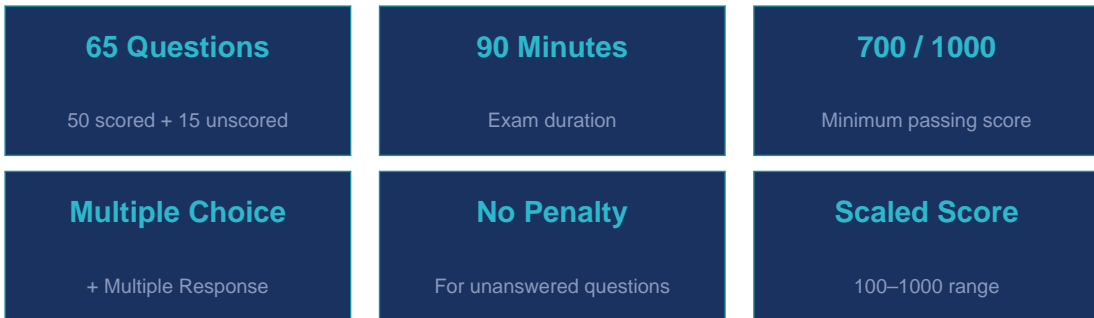
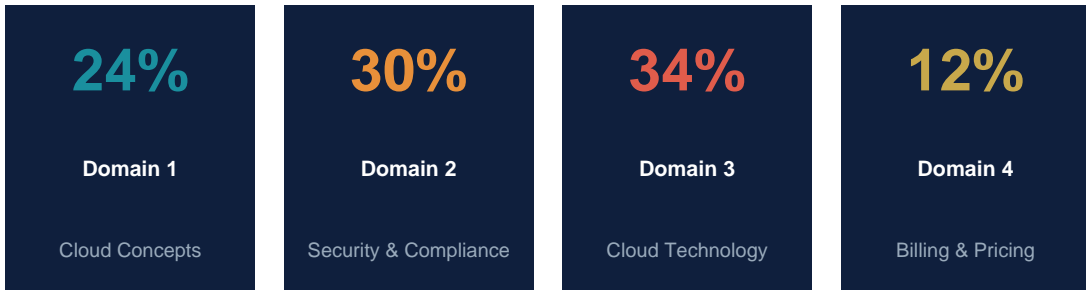


AWS Certified

# Cloud Practitioner

CLF-C02 · QUICK REFERENCE CHEAT SHEET



## DOMAIN 1 - CLOUD CONCEPTS (24%)

### 6 Advantages of Cloud Computing

<b>Trade CapEx for OpEx</b>	Pay only for what you use — no large upfront hardware investments.
<b>Economies of Scale</b>	AWS aggregates millions of customers, translating into lower prices.
<b>Stop Guessing Capacity</b>	Scale up/down in minutes; eliminate idle resources and underprovisioning.
<b>Speed &amp; Agility</b>	New IT resources available in minutes; innovate and experiment faster.
<b>Go Global in Minutes</b>	Deploy to any AWS Region worldwide with a few clicks.
<b>No Data Center Ops</b>	Focus on differentiating products, not managing undifferentiated infrastructure.

### Well-Architected Framework — 6 Pillars

Pillar	Focus	Key Principle
Operational Excellence	Run & monitor; improve processes	IaC; small reversible changes; learn from failures
Security	Protect data, systems, assets	Least privilege; traceability; encrypt in transit & at rest
Reliability	Recover from failures; meet demand	Test recovery; scale horizontally; stop guessing capacity
Performance Efficiency	Use resources efficiently	Go global in minutes; serverless; experiment often
Cost Optimization	Avoid unnecessary costs	Consumption model; measure efficiency; managed services
Sustainability	Minimize environmental impact	Maximize utilization; use efficient hardware & regions

### Migration Strategies — The 6 R's

<b>Rehost (Lift &amp; Shift)</b>	Move to cloud with NO architecture changes. Fastest migration path.
<b>Replatform</b>	Minor optimizations during move (e.g., migrate to managed RDS).
<b>Repurchase (Drop &amp; Shop)</b>	Replace with SaaS solution (e.g., on-prem CRM -> Salesforce).
<b>Refactor / Re-architect</b>	Redesign as cloud-native. Highest effort, highest long-term benefit.
<b>Retire</b>	Decommission apps no longer needed (10-20% of portfolio typically).
<b>Retain</b>	Keep on-premises for now; revisit later (compliance, not ready yet).

**AWS CAF** Cloud Adoption Framework has 6 perspectives: Business, People, Governance (business side) + Platform, Security, Operations (technical side). Guides organizational cloud adoption strategy.

**DEPLOYMENT MODELS** Cloud: all components in the cloud. Hybrid: cloud + on-premises connected. On-Premises (Private Cloud): virtualization in your own data center.

**DOMAIN 2 - SECURITY & COMPLIANCE (30%)****Shared Responsibility Model**

Area	AWS Responsible ("OF Cloud")	Customer Responsible ("IN Cloud")
Physical Infrastructure	Data centers, hardware, servers	—
Hypervisor	Manages hypervisor layer	—
EC2 Guest OS	—	Patch, configure & secure OS
Network Controls	Global network infrastructure	Security groups, NACLs, VPCs
Data & Encryption	Provides tools (KMS, etc.)	Encrypt & manage your data
IAM / Permissions	Provides IAM service	Configure users, roles, MFA, policies
Managed Services (RDS)	OS & DB engine patching	Access control, data, DB config
Lambda / Serverless	Runtime environment	Function code & IAM permissions

**IAM — Identity & Access Management**

<b>Users</b>	Individual identities; long-term credentials (username + password or access keys).
<b>Groups</b>	Collections of IAM users that share a permissions policy.
<b>Roles</b>	Temporary permissions for services/users; no long-term credentials stored.
<b>Policies</b>	JSON documents defining allow/deny. Attached to users, groups, or roles.
<b>Least Privilege</b>	Grant ONLY minimum permissions needed. Review and reduce regularly.
<b>MFA</b>	Enable on root account and all privileged users. Virtual or hardware.
<b>Root Account</b>	Full unrestricted access. Use ONLY for initial setup. Enable MFA immediately.
<b>IAM Identity Center</b>	Workforce SSO — one login across multiple AWS accounts & business apps.
<b>Cognito</b>	Application user auth for customers (sign-up/sign-in). NOT for workforce.
<b>Secrets Manager</b>	Store, manage, auto-rotate DB passwords, API keys, and other secrets.

**Security Services Quick Reference**

Service	What It Does	Key Differentiator
Shield Standard	DDoS protection	FREE — auto-enabled for all AWS customers
Shield Advanced	Enhanced DDoS + DRT team	Paid; financial protections; real-time visibility
AWS WAF	Web App Firewall (L7)	Blocks SQLi, XSS; attaches to CloudFront/ALB/API GW
GuardDuty	ML-based threat detection	Analyzes CloudTrail + VPC Flow Logs + DNS logs
Inspector	Vulnerability scanning	EC2, ECR, Lambda — automated CVE assessment
Security Hub	Central findings dashboard	Aggregates GuardDuty, Inspector, Macie findings
Amazon Macie	S3 data privacy / PII	Finds sensitive data; alerts on public/unencrypted S3
AWS KMS	Encryption key management	Shared service; integrates with all AWS services
AWS CloudHSM	Dedicated HSM hardware	Single-tenant; FIPS 140-2 L3; you control keys
CloudTrail	API activity audit log	"Who did what, when, where" — across ALL API calls
AWS Config	Resource config compliance	Evaluates configs against rules; history tracking

AWS Artifact

Compliance reports portal

Download SOC, PCI, ISO certs — free, on demand

**SG vs NACL**

Security Groups: STATEFUL — return traffic auto-allowed; instance-level; allow rules only. NACLs: STATELESS — must allow both inbound AND outbound explicitly; subnet-level; support deny rules.

**DOMAIN 3 - CLOUD TECHNOLOGY & SERVICES (34%)****AWS Global Infrastructure**

<b>Region</b>	33+ geographic areas. Choose based on: latency, compliance, service availability, cost.
<b>Availability Zone</b>	2-6 isolated data centers per Region. Multi-AZ deployments = High Availability.
<b>Edge Location</b>	400+ CloudFront CDN cache points worldwide. Also used by Route 53.
<b>Local Zone</b>	AWS infra extension near major cities for ultra-low latency (gaming, media).
<b>Wavelength Zone</b>	AWS compute in 5G networks for single-digit millisecond latency.
<b>AWS Outposts</b>	Fully managed AWS rack in YOUR on-premises data center. AWS manages it.

**Compute Services**

Service	Type	Best Use Case
Amazon EC2	IaaS — Virtual Machines	Full OS control, custom configs, lift-and-shift workloads
AWS Lambda	Serverless (FaaS)	Event-driven; no server mgmt; pay per invocation; 15-min max
Amazon ECS	Container orchestration	Run Docker containers; AWS-native; pairs with Fargate
Amazon EKS	Managed Kubernetes	Kubernetes-native workloads at scale
AWS Fargate	Serverless containers	Run ECS/EKS without managing EC2 instances
Elastic Beanstalk	PaaS	Deploy app code; AWS handles infra; retain EC2 control
Amazon Lightsail	Simplified VPS	Simple apps; predictable pricing; new-to-AWS developers
EC2 Auto Scaling	Automatic scaling	Scale in/out based on CloudWatch metrics and schedules

**EC2 Purchasing Options**

Option	Discount / Cost	Best For
On-Demand	No discount; pay per sec/hr	Unpredictable, short-term, dev/test workloads
Reserved (1-yr)	Up to 40% savings	Steady-state workloads lasting 1+ year
Reserved (3-yr)	Up to 75% savings	Long-term committed workloads; max savings
Convertible RI	Up to 54%	Need flexibility to change instance type/OS/region
Savings Plans	Up to 72%; most flexible	Commit \$/hr; applies to EC2 + Fargate + Lambda
Spot Instances	Up to 90% savings	Fault-tolerant, interruptible batch/rendering jobs
Dedicated Hosts	On-demand or RI pricing	Per-socket/per-core software licensing compliance
Dedicated Instances	Higher than on-demand	Hardware isolated to your account only

**LOAD  
BALANCERS**

ALB (Application LB): Layer 7, HTTP/HTTPS, path-based routing. NLB (Network LB): Layer 4, TCP/UDP, ultra-high performance. GWLB (Gateway LB): 3rd-party virtual network appliances. All managed by Elastic Load Balancing (ELB).

## DOMAIN 3 - STORAGE, DATABASE & NETWORKING

### Storage Services

Service	Type	Key Facts
Amazon S3	Object (unlimited)	11 nines durability; static websites; data lakes; versioning; policies
S3 Standard-IA	Object (infrequent)	Lower storage cost; retrieval fee; rapid access when needed
S3 Glacier Instant	Archive (ms retrieval)	Lowest cost for archives needing millisecond access
S3 Glacier Flexible	Archive (1-12 hr)	Lower cost than Instant; good for backups
S3 Glacier Deep	Archive (12-48 hr)	Cheapest storage class; long-term cold archive
Amazon EBS	Block storage for EC2	Network-attached; persists after stop; one instance at a time
Amazon EFS	Shared NFS (Linux)	Mount on many EC2 simultaneously; auto-scales; multi-AZ
AWS Storage Gateway	Hybrid cloud bridge	On-prem access to S3; File/Volume/Tape gateway types
AWS Snow Family	Physical data transfer	Snowcone/Snowball/Snowmobile for petabyte-scale migrations

### Database Services

Service	DB Type	Key Facts
Amazon RDS	Relational (managed)	MySQL, PostgreSQL, Oracle, SQL Server; AWS patches OS & DB
Amazon Aurora	Cloud-native relational	5x faster MySQL; 6-way replication; serverless option
Amazon DynamoDB	Serverless NoSQL	Single-digit ms latency; any scale; global tables
Amazon Redshift	Data Warehouse (OLAP)	Petabyte SQL analytics; columnar; MPP architecture
ElastiCache	In-memory cache	Redis or Memcached; microsecond latency caching layer
Amazon Neptune	Graph database	Social networks, fraud detection, knowledge graphs
Amazon DocumentDB	Document (MongoDB)	JSON documents; MongoDB-compatible workloads
AWS DMS	DB migration service	Migrate databases to AWS with minimal downtime

### Networking Services

Service	Purpose	Key Points
Amazon VPC	Virtual private network	Isolated; subnets, route tables, internet gateways, NACLs
Amazon CloudFront	CDN	Cache at 400+ edges; reduce latency; integrates with S3/ALB
Amazon Route 53	DNS & domain registration	Routing policies: simple, weighted, latency, failover, geo
AWS Direct Connect	Dedicated private link	On-prem to AWS; NOT internet; consistent/predictable latency
AWS Site-to-Site VPN	Encrypted tunnel	On-prem to VPC over internet; faster to set up than Direct Connect
AWS Transit Gateway	Central network hub	Connect multiple VPCs and on-prem networks centrally
Global Accelerator	AWS backbone routing	Static Anycast IPs; TCP/UDP; non-HTTP performance boost
AWS PrivateLink	Private service access	Access AWS services without NAT or internet gateway

## DOMAIN 3 - AI/ML & INTEGRATION SERVICES

### AI / Machine Learning & Analytics

<b>SageMaker</b>	Build, train, and deploy ML models. Full ML lifecycle platform.
<b>Rekognition</b>	Image & video analysis: objects, faces, text, inappropriate content.
<b>Comprehend</b>	NLP: sentiment analysis, entity extraction, key phrases, language detection.
<b>Lex</b>	Conversational chatbots with voice & text (same tech as Alexa).
<b>Polly</b>	Text-to-speech: convert text into lifelike speech audio.
<b>Transcribe</b>	Speech-to-text: automatic speech recognition from audio.
<b>Translate</b>	Neural machine translation between 75+ language pairs.
<b>Bedrock</b>	Access foundation models (FMs) for generative AI apps — fully managed.
<b>Amazon Q</b>	Generative AI assistant: Q Developer (coding) + Q Business (enterprise).
<b>Athena</b>	Serverless SQL on S3 — query data lakes without loading into a database.
<b>Kinesis</b>	Real-time streaming data: collect, process, analyze IoT/clickstream data.
<b>QuickSight</b>	Business intelligence dashboards and data visualization.
<b>AWS Glue</b>	Serverless ETL service — discover, prepare, and move data.

### Application Integration

<b>Amazon SQS</b>	Message queue — decouples components; messages retained up to 14 days.
<b>Amazon SNS</b>	Pub/sub — fan-out one message to many subscribers simultaneously.
<b>Amazon EventBridge</b>	Event bus — route events from AWS services, SaaS, and custom apps.
<b>Step Functions</b>	Serverless visual workflow orchestration for distributed applications.
<b>API Gateway</b>	Create, manage, secure REST and WebSocket APIs at any scale.
<b>CloudFormation</b>	IaC via JSON/YAML templates — consistent, automated resource provisioning.
<b>CloudWatch</b>	Metrics, logs, dashboards, alarms — central monitoring for AWS services.
<b>CloudTrail</b>	API audit trail — who, what, when, where across your entire account.

## DOMAIN 4 - BILLING, PRICING & SUPPORT (12%)

### Pricing Models

<b>On-Demand</b>	Pay per second/hour; no commitment; highest flexibility; highest per-unit cost.
<b>Reserved (1-yr)</b>	1-year commitment; ~40% savings. Standard (rigid) or Convertible (flexible).
<b>Reserved (3-yr)</b>	3-year commitment; up to 75% savings. All-upfront = maximum discount.
<b>Savings Plans</b>	Commit to \$/hr spend (1 or 3 yr); applies to EC2, Fargate, Lambda; most flexible.
<b>Spot Instances</b>	Up to 90% off spare capacity; can be interrupted with 2-min notice.
<b>Dedicated Hosts</b>	Physical server; bring existing per-socket/per-core software licenses.

### Cost Management Tools

<b>Cost Explorer</b>	Visualize and analyze historical costs; forecast spending; rightsizing tips.
<b>AWS Budgets</b>	Set alerts on cost/usage thresholds — notifies BEFORE you overspend.
<b>Pricing Calculator</b>	Estimate costs for NEW architectures before deploying them.
<b>Cost &amp; Usage Report</b>	Most granular billing data; export to S3; query with Athena.
<b>Consolidated Billing</b>	One invoice for all AWS Organization accounts; shares volume discounts.
<b>Compute Optimizer</b>	ML-based right-sizing for EC2, EBS, Lambda, ECS Fargate.
<b>Trusted Advisor</b>	5 categories: Cost, Security, Performance, Fault Tolerance, Service Limits.
<b>Cost Allocation Tags</b>	Tag resources by project/team; filter cost reports by tag in Billing console.

## DOMAIN 4 - SUPPORT PLANS

## AWS Support Plans Comparison

Feature	Basic	Developer	Business	Ent. On-Ramp	Enterprise
Cost	Free	\$29+/mo	\$100+/mo	\$5,500+/mo	\$15,000+/mo
Technical Support	Forums	Biz hours	24/7 phone	24/7 phone	24/7 phone
Critical SLA	—	12 hrs	1 hour	30 minutes	15 minutes
Trusted Advisor	7 core	7 core	All checks	All checks	All checks
TAM	—	—	—	Pool of TAMs	Dedicated TAM
Concierge Team	—	—	—	Yes	Yes
Infra Event Mgmt	—	—	Extra fee	Yes	Yes

**FREE TIER QUICK REFERENCE** Always Free (never expires): Lambda 1M req/mo, DynamoDB 25 GB, CloudWatch 10 metrics. 12 Months Free: EC2 t2.micro 750 hrs/mo, S3 5 GB, RDS 750 hrs/mo, CloudFront 1 TB. Short Trials: GuardDuty 30 days, Inspector 90 days, Macie 30 days.

## MASTER SERVICE QUICK REFERENCE — MOST TESTED

## Know These Cold

Service	Category	Remember This
EC2	Virtual servers (IaaS)	Full OS control; all purchasing options apply
Lambda	Serverless functions	Event-driven; no servers; pay per invocation
ECS + Fargate	Serverless containers	Docker without managing EC2 infrastructure
Elastic Beanstalk	PaaS app platform	Deploy code; AWS manages infra underneath
S3	Object storage	11 nines durability; unlimited; 7 storage classes
EBS	Block storage	Attached to one EC2; persists after stop; like a hard drive
EFS	Shared file system	Multiple EC2 mount simultaneously; auto-scales (Linux NFS)
RDS	Managed relational DB	AWS patches OS & DB; Multi-AZ for HA; Read Replicas for scale
Aurora	Cloud-native relational	5x faster MySQL; serverless option; 6-way replication
DynamoDB	Serverless NoSQL	Millisecond latency; global tables; no capacity guessing
Redshift	Data warehouse	Petabyte SQL analytics; OLAP; columnar storage
ElastiCache	In-memory cache	Redis/Memcached; microsecond reads; sit in front of DB
VPC	Virtual private network	Isolated; you define IP space, subnets, routes
CloudFront	CDN	400+ edges; cache HTTP/HTTPS content near users
Route 53	DNS service	Domain registration + DNS + health checks
Direct Connect	Dedicated circuit	NOT internet; consistent latency; on-prem to AWS
IAM	Access control	Users, Groups, Roles, Policies; always least privilege
Shield Standard	DDoS protection	FREE; automatic; covers all AWS customers
WAF	Web app firewall	Blocks SQLi/XSS at Layer 7; attaches to CloudFront/ALB
GuardDuty	Threat detection	ML-based; analyzes CloudTrail + VPC + DNS logs
Macie	S3 data privacy	Finds PII; alerts on public/unencrypted S3 buckets
KMS	Key management	Encryption keys; integrates with all AWS services

CloudTrail	API audit log	Who, what, when, where for every API call
Cost Explorer	Cost analysis	Visualize historical spend + forecast + rightsizing
Budgets	Spend alerts	Alert before/when you exceed cost or usage thresholds
Trusted Advisor	Best practice checks	Cost, Security, Performance, Fault Tolerance, Limits

**EXAM DAY  
REMINDERS**

700/1000 to pass | 65 questions (50 scored + 15 unscored) | 90 minutes | No penalty for guessing — answer every question! | Shared Responsibility: AWS = "OF the cloud"; You = "IN the cloud" | Shield Standard = FREE | CloudTrail = audit log | Config = compliance rules | Multi-AZ = High Availability | Multi-Region = Disaster Recovery | Reserved 3-yr all-upfront = maximum savings | Spot = cheapest but interruptible