Chapter 2: Docker

Reading material on: - **Docker Curriculum**

Step-by-Step Guide to Install and Verify Docker on Ubuntu

Step 1: Update the Package Index**:** sudo apt-get update

Description: This command updates the local package index with the latest information from the repositories. It ensures that you install the latest versions of packages.

Step 2: Install Required Packages

```
sudo apt-get install \
ca-certificates \
curl \
gnupg \
lsb-release
```

Description: This command installs the necessary packages for adding a new repository:

- **ca-certificates:** Ensures that your system can verify the authenticity of SSL certificates.
- **curl:** A tool to transfer data from or to a server, used here to fetch Docker's GPG key.
- **gnupg:** Provides tools for secure communication and data storage, essential for managing GPG keys.
- **lsb-release:** Provides Linux Standard Base (LSB) information about the distribution.

Step 3: Add Docker's Official GPG Key: -

curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /usr/share/keyrings/docker-archive-keyring.gpg

```
(base) amresh@LAPTOP-893VU91K:~/MLOPSTALOCAL$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearm
or -o /usr/share/keyrings/docker-archive-keyring.gpg
```

Description: This command downloads Docker's GPG key and stores it in a keyring file. The -fsSL options make curl fail silently on server errors, follow redirects, and use SSL.

Step 4: Set Up the Docker Repository

sudo bash -c 'echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/docker-archive-keyring.gpg] https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable" > /etc/apt/sources.list.d/docker.list'

```
(base) amresh@LAPTOP-893VU91K:~/MLOPSTALOCAL$ sudo bash -c 'echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/
share/keyrings/docker-archive-keyring.gpg] https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable" > /etc/ap
t/sources.list.d/docker.list'
```

Description: This command adds Docker's official repository to your system's package Sources.
It specifies:

- **arch=$(dpkg --print-architecture):** Gets the architecture of your system (e.g., amd64).
- **$(lsb_release -cs):** Gets the codename of your Ubuntu release (e.g., focal for 20.04).

The command writes this information to a new file named docker.list in the **/etc/apt/sources.list.d/ directory.**

Step 5: Verify the Docker Repository

cat /etc/apt/sources.list.d/docker.list

Description: This command displays the contents of the docker.list file to verify that the Docker repository was added correctly.

Step 6: Update the Package Index Again

sudo apt-get update

Description: This command updates the package index again, now including the Docker repository.

Step 7: Install Docker Engine

sudo apt-get install docker-ce docker-ce-cli containerd.io

Description: This command installs Docker Engine and related packages:

- **docker-ce:** The Community Edition of Docker.
- **docker-ce-cli:** The command-line interface for Docker.
- **containerd.io:** The container runtime used by Docker.

Step 8: Start Docker

sudo systemctl start docker

Description: This command starts the Docker service on your system.

Step 9: Enable Docker to Start on Boot

sudo systemctl enable docker

Description: This command ensures that the Docker service starts automatically when the system boots up.

Step 10: Verify Docker Installation

sudo docker run hello-world

Description: This command runs a test Docker container that prints a message indicating that the Docker is installed and functioning correctly. If Docker is installed properly, you will see a message from Docker confirming that it's working.

The output will be like this:

```
(my_conda_env) amresh@LAPTOP-893VU91K:~/MLOPSTALOCAL$ sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
c1ec31eb5944: Pull complete
Digest: sha256:53cc4d415d839c98be39331c948609b659ed725170ad2ca8eb36951288f81b75
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.
```

If you do not get output like Hello from Docker!
Then go to [hello-world - Official Image | Docker Hub]
Copy the docker pull code(docker pull hello-world) and paste it on the terminal
Then again, run docker run hello-world