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Cloud Computing Basics

AGENDA

- Introduction to Cloud Computing
- Why Cloud Computing?
  - Virtualization
  - Containerization Technology
  - Software Development Cycle
- Service Model
- Deployment Models
- Conclusions

Introduction to Cloud Computing

Introduction to Cloud Computing

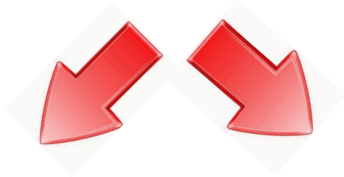
Tulip

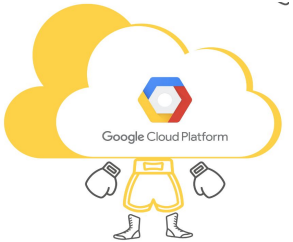
Introduction to Cloud Computing

Tulip

Introduction to Cloud Computing

www.amazon.com





Introduction to Cloud Computing

What is Cloud Computing?

- The **Cloud** term refers to software and services running on the Internet, not locally on your computer.

- So you can store and access data and programs over the internet rather than the hard drive of your computer

Cloud Computing = Application running on someone else's computer

Introduction to Cloud Computing

Evolution of the Cloud Computing

- In 1950, The idea of cloud computing came into the picture,
- In 1970, The concept of virtualization has evolved with the Internet,
- In 1997, Professor Ramnath Chellappa had mentioned the Cloud in an article,
- In 2002, Amazon Web Services (AWS) launched its public cloud,
- In 2008, Google announced a preview release of App Engine,
- In 2008, Microsoft launched Azure,
- In 2009, Alibaba launched Alibaba Cloud,
- In 2011, IBM introduced the IBM SmartCloud Project,
- In 2012, Oracle launched the Oracle Cloud.

Introduction to Cloud Computing

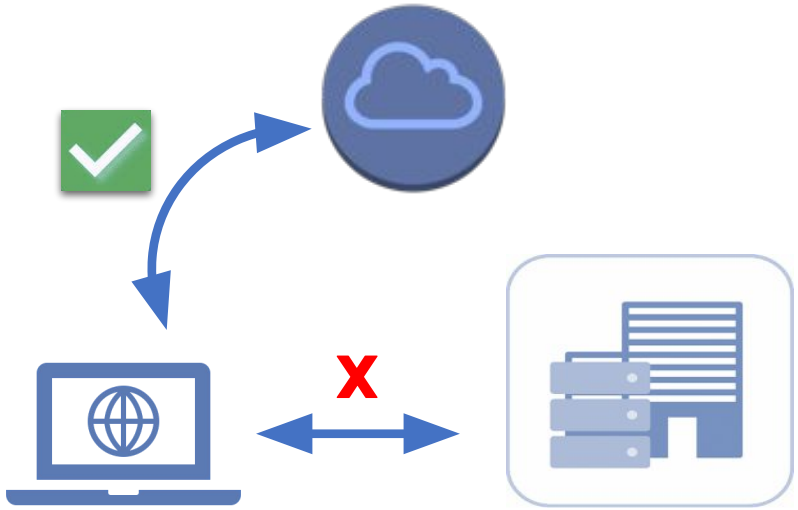
Evolution of the Cloud Computing

- In 2002, Amazon Web Services (AWS) launched its public cloud,

Introduction to Cloud Computing

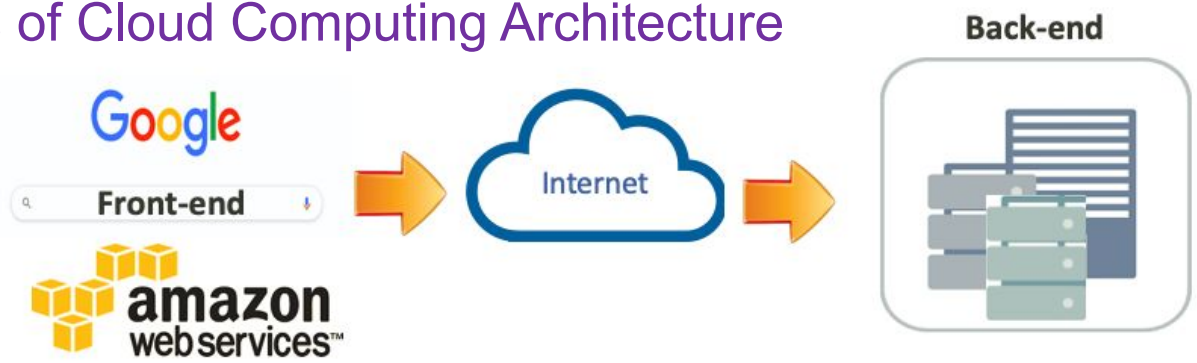
How Cloud Works?

- Information and data are stored on physical or virtual servers that a cloud computing service can retain and monitor.
- Instead of computer or data center, a client uses an internet connection to access the stored information on the cloud.



Introduction to Cloud Computing

Parts of Cloud Computing Architecture

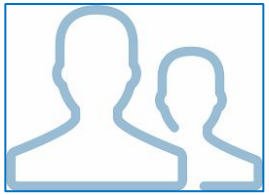


- The **Front-end** is the client part of cloud computing.
- User interface, applications and cloud computing platforms.
- Example: AWS Management Console

- The **Back-end** is managed by the host.
- It consists of virtual machines, data storage, security system, etc.
- Responsible for security mechanisms, traffic control, etc.
- Example: AWS Data Center

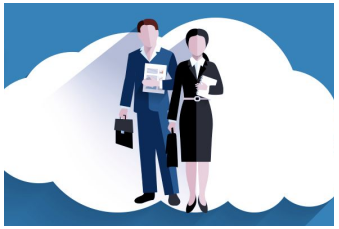
Introduction to Cloud Computing

Roles of Cloud Computing



Cloud Consumer

Cloud Provider



Cloud Broker

Cloud Auditor

Cloud Carrier

- A **Cloud Consumer** is an user of cloud products and services.
- The purveyor of products and services is the **Cloud Provider**.
- The **Cloud Broker** connects consumers to appropriate cloud providers.
- The **Cloud Auditor** conducts independent performance and security monitoring.
- The **Cloud Carrier** is the interconnect between datacenters and aggregated WANs.

Introduction to Cloud Computing

Popular Cloud Computing App.

- Cloud usage is now spreading rapidly around the world.

- Examples of companies using cloud computing :
  - Google Drive,
  - Netflix,
  - Apple iCloud,
  - Dropbox,
  - Microsoft Office Online.

iCloud

What is Cloud Computing?

Cloud Computing vs. Cloud Storage

Cloud Storage

Cloud Computing

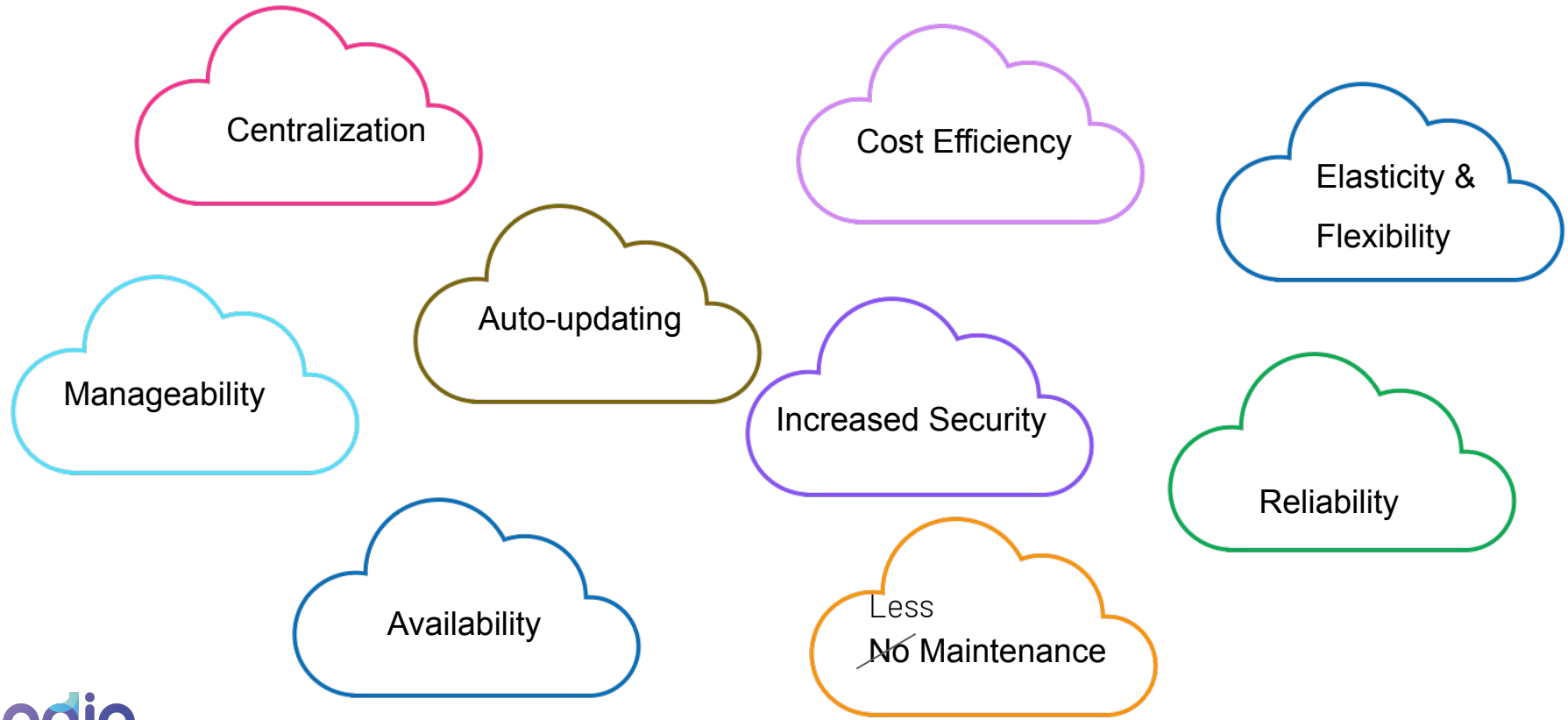
Cloud

Introduction to Cloud Computing

Cloud Computing Leveraging Endustries

Introduction to Cloud Computing

Features of the Cloud Technology



Introduction to Cloud Computing

Advantages of the Cloud Technology

- Increases the **value of the work (cloud native, cloud agnostic,)**

Introduction to Cloud Computing

Disadvantages of the Cloud Technology

- Internet Dependency
- Loss of Control
- Lack of Support

Why Cloud Computing?

Why Cloud Computing?

Zeitgeist (The spirit of the time)

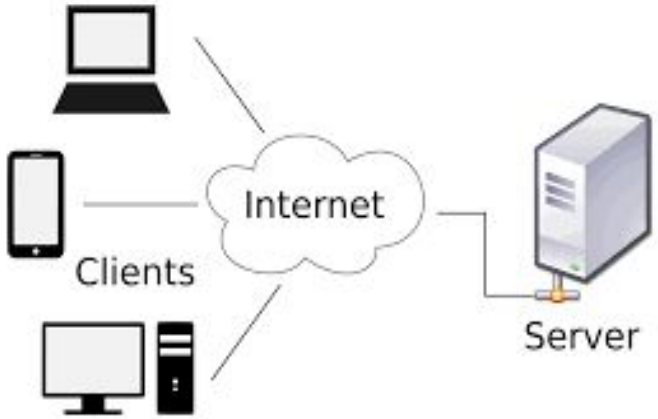
New Concepts

- Virtualization
- Containerization Technology
- Software Development Cycle
- Serverless

Virtualization

Virtualization

Server and Client



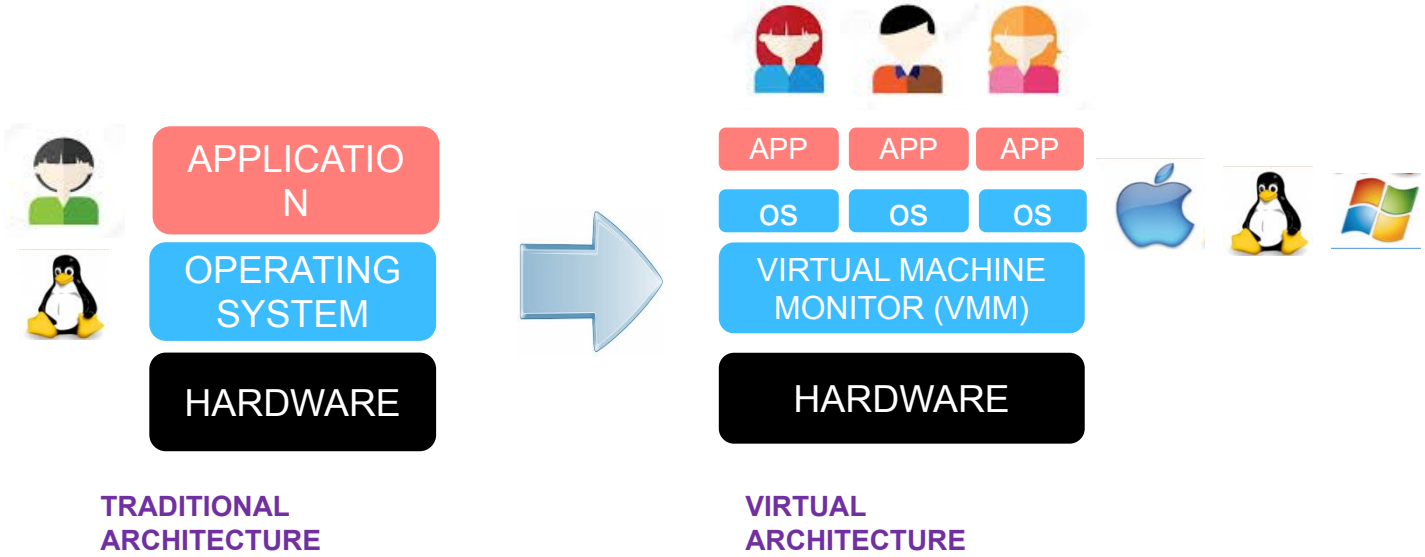
Maslow Hierarchy of Needs

- A server is a connection point for several clients, that will handle their requests.

- A client is software that (usually) connects to the server to perform actions. The client provide a user interface that allows users to carry out actions. It forwards these requests to the server, which carries out the action and returns a response.

Virtualization

What is Virtualization?



- Virtualization refers to the operation of multiple operating systems called ha by sharing the same physical equipment resources.

- This will help the user to share a single physical resource instance or application with multiple users by providing multiple machines at the same time.

Virtualization

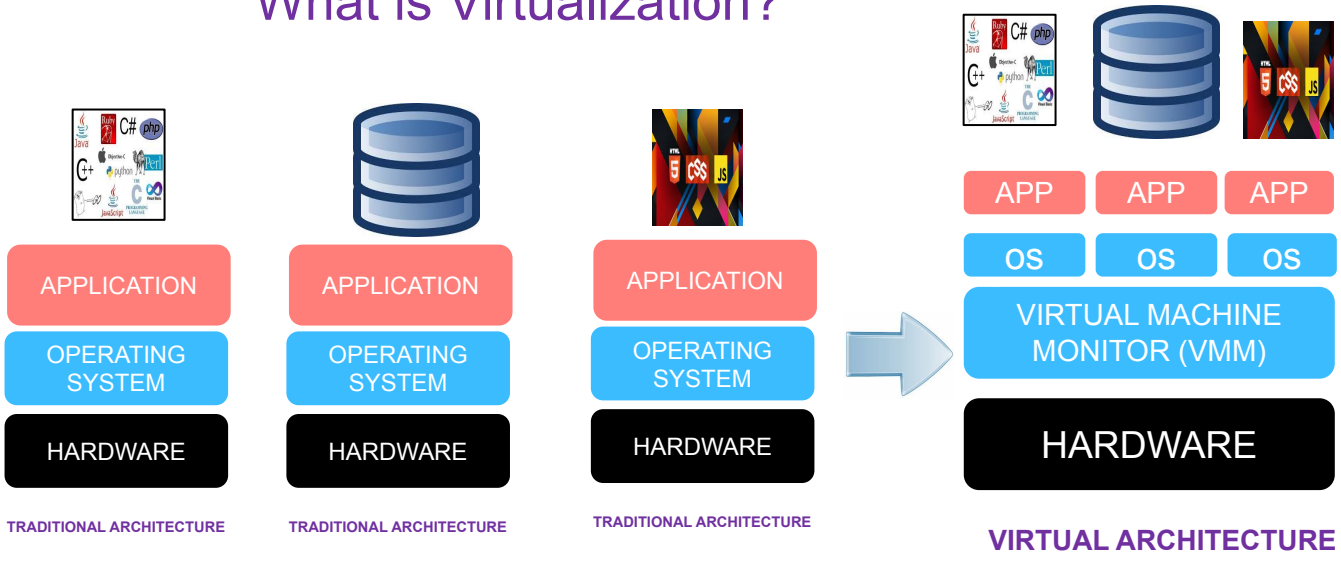
Server and Client

- Assume that you have web application, and at least you need three servers to keep application running; Front-end , Back-end and Database

- But the necessity to install these servers on separate machines creates an idle capacity for you.

Virtualization

What is Virtualization?

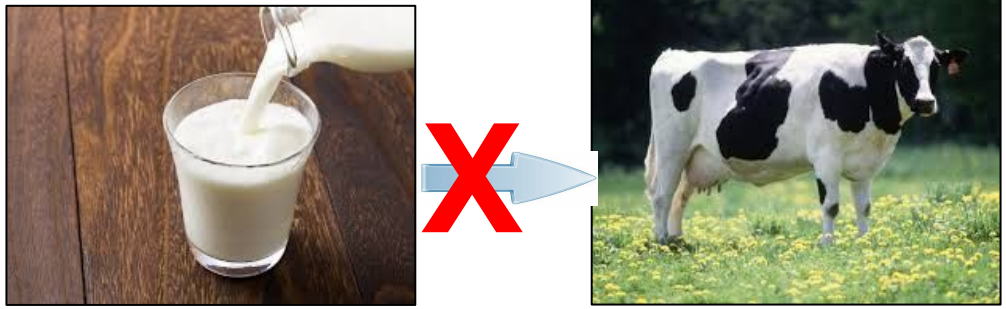


App	: 3	App : 3
Hardware	: 3	Hardware : 1
O/S	: 3	O/S : 3

Virtualization

Why Virtualization?

ANALOGY



“If you only need milk, would you buy a cow?”

SCALE OUT - SCALE IN

Virtualization

Type of Virtualization?

Software Virtualization

Server Virtualization

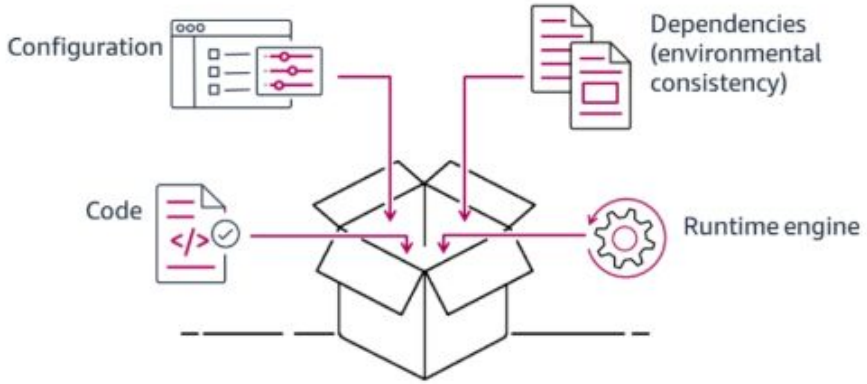
Storage Virtualization

O/S Virtualization

Containerization Technology

Containerization Technology

What is container?

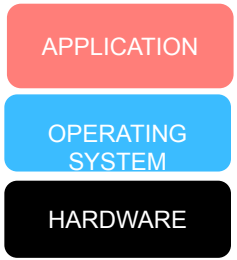


Container technology, also simply known as just a container, is a method to package an application so it can be run, with its dependencies, isolated from other processes.

The major public cloud computing providers, including Amazon Web Services, Microsoft Azure and Google Cloud Platform have embraced container technology.

Containerization Technology

Containerization

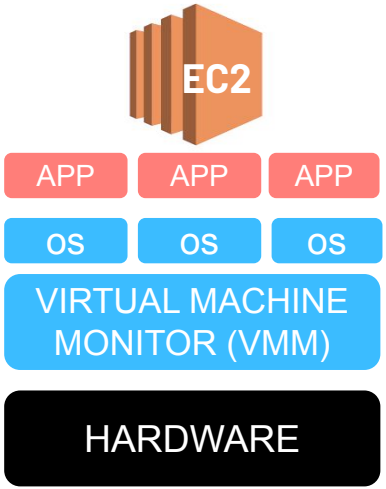


TRADITIONAL ARCHITECTURE

App : 3

Hardware : 3

O/S : 3

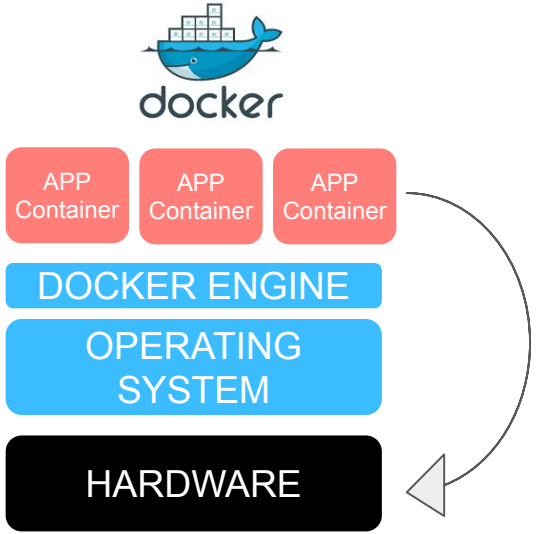


VIRTUAL ARCHITECTURE

App : 3

Hardware : 1

O/S : 3



CONTAINERIZATION ARCHITECTURE

App Container : 3

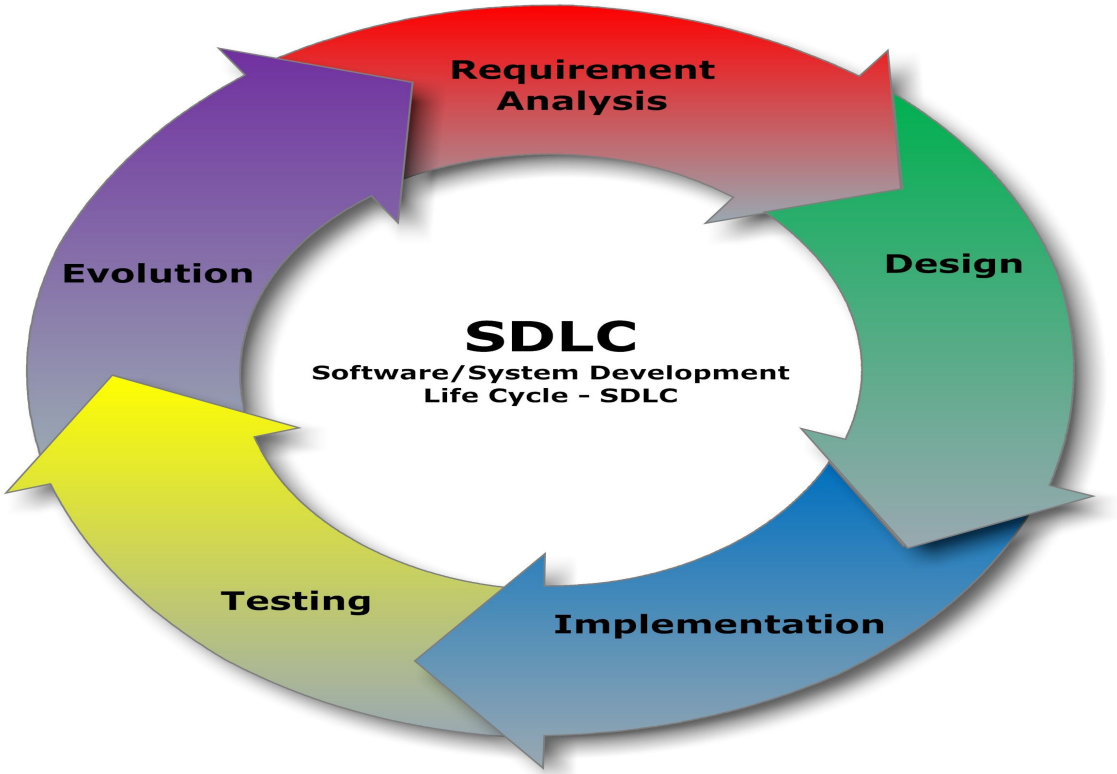
Hardware : 1

O/S : 1

Software Development Life Cycle

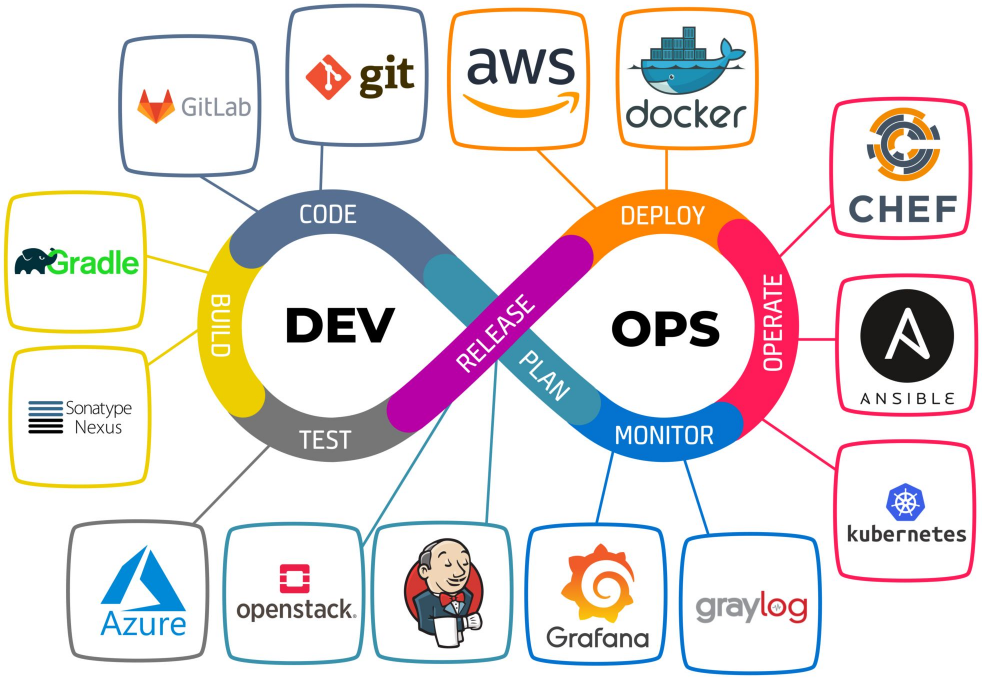
Software Development Cycle

What is SDLC?



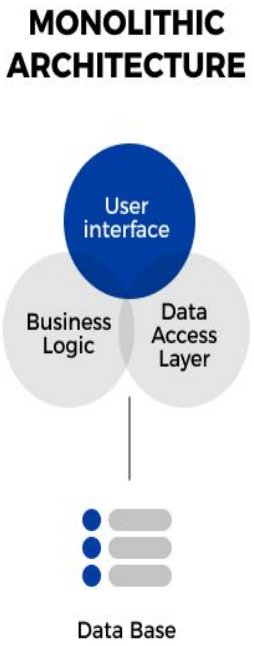
Software Development Cycle

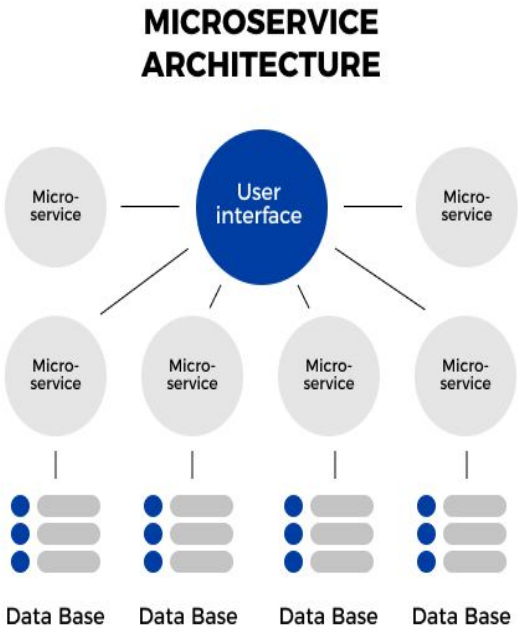
DevOps

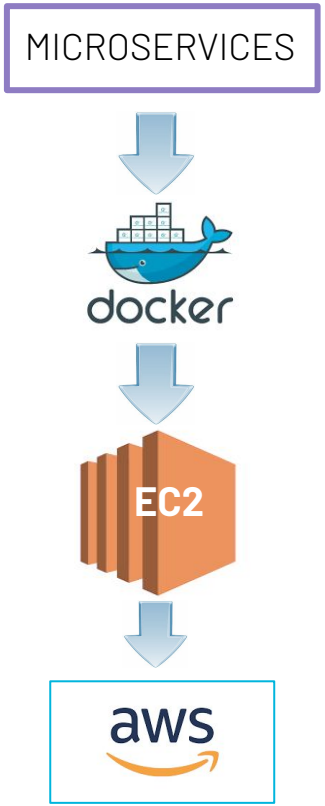


Software Development Cycle

Software Development Architectures



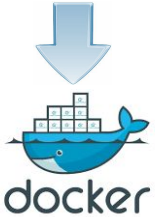




Software Development Cycle

Software Development Architectures

MICROSERVICES

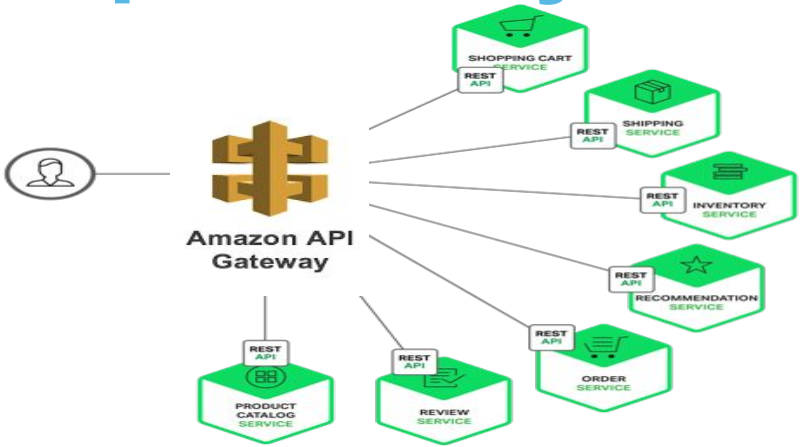


Software Development Cycle

API Gateway

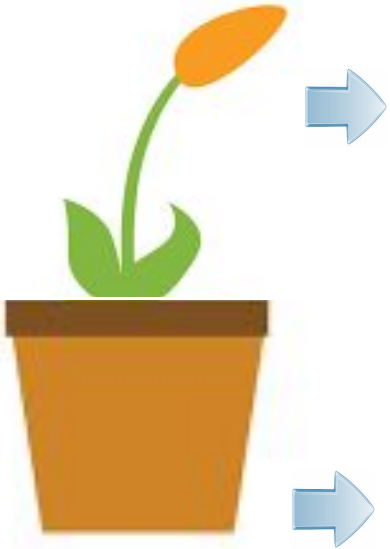
API stands for Application Programming Interface. An API is a software that allows two applications to talk to each other.

An API gateway is an API management solution acting as the single entryway into a system for all API.



Serverless

Serverless



Soilless Agriculture = Serverless

Serverless

Why Build Serverless Application?

Benefit from a fully managed service

Scale flexibly

Only pay for resources you use

Enhance developer productivity

Seamless Connections

Develop Intelligent Apps

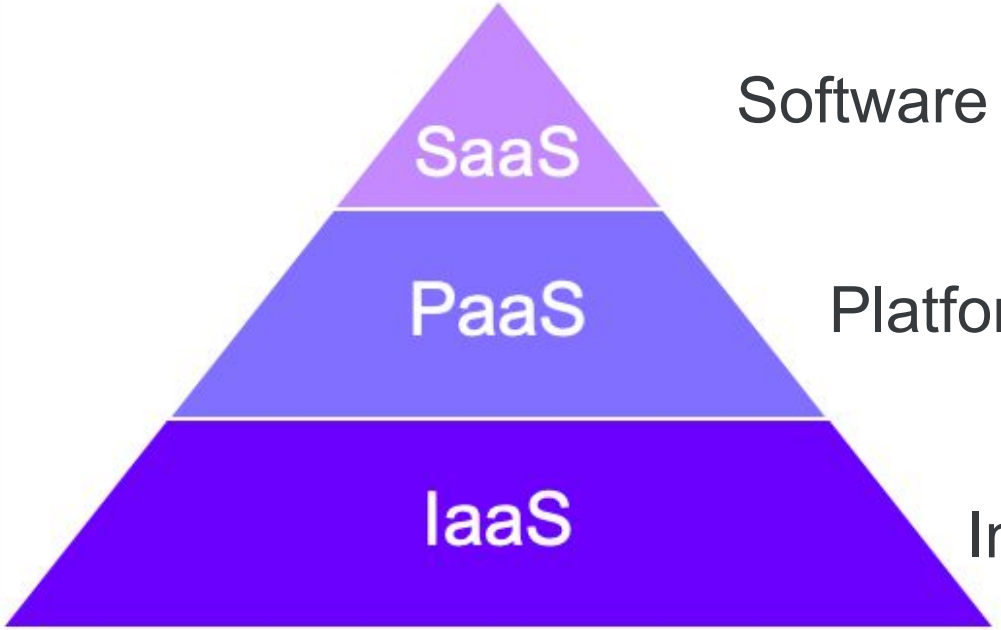
Why Cloud Computing?

- Increases the value of the work
- Zeitgeist (The spirit of the time)
- Cost reduction (pay as you go -source optimization)
- Scalability need
- Virtualization
- Containerization Technology
- Software Development Cycle
- From Monolithic to Microservices
- Serverless

Service Models

Service Models

Cloud Service Models



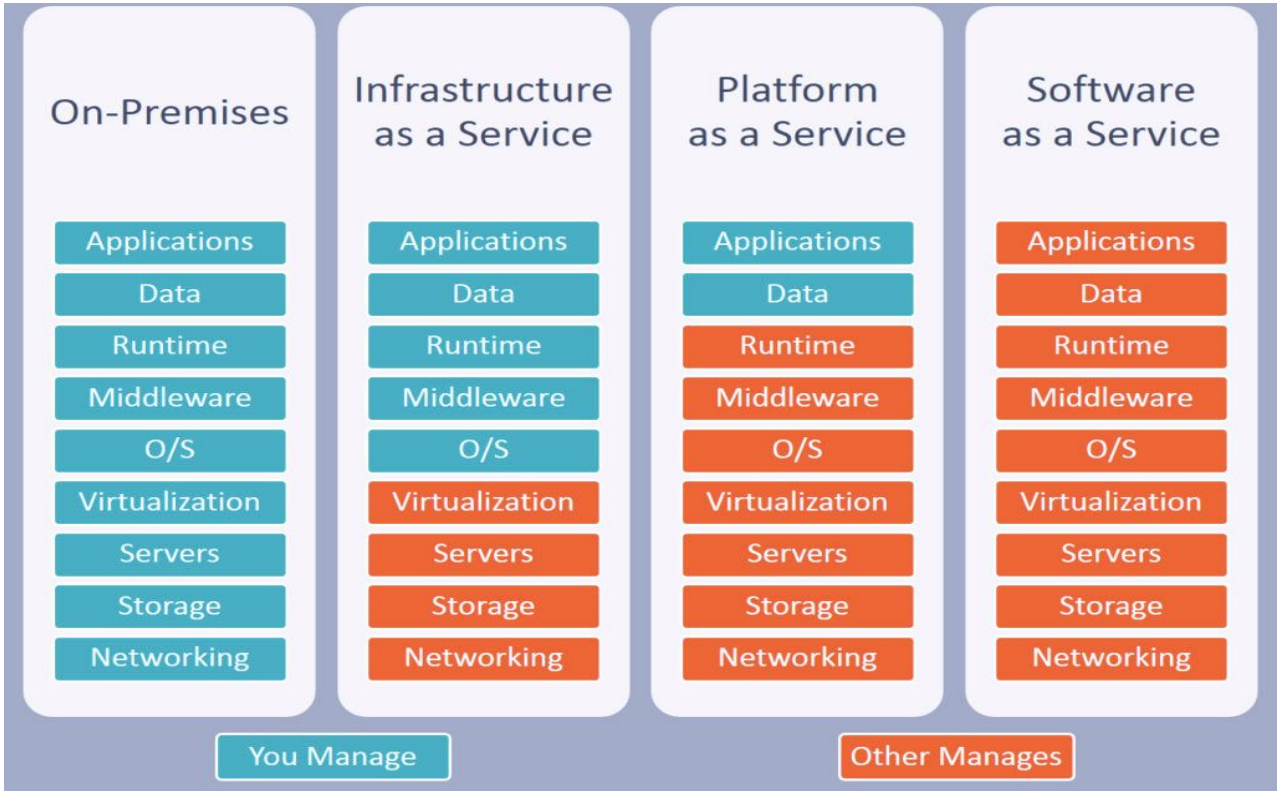
Software as a Service

Platform as a Service

Infrastructure as a Services

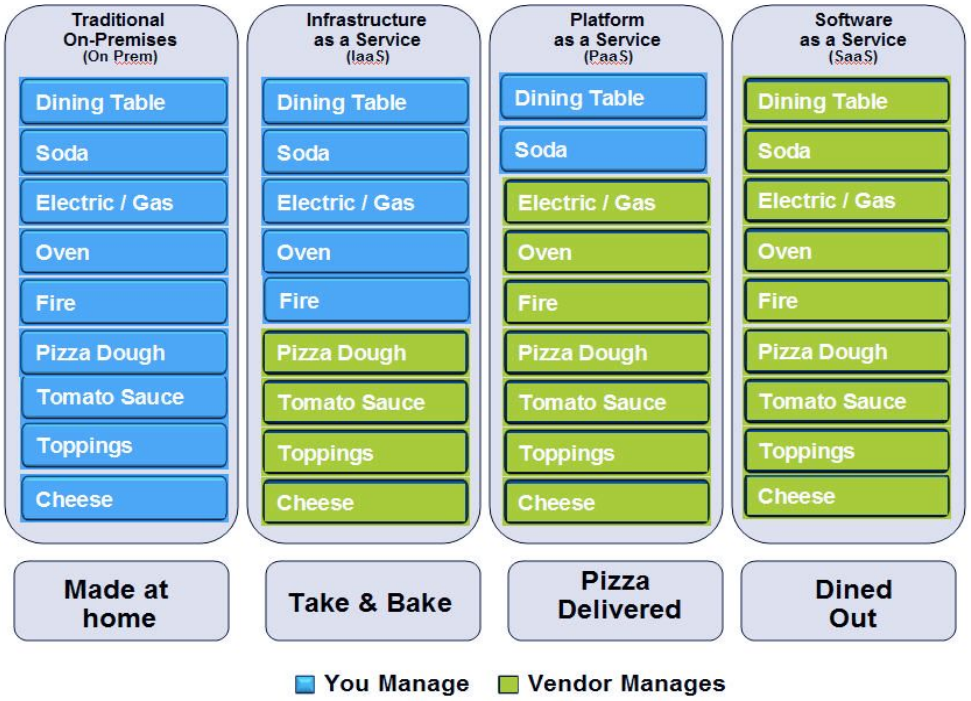
Service Models

Cloud Service Models



Service Models

Pizza Analogy for Service Model Comparison



- **On-Premise Model**; You take **all** the ingredients-Make it yourself
- **IaaS Model**; You buy **some** ingredients- Make it yourself
- **Paas Model**; Order pizza delivered
- **Saas Model**; Go to the pizzeria.

Deployment Models

Deployment Models

Cloud Deployment Models

Deployment Models

Public Cloud

- Public Cloud is the name of the information service used for platforms that transfer data to all individuals or organizations with internet access.
- Public Clouds are owned and operated by cloud service providers.
- Amazon EC2, Google AppEngine, Windows Azure Services Platform, IBM Blue Cloud

Deployment Models

Private Cloud

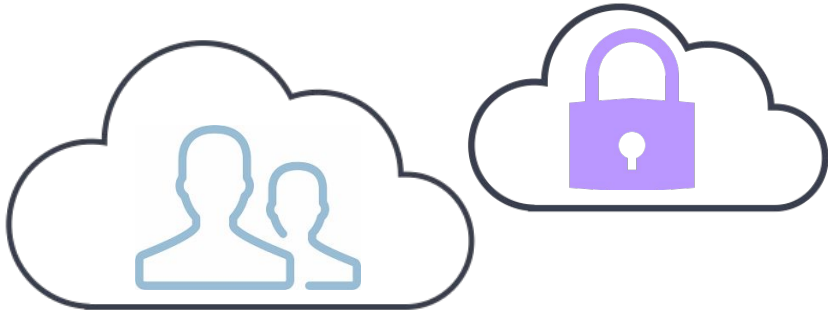
- It means using or creating a cloud infrastructure that is dedicated to only a specific customer/organization.

- The key differences between private and public clouds;

  - Not publicly accessible
  - Private Clouds are owned and operated by your IT team.

Deployment Models

Hybrid clouds



- Hybrid clouds use both private and public clouds, depending on their purpose.
- Hybrid clouds are Integrated environments of public and private infrastructure.
- For example, You can use a Public Cloud to interact with customers while retaining secure data via a Private Cloud.

Deployment Models

Community Cloud

- Community clouds are shared platforms, usually with shared data and data management considerations, between organizations.
- If multiple/sister companies share use of cloud technology, it is called Community Cloud
- A community cloud, for example, may belong to a single government and can be used by different departments of that government.

THANKS!

Any questions?