ANNA UNIVERSITY

COLLEGE OF ENGINEERING GUINDY

DEPARTMENT OF INFORMATION SCIENCE AND TECHNOLOGY

DSC ASSIGNMENT- 3

TITLE : Implementation of Virtual Machine and containers using VMware and Docker

By,

Akshaya S K - 2023115095

1.Introduction

Implementing different types of virtual machines by creating:

1. A **System Virtual Machine** using VMware, and
2. An **OS-Level Virtual Machine** using Docker containers, and to demonstrate multiple container instances.

2. Requirements

Software Requirements

- Host Operating System: Windows / Linux
- VMware Workstation
- Ubuntu Linux (Guest OS)
- Docker Engine
- Terminal

Hardware Requirements

- Minimum 8 GB RAM
- Intel/AMD processor with virtualization support

3. Implementation

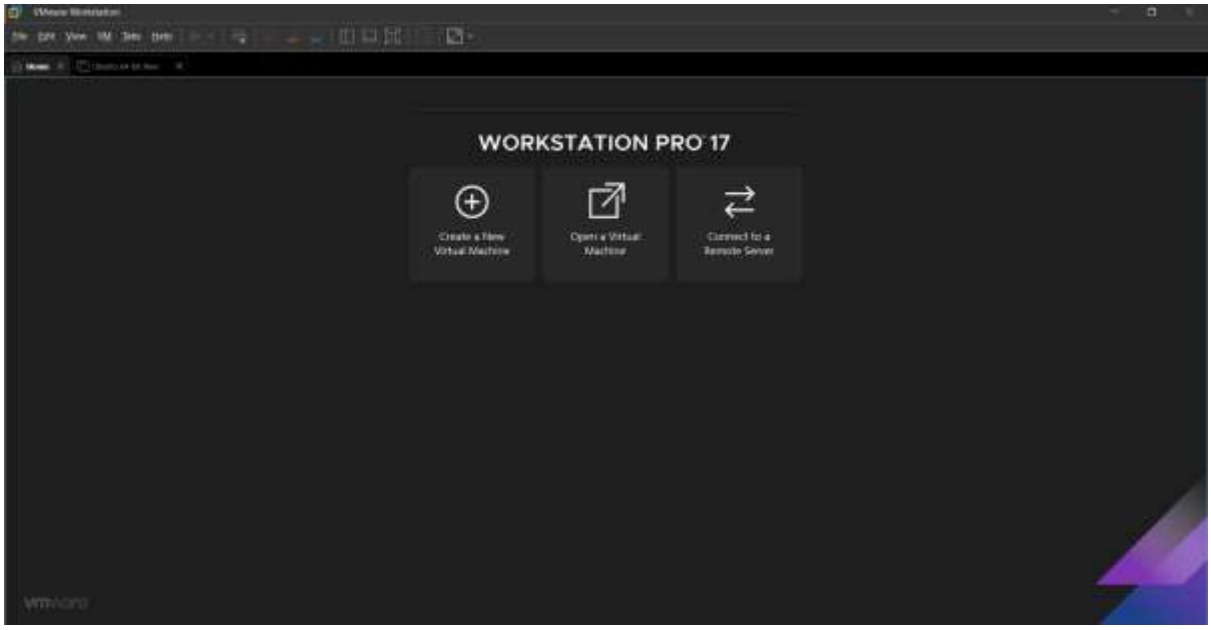
Creation of System Virtual Machine using VMware

Step 1: Launch VMware Workstation

VMware Workstation was launched on the host system.

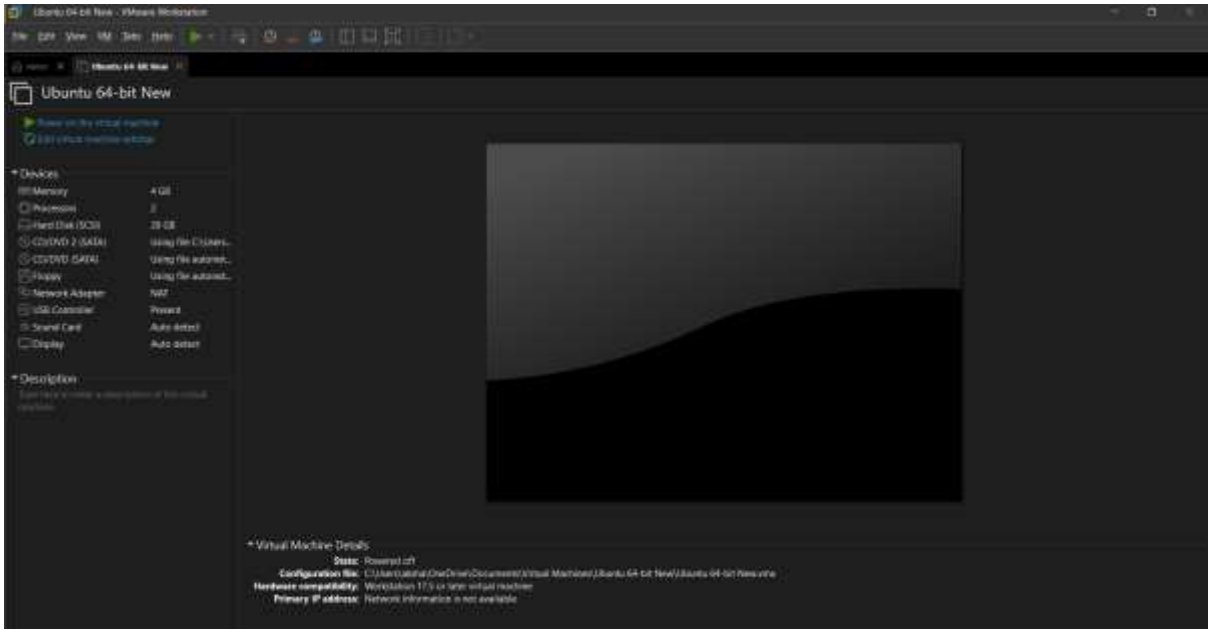
Step 2: Create a New Virtual Machine

- Selected **Create a New Virtual Machine**
- Chose **Typical** configuration
- Selected Ubuntu ISO file
- Allocated memory and disk space



Step 3: Install Ubuntu Operating System

Ubuntu Linux was installed inside VMware, resulting in a fully functional **System Virtual Machine**.



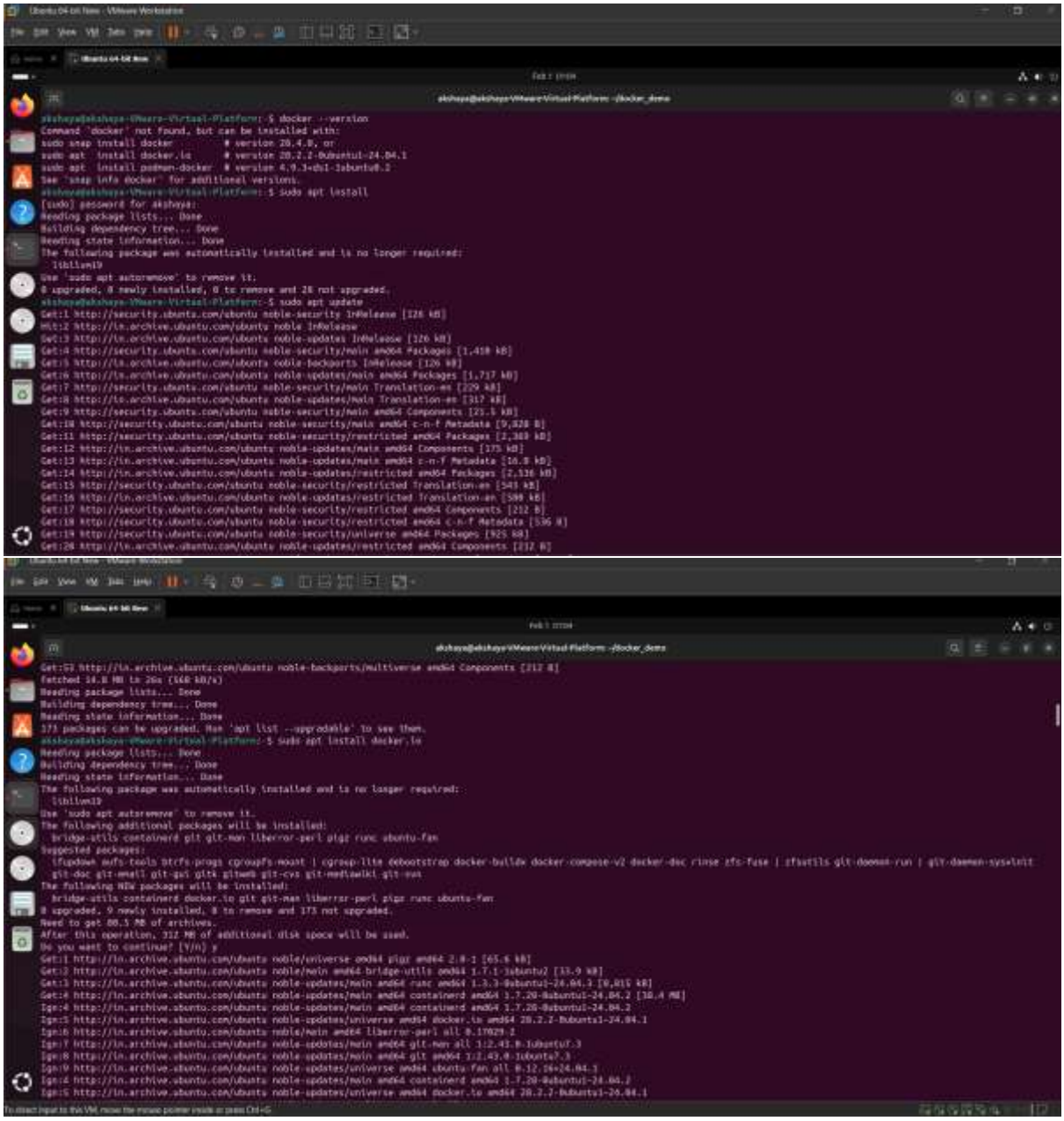
Creation of OS-Level Virtual Machine using Docker

Docker was installed inside the Ubuntu system virtual machine.

Step 1: Install Docker

sudo apt update

sudo apt install docker.io



Step 2: Start Docker Service

sudo systemctl start docker

sudo systemctl enable docker

Step 3: Create OS-Level Virtual Machine (Container)

sudo docker run -it ubuntu

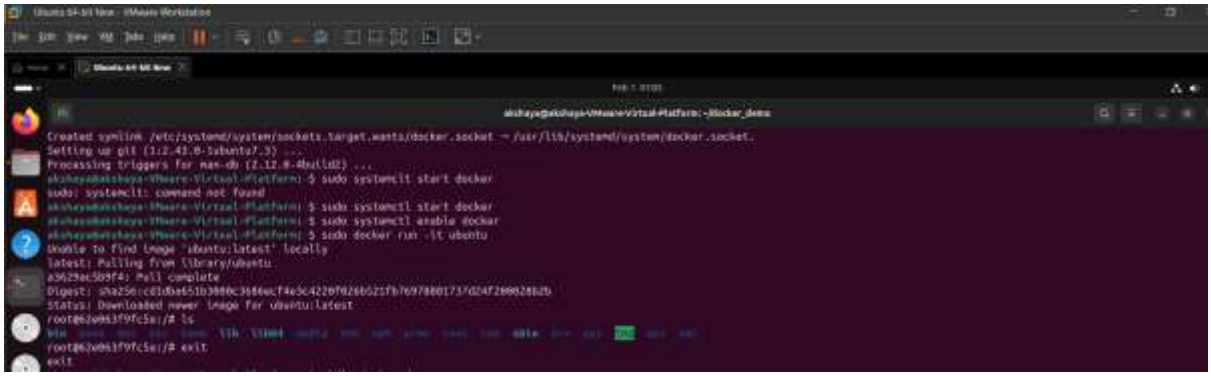
This command creates a Docker container, which acts as an **OS-Level Virtual Machine**.

Creation of Different Types of Containers

Container Type 1: Ubuntu Base Container

sudo docker run -it ubuntu

This container provides a minimal Ubuntu environment.



Container Type 2: Custom Python Container

Dockerfile

FROM ubuntu

RUN apt update

RUN apt install -y python3

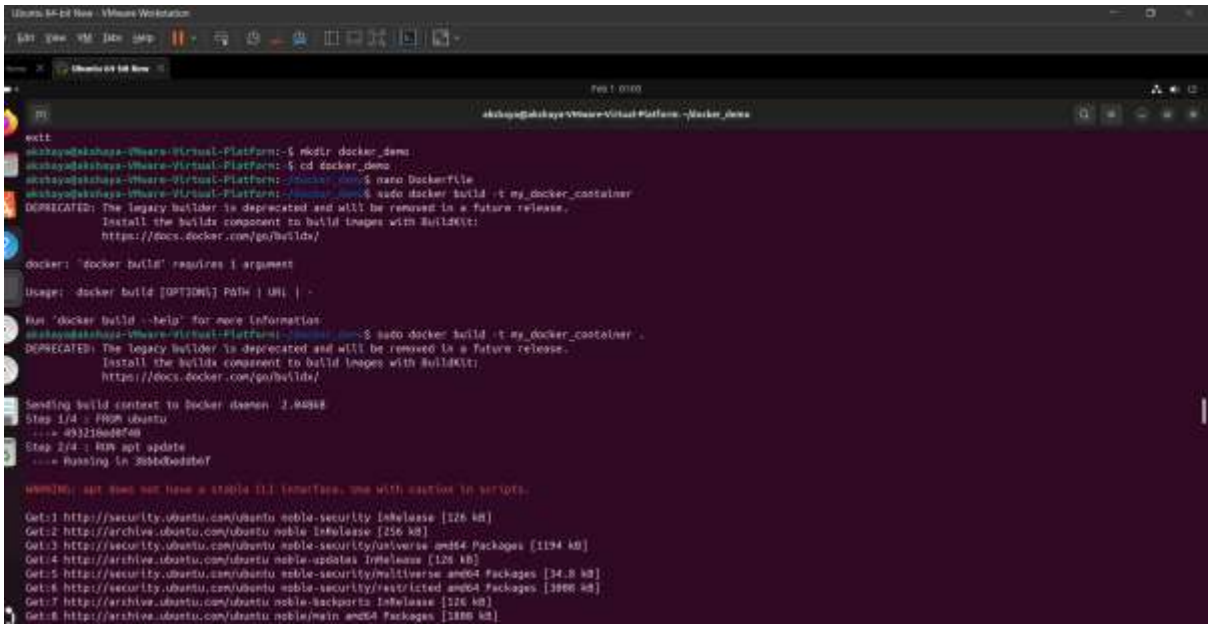
CMD ["python3"]

Build Image:

sudo docker build -t python_container .

Run Container

sudo docker run -it python_container



4. Types of Virtual Machines Implemented

Virtual Machine Type	Technology Used	Description
System Virtual Machine	VMware	Full OS with separate kernel
OS-Level Virtual Machine	Docker	Lightweight container sharing host kernel

5. Observations

- System virtual machines provide strong isolation but consume more resources.
- OS-level virtual machines are lightweight and start quickly.
- Docker containers are suitable for distributed systems due to scalability and portability.