Paris BJPC JUG

Sponsors
Platinium

www.parisjug.org

norsys
transformer vos stratégies en logiques informatiques
EASY MAKERS

arolla
Mastering Software Development

carbon IT

zenika

OXiane

SOFTEAM Cadextan

Couchbase

MIRAKL

Sponsors
Gold

IPPON
Digital . Technologies . Hosting

VISEO

JAVA USER GROUP

Having fun with Raspberry(s) and Apache projects

par Jean-Frederic Clere
@jfclere

AGENDA

- Who I am
- How does it started
- OK now I have my demo for HTTP/2 what next.
- Get Astro Hat and have fun.
- Get another Hat and have another fun.
- More serious people using Industrino
- Questions

Who I am I?

Jean-Frederic Clere
Red Hat
Years writing JAVA code and server software
Tomcat committer since 2001
Doing OpenSource since 1999
Cyclist/Runner etc
Lived 15 years in Spain (Barcelona)
Now in Neuchâtel (CH)

How does it start?

Trying to make a demo :D

- first localhost (failed)
- remote server (failed)
- try local + configurable:
  - Need a very small hardware:
  - Need real OS (no Arduino)
  - Fast
  - With WIFI

Raspberry PI3 / basics

- Hardware: sd card / wifi access point
- Most distributions requires for installation:
  - Screen
  - Keyboard
  - Solution:
    - mount root
    - remove autostart (tricky SystemD)
    - add ssh keys
- Next yum install java/openssl/gcc etc…
- Done in a few hours…

Raspberry PI3 / basics

- Fedora 24 (with RPI kernel and modules)
- Drivers from https://github.com/raspberrypi/firmware
- wifi access point from (free since September 2016) https://raw.githubusercontent.com/RPi-Distro/firmware-nonfree/master/
- dhcp (server)
- bind (name server to make captive portal)
- Oracle JDK 8 for ARM (Java Openjdk version "1.8.0" too slow)
- Tomcat apache-tomcat-8.5.6
- Apache httpd (the fedora one)
- http://10.0.0.201/

Raspberry PI3 / demo

- HTTP/2
- Tomcat-8.5.6 (bin tar)
- Tomcat-native-1.2.10 (sources compiled on the Raspberry)
- Openssl 1.0.2j (from Fedora 24)
- http://10.0.0.203:8080/(normal tomcat)
- http://10.0.0.203:8080/http2.html
- https://10.0.0.203:8443/http2.html https normal
- https://10.0.0.203:8002/http2.html https HTTP/2
- So play with latency:
  - tc qdisc add dev eth0 delay 85ms 20ms (to get something that isn't localhost).
  - tc qdisc del dev eth0 root (remove it).
  - tc qdisc add dev eth0 root netem delay 185ms 120ms
- https://10.0.0.202:8443/http2.html https normal
- https://10.0.0.202:8002/http2.html https HTTP/2

Let's start the fun!

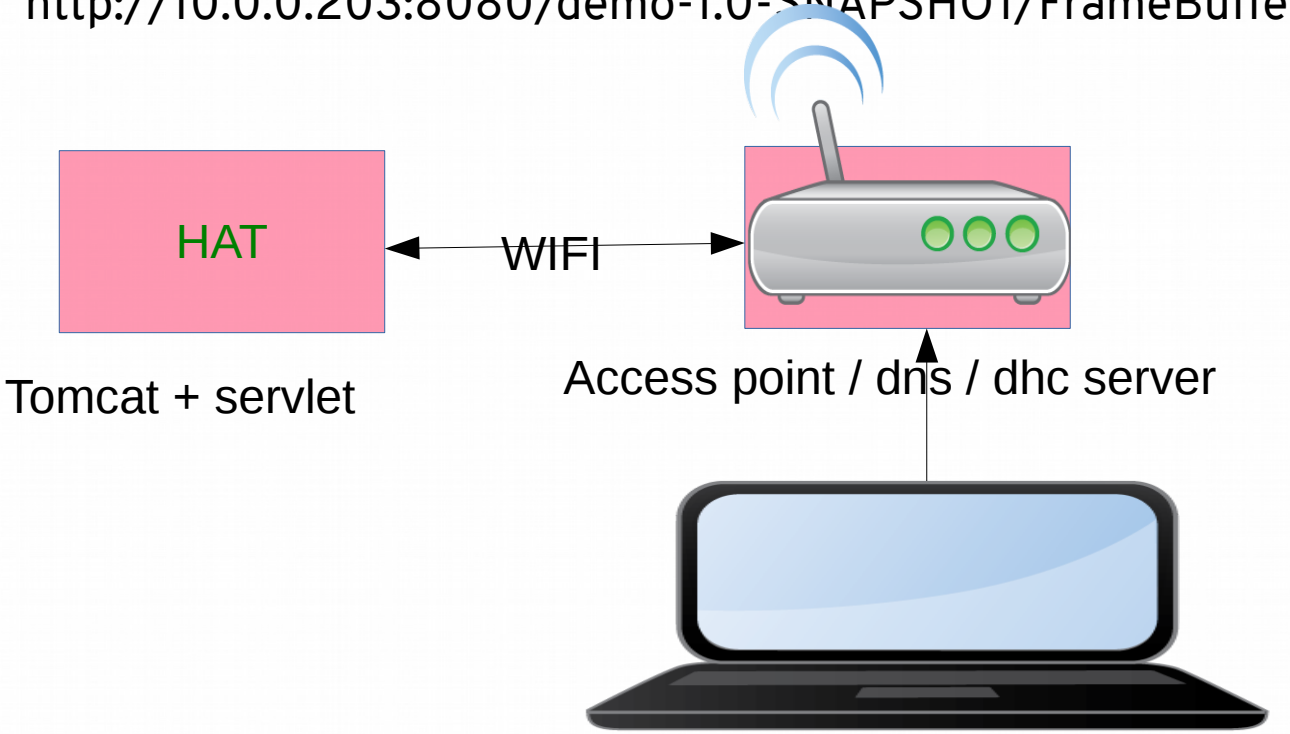
- Hats…
- Iot experimentation boxes
- Use Astro Hat
- Sensors:
  - Magnetometer
  - Humidity sensor
  - Temperature
  - Accelerometer
  - Joystick
  - And a DISPLAY!!!

First Tomcat fun

- Servlet
- Frame Buffer
- HTLM5 scripts
- Read the display / write / reset etc
- Note the following:
  - Openjdk no JIT compiler (slow, so I use Oracle VM).
  - Openjdk (arm version: memory map file ~ broken)
  - Or frame buffer problem.
- Use RandomAccessFile

First Fun demo

- http://10.0.0.239:8080/demo-1.0-SNAPSHOT/FrameBuffer
  http://10.0.0.203:8080/demo-1.0-SNAPSHOT/FrameBuffer

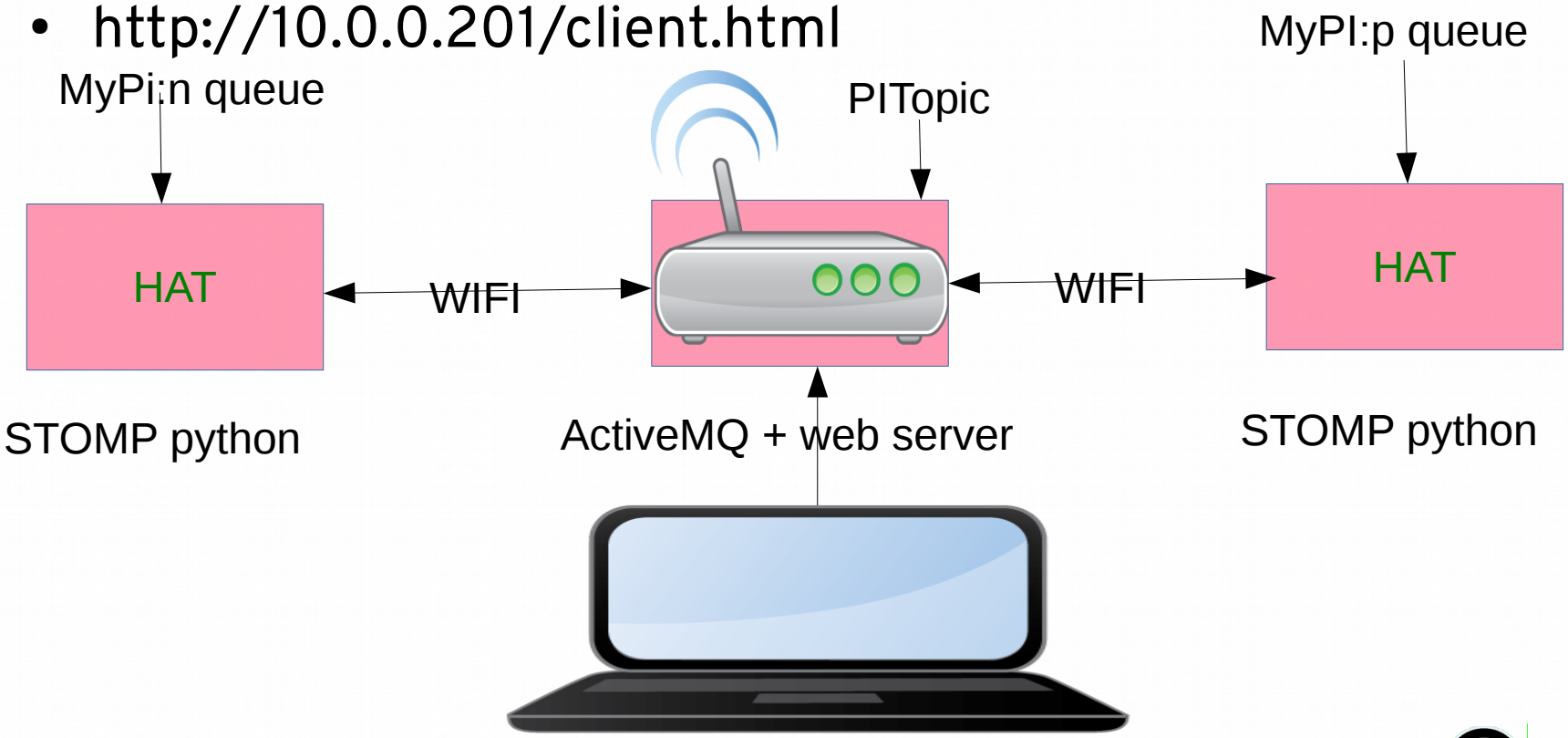


ActiveMQ fun

- Broker easy to collect information
- The Raspberry library are in Python
- Easy to make STOMP (on the PI)
  - Topic to send temperature in the example.
  - Queue on the PI to display a message
- Websocket STOMP on the client
  - html page with java script
  - jquery
  - stomp

First Fun demo

- http://10.0.0.201/client.html



ActiveMQ demo

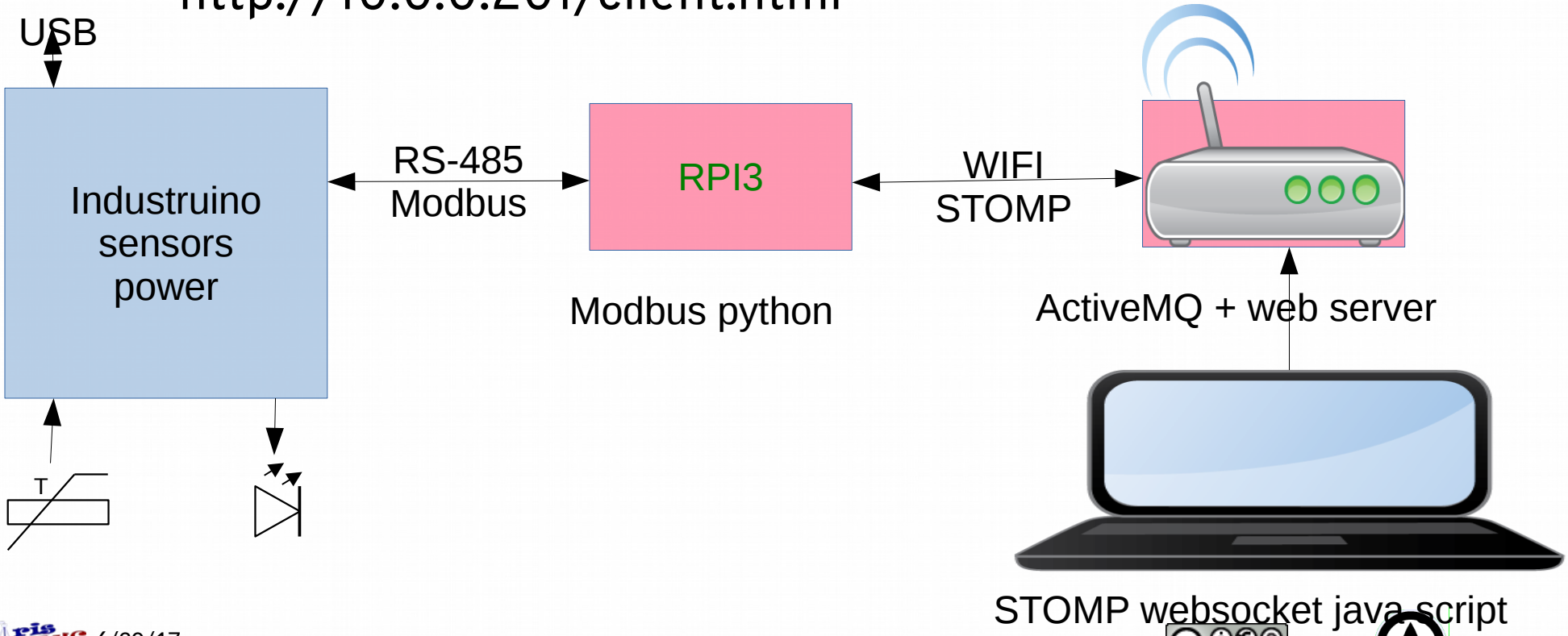
- First the client (java script): http://10.0.0.201/client.html
- bin/activemq console
- http://10.0.0.201:8161/admin/ (the activeMQ console admin/admin)
- The object Raspberry have STOMP python application running. (autostarted):
- root@localhost ROOT]# ps -ef | grep pytho
- root 371 1 0 17:28 ? 00:00:07 /usr/bin/python3 -Es /usr/sbin/firewalld --nofork --nopid
- root 2007 1 1 18:09 ? 00:00:01 /usr/bin/python /root/tomcatPI/python/sendtemprecvmess.py
- root 2047 745 0 18:11 pts/0 00:00:00 grep --color=auto pytho

Serious stuff with Industruino

- Based on Arduino but for electricians.
- Powered with 24 volts
- No OS programmed via USB
- Industrial format
- To control pumps, heaters etc
- Measures 2 temperatures
- Connected to ActiveMQ via RPI3 using Modbus
- Mostly OpenSource and OpenHardware

Industrial Demo

- http://10.0.0.201/client.html



Apache hardware?

- Internet of Things (IoT).
- http://mynewt.apache.org/ Arduino
- https://edgent.apache.org/RPI
- Problems with hardware:
  - Partially OpenSource /OpenHardware :-(
  - Hard to explain to the players the Apache Way

Do it your self?

- PI 3 + memory + power = 2 lunches
- http://mynewt.apache.org/
- https://edgent.apache.org/
- Blog: http://jfclere.blogspot.com.es/
- Github: https://github.com/jfclere/tomcatPI
- Fedora 25: https://fedoraproject.org/wiki/Raspberry_Pi
- Industruino code (you need Industruino libs too): https://github.com/jfclere/Industruino_HVAC_Functions
- Hardware controler: http://econtrols.org
- Mail: jfclere@gmail.com

Question ?

Merci !

carbon IT

arolla
Mastering Software Development

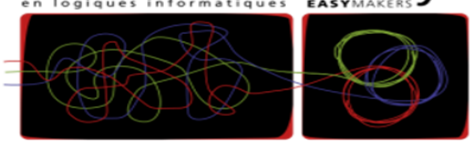
Couchbase

zenika

OXiane

MIRAKL

transformer vos stratégies en logiques informatiques
norsys
EASYMAKERS



SOFTEAM Cadextan

---

esiea
ÉCOLE D'INGÉNIEURS DU MONDE NUMÉRIQUE

WIKI

Paris JUG

VISEO

IPPON
Digital . Technologies . Hosting