



Pantech e Learning  
DIGITAL LEARNING SIMPLIFIED

# Amazon Web Services

## MLOps with AWS

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### Masterclass





Pantech e Learning  
DIGITAL LEARNING SIMPLIFIED

VISION MISSION

Help 10 Million Students  
to Learn the Technology  
in Easy Way





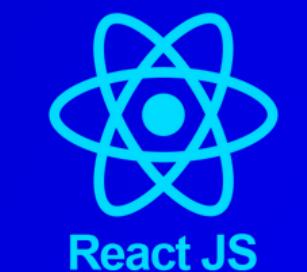
**Pantech e Learning**  
DIGITAL LEARNING SIMPLIFIED

- Python Programming
- Advanced Python Programming
- Python Full Stack
- Machine Learning
- Artificial Intelligence
- Data Science
- Java Programming
- Java Full Stack
- React JS
- Web Development Full Stack

@AWS MASTERCLASS

**MASTERCLASS**

**30 DAYS ON LEARNING**



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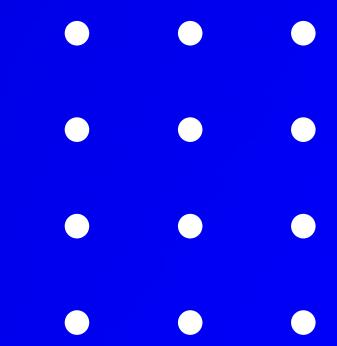
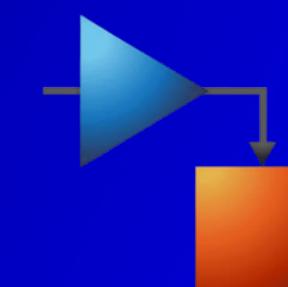
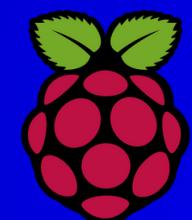
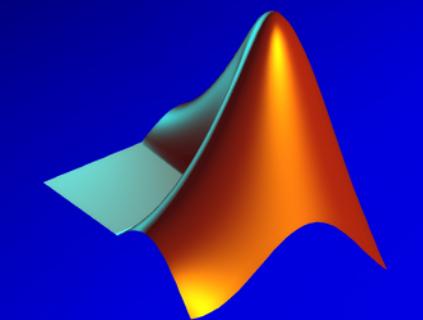


Pantech e Learning  
DIGITAL LEARNING SIMPLIFIED

- Embedded Systems
- IoT using Raspberry Pi
- Computer Vision ( Open CV )
- Image Processing - MATLAB
- Artificial Intelligence - MATLAB
- MATLAB Simulink
- EV Design using MATLAB
- Renewable Energy Design

MASTERCLASS

30 DAYS ON LEARNING



# Machine Learning Operations with AWS

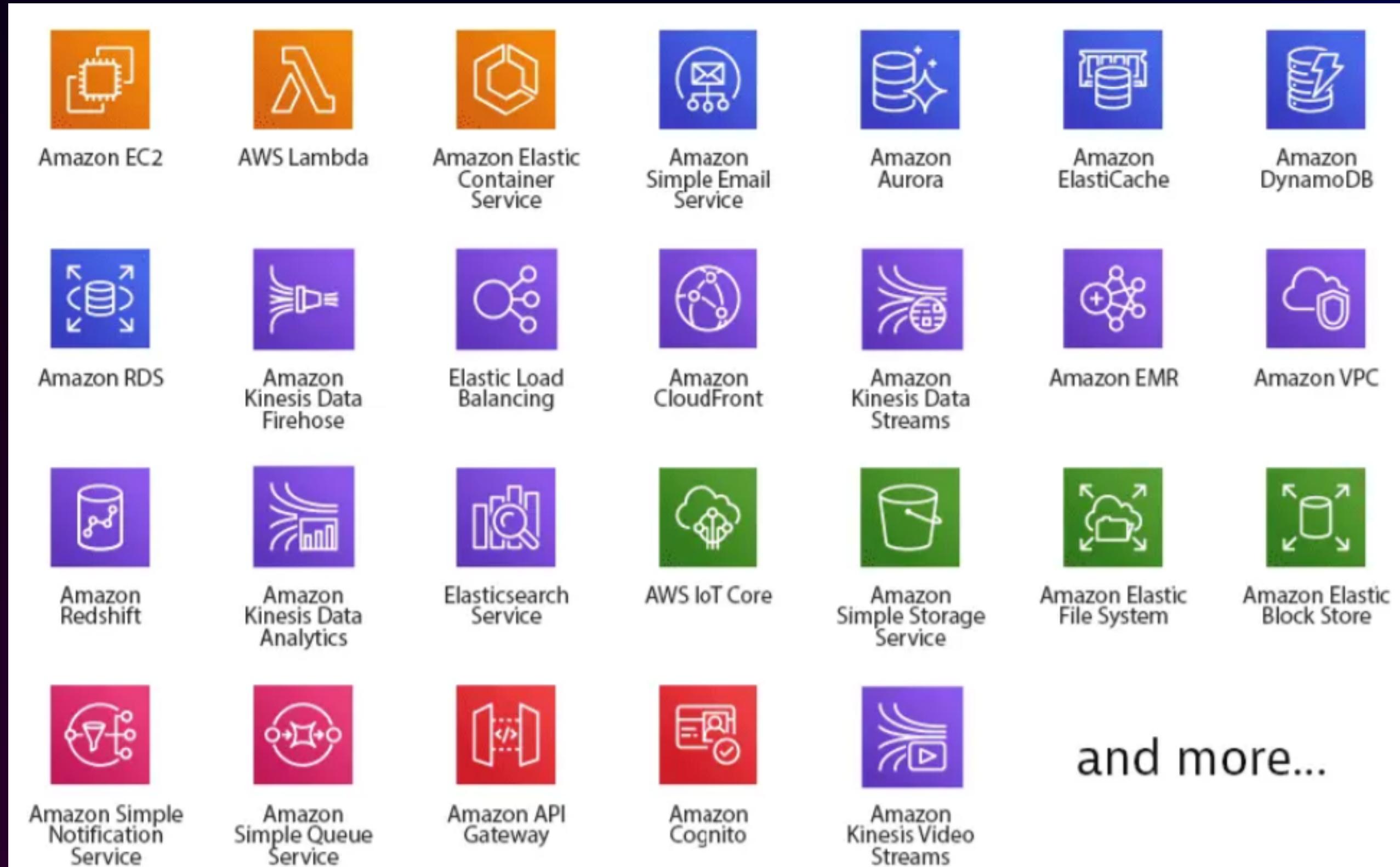


Pantech e Learning  
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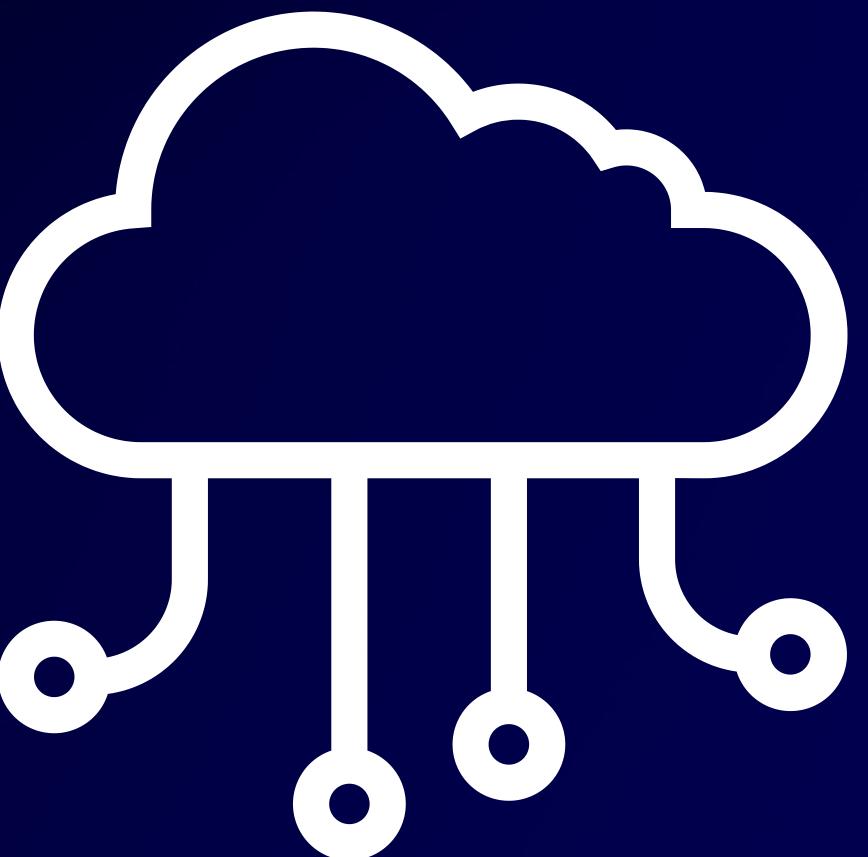
# Amazon Web Services (AWS)



# AWS Services



# What is Cloud Computing ?

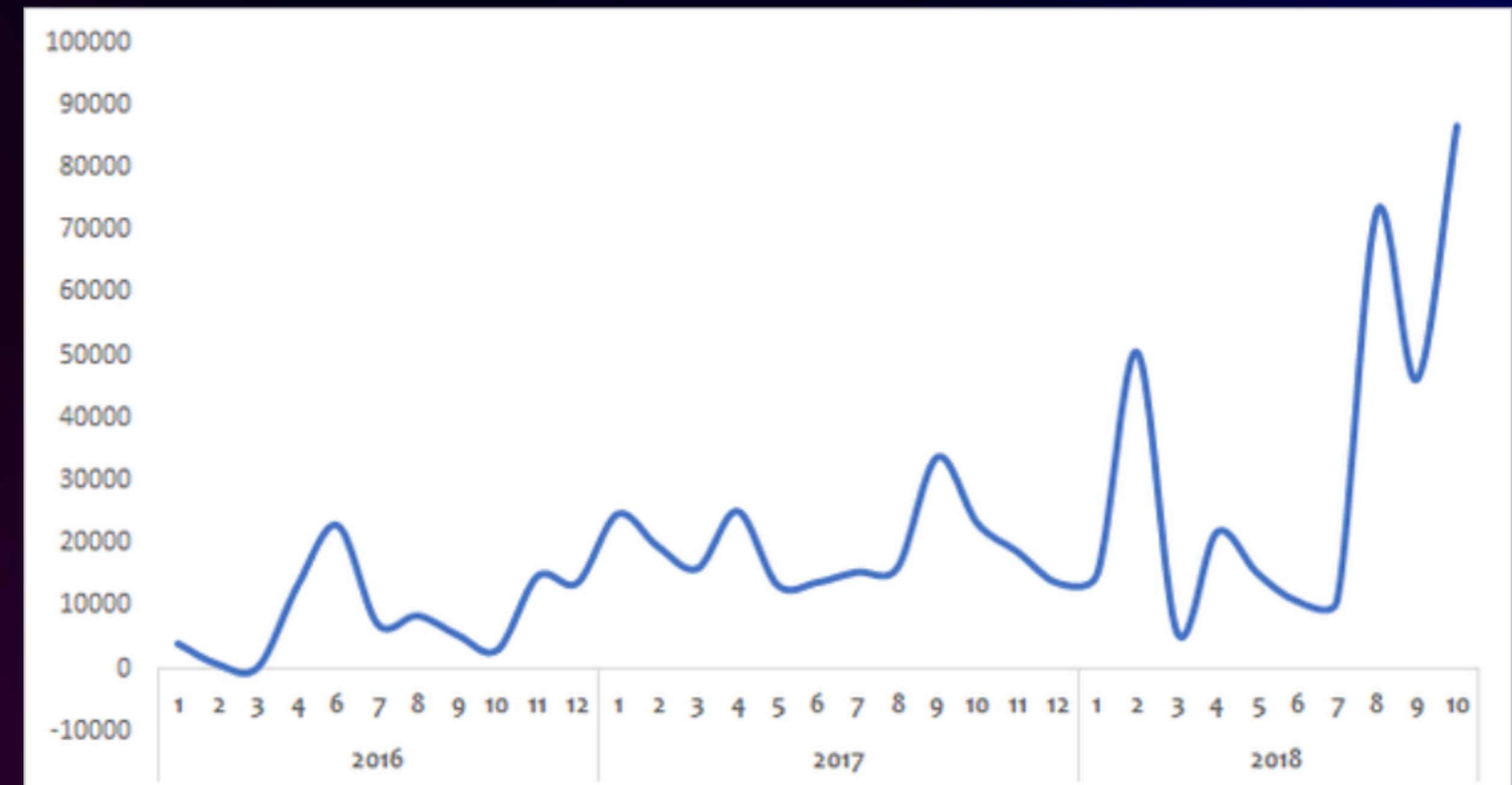
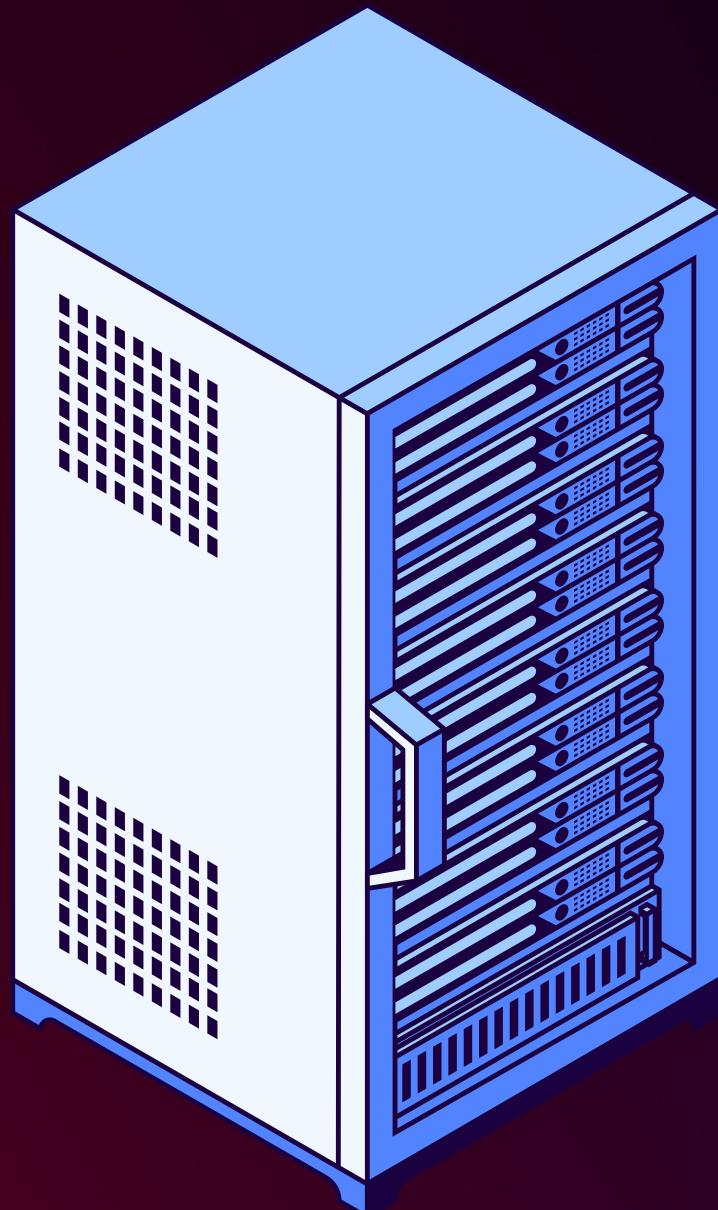


# What is Cloud Computing ?

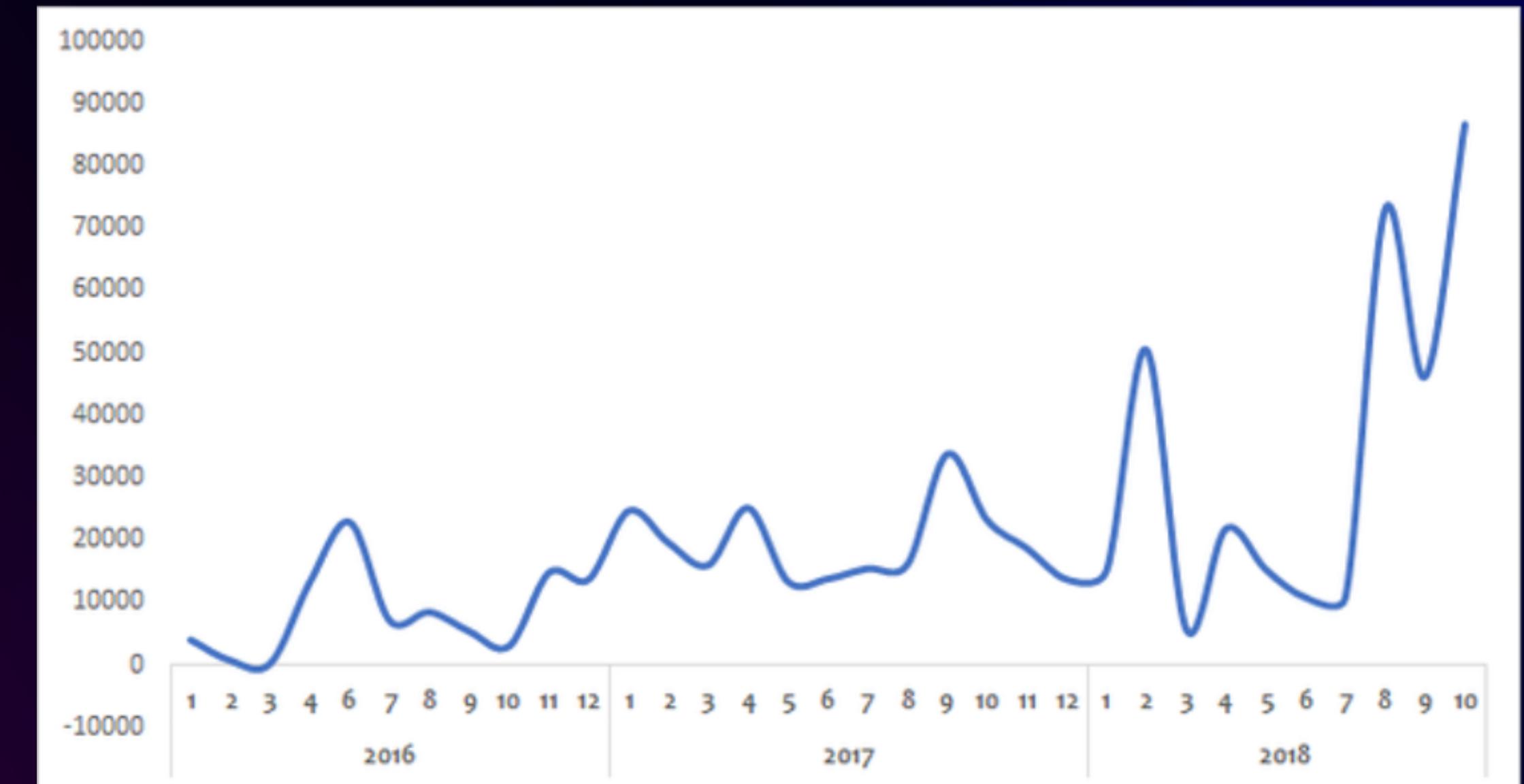
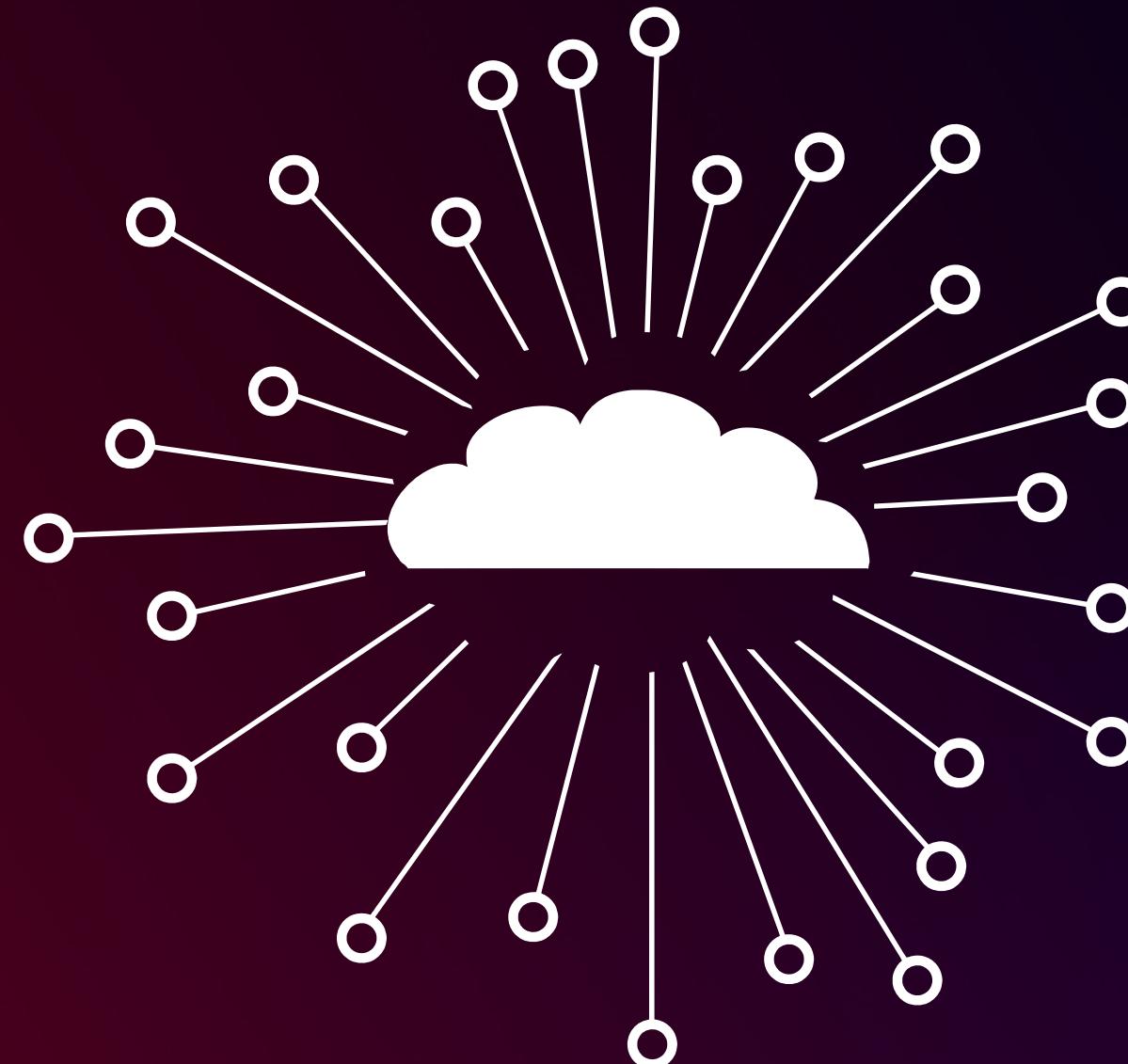
- Cloud computing is the on-demand delivery of IT resources via the Internet, with pay-as-you-go pricing.



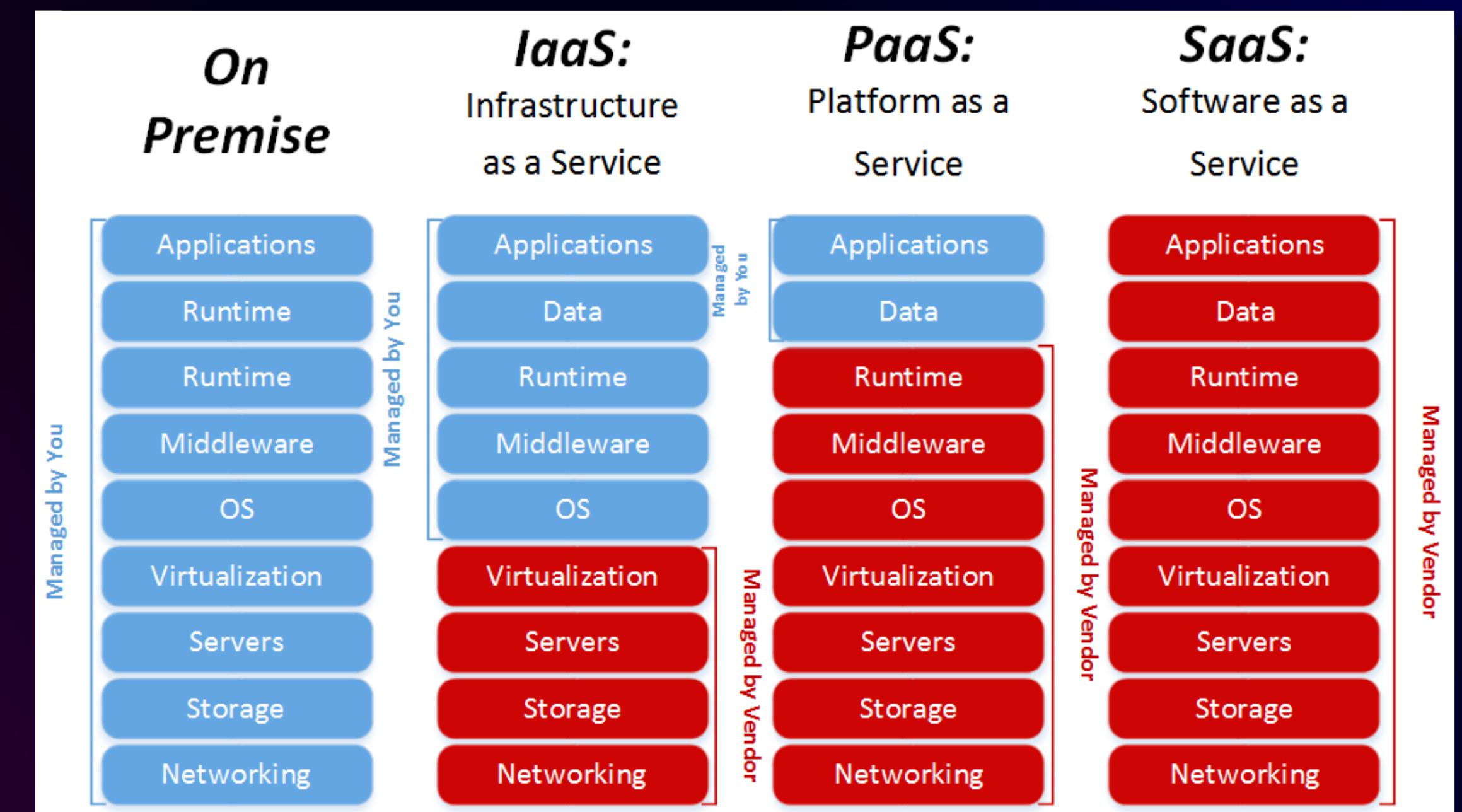
# Disadvantages of On-Premises storage



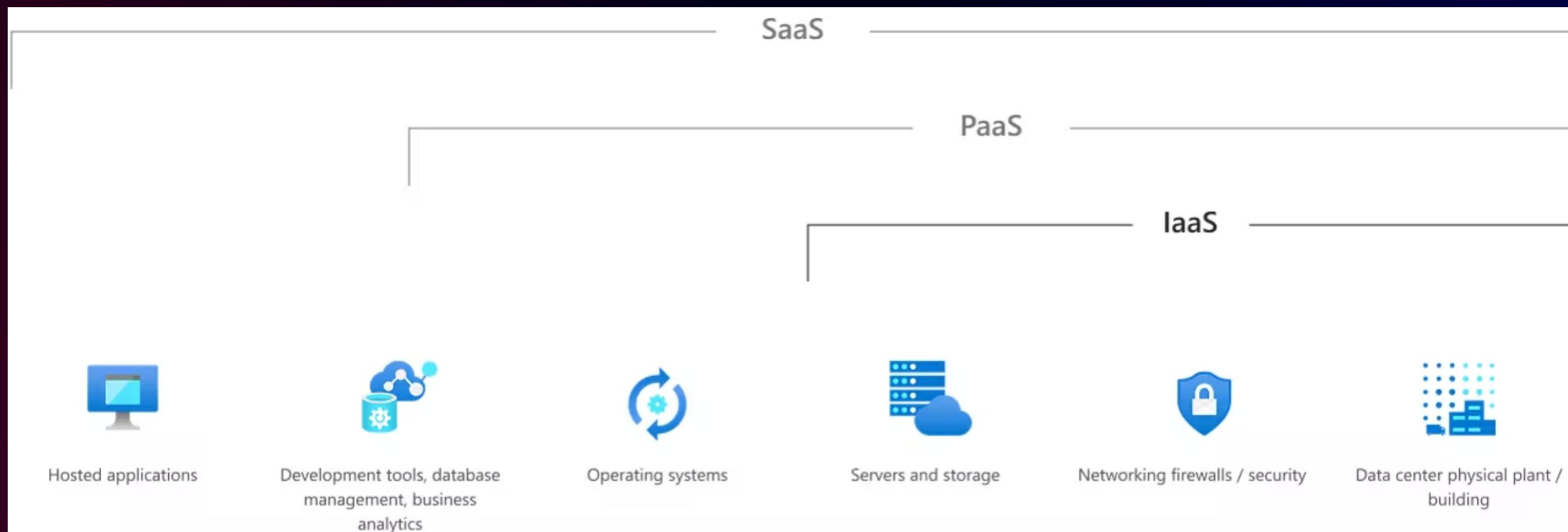
# Advantage of cloud storage



# Types of Cloud Services



# Types of Cloud Services



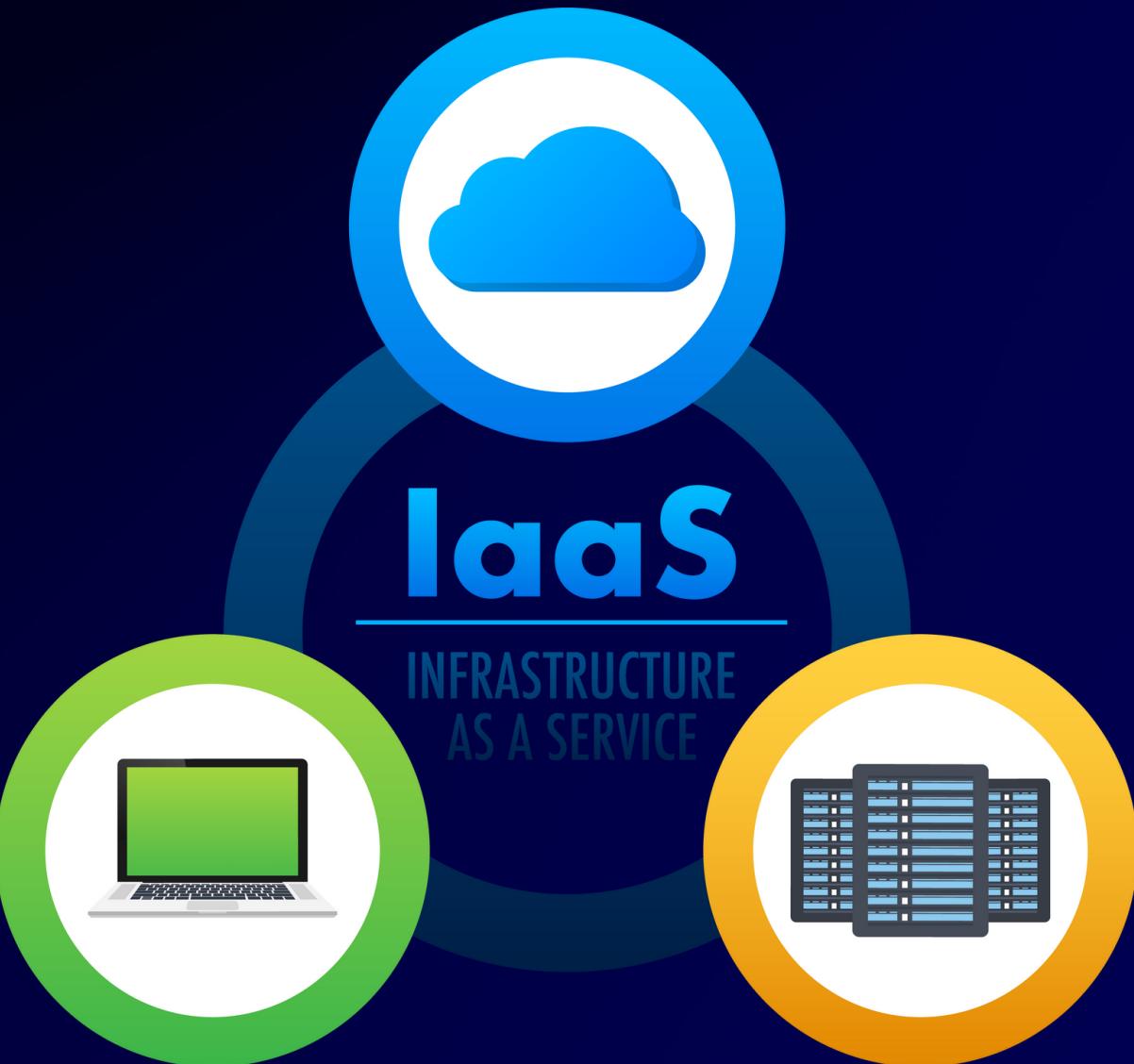
# Infrastructure as a Service (IaaS)

**Service provider is responsible for:**

- Infrastructure (Hardware, virtualization, Networking)

**You are responsible for:**

- OS updates
- Configuring
- Auto-Scaling
- Load balancing, etc...



# Platform as a Service (PaaS)

**Service provider is responsible for:**

- Infrastructure (Hardware, virtualization, Networking)
- OS, Auto-Scaling, Load Balancing

**You are responsible for:**

- Configuration
- Application Code



# Software as a Service (SaaS)

**Service provider is responsible for:**

- Infrastructure (Hardware, virtualization, Networking)
- OS, Auto-Scaling, Load Balancing
- Application Code
- Technical Support

**You are responsible for:**

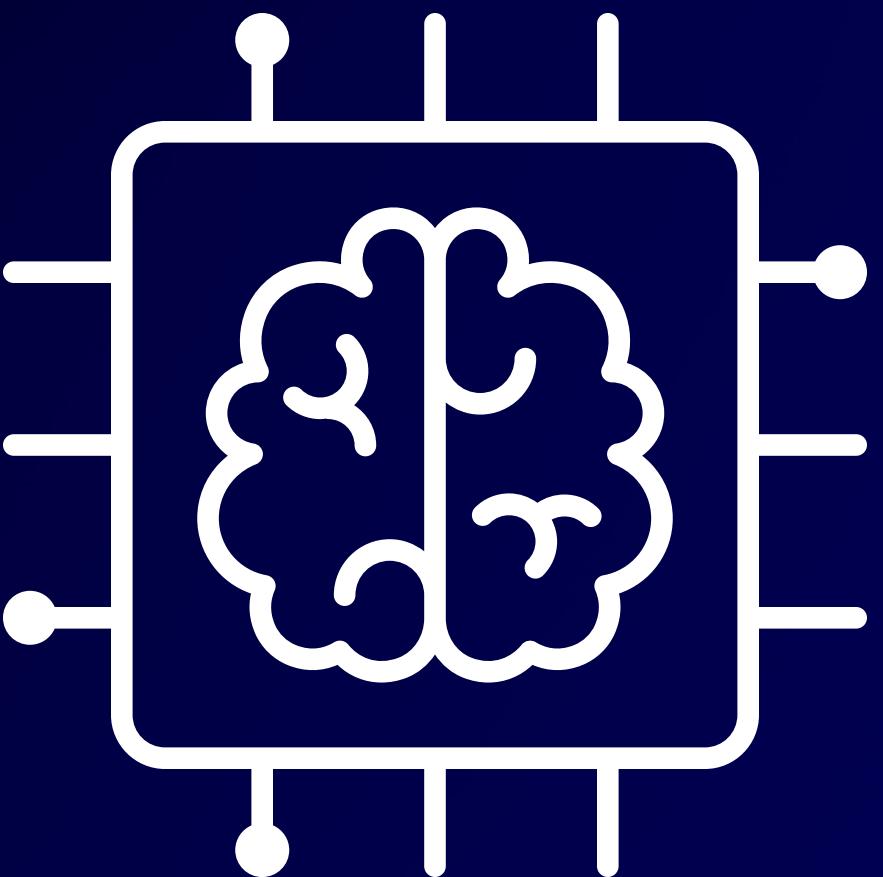
- Configuration



# Leading Cloud Service Providers



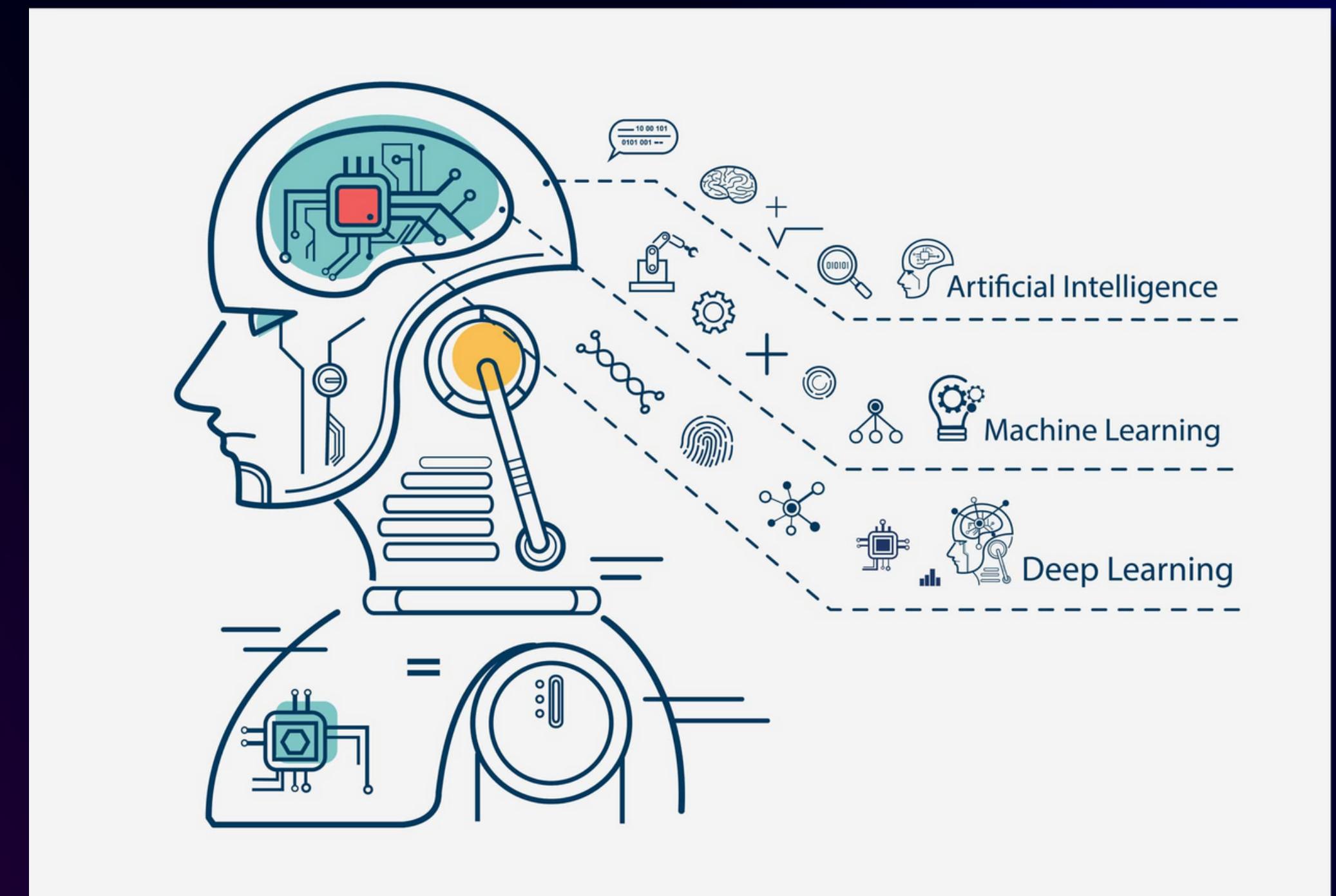
# What is Machine learning ?



# Artificial Intelligence ?

# Machine Learning ?

# Deep Learning ?



# AI vs ML vs DL

## ARTIFICIAL INTELLIGENCE

A program that can sense, reason, act, and adapt

## MACHINE LEARNING

Algorithms whose performance improve as they are exposed to more data over time

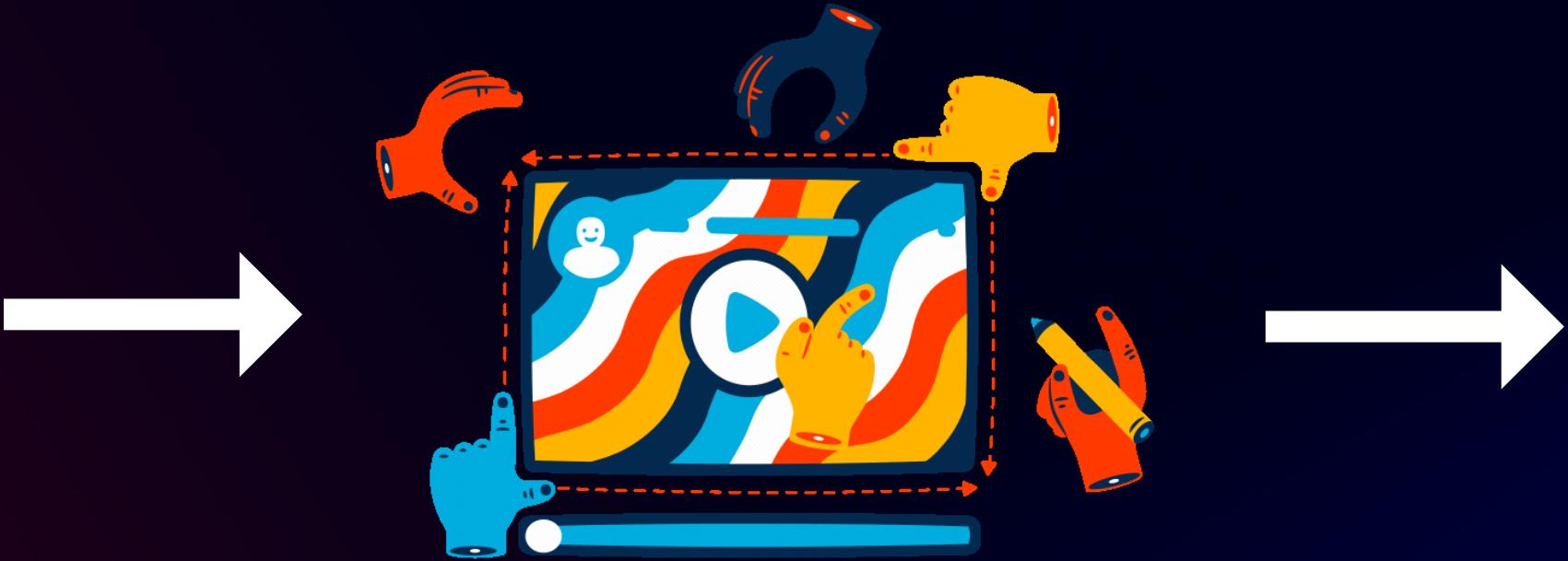
## DEEP LEARNING

Subset of machine learning in which multilayered neural networks learn from vast amounts of data

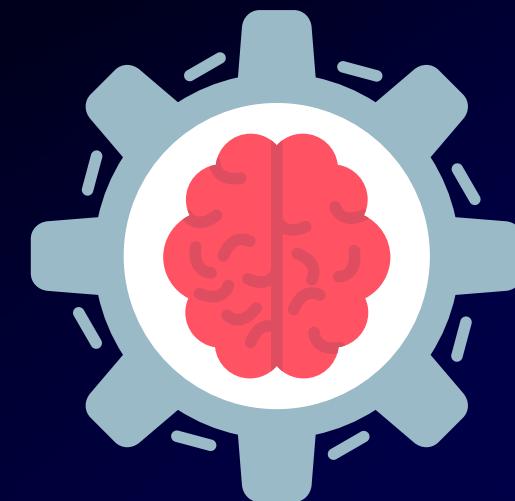
# Machine Learning



Past data



process and analyze

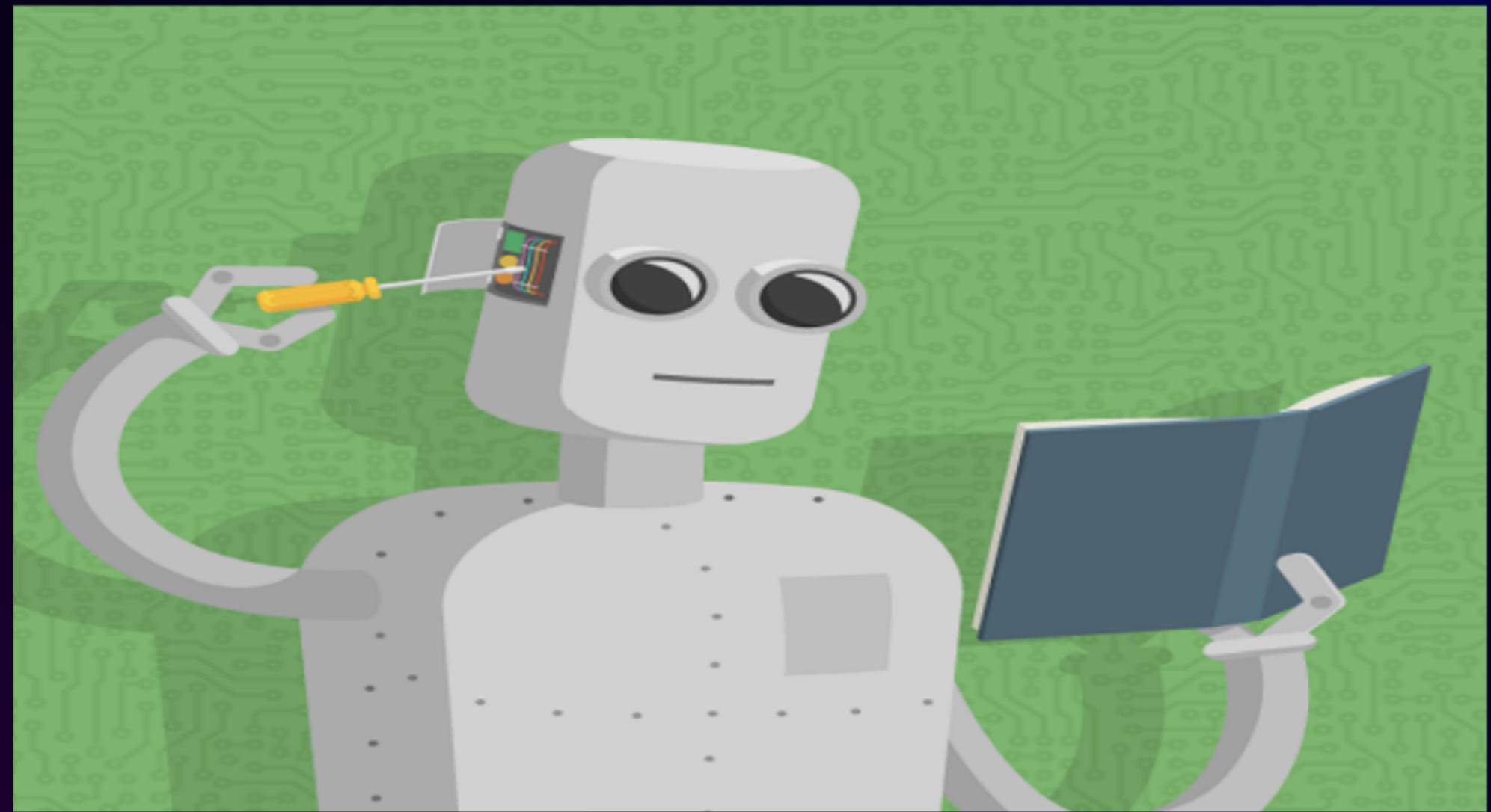


ML algorithm

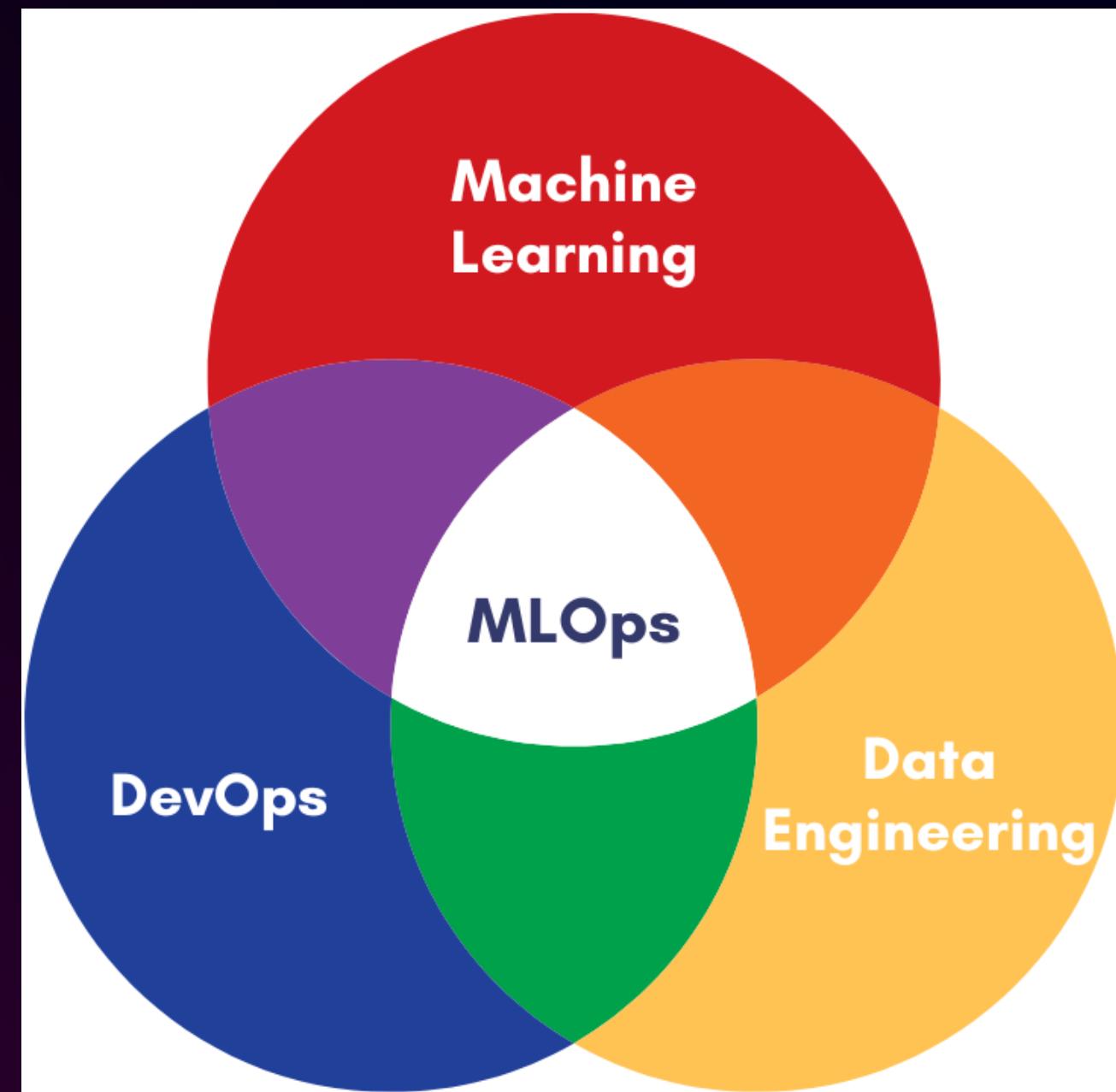


Predictions

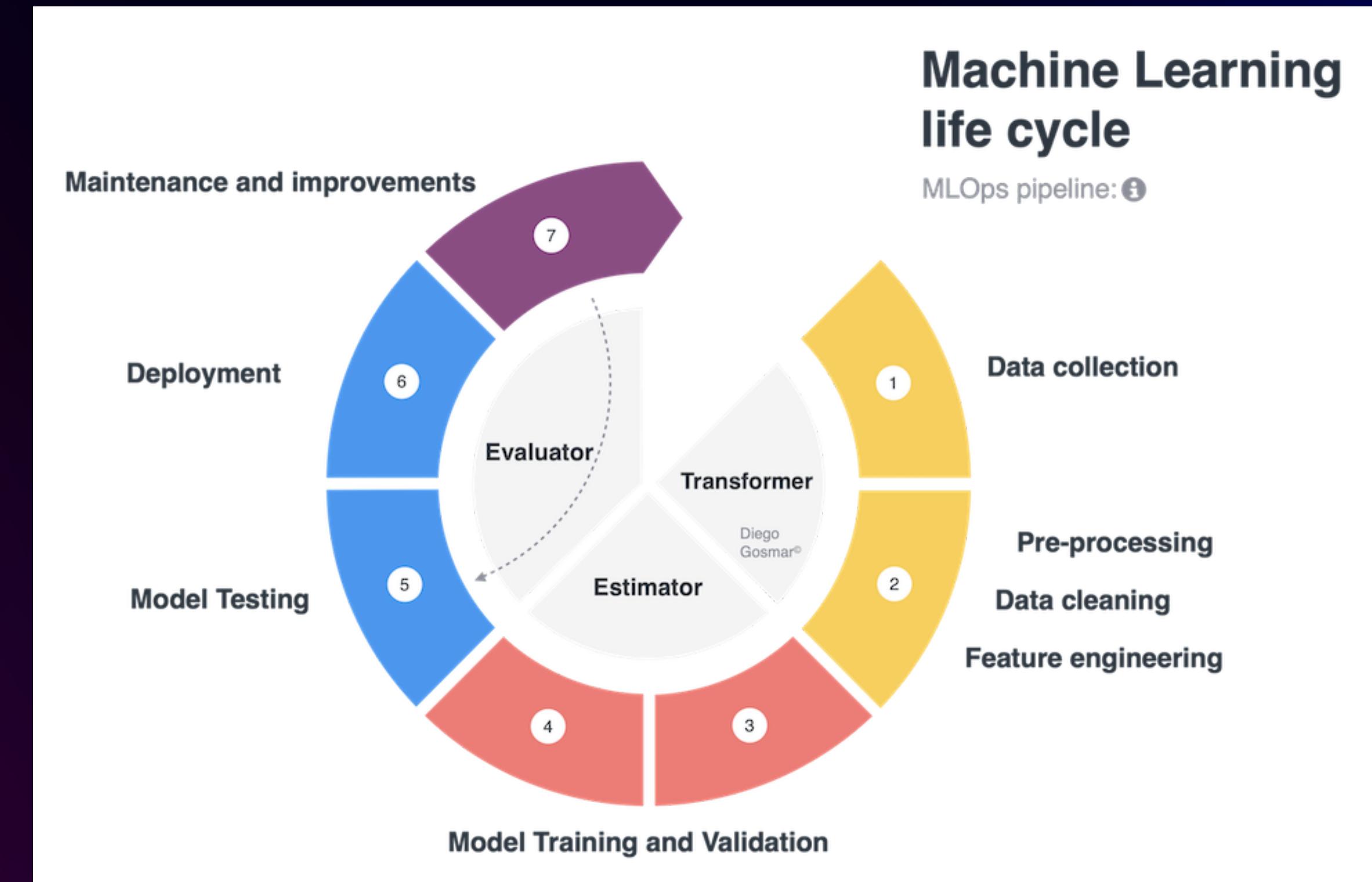
# What is MLOps ?



# MLOps - Machine Learning Operations



# MLOps Life cycle



# Agenda

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# 1. Introduction to Amazon Web Services

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Day 1 - **AWS Introduction**, account creation

Day 2 - **Virtual machines** (EC2), VPC, ELB, Beanstalk

Day 3 - **AWS Lambda**, Docker container, ECS, EKS

Day 4 - Data Storage - **RDS, DynamoDB, S3**



## 2. Machine Learning

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Day 5 - Introduction to machine learning, ML with **AWS Sagemaker**

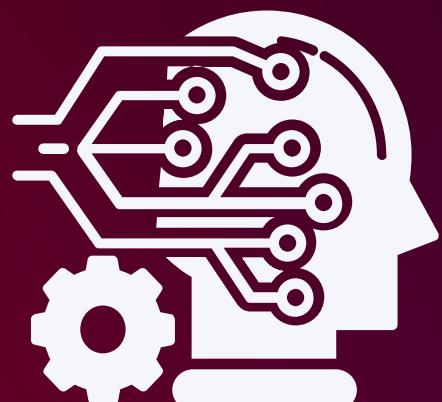
Day 6 - Data collection, Pandas for machine learning

Day 7 - Data Engineering with (**AWS Glue, GLUE ETL, Athena**)

Day 8 - Numpy for machine learning

Day 9 - Matplotlib, Seaborn for machine learning

Day 10 - **AWS Data wrangler**



## 2. Machine Learning

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Day 11 - Feature Scaling, encoding, handling null values

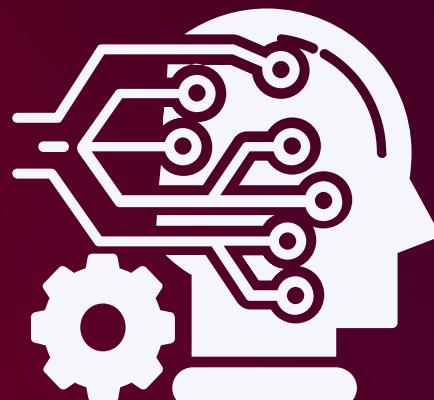
Day 12 - Outlier detection & handing, feature selection, train test split

Day 13 - Data preprocessing with **SageMaker's Scikit-Learn Container**

Day 14 - Machine learning Modeling, model evaluation

Day 15 - **AWS Sagemaker** built-in Algorithms for ML

Day 16 - Vehicle insurance claim fraud detection ( **PROJECT 1 WITH AWS** )



## 2. Machine Learning

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Day 17 - Abalone age prediction ( **PROJECT 2 WITH AWS** )

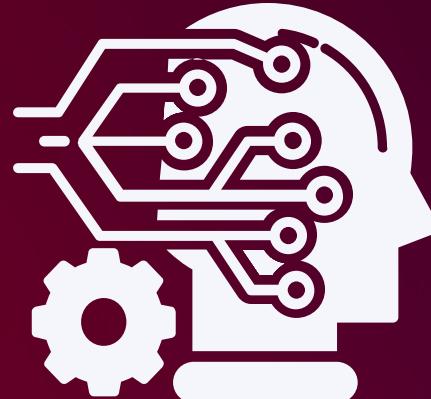
Day 18 - AWS Sagemaker canvas, **Autopilot (Project 3 WITH AWS)**

Day 19 - Deep learning introduction

Day 20 - Dog / Cat identification project ( **PROJECT 4 WITH AWS** )

Day 21 - RNN, NLP basics

Day 22 - E-commerce review project ( **PROJECT 5 WITH AWS** )



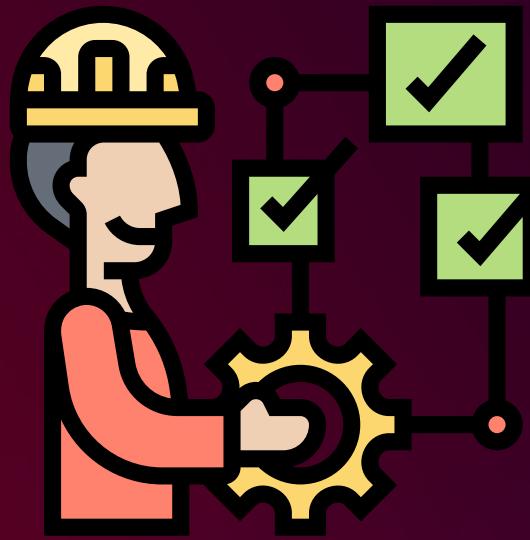
# 3. Machine Learning Operations

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Day 23 - Version control with **Git & Github**

Day 24 - CI/CD with Github

Day 25 - Deploying model with **AWS sagemaker**



Day 26 - CI/CD with sagemaker pipeline

Day 27 - Census income prediction project with deployment (**project 6**)

Day 28 - Music recommender system project with deployment (**project 7**)

Day 29 - AWS AI services - **Amazon Rekognition, Comprehend, Polly**

Day 30 - AWS AI services - **Lex, Transcribe, Textract**

# Why AWS ?

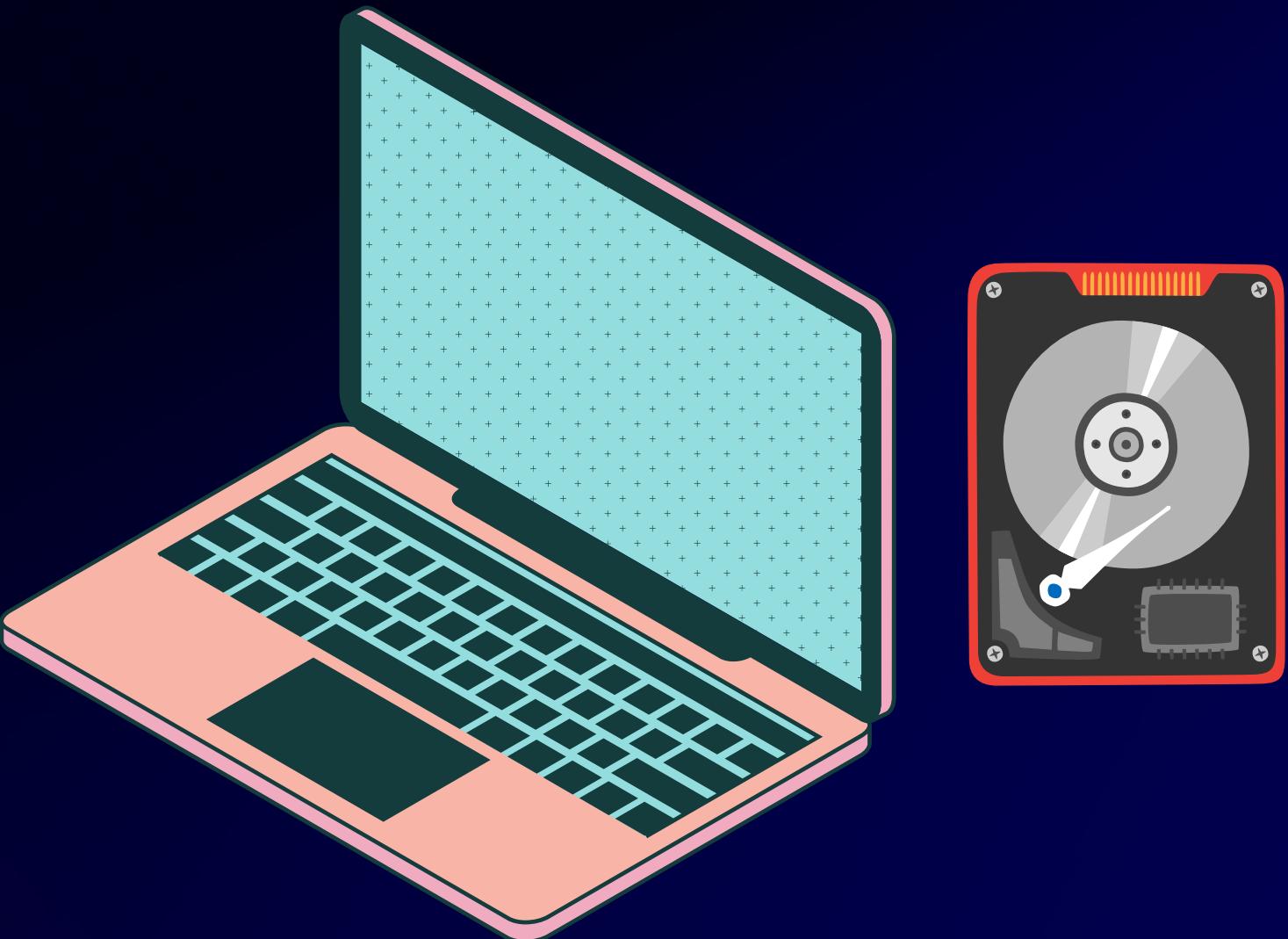
- Leading Cloud service provider
- Provides Lot of services
- Reliable, Secure, Cost-effective
- Go Global in minutes
- Comprehensive ML services for the entire workflow

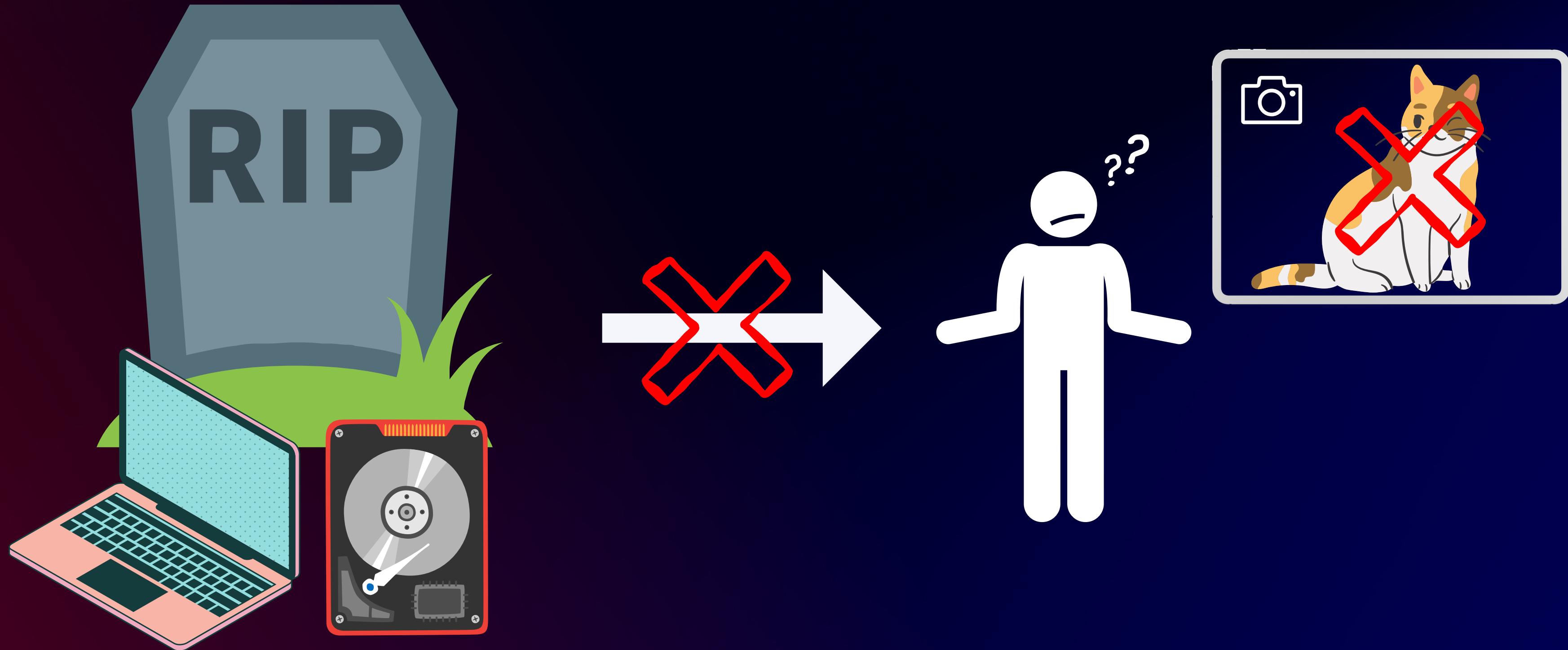
# Why AWS ?



# Is AWS Reliable ?









Data center



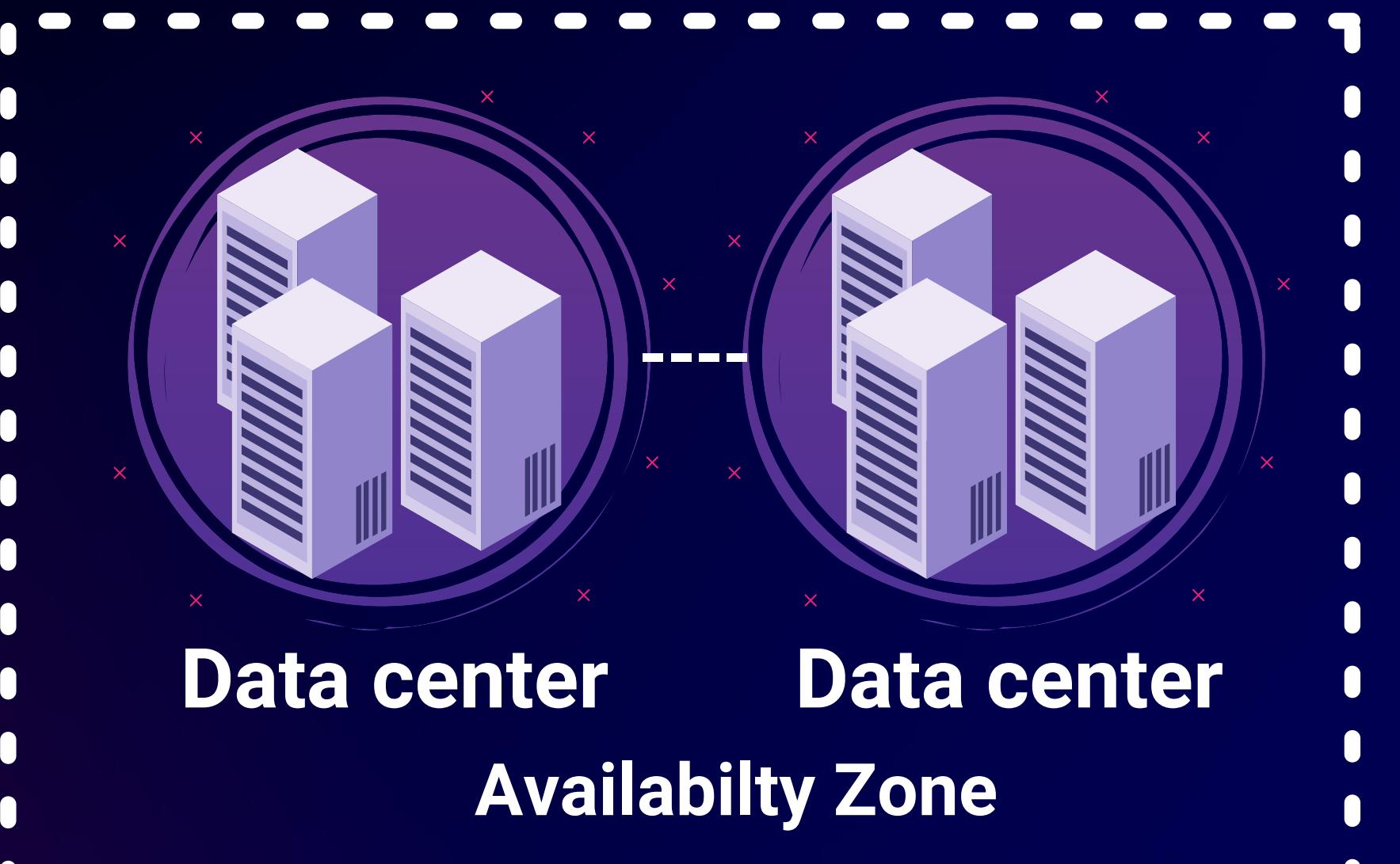
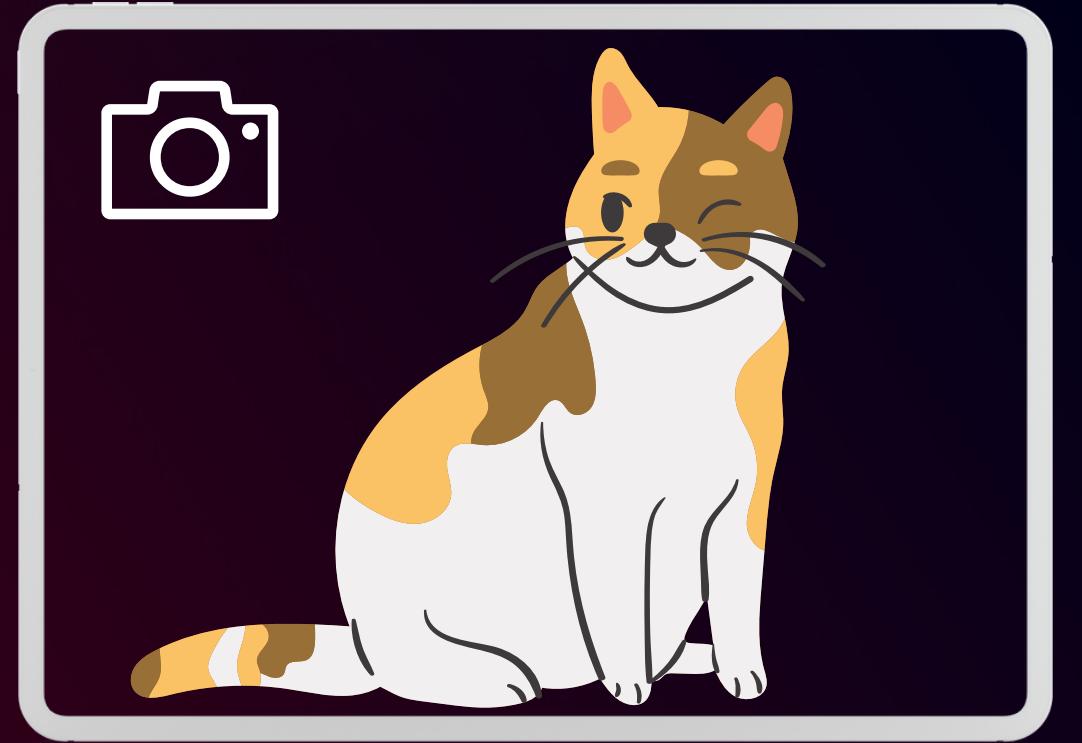




Data center



Data center



Data center

Data center

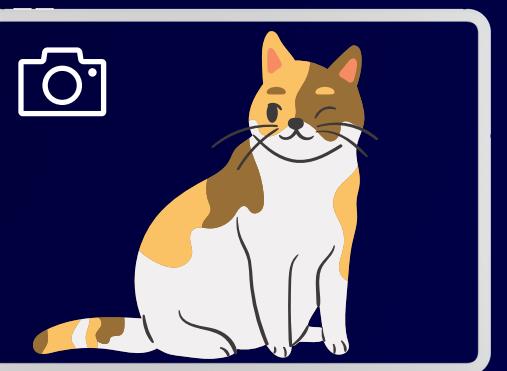
Availability Zone



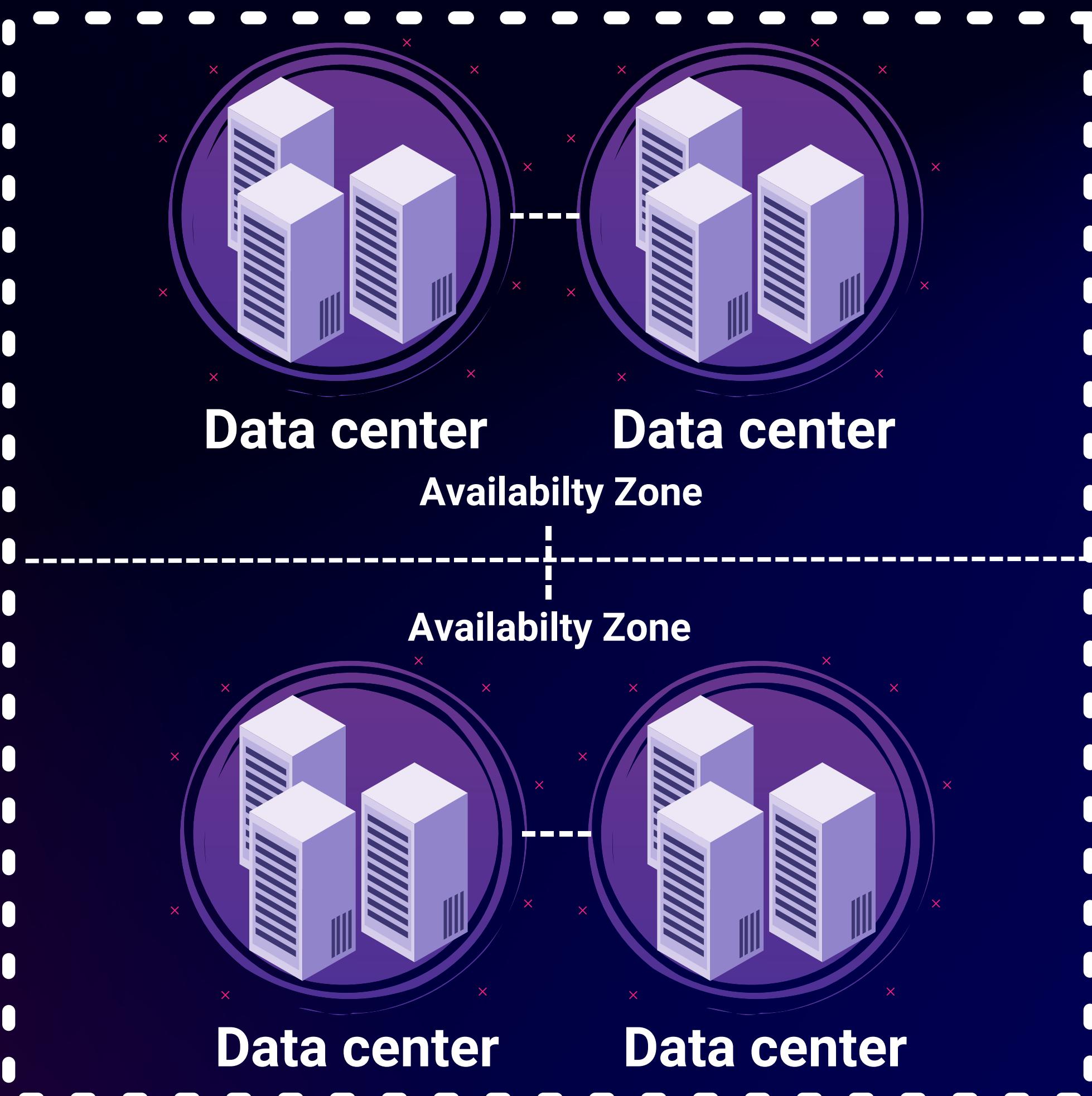
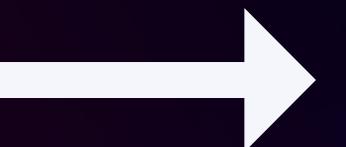
Data center



Data center



# Region





The AWS Cloud spans 99 Availability Zones within  
31 geographic regions around the world

# AWS Region Considerations



Compliance



Latency



Cost



Services & Features

# AWS Free Tier

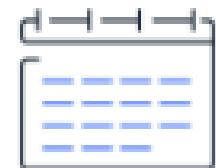
## Types Of Offers

Explore more than 100 products and start building on AWS using the Free Tier. Three different types of free offers are available depending on the product used. Click icon below to explore our offers.



### Free trials

Short-term free trial offers start from the date you activate a particular service



### 12 months free

Enjoy these offers for 12-months following your initial sign-up date to AWS



### Always free

These free tier offers do not expire and are available to all AWS customers

# AWS Account Creation



## Sign up for AWS

Root user email address

Used for account recovery and some administrative functions

AWS account name

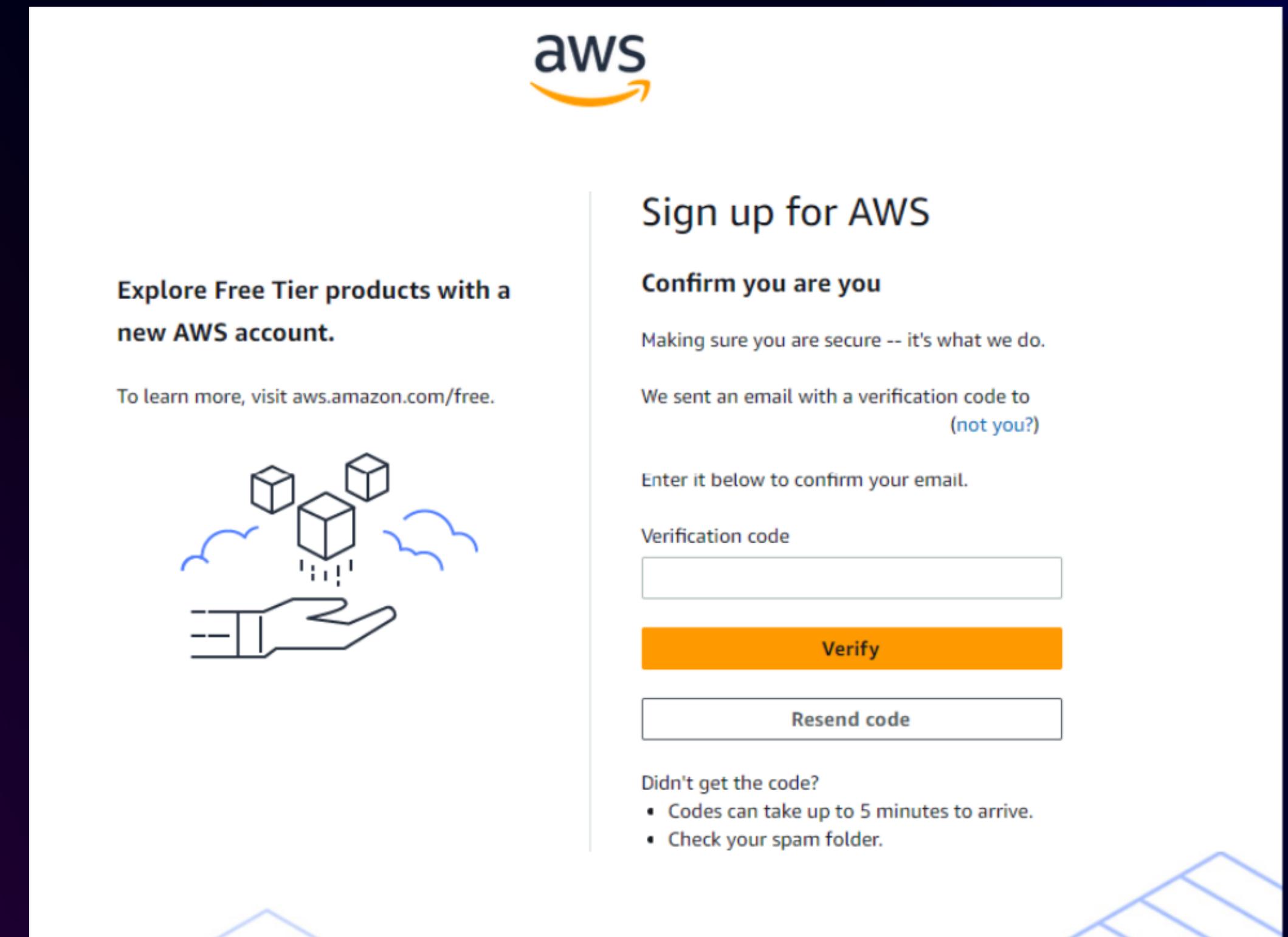
Choose a name for your account. You can change this name in your account settings after you sign up.

**Verify email address**

OR

[Sign in to an existing AWS account](#)

# AWS Account Creation



The image shows the AWS sign-up page. At the top right is the AWS logo. Below it, the heading "Sign up for AWS" is followed by "Confirm you are you". A sub-instruction "Making sure you are secure -- it's what we do." is present. It states "We sent an email with a verification code to" with "(not you?)" in blue. Below this is a placeholder "Enter it below to confirm your email." A "Verification code" input field is followed by a yellow "Verify" button. To its right is a "Resend code" button. At the bottom left is a link "Didn't get the code?". To the right of the "Verify" button is a small graphic of a blue triangle.

aws

**Sign up for AWS**

**Confirm you are you**

Making sure you are secure -- it's what we do.

We sent an email with a verification code to  
[\(not you?\)](#)

Enter it below to confirm your email.

Verification code

**Verify**

**Resend code**

Didn't get the code?

- Codes can take up to 5 minutes to arrive.
- Check your spam folder.

# AWS Account Creation

Explore Free Tier products with a new AWS account.

To learn more, visit [aws.amazon.com/free](https://aws.amazon.com/free).



## Sign up for AWS

### Create your password

 It's you! Your email address has  been successfully verified.

Your password provides you with sign in access to AWS, so it's important we get it right.

Root user password

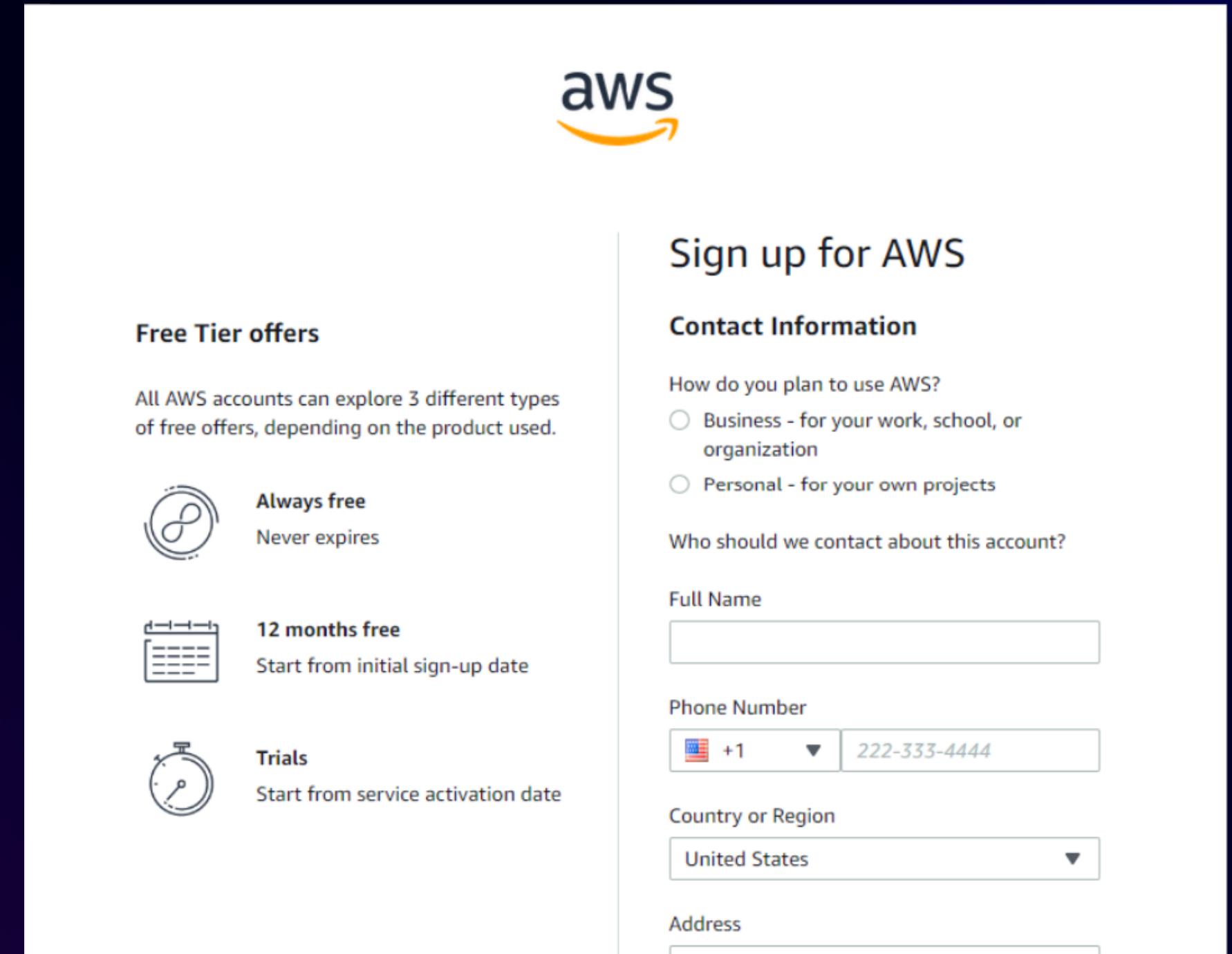
Confirm root user password

**Continue (step 1 of 5)**

OR

[Sign in to an existing AWS account](#)

# AWS Account Creation



The image shows the AWS sign-up page. At the top right is the AWS logo. Below it, the heading "Sign up for AWS" is displayed. To the left, there's a section titled "Free Tier offers" with three options: "Always free" (never expires), "12 months free" (start from initial sign-up date), and "Trials" (start from service activation date). To the right, the "Contact Information" section includes fields for "Full Name", "Phone Number" (with a dropdown for country code "+1" and the number "222-333-4444"), "Country or Region" (set to "United States"), and "Address".

aws

## Sign up for AWS

### Contact Information

How do you plan to use AWS?

Business - for your work, school, or organization

Personal - for your own projects

Who should we contact about this account?

Full Name

Phone Number

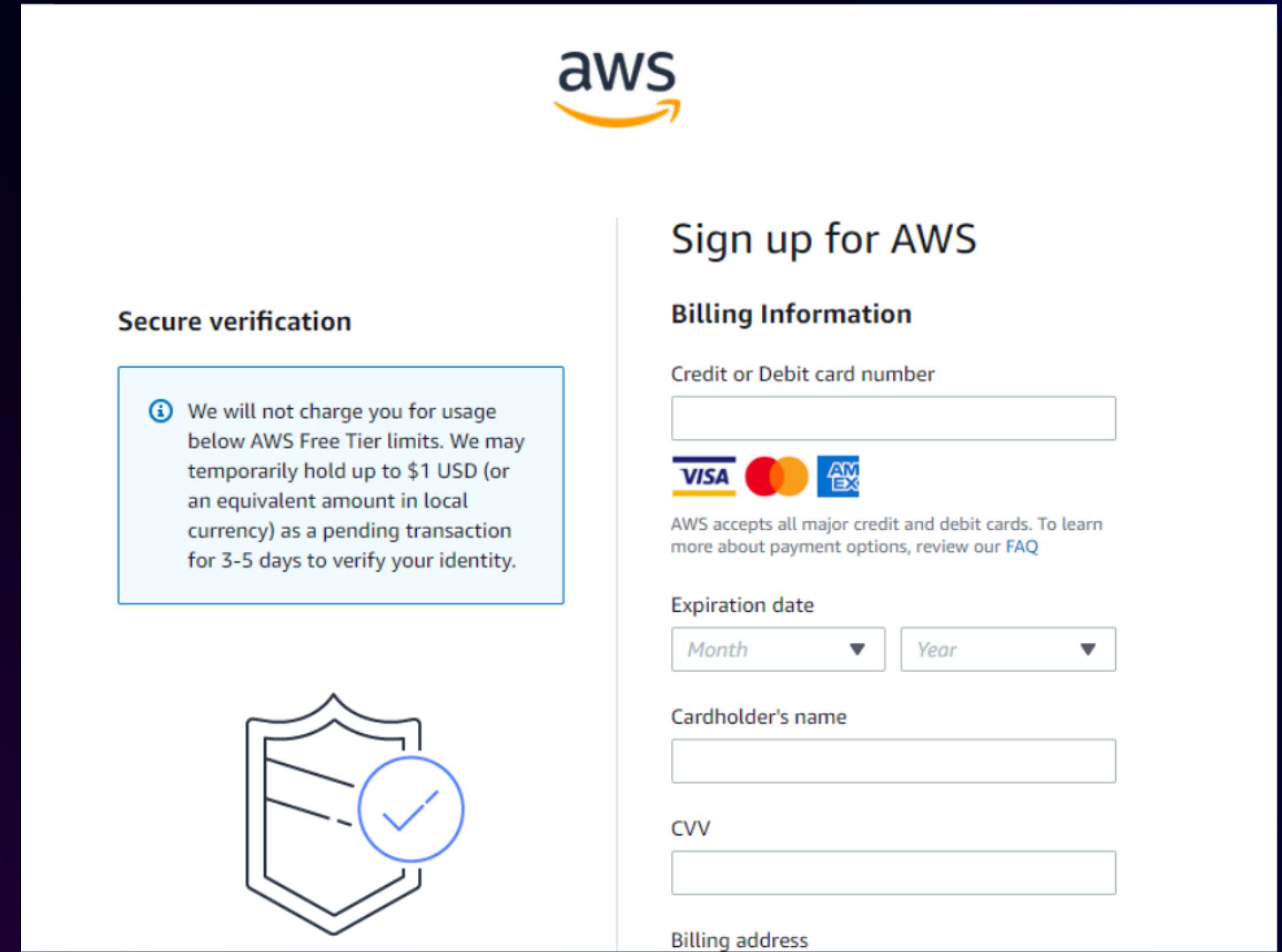
+1 222-333-4444

Country or Region

United States

Address

# AWS Account Creation



The image shows the 'Sign up for AWS' page. At the top right is the AWS logo. Below it, the heading 'Sign up for AWS' is followed by 'Billing Information'. Under 'Billing Information', there is a field for 'Credit or Debit card number' with a placeholder box, and icons for VISA, MasterCard, and AMEX. Below this, there are fields for 'Expiration date' (Month and Year dropdowns), 'Cardholder's name' (text box), 'CVV' (text box), and 'Billing address' (text box). On the left side, there is a 'Secure verification' section containing a message about pending transactions for identity verification, preceded by an info icon. Below this message is a shield icon with a checkmark inside.

**aws**

**Sign up for AWS**

**Billing Information**

Credit or Debit card number

VISA    MasterCard    AMEX

AWS accepts all major credit and debit cards. To learn more about payment options, review our [FAQ](#).

Expiration date

Month  Year

Cardholder's name

CVV

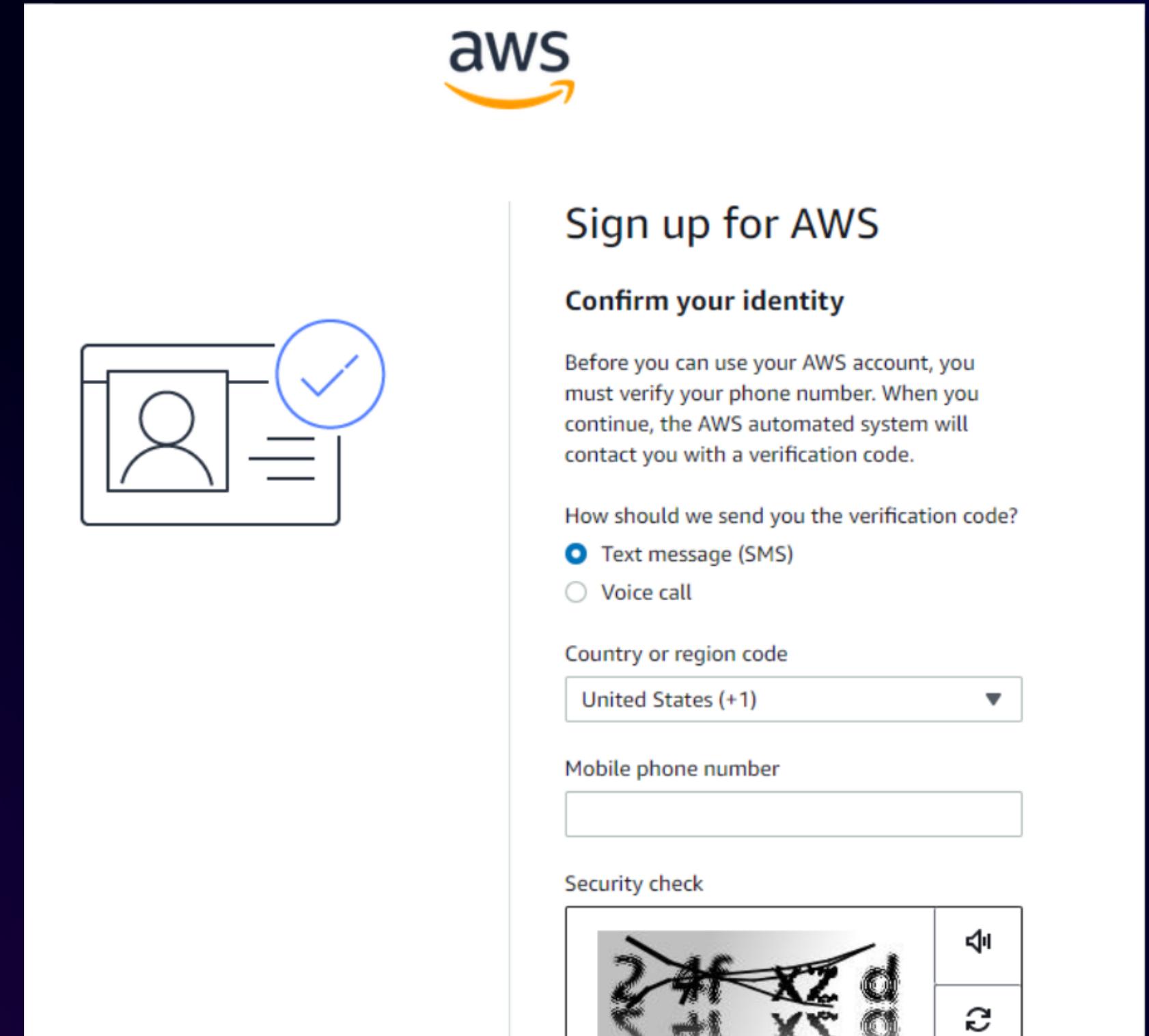
Billing address

**Secure verification**

 We will not charge you for usage below AWS Free Tier limits. We may temporarily hold up to \$1 USD (or an equivalent amount in local currency) as a pending transaction for 3-5 days to verify your identity.



# AWS Account Creation



The image shows the AWS sign-up page for account creation. At the top right is the AWS logo. Below it, the heading "Sign up for AWS" is displayed. A section titled "Confirm your identity" instructs the user to verify their phone number. It asks, "How should we send you the verification code?" with two options: "Text message (SMS)" (selected) and "Voice call". A dropdown menu for "Country or region code" is set to "United States (+1)". A field for "Mobile phone number" is present. A "Security check" section features a CAPTCHA image showing distorted text ("24f XZ d") next to a speaker icon and a refresh/reload button.

aws

Sign up for AWS

Confirm your identity

Before you can use your AWS account, you must verify your phone number. When you continue, the AWS automated system will contact you with a verification code.

How should we send you the verification code?

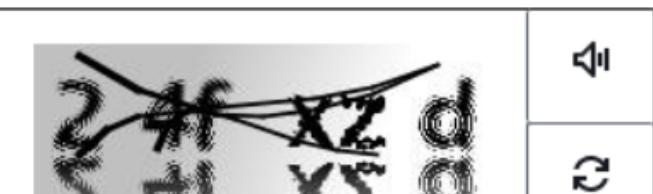
Text message (SMS)  
 Voice call

Country or region code

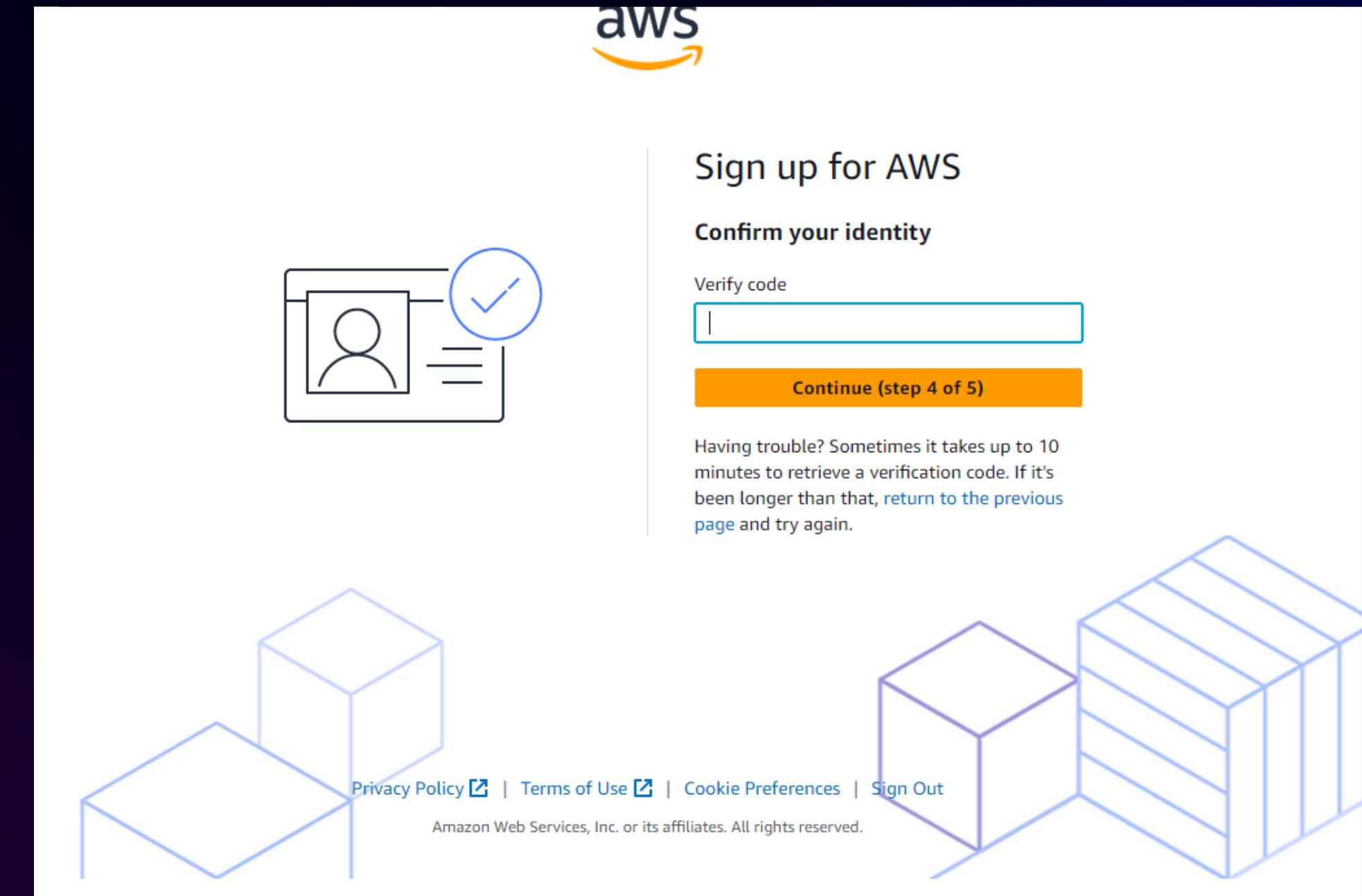
United States (+1)

Mobile phone number

Security check



# AWS Account Creation



The image shows the AWS sign-up process for identity verification. At the top right is the AWS logo. Below it, the text "Sign up for AWS" and "Confirm your identity". A "Verify code" input field contains a single vertical bar character. A blue "Continue (step 4 of 5)" button is below the input field. To the left of the input field is a graphic of a user icon with a checkmark inside a circle. At the bottom center are links for "Privacy Policy", "Terms of Use", "Cookie Preferences", and "Sign Out". The background features abstract 3D cube graphics.

aws

Sign up for AWS

Confirm your identity

Verify code

|

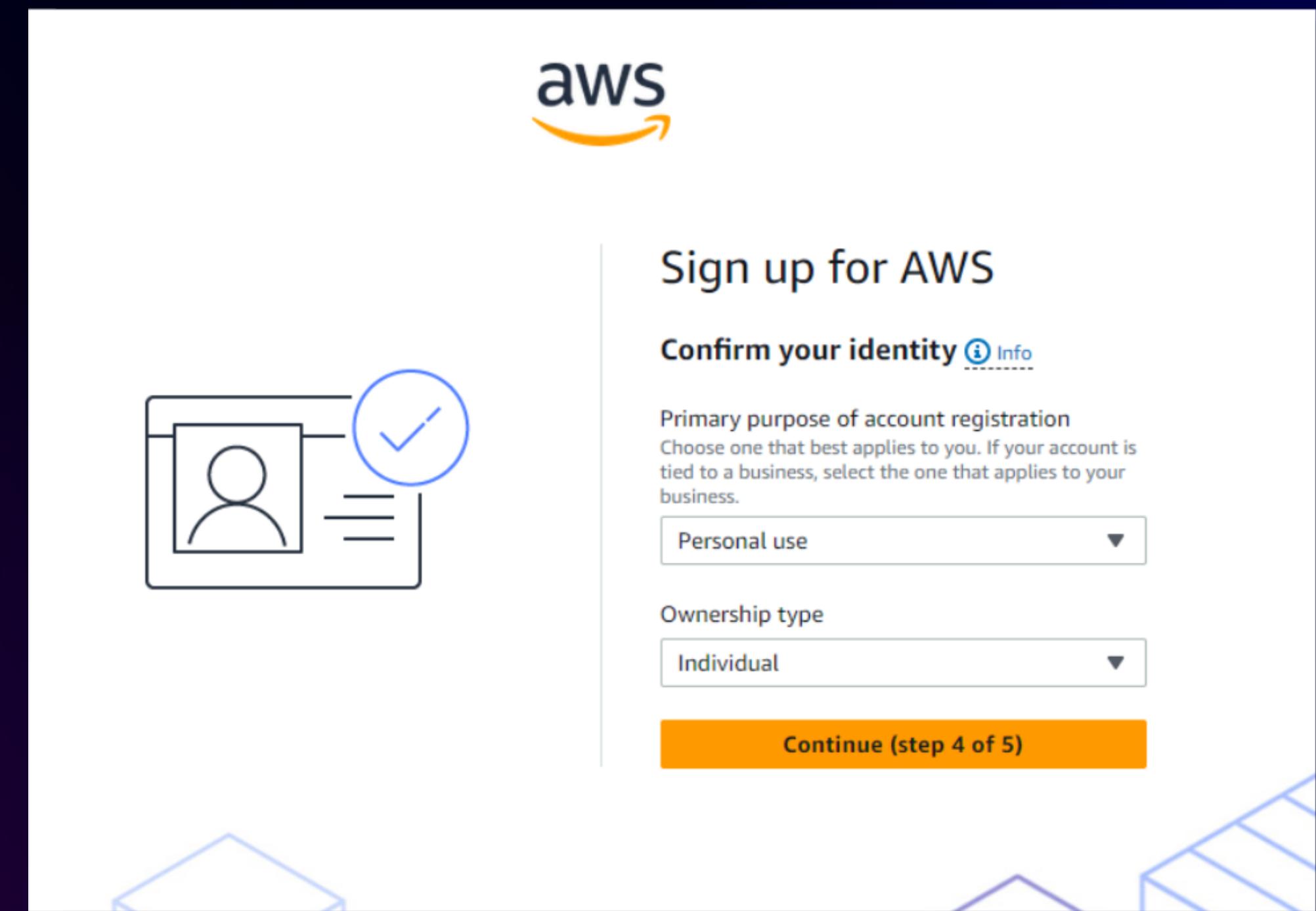
Continue (step 4 of 5)

Having trouble? Sometimes it takes up to 10 minutes to retrieve a verification code. If it's been longer than that, [return to the previous page](#) and try again.

Privacy Policy | Terms of Use | Cookie Preferences | Sign Out

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# AWS Account Creation



# AWS Account Creation

## Sign up for AWS

### Select a support plan

Choose a support plan for your business or personal account. [Compare plans and pricing examples](#). You can change your plan anytime in the AWS Management Console.

Basic support - Free

- Recommended for new users just getting started with AWS
- 24x7 self-service access to AWS resources
- For account and billing issues only
- Access to Personal Health Dashboard & Trusted Advisor



Developer support - From \$29/month

- Recommended for developers experimenting with AWS
- Email access to AWS Support during business hours
- 12 (business)-hour response times



Business support - From \$100/month

- Recommended for running production workloads on AWS
- 24x7 tech support via email, phone, and chat
- 1-hour response times
- Full set of Trusted Advisor best-practice recommendations



Need Enterprise level support?

From \$15,000 a month you will receive 15-minute response times and concierge-style experience with an assigned Technical Account Manager. [Learn more](#)

[Complete sign up](#)

# AWS Account Creation



**Congratulations**

Thank you for signing up for AWS.

We are activating your account, which should only take a few minutes. You will receive an email when this is complete.

[Go to the AWS Management Console](#)

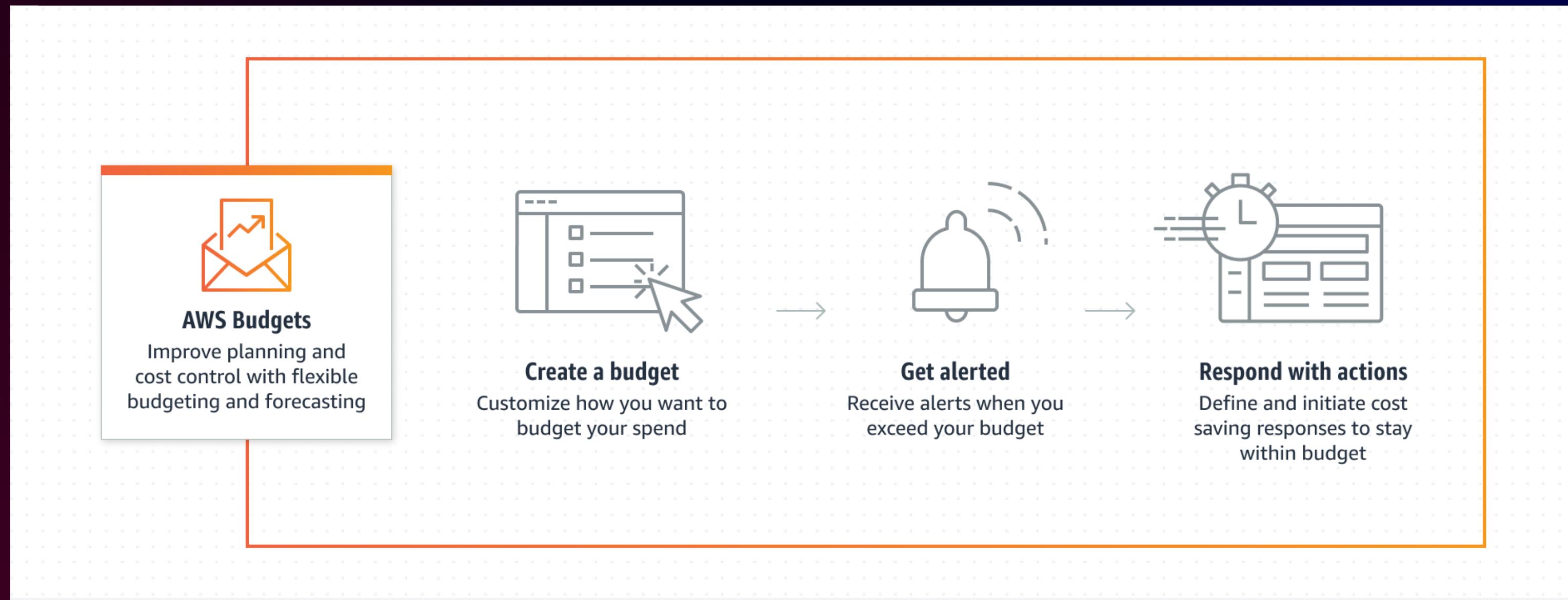
[Sign up for another account or contact sales.](#)

# AWS Budgets



**AWS Budgets**

# AWS Budgets



# IAM (Identity & Access Management)



IAM

# Thank you

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