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Building a Connected Plant

An IoT613 Technical Workshop

confidential not
for distribution

About Us

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Plant: Office Shrub @ macadamian. Also @office_shrub on twitter.

About today's workshop

We will connect lots of plants to the internet!

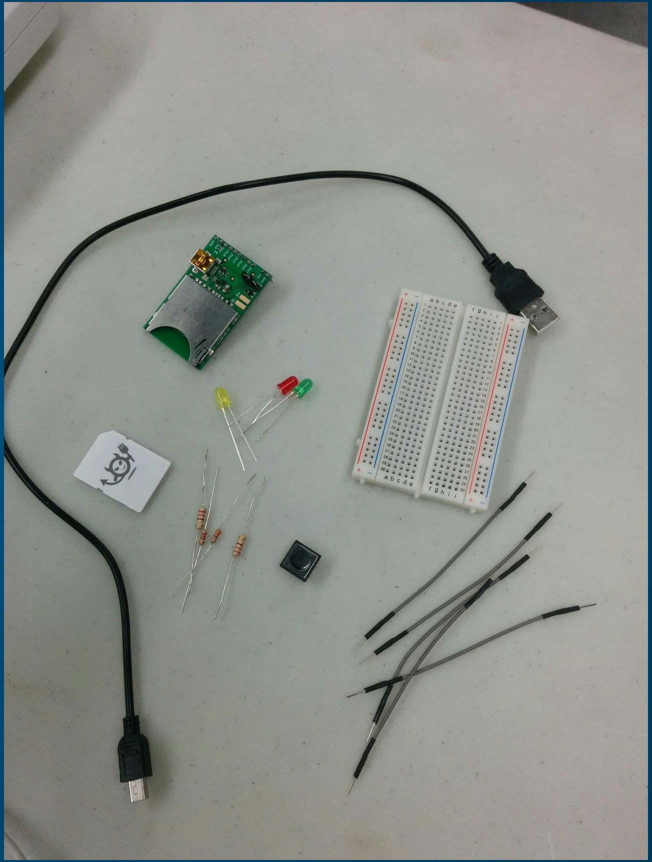
What you need:

- The sensor kit included.
- A laptop with a web browser and a free USB port.
- Information Sheet.
- Access to our GitHub: http://tiny.cc/IoT613-GH
- Your code-fu.

Sensor kit - quick check

What you need:

- A breadboard
- A circuit board
- An Electric Imp
- 4 resistors (220 ohms)
- 3 LEDs (red, yellow, green)
- A photoresistor
- A button
- 3 small cables



The “Problem” Statement

- Plants are pretty dumb.
- I don’t want to have to walk up to it to know how it’s doing.

Solution:

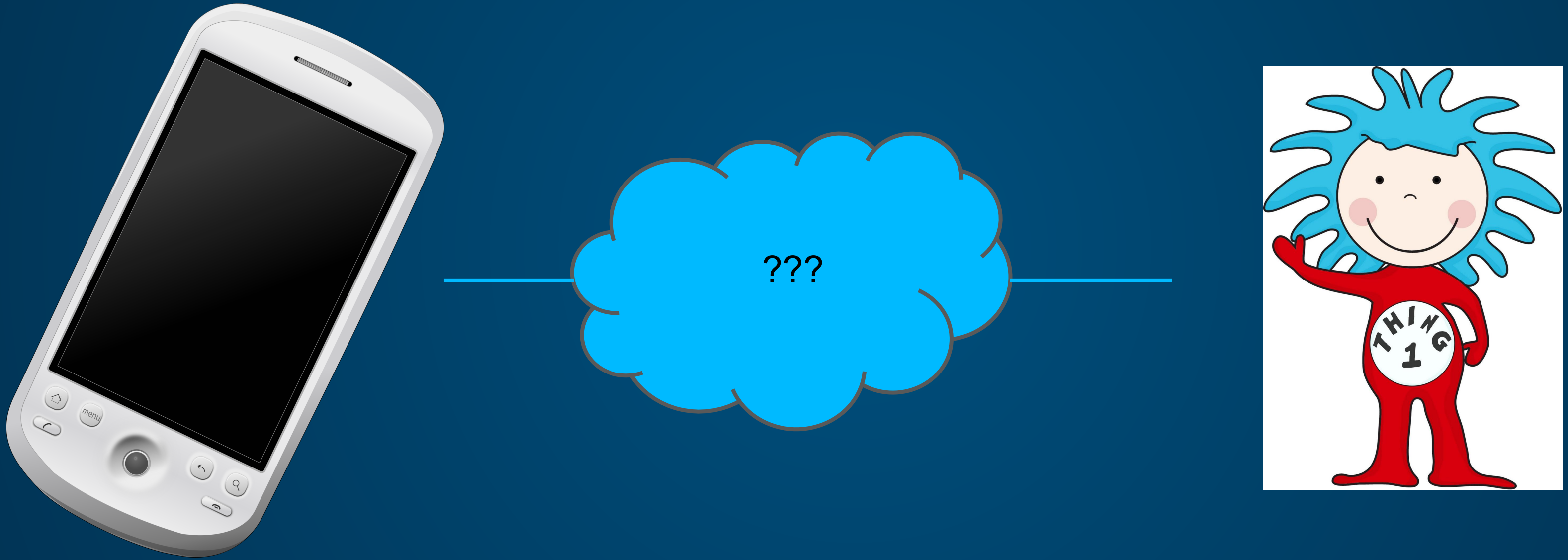
- A connected plant, that provides:
  - Light Level
  - Water Level
  - A button to make it tweet

Why would you possibly want a tweeting plant?

Adds features to any boring neighborhood shrub:

- The plant tweets when it is watered!
- The plant tweets in the morning when it wakes up about how his previous day went.
- The plant tells us how it feels on a website, LEDs, and tweets when you press a button.

DYI project IOT architecture



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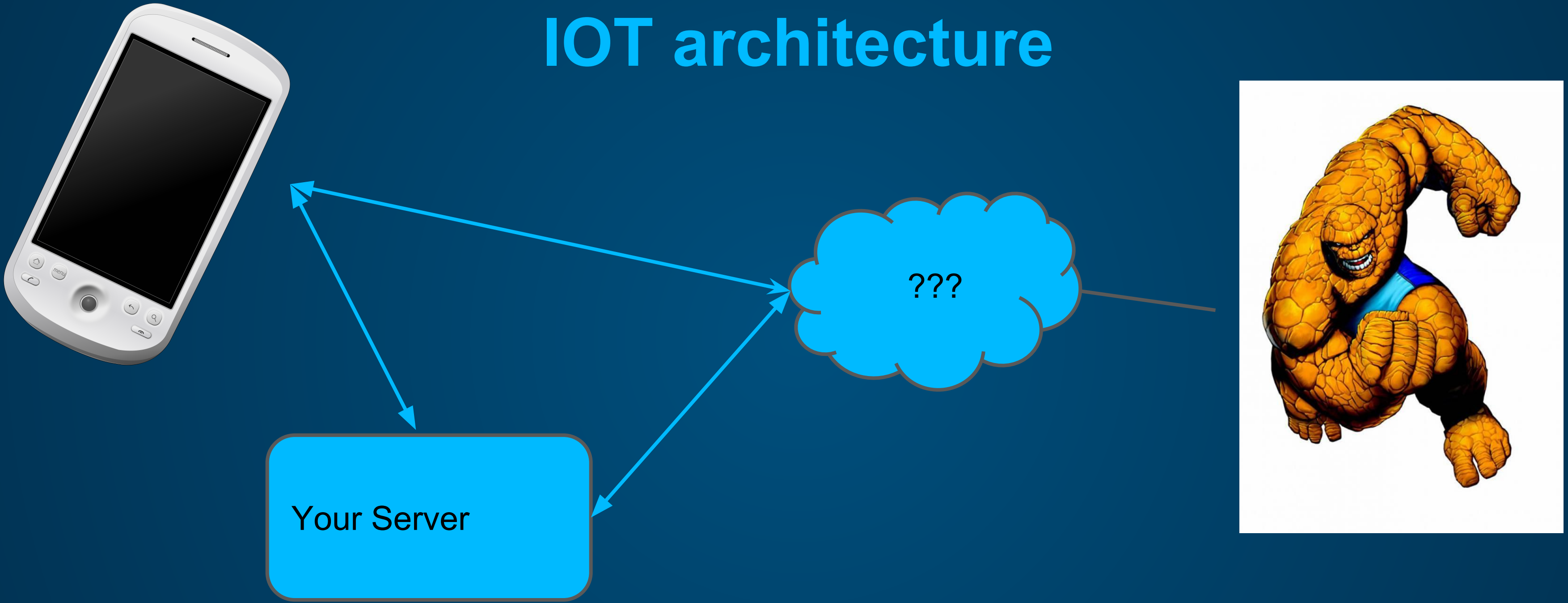
Real world
IOT architecture



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Your Server

The Electric Imp Platform

- Cloud-based computing (agents)
- Device-side computing (device)
- Uses JavaScript-like language called Squirrel.
- Pre-certified by the FCC

Demo: @office_shrub

“You pressed my button! I feel dark
and wet”

-- @office_shrub, on twitter.

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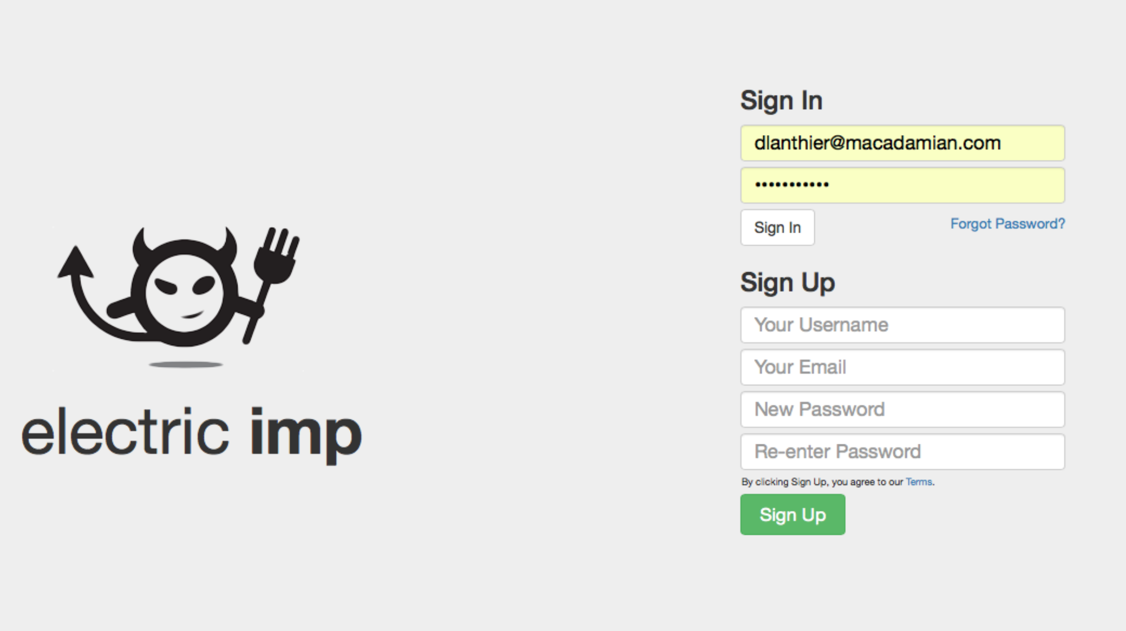
Okay, now it’s your turn

Create an Electric Imp Account

Create an account at ide.electricimp.com



Sign In

dlanthier@macadamian.com

••••••••••••

Sign Up

Your Username

Your Email

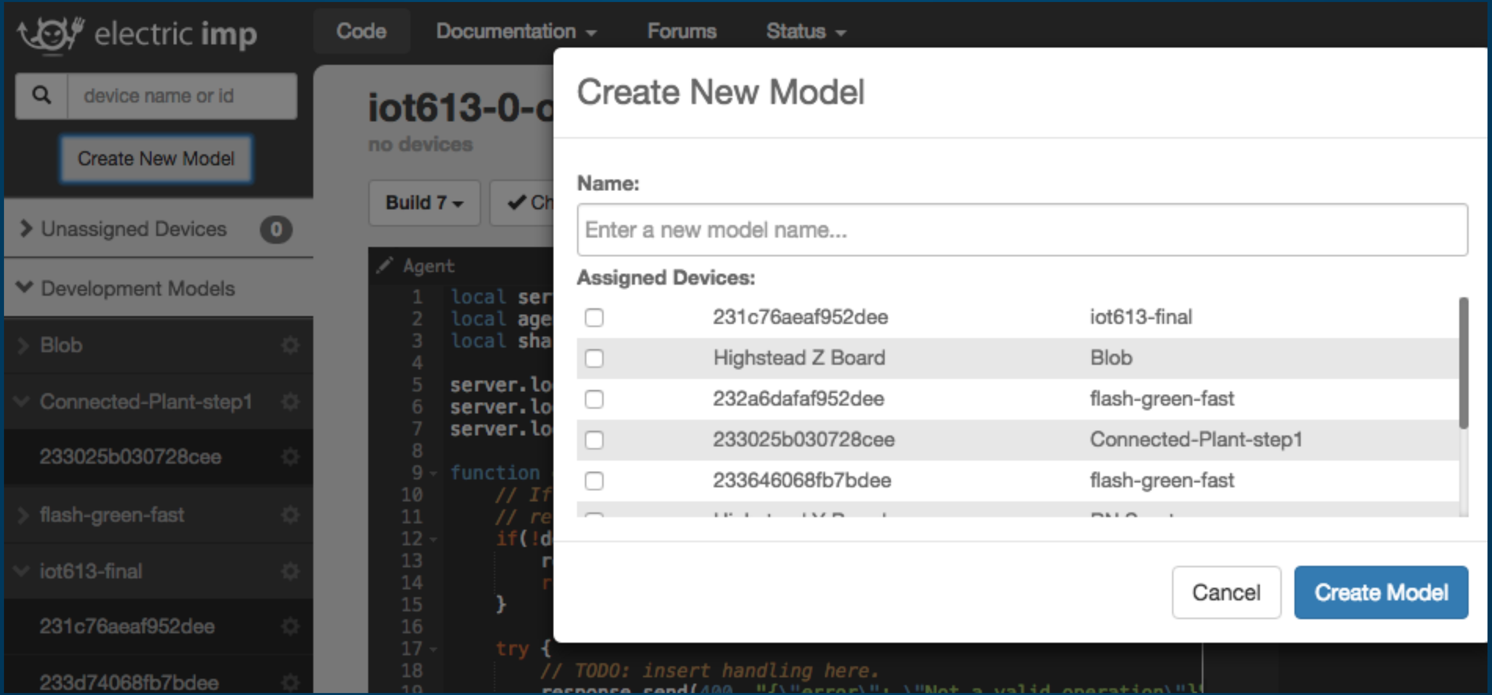
New Password

Re-enter Password

By clicking Sign Up, you agree to our Terms.

Create a model for your code

Don’t close ide.electricimp.com!



```
local ser
local age
local sha

server.lo
server.lo
server.lo

function
    // If
    // re
    if(!d
        r
        r
    }

    try {
        // TODO: insert handling here.
```

Create New Model

Name:

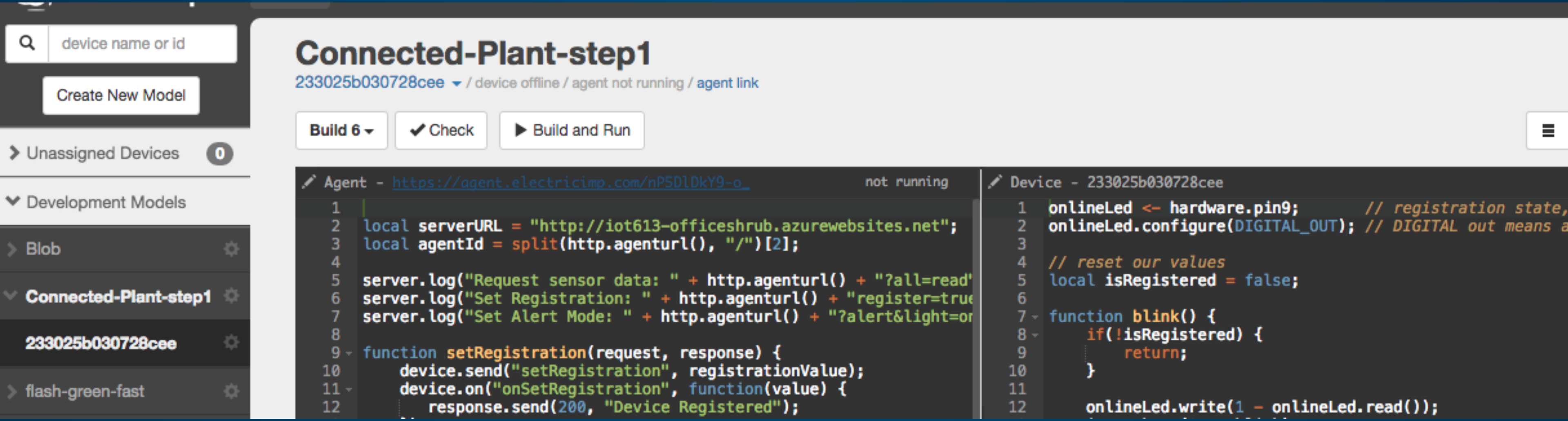
Enter a new model name...

Assigned Devices:

☐	231c76aeaf952dee	iot613-final
☐	Highstead Z Board	Blob
☐	232a6dafaf952dee	flash-green-fast
☐	233025b030728cee	Connected-Plant-step1
☐	233646068fb7bdee	flash-green-fast

Electric Imp Editor

Agent (Cloud) on the left side.
Device Code on the right side.
Logging at the bottom.



Connected-Plant-step1

233025b030728cee / device offline / agent not running / agent link

Agent - https://agent.electricimp.com/nP5DlDkY9-o_ not running

```

local serverURL = "http://iot613-officeshrub.azurewebsites.net";
local agentId = split(http.agenturl(), "/")[2];

server.log("Request sensor data: " + http.agenturl() + "?all=read"
server.log("Set Registration: " + http.agenturl() + "register=true
server.log("Set Alert Mode: " + http.agenturl() + "?alert&light=or

function setRegistration(request, response) {
    device.send("setRegistration", registrationValue);
    device.on("onSetRegistration", function(value) {
        response.send(200, "Device Registered");
```

Device - 233025b030728cee

```
onlineLed <- hardware.pin9;          // registration state,
onlineLed.configure(DIGITAL_OUT); // DIGITAL out means a

// reset our values
local isRegistered = false;

function blink() {
    if(!isRegistered) {
        return;
    }

    onlineLed.write(1 - onlineLed.read());
```

Electric Imp Application + BlinkUp

Install the mobile application, and BlinkUp your device.
Once Blinked Up, configure your device with the model that you created.

WiFi Credentials: MSNGuest / M3mb3r5!

Success!

The SD Card's is blinking green.

Uhh?

SD Card is blinking Red, or Orange. Restart the imp, and reboot right away.

Create a Twitter Account

- Check your information sheet to enable an application.
- Browse to https://apps.twitter.com/
  - Please notify your followers that you might be spammy for the next 60 minutes.
- The important part is under Keys and Access Tokens.

Keep these values handy:

Consumer Key (API Key)

Consumer Secret (API Secret)

Access Token

Access Token Secret

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We are ready!

Building the project

Visit our Github: http://bit.ly/1Mq5qMh.

Visit http://bit.ly/1KvaNJq for our dashboard.

Folder for each step:

Step #1: Hello World!

Step #2: Tweeting Button

Step #3: Water Sensor

Step #4: Light sensor

Let’s Hack!

Contact Us

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Thank you.

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