CE644

CLOUD COMPUTING AND APPLICATIONS

Cloud Computing History

ARPANET
—
by J.C.R. Licklider

Cloud Computing
—
is defined by Prof.
Ramnath Chellappa

Amazon
—
launches Elastic
Compute cloud (EC2)
Simple Storage
Service (S3)

1950s   **1969**   **1970**   **1997**   **1999**   **2006**   **2020**

John McCarthy
—
introduces mainframe
timesharing

Virtualisation
software launched

salesforce

$266 billion
estimated global
public **cloud**
service market

Why Cloud Computing?

Why Cloud Computing?

On-premise vs Cloud Computing

ON-PREMISE

CLOUD COMPUTING

- Higher pay, less scalability

- Allot huge space for servers

- Appoint a team for hardware and software maintenance
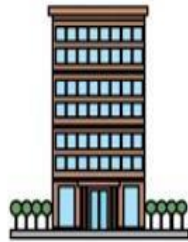
- Poor data security

- Less chance of data recovery

- Pay for what you use

  Scale up= pay more
  Scale down= pay less

- No server space required

- No experts required for hardware and software maintenance

- Better data security

- Disaster recovery

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Why Cloud Computing?

On-premise vs Cloud Computing

ON-PREMISE

- Lack of flexibility

- No automatic updates

- Less collaboration

- Data cannot be accessed remotely

- Takes longer implementation time

CLOUD COMPUTING

- High Flexibility

- Automatic software updates

- Teams can collaborate from widespread locations

- Data can be accessed and shared anywhere over the internet

- Rapid implementation

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What is Cloud Computing?

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What is Cloud Computing?

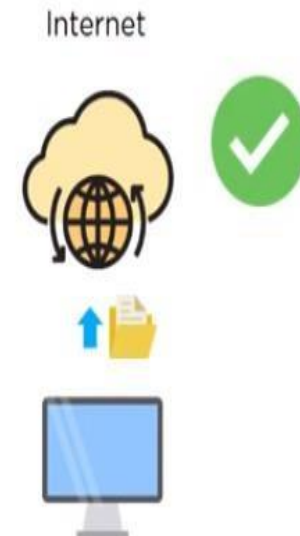Cloud computing is the delivery of on-demand computing services over the internet on a pay-as-you-go basis

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What is Cloud Computing?

Rather than managing files on a local storage device, cloud computing makes it possible to save them over internet

Internet

Storage device

Save files

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Types of Cloud Computing

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Types of Cloud Computing

CLOUD COMPUTING

DEPLOYMENT MODEL

SERVICE MODEL

Public Cloud

Hybrid Cloud

Private Cloud

WWW

IaaS

PaaS

SaaS
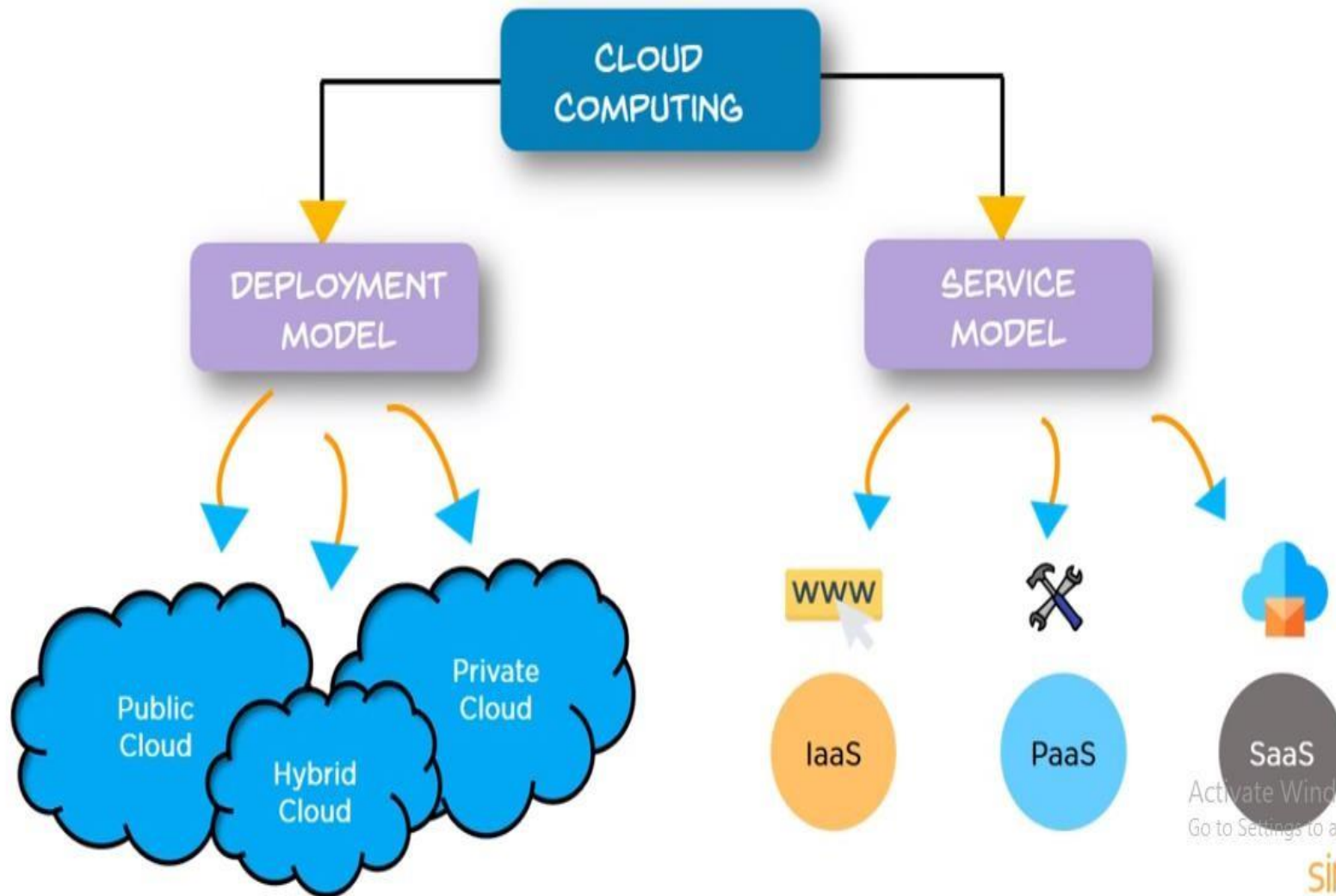
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Deployment Model

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Types of Deployment Models

PUBLIC CLOUD	PRIVATE CLOUD	HYBRID CLOUD
BUS	OWN CAR	TAXI
Accessible to everyone	Owned by a single person	Rent a private taxi

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Public Cloud
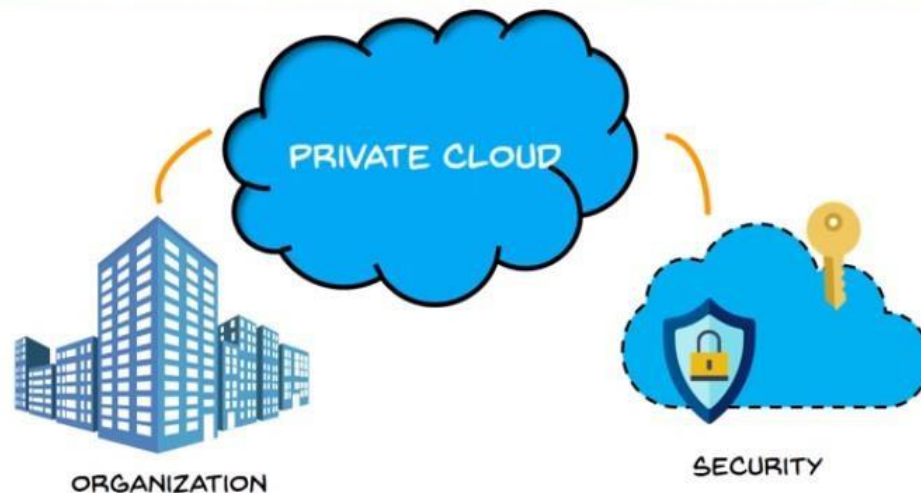

SHARABLE STORAGE
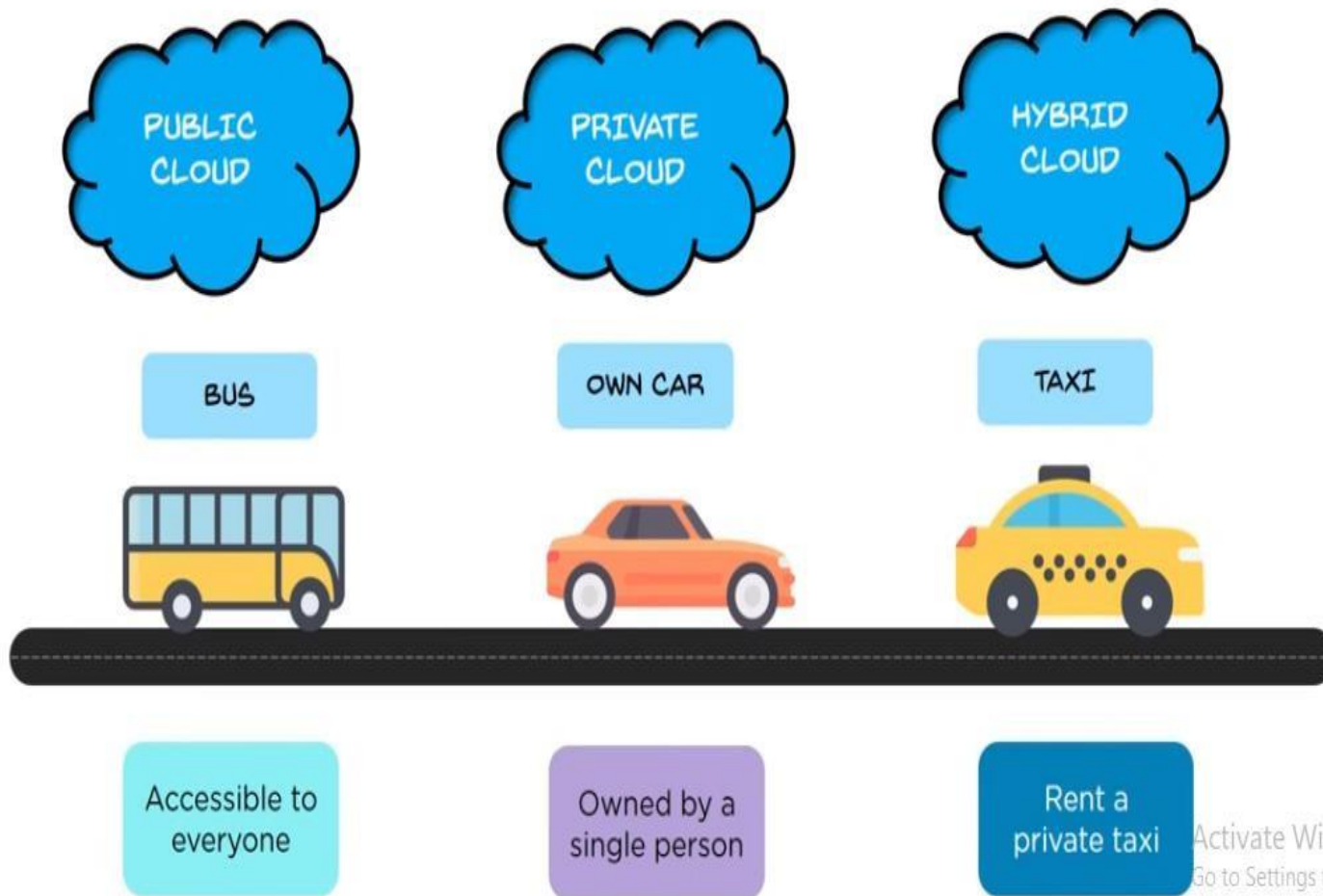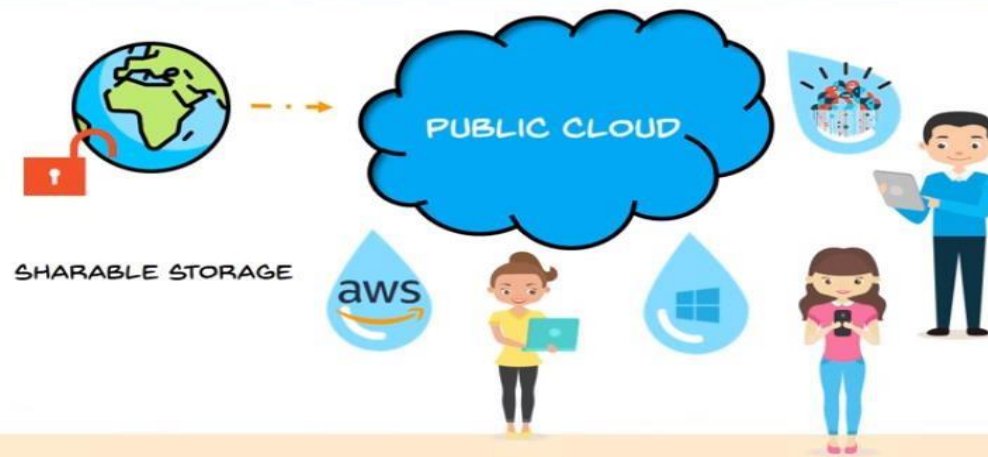
PUBLIC CLOUD

The cloud infrastructure is made available to the general public over the internet and is owned by a cloud provider

Example: AWS, Microsoft Azure, IBM's Blue Cloud and Sun Cloud
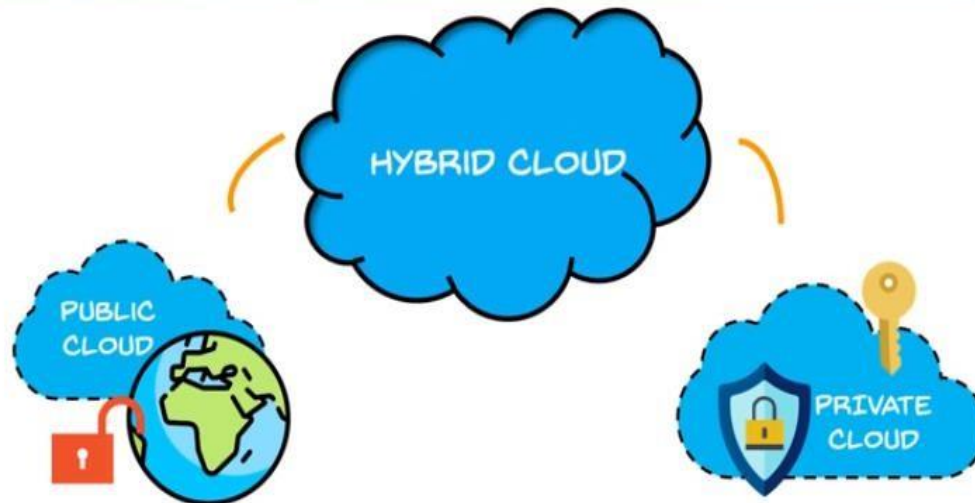
Private Cloud

The cloud infrastructure is exclusively operated by a single organization. It can be managed by the organization or a third party and may exist on-premise or off-premise

Example: AWS, VMware

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Hybrid Cloud

It consists the functionalities of both public and private cloud

For example:
Federal agencies opt for private clouds when sensitive information is involved
Also, they use the public cloud to share datasets with general public or other
government departments

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Service Model

Types of Service Models

Which cloud service is suitable for you?

WWW

IAAS

If your business needs a virtual machine, opt for Infrastructure as a Service

PAAS

If your company requires a platform for building software products, pick Platform as a Service

SAAS

If your business doesn't want to maintain any IT equipment, then choose Software as a Service

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IaaS

IAAS PRODUCTS AND SERVICES

IaaS

WWW

- ✓ IaaS is a cloud service that provides basic computing infrastructure

- ✓ Services are available on PAY-FOR-WHAT-YOU-USE model

- ✓ IaaS providers include Amazon Web Services, Microsoft Azure and Google Compute Engine

- ✓ Users: IT Administrators

amazon web services™ EC2

Microsoft Azure

GOGRID

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PaaS

PaaS

✓ PaaS provides cloud platforms and runtime environments for developing, testing, and managing applications

✓ It allows software developers to deploy applications without requiring all the related infrastructure

✓ Users: Software Developers

amazon web services EBS

Google app engine

Microsoft Azure

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SaaS

- In SaaS, cloud providers host and manage the software application on a pay-as-you-go pricing model

- All software and hardware are provided and managed by a vendor so you don't have to maintain anything

- Users: End Customers

SAAS PRODUCTS AND SERVICES

Office 365   Google Apps

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Differences between IaaS, PaaS and SaaS

On-Premises	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
O/S	O/S	O/S	O/S
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

Managed by you   Managed by Vendor

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Differences between IaaS, PaaS and SaaS

Example:

Consider a task where you are planning to bake a cake

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Differences between IaaS, PaaS and SaaS

On-Premises	IaaS	PaaS	SaaS
Made at Home	Buy & bake	Cake delivery	Dine out

On-Premises	IaaS	PaaS	SaaS
Dinning table	Dinning table	Dinning table	Dinning table
Water	Water	Water	Water
Electricity	Electricity	Electricity	Electricity
Oven	Oven	Oven	Oven
Cake Pan	Cake Pan	Cake Pan	Cake Pan
Flour	Flour	Flour	Flour
Sugar	Sugar	Sugar	Sugar
Butter	Butter	Butter	Butter
Eggs	Eggs	Eggs	Eggs

Managed by you   Managed by Vendor

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Cloud Providers

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Cloud Providers

Cloud Computing with AWS

Amazon Web Services (AWS) is a cloud service from Amazon

It provides services over the internet

AWS services can be used to create and deploy any type of application in the cloud

AWS uses the subscription pricing model (pay for what you use)

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