AWS

WEEKLY TEST- HARITHA P V (09-08-2024)

1).What is AWS?

- AWS (Amazon Web Services) is a comprehensive cloud computing platform by Amazon.
- It provides a variety of on-demand services including computing power, storage, and databases.
- AWS enables businesses to scale and grow without investing in physical infrastructure.
- It operates on a pay-as-you-go model, reducing upfront costs and offering flexibility.

2).**Describe what AWS is and its significance in cloud computing.**

- AWS is a leader in cloud services, offering scalable and reliable infrastructure.
- It supports a broad range of applications from simple web hosting to complex data analysis.
- AWS reduces the need for physical hardware and enables global reach.
- Its significance lies in enabling businesses to innovate and scale efficiently without heavy upfront investment.

3).**Explain the key components of AWS architecture.**

Compute:

- EC2: Scalable virtual servers for applications.
- Lambda: Serverless code execution in response to events.
- ECS/EKS: Manage containerized applications.

Storage:

- S3: Scalable object storage for data and backups.
- EBS: Block storage for EC2 instances.
- Glacier: Low-cost archival storage.

Databases:

- RDS: Managed relational databases.
- DynamoDB: Fast, NoSQL database service.
- Redshift: Data warehouse for analytics.

Networking:

- VPC: Isolated network environments.
- Route 53: Scalable DNS and domain registration.
- Direct Connect: Dedicated network connection to AWS.

Security and Identity:

- IAM: Manage user permissions and access.
- KMS: Encryption key management.
- Shield/WAF: DDoS protection and web traffic filtering.

4).Discuss services like EC2, S3, RDS, and IAM.

Amazon EC2 (Elastic Compute Cloud)

- **Description**: Provides resizable compute capacity in the cloud using virtual servers called instances.
- **Use Case**: Running applications, hosting web servers, or performing computational tasks.
- **Example**: Hosting a website or web application on a virtual server that can scale based on demand.
- **Example**: A startup runs its e-commerce website on EC2 instances to handle traffic spikes during sales events. They use auto-scaling to increase the number of instances during high traffic periods and reduce them during low traffic.

Amazon S3 (Simple Storage Service)

- **Description**: Scalable object storage service for storing and retrieving any amount of data.
- **Use Case**: Backup, archiving, and serving static assets like images, videos, and website files.
- **Example**: Storing and serving images for a website or storing backups of databases.
- **Example**: A media company stores and serves thousands of high-resolution images for their online photo gallery using Amazon S3. They use S3 to handle the storage and retrieval of images with low latency and high durability.

Amazon RDS (Relational Database Service)

- **Description**: Managed relational database service that supports various database engines.
- **Use Case**: Hosting and managing relational databases for applications with automated backups, patching, and scaling.
- **Example**: Running a MySQL database for a web application with automatic backups and scaling capabilities.

AWS IAM (Identity and Access Management)

- **Description**: Manages access to AWS services and resources securely.
- **Use Case**: Controlling user permissions and managing access to AWS resources.
- **Example**: Creating IAM roles for different teams with specific permissions for accessing AWS services.

5).**What are the benefits of using cloud computing with AWS?**

6).Focus on scalability, flexibility, cost-efficiency, and security.

- **Scalability:** Automatically adjusts resources based on demand.

- **Flexibility:** Supports various services and configurations for different needs.
- **Cost-efficiency:** Pay-as-you-go pricing reduces capital expenditure.
- **Security:** Provides robust security features and compliance certifications.

7).How does AWS pricing work?

8).Explain the pay-as-you-go model, reserved instances, and free tier

- Pay-as-you-go: Users pay only for the resources they use, with no upfront costs or long-term commitments.
- Reserved Instances: Offers lower rates in exchange for committing to use specific services for a one- or three-year term.
- Free Tier: Allows new users to access certain AWS services for free up to specified limits for a limited time.

9).Explain cloud computing models.

1. Software as a Service (SaaS)

- **Purpose**: Provides software applications over the internet on a subscription basis.
- **Characteristics**: Users access applications via web browsers or APIs, with no need for infrastructure management.
- **Examples**: Gmail, Slack, Salesforce, Dropbox, Microsoft Office 365, Zoom, Atlassian Jira.

2. Platform as a Service (PaaS)

- **Purpose**: Offers a platform to develop, deploy, and manage applications without managing the underlying infrastructure.

- **Characteristics**: Provides tools and services for application development, including databases and middleware.
- **Examples**: Microsoft Azure App Services, Google App Engine, Heroku, Red Hat OpenShift, IBM Cloud Foundry, Salesforce App Cloud.

3. Infrastructure as a Service (IaaS)

- **Purpose**: Provides virtualized computing resources over the internet, including virtual machines, storage, and networking.
- **Characteristics**: Users manage the operating systems and applications, while the provider manages the hardware.
- **Examples**: AWS EC2, Microsoft Azure Virtual Machines, Google Compute Engine, IBM Cloud Infrastructure, DigitalOcean Droplets, Linode.

4.Desktop as a Service (DaaS)

- **Purpose**: Delivers virtual desktop environments over the internet.
- **Characteristics**: Provides access to a desktop interface from any device, managed by the provider.
- **Examples**: Amazon WorkSpaces, VMware Horizon Cloud, Citrix Virtual Apps and Desktops, Microsoft Windows Virtual Desktop, Cloudalize.

5. Identity as a Service (IDaaS)

- **Purpose**: Provides cloud-based identity and access management, including authentication and user management.
- **Characteristics**: Manages and secures user identities, often integrating with various applications and systems.
- **Examples**: Okta, Azure Active Directory, OneLogin, Auth0, IBM Security Verify, Ping Identity.

6.Function as a Service (FaaS)

- **Purpose**: Executes individual functions in response to events without managing server infrastructure.
- **Characteristics**: Automatically scales based on the number of requests, with users only paying for the execution time.
- **Examples**: AWS Lambda, Google Cloud Functions, Azure Functions, IBM Cloud Functions, Alibaba Cloud Function Compute, Oracle Functions.

10).Explain AWS Snowball.

- **Description**: A data transport solution that uses physical devices to transfer large amounts of data to and from AWS.
- **Use Case**: Migrating large datasets to AWS when network transfer is impractical or time-consuming.
- **Example**: Using Snowball to transfer terabytes of data from an on-premises data center to Amazon S3.
- **Example**: A large research institution uses AWS Snowball to transfer petabytes of data from their on-premises data center to Amazon S3. This is done to facilitate the analysis of large datasets for scientific research, which would be too slow over the internet.

11).Explain Load Balancing.

- **Load Balancing:** Distributes incoming traffic across multiple servers to ensure no single server is overwhelmed.
- **Improves Performance:** Enhances the availability and reliability of applications by balancing the load.
- **Types:** Includes Application Load Balancer, Network Load Balancer, and Classic Load Balancer.
- **AWS Service:** Elastic Load Balancing (ELB) automates this process in AWS environments.

12).Explain Auto Scaling.

- **Auto Scaling:** Automatically adjusts the number of EC2 instances based on current demand.
- **Maintains Performance:** Ensures that the application performs well during high or low traffic periods.
- **Cost-Efficiency:** Reduces costs by scaling down when demand decreases.
- **Configuration:** Can be configured using policies and schedules to manage scaling behavior.

13).**Explain AWS Lambda Service.**

- **AWS Lambda:** A serverless computing service that executes code in response to events without provisioning or managing servers.
- **Event-Driven:** Automatically runs code in response to triggers such as changes in data or HTTP requests.
- **Cost-Efficient:** Charges are based on the number of requests and the duration of code execution.
- **Scalable:** Scales automatically with the number of incoming events.