AWS Certified Cloud Practitioner (CLF-C02), Skill Labs

Course Specifications

Course Number: ACI76-020SL_rev1.0
Lab Length: Approximately 12 hours

Introduction to AWS Cloud (CLF-C02)

Introduction
Objective

Welcome to the Introduction to the AWS Cloud practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Amazon Web Services (AWS) offers a comprehensive suite of cloud computing services designed to provide scalable, reliable, and cost-effective solutions for businesses. These services include compute capabilities through Amazon Elastic Compute Cloud (EC2) for virtual servers as well as storage options like Amazon S3 for object storage and Amazon Elastic Block Store (EBS) for block storage. Networking services like Amazon Virtual Private Cloud (VPC) enable users to create isolated networks within the AWS cloud, while security services like AWS Identity and Access Management (IAM) help manage user access and permissions.

In this lab, you will discover the strength of the global infrastructure that AWS provides, research cloud computing essential characteristics, and how AWS meets these essential characteristics, and explore the AWS Pricing Calculator for an EC2 instance with affixed EBS volume.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Global Infrastructure
- Exercise 2 – Cloud Computing Essential Characteristics
- Exercise 3 – AWS Pricing Calculator

After completing this module, you should be able to:

- Discover AWS regions and Availability Zones (AZs).
- Discover AWS edge locations.
- Review NIST documentation.
- View the Amazon EC2 Service Level Agreement (SLA).
- Utilize the AWS pricing calculator.

Exam Objectives

The following exam objectives are covered in this module:

1.1 Define the benefits of the AWS Cloud

- Skills – Understanding the economies of scale (for example, cost savings)
- Skills – Understanding the benefits of global infrastructure (for example, speed of deployment, global reach)
- Skills – Understanding the advantages of high availability, elasticity, and agility

Identifying AWS Services (CLF-C02)

Introduction
Objective

Welcome to the Identifying AWS Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Amazon Web Services (AWS) offers a comprehensive suite of cloud computing services designed to provide scalable, reliable, and cost-effective solutions for business. These services include computing power with Amazon Elastic Compute Cloud (EC2), storage options like Amazon Simple Storage Service (S3), and databases such as Amazon Relational Database Service (RDS) and Amazon DynamoDB. AWS also provides networking services, content delivery, machine learning, and analytics tools, among others.

To manage and automate infrastructure deployment, AWS offers AWS CloudFormation—a service that allows users to define their infrastructure in code using templates, enabling consistent and repeatable provisioning of resources.

In this module, you will conduct a manual configuration of a simple public webserver deployment and then deploy the same configuration with CloudFormation.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Create a Public Website Manually
- Exercise 2 – Create a Public Website Using CloudFormation

After completing this module, you should be able to:

- Create a Virtual Private Cloud (VPC) and public subnet.
- Create an Internet gateway and route table.
- Create a security group.
- Launch an Elastic Compute Cloud (E2) instance web server.
- Create and launch a stack with CloudFormation.

Exam Objectives

The following exam objectives are covered in this module:

1.4 Understand concepts of cloud economics

- Skills – Understanding the role of fixed costs compared with variable costs
- Skills – Understanding the concept of right sizing
- Skills – Identifying benefits of automation (for example, provisioning and configuration management with AWS CloudFormation)

AWS Monitoring and Logging Services (CLF-C02)

Introduction
Objective

Welcome to the AWS Monitoring and Logging Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

In this module, you will explore Amazon Web Services (AWS) CloudWatch, AWS Shield, and AWS Artifact.

AWS CloudWatch is a management and monitoring service providing real-time insight into AWS resources, enabling users to collect and track metrics and logs, set alarms, and react to environmental changes in AWS.

AWS Shield is a Distributed Denial-of-Service (DDoS) protection service managed by AWS, blocking harmful and malicious traffic and ensuring high availability and security. It offers advanced threat intelligence and detection mechanisms to mitigate DDoS attacks.

AWS Artifact is a portal that provides on-demand access to AWS compliance reports, reducing the complexity and time involved in ensuring adherence to regulatory requirements. It offers a central repository for documentation, including compliance reports and agreements, helping organizations navigate and demonstrate their compliance with various standards and regulations.

Together, CloudWatch, Shield, and Artifact contribute to the overall robustness, security, and compliance of AWS-based applications and services.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Create an EC2 Instance and Supporting Infrastructure
- Exercise 2 – Use AWS CloudWatch
- Exercise 3 – Explore AWS Shield
- Exercise 4 – Use AWS Artifact

After completing this module, you should be able to:

- Create a Virtual Private Cloud (VPC).
- Create an Elastic Compute Cloud (EC2) instance.
- View available CloudWatch metrics.
- Discover AWS Shield pricing and global activity.
- Download an AWS Artifact report.

Exam Objectives

The following exam objectives are covered in this module:

2.2 Understand AWS Cloud security, governance, and compliance concepts

- Skills – Identifying where to find AWS compliance information (for example, AWS Artifact)

- Skills – Describing how customers secure resources on AWS (for example, Amazon Inspector, AWS Security Hub, Amazon GuardDuty, AWS Shield)
- Skills – Recognizing services that aid in governance and compliance (for example, monitoring with Amazon CloudWatch; auditing with AWS CloudTrail, AWS Audit Manager, and AWS Config; reporting with access reports)
- Skills – Recognizing compliance requirements that vary among AWS services

AWS Identity and Access Management (CLF-C02)

Introduction
Objective

Welcome to the AWS Identity and Access Management practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Password policies within AWS Identity and Access Management (IAM) establish requirements for password attributes such as complexity, expiration, and improving account security. The AWS Secrets Manager provides a secure vault for storing and managing sensitive credentials such as database passwords and API keys, ensuring their protection and facilitating automated rotation. API keys serve as authentication tokens for secure communication between applications and AWS services. The AWS Systems Manager Patch policies automate the application of security patches across EC2 instances, enhancing system integrity, and mitigating vulnerabilities. By implementing measures such as these, organizations can strengthen their AWS environments and comply with security best practices.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Password Policy
- Exercise 2 – API Key
- Exercise 3 – Patch Policy

After completing this module, you should be able to:

- Create a custom password policy.
- Create an API key.
- Create a custom patch policy.

Exam Objectives

The following exam objectives are covered in this module:

2.3 Identify AWS access management capabilities

- Knowledge – Identity and access management (for example, AWS IAM)
- Skills – Understanding access keys, password policies, and credential storage (for example, AWS Secrets Manager, AWS Systems Manager)
- Skills – Defining groups, users, custom policies, and managed policies in compliance with the principle of least privilege

AWS Security Services (CLF-C02)

Introduction
Objective

Welcome to the AWS Security Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

AWS security services are designed to protect data, applications, and infrastructure within the AWS cloud. They offer comprehensive solutions for identity and access management, network security, encryption, threat detection, and compliance management. Some important implementation concepts are Security Groups and Network Access Control Lists (NACLs). These serve as fundamental components for controlling network traffic within Amazon Virtual Private Cloud (VPC) environments. Specifically, security groups acts as virtual firewalls at the instance level, allowing or denying traffic based on port, protocol, and IP address rules. NACLs operate at the subnet level, providing additional control over inbound and outbound traffic with rules based on IP addresses and port ranges.

AWS Marketplace complements these security measures by offering a vast selection of third-party security solutions and services, empowering users to enhance their cloud security posture through customizable and specialized offerings that address specific security needs and compliance requirements.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Security Groups and Network ACLs
- Exercise 2 – AWS Marketplace

After completing this module, you should be able to:

- Establish cloud infrastructure.
- Use security group to block Internet Control Message Protocol (ICMP).
- Use NACL to block Internet Control Message Protocol (ICMP).
- Search for Center for Internet Security (CIS).

Exam Objectives

The following exam objectives are covered in this module:

2.4 Identify components and resources for security

- Knowledge – Security capabilities that AWS provides.
- Skills – Describing AWS security features and services (for example, security groups, NACLs, AWS WAF).
- Skills – Understanding that third-party security products are available from AWS Marketplace.

AWS Deployment Models (CLF-C02)

Introduction
Objective

Welcome to the AWS Deployment Models practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

AWS offers various deployment models and connectivity options to meet business needs. Through the AWS Management Console, users can provision and manage resources in the cloud by accessing a wide range of services. Furthermore, AWS provides multiple cloud service and deployment models, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) which allows users to select the level of control and flexibility they require. Additionally, connectivity options such as Virtual Private Cloud (VPC), Internet Gateway (IGW), and Direct Connect offer secure and scalable solutions for connecting on-premises infrastructure to AWS resources facilitating seamless integration in hybrid cloud deployments.

In this module, you will explore AWS deployment models.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – AWS Management Console
- Exercise 2 – Cloud Service and Deployment Models
- Exercise 3 – Connectivity Options

After completing this module, you should be able to:

- Discover the console.
- Explore the types of cloud computing.
- Build a VPC.
- Create an EC2 instance.
- Connect via RDP.

Exam Objectives

The following exam objectives are covered in this module:

3.1 Define methods of deploying and operating in the AWS cloud

- Knowledge – Different ways of provisioning and operating in the AWS Cloud
- Knowledge – Different ways to access AWS services
- Knowledge – Types of cloud deployment models
- Knowledge – Connectivity options
- Skills – Deciding between options such as programmatic access (for example, APIs, SDKs, CLI), the AWS management console, and Infrastructure as Code (IaC)
- Skills – Identifying different deployment models (for example, cloud, hybrid, on-premises)

- Skills – Identifying connectivity options (for example, AWS VPN, AWS direct connect, public internet)

AWS Global Infrastructure (CLF-C02)

Introduction
Objective

Welcome to the AWS Global Infrastructure practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

AWS global infrastructure consists of multiple Availability Zones (AZs) and Edge locations strategically distributed around the globe. AZs are isolated locations within AWS regions that are physically and logically separate from one another, providing redundancy and fault tolerance. Edge locations are points of presence (POPs) that reside in major cities worldwide. They are in place to facilitate the caching and delivery of content by the Amazon CloudFront content delivery network (CDN) at very low latency. Together, AZs and Edge locations enable AWS to offer highly available, scalable, and performant services to customers globally and ensuring reliable and responsive cloud computing experiences.

In this module, you will learn about the AWS global infrastructure.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Availability Zones and Edge Locations
- Exercise 2 – Multi-AZ Deployment for High Availability
- Exercise 3 – Deploying a Multi-AZ Database

After completing this module, you should be able to:

- Discover AWS AZ and edge documentation.
- Discover Multi-AZ documentation.
- Create a Virtual Private Cloud (VPC) and Database (DB).
- Deploy a DB to multiple AZs.

Exam Objectives

The following exam objectives are covered in this module:

3.2 Define the AWS global infrastructure

- Skills – Describing relationships among Regions, AZs, and edge locations
- Skills – Describing how to achieve high availability by using multiple AZs
- Skills – Recognizing that AZs do not share single points of failure
- Skills – Describing when to use multiple regions (for example, disaster recovery, business continuity, low latency for end users, data sovereignty)
- Skills – Describing at a high level the benefits of edge locations (for example, Amazon CloudFront, AWS Global Accelerator)

AWS Computing Services (CLF-C02)

Introduction
Objective

Welcome to the AWS Computing Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Amazon Web Services (AWS) offers a comprehensive suite of computing services designed to meet diverse workload requirements efficiently and cost-effectively. For example, Amazon Elastic Compute Cloud (EC2) provides a wide range of instance types tailored to specific use cases, providing flexibility in selecting the right balance of compute, memory, and storage resources. With AWS Auto Scaling users can dynamically adjust the number of EC2 instances in response to changing demand, ensuring optimal performance and cost optimization. Additionally, AWS Load Balancing services distribute incoming traffic across multiple EC2 instances, enhancing fault tolerance and scalability while improving the overall availability of applications and services.

In this module, you will explore EC2 instance options and the advantages of auto scaling and load balancing.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – EC2 Instances
- Exercise 2 – Load Balancing

After completing this module, you should be able to:

- Compare instance types.
- Explain auto scaling benefits.
- Create a Virtual Private Cloud (VPC) and web servers.
- Configure load balancing.
- Test load balancing.

Exam Objectives

The following exam objectives are covered in this module:

3.3 Identify AWS compute services

- Skills – Recognizing the appropriate use of different EC2 instance types (for example, compute optimized, storage optimized)
- Skills – Recognizing that auto scaling provides elasticity
- Skills – Identifying the purposes of load balancers

AWS Database Services (CLF-C02)

Introduction

Objective

Welcome to the AWS Database Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

AWS provides a range of database services. These services include relational databases like Amazon Relational Database Service (RDS), which supports popular database engines such as MySQL, PostgreSQL, and Structured Query Language (SQL) Server as well as non relational databases like Amazon DynamoDB, a fully managed NoSQL database. Additionally, AWS provides database migration tools and services to facilitate the migration of on-premises databases to the AWS cloud.

In this module, you will explore the various database types and migration options that AWS offers.

Overview

Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – AWS Databases
- Exercise 2 – MSSQL Server Database
- Exercise 3 – Database Migration

After completing this module, you should be able to:

- Compare database types.
- Create Microsoft SQL (MSSQL) server database.
- Install SQL Server Management Studio (SSMS).
- Connect to the MSSQL database.
- Explore database migration options.
- Discover database schema conversion.

Exam Objectives

The following exam objectives are covered in this module:

3.4 Identify AWS database services.

- Skills – Identifying relational databases (for example, Amazon RDS, Amazon Aurora).
- Skills – Identifying NoSQL databases (for example, DynamoDB).
- Skills – Identifying database migration tools (for example, AWS Database Migration Service [AWS DMS], AWS Schema Conversion Tool [AWS SCT]).

AWS Networking Services (CLF-C02)

Introduction
Objective

Welcome to the AWS Networking Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Amazon Virtual Private Cloud (VPC) is a networking service that provisions a logically isolated part of the AWS Cloud where users can launch their own AWS resources. VPC provides control over IP addressing, subnets, routing tables, and network gateways. Additionally, AWS Route 53 is a Domain Name System (DNS) service used to route end users to Internet applications. Together, VPC and Route 53 empower users to build highly secure, scalable, and reliable networking architectures in the AWS Cloud.

In this module, you will explore networking services such as VPC and Route 53.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Route 53
- Exercise 2 – VPC Infrastructure

After completing this module, you should be able to:

- Explore Route 53 documentation.
- Create a VPC and subnet.
- Create an Internet gateway and route table.
- Create a Security group and Elastic Compute Cloud (EC2) instance.
- Connect to EC2 instance via Secure Shell (SSH).

Exam Objectives

The following exam objectives are covered in this module:

3.5 Identify AWS network services

- Skills – Identifying the components of a VPC (for example, subnets, gateways)
- Skills – Understanding security in a VPC (for example, network ACLs, security groups)
- Skills – Understand the purpose of Amazon Route 53

AWS Storage Services (CLF-C02)

Introduction
Objective

Welcome to the AWS Storage Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Amazon Elastic Block Store (EBS) and Amazon Simple Storage Service (S3) are two key storage services offered by Amazon Web Services (AWS). EBS provides block-level storage volumes attached to Elastic Compute Cloud (EC2) instances, and S3 offers object storage with virtually unlimited scalability.

In this module, you will explore the AWS Storage Services, EBS, and S3.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Elastic Block Store (EBS)
- Exercise 2 – Simple Storage Service (S3)

After completing this module, you should be able to:

- Create a Virtual Private Cloud (VPC).
- Create an EC2 instance.
- Add an EBS volume to an EC2 instance
- Discover storage class documentation.
- Create an S3 bucket.
- Create an S3 lifecycle rule.

Exam Objectives

The following exam objectives are covered in this module:

3.6 Identify AWS Storage Services

- Skills – Identifying the uses for object storage
- Skills – Recognizing the differences in Amazon S3 storage classes
- Skills – Identifying block storage solutions (for example, Amazon EBS, instance store)
- Skills – Understanding use cases for lifecycle policies

AWS Billing and Support Services (CLF-C02)

Introduction
Objective

Welcome to the AWS Billing and Support Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Understanding Amazon Web Services (AWS) billing is crucial for optimizing costs and ensuring cost-effective usage of AWS services. In this module, you will discover the various pricing models offered by AWS, such as on-demand pricing, reserved instances, and spot instances, and learn how to estimate costs using the AWS Pricing Calculator. Additionally, you will discover the different support plans available, ranging from basic-level to enterprise-level support, and explore the features and benefits of each plan.

Overview
Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 – Pricing Models
- Exercise 2 – Pricing Calculator
- Exercise 3 – AWS Support

After completing this module, you should be able to:

- Locate purchasing options.
- Discuss data transfer charges.
- Create an estimate with the Pricing Calculator.
- Use re:Post and Knowledge Center.
- Explore support levels.

Exam Objectives

The following exam objectives are covered in this module:

4.1 Compare AWS pricing models

- Skills – Identifying and comparing when to use various compute purchasing options
- Skills – Understanding incoming data transfer costs and outgoing data transfer costs (for example, from one region to another region, within the same region)

4.2 Understand resources for billing, budget, and cost management

- Skills – Understanding the appropriate uses and capabilities of AWS Pricing Calculator

4.3 Identify AWS technical resources and AWS Support options

- Skills – Identifying and locating AWS technical resources (for example, AWS Prescriptive Guidance, AWS Knowledge Center, AWS re:Post)
- Skills – Identifying AWS Support options for AWS customers (for example, customer service and communities, AWS Developer Support, AWS Business Support, AWS Enterprise, AWS Enterprise On-Ramp Support, AWS Enterprise Support