

## Google Cloud Platform

Google Cloud Platform (GCP) enables developers to build, test, and deploy applications on Google's scalable and reliable infrastructure.

### Example:

A startup wants to create a social media platform with image-sharing capabilities. Using GCP, they can:

- Deploy their web application on **Google App Engine** to automatically scale up or down based on user traffic.
  - Store images securely in **Google Cloud Storage** for fast access and retrieval.
  - Use **BigQuery** for real-time data analysis to gain insights into user engagement.
- 

## Google Cloud Storage

Google Cloud Storage is a RESTful online storage service for storing and accessing data on Google's infrastructure.

### Example:

A company wants to store and analyze customer purchase data:

- They store transaction records as JSON files in **Google Cloud Storage**.
  - They use **Cloud Functions** to trigger events when new data is added, such as notifying the sales team.
  - They integrate **BigQuery** to analyze buying trends and improve marketing strategies.
- 

## Google Cloud Connect

Google Cloud Connect allows users to integrate Microsoft Office with Google Cloud, enabling file synchronization and collaboration.

### Example:

A marketing team is working on a presentation in **Microsoft PowerPoint**:

- They install **Google Cloud Connect** to store files in the cloud.
- Team members make edits in their Office applications, and updates sync automatically.

- The document is accessible with a unique URL, making it easy to share with stakeholders.
- 

### **Google Cloud Print**

Google Cloud Print allows users to print from any internet-connected device to a cloud-enabled printer.

#### **Example:**

A remote employee needs to print an important contract at the office:

- They upload the document via **Google Cloud Print** from their laptop.
  - The document is sent securely to a cloud-connected office printer.
  - The office assistant collects the printed contract for signing.
- 

### **Google App Engine**

Google App Engine is a platform that lets users build and run applications without managing servers.

#### **Example:**

A company builds an **AI chatbot** that helps customers with online shopping:

- The chatbot application is deployed on **Google App Engine**.
- It uses **Google Cloud Datastore** to store customer interactions.
- The system auto-scales when there are more customer queries, ensuring smooth performance.

### **Amazon Web Services (AWS)**

AWS is a leading cloud computing platform that offers various remote computing services over the internet. It provides secure, scalable, and reliable infrastructure for businesses of all sizes.

The most well-known AWS services include:

- **Amazon Elastic Compute Cloud (EC2)** – Computing power in the cloud

- **Amazon Simple Storage Service (S3)** – Scalable cloud storage
  - **Amazon Simple Queue Service (SQS)** – Reliable message queuing service
- 

## 1. Amazon Elastic Compute Cloud (EC2)

### What is Amazon EC2?


Amazon EC2 is an **Infrastructure as a Service (IaaS)** offering that provides **virtual servers (instances)** on demand. It allows businesses to **run applications, host websites, and scale computing resources** as needed.

### Example Scenario

#### Example: Hosting a Website Using EC2

Imagine a startup wants to host a web application. Instead of purchasing physical servers, they launch an **EC2 instance** with their required OS (e.g., Ubuntu). They install a web server like **Apache** or **NGINX**, deploy their website, and configure **Auto Scaling** to handle traffic spikes.

1. The company selects an **Amazon Machine Image (AMI)** (pre-configured OS).
2. They choose an instance type (CPU, RAM, storage) based on the app's needs.
3. They configure security settings and launch the instance.
4. They install a web server and host their website.
5. They enable **Auto Scaling** to add more instances during high traffic.

 **Advantage:** Pay only for the resources used. If traffic decreases, EC2 automatically shuts down extra instances.

---

## 2. Amazon Simple Storage Service (S3)

### What is Amazon S3?

Amazon S3 is a **highly scalable object storage service** used to store and retrieve data from anywhere on the web. It is reliable, secure, and designed for big data storage, backup, and content delivery.

### Example Scenario

#### Example: Storing Images for a Social Media App

A social media company needs a scalable solution to store user-uploaded images. Instead of maintaining local storage, they use Amazon S3.

1. When a user uploads a photo, the app stores it in an **S3 bucket**.
2. Each image gets a unique **URL** for retrieval.

✅ **Advantage:** No need to worry about disk space, as S3 scales automatically.

---

### 3. Amazon Simple Queue Service (SQS)

#### What is Amazon SQS?

Amazon SQS is a **fully managed message queue service** that allows applications to **communicate asynchronously**. It helps in **decoupling** components of a system for better scalability and fault tolerance.

#### Example Scenario

##### Example: Processing Orders in an E-commerce Website

An online store receives thousands of orders per minute. Instead of handling all orders in real time, they use **SQS** to queue them.

1. When a customer places an order, the system **sends a message to an SQS queue**.
2. A **worker application** (running on EC2) retrieves and processes the orders one by one.
3. If an EC2 instance goes down, the messages remain in the queue until another instance picks them up.
4. After successful order processing, the message is removed from the queue.

✅ **Advantage:** Ensures **fault tolerance** and **smooth order processing** without losing any data.

### Microsoft Cloud Computing

Microsoft offers various cloud computing solutions for businesses, including Windows Azure, the Microsoft Assessment and Planning Toolkit, and SharePoint.

#### 1. Windows Azure

Windows Azure (now called Microsoft Azure) is a cloud platform that provides services like computing, storage, and networking.

##### ◆ Example:

A financial firm wants to build a web-based application for processing transactions. Instead of purchasing and maintaining physical servers, they can use **Azure Web Apps** (a service in Azure) to deploy and manage their application efficiently.

## **2. Microsoft Assessment and Planning Toolkit (MAP)**

MAP is a tool that helps organizations assess their IT infrastructure and plan cloud migration.

### **◆ Example:**

A university wants to move its email system from on-premises servers to Microsoft 365. MAP analyzes the current email system and provides a migration strategy to shift data to the cloud.

## **3. Microsoft SharePoint**

SharePoint is a web-based collaboration and document management tool that integrates with Microsoft Office.

### **◆ Example:**

A multinational company uses SharePoint to create an intranet portal where employees can share documents, manage projects, and collaborate in real time. Teams across different locations can access the latest files and updates, ensuring smooth workflow management.