

Orange IoT diversification

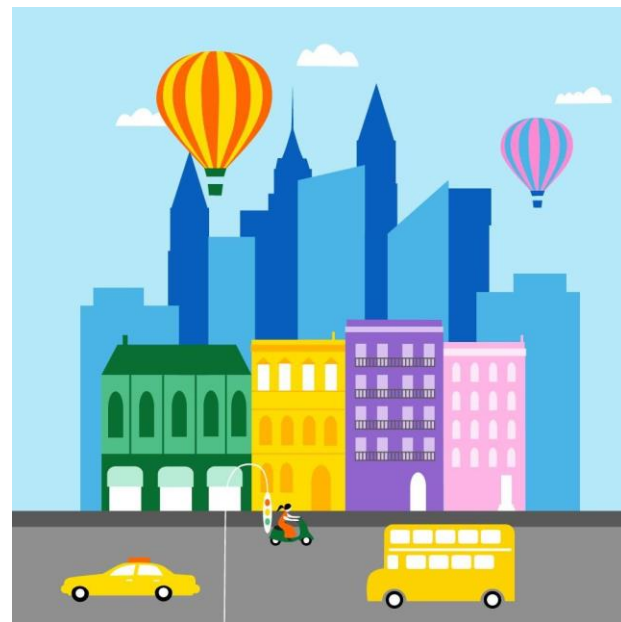
Quels réseaux pour l'Internet des Objets ?

Télécom ParisTalks

Arnaud Vamparys

SVP Radio Networks

December 8th, 2016

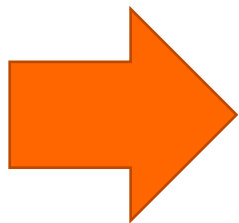


Essentials 2020 diversification

IoT is the first new revenue for Orange in 2018

€400 million

mobile banking revenues in 2018



€600 million

Internet of Things & M2M
revenues in 2018

x10

vs. 2014

x6

vs. 2014



IoT diversification

our ambition is to reach 600M€ on IoT, relying on 4 pillars

1 connectivity

our core business



3 enterprise services (incl. b2b2c)

vertical solutions



2 distribution

Orange "know-how"

Wearables



Health



Others

Toys & Robots



Anti-Theft and Loss



4 consumer services

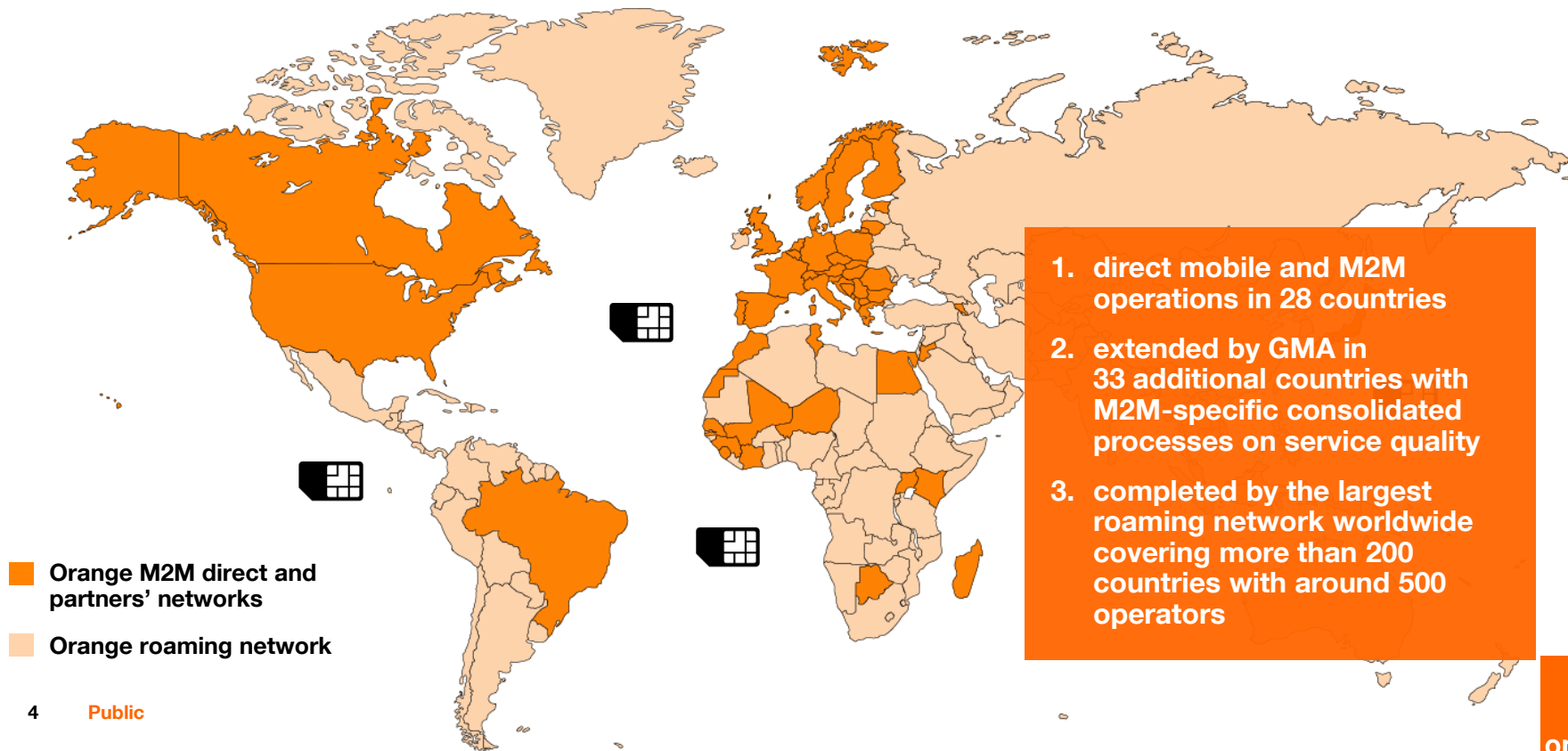
smart home & mobility



Kid Watch

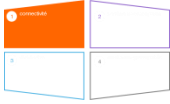
Orange Business Services: from M2M to Internet of Things

Orange global mobile network



IoT journey

some specifics must be taken into account



IoT is about verticals



main value will come from
generated data :
=> ecosystem, data analytics & privacy



IoT is emerging & heterogenous ,
it requires **prioritization** and
appropriated organization

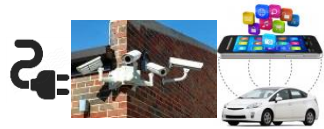
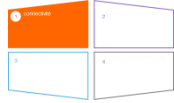


part of the market will develop
through b2b2c offers => wholesale



IoT connectivity requirements are extremely diverse

LPWA (new), actual M2M and high speed M2M



V2X / connected cars (infotainment)
wifi on board
video monitoring

**External powering,
Mbps Throughput,
Low latency,
High mobility**

4G+



health (patient monitoring)
security
payment
connected cars (excepted infotainment)
gateway for smart metering
wearables
sensitive device tracking

**Rechargeable battery,
Kbps Throughput,
Real time transaction**

2G / 4G



smart building
smart agriculture (with extended coverage)
sensors, smart meters, smart cities
insensitive devices tracking,
smart home, e-health (wellness)
smart plant

**Low power,
Low cost,
Long Range**



Mobile IoT

LTE-M
NB-IoT
EC-GSM-IoT

LoRa™ LPWA

LPWA : many new use cases added to actual 2G/4G M2M



Smart Agriculture

- Connected beehives
- Ground sensors
- Animal monitoring

Smart City

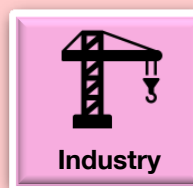
- Street Lighting
- Waste management
- Air monitoring
- Parking
- Traffic Lightning
- Advertising monitoring
- Tracking (bikes, mobile ads, ...)
- Fire Hydrant monitoring
- Flood detection / monitoring

Smart Building

- Heating / T° , humidity, CO₂ monitoring
- Water, Gas, Elec metering
- Presence detection
- Zoning / indoor location
- Smoke detection / security equipment monitoring
- Access control & monitoring



- Alerting, monitoring
- Monitoring of equipment use
- Home services and badging
- Feedback buttons



- Bridge, railway , tank, vibration, road T° ... sensors
- Objects and people tracking
- Weighing machines



- High end home objects
- Tracking
- Smoke detection monitoring
- Oil/Gas tank monitoring

Orange selected LoRa beginning 2015 as first LPWA solution to address B2B customer connectivity needs



LoRa, an unlicensed LPWA technology...

Non-cellular technology based on a new network

- ✓ Available now
- 🔄 Easy to deploy, anywhere in the world on-demand
- 🇫🇷 On-going Large scale deployment in France
- 🌐 Supported by a growing World Wide Eco-system

LoRa Model

Specifications of LoRaWan MAC by LoRa Alliance

Regional Specific Band
433 / 868 / 915 MHz

Private and Public operators deployment

Certification program by LoRa Alliance and Orange to ensure interoperability

Roaming under definition by LoRa Alliance

LoRa Key Strengths

- 💰 Low cost modules available Now
- 🔋 Proven Low power consumption
- 📶 Long Range: Deep Indoor
- ↔ Bi-Directionnal
- 📍 Geolocation
- 💰 Small size Gateway and Nano-gateway
- 🔄 Light Backhaul requirement compatible (Cellular / Ethernet)

LoRa ideally suited for low cost sensors on battery sending few messages per day in Smart City and Smart Industry

Ad-Hoc deployment possible anywhere to address local needs

commercial IoT network

Q2 2015 first LoRa City in Grenoble

- address **LPWA B2B use cases**
- develop the **Datavenue** Data Management Platform
- develop the ecosystem of LoRa user and developer: **> 130 MoU** signed with B2B customers and startups
- validate a variety of use cases covering **Smart City and Smart Industry**

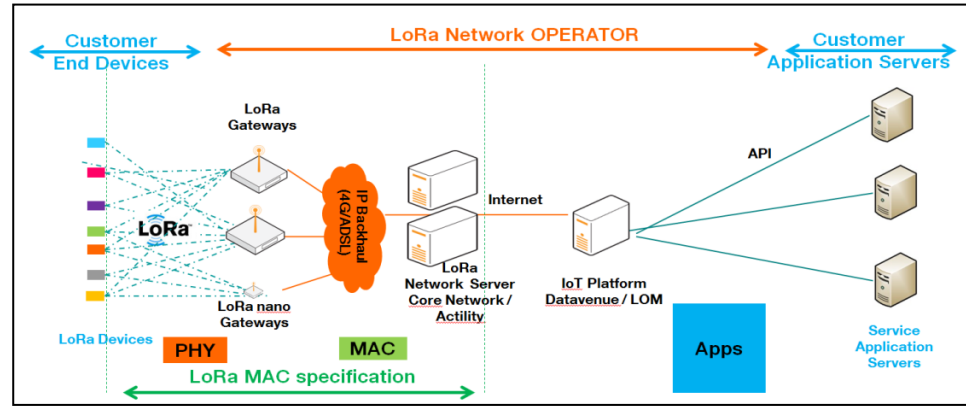
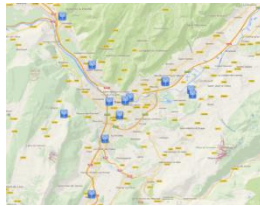
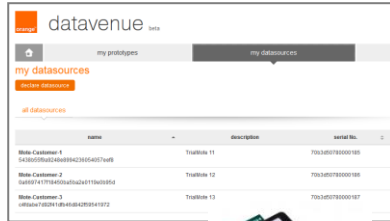
2016 Orange France Roll Out

- Pilot customers in S1 2016
- Top 19 urban areas covered = 1500 cities
- Fully commercial since mid-2016 using Live Object – Datavenue platform
- Top 120 urban areas target by Q1 2017
- On-demand LoRa connectivity for specific needs



**capability to
deploy LoRa
anywhere
worldwide**

**rapid LoRa
market adoption
in France**

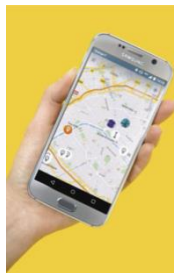


Orange contribute to LoRa Ecosystem development



Orange Certification program

Orange launched a **certification process** on LoRa to ensure performance and interoperability. Already many modules and devices certified.



Orange Product Innovation

Technocentre working on innovative **LoRa B2C product** combining Crowd Networking & tracking feature



Orange Partner program

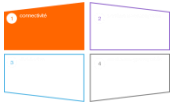
Orange distribute for startups and developers a **LoRa starter kit**



LoRa challenge schedule in December 2016 in Paris with other key players of the LoRa community Operator- Chipset – Device maker

LoRa Lamp and tracker for employees





Mobile IoT

Orange Labs active in standardisation and promotion of Mobile IOT through GSMA



The 3 evolutions standardised by 3GPP are designed to meet objects connectivity requirements compatible with LPWA

The three evolutions were needed to cover all markets and IoT segments

EC-GSM-IoT evolution of 2G GSM

LTE-M evolution of 4G LTE

NB-IoT evolution of 4G LTE



Common characteristics



Reduce deployment cost and enable fast roll outs by software upgrades on 2G and 4G networks (hardware upgrade can be necessary in some configurations)



Standardized technology by 3GPP



Low cost modules (Target ~ 5\$)



Enhanced coverage with ~ +15/20 dB over existing LTE/ GPRS



Low power consumption (more than 10 years with a metering use case - 200 bytes /day)

IoT multi-techno connectivity

LTE-M is the most versatile Mobile IoT solution



LTE-M as a pillar for our IoT network strategy...



LTE-M

- **LTE-M can address most of new LPWA / IoT and M2M use cases**
- **LTE-M working as a “swiss knife” of Mobile IoT technologies**
- **LTE-M support full mobility and voice capability**
- **LTE-M roll-out will have little impact on the network**

with existing solutions



**Current
2G**

for a local deal where a bespoke roll out is required, to meet expectations from b2b, to lead the low power market (availability of modules)

as a fall back solution for use cases requiring national coverage now (demand hybrid modules to manage transition with LTE-M)

Orange to consider others Mobile IoT solutions if required by use-cases and countries infrastructure

NB-IoT

NB-IoT to be assessed against use cases requiring deep indoor coverage with very low throughput and static objects

**2G /
EC-GSM-IoT**

EC-GSM-IoT makes sense for IoT national coverage in some countries where LTE is not well developed yet. Large countries in Europe and Africa Middle East.

IoT connectivity combining LoRa and Mobile IoT



2G/4G strategy

4G Mobile IoT
Focus on LTE-M



M2M
2G



2G IoT for backup & continuity
Full EC-GSM-IoT in some markets like Africa

5G

Current Base mainly B2B

Low Power
LoRa



Static sensors running on battery + tracking , city wide + ad-hoc deployments anywhere worldwide

2016

2017

2018

Orange developing a suite of services for IoT

Live Object - Datavenue portfolio



IoT LoRa/Mobile

Future objects



Connected objects



IoT Platforms



Select



Connect*



Manage



Control



Enterprise data



Enterprise Data



Open Data



Orange data



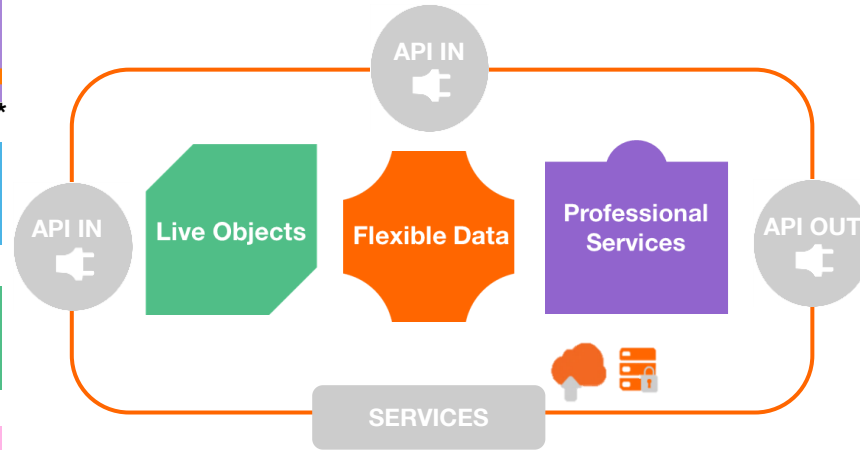
B2B



B2B2C



Développeurs /
Startups
Data Scientists



Thanks



**Boost my business
IoT potential**



**Internet of
things**



IoT connectivity

first existing asset for Orange



1

address connectivity stakes

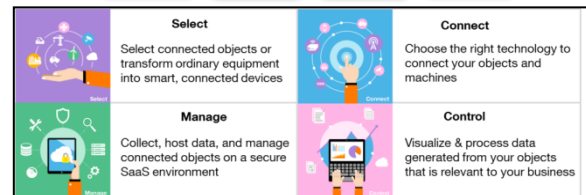
- ✓ adapt our **networks** for low throughput objects : LoRa but also 2G, 4G, and later 5G
- ✓ bring b2b – b2b2c **multicountries connectivity**
- ✓ get ready to make **esim** an opportunity for Orange
- ✓ make it easy to **access or embed Orange connectivity**



2

leverage connectivity to offer innovative services

- ✓ cover key verticals **to** take position and prepare the ground for **innovative services**
- ✓ propose **end to end solutions** including data analytics services on key verticals



LoRa : a growing ecosystem

large players including mobile operators covering multiple verticals



LoRa : 25+ countries commercial

- Belgium: Proximus
- France: 4 players !
- Germany: Digimondo, Telent
- India: Tata Networks
- Japan: Softbank, NTT
- Netherlands: KPN
- Switzerland: Swisscom, Swisspost
- South Korea: SK Telecom
- South Africa: FastNet
- Sweden: Tele2, Telenor
- USA: Comcast, Senet
- ...



Orange present in various markets with different IoT / M2M needs



Europe

- Large and still growing SIM based M2M subscription on 2G/3G moving to 4G
- LTE roll-outs ongoing with a 3-5 years gap with 2G for coverage
- High potential for IoT in several verticals (Smart City / Industry / Cars / Home / Health) for both B2B and B2C.

Africa

- Limited M2M offers on key verticals including Tracking
- LTE coverage still limited to urban areas
- GSM still the only solution to cover territory for 5 to 10 years
- IoT is an enabler to country and society development (Smart City / Smart Farming / Environment) + Smart Energy

Worldwide: Orange Business Services

- Global M2M offer based on adopted standard: Industry / Smart City / Tracking
- Currently relying on 2G
- Support of several bands in LTE will be an issue for Low Cost LPWA use case
- OBS has the ability to deploy and integrate global solution adapted to local constraint



**no single solution covering all Orange markets and key verticals
multi-techno strategy is needed**

Some IoT technos will be more relevant for specific use cases.

LTE-M appears to cover many of them.

