HOME AUTOMATION

Raspberry Pi + MQTT + Grails + Arduino

WHO AM I?

Cássio Landim
Freelancer Software
Developer
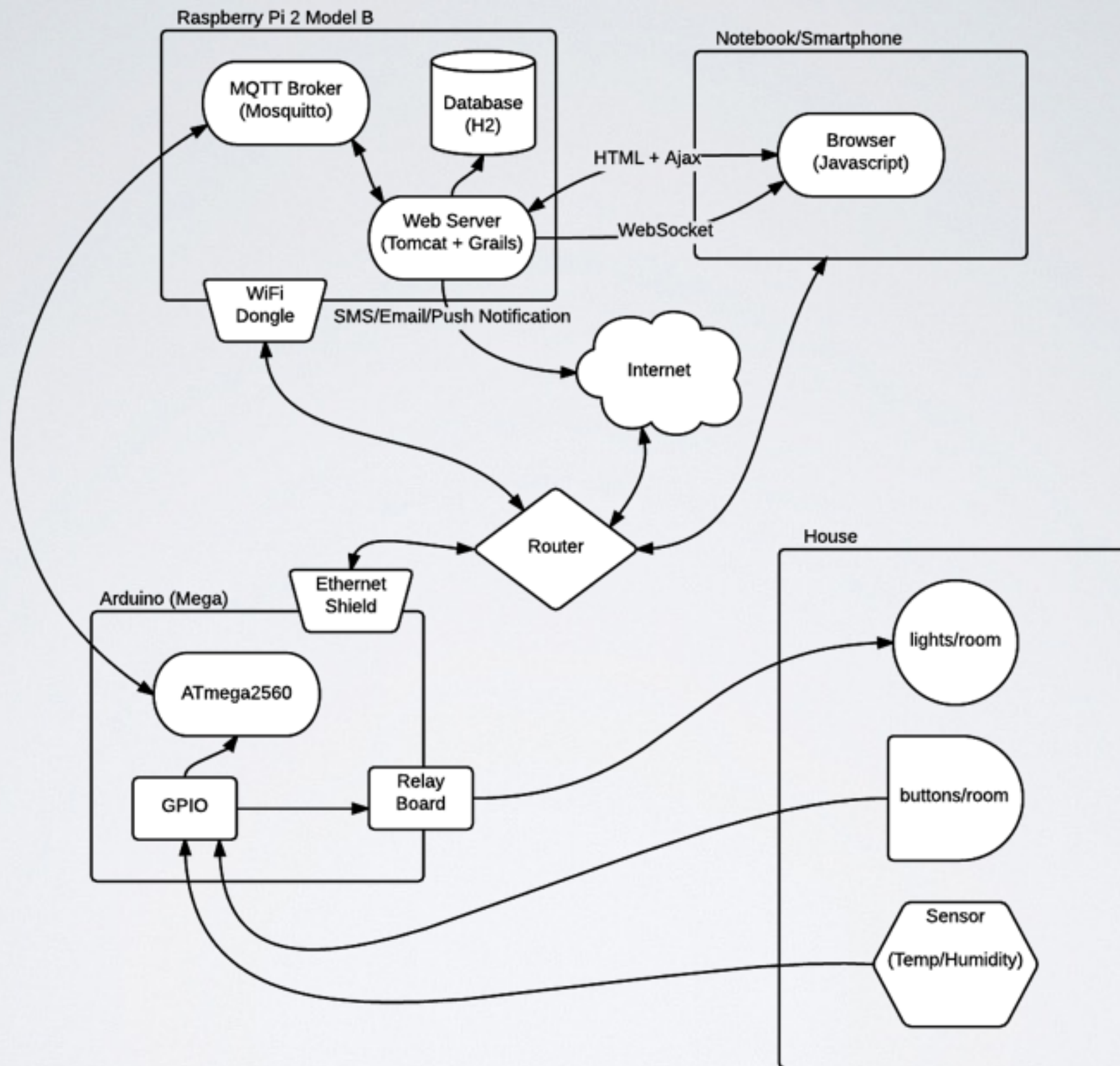twitter.com/cassiolandim
facebook.com/cassiolandim
br.linkedin.com/in/cassiolandim
github.com/ziglee

COMPONENTS

- MQTT Broker (Mosquitto)

- Web Server (Tomcat + Grails)

- Database (H2 File)

- Raspberry Pi 2 Model B

- Browser (WebSocket + Ajax)

- Arduino (Relay Board + Sensors + Buttons)

Components interaction

RASPBERRY PI 2 MODEL B

900MHz quad-core ARM Cortex-A7 CPU 1GB RAM

MQTT BROKER

- MQTT provides a lightweight method of carrying out messaging using a publish/subscribe model

- Mosquitto (Open Source MQTT v3.1/v3.1.1)

- Central component

- Organizes all messages/events in one place

- Has many clients implementations (Languages & Platforms)

WEB SERVER

- Centralizes the logic (e.g sends an email when doorbell button fires)

- Tomcat 7 (JDK 7 + Servlet 3.0)

- Grails 2.5.0 (Groovy language)

- Web-socket plugin (Spring)

- Paho MQTTv3 Java Client Library (Eclipse)

    - Subscribed to channels sensors/status and switches/status and publish this data to WebSocket topics

    - Publishes to channels like lights/kitchen/set with message "on" or "off"
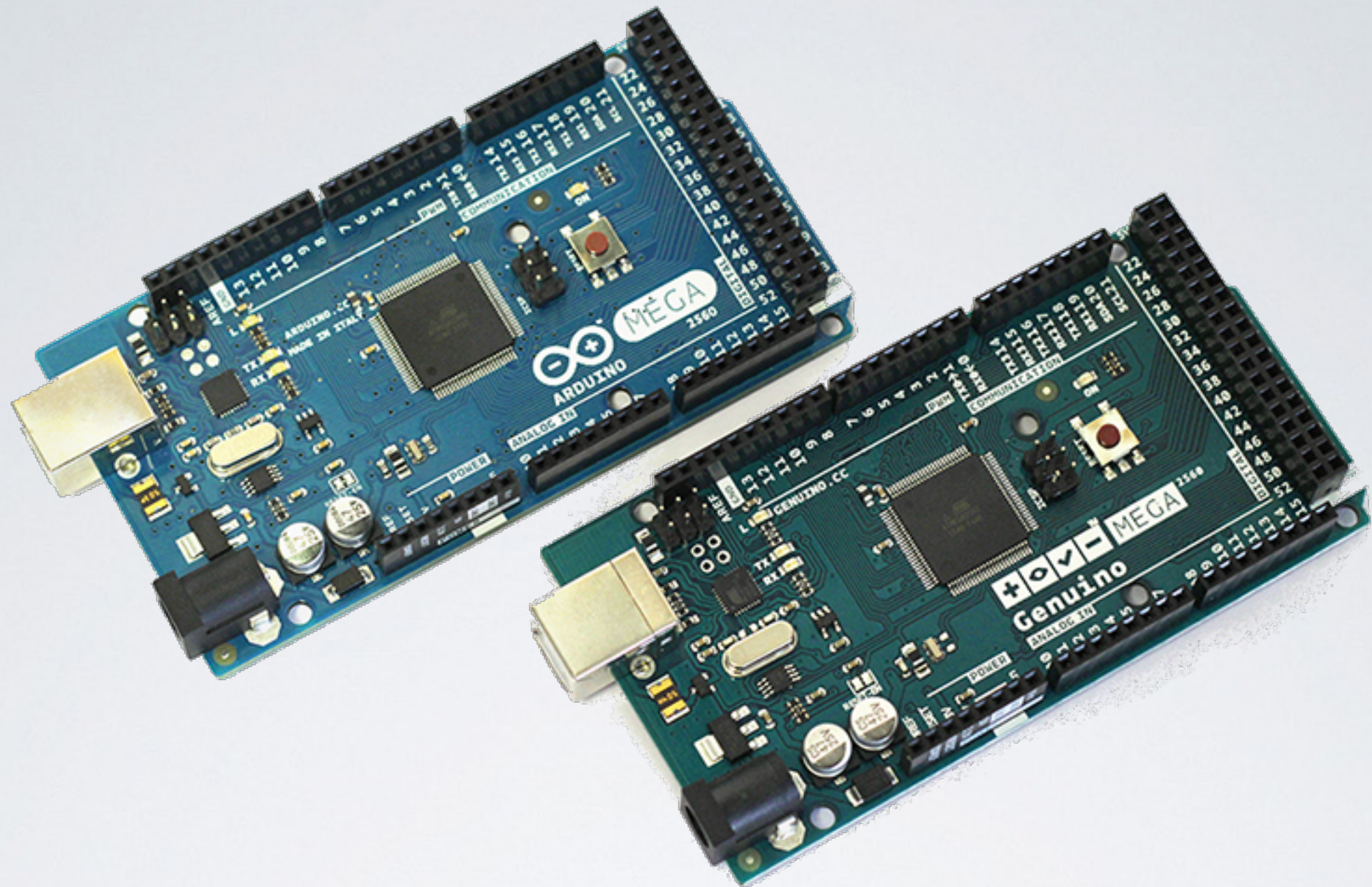
BROWSER

Remote interaction with realtime feedback

BROWSER

- HTML

- Javascript

- Ajax (Post events like "turn on room lights")

- WebSocket (refreshes dashboard with real time data)

- Bootstrap (http://getbootstrap.com/)

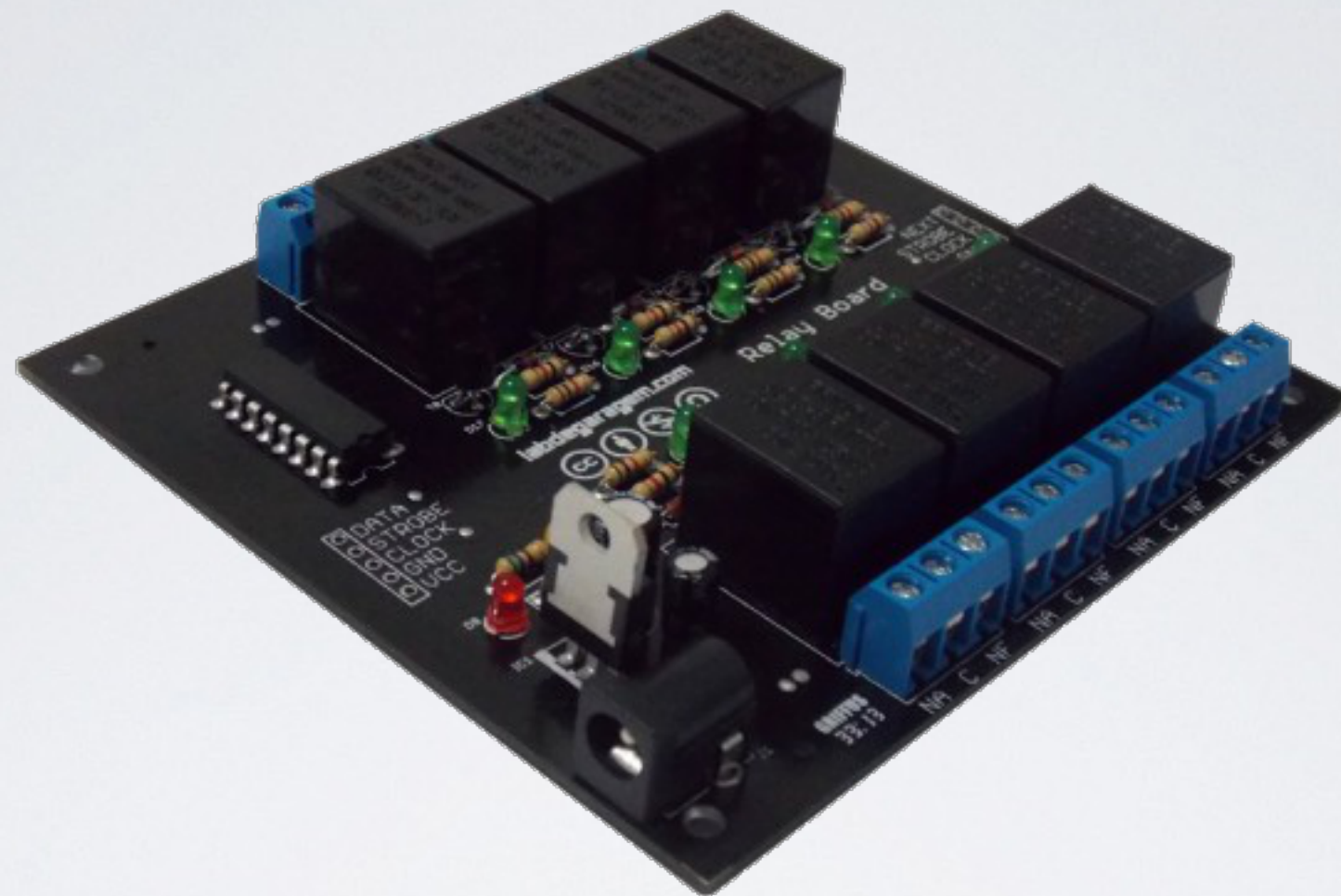- JustGauge (https://github.com/toorshia/justgage)

ARDUINO

Open-source electronics platform

ARDUINO MEGA

- Interacts with real world through 54 digital input/output pins + 16 analog inputs and with MQTT Broker via Ethernet Shield

- Periodically publishes a JSON with all sensors data on channel sensors/status

- Publishes a JSON with the status of all the switches on channel switches/status when an event occurs

- Subscribed to channels like buttons/room and lights/room/set

RELAY BOARD

http://www.labdegaragem.org/loja/relayboard.html

RELAY BOARD

- Expansible

- 3 control pins

- 8 relays

- 12 Volts

OPEN SOURCE CODE

- https://github.com/ziglee/home-automation-web (Grails)

- https://github.com/ziglee/HomeAutomationArduinoCentral (Arduino)