# STUDY OF DOCKER

## AIM:

To study about the Docker in general, its running on AWS, its working and uses.

## INTRODUCTION:

Docker is a software platform that allows you to build, test, and deploy applications quickly. Docker packages software into standardized units called containers that have everything the software needs to run including libraries, system tools, code, and runtime. Using Docker, you can quickly deploy and scale applications into any environment and know the code will run.

Running Docker on AWS provides developers and admins a highly reliable, low-cost way to build, ship, and run distributed applications at any scale. Docker collaborates with AWS to help developers speed delivery of modern apps to the cloud. This collaboration helps developers use Docker Compose and Docker Desktop to leverage the same local workflow they use today to seamlessly deploy apps on Amazon ECS and AWS Fargate.

## How Docker Works?

Docker works by providing a standard way to run your code. Docker is an operating system for containers. Similar to how a virtual machine virtualizes (removes the need to directly manage) server hardware, containers virtualize the operating system of a server. Docker is installed on each server and provides simple commands you can use to build, start, or stop containers.

AWS services such as AWS Fargate, Amazon ECS, Amazon EKS, and AWS Batch make it easy to run and manage Docker containers at scale.

## Why Use Docker?

Using Docker lets you ship code faster, standardize application operations, seamlessly move code, and save money by improving resource utilization. With Docker, you get a single object that can reliably run anywhere. Docker's simple and straightforward syntax gives you full control. Wide adoption means there's a robust ecosystem of tools and off-the-shelf applications that are ready to use with Docker.

## Ship more software faster:

Docker users on average ship software 7x more frequently than non-Docker users. Docker enables you to ship isolated services as often as needed.

## Standardize operations:

Small containerized applications make it easy to deploy, identify issues, and roll back for remediation.

## Seamlessly move:

Docker-based applications can be seamlessly moved from local development machines to production deployments on AWS.

## Save money:

Docker containers make it easier to run more code on each server, improving the utilization and saving you money.

## When to use Docker?

Docker containers can be used as a core building block creating modern applications and platforms. Docker makes it easy to build and run distributed microservices architectures, deploy the code with standardized continuous integration and delivery pipelines, build highly-scalable data processing systems, and create fully-managed platforms for the developers. The recent collaboration between AWS and Docker makes it easier for you to deploy Docker Compose artifacts to Amazon ECS and AWS Fargate.

## Microservices:

Build and scale distributed application architectures by taking advantage of standardized code deployments using Docker containers.

## Continuous integration & delivery:

Accelerate application delivery by standardizing environments and removing conflicts between language stacks and versions.

## Data processing:

Provide big data processing as a service. Package data and analytics packages into portable containers that can be executed by non-technical users.

## Containers as a service:

Build and ship distributed applications with content and infrastructure that is IT-managed and secured.

## Run Docker on AWS

AWS provides support for both Docker open-source and commercial solutions. There are a number of ways to run containers on AWS, including Amazon Elastic Container Service (ECS) is a highly scalable, high performance container management service. Customers can easily deploy their containerized applications from their local Docker environment straight to Amazon ECS. AWS Fargate is a technology for Amazon ECS that lets you run containers in production without deploying or managing infrastructure. Amazon Elastic Container Service for Kubernetes (EKS) makes it easy for you to run Kubernetes on AWS. AWS Fargate is technology for Amazon ECS that lets you run containers without provisioning or managing servers. Amazon Elastic Container Registry (ECR) is a highly available and secure private container repository that makes it easy to store and manage the Docker container images, encrypting and compressing images at rest so they are fast to pull and secure. AWS Batch lets you run highly-scalable batch processing workloads using Docker containers.

## Amazon ECS

Amazon ECS is a highly scalable, high-performance container orchestration service to run Docker containers on the AWS cloud.

## AWS Fargate

AWS Fargate is a technology for Amazon ECS that lets you run Docker containers without deploying or managing infrastructure.

## Amazon EKS

Amazon EKS makes it easy to run Kubernetes on AWS without needing to install and operate Kubernetes masters.

## Amazon ECR

Amazon ECR is a highly available and secure private container repository that makes it easy to store and manage Docker container images.

## AWS Batch

AWS Batch enables developers, scientists, and engineers to easily and efficiently run batch computing jobs using containers on AWS.

## AWS Copilot

AWS Copilot is a command line interface that enables customers to launch and easily manage containerized applications on AWS.

## Get started using Docker

The steps below will get you started using Docker on AWS.

## Sign up for an AWS Account

Instantly get access to the AWS Free Tier.

## Deploy Docker Containers in 10 minutes

» **Using Docker Desktop -** Deploy Docker Containers to Amazon ECS in this simple tutorial using Docker CLI.

» **Using AWS Console -** Deploy Docker Containers to Amazon ECS in this simple tutorial using the AWS Console.

## Start building with Docker

**» Docker Basics**

Docker is a technology that provides the tools for you to build, run, test, and deploy distributed applications that are based on Linux containers. Amazon ECS uses Docker images in task definitions to launch containers as part of tasks in the clusters.AWS and Docker have collaborated to make a simplified developer experience that enables you to deploy and manage containers on Amazon ECS directly using Docker tools. Docker provides a walkthrough on deploying containers on Amazon ECS.

## » Docker/ECS integration

The Docker Compose CLI enables developers to use native Docker commands to run applications in Amazon EC2 Container Service (ECS) when building cloud-native applications.

The integration between Docker and Amazon ECS allows developers to use the Docker Compose CLI to:

* + Set up an AWS context in one Docker command, allowing you to switch from a local context to a cloud context and run applications quickly and easily
  + Simplify multi-container application development on Amazon ECS using Compose files.

## RESULT:

Thus, the study about the Docker in general, its running on AWS, its working and uses has been completed successfully.