



18-19.11.18

SEVILLE, SPAIN

# Having fun with Raspberry(s) and Apache projects

Jean-Frederic Clere, Manager, Red Hat

- 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

**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)**

## 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

- 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.

- Fedora 24
- Drivers from <https://github.com/raspberrypi/firmware>
- wifi access point from (non free)  
<https://raw.githubusercontent.com/RPi-Distro/firmware-nonfree/master/>
- dhcp (server)
- bind (name server to make captive portal)
- Java Openjdk version "1.8.0"
- Tomcat apache-tomcat-8.5.6 (normal well on 80)
- <http://10.0.0.201/>

- 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://10.0.0.239:8080/> (normal tomcat)
- <http://10.0.0.239:8080/http2.html>
- <https://10.0.0.239:8443/http2.html> https normal
- <https://10.0.0.239:8002/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`

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



- Servlet
- Frame Buffer
- HTML5 scripts
- Read the display / write / reset etc
- Note the following:
  - Openjdk no JIT compiler (slow).
  - Openjdk (arm version: memory map file ~ broken)
  - Or frame buffer problem.
- Use RandomAccessFile

- <http://10.0.0.239:8080/demo-1.0-SNAPSHOT/FrameBuffer>

- 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 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

- 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
- Displays stuff via a web page.
- Partially OpenSource /OpenHardware :-)

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

- 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>
- Mail: [jfclere@gmail.com](mailto:jfclere@gmail.com)

Questions

• **THANK YOU!!!**

