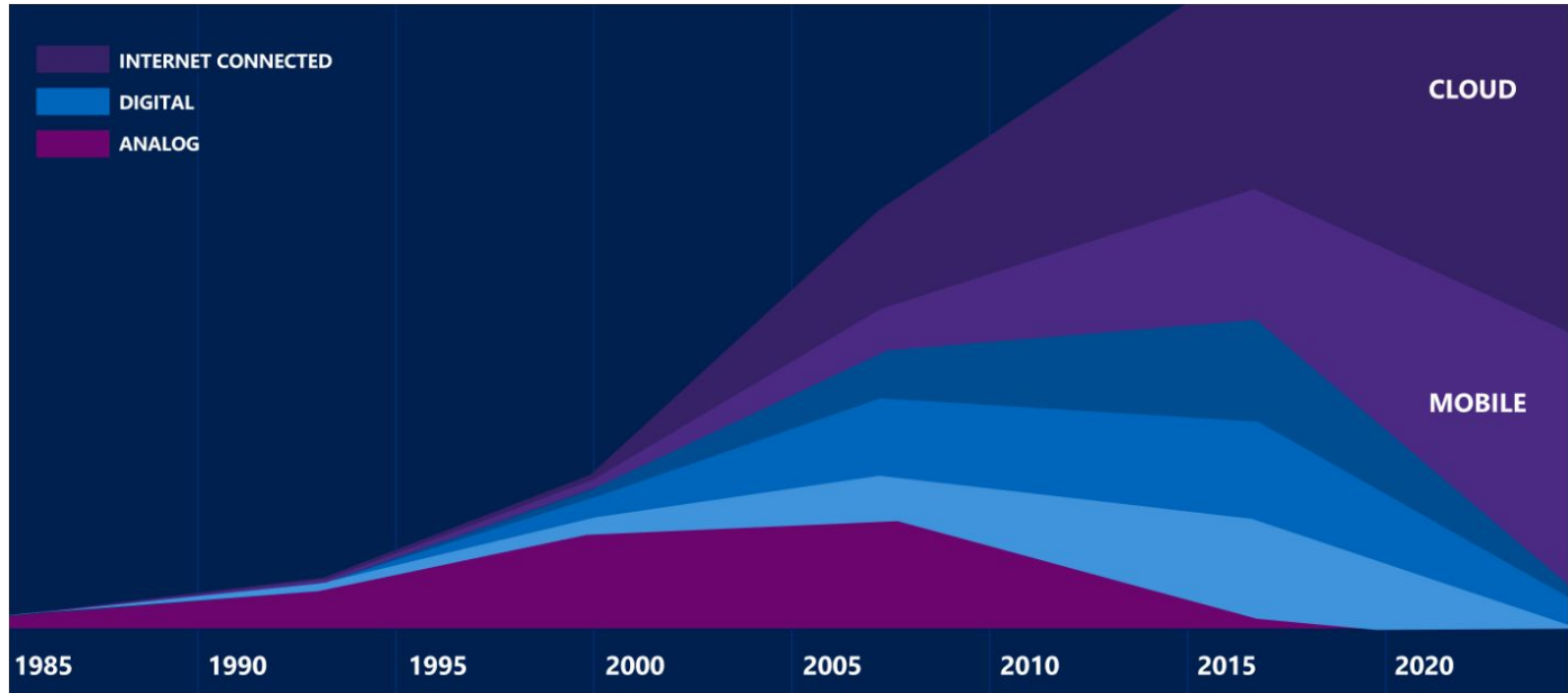
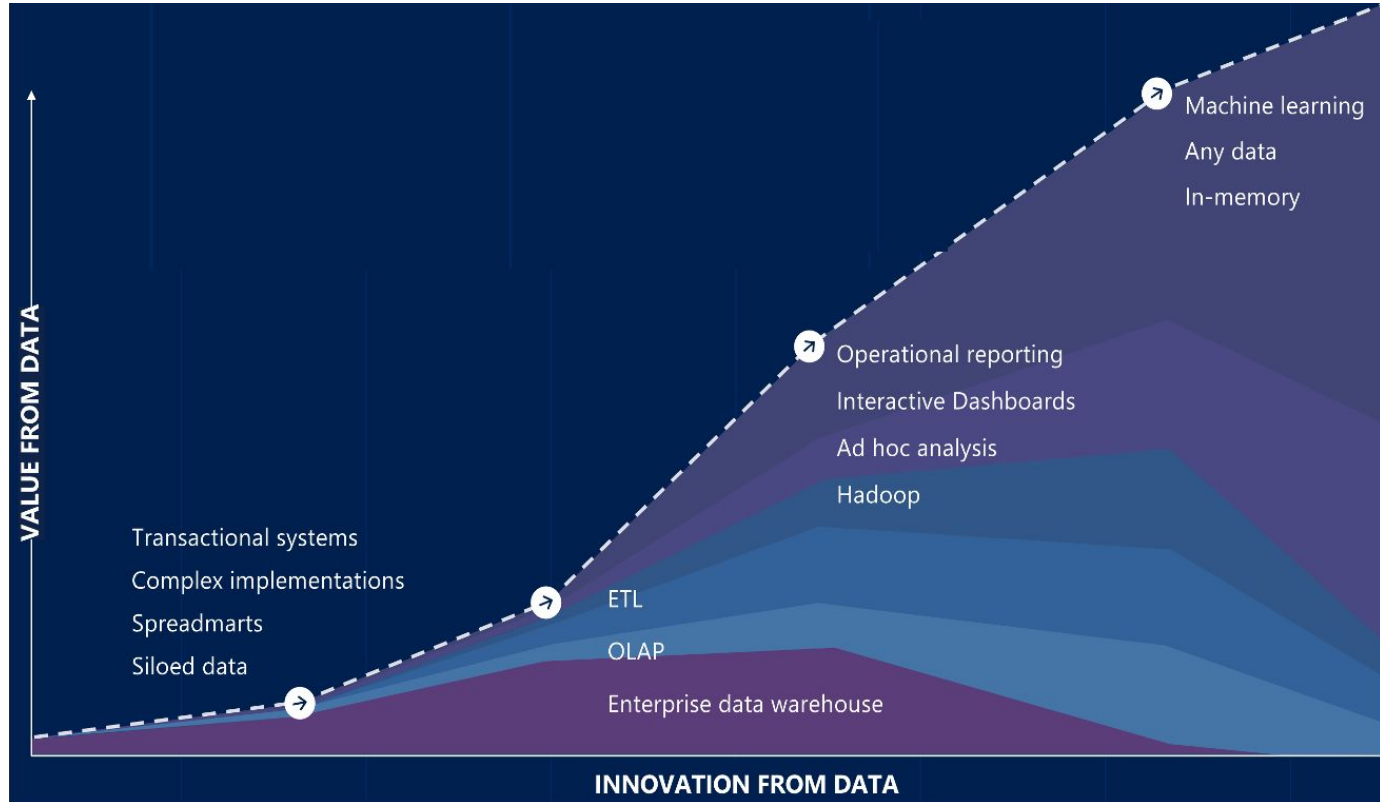


ML in the Cloud 101

Data, data and more data



Data needs for..

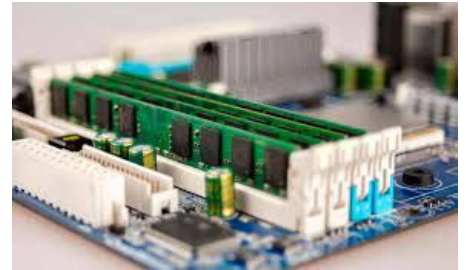


A brief review of physical infrastructure

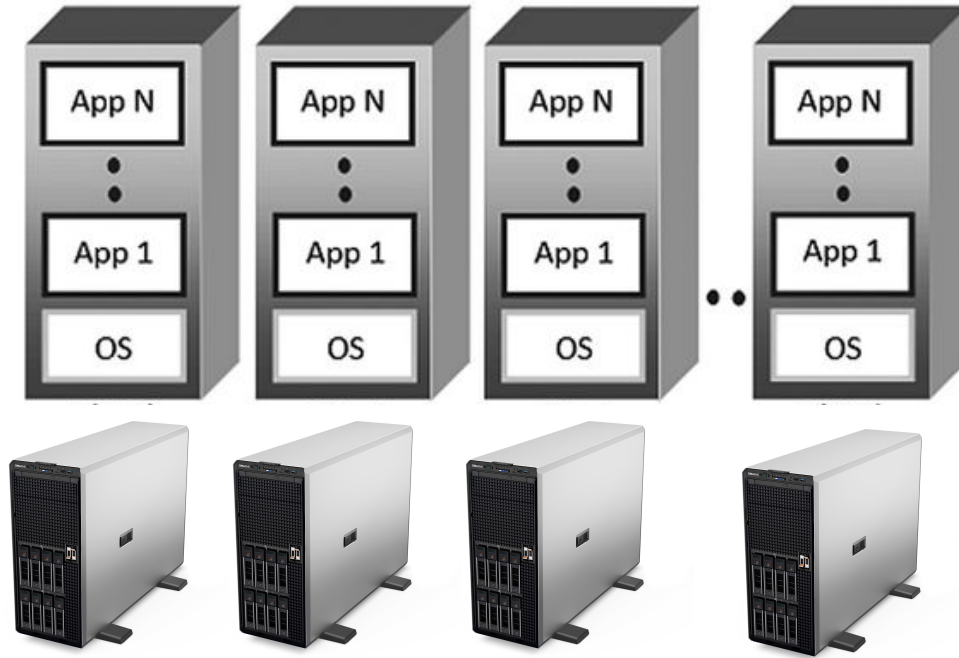
Simple “*server*”



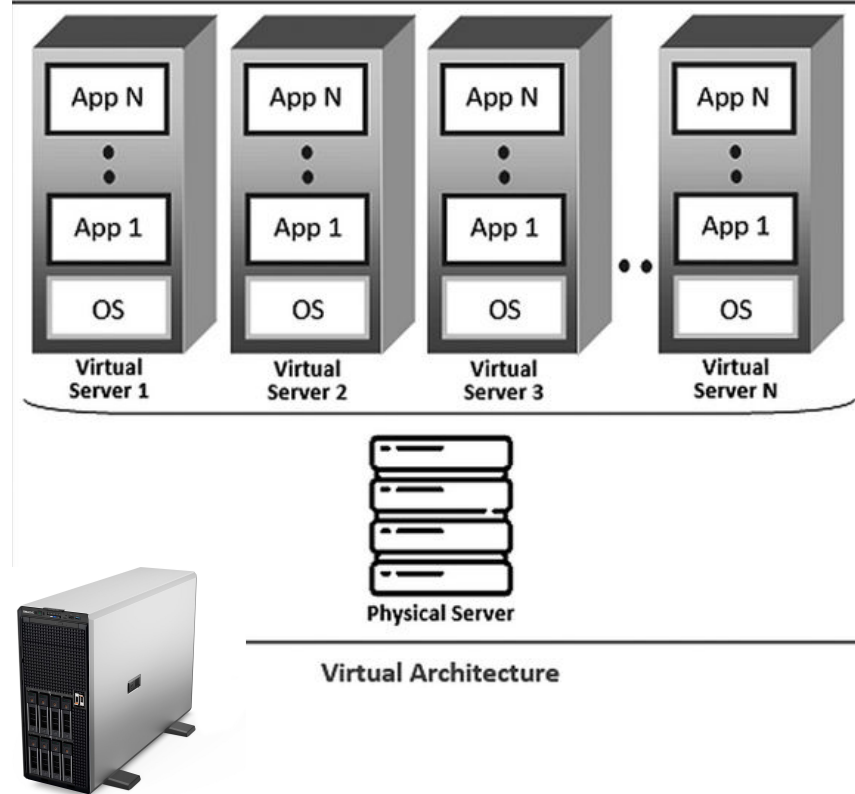
Server



One server one app



Virtualization

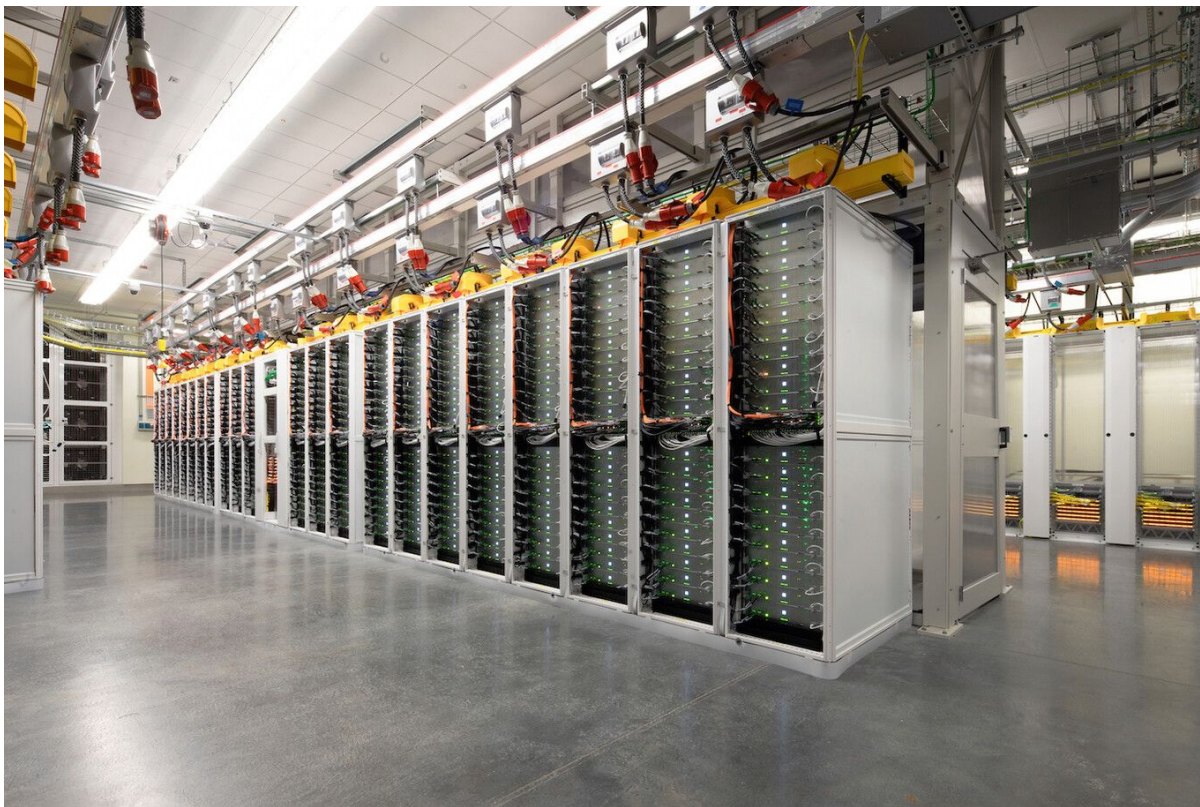


Rack servers and racks

AMD



Data Center



Storage Area Network (SAN) and blade servers

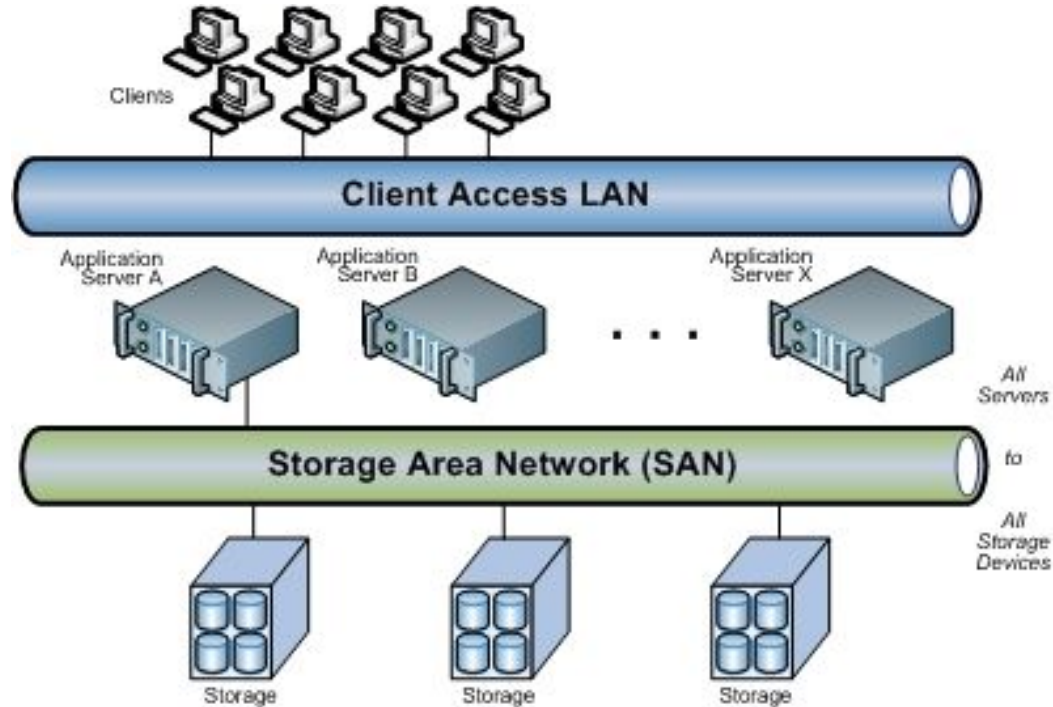


Servers (CPU + RAM)



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

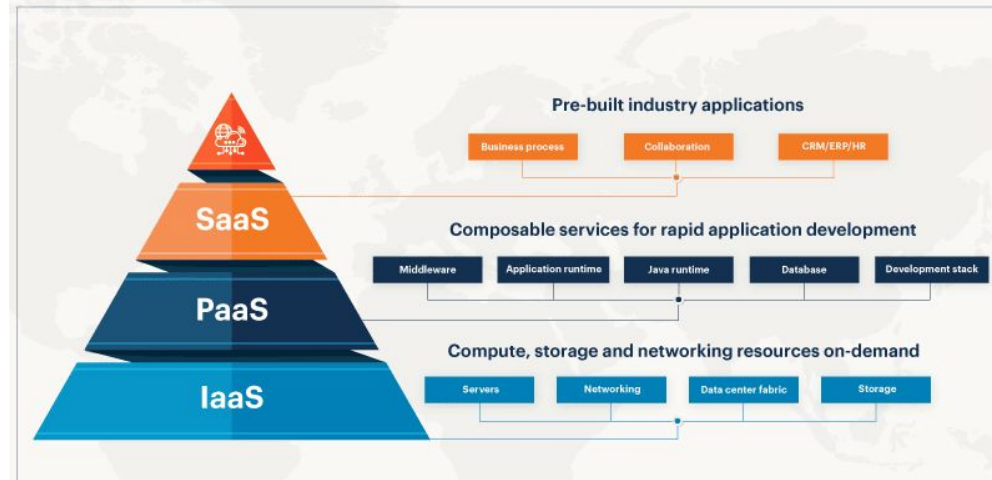
Figure 1: Magic Quadrant for Cloud Infrastructure and Platform Services



Source: Gartner (July 2021)

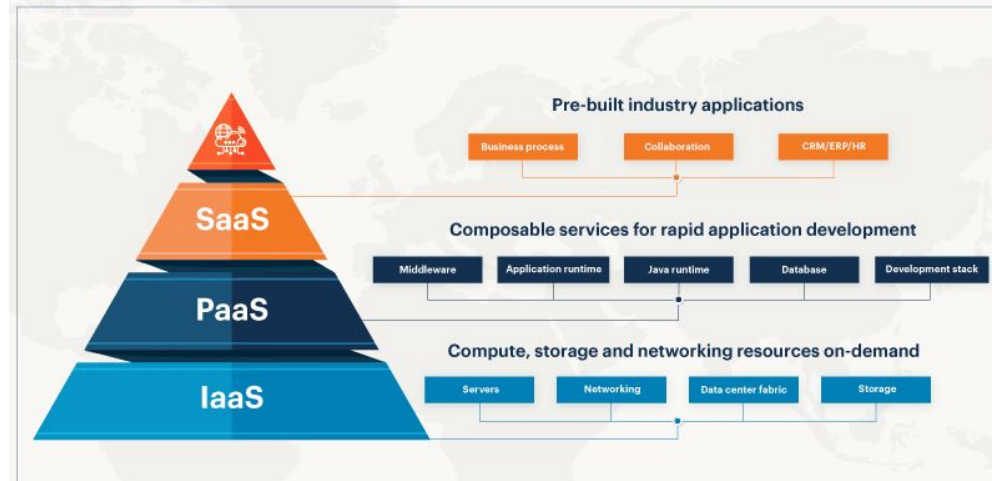
Cloud concepts

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).



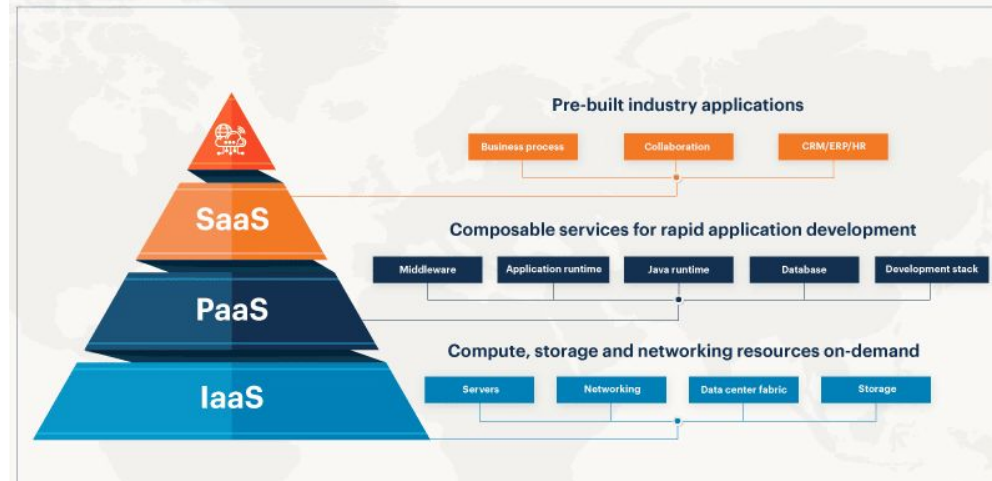
Cloud concepts

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).



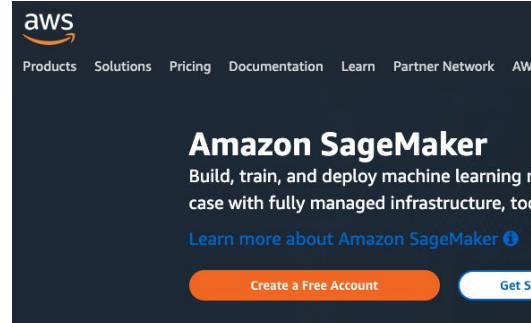
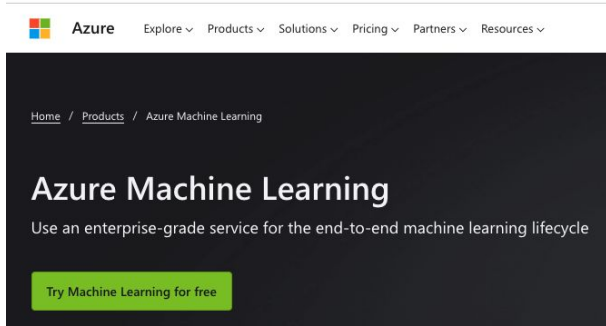
Cloud Services

Cloud Computing Services: Who Manages What?

	Traditional IT	IaaS	PaaS	SaaS
Applications	You manage	You manage	You manage	Provider manages
Data	You manage	You manage	You manage	Provider manages
Runtime	You manage	You manage	Provider manages	Provider manages
Middleware	You manage	You manage	Provider manages	Provider manages
OS	You manage	Provider manages	Provider manages	Provider manages
Virtualization	You manage	Provider manages	Provider manages	Provider manages
Servers	You manage	Provider manages	Provider manages	Provider manages
Storage	You manage	Provider manages	Provider manages	Provider manages
Networking	You manage	Provider manages	Provider manages	Provider manages

 You manage  Provider manages

Cloud for Data Scientist



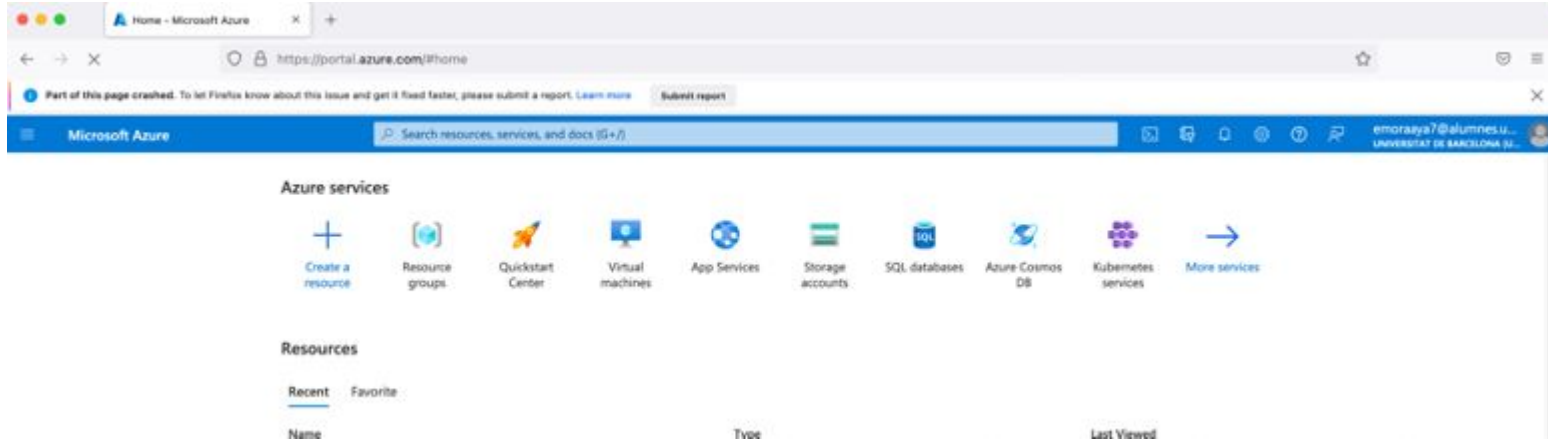
Vertex AI

Build, deploy, and scale machine learning (ML) models faster, with fully managed ML tools for any use case.

New customers get \$300 in free credits to spend on Vertex AI.



Azure Portal lab

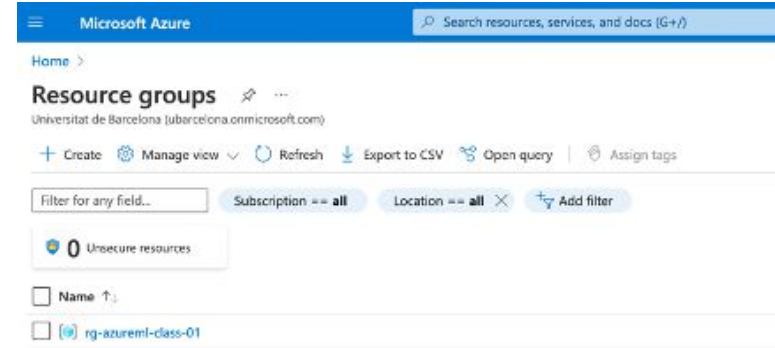


1. Create a \$100 [Azure for Students](#) account for free with your UB Credentials.
2. Log in the [Azure Portal](#)
3. Azure [Calculator](#)

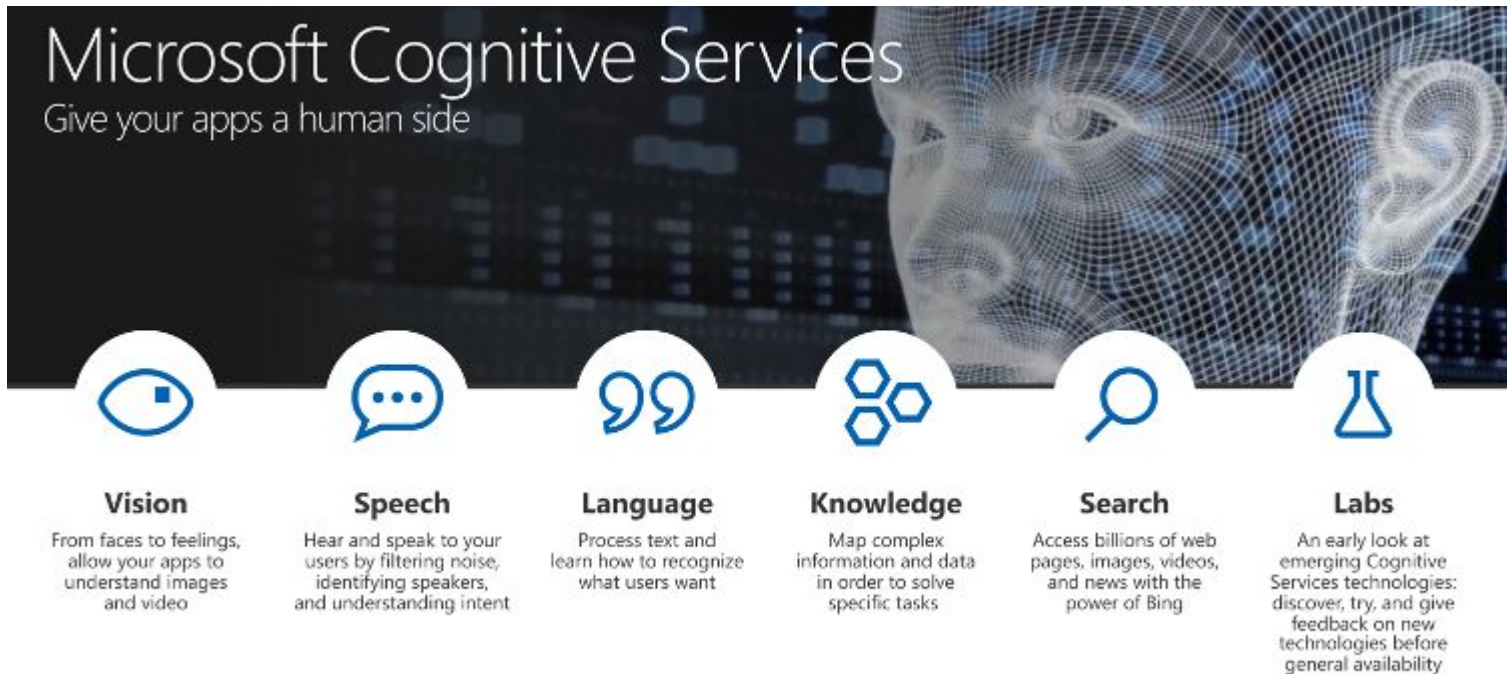
Azure Portal. Resource Groups

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



Microsoft Cognitive Services
Give your apps a human side

The banner features a wireframe face of a human head on the right side, composed of blue and white lines. Below the banner are six circular icons, each representing a different cognitive service: Vision (an eye), Speech (a speech bubble), Language (two overlapping speech bubbles), Knowledge (three interconnected hexagons), Search (a magnifying glass), and Labs (a flask).

- Vision**
From faces to feelings, allow your apps to understand images and video
- Speech**
Hear and speak to your users by filtering noise, identifying speakers, and understanding intent
- Language**
Process text and learn how to recognize what users want
- Knowledge**
Map complex information and data in order to solve specific tasks
- Search**
Access billions of web pages, images, videos, and news with the power of Bing
- Labs**
An early look at emerging Cognitive Services technologies: discover, try, and give feedback on new technologies before general availability