AWS Exam Cheat Sheet Cheat Sheet

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1. AWS Cloud Computing

Definition: On-demand IT resources (compute, storage, DB) over the Internet, pay-as-you-go.

5 Characteristics (NIST model):

- On-Demand Self-Service → provision instantly.
- Broad Network Access → access via devices/APIs.
- Resource Pooling → multi-tenant, shared.
- Rapid Elasticity → scale up/down.
- Measured Service → pay per use.

Benefits of AWS:

Agility;	Faster innovation, deploy in minutes.
Cost savings:	Handle spikes, avoid overprovisioning.
Global reach:	OPEX model, Reserved/Spot instances.
Scalability:	Deploy in multiple regions/AZs.
Security:	IAM, encryption, compliance standards.
Innovation:	ML, IoT, serverless, analytics.

Limitations + Mitigation:

Compliance:

> Regulations (GDPR, HIPAA) → use AWS Artifact, regional data residency.

Latency:

> Distance issues → use CloudFront, Edge Locations, Local Zones.

Vendor lock-in:

> Hard to migrate → use hybrid/multi-cloud strategies.

2. AWS Networking & Security

VPC = isolated virtual network.

- **Subnets** → Public (Internet GW) / Private.
- **Route Tables** → traffic rules.
- **Security Groups (SGs)** → instance firewall (stateful, allow only).
- **NACLs** → subnet firewall (stateless, allow/deny).

Connectivity Options:

- VPN (encrypted tunnel)
- Direct Connect (dedicated private line)
- Hybrid Cloud = on-prem + AWS

6. Compute Services

EC2	Resizable VMs
Lambda	Serverless compute, pay per request
Elastic Beanstalk	PaaS for app deployment
ECS/EKS	Containers

7. Storage Services

Service	Type	Use Case
EBS	Block	Attach to EC2
S3	Object	General storage
EFS	File	Shared, scalable
Glacier	Archival	Backups, compliance

9. Cloud Architecture Design

- **Trusted Advisor** → recommends on cost, performance, security.
- **High Availability** → deploy across AZs & Regions.
- **Reliability** → backups, failover, replication.

3. AWS Architectures

Core Services:

- **EC2** = scalable VMs
- **S3** = object storage (11 9's durability)
- **Glacier** = archival storage

Optimisation:

- Right-size EC2, Auto Scaling
- Reserved Instances, Spot Instances
- Elastic Load Balancing

Well-Architected Framework → 5 pillars:

1. Operational Excellence
2. Security
3. Reliability
4. Performance Efficiency
5. Cost Optimisation

4. Automation & Serverless

- **CloudFormation** = Infrastructure as Code (IaC).
- **Lambda** = serverless, event-driven, stateless.
- **API Gateway** = expose Lambda as APIs.
- **Monitoring**: CloudWatch (metrics), X-Ray (tracing).

5. Identity & Access Management (IAM)

IAM Components:	Users, Groups, Roles, Policies.
Risks:	`*:*` permissions, long-lived keys.
Mitigation:	IAM Access Analyser, CloudTrail audits.
Best Practices:	MFA, Rotate keys, Avoid root account, Cross-account roles

Principle: Least Privilege (grant minimum required).

8. Database Services

- **RDS** (SQL, managed) → backups, scaling.
- **Aurora** → high-perf managed DB.
- **DynamoDB** → NoSQL, serverless, key-value.
- **Redshift** → analytics/data warehouse.

SQL vs NoSQL:

- **SQL** = structured, ACID, relational.
- **NoSQL** = schema-less, horizontal scaling.

10. Scalability & Monitoring

- **Elastic Load Balancing (ELB)** → distributes traffic.
- **Auto Scaling** → adds/removes EC2 instances.
- **CloudWatch** → monitors metrics in real-time.