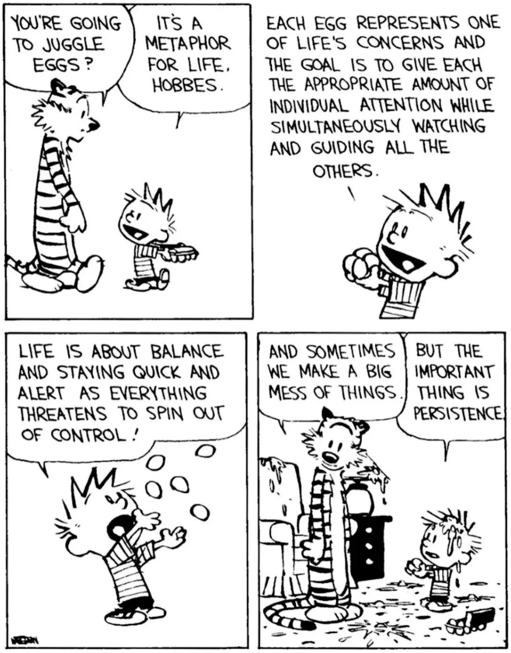
Session - 4

Containerization & Docker

Oct 08, 2025

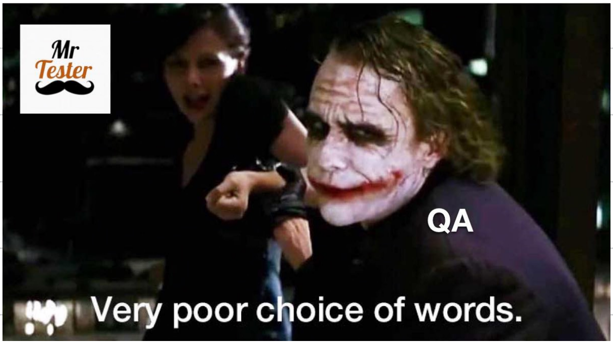

YOU'RE GOING TO JUGGLE EGGS?
IT'S A METAPHOR FOR LIFE, HOBBES.
EACH EGG REPRESENTS ONE OF LIFE'S CONCERNS AND THE GOAL IS TO GIVE EACH THE APPROPRIATE AMOUNT OF INDIVIDUAL ATTENTION WHILE SIMULTANEOUSLY WATCHING AND GUIDING ALL THE OTHERS.
LIFE IS ABOUT BALANCE AND STAYING QUICK AND ALERT AS EVERYTHING THREATENS TO SPIN OUT OF CONTROL!
AND SOMETIMES WE MAKE A BIG MESS OF THINGS.
BUT THE IMPORTANT THING IS PERSISTENCE.

Agenda

1. What is Docker??
2. Diff b/w Docker_ Virtual machine and virtual environments.
3. WorkFlow of Docker
4. Docker hub

What Is Docker Why We Need It?

Dev: Works in my machine...



How do I install CUDA 12.1 on Ubuntu 24.04?

Thought for 27 hours, 42 seconds

I don't really know.

Diff reasons why it might not work ?.

① Library Versions

② Diff OS

③ Frontend

Backend

Database

ML

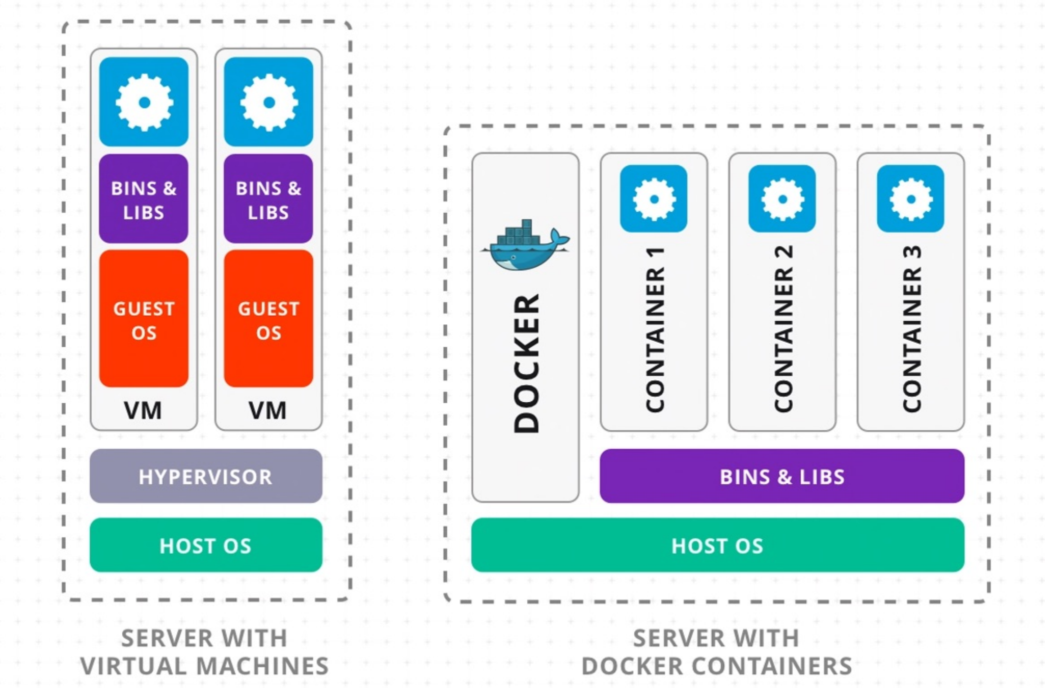
Virtual Environment ?!

only refers to python package

Docker → Isolated Environment / Container

Mini- OS — Container

Diff b/w Virtual Machine, Virtual Environment, and Docker Container



VM -> Installs a full blown OS

Reserves resources
RAM & HDD

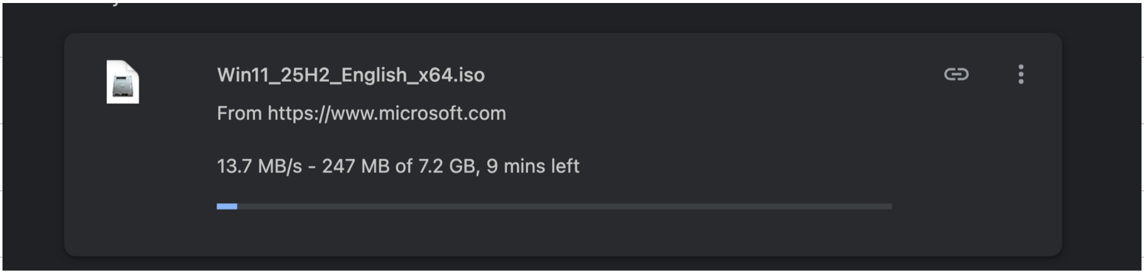
64 GB RAM

2TB SSD

(Left with
40 GB RAM)

① VM- Windows
(12 GB RAM, 50 GB SSD)

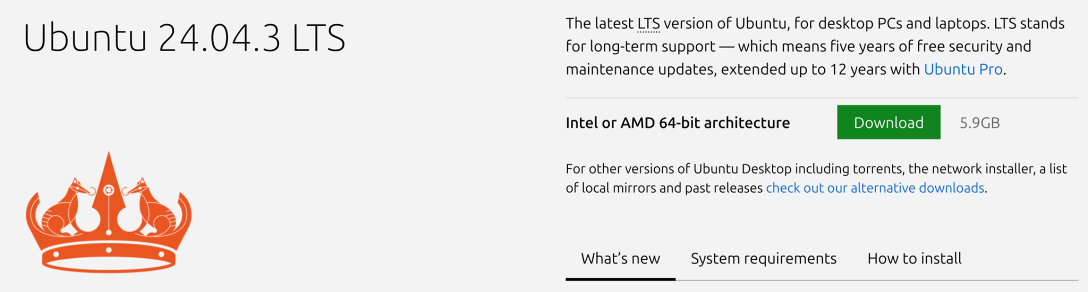
② VM- UBuntu
(12 GB RAM, 50 GB SSD)



Win11_25H2_English_x64.iso

From https://www.microsoft.com

13.7 MB/s - 247 MB of 7.2 GB, 9 mins left

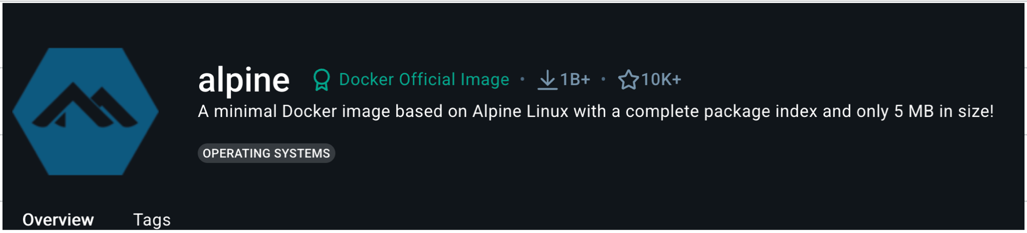


Ubuntu 24.04.3 LTS

The latest LTS version of Ubuntu, for desktop PCs and laptops. LTS stands for long-term support — which means five years of free security and maintenance updates, extended up to 12 years with Ubuntu Pro.

Intel or AMD 64-bit architecture

For other versions of Ubuntu Desktop including torrents, the network installer, a list of local mirrors and past releases check out our alternative downloads.



alpine

A minimal Docker image based on Alpine Linux with a complete package index and only 5 MB in size!

In Every operating system, it has a kernel, it is the lowest level of software in your OS. Kernel interacts and interfaces with your hardware and all the applications.

Some responsibilities:

1. Process Management, and scheduling .
2. Memory management, like allocating RAM.
3. I/O handling.
4. Security Supervise.

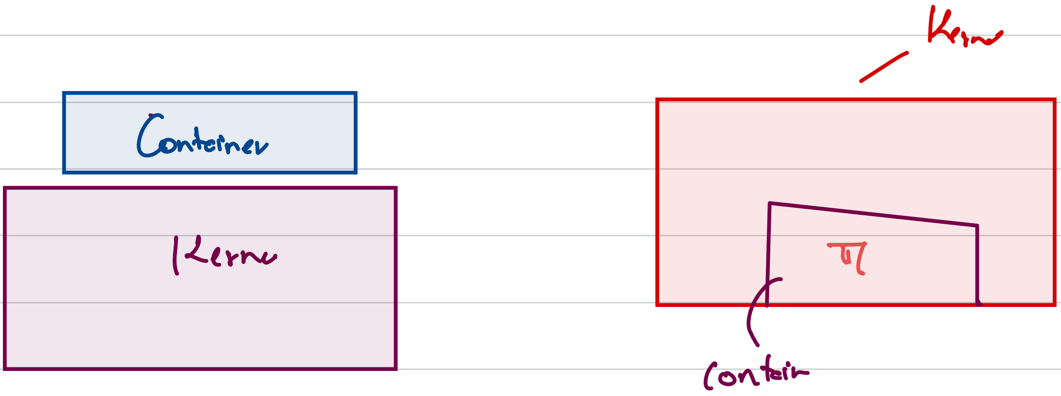
Pros of VM:

1. Virtual machines are extremely secure, isolated and allows us to work on diff OS. (Kali Linux)
2. If you're working on something very secretive/shady, you'll still be fine.

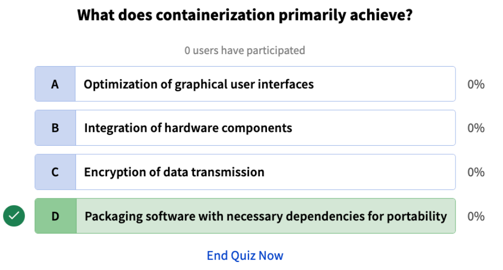
Cons:

1. It's very heavy weight, slow, and cause performance issues, and sluggishness both in Host OS and installed OS.

Dockers are relatively Lot less Secur



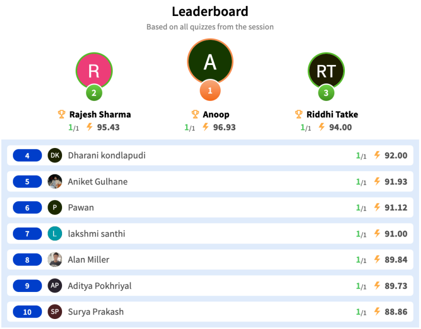
Docker doesn't reserve any RAM/HDD when it runs the container, it uses as much as it needs (you can limit upper bound to RAM it uses, but it doesn't reserve anything)



What does containerization primarily achieve?

0 users have participated

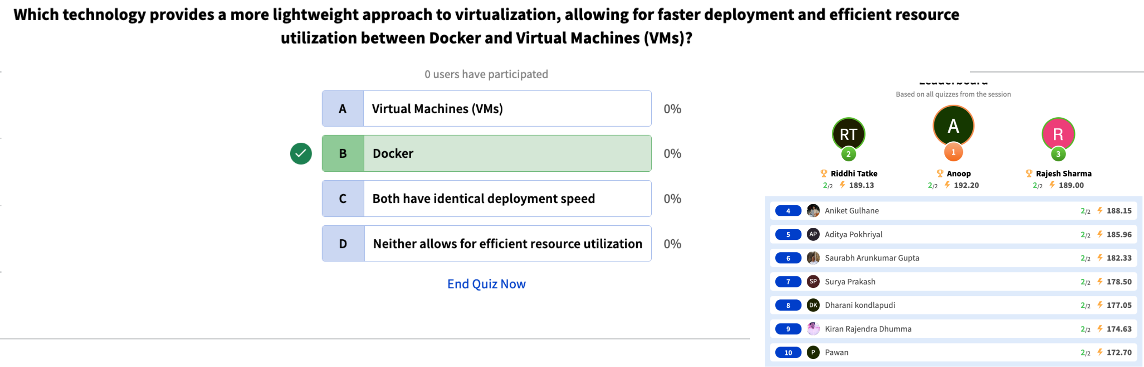
A	Optimization of graphical user interfaces	0%
B	Integration of hardware components	0%
C	Encryption of data transmission	0%
✓ D	Packaging software with necessary dependencies for portability	0%



Leaderboard

Based on all quizzes from the session

Rank	Name	Score	Points
2	Rajesh Sharma	1/1	95.43
1	Anoop	1/1	96.93
3	Riddhi Tatke	1/1	94.00
4	Dharani kondlapudi	1/1	92.00
5	Aniket Gulhane	1/1	91.93
6	Pawan	1/1	91.12
7	lakshmi santhi	1/1	91.00
8	Alan Miller	1/1	89.84
9	Aditya Pokhriyal	1/1	89.73
10	Surya Prakash	1/1	88.86



Which technology provides a more lightweight approach to virtualization, allowing for faster deployment and efficient resource utilization between Docker and Virtual Machines (VMs)?

0 users have participated

A	Virtual Machines (VMs)	0%
✓ B	Docker	0%
C	Both have identical deployment speed	0%
D	Neither allows for efficient resource utilization	0%

Based on all quizzes from the session

Rank	Name	Score	Points
2	Riddhi Tatke	2/2	189.13
1	Anoop	2/2	192.20
3	Rajesh Sharma	2/2	189.00
4	Aniket Gulhane	2/2	188.15
5	Aditya Pokhriyal	2/2	185.96
6	Saurabh Arunkumar Gupta	2/2	182.33
7	Surya Prakash	2/2	178.50
8	Dharani kondlapudi	2/2	177.05
9	Kiran Rajendra Dhumma	2/2	174.63
10	Pawan	2/2	172.70

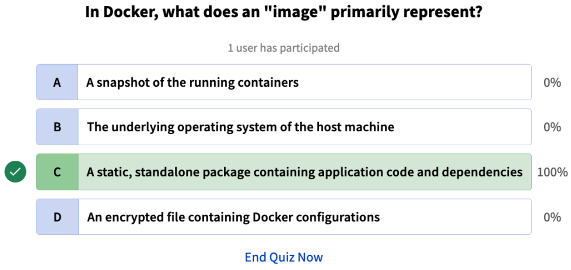
Deployment Steps

1. Find some suitable cloud environment (AWS, GCP, Azure, etc.)
2. Install/Choose some OS -> Linux/Unix (you can even have MacOS, Windows)
3. Install dependencies and libraries (also front-end, backend, database, etc)
4. Copy the code from the repo, to the server (current cloud server)
5. Run the code, and expose the URL/API

Terminologies of Docker

1. DockerFile: Contains the instructions, of all the packages and codes, any and all relevant file needed for your application. (Recipe for application)
2. Use Dockerfile to create "Docker Image" — Class
3. Using DockerImage you create a running container (Executing the application, here application being the docker image) - Container is a running image.

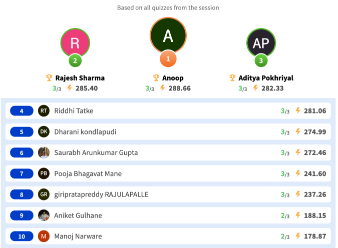
\ creating an object/instance of the Class.



In Docker, what does an "image" primarily represent?

1 user has participated

A	A snapshot of the running containers	0%
B	The underlying operating system of the host machine	0%
✓ C	A static, standalone package containing application code and dependencies	100%
D	An encrypted file containing Docker configurations	0%



Based on all quizzes from the session

Rank	Name	Score	Points
2	Rajesh Sharma	3/3	285.40
1	Anoop	3/3	288.66
3	Aditya Pokhriyal	3/3	282.33
4	Riddhi Tatke	3/3	281.06
5	Dharani kondlapudi	3/3	274.99
6	Saurabh Arunkumar Gupta	3/3	272.46
7	Pooja Bhagavat Mane	3/3	241.60
8	giripratapreddy RAJULAPALLE	3/3	237.26
9	Aniket Gulhane	2/3	188.15
10	Manoj Narware	2/3	178.87