Internet of Things (IoT)

architectures et technologies

/me

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Business Services

Avant de commencer, voici deux cas...

Comment ça marche?

J'entre "https://httpbin.org/get" dans le navigateur web de mon smartphone...

… il m'affiche la page.

Cet équipement mesure et remonte périodiquement température et humidité...

santboimeteo.es @santboimeteo · 4 min
03/12/2016 a 22:00h
Temp:11,1°C
Temp aparente:10,6°C
Hum:87%

santboimeteo.es @santboimeteo · 1 h
03/12/2016 a 21:00h
Temp:10,6°C
Temp aparente:10,3°C
Hum:88%

santboimeteo.es @santboimeteo · 2 h
03/12/2016 a 20:00h
Temp:11,7°C
Temp aparente:11,6°C

… qui apparaît finalement dans un flux twitter.

Indices: fiche produit de l'équipement

Temperature/Humidity sensor

Overview
- Plastic housing; size 81 x 73 x 20 mm; material: PC UL94 V0;
- interfaces: 2 buttons (RESET, zero setting), 2 LEDs (configuration and pairing)
- Mounted on wall support or angle support
- 2 solar cells
- Measurement of temperature and ambient relative humidity
- Ambient luminosity indicator

Power supply
- "Harvesting": power supply through generation of energy accumulated by solar cells.
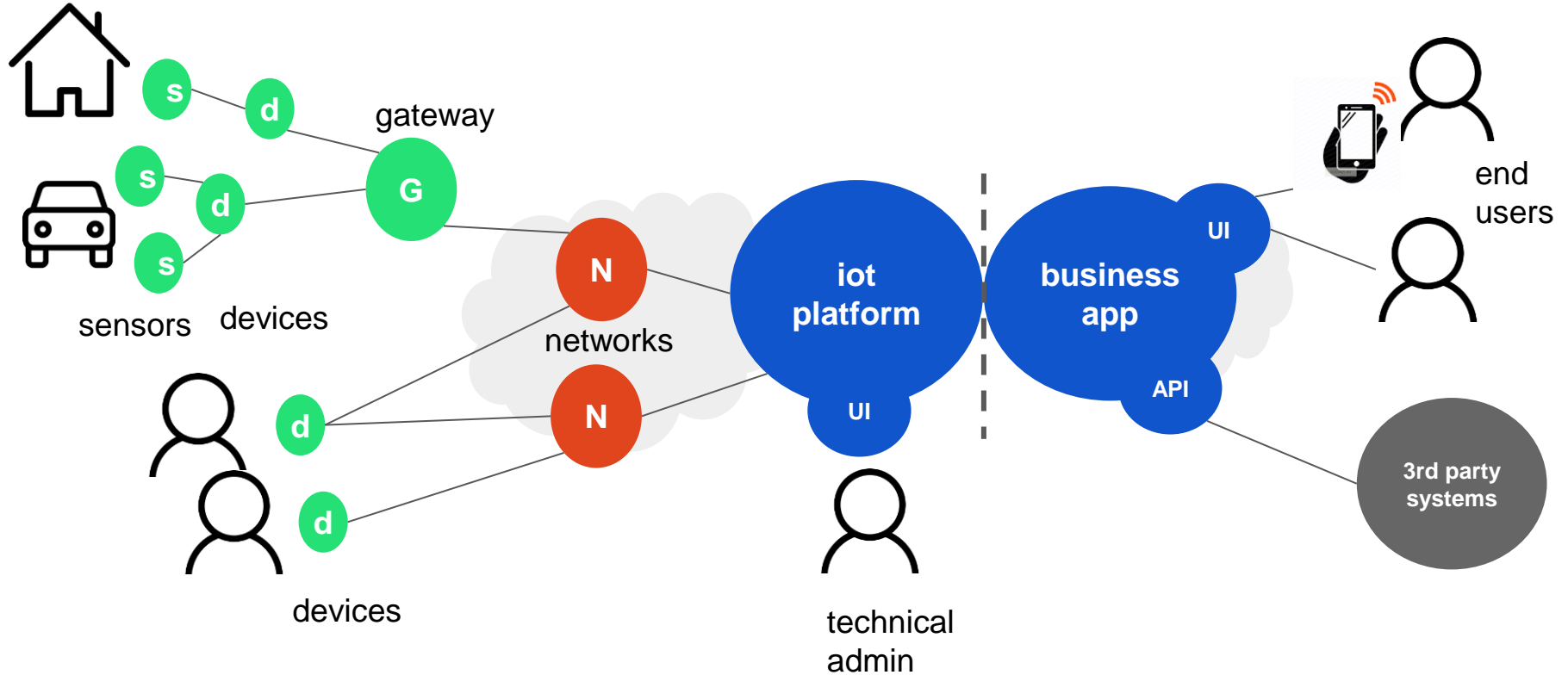- Autonomous from a daily average of 200 lux.

Communication
- Radio frequency link to the PAN Router: ultra long range radio technology using a specific spread spectrum modulation in the 868 MHz band (from 2 km for dense cities to 15 km in countryside).

Specifications
- Software
    - OS: Contiki
    - Physical Layer: LORA™-868MHz
    - MAC Layer: IEEE 802.15.4-2006 (non beacon enabled CSMA/CA)
    - Network: IPv6 / 6LoWPAN
    - Routing: Leaf Mode RPL
    - Transport/presentation: UDP
    - Application: pseudo ZCL
- Compatible with ThingPark Wireless network
- Self-organizing network
- Temperature/humidity sensor Sensirion SHT21.

- Accuracy for temperature:
    - < +/-0.5°C from 0° to +65°C
    - < +/-1°C from -30°C to 0°C and from +65°C to +90°C
    - < +/-2°C below -30°C and above +90°C
- Accuracy for relative humidity:
    - < +/- 3% from 20% to 80%
    - < +/- 5% below 20% and above 80%
- Measurement range: -40 to 120°C and 0 to 100% for relative humidity
- Resolutions: 1/100°C for temperature and 4/100% for relative humidity.
- Luminosity indicator: in % of the luminosity level.

source: http://www.nke-watteco.fr/

Une solution IoT de bout en bout

Plan du cours

1. équipements

(form factors, sensors, contraintes)

3. plateformes

(décomposition type, composants, solutions cloud)

2. communications et protocoles

(couches, PAN/LAN/WAN, protocoles applicatifs)

4. enjeux / perspectives

(volumes/scalabilité, sécurité, contraintes légales, normalisation)