100 AWS interview questions

Beginner-Level Questions

AWS General

1. **What is AWS?**
   - AWS (Amazon Web Services) is a cloud computing platform that offers on-demand computing resources and services such as storage, databases, networking, and more.
2. **What are the benefits of using AWS?**
   - Benefits include scalability, cost efficiency, flexibility, security, and high availability.
3. **What types of cloud computing models does AWS offer?**
   - The models include Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).
4. **What is an AWS Region?**
   - A region is a specific geographical area that contains multiple AWS data centers (availability zones). Each region operates independently and provides services closer to users for reduced latency.
5. **What is an Availability Zone?**
   - An Availability Zone (AZ) is a physical data center located within an AWS Region. Each region has multiple AZs to ensure fault tolerance.

EC2 (Elastic Compute Cloud)

1. **What is EC2 in AWS?**
   - EC2 is a web service that offers resizable compute capacity in the cloud, enabling users to launch and manage virtual machines (instances).
2. **What are the different types of EC2 instances?**
   - Instance types include General Purpose (e.g., t2, t3), Compute Optimized (e.g., c5), Memory Optimized (e.g., r5), Storage Optimized (e.g., i3), and GPU Instances (e.g., p3).
3. **How do you launch an EC2 instance?**
   - You can launch an instance through the AWS Management Console, AWS CLI, or AWS SDKs by selecting an AMI, instance type, and security settings.
4. **What is an AMI (Amazon Machine Image)?**
   - An AMI is a pre-configured template that contains the operating system, application server, and applications necessary to launch an EC2 instance.
5. **What are EC2 key pairs?**
   - Key pairs are used for secure login to EC2 instances, consisting of a public key (stored in AWS) and a private key (kept by the user).

S3 (Simple Storage Service)

1. **What is Amazon S3?**
   - Amazon S3 is an object storage service that saves data as objects within buckets, providing high availability, scalability, and durability.
2. **What are the storage classes in S3?**
   - The storage classes include Standard, Intelligent-Tiering, Standard-IA, One Zone-IA, Glacier, and Glacier Deep Archive.
3. **How does versioning work in S3?**
   - S3 versioning allows multiple versions of an object to be stored in a bucket, protecting against accidental overwrites or deletions.
4. **What is an S3 bucket?**
   - A bucket is a container used to store objects (files) in Amazon S3, with each bucket having a unique name.
5. **What are S3 access control policies?**
   - S3 uses Bucket Policies and ACLs (Access Control Lists) to manage access to buckets and objects.

RDS (Relational Database Service)

1. **What is Amazon RDS?**
   - RDS is a managed database service that supports relational databases like MySQL, PostgreSQL, Oracle, SQL Server, and Amazon Aurora.
2. **How do you ensure high availability in RDS?**
   - RDS Multi-AZ deployment enhances availability by automatically replicating data to a standby instance in another AZ.

3. **What is Amazon Aurora?**
   ○ Amazon Aurora is a high-performance relational database engine compatible with MySQL and PostgreSQL, designed for cloud scalability and availability.
4. **How does automated backup work in RDS?**
   ○ RDS conducts daily automatic backups and retains transaction logs, facilitating point-in-time recovery.
5. **What is the difference between RDS and DynamoDB?**
   ○ RDS is for relational databases (SQL-based), while DynamoDB is a NoSQL database service designed for high throughput.

Intermediate-Level Questions

EC2 (Elastic Compute Cloud)

1. **What are the EC2 instance types based on workload?**
   ○ Instance types include General Purpose (e.g., t3, m5), Compute Optimized (e.g., c5), Memory Optimized (e.g., r5), and Storage Optimized (e.g., i3).
2. **What are Spot Instances?**
   ○ Spot Instances are unused EC2 instances available at discounted rates, which can be interrupted by AWS with little notice.
3. **What is Auto Scaling in AWS EC2?**
   ○ Auto Scaling automatically adjusts the number of EC2 instances based on demand to sustain application performance and cost efficiency.
4. **What is an Elastic IP in AWS?**
   ○ An Elastic IP is a static, public IP address that can be linked to any instance or network interface in a VPC.
5. **How do you stop and start an EC2 instance without losing data?**
   ○ Stopping an instance shuts it down while preserving the attached EBS volumes. However, data on the instance store (ephemeral storage) will be lost.

S3 (Simple Storage Service)

1. **What is S3 lifecycle management?**
   ○ Lifecycle management automates the transition of objects between storage classes or deletes them after a defined period.
2. **What is S3 Cross-Region Replication (CRR)?**
   ○ CRR automatically replicates objects in an S3 bucket to another bucket in a different AWS Region for disaster recovery or low-latency access.
3. **How can you make S3 objects publicly accessible?**
   ○ By configuring S3 bucket policies, ACLs, or enabling public read permissions for the objects.
4. **What is S3 Transfer Acceleration?**

- This feature accelerates file uploads to S3 by utilizing Amazon CloudFront's globally distributed edge locations.
5. **How is encryption managed in S3?**
   - S3 supports server-side encryption (SSE) using S3-managed keys (SSE-S3), KMS-managed keys (SSE-KMS), and customer-provided keys (SSE-C).

IAM (Identity and Access Management)

1. **What is AWS IAM?**
   - IAM is a service that enables users to securely control access to AWS resources through policies, roles, and user accounts.
2. **What is an IAM policy?**
   - An IAM policy specifies permissions for actions on AWS resources and is attached to users, groups, or roles to manage access.
3. **What is an IAM role?**
   - A role is an AWS identity with permission policies that can be assumed by entities like users, applications, or services.
4. **How do you implement multi-factor authentication (MFA) in AWS?**
   - MFA adds an extra security layer by requiring users to input a one-time password in addition to their regular credentials.
5. **What distinguishes an IAM user from a role?**
   - An IAM user is an AWS identity linked to login credentials, while a role is designed for granting temporary access to AWS resources.

Advanced-Level Questions

Lambda (Serverless Computing)

1. **What is AWS Lambda?**
   - AWS Lambda is a serverless compute service that executes code in response to events without the need to provision or manage servers.
2. **How does Lambda scale?**
   - Lambda scales automatically by running code in response to triggers, capable of processing thousands of concurrent executions.
3. **What are Lambda triggers?**
   - Triggers are events that invoke Lambda functions, such as S3 uploads, API Gateway requests, DynamoDB table updates, or scheduled CloudWatch events.
4. **How do you monitor Lambda functions?**
   - Monitoring is done using AWS CloudWatch Logs for logging, CloudWatch Metrics for performance oversight, and AWS X-Ray for tracing.
5. **What is the maximum execution time for a Lambda function?**

○ The maximum execution time allowed for a Lambda function is 15 minutes.

CloudFormation (Infrastructure as Code)

1. **What is AWS CloudFormation?**
   ○ CloudFormation is a service that enables you to model and set up your AWS resources through templates, facilitating Infrastructure as Code (IaC).
2. **What is a CloudFormation stack?**
   ○ A stack refers to a collection of AWS resources managed as a single unit using a CloudFormation template.
3. **How do you handle updates to a CloudFormation stack?**
   ○ You can update a stack by altering its template or parameters, and CloudFormation will implement the changes systematically and in a controlled manner.
4. **What is a CloudFormation template?**
   ○ A template is a file in JSON or YAML format that specifies the AWS resources and their configurations.
5. **What is CloudFormation drift detection?**
   ○ Drift detection identifies any discrepancies between the resources in your stack and the expected configuration as defined in your template.

DynamoDB (NoSQL Database)

1. **What is Amazon DynamoDB?**
   ○ DynamoDB is a fully managed NoSQL database service that delivers fast and reliable performance, along with effortless scalability.
2. **What is a DynamoDB partition key?**
   ○ The partition key, also known as the hash key, is a unique attribute that DynamoDB utilizes to distribute data across multiple partitions for storage.
3. **What are DynamoDB global and local secondary indexes?**
   ○ A Global Secondary Index (GSI) enables querying based on attributes other than the primary key across the entire table. In contrast, a Local Secondary Index (LSI) allows querying with a different sort key within the same partition as the primary key.
4. **What is DynamoDB auto-scaling?**
   ○ Auto-scaling automatically adjusts the read and write capacity of your DynamoDB table in response to traffic, preventing both under- and over-provisioning of resources.
5. **What is DynamoDB Streams?**
   ○ DynamoDB Streams captures table activities (insert, update, delete) and facilitates real-time processing of this data, typically in conjunction with Lambda.
6. **How do you ensure strong consistency in DynamoDB?**

- By default, DynamoDB operates with eventual consistency. To obtain strong consistency, you must specify "ConsistentRead" during a read operation.
7. **What is DynamoDB TTL (Time to Live)?**
   - TTL automatically deletes expired data from your DynamoDB tables, assisting in the management of storage costs.

VPC (Virtual Private Cloud)

1. **What is an Amazon VPC?**
   - Amazon VPC allows you to create a logically isolated area of the AWS cloud to launch AWS resources within a specified virtual network.
2. **What is a subnet in VPC?**
   - A subnet is a portion of a VPC's IP address space where you can deploy EC2 instances, categorized as either public or private.
3. **What is the difference between a public and a private subnet?**
   - Public subnets have a route to an internet gateway, allowing external access, whereas private subnets lack direct internet connectivity.
4. **What is an Internet Gateway?**
   - An Internet Gateway facilitates communication between instances in your VPC and the internet.
5. **What are NAT instances and NAT gateways?**
   - NAT instances and NAT gateways enable instances in a private subnet to access the internet while preventing inbound traffic.
6. **What is a route table in VPC?**
   - A route table consists of rules that dictate where network traffic from your subnets is directed.
7. **What is VPC peering?**
   - VPC peering allows for a private connection between two VPCs, enabling them to communicate as if they were on the same network.
8. **What is a VPC endpoint?**
   - A VPC endpoint provides a private connection from your VPC to supported AWS services without the need for an internet gateway or NAT.
9. **What are VPC flow logs?**
   - VPC Flow Logs offer detailed insights into IP traffic to and from network interfaces in your VPC, which is helpful for security and troubleshooting purposes.
10. **What are security groups and NACLs?**
    - Security Groups function as virtual firewalls for your instances, managing both inbound and outbound traffic, while Network ACLs (NACLs) regulate traffic at the subnet level.

CloudWatch (Monitoring)

1. **What is Amazon CloudWatch?**
   - CloudWatch is a monitoring and observability service that provides insights and data on AWS resources and applications by collecting metrics and logs.
2. **What are CloudWatch Alarms?**
   - Alarms monitor metrics and trigger notifications or automated actions when a specified threshold is exceeded.
3. **What is a CloudWatch Metric?**
   - Metrics are sets of time-ordered data points used for monitoring resources and applications.
4. **What is CloudWatch Logs?**
   - CloudWatch Logs allow for real-time monitoring of logs from AWS services, applications, and systems, enabling searching and filtering of log data.
5. **What is CloudWatch Events?**
   - CloudWatch Events provide a stream of system events that describe changes in AWS resources, allowing for automated responses or the invocation of Lambda functions.
6. **How do you set up a CloudWatch dashboard?**
   - A CloudWatch dashboard is a customizable interface that lets you visualize metrics from various AWS services in one place.
7. **What is AWS X-Ray?**
   - X-Ray is a service that helps debug and analyze distributed applications by providing end-to-end tracing of requests as they move through your services.
8. **What distinguishes CloudWatch from CloudTrail?**
   - CloudWatch focuses on performance monitoring (metrics, logs), while CloudTrail is centered on auditing API calls made within your AWS account.

Elastic Beanstalk (PaaS)

1. **What is AWS Elastic Beanstalk?**
   - Elastic Beanstalk is a Platform as a Service (PaaS) that simplifies the deployment and scaling of web applications and services built in popular programming languages.
2. **How does Elastic Beanstalk simplify application deployment?**
   - Elastic Beanstalk handles infrastructure provisioning, load balancing, scaling, and monitoring, allowing developers to focus on coding.
3. **What is an environment in Elastic Beanstalk?**
   - An environment is a collection of AWS resources running a specific version of an application within Elastic Beanstalk.
4. **How does Elastic Beanstalk manage updates?**
   - Elastic Beanstalk employs rolling updates to avoid downtime, deploying new instances while phasing out old ones.
5. **How do you monitor applications in Elastic Beanstalk?**

- Elastic Beanstalk integrates with CloudWatch to monitor resource usage, application logs, and metrics.

ECS (Elastic Container Service)

1. **What is Amazon ECS?**
   - ECS is a fully managed container orchestration service that allows you to run Docker containers on a cluster of EC2 instances.
2. **What is the difference between ECS and EKS?**
   - ECS is an AWS-native service for container management, while EKS is AWS's managed Kubernetes service for container orchestration.
3. **What are ECS tasks and services?**
   - A task is a single instance of a running container, and an ECS service manages the number of task instances and load balancing.
4. **What is an ECS cluster?**
   - A cluster is a logical grouping of EC2 instances or Fargate tasks where ECS tasks are initiated.
5. **What is Amazon Fargate?**
   - Fargate is a serverless compute engine for containers, allowing you to run containers without managing the underlying EC2 instances.

Elastic Load Balancer (ELB)

1. **What is an Elastic Load Balancer (ELB)?**
   - ELB automatically distributes incoming traffic across multiple EC2 instances, containers, or IP addresses to enhance availability.
2. **What types of load balancers exist in AWS?**
   - There are three types: Application Load Balancer (ALB), Network Load Balancer (NLB), and Gateway Load Balancer (GWLB).
3. **What distinguishes an ALB from an NLB?**
   - ALB operates at the application layer (HTTP/HTTPS), while NLB functions at the transport layer (TCP), providing low-latency load balancing.
4. **What is a target group in ELB?**
   - A target group directs requests to one or more registered targets, such as EC2 instances, containers, or IP addresses.
5. **How does ELB manage SSL termination?**
   - ELB can handle SSL certificates and perform SSL termination at the load balancer level, relieving backend servers of SSL processing.

CodePipeline (CI/CD)

1. **What is AWS CodePipeline?**

- ○ CodePipeline is a continuous integration and continuous delivery (CI/CD) service that automates the release pipeline for application updates.
2. **What are the primary components of CodePipeline?**
  - ○ Key components include sources (where code is stored), build providers (like CodeBuild), test stages, and deployment stages.
3. **How does CodePipeline integrate with other AWS services?**
  - ○ CodePipeline collaborates with services such as CodeBuild, CodeDeploy, Lambda, S3, and CloudFormation to create a comprehensive CI/CD pipeline.
4. **What is the difference between CodePipeline and Jenkins?**
  - ○ CodePipeline is a fully managed AWS service for CI/CD, whereas Jenkins is an open-source CI tool that requires more manual setup and maintenance.
5. **What is AWS CodeBuild?**
  - ○ CodeBuild is a fully managed build service that compiles source code, runs tests, and generates software packages for deployment.

Advanced Security & Identity Management

1. **What is AWS KMS (Key Management Service)?**
  - ○ KMS is a managed service for creating and controlling encryption keys used to encrypt and decrypt data across AWS services.
2. **What encryption types does AWS KMS support?**
  - ○ It supports both symmetric and asymmetric encryption.
3. **What is AWS Secrets Manager?**
  - ○ Secrets Manager provides secure storage, retrieval, and management of sensitive information such as database credentials or API keys.
4. **What is AWS Shield?**
  - ○ AWS Shield is a managed DDoS protection service that defends applications running on AWS from network and application layer attacks.
5. **What is Amazon GuardDuty?**
  - ○ GuardDuty is a threat detection service that continuously monitors AWS accounts and workloads for malicious or unauthorized activities.
6. **What is AWS WAF (Web Application Firewall)?**
  - ○ AWS WAF is a web application firewall designed to safeguard web applications from common attacks such as SQL injection and cross-site scripting.
7. **What is Amazon Inspector?**
  - ○ Amazon Inspector automatically evaluates applications for vulnerabilities and deviations from best practices.
8. **What is an AWS Organizations policy?**
  - ○ Organizations policies enable centralized management of security, auditing, and compliance for multiple AWS accounts within your organization.
9. **How does AWS IAM role delegation operate?**
  - ○ Role delegation provides temporary access to AWS resources without the need to share long-term credentials by assuming IAM roles.

10. **What is a service-linked role in AWS IAM?**
    - A service-linked role is automatically generated by AWS services to enable them to access resources on your behalf.

THE END

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