

# What is AWS?

**Amazon Web Services (AWS)** is a cloud computing platform provided by Amazon. It offers various services and tools that you can access over the internet. Instead of investing in physical hardware like servers and storage, you can use AWS to handle these resources virtually. This makes it easier and more cost-effective to run applications and store data.

# History of AWS

1. **2002**: AWS was introduced, marking the beginning of its cloud services.
2. **2006**: AWS launched its first cloud products, which allowed users to start using computing resources over the internet.
3. **2012**: AWS held its first major event for customers, showcasing its services and creating a community around its platform.
4. **2015**: AWS achieved $4.6 billion in revenue, demonstrating its growing importance and adoption.
5. **2016**: AWS’s revenue surpassed $10 billion. New services like AWS Snowball and Snowmobile were introduced to help with large-scale data transfers.
6. **2019**: AWS released about 100 new cloud services, continually expanding and enhancing its offerings.

# Applications of AWS

AWS can be used for a wide range of applications, making it versatile for different business needs:

* **Storage and Backup**: AWS provides several storage options for saving data securely, archiving old files, and supporting applications that require constant access to data.
* **Websites**: You can host websites on AWS, which is similar to how other web applications are managed.
* **Gaming**: AWS offers the computing power needed to support online games, handling everything from game servers to real-time data processing.
* **Mobile, Web, and Social Applications**: AWS supports scalable mobile apps, e-commerce sites, and software-as-a-service (SaaS) applications, allowing for flexibility in coding and deployment.

# Advantages of AWS Services

1. **Security**: AWS is known for its strong security features, protecting your data and applications.
2. **Global Availability**: With 80 Availability Zones across 25 regions, AWS ensures that services are available worldwide, providing reliability and reducing latency.
3. **Scalability and Flexibility**: AWS allows you to easily scale resources up or down based on your needs. You can adjust your infrastructure dynamically as your requirements change.
4. **Low Investment**: AWS reduces the need to buy and maintain physical hardware, which lowers your initial investment and ongoing costs.

# Key AWS Services

## Compute Services

* + **AWS EC2 (Elastic Compute Cloud)**: Lets you rent virtual servers to run applications and manage compute resources according to your needs.
  + **AWS Lambda**: Allows you to run code without managing servers. You just upload your code, and AWS handles the rest, including scaling and execution.

## Storage Services

* + **Amazon S3 (Simple Storage Service)**: Provides scalable storage for storing and retrieving data at any time. It's useful for backups and large data archives.
    - Example
    1. **Data Storage:** Upload your image dataset to an Amazon S3 bucket.
    2. **Training:** Retrieve images from S3 for training your deep learning model.
    3. **Checkpoints:** Save model checkpoints and logs to S3 during training.
    4. **Deployment:** Store the trained model in S3 for easy access during deployment.
    5. **Backup:** Use S3 for backup and archiving of data and model artifacts.
  + **Amazon EBS (Elastic Block Store)**: Offers persistent storage for data used by EC2(Elastic Compute Cloud) instances, ensuring that your data remains intact even if the virtual server is stopped.

**Your Task**: Training a machine learning model on an AWS EC2 instance.

**Without Persistent Storage**: If you stop the EC2 instance, you lose your saved model and data.

**With Persistent Storage**:

* + - 1. Use AWS Elastic Block Store (EBS), which works like a hard drive.
      2. Save your data to EBS.
      3. Stop or restart the EC2 instance, but your data stays safe on EBS.

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## Database Services

* + **DynamoDB**: A NoSQL database service that provides fast and flexible data storage. It is designed to handle large amounts of data with high performance.
  + **RDS (Relational Database Service)**: Manages relational databases (like MySQL, PostgreSQL) and automates tasks such as backups, patching, and scaling.

## Networking and Content Delivery

* + **VPC (Virtual Private Cloud)**: Lets you create a private network within AWS where you can launch and manage resources securely.
  + **Route 53**: A DNS service that helps route users to your application’s resources quickly and efficiently.

## Developer Tools

* + **CodeStar**: Provides a unified interface for managing your application’s development, making it easier to plan, build, and deploy applications.
  + **CodeBuild**: A service that compiles your source code, runs tests, and produces ready-to-deploy software packages.

## Security, Identity & Compliance

* + **IAM (Identity and Access Management)**: Controls who can access AWS services and resources, ensuring secure management of permissions.
  + **KMS (Key Management Service)**: Manages and controls encryption keys to protect your data.

## Management Tools

* + **CloudWatch**: Monitors your AWS resources and applications in real-time, providing metrics, logs, and alerts to help you manage your infrastructure.
  + **CloudFormation**: Allows you to define and provision AWS infrastructure using text files (templates), which helps in automating and managing your resources.

# Registering for an AWS Free Tier Account

1. **Open your web browser** and visit the [AWS Free Tier page](https://aws.amazon.com/free/).
2. **Click on "Create a Free Account"** to start the registration process.
3. **Enter your email address**, choose a password, and provide an account name.
4. **Select account type** (Personal or Company) and fill in your contact details.
5. **Enter your credit card information** to verify your identity. AWS uses this to ensure that the account is genuine.
6. **Verify your phone number** by selecting either text message or voice call for verification.
7. **Follow the remaining instructions** provided by AWS to complete your registrations