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FOUNDATIONAL · CLF-C02

AWS Certified Cloud Practitioner

CLF-C02 Cheat Sheet

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The full AWS vocabulary you need for the CLF-C02 exam, organised by service family and built around the patterns AWS examiners actually test. Foundational coverage — no prior AWS experience assumed.

EXAM SNAPSHOT

- **65 questions** — 50 scored + 15 unscored
- **90 minutes** total time
- **700 / 1000** to pass
- **$100 USD** exam fee

- **Cloud Concepts** — 24%
- **Security & Compliance** — 30%
- **Cloud Technology & Services** — 34%
- **Billing, Pricing & Support** — 12%

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1 · Cloud Concepts

Six Advantages of the Cloud

- **Trade capital expense (CapEx) for variable expense (OpEx)** — pay only for what you use, when you use it.
- **Benefit from massive economies of scale** — AWS aggregates usage across millions of customers so prices keep dropping.
- **Stop guessing capacity** — scale up or down on demand, not on forecasts.
- **Increase speed and agility** — provision resources in minutes, not weeks.
- **Stop spending money running and maintaining data centres** — focus on applications, not infrastructure.
- **Go global in minutes** — deploy to multiple Regions for low latency and disaster resilience.

Cloud Deployment Models

Model	What It Is
Cloud (All-in cloud)	Entire solution runs in the cloud. Services consumed via APIs, no on-premises footprint.
Hybrid	Cloud connects to on-premises infrastructure. Common bridges: Direct Connect, VPN, Outposts, Storage Gateway.
On-premises (Private cloud)	Virtualised infrastructure in your own data centre. Can use AWS Outposts to run AWS services on-prem with AWS-managed hardware.

Well-Architected Framework — Six Pillars

Pillar	What It Means
Operational Excellence	Run and monitor systems; continuously improve processes and procedures. Keywords: runbooks, automation, observability.
Security	Protect information, systems, and assets. Apply least privilege; encrypt at rest and in transit; enable traceability.
Reliability	Recover from infrastructure or service disruptions; dynamically acquire resources. Multi-AZ, backups, automated recovery.
Performance Efficiency	Use computing resources efficiently to meet requirements. Right-size, go serverless, use global delivery.
Cost Optimization	Avoid unnecessary costs. Use Reserved/Savings Plans for steady workloads, Spot for fault-tolerant jobs, shut down unused resources.
Sustainability	Minimise the environmental impact of running cloud workloads. Use Graviton, serverless, efficient Region selection.

Exam Tip: When a question describes a business outcome, map to the pillar: 'reduce downtime' → Reliability; 'reduce spend' → Cost Optimization; 'meet demand spikes' → Performance Efficiency; 'protect customer data' → Security; 'automate deploys' → Operational Excellence; 'lower carbon footprint' → Sustainability.

Cloud Design Principles

- **Design for failure** — assume components will fail; build in redundancy and automated recovery.
- **Implement elasticity** — scale out/in automatically with demand (Auto Scaling, serverless).
- **Decouple components** — use SQS, SNS, EventBridge, load balancers to isolate failure domains.
- **Think parallel, not serial** — horizontal scaling over vertical.
- **Leverage managed services** — reduce undifferentiated heavy lifting.

2 · AWS Global Infrastructure

Concept	Definition & Details
Region	A geographic area containing multiple, isolated Availability Zones (e.g. *us-east-1*, *eu-west-1*). Choose based on latency, data sovereignty laws, service availability, and price.
Availability Zone (AZ)	One or more discrete data centres with redundant power, networking, and connectivity. Physically separated by meaningful distance, low-latency linked. Deploy across ≥2 AZs for high availability.
Edge Location	700+ sites worldwide that cache content close to users. Used by CloudFront, Route 53, Lambda@Edge, AWS Shield.
Regional Edge Cache	Larger intermediate CloudFront cache between edge locations and origins. Holds objects too large for edge caches.
Local Zones	Extension of a Region that places compute, storage, and database close to a specific metropolitan area. Single-digit-millisecond latency for end users near the zone.
Wavelength Zones	AWS infrastructure embedded inside telco 5G networks. Ultra-low latency for mobile/5G applications (AR/VR, gaming, video processing).
AWS Outposts	Fully managed AWS racks that live in your data centre. Run EC2, EBS, S3, RDS, ECS, EKS on-prem with the same APIs as AWS.
AWS GovCloud	Isolated Regions designed for US government workloads with FedRAMP High / ITAR compliance. Separate credentials from standard AWS.

How to Choose a Region

- **Compliance & data sovereignty** — some data must stay in a specific country.
- **Proximity to users** — lower latency for end-users.
- **Service availability** — not every service launches in every Region simultaneously.
- **Pricing** — costs vary by Region (e.g. us-east-1 is generally cheapest).

3 · Shared Responsibility Model

AWS and the customer share security duties. **AWS secures the cloud; customers secure what they put in the cloud.** The split shifts depending on the service type.

Responsibility	Who Owns It	Examples
Physical data centre security	**AWS**	Facilities, hardware, networking infrastructure
Host operating system & virtualisation	**AWS**	Hypervisor, physical host patching
Managed service internals	**AWS**	Lambda runtime, RDS engine patches, DynamoDB scaling
Guest OS patching & configuration	**Customer**	EC2 Linux/Windows updates, installed software
Application code & data	**Customer**	What you build, what you store, how you classify it
IAM — users, roles, keys	**Customer**	Who can log in, what they can do, MFA enforcement
Network traffic protection	**Customer**	Security groups, NACLs, TLS, VPN configuration
Client-side data encryption	**Customer**	Encrypting data before uploading to S3, token management

Shift by Service Type

Service Type	Customer Burden
Infrastructure (EC2)	Highest — OS patching, networking, app, data all on the customer.
Container (ECS/EKS)	Medium — AWS handles orchestration layer; customer still owns container image and runtime config.
Abstracted / Managed (Lambda, DynamoDB, S3)	Lowest — customer manages data, IAM, configuration; AWS handles everything else.

Exam Tip: 'Security OF the cloud' = AWS. 'Security IN the cloud' = you. Patching the EC2 guest OS is always the customer. Patching an RDS engine is always AWS.

4 · Security, Identity & Compliance

AWS IAM

Global service controlling who can do what in your AWS account. Follow the principle of least privilege.

Concept	Definition
User	A long-term identity for a person or application. Gets a username + password and/or access keys.
Group	A collection of users. Attach policies to the group to manage many users at once. Cannot be nested.
Role	An identity assumable by users, services, or external identities. Returns temporary credentials — preferred over long-term keys for workloads.
Policy	JSON document describing allow/deny rules. Identity-based (attached to user/group/role) or resource-based (attached to the resource itself, e.g. S3 bucket policy).
MFA	Multi-Factor Authentication. Always enable on the root account and on privileged IAM users. Virtual, hardware, or FIDO security key.
Root user	The account owner — full access to everything, cannot be restricted. Lock away credentials, enable MFA, never use for daily work.

Exam Tip: When a question says 'an EC2 instance needs to access S3', the answer is always an **IAM role**, never access keys stored on the instance. Root account = for account creation and sensitive tasks only.

IAM Identity Center (formerly AWS SSO)

Central place to manage workforce access to multiple AWS accounts and business applications from one identity (Active Directory, Okta, built-in, or external SAML IdP). Issues temporary credentials when users sign in.

Amazon Cognito

Authentication and authorisation for web and mobile apps.

- **User Pools** — sign-up/sign-in, MFA, social federation. Returns JWT tokens. Think 'who is this person?'
- **Identity Pools** — exchanges tokens for temporary AWS credentials via STS. Think 'what can this person do in AWS?'

Encryption & Key Management

Service	Purpose
AWS KMS	Managed encryption-key service. Create and control symmetric/asymmetric keys. Integrated with S3, EBS, RDS, DynamoDB, and more — enable encryption with a checkbox.

Service	Purpose
AWS CloudHSM	Dedicated hardware security modules. FIPS 140-2 Level 3. Use when you need full control of the keys for compliance.
AWS Certificate Manager (ACM)	Free public TLS certificates for ALB, CloudFront, API Gateway. Auto-renews.
AWS Secrets Manager	Store and automatically rotate database credentials, API keys, OAuth tokens. Built-in rotation for RDS/Redshift/DocumentDB. Cross-account access.
Systems Manager Parameter Store	Store config values and non-rotating secrets. Free tier (up to 10K params). Use KMS for SecureString.

Threat Detection & Protection

Service	What It Does
Amazon GuardDuty	ML-based threat detection. Analyses VPC Flow Logs, DNS logs, CloudTrail, S3 data events, EKS audit logs. No agents. Detects crypto mining, compromised credentials, unusual API calls.
Amazon Inspector	Automated vulnerability scanning for EC2, Lambda, and ECR images. Checks for CVEs and network reachability. Continuous.
Amazon Macie	ML-based discovery of sensitive data in S3 (PII, credit cards, credentials). Alerts on public buckets or unencrypted sensitive data.
Amazon Detective	Investigates and analyses potential security issues. Auto-builds a behavioural graph from GuardDuty/VPC/CloudTrail data.
AWS WAF	Web Application Firewall for ALB, CloudFront, API Gateway, AppSync. Block SQL injection, XSS, rate limiting, geo-blocking.
AWS Shield	DDoS protection. *Standard* is free and automatic. *Advanced* ($3K/month) adds 24/7 DDoS Response Team, cost protection, enhanced detection.
AWS Firewall Manager	Centrally manage WAF, Shield Advanced, Security Groups, Network Firewall rules across all accounts in an Organization.
AWS Security Hub	Single-pane-of-glass dashboard. Aggregates findings from GuardDuty, Inspector, Macie, Firewall Manager. Runs compliance checks (CIS, PCI, AWS Foundational).
AWS Audit Manager	Continuously audit usage and generate evidence reports for frameworks like PCI DSS, GDPR, HIPAA.
AWS Artifact	Self-service portal for AWS compliance reports (SOC, PCI, ISO, HIPAA BAA). Download what you need for audits.

Account-Level Controls

- **AWS Organizations** — consolidate multiple AWS accounts. Central billing, SCPs (Service Control Policies) to restrict permissions org-wide, OUs for hierarchy.
- **AWS Control Tower** — automated multi-account setup with guardrails (preventive SCPs + detective Config rules). Landing Zone + Account Factory.
- **AWS IAM Access Analyzer** — identifies resources (S3, IAM roles, KMS, Lambda, SQS) shared with external entities.
- **AWS Resource Access Manager (RAM)** — share resources across accounts within an Organization (Transit Gateways, subnets, Route 53 rules).
- **AWS Directory Service** — managed Microsoft AD, AD Connector (proxy to on-prem AD), or Simple AD for Linux workloads.

5 · Compute

Core Compute Services

Service	What It Is
Amazon EC2	Virtual servers. Full control of OS, instance type, storage, networking. Launch in minutes, pay per second (Linux) or per hour (Windows).
AWS Lambda	Run code in response to events — no server management. Up to 15 min per invocation, 128 MB – 10,240 MB memory. Pay per request + per ms of execution.
AWS Fargate	Serverless compute engine for ECS and EKS. No EC2 to manage — specify CPU/memory per task.
AWS Elastic Beanstalk	Platform-as-a-Service. Upload code, Beanstalk handles capacity provisioning, load balancing, auto-scaling, health monitoring. Java, .NET, Node.js, Python, Ruby, Go, Docker.
Amazon Lightsail	Bundled virtual private servers with predictable monthly pricing. Pre-configured for web apps, dev/test, simple WordPress sites. For beginners or simple workloads.
AWS Batch	Fully managed batch processing. Auto-provisions EC2 or Fargate based on job volume. Good for scientific computing, video encoding, ETL at scale.
AWS Outposts	AWS hardware running in your data centre. Extends AWS services on-prem for data residency or low-latency local processing needs.

EC2 Instance Families

Family	Use Case
General Purpose (T, M)	Balanced workloads — web servers, small databases, dev/test.
Compute Optimised (C)	CPU-heavy — batch, HPC, gaming, ML inference.
Memory Optimised (R, X, z)	In-memory databases, real-time analytics, large caches.
Storage Optimised (I, D, H)	High sequential I/O — data warehouses, distributed file systems.
Accelerated Computing (P, G, Inf, Trn)	GPU/FPGA — ML training, video encoding, graphics.

EC2 Auto Scaling

Automatically adjusts the number of EC2 instances based on demand. Uses launch templates. Scaling policies: **target tracking** (keep CPU at 50%), **step scaling** (add N when CPU > 80%), **simple**, **scheduled**, and **predictive** (ML-based forecast).

Containers on AWS

- **Amazon ECS** — AWS-native container orchestration. Launch tasks on EC2 or Fargate.
- **Amazon EKS** — managed Kubernetes. Choose if you already use K8s or need its ecosystem. Runs on EC2 or Fargate.
- **Amazon ECR** — managed Docker registry. Stores, scans, and encrypts images.
- **AWS Fargate** — serverless launch type for ECS and EKS. No nodes to manage.

> **Exam Tip:** 'Run code without managing servers' = Lambda (short) / Fargate (long-running). 'Simple VPS for a WordPress site' = Lightsail. 'Lift-and-shift VM to cloud' = EC2. 'Need Kubernetes' = EKS. 'Batch workloads' = AWS Batch.

6 · Storage

Amazon S3 — Object Storage

Object storage with virtually unlimited capacity. 11 nines (99.999999999%) of durability. Globally unique bucket names. Access via HTTP/HTTPS.

Storage Class	Use Case	Retrieval
S3 Standard	Frequently accessed data	Instant
S3 Intelligent-Tiering	Unknown or changing access patterns — auto-moves between tiers	Instant
S3 Standard-IA	Infrequent access, rapid retrieval needed	Instant + retrieval fee
S3 One Zone-IA	Infrequent, re-creatable (single AZ — 47% cheaper than IA)	Instant + retrieval fee
S3 Glacier Instant Retrieval	Archives accessed once per quarter	Milliseconds
S3 Glacier Flexible Retrieval	Archives, minutes-to-hours retrieval	1 min – 12 hr
S3 Glacier Deep Archive	Lowest cost, regulatory archives	12 – 48 hr

- **Versioning** — keep multiple versions; protects against accidental deletion.
- **Lifecycle policies** — transition objects between classes or expire them automatically.
- **Replication (CRR / SRR)** — cross-Region or same-Region replication for compliance/latency.
- **Encryption** — SSE-S3, SSE-KMS, SSE-C, or client-side. Default encryption available.
- **Pre-signed URLs** — time-limited access to private objects.

Block & File Storage

Service	What It Is
Amazon EBS	Persistent block storage for a single EC2 instance. Survives stop/start. Snapshots to S3. Types: gp3 (default SSD), io2 (high-performance SSD), st1 (throughput HDD), sc1 (cold HDD).
Instance Store	Ephemeral block storage physically attached to the host. Very high IOPS but data lost on stop/terminate. Use for caches and scratch space.
Amazon EFS	Managed NFS file system. Shared across many EC2 instances in many AZs. Auto-scales from GB to PB. Linux only.
Amazon FSx	Managed file systems: for Windows (SMB, AD), Lustre (HPC), NetApp ONTAP (multi-protocol), OpenZFS (Linux migration).
Amazon S3 Glacier	Archive storage — three classes (Instant Retrieval, Flexible Retrieval, Deep Archive). Vault Lock for WORM compliance.

Hybrid & Data Transfer

Service	When to Use
AWS Storage Gateway	Bridge on-prem file/block/tape to S3. Variants: S3 File Gateway (NFS/SMB), FSx File Gateway (SMB), Volume Gateway (iSCSI), Tape Gateway (VTL).
AWS Backup	Centralised backup across EC2, EBS, RDS, Aurora, DynamoDB, EFS, FSx, Storage Gateway, S3. Backup Vault Lock for immutable retention.
AWS Elastic Disaster Recovery	Lowest-cost DR for on-prem or cloud servers. Continuously replicates to AWS; fail over in minutes.

Service	When to Use
AWS Snow Family LEGACY	Physical devices for offline data transfer. **Snowball Edge** only, closed to new customers Nov 7, 2025. Snowmobile and Snowcone retired. New customers: use DataSync or AWS Data Transfer Terminal.

Exam Tip: 'Object storage, unlimited scale' = S3. 'Attached disk for one EC2' = EBS. 'Shared file system for many EC2' = EFS. 'Windows file share' = FSx for Windows. 'On-prem to S3 bridge' = Storage Gateway. 'Archival, cheapest' = S3 Glacier Deep Archive.

7 · Database

Service	Type	Use Case
Amazon RDS	Managed relational	MySQL, PostgreSQL, MariaDB, Oracle, SQL Server, IBM Db2. AWS handles backups, patching, Multi-AZ failover, read replicas.
Amazon Aurora	AWS-built relational	MySQL-compatible (5× faster) or PostgreSQL-compatible (3× faster). 6 copies across 3 AZs. Serverless v2 auto-scales. Global Database for cross-Region.
Amazon DynamoDB	NoSQL key-value / document	Single-digit-ms performance at any scale. Serverless. Global Tables for active-active multi-Region writes. DAX for microsecond caching.
Amazon DocumentDB	Document (MongoDB-compatible)	Catalogs, user profiles, content management. Managed alternative to self-hosted MongoDB.
Amazon Neptune	Graph	Social networks, knowledge graphs, fraud detection, recommendations. Gremlin and SPARQL.
Amazon ElastiCache	In-memory	Redis or Memcached. Microsecond caching to offload databases or hold session state.
Amazon Redshift	Data warehouse	Analytics, BI, OLAP. Columnar storage. Redshift Serverless for variable workloads.

RDS High Availability Patterns

- **Multi-AZ deployment** — synchronous standby in another AZ. Automatic failover in 60–120s. For *high availability*, not read scaling.
- **Read Replicas** — asynchronous copies for read scaling. Up to 15 (5 for non-Aurora). Can be promoted to standalone. Cross-Region supported.

Exam Tip: Multi-AZ = availability, Read Replicas = read scaling. Frequently tested together. 'Migrate on-prem MySQL' = DMS to RDS. 'Single-digit-ms NoSQL' = DynamoDB. 'MongoDB workload' = DocumentDB. 'Complex SQL analytics' = Redshift.

8 · Networking & Content Delivery

Amazon VPC

Logically isolated virtual network. You control IP ranges (CIDR blocks), subnets, route tables, gateways. Every new account gets a default VPC in each Region.

Component	Purpose
Subnet	Range of IPs inside a VPC. Public (route to IGW) or private (no direct internet route).
Internet Gateway (IGW)	Lets public subnets reach the internet. One per VPC.

Component	Purpose
NAT Gateway	Lets private-subnet instances egress to the internet without exposing them to inbound traffic. Deploy one per AZ for HA.
Security Group	Stateful virtual firewall at the instance/ENI level. Allow rules only — no explicit deny.
Network ACL (NACL)	Stateless firewall at the subnet level. Allow AND deny rules. Both inbound and outbound needed.
VPC Endpoint	Private connection to AWS services without traversing the internet. Gateway endpoints (S3, DynamoDB) are free; Interface endpoints use PrivateLink.
VPC Peering	Private connectivity between two VPCs. Not transitive.

Exam Tip: Security Groups = stateful; NACLs = stateless. One of the most-tested distinctions.

Connectivity & Delivery

Service	What It Does
Amazon CloudFront	Global CDN with 600+ edge locations. Caches content close to users. Origins: S3, ALB, EC2, custom HTTP. OAC for secure S3 origin.
Amazon Route 53	DNS service + domain registrar. Routing policies: simple, weighted, latency, failover, geolocation, geoproximity, multi-value, IP-based.
AWS Global Accelerator	Routes traffic over AWS backbone to the nearest Regional endpoint. Two static anycast IPs; good for TCP/UDP (gaming, IoT, VoIP).
AWS Direct Connect	Dedicated private network link from on-prem to AWS. 1/10 Gbps dedicated. Consistent latency, no internet. Not encrypted by default.
AWS Site-to-Site VPN	Encrypted tunnel over public internet between on-prem and a VPC. Quick to set up (minutes). Up to 1.25 Gbps per tunnel.
AWS Client VPN	Managed VPN for individual remote users. OpenVPN-based.
AWS Transit Gateway	Hub-and-spoke network connecting many VPCs, VPNs, and Direct Connect. Supports transitive routing — unlike VPC peering.
AWS PrivateLink	Expose services to other VPCs or customers without VPC peering. Interface endpoints over the AWS backbone.
Elastic Load Balancing (ALB/NLB/GWLB)	ALB — HTTP/S, path/host routing. NLB — TCP/UDP, static IPs, ultra-low latency. GWLB — third-party security appliances.
Amazon API Gateway	Managed REST and WebSocket APIs. Integrates with Lambda, HTTP backends, AWS services. Caching, throttling, usage plans.

Exam Tip: 'Consistent low latency + private connection' = Direct Connect. 'Quick encrypted tunnel' = Site-to-Site VPN. 'Need static IPs for TCP/UDP' = Global Accelerator. 'Cache HTTP content worldwide' = CloudFront. 'Hundreds of VPCs to connect' = Transit Gateway.

9 · Application Integration

Service	Pattern	Details
Amazon SQS	Queue (point-to-point)	Standard (unlimited throughput, at-least-once, best-effort ordering) or FIFO (exactly-once, strict ordering, 300 msg/s). Decouples producers from consumers.

Service	Pattern	Details
Amazon SNS	Pub/Sub (fan-out)	Topic-based. One message → many subscribers (SQS, Lambda, HTTP, email, SMS, mobile push). Classic SNS → SQS fan-out pattern.
Amazon EventBridge	Event bus	Serverless event router with rules. Archive + replay events. Integrates with 100+ SaaS sources. Successor to CloudWatch Events.
AWS Step Functions	Workflow	Visual state machine to coordinate Lambda, ECS, other AWS services. Standard Workflows (up to 1 year, exactly-once) or Express (5 min, high throughput).
AWS AppSync	GraphQL API	Managed GraphQL. Real-time sync for web/mobile. Offline support via caching.

Exam Tip: SQS = decouple + buffer. SNS = fan-out. EventBridge = complex event routing from many sources. Step Functions = orchestration of multi-step workflows.

10 · Analytics & Data

Service	What It Does
Amazon Athena	Serverless SQL queries on S3 data directly. Pay per query ($5/TB scanned). Use Parquet/ORC to save cost.
Amazon EMR	Managed Hadoop/Spark clusters. Apache Spark, Hive, Presto, HBase. EMR Serverless for simpler deployments.
AWS Glue	Serverless ETL + Data Catalog. Crawlers auto-detect schema. Central metadata used by Athena, Redshift Spectrum, EMR.
Amazon Kinesis	Real-time streaming data. Data Streams (shards, you manage capacity). Amazon Data Firehose (managed delivery to S3/Redshift/OpenSearch).
Amazon OpenSearch Service	Search and log analytics (ELK-stack replacement). Pairs with Firehose for log pipelines.
Amazon QuickSight	Serverless BI dashboards. SPICE in-memory engine. Connects to RDS, S3, Athena, Redshift.
Amazon Redshift	Cloud data warehouse. Redshift Spectrum for S3 queries. Serverless option.

11 · Machine Learning

Service	What It Does
Amazon SageMaker AI	End-to-end platform to build, train, and deploy ML models at scale. JumpStart for pre-trained models. Studio for visual ML development.
Amazon Q	Generative-AI assistant for work. Q Developer for coding; Q Business for enterprise Q&A over internal data.
Amazon Rekognition	Image and video analysis: object/face detection, content moderation.
Amazon Textract	Extract text, tables, forms from scanned documents. Beyond simple OCR.
Amazon Comprehend	NLP — sentiment analysis, entity recognition, topic modelling, language detection.
Amazon Translate	Neural machine translation across 75+ languages.
Amazon Transcribe	Speech-to-text. Real-time and batch. Medical-specific model available.

Service	What It Does
Amazon Polly	Text-to-speech with natural-sounding voices. SSML support.
Amazon Lex	Build conversational bots (same tech as Alexa). Integrates with Lambda.
Amazon Kendra	ML-powered enterprise search over S3, RDS, SharePoint, etc.

12 · Management & Governance

Service	Purpose
Amazon CloudWatch	Metrics, logs, alarms, dashboards. Triggers Auto Scaling, SNS, Lambda. Logs Insights for SQL-like queries over logs.
AWS CloudTrail	Records every API call — who did what, when, from where. Management events on by default. Store in S3, query with Athena.
AWS Config	Tracks resource configuration changes over time. Rules evaluate compliance (e.g. 'all EBS volumes must be encrypted'). Conformance packs for PCI/HIPAA/CIS.
AWS CloudFormation	Infrastructure as Code. JSON/YAML templates. Stack sets deploy across accounts/Regions.
AWS Systems Manager	Operational hub: Session Manager (SSH-less access), Patch Manager, Run Command, Automation runbooks, Parameter Store.
AWS Trusted Advisor	Real-time recommendations across cost, performance, security, fault tolerance, service limits. Full checks with Business/Enterprise support.
AWS Compute Optimizer	ML-based right-sizing recommendations for EC2, EBS, Lambda, Fargate, Auto Scaling groups.
AWS Health Dashboard	Personalised view of AWS service events affecting your account. Includes Service Health Dashboard (global) and Personal Health (account-specific).
AWS License Manager	Track and manage software licences (BYOL) across AWS and on-prem.
AWS Service Catalog	Create and distribute approved portfolios of products for end-users to self-service.
Service Quotas	View and request increases to AWS service limits (EC2 instances per Region, Lambda concurrent executions, VPCs per Region, etc.). Integrates with CloudWatch to alarm when approaching a quota.
AWS Management Console	Web-based UI for managing AWS. Also available as a mobile app. AWS CLI, SDKs, and CloudShell for programmatic access.
AWS Well-Architected Tool	Self-assessment tool — review workloads against the six pillars and get improvement recommendations.

Exam Tip: CloudTrail = WHO did WHAT (audit). CloudWatch = HOW are resources PERFORMING (metrics/logs). Config = WHAT CHANGED in configuration over time. This trio is frequently tested together.

13 · Migration & Transfer

Service	What It Does
AWS Database Migration Service (DMS)	Migrate databases to AWS with minimal downtime. Homogeneous (MySQL→MySQL) or heterogeneous (Oracle→Aurora, with SCT).
AWS Schema Conversion Tool (SCT)	Converts database schemas between engines (Oracle→PostgreSQL, SQL Server→MySQL). Pairs with DMS.

Service	What It Does
AWS Application Migration Service (MGN)	Lift-and-shift server migration. Agent-based replication. Replaces the older Server Migration Service.
AWS Application Discovery Service	Discover on-prem servers, dependencies, utilisation — for migration planning. Agentless (VMware) or agent-based.
AWS Migration Hub	Single dashboard to track migration progress across MGN, DMS, and partner tools.
Migration Evaluator	Right-sized AWS cost estimate based on on-prem usage data. Formerly TSO Logic.
AWS DataSync	Online, accelerated file transfer between on-prem storage and S3/EFS/FSx. 10× faster than open-source tools.
AWS Transfer Family	Managed SFTP, FTPS, FTP, AS2 server backed by S3 or EFS.
AWS Snow Family LEGACY	Physical devices for bulk offline transfer. Only Snowball Edge remains; closed to new customers Nov 7, 2025. Favour DataSync or Data Transfer Terminal.

The 7 Rs of Migration

- **Rehost** (lift-and-shift) — move as-is to EC2. Fastest, uses MGN.
- **Replatform** — small optimisations (self-managed MySQL → RDS).
- **Repurchase** — switch to SaaS (CRM → Salesforce).
- **Refactor / Re-architect** — rebuild cloud-native (Lambda, DynamoDB, containers).
- **Retire** — decommission unused systems.
- **Retain** — keep on-prem for now.
- **Relocate** — move VMware workloads to VMware Cloud on AWS.

14 · Pricing & Cost Management

Core Pricing Principles

- **Pay as you go** — no upfront commitment; pay for what you consume.
- **Save when you reserve** — lower rates for 1- or 3-year commitments.
- **Pay less by using more** — tiered pricing for S3, data transfer, etc.
- **Pay less per unit by scaling** — volume discounts across AWS Organizations.
- **Pay less as AWS grows** — ongoing price reductions passed to customers.

EC2 Purchasing Options

Option	Discount	Best For
On-Demand	None	Short-term, spiky, unpredictable workloads.
Reserved Instances (RI)	Up to 72%	Steady-state workloads; 1 or 3 year commitment.
Savings Plans	Up to 72%	Flexible $/hr commitment covering EC2, Fargate, Lambda. 1 or 3 year.
Spot Instances	Up to 90%	Fault-tolerant batch, CI/CD, HPC — can be interrupted.
Dedicated Hosts	Varies	BYOL, socket/core licensing, compliance.
Capacity Reservations	None	Guarantee capacity in a specific AZ without long commitment.

Cost Management Services

Service	What It Does
AWS Cost Explorer	Visualise, understand, and forecast AWS spending. Filter by service, tag, account. Shows RI / Savings Plan recommendations.
AWS Budgets	Set cost/usage thresholds and get alerts (email/SNS). Can trigger remediation actions.
AWS Cost and Usage Reports (CUR)	Most granular billing dataset — hourly line items by resource. Export to S3, query with Athena or QuickSight.
AWS Pricing Calculator	Estimate costs before deploying. Model architectures; compare options.
AWS Marketplace	Curated catalog of third-party software (AMIs, SaaS, containers, ML models). Unified billing through AWS.
Cost Allocation Tags	Tag resources to attribute costs to projects/teams/environments. Must be activated in the billing console.

Free Tier

- **Always Free** — e.g. 1M Lambda requests/month, 25 GB DynamoDB storage, 10 custom CloudWatch metrics.
- **12 Months Free** — e.g. 750 EC2 t2.micro/t3.micro hours/month, 5 GB S3 Standard storage.
- **Trials** — short-term free for services like Amazon Inspector, Amazon Redshift.

Exam Tip: 'Predictable steady workload' = Reserved Instances or Savings Plans. 'Interruptible batch' = Spot. 'Visualise spend' = Cost Explorer. 'Stop overspend' = AWS Budgets. 'Granular line items for chargeback' = CUR.

15 · AWS Support Plans

Restructure in progress: At re:Invent 2025 AWS replaced Developer, Business, and Enterprise On-Ramp with a simpler tier set. The legacy plans stop accepting **new subscriptions on December 2, 2025** and are fully discontinued on **January 1, 2027** (existing customers can keep using them until then). They remain available in AWS GovCloud (US). The CLF-C02 exam still references the *legacy* plan names, so learn both — recognise the legacy tiers on questions, recommend the modern tiers in real-world designs.

Legacy Tiers (on the current exam)

Plan	Cost	What You Get
Basic	Free	Documentation, whitepapers, re:Post community forum, 7 core Trusted Advisor checks, Personal Health Dashboard. No case-based tech support. *Still available — not being retired.*
Developer DEPRECATED	From $29/month	Business-hours email support via Cloud Support Associates. One primary contact. 12–24h general guidance / 4–12h impaired system response. *No new subscriptions after Dec 2, 2025; discontinued Jan 1, 2027.*
Business DEPRECATED	From $100/month	24×7 phone/email/chat via Cloud Support Engineers, unlimited contacts, 1h production-down response, full Trusted Advisor, Infrastructure Event Management (pay-per-use). *Discontinued Jan 1, 2027.*
Enterprise On-Ramp DEPRECATED	From $5,500/month	Everything in Business + pool of Technical Account Managers, 30-min business-critical response, Concierge billing, annual architecture review. *Auto-upgraded to Enterprise Support during 2026; discontinued Jan 1, 2027.*
Enterprise	From $5,000/month	Designated TAM, 15-min business-critical response, training, operations reviews, Infrastructure Event Management included, AWS Security Incident Response. *Minimum reduced from $15K to $5K in 2025 restructure.*

Modern Tiers (Dec 2025 onward)

Plan	Cost	Key Differentiators
Basic	Free	Included with every AWS account. Documentation, whitepapers, re:Post community forum, 7 core Trusted Advisor checks, Personal Health Dashboard. No case-based technical support. Unchanged by the restructure.
Business Support+	From $29/month	AI-powered assistance aware of your operational context. 24/7 access to AWS experts, 30-min response for critical tickets. Successor to both Developer and Business.
Enterprise Support	From $5,000/month	Designated TAM, 15-min critical response, AWS Security Incident Response at no extra cost. Successor to Enterprise On-Ramp + classic Enterprise.
Unified Operations	From $50,000/month	Designated team of AWS experts for mission-critical workloads. Fastest response times (5-min critical). New top tier introduced in 2025.

Plan Comparison — Highest-Frequency Exam Differentiators

- **24×7 support** starts at **Business** plan (legacy) or **Business Support+** (modern).
- **Technical Account Manager (TAM)** — pool on legacy **Enterprise On-Ramp**, designated on **Enterprise** (both legacy and modern).
- **Full Trusted Advisor** — Business and above; Basic/Developer only get 7 core checks.
- **Infrastructure Event Management** — included at Enterprise tier, additional fee at Business.
- **Response times for critical tickets** — legacy: 15 min (Enterprise), 30 min (Enterprise On-Ramp), 1 h (Business), 4 h (Developer). Modern: 5 min (Unified Operations), 15 min (Enterprise), 30 min (Business Support+).

Exam Tip: On CLF-C02 today, expect legacy plan names. 'Need a designated TAM' = Enterprise. '24×7 with 1-hour response' = Business. 'Cheapest production support' = Developer (but no 24×7). Basic is never right for production. If a question post-2026 mentions *Business Support+*, apply the same 'need 24×7 + AI-powered guidance' logic.

16 · Additional Services — Quick Reference

Service	Category	What It Does
AWS Amplify	Front-end	Build, deploy, host full-stack web and mobile apps. Git-based CI/CD with managed hosting.
AWS AppSync	Front-end	Managed GraphQL API with real-time sync.
Amazon Connect	Business apps	Cloud contact-centre. Pay-as-you-go voice + omnichannel.
Amazon SES	Business apps	Scalable email sending for transactional and marketing mail.
Amazon WorkSpaces	End-user	Managed virtual desktops (Windows/Linux) streamed to any device.
Amazon WorkSpaces Secure Browser	End-user	Browser-only access to internal web apps without VPN.
Amazon AppStream 2.0	End-user	Stream desktop applications from AWS to any device.
AWS IoT Core	IoT	Connect devices to AWS. MQTT/HTTPS broker. Device Shadow for last-known state.
AWS CLI / CloudShell	Developer	Command-line access to AWS. CloudShell is a browser-based shell with CLI pre-configured — free, no setup.
AWS CodeBuild	Developer	Managed build service. Pay per build minute. Uses buildspec.yml.

Service	Category	What It Does
AWS CodePipeline	Developer	CI/CD pipeline orchestration. Integrates with CodeCommit, CodeBuild, CodeDeploy, third-party tools.
AWS X-Ray	Developer	Distributed tracing for microservices. Visual service map showing latency and errors.

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