

Exp. No.	01	Cloud Account Setup and Services Overview	Year/ SEM	2/IV
Date	11/03/2025		Branch	BTECH/IT

**Aim:**

To create an AWS cloud account and explore its various services.

**Procedure:****1. Create an AWS Account**

- Go to AWS Official Website. Branch
- Click on "Create an AWS Account" and enter the required details (email, password, account name).
- Choose "Personal" or "Business" account type and provide billing information.
- Complete identity verification using a phone number.
- Select a support plan (Free Tier recommended for beginners).
- Log in to the AWS Management Console.

**2. Exploring AWS Services**

- Navigate through the AWS Management Console to explore services. CSE
- Access different categories such as Compute, Storage, Database, Networking, and Security.
- Experiment with services like EC2 (Elastic Compute Cloud), S3 (Simple Storage Service), and RDS (Relational Database Service) using Free Tier options.

## AWS:

Amazon Web Services (AWS) is a cloud computing platform that provides on-demand computing power, storage, and various services for businesses and developers.

## Services in AWS:

<b>Compute</b> <ul style="list-style-type: none"> <li>EC2</li> <li>LightSail</li> <li>Lambda</li> <li>Batch</li> <li>Elastic Beanstalk</li> <li>Serverless Application Repository</li> <li>AWS Outposts</li> <li>EC2 Image Builder</li> <li>AWS App Runner</li> <li>AWS Sinspace Weaver</li> <li>EC2 Global View</li> <li>Parallel Computing Service</li> </ul>	<b>Developer Tools</b> <ul style="list-style-type: none"> <li>CodeCommit</li> <li>CodeBuild</li> <li>CodeDeploy</li> <li>CodePipeline</li> <li>Cloud9</li> <li>CloudShell</li> <li>X-Ray</li> <li>AWS FIS</li> <li>CodeArtifact</li> <li>Amazon CodeCatalyst</li> <li>AWS AppConfig</li> <li>Amazon Q Developer (Including Amazon CodeWhisperer)</li> <li>Infrastructure Composer</li> <li>AWS App Studio</li> </ul>	<b>Machine Learning</b> <ul style="list-style-type: none"> <li>Amazon SageMaker AI</li> <li>Amazon Augmented AI</li> <li>Amazon CodeGuru</li> <li>Amazon DevOps Guru</li> <li>Amazon Comprehend</li> <li>Amazon Forecast</li> <li>Amazon Fraud Detector</li> <li>Amazon Kendra</li> <li>Amazon Personalize</li> <li>Amazon Polly</li> <li>Amazon Rekognition</li> <li>Amazon Transcribe</li> <li>Amazon Translate</li> <li>AWS DeepComposer</li> <li>AWS DeepRacer</li> <li>AWS Panorama</li> <li>Amazon Monitor</li> <li>AWS HealthLake</li> <li>Amazon Lookout for Vision</li> <li>Amazon Lookout for Equipment</li> <li>Amazon Lookout for Metrics</li> <li>Amazon Lex</li> <li>Amazon Comprehend Medical</li> <li>AWS HealthOmics</li> <li>Amazon Bedrock</li> <li>AWS HealthImaging</li> <li>Amazon Q</li> <li>Amazon Q Business</li> </ul>	<b>Cloud Financial Management</b> <ul style="list-style-type: none"> <li>AWS Marketplace</li> <li>AWS Billing Conductor</li> <li>Billing and Cost Management</li> </ul>
<b>Containers</b> <ul style="list-style-type: none"> <li>Elastic Container Service</li> <li>Elastic Kubernetes Service</li> <li>Red Hat OpenShift Service on AWS</li> <li>Elastic Container Registry</li> </ul>	<b>Customer Enablement</b> <ul style="list-style-type: none"> <li>AWS IQ</li> <li>Managed Services</li> <li>Activate for Startups</li> <li>Support</li> <li>AWS rePost Private</li> </ul>	<b>Analytics</b> <ul style="list-style-type: none"> <li>Athena</li> <li>Amazon Redshift</li> <li>CloudSearch</li> <li>Amazon OpenSearch Service</li> <li>Kinesis</li> <li>QuickSight</li> <li>AWS Data Exchange</li> <li>AWS Lake Formation</li> <li>MSK</li> <li>AWS Glue DataBrew</li> <li>Amazon FinSpace</li> <li>AWS Glue</li> <li>Amazon Data Firehose</li> <li>EMR</li> <li>AWS Clean Rooms</li> <li>Amazon SageMaker</li> <li>AWS Entity Resolution</li> <li>Managed Apache Flink</li> <li>Amazon DataZone</li> </ul>	<b>Front-end Web &amp; Mobile</b> <ul style="list-style-type: none"> <li>AWS Amplify</li> <li>AWS AppSync</li> <li>Device Farm</li> <li>Amazon Location Service</li> </ul>
<b>Storage</b> <ul style="list-style-type: none"> <li>S3</li> <li>EFS</li> <li>FIS</li> <li>S3 Glacier</li> <li>Storage Gateway</li> <li>AWS Backup</li> <li>AWS Elastic Disaster Recovery</li> </ul>	<b>Robotics</b> <ul style="list-style-type: none"> <li>AWS RoboMaker</li> </ul>	<b>Blockchain</b> <ul style="list-style-type: none"> <li>Amazon Managed Blockchain</li> </ul>	<b>Application Integration</b> <ul style="list-style-type: none"> <li>Step Functions</li> <li>Amazon AppFlow</li> <li>Amazon MQ</li> <li>Simple Notification Service</li> <li>Simple Queue Service</li> <li>SWF</li> <li>Managed Apache Airflow</li> <li>AWS EventBridge</li> <li>AWS B2B Data Interchange</li> </ul>
<b>Database</b> <ul style="list-style-type: none"> <li>Aurora and RDS</li> <li>ElastiCache</li> <li>Neptune</li> <li>Amazon QLDB</li> <li>Amazon DocumentDB</li> <li>Amazon Keyspaces</li> <li>Amazon TimeStream</li> <li>DynamoDB</li> <li>Amazon MemoryDB</li> <li>Amazon Aurora DSQL</li> <li>Oracle Database@AWS</li> </ul>	<b>Satellite</b> <ul style="list-style-type: none"> <li>Ground Station</li> </ul>	<b>Quantum Technologies</b> <ul style="list-style-type: none"> <li>Amazon Braket</li> </ul>	<b>Business Applications</b> <ul style="list-style-type: none"> <li>Amazon Connect</li> <li>Amazon Chime</li> <li>Amazon Simple Email Service</li> <li>Amazon WorkDocs</li> <li>Amazon WorkMail</li> <li>AWS Supply Chain</li> <li>AWS AppFabric</li> <li>AWS Vicer</li> <li>Amazon Chime SDK</li> <li>Amazon One Enterprise</li> <li>Amazon Pinpoint</li> <li>AWS End User Messaging</li> </ul>
<b>Migration &amp; Transfer</b> <ul style="list-style-type: none"> <li>AWS Migration Hub</li> <li>AWS Application Migration Service</li> <li>Application Discovery Service</li> <li>Database Migration Service</li> <li>AWS Transfer Family</li> <li>AWS Snow Family</li> <li>DataSync</li> <li>AWS Mainframe Modernization</li> <li>Amazon Elastic VMware Service (Preview)</li> </ul>	<b>Management &amp; Governance</b> <ul style="list-style-type: none"> <li>AWS Organizations</li> <li>CloudWatch</li> <li>AWS Auto Scaling</li> <li>CloudFormation</li> <li>AWS Config</li> <li>OpsWorks</li> <li>Service Catalog</li> <li>Systems Manager</li> <li>Trusted Advisor</li> <li>Control Tower</li> <li>AWS Well-Architected Tool</li> <li>Amazon Q Developer in chat applications (Previously AWS Chatbot)</li> <li>Launch Wizard</li> <li>AWS Compute Optimizer</li> <li>Resource Groups &amp; Tag Editor</li> <li>Amazon Grafana</li> <li>Amazon Prometheus</li> <li>AWS Resilience Hub</li> <li>Incident Manager</li> <li>AWS License Manager</li> <li>Service Quotas</li> <li>AWS Proton</li> <li>CloudTrail</li> <li>AWS Resource Explorer</li> <li>AWS User Notifications</li> <li>AWS Health Dashboard</li> <li>AWS Telco Network Builder</li> </ul>	<b>Security, Identity, &amp; Compliance</b> <ul style="list-style-type: none"> <li>Resource Access Manager</li> <li>Cognito</li> <li>Secrets Manager</li> <li>GuardDuty</li> <li>Amazon Inspector</li> <li>Amazon Macie</li> <li>IAM Identity Center</li> <li>Certificate Manager</li> <li>Key Management Service</li> <li>CloudHSM</li> <li>Directory Service</li> <li>AWS Firewall Manager</li> <li>AWS Artifact</li> <li>Detective</li> <li>AWS Signer</li> <li>AWS Private Certificate Authority</li> <li>Security Hub</li> <li>AWS Audit Manager</li> <li>Security Lake</li> <li>WAF &amp; Shield</li> <li>Amazon Verified Permissions</li> <li>AWS Payment Cryptography</li> <li>AWS Security Incident Response</li> <li>IAM</li> </ul>	<b>End User Computing</b> <ul style="list-style-type: none"> <li>WorkSpaces</li> <li>AppStream 2.0</li> <li>WorkSpaces Secure Browser</li> <li>WorkSpaces Thin Client</li> </ul>
<b>Networking &amp; Content Delivery</b> <ul style="list-style-type: none"> <li>VPC</li> <li>CloudFront</li> <li>API Gateway</li> <li>Direct Connect</li> <li>AWS App Mesh</li> <li>Global Accelerator</li> <li>AWS Cloud Map</li> <li>Amazon Application Recovery Controller</li> <li>AWS Private 5G</li> <li>Route 53</li> <li>AWS Data Transfer Terminal</li> </ul>	<b>Media Services</b> <ul style="list-style-type: none"> <li>Kinesis Video Streams</li> <li>MediaConvert</li> <li>MediaLive</li> <li>MediaPackage</li> <li>MediaStore</li> <li>MediaTailor</li> <li>Elemental Appliances &amp; Software</li> <li>Elastic Transcoder</li> <li>MediaConnect</li> <li>Amazon Interactive Video Service</li> <li>AWS Deadline Cloud</li> </ul>	<b>Internet of Things</b> <ul style="list-style-type: none"> <li>IoT Analytics</li> <li>IoT Device Defender</li> <li>IoT Device Management</li> <li>IoT Greengrass</li> <li>IoT SiteWise</li> <li>IoT Core</li> <li>IoT Events</li> <li>AWS IoT FleetWise</li> <li>IoT TwinMaker</li> </ul>	<b>Game Development</b> <ul style="list-style-type: none"> <li>Amazon GameLift Servers</li> <li>Amazon GameLift Sessions</li> </ul>

## i)COMPUTE NETWORKING:

AWS provides various compute and networking services to help users build, deploy, and manage applications efficiently. Here are key services under each category:

### **1. Compute Services:**

AWS compute services provide the infrastructure needed to run applications, including virtual machines, container orchestration, and serverless computing.

- **Amazon EC2 (Elastic Compute Cloud):** Scalable virtual servers in the cloud.
- **AWS Lambda:** Serverless computing service that runs code in response to events.

### **2. Networking Services:**

AWS networking services ensure secure, scalable, and reliable communication between resources.

- **Amazon VPC (Virtual Private Cloud):** Isolated network environment for AWS resources.
- **AWS Direct Connect:** Private network connection between AWS and on-premises infrastructure.
- **AWS Transit Gateway:** Connects multiple VPCs and on-premises networks.
- **Amazon Route 53:** Scalable domain name system (DNS) for routing traffic.

### **ii) STORAGE AND CONTENT DELIVERY:**

- **Storage:** AWS offers scalable and durable services like S3, EBS, and EFS for diverse data storage needs.

- **Content Delivery:** AWS CloudFront accelerates content distribution globally by caching data at edge locations, reducing latency.

### **Amazon S3 (Simple Storage Service):**

- ❖ This is object storage, ideal for storing and retrieving any amount of data from anywhere.
- ❖ It's highly scalable, durable, and versatile, used for various purposes like data lakes, backups, and content storage.

### **Amazon EBS (Elastic Block Store):**

- ❖ This provides block-level storage volumes for use with Amazon EC2 instances.
- ❖ It's designed for high-performance workloads that require low-latency access to data, like databases and enterprise applications

### **Content Delivery Acceleration:**

- ❖ To improve the performance and user experience of web applications and content delivery by reducing latency and increasing transfer speeds.
- ❖ To distribute content globally, ensuring that users can access it quickly and reliably from anywhere in the world.

### **Scalability and Flexibility:**

- ❖ To offer storage and content delivery solutions that can scale dynamically to meet changing demands.

- ❖ To provide a variety of storage options to accommodate different data types and access patterns.

### **iii Databases:**

Amazon Web Services (AWS) provides various **managed database services** to store, manage, and process data efficiently in the cloud. These services are designed for **scalability, security, high availability, and performance** without requiring users to manage the underlying infrastructure manually.

#### **Types of AWS Database Services**

##### **1. Relational Databases (SQL-based)**

These databases store structured data in tables with predefined schema. Examples include Amazon RDS, Amazon Aurora, Microsoft SQL Server, and Oracle.

- Automates backups, patching, and scaling.
- **Amazon Aurora**
  - High-performance relational database compatible with MySQL and PostgreSQL.
  - Faster and more scalable than traditional RDS options.

##### **2. NoSQL Databases**

Designed for unstructured or semi-structured data, providing fast read/write operations.

- **Amazon DynamoDB**
  1. Serverless, highly scalable key-value and document database.
  2. Ideal for applications requiring low-latency access, such as gaming, IoT, and mobile apps.
- **Amazon ElastiCache**

1. In-memory caching for high-speed performance using **Redis** and **Memcached**.

- **Amazon Keyspaces**

- Managed **Apache Cassandra**-compatible NoSQL database for high availability.

### **3. Data Warehousing & Analytics**

For storing and analyzing large datasets used in business intelligence.

- **Amazon Redshift**

- Fully managed data warehouse for large-scale analytics.
- Supports SQL queries and integrates with **AWS Glue** and **Amazon S3** for data processing.

### **4. Specialized Databases**

AWS offers services for unique data models and workloads.

- **Amazon Neptune** – Managed graph database for applications needing relationships between data (e.g., social networks, fraud detection).
- **Amazon Timestream** – Time-series database optimized for IoT and real-time data.
- **Amazon QLDB (Quantum Ledger Database)** – Immutable, cryptographically verifiable ledger database for tracking changes.
- **Amazon Managed Blockchain** – Service to build and manage blockchain networks.

## **iv Deployment and Management of AWS Databases**

AWS provides **fully managed** database services that simplify deployment, scaling, security, and monitoring. These services ensure **high availability, automated backups, and minimal operational overhead** for database administrators.

## Deployment of AWS Databases

### 1. Choosing the Right AWS Database

- a. **Amazon RDS** – For relational databases (MySQL, PostgreSQL, SQL Server, Oracle, etc.).
- b. **Amazon DynamoDB** – For NoSQL key-value and document storage.
- c. **Amazon Redshift** – For data warehousing and analytics.

### 2. Configuring the Database

- a. Set database instance type, storage, and security settings.
- b. Choose **Single-AZ** (one region) or **Multi-AZ** (automatic failover for high availability).
- c. Enable automated backups and monitoring.

### 3. Deploying the Database

- a. AWS provisions the database, managing resources automatically.
- b. A **database endpoint** is provided for applications to connect.

### 4. Connecting to the Database

- a. Use **SQL clients** (MySQL Workbench, pgAdmin) or **AWS SDKs** for DynamoDB.
- b. Example MySQL connection:
- c. `mysql -h <your-db-endpoint> -u <username> -p`

## Management of AWS Databases

### 1. Monitoring & Performance Optimization

- a. **Amazon CloudWatch** – Tracks CPU, memory, connections, and query performance.
- b. **Performance Insights (RDS, Aurora)** – Identifies slow queries and optimizes performance.
- c. **DynamoDB Auto Scaling** – Adjusts capacity dynamically based on workload.

### 2. Backup & Disaster Recovery

- a. **Automated Backups (RDS, Aurora)** – Retains daily backups up to 35 days.
- b. **Point-in-Time Recovery** – Restores data to a specific moment in time.
- c. **Manual Snapshots** – Create long-term backups for compliance and recovery.

### 3. Security & Access Control

- a. **IAM (Identity and Access Management)** – Controls user permissions.
- b. **VPC Security Groups** – Restricts database access to private networks.
- c. **AWS KMS Encryption** – Encrypts data at rest and in transit.

### 4. Scaling & High Availability

- a. **Multi-AZ Deployment (RDS, Aurora)** – Provides automatic failover for reliability.
- b. **Read Replicas** – Distributes database load for improved performance.
- c. **DynamoDB Global Tables** – Ensures worldwide replication for faster access.

### 5. Cost Optimization & Cleanup

- a. **AWS Cost Explorer** – Monitors database usage to reduce costs.
- b. **Delete Unused Instances** – Prevents unnecessary billing.
- c. **Enable Auto Scaling** – Adjusts database resources based on demand.

## v)ANALYTICS:

Services refer to a suite of cloud-based tools provided by Amazon Web Services (AWS) for collecting, processing, storing, analyzing, and visualizing data at scale. These services support real-time and batch processing, big data analytics, business intelligence, machine learning, and data warehousing.

### 1.Data Collection & Ingestion :

AWS Kinesis – Real-time data streaming for processing logs, IoT data, and event streams.

AWS Data Pipeline – Automates data movement between AWS services and on-premises storage.



AWS Glue – Fully managed ETL (Extract, Transform, Load) service to prepare and transform data.

## **2.Data Warehousing Amazon Redshift:**

A fast, scalable cloud data warehouse for analytical queries over structured data.

## **3.Machine Learning & AI Analytics Amazon SageMaker:**

Build, train, and deploy machine learning models. AWS Forecast – Uses ML for time-series forecasting. Amazon Comprehend – NLP (Natural Language Processing) service for text analytics.

## **4.Data Lakes & Storage Amazon S3:**

Scalable object storage used for data lakes and analytics workloads.

## **vi)MOBILE SERVICES:**

AWS (Amazon Web Services) provides a comprehensive suite of mobile services designed to help developers build, deploy, and manage mobile applications.

### **AWS Amplify:**

- This is a set of tools and services that enable front-end web and mobile developers to build scalable full stack applications, powered by AWS.

### **AWS AppSync:**

- This service simplifies application development by enabling you to create flexible APIs using GraphQL.

### **AWS Device Farm:**

- This is an app testing service that allows you to test your Android, iOS, and web apps on a wide range of real devices hosted in the AWS Cloud.

### **Amazon Location Service:**

- This service allows developers to add location functionality to applications, such as maps, points of interest, geocoding, and tracking.

### **AWS Console Mobile Application:**

- This app allows users to monitor and manage a selection of AWS resources from their mobile devices.

### **PURPOSE OF AWS IN MOBILE SERVICES:**

- Simplifying Backend Development.

- Enabling Scalability and Reliability.
- Providing Testing and Quality Assurance.
- Enhancing User Experience.
- Accelerating Development.

## **vii) APP SERVICES:**

AWS offers a very broad range of app services, catering to diverse needs from simple web hosting to complex, distributed applications.

- **Amazon EC2 (Elastic Compute Cloud):**
  1. Provides virtual servers (instances) in the cloud.
  2. Suitable for a wide variety of applications.
- **AWS App Runner:**
  1. A fully managed service that makes it easy to deploy containerized web applications and APIs at scale.
  2. Simplifies deployment and management, handling infrastructure automatically.
- **AWS Lambda:**
  1. A serverless compute service that lets you run code without provisioning or managing servers.
  2. Ideal for event-driven applications and microservices.

## **Application Integration Services:**

- **Amazon API Gateway:**
  1. Enables you to create, publish, maintain, monitor, and secure APIs.
  2. Crucial for building microservices and exposing backend functionality.
- **Amazon SQS (Simple Queue Service):**
  1. A fully managed message queuing service.

2. Used to decouple application components and improve reliability.

- **Amazon SNS (Simple Notification Service):**

1. A fully managed messaging service for pub/sub messaging.
2. Enables you to send notifications to various endpoints.
3. Improves performance and reduces latency for users.

### **viii)APPLICATION OF AWS:**

- **Data Storage and Backup:**

Amazon S3 is widely used for storing various types of data, from website assets to backups and archives.

- **Big Data Analytics:**

AWS provides tools for processing and analyzing large datasets, such as Amazon EMR (Elastic MapReduce) and Amazon Redshift.

- **Internet of Things (IoT):**

AWS IoT services enable devices to connect to the cloud, collect data, and interact with other applications.

- **Artificial Intelligence and Machine Learning:**

AWS offers a range of AI/ML services, such as Amazon SageMaker, for building and deploying machine learning models.

- **Enterprise Applications:**

AWS provides services for running enterprise applications, such as CRM, ERP, and collaboration tools.

### **Specific AWS Service Applications:**

- **Amazon EC2 (Elastic Compute Cloud):**

- 1) Running web servers, application servers, and other compute-intensive workloads.
- 2) High performance computing.

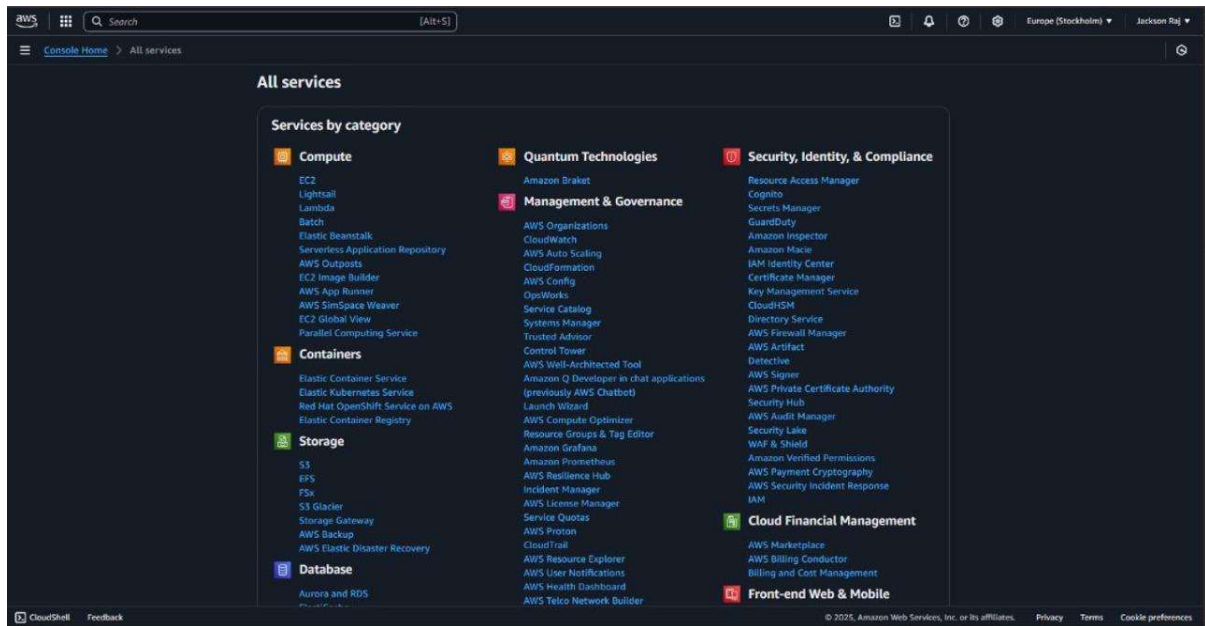
- **Amazon S3 (Simple Storage Service):**

- 1) Storing website content, media files, backups, and data archives.
- 2) Building data lakes.

- **Amazon RDS (Relational Database Service):**

- 1) Hosting relational databases for web applications, e-commerce platforms, and other data-driven applications.

### **Conclusion:**



AWS provides a wide range of cloud services that enable businesses and developers to build, deploy, and manage applications efficiently. Exploring AWS services gives hands-on experience in cloud computing, storage, networking, and security.

## Result:

Successfully created an AWS account and explored various AWS services.