

Docker Teaching Book

Chapter 1: Introduction to Docker

Docker is a platform designed to help developers build, deploy, and run applications inside containers. Containers allow you to package applications with all dependencies so they run reliably across different environments.

Chapter 2: Installing Docker

To install Docker, visit the official Docker website and download Docker Desktop for your operating system. Follow the installation instructions provided.

Chapter 3: Docker Architecture

Docker uses a client-server architecture. The Docker client communicates with the Docker daemon, which builds, runs, and manages containers.

Chapter 4: Images and Containers

An image is a lightweight, standalone, executable package that includes everything needed to run a piece of software. A container is a runtime instance of an image.

Chapter 5: Docker Commands

- `docker pull`: Downloads an image from a registry
- `docker run`: Runs a container from an image
- `docker ps`: Lists running containers
- `docker stop`: Stops a running container

Chapter 6: Dockerfile Basics

A Dockerfile is a text file that contains instructions to build a Docker image. It includes commands such as FROM, WORKDIR, COPY, RUN, and CMD.

Chapter 7: Docker Compose

Docker Compose helps define and run multi-container Docker applications. You describe services in a `docker-compose.yml` file and start them using `docker compose up`.

Chapter 8: Best Practices

- Keep images small
- Use multi-stage builds
- Tag images properly
- Avoid running containers as root

Chapter 9: Deployment with Docker

Docker makes deployment easier by ensuring consistency across environments. You can deploy containers manually or using orchestration tools like Kubernetes.

Chapter 10: Conclusion

Docker is a powerful tool for modern application development and deployment. With containers, developers can ensure consistent, efficient, and portable software delivery.