Everything About Docker

1. What Problem Does Docker Solve?

Docker solves environment inconsistency, dependency issues, and deployment problems by packaging applications with their environment.

2. What is Docker?

Docker is a platform to build, run, and ship applications inside containers.

3. Containers vs Virtual Machines

- Containers are lightweight, share the host OS kernel, and start instantly.

- VMs emulate hardware, include a full OS, and are heavier.

4. Key Docker Concepts

- Container

- Image

- Dockerfile

- Registry

- Docker Engine

5. Essential Docker Commands

docker pull nginx

docker run -d -p 8080:80 nginx

docker ps

docker stop

docker build -t myapp .

6. Dockerfile Example

FROM node:20-alpine

WORKDIR /app

COPY package*.json ./

RUN npm install

COPY . .

EXPOSE 3000

CMD ["npm", "start"]

7. Volumes

docker volume create data_vol

docker run -v data_vol:/var/lib/mysql mysql

8. Docker Compose

Multi-container orchestration using docker-compose.yml.

9. Docker in Production

Used with Kubernetes for large-scale deployments.

This PDF summarizes the basic to intermediate Docker concepts for your learning.