Internet of Things
Telecommunication operator perspective

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Goal: Giving you overview of the perspective of an telecommunication operator in the IoT era

- Role of Telecom Operators in IoT:
  - Business Models (very basic !)
- Telcos, IoT and standards
- Orange IoT offerings for business and consumer
  - Datavenue
  - Homelive

IoT: Business cases for telecoms operators

- Sell connectivity for IoT
- Sell end-to-end IoT Solutions
- Sell a platform and infrastructure

Selling connectivity

- An obvious choice, the basic operator's job:
  - deploying
  - running
  - maintaining IoT-compliant cellular networks
- Nothing really new: we already do for data / voice, and for M2M devices
- Leverage and expand the enterprise customer base
- Leverage the infrastructure for billing and supporting customers

But selling only 'pipes' is a weak position (commodity) with low margins !

Selling an end-to-end IoT solution

Aka be a 'Thing' company

- Product designed for one specific market
- Packaged with connectivity, hosting, application, etc.
- Can be for business or consumers:
  - Business: fleet management, assets tracking, etc.
  - Consumer: Smart Home

Interesting but difficult: footprint, domain expertise, etc.

Selling an IoT platform

IoT platform: *Enabling* IoT applications

- For an IoT solution you need connectivity, but also a lot of other functionalities / services !
- These services are the same for most applications and can be shared and re-used.
- Ideally, only the application part should be specific to the end-user vertical market.
- These services are often functionalities operators already implement for their own operations.

That's the model already used by Amazon (AWS) and Google.

IoT platform services:

- **Device Management:** monitoring, upgrading
- **Data Collection:** once devices are connected
- **Storage:** IoT generates LOTS of data
- **Analytics and Big Data:** extracting meaningful information from the data
- **Hosting:** running the applications, which use the data and extracted information
- **Billing:** for end-customers (not for connectivity)
- ...

Many operators, and other companies, are betting on the platform approach.

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Standards for IoT

- Cannot speak about Telcos without standards : standards are in our DNA !
- Needed because of
  - Regulations
  - Interoperability
  - Complexity
  - Investments (and associated risks)
  - Intellectual Property
- Telco are used to manage many millions of devices and connections ... yet none is big enough to avoid standards.

Standard for networks

Standard for IoT:

- Connectivity
  - Wide area networks
  - Local networks
- Application protocols
- Infrastructure

Wide area networks

Current cellular networks were not designed for IoT:

- 3G and 4G were designed for high-bandwidth
- 5G takes into account IoT requirements:
  - equipment price,
  - energy efficiency,
  - coverage vs bandwidth
- but it won't be deployed for a few years (2020 ?)

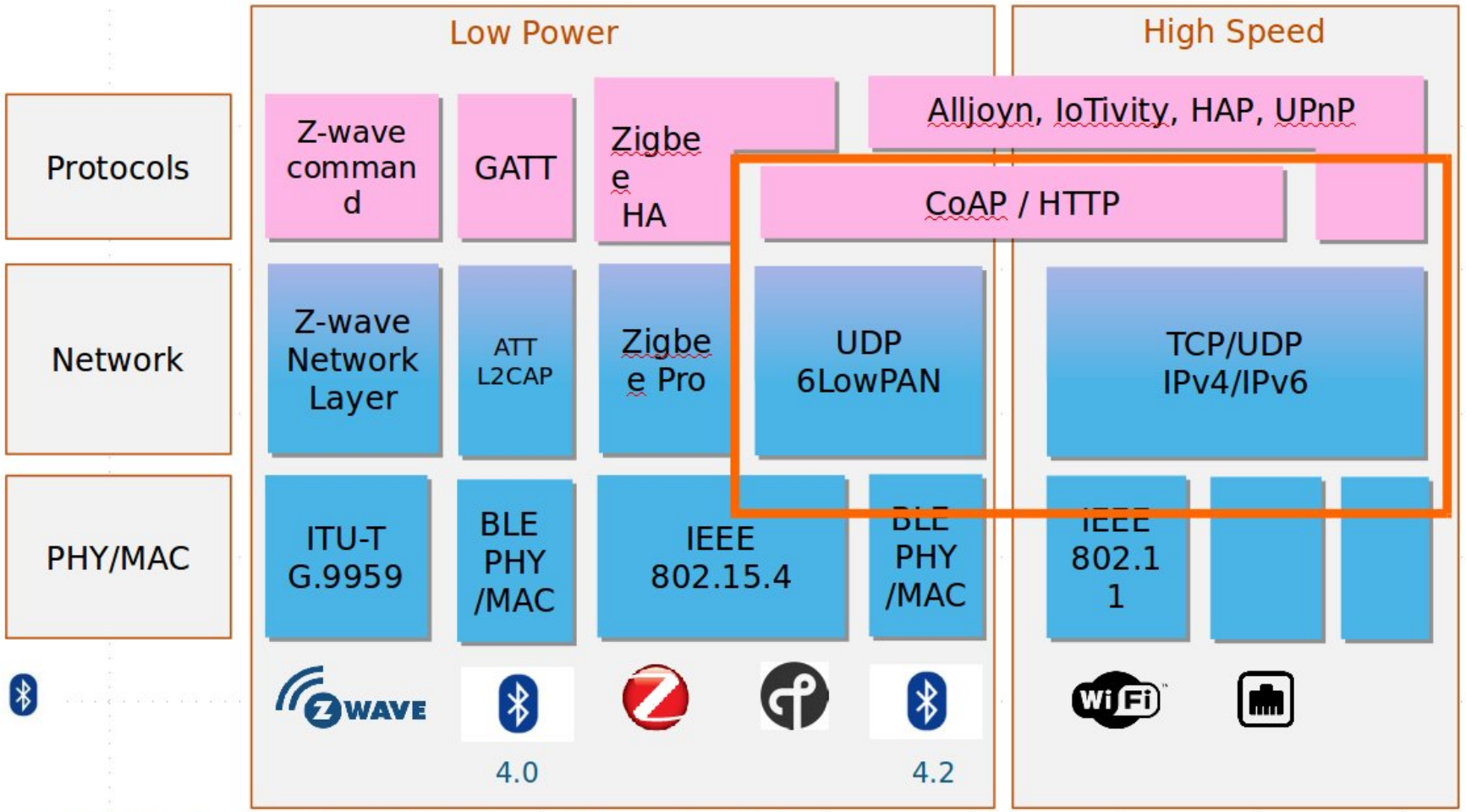
In the meantime, many Telcos are deploying transition networks based on LPWAN technologies

- LoRa : Bouygues & Orange
- Sigfox: Telefonica, NTT DoCoMo

Local Area Network

- Traditional Broadband Local Area Network is simple :
  - Wifi, Ethernet, PLC (HomePlug AV)
  - all are running an IP layer
- Low Power Local connectivity is awfully fragmented:
  - dozen of protocols: Bluetooth, Zigbee, ZWave, Thread, and many other proprietary protocols
  - mixing physical, network and application layers (no IP !)
  - trend : moving to a low power IP layer : 6LowPan
  - next battle: application layer!

From physical layer to protocols : future convergence ?



6 Digital Home Research and Standards Seminar, Issy-les-Moulineaux, May 19th 2015

Application protocols

Two kind of approaches:

- **Big players:** define their own protocols and expect manufacturer to use it (because of their ecosystem)
  - Apple Homekit
  - Google Weave (with Nest)
- **Standards-based approach:** consortium of companies, defining specification and certification:
  - Allseen Alliance: Alljoyn
  - Open Connectivity Foundation: OIC (aka Iotivity) & UPnP

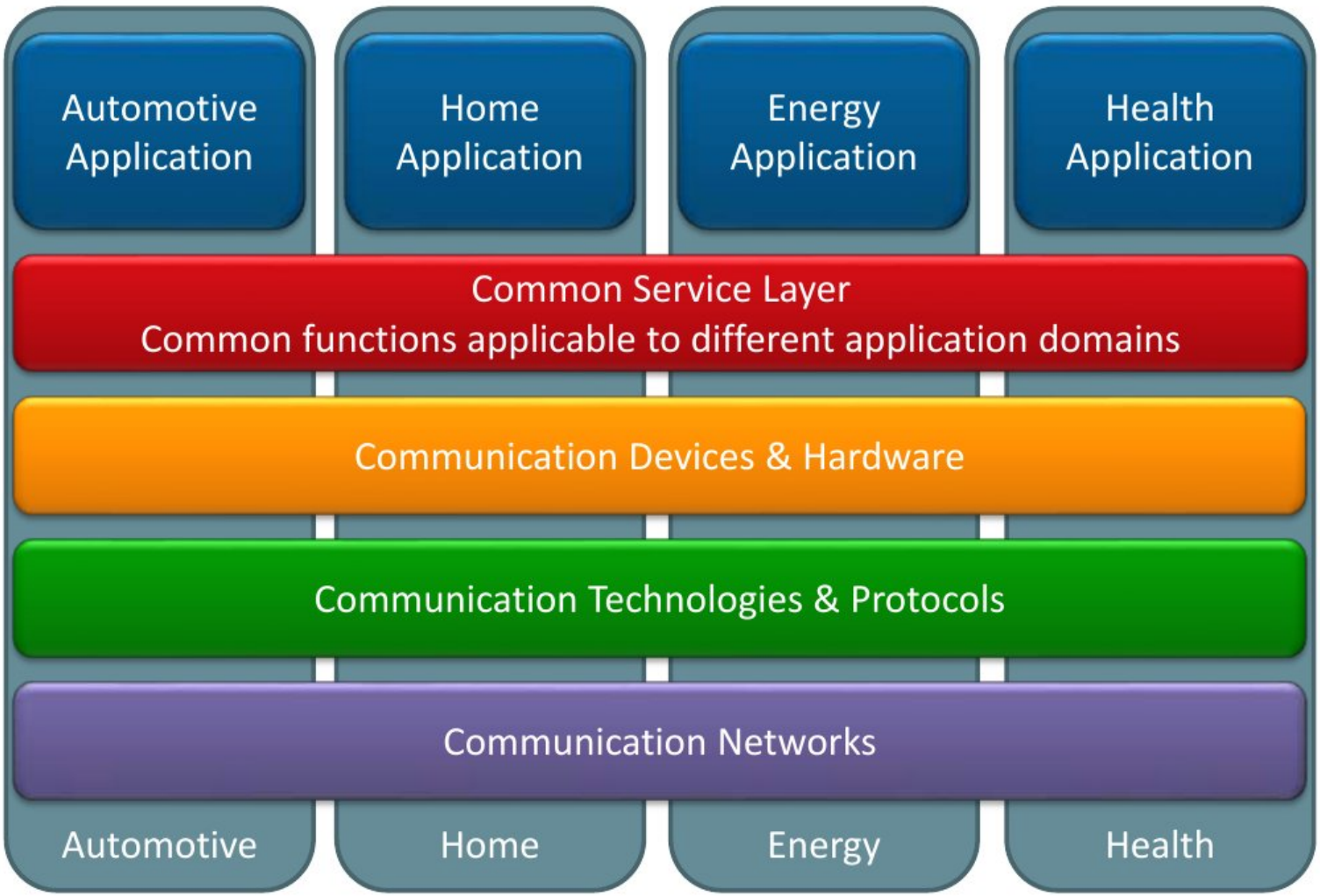
New trend in standards: alliances now provide a working open-source implementation !

Standards for infrastructure

OneM2M: standard organization for IoT
"oneM2M is a global organization that creates requirements, architecture, API specifications, security solutions and interoperability for Machine-to-Machine and IoT technologies."

- many operators are part of the organization
- defines Data-models, building blocks and API for common Services in IoT
- fit perfectly the platform approach

The Common Service Layer



Common Service Functions

- Registration
- Discovery
- Security
- Group Management
- Data Management & Repository
- Subscription & Notification
- Device Management
- Application & Service Management
- Communication Management
- Network Service Exposure
- Location
- Service Charging & Accounting

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Datavenue

Orange Datavenue: suite of services for IoT

Live Objects

A customized service to connect your machines & objects to your company's IT.

Flexible Data

A complete and secured service to power up your Big Data projects.

Flux Vision

Markers to measure the attendance of a specific location or event based on mobility data

Professional Services

Support services to help you drive your Data & IoT business to the next level.

"Providing companies with a single, consistent environment, combining the best of cloud technologies, data and IoT, while offering a high level of trust and security"

Orange Live Objects : services for connected objects

Select

Choose your connected objects or transform your equipment into smart objects.

Connect

Facilitate data transmission by choosing the most adapted connectivity solution.

Manage

Collect, host data, but also manage connected objects on a secure SaaS environment.

Control

View your connected objects' data on your existing business applications or personalized interfaces

- LoRa or cellular connection
- Collect data, storage and event processing
- Dashboard, visualization, connection with existing systems (API)

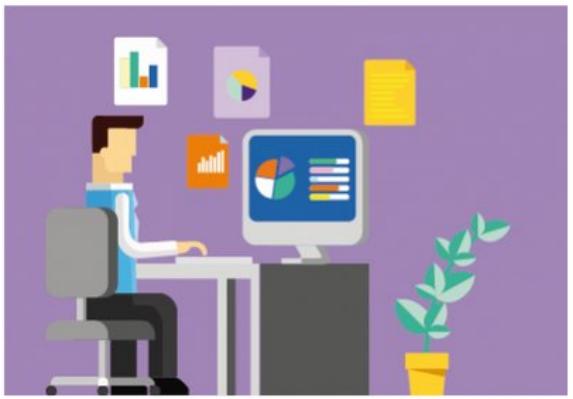
Flexible Data

Not IoT specific, but strongly linked to IoT-generated data.

- Data analytics platform
- Data marketplace

Marketplace

Collect, exchange and monetize data in a secured envrionnement thanks to our data catalog.



Analytics

Analyze your data with a selection of the best Data Intelligence applications available on the market.

Platform

Create and host your services infrastructures and Data tools in a secure and scalable cloud infrastructure.

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Homelive

Smart Home solution

- For end-user,
- Subscription based independent of Orange Internet access (OTT)
- Smart Home hub + accessories

Homelive

Homelive System

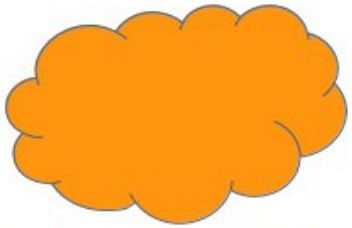
- A Smart Home Hub: the "brain" that connects and control all devices
- a wide set of sensors (Zwave) and accessories :
  - sensors: movement, humidity, luminosity
  - security: smoke detector, water leak detector, alarm, camera
  - control: electric plugs, switchs, remote control, roller shutters
- a set of third party supported devices
  - Netatmo: Thermostat and weather station
  - Wiser: Scheidner heating control system
  - Philips Hue: lighting

Homelive

Functionnalities:

- Smartphone and web application
- Remote control and monitoring of all connected devices
  - sensors & camera
  - actuators : electric plugs
- Pre-defined 'modes' : away, at home , night & vacation
- Custom Scenario
- Alerts : water leak, smoke, presence detection (mail & sms)
- Continuity of service monitoring and alerts in case of Internet failure

Homelive UI



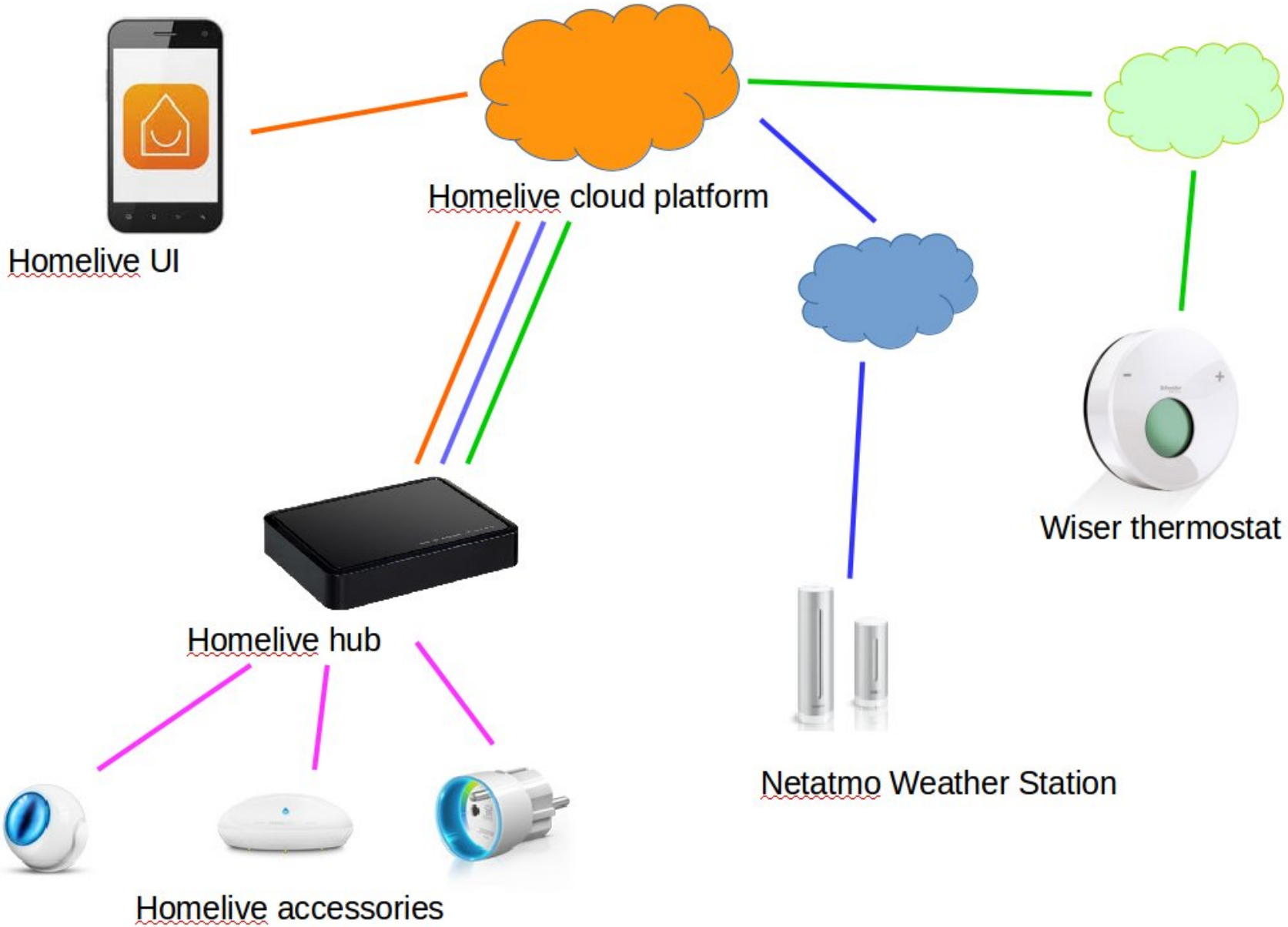
Homelive cloud platform

Wiser thermostat

Homelive hub

Netatmo Weather Station

Homelive accessories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Questions ?