Providing 100 detailed AWS interview questions and answers in a single response would be extremely lengthy (likely exceeding 50,000+ words). However, I can offer you a comprehensive, categorized list of 100 high-quality AWS interview questions with concise yet detailed answers that cover core services, architecture, security, cost optimization, and real-world scenarios.

Below is a well-structured set of 100 AWS Interview Questions and Answers, grouped by topic for easy reference. Each answer includes key concepts, best practices, and relevant AWS service details.

◆ **Section 1: AWS Fundamentals (10 Questions)**

1. What is AWS?
Answer:
Amazon Web Services (AWS) is a comprehensive cloud computing platform offering over 200 services globally, including compute, storage, databases, analytics, machine learning, and more. It operates on a pay-as-you-go model and supports scalability, reliability, and global infrastructure.

2. Explain the AWS Global Infrastructure.
Answer:
AWS infrastructure consists of:
- Regions: Geographically separate areas (e.g., us-east-1).
- Availability Zones (AZs): Isolated data centers within a region with independent power/network.
- Edge Locations: Used by Amazon CloudFront for caching content closer to users.
This design ensures high availability, fault tolerance, and low latency.

3. What is the Shared Responsibility Model?
Answer:
AWS is responsible for security *of* the cloud (hardware, software, facilities).
Customers are responsible for security *in* the cloud (data, IAM, OS, apps, network config).
Example: AWS manages EC2 host security; you manage OS patches and IAM policies.

4. What is IAM?
Answer:
Identity and Access Management (IAM) enables secure control of access to AWS resources. Features include:
- Users, Groups, Roles
- Policies (JSON documents defining permissions)
- Multi-factor authentication (MFA)
- Temporary credentials via STS

5. What is the difference between IAM User and IAM Role?
Answer:
- IAM User: Permanent credentials (access keys) for human or app access.
- IAM Role: Temporary credentials assumed by AWS services (e.g., EC2) or federated users. No long-term keys.

6. What is an AWS Account Root User?

Answer:

The root user is created when an AWS account is set up (email/password). It has unrestricted access. Best practice: avoid using it; create IAM users with least privilege instead.

7. What is AWS Organizations?

Answer:

A service to centrally manage multiple AWS accounts. Enables:

- Consolidated billing

- Service Control Policies (SCPs) for governance

- Automated account creation

8. Explain AWS Well-Architected Framework.

Answer:

Five pillars:

1. Operational Excellence

2. Security

3. Reliability

4. Performance Efficiency

5. Cost Optimization

Used to design and operate secure, efficient, and resilient workloads.

9. What is AWS CloudFormation?

Answer:

Infrastructure as Code (IaC) service to model and provision AWS resources using templates (YAML/JSON). Enables version control, repeatability, and automated deployments.

10. What is the AWS Free Tier?

Answer:

Offers limited free usage for 12 months (e.g., 750 hrs of t2.micro EC2, 5 GB S3 storage) plus always-free services (e.g., Lambda 1M requests/month). Great for learning and testing.

◆ **Section 2: Compute Services (15 Questions)**

11. What is Amazon EC2?

Answer:

Elastic Compute Cloud provides resizable virtual servers in the cloud. Features:

- On-Demand, Reserved, Spot Instances

- AMIs (Amazon Machine Images)

- Security Groups (firewall)

- Elastic IPs

12. Explain EC2 Instance Types.

Answer:

- General Purpose (t3, m5): Balanced compute/memory.

- Compute Optimized (c5): High-performance CPUs.

- Memory Optimized (r5): In-memory apps, databases.

- Storage Optimized (i3): High I/O, NoSQL.

- Accelerated Computing (p3): GPUs for ML.

13. What is Auto Scaling?

Answer:

Automatically adjusts EC2 capacity based on demand. Components:

- Launch Template/Config: Defines instance settings.

- Auto Scaling Group: Manages instances across AZs.

- Scaling Policies: Target tracking, step, or scheduled.

14. What is AWS Lambda?

Answer:

Serverless compute service that runs code in response to events (e.g., S3 upload, API Gateway). You pay per request and execution time. No server management.

15. EC2 vs Lambda: When to use which?

Answer:

- EC2: Long-running apps, full OS control, predictable workloads.

- Lambda: Event-driven, short-lived tasks (<15 min), sporadic traffic, cost-efficient at scale.

16. What is Elastic Beanstalk?

Answer:

Platform-as-a-Service (PaaS) that deploys and scales web apps (Java, Python, etc.) automatically. Handles capacity provisioning, load balancing, and health monitoring.

17. What is AWS Batch?

Answer:

Managed service for running batch computing workloads (e.g., genomics, financial modeling). Dynamically provisions EC2/Spot instances and schedules jobs.

18. What is EC2 Spot Instance?

Answer:

Unused EC2 capacity offered at up to 90% discount. Can be interrupted with 2-minute warning. Ideal for fault-tolerant, flexible workloads (e.g., CI/CD, batch jobs).

19. What is EC2 Reserved Instance (RI)?

Answer:

Commit to 1- or 3-year usage for significant discounts (up to 75%). Types: Standard, Convertible, Scheduled. Now largely replaced by Savings Plans.

20. What is AWS Fargate?

Answer:

Serverless compute engine for containers (ECS/EKS). No need to manage EC2 instances—just define container resources.

21. Explain EC2 Placement Groups.

Answer:

Logical grouping of EC2 instances for low-latency/high-throughput networking:

- Cluster: Same rack (high perf, low fault tolerance).
- Spread: Across distinct hardware (high availability).
- Partition: For HPC apps (up to 7 partitions).

22. What is an AMI?

Answer:

Amazon Machine Image is a template containing OS, apps, and config to launch EC2 instances. Can be public, private, or shared.

23. How do you secure EC2 instances?

Answer:

- Use IAM roles (not access keys)
- Apply security groups (least privilege)
- Enable VPC flow logs
- Patch OS regularly
- Use SSM Session Manager (no SSH keys)

24. What is EC2 Instance Metadata Service (IMDS)?

Answer:

Provides instance info (e.g., IAM role, AZ) via `169.254.169.254`. IMDSv2 (token-based) is more secure against SSRF attacks.

25. What is AWS Outposts?

Answer:

Fully managed AWS infrastructure deployed on-premises. Extends AWS services (EC2, EBS, VPC) to local data centers for low-latency or data residency needs.

◆ **Section 3: Storage Services (10 Questions)**

26. Explain Amazon S3.

Answer:

Object storage service for unlimited data. Features:

- Buckets (globally unique names)
- Objects (files + metadata)
- Storage classes: S3 Standard, IA, One Zone-IA, Glacier, Intelligent-Tiering
- Versioning, encryption, lifecycle policies

27. S3 Storage Classes Comparison

Answer:

Class	Use Case	Availability	Durability
Standard	Frequent access	99.99%	99.999999999%
IA	Infrequent access	99.9%	Same
One Zone-IA	Infrequent, non-critical	99.5%	Same
Glacier	Archival (mins to hrs retrieval)	Varies	Same
Intelligent-Tiering	Auto-optimizes cost	99.9%	Same

28. What is S3 Versioning?

Answer:

Keeps multiple versions of an object. Protects against accidental deletion/overwrite. Increases storage cost but enhances data resilience.

29. How to secure S3 buckets?

Answer:

- Block Public Access (enabled by default)
- Bucket policies + IAM policies
- Encryption (SSE-S3, SSE-KMS, SSE-C)
- MFA Delete
- S3 Access Points for granular access

30. What is Amazon EBS?

Answer:

Elastic Block Store provides persistent block storage for EC2. Types:

- gp3 (general purpose SSD)
- io2 (high-performance, mission-critical)
- st1 (throughput-optimized HDD)
- sc1 (cold HDD)

31. EBS vs Instance Store

Answer:

- EBS: Persistent, network-attached, survives stop/start.

- Instance Store: Ephemeral, physically attached, lost on stop/terminate. Higher I/O.

32. What is Amazon EFS?

Answer:

Elastic File System is a managed NFS for Linux EC2. Scales automatically, supports thousands of concurrent connections. Use for shared file storage.

33. What is AWS Storage Gateway?

Answer:

Hybrid storage service connecting on-prem apps to AWS cloud storage. Types:

- File Gateway (NFS/SMB → S3)

- Volume Gateway (block storage → EBS snapshots)

- Tape Gateway (virtual tape library → S3/Glacier)

34. What is S3 Transfer Acceleration?

Answer:

Uses CloudFront edge locations to speed up uploads to S3. Ideal for large files or distant clients.

35. What is S3 Cross-Region Replication (CRR)?

Answer:

Automatically replicates objects across regions for DR, compliance, or latency. Requires versioning enabled.

◆ **Section 4: Networking & Content Delivery (10 Questions)**

36. What is Amazon VPC?

Answer:

Virtual Private Cloud lets you launch AWS resources in a logically isolated network. Components:

- Subnets (public/private)

- Route Tables

- Internet Gateway (IGW)

- NAT Gateway

- Security Groups & NACLs

37. Public vs Private Subnet

Answer:

- Public: Has route to IGW → internet accessible.

- Private: No IGW route → accesses internet via NAT Gateway.

38. What is AWS Direct Connect?

Answer:

Dedicated network connection from on-prem to AWS (bypasses public internet). Reduces latency, increases bandwidth, and lowers data transfer costs.

39. What is Amazon Route 53?

Answer:

Scalable DNS service. Features:
- Domain registration
- Health checks
- Routing policies (Simple, Weighted, Latency, Failover, Geolocation)

40. Explain VPC Peering.

Answer:

Connects two VPCs privately (same or different accounts/regions). Non-transitive—no transitive routing between peered VPCs.

41. What is AWS Transit Gateway?

Answer:

Central hub to connect VPCs, on-prem networks (via DX/VPN). Simplifies hub-and-spoke topology vs. complex VPC peering.

42. What is Amazon CloudFront?

Answer:

CDN that caches content at edge locations globally. Integrates with S3, EC2, ALB. Features:
- DDoS protection (with AWS Shield)
- Field-level encryption
- Origin failover

43. What is AWS Global Accelerator?

Answer:

Improves availability/performance using AWS global network. Provides static IPs that route to optimal endpoints (ALB, EC2, etc.).

44. Security Groups vs NACLs

Answer:

Feature	Security Group	NACL
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Scope	Instance-level	Subnet-level
Rules	Allow only	Allow/Deny
Stateful	Yes	No
Eval Order	All rules applied	Numbered rules (lowest first)

45. What is VPC Flow Logs?

Answer:

Captures IP traffic info for VPC, subnet, or ENI. Sent to CloudWatch Logs or S3. Used for monitoring, troubleshooting, and security analysis.

🔷 Section 5: Databases (10 Questions)

46. RDS vs DynamoDB

Answer:

- RDS: Managed relational DB (MySQL, PostgreSQL, etc.). Vertical scaling, ACID.
- DynamoDB: NoSQL, key-value/document. Horizontal scaling, single-digit ms latency, serverless.

47. What is Amazon Aurora?

Answer:

MySQL/PostgreSQL-compatible RDS engine. 5x faster than MySQL, auto-scaling storage (up to 128 TB), 6 copies across 3 AZs.

48. DynamoDB Read/Write Capacity Modes

Answer:

- Provisioned: Specify RCUs/WCUs. Use auto-scaling.
- On-Demand: Pay per request. No capacity planning.

49. What is DynamoDB Global Tables?

Answer:

Multi-region, multi-master replication for low-latency global apps. Conflict resolution via "last write wins."

50. What is Amazon Redshift?

Answer:

Fully managed data warehouse for analytics. Uses columnar storage, massively parallel processing (MPP). Integrates with S3 (Redshift Spectrum).

51. What is ElastiCache?

Answer:

In-memory caching (Redis or Memcached). Use cases: session stores, DB caching, leaderboards.

52. What is Amazon DocumentDB?

Answer:

Managed MongoDB-compatible database. Handles provisioning, patching, backups.

53. Explain RDS Read Replicas.

Answer:

Asynchronous copies of DB for read scaling or DR. Can be cross-region. Not for writes.

54. What is Amazon Neptune?

Answer:

Managed graph database for highly connected data (e.g., fraud detection, social networks).

55. What is AWS DMS?

Answer:

Database Migration Service migrates databases to AWS with minimal downtime. Supports homogenous/heterogeneous migrations.

◆ **Section 6: Security & Identity (10 Questions)**

56. What is AWS KMS?

Answer:

Key Management Service creates and controls encryption keys. Integrates with S3, EBS, RDS. Supports customer-managed keys (CMKs).

57. What is AWS Secrets Manager?

Answer:

Rotates, manages, and retrieves secrets (DB passwords, API keys). Auto-rotates RDS credentials.

58. What is AWS Shield?

Answer:

DDoS protection:

- Standard: Free, for all AWS customers.

- Advanced: Paid, for critical apps (with WAF integration, 24/7 support).

59. What is AWS WAF?

Answer:

Web Application Firewall protects apps from common exploits (SQLi, XSS). Rules based on IP, headers, rate limiting.

60. What is AWS GuardDuty?

Answer:

Threat detection using ML, anomaly detection, and threat intel. Monitors VPC Flow Logs, CloudTrail, DNS logs.

61. What is AWS Inspector?

Answer: Automated security assessment for EC2 and container workloads. Checks against CVEs and best practices.

62. What is AWS Macie?

Answer: Uses ML to discover, classify, and protect sensitive data (PII) in S3.

63. Explain AWS Cognito.

Answer:

User identity service for web/mobile apps. Features:

- User Pools (sign-up/sign-in)

- Identity Pools (federated identities → AWS credentials)

64. What is AWS Artifact?

Answer:

Portal for on-demand access to AWS compliance reports (SOC, ISO, PCI) and agreements.

65. What is AWS Security Hub?

Answer:

Centralized security dashboard aggregating findings from GuardDuty, Inspector, Macie, and partner tools.

◆ **Section 7: Monitoring, Logging & DevOps (10 Questions)**

66. What is Amazon CloudWatch?

Answer:

Monitoring service for AWS resources and apps. Features:
- Metrics (CPU, latency)
- Alarms
- Logs (CloudWatch Logs)
- Events (now EventBridge)
- Dashboards

67. CloudWatch vs CloudTrail

Answer:

- CloudWatch: Performance monitoring, logs, alarms.
- CloudTrail: Audits API activity (who did what, when).

68. What is AWS X-Ray?

Answer:

Analyzes and debugs distributed apps (e.g., microservices). Traces requests end-to-end.

69. What is AWS CodePipeline?

Answer:

CI/CD service to model, visualize, and automate release pipelines (source → build → deploy).

70. What is AWS Systems Manager (SSM)?

Answer:

Operational data and automation:
- Session Manager: Secure shell without SSH
- Parameter Store: Secure config storage
- Run Command: Remote script execution

71. What is AWS Config?

Answer:

Tracks configuration changes and compliance over time. Answers: "What changed? When? Who?"

72. What is AWS CloudTrail?

Answer:

Logs all AWS API calls (management + data events). Critical for security, compliance, and troubleshooting.

73. What is AWS OpsWorks?

Answer:

Configuration management using Chef/Puppet. Largely superseded by Systems Manager.

74. What is AWS Step Functions?

Answer:

Serverless orchestration for distributed apps. Coordinates Lambda, ECS, etc., via visual workflows.

75. What is AWS EventBridge?

Answer:

Event bus for serverless apps. Routes events from AWS, SaaS, or custom apps to targets (Lambda, SQS, etc.).

◆ Section 8: Cost Optimization & Billing (5 Questions)

76. How to reduce AWS costs?

Answer:
- Use Savings Plans/Reserved Instances
- Delete unused resources (EBS, EIPs)
- Right-size instances
- Use S3 lifecycle policies
- Monitor with Cost Explorer + Budgets

77. What is AWS Cost Explorer?

Answer:

Visualizes cost/usage trends, forecasts, and identifies savings opportunities (e.g., RI coverage).

78. What are AWS Budgets?

Answer:

Set custom cost/usage thresholds with alerts (email/SNS). Can trigger automated actions.

79. What is AWS Trusted Advisor?

Answer:

Provides best practice recommendations in 5 categories: cost, security, fault tolerance, performance, service limits.

80. What is AWS Compute Optimizer?

Answer:

Uses ML to recommend optimal EC2 instance types, EBS volumes, and Lambda configurations.

◆ Section 9: Advanced Architecture & Scenarios (20 Questions)

81. Design a highly available web app on AWS.

Answer:
- ALB across multiple AZs
- Auto Scaling Group (EC2 or Fargate)
- RDS Multi-AZ
- S3 for static assets + CloudFront
- Route 53 health checks

82. How to back up EC2 instances?

Answer:

- EBS snapshots (incremental, stored in S3)
- AMIs for full system images
- Automate with Data Lifecycle Manager (DLM)

83. What is a VPC Endpoint?

Answer:

Private connection between VPC and AWS services (S3, DynamoDB) without internet. Types: Gateway (S3/DynamoDB) and Interface (most services).

84. Explain S3 Event Notifications.

Answer:

Trigger Lambda, SQS, or SNS when objects are created/deleted in S3. Enables event-driven workflows.

85. What is AWS Backup?

Answer:

Centralized backup service for EBS, RDS, DynamoDB, EFS, etc. Supports cross-region backup and lifecycle policies.

86. How to achieve PCI compliance on AWS?

Answer:

- Use PCI-compliant services (EC2, RDS, etc.)
- Encrypt data at rest/in transit
- Isolate cardholder data in private subnets
- Enable CloudTrail + GuardDuty
- Use AWS Artifact for compliance docs

87. What is AWS Snowball?

Answer:

Physical device for large-scale data transfer (50-80 TB). Alternatives: Snowmobile (exabytes), Snowcone (edge computing).

88. Explain AWS Fault Isolation.

Answer:

Design to contain failures:

- Multi-AZ deployments
- Decoupled microservices
- Circuit breakers
- Chaos Engineering (via AWS Fault Injection Simulator)

89. What is Amazon MQ?

Answer:

Managed message broker (Apache ActiveMQ, RabbitMQ). For legacy app migration.

90. SQS vs SNS

Answer:

- SQS: Queuing (1:1, decoupling producers/consumers).

- SNS: Pub/sub (1:many, fan-out).

91. What is AWS Step Functions vs Lambda?

Answer:

- Lambda: Single function execution.

- Step Functions: Orchestrates multiple Lambdas/services with error handling, retries, and state management.

92. How to deploy serverless apps?

Answer:

- API Gateway + Lambda + DynamoDB

- Use SAM (Serverless Application Model) or CDK for IaC

- Monitor with X-Ray + CloudWatch

93. What is AWS Control Tower?

Answer:

Automates multi-account AWS environment setup with governance (SCPs, detective controls).

94. Explain AWS Resource Access Manager (RAM).

Answer:

Shares AWS resources (e.g., Transit Gateway, License Manager) across accounts securely.

95. What is Amazon Managed Streaming for Kafka (MSK)?

Answer:

Fully managed Apache Kafka service for streaming data pipelines.

96. How to migrate on-prem to AWS?

Answer:

- Rehost (lift-and-shift): Server Migration Service (SMS)

- Replatform: RDS, ElastiCache

- Refactor: Serverless, containers

- Use DMS for DBs, DataSync for files

97. What is AWS AppSync?

Answer:

Managed GraphQL service for real-time data sync across devices.

98. What is Amazon QuickSight?

Answer:

Serverless BI service for dashboards and ML-powered insights.

99. What is AWS IoT Core?

Answer:

Managed service to connect IoT devices to AWS. Handles device authentication, messaging (MQTT), and rules engine.

100. How to prepare for AWS Certified Solutions Architect exam?

Answer:

- Study AWS Whitepapers (Well-Architected, Security)
- Hands-on practice (free tier)
- Take practice exams (Tutorials Dojo, Whizlabs)
- Understand core services deeply (EC2, S3, VPC, RDS, IAM)
- Focus on scenario-based questions

✅ This list covers foundational to advanced AWS concepts tested in interviews for roles like Solutions Architect, DevOps Engineer, and Cloud Developer.