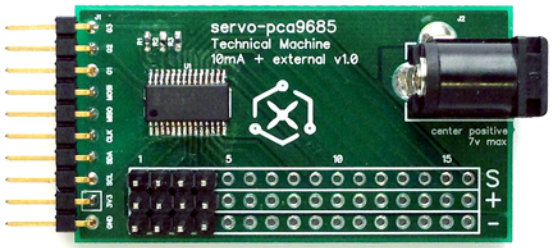

GTPA013

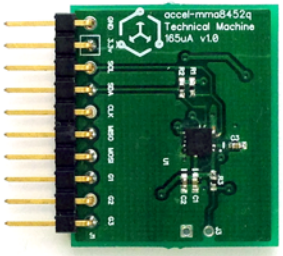

relay-IM48DGR
Technical Machine
0mA@v1
AXICOM
IM48D
2.4VDC

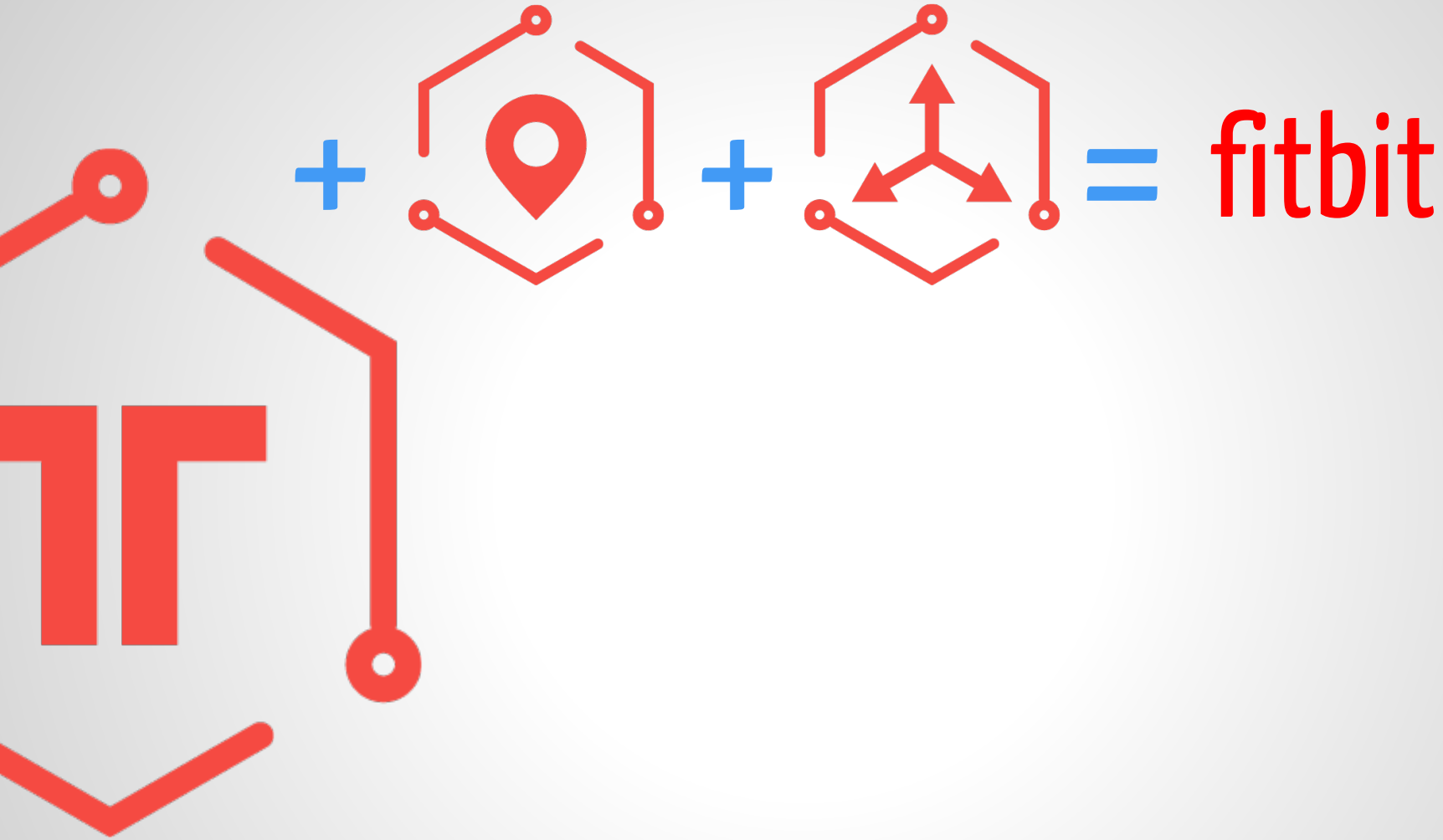

sd-tm01
Technical Machine
50mA v1.0

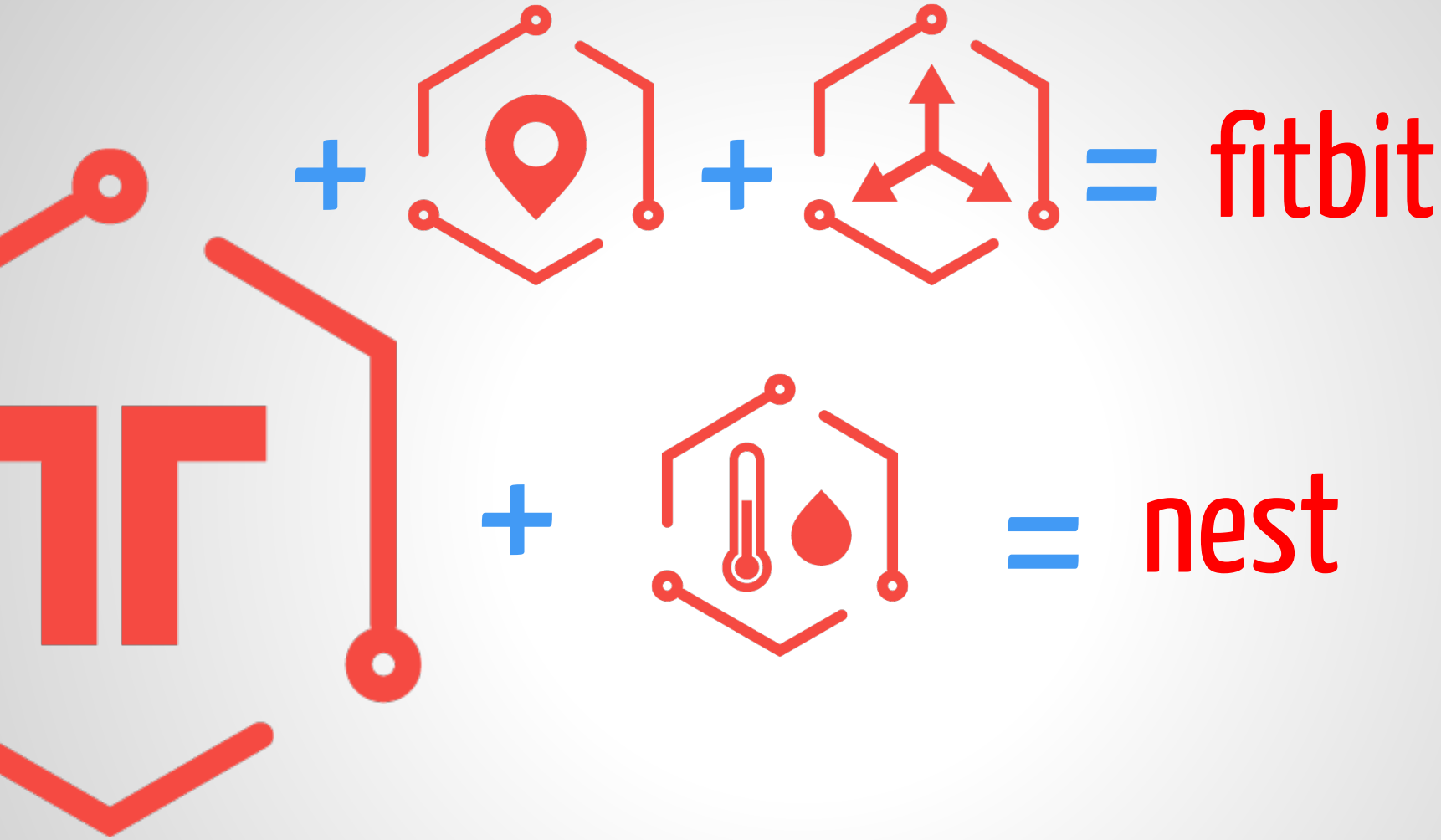

temp-humid-si7005
Technical Machine
320uA v1.0

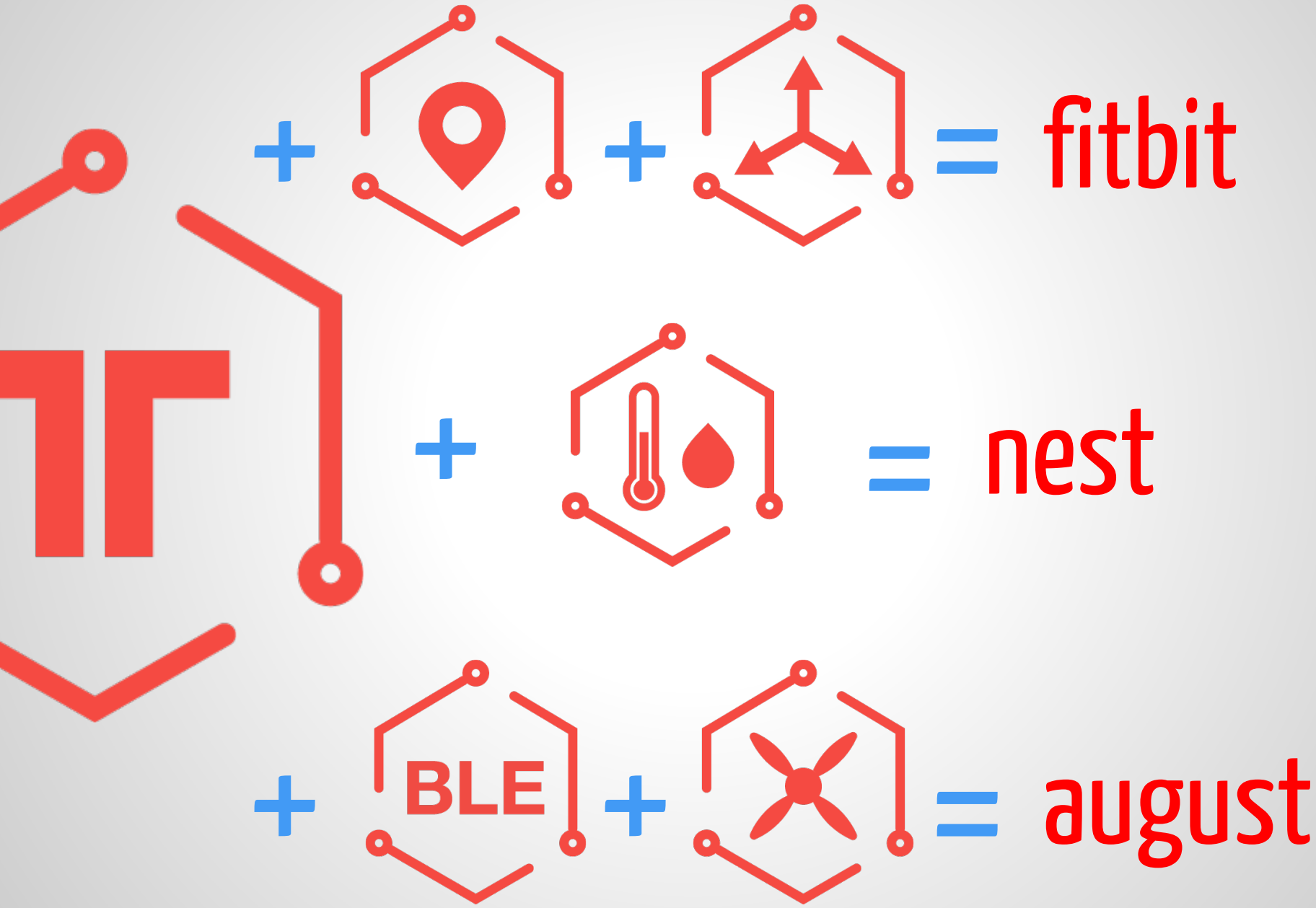

ble-ble112a
Technical Machine
35mA v1.0
ble


servo-pca9685
Technical Machine
10mA + external v1.0
center positive
7v max
S+-


accel-mma8452q
Technical Machine
165uA v1.0


+
+
=
fitbit


+
+
=
fitbit
+
=
nest


BLE
= fitbit
= nest
= august

Web Development isn't just about making websites anymore.

Web Development is about making new experiences

thanks!

Jon McKay

@jonmckay

tessel.io

Questions?