VANLANG UNIVERSITY

Introduction to Computer Networks and Cloud Computing

# Overview of Cloud Computing

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2. History and Evolution
3. Key Considerations
4. Key Cloud Service Providers and Their Services
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# Definition and Characteristics

# Definition of Cloud Computing

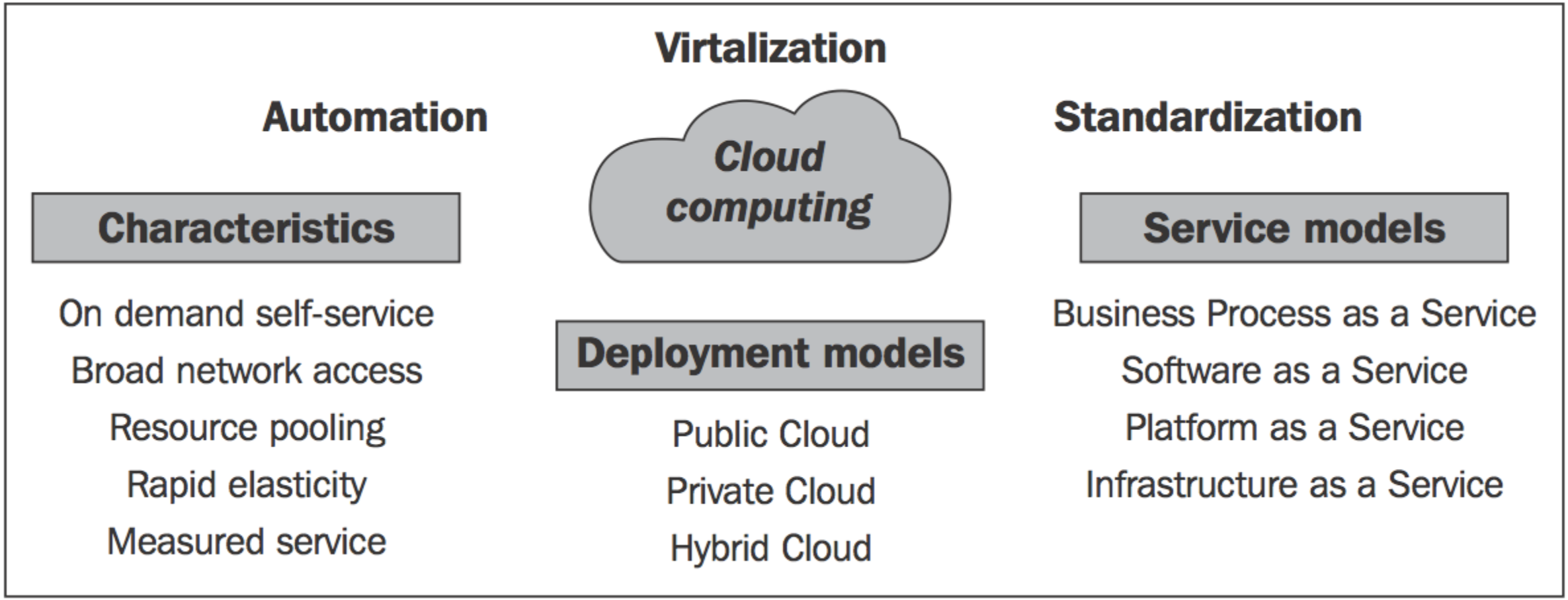
- "The cloud," is the delivery of on-demand **computing resources**—everything from applications to data centers—over the internet on a **pay-for-use** basis.

# Definition of Cloud Computing

According to NIST (The US National Institute of Standards and Technology)

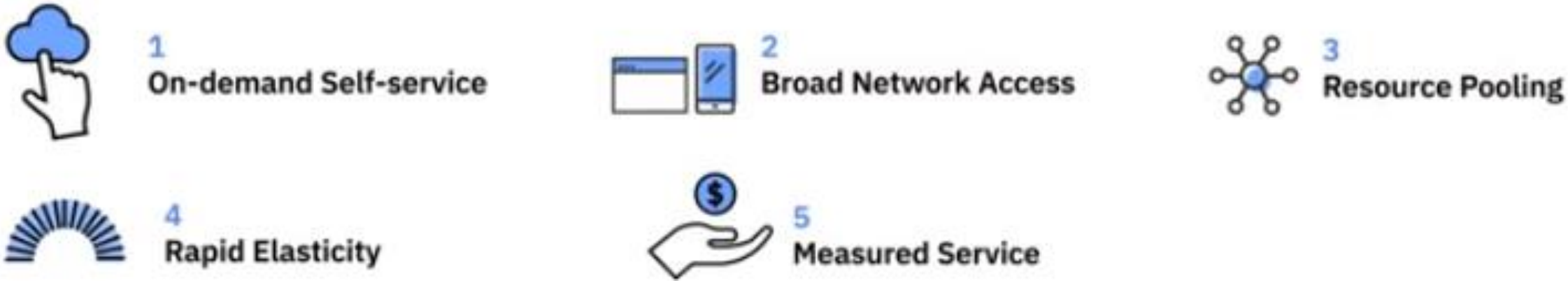
- A **model** for enabling convenient, on-demand network **access** to a **shared** pool of configurable **computing resources** that can be rapidly provisioned and released with **minimal** management effort or service provider interaction.

# Characteristics and Models

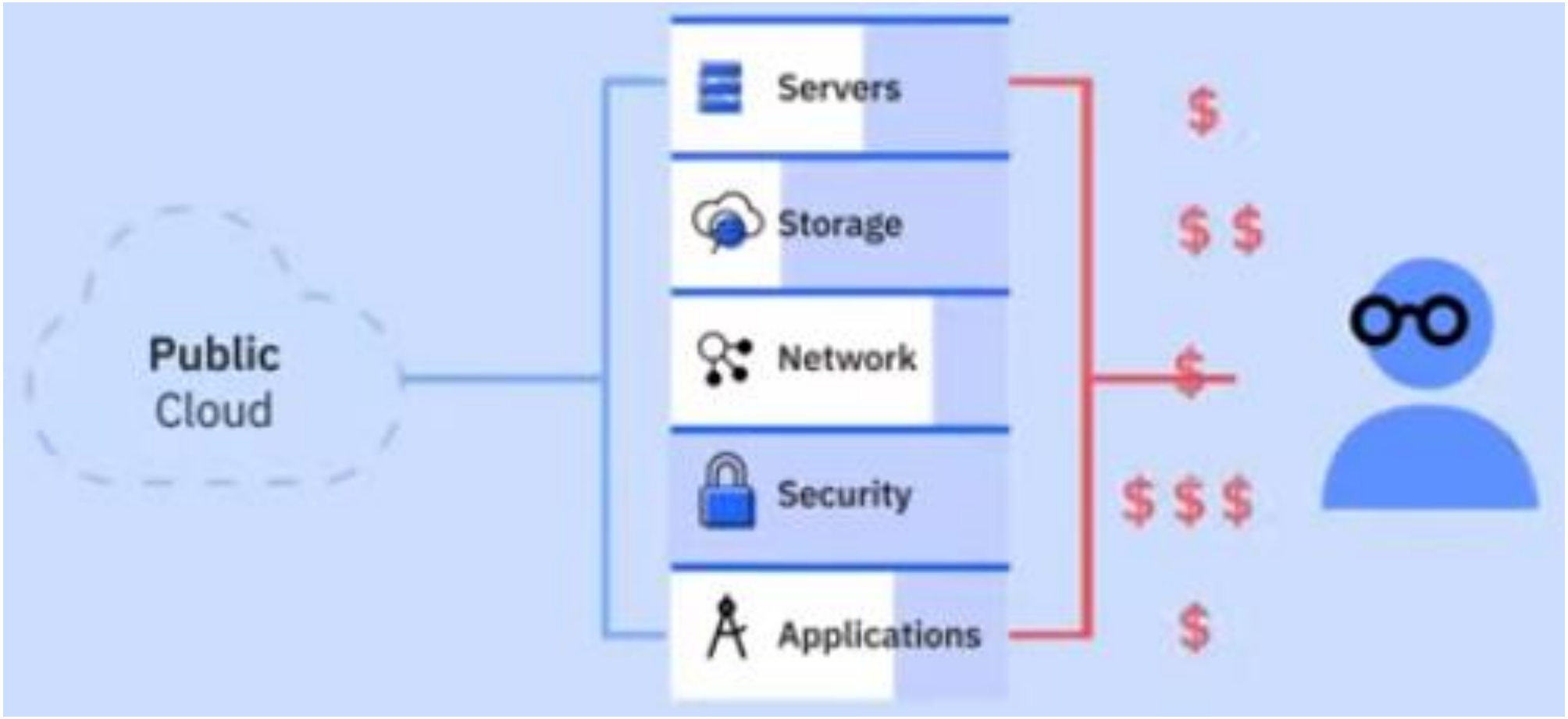


# Characteristics

- Five essential characteristics.



# Cloud Computing as a Service (CaaS)



# Cloud Computing as a Service (CaaS)

# Deployment Models

1

## Public

leverage cloud services over the open internet on hardware owned by the cloud provider, but its usage is shared by other companies.

3

## Hybrid

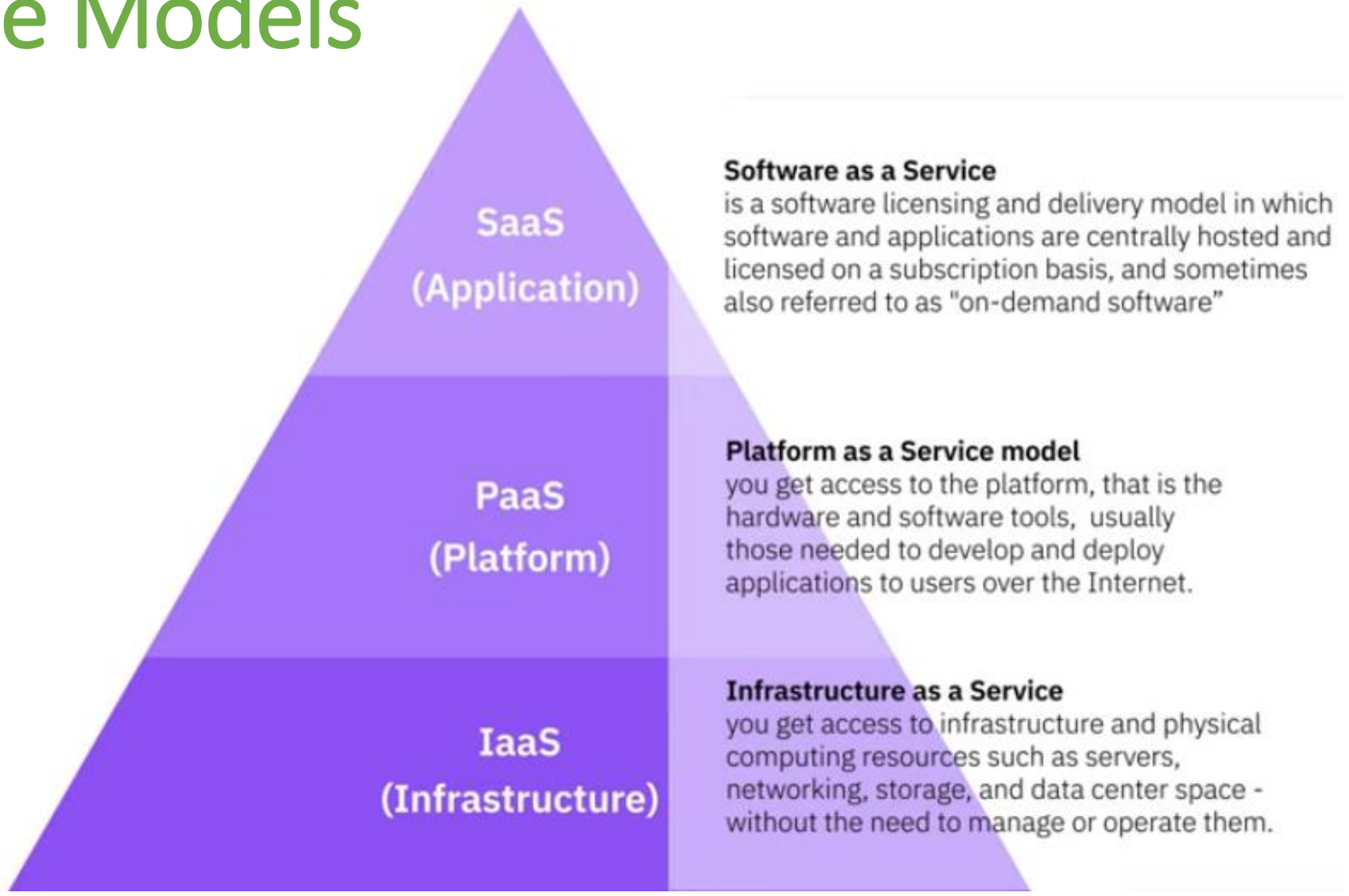
mix of both public and private clouds, working together seamlessly

2

## Private

the cloud infrastructure is provisioned for exclusive use by a single organization. It could run on-premises or it could be owned, managed, and operated by a service provider.

# Service Models



# History and Evolution

# Cloud Computing Evolution

1950s

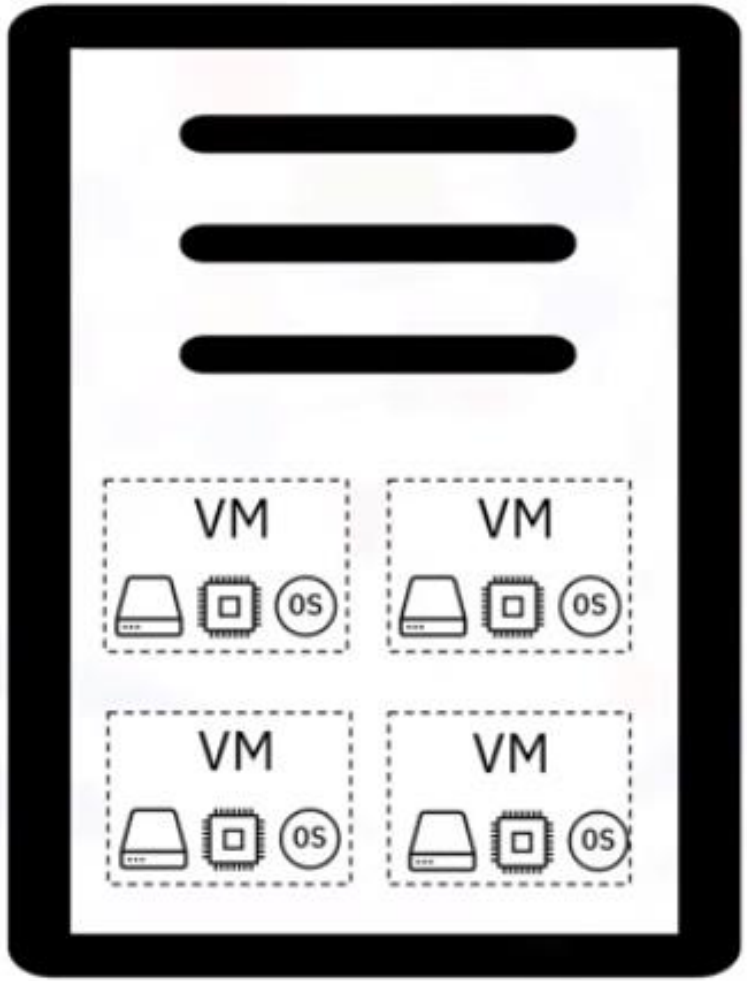
Large-scale mainframes with high-volume processing power.
The practice of time sharing, or resource pooling, evolved.
Multiple users were able to access the same data storage layer and CPU power.

1970s

Virtual Machine (VM).
Mainframes to have multiple virtual systems, or virtual machines, on a single physical node.

# Virtual Machines

VMs - multiple distinct compute environments to exist on the same physical hardware.




Each virtual machine hosted guest operating systems that behaved as though they had their own memory, CPU, and hard drives, even though these were shared resources.

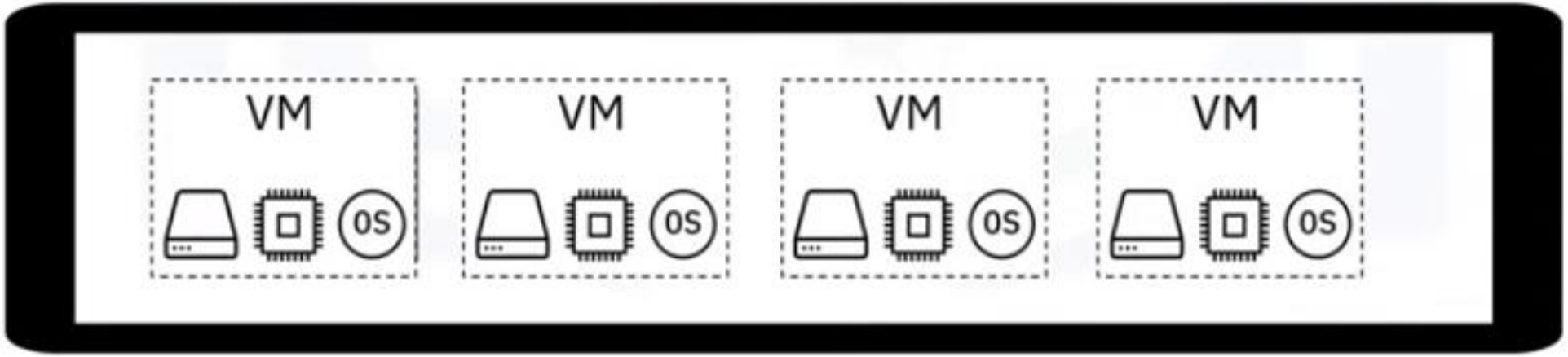
# Virtualization

A huge catalyst for evolutions in computing.

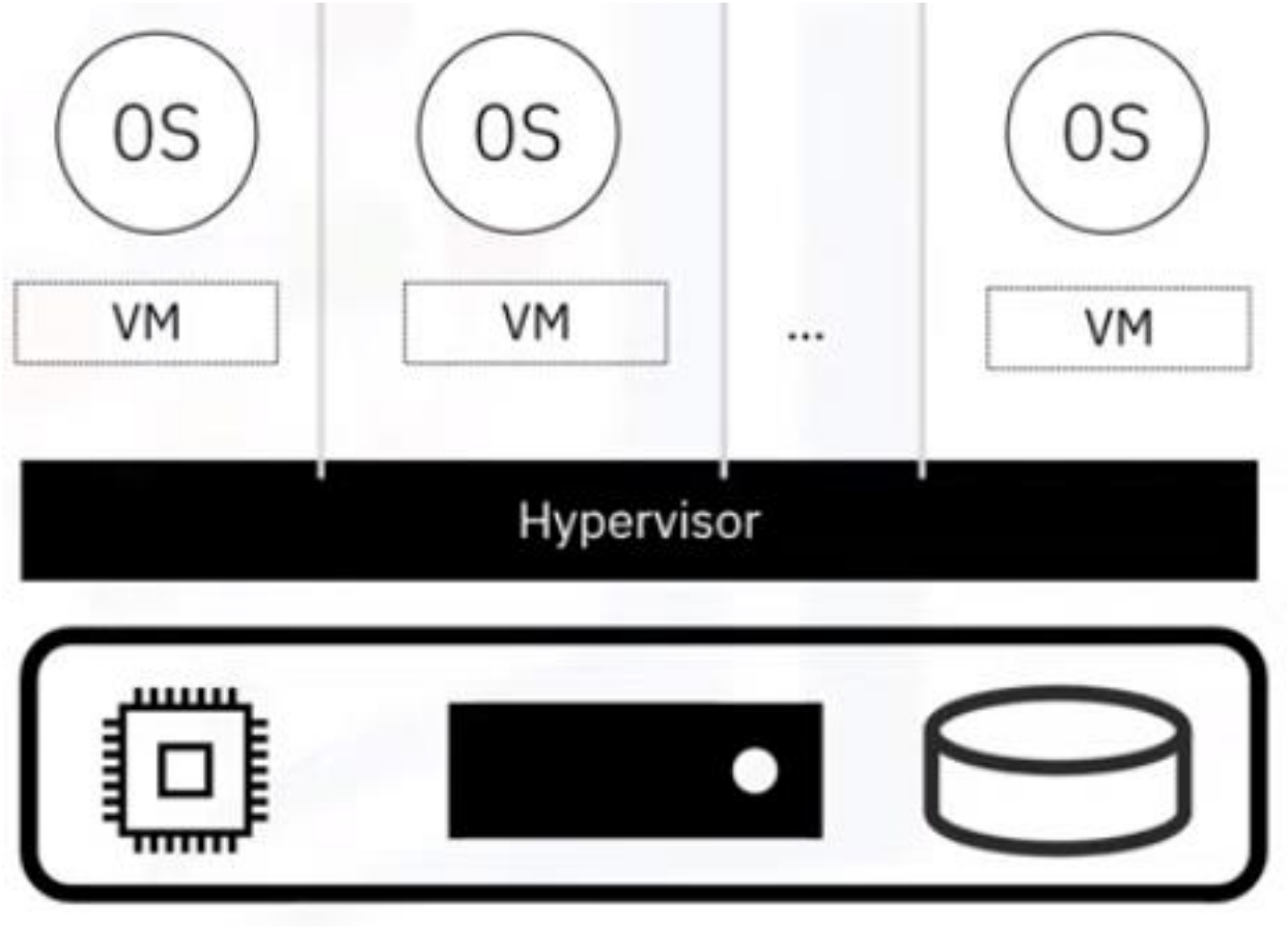
Shared hosting environments

Virtual private servers

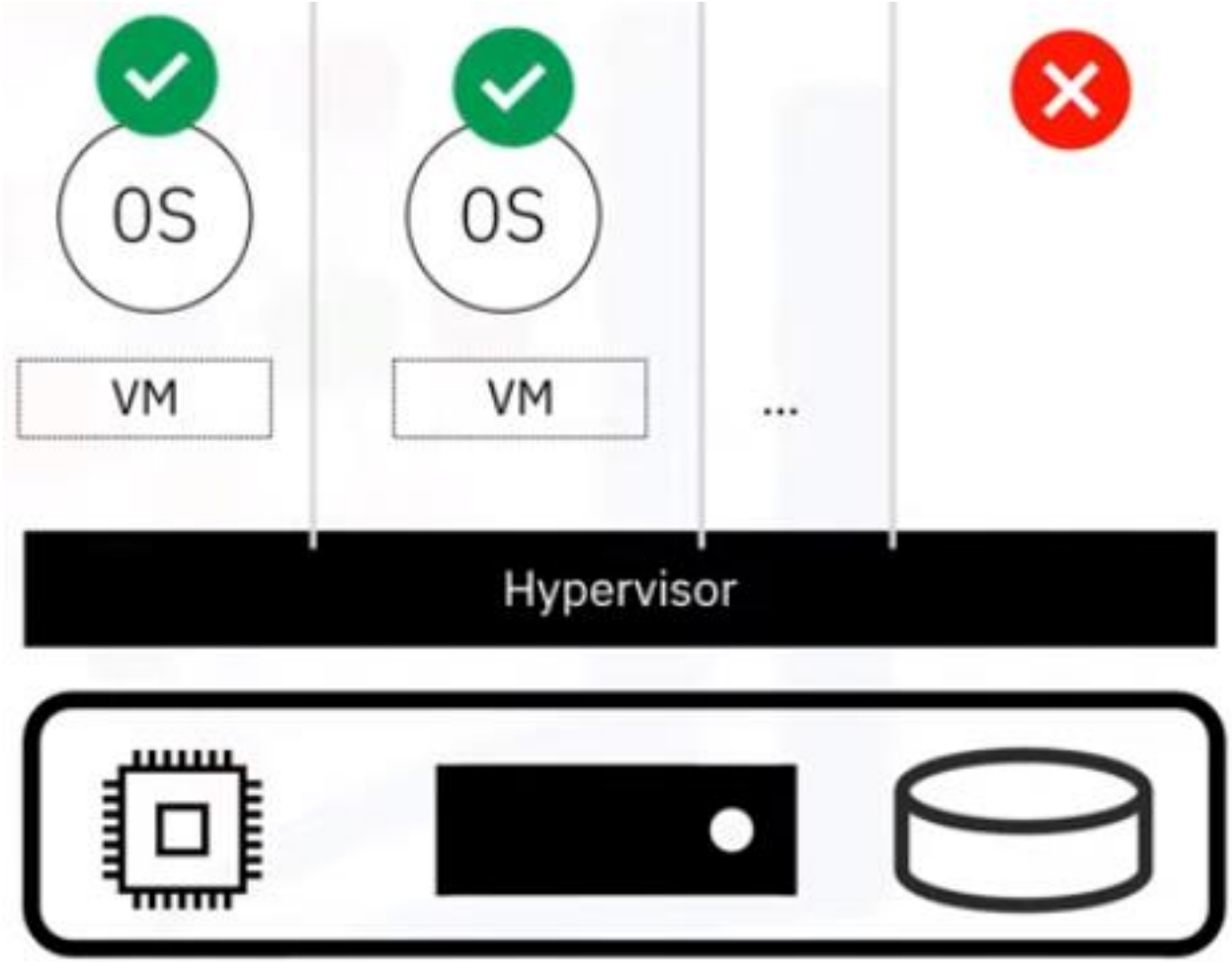
Virtual dedicated servers



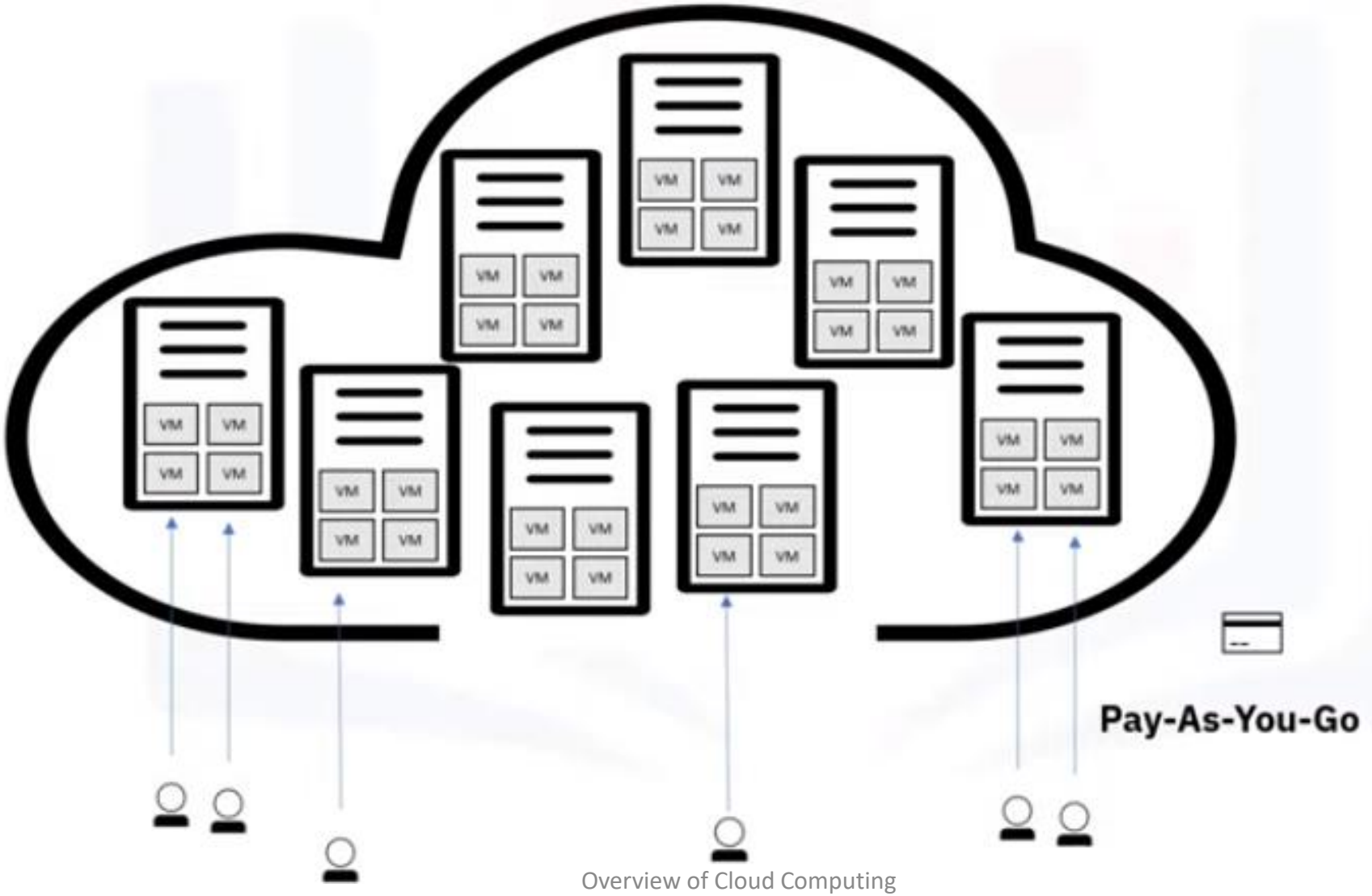
# Hypervisor



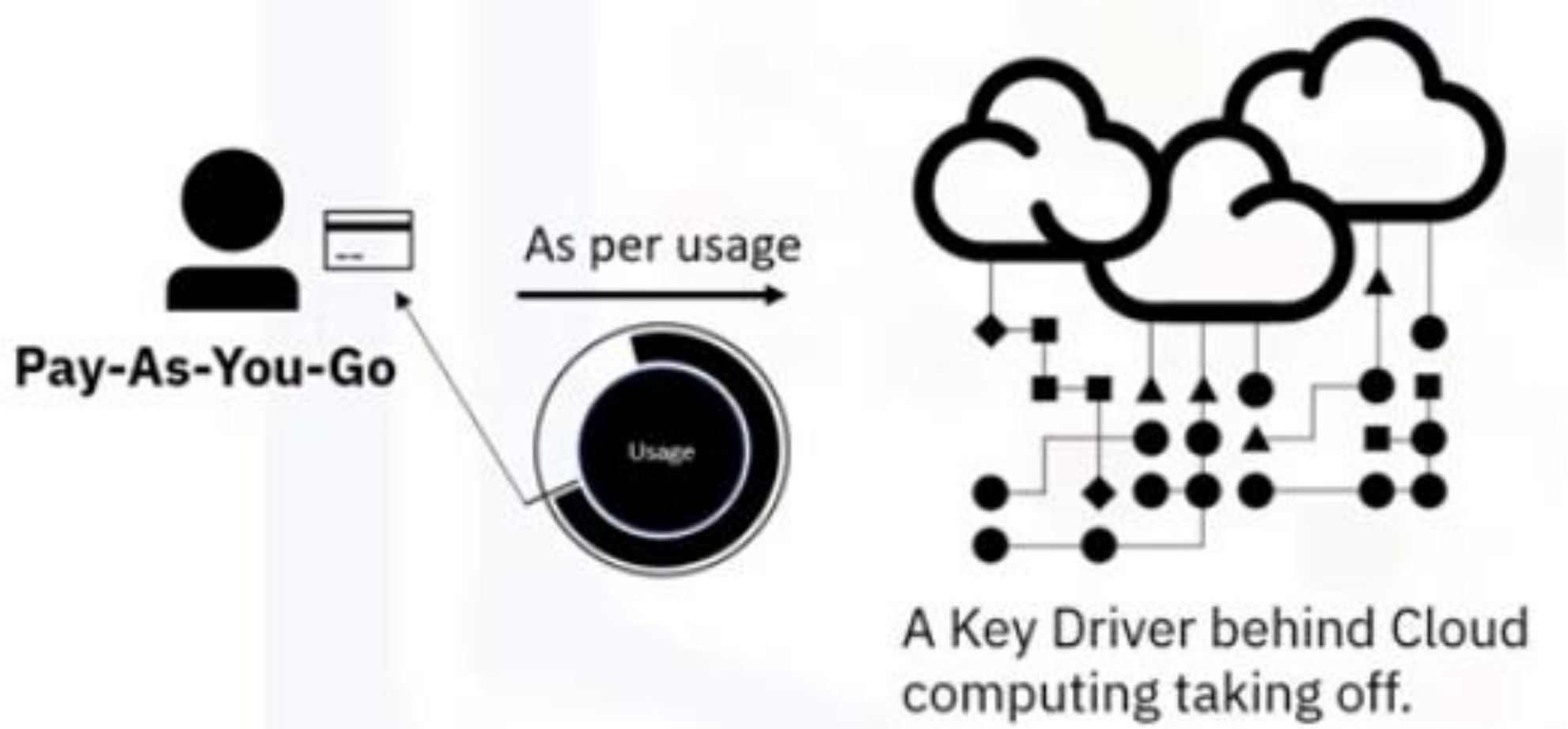
# Hypervisor



# Cloud Computing Is Born



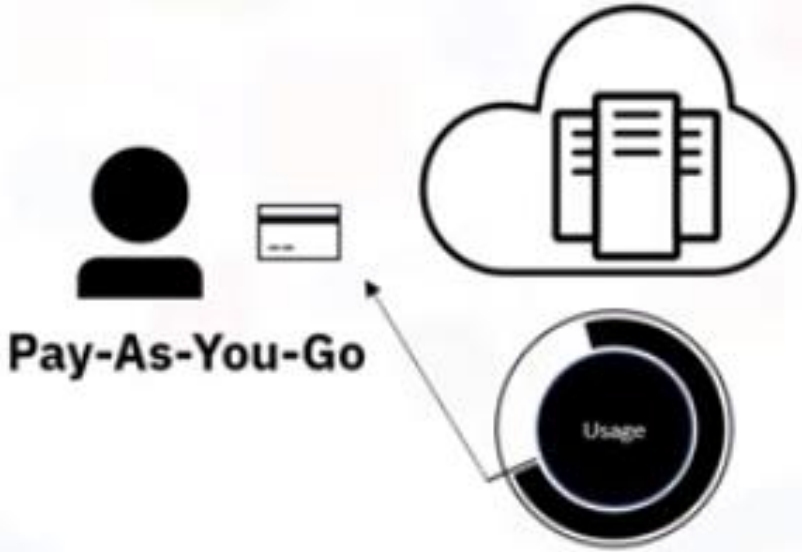
# Pay-As-You-Go


As per usage
Pay-As-You-Go
Usage
A Key Driver behind Cloud computing taking off.

# Cloud: Switch from CapEx to OpEx

**Capital Expense**
( High up-front costs )

**Operating Expense**
( No or low up-front costs )





Scale their workloads during usage peaks, and scale down when usage subsided

# Key Considerations

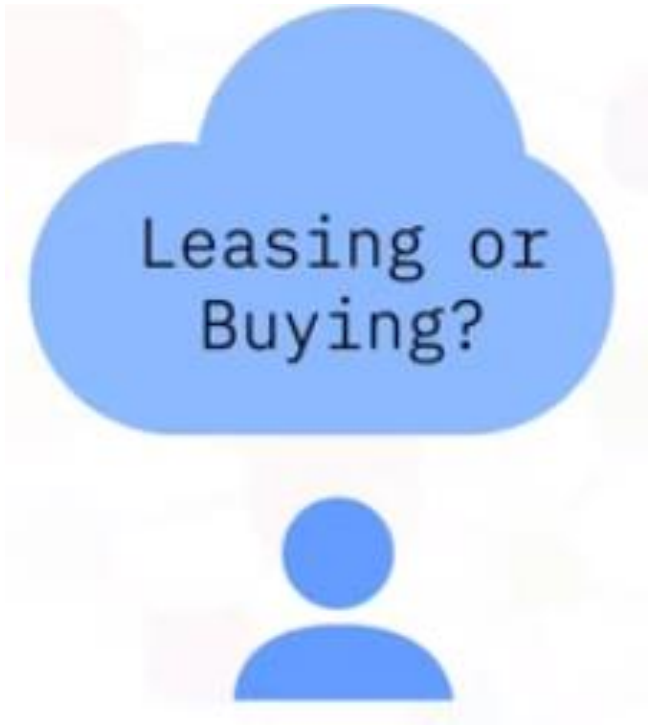
# Key Drivers For Moving To Cloud

# Infrastructure and Workloads

- The cost of building and operating data centers can become astronomical.

- Low initial costs and pay-as-you-go attributes of cloud computing can add up to significant cost savings.

# SaaS and Development Platforms



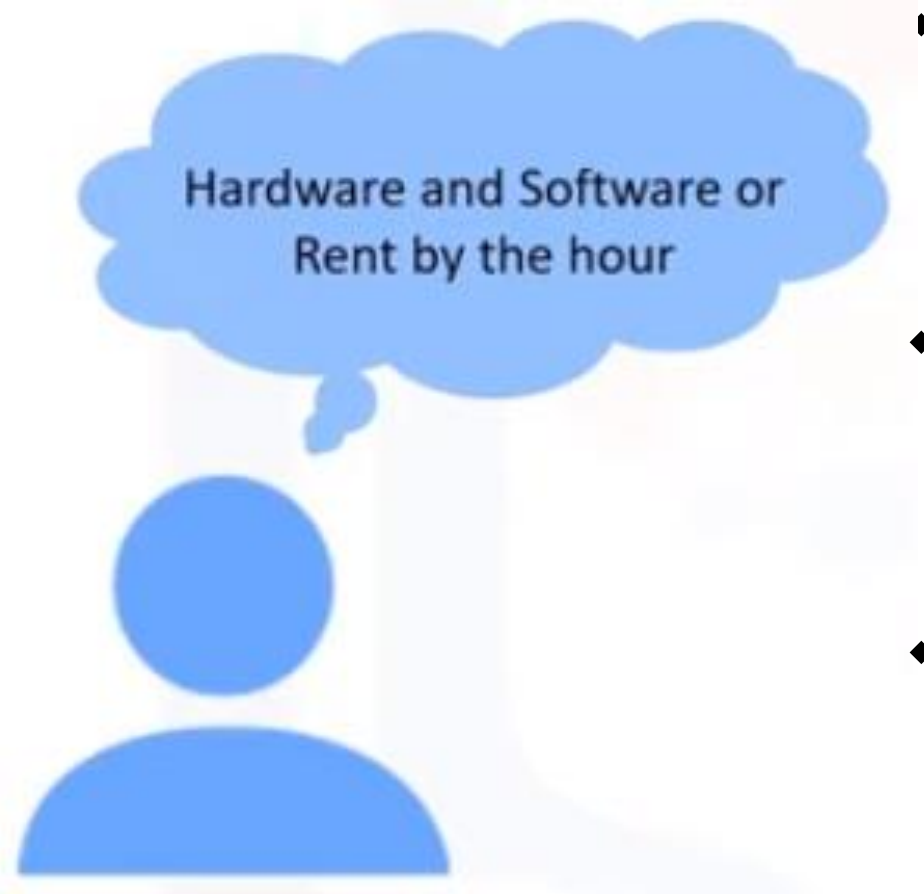

- Organizations need to consider if paying for application access is a more viable option than purchasing off-the-shelf software and subsequently investing in upgrades.

# Speed and Productivity

- Organizations also need to consider what it means for them to get a new application up and running in ‘x’ hours on the cloud versus a couple of weeks, even months on traditional platforms.

- Also, the person-hour cost efficiencies they gain from using cloud dashboards, real-time statistics, and active analytics.

# Risk Exposure




- Organizations need to consider the impact of making a wrong decision—their risk exposure.
- Is it safer for an organization to work on a 12-month plan to build, write, test, and release the code if they're uncertain about adoption?
- And is it better for them to "try" something new paying-as-you-go rather than making long-term decisions based on little or no trial or adoption?

# Benefits of Cloud Adoption

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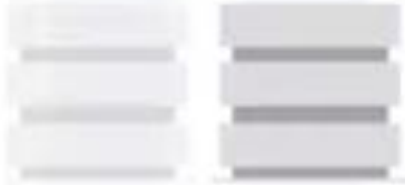
Efficiency

Enterprise users can get applications to market without worrying about underlying infrastructure costs or its maintenance

Cloud-based applications and data are accessible from virtually any internet-connected device



Hardware failures do not result in data loss because of networked backups

# Benefits of Cloud Adoption

Strategic Value

# Challenges of Cloud Adoption

- Data security, associated with loss or unavailability of data causing business disruption
- Governance and sovereignty issues
- Legal, regulatory, and compliance issues
- Lack of standardization in how the constantly evolving technologies integrate and interoperate
- Choosing the right deployment and service models to serve specific needs
- Partnering with the right cloud service providers
- Concerns related to business continuity and disaster recovery.

# Key Cloud Service Providers and Their Services

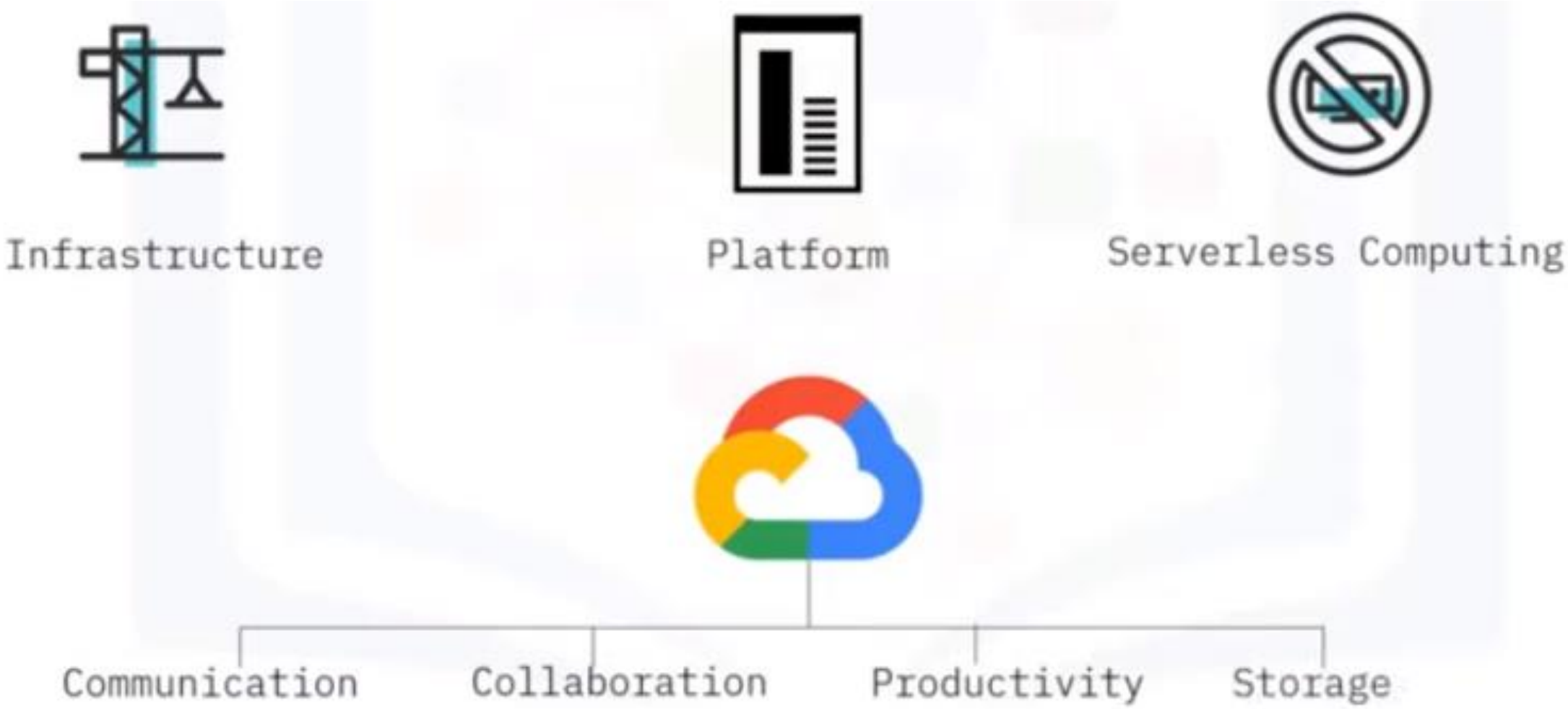
# Future of Cloud Computing

# Cloud Service Providers

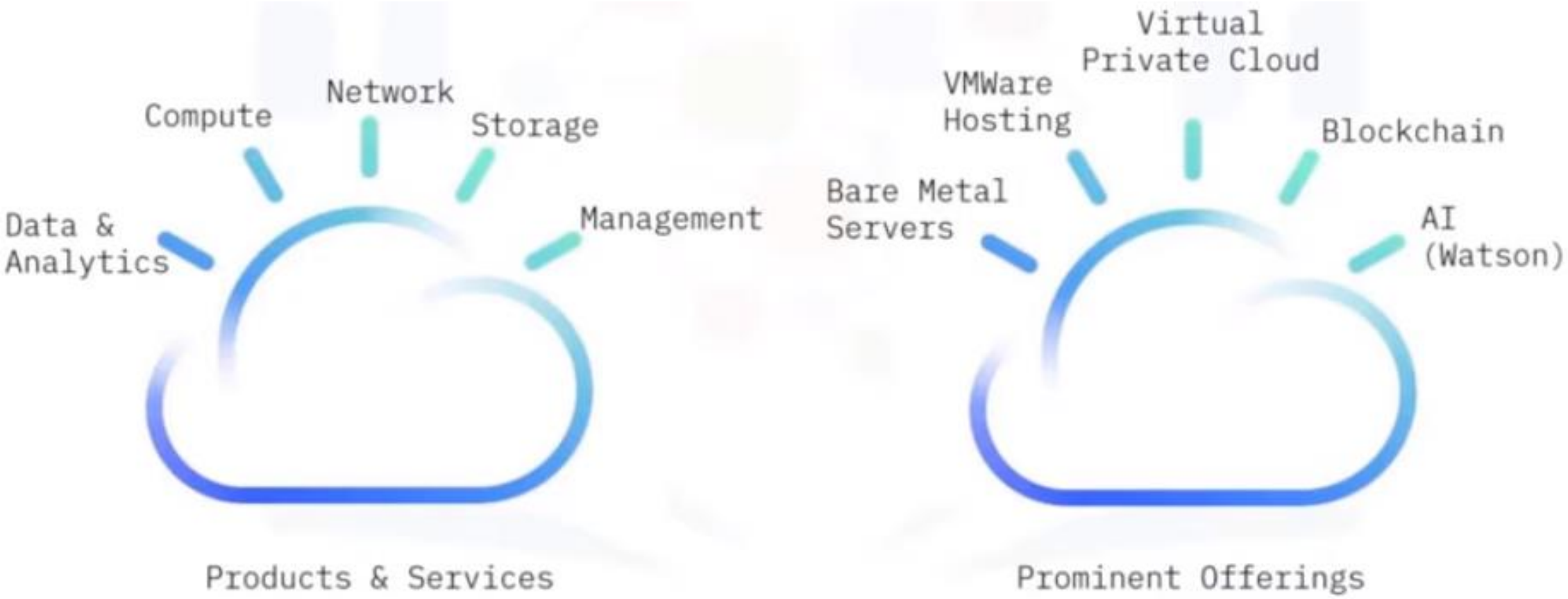
# Alibaba Cloud

# Amazon Web Services

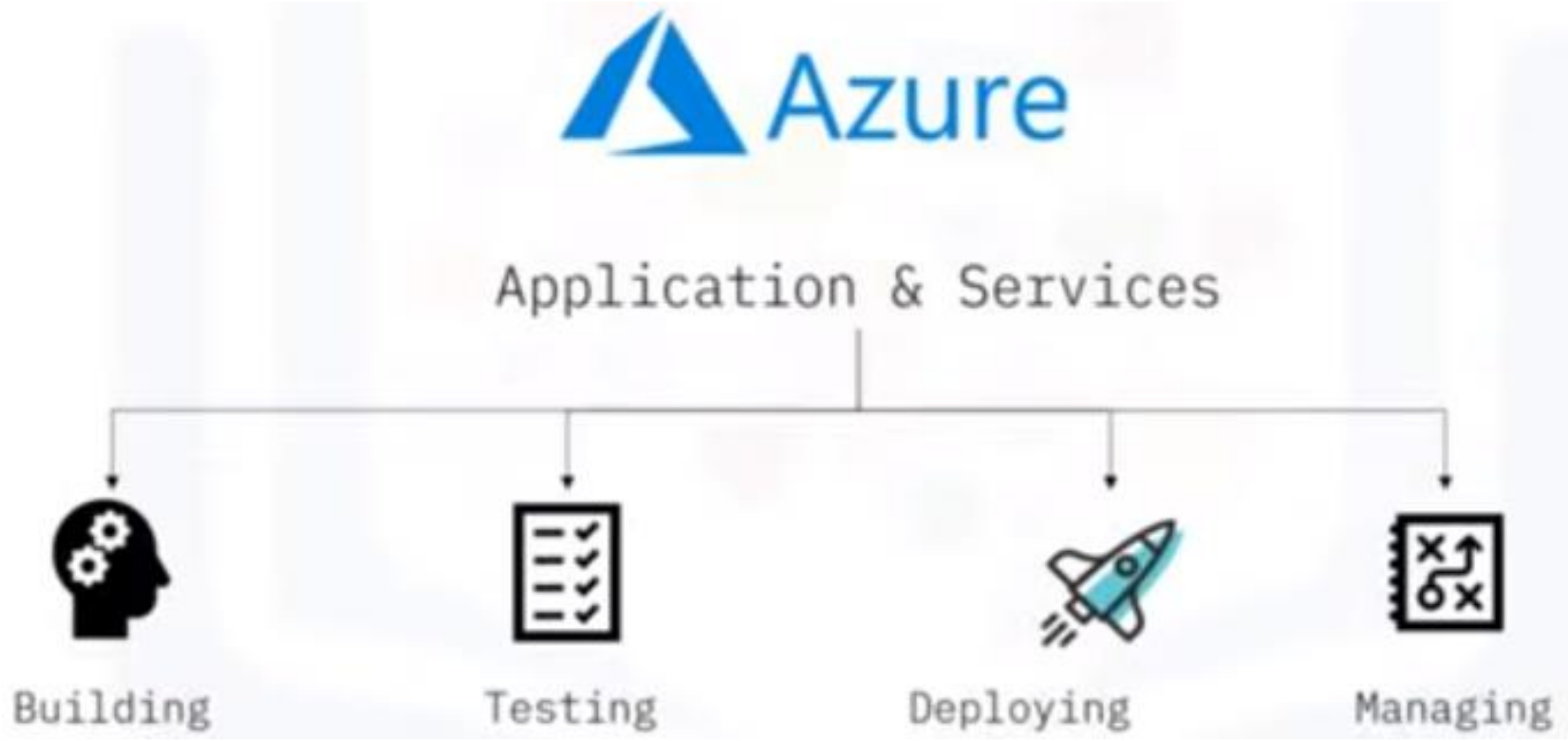
# Google Cloud Platform



# IBM Cloud

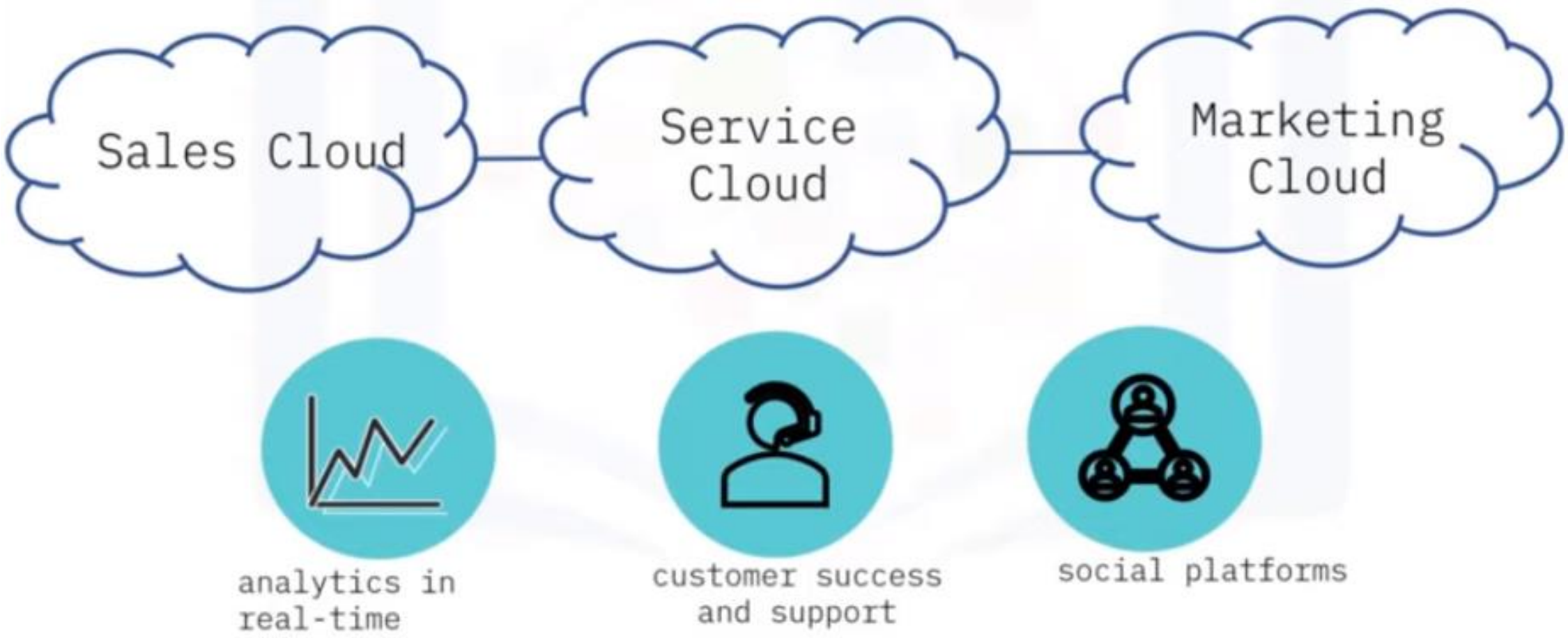

Compute
Network
Storage
Data &
Analytics
Management
Products & Services
Virtual
Private Cloud
VMWare
Hosting
Blockchain
Bare Metal
Servers
AI
(Watson)
Prominent Offerings

# Microsoft Azure

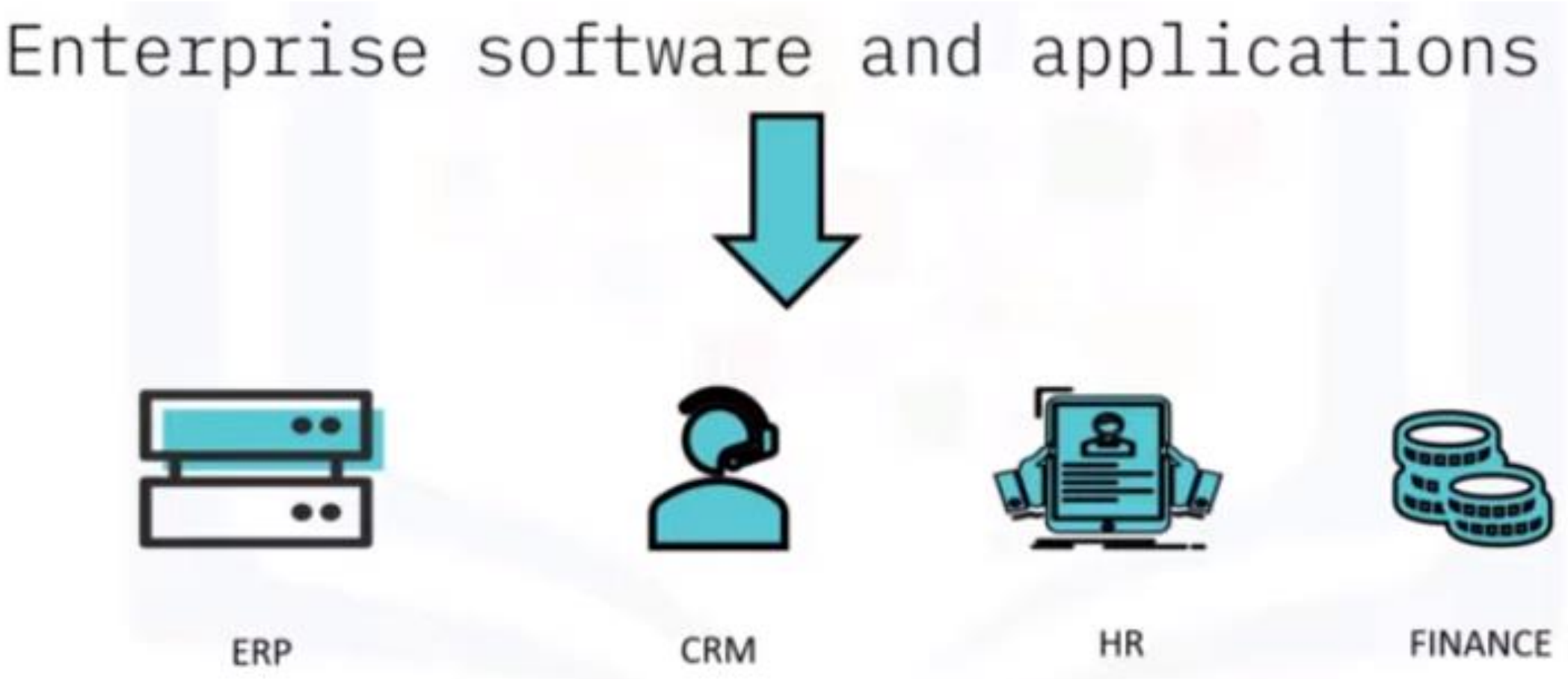


# Oracle Cloud

# Salesforce


Sales Cloud
Service Cloud
Marketing Cloud
analytics in real-time
customer success and support
social platforms

# SAP



# 4. Q&A

**Any question?**