

## TRAINING AND CERTIFICATION

# AWS Certified Cloud Practitioner Exam (CLF-C02) Reference Guide

This guide is not exhaustive and does not include all content for the exam.



## SERVICE SUMMARIES

Choose the link for each service name for more information, including the full service name for those that are abbreviated.

ANALYTICS	
<a href="#">Amazon Athena</a>	analyze data directly in Amazon S3 by using standard SQL
<a href="#">AWS Data Exchange</a>	find, subscribe to, and use third-party data in the cloud
<a href="#">Amazon EMR</a>	run big data frameworks, such as Apache Hadoop and Apache Spark, to process and analyze vast amounts of data
<a href="#">AWS Glue</a>	discover, prepare, move, and integrate data from multiple sources
<a href="#">Amazon Kinesis</a>	collect, process, and analyze video streams and data streams in near real time
<a href="#">Amazon MSK</a>	build and run applications that use Apache Kafka to process streaming data
<a href="#">Amazon OpenSearch Service</a>	deploy, operate, and scale OpenSearch clusters in the cloud
<a href="#">Amazon QuickSight</a>	business intelligence service that provides insights in a single data dashboard

APPLICATION INTEGRATION	
<a href="#">Amazon EventBridge</a>	use events to connect application components together, build scalable event-driven applications
<a href="#">Amazon SNS</a>	provides message delivery from publishers to subscribers
<a href="#">Amazon SQS</a>	provides a queue to integrate and decouple distributed software systems and components
<a href="#">AWS Step Functions</a>	integrate with Lambda functions and view application workflows as a series of event-driven steps



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BUSINESS APPLICATIONS	
<a href="#">Amazon Connect</a>	omnichannel cloud contact center
<a href="#">Amazon SES</a>	send and receive emails through existing email addresses and domains

CLOUD FINANCIAL MANAGEMENT	
<a href="#">AWS Billing Conductor</a>	custom billing service that can support showback and chargeback workflows of AWS Solution Providers and Enterprise customers
<a href="#">AWS Budgets</a>	set a monthly cost budget with alerts for actual spend or forecasted spend
<a href="#">AWS Cost and Usage Report</a>	contains the most comprehensive set of cost and usage data available
<a href="#">AWS Cost Explorer</a>	visualize cost and usage over time, including the past 12 months and a forecast of the next 12 months
<a href="#">AWS Marketplace</a>	curated digital catalog of third-party software, data, and services

COMPUTE	
<a href="#">AWS Batch</a>	run batch computing workloads
<a href="#">Amazon EC2</a>	provides scalable computing capacity in the AWS Cloud
<a href="#">AWS Elastic Beanstalk</a>	deploy and manage applications without knowledge of the underlying infrastructure
<a href="#">AWS Lambda</a>	run code without the need to provision or manage servers
<a href="#">Amazon Lightsail</a>	launch projects quickly from a simple management interface
<a href="#">AWS Outposts</a>	extends AWS infrastructure, services, APIs, and tools to customer premises



CONTAINERS	
<a href="#">Amazon ECR</a>	container image registry that is secure, scalable, and reliable
<a href="#">Amazon ECS</a>	deploy, manage, and scale containerized applications
<a href="#">Amazon EKS</a>	run Kubernetes without the need to install, operate, or maintain the Kubernetes control plane or nodes
<a href="#">AWS Fargate</a>	works with Amazon ECS to run containers without the need to manage servers or EC2 instances

CUSTOMER ENGAGEMENT	
<a href="#">AWS Activate for Startups</a>	provides resources to help startups build and grow on AWS
<a href="#">AWS IQ</a>	connects users to AWS Certified experts for help with AWS projects
<a href="#">AWS Managed Services (AMS)</a>	provides ongoing management for a user's AWS infrastructure

DATABASE	
<a href="#">Amazon Aurora</a>	database engine that is compatible with MySQL and PostgreSQL
<a href="#">Amazon DynamoDB</a>	NoSQL database service with fast and predictable performance and seamless scalability; schemaless
<a href="#">Amazon MemoryDB for Redis</a>	durable, in-memory database service that delivers ultra-fast performance
<a href="#">Amazon Neptune</a>	graph database service for highly connected datasets
<a href="#">Amazon RDS</a>	set up, operate, and scale a relational database in the cloud
<a href="#">Amazon Redshift</a>	petabyte-scale data warehouse with automatically provisioned resources and intelligent scaling

DEVELOPER TOOLS	
<a href="#">AWS AppConfig</a>	create, manage, and quickly deploy application configurations
<a href="#">AWS CLI</a>	interact with AWS services through commands in the command-line shell
<a href="#">AWS Cloud9</a>	an integrated development environment (IDE) with a built-in terminal that supports several programming languages
<a href="#">AWS CloudShell</a>	a browser-based, pre-authenticated shell that users can launch directly from the console
<a href="#">AWS CodeArtifact</a>	artifact repository that helps companies to store and share software packages for application development
<a href="#">AWS CodeBuild</a>	compiles source code, runs unit tests, and produces artifacts that are ready to deploy
<a href="#">AWS CodeCommit</a>	host private Git repositories, store and manage assets
<a href="#">AWS CodeDeploy</a>	automate application deployments to on-premises instances or select AWS resources
<a href="#">AWS CodePipeline</a>	model, visualize, and automate the steps to release software with continuous delivery
<a href="#">AWS CodeStar</a>	create and manage software development projects by integrating AWS services in the project development toolchain
<a href="#">AWS SDK</a>	use software development kits to develop applications in your preferred programming language
<a href="#">AWS X-Ray</a>	collects data about application requests and provides tools to view, filter, and gain insights into the data

END-USER COMPUTING	
<a href="#">Amazon AppStream 2.0</a>	application streaming service that provides users with instant access to desktop applications from anywhere
<a href="#">Amazon WorkSpaces</a>	provision virtual, cloud-based desktops without the need to deploy hardware or install complex software
<a href="#">Amazon WorkSpaces Web</a>	facilitates secure browser access to internal websites and SaaS applications



FRONTEND WEB AND MOBILE	
<a href="#">AWS Amplify</a>	set of purpose-built tools and features to build full-stack applications
<a href="#">AWS AppSync</a>	connect applications and services to data and events with GraphQL and pub/sub APIs
<a href="#">AWS Device Farm</a>	app testing for Android, iOS, and web apps

INTERNET OF THINGS (IoT)	
<a href="#">AWS IoT Core</a>	connect and process messages between IoT devices and IoT services
<a href="#">AWS IoT Greengrass</a>	build, deploy, and manage IoT edge runtime applications on devices

MACHINE LEARNING (ML)	
<a href="#">Amazon Comprehend</a>	uses natural language processing (NLP) to extract insights from documents
<a href="#">Amazon Kendra</a>	intelligent search service that uses NLP and ML algorithms
<a href="#">Amazon Lex</a>	build conversational interfaces for applications that use voice and text
<a href="#">Amazon Polly</a>	convert text into lifelike speech
<a href="#">Amazon Rekognition</a>	identify objects, people, text, scenes, and activities in images and videos
<a href="#">Amazon SageMaker</a>	build and train ML models, then deploy the models in a production-ready hosted environment
<a href="#">Amazon Textract</a>	automatically extract text, handwriting, and data from scanned documents
<a href="#">Amazon Transcribe</a>	automatic speech recognition that converts audio to text
<a href="#">Amazon Translate</a>	translate unstructured text documents or build applications that work in multiple languages



MANAGEMENT AND GOVERNANCE	
<a href="#">AWS Auto Scaling</a>	monitors applications to automatically scale resources dynamically by adjusting capacity based on defined thresholds
<a href="#">AWS CloudFormation</a>	model, set up, and create templates of AWS resources
<a href="#">AWS CloudTrail</a>	records actions taken by users in the console, AWS CLI, AWS SDKs, and APIs
<a href="#">Amazon CloudWatch</a>	monitors resources and applications, collects and tracks metrics, has alarms
<a href="#">AWS Compute Optimizer</a>	analyzes the configuration and utilization metrics of resources, provides optimization recommendations
<a href="#">AWS Config</a>	provides a detailed view of AWS resource configuration, changes in configuration, and compliance
<a href="#">AWS Control Tower</a>	set up and govern a multi-account environment
<a href="#">AWS Health Dashboard</a>	provides ongoing visibility into resource performance and availability of AWS services and user accounts
<a href="#">AWS Launch Wizard</a>	deploy application and domain-controller solutions to the cloud
<a href="#">AWS License Manager</a>	manage software licenses from software vendors centrally across AWS and on-premises environments
<a href="#">AWS Management Console</a>	web application used to manage AWS resources
<a href="#">AWS Organizations</a>	account management service that can consolidate billing and accounts
<a href="#">AWS Service Catalog</a>	create and manage catalogs of IT services that are approved for AWS
<a href="#">AWS Systems Manager</a>	organize, monitor, and automate management tasks on AWS resources
<a href="#">AWS Trusted Advisor</a>	inspects a user's AWS environment and makes recommendations based on best practices
<a href="#">AWS Well-Architected Tool</a>	provides recommendations to improve workloads based on best practices

MIGRATION AND TRANSFER	
<a href="#">AWS Application Discovery Service</a>	collects usage and configuration data about on-premises servers and databases to help plan a migration to AWS
<a href="#">AWS Application Migration Service</a>	automated lift-and-shift (rehost) solution for migrations to AWS
<a href="#">AWS DMS</a>	migrate relational databases, data warehouses, NoSQL databases, and data stores to AWS
<a href="#">AWS Migration Hub</a>	a central location to discover existing servers, plan migrations, and track the status of each application migration
<a href="#">AWS SCT</a>	convert an existing database schema from one database engine to another
<a href="#">AWS Snow Family</a>	run operations in remote, non-data center environments, and locations without network connectivity
<a href="#">AWS Transfer Family</a>	transfer files in to and out of AWS storage services

NETWORKING AND CONTENT DELIVERY	
<a href="#">Amazon API Gateway</a>	create, publish, and monitor REST, HTTP, and WebSocket APIs at any scale
<a href="#">Amazon CloudFront</a>	speed up distribution of static and dynamic web content to end users through edge locations
<a href="#">AWS Direct Connect</a>	a private dedicated network connection from an on-premises data center to the cloud
<a href="#">AWS Global Accelerator</a>	improve availability and performance of applications through a global network of endpoints
<a href="#">Amazon Route 53</a>	DNS service for domain registration, DNS routing, and health checking
<a href="#">Amazon VPC</a>	launch AWS resources in logically isolated virtual networks
<a href="#">AWS VPN</a>	establish a secure and private tunnel from on premises to the cloud



SECURITY, IDENTITY, AND COMPLIANCE	
<a href="#">AWS Artifact</a>	download security and compliance documents
<a href="#">AWS Audit Manager</a>	continually audit AWS usage to manage risk and to comply with regulations and industry standards
<a href="#">AWS Certificate Manager (ACM)</a>	creates, stores, and renews public and private SSL/TLS certificates
<a href="#">AWS CloudHSM</a>	provides a compute device that processes cryptographic operations and storage
<a href="#">Amazon Cognito</a>	identity platform for web and mobile applications, including federation for third parties
<a href="#">Amazon Detective</a>	analyze, investigate, and identify the root cause of security findings or suspicious activities
<a href="#">AWS Directory Service</a>	provides multiple ways to set up and run Microsoft Active Directory with AWS services
<a href="#">AWS Firewall Manager</a>	provides administration and maintenance tasks across multiple accounts and resources for a variety of protections
<a href="#">Amazon GuardDuty</a>	intelligent threat detection that provides continuous monitoring
<a href="#">IAM</a>	helps users securely control access to AWS resources
<a href="#">IAM Identity Center</a>	manage sign-in security for workforce identities
<a href="#">Amazon Inspector</a>	continuously scans AWS workloads for software vulnerabilities and unintended network exposure
<a href="#">AWS KMS</a>	create and control cryptographic keys that protect user data
<a href="#">Amazon Macie</a>	discovers sensitive data, PII, and security risks, then provides automated protection against those risks
<a href="#">AWS Network Firewall</a>	provides intrusion detection and prevention for a VPC

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SECURITY, IDENTITY, AND COMPLIANCE (CONTINUED)	
<a href="#">AWS RAM</a>	securely share resources across AWS accounts
<a href="#">AWS Secrets Manager</a>	manage and rotate credentials to improve security
<a href="#">AWS Security Hub</a>	collects security data across accounts and identifies priority security issues
<a href="#">AWS Shield</a>	provides protection against DDoS attacks for AWS resources
<a href="#">AWS WAF</a>	monitor HTTP(S) requests and control access to web application resources

STORAGE	
<a href="#">AWS Backup</a>	centralize and automate backups of data from AWS storage services and on-premises storage systems
<a href="#">Amazon EBS</a>	block-level storage volumes for use with EC2 instances
<a href="#">Amazon EFS</a>	serverless, fully scalable shared file system
<a href="#">AWS Elastic Disaster Recovery</a>	minimizes downtime and data loss from natural catastrophes, application failures, or disruptions of service
<a href="#">Amazon FSx</a>	launch, run, and scale file systems in the cloud
<a href="#">Amazon S3</a>	scalable object storage in the cloud
<a href="#">Amazon S3 Glacier storage classes</a>	secure and durable data archiving and long-term backup
<a href="#">AWS Storage Gateway</a>	connect an on-premises software appliance with cloud-based storage



## CONCEPTS

AWS WELL-ARCHITECTED FRAMEWORK	
<a href="#">Operational excellence</a>	support development and run workloads effectively, gain insights into workload operations, and continuously improve supporting processes and procedures to deliver business value
<a href="#">Security</a>	protect data, systems, and assets by using cloud technologies to improve security
<a href="#">Reliability</a>	includes the ability of a workload to perform its intended function correctly and consistently when expected throughout its lifecycle
<a href="#">Performance efficiency</a>	use computing resources efficiently to meet system requirements and to maintain efficiency as demand changes and technologies evolve
<a href="#">Cost optimization</a>	includes the ability to run systems to deliver business value at the lowest price point
<a href="#">Sustainability</a>	focuses on environmental impacts, especially energy consumption and efficiency, to inform direct actions to reduce resource usage

GLOBAL INFRASTRUCTURE	
<a href="#">Regions</a>	isolated geographic area that consists of multiple Availability Zones
<a href="#">Availability Zones</a>	one or more data centers within a Region
<a href="#">Edge locations</a>	a worldwide network of data centers that optimizes latency and throughput to users
<a href="#">AWS Local Zones</a>	provides low-latency access to applications by placing AWS resources close to large population and industry centers
<a href="#">AWS Wavelength</a>	build applications that deliver ultra-low latencies to mobile devices and end users through 5G networks



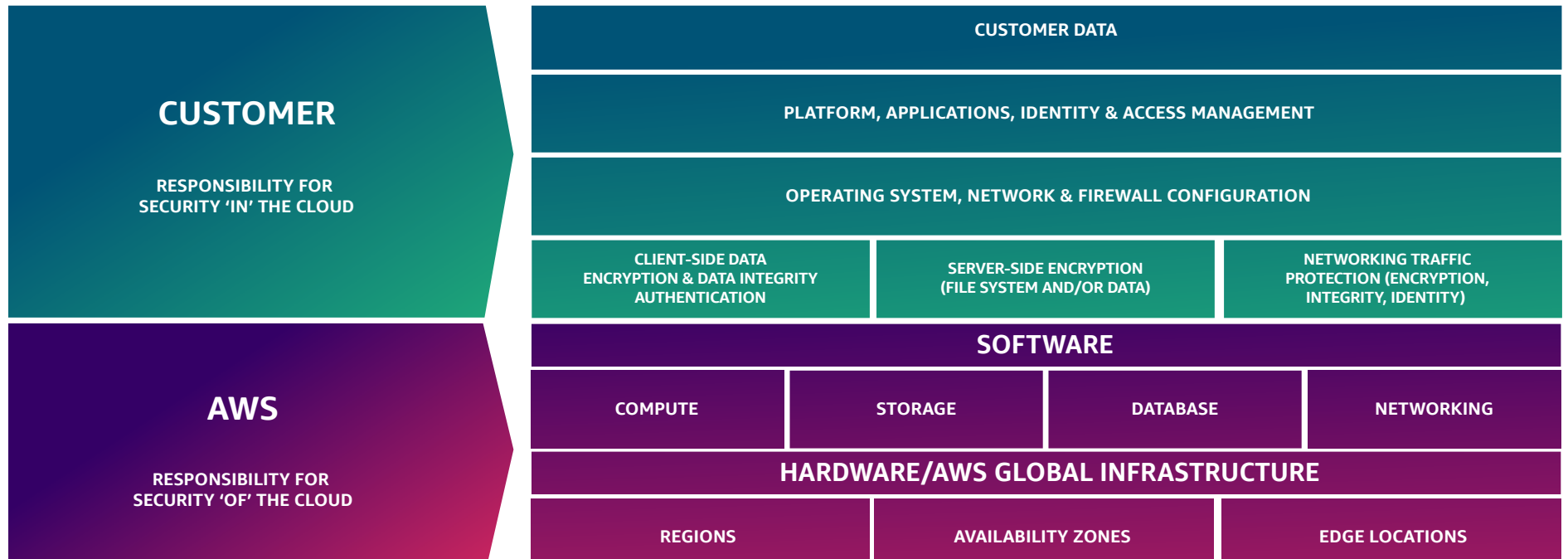
AWS NETWORKING GATEWAYS	
<a href="#">AWS Transit Gateway</a>	connects Amazon VPCs, AWS accounts, and on-premises networks to a single gateway
<a href="#">Customer gateway</a>	a physical or software appliance that a user owns and manages on premises
<a href="#">Direct Connect gateway</a>	establishes connectivity that spans Amazon VPCs spread across multiple Regions
<a href="#">Internet gateway</a>	an Amazon VPC component that allows communication between a user's computer and the internet
<a href="#">NAT gateway</a>	a network address translation service that gives instances in a private subnet the ability to connect to services outside of the user's Amazon VPC
<a href="#">Virtual private gateway</a>	the gateway on the AWS side of an AWS Site-to-Site VPN connection

EC2 INSTANCE PURCHASING OPTIONS	
<a href="#">Dedicated Hosts</a>	physical host that is fully dedicated to the user
<a href="#">Dedicated Instances</a>	EC2 instance in a VPC dedicated to one user, no long-term commitment required, pay by the second
<a href="#">EC2 Savings Plan</a>	commit to a 1-year or 3-year term for individual instance families in a Region, can change instance types within the family
<a href="#">On-Demand Capacity Reservations</a>	reserve EC2 instance capacity with no term commitment required
<a href="#">On-Demand Instances</a>	no long-term commitment required, pay by the second
<a href="#">Reserved Instances</a>	commit to a 1-year or 3-year term
<a href="#">Spot Instances</a>	request unused instances for flexible workloads

## AWS Support Plans Comparison

BASIC	DEVELOPER	BUSINESS	ENTERPRISE
<ul style="list-style-type: none"><li>• Core Trusted Advisor checks (service quotas and basic security)</li></ul>	<ul style="list-style-type: none"><li>• Core Trusted Advisor checks (service quotas and basic security)</li><li>• Business hours access to associate</li><li>• General guidance within 24 business hours</li><li>• System impaired help within 12 business hours</li></ul>	<ul style="list-style-type: none"><li>• All Trusted Advisor checks</li><li>• Phone, web, and chat access 24 hours a day, 7 days a week</li><li>• General guidance within 24 hours</li><li>• System impaired help within 12 hours</li><li>• Production system impaired help within 4 hours</li><li>• Production system down help within 1 hour</li></ul>	<ul style="list-style-type: none"><li>• All Trusted Advisor checks</li><li>• Phone, web, and chat access 24 hours a day, 7 days a week</li><li>• General guidance within 24 hours</li><li>• System impaired help within 12 hours</li><li>• Production system impaired help within 4 hours</li><li>• Production system down help within 1 hour</li><li>• Business-critical system down help within 15 minutes</li></ul>

## Shared Responsibility Model



### Customer Responsibility

- client-side data integrity and encryption
- manage guest OS
- set password policies
- configure firewalls and networks
- encrypt client-side data
- configure IAM roles
- patch OS of EC2 instances
- determine which services have access to DynamoDB tables

### Shared Responsibility

- patches
- configuration
- training and awareness

### AWS Responsibility

- global infrastructure
- hosts
- operation and virtualization of software
- hardware maintenance
- physical and environmental controls
- edge location management
- secure the EC2 hypervisor
- patch OS of RDS instances
- patch ELBs
- patch OS used by Lambda
- server-side encryption in Amazon S3

The preceding list is not exhaustive and provides only a few examples within the shared responsibility model.