

Kubernetes for All

Build a Datacenter from Scratch



Joel Bryan Juliano

Kubernetes for All

Build a Datacenter from Scratch

Joel Bryan Juliano

This book is available at <https://leanpub.com/k8s4all>

This version was published on 2026-05-28



Leanpub

This is a [Leanpub](#) book. Leanpub empowers authors and publishers with the Lean Publishing process. [Lean Publishing](#) is the act of publishing an in-progress ebook using lightweight tools and many iterations to get reader feedback, pivot until you have the right book and build traction once you do.

© 2019 - 2026 Joel Bryan Juliano

Also By Joel Bryan Juliano

From Ruby to TypeScript

AWS in Production

Emacs for Life

From Ruby to Golang

Contents

Introduction: Gluing Kubernetes Together with Bash	1
Prerequisites	1
Why Bash?	1
What We Are Building	2
The Entry Point: setup.sh	2
Starting datacenter.sh	4
Hands-On Exercises	4
Safety Settings, Initialization, and Lifecycle Hooks	6
Global Set Options	6
Script Initialization	7
The Main Controller	7
Error Handler	7
Exit Handler	8
Putting It Together	8
Hands-On Exercises	8
Exit Codes and Controlled Exits	9
The script_exit Function	9
Exit Code Conventions	9
Bash Safety Patterns in Review	9
Updated Script	10
Hands-On Exercises	10
Cron Mode and IO Redirection	11
What Cron Mode Does	11
File Descriptors	11
Redirecting for Cron Mode	11
Updating the Error Handler	11
Updating the Exit Handler	12
Registering cron_init in main	12
Updated Script	12
Hands-On Exercises	12
The Library Pattern: Organizing a Bash Codebase	13

CONTENTS

The lib/ Directory	13
Loading Libraries in main	13
Writing a Library File	13
Naming Conventions	13
The Dependency Graph	14
Two Utility Libraries Worth Knowing Now	14
Hands-On Exercises	14
Terminal Colors and Logging	15
The Logging Library	15
Colour Initialization	15
The log Function	16
verbose_print — Verbose Mode Output	16
Updating init	16
Updating main	16
Updating the Error Handler	16
Hands-On Exercises	16
Validation Helpers and Binary Checks	17
lib/script.sh	17
check_binary — Required Tool Detection	17
check_required_binaries — System Preconditions	17
vm_mode — Mode Detection	17
check_arguments — Variable Presence Validation	17
check_directories — Path Validation	17
check_files — File Presence Validation	18
check_repos — Repository Presence Guard	18
build_path — PATH Construction	18
Using the Helpers in the init Chain	18
Hands-On Exercises	18
Configuration Management	19
The Configuration File	19
lib/config.sh	19
get_configurations — Interactive Setup	19
Reading Configuration in main	20
Docker Network Modes	20
Hands-On Exercises	20
Script Locking: Preventing Concurrent Runs	21
Why a Directory, Not a File	21
lock_init	21
Stale Lock Handling	22
Hands-On Exercises	22

CONTENTS

Complete Parameter Parsing	23
parse_params	23
script_usage — The Help Text	24
Connecting parse_params to main	24
Hands-On Exercises	24
VM Mode and Minikube Management	25
lib/vm.sh	25
start_env — Starting Minikube	25
stop_env — Stopping Minikube	25
delete_env — Deleting Minikube	26
mount_folders — Sharing Code into the VM	26
Minikube Docker Environment	26
Hands-On Exercises	26
Docker Operations	27
lib/docker.sh	27
safe_docker — The Base Wrapper	27
safe_docker_build — Building Images	27
safe_docker_run — Running Containers	27
safe_docker_tag and safe_docker_push	28
Docker Compose Operations	28
docker_cleanup — Removing Dead Containers and Images	28
Hands-On Exercises	28
Kubernetes with kubectl	29
lib/kubectl.sh	29
safe_kubectl — The Base Wrapper	29
kubectl_install_resource_from_file	29
kubectl_install_database — PostgreSQL Setup	29
kubectl_delete — Pod Reload Pattern	30
DNS Management	30
Deleting All Pods	30
Hands-On Exercises	30
Helm: Package Management for Kubernetes	31
lib/helm.sh	31
safe_helm — The Base Wrapper	31
Helm Charts in k8s/	31
helm_install_service — Generic Service Installer	31
helm_install_core_service — Template-Based Services	32
Install Config Releases	32
Update Functions — Upgrades Without Reinstall	32
Consul and Traefik	32

CONTENTS

Hands-On Exercises	32
Building Services	33
The Build Pipeline	33
lib/build.sh	33
build_service — The Core Build Function	33
Service Group Functions	34
build_images_init — The Build Dispatcher	34
lib/install_deps.sh	34
check_registry	34
Hands-On Exercises	35
Provisions from Scratch	36
The Full Provisioning Sequence	36
Step by Step	36
Supporting Functions	38
Kubernetes Cluster Parameters	39
Hands-On Exercises	39
Reload and Recovery Operations	40
lib/reload_services.sh	40
reload_services — Lightweight Service Refresh	40
reload_services_init — The Reload Dispatcher	40
lib/reload_kubernetes.sh	40
reload_all_kubernetes — Full Cluster Rebuild	40
Consul Updates	41
Hands-On Exercises	41
Teardown and Cleanup	42
Stopping the Environment	42
Deleting the Environment	42
Full Kubernetes Teardown	42
Docker Cleanup	42
The Exit Handler: Complete Version	43
Putting the Complete Script Together	43
The Full init Function	43
The Complete Lifecycle	43
Hands-On Exercises	43
Appendix: datacenter.sh Command Reference	44
setup.sh	44
datacenter.sh	44
Exit Codes	45
Chainable vs Non-Chainable Parameters	45

CONTENTS

Common Workflows 45

Glossary 46

Introduction: Gluing Kubernetes Together with Bash

In this chapter we will lay the foundation for a script that manages a complete Kubernetes cluster from the ground up. By the end of the book, that script will be able to install, provision, reload, and tear down an entire Kubernetes environment with a single command.

Before we write any Kubernetes-specific logic, we need to understand the tool we will use to build it: Bash.

Prerequisites

The exercises in this book require the following tools to be installed on your machine:

- **Docker** — docker.com/get-started
- **kubectl** — kubernetes.io/docs/tasks/tools
- **Helm** — helm.sh/docs/intro/install
- **Minikube** — minikube.sigs.k8s.io/docs/start

On macOS, all four can be installed via Homebrew. On Linux, follow the official installation guides. The chapters that use these tools reference them by name. Install them before working through the hands-on exercises.

Why Bash?

Kubernetes deployments involve many moving parts — container builds, cluster configuration, DNS setup, Helm chart installations, database bootstrapping, and service reloads. Doing any of this manually is error-prone and slow. A shell script turns that checklist into a single repeatable command.

We choose Bash specifically because:

- It runs on every Linux server and macOS machine without installation.
- It can orchestrate other tools (`kubectl`, `helm`, `docker`, `minikube`) by calling them directly.
- It is the lingua franca of DevOps automation.

The disadvantage of relying on manual commands is that you must remember every step in the correct order, every time. A script remembers for you. When your cluster grows to span multiple datacenters, the script scales with it.

I've run Kubernetes in production since 2018 — six years of clusters, deployments, and the hard-won knowledge that comes from keeping them alive. This book is the script I wish I'd had on day one.

What We Are Building

The script we build across this book is called `datacenter.sh`. It is a single self-contained management script that can:

- Provision a Kubernetes cluster from bare metal.
- Build and push Docker images.
- Install Helm releases.
- Manage a Minikube virtual machine for local development.
- Reload services after code changes.
- Tear down and clean up an environment completely.

It works in two modes:

- **VM mode** (`--vm-mode`): Runs against a local Minikube cluster inside a virtual machine. Useful for development.
- **Datacenter mode** (default): Runs against a real server. Used in staging and production.

The Entry Point: `setup.sh`

We start with a thin entry point called `setup.sh`. Its only job is to call `datacenter.sh` with a sensible default mode.

```
1 #!/usr/bin/env bash
2
3 exec ./datacenter.sh --vm-mode "${@-}"
```

This is three lines, but each one matters.

The Shebang Line

```
1 #!/usr/bin/env bash
```

The first line of any shell script is the shebang. The `#!` characters tell the operating system which interpreter to use to run the file. We pass the interpreter path after it.

Rather than hardcoding `/bin/bash`, we call `/usr/bin/env bash`. The `env` command searches the user's `$PATH` for the first `bash` it finds. On some systems `bash` lives at `/usr/local/bin/bash` (a newer version installed by Homebrew, for example). Using `env` picks up that version automatically.

`sh` is an alternative you will see in older scripts. It is a POSIX-compliant shell, which means it runs on any Unix system. However, `sh` does not support many of the Bash features we use throughout this book — arrays, `[[]]` syntax, `readonly`, and more. On modern Linux systems `sh` is usually `dash`, not `bash`, and they are not interchangeable. We use `bash` throughout.

Delegating with `exec`

```
1 exec ./datacenter.sh --vm-mode "${@-}"
```

`exec` replaces the current shell process with the command that follows. Instead of `setup.sh` spawning a child process that runs `datacenter.sh`, the calling process *becomes* `datacenter.sh`. This avoids an extra process in the process table and means the exit code of `datacenter.sh` is returned directly to whoever called `setup.sh`.

`"${@-}"` passes all arguments given to `setup.sh` through to `datacenter.sh`. The `@` variable holds all positional parameters as separate words. The `-` suffix is a safety net: if `$@` is unset, the substitution produces nothing rather than causing an error. You will see this pattern throughout the script.

The `--vm-mode` flag is the default we inject. Any user-provided arguments follow it. This means `./setup.sh --install` becomes `./datacenter.sh --vm-mode --install`.

Minikube and VM Mode

Minikube runs a single-node Kubernetes cluster inside a virtual machine on your laptop. It uses VirtualBox (or another hypervisor) to create an isolated environment that closely mirrors a real cluster.

The advantages of Minikube for development are:

- You get a real Kubernetes API without needing cloud infrastructure.
- Changes deploy in seconds instead of minutes.
- You can reset the VM to a previous state when something goes wrong.
- Nothing is installed on your host machine beyond the VM image.

We call this the `virtual-machine` server in contrast to a `datacenter` server — a real machine in a staging or production environment. The script handles both modes. The `--vm-mode` flag tells it which one it is operating against.

Starting datacenter.sh

Now we create `datacenter.sh`. We will build it up piece by piece throughout the book. Every chapter adds a new capability. By the final chapter the script will be complete.

Here is the skeleton we start from:

```
1  #!/usr/bin/env bash
2
3  set -o errexit
4  set -o errtrace
5  set -o nounset
6  set -o pipefail
7  # set -o xtrace
8
9  main() {
10     # everything is called from here
11     :
12 }
13
14 main "$@"
```

The `set` options at the top and the `main "$@"` pattern at the bottom are the two structural anchors of the script. We discuss the `set` options in detail in the next chapter. For now, understand that they turn the script from a sequence of commands that silently ignores errors into a program that fails loudly and exits immediately when something goes wrong.

The call `main "$@"` at the last line passes all arguments the user typed to the `main` function. Putting it at the bottom of the file means all function definitions are parsed before `main` runs — Bash does not require functions to be declared before they are called, but the definition must exist in the file before execution reaches it.

Hands-On Exercises

Exercise 1.1 — Run `setup.sh`

Create both files and make them executable:

```
1 touch setup.sh datacenter.sh
2 chmod +x setup.sh datacenter.sh
```

Add the shebang and `exec` line to `setup.sh`. Run it and observe that `exec` replaces the shell:

```
1 ./setup.sh
```

Exercise 1.2 — Observe exec vs subprocess

Replace `exec ./datacenter.sh` with `./datacenter.sh` (without `exec`). Open a second terminal and run `ps aux | grep datacenter` while the script is running. You will see two processes. Restore `exec` and repeat the experiment. With `exec`, only one process exists.

Exercise 1.3 — Test argument forwarding

Add `echo "Arguments: $*" as the first line of datacenter.sh's main function. Run:`

```
1 ./setup.sh --install --verbose
```

Verify the output shows `--vm-mode --install --verbose`.

Safety Settings, Initialization, and Lifecycle Hooks

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Global Set Options

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

errexit — Exit on Most Errors

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

errtrace — Inherit Error Traps

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

nounset — Disallow Unset Variables

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

pipefail — Capture Failures in Pipelines

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

xtrace — Debugging (Commented Out)

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Script Initialization

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

readonly — Immutable Variables

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

orig_cwd — Current Working Directory

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

script_path — Full Script Path

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

script_dir and script_name

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

script_params — All Arguments as a String

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Main Controller

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Error Handler

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Default Exit Code

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Disable the Trap Inside the Handler

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Disable Error Options Inside the Handler

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Validate the Exit Code

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Exit Handler

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Putting It Together

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Exit Codes and Controlled Exits

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The script_exit Function

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Printing a Message

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Adding an Exit Code

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Exit Code Conventions

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Bash Safety Patterns in Review

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Double Square Brackets

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Curly Brace Expansion

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The `=~` Operator and Regular Expressions

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Special Positional Variables

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

local — Function-Scoped Variables

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Updated Script

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Cron Mode and IO Redirection

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

What Cron Mode Does

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

File Descriptors

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Redirecting for Cron Mode

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Creating a Temporary File

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Redirection Chain

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Updating the Error Handler

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Restoring the Terminal

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Diagnostic Output

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Printing the Log

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Updating the Exit Handler

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Registering cron_init in main

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Updated Script

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Library Pattern: Organizing a Bash Codebase

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The lib/ Directory

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Loading Libraries in main

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Path Resolution

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

source — Loading Without a Subprocess

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Writing a Library File

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Naming Conventions

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Dependency Graph

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Two Utility Libraries Worth Knowing Now

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/repos.sh — Repository Location

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/superuser.sh — Privilege Escalation

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Terminal Colors and Logging

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Logging Library

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Colour Initialization

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

tput — Querying Terminal Capabilities

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

ta_none — The Reset Escape Sequence

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Foreground and Background Colors

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Text Attributes

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The `-no-colour` Branch

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The `log` Function

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

`verbose_print` — Verbose Mode Output

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Updating `init`

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Updating `main`

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Updating the Error Handler

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Validation Helpers and Binary Checks

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/script.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

check_binary — Required Tool Detection

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

check_required_binaries — System Preconditions

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

vm_mode — Mode Detection

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

check_arguments — Variable Presence Validation

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

check_directories — Path Validation

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

check_files — File Presence Validation

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

check_repos — Repository Presence Guard

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

build_path — PATH Construction

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Using the Helpers in the init Chain

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Configuration Management

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Configuration File

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/config.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

get_configurations — Interactive Setup

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

read — Capturing User Input

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

select — Menu-Driven Input

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Writing the Configuration File

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Reading Configuration in main

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

source — Loading Another Script's Variables

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Promoting to Read-Only Globals

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Docker Network Modes

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Script Locking: Preventing Concurrent Runs

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Why a Directory, Not a File

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lock_init

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Lock Types

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Acquiring the Lock

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Releasing the Lock

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Using lock_init in main

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Stale Lock Handling

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Complete Parameter Parsing

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

parse_params

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The while Loop and shift

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Flags vs Value Parameters

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Immediate-Execute Parameters

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Chainable Parameters

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The cleanup Flag

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Backwards-Compatible Positional Arguments

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

script_usage — The Help Text

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Here Documents

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Connecting parse_params to main

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

VM Mode and Minikube Management

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/vm.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

start_env — Starting Minikube

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

minikube start

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Volume Mounting

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

configure_registry

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

stop_env — Stopping Minikube

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

delete_env — Deleting Minikube

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

mount_folders — Sharing Code into the VM

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Background Processes with &

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

mk_mount_fix.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Minikube Docker Environment

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Docker Operations

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/docker.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

safe_docker — The Base Wrapper

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

safe_docker_build — Building Images

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

safe_docker_run — Running Containers

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Volume Mounts

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Environment Variables

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

safe_docker_tag and safe_docker_push

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Docker Compose Operations

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

docker_compose_up — Starting External Services

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

docker_compose_down — Stopping External Services

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

docker_cleanup — Removing Dead Containers and Images

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Kubernetes with kubectl

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/kubectl.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

safe_kubectl — The Base Wrapper

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

kubectl_install_resource_from_file

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

kubectl_install_database — PostgreSQL Setup

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Waiting for Pods with jsonpath

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Executing Commands in Pods

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Creating ConfigMaps with Multiple Files

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

kubectl_delete — Pod Reload Pattern

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

DNS Management

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Deleting All Pods

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Helm: Package Management for Kubernetes

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/helm.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

safe_helm — The Base Wrapper

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Helm Charts in k8s/

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

helm_install_service — Generic Service Installer

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Dynamic Command Construction

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

eval — Dynamic Execution

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

-set — Injecting Values at Install Time

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

-wait — Synchronous Installation

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

helm_install_core_service — Template-Based Services

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Install Config Releases

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Update Functions — Upgrades Without Reinstall

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Consul and Traefik

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Building Services

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Build Pipeline

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/build.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

build_service — The Core Build Function

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Resolving the Registry IP

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Image Tagging Strategy

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Build Arguments

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Service Group Functions

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

build_images_init — The Build Dispatcher

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Comma-Separated Arguments

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Dynamic Function Calls

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/install_deps.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Docker-Based Build Isolation

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Go Module Cache

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

check_registry

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Provisions from Scratch

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Full Provisioning Sequence

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step by Step

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 1 — Pull Base Images

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 2 — Build Router

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 3 — Mount Volumes (VM Mode Only)

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 4 — Create the Namespace

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 5 — Install the Registry

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 6 — Build All Service Images

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 7 — Install the Database

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 8 — Install Go Dependencies

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 9 — Build the Frontend

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 10 — Create Service Account

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 11 — Start External Services

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 12 — Configure DNS

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 13 — Storage (VM Mode Only)

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 14 — Deploy Configurations

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 15 — Deploy Application Services

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 16 — Namespace Services

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Step 17 — Configure the Registry

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Supporting Functions

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

build_bff — Frontend Build

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

helm_install_consul — Service Discovery

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

helm_install_volume — Persistent Storage

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

helm_install_webapp_service — Frontend Deployment

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

install_kubernetes_service — Registry Bootstrap

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Kubernetes Cluster Parameters

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Reload and Recovery Operations

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/reload_services.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

reload_services — Lightweight Service Refresh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

What Reload Does

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

reload_services_init — The Reload Dispatcher

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

lib/reload_kubernetes.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

reload_all_kubernetes — Full Cluster Rebuild

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Restarting the Kubernetes System Service

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Deleting All Pods and Services

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Nginx Configuration Update

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Cleaning Up Go Package Data

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Consul Updates

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Teardown and Cleanup

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Stopping the Environment

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Deleting the Environment

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Full Kubernetes Teardown

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Docker Cleanup

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

What Gets Removed

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Guard Pattern

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Exit Handler: Complete Version

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Putting the Complete Script Together

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Full init Function

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

The Complete Lifecycle

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Hands-On Exercises

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Appendix: datacenter.sh Command Reference

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

setup.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

datacenter.sh

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Global Flags

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Installation

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Building

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Reloading

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

VM Lifecycle (requires --vm-mode)

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Exit Codes

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Chainable vs Non-Chainable Parameters

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Common Workflows

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.

Glossary

This content is not available in the sample book. The book can be purchased on Leanpub at <https://leanpub.com/k8s4all>.