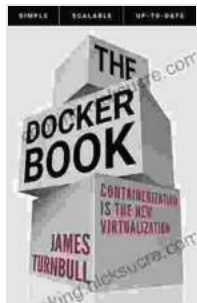# The Docker Book: Containerization Is the New Virtualization

### The Docker Book: Containerization is the new virtualization by James Turnbull

★★★★☆  4.4 out of 5

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|---|---|---|
| Language | : | English |
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Docker is a software platform that allows you to build, ship, and run distributed applications, whether on-premises or in the cloud. It uses containers to package and isolate applications, making them more portable and easier to manage.

This book will teach you everything you need to know about Docker, from the basics to advanced topics. You will learn how to:

- Install and configure Docker

- Build and manage Docker images

- Run Docker containers

- Deploy Docker applications to production

- Troubleshoot Docker problems

Whether you are a developer, system administrator, or IT professional, this book will help you get started with Docker and learn how to use it to build, ship, and run distributed applications.

**Table of Contents**

**Chapter 1: to Docker**

In this chapter, you will learn the basics of Docker, including what it is, how it works, and why it is useful. You will also learn how to install Docker on your system.

**What is Docker?**

Docker is a software platform that allows you to build, ship, and run distributed applications, whether on-premises or in the cloud. It uses containers to package and isolate applications, making them more portable and easier to manage.

A container is a lightweight, standalone, executable package that includes everything an application needs to run, including its code, runtime, libraries,

and system tools. Containers are isolated from each other and from the host operating system, making them more secure and portable.

**How does Docker work?**

Docker uses a client-server architecture. The Docker client communicates with the Docker daemon, which is a service that runs on the host operating system. The Docker client can be used to build, manage, and run Docker containers.

When you build a Docker image, the Docker client sends the image to the Docker daemon. The Docker daemon then builds the image and stores it in a local registry. When you run a Docker container, the Docker client sends the container to the Docker daemon. The Docker daemon then creates and runs the container.

**Why use Docker?**

There are many benefits to using Docker, including:

- **Portability:** Docker containers can be run on any machine that has Docker installed, regardless of the underlying operating system.

- **Security:** Docker containers are isolated from each other and from the host operating system, making them more secure.

- **Manageability:** Docker containers are easy to manage and can be scaled up or down as needed.

- **Cost-effectiveness:** Docker containers are a cost-effective way to run distributed applications, as they require less resources than virtual machines.

## Chapter 2: Installing Docker

In this chapter, you will learn how to install Docker on your system. Docker can be installed on a variety of operating systems, including Linux, macOS, and Windows.

### Installing Docker on Linux

To install Docker on Linux, you can use the following commands:

sudo apt-get update sudo apt-get install docker-ce docker-compose

### Installing Docker on macOS

To install Docker on macOS, you can use the following commands:

brew cask install docker

### Installing Docker on Windows

To install Docker on Windows, you can use the following commands:

Download the Docker Desktop installer from https://www.docker.com/products/docker-desktop Run the installer and follow the prompts

## Chapter 3: Building Docker Images

In this chapter, you will learn how to build Docker images. A Docker image is a self-contained, executable package that contains everything an application needs to run, including its code, runtime, libraries, and system tools.

### Creating a Dockerfile

The first step to building a Docker image is to create a Dockerfile. A Dockerfile is a text file that contains instructions for building the image. The following is an example of a Dockerfile:

FROM ubuntu:16.04 RUN apt-get update && apt-get install -y nginx

This Dockerfile creates an image based on the Ubuntu 16.04 image. It then installs the nginx web server.

## Building a Docker image

To build a Docker image, you can use the following command:

docker build -t my-image .

This command builds an image named `my-image` from the Dockerfile in the current directory.

## Chapter 4: Running Docker Containers

In this chapter, you will learn how to run Docker containers. A Docker container is a running instance of a Docker image. Containers are isolated from each other and from the host operating system, making them more secure and portable.

## Running a Docker container

To run a Docker container, you can use the following command:

docker run -it --rm --name my-container my-image

This command runs a container named `my-container` from the image `my-image`. The `-it` option makes the container interactive, and the `--rm` option removes the container when it exits.

## Chapter 5: Deploying Docker Applications

In this chapter, you will learn how to deploy Docker applications. Deploying a Docker application involves creating a Docker image, running the image in a container, and exposing the container to the outside world.

### Creating a Docker Compose file

One way to deploy a Docker application is to use a Docker Compose file. A Docker Compose file is a YAML file that defines the services that make up your application and how they are connected.

The following is an example of a Docker Compose file:

version: '3' services: web: image: my-web-image ports: - "80:80" db: image: my-db-image

This Docker Compose file defines two services, `web` and `db`. The `web` service is based on the `my-web-image` image and exposes port 80. The `db` service is based on the `my-db-image` image.

### Deploying a Docker application

To deploy a Docker application, you can use the following command:

docker-compose up -d

This command builds the Docker images for the services defined in the Docker Compose file, creates and runs containers for the services,
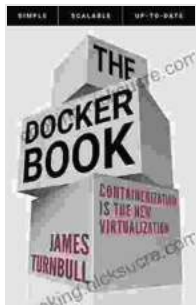
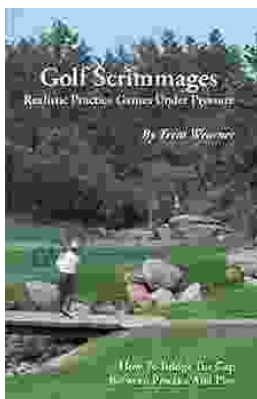### The Docker Book: Containerization is the new virtualization by James Turnbull

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