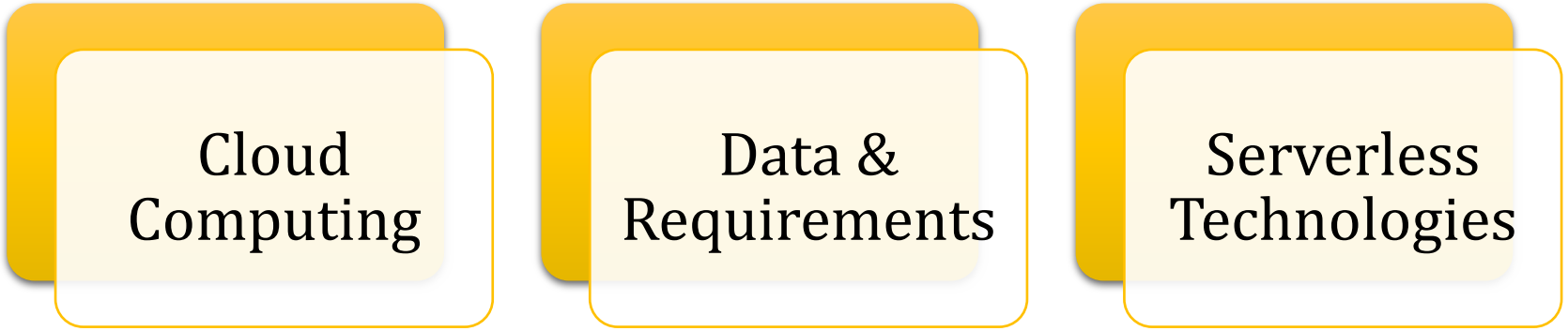
Serverless Data Processing (CSCI 5410)

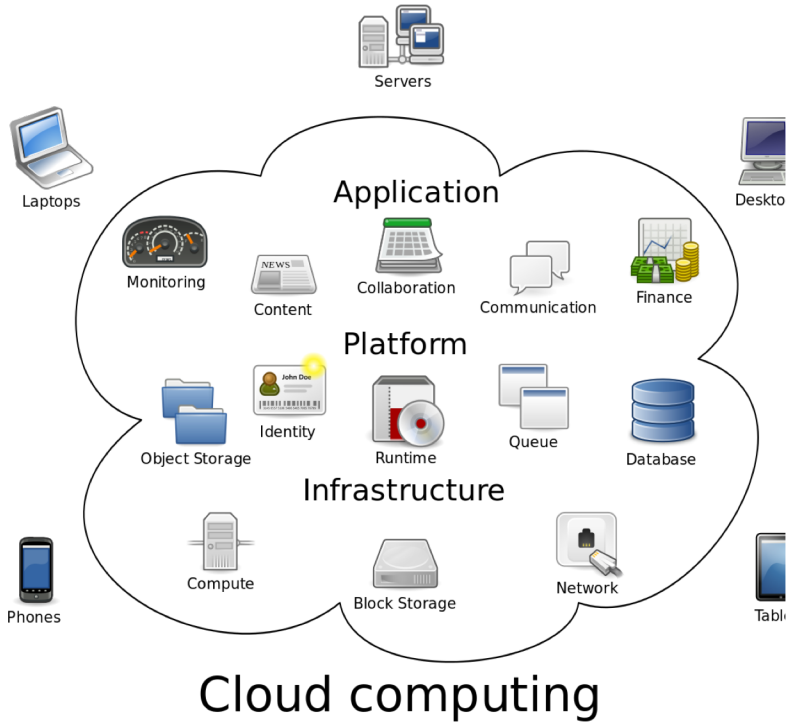
Dr. Saurabh Dey

Outline

1. Cloud Computing Definition
2. Examples of Cloud Computing
3. Things we need to know before using cloud
4. What are the essential services of cloud computing

3 Key Components of CSCI 5410





What is Cloud Computing?

"Simply put, cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet ("the cloud") to offer faster innovation, flexible resources, and economies of scale. You typically pay only for cloud services you use, helping you lower your operating costs, run your infrastructure more efficiently, and scale as your business needs change."

- Microsoft Azure

Citation: https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/

Examples of Cloud Computing

Social Network – e.g. Facebook

Online Streaming – e.g. Netflix, Amazon

Chatbots – e.g. Alexa, Siri

Communication Apps – e.g. Skype, WhatsApp

Business Apps – e.g. IBM Watson heath cloud

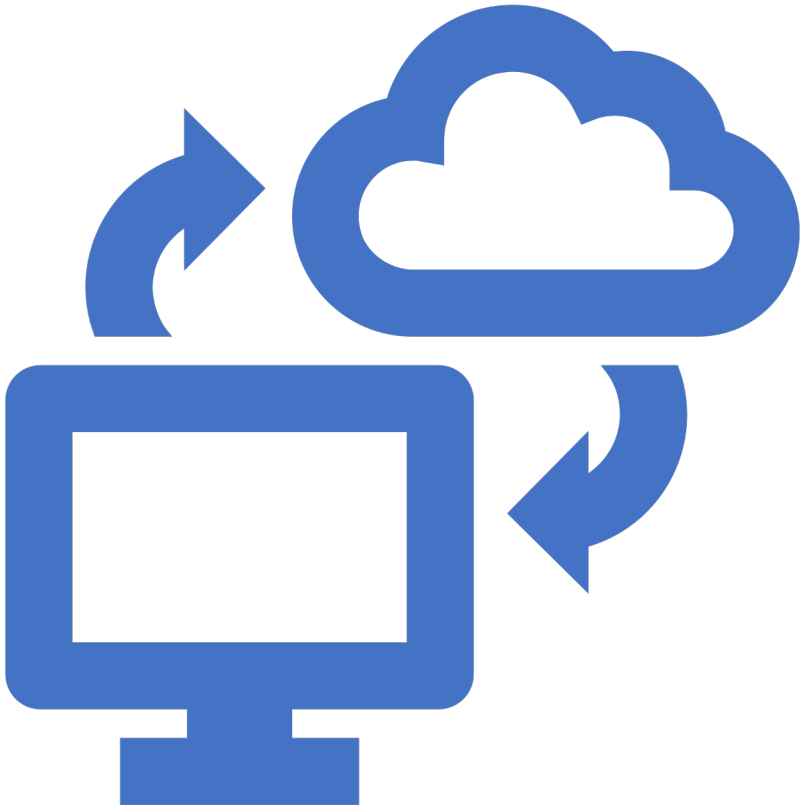
Application Development, Testing, & Deployment – e.g. Azure, AWS, GCP

Deep Learning in Cloud – e.g. AWS Sagemaker

Citation: https://www.ubuntupit.com/best-cloud-computing-examples-and-uses/

What do we need to know?

- Understand the data
- Organization's business goals, processes, workflows
- Software development processes
- Infrastructure concepts, skills, tools
- Security vulnerabilities, technologies, best practices
- Automation tools
- Lifelong learning…



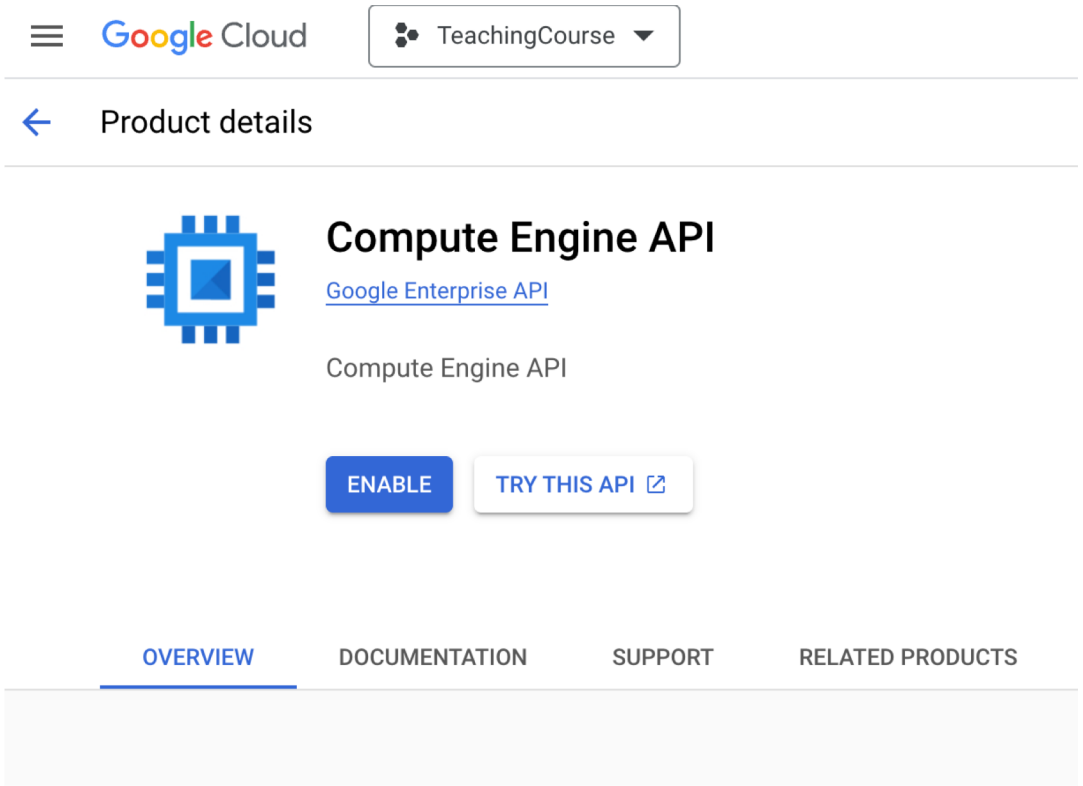
Essential Services of Cloud Computing

- On-Demand Self-Service
- Broad Network Access
- Resource Pooling
- Rapid Elasticity
- Measured Service

Citation: Dan C. Marinescu. (2018) *Cloud Computing Theory and Practice*, Second Ed

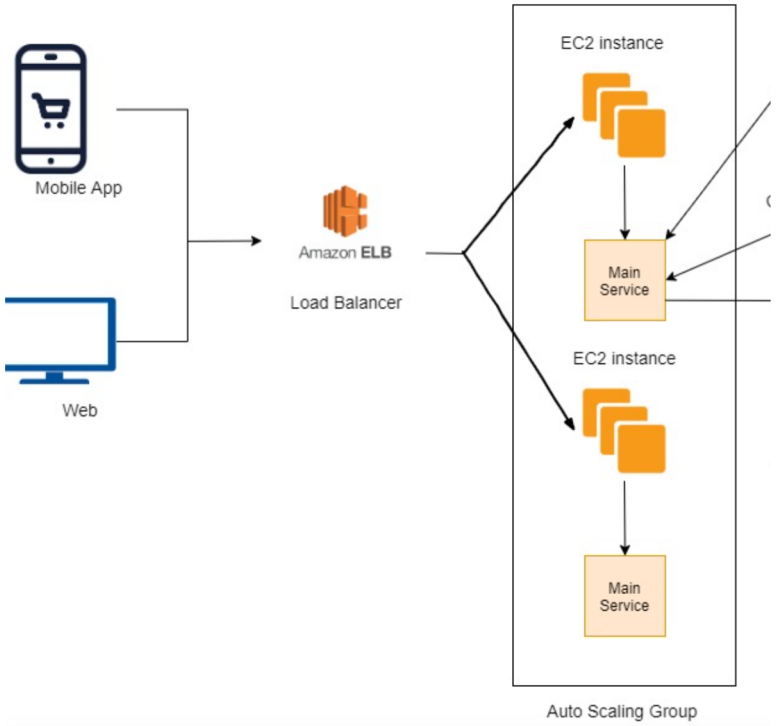
On-Demand Self-Service

Service subscriber or other users can add, adjust, or remove cloud services at any time. E.g. adding cloud functions to perform specific task.



Broad Network Access

Connect to cloud-hosted resources from anywhere on the Internet using a variety of device types. E.g. we can access cloud infrastructure using a web browser, form Arduino device, from IoS, Android platforms. And we can access using WiFi, 5G, 2G, Wired Connection etc.



Resource Pooling

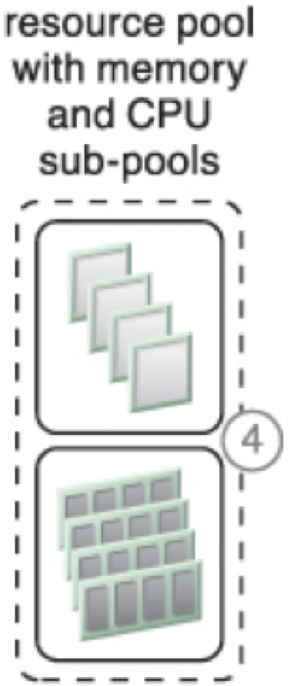
Availability of physical and virtual cloud resources to multiple subscribers according to consumer demand without regard to geographic location.

E.g. I am sitting here in Halifax and I demand 5 GB space, which I can obtain just by paying and agreeing to the terms, the same space I can obtain from any part of the world may be from Singapore

https://cloud.google.com/about/locations#lightbox-regions-map

Rapid Elasticity

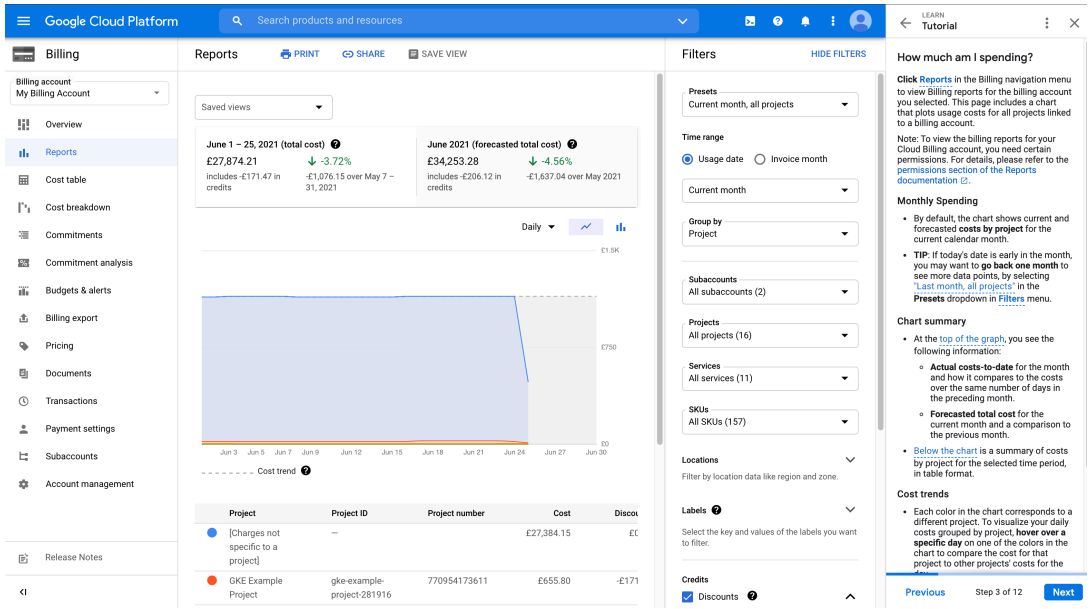
Scale cloud resources up or down according to demand. E.g. if the number of customers for a cloud consumer company increases, then the cloud provider company meets the demand by provisioning more resources, such as adding virtual CPUs, adding memory, adding physical servers, and adding network devices.



Measured Services

Providers charge for cloud resource usage according to an incremented schedule based on the type of service being used.

E.g. we are going to use AWS Academy $50 or $100 account. If we add more services, and we do not terminate, this will eat up all our credits. This is possible because the offered services are measured.



Questions to Consider

- Is the term “Serverless” applicable to only cloud computing?
- Do we compromise our security and privacy if we use cloud computing?