**Practical 1**

**Aim:** Install and understand Docker container, Node.js, Java and Hyperledger Fabric, Ethereum and perform necessary software installation on local machine/create instance on Cloud to run.

**Background Information:**

**Docker:**

* Docker is a set of platforms as a service (PaaS) product that an OS-level virtualization software platform that helps users in building and managing applications in the Docker environment with all its library dependencies.
* Docker is considered a better alternative to a virtual machine. It was first released in 2013 and is developed by Docker, Inc.
* Docker is a tool that is used to automate the deployment of applications in lightweight containers so that applications can work efficiently in different environments in isolation.

|  |  |
| --- | --- |
|  | |
| [**Original author(s)**](https://en.wikipedia.org/wiki/Programmer) | Solomon Hykes |
| [**Developer(s)**](https://en.wikipedia.org/wiki/Programmer) | [Docker, Inc.](https://en.wikipedia.org/wiki/Docker,_Inc.) |
| **Initial release** | March 20, 2013; 10 years ago |
| [**Stable release**](https://en.wikipedia.org/wiki/Software_release_life_cycle) | 24.0.7 / 26 October 2023; 35 days ago |
| [**Repository**](https://en.wikipedia.org/wiki/Repository_(version_control)) | [github.com/moby/moby](https://github.com/moby/moby) |
| **Written in** | [Go](https://en.wikipedia.org/wiki/Go_(programming_language)) |
| [**Operating system**](https://en.wikipedia.org/wiki/Operating_system) | [Linux](https://en.wikipedia.org/wiki/Linux), [Windows](https://en.wikipedia.org/wiki/Windows), [macOS](https://en.wikipedia.org/wiki/MacOS) |
| [**Platform**](https://en.wikipedia.org/wiki/Computing_platform) | [x86-64](https://en.wikipedia.org/wiki/X86-64), [ARM](https://en.wikipedia.org/wiki/ARM_architecture), [s390x](https://en.wikipedia.org/wiki/Z/Architecture), [ppc64le](https://en.wikipedia.org/wiki/Ppc64) |
| [**Type**](https://en.wikipedia.org/wiki/Software_categories#Categorization_approaches) | [OS-level virtualization](https://en.wikipedia.org/wiki/OS-level_virtualization) |
| **Website** | [docker.com](https://www.docker.com/) |

**The main components of Docker are:**

1. Images:

These are like templates for containers.

An image contains everything your software needs to run - it's the blueprint for creating containers.

1. Containers:

These are the actual instances created from images.

They are isolated environments that contain your software and everything it needs, ensuring the software runs consistently across different environments.

1. Docker Engine:

This is the heart of Docker.

It's the tool that manages images and containers, allowing you to create, run, and manage them on your computer or in the cloud.

Docker makes it easy to build, ship, and run applications reliably and efficiently because these containers work the same way no matter where they're running - on your laptop, a server, or in the cloud.

**Installation steps:**

1.Download Docker: Go to the Docker website and download the appropriate Docker installer for your operating system. Or download docker from here, https://www.docker.com/products/docker-desktop/

2.Install Docker: Follow the on-screen instructions to install Docker.

3.Verify installation: Open a terminal window (command prompt) and run the following

**Command 1:** #docker version

4.Start the Docker daemon: The Docker daemon is the service that runs Docker containers.

5.Test Docker: To test Docker, run the following command:

**Command 2: #**docker run hello-world

6.Pull a UBUNTU image from docker hub and run the CentOS container.

Make sure the Docker daemon is running.

7.Pull a UBUNTU image from docker hub and run.

**Command 3:** #docker pull ubuntu

#docker run -it ubuntu

8. Now Install and understand Hyperledger Fabric and Ethereum.

**Command 4:**

apt-get update && apt-get install -y \

software-properties-common \

curl \

wget \

unzip \

git \

apt-utils \

build-essential \

gcc \

g++ \

make

curl -sL https://deb.nodesource.com/setup\_20.x | bash -

apt-get install -y nodejs

apt-get install -y openjdk-11-jdk

add-apt-repository ppa:ethereum/Ethereum

apt-get update -y

apt-get install -y solc

wget <https://go.dev/dl/go1.21.3.linux-amd64.tar.gz>

tar -C /usr/local -xzf go1.21.3.linux-amd64.tar.gz

rm go1.21.3.linux-amd64.tar.gz

apt-get install -y \

docker.io \

libtool \

libltdl-dev \

libssl-dev \

autoconf \

automake \

bison \

libboost-all-dev \

libgflags-dev \

libprotobuf-dev \

libleveldb-dev \

libsnappy-dev \

libsodium-dev \

liblz4-tool

service --status-all

**Conclusion:** Thus, the installation of Docker container, Node.js, Java is successfully completed.