The Extremely Unofficial AWS Certified Cloud Practitioner Exam (CLF-C02) Study Guide

By Hiroko Nishimura (hirokonishimura.com / @hirokonishimura)

Instructor "Introduction to AWS for Non-Engineers" on LinkedIn Learning
Author "AWS for Non-Engineers" at Manning / AWS Community Hero

About AWS Certified Cloud Practitioner Exam (CLF-C02)

- Updated September, 2023 from CLF-C01 to CLF-C02
- Multiple choice and multiple responses, with 65 questions (15 unscored)
- Need 700 out of 1000 points to pass
- "Effectively demonstrate overall knowledge of the AWS Cloud, independent of a specific job role" with up to 6 months of exposure to AWS Cloud design, implementation, and/or operations
- Ideal for candidates from non-IT backgrounds
- Recommended AWS knowledge:
    - AWS Cloud Concepts
    - Security and compliance in the AWS Cloud
    - Core AWS services
    - Economics of AWS Cloud

Resources (paid and free) shared at the end of this guide for further studying.

Domain 1: Cloud Concepts (24%)

1.1: Define the benefits of the AWS Cloud

- Advantages to cloud computing (source):
    - Trade fixed expense for variable expense
    - Benefit from massive economies of scale
    - Stop guessing capacity
    - Increase speed and agility
    - Stop spending money running and maintaining data centers
    - Go global in minutes

1.2: Identify design principles of the AWS Cloud

- AWS Well-Architected Framework (source): key concepts, design principles, and architectural best practices for architecting and running workloads in the Cloud
    - Operational excellence: continuously improving processes and procedures of the daily running and monitoring of systems
    - Security: protecting information and systems
    - Reliability: workloads performing intended functions and recovering quickly from failures

- Performance efficiency: structured and streamlined allocation of IT and computing resources
- Cost optimization: avoid unnecessary costs
- Sustainability: minimizing environmental impacts of running cloud workloads

1.3: Understand the benefits of and strategies for migration to the AWS Cloud

- AWS Cloud Adoption Framework (source): best practices to help facilitate successful IT migrations into the Cloud, with recommendations for implementing, adapting, configuring, and maintaining effective workflows in the Cloud
    - Reduce business risk
    - Improve ESG (environmental, social, and governance) performance
    - Grow revenue
    - Increase operational efficiency
- Cloud Migration Strategies
    - Database replication
    - AWS Snow Family (Snowcone, Snowball, Snowmobile)

1.4: Understand concepts of cloud economics

- Role of fixed costs compared with variable costs ("trade fixed expenses for variable expenses" in advantages of cloud computing)
- Costs associated with on-premises environments ("stop spending money running and maintaining data centers" in advantages of cloud computing)
- Benefits of automation: less times a human touches it, the more secure and less vulnerable to intentional or unintentional issues
- Licensing strategies: Bring Your Own License (BYOL) model vs included licenses (source)
- Managed AWS services: "fully managed" by AWS (underlying infrastructure, server management, patching, operations, etc. managed by AWS) so users can shift focus away from administration of these resources to other more innovative tasks
    - Examples: Amazon RDS, Amazon Elastic Container Service (Amazon ECS), Amazon Elastic Kubernetes Service (Amazon EKS), Amazon DynamoDB

Domain 2: Security and Compliance (30%)

2.1: Understand the AWS Shared Responsibility Model

- AWS Shared Responsibility Model (source):
  - AWS is responsible for security OF the Cloud
  - Customer is responsible for security IN the Cloud
  - Responsibilities shift between AWS and customer depending on the services used
  - Both AWS and the customer are responsible for training and educating

2.2: Understand AWS Cloud security, governance, and compliance concepts

- Compliance requirements change depending on industries and geographic locations, which AWS accounts for with dozens of compliance programs (source)
- You need to encrypt data in transit (while it's moving from one place to another) and at rest (while it's residing in a location)
- Governance is process of creating and enforcing decisions within an organization
- Security in the Cloud is composed of identity and access management, detective controls, infrastructure protection, data protection, and incident response (Security Pillar of the Well-Architected Framework)
- There are many services to help you secure resources on AWS, like Amazon Inspector, AWS Security Hub, Amazon GuardDuty, AWS Shield
- AWS Artifact helps you locate on-demand compliance information relevant to your IT infrastructure
- There are many services that aid in governance and compliance like Amazon CloudWatch, AWS CloudTrail, AWS Audit Manager, and AWS Config
- Compliance requirements varies depending on the AWS service being used

2.3: Identity AWS access management capabilities

- Identity and Access Management (IAM) and IAM Identity Center provide granular control over permissions for identities, generally dealing with defining *WHO* has access to *WHAT*
- Principle of Least Privilege (source): give only the least amount of access for an entity to do perform its tasks

    - Utilize groups, users, custom policies, and manage policies in compliance with the Principle of Least Privilege
- There are multiple ways of authentication in AWS such as MFA, IAM Identity Center, cross-account IAM roles, federated users
- When you create an AWS account, that account is a root user account, which should not be utilized unless absolutely necessary (make sure to secure it with MFA); know how to secure it, and what specific tasks you need the root account for
- Access keys, password policies, credential storage (AWS Secrets Manager, AWS Systems Manager)

2.4: Identify components and resources for security

- You can utilize network access control lists (NACLs) and security groups to control the traffic coming in and out of your resources (compare NACLs vs security groups)
- There are many security services that help you protect your infrastructure, like AWS WAF, Amazon Inspector, AWS Shield, and Amazon GuardDuty
- There are third-party security products (provided by other companies) on the AWS Marketplace
- You can find AWS security-related information in AWS Knowledge Center, AWS Security Center, AWS Security Blog, etc.
- You can utilize AWS Trusted Advisor to identify security issues

Domain 3: Cloud Technology and Services (34%)

3.1: Define methods of deploying and operating in the AWS Cloud

- Connecting to AWS Cloud: Virtual Private Network (VPN), AWS Direct Connect, Public Internet
- Cloud Deployment Models: Cloud Deployment, Hybrid Deployment, On-Premises Deployment
- Deploy and manage IT infrastructure on AWS: AWS Management Console, Command Line Interface (CLI), Software Development Kits (SDKs)

3.2: Define the AWS global infrastructure

- Availability Zones (AZs): independent AWS data centers
- Regions: 2 or more Availability Zones
- Edge Locations: caches data closest to your customers
- AWS Local Zones: provides extremely low latency to end users when AWS Regions aren't close enough
- AWS Wavelength Zones: extremely low latency for applications by embedding AWS compute and storage services within 5G networks
- High Availability
- Learn more about the AWS Global Infrastructure: https://aws.amazon.com/about-aws/global-infrastructure/

3.3: Identify AWS compute services

- Amazon Elastic Compute Cloud (Amazon EC2): virtual servers with virtually limitless use cases
- Amazon Elastic Container Service (Amazon ECS): fully-managed container orchestration service
- Amazon Elastic Kubernetes Service (Amazon EKS): fully-managed container service to run Kubernetes
- Elastic Beanstalk: deploy and scale web applications by uploading code
- Elastic Load Balancing: helps applications achieve fault tolerance
- AWS Lambda: event-driven, serverless compute service to run code without provisioning or managing your own servers
- AWS Fargate: serverless compute engine for containers
- Amazon Lightsail: pre-configured websites and applications to help you get your projects up and running with minimal configurations on your end
- Autoscaling provides elasticity

3.4: Identify AWS database services

- Database Services
    - Amazon Relational Database Service (Amazon RDS): fully-managed relational database service
    - Amazon Aurora: relational database engine managed by Amazon RDS
    - Amazon DynamoDB: fully-managed NoSQL database service
    - Amazon Memory DB for Redis, Amazon ElastiCache, Amazon DynamoDB Accelerator (DAX): fully-managed in-memory database services
- Database Migration Tools:

- AWS Database Migration Service: migrate your database to AWS's database services
- AWS Schema Conversion Tool: convert your database into one of the schemas supported by AWS's managed databases

3.5: Identify AWS network services

- Amazon Virtual Private Cloud (Amazon VPC): isolated virtual network on AWS Cloud for your IT infrastructure
- Amazon CloudFront: Content Delivery Network to help websites and applications load faster
- AWS Global Accelerator: allows customer access requests to take the high-speed AWS global network towards its destination instead of spending time on slower public networks
- Amazon Route 53: DNS service

3.6: Identify AWS storage services

- Amazon Simple Storage Service (Amazon S3): object storage service
    - Understand lifecycle policies and storage classes (tendency: less you need to access, less durable, longer retrieval time = cheaper)
- Amazon Elastic Block Store (Amazon EBS): block storage service that acts like unformatted block devices you can mount to your Amazon EC2 instances
- AWS Storage Gateway: connects on-premises storage with AWS's cloud storage
- AWS Backup: backup service for all your AWS services and hybrid environments
- Three types of storage: object storage, file storage, block storage

3.7: Identify AWS AI/ML services and analytics services

- AI/ML (Artificial Intelligence/Machine Learning) services
    - Amazon SageMaker: build, train, and deploy machine learning models
    - Amazon Lex: create conversational AI support chatbots (Amazon aLEXa, anyone?)
    - Amazon Kendra: utilize machine learning to find answers quickly with intelligent search
- Data Analytics Services
    - Amazon Athena: analyze data directly in Amazon S3 using standard SQL
    - AWS Glue: integrate data from diverse data sources and prepare them for analytics

- Amazon Kinesis: helps collect, process, and analyze data like audio and video in real-time to derive insights
- Amazon QuickSight: business intelligence service that helps you quickly build visualizations and perform ad hoc analysis on your data with machine learning

3.8: Identify services from other in-scope AWS service categories

- Application integration services: Amazon EventBridge, Amazon Simple Notification Service (Amazon SNS), Amazon Simple Queue Service (Amazon SQS)
- Business application services: Amazon Connect, Amazon Simple Email Service (Amazon SES)
- Customer engagement services: AWS Activate for Startups, AWS IQ, AWS Managed Services (AMS), AWS Support
- Developer tool services and capabilities: AWS AppConfig, AWS Cloud9, AWS CloudShell, AWS CodeArtifact, AWS CodeBuild, AWS CodeCommit, AWS CodeDeploy, AWS CodePipeline, AWS CodeStar, AWS X-Ray
- End user computing services: Amazon AppStream 2.0, Amazon WorkSpaces, Amazon WorkSpaces Web
- Frontend web and mobile services: AWS Amplify, AWS AppSync
- IoT services: AWS IoT Core, AWS IoT Greengrass

Domain 4: Billing, Pricing, and Support (12%)

4.1: Compare AWS pricing models

- Fundamental ways AWS charges:
  - Compute
  - Storage
  - Data transfer
- Learn more about AWS Pricing:
  - AWS Pricing Page: https://aws.amazon.com/pricing
  - Whitepaper: "How AWS Pricing Works"
- Compute Resource Pricing Models
  - Pay as you go (on-demand instances)
  - Save when you commit (reserved instances)
  - Save when you commit 2 (savings plans)
  - Take advantage of unutilized AWS capacity (spot instances)

- Save by using your own licenses and utilize dedicated hardware (dedicated hosts)
- Run Amazon EC2 instances on dedicated hardware (dedicated instances)
- Reserve compute capacity in advance (capacity reservations)
- Pay less by using more

4.2: Understand resources for billing, budget, and cost management

- Billing, budget, and cost management resources: AWS Budgets, AWS Cost Explorer, AWS Billing Conductor, AWS Pricing Calculator
- Tools to help larger organizations manage multiple AWS accounts and their billing: Consolidated Billing, AWS Organizations, AWS cost allocation tags
    - Generate billing reports with AWS Cost and Usage Report (AWS CUR) by utilizing AWS cost allocation tags effectively
    - AWS Cost Management Resources: https://aws.amazon.com/aws-cost-management

4.3: Identify AWS technical resources and AWS Support options

- AWS Support Plans (source)
    - Basic Support Plan (free): for testing out/experimenting with AWS; great for AWS Free Tier
    - Developer Support Plan (starts at $29): for testing/experimenting with AWS
    - Business Support Plan (starts at $100): minimum recommendation for production workloads in AWS
    - Enterprise On-Ramp Support Plan (starts at $5,500): for production and/or business critical workloads in AWS
    - Enterprise Support Plan (starts at ($15,000): business and/or mission critical workloads in AWS… and A LOT of it
- Manage and monitor environments for cost optimization: Trusted Advisor, AWS Health Dashboard, AWS Health API
- Official AWS resources
    - AWS Whitepapers: https://aws.amazon.com/whitepapers
    - AWS Blog: https://aws.amazon.com/blogs
    - AWS Documentation: https://docs.aws.amazon.com
    - AWS re:Post: https://repost.aws
    - AWS Knowledge Center: https://repost.aws/knowledge-center
    - AWS Partner Networks

- AWS Marketplace: https://aws.amazon.com/marketplace
- AWS Support Plans
- AWS Trust and Safety Team
- AWS Support Center: https://aws.amazon.com/contact-us
- AWS Support Teams: AWS Professional Services, AWS Solutions Architects

Resources

Remember, this is just a study guide. Make sure you utilize many resources available to you to ace the exam! Good luck!

Official AWS Resources

- AWS Cloud Practitioner Exam Official Exam Guide: https://aws.amazon.com/certification/certified-cloud-practitioner/
- Sign up for the exam: https://www.aws.training/certification/
- Official courses, gamified study materials, etc: https://skillbuilder.aws/
- Official practice exam for AWS CLF-C02 exam: https://explore.skillbuilder.aws/learn/course/external/view/elearning/14637/aws-certified-cloud-practitioner-official-practice-exam-clf-c02-english
- Official forum: https://repost.aws/
- Collection of official AWS resources, career training programs, scholarships, and more: https://hiroko.io/aws/

Un-Official Resources

- Introduction to AWS for Non-Engineers - Video Courses (LinkedIn Learning): https://introtoaws.com
- AWS for Non-Engineers - Book (Manning Publications): https://awsfornonengineers.com
- Learn AWS for free (freeCodeCamp): https://www.freecodecamp.org/news/tag/aws/

Thanks for downloading the e*xtremely unofficial AWS Certified Cloud Practitioner study guide*! If you need to find me (Hiroko Nishimura), you can find my various contact information/social media profiles at hirokonishimura.com, and my AWS content at aws.hiroko.io!
Was this helpful? Leave me a tip for some coffee if you're so inclined: ko-fi.com/hiroko!