AWS

50 interview questions/answers

1. **What is AWS?**
    - **Answer:** AWS (Amazon Web Services) is a comprehensive cloud computing platform provided by Amazon. It offers a wide range of cloud services, including computing power, storage, databases, networking, analytics, machine learning, and more.
    - **Example:** AWS offers over 200 fully featured services like Amazon EC2 for computing, Amazon S3 for storage, and Amazon RDS for databases.
2. **What are the main components of AWS?**
    - **Answer:** The main components of AWS are:
        - **Compute**: Amazon EC2, AWS Lambda
        - **Storage**: Amazon S3, Amazon EBS, Amazon Glacier
        - **Database**: Amazon RDS, Amazon DynamoDB, Amazon Redshift
        - **Networking**: Amazon VPC, AWS Direct Connect
        - **Management Tools**: AWS CloudFormation, AWS CloudTrail
        - **Security & Identity**: IAM, AWS Shield, AWS WAF
    - **Example:** For compute needs, you can use EC2 instances, and for storage, you can use S3 buckets.
3. **Explain the difference between S3 and EBS.**
    - **Answer:** S3 (Simple Storage Service) is an object storage service, ideal for storing and retrieving large amounts of unstructured data. EBS (Elastic Block Store) is a block storage service that is used with EC2 instances for data that requires frequent updates.
    - **Example:** Use S3 to store static files like images and videos. Use EBS for databases and file systems that need low-latency access.
4. **What is EC2?**

- **Answer:** Amazon EC2 (Elastic Compute Cloud) is a web service that provides resizable compute capacity in the cloud. It allows users to launch virtual servers, known as instances, and scale capacity as needed.
- **Example:** You can launch an EC2 instance to run a web server or a database server.

5. **What are the types of EC2 instances?**
   - **Answer:** The main types of EC2 instances are:
     - **General Purpose**: Balanced CPU, memory, and network resources (e.g., T3, M5)
     - **Compute Optimized**: High CPU performance (e.g., C5, C6g)
     - **Memory Optimized**: High memory capacity (e.g., R5, X1e)
     - **Storage Optimized**: High I/O performance (e.g., I3, D2)
     - **Accelerated Computing**: GPU-based instances (e.g., P3, G4)
   - **Example:** Use a T3 instance for a small web server and a P3 instance for machine learning workloads.
6. **What is Elastic Beanstalk?**
   - **Answer:** AWS Elastic Beanstalk is an easy-to-use service for deploying and scaling web applications and services. It automatically handles the deployment, from capacity provisioning, load balancing, and auto-scaling to application health monitoring.
   - **Example:** You can deploy a Python web application using Elastic Beanstalk by uploading your code, and Elastic Beanstalk will manage the rest.
7. **How does AWS Lambda work?**
   - **Answer:** AWS Lambda is a serverless compute service that lets you run code without provisioning or managing servers. You write your code, upload it to Lambda, and Lambda takes care of everything required to run and scale your code.
   - **Example:** You can use Lambda to run a function in response to changes in an S3 bucket or to process events from a DynamoDB stream.
8. **What is the difference between SNS and SQS?**
   - **Answer:** SNS (Simple Notification Service) is a pub/sub messaging service that allows you to send messages to multiple subscribers. SQS (Simple Queue Service) is a message queuing service that allows you to decouple and scale microservices, distributed systems, and serverless applications.

- **Example:** Use SNS to send notifications to multiple endpoints (e.g., SMS, email). Use SQS to decouple processing from message producers and consumers.

9. **What are the benefits of using AWS CloudFormation?**
    - **Answer:** AWS CloudFormation allows you to define and provision AWS infrastructure using code. Benefits include:
        - **Infrastructure as Code**: Treat infrastructure the same way as application code.
        - **Automated Resource Management**: Automatically provision and update resources.
        - **Consistency**: Ensure consistent configurations across environments.
        - **Reusability**: Reuse CloudFormation templates for different projects.
    - **Example:** Create a CloudFormation template to define a VPC, EC2 instances, and security groups.
10. **Explain the concept of IAM in AWS.**
    - **Answer:** AWS IAM (Identity and Access Management) enables you to manage access to AWS services and resources securely. You can create and manage users, groups, and roles, and control their access permissions.
    - **Example:** Create an IAM user for a developer with limited access to specific S3 buckets and EC2 instances.
11. **How do you secure data in transit and at rest in AWS?**
    - **Answer:**
        - **In Transit**: Use SSL/TLS for secure data transmission over the network.
        - **At Rest**: Use encryption services like AWS KMS (Key Management Service) to encrypt data stored in services like S3, EBS, and RDS.
    - **Example:** Enable server-side encryption in S3 to automatically encrypt data at rest.
12. **What is an AWS VPC?**
    - **Answer:** Amazon VPC (Virtual Private Cloud) allows you to create a logically isolated section of the AWS cloud where you can launch AWS resources in a virtual network that you define.
    - **Example:** Create a VPC with public and private subnets for running a web application with a publicly accessible front end and private backend servers.
13. **How do you monitor AWS resources?**

- **Answer:** Use AWS CloudWatch to monitor AWS resources and applications. CloudWatch provides metrics, logs, and alarms to help you gain visibility into your infrastructure.
- **Example:** Set up a CloudWatch alarm to trigger a notification if an EC2 instance's CPU utilization exceeds 80%.

14. **What is Auto Scaling in AWS?**
    - **Answer:** Auto Scaling automatically adjusts the number of EC2 instances in a group based on demand. It helps maintain application availability and ensures you have the right amount of capacity to handle the load.
    - **Example:** Configure an Auto Scaling group to add more instances during peak traffic hours and reduce instances during low traffic.
15. **Explain the concept of AMI in AWS.**
    - **Answer:** An Amazon Machine Image (AMI) provides the information required to launch an EC2 instance. It includes the operating system, application server, and applications.
    - **Example:** Create a custom AMI with pre-installed software and configurations to quickly launch new instances with the same setup.
16. **What is the difference between RDS and DynamoDB?**
    - **Answer:** RDS (Relational Database Service) is a managed relational database service that supports multiple database engines like MySQL, PostgreSQL, and Oracle. DynamoDB is a managed NoSQL database service that provides fast and predictable performance with seamless scalability.
    - **Example:** Use RDS for applications requiring complex queries and transactions. Use DynamoDB for applications needing high-speed reads and writes with simple queries.
17. **How do you manage AWS infrastructure using code?**
    - **Answer:** Use AWS CloudFormation or Terraform to manage AWS infrastructure as code. Define your infrastructure in code templates, and these tools will provision and manage the resources.
    - **Example:** Write a CloudFormation template to create an EC2 instance and an S3 bucket, then deploy it using the AWS Management Console or CLI.
18. **What is the purpose of AWS Route 53?**
    - **Answer:** Amazon Route 53 is a scalable and highly available Domain Name System (DNS) web service. It translates domain names into IP addresses to route end-user requests to AWS services and external resources.

- **Example:** Use Route 53 to manage the DNS records for your website and route traffic to your application running on EC2 instances.

19. **Explain the concept of AWS Direct Connect.**
    - **Answer:** AWS Direct Connect allows you to establish a dedicated network connection from your on-premises data center to AWS. It provides a more consistent network experience and can reduce network costs.
    - **Example:** Use Direct Connect for high-throughput workloads requiring a stable and reliable connection between your data center and AWS.
20. **How do you configure multi-factor authentication (MFA) in AWS?**
    - **Answer:** Enable MFA for IAM users by using the AWS Management Console, CLI, or API. Configure MFA devices like hardware tokens or virtual MFA apps (e.g., Google Authenticator) for added security.
    - **Example:** Configure MFA for an IAM user to require a one-time passcode in addition to their password when logging into the AWS Management Console.
21. **What is AWS CloudTrail?**
    - **Answer:** AWS CloudTrail records AWS API calls and events for your account and delivers log files to an S3 bucket. It helps with security analysis, resource change tracking, and compliance auditing.
    - **Example:** Use CloudTrail to monitor and log all actions taken by users, roles, or AWS services in your account.
22. **What are AWS Reserved Instances?**
    - **Answer:** Reserved Instances (RIs) provide a significant discount (up to 75%) compared to On-Demand instances in exchange for a one- or three-year commitment. They are available for EC2, RDS, Redshift, and other services.
    - **Example:** Purchase RIs for steady-state workloads like a web server that runs 24/7 to save costs.
23. **What is the difference between a public and private subnet in AWS?**
    - **Answer:**
      - **Public Subnet**: A subnet that has a route to an Internet Gateway, allowing resources in the subnet to communicate with the internet.
      - **Private Subnet**: A subnet that does not have a route to an Internet Gateway, isolating resources from the internet.
    - **Example:** Place web servers in a public subnet to allow internet access and databases in a private subnet for security.
24. **How does AWS Elastic Load Balancer work?**

- **Answer:** AWS Elastic Load Balancer (ELB) distributes incoming application traffic across multiple targets, such as EC2 instances, in multiple Availability Zones. It helps improve fault tolerance and availability.
- **Example:** Use ELB to distribute traffic to a fleet of web servers running in multiple Availability Zones.

25. **What is the difference between AWS CloudWatch and AWS CloudTrail?**
    - **Answer:**
        - **CloudWatch**: Monitors and logs operational metrics and application logs.
        - **CloudTrail**: Records and logs API calls and user activity.
    - **Example:** Use CloudWatch to monitor the CPU utilization of EC2 instances and CloudTrail to audit who made changes to your AWS resources.
26. **Explain the concept of a security group in AWS.**
    - **Answer:** A security group acts as a virtual firewall for your EC2 instances to control inbound and outbound traffic. You define rules that specify allowed protocols, ports, and IP address ranges.
    - **Example:** Create a security group that allows inbound HTTP traffic (port 80) from anywhere and SSH traffic (port 22) from a specific IP address.
27. **What is AWS Snowball?**
    - **Answer:** AWS Snowball is a data transport solution that uses secure appliances to transfer large amounts of data into and out of AWS. It helps migrate data when network transfer is not practical.
    - **Example:** Use Snowball to transfer petabytes of data from your on-premises data center to AWS for analysis.
28. **How do you create a backup strategy in AWS?**
    - **Answer:** Implement a backup strategy using AWS services like S3, RDS snapshots, EBS snapshots, and AWS Backup. Schedule regular backups, automate processes, and store backups in multiple regions.
    - **Example:** Use AWS Backup to automate the backup of EBS volumes and RDS databases, and store copies in another region for disaster recovery.
29. **What are the different storage classes in S3?**
    - **Answer:** S3 offers various storage classes to optimize cost and performance:
        - **S3 Standard**: General-purpose storage.

        - **S3 Intelligent-Tiering**: Automatically moves data to the most cost-effective access tier.
        - **S3 Standard-IA**: Infrequent access with lower storage cost.
        - **S3 One Zone-IA**: Lower-cost infrequent access stored in a single Availability Zone.
        - **S3 Glacier**: Low-cost archive storage with retrieval times in minutes or hours.
        - **S3 Glacier Deep Archive**: Lowest-cost storage for long-term archiving.
    - **Example:** Store frequently accessed data in S3 Standard and archive old data in S3 Glacier.

30. **What is AWS Redshift?**
    - **Answer:** Amazon Redshift is a fully managed data warehousing service that allows you to run complex queries and perform large-scale data analysis. It uses SQL to analyze structured and semi-structured data.
    - **Example:** Use Redshift to analyze petabytes of sales data and generate business reports.

31. **How do you handle failure in AWS?**
    - **Answer:** Implement fault-tolerant and highly available architectures using services like Auto Scaling, ELB, multi-AZ deployments, cross-region replication, and backups. Use monitoring and alerting tools to detect and respond to failures.
    - **Example:** Deploy applications across multiple Availability Zones and set up automated backups to handle potential failures.

32. **What are the different types of load balancers in AWS?**
    - **Answer:** AWS offers three types of load balancers:
        - **Application Load Balancer (ALB)**: Best suited for HTTP and HTTPS traffic, providing advanced routing and load balancing.
        - **Network Load Balancer (NLB)**: Best suited for ultra-high-performance, low-latency traffic, capable of handling millions of requests per second.
        - **Classic Load Balancer (CLB)**: Legacy load balancer for both HTTP/HTTPS and TCP traffic.
    - **Example:** Use ALB for a web application that requires path-based routing and NLB for high-performance applications requiring low latency.

33. **How do you manage cross-region replication in S3?**

- **Answer:** Enable S3 Cross-Region Replication (CRR) to automatically replicate objects in an S3 bucket to another bucket in a different AWS region. This helps improve data availability and disaster recovery.
- **Example:** Configure CRR to replicate objects from a bucket in the US East (N. Virginia) region to a bucket in the EU (Ireland) region.

34. **What is AWS Elastic File System (EFS)?**
    - **Answer:** Amazon EFS is a fully managed, scalable, and elastic file storage service for use with AWS Cloud and on-premises resources. It provides a simple, scalable, and cost-effective way to share file data.
    - **Example:** Use EFS to provide a shared file system for multiple EC2 instances running in different Availability Zones.
35. **Explain the concept of AWS Kinesis.**
    - **Answer:** Amazon Kinesis is a platform for real-time data streaming and processing. It allows you to collect, process, and analyze streaming data from various sources.
    - **Example:** Use Kinesis Data Streams to ingest real-time data from IoT devices and process it with Kinesis Data Analytics for real-time analytics.
36. **What is AWS OpsWorks?**
    - **Answer:** AWS OpsWorks is a configuration management service that provides managed instances of Chef and Puppet. It allows you to automate the configuration, deployment, and management of your applications.
    - **Example:** Use OpsWorks to deploy and manage a web application using Chef recipes to configure the application stack.
37. **How do you manage secrets and credentials in AWS?**
    - **Answer:** Use AWS Secrets Manager or AWS Systems Manager Parameter Store to securely manage, store, and retrieve secrets and credentials.
    - **Example:** Store database credentials in Secrets Manager and retrieve them in your application code without hardcoding sensitive information.
38. **What is the purpose of AWS Config?**
    - **Answer:** AWS Config provides a detailed view of the configuration of AWS resources in your account. It helps with auditing, compliance, and resource change tracking.
    - **Example:** Use AWS Config to monitor changes to security groups and ensure compliance with your security policies.
39. **How do you deploy applications using AWS CodePipeline?**

- **Answer:** AWS CodePipeline is a continuous integration and continuous delivery (CI/CD) service that automates the build, test, and deployment phases of your release process. You define stages in a pipeline, and CodePipeline orchestrates the workflow.
- **Example:** Create a pipeline with stages for source, build, test, and deploy to automatically deploy a web application to EC2 instances.

40. **What is the difference between AWS Inspector and AWS Trusted Advisor?**
    - **Answer:**
        - **AWS Inspector**: An automated security assessment service that helps improve the security and compliance of applications deployed on AWS.
        - **AWS Trusted Advisor**: Provides real-time guidance to help you provision your resources following AWS best practices, focusing on cost optimization, performance, security, and fault tolerance.
    - **Example:** Use Inspector to run security assessments on your EC2 instances and Trusted Advisor to get recommendations on cost savings and performance improvements.

41. **How do you implement CI/CD in AWS?**
    - **Answer:** Implement CI/CD using services like AWS CodeCommit, CodeBuild, CodeDeploy, and CodePipeline. These services allow you to automate the entire release process, from code commits to deployment.
    - **Example:** Set up a pipeline with CodeCommit for source control, CodeBuild for building and testing, and CodeDeploy for deploying the application to EC2 instances.

42. **What are AWS Elastic Beanstalk and its benefits?**
    - **Answer:** AWS Elastic Beanstalk is a service for deploying and managing applications in the AWS Cloud without worrying about the infrastructure. It handles provisioning, load balancing, scaling, and monitoring.
    - **Example:** Deploy a Java web application by uploading your WAR file to Elastic Beanstalk, which manages the environment setup and deployment.

43. **How do you manage DNS in AWS?**
    - **Answer:** Use Amazon Route 53 to manage DNS records for your domain names. Route 53 provides DNS routing, health checking, and domain registration services.
    - **Example:** Create an A record in Route 53 to map your domain name to an EC2 instance's IP address.

44. **What is the purpose of AWS Glue?**

- **Answer:** AWS Glue is a fully managed extract, transform, and load (ETL) service that makes it easy to prepare and load data for analytics. It automates the process of discovering, cataloging, cleaning, and transforming data.
- **Example:** Use Glue to extract data from S3, transform it using Python or Scala scripts, and load it into a Redshift data warehouse for analysis.

45. **Explain the concept of AWS Step Functions.**

- **Answer:** AWS Step Functions is a serverless orchestration service that lets you coordinate multiple AWS services into serverless workflows. It allows you to build and run multi-step applications with retries and parallel execution.
- **Example:** Use Step Functions to automate a workflow that involves invoking a Lambda function, processing data, and storing the results in DynamoDB.

46. **How do you use AWS Systems Manager?**

- **Answer:** AWS Systems Manager provides a unified interface to manage your AWS resources and applications. It offers capabilities like automation, configuration management, patch management, and run command.
- **Example:** Use Systems Manager Run Command to execute scripts on your EC2 instances without needing SSH access.

47. **What is the difference between AWS Batch and AWS Lambda?**

- **Answer:**
  - **AWS Batch**: Enables you to run batch computing workloads on AWS, managing the execution of jobs on a dynamically provisioned cluster of EC2 instances.
  - **AWS Lambda**: Executes code in response to events without provisioning or managing servers.
- **Example:** Use AWS Batch for long-running, compute-intensive tasks, and Lambda for event-driven, short-duration tasks.

48. **How do you ensure compliance in AWS?**

- **Answer:** Use AWS compliance services and features like AWS Config, AWS CloudTrail, AWS Artifact, and AWS Audit Manager to monitor, audit, and ensure compliance with industry standards and regulations.
- **Example:** Use AWS Config to continuously monitor and record your AWS resource configurations and ensure they comply with required configurations.

49. **What is the purpose of AWS Macie?**

- **Answer:** Amazon Macie is a security service that uses machine learning to automatically discover, classify, and protect sensitive data stored in S3. It identifies and alerts you to risks like unauthorized access and data leaks.
- **Example:** Use Macie to scan your S3 buckets for sensitive data like personally identifiable information (PII) and receive alerts for any security risks.

50. **Explain the concept of serverless architecture in AWS.**
    - **Answer:** Serverless architecture allows you to build and run applications without managing infrastructure. AWS provides serverless services like AWS Lambda, API Gateway, DynamoDB, and Step Functions to build scalable, event-driven applications.
    - **Example:** Develop a serverless web application using Lambda for backend logic, API Gateway for routing requests, and DynamoDB for data storage.