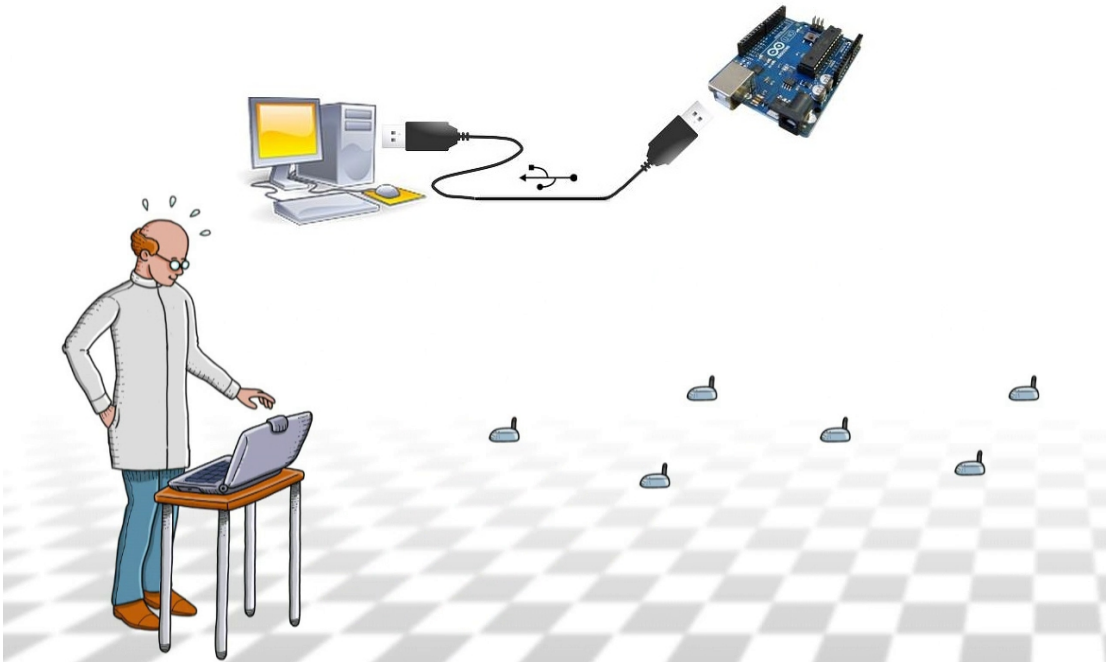
FIT
FUTURE INTERNET
TESTING FACILITY

THE **FIT IOT-LAB** TESTBED

Alexandre Abadie, Frédéric Saint-Marcel
INRIA
EWSN 2021, Delft

CONTEXT

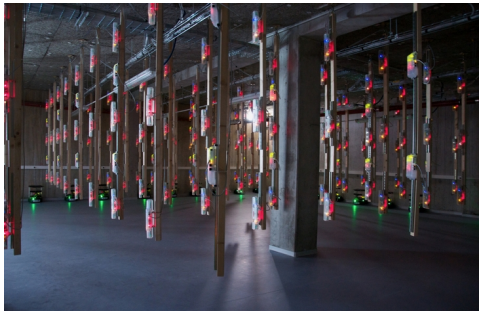
- How to develop and test easily an IoT application at a large scale?



FIT IOT-LAB

http://www.iot-lab.info

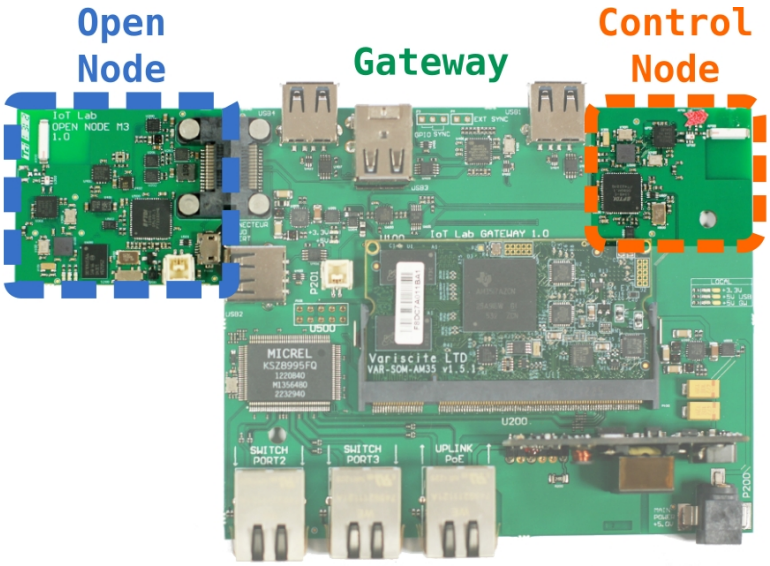
- Very large scale experimentation testbed for the Internet of Things
  - **1500+** connected things
  - 6 sites in France



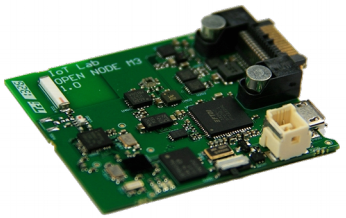
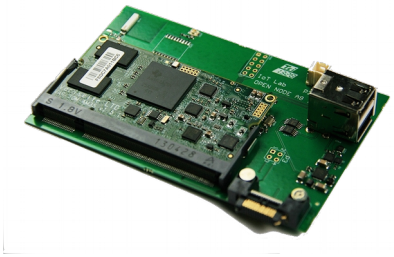
FIT FUTURE INTERNET TESTING FACILITY

FIT IOT-LAB NODES

- 3 components:
  - **Open Node**: *programmable connected thing*
  - **Gateway**: infrastructure link, user's code deployment
  - **Control Node**: monitoring (consumption, radio)

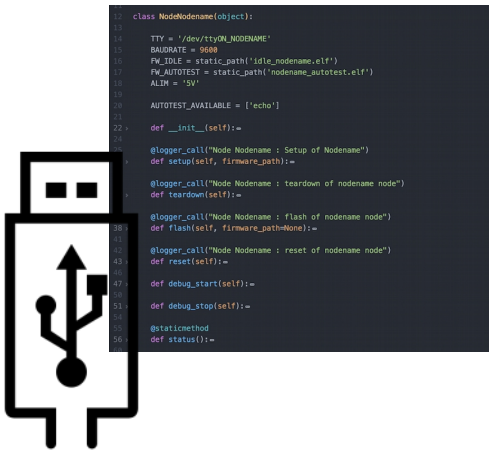


FIT IOT-LAB OPEN NODES

Name (nb)	Micro-controller	Sensors	Radio	
M3 (956)	Cortex M3 (32bits), 72 MHz, 256 kB ROM, 64 kB RAM	• luminosity • accelerometer • preasure	• AT86RF231 (2.4GHz)	
A8 (561)	Cortex A8 (32 bits), 600 Mhz, 256 MB RAM	• luminosity • accelerometer • preasure	• AT86RF231 (2.4GHz) • Ethernet	

EXTENDED WITH BOARDS FROM THE MARKET

- Currently >20 boards supported
  - Microchip SAMR21
  - Microchip SAMR30
  - Zolertia Firefly
  - ST B-L072Z-LRWAN1
  - ST B-L475E-IOT01A
  - Decawave DWM1001
  - Nordic NRF52DK
  - Arduino zero
  - Nordic nRF52840DK
  - nRF52840-MDK
  - Nordic nRF51DK
  - BBC micro:bit
  - NXP FRDM-KW41Z
  - Zigduino
  - ...



- Radios: 802.15.4, Sub-1GHz, BLE, LoRa

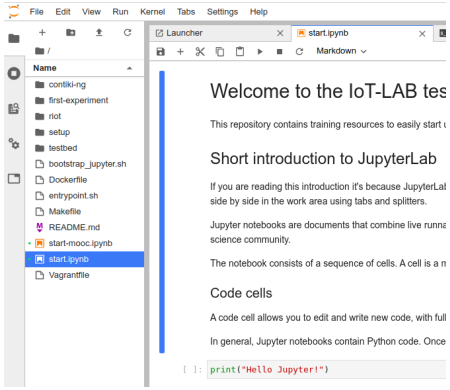
KEY FEATURES

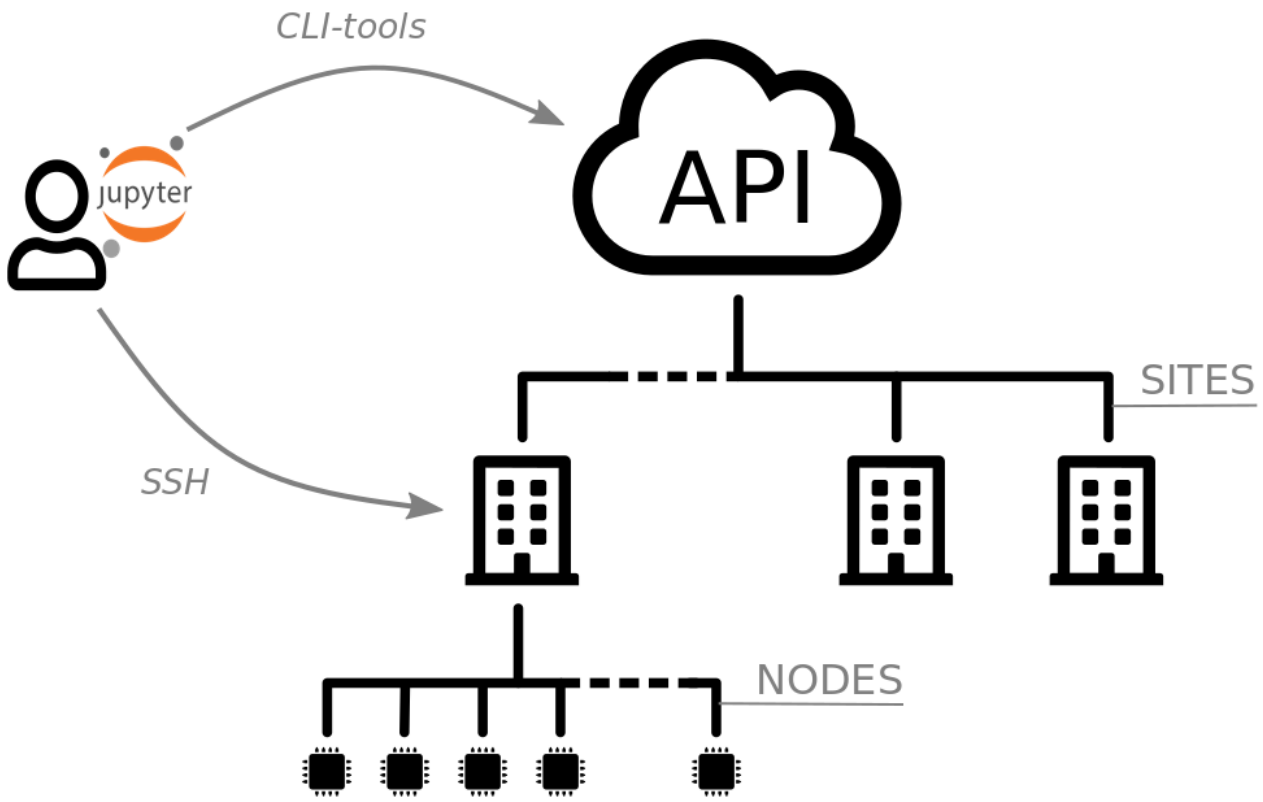
- Very **large scale** deployment
- Several physical topologies, microcontroller boards and radio support
- Reproducible research
- Nodes interaction : flash firmwares, serial I/O access, debug, power supply management
- Automatic monitoring
  - Energy consumption, RSSI, radio sniffing
- Toolbox : CLI tools, SSH-CLI tools, websocket, serial/sniffer aggregation, ...
- OSes support (RIOT, Contiki-NG, FreeRTOS, Zephyr)
- Public IPv6 connectivity

FIT FUTURE INTERNET TESTING FACILITY

IOT-LAB LABS

https://labs.iot-lab.info





Thanks for your attention