Eng. Mohammed Mashharawi

Abu Anas

moh6390@Hotmail.com

@master212

www.linkedin.com/in/mohammed-mashharawi-86570b8b

https://github.com/Mashharawi

mohammed@mashharawi.com

About the trainer

Eng. AbuAnas Mashharawi

System & Cloud Engineer

High Tech. Expert

Computer Science - Baghdad University - Iraq

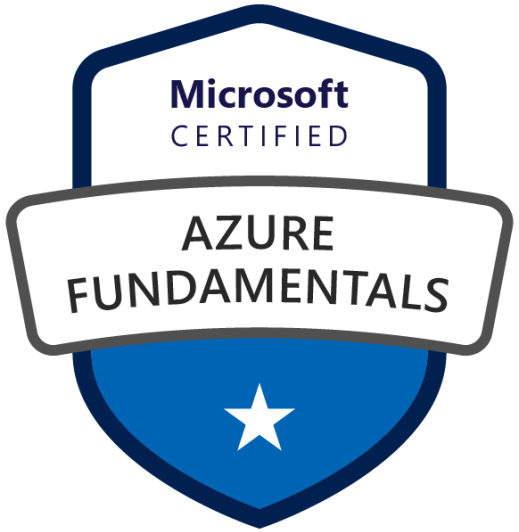
Microsoft Certified System Engineer

Cisco Admin

Trainer

Over than 15 years of networking and helpdesk assistance

Cloud Computing Service



Thank You

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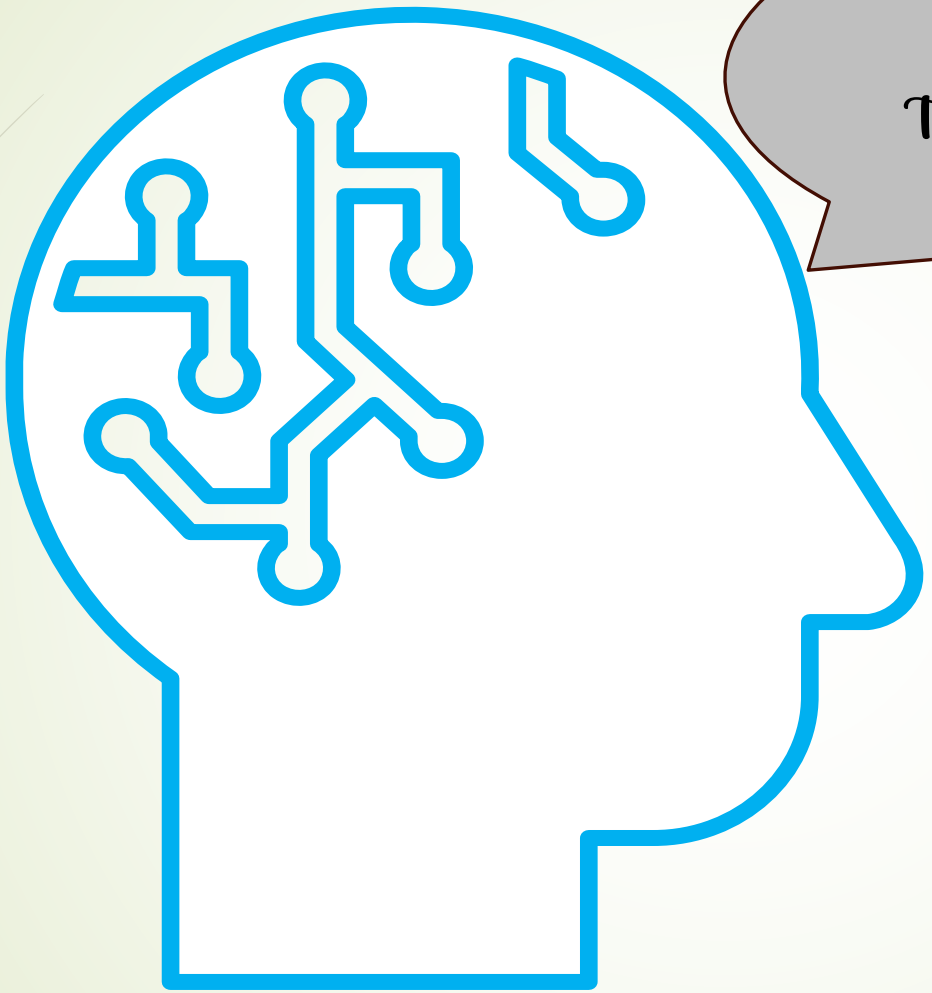
الدورة تهدف الي تعليم الطلاب وتعريفهم بمهارات بعض خدمات امازون علي الحوسبة السحابية –
This course is aiming to educate youth and students about some AWS Cloud Computing Basics



Why Computing?
The beginning of the story.

Section 1 : Understand Cloud Concepts

- What is Cloud
- Why Cloud
- Cloud Deployment Models
- Cloud Service Models
- Cloud Key Terminology

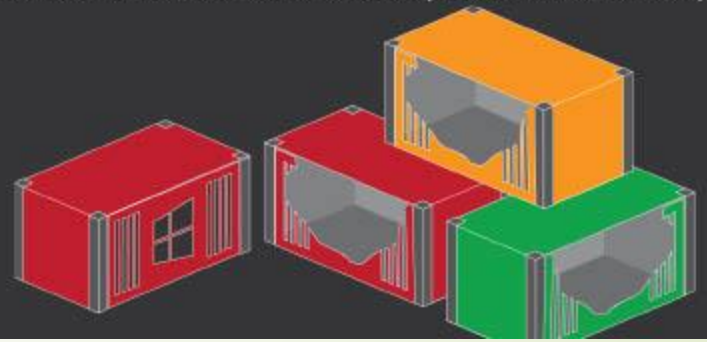
Computing & Virtualization

Computing:

The process of utilizing computer technology to complete a task. Computing may involve computer hardware and/or software, but must involve some form of a computer system.

Virtualization:

In computing, virtualization means to create a virtual version of a device or resource, such as a server, storage device, network or even an operating system.



What is Cloud Computing

Microsoft Says:

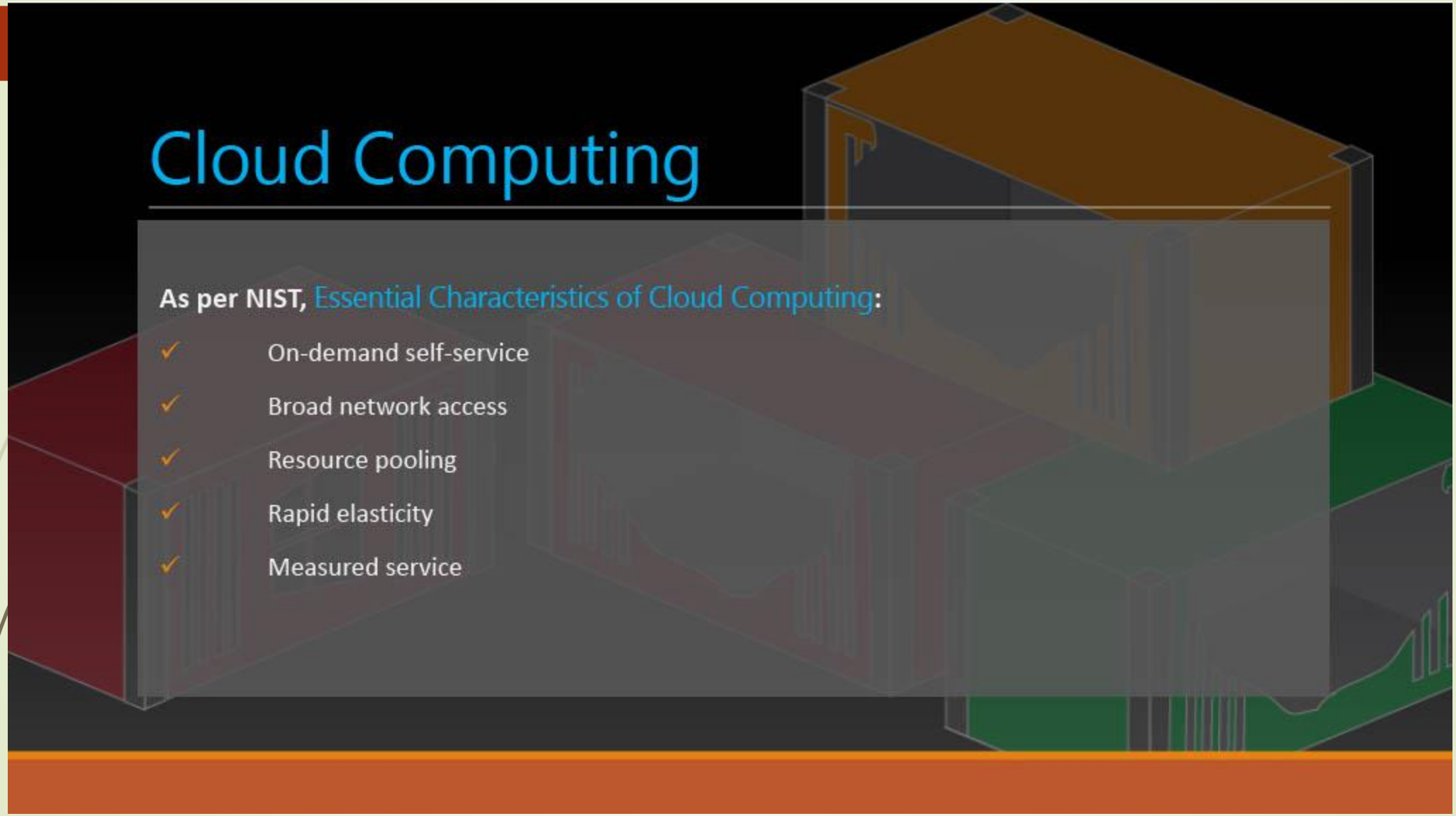
Cloud computing is the delivery of computing services including servers, storage, databases, networking, software, analytics, intelligence and more over the Internet ("the cloud") to offer faster innovation, flexible resources and economies of scale.

AWS says:

Cloud computing is the on-demand delivery of compute power, database storage, applications, and other IT resources through a cloud services platform via the internet with pay-as-you-go pricing.


What is Cloud Computing
NIST Definition:
Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.
This cloud model is composed of five essential characteristics, three service models, and four deployment models.
Source: https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Cloud Computing Service



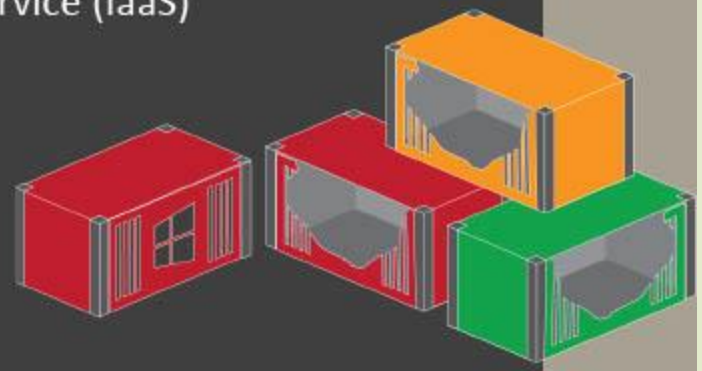
As per NIST, Cloud Computing

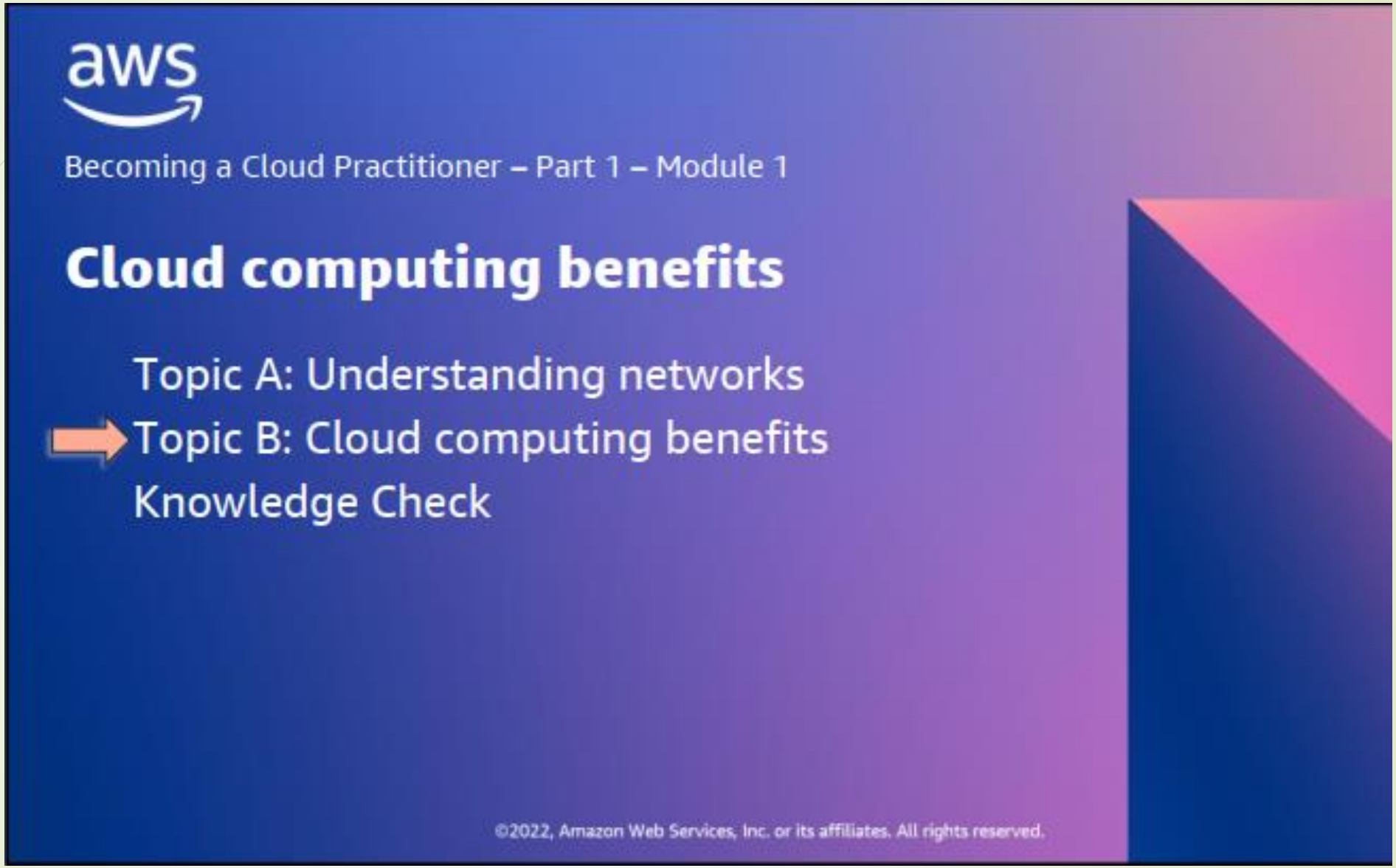
Deployment Models:

- ✓ Private cloud
- ✓ Community cloud
- ✓ Public cloud
- ✓ Hybrid cloud

Service Models:

- ✓ Software as a Service (SaaS)
- ✓ Platform as a Service (PaaS)
- ✓ Infrastructure as a Service (IaaS)

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Becoming a Cloud Practitioner – Part 1 – Module 1
Cloud computing benefits
Topic A: Understanding networks
Topic B: Cloud computing benefits
Knowledge Check
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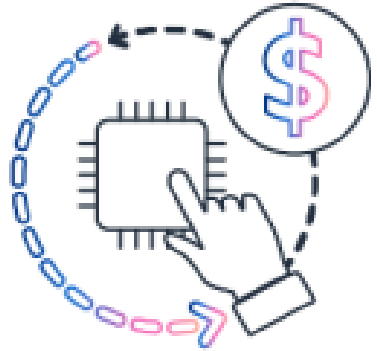
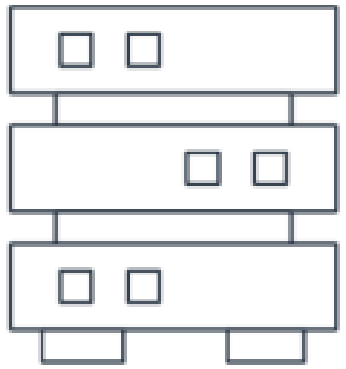
Upfront vs variable expenses

On-premises deployment	Cloud deployment
Upfront expenses	Variable expenses
	
Invest in technology resources before using them	Pay only for what you use

Cost optimization

On-premises deployment	Cloud deployment



Investment

Run data centers

Focus on applications and customers

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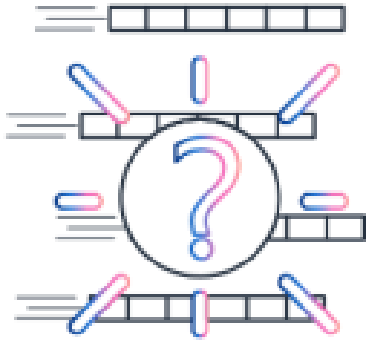
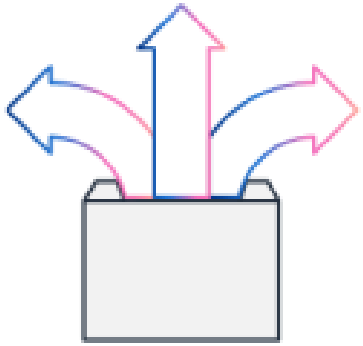
Capacity

On-premises deployment	Cloud deployment
	
Guessing on your infrastructure capacity needs	Scale in and scale out as needed

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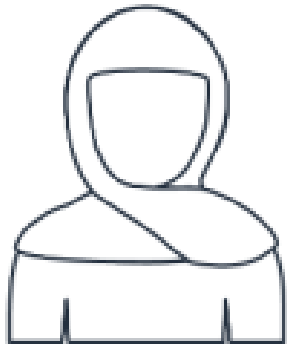
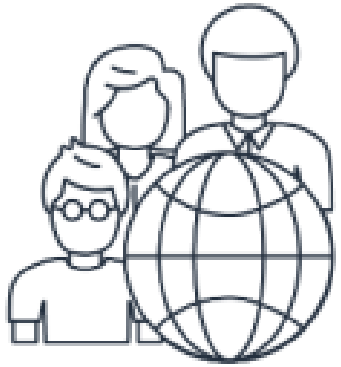
Economies of scale

On-premises deployment	Cloud deployment
Smaller scale	Economies of scale
	
Pay higher prices based on only your own usage	Benefit from customers' aggregated usage

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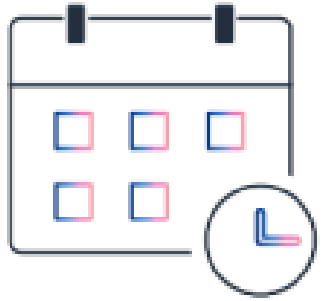
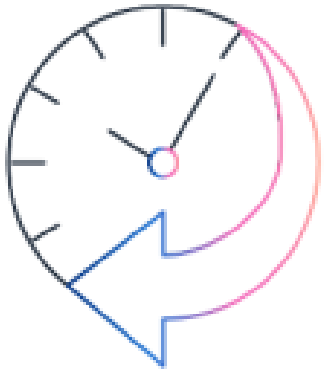
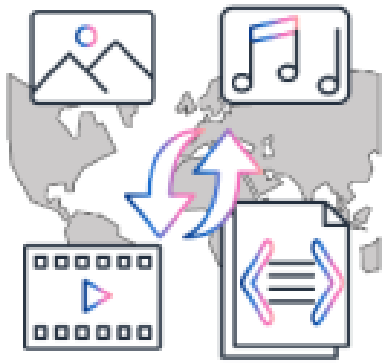
Speed and agility

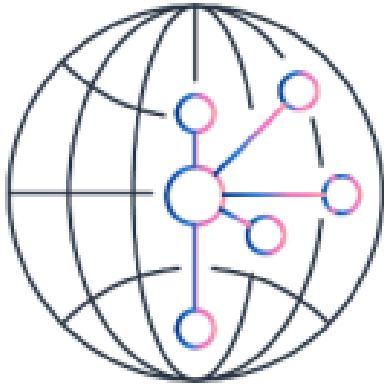
On-premises deployment	Cloud deployment
Data centers	Cloud computing
	
Weeks between wanting resources and having resources	Minutes between wanting resources and having resourc

Global in minutes

Cloud deployment



Quickly deploy applications worldwide



Use the AWS global infrastruc

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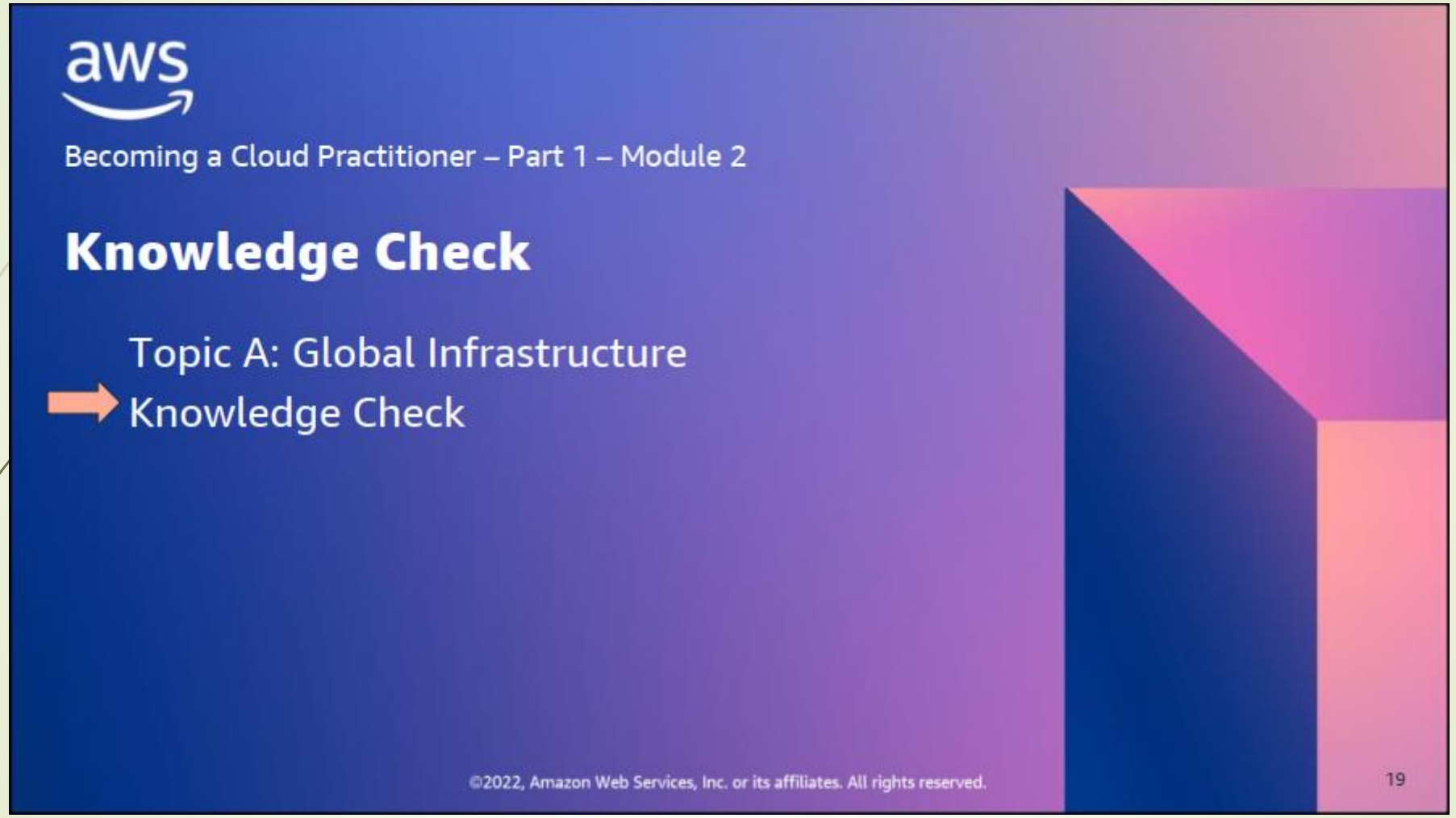
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Knowledge Check
Topic A: Global Infrastructure
Knowledge Check
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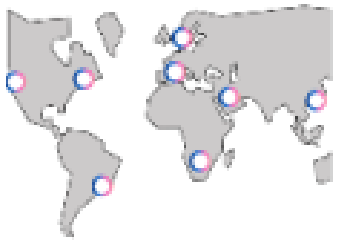
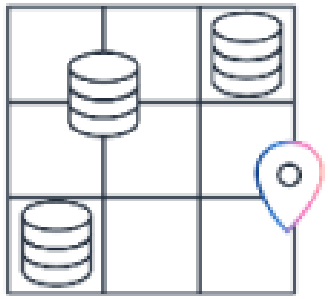
What is a Region?

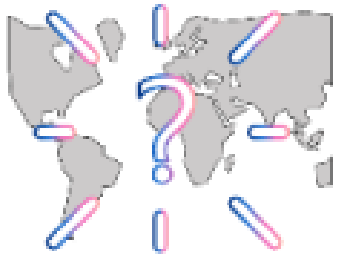


A **physical location** (Region) where AWS builds a cluster of data centers.

There are **27 regions** as of September 2022.



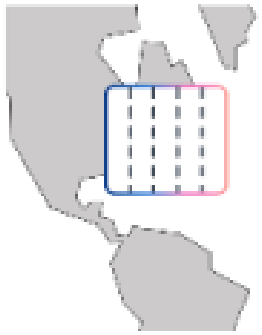
A **data center** is a building that houses the physical computing equipment that the AWS region runs on.



A Region is what connects the physical and logical.
Multiple, physically distant data centers provide **resiliency**.

What is an Availability Zone (AZ)?

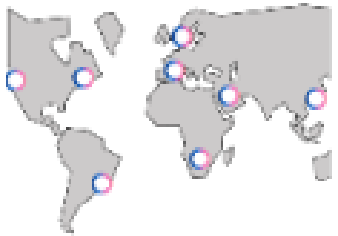
Availability Zones are distinct locations within a Region that are engineered to be isolated from failures in other AZs.



An AZ can only exist in a single Region.

AZs are logical representations of how cloud resources are grouped.

The hardware that supports AZs is located in **data centers**.



The AWS Cloud spans **87 AZs** as of September 2022.

Cloud Computing Service

Azure Data Center

Designed for Al-Qattan Cultural Centre - Gaza

Cloud Computing Service

Azure Data Center

Designed for Al-Qattan Cultural Centre - Gaza

Question 1

AWS services reside in which of the following?
(Choose TWO)

Choice	Response
A	Region
B	Router
C	AZ
D	Instance
E	Server

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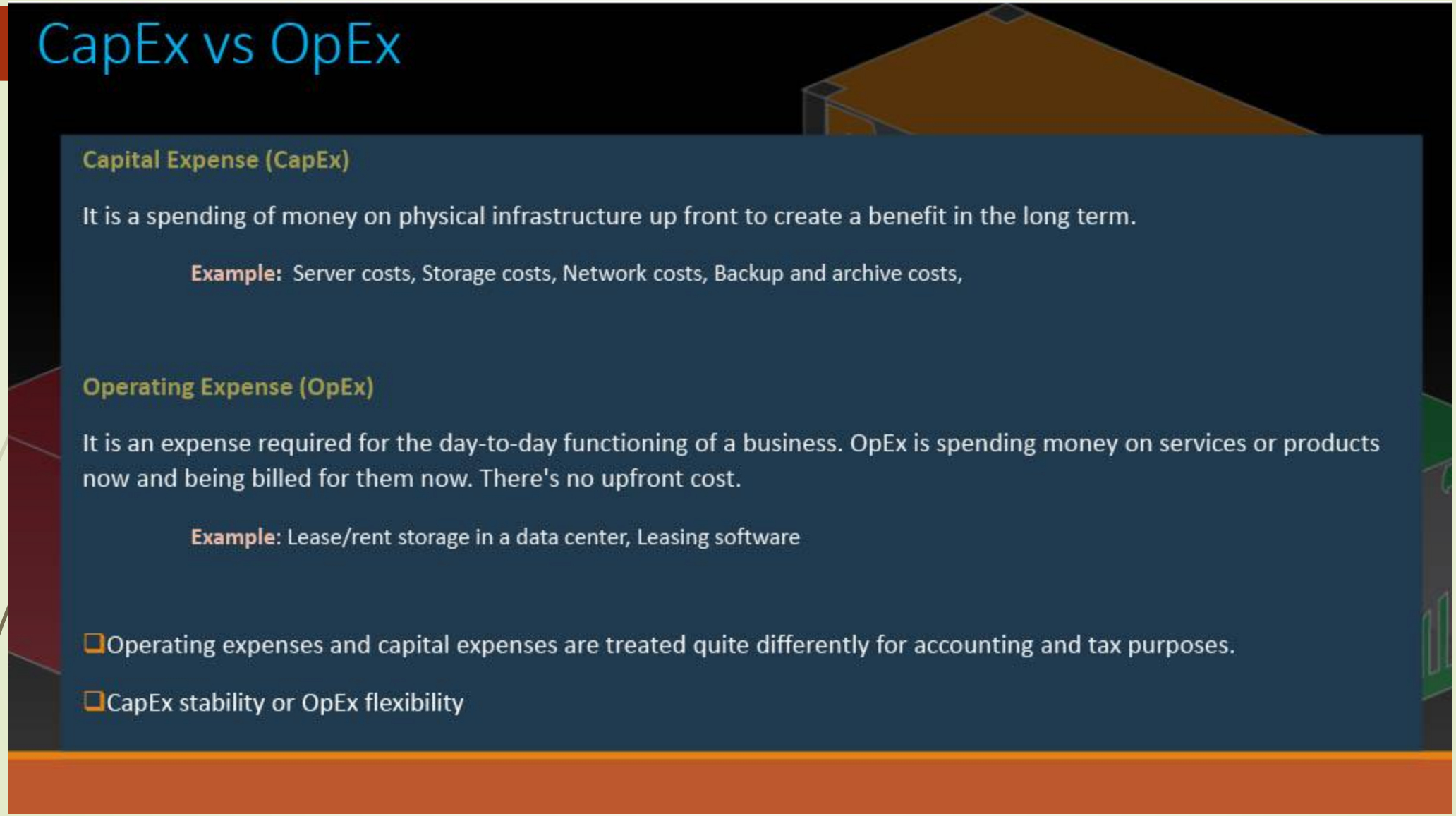
Question 1 answer

AWS services reside in which of the following? (Choose TWO)

Choice	Router
A correct	Region
B	Router
C correct	AZ
D	Instance
E	Server


CapEx vs OpEx
Capital Expense (CapEx)
It is a spending of money on physical infrastructure up front to create a benefit in the long term.
Example: Server costs, Storage costs, Network costs, Backup and archive costs,
Operating Expense (OpEx)
It is an expense required for the day-to-day functioning of a business. OpEx is spending money on services or products now and being billed for them now. There's no upfront cost.
Example: Lease/rent storage in a data center, Leasing software
Operating expenses and capital expenses are treated quite differently for accounting and tax purposes.
CapEx stability or OpEx flexibility

CapEx vs OpEx

Cloud services, Regions, and AZs

All AWS services logically reside within a Region.

Some services reside directly in a Region, **Regional services**.

Some services reside in AZs within a Region, **Zonal services**.

Amazon S3

Each bucket is created in a specific Region.

Amazon EC2

Each instance is assigned to a specific AZ.

aws

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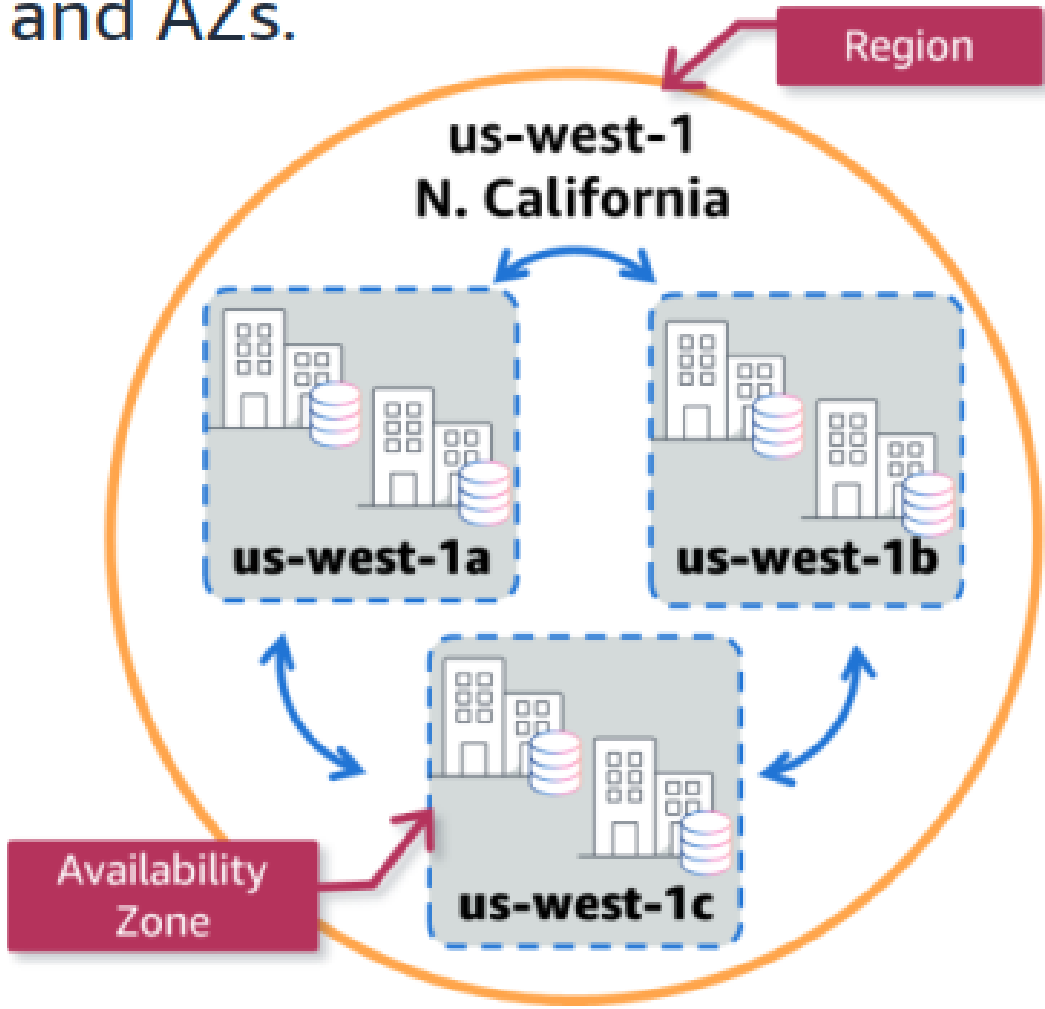
Regions and Availability Zones

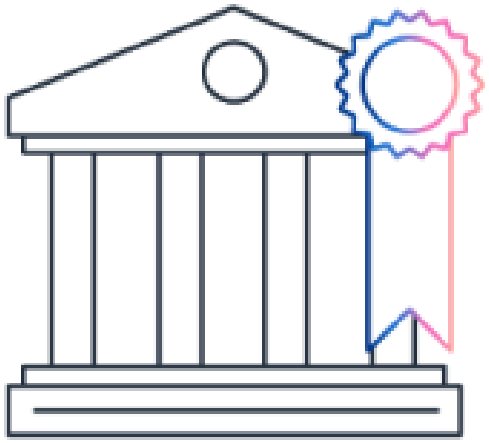
Naming conventions are used for Regions and AZs.

- Region name has two parts
  - Region identifier (us-west-1)
  - Familiar name (N. California)
- AZs are named based on their Region
  - AZ identifier (us-west-1a)
  - AZ identifier (us-west-1b)
  - AZ identifier (us-west-1c)

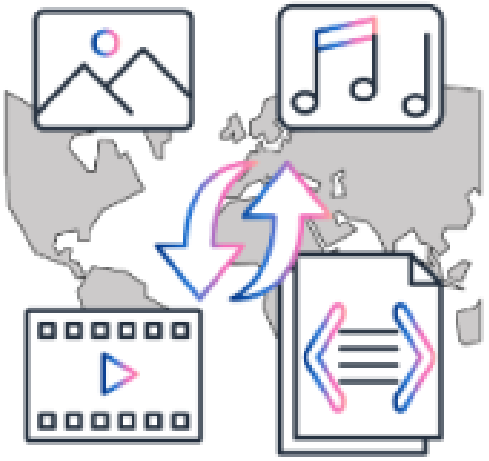


Select a Region

Determine the right Region for your services, data, and applications based on:

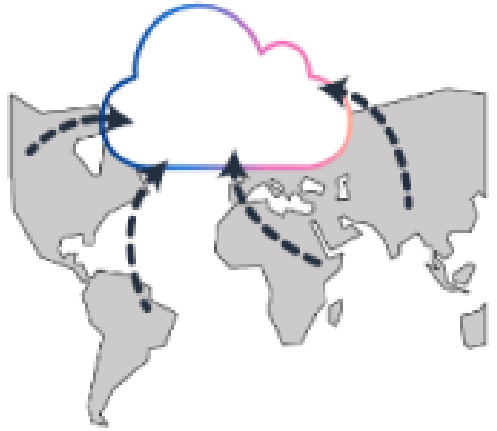


Compliance with data governance and legal requirements

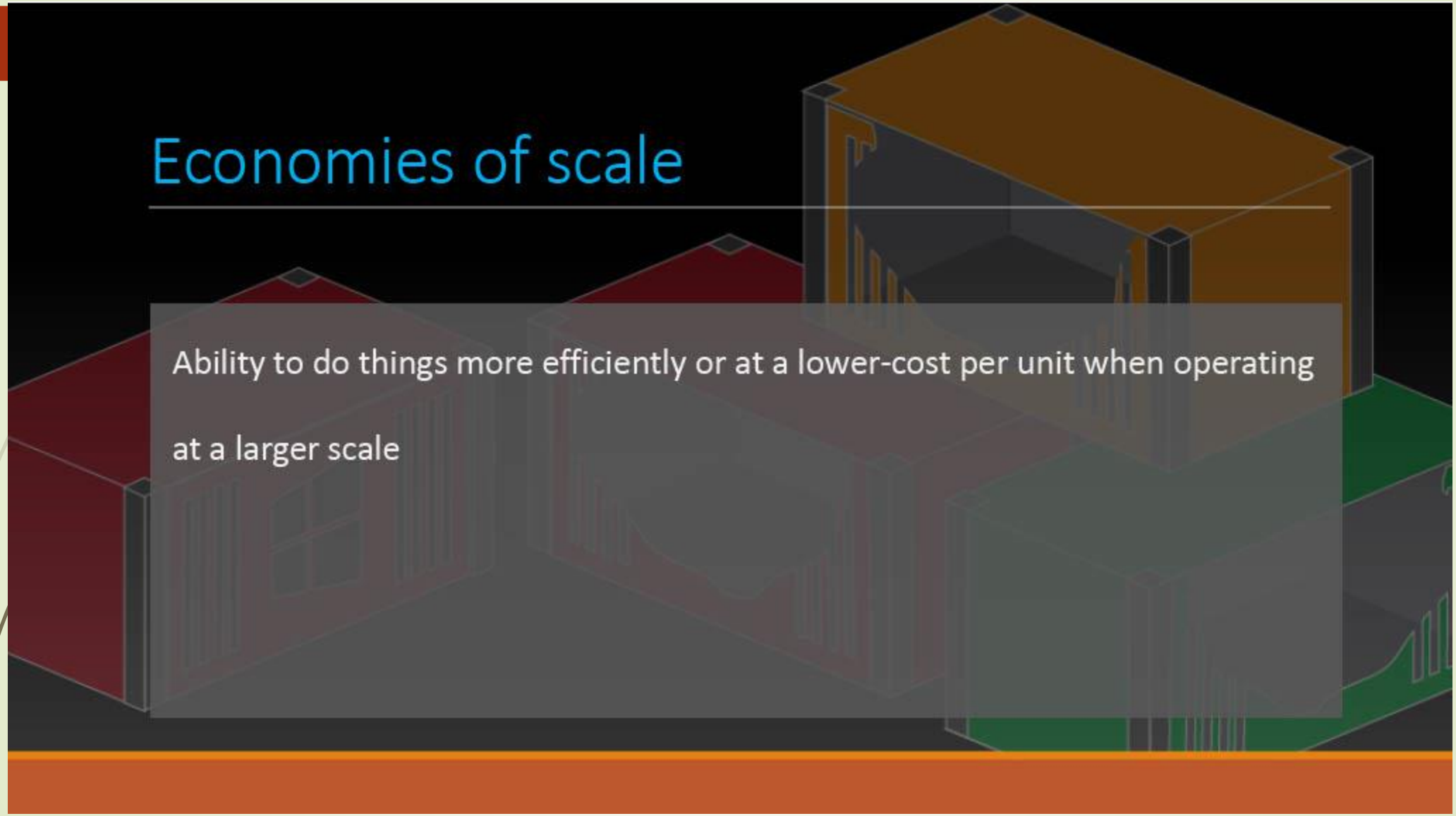


Available services within a Region

Pricing

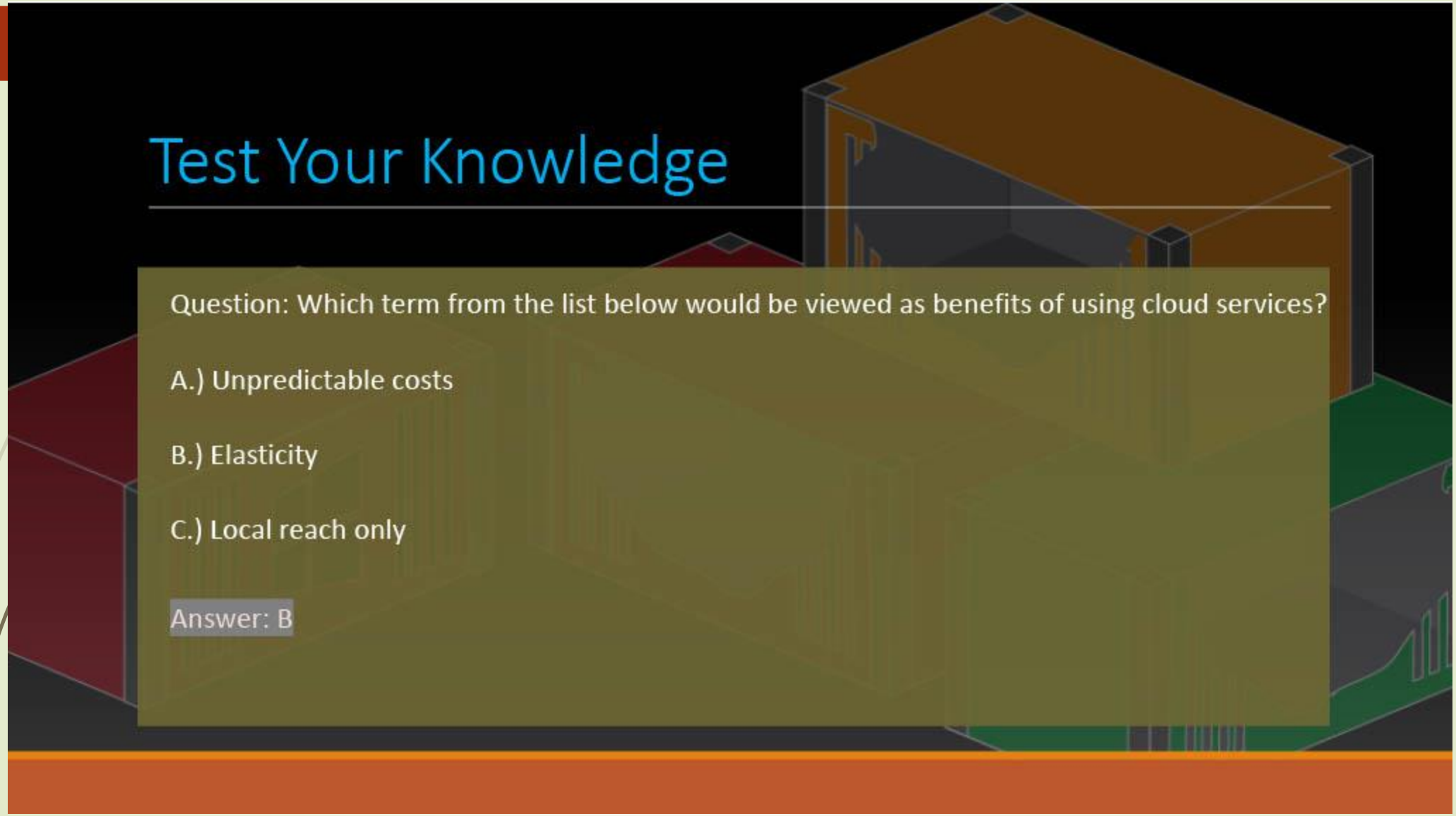


Proximity to your customers


Economies of scale
Ability to do things more efficiently or at a lower-cost per unit when operating
at a larger scale


Disadvantages of cloud
Fear of change when there's no going back
Fear of data security
Fear of losing control


Test Your Knowledge
Question: Which term from the list below would be viewed as benefits of using cloud services?
A.) Unpredictable costs
B.) Elasticity
C.) Local reach only


Test Your Knowledge
Question: Which term from the list below would be viewed as benefits of using cloud services?
A.) Unpredictable costs
B.) Elasticity
C.) Local reach only
Answer: B

Clouds Deployment Models

A cloud deployment model defines **where your data is stored** and **how your customers interact with it – how do they get to it**, and **where do the applications run**?

- Private cloud
- Public cloud
- Hybrid cloud
- Community Cloud

Private Cloud

- Services offered over the Internet or over a private internal network to only select users, not the general public. It is a cloud-based infrastructure used by stand-alone organizations.
- A private cloud hosting solution resides on company's intranet or hosted data center where all of your data is protected behind a firewall.
- Private clouds are perfect for organizations that have high-security requirements, high management demands, and availability requirements.

Advantages: More flexibility, Improved security, High scalability

Public Cloud

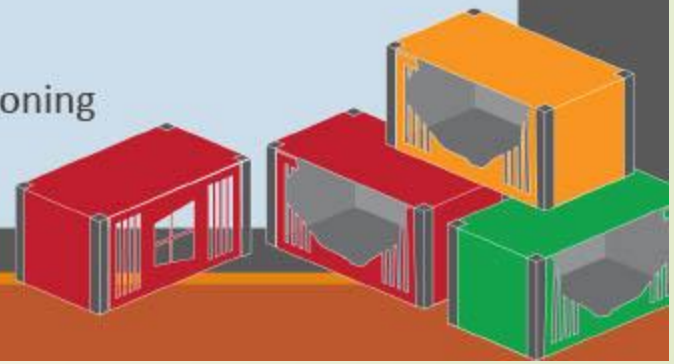
- ✓Services offered over the public Internet and available to anyone who wants to purchase them.
- ✓Infrastructure is shared by multiple businesses and owned and operated by a service provider, offering fast provisioning.
- ✓The cloud resources are owned and operated by a third-party cloud service provider and delivered over the Internet. Microsoft Azure is an example of a public cloud.

Advantages: Lower costs, No maintenance, Near-unlimited scalability, High reliability

Hybrid Cloud

- Often called "the best of both worlds", hybrid clouds combine on-premises infrastructure, or private clouds, with public clouds so organizations can reap the advantages of both.
- Connect dedicated servers, private and public clouds to tap the power of each and run workloads where they perform best.

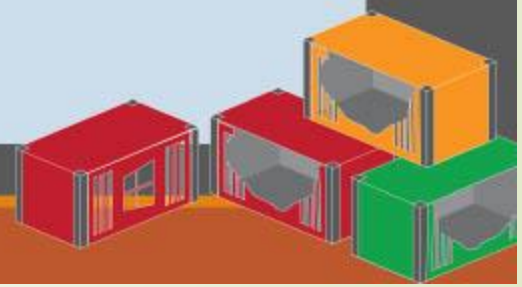
Advantages: Control, Flexibility, Cost-effectiveness, Ease—transitioning

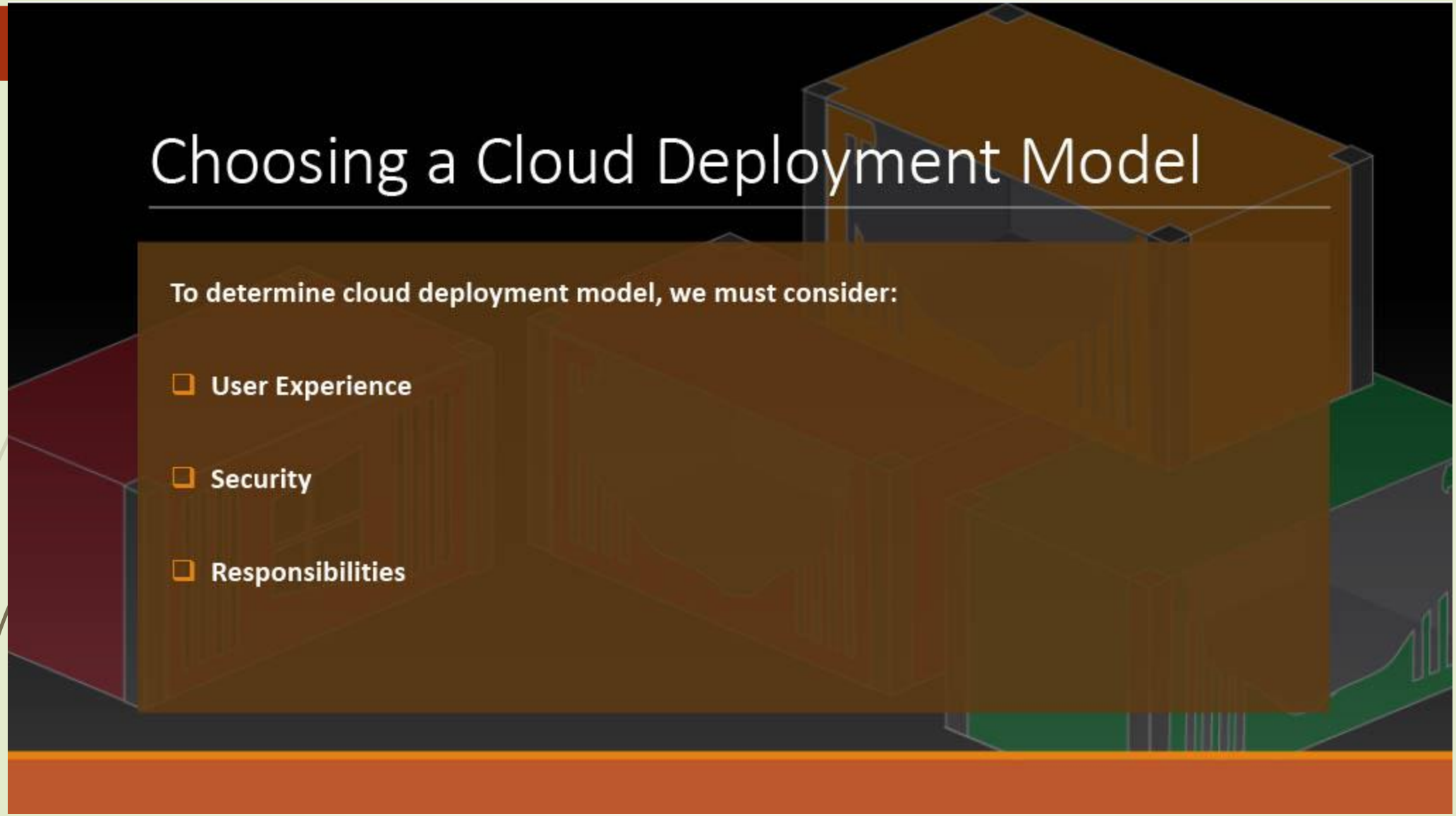


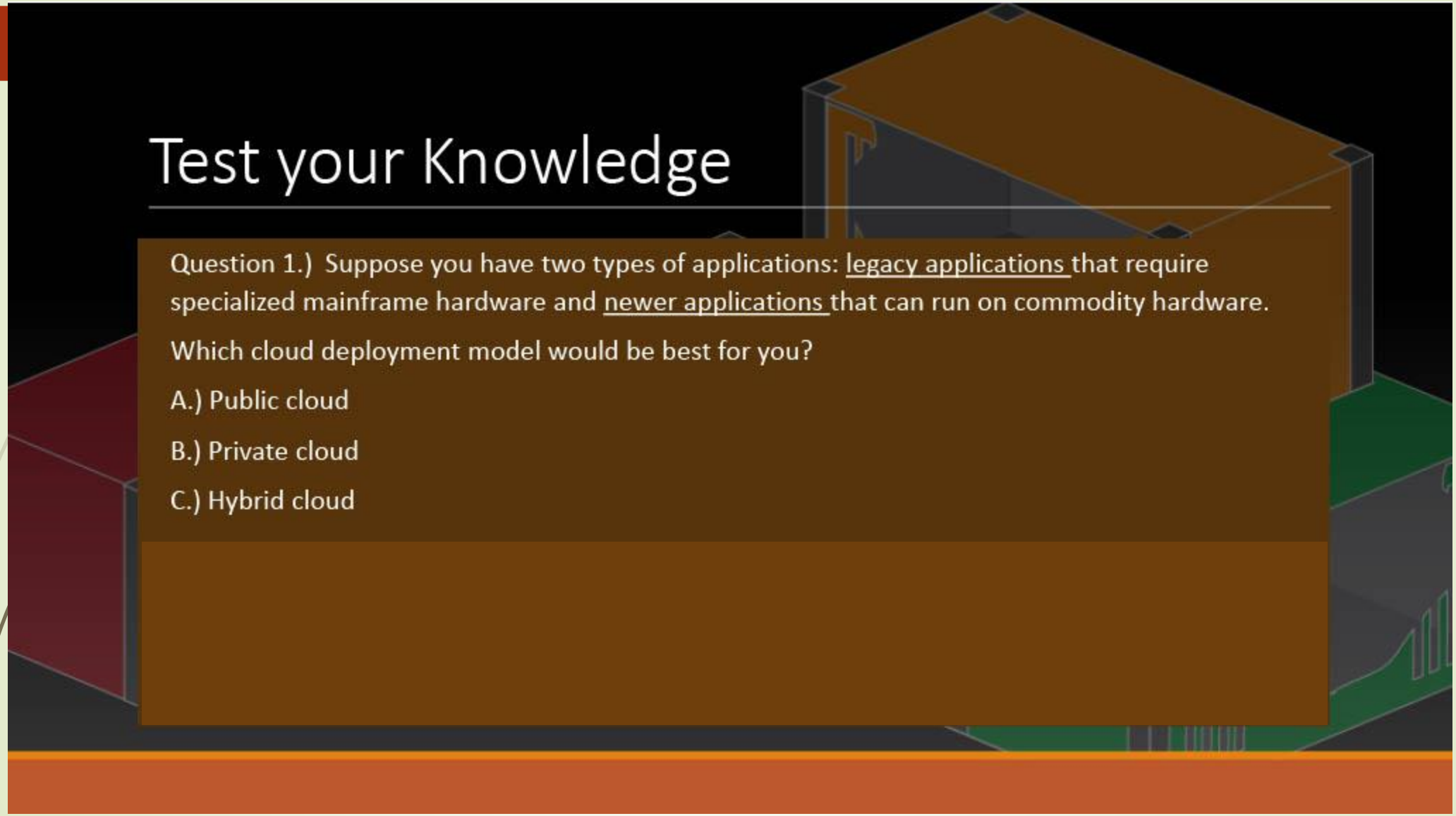
Community Cloud

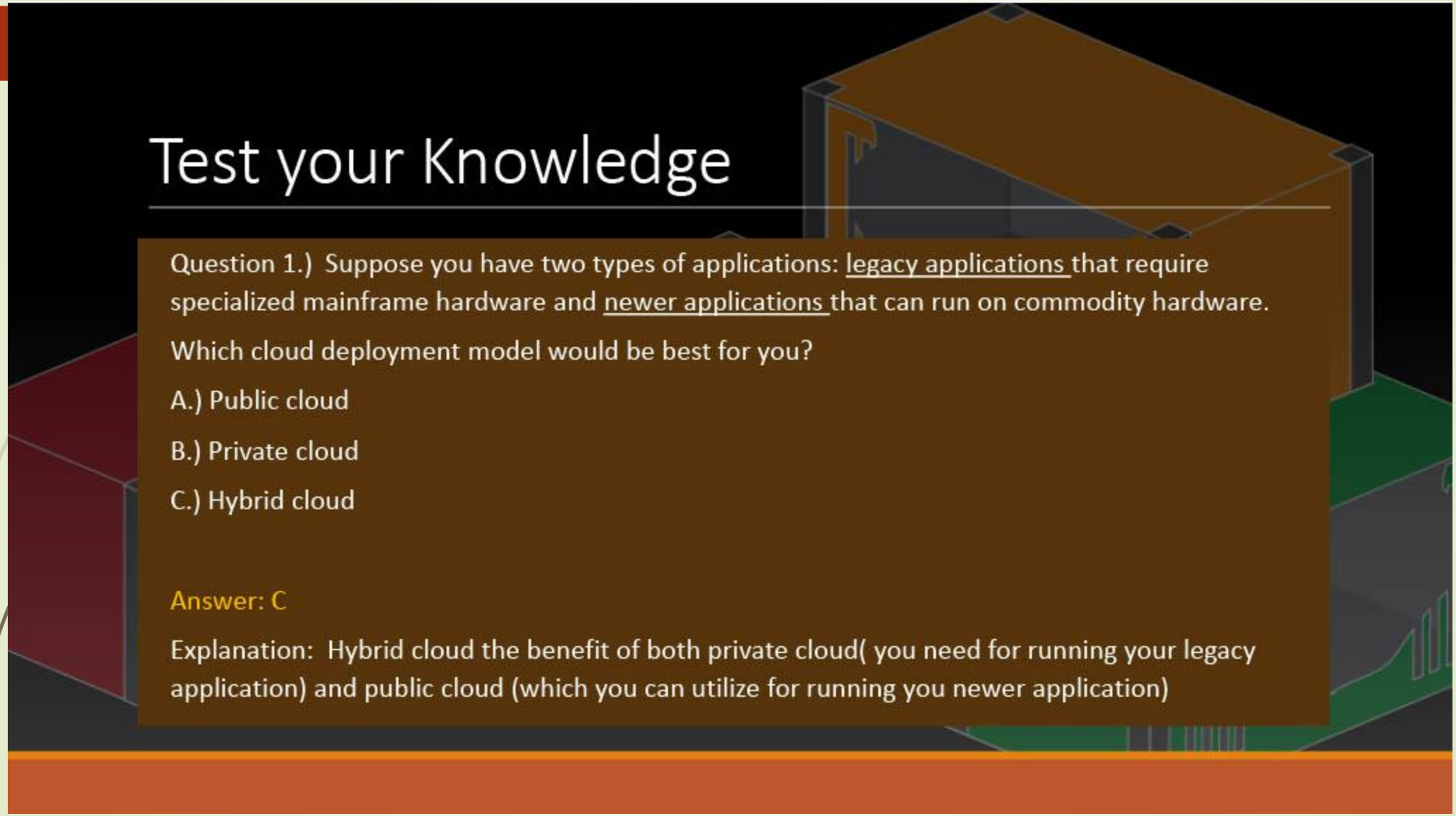
- It is a mutually shared model between organizations that belong to a particular community such as banks, government organizations, or commercial enterprises.

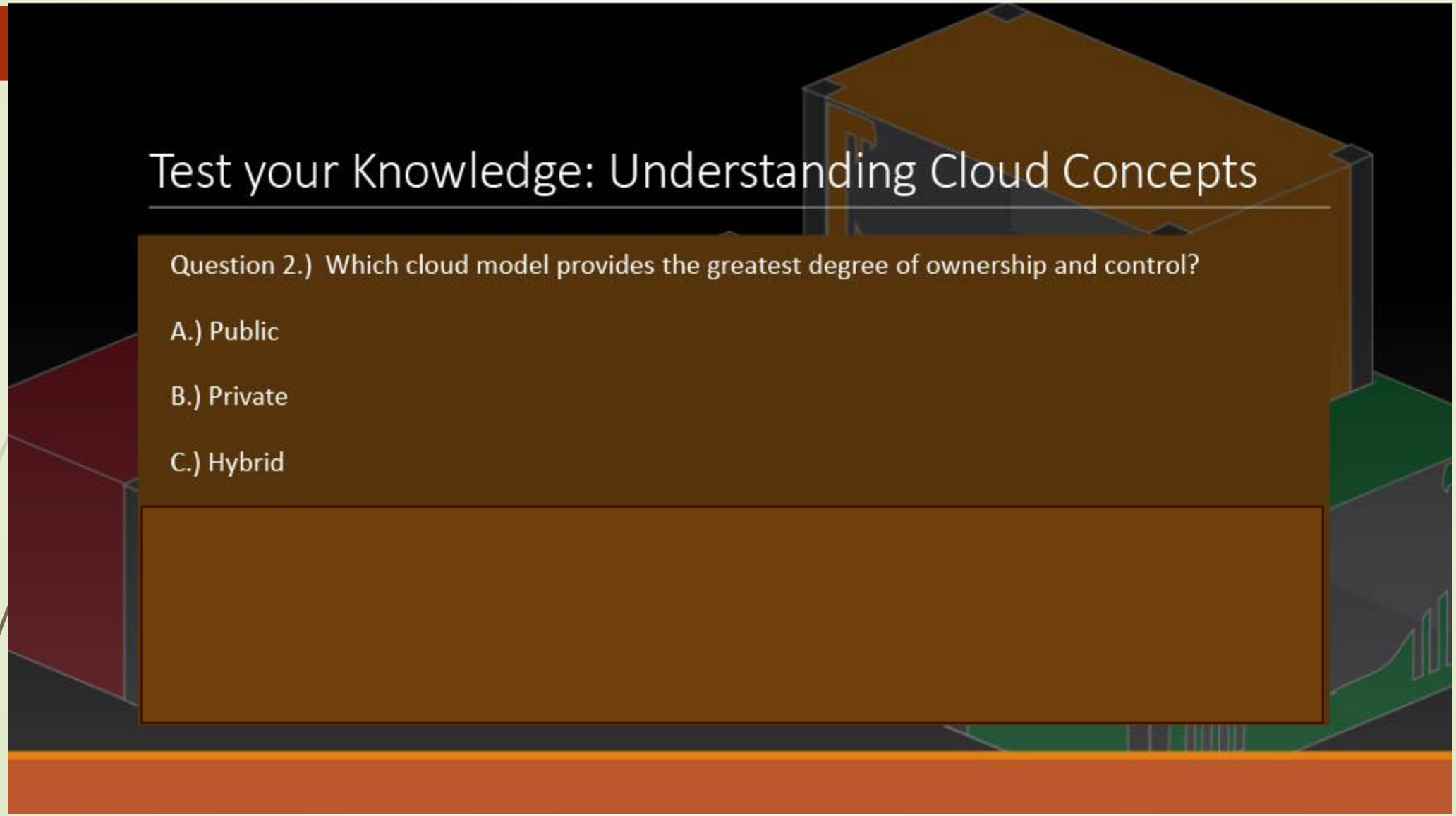
- Examples include universities cooperating in certain areas of research, or police departments within a county or state sharing computing resources..

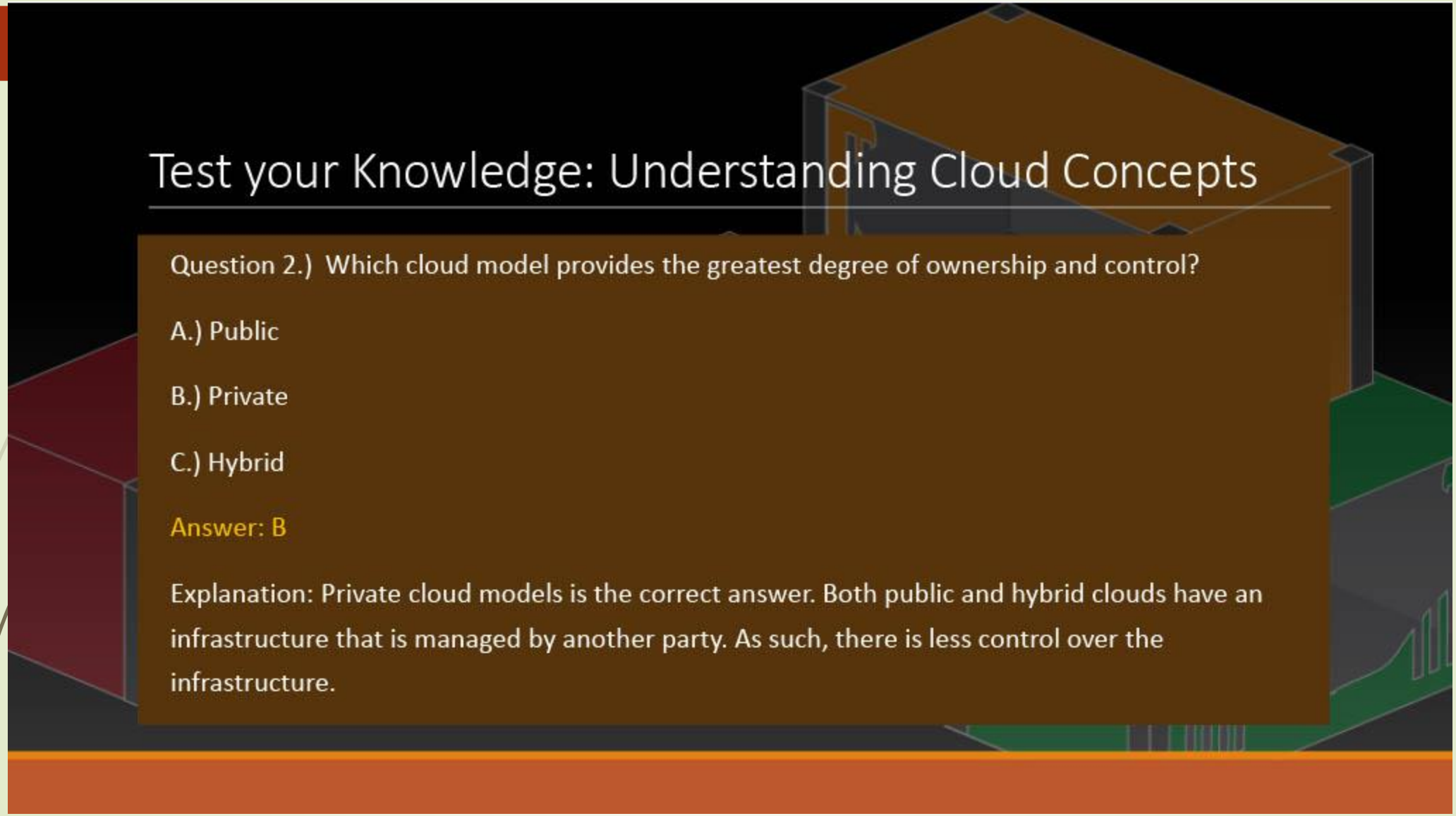



Choosing a Cloud Deployment Model
To determine cloud deployment model, we must consider:
User Experience
Security
Responsibilities


Test your Knowledge
Question 1.) Suppose you have two types of applications: legacy applications that require specialized mainframe hardware and newer applications that can run on commodity hardware.
Which cloud deployment model would be best for you?
A.) Public cloud
B.) Private cloud
C.) Hybrid cloud


Test your Knowledge
Question 1.) Suppose you have two types of applications: legacy applications that require specialized mainframe hardware and newer applications that can run on commodity hardware.
Which cloud deployment model would be best for you?
A.) Public cloud
B.) Private cloud
C.) Hybrid cloud
Answer: C
Explanation: Hybrid cloud the benefit of both private cloud(you need for running your legacy application) and public cloud (which you can utilize for running you newer application)

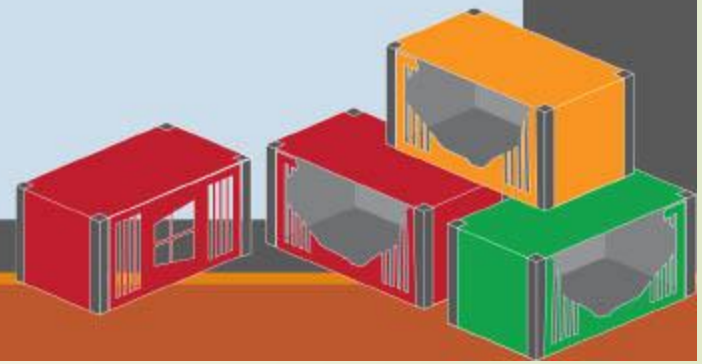

Test your Knowledge: Understanding Cloud Concepts
Question 2.) Which cloud model provides the greatest degree of ownership and control?
A.) Public
B.) Private
C.) Hybrid


Test your Knowledge: Understanding Cloud Concepts
Question 2.) Which cloud model provides the greatest degree of ownership and control?
A.) Public
B.) Private
C.) Hybrid
Answer: B
Explanation: Private cloud models is the correct answer. Both public and hybrid clouds have an infrastructure that is managed by another party. As such, there is less control over the infrastructure.

Cloud Computing Service Models vs Cloud Deployment Models

Types of Cloud Services

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)



Pizza as a service

Homemade

- Dining Table
- Soda
- Pizza pan
- Oven
- Pizza Dough
- Pizza Sauce
- Toppings
- Cheese

Take & Bake

- Dining Table
- Soda
- Pizza pan
- Oven
- Pizza Dough
- Pizza Sauce
- Toppings
- Cheese

Delivery

- Dining Table
- Soda
- Pizza pan
- Oven
- Pizza Dough
- Pizza Sauce
- Toppings
- Cheese

Dining Out

- Dining Table
- Soda
- Pizza pan
- Oven
- Pizza Dough
- Pizza Sauce
- Toppings
- Cheese

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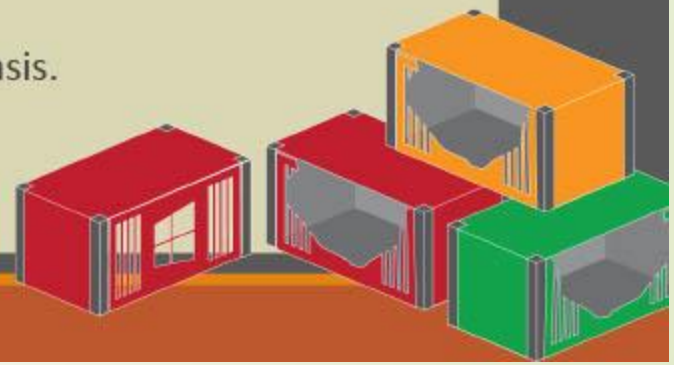
Types of Cloud Services

Infrastructure as a Service (IaaS)

IaaS is the lowest level of cloud solution

The cloud computing service provider such as Azure or AWS, manages the infrastructure, while you purchase, install, configure, and manage your own software—operating systems, middleware, and applications.

Example: Virtual Machines, Networks, and Storage etc. on rent basis.



Types of Cloud Services

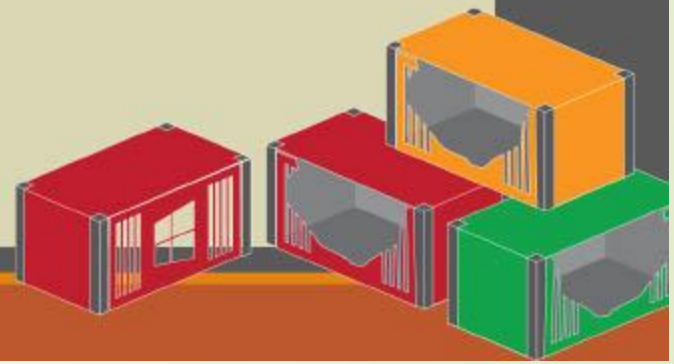
Platform as a Service (PaaS)

With PaaS, apart from simply providing infrastructure, providers also offer a computing platform and solution stack as a service.

This service is used in developing, testing and maintaining of software. PaaS is same as IaaS but also provides the additional tools like DBMS, BI services etc.

PaaS services are mostly used by companies that need to develop, test, collaborate and deploy cloud solutions for particular applications

Examples: Azure WebApps, Salesforce, Azure SQL database



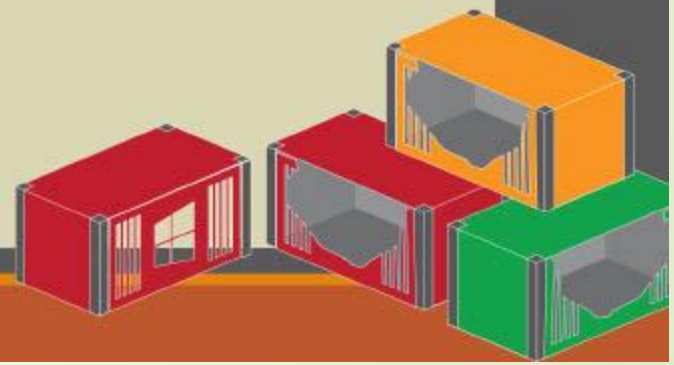
Types of Cloud Services

Software as a Service

SaaS providers provide fully functionally web-based applications on demand to customers. The applications are mainly targeted at business users and can include web conferencing, ERP, CRM, email, time management, project tracking among others.

This service makes the users connect to the applications through the Internet on a subscription basis.

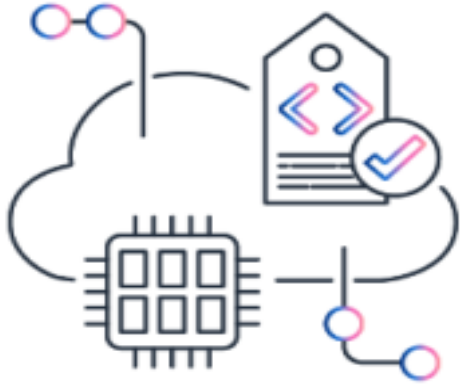
Example: Office365 , Google Applications, Salesforce, Citrix



Cloud computing models (1 of 2)

There are three main models for cloud computing. Each model represents a different part of the cloud computing stack.

Infrastructure as a Service (IaaS)
Amazon Web Services



Platform as a Service (PaaS)
AWS Elastic Beanstalk, SAP Cloud

Software as a Service (SaaS)
Dropbox, Slack, Salesforce

Cloud computing models (2 of 2)

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

aws

Cloud Computing Service

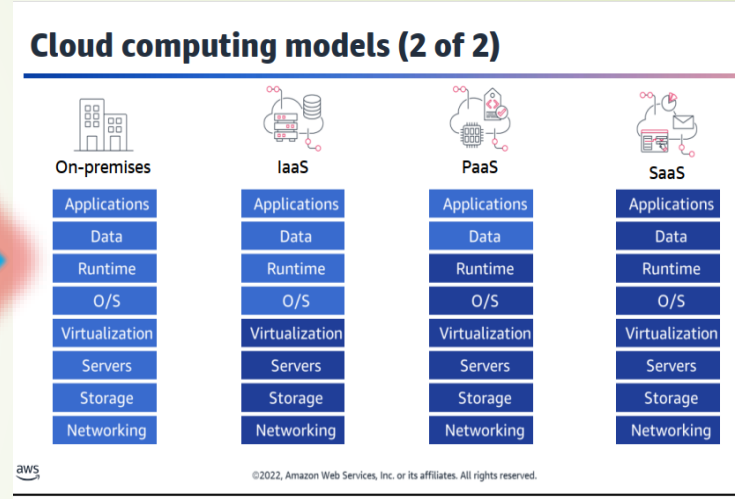
Computing models help us to define what responsibilities the company administrators are responsible and what a service provider will be responsible for.

In an **on-premises deployment** the administrator is responsible for everything.

In an **IaaS deployment** the administrator is responsible for the application, data, runtime, and operating system. The service provider is responsible for the virtualization, servers, storage, and networking.

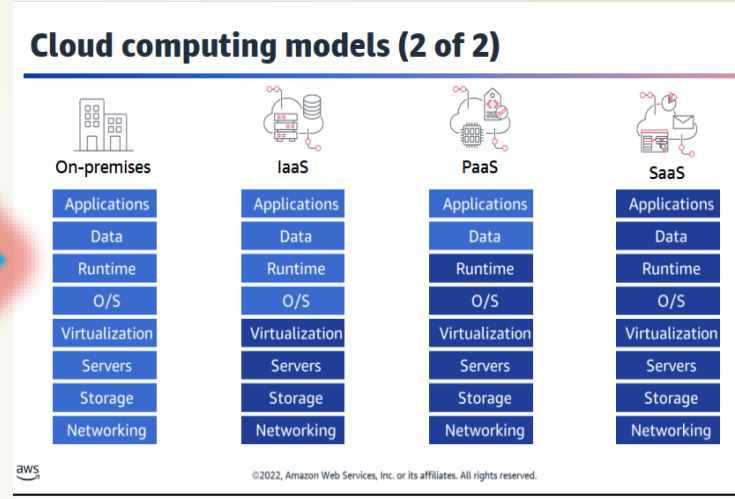
In a **PaaS deployment** the administrator is only responsible for the application and data. The service provider is responsible for everything else.

In a **SaaS deployment** the administrator is no responsible for anything other that the internal application management. The service provider is responsible for everything else.



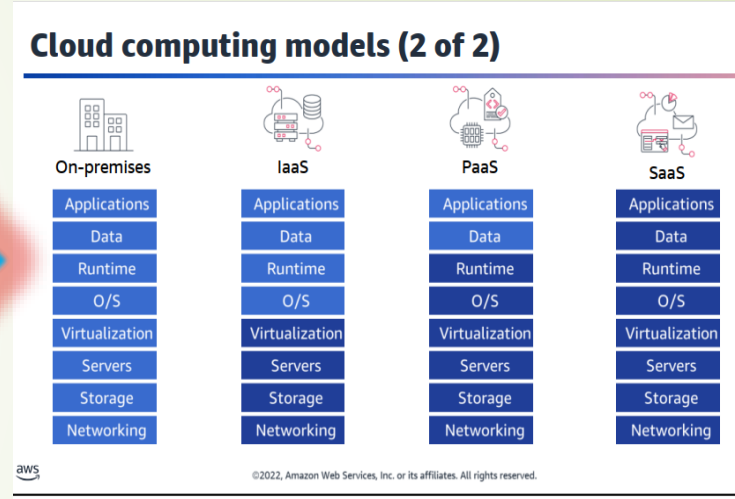
IaaS deployment Ex.:

Microsoft Azure IaaS, Amazon EC2, Google Compute Cloud (GCP), and Rackspace,S3,Load Balancers, Network Flexiscale, GoGrid, Joyent, ARSyS



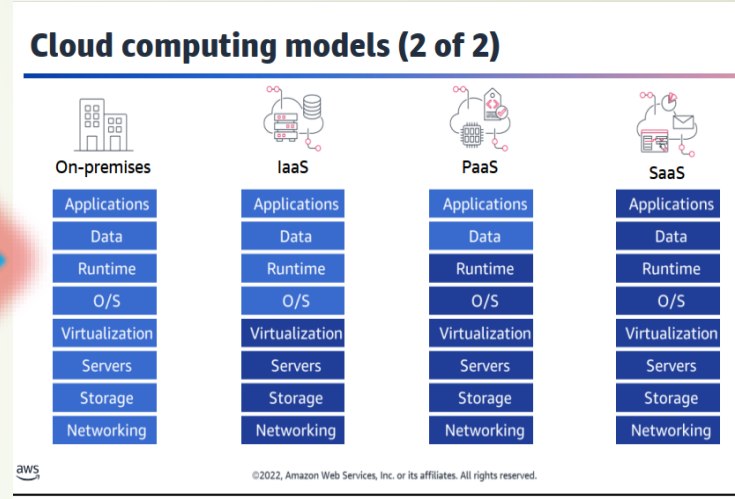
PaaS deployment Ex.:

Docker containers-as-a-service (CaaS) Amazon RDS, WebApps (WebServers), Heroku, Force.com and Google App Engine. AWS Elastic Beanstalk, Windows Azure, Heroku, Apache Stratos, OpenShift, Development tools, SQS, Azure SQL, Aneka, Amazon Elastic MapReduce, CloudFoundry

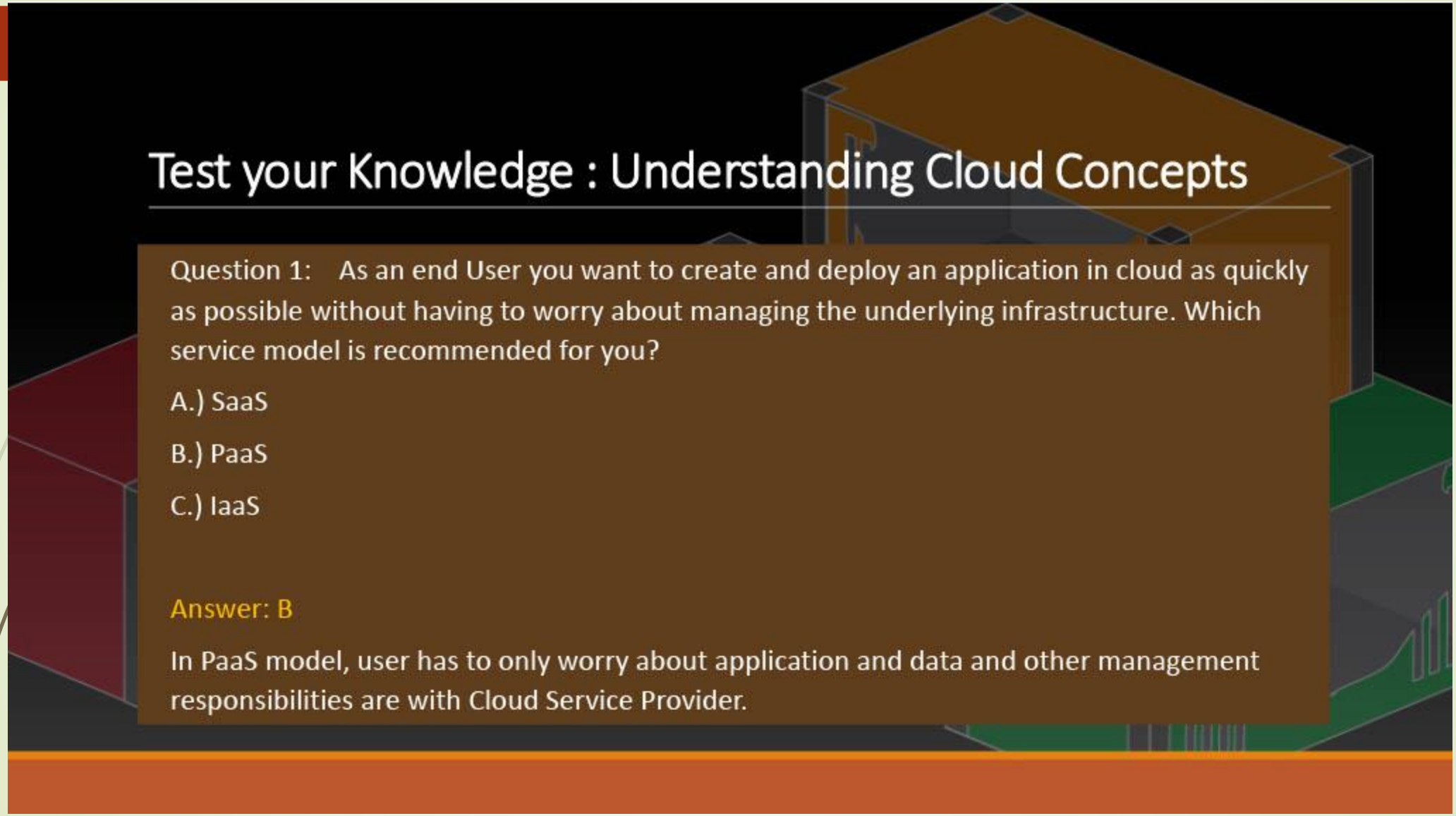


SaaS deployment Ex.:

Google Apps, Microsoft Office 365, and Salesforce, Google Workspace, Dropbox, Salesforce, Cisco WebEx, SAP Concur, GoToMeeting, online mail, project-management systems, CRMs, and social media platforms, ERP, Symantec online backup, Zoho, Smartsheet, NetSuite




Test your Knowledge : Understanding Cloud Concepts
Question 1: As an end User you want to create and deploy an application in cloud as quickly as possible without having to worry about managing the underlying infrastructure. Which service model is recommended for you?
A.) SaaS
B.) PaaS
C.) IaaS


Test your Knowledge : Understanding Cloud Concepts
Question 1: As an end User you want to create and deploy an application in cloud as quickly as possible without having to worry about managing the underlying infrastructure. Which service model is recommended for you?
A.) SaaS
B.) PaaS
C.) IaaS
Answer: B
In PaaS model, user has to only worry about application and data and other management responsibilities are with Cloud Service Provider.


Test your Knowledge : Understanding Cloud Concepts
Question 2: You are an IT company providing a supply chain software solution which is a multi tier application and has very complex architecture. You want to be able to quickly migrate your solution to public cloud. Which Service Model is ideal for your needs:
A.) SaaS
B.) PaaS
C.) IaaS

Test your Knowledge : Understanding Cloud Concepts

Question 2: You are an IT company providing a supply chain software solution which is a multi tier application and has very complex architecture. You want to be able to quickly migrate your solution to public cloud. Which Service Model is ideal for your needs:

A.) SaaS

B.) PaaS

C.) IaaS

Answer: C

Explanation: IaaS will provides maximum flexibility and control among other service model to deploy your application quickly(lift and shift migration)

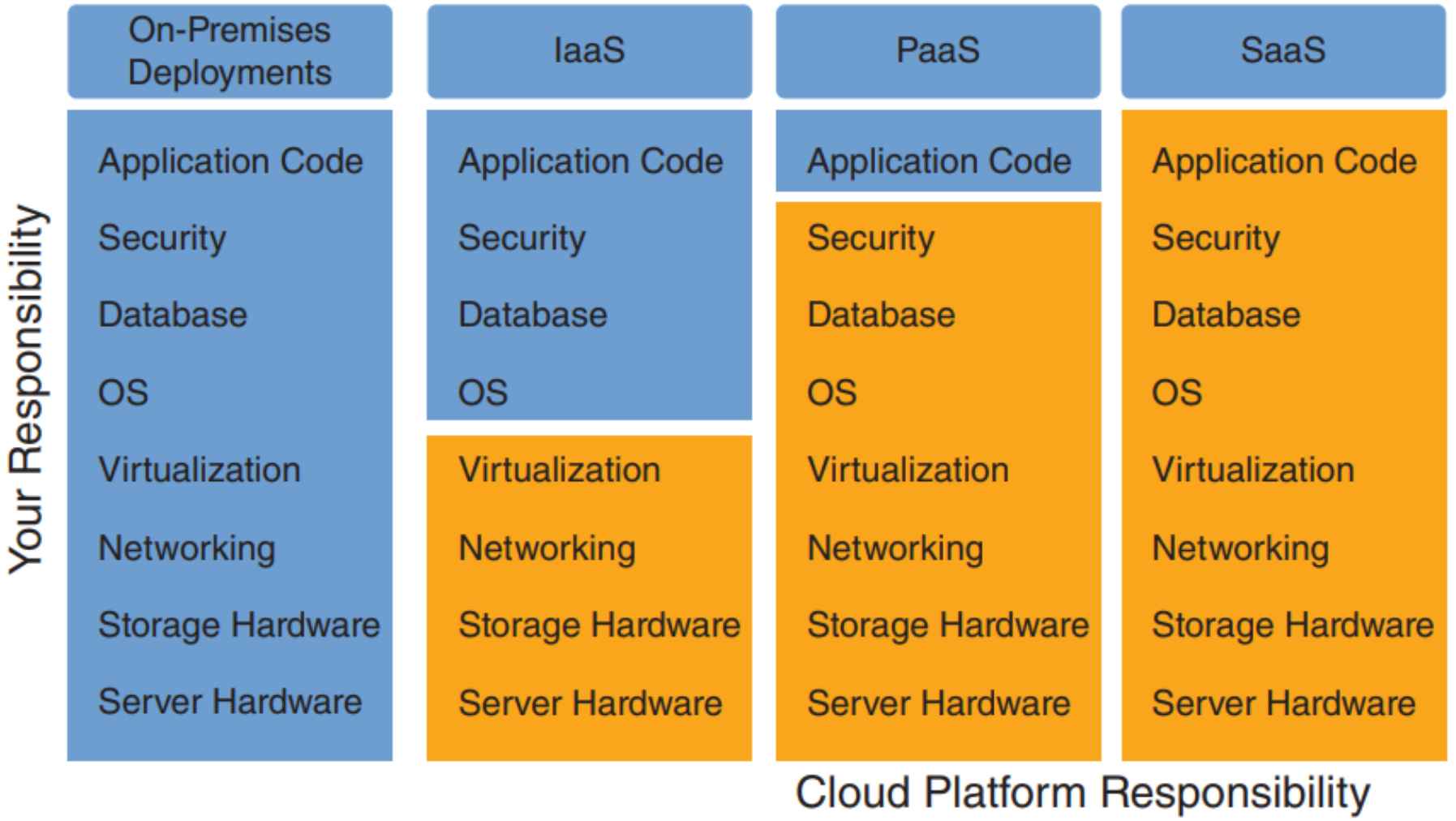
Cloud computing summary

Cloud computing provides a modern alternative to the traditional on-premises datacenter. Public cloud vendors provide and manage all computing infrastructure and the underlying management software.

These vendors provide a wide variety of cloud services. A cloud service in this case might be a virtual machine, a web server, or cloud-hosted database engine. As a cloud provider customer, you lease these cloud services on an as-needed basis.

In doing so, you convert the capital expense of hardware maintenance into an operational expense

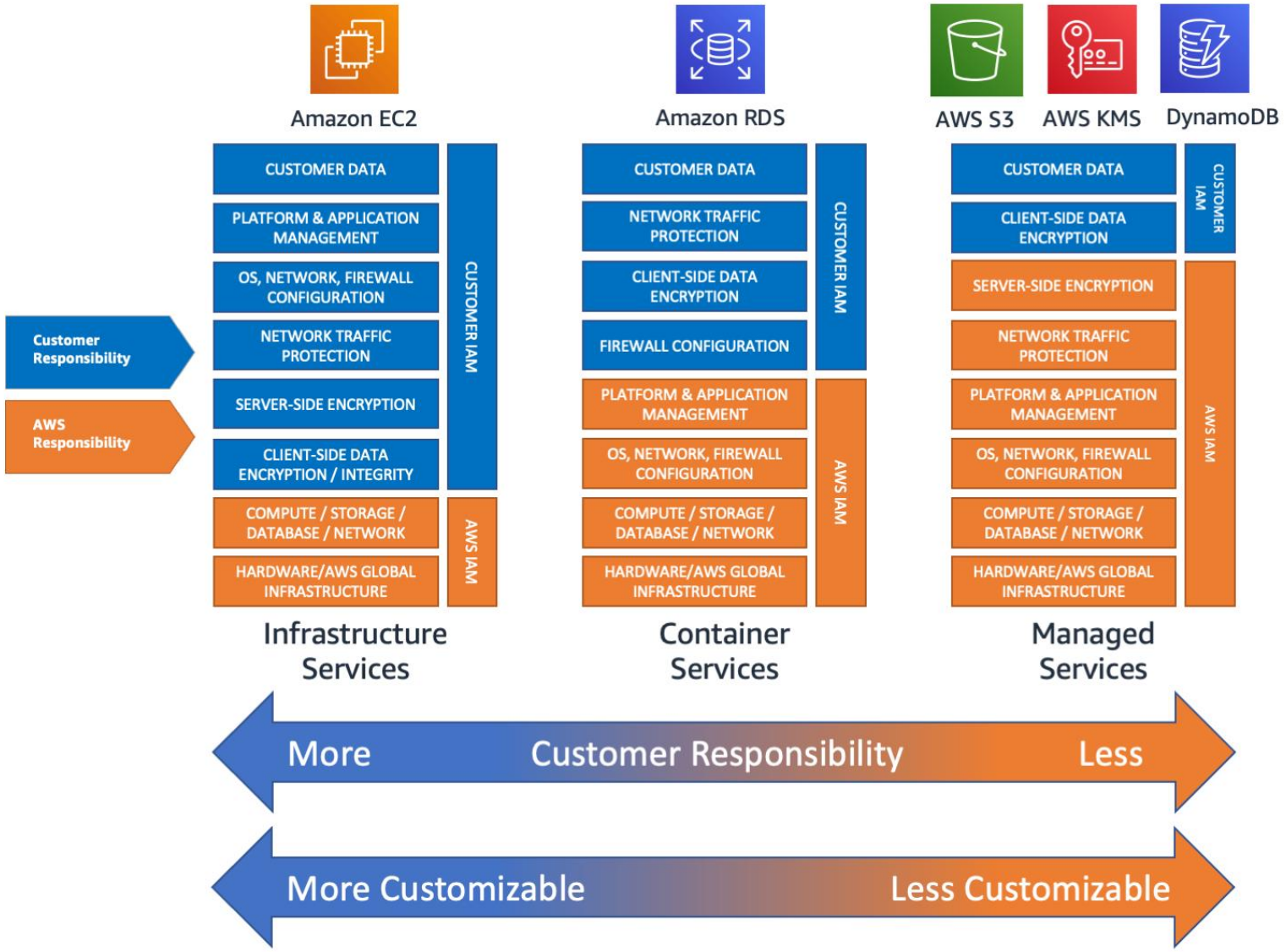
Cloud Computing Service



Cloud Computing Service

Layer	Infrastructure as a Service (IaaS)	Platform as a Service (PaaS)	Software as a Service (SaaS)
Data	Customer responsibility	Customer responsibility	Customer responsibility
Application	Customer responsibility	Customer responsibility	Cloud provider responsibility
Operating system	Customer responsibility	Cloud provider responsibility	Cloud provider responsibility
Virtualization	Cloud provider responsibility	Cloud provider responsibility	Cloud provider responsibility
Servers	Cloud provider responsibility	Cloud provider responsibility	Cloud provider responsibility
Storage	Cloud provider responsibility	Cloud provider responsibility	Cloud provider responsibility
Network	Cloud provider responsibility	Cloud provider responsibility	Cloud provider responsibility
Physical	Cloud provider responsibility	Cloud provider responsibility	Cloud provider responsibility

https://aws.amazon.com/ar/blogs/industries/applying-the-aws-shared-responsibility-model-to-your-gxp-solution/


Amazon EC2
Amazon RDS
AWS S3
AWS KMS
DynamoDB
Customer Responsibility
AWS Responsibility
CUSTOMER DATA
PLATFORM & APPLICATION MANAGEMENT
OS, NETWORK, FIREWALL CONFIGURATION
NETWORK TRAFFIC PROTECTION
SERVER-SIDE ENCRYPTION
CLIENT-SIDE DATA ENCRYPTION / INTEGRITY
COMPUTE / STORAGE / DATABASE / NETWORK
HARDWARE/AWS GLOBAL INFRASTRUCTURE
CUSTOMER IAM
AWS IAM
CUSTOMER DATA
NETWORK TRAFFIC PROTECTION
CLIENT-SIDE DATA ENCRYPTION
FIREWALL CONFIGURATION
PLATFORM & APPLICATION MANAGEMENT
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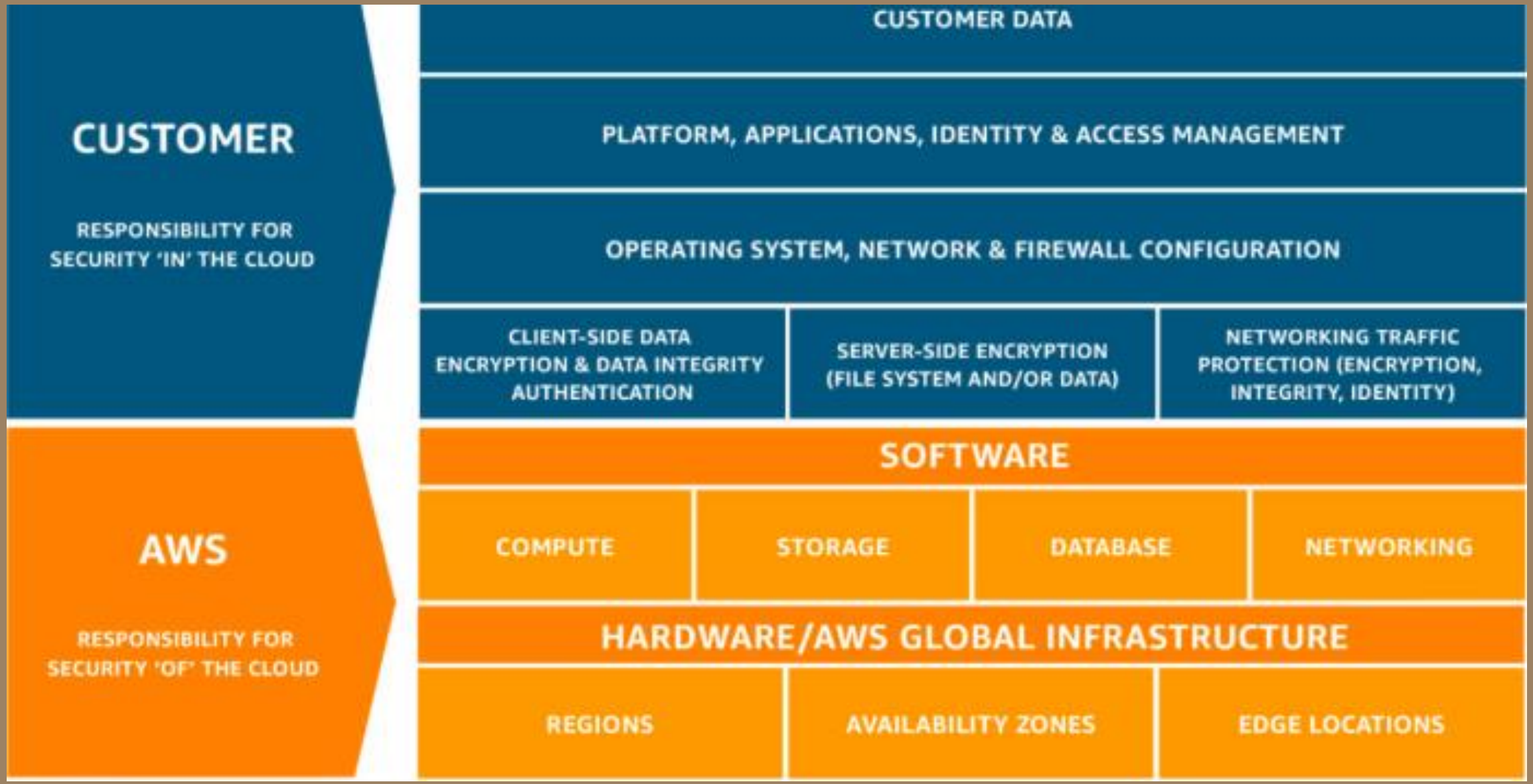
OS, NETWORK, FIREWALL CONFIGURATION
COMPUTE / STORAGE / DATABASE / NETWORK
HARDWARE/AWS GLOBAL INFRASTRUCTURE
CUSTOMER IAM
AWS IAM
Infrastructure Services
Container Services
Managed Services
More
Customer Responsibility
Less
More Customizable
Less Customizable


CUSTOMER
RESPONSIBILITY FOR SECURITY 'IN' THE CLOUD
CUSTOMER DATA
PLATFORM, APPLICATIONS, IDENTITY & ACCESS MANAGEMENT
OPERATING SYSTEM, NETWORK & FIREWALL CONFIGURATION
CLIENT-SIDE DATA ENCRYPTION & DATA INTEGRITY AUTHENTICATION
SERVER-SIDE ENCRYPTION (FILE SYSTEM AND/OR DATA)
NETWORKING TRAFFIC PROTECTION (ENCRYPTION, INTEGRITY, IDENTITY)
AWS
RESPONSIBILITY FOR SECURITY 'OF' THE CLOUD
SOFTWARE
COMPUTE
STORAGE
DATABASE
NETWORKING
HARDWARE/AWS GLOBAL INFRASTRUCTURE
REGIONS
AVAILABILITY ZONES
EDGE LOCATIONS

Customers are responsible for the security of everything that they create and put in the AWS Cloud.

AWS is responsible for security of the cloud.

AWS operates, manages, and controls the components at all layers of infrastructure. This includes areas such as

the host operating system, the virtualization layer, and even the physical security of the data centers from which

services operate

تعد **Amazon Web Services (AWS)** منصة سحابية شهيرة توفر مجموعة واسعة من الخدمات السحابية للشركات والأفراد. وتشمل الخدمات التي توفرها **AWS** الحوسبة السحابية، وخدمات التخزين السحابي، وخدمات قواعد البيانات، وخدمات الشبكات، وخدمات الأمان السحابي، وغيرها الكثير. وتتميز **AWS** بالمرونة والتوفير الكبير في التكاليف والتشغيل السريع والسهل.

خدمات التخزين السحابي:

توفر AWS خدمات تخزين البيانات السحابية، بما في ذلك Amazon S3 و Amazon Glacier و Amazon EFS و Amazon EBS و Amazon FSx وغيرها. وتتيح هذه الخدمات تخزين البيانات بأمان وسهولة وفي مواقع متعددة، كما تتضمن خيارات النسخ الاحتياطي واستعادة البيانات.

خدمات قواعد البيانات:

توفر AWS خدمات قواعد البيانات السحابية، بما في ذلك Amazon RDS و Amazon DynamoDB و Amazon Redshift و Amazon Aurora وغيرها. وتتيح هذه الخدمات إدارة البيانات بسهولة وفعالية، وتوفر الأدوات اللازمة للتكوين والتحسين والمراقبة.

خدمات الشبكات:

توفر AWS خدمات شبكات سحابية تتضمن Amazon VPC و AWS Direct Connect و Amazon Route 53 و CloudFront، والتي تتيح إدارة الشبكات الافتراضية بسهولة وتوفر الأدوات اللازمة لتوزيع المحتوى وتحسين الأداء.

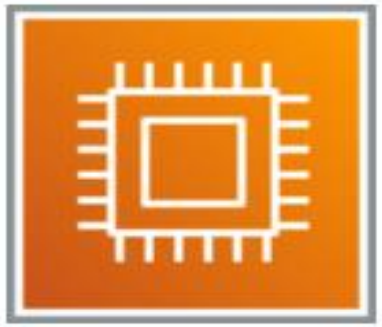
خدمات الأمان السحابي:

توفر AWSخدمات الأمان السحابي، بما في ذلك AWS Identity and Access Management وAWS Key Management Service وAmazon Guard Duty وAWS WAF وAmazon Inspector وCloudTrail، والتي تتيح إدارة الوصول والتحكم في البيانات والكشف عن التهديدات والتحقق من الامتثال.

إضافة إلى ذلك، توفر **AWS** خدمات أخرى مثل خدمات الذكاء الاصطناعي والحوسبة الكمية والأدوات التحليلية، والتي تتيح للشركات والأفراد استخدام التقنيات الحديثة للتحليل والتعلم الآلي والتحسين المستمر.

*يمكن القول إن **AWS** هي منصة سحابية شاملة وشهيرة وتوفر العديد من الخدمات السحابية المتطورة، والتي يمكن استخدامها لتلبية متطلبات الشركات والمؤسسات والأفراد في مختلف المجالات. ومن المهم الإشارة إلى أن **AWS** توفر العديد من الأدوات والموارد التعليمية المجانية على موقعها الرسمي، مما يجعل من السهل بدء العمل مع هذه الخدمات*

AWS core service categories



Compute

Network and Content Delivery

Storage

Database

Security, Identity, and Compliance

Management and Governance

aws

17

AWS Cloud Services

Amazon EC2 – Compute

AWS Lambda – Compute

Amazon RDS – Database

Amazon DynamoDB – Database

Amazon CloudWatch – Monitoring

Amazon CloudFormation – Deployment

AWS IAM – Security

Amazon S3 – Storage

aws

Thank You

EC2: The AWS Compute Service

Have you ever considered working from any place in the world, whether it is your home or another location? Isn't it fascinating? It is feasible with Amazon EC2. You can work from your home or any other location while maintaining a secure and safe IT environment. You do not have to be concerned about the hardware system or manage anything.

Cloud Computing Service

AWS provides a broad range of services in areas such as compute, storage, database, migration, network, management tools, media services, security, business productivity, application integration, machine learning, game creation, and more. EC2 is included in the compute capacity category.

In this article, we will dive deeper into what the AWS EC2 service is all about.

What is EC2: The AWS Compute Service?

Amazon EC2 or Amazon Elastic Compute Cloud is a web service that seeks to make developers' lives easier by providing secure and scalable cloud computing resources. In general terms, EC2 allows users to rent virtual computers that are known as virtual machines on which they can execute their computer applications.

Rather than purchasing and connecting your own hardware, Amazon provides you with practically unlimited virtual machines on which you can execute your apps while they handle the hardware.

It is effortless to scale up and down our infrastructure based on demand using EC2. This service can be linked easily with practically all of Amazon's services, and the most significant part may be that we only pay for what we use .

Benefits of EC2:

Below are a few of the advantages of using EC2:

1. **AWS EC2 does not require any hardware components, hardware management, or physical hardware provisioning.**
2. **It is quite simple to scale up and down our infrastructure in response to demand.**
3. **The EC2 service works well with practically all of Amazon's services.**
4. **We do not have to commit upfront, and we only pay for what we have used.**
5. **It can be accessed from any location in the world like any other cloud service.**
6. **Users can have complete control from their end.**
7. **It provides a wide range of operating systems to choose from.**
8. **It speeds up the deployment of new servers.**

Features of Amazon EC2:

Functionality – EC2 provides its users a true virtual computing platform, where they can use various operations and even launch another EC2 instance from this virtually created environment. This will increase the security of the virtual devices. Not only creating but also EC2 allows us to customize our environment as per our requirements, at any point of time during the life span of the virtual machine.

Features of Amazon EC2:

Amazon EC2 itself comes with a set of default AMI(Amazon Machine Image) options supporting various operating systems along with some pre-configured resources like RAM, ROM, storage, etc. Besides these AMI options, we can also create an AMI curated

Features of Amazon EC2:

Operating Systems – Amazon EC2 includes a wide range of operating systems to choose from while selecting your AMI. Not only these selected options, but users are also even given the privileges to upload their own operating systems and opt for that while selecting AMI during launching an EC2 instance. Currently, AWS has the following most preferred set of operating systems available on the EC2 console.

Cloud Computing Service

Features of Amazon EC2:

Software AWS Marketplace

Components of EC2: The AWS Compute Service

Virtual Private Clouds (VPCs): They are virtual networks that you can create that are conceptually isolated from the other part of the AWS cloud and can optionally connect to your own network.

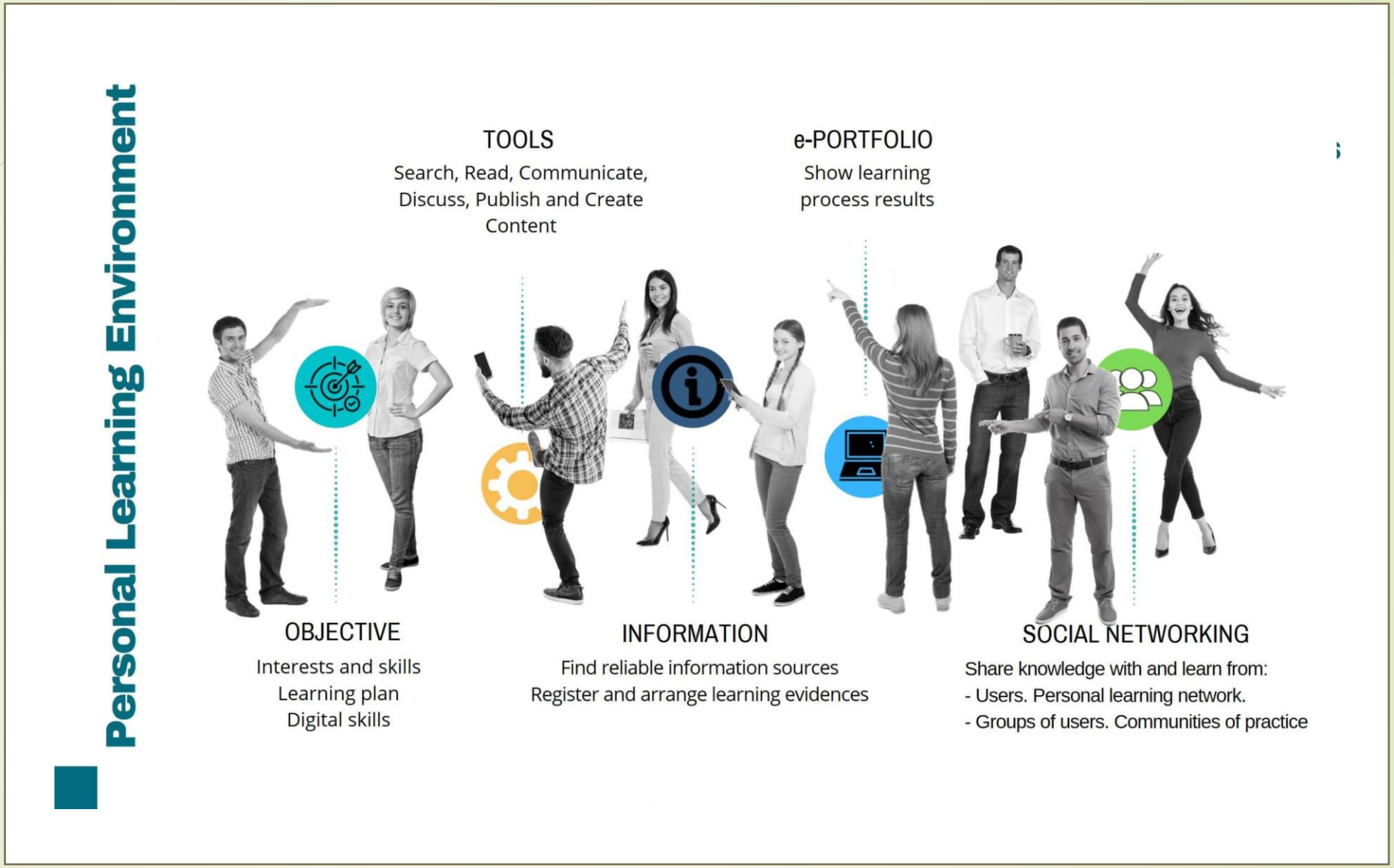
Instances: They are virtual computing environments.

Amazon Machine Images (AMIs): They are the set of pre-configured templates for your instances that bundle the components you will need for your server.

Amazon EBS volumes: They are Amazon Elastic Block Store-based persistent storage volumes for your data.

Instance types: They are the numerous CPU, memory, storage, and networking configurations for your instances.

Cloud Computing Service



S3

AWS Simple Storage Service (S3): From the aforementioned list, S3, is the object storage service provided by AWS. It is probably the most commonly used, go-to storage service for AWS users given the features like extremely high availability, security, and simple connection to other AWS Services. AWS S3 can be used by people with all kinds of use cases like mobile/web applications, big data, machine learning and many more.

S3

AWS S3 Terminology:

Bucket: Data, in S3, is stored in containers called buckets.

Each bucket will have its own set of policies and configuration. This enables users to have more control over their data.

S3

Bucket Names must be unique.

Can be thought of as a parent folder of data.

There is a limit of 100 buckets per AWS accounts. But it can be increased if requested from AWS support.

S3

Bucket Owner: The person or organization that owns a particular bucket is its bucket owner.

S3

Versioning: Versioning means to always keep a record of previously uploaded files in S3. Points to note:

Versioning is not enabled by default. Once enabled, it is enabled for all objects in a bucket.

S3

Versioning keeps all the copies of your file, so, it adds cost for storing multiple copies of your data. For example, 10 copies of a file of size 1GB will have you charged for using 10GBs for S3 space.

S3

Versioning is helpful to prevent unintended overwrites and deletions.

Note that objects with the same key can be stored in a bucket if versioning is enabled (since they have a unique version ID).

S3

Object: Fundamental entity type stored in AWS S3.

S3

Access Control Lists (ACL): A document for verifying the access to S3 buckets from outside your AWS account. Each bucket has its own ACL.

S3

Bucket Policies: A document for verifying the access to S3 buckets from within your AWS account, this controls which services and users have what kind of access to your S3 bucket. Each bucket has its own Bucket Policies.

S3

Features of AWS S3:

Durability: AWS claims Amazon S3 to have a 99.999999999% of durability (11 9's). This means the possibility of losing your data stored on S3 is one in a billion.

S3

Availability: AWS ensures that the up-time of AWS S3 is 99.99% for standard access.

Note that availability is related to being able to access data and durability is related to losing data altogether.

S3

File Size support: AWS S3 can hold files of size ranging from 0 bytes to 5 terabytes. A 5TB limit on file size should not be a blocker for most of the applications in the world.

S3

Infinite storage space: Theoretically AWS S3 is supposed to have infinite storage space. This makes S3 infinitely scalable for all kinds of use cases.

S3

Pay as you use: The users are charged according to the S3 storage they hold.

S3

AWS-S3 is region-specific.

S3

S3 Glacier:

S3 Glacier is a durable, secure, and extremely low-cost S3 storage class for data archiving and long-term backup. S3 glacier provides the facility of storing the archived data and you don't need to think about the administrative burden such as capacity planning, health checks of drives, recovery planning, etc.

S3

Benefits:

In five simple and easy steps you have learned how to host your static website out of AWS S3. Not to mention you scored some benefits from moving your static website to S3.

S3

Benefits:

Low cost — Hosting a website in S3 does not incur extra charges. You are paying standard S3 prices on GET requests and Data Transfer out of the bucket when a user visits your site.

S3

Benefits:

Low cost — Hosting a website in S3 does not incur extra charges. You are paying standard S3 prices on GET requests and Data Transfer out of the bucket when a user visits your site.

GET Requests cost $0.004 per 10,000 requests

Data Transfer Out cost $0.090 per GB (up to 10 TB / month)

S3

Benefits:

A Cost breakdown example: Let's say that www.my-awesome-site.com loads 20 resources. The total size of those resources per visit is 1MB. The average total monthly visits is 20,000. Then we estimate the total cost of S3 on a monthly basis at around $1.96 per month.

Not long ago, you paid $10/month, so $2 is worth it.

S3

Benefits:

Maintenance — Your static website now resides in S3. There is no longer any server side code to maintain and no web servers to configure and keep up to date.

S3

Benefits:

Scale — S3 is a high availability and durable service that AWS maintains. If your website goes from 10 users a day to 10 million, S3 scales your website automatically.

S3

Benefits:

Security — There is no server running that you maintain. Thus you avoid making configuration errors that make you vulnerable to attacks. You are still responsible for the security of your bucket.

Thank You

IAM

Identity and Access Management (IAM)

is a combination of policies and technologies that allows organizations to identify users and provide the right form of access as and when required

IAM

Components of IAM

- Users
- Roles
- Groups
- Policies

IAM

Components of IAM

- Users
- Roles
- Groups
- Policies

Thank You