

Contents

0: About the book	1
Why should I read this book or care about Docker?	1
What if I'm not a developer	1
Should I buy the book if I've already watched your video training courses?	1
How the book is organized	2
Editions of the book	3
Having problems getting the latest updates on your Kindle?	3
The paperback edition	3
Leave a review	3
Part 1: The big picture stuff	5
1: Containers from 30,000 feet	7
The bad old days	7
Hello VMware!	7
VMwarts	7
Hello Containers!	8
Linux containers	8
Hello Docker!	8
Windows containers	8
Windows containers vs Linux containers	9
What about Mac containers?	9
What about Kubernetes	9
Chapter Summary	10
2: Docker	11
Docker - The TLDR	11
Docker, Inc.	11
The Docker technology	12
The Open Container Initiative (OCI)	13
Chapter summary	14
3: Installing Docker	15
Docker Desktop	15
Windows pre-reqs	15

Installing Docker Desktop on Windows 10	16
Installing Docker Desktop on Mac	17
Installing Docker on Linux	18
Installing Docker on Windows Server 2019	19
Play with Docker	20
Chapter Summary	20
4: The big picture	21
The Ops Perspective	21
Images	22
Containers	23
Attaching to running containers	25
The Dev Perspective	26
Chapter Summary	30
Part 2: The technical stuff	31
5: The Docker Engine	33
Docker Engine - The TLDR	33
Docker Engine - The Deep Dive	34
Getting rid of LXC	35
Getting rid of the monolithic Docker daemon	35
The influence of the Open Container Initiative (OCI)	36
runc	37
containerd	37
Starting a new container (example)	37
One huge benefit of this model	39
What's this shim all about?	39
How it's implemented on Linux	39
What's the point of the daemon	39
Securing client and daemon communication	40
Chapter summary	48
6: Images	51
Docker images - The TLDR	51
Docker images - The deep dive	51
Images and containers	52
Images are usually small	52
Pulling images	52
Image naming	54
Image registries	54
Image naming and tagging	56
Images with multiple tags	57
Filtering the output of <code>docker image ls</code>	58
Searching Docker Hub from the CLI	59
Images and layers	60

Sharing image layers	64
Pulling images by digest	65
A little bit more about image hashes (digests)	67
Multi-architecture images	67
Deleting Images	70
Images - The commands	72
Chapter summary	72
7: Containers	73
Docker containers - The TLDR	73
Docker containers - The deep dive	74
Containers vs VMs	74
The VM tax	76
Running containers	77
Checking that Docker is running	77
Starting a simple container	78
Container processes	80
Container lifecycle	81
Stopping containers gracefully	84
Self-healing containers with restart policies	84
Web server example	87
Inspecting containers	88
Tidying up	89
Containers - The commands	90
Chapter summary	90
8: Containerizing an app	91
Containerizing an app - The TLDR	91
Containerizing an app - The deep dive	92
Containerize a single-container app	92
Moving to production with Multi-stage Builds	101
A few best practices	104
Containerizing an app - The commands	107
Chapter summary	107
9: Deploying Apps with Docker Compose	109
Deploying apps with Compose - The TLDR	109
Deploying apps with Compose - The Deep Dive	110
Compose background	110
Installing Compose	110
Compose files	112
Deploying an app with Compose	115
Managing an app with Compose	119
Deploying apps with Compose - The commands	124
Chapter Summary	125
10: Docker Swarm	127
Docker Swarm - The TLDR	127

Docker Swarm - The Deep Dive	127
Swarm primer	128
Build a secure Swarm cluster	128
Swarm manager high availability (HA)	132
Swarm services	135
Viewing and inspecting services	136
Replicated vs global services	137
Scaling a service	137
Removing a service	139
Rolling updates	139
Troubleshooting	144
Backing up Swarm	145
Docker Swarm - The Commands	148
Chapter summary	148
11: Docker Networking	151
Docker Networking - The TLDR	151
Docker Networking - The Deep Dive	151
The theory	152
Single-host bridge networks	155
Multi-host overlay networks	162
Connecting to existing networks	163
Service discovery	169
Ingress load balancing	170
Docker Networking - The Commands	173
Chapter Summary	173
12: Docker overlay networking	175
Docker overlay networking - The TLDR	175
Docker overlay networking - The deep dive	175
Build and test a Docker overlay network in Swarm mode	176
Test the overlay network	179
The theory of how it all works	182
Docker overlay networking - The commands	186
Chapter Summary	187
13: Volumes and persistent data	189
Volumes and persistent data - The TLDR	189
Volumes and persistent data - The Deep Dive	189
Containers and non-persistent data	190
Containers and persistent data	191
Demonstrating volumes with containers and services	193
Sharing storage across cluster nodes	196
Volumes and persistent data - The Commands	198
Chapter Summary	198
14: Deploying apps with Docker Stacks	199
Deploying apps with Docker Stacks - The TLDR	199

Deploying apps with Docker Stacks - The Deep Dive	199
Overview of the sample app	200
Looking closer at the stack file	202
Deploying the app	208
Managing the app	213
Deploying apps with Docker Stacks - The Commands	216
Chapter Summary	216
15: Security in Docker	217
Security in Docker - The TLDR	217
Security in Docker - The deep dive	218
Linux security technologies	218
Docker platform security technologies	222
Docker Secrets	234
Chapter Summary	235
16: What next	237
Practice makes perfect	237
Video training	237
Get involved with the community	237
Kubernetes	237
Feedback and connecting	238