

Open Air Interface Platform: Orange expectations

2016, Jan. 22nd

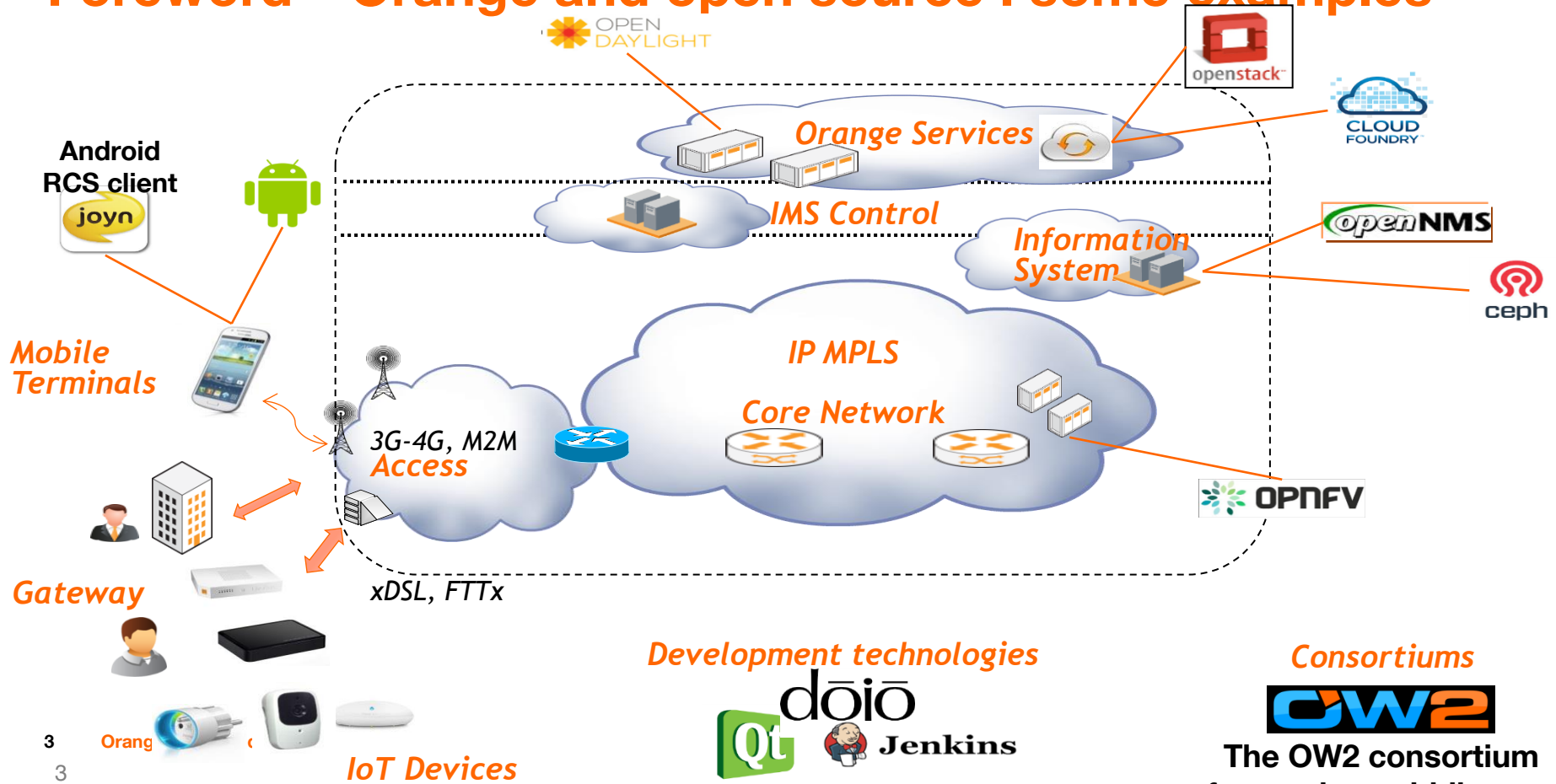
OAI Alliance January 2016 meeting



Foreword – Orange and open source

- For many years Orange has embedded Open Source software within its products and services (incl. traditional Voice & Communication services)
- Orange is an active contributor to initiatives such as:
 - The OW2 consortium focused on middleware
 - OPNFV, OpenDaylight and OpenStack
 - Android, Jenkins, Dojo, Qt, OpenDaylight, Ceph, CloudFoundry, ...
- In recognition of this, the Orange Open Source governance was created:
 - to **ensure respect** for Open Source license conditions and laws
 - to **promote the use** of Open Source within the Group
 - to **manage contributions** to Open Source communities

Foreword – Orange and open source : some examples



Foreword – Orange and open source

- Orange is committed to moving beyond an opportunistic approach to Open Source software use
- Orange Open Source governance has a clear Open Source strategy:
 - open source software **preferred** in all domains
 - **contribution** is part of the technical strategy of the group
 - **partnerships** with other operators and major actors
 - **legal and intellectual property** risks are under control
- The OAI initiative has the potential to be a key example of OS within telco
 - A European showcase
 - Understand opportunities offered by **Open Source in Radio / Network** contexts
 - A model for **Open Source in collaboration with standards**
 - A model for **open, inter-industry collaboration** on key technologies

Foreword – Orange and virtualization

- **Virtualization is a global industry trend today**
 - **“old story” on the network side with NFV**
 - **still to be clarified what can be / can not be virtualized on the radio side (e.g. physical layer)**
- **Flexibility offered by virtualization to operate the network.**
- **“5G network slicing” concept, which still need to be clarified, as one of the main drivers of virtualization for 5G.**
- **Not clear today if virtualization is economically profitable (limited gains on RAN side?)**

OAI seen as a Research tool first

- **Open Air Interface seen as a mutual platform used to implement, test and prove performance of 5G concepts as proposed and specified by 3GPP.**
- **Open Air Interface could become THE “reference implementation” of future 5G and could illustrate some joint (?) contributions to 3GPP standardization process.**

OAI more than a Research tool in a longer term?

- **What about field trials of “early 5G” based on the platform?**
- **What about using the platform as an interoperability testing tool?**

Orange concepts proposals on the network side

- **Global OS: context of network functions virtualization, orchestration, management of IT/storage/computation resources.**
 - **IT and Network worlds get closer**
 - **New kind of infrastructure for operators including diverse nodes types, e.g. datacenters, networks points of presence, boxes, devices, connected objects ...**
 - **Need to define a kind of OS able to manage all the network, storage and processing resources => Global OS**
 - **Objective is to take advantage of our network to offer optimised infrastructure services.**

Orange concepts proposals on the network side

- **Convergent Gateway**
 - **GW implementing the convergence of fixed and mobile networks.**
 - **Use of SDN and virtualisation concepts**

Orange concepts proposals on the network side

- **Device considered as a network element**
 - **use of computation and storage resources of devices, to offer better experience to users, via an extension of the network and an orchestration of resources**
 - **need of SW open source implementation of a device**

Orange concepts proposals on the radio side

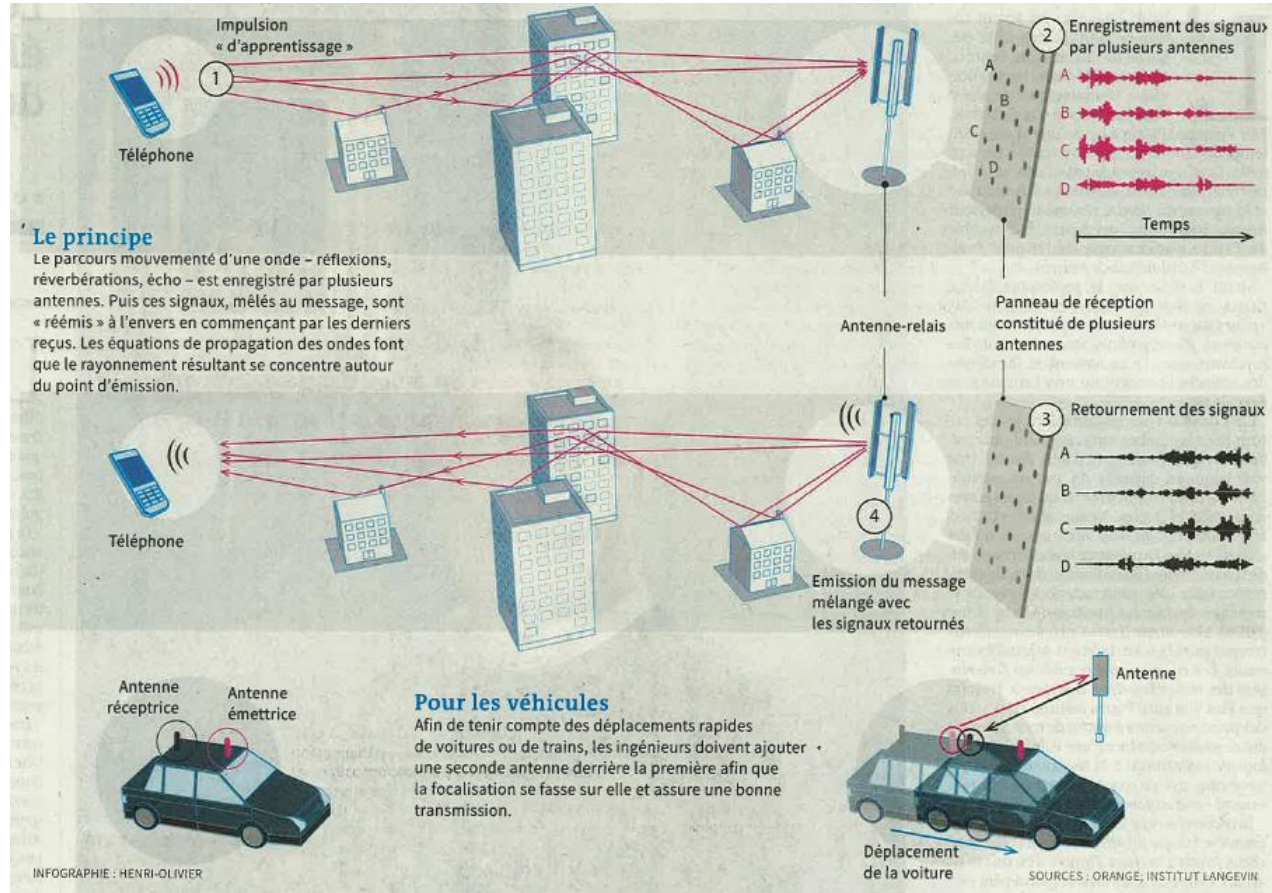
- **New waveforms for 5G**
 - **Strong expertise on Orange side on multi-carrier waveforms (OFDM, MWC 2015 demo on FBMC modulation, ...)**
 - **Orange has its own candidate known as FC-OFDM for Flexible Configurable OFDM, a framework to multiplex different waveforms in order to address the very diverse 5G use cases.**
 - **Objective is to compare with other 5G waveform candidates on a common test-bed**

Orange concepts proposals on the radio side

- **Time Reversal**
 - **Focusing technology (multi-antenna system assumed), inherited from acoustics, applied to radio communications**
 - **Main objective is to reduce the energy required to transmit data towards a targeted user, and then to reduce power consumption on network side.**
 - **We have a real-time implementation (FPGA) of the technology (MWC 2016 demo) but not in a standardised system...**

Orange concepts proposals on the radio side

- “Le Monde” paper on Time Reversal



Thank you

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