

Summary of Cloud Computing at University of Bristol 2018 / 2019*

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*This is just a simple summary. I am not responsible for the provided content or anything which belongs to this. If there are any questions please contact me at bauerflorian13@gmail.com .

Contents

Lecture 01: Introduction

Comparison of the internet and electricity network

- starts with everyone has his own (electricity/computationally power)
- connection between every single users grows
- ends in an all connected world with only a few big services provided by a small number of providers (computationally power goes from the device of the endusers to the cloud, electricity comes from big providers)

Normal Failure

- cloud data centre with 99.999% survival rate
- 500000 server, probability of 100% of the servers are still running after 3 years is 1%.
- **solution:** modular data centres, *servers in container boxes*

Essential Characteristics of Cloud Computing

This definition belongs to NIST's characteristics of Cloud Computing

- **On-demand self service**
- **Broad network access**
- **Ressource pooling**
- **Rapid elasticity**
- **Measured service**

A common stratification: *aaS

Everything as a Service.

- **SaaS:** *Software as a Service*, for instance: everyone

- **PaaS:** *Platform as a Service*, for instance: *Google App Engine, Amazon Appstream*
- **IaaS:** *Infrastructure as a Service*, for instance: *Amazon EC2, S3, Google Compute Engine*

A small number of companies providing IaaS/PaaS services. Convergence to an oligopoly of less than five providers seems certain.

Lecture 02: Coursework

Just a few informations about the coursework and programming project. May be hopefully not important for the exam...

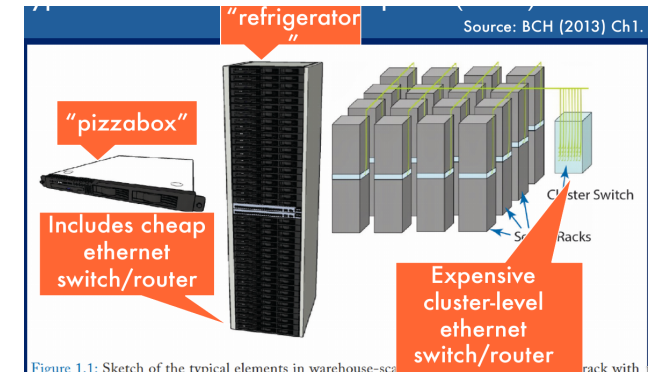
L03: Economics of Cloud

The basic Economics

- **Capital Expenditure:** *Capex*
- **Operating Expenditure:** *Opex*
- Capex vs Opex: *Why buy a cow if all you need is the milk?*

A typical warehouse scale computer

- *pizzabox* in a *refrigerator* is a server rack
- multiple server racks together are a cluster
- see ??



Energy & Power Efficiency

- cooling cost are around 42%
- optimizing the cooling efficiency will lower the overall costs massively

Resume

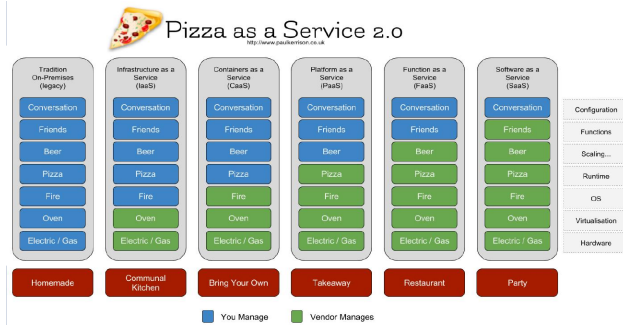
- there is a lot going on *under the hood* of a WSC (WSC = **Warehouse-scale Computer**)
- *prod&dev*: The innovations are made by and in companies not universities

L05: *aaS

Definiton see ??

Why XaaS or *aaS

- avoiding of **Undifferentiated Heavy Lifting**
- the cloud is an ideal environment providing *scale, low cost, automation via Infrastructure-as-Code*



L07: Virtualisation

L09: Serverless

L11: Scalable Systems

**L13: MapReduce and
GFS/HDFS**

L14: CAP, Paxos, BGP

L15: The Hadoop Ecosystem

**L16: Spark and In-Memory
Methods**

L17: NoSQL

L18: Graph Databases

**L19: NewSQL & Event Stream
Processing**

L20: Cloud Security

L21: DevOp

Todo...