IT structure; class 1

Data center

Composed of servers, power, air conditioning, telecommunication links, ...

* Contents
* technologies serveur & virtualisation
* mutualized infrastructures : lan, interconnexions….
* Container
* site/hosting room
* hosting capacity

Services :

* hosting service = hosting is infrastructures
* operation service
* infrastructure exploitation/administration
* service cloud

1. choose in which datacenter
2. how

There is a pretty good selection to do to have a great data center.

Problematics of IT division :

* Hosting strategy, outsourcing, scalability
* IT Infrastructure design
* Operations industrialization

Stakes :

* Business expectations
* Keep up with evolution and scalability
* Global & connected infrastructure

Challenges of datacenter :

* capacity limitation : you always need more servers and storage
* you need to make more energy and extract more heatness
* reducing environmental footprint

A datacenter doesn’t run by itself, you need humans to run them

Strategy :

* Natural enthropy
* centralization & consolidation
* greater density and power
* reduce environmental emprint

There is different kind of hosts :

* pure players (biggest atm)
* outsourcers
* operators

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Racks = hosts all the servers in U (unit) where 1 U = 5-6 cm

front door : lock & prevent people to access the servers

not too much space for airflow

top : electrical cables coming from the top & no suspended ceiling

suspended floor to allow the cool air to reach the servers

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When you lose hard drive, you lose storage but also backup.

maintaining a good availability is pretty important.

upper layer : - os

- application working

For a working datacenter, you need:

* power system
* telecommunication system
* climatic infrastructures : air cooling and power
  + 500W - 1.5 kW for servers
  + hydrometry : between electricity static and rust

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Availability is very important because when it breaks it has huge impacts (like in Paris and London), and companies lose a lot of money.

It doesn’t depend on the hosting service component, it is depending on the whole underlaying infrastructure.

TIer classification from I to IV :

* defined by Uptime Institute
  + how well is your data center built?
* 70% of problems comes from humans :
  + ⅔ by management
  + ⅓ by human

Tier I : no redundancy

Tier II : redundancy of critical component

Tier III : two physical supply chain (1 active, 1 passive)

Tier IV : two active physical supply chain + good maintenance

Sourcing hosting space :

* build your own data center (costs a lot)

Cloud services adapt to your usage of the cloud

You can have :

* applications directly

You need to avoid oversizing -> 90% chance that in 5 years it will be upgradeable (power & infrastructure)

[Math]

Power usage efficiency : kWh total / kwH IT

Data centre efficiency : 1 / PUE \* 100 (in %)

Green datacenters :

* rise of electric bills
* communication about good practices
* low waste transformer
* cooling with ice or environment