Cloud & Virtualization techniques

Christophe Rodrigues

Lessons Organization

- Practical lessons : 8 x 3 hours
- Quizz at beginning of each lesson (except first week)
- An evaluation during class time (midpoint)
- A final project

technical requirements

- Your personal laptop
- At least 10 Go available for VM and ISO storage

What's Cloud Computing?
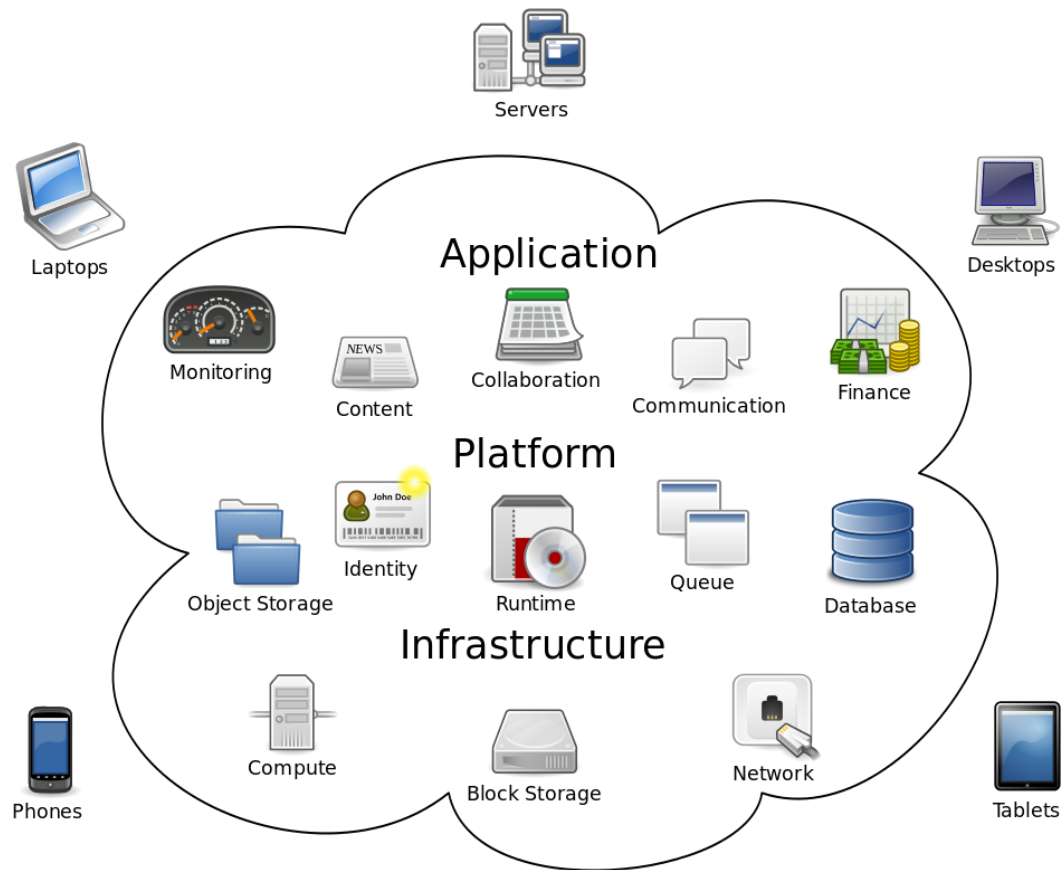
Wikipedia Definition :

"**Cloud computing** is an information technology paradigm that enables ubiquitous access to shared pools of configurable system resources and higher-level services that can be rapidly provisioned with minimal management effort, often over the Internet."

What's Cloud Computing?

-> outsourcing of computer services!
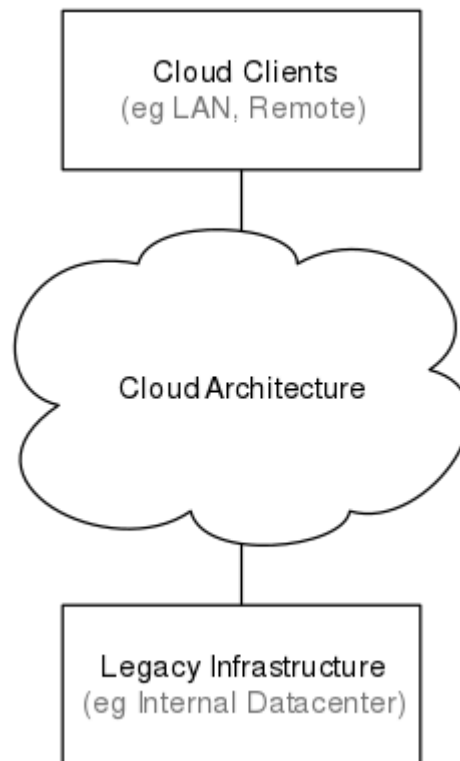
What's Cloud Computing?

Advantages

- Services on demand:

Self-service : a client can ask for direct ressources:

- computation time

- storage

- softwares

- any other ressource available by a provider

Updates are transparents for user

Advantages

- Scalability/Modularity:

Cloud computing has the capability to evolve when the number of users increase or if the ressources needed for a software changed.

Advantages

- Cost Reduction:

Companies wants to reduce costs but almost all the time software functionalities increases.

With cloud computing companies can buy only what is needed.

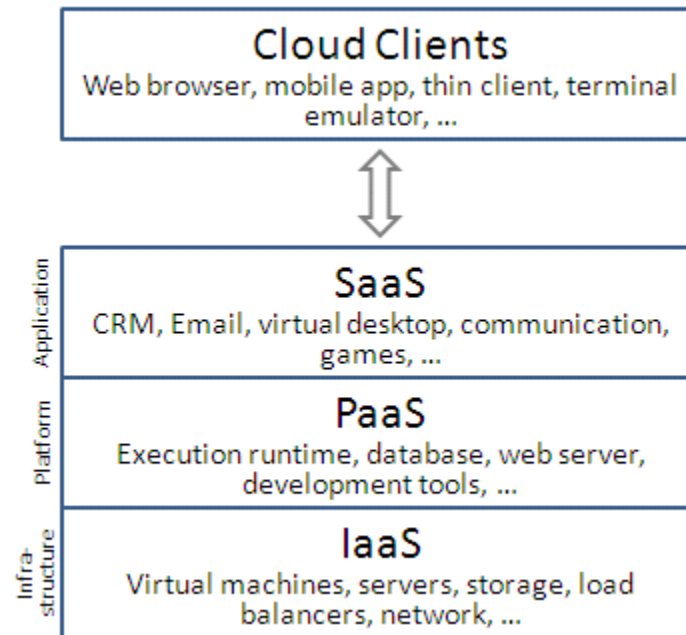(Possible to pay by month, day or hour)

Advantages

High level interfaces:

With Cloud Computing it's possible to access to services by unique access points through web services. The exact location of servers is unkown.
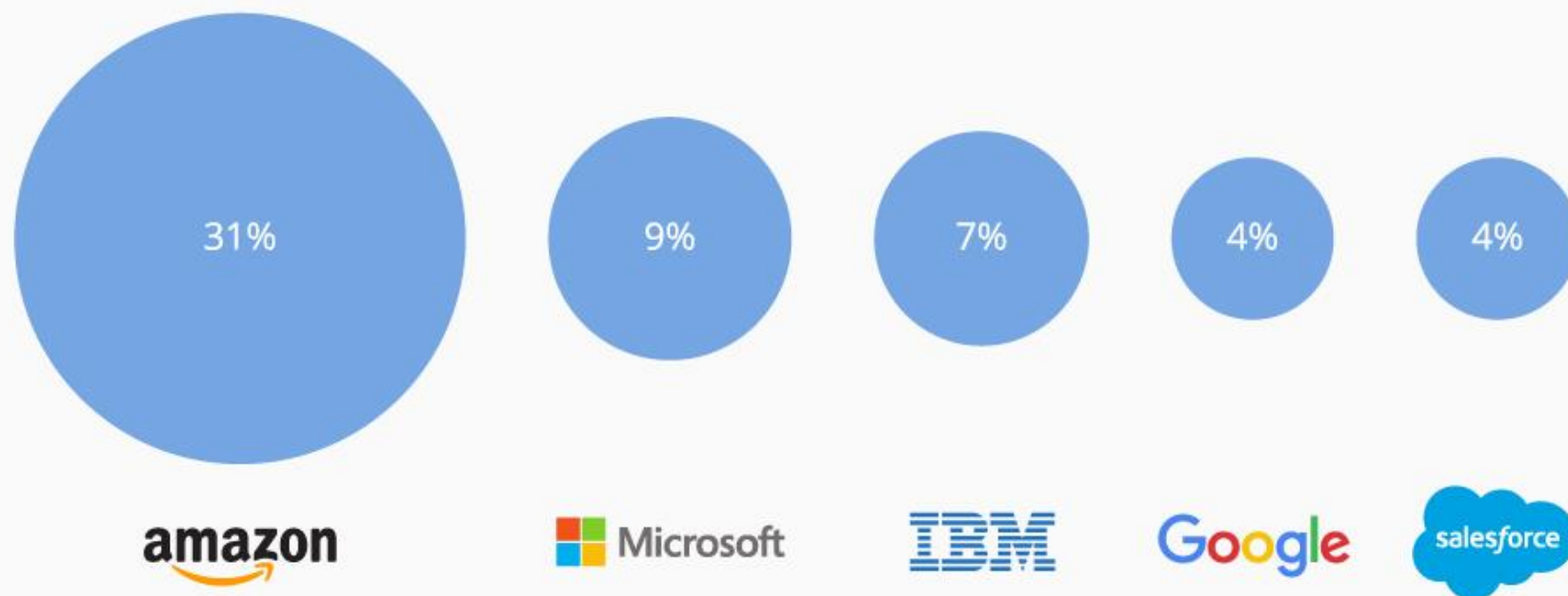
This interactions are independents of hardware or infrastructures.

Different Cloud Levels

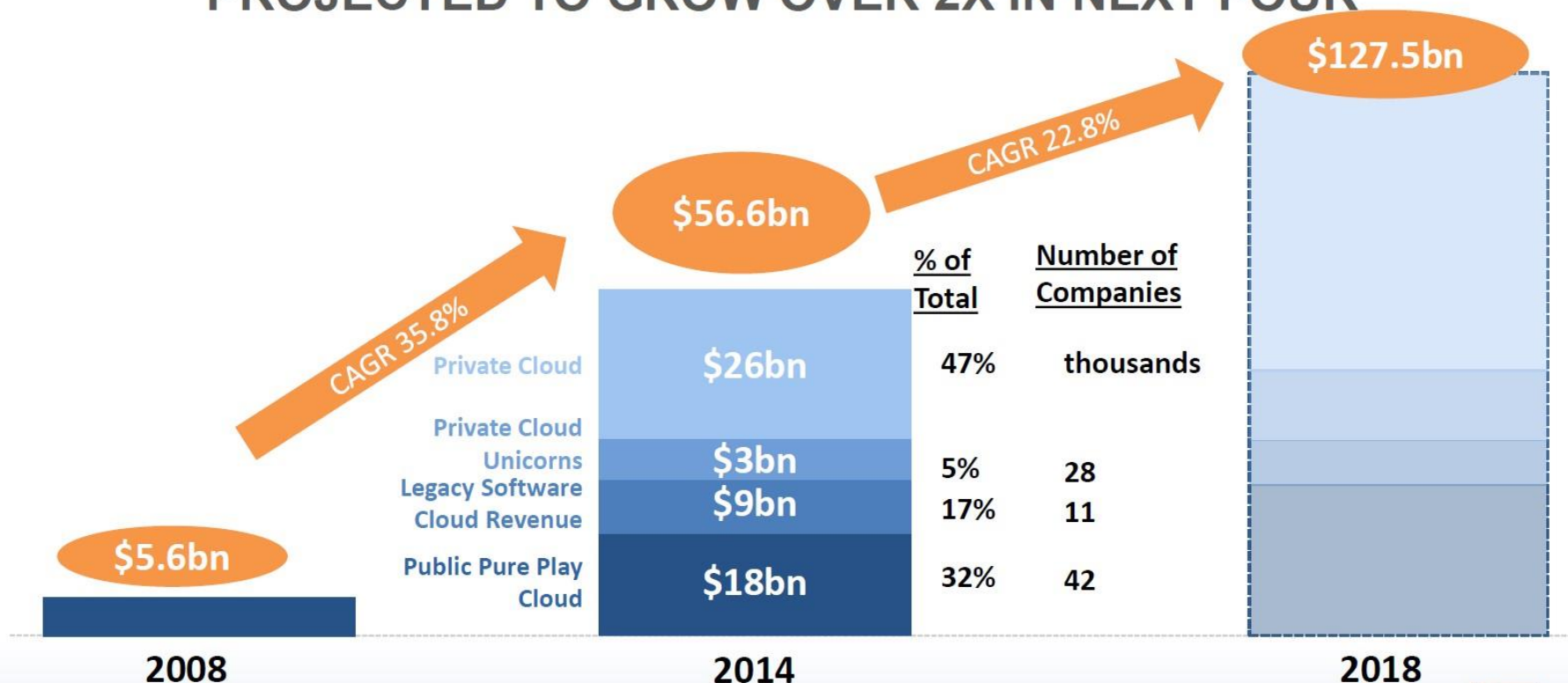# Top 5 Cloud Infrastructure Service Providers
Worldwide cloud infrastructure services market share in 2015*

31% amazon

9% Microsoft

7% IBM

4% Google

4% salesforce

* includes IaaS, PaaS, private & hybrid cloud services
Source: Synergy Research Group

statista

CLOUD REVENUE UP 10X IN LAST SIX YEARS PROJECTED TO GROW OVER 2X IN NEXT FOUR

$127.5bn

CAGR 22.8%

$56.6bn

CAGR 35.8%

		% of Total	Number of Companies
Private Cloud	$26bn	47%	thousands
Private Cloud Unicorns	$3bn	5%	28
Legacy Software Cloud Revenue	$9bn	17%	11
Public Pure Play Cloud	$18bn	32%	42

$5.6bn

2008   **2014**   **2018**

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Figure 3 Forecast: Global Public Cloud Market Size, 2011 To 2020

The spreadsheet detailing this forecast is available online.

|	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BPaaS ($)	0.15	0.23	0.35	0.53	0.80	1.26	1.95	2.93	4.28	6.00	7.66	9.08	10.02
SaaS ($)	5.56	8.09	13.40	21.21	33.09	47.22	63.19	78.43	92.75	105.49	116.39	125.52	132.57
PaaS ($)	0.05	0.12	0.31	0.82	2.08	4.38	7.39	9.80	11.26	11.94	12.15	12.10	11.91
IaaS ($)	0.06	0.24	1.02	2.94	4.99	5.75	5.89	5.82	5.65	5.45	5.23	5.01	4.78
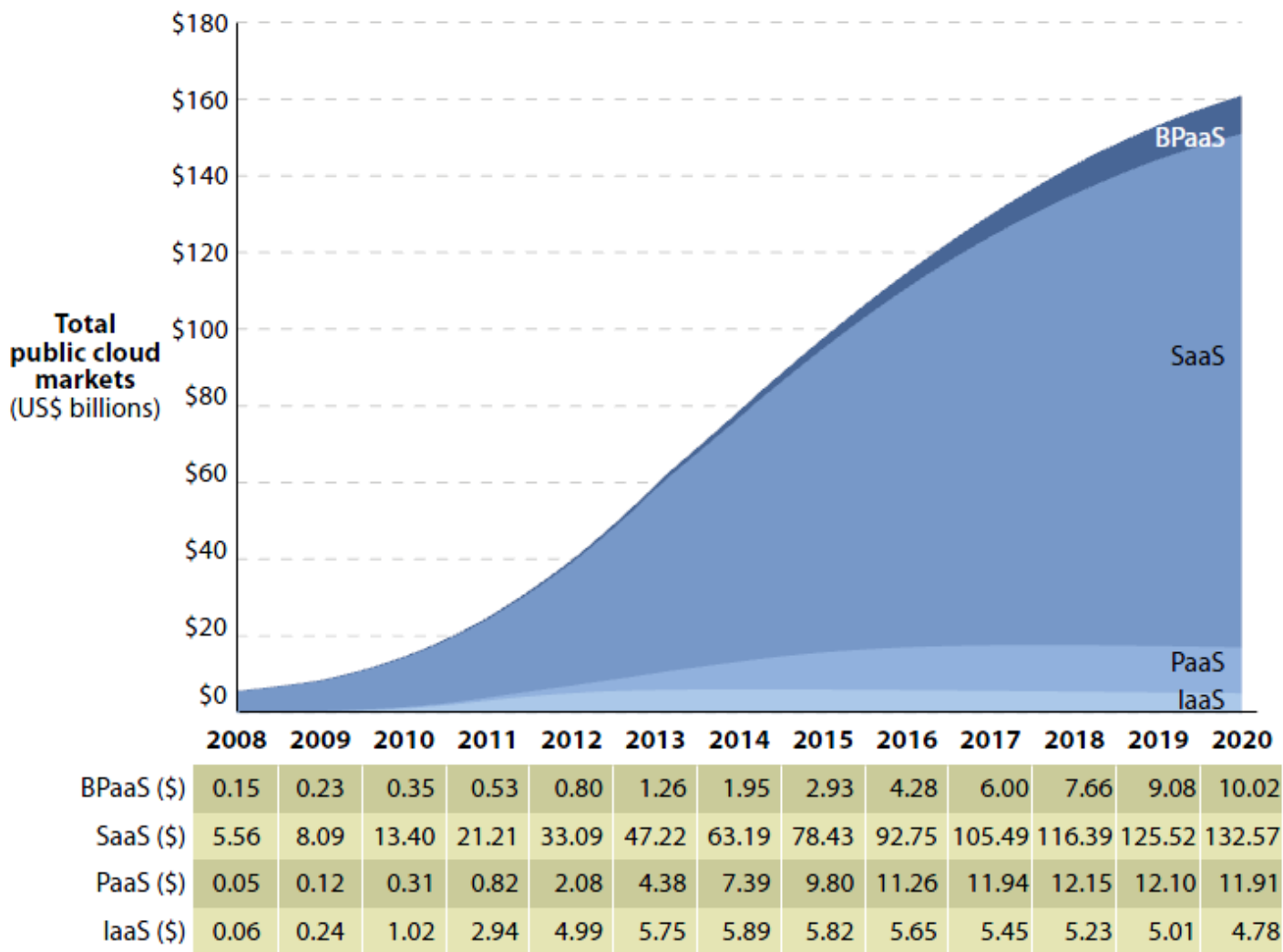
What's Virtualization?

" **virtualization** refers to the act of creating a virtual (rather than actual) version of something, including virtual computer hardware platforms, storage devices, and computer network resources. " Wikipedia

Advantages

For a personal user, virtualization allows to run programs not supported by user Operating System.

For a company, virtualization allows to isolate programs increasing security.

principal virtualization techniques
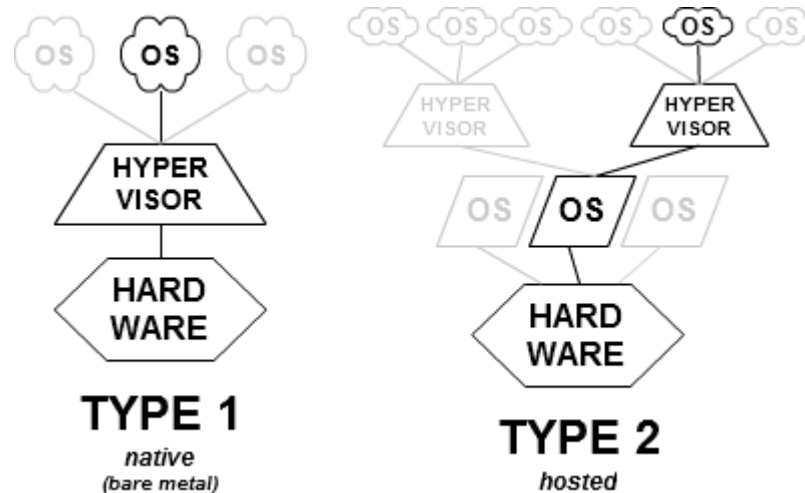
Type-1, native or bare-metal hypervisors:
        run directly on the host's hardware

Type-2 or hosted hypervisors:
        run on a conventional operating system (OS) just as other computer programs do

principal virtualization techniques

Application virtualization:

Software technology that encapsulates computer programs from the underlying operating system on which it is executed.

Allow to avoid dependencies on libraries and installation problems.

Virtualization is not Cloud!

- But virtualization is central in Cloud evolution.
- Virtualization allows to break hardware constraints.
- Cloud allows to exploit hardware on demand.

- Virtualization + Cloud allows to run programs and adapt physical ressources.

Cloud Limitations!

- Richard Stallman, founder of the Free Software Foundation and creator of the computer operating system GNU, said that

" **cloud computing was simply a trap aimed at forcing more people to buy into locked, proprietary systems that would cost them more and more over time** " at *The Guardian*

Cloud Limitations!

- Do you remember OVH big failure last 9 november?

- What consequences here at deVinci?

- Also security issues:
  - Data on the cloud
  - Programs on the cloud