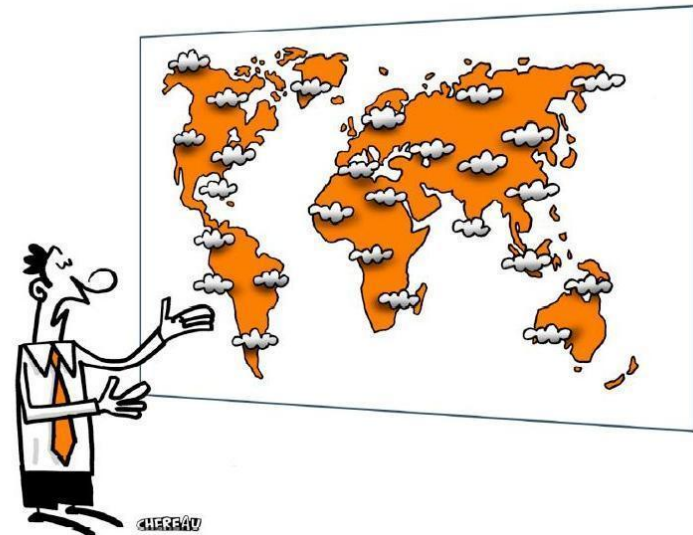


A Telecommunications Operator View on Cloud Computing

CNRS France Grilles Seminar
From grids to clouds

ENS, Lyon, Dec 13, 2010

Thierry Coupaye (PhD), Orange Labs R&D Grenoble

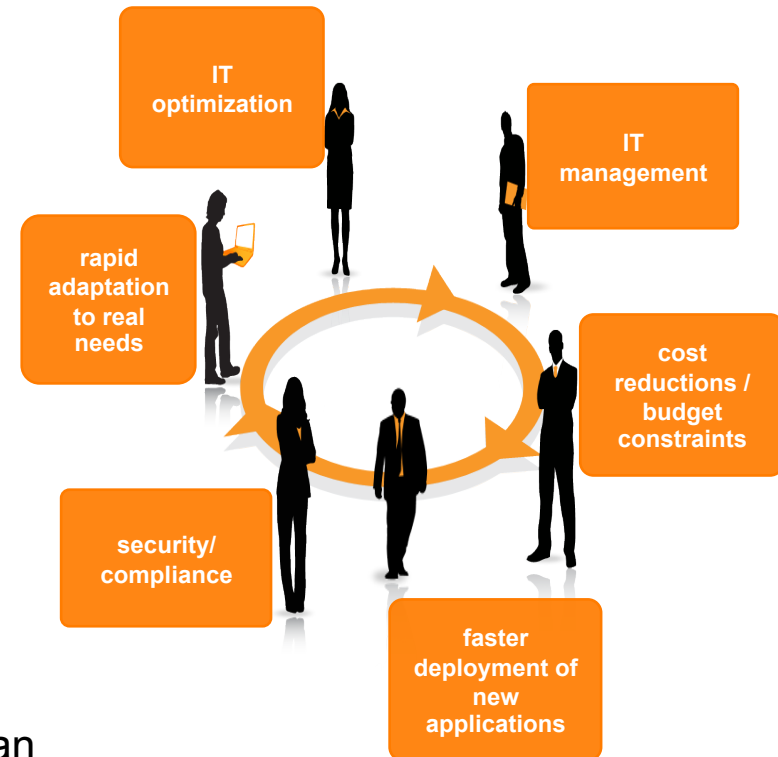


Agenda

- An “industrial view” on cloud computing
 - Drivers and barriers associated to cloud computing*
- Orange & cloud computing
 - Stakes & current offers*
- A glimpse of the future @ Orange Labs
 - *the open cloud, the personal cloud, cloud networking...*
- The last word, cloud & grid?

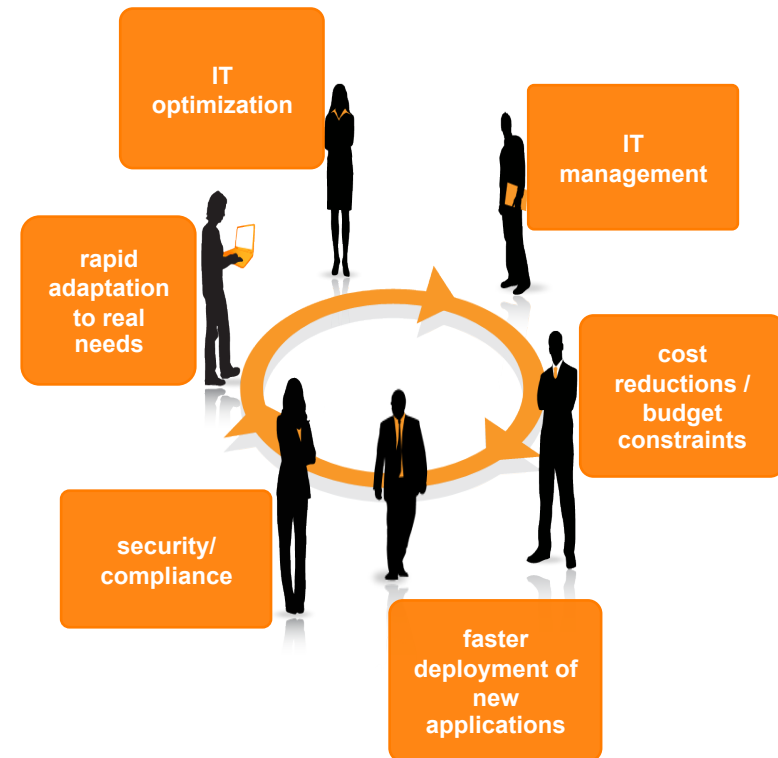
Drivers for users

- Cost savings
 - Reduced TCO: hardware, software, IT staff
 - Pay-per-use (pay as you go), multi-tenancy
- Simplicity, Faster Time-to-market
 - Easy service experimentation before service launch
 - Faster deployment, no need for servers and software to launch a service
- Flexibility, Scalability
 - Automatic, transparent scale up and down
- Improved availability and QoS
 - Although well-known breakdowns, cloud services have statistically better availability than on site services... and they are improving



Drivers for hosters (or Private Cloud Users)

- Consolidation through **virtualization** and **automation** allows for:
 - Ease and speed up (un)provisioning drastically
 - Maintain far larger IT infrastructure
 - Reduction of risk of human errors
 - Possibility of better energy management
 - *NB: whether large DC are “green” or not is currently subject to discussion...*
 - ... altogether tailor IT infrastructure to the need and optimized OPEX/ CAPEX



Barriers

- Lack of technical maturity
 - SLA, auto-scaling/auto-sharing, performance, availability, dependability
 - PaaS: applications packaging, deployment, management, test, configuration management...
 - Storage
 - Network
 - Security, privacy with multi-tenancy
- Major risks of lock-in lock-in
 - Lack of standards (API, programming models)
 - Lack interoperability
 - Lack of portability (applications, mgt tools)
- Legal Issues
 - Software licences
 - Data location (eg government, health)
- Integration with legacy IT (IS)
- Huge investments in data centers
 - building, hardware, cooling, energy



France Telecom / Orange

On the move

- N°3 in Europe for mobile with around **133 millions** customers
- Around **27 millions** broadband mobile customers with access to **Orange world** mobile portal.

193 millions
customers in
32 countries



At home

- Europe leader for broadband Internet (ADSL) with around **13,4 millions** customers
- 8,4 millions residential home gateways **Livebox**, key component to get access to broadband services
- N°1 in Europe for IPTV (ADSL) with over **3.2 million** customers

At work

- With Orange Business Services, one of the **leaders in the world (220 territories)**
- Provides telecommunication services to more than **3 750 MNC (Multi National Companies)**

Opportunities for Orange in Cloud Computing

- Optimized (cost, flexibility) ITN **business support infrastructures**
- Provide on-demand provisioning, reliability and security on the **enterprise market**
- Provide storage services for user generated content on the **residential market**
- Leverage ubiquity of **mobile devices**
- Leverage **network assets**
- **Green computing**

Orange involvement in Cloud Computing

1. evolution of **hosting offers** for enterprise market

cloud services offers
for multinational companies, large national accounts,
and **medium and small enterprises**

“Cloud Computing is here to drive the IT ecosystem so traditional ICT providers must transform or die.”
Yankee Group, 2008

2. evolution of mass market **services platforms and networks**

personal communications, audiovisual, storage, M2M,
healthcare, gaming...
network virtualization, cloud networking, network as a service

“Cloud computing holds enormous potential for telecom service providers if they get aggressive about driving technological innovation there.”
Telephony Online, April 2009.

3. evolution of **information systems**

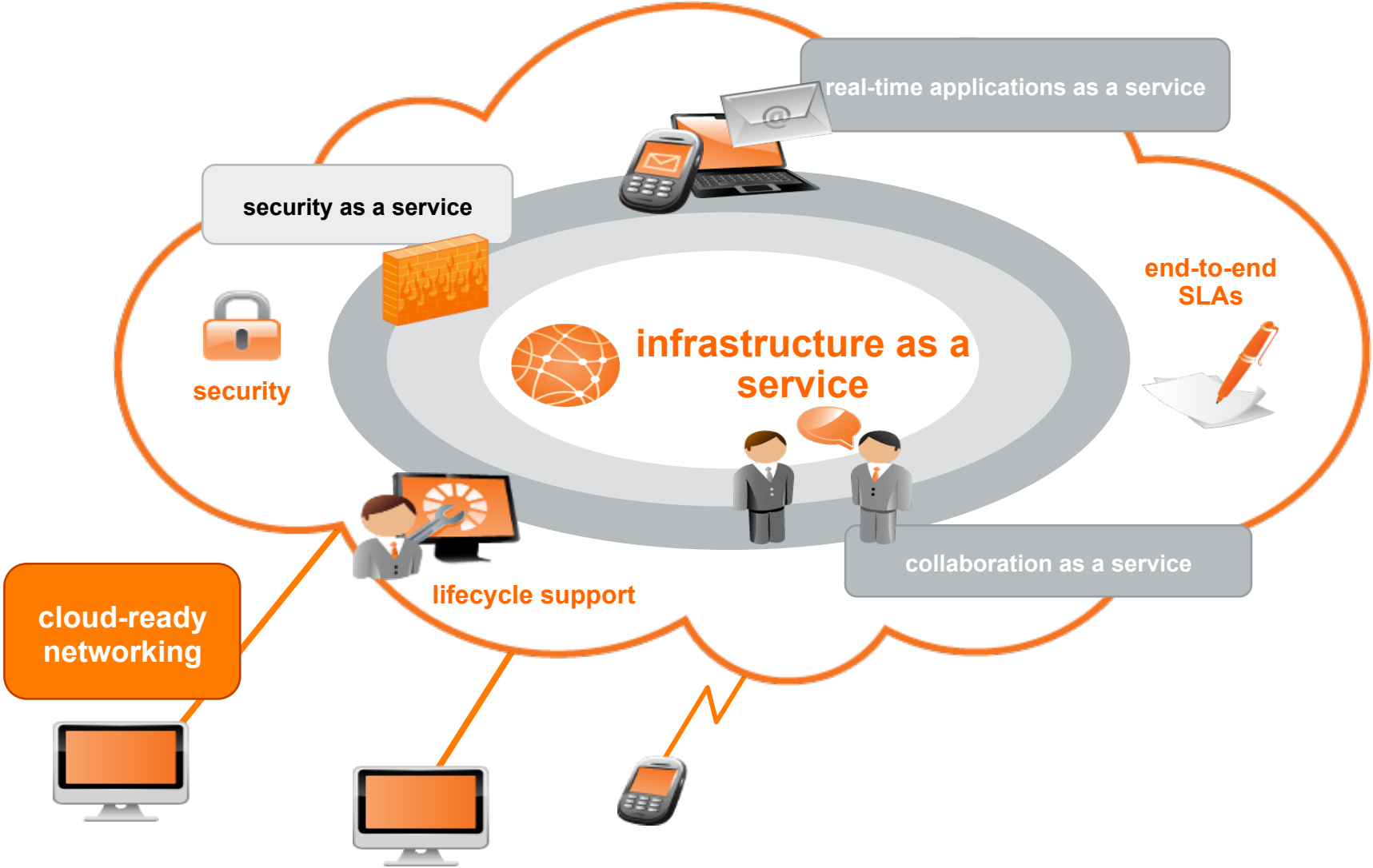
- network and service provisioning and management, customers management, business intelligence, billing...
- human resources, inventory (network, suppliers), finances...

“Le Cloud Computing est dans notre ADN”.

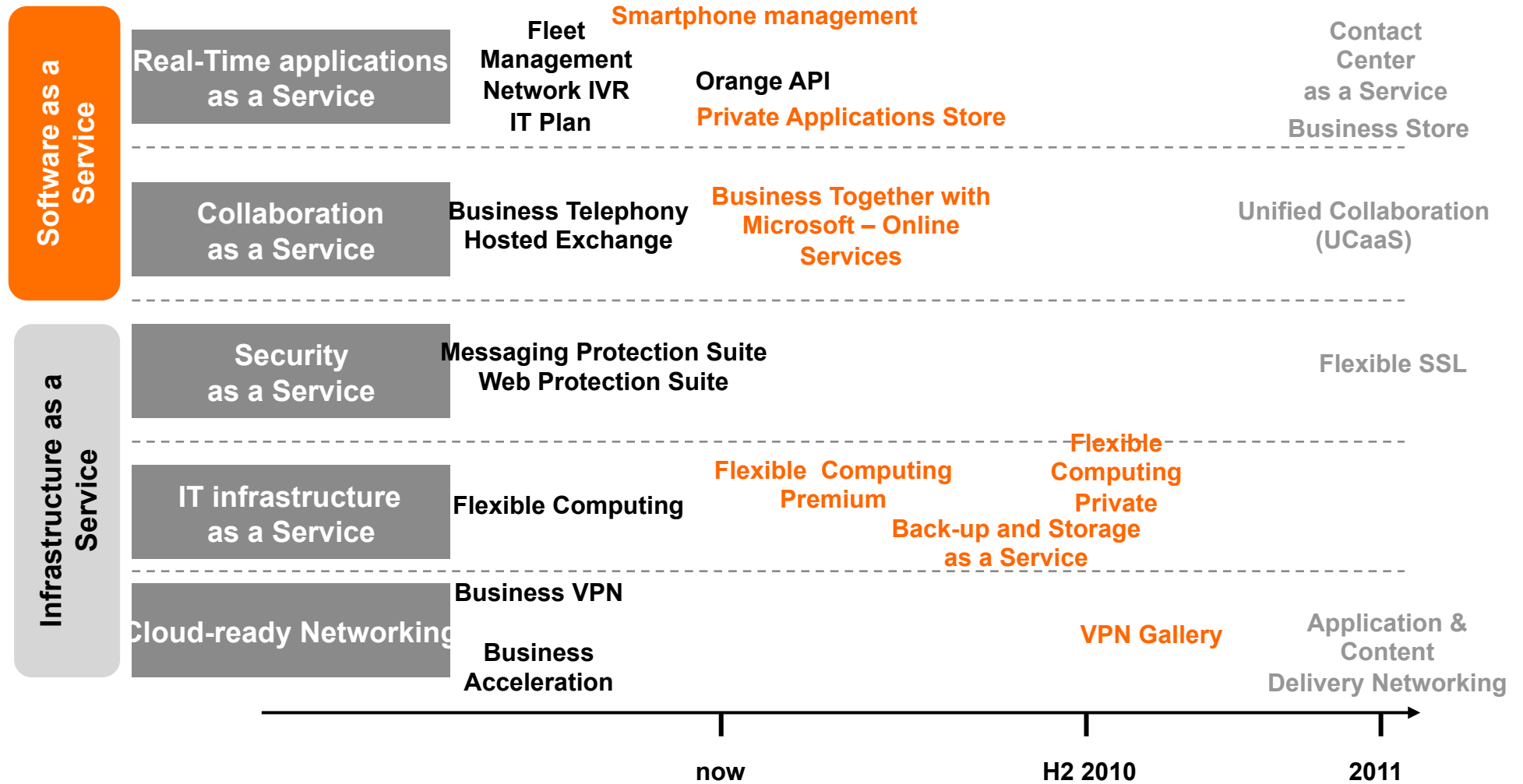
4. embodiment of **Future Internet** Architecture

Orange Business Services, Dec. 2009

Orange leverages its VPN heritage to guarantee efficient communications (scalability, security and end-to-end SLA's)

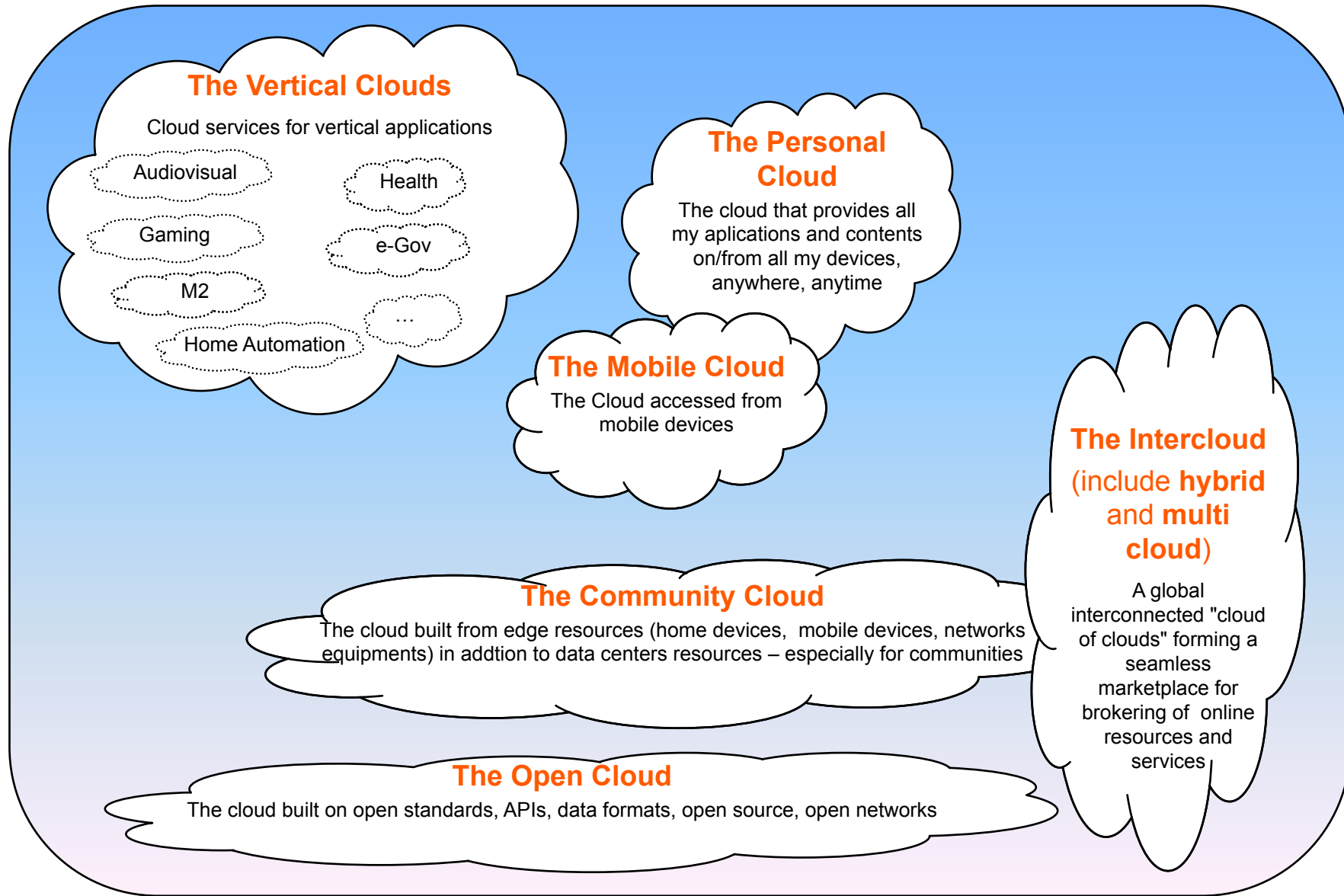


Offers roadmap



launched in 2010

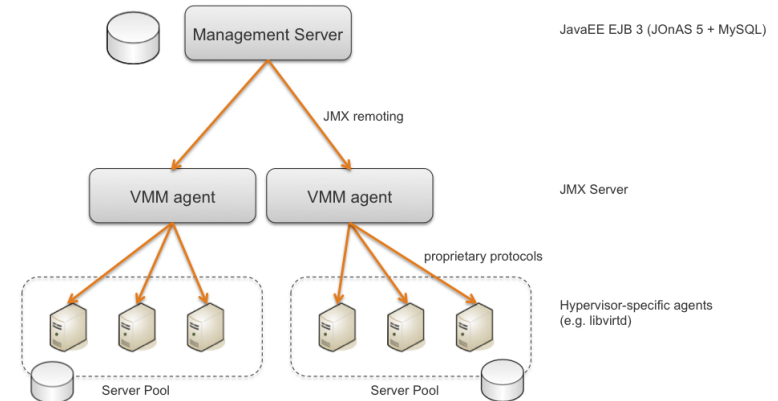
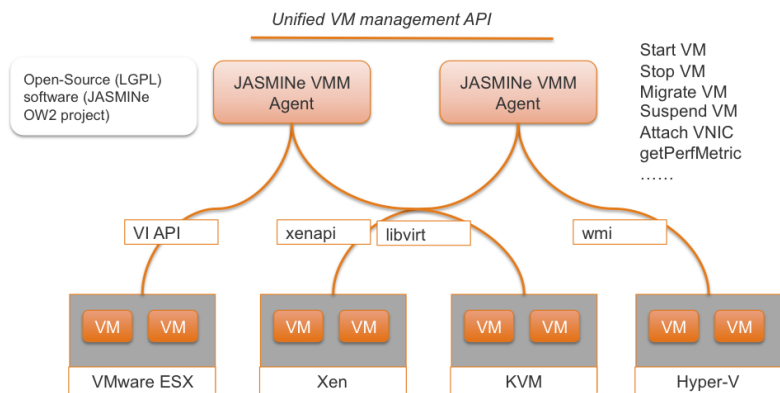
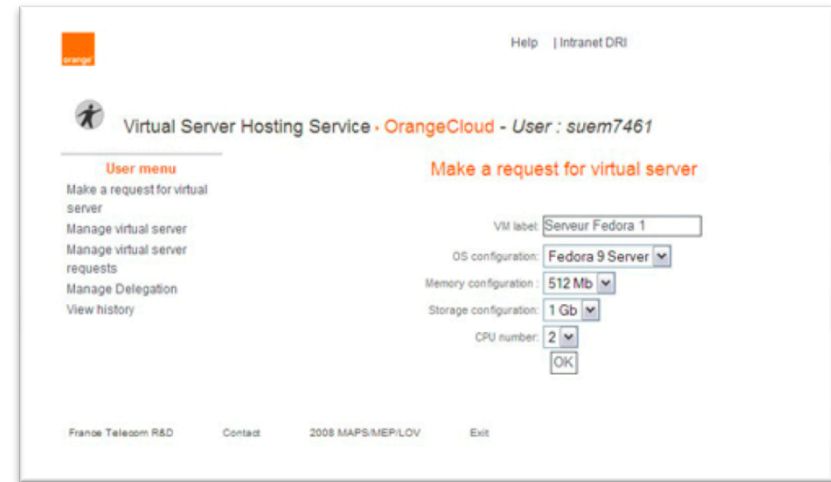
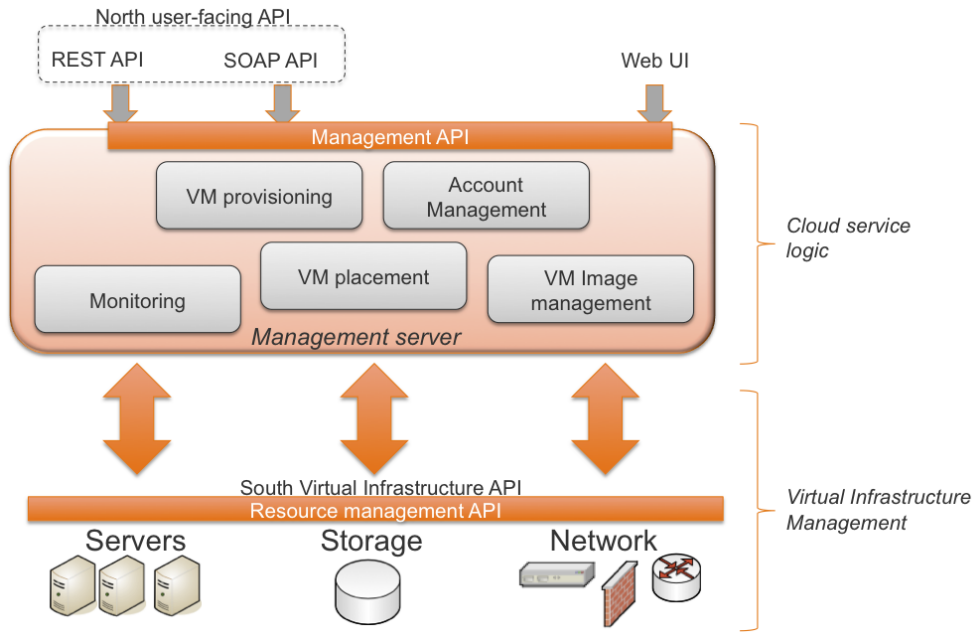
The Future of Cloud @ Orange Labs



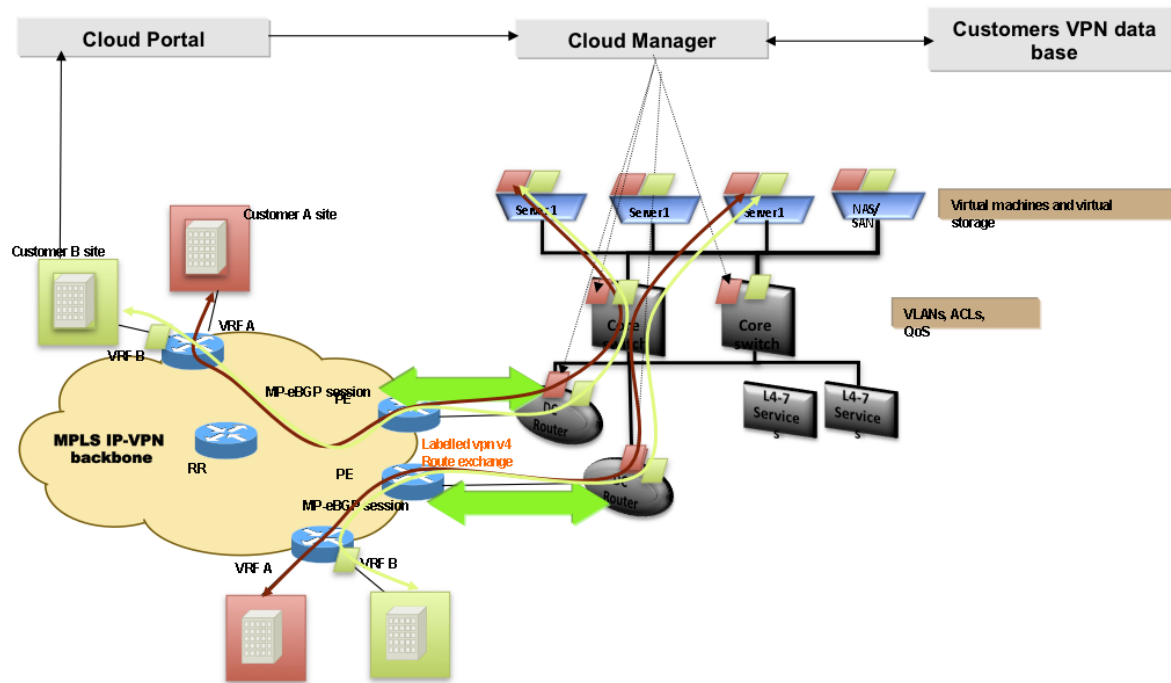
<http://blogs.orange-business.com/realtimes/opinion/where-next-for-cloud-computing.php>
<http://blogs.orange-business.com/live/2010/01/six-futures-for-cloud-computing.html>

The Open Cloud

OOCOS – Orange Open Cloud R&D Service



Cloud Networking

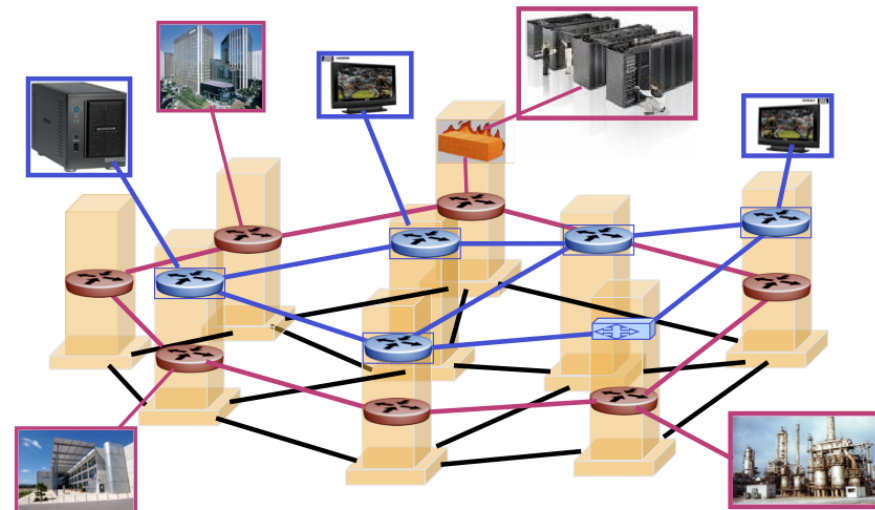


On-demand Virtual Private Cloud

Inclusion of cloud compute and storage resources in VPNs

Full Network Virtualization

Virtualization of network nodes and links based on open network equipments (APIs, SDKs).
Investigation of OpenFlow technology.



The Personal Cloud



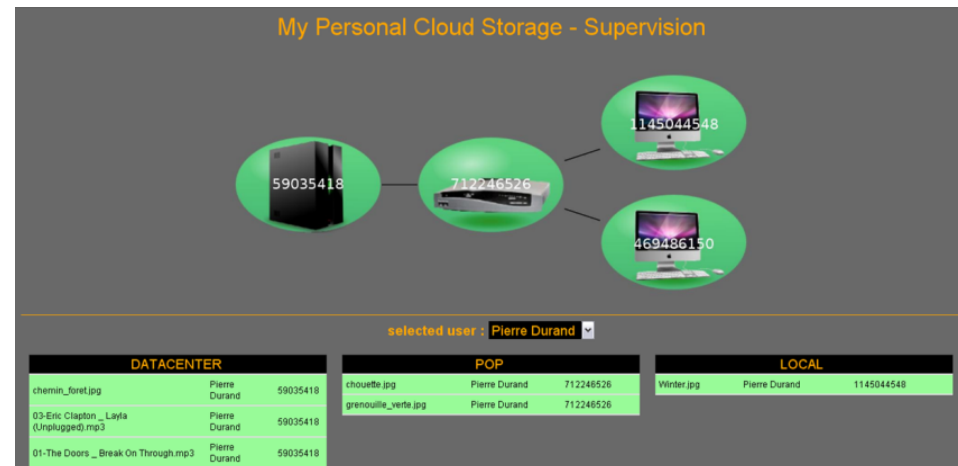
My Personal Storage Cloud

Service providing federated and transparent

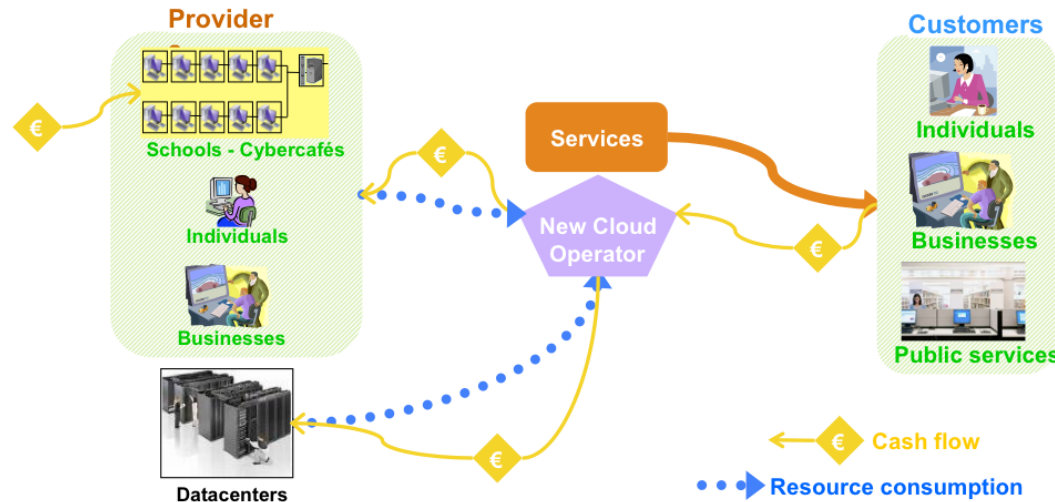
- storage online
- on users devices (including mobile)
- on network equipments

Clostera storage enabler

Framework providing heuristics based distributed placement and replication of data

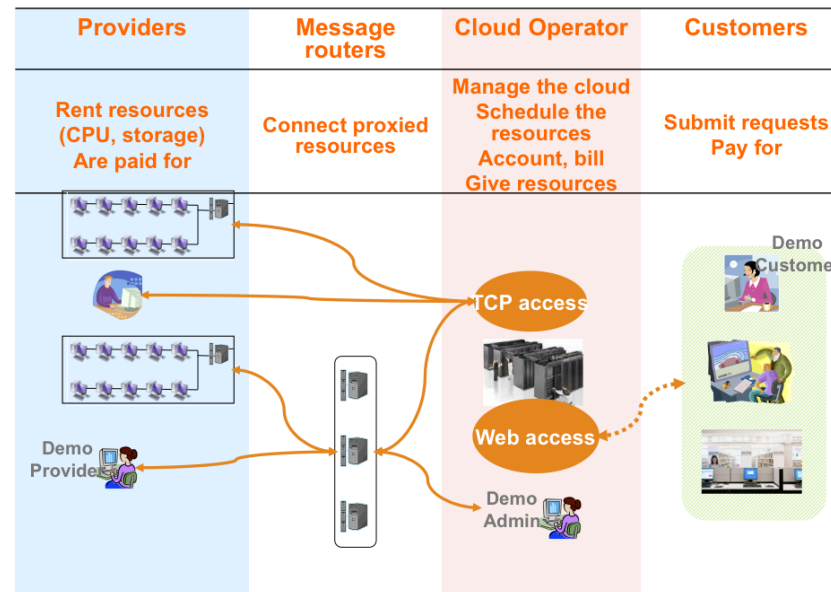


The Community Cloud



Cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed **by the community or a third party** and may exist on premises or off premises.

2010 Video-batch proof-of-concept with INRIA Oasis/ActiveEon



The last word: “scalability”

- “Scalability” in mainstream cloud computing is currently more perceived:
 - as hundreds of thousands applications/users each having a few virtual machines
 - than about few applications having each thousands of virtual machines
- What about then:
 - Grid, HPC & cloud?
 - Cloud for e-science? Cloud market for e-science?



*Want to get involved in OW2 Open Source Cloudware initiative?
-> <http://www.ow2.org/view/Cloud>*