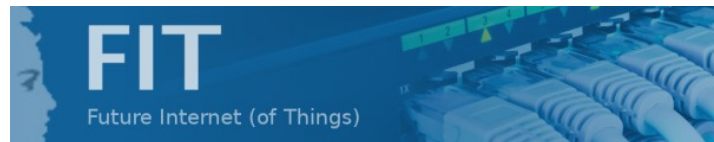


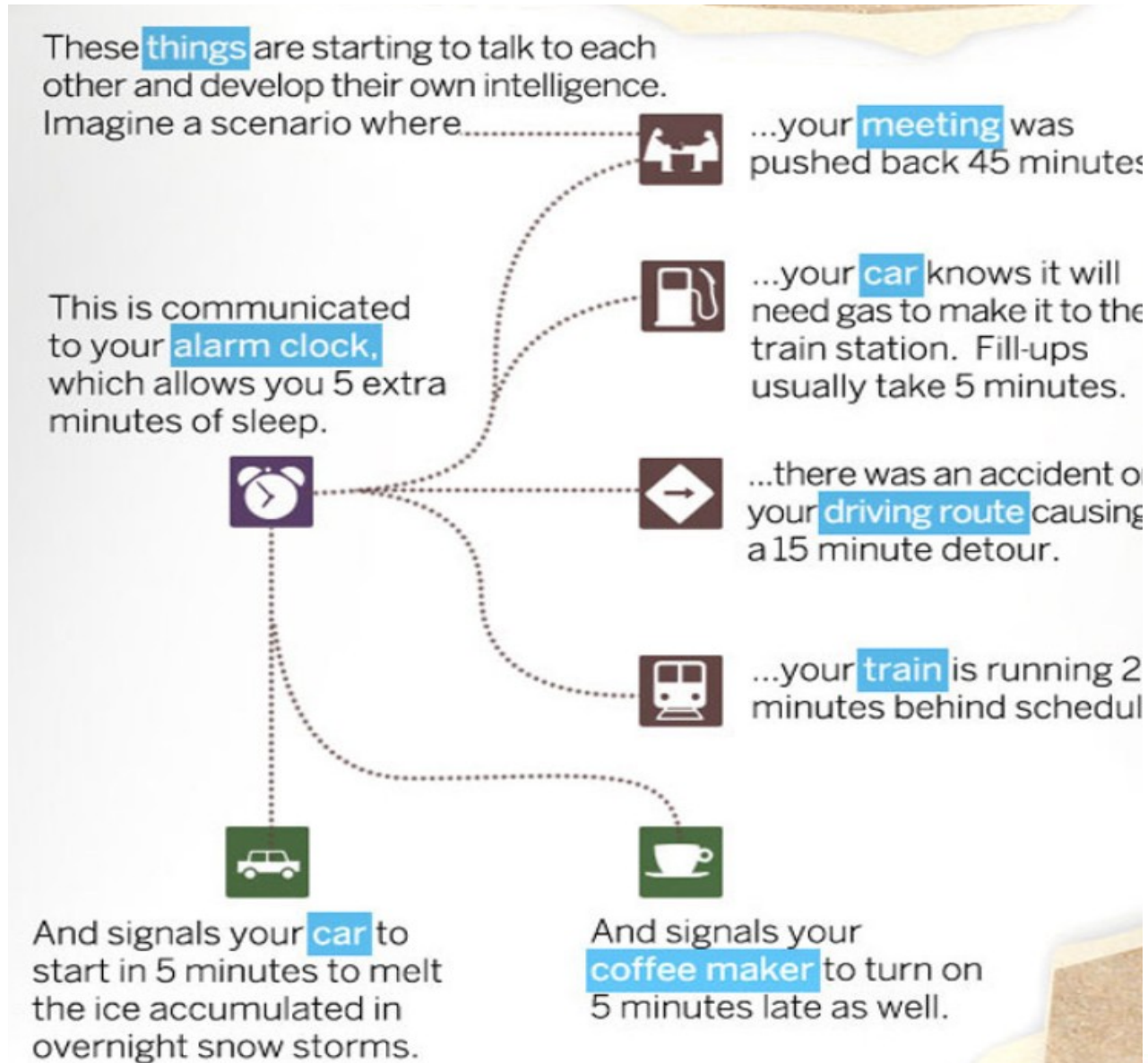
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An IoT future application

2020 : 30 à 50 billion communicating objects



Communicating Objects



	Sensors (S)
Communication(C)	Processor (P)
Energy	Actuators(A)



Physical World
« Environment »



IoT Architecture

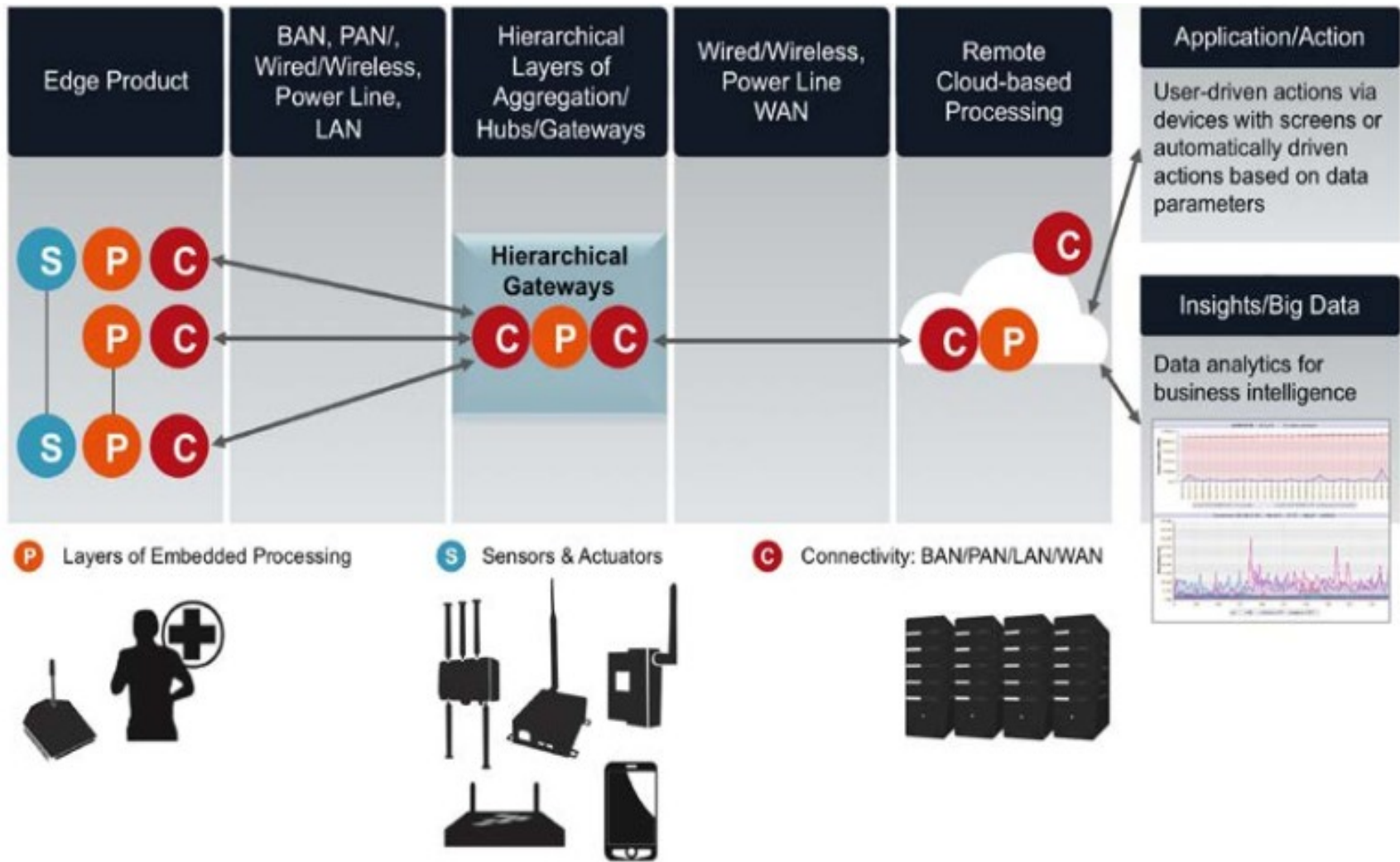


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FIT in a nutshell

5 partners:



Ambition: create a first-class facility to promote experimentally driven research and to facilitate the emergence of the Internet of the future.

Goal: meet the advanced user requirements (multiple environments, integration tests, reproducibility, ...).

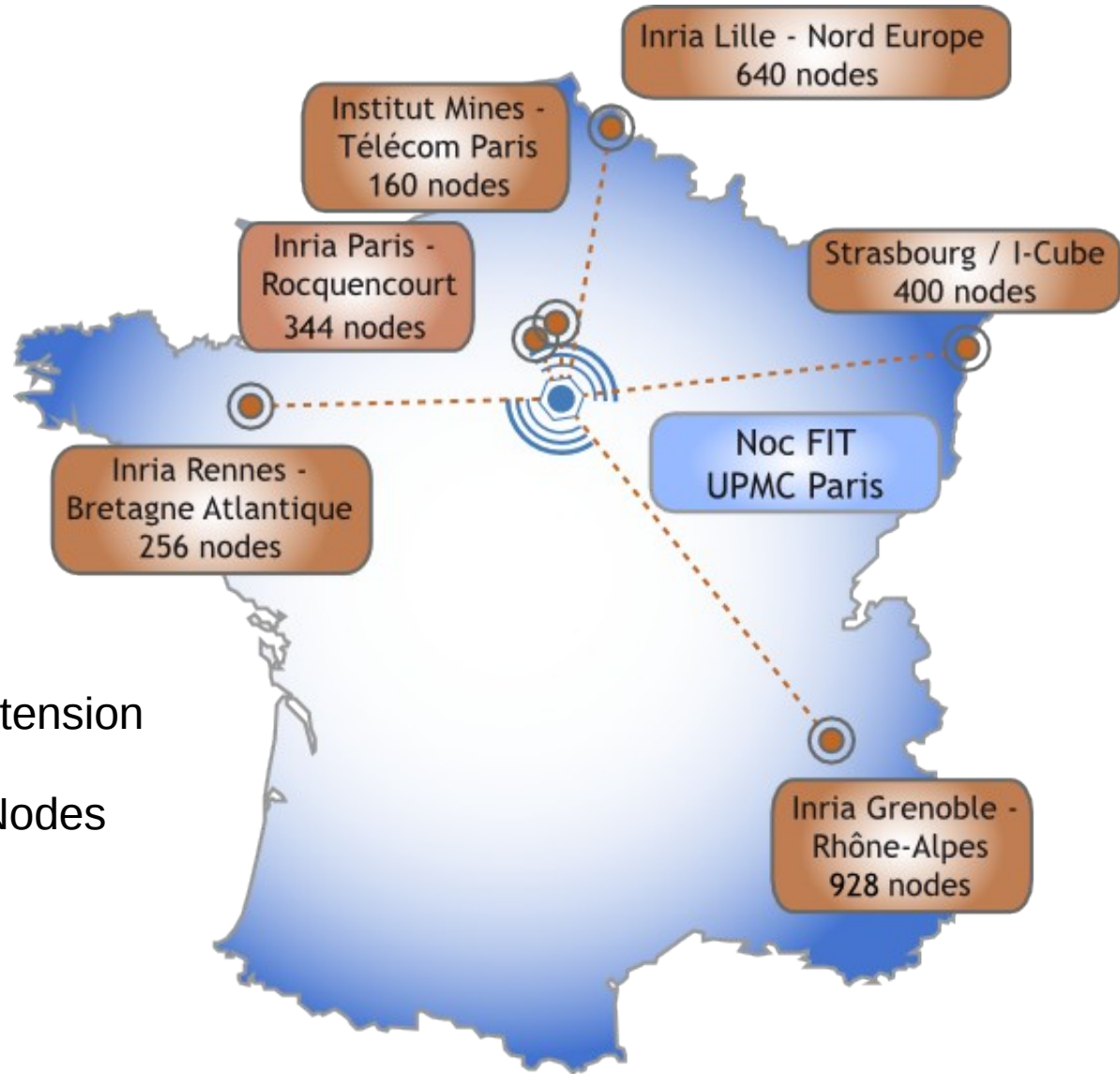
Distributed facility, heterogeneous devices, complementary components, adequate/relevant locations.

9 sites: Paris (2), Evry, Rocquencourt, Lille, Strasbourg, Lyon, Grenoble, Sophia Antipolis.

4 parts (composed of 10 elements): Network Operations Center, Cognitive Radio Testbed, IoT-LAB Testbed, Wireless OneLab Testbed

Grand Emprunt funding: 5 M€ Investment (3 years) + 0.8 M€ Operation (6 years 10 months).

FIT IoT-LAB



SensLAB platform extension

2728 Heterogenous Nodes

Present users (SensLAB)

- **263 user account (11 companies et 25 country) for the previous version SENSLAB**
- **Academic**
 - networking / robotic / Ambient network
- **Industrial**
 - Thales, Orange Lab, Atos
 - SmartGrains (spinoff), Noolitic (spinoff), HikoB (spinoff)
 - Etineo (SME), Wateco, EasiFab, Alpwise
- **I' EQUIPEX FIT target platform for ANR INFRA call**

FIT IoT-LAB objectives

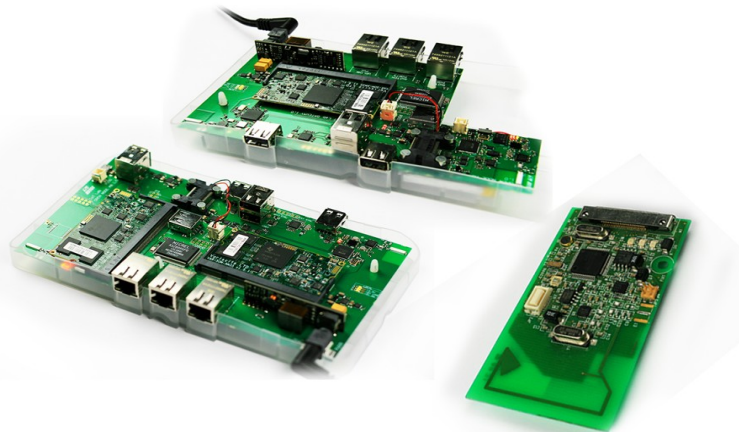
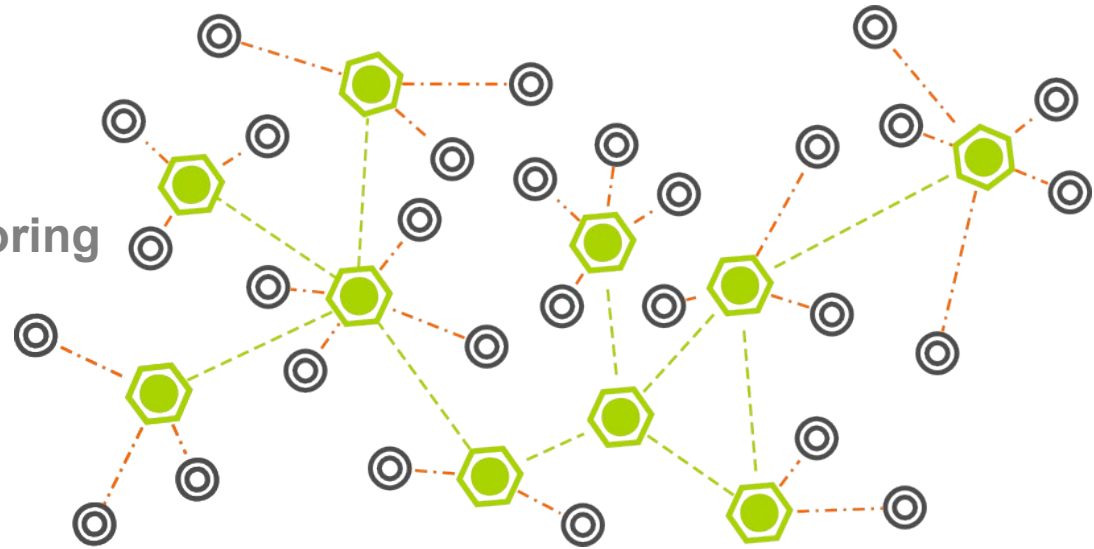
Target and challenge :

M2M / scaling

IoT (heterogeneous)

Design/test/deployment/monitoring

Large scale / Automatization



Use Cases :

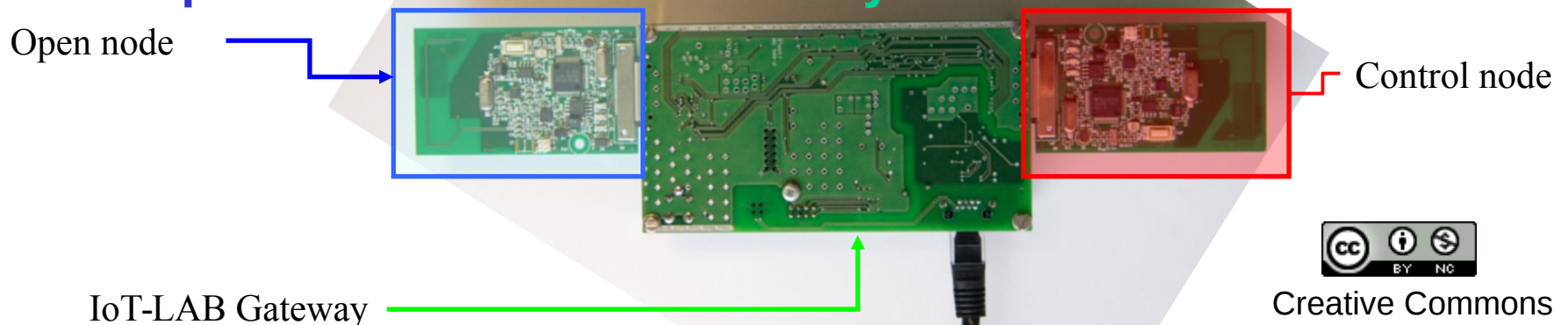
- Home gateway
- Monitoring via cloud services
- IPV6 from the sensor to the cloud

IoT-LAB node

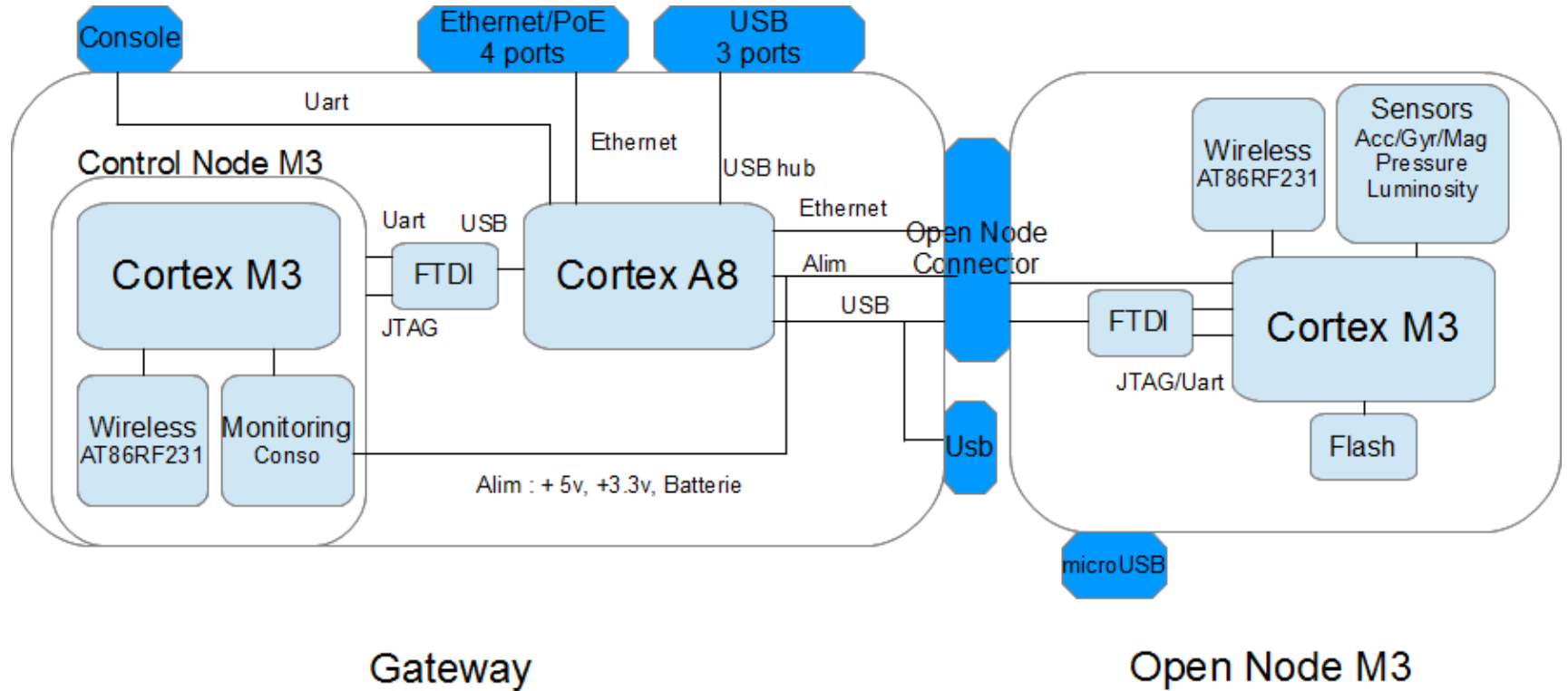
⦿ What is a IoT-LAB node

- **OPEN, i.e., no « a-priori » knowledge on the embedded user software**
- **Efficient canal of monitoring (wired)**
- ➔ Open node dedicated to the user
- ➔ Control node
- ➔ An IoT-LAB “Gateway”

= **Open node + IoT-LAB Gateway + Control node**

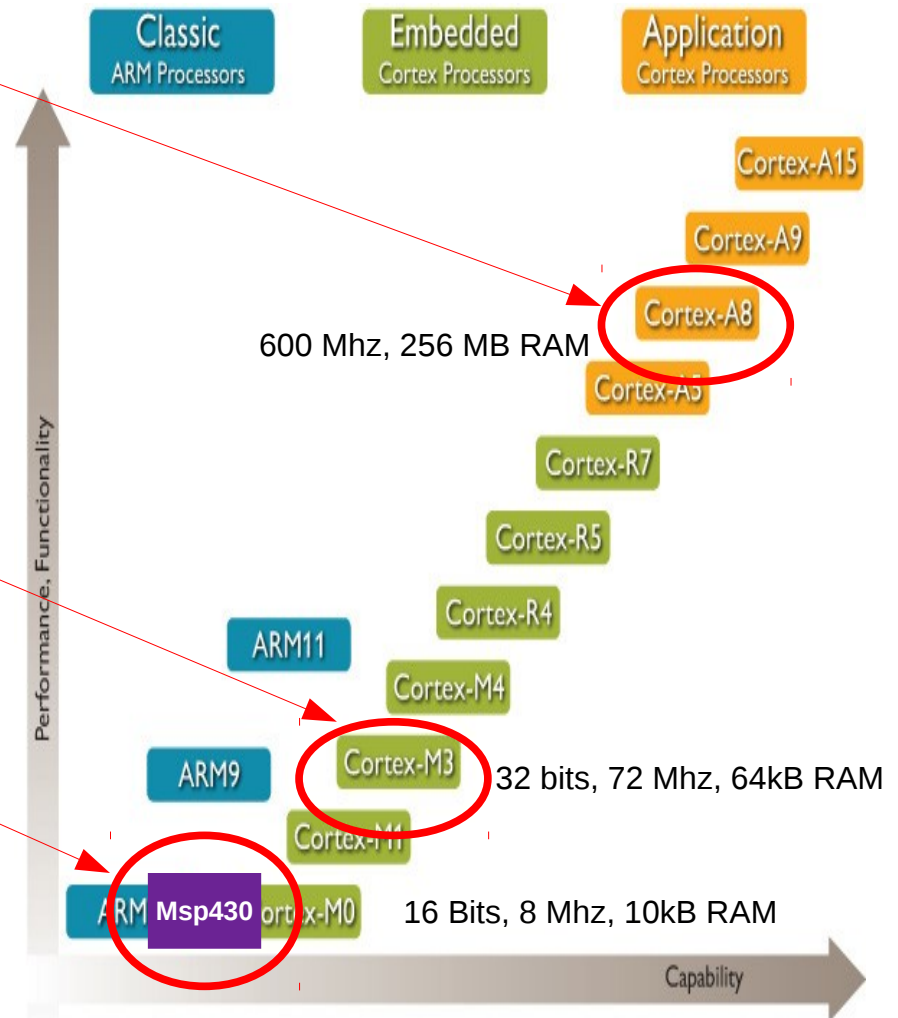


IoT-LAB Node M3 Architecture



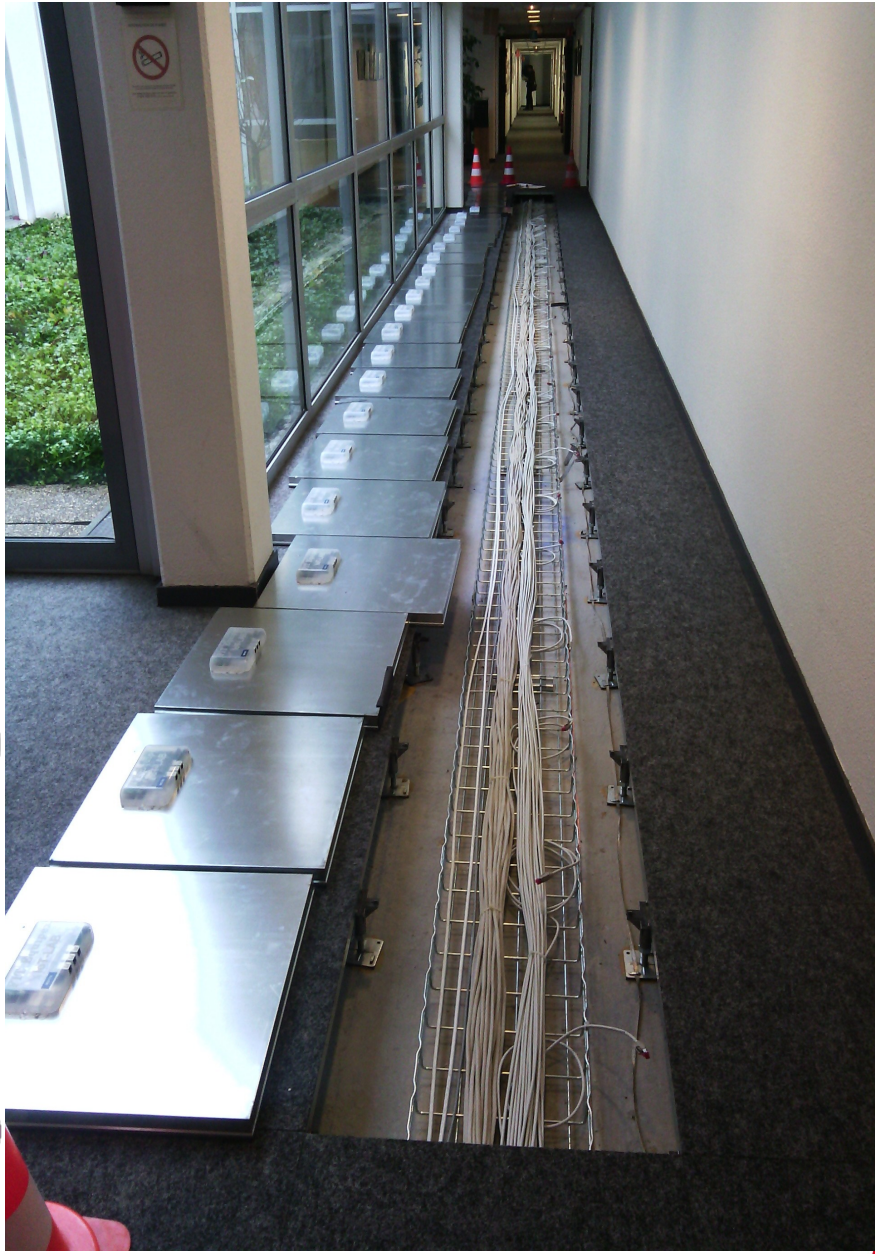
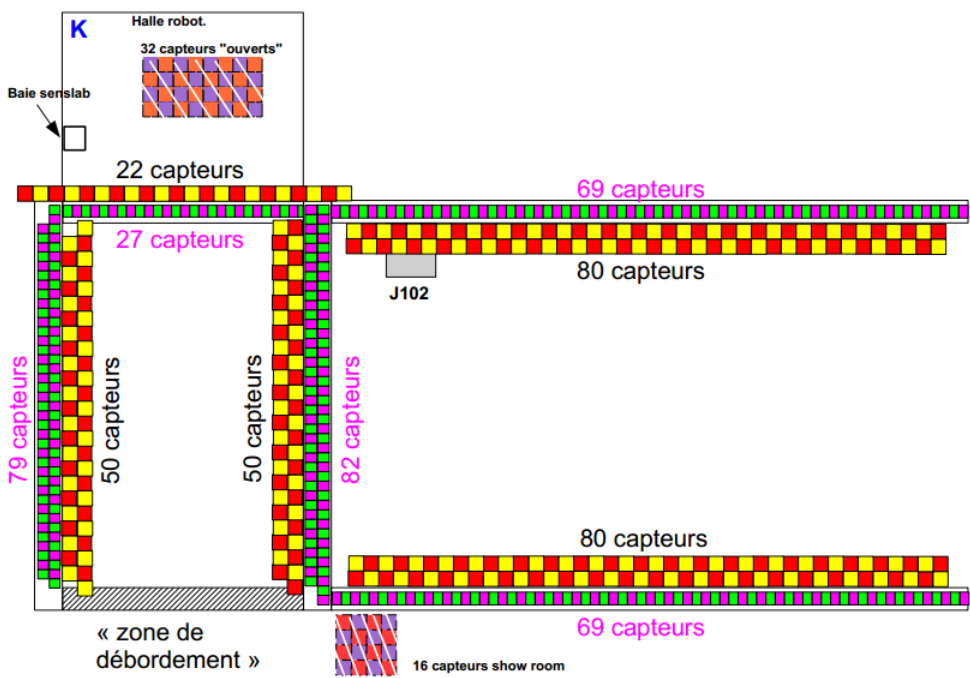
IoT-LAB nodes

- **A8 node : TI-SITARA AM3505**
 - Ethernet, USB
 - Linux/Android
 - M3 node (Radio Atmel AT86RF231)
- **M3 node : STM32**
 - Radio Atmel AT86RF231
 - Ambient light, Temp. Pressure, IMU
- **WSN430 node : TI MSP430**
 - Radio TI CC1101 / CC2420
 - Ambient light, Temp.

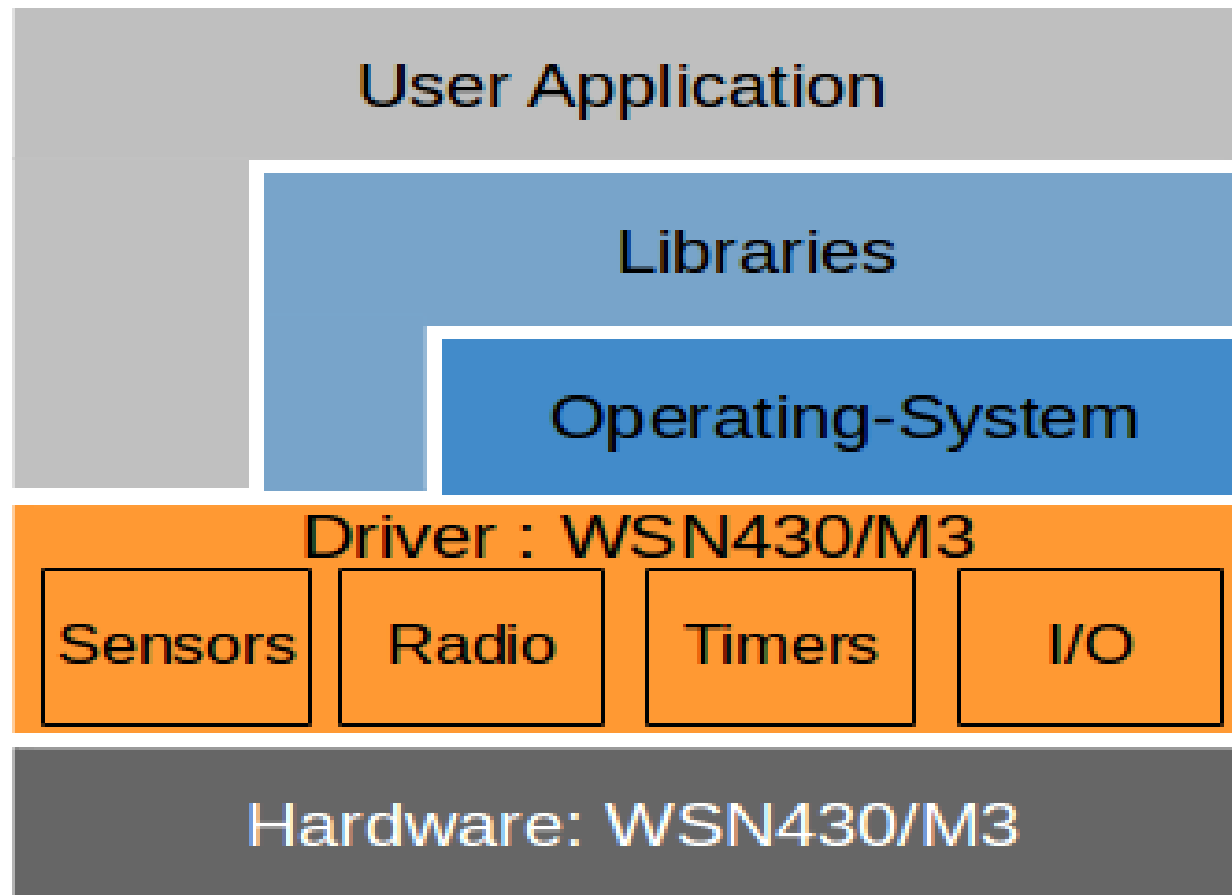


IoT-LAB Grenoble Site

- 256 WSN nodes
- 200/384 M3 nodes
- 256 A8 nodes
- 32 Open nodes



Embedded User Software



Several Operating Systems

	Wsn430 Node	M3 Node	A8 Node
FreeRTOS	X	X	-
Contiki	X	X	-
Riot	X	X	-
TinyOS	X	-	-
OpenWSN	X	X	-
Linux	-	-	X

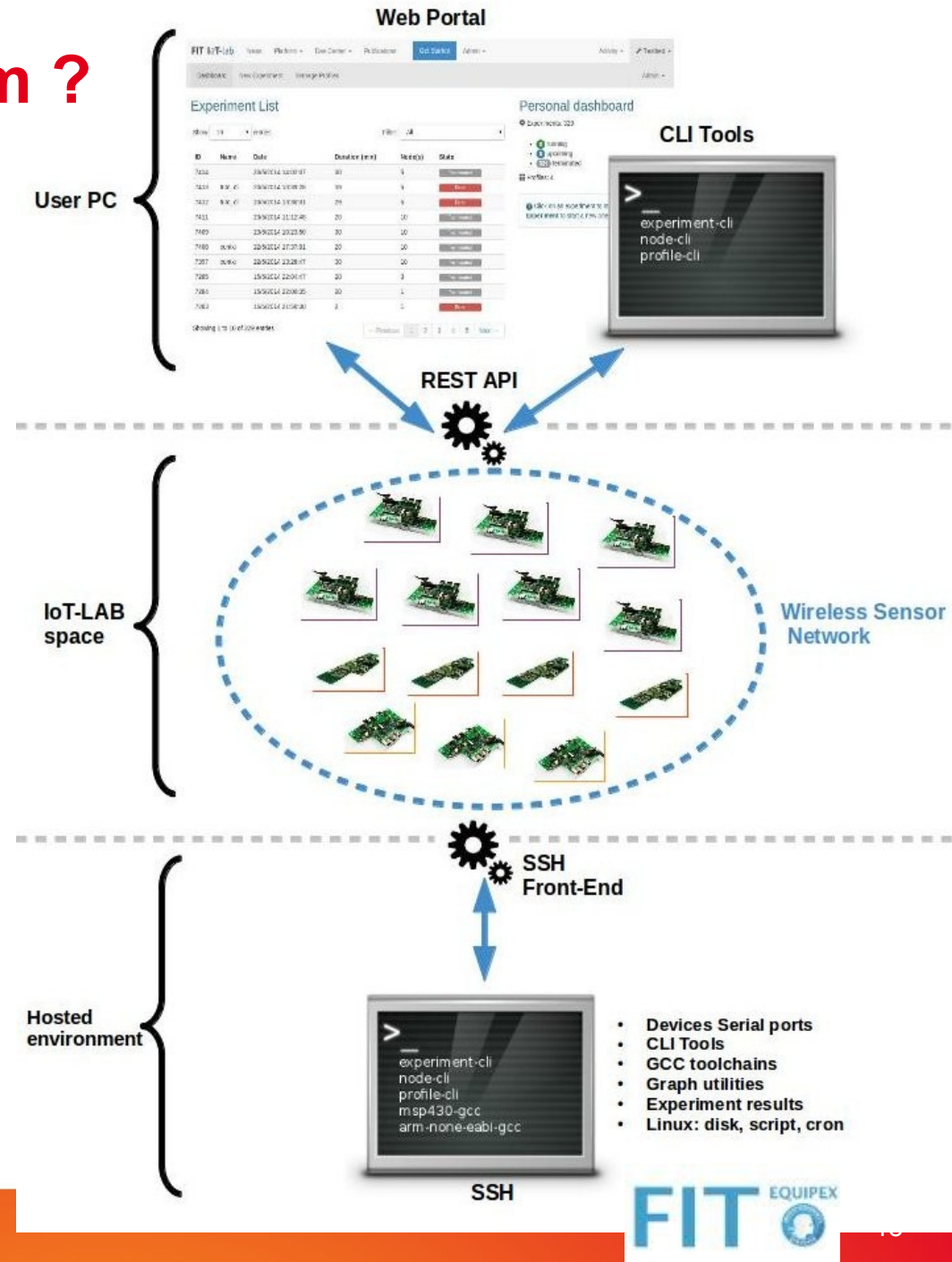
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How to use the platform ?

- Open a user account
- Ressources reservation
 - Geographical sites
 - WSN430/M3/A8 nodes
- Experimentation description
 - Firmware/nodes association
 - Monitoring tuning
- Experimentation launching
- Monitoring data analysis



Tutorial

- **0. Accounts, SSH keys, Development Environments**
- **1. First Experiment**
 - Create a New Experiment with the Web Portal
- **2. Monitoring Devices**
 - Monitor Consumption on a M3 Node During Experiment
- **3. Contiki's uIPv6 stack & Tools**
- **4. Sensor Information Collection**
- **5. Demo: The Big Red Button**

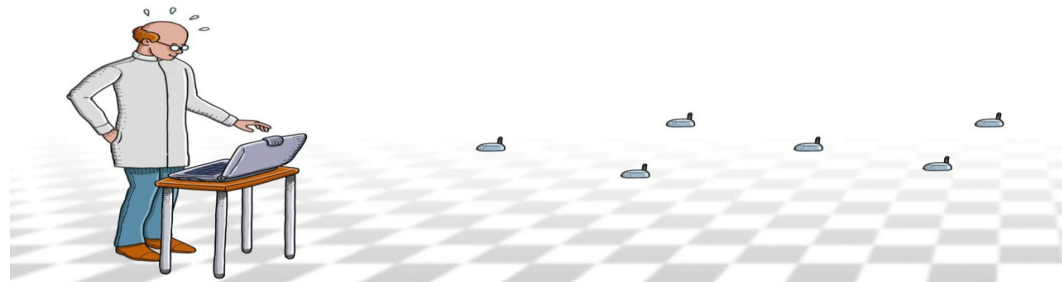
User support

- **Web Portal** : www.iot-lab.info/
- **Git-Hub**
 - **Wiki** : <https://github.com/iot-lab/iot-lab/wiki>
 - **Sources** : <https://github.com/iot-lab/>
 - **Issues** : <https://github.com/iot-lab/iot-lab/issues>
- **Mailing-list** : users@iot-lab.info



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Road Map 2014

May	M3 nodes partial deployment on Grenoble site
June	M3 nodes partial deployment on Strasbourg site
July	A8 nodes partial deployment on Paris site
	M3 nodes partial deployment on Lille site
September	Sniffer (802.15.4 packets capture)
	Robot mobile node on Lille, Grenoble and Strasbourg site
November	National Workshop for IoT-LAB inauguration
	Noise injection, GPS clock synchronisation
December	A8 and M3 nodes total deployment on all sites

2015

Mobile nodes on all sites, more fonctionnalities,