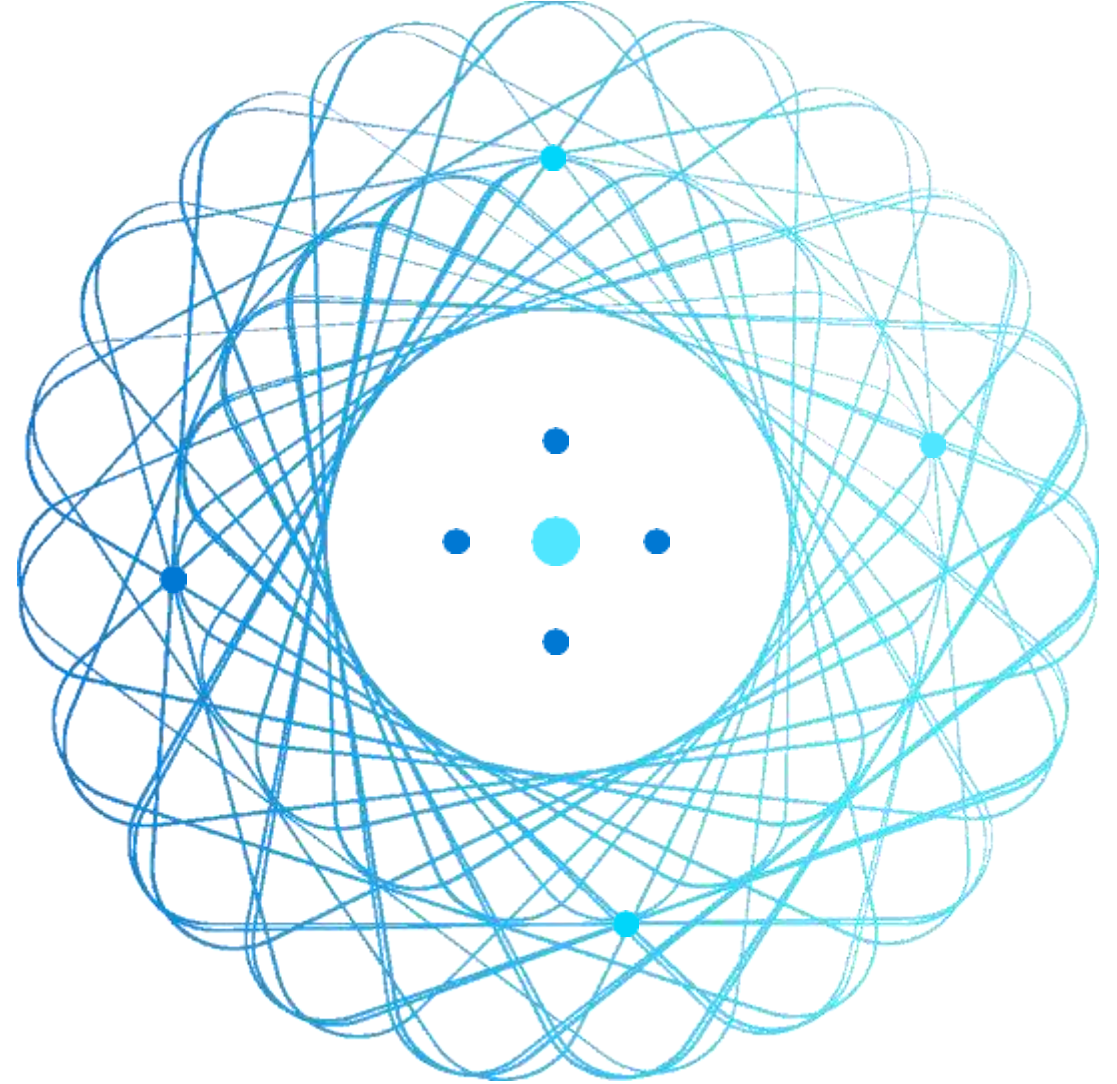


AZ-900T0x

Module 01:

Cloud concepts

Ravindra Kudache



Module Outline



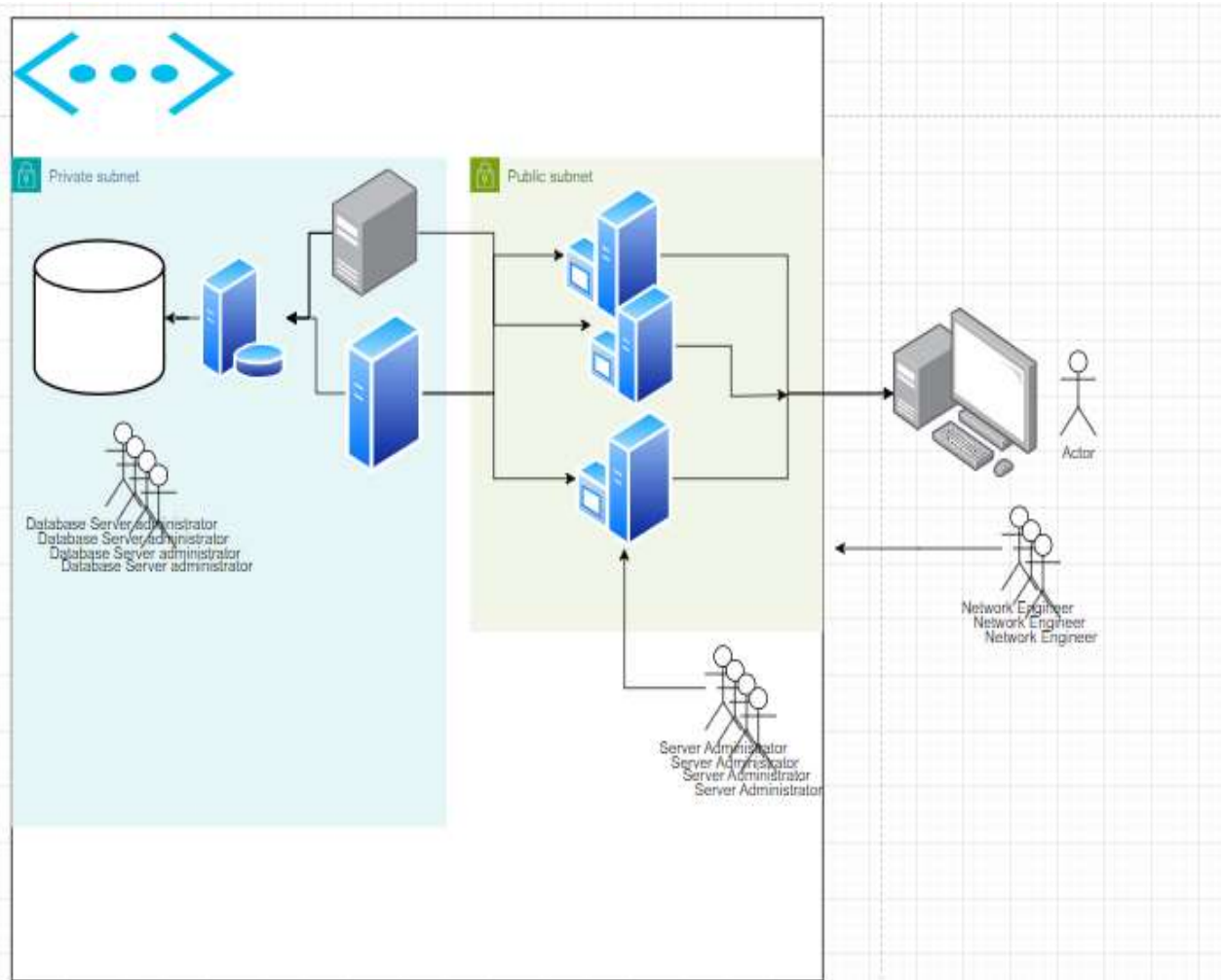
Module 01 - Outline

You will learn the following concepts:

- **Cloud Models**
 - Public, Private, and Hybrid cloud
 - Choosing the best for you
- **Cloud Benefits and Considerations**
 - Benefits of the cloud
 - Cloud considerations
- **Cloud Services**
 - IaaS, PaaS, and SaaS
 - Sharing responsibility



On-Premise



Physical Hardware: Servers, storage devices, networking equipment, and other hardware components are located and operated within the organization's facilities.

Software and Applications: All software applications, databases, and operating systems are installed and run on the organization's own servers and machines.

Networking Infrastructure: Local area networks (LANs), routers, switches, firewalls, and related networking equipment are established and managed internally.

Data Storage and Backup: Data storage systems, including backups and disaster recovery solutions, are implemented within the organization's premises.

Maintenance and Security: IT teams within the organization are responsible for maintaining, updating, and securing the entire infrastructure, including hardware and software components.

Control and Customization: Organizations have full control over their infrastructure, allowing for customized configurations and security policies tailored to their specific needs and compliance requirements.

Traditional Data Centers

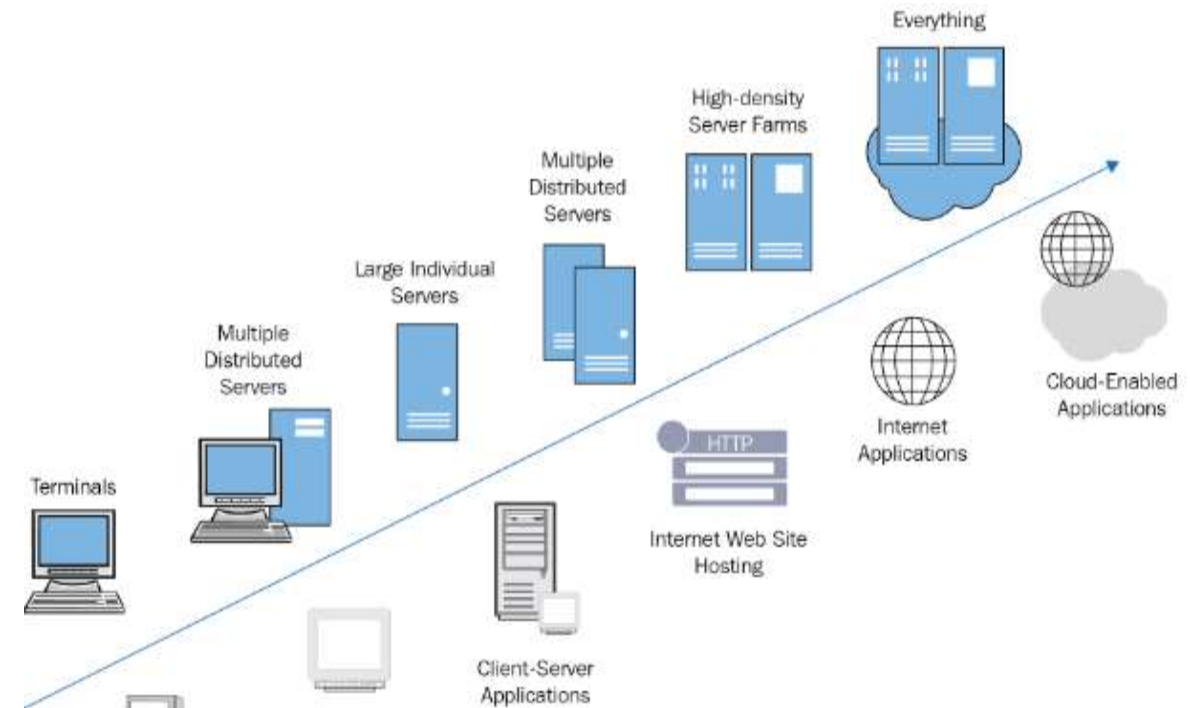
- 1 management
Need to manage
Large machine
- 2 investment
Need to invest in
hardware
- 3 operations
Need to invest in
managing the data center
- 4 Focus on business
You get to focus on
your business and
applications
+
Infrastructure



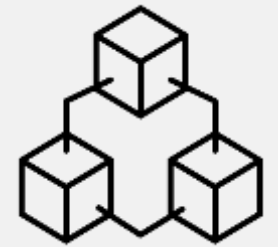
Lets start Cloud Journey

Evolution of Cloud Computing

- 1961: John McCarthy's Vision
- Early Hesitance and Later Adoption
- 1999: Salesforce.com Pioneers Cloud Applications
- 2002: Amazon Web Services (AWS)
- 2009: Expansion and Competition
- Present Day: Cloud Computing Significance



Cloud Models

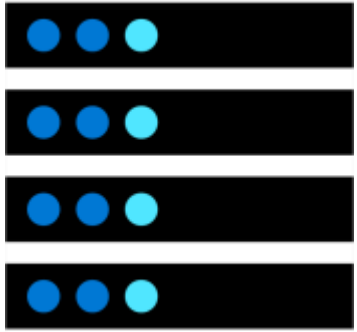


Cloud Models - Objective Domain

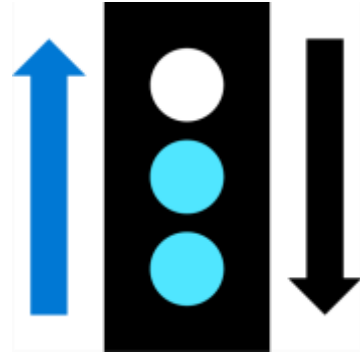
- Define cloud computing
- Describe Public cloud
- Describe Private cloud
- Describe Hybrid cloud
- Compare and contrast the three different cloud models

What is cloud computing?

Cloud Computing is the delivery of computing services over the internet, enabling faster innovation, flexible resources, and economies of scale.



Compute



Networking



Storage



Analytics

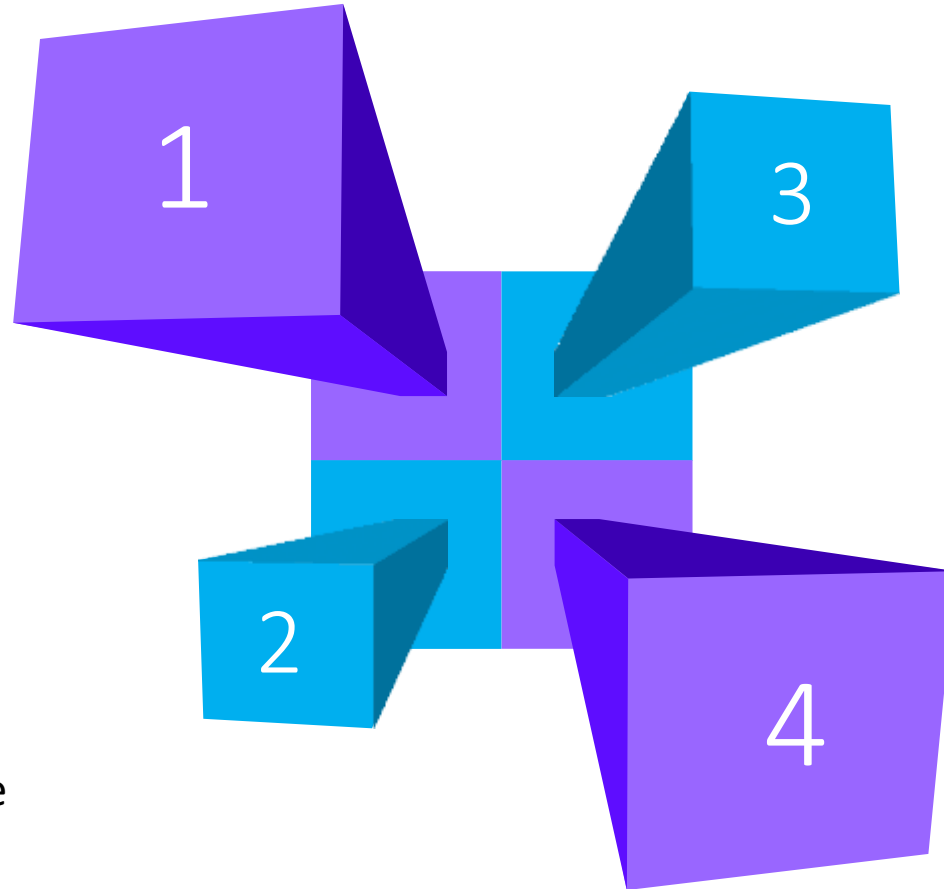
What is cloud computing

Delivery

This is the delivery of computing services – servers , storage , databases, networking, software and more

Cloud

The delivery of these services is done over the Internet.



Payment model

Here you pay for how much you use.

Be ahead of the competition

Allows for faster innovation, flexibility and faster delivery of services.

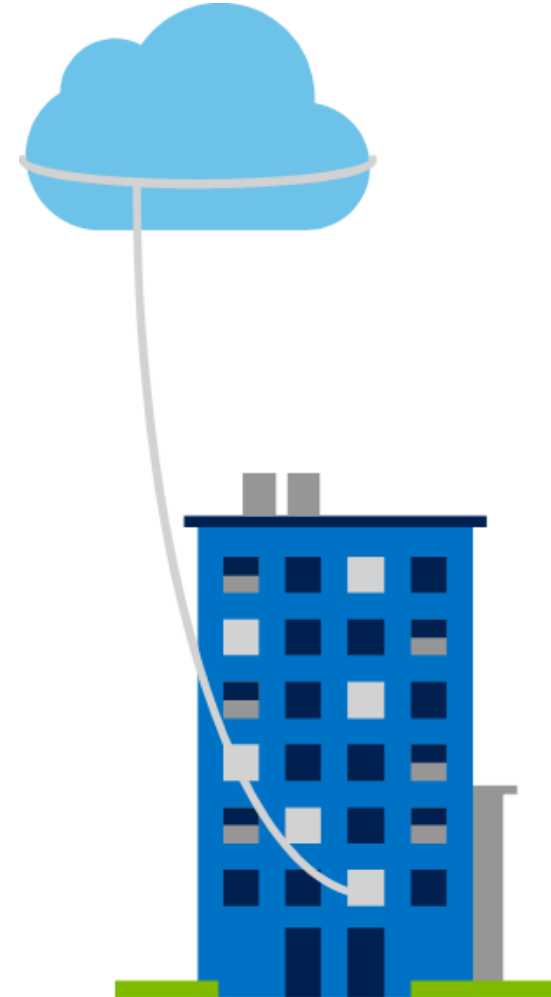
Public cloud

- Owned by cloud services or hosting provider.
- Provides resources and services to multiple organizations and users.
- Accessed via secure network connection (typically over the internet).



Private cloud

- Organizations create a cloud environment in their datacenter.
- Organization is responsible for operating the services they provide.
- Does not provide access to users outside of the organization.



Hybrid cloud



Combines **Public** and **Private** clouds to allow applications to run in the most appropriate location.

Cloud model comparison

Public Cloud

- No capital expenditures to scale up.
- Applications can be quickly provisioned and deprovisioned.
- Organizations pay only for what they use.

Private Cloud

- Hardware must be purchased for start-up and maintenance.
- Organizations have complete control over resources and security.
- Organizations are responsible for hardware maintenance and updates.

Hybrid Cloud

- Provides the most flexibility.
- Organizations determine where to run their applications.
- Organizations control security, compliance, or legal requirements.

Cloud benefits and considerations



Economies of Scale

Basics

This is the ability to carry out tasks more efficiently or at a lower-cost per unit when operating at a large scale.

Discount

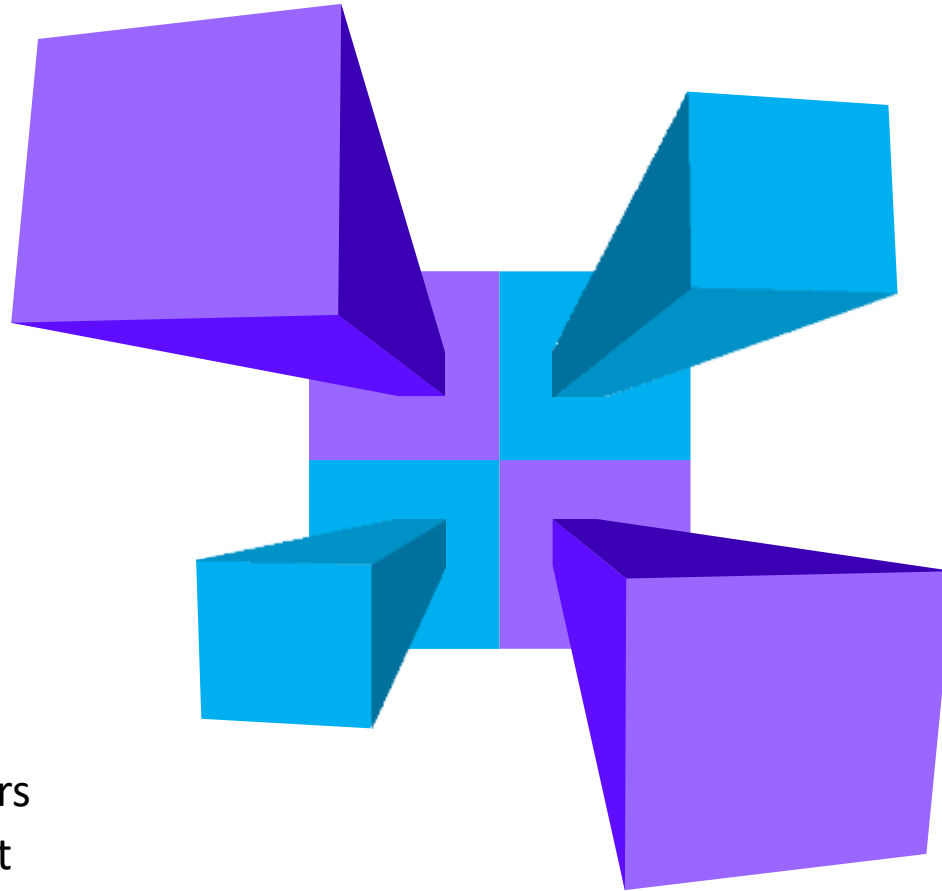
When the demand increases, cloud providers can then get hardware at discount prices.

Benefit

This becomes a benefit to the customer wherein the discounts can be passed to the customer.

Service cost

If the number of customers increase the chances of services costs can go down.



Cloud Benefits

High availability

Scalability

Global reach

Agility

Disaster recovery

Fault tolerance

Elasticity

Customer latency capabilities

Predictive cost considerations

Security

Capital Expenditure

This is when you pay money upfront



Server
Costs

Storage
Costs

Software
Licenses

Datacenter
costs

Operational Expenditure

Ongoing money spent on services



The diagram consists of four rectangular boxes arranged horizontally, each with a folded top-right corner. The first and third boxes are purple, while the second and fourth are blue. Each box contains a label for a component of operational expenditure.

Human
Resources

Maintenance

Software
Support

Datacenter
Costs - Cooling

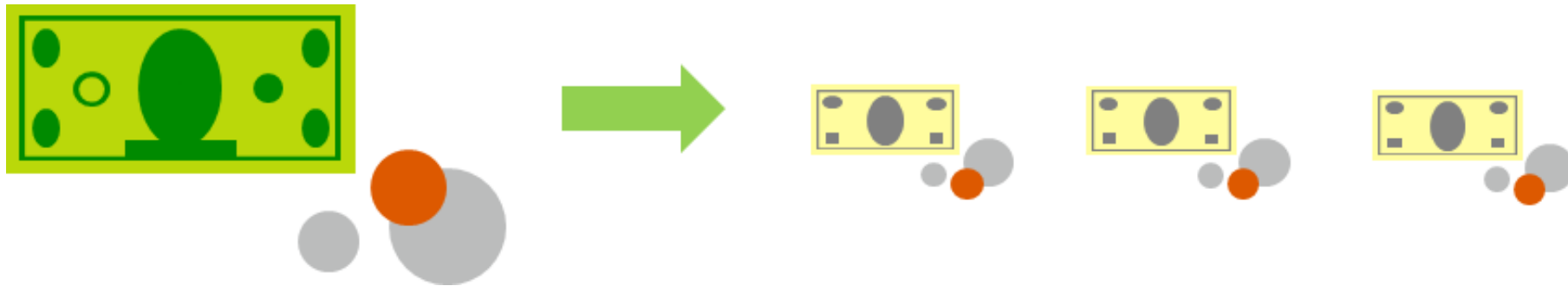
Compare CapEx vs. OpEx

Capital Expenditure (CapEx)

- The up-front spending of money on physical infrastructure.
- Costs from CapEx have a value that reduces over time.

Operational Expenditure (OpEx)

- Spend on products and services as needed, pay-as-you-go
- Get billed immediately



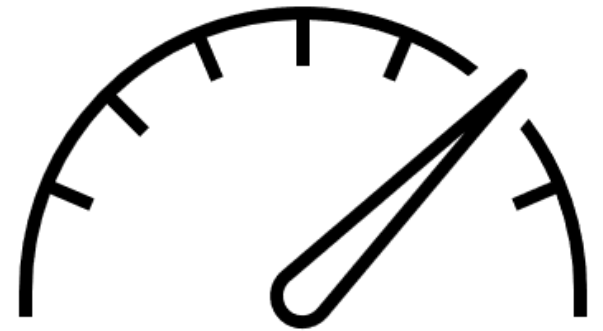
Cloud Benefits - Objective Domain

- Identify the benefits of cloud computing such as High Availability, Scalability, Elasticity, Agility, and Disaster Recovery.
- Identify the differences between Capital Expenditure (CapEx) and Operational Expenditure (OpEx).
- Describe the consumption-based model.

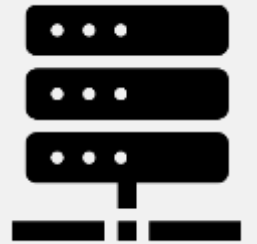
Consumption-based model

Cloud service providers operate on a consumption-based model, which means that end users only pay for the resources that they use. Whatever they use is what they pay for.

- Better cost prediction
- Prices for individual resources and services are provided
- Billing is based on actual usage



Cloud services

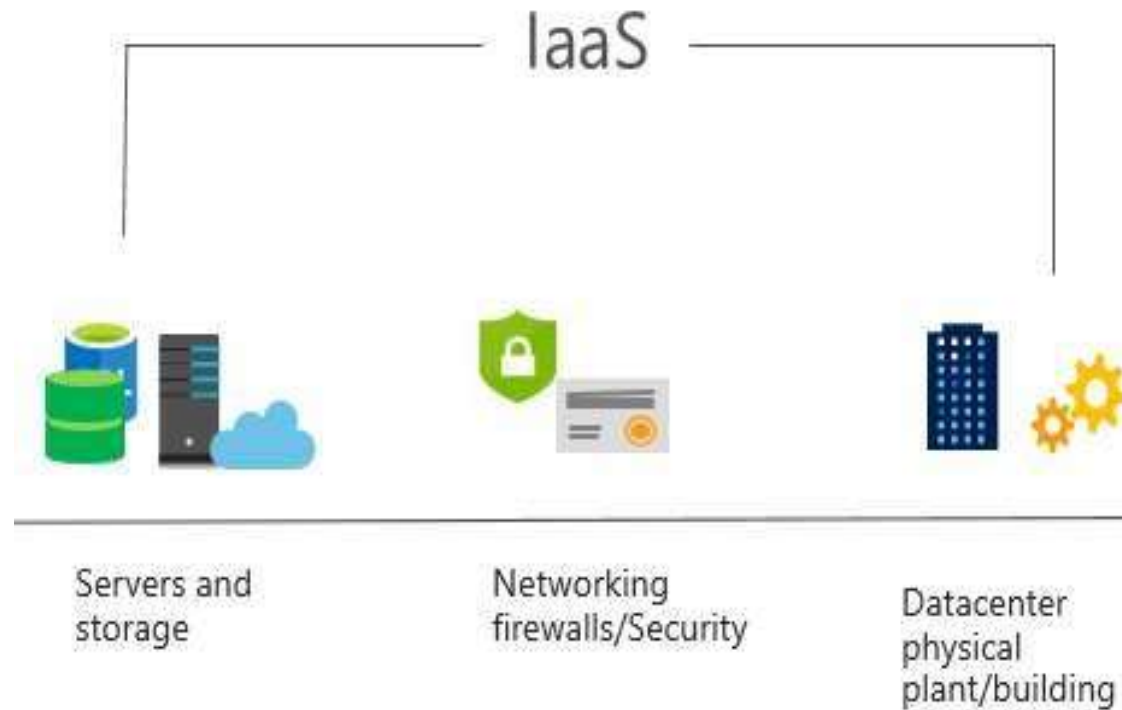


Cloud Services - Objective Domain

- Describe Infrastructure-as-a-Service (IaaS)
- Describe Platform-as-a-Service (PaaS)
- Describe Software-as-a-Service (SaaS)
- Identify a service type based on a use case
- Describe the shared responsibility model
- Describe serverless computing

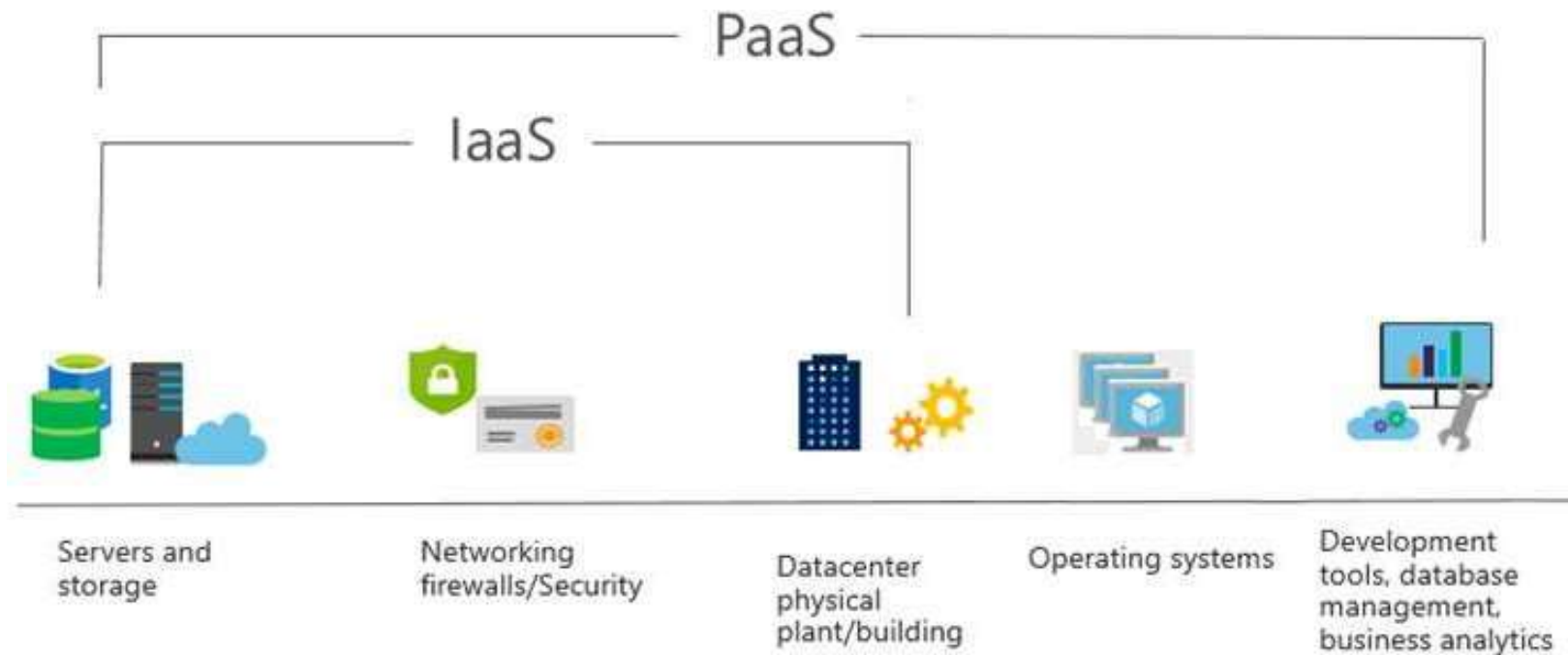
Infrastructure as a Service (IaaS)

Build pay-as-you-go IT infrastructure by renting servers, virtual machines, storage, networks, and operating systems from a cloud provider.



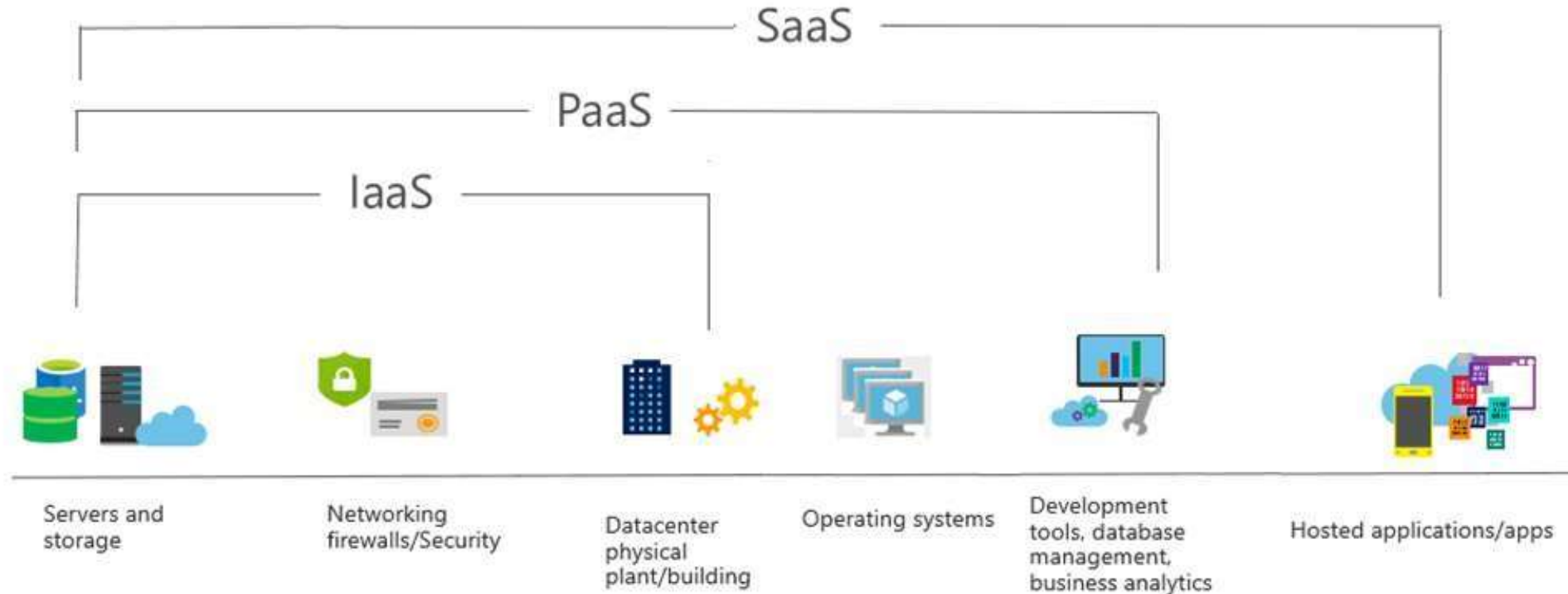
Platform as a Service (PaaS)

Provides environment for building, testing, and deploying software applications; without focusing on managing underlying infrastructure.



Software as a Service (SaaS)

Users connect to and use cloud-based apps over the internet: for example, Microsoft Office 365, email, and calendars.



Cloud service comparison

IaaS

The most flexible cloud service.

You configure and manage the hardware for your application.

PaaS

Focus on application development.

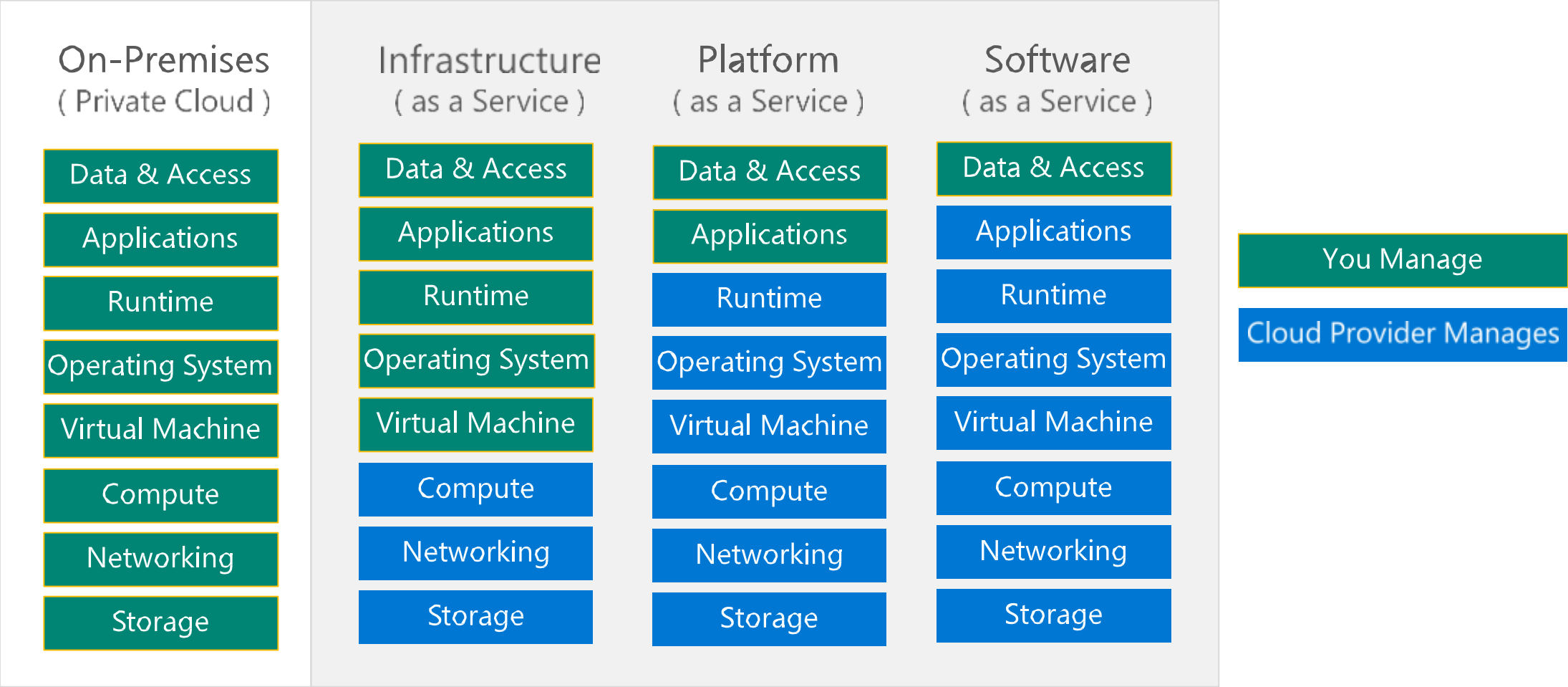
Platform management is handled by the cloud provider.

SaaS

Pay-as-you-go pricing model.

Users pay for the software they use on a subscription model.

Shared responsibility model

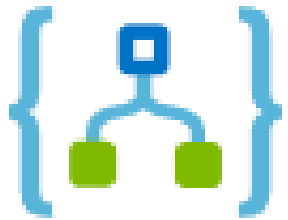


Serverless Computing

With **serverless computing applications**, the cloud service provider automatically provisions, scales, and manages the infrastructure required to run the code.

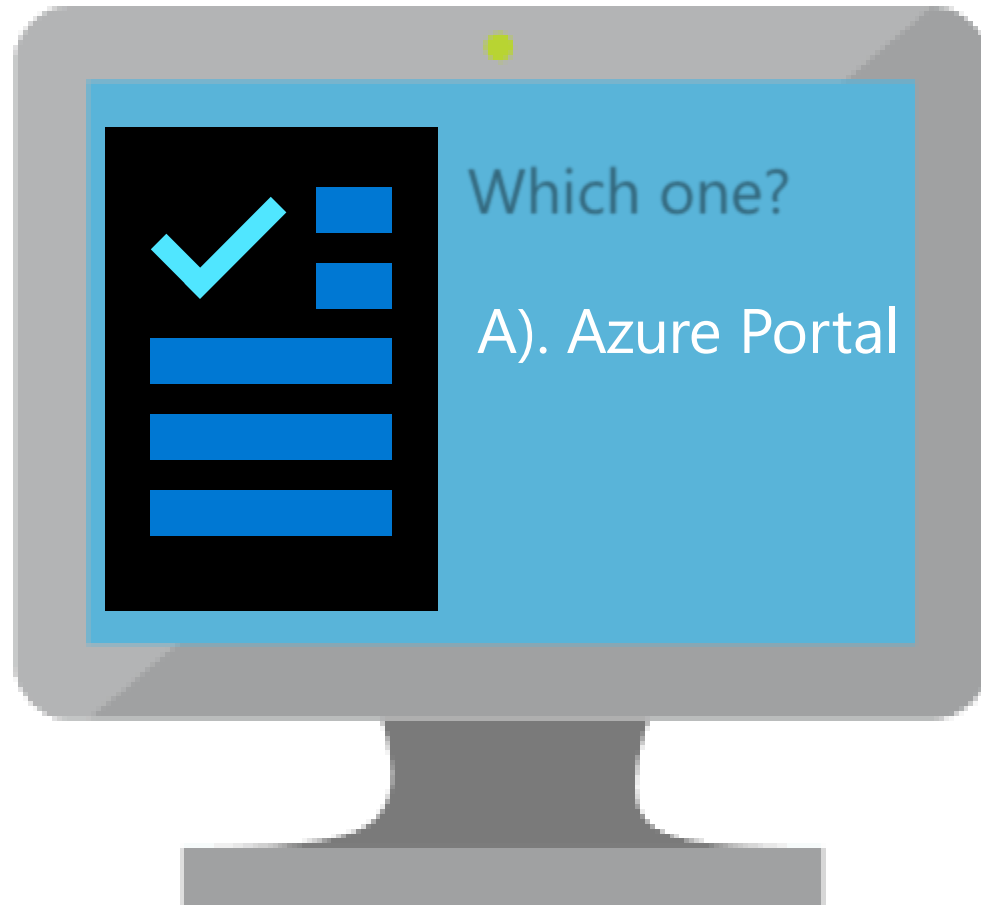


Azure Functions is code running your service and not the underlying platform or infrastructure. It creates infrastructure based on an event.



Azure Logic Apps is a cloud service that helps you automate and orchestrate tasks, business processes, and workflows when you need to integrate apps, data, systems, and services.

Knowledge Check



Module 01 Review



Microsoft Learn Modules
(docs.microsoft.com/Learn)

- Microsoft offers Public, Private, and Hybrid cloud models so you can build based on your needs.
- From high-availability to elasticity to disaster recovery to pay-as-use the benefits of the Azure cloud are numerous.
- IaaS, PaaS, SaaS, and serverless, or a combination.
- Shared responsibility.