**What is Docker?**

**Docker** is an open-source, centralized platform designed to **create, deploy, and run applications** efficiently.

**Key Features:**

* **Container-Based**: Docker uses **containers** on the host operating system to run applications.
* **Kernel Sharing**: Applications share the **same Linux kernel** as the host system, enabling lightweight and efficient execution.
* **Cross-Platform**: Docker can be installed on any operating system, but the Docker Engine runs **natively on Linux distributions**.
* **Language**: Docker is developed using the **Go programming language**.
* **Virtualization Type**: Docker performs **operating system-level virtualization**, commonly known as **containerization**.

**History:**

* **Initial Release**: March 2013
* **Developers**: Created by **Solomon Hykes** and **Sebestian Phal**

**Comparison with VMware:**

* Docker is a **Platform as a Service (PaaS)** that uses **OS-level virtualization**.
* VMware, on the other hand, uses **hardware-level virtualization**.

**Advantages of Docker**

* **No need for pre-allocated RAM**  
  Docker containers dynamically use memory as needed, improving efficiency.
* **Continuous Integration (CI) Friendly**  
  Docker allows you to build a container image once and reuse it throughout the entire deployment pipeline.
* **Cost-Effective**  
  Reduces infrastructure costs due to lightweight and efficient resource usage.
* **Lightweight**  
  Containers are smaller and faster compared to virtual machines.
* **Flexible Deployment**  
  Can run on physical hardware or cloud platforms with ease.
* **Reusable Images**  
  Docker images can be reused across multiple environments, saving time and effort.
* **Fast Deployment**  
  Container-based applications can be deployed rapidly with minimal overhead.

**Disadvantages of Docker**

* **Limited GUI Support**  
  Docker is not well-suited for applications that require a rich graphical user interface.
* **Complexity in Scaling**  
  Managing a large number of containers can become challenging without proper orchestration tools.
* **Lack of True Cross-Platform Compatibility**  
  Docker containers are not fully portable across different operating systems—for example, a container built for Ubuntu may not run properly on CentOS.