
💼 AWS EBS – Interview Questions & Answers (Production-Focused)

🔹 Q1: What is Amazon EBS and how is it different from instance store volumes?

Answer:
Amazon EBS is a durable, high-performance block storage service designed for use with EC2. Unlike instance store (ephemeral storage), EBS volumes are:

- Persistent across reboots
- Replicable and snapshot table
- Can be resized or detached independently

🔹 Q2: Which EBS volume types are best suited for production workloads?

Answer:

Volume Type	Use Case
gp3	General-purpose SSD, better cost/performance ratio
io1/io2	High IOPS, latency-sensitive DB workloads
st1	Throughput-intensive workloads like log processing
sc1	Cold storage, infrequent access

In production, gp3 is preferred for most workloads. Use io1/io2 for databases like PostgreSQL, Oracle, etc.

🔹 Q3: What are some key performance characteristics of EBS volumes?

Answer:

- IOPS: Input/output operations per second
- Throughput: MB/sec, important for large sequential reads/writes
- Latency: Time taken for I/O to complete
- gp3 allows provisioned IOPS and throughput separately, unlike gp2.

🔹 Q4: How do you resize an EBS volume in production without downtime?

Answer:

1. Modify the volume using aws ec2 modify-volume
2. Wait for the state to reach completed
3. Use growpart to resize partition
4. Use resize2fs (ext4) or xfs_growfs (xfs) to expand filesystem

✅ Modern Linux OS supports online resizing.

🔹 Q5: What is EBS Multi-Attach? When should you use it?

Answer:
EBS Multi-Attach allows an io1/io2 volume to be attached to multiple EC2 instances simultaneously in the same AZ.

Use cases:

- High availability clusters (e.g., Oracle RAC)
- Cluster-aware filesystems (GFS2, OCFS2)

⚠️ Not for standard filesystems like EXT4 or XFS (can lead to corruption).

🔹 Q6: How do you back up EBS volumes?

Answer:

- Use EBS Snapshots (incremental, stored in S3)
- Automate via Data Lifecycle Manager (DLM) or Backup Plans
- Snapshots can be copied across regions

Snapshots are crash-consistent, not application-consistent unless coordinated with app pause or freeze.

🔹 Q7: How would you encrypt an EBS volume in production?

Answer:

- At creation: Enable encryption with a CMK (KMS key)
- For existing volumes:
    1. Create a snapshot
    2. Copy snapshot with encryption
    3. Create new volume from encrypted snapshot

4. Swap volume in instance (zero downtime via attach/detach)

All data at rest, snapshots, and in-transit between instance and volume are encrypted.

🔹 Q8: How do you monitor and alert on EBS performance in production?

Answer:
Use CloudWatch Metrics:

- VolumeReadOps, VolumeWriteOps
- VolumeReadBytes, VolumeWriteBytes
- VolumeQueueLength
- BurstBalance (for gp2)
  Set alarms on high latency or low IOPS thresholds.

🔹 Q9: How does EBS Snapshots impact performance?

Answer:
When restoring a volume from a snapshot:

- Initial reads are lazy-loaded, causing higher latency
- Use Fast Snapshot Restore (FSR) to preload data blocks into volume for performance-sensitive apps

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🔹 Q10: What's the difference between gp2 and gp3?

Feature	gp2	gp3

IOPS	Scales with size (3 IOPS/GB)	User-defined, up to 16,000
Throughput	Max 250 MiB/s	Up to 1,000 MiB/s
Cost	Higher	20% lower (on average)

In production, always prefer gp3 unless legacy constraints require gp2.

🔹 Q11: How do you handle EBS volume failures in production?

Answer:

- EBS has 99.999% durability, failures are rare.
- Use snapshots + automation for recovery.
- Design for availability: multiple AZs, use EFS or S3 for shared data.

🔹 Q12: What are some anti-patterns using EBS in production?

Answer:

- Using a single EBS volume for all data (no separation of concerns)
- Relying on gp2 burst for high IOPS workloads
- Forgetting to set volume deletion on instance termination
- Ignoring filesystem expansion after resize

🔹 Q13: Can you share an EBS volume across regions or AZs?

Answer:
No. EBS volumes are AZ-bound. You must:

1. Snapshot the volume
2. Copy the snapshot to another region
3. Create a new volume from the snapshot

🔹 Q14: What's the difference between EBS and EFS in production?

Feature	EBS	EFS
Type	Block storage	File system
Attachment	One EC2 (or Multi-Attach)	Multiple EC2 (multi-AZ)
Use Case	Databases, boot volumes	Shared configs, logs, web content
Performance	High IOPS	Higher latency

🔹 Q15: How would you automate EBS snapshot backups?

Answer:
Use:

- AWS Backup service
- Data Lifecycle Manager (DLM) policies
- Scheduled Lambda functions with Boto3 script

Automation ensures backup compliance and retention enforcement.
