Introduction to Amazon Web Services

Module 1

Units

OVERVIEW : MODULE 01

Introduction to Amazon Web Services

Learning Outcomes

- Define Amazon Web Services (AWS) and its role in the cloud computing industry
- Understand the global infrastructure of AWS, including regions and availability zones
- Recognize fundamental concepts that underpin AWS Cloud
- Articulate the importance of AWS IAM in managing secure access to AWS resources
- Explain essential IAM concepts, such as users, groups, roles, policies, and permissions
- Understand the purpose and advantages of IAM groups for effective user management
- Grasp the concept of IAM roles and their application in delegating permissions
- Apply IAM knowledge to enhance security and access control within the AWS service
- Apply theoretical knowledge gained in the IAM module through practical, hands-on lab exercises.
- Develop confidence in utilizing IAM for secure access control within AWS

Lesson Learning Outcomes

- ✓ Understand the concept of cloud computing
- ✓ Define key characteristics of cloud computing, such as on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service
- ✓ Explain an overview of Amazon Web Services (AWS) and its role in providing cloud computing services
- ✓ Understand about the global infrastructure of AWS, including the concept of regions and availability zones

LESSON OVERVIEW

MODULE 1 INTRODUCTION TO AMAZON WEB SERVICES

Lesson 1.1 Introduction to AWS Cloud

- Cloud Definition
- What is AWS Cloud
- AWS Global Infrastructure

1.1

Introduction to AWS Cloud

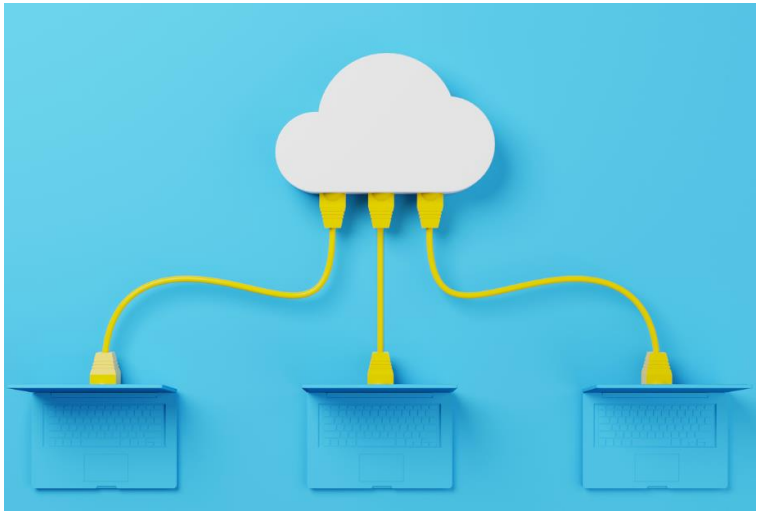
Amazon Web Services offers a broad set of global cloud-based products including computing, storage, databases, analytics, networking, mobile, developer tools, management tools, IoT, security, and enterprise applications: on-demand, available in seconds, with pay-as-you-go pricing

Introduction to AWS Cloud

Definition of Cloud Computing

According to Forrester, Cloud Computing is:

"A form of standardized IT-based capabilities, such as Internet-based services, software, or IT infrastructure offered by a service provider that is accessible via Internet Protocols from any computer, is always available and scales automatically to adjust to demand, is pay-per-use, has Web- or programmatic-based control interfaces, and enable full customer self-service."

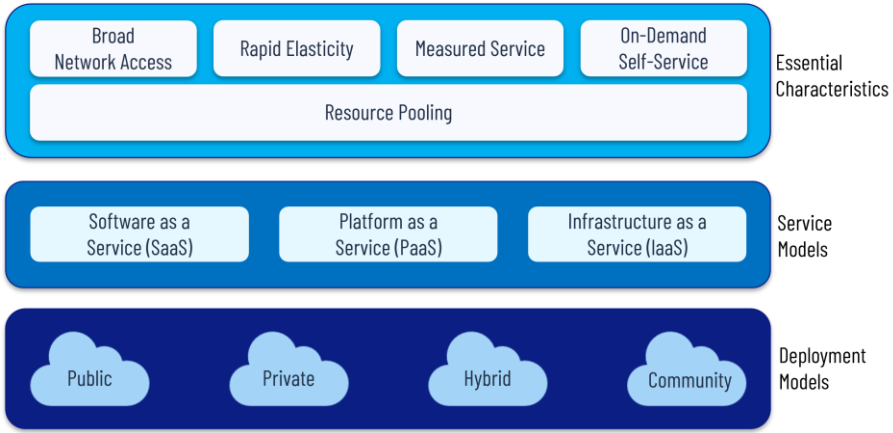


Introduction to AWS Cloud

Definition of Cloud Computing

National Institute of Standards and Technology (NIST)

A model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model comprises five essential characteristics, three service, and four deployment models.



Introduction to AWS Cloud

What is AWS Cloud

Amazon Web Services, Inc. is a subsidiary of Amazon that provides on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis. These cloud computing web services provide distributed computing processing capacity and software tools via AWS server farms.

Introduction to AWS Cloud

AWS Global Infrastructure

Introduction to AWS Cloud

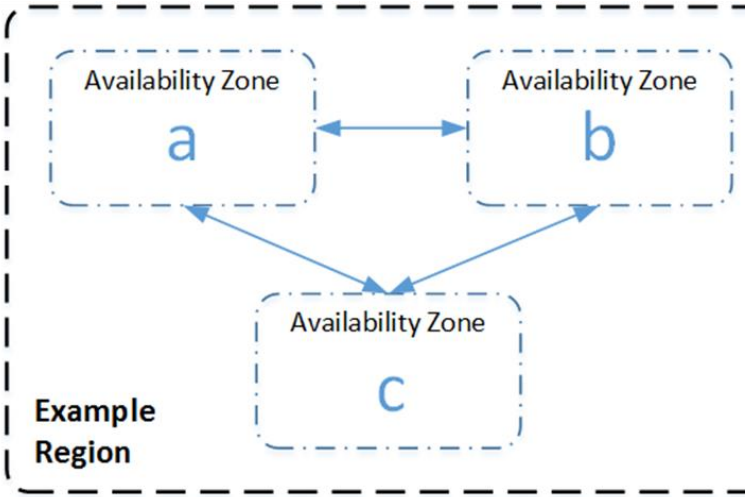
AWS Global Infrastructure

What is AWS Availably Zone?

Think Availably Zone as a data center. An Availability Zone may have multiple data centers but because they are close together, they count as 1 Availability Zone.

What is the AWS Region?

The region is a separate geographic area. Each Region consists 2 or More Availability Zones.

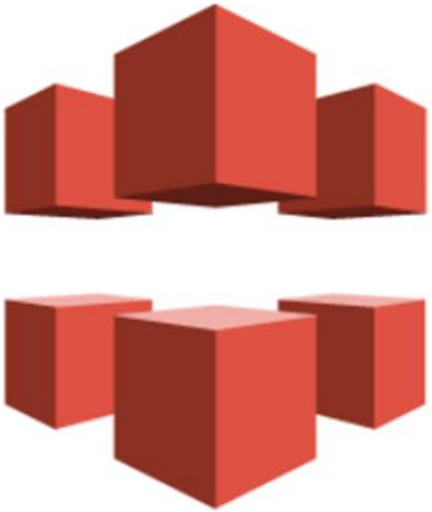


Introduction to AWS Cloud

AWS Global Infrastructure

Edge Locations

Edge Locations are part of AWS's CDN service, Amazon CloudFront. CloudFront uses a network of edge locations to cache and deliver content to users with lower latency by serving content from the edge location closest to the user.



Introduction to AWS Cloud

SUMMARY

- ✓ Key characteristics of cloud computing: on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service
- ✓ Understanding the concept of cloud computing and its implications
- ✓ Overview of Amazon Web Services (AWS) and its role in the cloud computing industry
- ✓ Exploration of various AWS services, covering computing power, storage, databases, machine learning, analytics, and more
- ✓ Introduction to AWS regions and availability zones
- ✓ Explanation of AWS's distributed data center model for reliability, scalability, and fault tolerance

Introduction to AWS Cloud

Resources

- https://www.researchgate.net/figure/NIST-cloud-computing-definition-Based-on-NIST-working-definition-of-cloud-computing-v14_fig1_295090956
- https://docs.aws.amazon.com/whitepapers/latest/aws-overview/introduction.html
- https://aws.amazon.com/about-aws/global-infrastructure/

Lesson Learning Outcomes

- ✓ Articulate the role of AWS IAM in managing access to AWS resources
- ✓ Explain key IAM concepts, including users, groups, roles, policies, and permissions
- ✓ Identify and describe security features offered by IAM, such as MFA and identity federation
- ✓ Understand the purpose and benefits of IAM groups for user management
- ✓ Grasp the concept of IAM roles and their application in permission delegation
- ✓ Create IAM policies and associate them with users, groups, and roles
- ✓ Apply IAM knowledge to enhance security and access control within AWS services

LESSON OVERVIEW

MODULE 1 INTRODUCTION TO AMAZON WEB SERVICES

Lesson 1.2 AWS Identity Access Management (IAM)

- IAM Overview
- IAM Features
- IAM User, Group and Role
- IAM Policy and Permission

1.2

AWS Identity Access Management (IAM)

AWS Identity and Access Management (IAM) is a web service provided by Amazon Web Services (AWS) that allows you to manage access to AWS resources securely.

AWS Identity Access Management (IAM)

IAM Overview

AWS IAM

IAM allows you to manage users and their level of access to the AWS Console. It is important to understand IAM and how it works. Both for the exam and for administrating a company's AWS account in real life.

AWS Identity Access Management (IAM)

IAM Features

AWS IAM offers the following features:

- User Management
- Group Management
- Role Management
- Policy Management
- Granular Permissions
- Access Key Rotation
- Multi-Factor Authentication (MFA)
- Identity Federation

AWS Identity Access Management (IAM)

IAM User, Group, Role and Policies

IAM Users

An Individual who has set of permissions is an ***IAM User***

Users have credentials to make API calls in order to communicate with AWS resources

IAM Groups

A Collection of IAM users is called as ***IAM Groups***

All the IAM users in a group can access the permissions assigned to that group

IAM Policies

IAM Policies Specifies those permissions that you want to acquire

IAM Roles

IAM Roles define set of permissions for making AWS service Requests

IAM Roles are basically assigned to the applications

AWS Identity Access Management (IAM)

IAM Policy and Permission

IAM policies in AWS are JSON documents that define permissions. These policies are attached to IAM identities (users, groups, or roles).

Policy Structure:

IAM policies have a JSON structure. A policy consists of one or more statements. Each statement has an "Effect" (Allow or Deny), "Action" (the AWS API actions), and "Resource" (the AWS resources affected by the actions).

AWS Identity Access Management (IAM)

IAM Policy and Permission

AdministratorAccess

Provides full access to AWS services and resources.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "*",
            "Resource": "*"
        }
    ]
}
```

AWS Identity Access Management (IAM)

IAM Policy and Permission

AmazonS3ReadOnlyAccess

Provides read only access to all buckets via the AWS Management Console.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "s3:Get*",
                "s3:List*",
                "s3:Describe*",
                "s3-object-lambda:Get*",
                "s3-object-lambda:List*"
            ],
            "Resource": "*"
        }
    ]
}
```

AWS Identity Access Management (IAM)

SUMMARY

- ✓ Recognizing IAM as AWS's identity management service for secure access control to AWS services and resources
- ✓ Key Concepts: fundamental IAM concepts, including users, groups, roles, policies, and permissions
- ✓ Understanding IAM's security features, such as multi-factor authentication (MFA) and identity federation
- ✓ Exploring IAM's integration with other AWS services and its role in enhancing security practices
- ✓ Understanding the lifecycle of IAM users, from creation to deletion
- ✓ Comprehending the advantages and purpose of IAM groups for effective user management
- ✓ Gaining hands-on experience in crafting IAM policies to define granular permissions
- ✓ Understanding how permissions are associated with IAM users, groups, and roles

AWS Identity Access Management (IAM)

Resources

- https://aws.amazon.com/iam/
- https://docs.aws.amazon.com/IAM/latest/UserGuide/introduction.html

1.3

Hands-On Lab

Introduction to AWS Identity and Access Management (IAM)