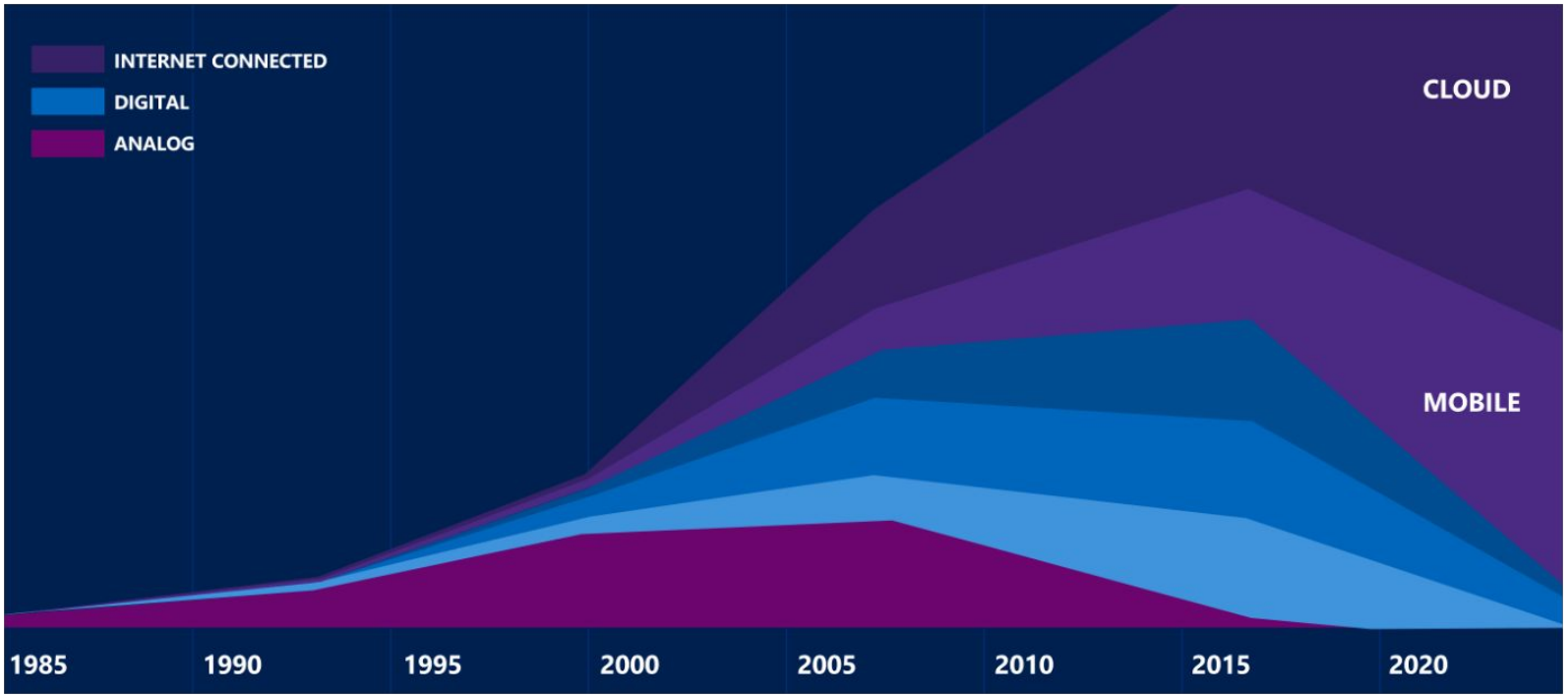
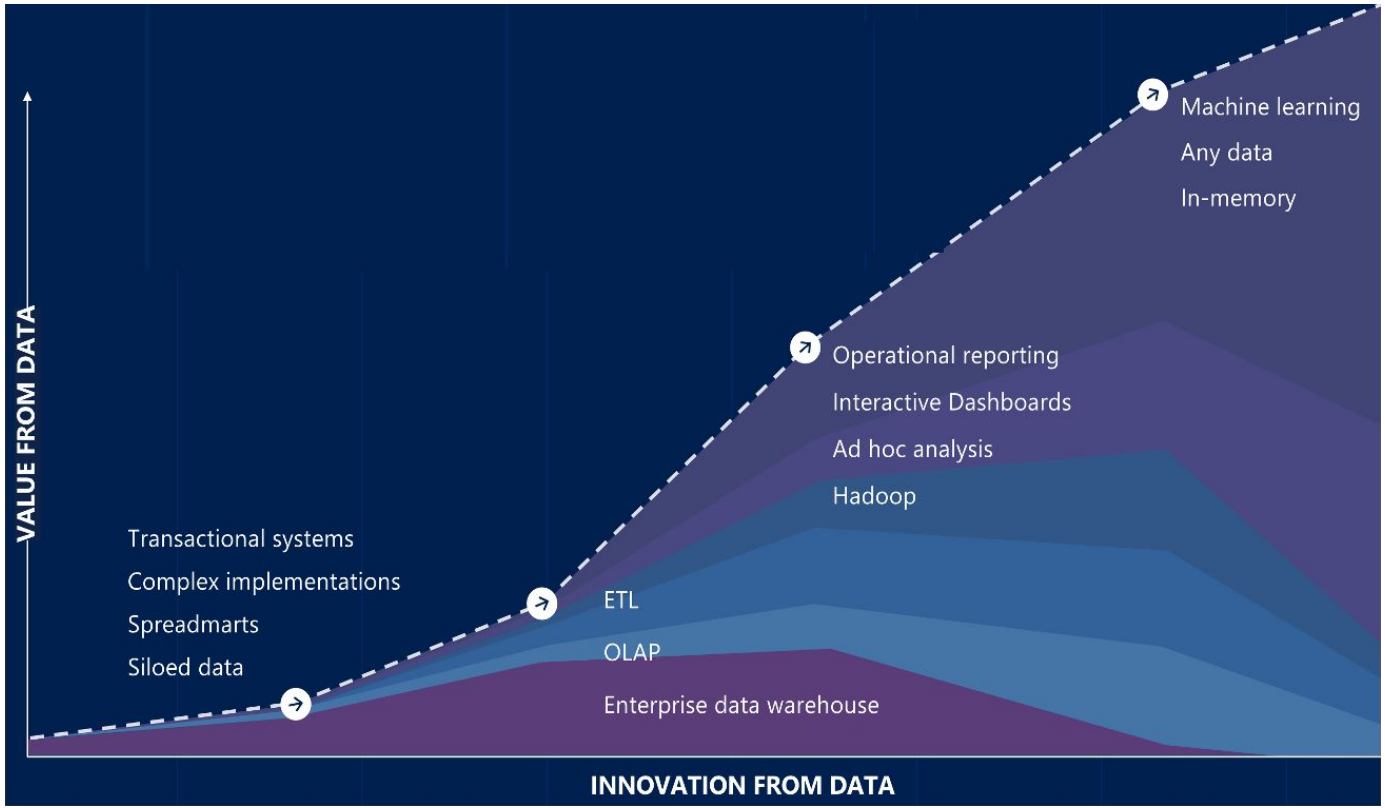
ML in the Cloud 101

Data, data and more data

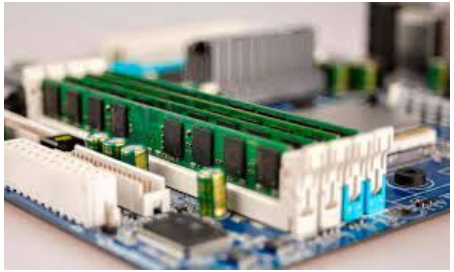


Data needs for..



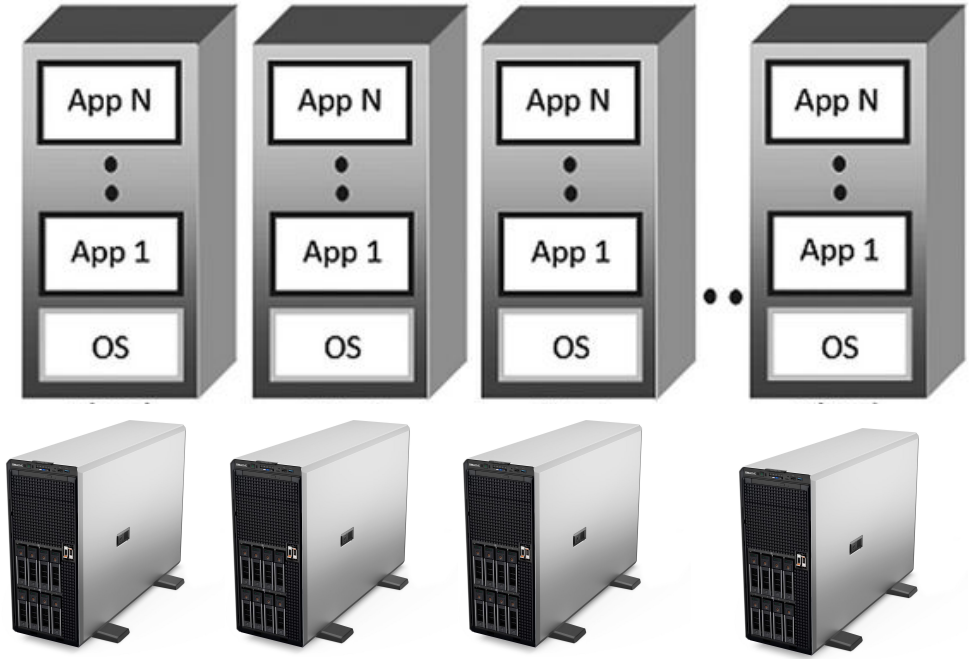
A brief review of physical infrastructure

Simple “***server***”

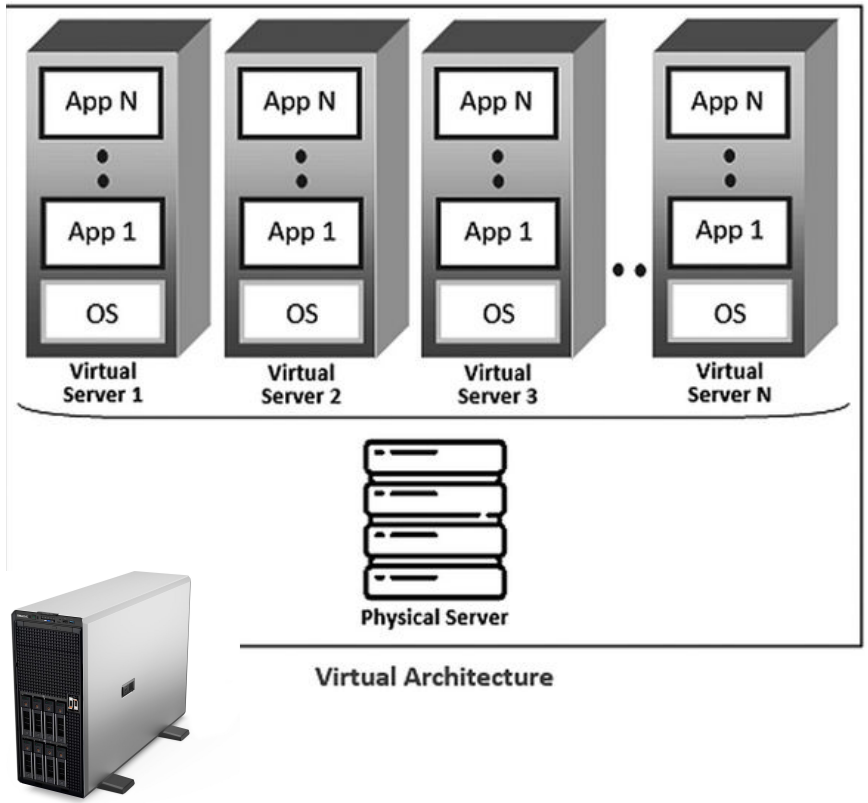


Server

One server one app

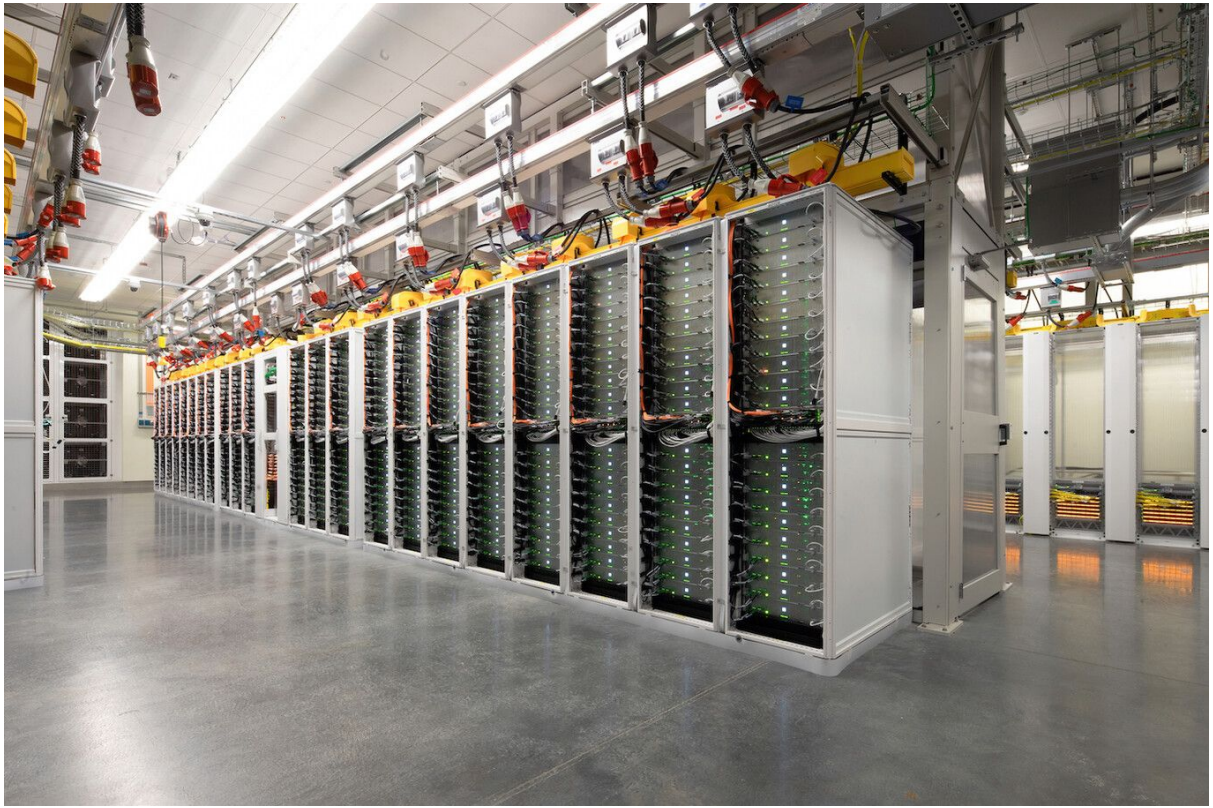


Virtualization



Rack servers and racks

Data Center

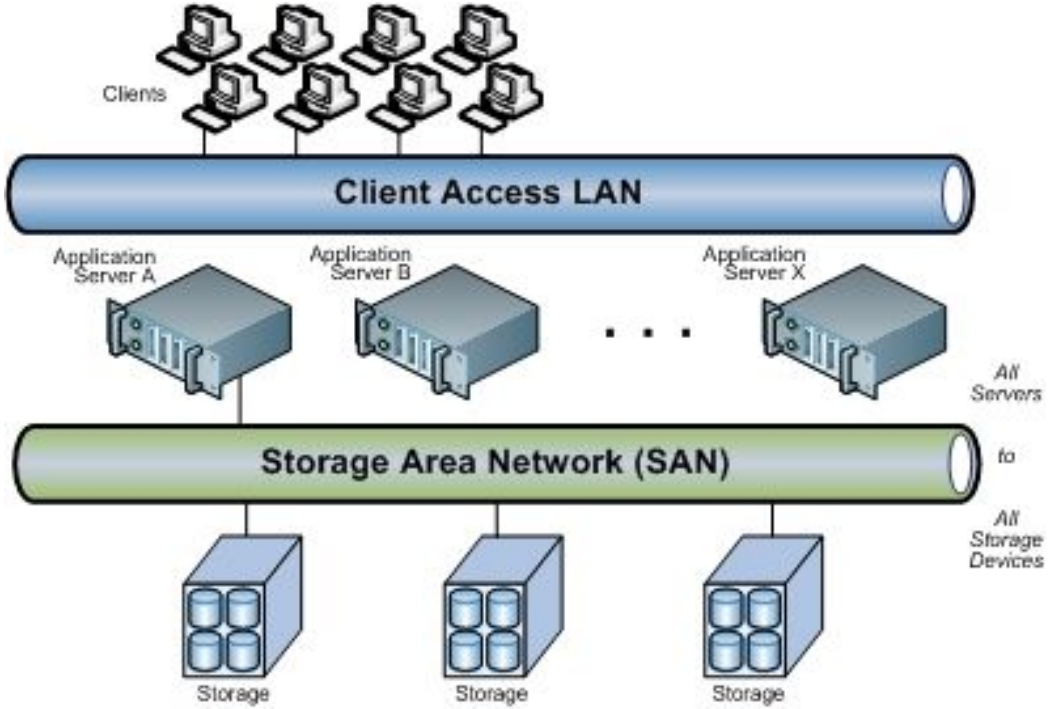


Storage Area Network (SAN) and blade servers

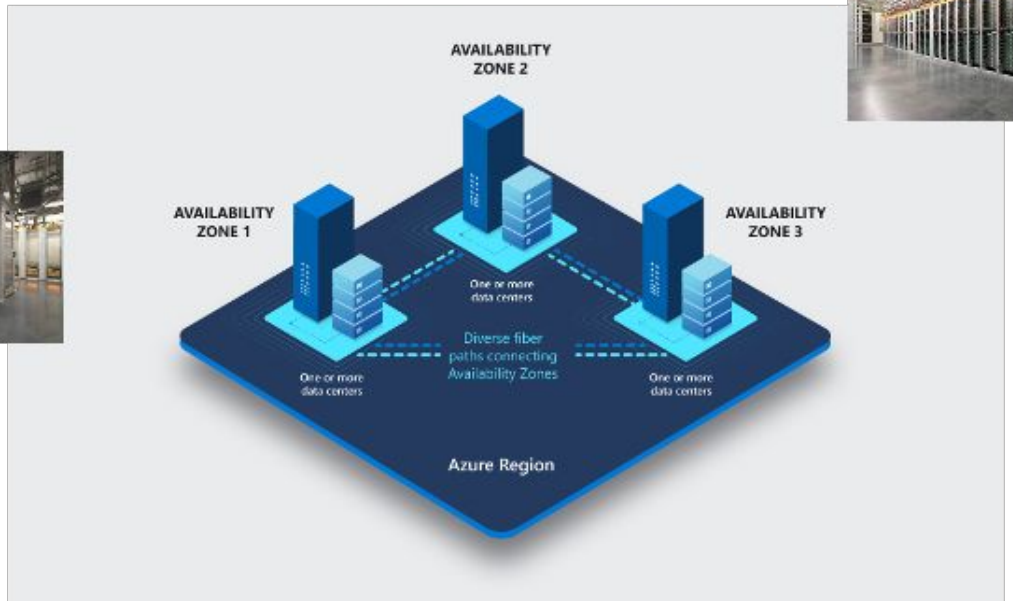
Servers (CPU + RAM)

Storage

A new world of possibilities…



Replication



On-premise data centers

*If you are **managing** the complete infrastructure **by yourself**, it is call **on-premise** data centers*

Cloud Computing definition

*The practice of using a network of **remote servers** hosted on the **internet** to store, manage, and process data, rather than a local server or a personal computer.*

On-premise vs cloud computing

Cloud, why now?

- Data Volume
- Need of elastic computing power
- Very dynamic hardware evolution (GPUs, TPUs, …)
- Pay only for use
- Flexibility

For example, “Nestlé’s journey to cloud”

Providing safe, quality nutrition for **155 years**

2 000 + brands worldwide

Around **273 000** employees

Number of countries we sell in **186**

376 factories in 81 countries

CHF 84.3 billion Group sales in 2020

1 billion Nestlé products sold every day

For example, “Nestlé’s journey to cloud”

So…

Cloud means flexibility… can you tell an example of development that needs a lot of flexibility in computer resources?

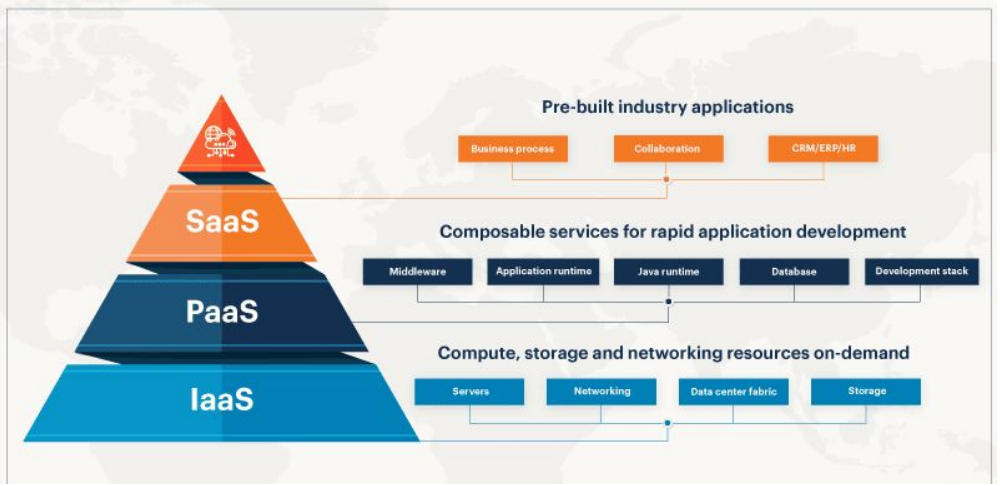
Big cloud providers

Figure 1: Magic Quadrant for Cloud Infrastructure and Platform Services

Source: Gartner (July 2021)

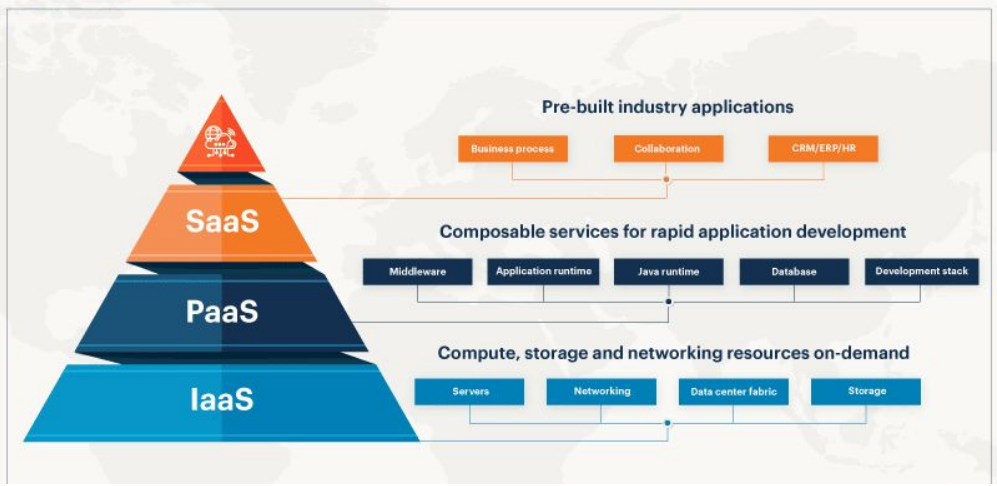
Cloud concepts

IaaS, or *infrastructure as a service*, is on-demand access to cloud-hosted physical and virtual servers, storage and networking - the backend IT infrastructure for running applications and workloads in the cloud (like Virtual Machines).



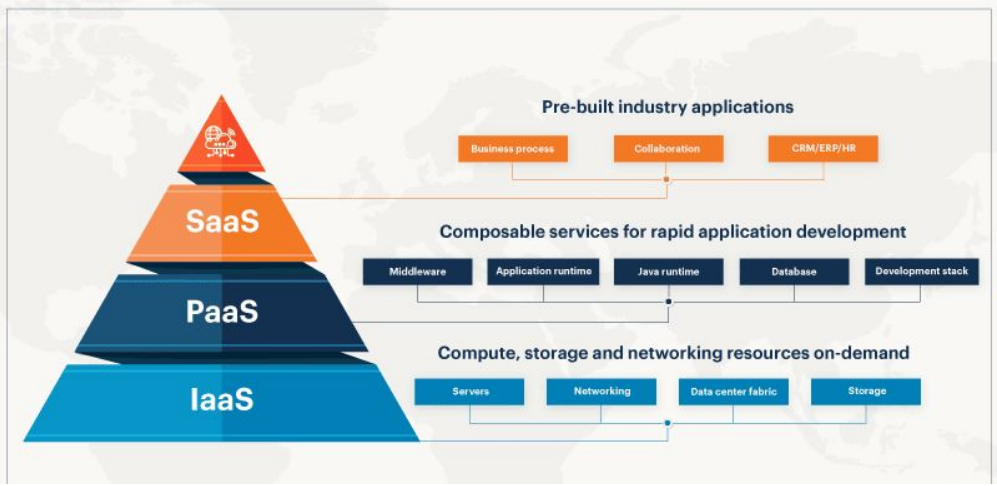
Cloud concepts

PaaS, or *platform as a service*, is on-demand access to a complete, ready-to-use, cloud-hosted platform for developing, running, maintaining and managing applications (like Azure Databricks).



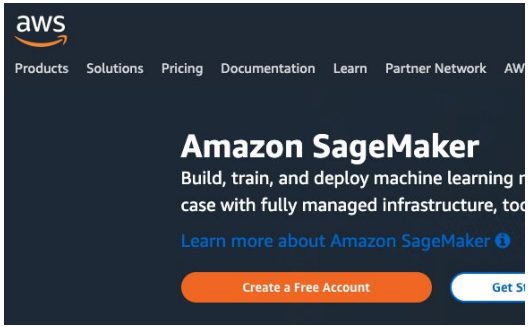
Cloud concepts

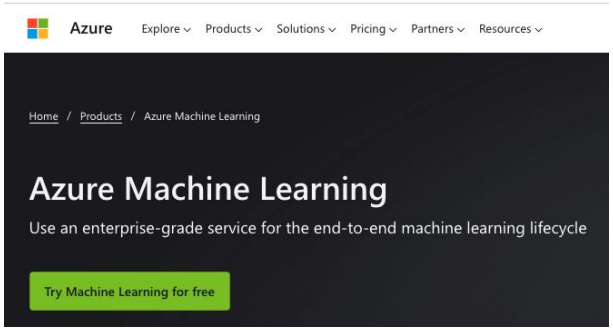
SaaS, or *software as a service*, is on-demand access to ready-to-use, cloud-hosted application software (like Office 365).

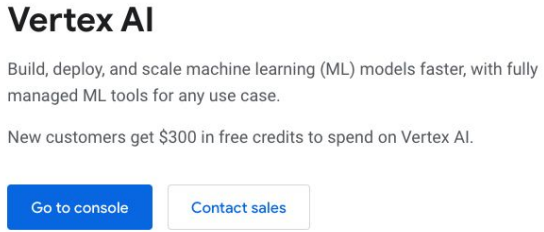


Cloud Services

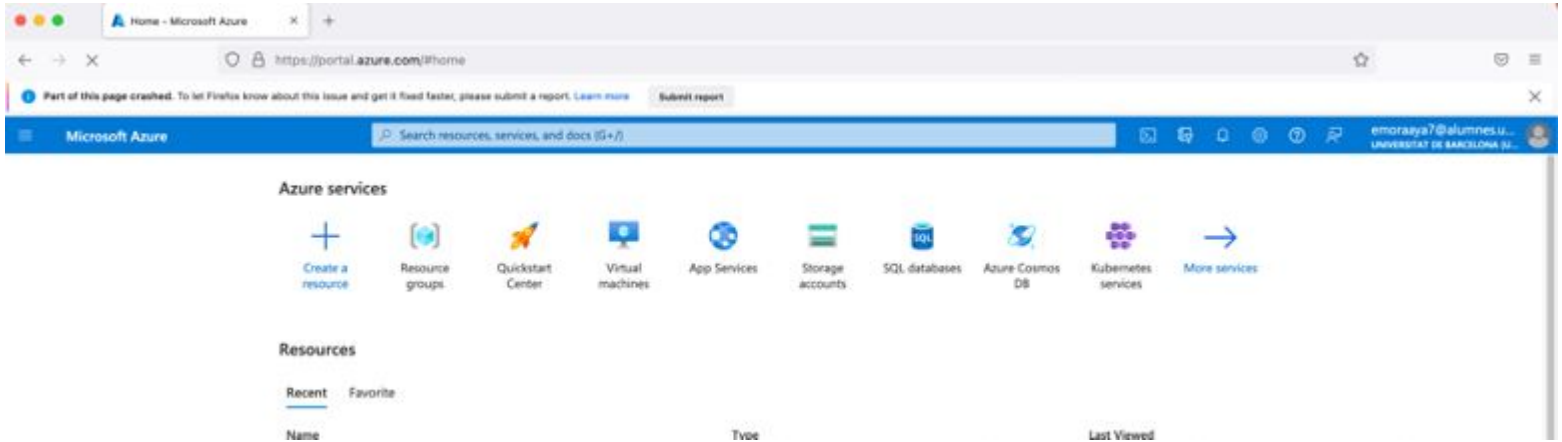
Cloud for Data Scientist







Azure Portal lab

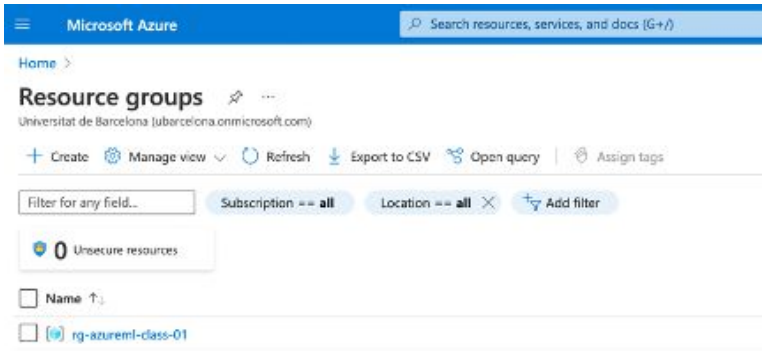


1. Create a $100 Azure for Students account for free with your UB Credentials.
2. Log in the Azure Portal
3. Azure Calculator

Azure Portal. Resource Groups

The **Resource Group** is the “logic” group of resources inside Azure

It can **manage** the user **rights** as well as the associated **costs**



ML SaaS. Cognitive Services and Azure AI