# Cloud Computing Lab 1

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Q – Lab 1  creating account on aws academy

1. **Pre-class Activity:**

* Gather 5 cloud services and come up with how they are used in 3 different mobile/web applications that you use daily
* Learn about top 10 cloud services offered by AWS and their equivalent services by GCP and Azure with the help of GenAI

**Part A: Five Cloud Services and Their Use in Everyday Applications**

**1. Cloud Storage**

* **Service Examples**: AWS S3, Google Cloud Storage, Azure Blob Storage
* **Use in Apps**:
  + **WhatsApp**: Media files such as photos, videos, and documents are stored in encrypted form on cloud storage when chat backup is enabled.
  + **Google Drive**: The entire application is built on cloud storage. Every file uploaded by the user is saved in a secure, scalable cloud object storage.
  + **Instagram**: Images and videos posted by users are stored in cloud object storage and retrieved efficiently using CDNs.

**2. Content Delivery Network (CDN)**

* **Service Examples**: AWS CloudFront, Google Cloud CDN, Azure CDN
* **Use in Apps**:
  + **Netflix**: Uses CDN to deliver video streams quickly and efficiently to users worldwide with minimal buffering.
  + **YouTube**: CDN ensures video content is streamed from servers closest to the viewer’s location.
  + **Flipkart**: Product images, thumbnails, and dynamic ads are quickly loaded using CDN edge servers to reduce page load time.

**3. Cloud Databases**

* **Service Examples**: Amazon RDS / DynamoDB, Google Cloud SQL / Firestore, Azure SQL Database / Cosmos DB
* **Use in Apps**:
  + **Swiggy**: Stores restaurant details, user orders, and delivery data using scalable databases.
  + **Spotify**: Uses cloud databases to manage user preferences, song metadata, and playlists in real time.
  + **LinkedIn**: Maintains millions of user profiles and recommendations using distributed cloud databases.

**4. Serverless Computing**

* **Service Examples**: AWS Lambda, Google Cloud Functions, Azure Functions
* **Use in Apps**:
  + **Zomato**: Uses serverless functions to trigger notifications, like order status updates, without managing servers.
  + **Paytm**: For event-driven tasks like sending OTPs, processing wallet payments, or verifying identity.
  + **Gmail (through Google Cloud)**: Serverless backend processes incoming and outgoing emails, filters spam, and syncs accounts.

**5. Identity & Access Management (IAM)**

* **Service Examples**: AWS IAM, Google IAM, Azure Active Directory
* **Use in Apps**:
  + **Amazon**: Ensures only authenticated users can access their accounts, manage purchases, or make transactions.
  + **Microsoft Teams**: Uses Azure AD to manage user identities, permissions, and secure collaboration across organizations.
  + **Zoom**: Manages meeting hosts, participants, and administrators using IAM for role-based access control.

**Part B: Top 10 AWS Cloud Services and Their Equivalents in GCP and Azure**

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| **AWS Service** | **Google Cloud Equivalent** | **Azure Equivalent** | **Function** |
| Amazon EC2 | Google Compute Engine | Azure Virtual Machines | Virtual server hosting and infrastructure |
| Amazon S3 | Google Cloud Storage | Azure Blob Storage | Scalable object storage for files, images, and videos |
| Amazon RDS | Google Cloud SQL | Azure SQL Database | Managed relational database services |
| AWS Lambda | Google Cloud Functions | Azure Functions | Serverless computing for event-driven tasks |
| Amazon CloudFront | Google Cloud CDN | Azure CDN | Content delivery and caching for low-latency access |
| Amazon DynamoDB | Google Firestore / BigTable | Azure Cosmos DB | NoSQL database for real-time applications |
| AWS IAM | Google Cloud IAM | Azure Active Directory | Identity and access control for users and roles |
| Amazon ECS / EKS | Google Kubernetes Engine (GKE) | Azure Kubernetes Service (AKS) | Container orchestration and management |
| AWS Glue | Google Cloud Data Fusion | Azure Data Factory | ETL (Extract, Transform, Load) service for data integration and prep |
| Amazon SageMaker | Google Vertex AI | Azure Machine Learning | End-to-end machine learning development and deployment |