Chapter 1: Docker Overview

App #1	App #2	App #3

Binaries / Libaries

Operating System

Hardware and Infrastructure

Dedicated Machines

App #1	App #2	App #3
Binaries / Libaries	Binaries / Libaries	Binaries / Libaries
Guest OS	Guest OS	Guest OS

Hypervisor

Host Operating System

Hardware and Infrastructure

Virtual Machines

App #1	App #2	App #3
Binaries / Libaries	Binaries / Libaries	Binaries / Libaries

Docker

Operating System

Hardware and Infrastructure
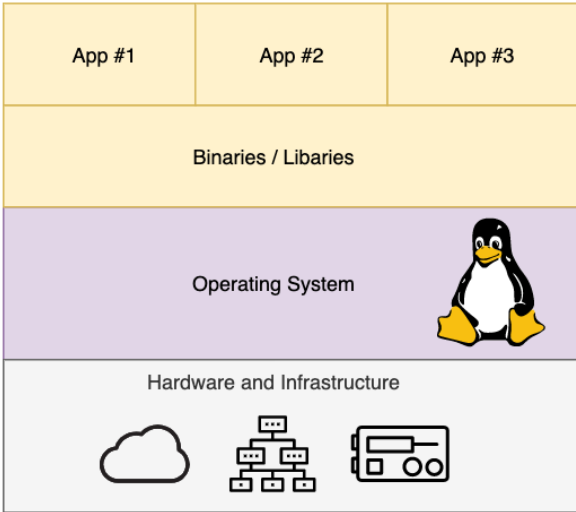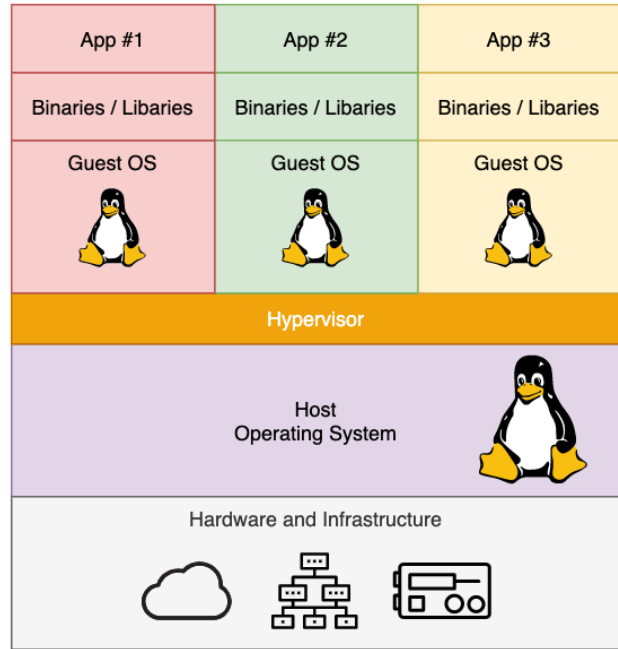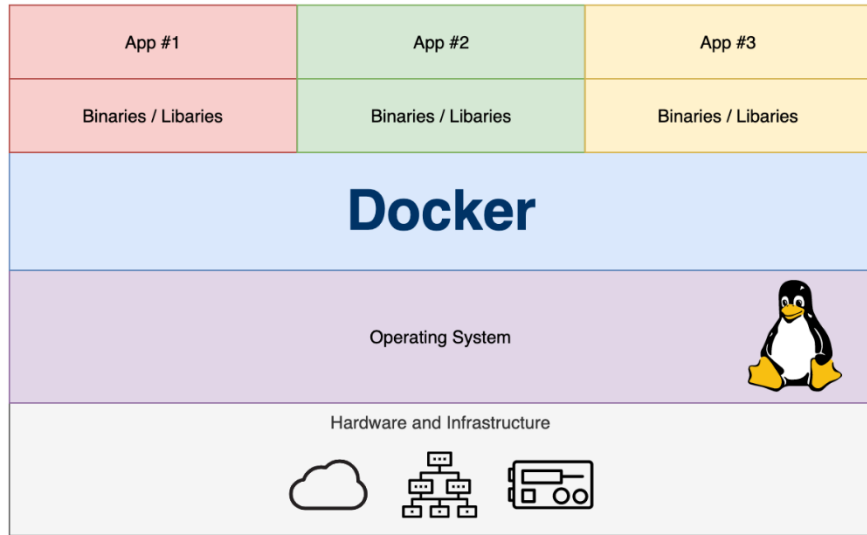
Conatiners

```
ubuntu@primary:~$ docker version
Client: Docker Engine - Community
 Version:           19.03.7
 API version:       1.40
 Go version:        go1.12.17
 Git commit:        7141c199a2
 Built:             Wed Mar  4 01:22:36 2020
 OS/Arch:           linux/amd64
 Experimental:      false

Server: Docker Engine - Community
 Engine:
  Version:          19.03.7
  API version:      1.40 (minimum version 1.12)
  Go version:       go1.12.17
  Git commit:       7141c199a2
  Built:            Wed Mar  4 01:21:08 2020
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.2.13
  GitCommit:        7ad184331fa3e55e52b890ea95e65ba581ae3429
 runc:
  Version:          1.0.0-rc10
  GitCommit:        dc9208a3303feef5b3839f4323d9beb36df0a9dd
 docker-init:
  Version:          0.18.0
  GitCommit:        fec3683
ubuntu@primary:~$
```
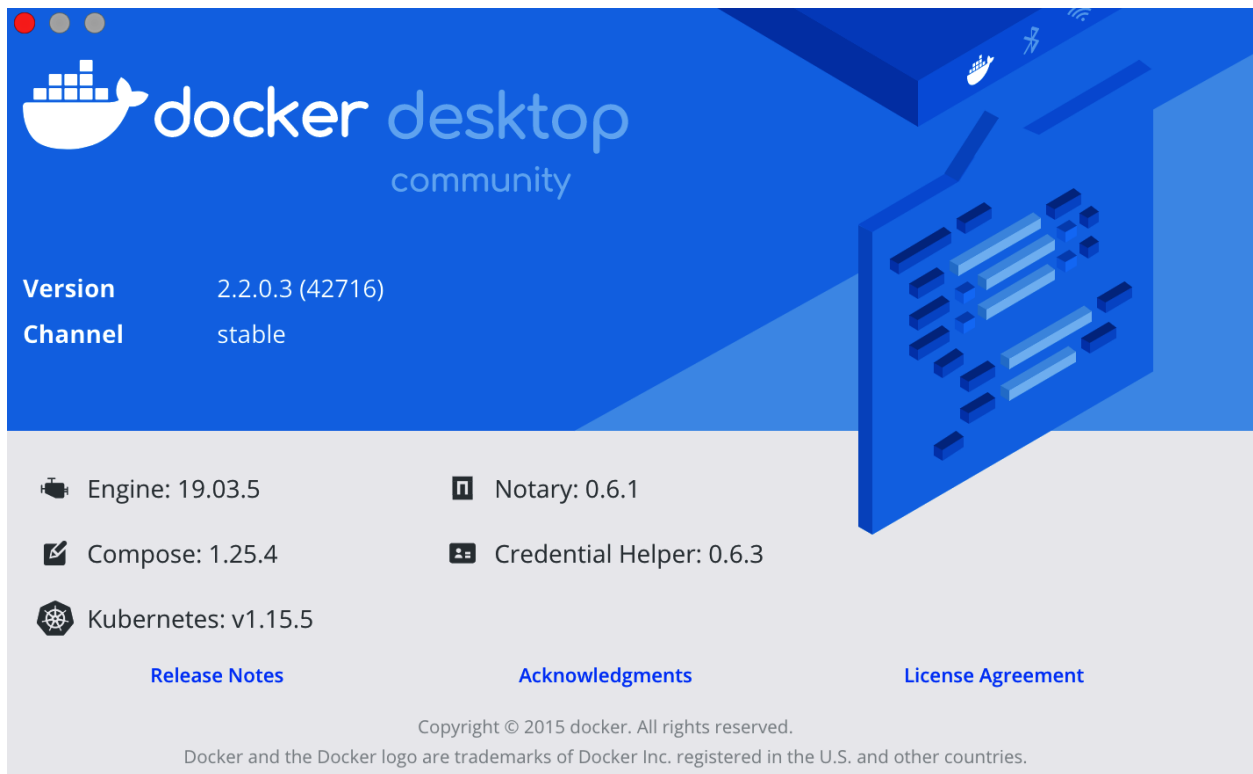
drag and drop

Docker → Applications
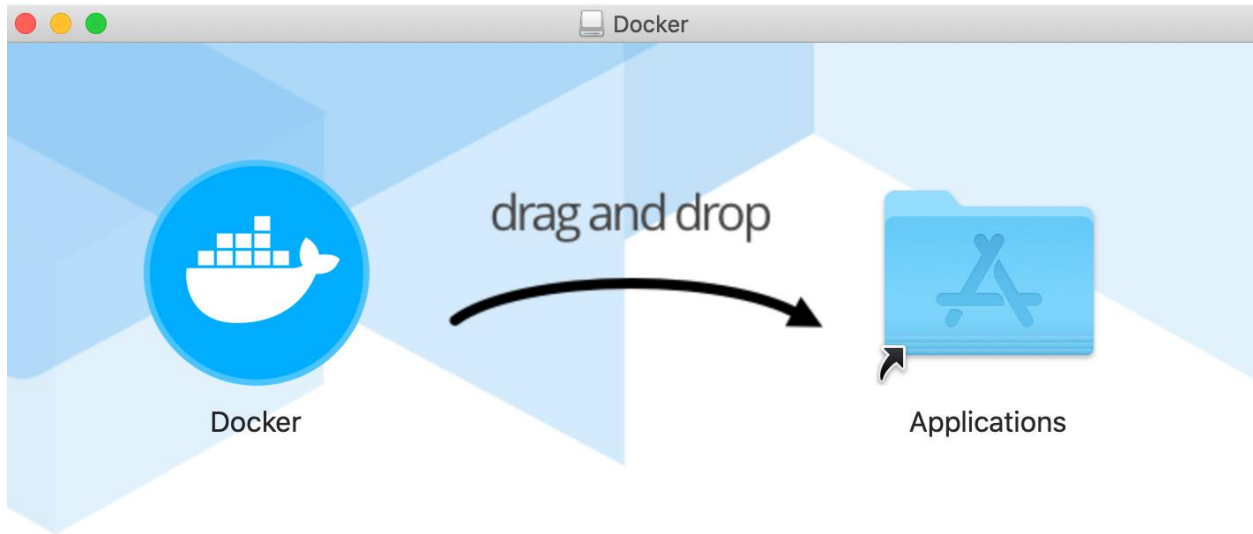
Docker Desktop needs privileged access.

Docker Desktop needs privileged access to install its networking components and links to the Docker apps.

You will be asked for your password.

Exit   OK

Version 2.2.0.3 (42716)

Channel stable

Engine: 19.03.5

Compose: 1.25.4

Kubernetes: v1.15.5

Notary: 0.6.1

Credential Helper: 0.6.3

Release Notes   Acknowledgments   License Agreement

Installing Docker Desktop

Configuration

☑ Enable required Windows Features

☑ Add shortcut to desktop

☐ Use Windows containers instead of Linux containers (this can be changed after installation)

Ok

Installing Docker Desktop

Docker Desktop 2.2.0.3

Unpacking files...

Unpacking file: resources/docker-desktop.iso
Unpacking file: resources/ddvp.ico
Unpacking file: resources/config-options.json
Unpacking file: resources/concrt140.dll
Unpacking file: resources/componentsVersion.json
Unpacking file: resources/com.docker.wsl-distro-proxy.exe
Unpacking file: resources/com.docker.proxy.exe
Unpacking file: resources/com.docker.localhost-forwarder.exe
Unpacking file: resources/com.docker.license.exe
Unpacking file: resources/com.docker.isowrap.exe
Unpacking file: resources/com.docker.diagnose.exe
Unpacking file: resources/com.docker.backend.exe
Unpacking file: resources/cli-plugins/docker-buildx.exe
Unpacking file: resources/cli-plugins/docker-app.exe

Installing Docker Desktop

Docker Desktop 2.2.0.3

Installation succeeded

You must restart Windows to complete installation.

Close and restart

docker desktop

community

Version	2.2.0.3 (42716)
Channel	stable

Engine: 19.03.5

Compose: 1.25.4

Kubernetes: v1.15.5

Notary: 0.6.1

Credential Helper: 0.6.3

Release Notes   Acknowledgments   License Agreement

```
PS C:\Users\russ> docker version
Client: Docker Engine - Community
 Version:           19.03.5
 API version:       1.40
 Go version:        go1.12.12
 Git commit:        633a0ea
 Built:             Wed Nov 13 07:22:37 2019
 OS/Arch:           windows/amd64
 Experimental:      false

Server: Docker Engine - Community
 Engine:
  Version:          19.03.5
  API version:      1.40 (minimum version 1.12)
  Go version:       go1.12.12
  Git commit:       633a0ea
  Built:            Wed Nov 13 07:29:19 2019
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          v1.2.10
  GitCommit:        b34a5c8af56e510852c35414db4c1f4fa6172339
 runc:
  Version:          1.0.0-rc8+dev
  GitCommit:        3e425f80a8c931f88e6d94a8c831b9d5aa481657
 docker-init:
  Version:          0.18.0
  GitCommit:        fec3683
PS C:\Users\russ>
```

```
 ~    docker container run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
1b930d010525: Pull complete
Digest: sha256:fc6a51919cfeb2e6763f62b6d9e8815acbf7cd2e476ea353743570610737b752
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/

 ~
```

```
ubuntu@primary:~$ docker image pull nginx
Using default tag: latest
latest: Pulling from library/nginx
68ced04f60ab: Pull complete
28252775b295: Pull complete
a616aa3b0bf2: Pull complete
Digest: sha256:2539d4344dd18e1df02be842ffc435f8e1f699cfc55516e2cf2cb16b7a9aea0b
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
ubuntu@primary:~$ docker container run -d --name nginx-test -p 8080:80 nginx
1e63e5da50ecf2a5f7f854d013e7bdb7c75b605c7bfa7a2fa8f1abf1e7c1822a
ubuntu@primary:~$
```

192.168.64.2

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

```
       docker image pull nginx
Using default tag: latest
latest: Pulling from library/nginx
68ced04f60ab: Pull complete
28252775b295: Pull complete
a616aa3b0bf2: Pull complete
Digest: sha256:2539d4344dd18e1df02be842ffc435f8e1f699cfc55516e2cf2cb16b7a9aea0b
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
       docker container run -d --name nginx-test -p 8080:80 nginx
6e6a775348b9b9f497e825276686dd649a3d387cf18c6db07d5329fd084b8425
```

localhost

Welcome to nginx!

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PS C:\Users\russ> docker image pull nginx
Using default tag: latest
latest: Pulling from library/nginx
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28252775b295: Pull complete
a616aa3b0bf2: Pull complete
Digest: sha256:2539d4344dd18e1df02be842ffc435f8e1f699cfc55516e2cf2cb16b7a9aea0b
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
PS C:\Users\russ> docker container run -d --name nginx-test -p 8080:80 nginx
a1bd347a5d534b5d49c3b4fedaed1562358fdef26c09bd5b2f68aad15949b971
PS C:\Users\russ>
```

← → ↻   ⓘ localhost:8080   ☆   ★☰   👤   …

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

# Chapter 2: Building Container Images

```
russ.mckendrick@russs-mbp: ~                          ⌥⌘1
~    docker image ls
REPOSITORY      TAG         IMAGE ID        CREATED         SIZE
debian          latest      971452c94376    2 weeks ago     114MB
ubuntu          latest      72300a873c2c    3 weeks ago     64.2MB
fedora          latest      536f3995adeb    3 weeks ago     193MB
alpine          latest      e7d92cdc71fe    8 weeks ago     5.59MB
centos          latest      470671670cac    8 weeks ago     237MB
~
```

```
russ.mckendrick@russs-mbp: ~                          ⌥⌘1
~    docker image inspect -f {{.Config.Labels}} 470671670cac
map[org.label-schema.build-date:20200114 org.label-schema.license:GPLv2 org.label-schema.name:CentOS
 Base Image org.label-schema.schema-version:1.0 org.label-schema.vendor:CentOS org.opencontainers.im
age.created:2020-01-14 00:00:00-08:00 org.opencontainers.image.licenses:GPL-2.0-only org.opencontain
ers.image.title:CentOS Base Image org.opencontainers.image.vendor:CentOS]
~
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master    docker i
mage build --tag local:dockerfile-example .
Sending build context to Docker daemon  64.51kB
Step 1/10 : FROM alpine:latest
 ---> e7d92cdc71fe
Step 2/10 : LABEL maintainer="Russ McKendrick <russ@mckendrick.io>"
 ---> Running in 1d5f25b804dc
Removing intermediate container 1d5f25b804dc
 ---> d1405398fc6e
Step 3/10 : LABEL description="This example Dockerfile installs NGINX."
 ---> Running in c28a7c63654c
Removing intermediate container c28a7c63654c
 ---> da3fb10a7142
Step 4/10 : RUN apk add --update nginx &&           rm -rf /var/cache/apk/* &&          mkdir -p /tmp/n
ginx/
 ---> Running in a854d5e0efd7
fetch http://dl-cdn.alpinelinux.org/alpine/v3.11/main/x86_64/APKINDEX.tar.gz
fetch http://dl-cdn.alpinelinux.org/alpine/v3.11/community/x86_64/APKINDEX.tar.gz
(1/2) Installing pcre (8.43-r0)
(2/2) Installing nginx (1.16.1-r6)
Executing nginx-1.16.1-r6.pre-install
Executing busybox-1.31.1-r9.trigger
OK: 7 MiB in 16 packages
Removing intermediate container a854d5e0efd7
 ---> 989afd33cfda
Step 5/10 : COPY files/nginx.conf /etc/nginx/nginx.conf
 ---> 5ff3241525f6
Step 6/10 : COPY files/default.conf /etc/nginx/conf.d/default.conf
 ---> 2adc624a83b9
Step 7/10 : ADD files/html.tar.gz /usr/share/nginx/
 ---> 290b5677eadb
Step 8/10 : EXPOSE 80/tcp
 ---> Running in 53e377a6e8ee
Removing intermediate container 53e377a6e8ee
 ---> 61f14f04369a
Step 9/10 : ENTRYPOINT ["nginx"]
 ---> Running in 501d5d2437b4
Removing intermediate container 501d5d2437b4
 ---> bb9f0181209b
Step 10/10 : CMD ["-g", "daemon off;"]
 ---> Running in 4461bc866a98
Removing intermediate container 4461bc866a98
 ---> 91f06a2eff29
Successfully built 91f06a2eff29
Successfully tagged local:dockerfile-example
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master    clear
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master    docker i
mage ls
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
local               dockerfile-example  91f06a2eff29        About a minute ago  7.15MB
alpine              latest              e7d92cdc71fe        8 weeks ago         5.59MB
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master
```
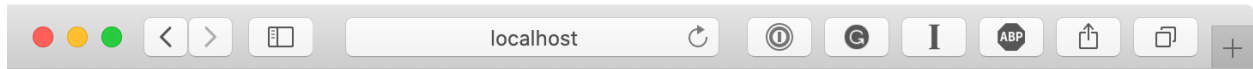
Hello world! This is being served from Docker.

```
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master   docker c
ontainer run --name nginx-version local:dockerfile-example -v
nginx version: nginx/1.16.1
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master
```

```
✗   ~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master   dock
er image inspect -f {{.Config.Labels}} local:dockerfile-example
map[description:This example Dockerfile installs NGINX. maintainer:Russ McKendrick <russ@mckendrick.
io>]
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master   docker c
ontainer run -it --name alpine-test alpine /bin/sh
/ # apk update
fetch http://dl-cdn.alpinelinux.org/alpine/v3.11/main/x86_64/APKINDEX.tar.gz
fetch http://dl-cdn.alpinelinux.org/alpine/v3.11/community/x86_64/APKINDEX.tar.gz
v3.11.3-120-g02b0001e98 [http://dl-cdn.alpinelinux.org/alpine/v3.11/main]
v3.11.3-125-gd257bf8630 [http://dl-cdn.alpinelinux.org/alpine/v3.11/community]
OK: 11268 distinct packages available
/ # apk upgrade
(1/3) Upgrading musl (1.1.24-r0 -> 1.1.24-r1)
(2/3) Upgrading ca-certificates-cacert (20191127-r0 -> 20191127-r1)
(3/3) Upgrading musl-utils (1.1.24-r0 -> 1.1.24-r1)
Executing busybox-1.31.1-r9.trigger
OK: 6 MiB in 14 packages
/ # apk add --update nginx
(1/2) Installing pcre (8.43-r0)
(2/2) Installing nginx (1.16.1-r6)
Executing nginx-1.16.1-r6.pre-install
Executing busybox-1.31.1-r9.trigger
OK: 7 MiB in 16 packages
/ # rm -rf /var/cache/apk/*
/ # mkdir -p /tmp/nginx/
/ # exit
~/Documents/Code/mastering-docker-fourth-edition/chapter02/dockerfile-example    master
```

```
~/broken-container      tree
.
├── 48ab3fa2c689ed19bae3c9beae20b5cca6e331f601a96a0a107df44c3251f4af
│   ├── VERSION
│   ├── json
│   └── layer.tar
├── 65815aef5a8f47a9befb22e35a3fbe9b787cc279fb066ef2e0951d7a21d70c18.json
├── eed47cd99d735b165a3c790be12592ae3f644e612fa4315bae7a0019a8ae4b28
│   ├── VERSION
│   ├── json
│   └── layer.tar
├── manifest.json
└── repositories

2 directories, 9 files
~/broken-container
```
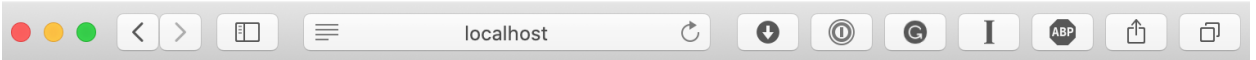
```
~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example  master  docker imag
e build --tag local:fromscratch .
Sending build context to Docker daemon  2.727MB
Step 1/3 : FROM scratch
 --->
Step 2/3 : ADD files/alpine-minirootfs-3.11.3-x86_64.tar.gz /
 ---> f76e2d276f75
Step 3/3 : CMD ["/bin/sh"]
 ---> Running in b09f5049a40d
Removing intermediate container b09f5049a40d
 ---> 28eca678b6d9
Successfully built 28eca678b6d9
Successfully tagged local:fromscratch
~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example  master
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example  master  docker imag
e ls
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
local               fromscratch         28eca678b6d9        40 seconds ago      5.59MB
local               broken-container    65815aef5a8f        52 minutes ago      7.95MB
local               dockerfile-example  91f06a2eff29        About an hour ago   7.15MB
alpine              latest              e7d92cdc71fe        8 weeks ago         5.59MB
~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example  master
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example      master   docker cont
ainer run -it --name alpine-test local:fromscratch /bin/sh
/ # cat /etc/*release
3.11.3
NAME="Alpine Linux"
ID=alpine
VERSION_ID=3.11.3
PRETTY_NAME="Alpine Linux v3.11"
HOME_URL="https://alpinelinux.org/"
BUG_REPORT_URL="https://bugs.alpinelinux.org/"
/ #
```
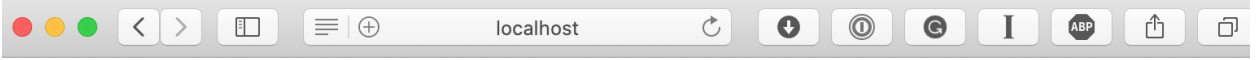
localhost

PHP Version 7.2.26

System	Linux ef25b1e22aa9 4.19.76-linuxkit #1 SMP Thu Oct 17 19:31:58 UTC 2019 x86_64
Build Date	Dec 22 2019 06:01:05
Configure Command	'./configure' '--build=x86_64-alpine-linux-musl' '--host=x86_64-alpine-linux-musl' '--prefix=/usr' '--program-suffix=7' '--libdir=/usr/lib/php7' '--datadir=/usr/share/php7' '--sysconfdir=/etc/php7' '--localstatedir=/var' '--with-layout=GNU' '--with-pic' '--with-pear=/usr/share/php7' '--with-config-file-path=/etc/php7' '--with-config-file-scan-dir=/etc/php7/conf.d' '--disable-short-tags' '--enable-bcmath=shared' '--with-bz2=shared' '--enable-calendar=shared' '--enable-ctype=shared' '--with-curl=shared' '--enable-dba=shared' '--with-db4' '--with-dbmaker=shared' '--with-gdbm' '--enable-dom=shared' '--with-enchant=shared' '--enable-exif=shared' '--enable-fileinfo=shared' '--enable-ftp=shared' '--with-gd=shared' '--with-freetype-dir=/usr' '--disable-gd-jis-conv' '--with-jpeg-dir=/usr' '--with-png-dir=/usr' '--with-webp-dir=/usr' '--with-xpm-dir=/usr' '--with-gettext=shared' '--with-gmp=shared' '--with-iconv=shared' '--with-imap=shared' '--with-imap-ssl' '--with-icu-dir=/usr' '--enable-intl=shared' '--enable-json=shared' '--with-kerberos' '--with-ldap=shared' '--with-ldap-sasl' '--with-libedit' '--enable-libxml' '--with-libxml-dir=/usr' '--enable-mbstring=shared' '--with-mysqli=shared,mysqlnd' '--with-mysql-sock=/run/mysqld/mysqld.sock' '--enable-mysqlnd=shared' '--enable-opcache=shared' '--with-openssl=shared' '--with-system-ciphers' '--enable-pcntl=shared' '--with-pcre-regex=/usr' '--enable-pdo=shared' '--with-pdo-dblib=shared' '--with-pdo-mysql=shared,mysqlnd' '--with-pdo-odbc=shared,unixODBC,/usr' '--with-pdo-pgsql=shared' '--with-pdo-sqlite=shared,/usr' '--with-pgsql=shared' '--

localhost

PHP Version 5.6.40

System	Linux b0c5d50eaa80 4.19.76-linuxkit #1 SMP Thu Oct 17 19:31:58 UTC 2019 x86_64
Build Date	Jan 17 2019 00:01:41
Configure Command	/home/buildozer/aports/community/php5/src/php-5.6.40/configure '--build=x86_64-alpine-linux-musl' '--host=x86_64-alpine-linux-musl' '--prefix=/usr' '--sysconfdir=/etc/php5' '--localstatedir=/var' '--with-layout=GNU' '--with-config-file-path=/etc/php5' '--with-config-file-scan-dir=/etc/php5/conf.d' '--enable-inline-optimization' '--disable-debug' '--disable-rpath' '--disable-static' '--enable-shared' '--mandir=/usr/share/man' '--with-pic' '--program-suffix=5' '--disable-cli' '--with-apxs2' '--enable-bcmath=shared' '--with-bz2=shared' '--enable-calendar=shared' '--with-cdb' '--enable-ctype=shared' '--with-curl=shared' '--enable-dba=shared' '--with-db4=shared' '--enable-dom=shared' '--with-enchant=shared' '--enable-exif=shared' '--with-freetype-dir=shared,/usr' '--enable-ftp=shared' '--with-gd=shared' '--enable-gd-native-ttf' '--with-gdbm=shared' '--with-gettext=shared' '--with-gmp=shared' '--with-iconv=shared' '--with-icu-dir=/usr' '--with-imap=shared' '--with-imap-ssl=shared' '--enable-intl=shared' '--with-jpeg-dir=shared,/usr' '--enable-json=shared' '--with-ldap=shared' '--enable-libxml=shared' '--enable-mbregex' '--enable-mbstring=all' '--with-mcrypt=shared' '--with-mysql=shared,mysqlnd' '--with-mysql-sock=/var/run/mysqld/mysqld.sock' '--with-mysqli=shared,mysqlnd' '--with-openssl=shared' '--with-pcre-regex=/usr' '--enable-pcntl=shared' '--enable-pdo=shared' '--with-pdo-mysql=shared,mysqlnd' '--with-pdo-odbc=shared,unixODBC,/usr' '--with-pdo-pgsql=shared' '--with-pdo-sqlite=shared,/usr' '--with-pgsql=shared' '--enable-phar=shared' '--with-png-dir=shared,/usr' '--enable-

```
russ.mckendrick@russs-mbp: ~                    ⌥⌘1

~    docker image ls
REPOSITORY         TAG      IMAGE ID        CREATED          SIZE
local/apache-php   5        7471b75e789e    2 minutes ago    44.5MB
local/apache-php   7        966dcf5cafdf    7 minutes ago    21.2MB
alpine             3.8      c8bccc0af957    7 weeks ago      4.41MB
~
```

```
russ.mckendrick@russs-mbp: ~                    ⌥⌘1

~    docker image ls
REPOSITORY    TAG              IMAGE ID        CREATED          SIZE
local         go-hello-world   5e196ed7f699    3 minutes ago    7.41MB
<none>        <none>           502d219e6869    3 minutes ago    862MB
golang        latest           25c4671a1478    2 weeks ago      809MB
~
```

```
russ.mckendrick@russs-mbp: ~                    ⌥⌘1

~    docker container run -d -p 8000:80 --name go-hello-world local:go-hello-world
5abdff44774c3a7fc533236aed4680f9e748873964dd85a3bafa9d28def0ad95
~    curl http://localhost:8000/
Hello, world! You have called me 1 times.
~    curl http://localhost:8000/
Hello, world! You have called me 2 times.
~    curl http://localhost:8000/
Hello, world! You have called me 3 times.
```

Chapter 3: Storing and Distributing Images

docker hub   🔍 Search for great content (e.g., mysql)   Explore   Repositories   Organizations   Get Help ▾   russmckendrick

🐳 DOCKER EE   🐳 DOCKER CE   ◼ CONTAINERS   🧩 PLUGINS

Filters (1)   Clear All

1 - 21 of 21 available images.

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✕ Base Images

Docker Certified ⓘ

☐ ✅ Docker Certified

Images

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OFFICIAL IMAGE ⚙

ubuntu
Updated 33 minutes ago

10M+ Downloads   10K+ Stars

Ubuntu is a Debian-based Linux operating system based on free software.

Container   Linux   386   ARM 64   ARM   IBM Z   PowerPC 64 LE   x86-64   Base Images   Operating Systems

OFFICIAL IMAGE ⚙

alpine
Updated 33 minutes ago

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A minimal Docker image based on Alpine Linux with a complete package index and only 5 MB in size!

Container   Linux   386   IBM Z   x86-64   ARM 64   ARM   PowerPC 64 LE   Featured Images   Base Images   Operating Systems

OFFICIAL IMAGE ⚙

busybox
Updated 33 minutes ago

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Busybox base image.

Container   Linux   ARM   386   x86-64   PowerPC 64 LE   IBM Z   ARM 64   Base Images

---

docker hub   🔍 Search for great content (e.g., mysql)   Explore   Repositories   Organizations   Get Help ▾   russmckendrick

russmckendrick ▾   🔍 Search by repository name...   **Create Repository**

russmckendrick / **mobycounterapp**
Updated a month ago
☆ 0   ⬇ 20   🌐 PUBLIC

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⑂ **russmckendrick** / **Mastering-Docker-Fourth-Edition**

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forked from **PacktPublishing/Mastering-Docker-Fourth-Edition**

<> Code   ⑂ Pull requests 0   ▷ Actions   ▦ Projects 0   ▤ Wiki   ⛨ Security   ┝ Insights   ⚙ Settings

| Branch: master ▾ | | Create new file | Upload files | Find file | History |

Mastering-Docker-Fourth-Edition / **chapter02** / **dockerfile-example** /

This branch is even with PacktPublishing:master.   ⑂ Pull request   ⎘ Compare

🖼 **russmckendrick** Update ...   Latest commit b7fb5f3 1 hour ago

..

| 📁 files | Update | 1 hour ago |
| 📄 **Dockerfile** | Update | 1 hour ago |

Create Repository

| masteringdockerfouthedi.▾ | Name |

Description

Visibility

Using 0 of 0 private repositories. Get more

⦿ **Public** 🌐
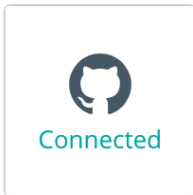Public repositories appear in Docker Hub search results

◯ **Private** 🔒
Only you can view private repositories

Build Settings (optional)

Autobuild triggers a new build with every **git push** to your source code repository. Learn More.

Connected   **Disconnected**

Cancel   Create   Create & Build

Create Repository

masteringdockerfouthedi. ▾	dockerfile-example

Testing an automated build

Visibility

Using 0 of 0 private repositories. <u>Get more</u>

● **Public** 🌐
Public repositories appear in Docker Hub search results

○ **Private** 🔒
Only you can view private repositories

Build Settings *(optional)*

Autobuild triggers a new build with every **git push** to your source code repository. <u>Learn More.</u>

Connected	Disconnected

russmckendrick ✕ ▾	Mastering-Docker-Fourth-Edition ✕ ▾

masteringdockerfouthedition / **dockerfile-example**

General Tags Builds Timeline Permissions Webhooks Settings

Repositories masteringdockerfouthedition / dockerfile-example

Using 0 of 0 private repositories. Get more

🌐 masteringdockerfouthedition / **dockerfile-example** **Docker commands** Public View

Testing an automated build ✏️

🕐 Last pushed: never

To push a new tag to this repository,

```
docker push masteringdockerfouthedition/dockerfile-
example:tagname
```

Tags
This repository is empty. When it's not empty, you'll see a list of the most recent tags here.

Recent builds
Repository never built. Click here to set up builds.

Readme ⓘ ✏️
Repository description is empty. Click here to edit.

REPOSITORY LINKS

○ Off
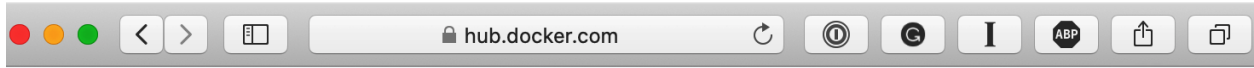
◉ Enable for Base Image ⓘ

BUILD RULES ✛

The build rules below specify how to build your source into Docker images.

Source Type	Source	Docker Tag	Dockerfile location	Build Context ⓘ	Autobuild	Build Caching
Branch	master	latest	./chapter02/dockerfi	./chapter02/dockerfi	🔵	🔵 🗑️

▶ View example build rules

BUILD ENVIRONMENT VARIABLES ✛
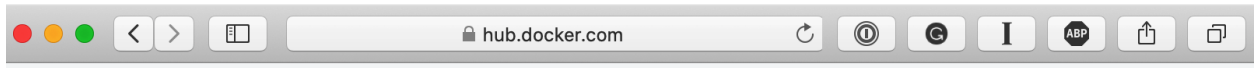
Delete   Cancel   Save   Save and Build

Automated Builds

Autobuild triggers a new build with every **git push** to your source code repository. Learn More.

russmckendrick/Mastering-Docker-Fourth-Edition | Use Docker Hub's infrastructure | Autotests: Off

Docker Tag	Source	Latest Build Status	Autobuild	Build caching	
latest	master		✓	✓	Trigger ▶

Automated Builds

Autobuild triggers a new build with every **git push** to your source code repository. Learn More.

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Docker Tag	Source	Latest Build Status	Autobuild	Build caching	
latest	master	**PENDING**	✓	✓	⟳

Browser window showing Docker Hub:

hub.docker.com

docker hub   Search for great content (e.g., mysql)   Explore   Repositories   Organizations   Get Help ▾   russmckendrick ▾

Repositories › masteringdockerfouthedition / dockerfile-example › Builds › Edit   ;ing 0 of 0 private repositories. Get more

General   Tags   **Builds**   Timeline   Permissions   Webhooks   Settings

🔄 **IN PROGRESS**   **Cancel**

NAME
Build in 'master:/chapter02/dockerfile-example' (b7fb5f3d)

TAG latest   CREATED 2 minutes ago ⓘ   USER russmckendrick

SOURCE   DURATION 1 min ⓘ
russmckendrick/Mastering-Docker-Fourth-Edition

BUILD LOGS   DOCKERFILE   README

```
Cloning into '.'...
Warning: Permanently added the RSA host key for IP address '140.82.112.3' to the list of known hosts.
Reset branch 'master'
Your branch is up-to-date with 'origin/master'.
KernelVersion: 4.4.0-1060-aws
Components: [{u'Version': u'18.03.1-ee-3', u'Name': u'Engine', u'Details':
u'4.4.0-1060-aws', u'Os': u'linux', u'BuildTime': u'2018-
Arch: amd64
BuildTime: 2018-08-30T18:42:30.000000000+00:00
ApiVersion: 1.37
Platform: {u'Name': u''}
Version: 18.03.1-ee-3
MinAPIVersion: 1.12
GitCommit: b9a5c95
Os: linux
GoVersion: go1.10.2
Starting build of index.docker.io/masteringdockerfouthedition/dockerfile-example:latest...
Step 1/10 : FROM alpine:latest
---> e7d92cdc71fe
Step 2/10 : LABEL maintainer="Russ McKendrick <russ@mckendrick.io>"
---> Running in 3485fb76ca7a
```

Terminal window:

russ.mckendrick@russs-mbp: ~   ⌥⌘1

```
~ > docker image pull masteringdockerfouthedition/dockerfile-example:latest
latest: Pulling from masteringdockerfouthedition/dockerfile-example
c9b1b535fdd9: Pull complete
10c3345e369b: Pull complete
7f2f2bda12da: Pull complete
abfcbbd8417b: Pull complete
d5da453417a5: Pull complete
Digest: sha256:6f08edab81342cbc501c753df921b48239386457cb789d2bc133feb11e60a117
Status: Downloaded newer image for masteringdockerfouthedition/dockerfile-example:latest
docker.io/masteringdockerfouthedition/dockerfile-example:latest
~ > docker image ls
REPOSITORY                                      TAG          IMAGE ID          CREATED
        SIZE
masteringdockerfouthedition/dockerfile-example  latest       0967aca209d1      6 minutes a
go      7.15MB
~ >
```

```
                                    russ.mckendrick@russs-mbp: ~                        ⌥⌘1
~      docker image pull masteringdockerfouthedition/multi-stage
Using default tag: latest
latest: Pulling from masteringdockerfouthedition/multi-stage
6e1e2369080d: Pull complete
Digest: sha256:b6559c1e7a072c5837609cdcb03123010af0912e6bf17e89091951c149ac41ca
Status: Downloaded newer image for masteringdockerfouthedition/multi-stage:latest
docker.io/masteringdockerfouthedition/multi-stage:latest
~      docker image ls
REPOSITORY                                    TAG           IMAGE ID         CREATED
        SIZE
masteringdockerfouthedition/multi-stage       latest        71fc328a30c4     4 minutes a
go       7.41MB
masteringdockerfouthedition/dockerfile-example   latest     0967aca209d1     23 minutes
ago      7.15MB
~      docker container run -d -p 8000:80 --name go-hello-world masteringdockerfouthedition/multi-stag
e
3a694f330d7dd6b52dab1e29648bcc4860837cc084c66bf4ffd2764782e9fe30
~      curl http://localhost:8000/
Hello, world! You have called me 1 times.
~      curl http://localhost:8000/
Hello, world! You have called me 2 times.
~      curl http://localhost:8000/
Hello, world! You have called me 3 times.
~
```

```
                                    russ.mckendrick@Russs-MacBook-Pro: ~                 ⌥⌘1
~      docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, he
ad over to https://hub.docker.com to create one.
Username: russmckendrick
Password:
Login Succeeded
~
```
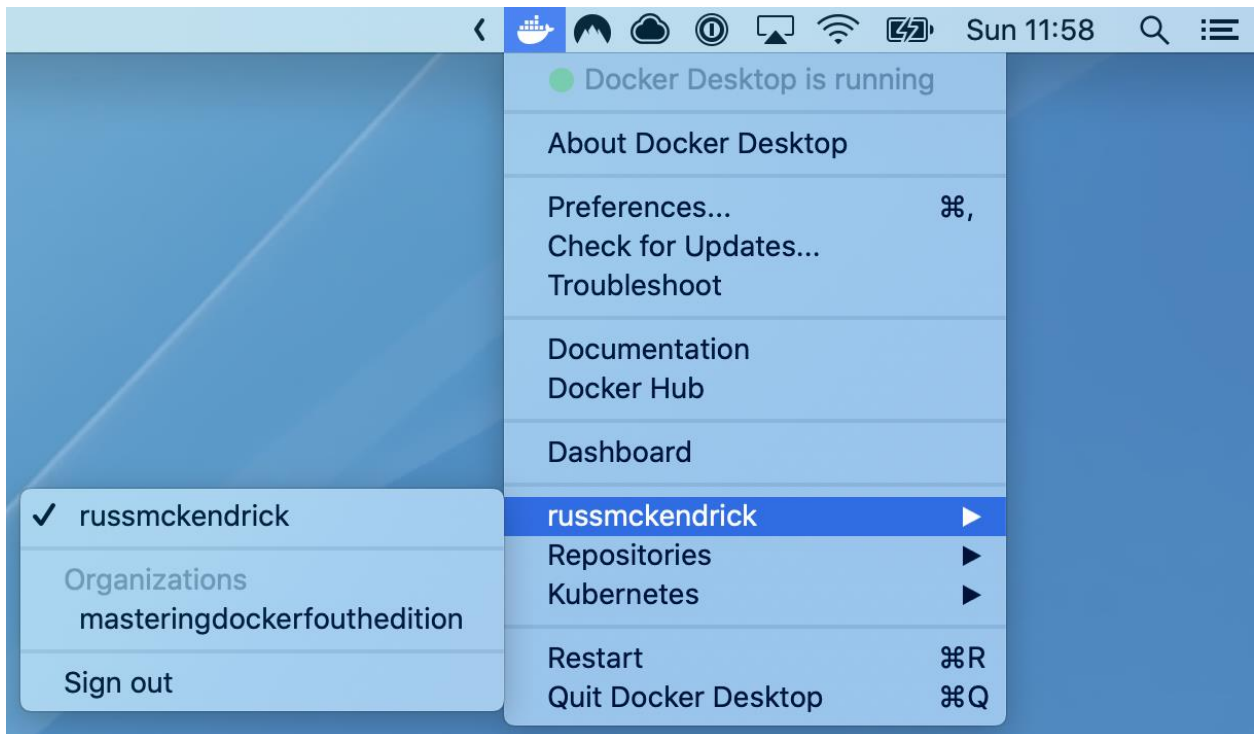
```
‹  🐳  🌀  ☁  ⓪  📺  📶  🔋  Sun 11:58  🔍  ☰

        🟢 Docker Desktop is running

        About Docker Desktop

        Preferences...                    ⌘,
        Check for Updates...
        Troubleshoot

        Documentation
        Docker Hub

        Dashboard

   ✓  russmckendrick                      russmckendrick              ▶
                                          Repositories                ▶
      Organizations                       Kubernetes                  ▶
        masteringdockerfouthedition
                                          Restart                    ⌘R
      Sign out                            Quit Docker Desktop        ⌘Q
```

```
russ.mckendrick@Russs-MacBook-Pro: ~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example

~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example    master   docker buil
d --tag masteringdockerfourthedition/scratch-example:latest .
Sending build context to Docker daemon  2.734MB
Step 1/3 : FROM scratch
 --->
Step 2/3 : ADD files/alpine-minirootfs-3.11.3-x86_64.tar.gz /
 ---> d72240bafe90
Step 3/3 : CMD ["/bin/sh"]
 ---> Running in 59299b41adb3
Removing intermediate container 59299b41adb3
 ---> 262d977b9b0d
Successfully built 262d977b9b0d
Successfully tagged masteringdockerfourthedition/scratch-example:latest
~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example    master
```

```
russ.mckendrick@Russs-MacBook-Pro: ~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example

~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example    master   docker imag
e push masteringdockerfouthedition/scratch-example:latest
The push refers to repository [docker.io/masteringdockerfouthedition/scratch-example]
5216338b40a7: Pushed
latest: digest: sha256:346b5b072c4f80df5ed698f021482d75f2ca3c1bbdeecb8a097dd117d6900ae7 size: 528
~/Documents/Code/mastering-docker-fourth-edition/chapter02/scratch-example    master
```

docker hub   Search for great content (e.g., mysql)   Explore   Repositories   Organizations   Get Help ▾   russmckendrick ▾

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Filters (1)   Clear All

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By Splunk

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docker
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Description   Reviews   Resources

Free Plan ✅

$0.00

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Terms of Service

Proceed to Checkout

```
  ~    docker image pull registry:2
2: Pulling from library/registry
486039affc0a: Pull complete
ba51a3b098e6: Pull complete
8bb4c43d6c8e: Pull complete
6f5f453e5f2d: Pull complete
42bc10b72f42: Pull complete
Digest: sha256:7d081088e4bfd632a88e3f3bcd9e007ef44a796fddfe3261407a3f9f04abe1e7
Status: Downloaded newer image for registry:2
docker.io/library/registry:2
  ~    docker container run -d -p 5000:5000 --name registry registry:2
1d0b49f6b19a467ee5bc23af6b877d65854de547b119fce8daede7d668dc5376
  ~
```

```
  ~    docker image pull alpine
Using default tag: latest
latest: Pulling from library/alpine
c9b1b535fdd9: Pull complete
Digest: sha256:ab00606a42621fb68f2ed6ad3c88be54397f981a7b70a79db3d1172b11c4367d
Status: Downloaded newer image for alpine:latest
docker.io/library/alpine:latest
  ~    docker image tag alpine localhost:5000/localalpine
  ~    docker image push localhost:5000/localalpine
The push refers to repository [localhost:5000/localalpine]
5216338b40a7: Pushed
latest: digest: sha256:ddba4d27a7ffc3f86dd6c2f92041af252a1f23a8e742c90e6e1297bfa1bc0c45 size: 528
  ~
```

```
  ~    docker image ls
REPOSITORY                 TAG      IMAGE ID      CREATED        SIZE
registry                   2        708bc6af7e5e  8 weeks ago    25.8MB
alpine                     latest   e7d92cdc71fe  2 months ago   5.59MB
localhost:5000/localalpine latest   e7d92cdc71fe  2 months ago   5.59MB
  ~
```

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multi-stage 4   Latest version

Pull image from the command line: Learn more

```
$ docker pull docker.pkg.github.com/russmckendrick/mastering-docker-fourth-edition/multi-stage:4
```

‹› Use as base image in DockerFile:

```
FROM docker.pkg.github.com/russmckendrick/mastering-docker-fourth-edition/multi-stage:4
```

Edit package ▾

Package details

russmckendrick

March 22, 2020

MIT License

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Total downloads   0

---

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Home > Container registries > Create container registry

Create container registry

Basics *   Encryption   Tags   Review + create

Azure Container Registry allows you to build, store, and manage container images and artifacts in a private registry for all types of container deployments. Use Azure container registries with your existing container development and deployment pipelines. Use Azure Container Registry Tasks to build container images in Azure on-demand, or automate builds triggered by source code updates, updates to a container's base image, or timers.   Learn more

Project details

Subscription *   [▾]

Resource group *   (New) masteringdocker-acr-rg   ▾
                    Create new

Instance details

Registry name *   masteringdocker   ✓
                   .azurecr.io

Location *   (Europe) UK South   ▾

Admin user * ⓘ   **Enable** Disable

SKU * ⓘ   Standard   ▾

Review + create   **< Previous**   **Next: Encryption >**

Readme ⓘ ✎

Apache Bench

───

`5.1MB` `7 layers`

A Docker build that installs Apache Bench.

Useage

First of all launch a web server;

- `docker run -d -p 80 -name web -v ./web:/var/www/html russmckendrick/nginx-php`

then run Apache Bench against it;

- `docker run --link=web russmckendrick/ab ab -k -n 10000 -c 16 http://web/`

Chapter 4: Managing Containers

```
russ.mckendrick@russs-mbp: ~                                          ⌥⌘1
~    docker container run hello-world


Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/
~
```

```
russ.mckendrick@russs-mbp: ~                                          ⌥⌘1
~    docker container ls
CONTAINER ID        IMAGE              COMMAND      CREATED           STATUS
PORTS               NAMES
~    docker container ls -a
CONTAINER ID        IMAGE              COMMAND      CREATED           STATUS
     PORTS              NAMES
2fe0bf491622        hello-world        "/hello"     4 minutes ago     Exited (0) 4 minutes
 ago                    awesome_jackson
~
```

```
russ.mckendrick@russs-mbp: ~                                          ⌥⌘1
~    docker container run -d --name nginx-test -p 8080:80 nginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
68ced04f60ab: Pull complete
28252775b295: Pull complete
a616aa3b0bf2: Pull complete
Digest: sha256:2539d4344dd18e1df02be842ffc435f8e1f699cfc55516e2cf2cb16b7a9aea0b
Status: Downloaded newer image for nginx:latest
662b6e5153ac77685f25a1189922d7f49c2df6b2375b3635a37eea4c8698aac2
~
```

```
~  docker container ls
CONTAINER ID        IMAGE           COMMAND                 CREATED           STATUS
   PORTS                    NAMES
662b6e5153ac        nginx           "nginx -g 'daemon of…" 4 minutes ago  Up 4 minutes
   0.0.0.0:8080->80/tcp      nginx-test
~
```

```
~  docker container run --name nginx-foreground -p 9090:80 nginx
172.17.0.1 - - [28/Mar/2020:15:11:52 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
2020/03/28 15:11:52 [error] 8#8: *1 open() "/usr/share/nginx/html/favicon.ico" failed (2: No such fi
le or directory), client: 172.17.0.1, server: localhost, request: "GET /favicon.ico HTTP/1.1", host:
 "localhost:9090", referrer: "http://localhost:9090/"
172.17.0.1 - - [28/Mar/2020:15:11:52 +0000] "GET /favicon.ico HTTP/1.1" 404 153 "http://localhost:90
90/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Versi
on/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:11:54 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:11:55 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:11:55 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:11:56 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
```

```
~  docker container ls -a
CONTAINER ID        IMAGE           COMMAND                 CREATED           STATUS
          PORTS                 NAMES
407bea03dc82        nginx           "nginx -g 'daemon of…" About a minute ago  Exited (0) 24
seconds ago                     nginx-foreground
662b6e5153ac        nginx           "nginx -g 'daemon of…" 7 minutes ago      Up 7 minutes
          0.0.0.0:8080->80/tcp  nginx-test
~
```

```
~  docker container attach nginx-test
172.17.0.1 - - [28/Mar/2020:15:52:25 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:52:32 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:52:32 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
^C
~
```

```
172.17.0.1 - - [28/Mar/2020:15:54:11 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
^C
✗  ~  docker container ls
CONTAINER ID        IMAGE           COMMAND                 CREATED           STATUS
   PORTS                    NAMES
662b6e5153ac        nginx           "nginx -g 'daemon of…" 48 minutes ago    Up About a minu
te   0.0.0.0:8080->80/tcp   nginx-test
~
```

```
~ ▸ docker container exec nginx-test cat /etc/debian_version
10.3
~ ▸ ▮
```

```
~ ▸ docker container exec -i -t nginx-test /bin/bash
root@662b6e5153ac:/# ls -lhat /usr/share/nginx/html/
total 16K
drwxr-xr-x 2 root root 4.0K Mar  4 17:31 .
drwxr-xr-x 3 root root 4.0K Mar  4 17:31 ..
-rw-r--r-- 1 root root  494 Mar  3 14:32 50x.html
-rw-r--r-- 1 root root  612 Mar  3 14:32 index.html
root@662b6e5153ac:/# exit
exit
~ ▸ ▮
```

```
~ ▸ docker container logs --tail 5 nginx-test
172.17.0.1 - - [28/Mar/2020:15:52:25 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:52:32 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:52:32 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:54:11 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:54:11 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
~ ▸ ▮
```

```
~ ▸ docker container logs --since 2020-03-28T15:52:00 nginx-test
172.17.0.1 - - [28/Mar/2020:15:52:25 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:52:32 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:52:32 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:54:11 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
172.17.0.1 - - [28/Mar/2020:15:54:11 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Macintosh; In
tel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1 Safari/605.1.15" "-"
~ ▸ ▮
```

```
russ.mckendrick@russs-mbp: ~                                    ⌥⌘1
~    docker container logs --since 2020-03-28T15:52:00 -t nginx-test
2020-03-28T15:52:25.408136881Z 172.17.0.1 - - [28/Mar/2020:15:52:25 +0000] "GET / HTTP/1.1" 200 612
"-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Versio
n/13.1 Safari/605.1.15" "-"
2020-03-28T15:52:32.004012137Z 172.17.0.1 - - [28/Mar/2020:15:52:32 +0000] "GET / HTTP/1.1" 200 612
"-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Versio
n/13.1 Safari/605.1.15" "-"
2020-03-28T15:52:32.587812601Z 172.17.0.1 - - [28/Mar/2020:15:52:32 +0000] "GET / HTTP/1.1" 200 612
"-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Versio
n/13.1 Safari/605.1.15" "-"
2020-03-28T15:54:11.005700043Z 172.17.0.1 - - [28/Mar/2020:15:54:11 +0000] "GET / HTTP/1.1" 200 612
"-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Versio
n/13.1 Safari/605.1.15" "-"
2020-03-28T15:54:11.998213247Z 172.17.0.1 - - [28/Mar/2020:15:54:11 +0000] "GET / HTTP/1.1" 200 612
"-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Versio
n/13.1 Safari/605.1.15" "-"
~
```

```
russ.mckendrick@russs-mbp: ~                                    ⌥⌘1
~     docker container top nginx-test
PID        USER        TIME        COMMAND
2368       root        0:00        nginx: master process nginx -g daemon of
f;
2402       101         0:00        nginx: worker process
~
```

```
docker container stats nginx-test                               ⌥⌘1
CONTAINER ID       NAME            CPU %       MEM USAGE / LIMIT       MEM %
   NET I/O           BLOCK I/O     PIDS
662b6e5153ac       nginx-test      0.00%       1.988MiB / 1.943GiB     0.10%
   3.13kB / 2.3kB     0B / 0B       2
```

```
docker container stats -a                                       ⌥⌘1
CONTAINER ID       NAME              CPU %       MEM USAGE / LIMIT       MEM %
   NET I/O           BLOCK I/O       PIDS
407bea03dc82       nginx-foreground  0.00%       0B / 0B                 0.00%
   0B / 0B           0B / 0B         0
662b6e5153ac       nginx-test        0.00%       1.988MiB / 1.943GiB     0.10%
   4.53kB / 2.3kB    0B / 0B         2
```

```
docker container stats nginx-test                               ⌥⌘1
CONTAINER ID       NAME            CPU %       MEM USAGE / LIMIT       MEM %
NET I/O            BLOCK I/O       PIDS
662b6e5153ac       nginx-test      0.00%       1.988MiB / 128MiB       1.55%
4.6kB / 2.3kB      0B / 0B         2
```

```
●●●                    russ.mckendrick@russs-mbp: ~                    ⌥⌘1
~     docker container ls -a
CONTAINER ID        IMAGE            COMMAND                CREATED          STATUS
         PORTS                    NAMES
407bea03dc82        nginx             "nginx -g 'daemon of…"  21 hours ago    Exited (0) 21 h
ours ago                          nginx-foreground
662b6e5153ac        nginx             "nginx -g 'daemon of…"  21 hours ago    Up 20 hours
         0.0.0.0:8080->80/tcp    nginx-test
~ ▮
```

```
●●●                    russ.mckendrick@russs-mbp: ~                    ⌥⌘1
~     for i in {1..5}; do docker container run -d --name nginx$(printf "$i") nginx; done
4365bdc2f32de9f4eac8ba535ac613003b5a5119998512911850c52089459b71
b99a9b4455b074dd3f09c631b00918fa02b45a4f40db3c927827f56a13c85f87
f19ead0b25f2415927356050290b9b3ccd3ef12d61bb96a90afe0a9ca807daf0
85dcd346ec326e543b952c4038b9b8ad52b424a18f2b7c9331e08deeb4959d71
7e77ea027d7877684bc697ae9c329de231f5f3180fe1eeb58df45729cd5a05e8
~ ▮
```

```
●●●                    russ.mckendrick@russs-mbp: ~                    ⌥⌘1
~     docker container ls -a
CONTAINER ID        IMAGE            COMMAND                CREATED          STATUS
         PORTS                    NAMES
7e77ea027d78        nginx             "nginx -g 'daemon of…"  31 seconds ago  Up 30 seconds
         80/tcp                   nginx5
85dcd346ec32        nginx             "nginx -g 'daemon of…"  31 seconds ago  Up 31 seconds
         80/tcp                   nginx4
f19ead0b25f2        nginx             "nginx -g 'daemon of…"  31 seconds ago  Up 31 seconds
         80/tcp                   nginx3
b99a9b4455b0        nginx             "nginx -g 'daemon of…"  32 seconds ago  Up 31 seconds
         80/tcp                   nginx2
4365bdc2f32d        nginx             "nginx -g 'daemon of…"  32 seconds ago  Up 32 seconds
         80/tcp                   nginx1
407bea03dc82        nginx             "nginx -g 'daemon of…"  21 hours ago    Exited (0) 21 h
ours ago                          nginx-foreground
662b6e5153ac        nginx             "nginx -g 'daemon of…"  21 hours ago    Up 20 hours
         0.0.0.0:8080->80/tcp    nginx-test
~ ▮
```

```
●●●                    russ.mckendrick@russs-mbp: ~                    ⌥⌘1
~     docker container pause nginx1
nginx1
~     docker container ls
CONTAINER ID        IMAGE            COMMAND                CREATED          STATUS
         PORTS                    NAMES
7e77ea027d78        nginx             "nginx -g 'daemon of…"  About a minute ago  Up About a min
ute           80/tcp            nginx5
85dcd346ec32        nginx             "nginx -g 'daemon of…"  About a minute ago  Up About a min
ute           80/tcp            nginx4
f19ead0b25f2        nginx             "nginx -g 'daemon of…"  About a minute ago  Up About a min
ute           80/tcp            nginx3
b99a9b4455b0        nginx             "nginx -g 'daemon of…"  About a minute ago  Up About a min
ute           80/tcp            nginx2
4365bdc2f32d        nginx             "nginx -g 'daemon of…"  About a minute ago  Up About a min
ute (Paused)  80/tcp            nginx1
662b6e5153ac        nginx             "nginx -g 'daemon of…"  21 hours ago    Up 20 hours
         0.0.0.0:8080->80/tcp    nginx-test
~ ▮
```

```
~  docker container ls -a
CONTAINER ID        IMAGE              COMMAND                CREATED           STATUS
          PORTS                       NAMES
7e77ea027d78        nginx              "nginx -g 'daemon of…"  10 minutes ago    Exited (137) 14
 seconds ago                          nginx5
85dcd346ec32        nginx              "nginx -g 'daemon of…"  10 minutes ago    Up 10 minutes
          80/tcp                      nginx4
f19ead0b25f2        nginx              "nginx -g 'daemon of…"  10 minutes ago    Up 10 minutes
          80/tcp                      nginx3
b99a9b4455b0        nginx              "nginx -g 'daemon of…"  10 minutes ago    Up 10 minutes
          80/tcp                      nginx2
4365bdc2f32d        nginx              "nginx -g 'daemon of…"  10 minutes ago    Up 10 minutes
          80/tcp                      nginx1
407bea03dc82        nginx              "nginx -g 'daemon of…"  21 hours ago      Exited (0) 21 h
ours ago                              nginx-foreground
662b6e5153ac        nginx              "nginx -g 'daemon of…"  21 hours ago      Up 21 hours
          0.0.0.0:8080->80/tcp        nginx-test
~
```

```
~  docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N] y
Deleted Containers:
7e77ea027d7877684bc697ae9c329de231f5f3180fe1eeb58df45729cd5a05e8
407bea03dc8229278a6f6eb434bc2f18d80f50252f9f7756323e1ceb6360f264

Total reclaimed space: 2B
~
```

```
~  docker container create --name nginx-test -p 8080:80 nginx
29544a03f18c899ef75c2beaac6888515133c3cbd68718ef9fa469d9394f4653
~  docker container ls -a
CONTAINER ID        IMAGE              COMMAND                CREATED           STATUS
    PORTS                    NAMES
29544a03f18c        nginx              "nginx -g 'daemon of…"  10 seconds ago    Created
                             nginx-test
~  docker container start nginx-test
nginx-test
~  docker container ls -a
CONTAINER ID        IMAGE              COMMAND                CREATED           STATUS
    PORTS                    NAMES
29544a03f18c        nginx              "nginx -g 'daemon of…"  56 seconds ago    Up 24 seconds
    0.0.0.0:8080->80/tcp     nginx-test
~
```

```
~  docker container cp nginx-test:/tmp/testing testing
~  ls -lhat testing
-rw-r--r--  1 russ.mckendrick  staff    0B 29 Mar 13:39 testing
~
```

```
~  echo "This is a test of copying a file from the host machine to the container" > testing
~  docker container cp testing nginx-test:/tmp/testing
~  docker container exec nginx-test cat /tmp/testing
This is a test of copying a file from the host machine to the container
~
```

```
~  docker image pull redis:alpine
alpine: Pulling from library/redis
aad63a933944: Pull complete
541cb024bf66: Pull complete
270420c343f3: Pull complete
8dd6c66eb1b0: Pull complete
782d2f0df1b3: Pull complete
b0648f46f4c9: Pull complete
Digest: sha256:511275ddf4c4582e296f6fca803df853a8ab2b733a704c44c498f0a6a90e5ba0
Status: Downloaded newer image for redis:alpine
docker.io/library/redis:alpine
~  docker image pull russmckendrick/moby-counter
Using default tag: latest
latest: Pulling from russmckendrick/moby-counter
ff3a5c916c92: Pull complete
0384617ecf25: Pull complete
3e2743173da8: Pull complete
40c2a5cd7772: Pull complete
e00657f4abd2: Pull complete
32312bfbca18: Pull complete
Digest: sha256:d0f51203130cb934a2910c2e0d577e68b7ab17962ce01918d37d7de9686553cc
Status: Downloaded newer image for russmckendrick/moby-counter:latest
docker.io/russmckendrick/moby-counter:latest
~  docker network create moby-counter
c9d98376f13ccd556d84b708e132350900036fb4cfecf275dcbd8657dc69b22c
~
```

```
~  docker container ls
CONTAINER ID      IMAGE                    COMMAND              CREATED          STATU
S               PORTS                 NAMES
e7335ca1830d      russmckendrick/moby-counter   "node index.js"      3 minutes ago   Up 3
minutes         0.0.0.0:8080->80/tcp   moby-counter
f3b6a0d45f56      redis:alpine             "docker-entrypoint.s…"  3 minutes ago   Up 3
minutes         6379/tcp              redis
~
```
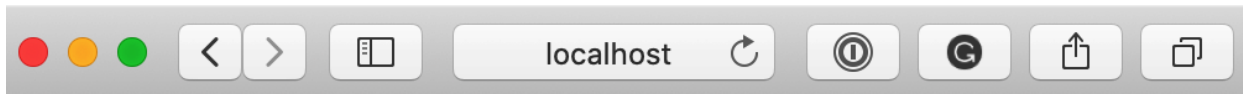
Click to add logos...
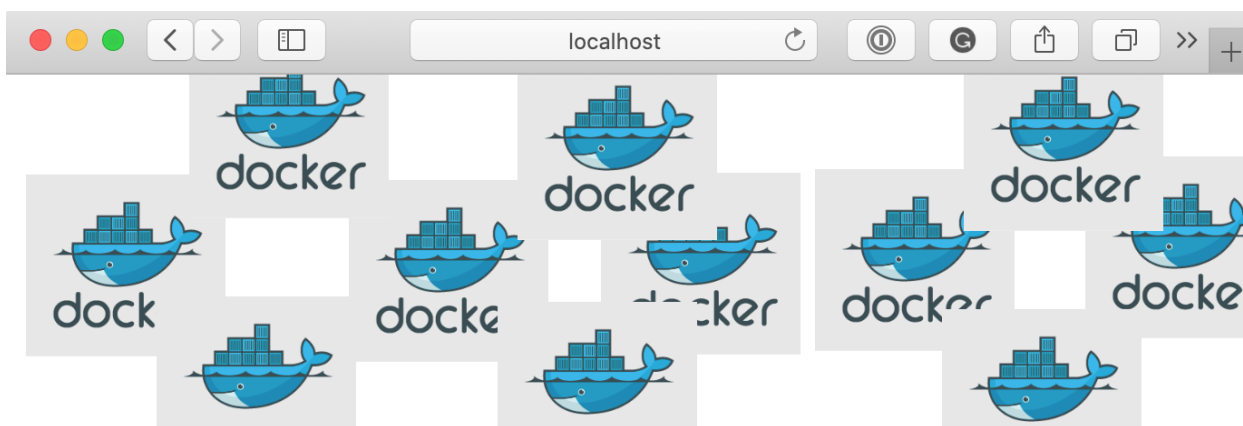

```
~    docker container exec moby-counter ping -c 3 redis
PING redis (172.18.0.2): 56 data bytes
64 bytes from 172.18.0.2: seq=0 ttl=64 time=0.101 ms
64 bytes from 172.18.0.2: seq=1 ttl=64 time=0.184 ms
64 bytes from 172.18.0.2: seq=2 ttl=64 time=0.447 ms

--- redis ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 0.101/0.244/0.447 ms
~
```

```
~ > docker network create moby-counter2
534197af52b949df1d54153adc3a8afa4732b554c92e38a5256175c90879e94c
~ > docker run -itd --name moby-counter2 --network moby-counter2 -p 9090:80 russmckendrick/moby-cou
nter
5bf5a95ec75d38eb434dd8a3386627e47f58c0909ca1b345bee83ead1da49bf2
~ > docker container exec moby-counter2 ping -c 3 redis
ping: bad address 'redis'
✗ > ~
```

```
~ >  docker network ls
NETWORK ID      NAME             DRIVER    SCOPE
1cb3f2ddc425    bridge           bridge    local
2bd8836d9ef1    host             host      local
c9d98376f13c    moby-counter     bridge    local
534197af52b9    moby-counter2    bridge    local
3609e9e110a7    none             null      local
~ >
```
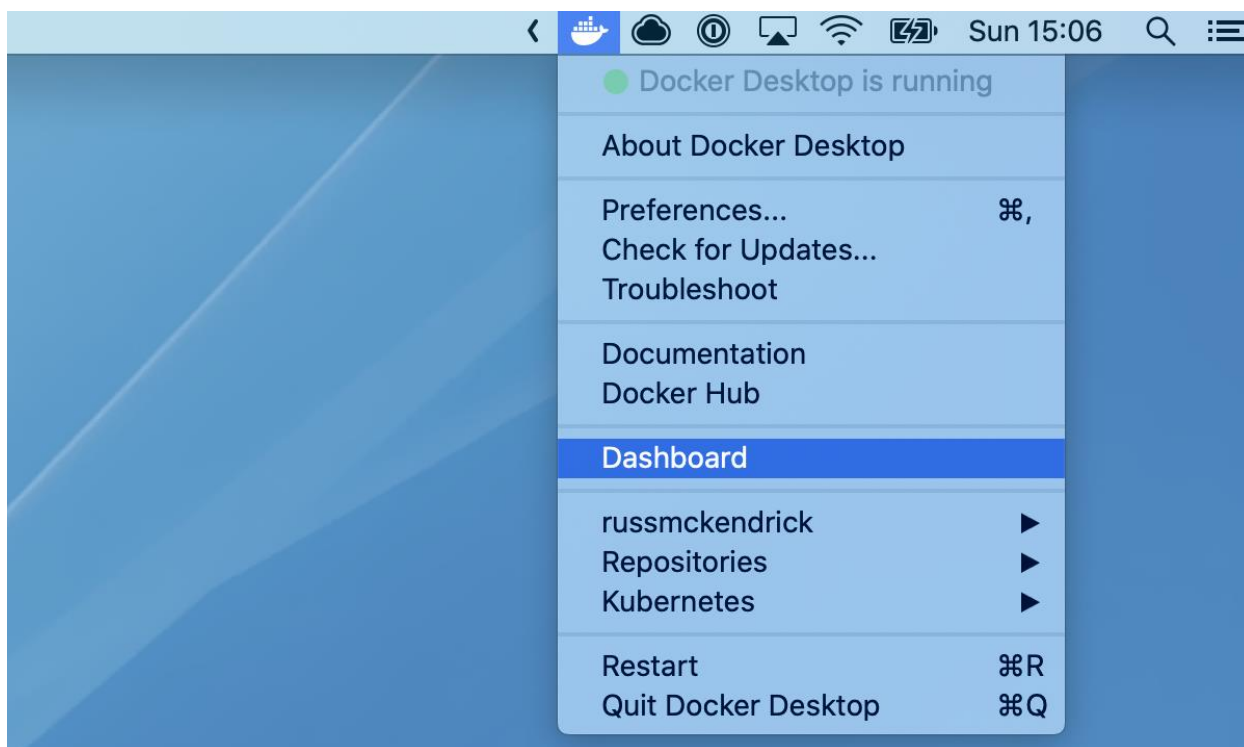
```
~ >  docker container stop moby-counter2 redis2

moby-counter2
redis2
~ >
~ >  docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N] y
Deleted Containers:
b94e769837a9cd7b5b1bd5536b71f88d2d65d85ba837f72f1de1f894c060bb51
5bf5a95ec75d38eb434dd8a3386627e47f58c0909ca1b345bee83ead1da49bf2

Total reclaimed space: 0B
~ >  docker network prune
WARNING! This will remove all networks not used by at least one container.
Are you sure you want to continue? [y/N] y
Deleted Networks:
moby-counter2
~ >
```

```
~ > docker container ls
CONTAINER ID       IMAGE                      COMMAND                  CREATED          STATU
S                  PORTS                      NAMES
e7335ca1830d       russmckendrick/moby-counter "node index.js"        27 minutes ago   Up 27
 minutes           0.0.0.0:8080->80/tcp       moby-counter
f3b6a0d45f56       redis:alpine               "docker-entrypoint.s…" 27 minutes ago   Up 27
 minutes           6379/tcp                   redis
~ >
```
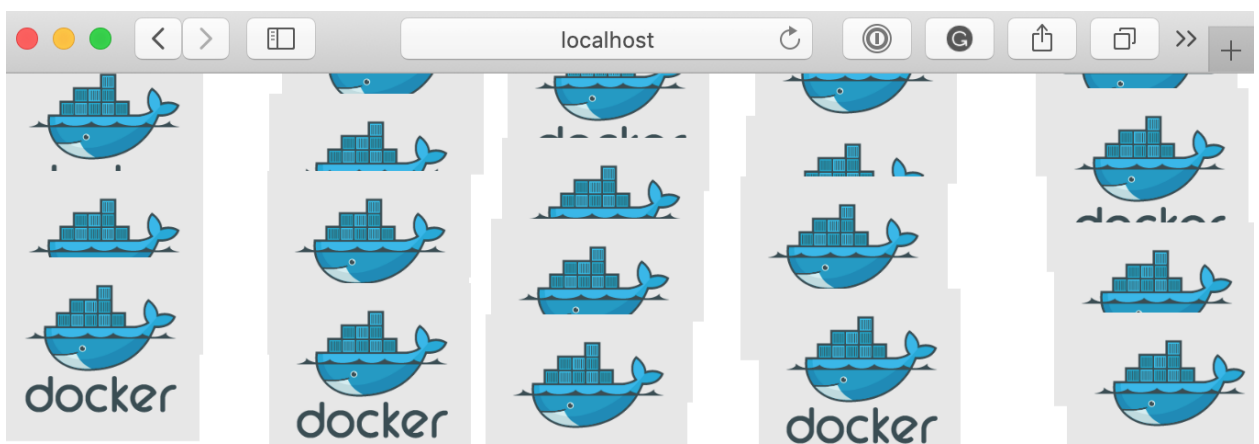


```
~ > docker volume ls
DRIVER        VOLUME NAME
local         45c4cb295fc831c085c49963a01f8e0f79534b9f0190af89321efec97b9d051f
local         1019f78d36d21d0b28a035a214d3fb9e7552948528ba89a461f9d5c75b02a41a
~ >
```

```
~ ▶ docker volume create redis_data
redis_data
~ ▶ docker container run -d --name redis -v redis_data:/data --network moby-counter redis:alpine
8e2ba1e6ff0c3321b99572d02aa15381814c91e2688b4cb525ce7617911c4b5b
~ ▶ docker container restart moby-counter
moby-counter
~ ▶ docker container stop redis && docker container rm redis
redis
redis
~ ▶ docker container run -d --name redis -v redis_data:/data --network moby-counter redis:alpine
7d2d34aebef78f3f84bc4715cb1b0b19e0fdb7f801e1dfa2d67104a09a917296
~ ▶
```

redis redis:alpine
RUNNING

Logs

Inspect

Stats

Environment

PATH	/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
REDIS_VERSION	5.0.8
REDIS_DOWNLOAD_URL	http://download.redis.io/releases/redis-5.0.8.tar.gz
REDIS_DOWNLOAD_SHA	f3c7eac42f433326a8d981b50dba0169fdfaf46abb23fcda2f933a7552ee4ed7

Mounts

| /DATA | /var/lib/docker/volumes/redis_data/_data |

Port

6379/tcp   Not binded

---

redis redis:alpine
RUNNING

Logs

Inspect

Stats

0.00%

CPU USAGE

0.09%

MEMORY USAGE

0 Bytes / 0 Bytes

DISK READ/WRITE

4.5 kB / 4.9 kB

NETWORK I/O

moby-counter russmckendrick/moby-counter
RUNNING

Logs

Inspect

Stats

```
    at RedisClient.on_error (/srv/app/node_modules/redis/index.js:196:24)
    at Socket.<anonymous> (/srv/app/node_modules/redis/index.js:106:14)
    at emitOne (events.js:116:13)
    at Socket.emit (events.js:211:7)
    at emitErrorNT (internal/streams/destroy.js:64:8)
    at _combinedTickCallback (internal/process/next_tick.js:138:11)
    at process._tickCallback (internal/process/next_tick.js:180:9)
Error from the redis connection:
Error: Redis connection to redis:6379 failed - getaddrinfo ENOTFOUND redis redis:6379
Connection made to the Redis server
Lost connection to Redis server
```

Search...   Stick to bottom

---

russ.mckendrick@russs-mbp: ~

```
~ ▶ docker container stop redis moby-counter
redis
moby-counter
~ ▶ docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N] y
Deleted Containers:
7d2d34aebef78f3f84bc4715cb1b0b19e0fdb7f801e1dfa2d67104a09a917296
e7335ca1830da66d4bdc2915a6a35e83e546cbde63cd97ab48bfd3ca06ae99ae

Total reclaimed space: 0B
~ ▶ docker network prune
WARNING! This will remove all networks not used by at least one container.
Are you sure you want to continue? [y/N] y
Deleted Networks:
moby-counter

~ ▶ docker volume prune
WARNING! This will remove all local volumes not used by at least one container.
Are you sure you want to continue? [y/N] y
Deleted Volumes:
45c4cb295fc831c085c49963a01f8e0f79534b9f0190af89321efec97b9d051f
1019f78d36d21d0b28a035a214d3fb9e7552948528ba89a461f9d5c75b02a41a
redis_data

Total reclaimed space: 485B
~ ▶
```

Chapter 5: Docker Compose


```
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter    master    docker-compose
up
Creating network "mobycounter_default" with the default driver
Creating volume "mobycounter_redis_data" with default driver
Creating mobycounter_redis_1 ... done
Creating mobycounter_mobycounter_1 ... done
Attaching to mobycounter_redis_1, mobycounter_mobycounter_1
redis_1          | 1:C 08 Feb 2020 18:01:44.287 # oO0OoO00oO00Oo Redis is starting oO0OoO00oO00Oo
redis_1          | 1:C 08 Feb 2020 18:01:44.287 # Redis version=5.0.7, bits=64, commit=00000000, modif
ied=0, pid=1, just started
redis_1          | 1:C 08 Feb 2020 18:01:44.287 # Warning: no config file specified, using the default
 config. In order to specify a config file use redis-server /path/to/redis.conf
redis_1          | 1:M 08 Feb 2020 18:01:44.289 * Running mode=standalone, port=6379.
redis_1          | 1:M 08 Feb 2020 18:01:44.289 # WARNING: The TCP backlog setting of 511 cannot be en
forced because /proc/sys/net/core/somaxconn is set to the lower value of 128.
redis_1          | 1:M 08 Feb 2020 18:01:44.289 # Server initialized
redis_1          | 1:M 08 Feb 2020 18:01:44.289 # WARNING you have Transparent Huge Pages (THP) suppor
t enabled in your kernel. This will create latency and memory usage issues with Redis. To fix this i
ssue run the command 'echo never > /sys/kernel/mm/transparent_hugepage/enabled' as root, and add it
to your /etc/rc.local in order to retain the setting after a reboot. Redis must be restarted after T
HP is disabled.
redis_1          | 1:M 08 Feb 2020 18:01:44.289 * Ready to accept connections
mobycounter_1    | using redis server
mobycounter_1    | -----------------------------------------
mobycounter_1    | have host: redis
mobycounter_1    | have port: 6379
mobycounter_1    | server listening on port: 80
mobycounter_1    | Connection made to the Redis server
```



```
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter    master    docker-compos
e up
ERROR: The Compose file './docker-compose.yml' is invalid because:
Unsupported config option for services: 'redis'
Unsupported config option for volumes: 'redis_data'
 x   ~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter    master
```

front-tier

voting-app
Python Code

result-app
Node.js Code

back-tier

redis
Redis Key Value
Store

db
postgreSQL
database

db-data

worker
.NET Code

---

localhost

CATS
50.0%

DOGS
50.0%

No votes yet

Cats vs Dogs!

CATS

DOGS

(Tip: you can change your vote)

Processed by container ID
da7b3ea04a3d
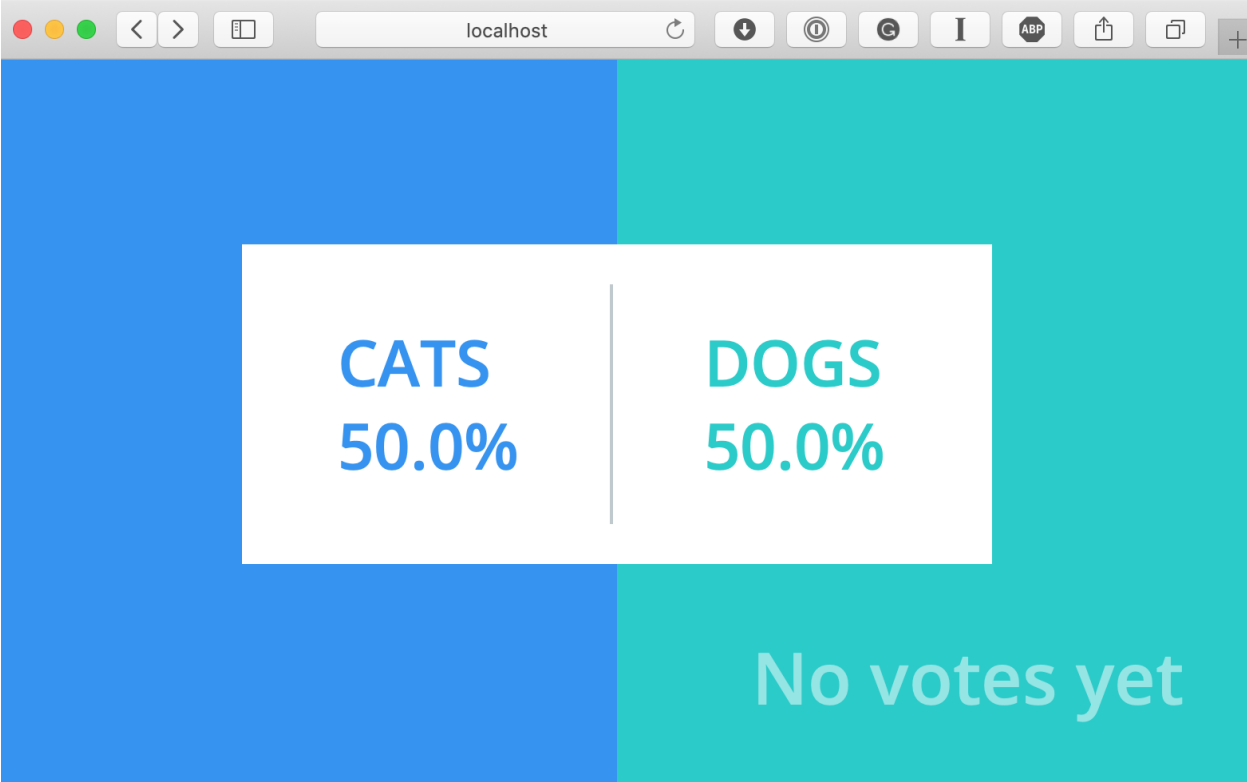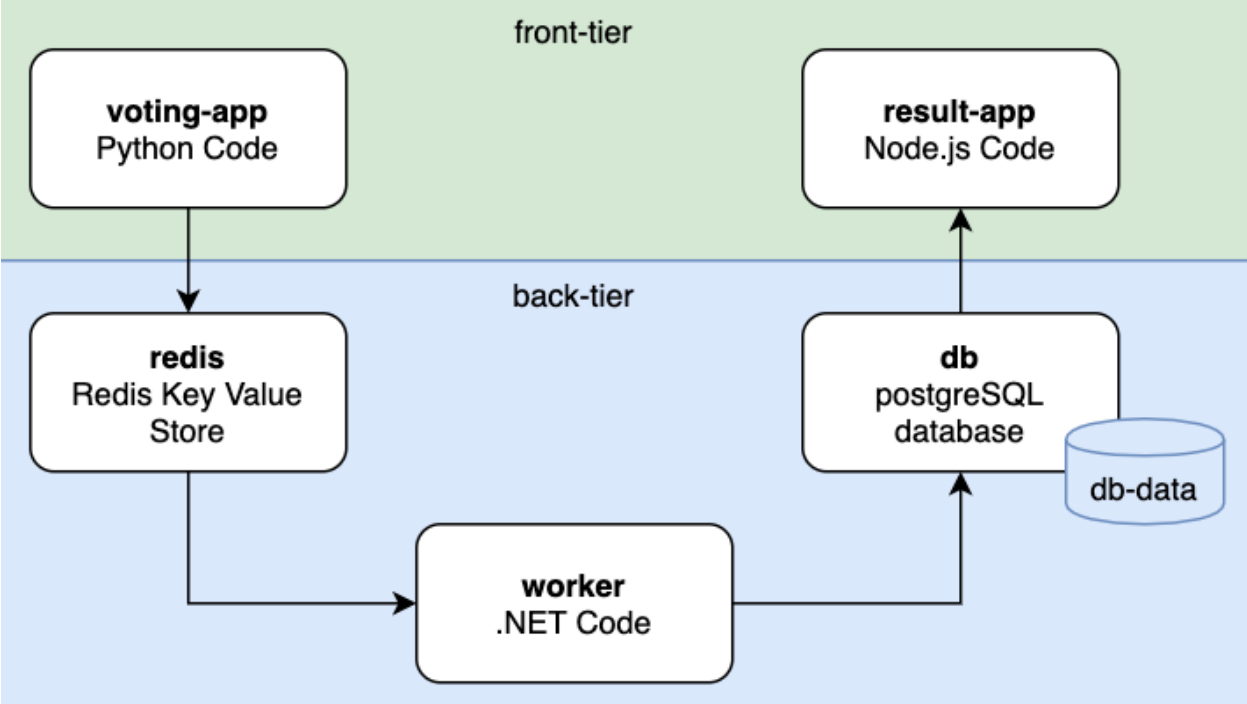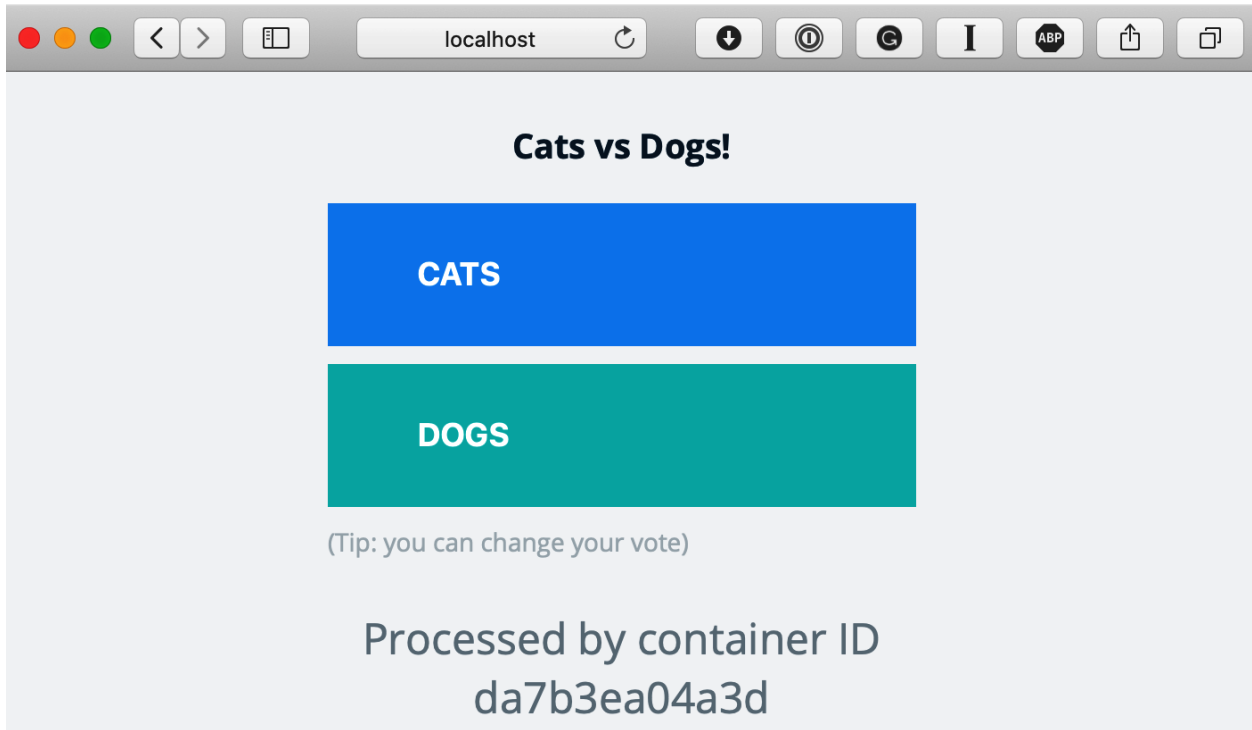
docker-compose up

```
vote_1      |   * Debugger PIN: 159-844-388
result_1    | Sun, 09 Feb 2020 11:05:29 GMT body-parser deprecated bodyParser: use individual json/url
encoded middlewares at server.js:73:9
result_1    | Sun, 09 Feb 2020 11:05:29 GMT body-parser deprecated undefined extended: provide extende
d option at ../node_modules/body-parser/index.js:105:29
result_1    | App running on port 80
result_1    | Connected to db
db          | ERROR:  relation "votes" does not exist at character 38
db          | STATEMENT:  SELECT vote, COUNT(id) AS count FROM votes GROUP BY vote
result_1    | Error performing query: error: relation "votes" does not exist
worker_1    | Connected to db
worker_1    | Found redis at 172.23.0.2
worker_1    | Connecting to redis
vote_1      | 172.23.0.1 - - [09/Feb/2020 11:14:09] "GET / HTTP/1.1" 200 -
vote_1      | 172.23.0.1 - - [09/Feb/2020 11:14:10] "GET /static/stylesheets/style.css HTTP/1.1" 200 -
vote_1      | 172.23.0.1 - - [09/Feb/2020 11:14:10] "GET /favicon.ico HTTP/1.1" 404 -
vote_1      | 172.23.0.1 - - [09/Feb/2020 11:16:51] "POST / HTTP/1.1" 200 -
worker_1    | Processing vote for 'a' by '6fb5c2a7c701e7aa'
```

Browser window (localhost):

CATS
100.0%

DOGS
0.0%

1 vote

Terminal window 1:

```
russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter05

~/Documents/Code/mastering-docker-fourth-edition/chapter05   master   docker container ls -a
CONTAINER ID        IMAGE                    COMMAND                  CREATED          STATU
S                        PORTS               NAMES
b98044261af8        example-voting-app_worker    "/bin/sh -c 'dotnet …"   16 minutes ago   Exite
d (137) About a minute ago             example-voting-app_worker_1
2046da5d1511        postgres:9.4             "docker-entrypoint.s…"   16 minutes ago   Exite
d (0) About a minute ago               db
861f50d8b162        example-voting-app_result    "docker-entrypoint.s…"   16 minutes ago   Exite
d (143) About a minute ago             example-voting-app_result_1
da7b3ea04a3d        example-voting-app_vote      "python app.py"          16 minutes ago   Exite
d (0) About a minute ago               example-voting-app_vote_1
ed9fbb02f438        redis:alpine             "docker-entrypoint.s…"   16 minutes ago   Exite
d (0) About a minute ago               redis
1191f6a5d301        russmckendrick/moby-counter   "node index.js"          16 hours ago     Exite
d (137) 16 hours ago                   mobycounter_mobycounter_1
17c1dfaf71fa        redis:alpine             "docker-entrypoint.s…"   16 hours ago     Exite
d (0) 16 hours ago                     mobycounter_redis_1
~/Documents/Code/mastering-docker-fourth-edition/chapter05   master
```
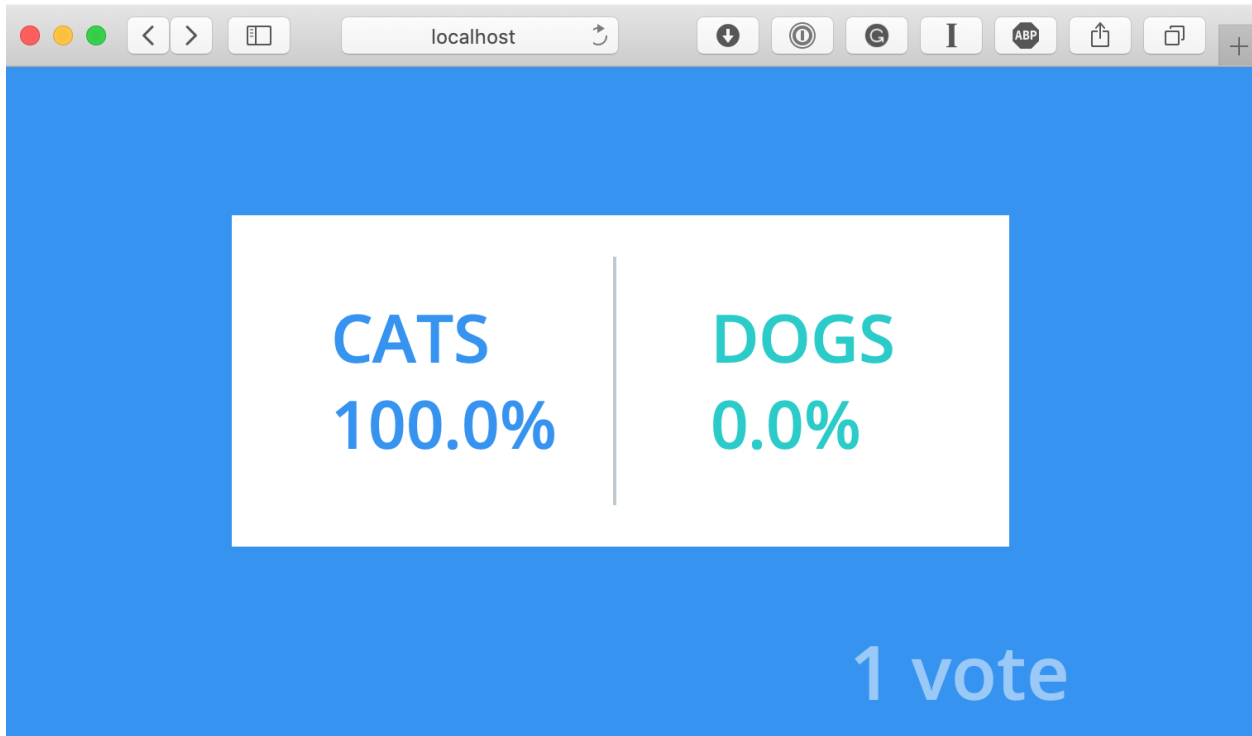
Terminal window 2:

```
russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app

~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app   master  docker-c
ompose up -d
Starting example-voting-app_vote_1    ... done
Starting example-voting-app_result_1  ... done
Starting redis                        ... done
Starting db                           ... done
Starting example-voting-app_worker_1  ... done
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app   master
```

```
● ● ●          russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app          ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app   ⑂ master   docker-c
ompose ps
            Name                         Command                 State              Ports
-------------------------------------------------------------------------------------------------
db                             docker-entrypoint.sh postgres     Up       5432/tcp
example-voting-app_result_1    docker-entrypoint.sh nodem ...    Up       0.0.0.0:5858->5858/tcp,
                                                                          0.0.0.0:5001->80/tcp
example-voting-app_vote_1      python app.py                     Up       0.0.0.0:5000->80/tcp
example-voting-app_worker_1    /bin/sh -c dotnet src/Work ...    Up
redis                          docker-entrypoint.sh redis ...    Up       0.0.0.0:32769->6379/tcp
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app   ⑂ master
```

```
● ● ●          russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app          ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app   ⑂ master   docker-c
ompose top
db
PID      USER    TIME                    COMMAND
--------------------------------------------------------------------
6334     999     0:00    postgres
6705     999     0:00    postgres: checkpointer process
6706     999     0:00    postgres: writer process
6707     999     0:00    postgres: wal writer process
6708     999     0:00    postgres: autovacuum launcher process
6709     999     0:00    postgres: stats collector process
6828     999     0:02    postgres: postgres postgres 172.23.0.6(34486) idle
6829     999     0:00    postgres: postgres postgres 172.23.0.5(40424) idle

example-voting-app_result_1
PID      USER    TIME                 COMMAND
----------------------------------------------------------
6428     root    0:00    node /usr/local/bin/nodemon server.js
6771     root    0:01    /usr/local/bin/node server.js

example-voting-app_vote_1
PID      USER    TIME                COMMAND
-------------------------------------------------------
6253     root    0:00    python app.py
6799     root    0:04    /usr/local/bin/python /app/app.py

example-voting-app_worker_1
PID      USER    TIME                   COMMAND
-----------------------------------------------------------
6718     root    0:00    /bin/sh -c dotnet src/Worker/Worker.dll
```

```
● ● ●                                docker-compose logs -f db                                ⌥⌘1
db   | LOG:  autovacuum launcher shutting down
db   | LOG:  shutting down
db   | LOG:  database system is shut down
db   |
db   | PostgreSQL Database directory appears to contain a database; Skipping initialization
db   |
db   | LOG:  database system was shut down at 2020-02-09 11:20:15 UTC
db   | LOG:  MultiXact member wraparound protections are now enabled
db   | LOG:  database system is ready to accept connections
db   | LOG:  autovacuum launcher started
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app  master   docker-c
ompose events
2020-02-09 11:40:49.737557 container pause da7b3ea04a3d0deb971a7fb829039d966f1caa29eaea79d966ef77fe7
3b687e8 (image=example-voting-app_vote, name=example-voting-app_vote_1)
2020-02-09 11:40:49.743486 container pause b98044261af8380993f539679422eda0cff372721c1efcec0516fa66d
fea8dfe (image=example-voting-app_worker, name=example-voting-app_worker_1)
2020-02-09 11:40:49.747073 container pause 2046da5d1511c02c27998ad59bbb8543f51f329258b8aa05a01fa360d
0252afc (image=postgres:9.4, name=db)
2020-02-09 11:40:49.754562 container pause 861f50d8b162751e06ceed0c3caa1afddc6600b141498279f7fbee222
aa8cdca (image=example-voting-app_result, name=example-voting-app_result_1)
2020-02-09 11:40:49.766961 container pause ed9fbb02f438b22dc5424db448dc2f2fb325d72a87bb3a3b32b7373d3
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app  master   docker-c
ompose exec worker ping -c 3 db
PING db (172.23.0.4): 56 data bytes
64 bytes from 172.23.0.4: icmp_seq=0 ttl=64 time=0.122 ms
64 bytes from 172.23.0.4: icmp_seq=1 ttl=64 time=0.230 ms
64 bytes from 172.23.0.4: icmp_seq=2 ttl=64 time=0.118 ms
--- db ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.118/0.157/0.230/0.052 ms
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app  master
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app  master   docker-c
ompose up -d --scale vote=3
example-voting-app_result_1 is up-to-date
WARNING: The "vote" service specifies a port on the host. If multiple containers for this service ar
e created on a single host, the port will clash.
Starting example-voting-app_vote_1 ...
redis is up-to-date
Starting example-voting-app_vote_1 ... done
example-voting-app_worker_1 is up-to-date
Creating example-voting-app_vote_2 ...
Creating example-voting-app_vote_2 ... error
WARNING: Host is already in use by another container
Creating example-voting-app_vote_3 ... error

ERROR: for example-voting-app_vote_2  Cannot start service vote: driver failed programming external
connectivity on endpoint example-voting-app_vote_2 (f53e728b44de8bc3d667db0f9a236aa4625b70e3bddd59fc
29b240cc4c4133f3): Bind for 0.0.0.0:5000 failed: port is already allocated

ERROR: for example-voting-app_vote_3  Cannot start service vote: driver failed programming external
connectivity on endpoint example-voting-app_vote_3 (d9e29263bda7b99078d6a71a1e36d15cf6f5933222808457
d4c5d69226cdfb93): Bind for 0.0.0.0:5000 failed: port is already allocated

ERROR: for vote  Cannot start service vote: driver failed programming external connectivity on endpo
int example-voting-app_vote_2 (f53e728b44de8bc3d667db0f9a236aa4625b70e3bddd59fc29b240cc4c4133f3): Bi
nd for 0.0.0.0:5000 failed: port is already allocated
ERROR: Encountered errors while bringing up the project.
✗   ~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app  master
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app  ⑂ master  docker-c
ompose down --rmi all --volumes
Stopping example-voting-app_worker_1 ... done
Stopping db                          ... done
Stopping example-voting-app_result_1 ... done
Stopping example-voting-app_vote_1   ... done
Stopping redis                       ... done
Removing example-voting-app_vote_3   ... done
Removing example-voting-app_vote_2   ... done
Removing example-voting-app_worker_1 ... done
Removing db                          ... done
Removing example-voting-app_result_1 ... done
Removing example-voting-app_vote_1   ... done
Removing redis                       ... done
Removing network example-voting-app_front-tier
Removing network example-voting-app_back-tier
Removing volume example-voting-app_db-data
Removing image example-voting-app_vote
Removing image example-voting-app_result
Removing image redis:alpine
ERROR: Failed to remove image for service redis: 409 Client Error: Conflict ("conflict: unable to re
move repository reference "redis:alpine" (must force) - container 345637bbd567 is using its referenc
ed image b68707e68547")
Removing image postgres:9.4
Removing image example-voting-app_worker
~/Documents/Code/mastering-docker-fourth-edition/chapter05/example-voting-app  ⑂ master
```

docker

⚙ 🐞 👤 russmckendrick

Settings   ✕

	Command line
⚏ General	v19.03.5
▣ Resources	
🚜 Docker Engine	🔵 Enable experimental features
⌖ Command Line	More information about the experimental features.
☸ Kubernetes	

● Docker *running*   Cancel   Apply & Restart

```
●●●          russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter        ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ docker app init
 mobycounterapp
Created "mobycounterapp.dockerapp"
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ ls -lhat mobyco
unterapp.dockerapp
total 24
drwxr-xr-x  5 russ.mckendrick  staff   160B  9 Feb 12:41 .
drwxr-xr-x  5 russ.mckendrick  staff   160B  9 Feb 12:41 ..
-rw-r--r--  1 russ.mckendrick  staff    3B   9 Feb 12:41 parameters.yml
-rw-r--r--  1 russ.mckendrick  staff   332B  9 Feb 12:41 docker-compose.yml
-rw-r--r--  1 russ.mckendrick  staff   260B  9 Feb 12:41 metadata.yml
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ ▌
```

```
●●●          russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter        ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ docker app vali
date mobycounterapp.dockerapp
Validated "mobycounterapp.dockerapp"
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ docker app insp
ect mobycounterapp.dockerapp
mobycounterapp 0.1.0

Maintained by: Russ McKendrick <russ@mckendrick.io>

places whales on screen whereever you click

Services (2) Replicas Ports Image
------------ -------- ----- -----
mobycounter  1        8080  russmckendrick/moby-counter
redis        1              redis:alpine

Volume (1)
----------
redis_data

Parameter (1) Value
------------- -----
port          8080
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ ▌
```

```
●●●          russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter        ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ docker app inst
all mobycounterapp.dockerapp --name mobycounterapp
Creating network mobycounterapp_default
Creating service mobycounterapp_mobycounter
Creating service mobycounterapp_redis
Application "mobycounterapp" installed on context "default"
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ docker app list

INSTALLATION    APPLICATION            LAST ACTION RESULT   CREATED        MODIFIED    REFERENCE
mobycounterapp  mobycounterapp (0.1.0) install     success  About a minute 56 seconds
~/Documents/Code/mastering-docker-fourth-edition/chapter05/mobycounter  ⟩ master ⟩ ▌
```

Chapter 6: Docker Machine, Vagrant, and Multipass
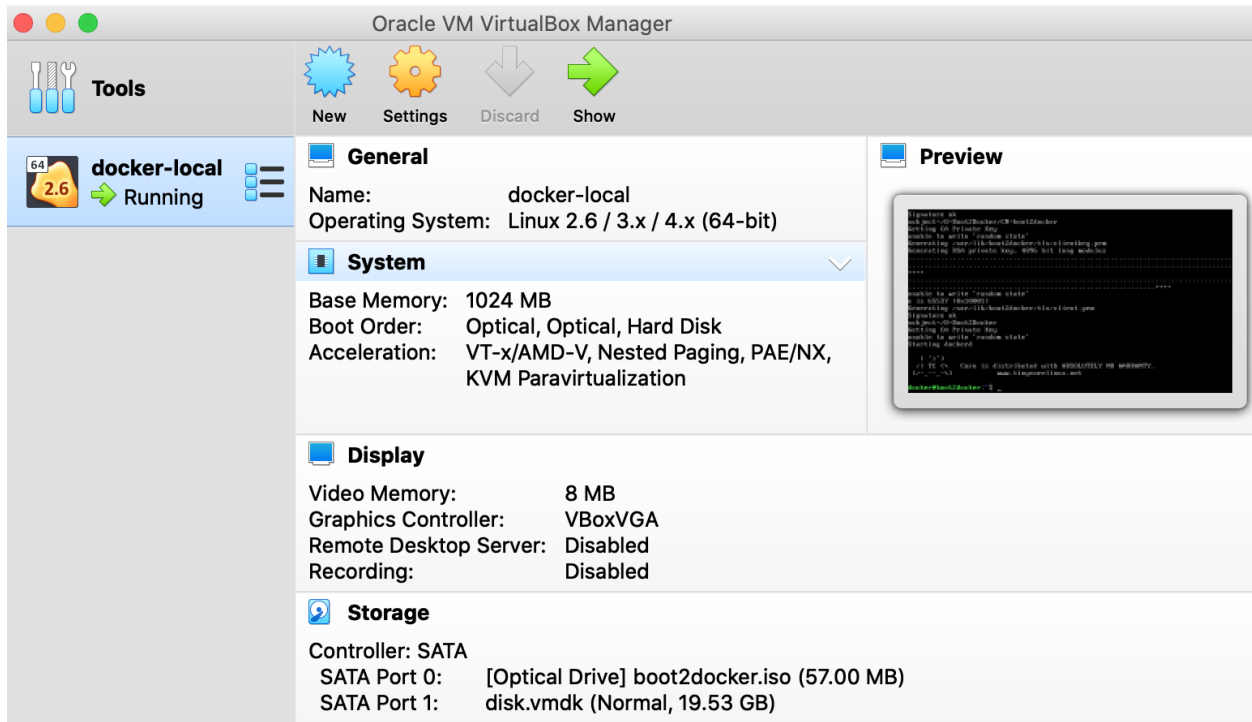
```
~    docker version
Client: Docker Engine - Community
 Version:           19.03.8
 API version:       1.40
 Go version:        go1.12.17
 Git commit:        afacb8b
 Built:             Wed Mar 11 01:21:11 2020
 OS/Arch:           darwin/amd64
 Experimental:      false

Server: Docker Engine - Community
 Engine:
  Version:          19.03.8
  API version:      1.40 (minimum version 1.12)
  Go version:       go1.12.17
  Git commit:       afacb8b
  Built:            Wed Mar 11 01:29:16 2020
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          v1.2.13
  GitCommit:        7ad184331fa3e55e52b890ea95e65ba581ae3429
 runc:
  Version:          1.0.0-rc10
  GitCommit:        dc9208a3303feef5b3839f4323d9beb36df0a9dd
 docker-init:
  Version:          0.18.0
  GitCommit:        fec3683
~
```

```
  ~     eval $(docker-machine env docker-local)
  ~     docker version
Client: Docker Engine - Community
 Version:           19.03.8
 API version:       1.40
 Go version:        go1.12.17
 Git commit:        afacb8b
 Built:             Wed Mar 11 01:21:11 2020
 OS/Arch:           darwin/amd64
 Experimental:      false

Server: Docker Engine - Community
 Engine:
  Version:          19.03.5
  API version:      1.40 (minimum version 1.12)
  Go version:       go1.12.12
  Git commit:       633a0ea838
  Built:            Wed Nov 13 07:28:45 2019
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          v1.2.10
  GitCommit:        b34a5c8af56e510852c35414db4c1f4fa6172339
 runc:
  Version:          1.0.0-rc8+dev
  GitCommit:        3e425f80a8c931f88e6d94a8c831b9d5aa481657
 docker-init:
  Version:          0.18.0
  GitCommit:        fec3683
  ~
```

```
  ~     docker-machine ls
NAME            ACTIVE   DRIVER       STATE     URL                           SWARM   DOCKER    ERRORS
docker-local    *        virtualbox   Running   tcp://192.168.99.100:2376             v19.03.5
  ~
```

~/vagrant vagrant ssh
Welcome to Ubuntu 18.04.4 LTS (GNU/Linux 4.15.0-91-generic x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

  System information as of Sun Apr 5 13:59:55 UTC 2020

  System load: 0.08   Processes: 101
  Usage of /:   16.2% of 9.63GB   Users logged in: 1
  Memory usage: 20%   IP address for enp0s3: 10.0.2.15
  Swap usage: 0%   IP address for docker0: 172.17.0.1

0 packages can be updated.
0 updates are security updates.

Last login: Sun Apr 5 13:59:47 2020 from 10.0.2.2
vagrant@ubuntu-bionic:~$ docker --version
Docker version 19.03.8, build afacb8b7f0
vagrant@ubuntu-bionic:~$ docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
1b930d010525: Pull complete
Digest: sha256:f9dfddf63636d84ef479d645ab5885156ae030f611a56f3a7ac7f2fdd86d7e4e
Status: Downloaded newer image for hello-world:latest

Hello from Docker!

```
~    multipass shell docker-host
Welcome to Ubuntu 18.04.4 LTS (GNU/Linux 4.15.0-91-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Sun Apr  5 15:57:48 BST 2020

  System load:  0.08               Processes:              106
  Usage of /:   33.5% of 4.67GB    Users logged in:        0
  Memory usage: 19%                IP address for enp0s2:  192.168.64.8
  Swap usage:   0%                 IP address for docker0: 172.17.0.1

32 packages can be updated.
16 updates are security updates.

Last login: Sun Apr  5 15:56:59 2020 from 192.168.64.1
ubuntu@docker-host:~$ docker --version
Docker version 19.03.8, build afacb8b7f0
ubuntu@docker-host:~$ docker container run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
1b930d010525: Pull complete
Digest: sha256:f9dfddf63636d84ef479d645ab5885156ae030f611a56f3a7ac7f2fdd86d7e4e
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
```
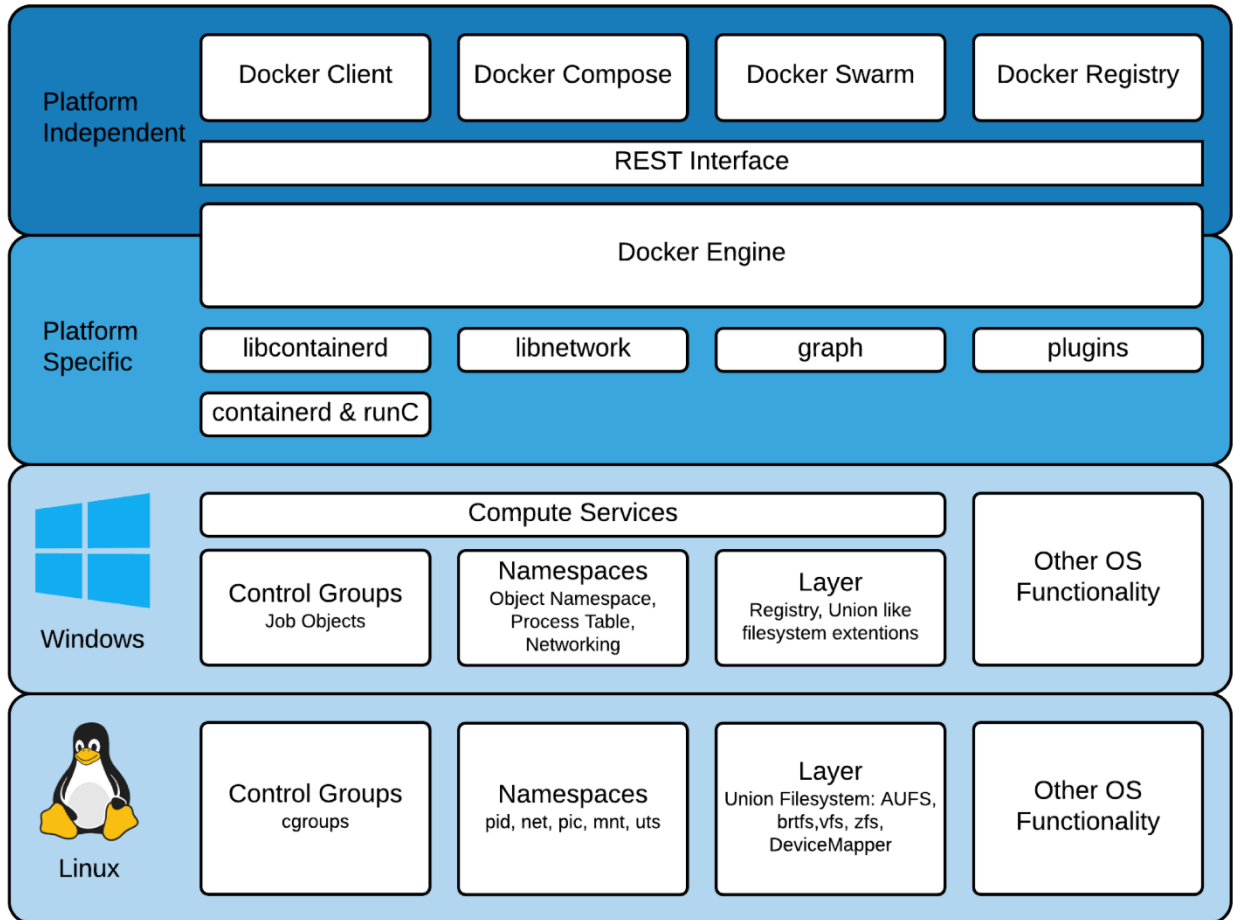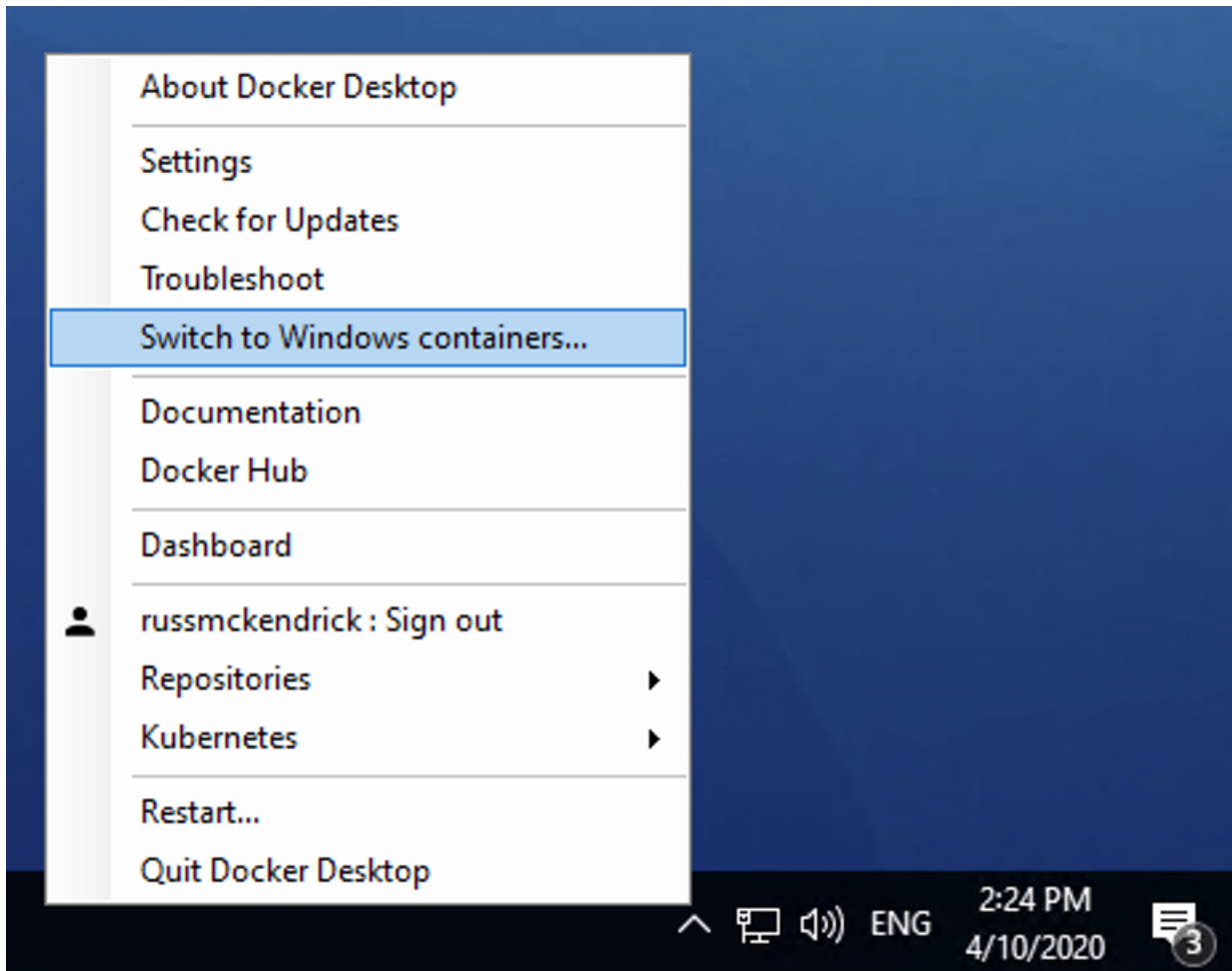
Chapter 7: Moving from Linux to Windows Containers

Platform Independent	Docker Client	Docker Compose	Docker Swarm	Docker Registry
	REST Interface			

Platform Specific	Docker Engine			
	libcontainerd	libnetwork	graph	plugins
	containerd & runC			

Windows	Compute Services			Other OS Functionality
	Control Groups Job Objects	Namespaces Object Namespace, Process Table, Networking	Layer Registry, Union like filesystem extentions	

Linux	Control Groups cgroups	Namespaces pid, net, pic, mnt, uts	Layer Union Filesystem: AUFS, brtfs,vfs, zfs, DeviceMapper	Other OS Functionality

About Docker Desktop

Settings
Check for Updates
Troubleshoot

Switch to Windows containers...

Documentation
Docker Hub

Dashboard

russmckendrick : Sign out
Repositories   ▶
Kubernetes   ▶

Restart...
Quit Docker Desktop

∧ 🖳 🔊)) ENG   2:24 PM
                 4/10/2020 🗨③

Switch to Windows containers   ✕

Switch to Windows containers

⚠️ You are about to switch to Windows containers. Existing containers will
continue to run, but you will not be able to manage them until you switch
back to Linux containers. No data will be lost otherwise.

Do you want to continue?

☐ Don't show this message again

                                        [Switch]   [Cancel]

```
PS C:\Users\russmckendrick> docker version
Client: Docker Engine - Community
 Version:           19.03.8
 API version:       1.40
 Go version:        go1.12.17
 Git commit:        afacb8b
 Built:             Wed Mar 11 01:23:10 2020
 OS/Arch:           windows/amd64
 Experimental:      false

Server: Docker Engine - Community
 Engine:
  Version:          19.03.8
  API version:      1.40 (minimum version 1.24)
  Go version:       go1.12.17
  Git commit:       afacb8b
  Built:            Wed Mar 11 01:37:20 2020
  OS/Arch:          windows/amd64
  Experimental:     false
PS C:\Users\russmckendrick> |
```

```
Administrator: Windows Power  ×    +  ∨                                     —   □   ✕

PS C:\Users\russmckendrick> docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
8e709836e4dc: Pull complete
543ff0f9573f: Pull complete
f01167dd6121: Pull complete
Digest: sha256:f9dfddf63636d84ef479d645ab5885156ae030f611a56f3a7ac7f2fdd86d7e4e
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (windows-amd64, nanoserver-1809)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run a Windows Server container with:
 PS C:\> docker run -it mcr.microsoft.com/windows/servercore powershell

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/

PS C:\Users\russmckendrick>
```

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\> Get-CimInstance -ClassName Win32_Desktop -ComputerName .

SettingID Name                                  ScreenSaverActive ScreenSaverSecure ScreenSav
                                                                                    erTimeout
--------- ----                                  ----------------- ----------------- ---------
          NT AUTHORITY\SYSTEM                    False
          NT AUTHORITY\LOCAL SERVICE             False
          NT AUTHORITY\NETWORK SERVICE           False
          B2733DF14F95\Administrator             False
          User Manager\ContainerAdministrator   False
          User Manager\ContainerUser            False
          .DEFAULT                              False
PS C:\> exit
PS C:\Users\russmckendrick>
```

```
PS C:\Users\russmckendrick> docker container ls -a
CONTAINER ID        IMAGE                                               COMMAND
  CREATED               STATUS                      PORTS                  NAMES
b2733df14f95        mcr.microsoft.com/windows/servercore:ltsc2019       "powershell"
  2 minutes ago         Exited (0) About a minute ago                           trusting_mendel
38552a2cf274        hello-world                                         "cmd /C 'type C:\\hel…"
  23 minutes ago        Exited (0) 23 minutes ago                               quirky_brown
PS C:\Users\russmckendrick>
```
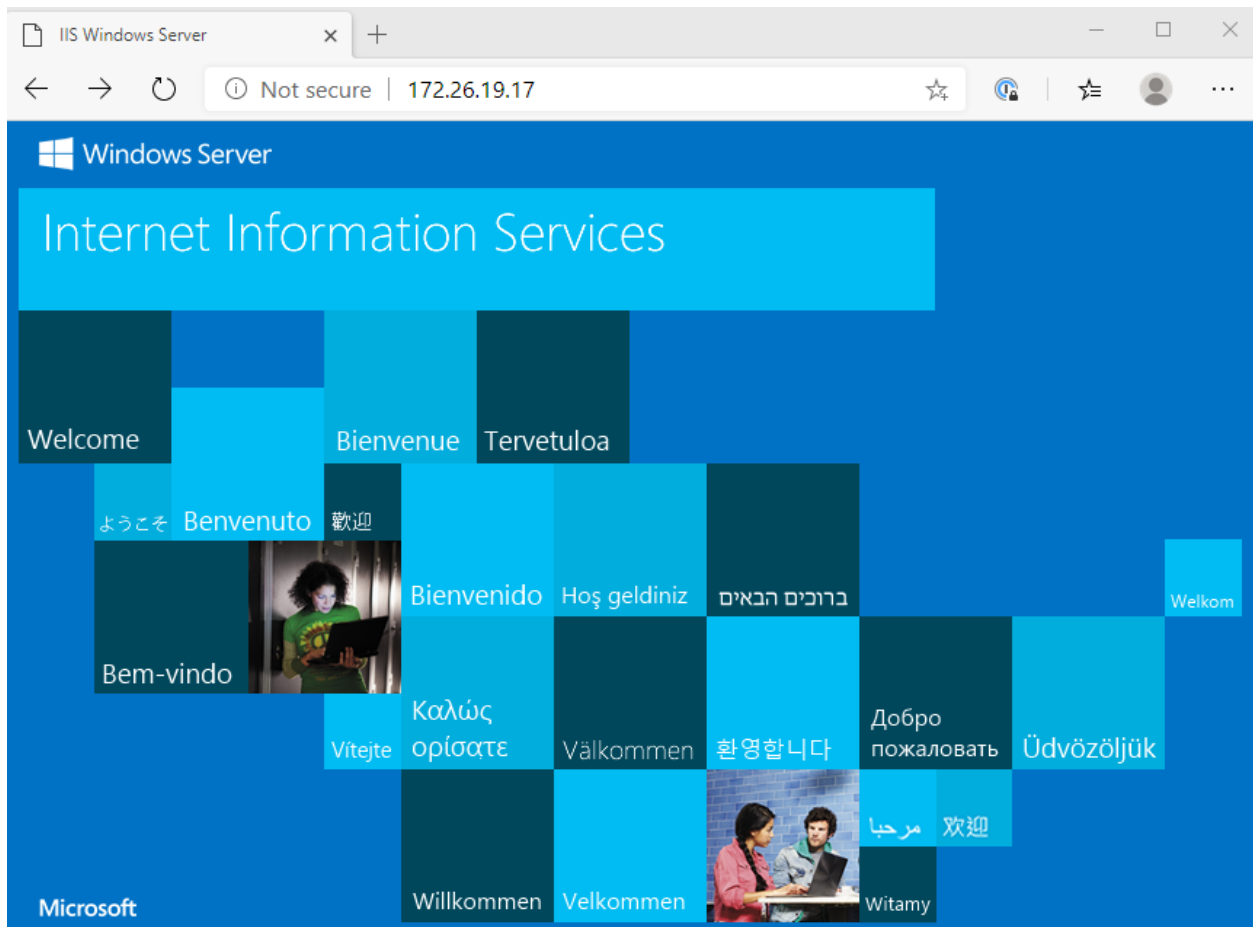
```
 ---> Running in 44548af88016
Removing intermediate container 44548af88016
 ---> a1827260443c
Step 4/4 : ENTRYPOINT ["C:\\ServiceMonitor.exe", "w3svc"]
 ---> Running in bb561d7c9ee6
Removing intermediate container bb561d7c9ee6
 ---> b3719bb9ceea
Successfully built b3719bb9ceea
Successfully tagged local:dockerfile-iis
PS C:\Users\russmckendrick\Documents\Docker> docker image ls
REPOSITORY                                TAG              IMAGE ID            CREATED
        SIZE
local                                     dockerfile-iis   b3719bb9ceea        19 seconds ag
o       5.13GB
hello-world                               latest           b209aa2b650e        4 weeks ago
        251MB
mcr.microsoft.com/windows/servercore      ltsc2019         80e84fd280e2        5 weeks ago
        4.94GB
PS C:\Users\russmckendrick\Documents\Docker>
```

```
PS C:\Users\russmckendrick\Documents\Docker> docker container run -d --name dockerfile-iis l
ocal:dockerfile-iis
043672573f55084c3839e2e6bed919db45b3902a62054e146c328ceb83135fb8
PS C:\Users\russmckendrick\Documents\Docker> docker inspect --format="{{.NetworkSettings.Net
works.nat.IPAddress}}" dockerfile-iis
172.26.30.80
PS C:\Users\russmckendrick\Documents\Docker>
```

IIS Windows Server

Not secure | 172.26.19.17

Windows Server

Internet Information Services

Welcome   Bienvenue   Tervetuloa

ようこそ Benvenuto 歓迎

Bienvenido   Hoş geldiniz   ברוכים הבאים

Bem-vindo

Καλώς
ορίσατε   Välkommen   환영합니다   Добро
пожаловать   Üdvözöljük

Vítejte

مرحبا   欢迎

Willkommen   Velkommen

Witamy

Microsoft

Welkom

```
octopus_1 | WHERE o.[type] = 'U'
octopus_1 |    AND i.name is not null
octopus_1 |    AND s.name <> 'sys'
octopus_1 |     AND o.name <> 'sysdiagrams'
octopus_1 | UNION ALL
octopus_1 | SELECT 'IDX ' + IsNull(s.name, '<null>') + '.' + IsNull(i.name, '<null>') + ' ' + IsNull(c.name, '<null>')
octopus_1 | FROM sys.indexes i
octopus_1 |    INNER JOIN sys.objects o on i.object_id = o.object_id
octopus_1 |    INNER JOIN sys.schemas s on o.schema_id = s.schema_id
octopus_1 |    INNER JOIN sys.index_columns ic on ic.object_id = i.object_id AND ic.index_id = i.index_id
octopus_1 |    INNER JOIN sys.all_columns c on ic.object_id = c.object_id AND ic.column_id = c.column_id
octopus_1 | WHERE o.[type] = 'U'
octopus_1 |    AND s.name <> 'sys'
octopus_1 |     AND o.name <> 'sysdiagrams'
octopus_1 | UNION ALL
octopus_1 | SELECT IsNull(o.[type_desc] COLLATE DATABASE_DEFAULT, '<null>') + ' ' + IsNull(s.name, '<null>') + '.' + IsNull(c.name, '<nul
l>') + '.' + IsNull(o.name, '<null>')
octopus_1 | FROM sys.objects o
octopus_1 |    INNER JOIN sys.schemas s on o.schema_id = s.schema_id
octopus_1 |    INNER JOIN sys.objects c ON o.parent_object_id = c.object_id
octopus_1 | WHERE o.[type] = 'TR'
octopus_1 | ORDER BY 1
octopus_1 | Completed System Integrity Check. Overall Result: Passed
```

Dashboard

CONFIGURE

Let's deploy your first software application

Before getting started, we recommend having a look at our fundamentals of deploying.

1 Tell Octopus where to deploy your software

▶ **Create your first environment**

▶ Create your first deployment target (optional)

With Octopus you can deploy your software anywhere you want, with built-in support for the most popular hosting environments. Learn more

2 Package and

3 Define your

1 Tell Octopus where to deploy your software

▶ **Create your first environment**

▶ Create your first deployment target (optional)

Chapter 8: Clustering with Docker Swarm

```
~    docker swarm --help

Usage:  docker swarm COMMAND

Manage Swarm

Commands:
  ca         Display and rotate the root CA
  init       Initialize a swarm
  join       Join a swarm as a node and/or manager
  join-token Manage join tokens
  leave      Leave the swarm
  unlock     Unlock swarm
  unlock-key Manage the unlock key
  update     Update the swarm

Run 'docker swarm COMMAND --help' for more information on a command.
~
```
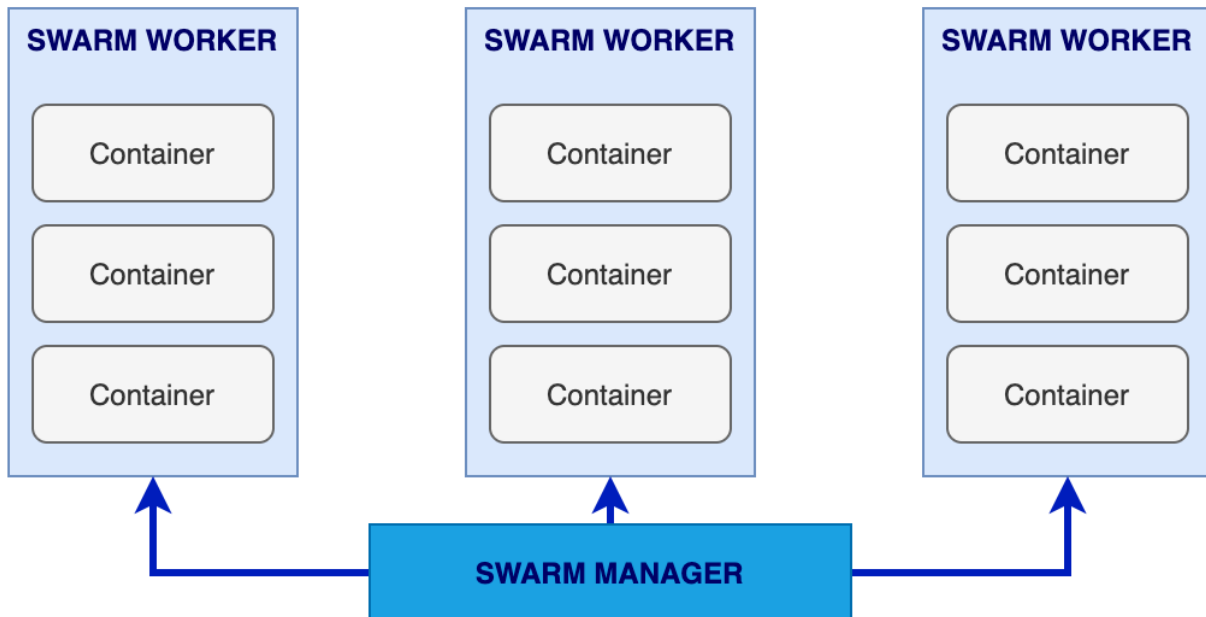
```
russ.mckendrick@russs-mbp: ~                          ⌥⌘1
~    multipass launch -n node1
Launched: node1
~    multipass launch -n node2
Launched: node2
~    multipass launch -n node3
Launched: node3
~    multipass list
Name            State           IPv4            Image
node1           Running         192.168.64.9    Ubuntu 18.04 LTS
node2           Running         192.168.64.10   Ubuntu 18.04 LTS
node3           Running         192.168.64.11   Ubuntu 18.04 LTS
~
```

```
russ.mckendrick@russs-mbp: ~                          ⌥⌘1
~    multipass exec node2 -- \
     /bin/bash -c "docker swarm join --token $SWARM_TOKEN $IP:2377"
This node joined a swarm as a worker.
~    multipass exec node3 -- \
     /bin/bash -c "docker swarm join --token $SWARM_TOKEN $IP:2377"
This node joined a swarm as a worker.
~
```

```
russ.mckendrick@russs-mbp: ~                          ⌥⌘1
~    multipass exec node1 -- /bin/bash -c "docker node ls"
ID                        HOSTNAME      STATUS      AVAILABILITY      MANAGER ST
ATUS      ENGINE VERSION
92kts1c9x17gbqv3in9t1w4qm *   node1       Ready       Active            Leader
          19.03.8
x5qbl7j7qp07amffbps56p562     node2       Ready       Active
          19.03.8
hs8r872ihh3e55k01b0u1khfb     node3       Ready       Active
          19.03.8
~
```
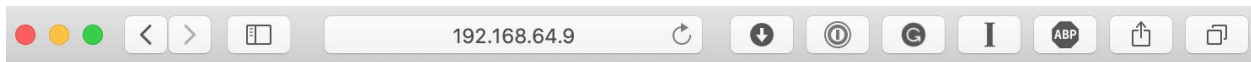
```
ubuntu@node1:~$ docker node ls
ID                            HOSTNAME   STATUS   AVAILABILITY   MANAGER ST
ATUS      ENGINE VERSION
92kts1c9x17gbqv3in9t1w4qm *   node1      Ready    Active         Leader
          19.03.8
x5qbl7j7qp07amffbps56p562     node2      Ready    Active         Reachable
          19.03.8
hs8r872ihh3e55k01b0u1khfb     node3      Ready    Active
          19.03.8
ubuntu@node1:~$
```

```
ubuntu@node2:~$ docker node ls
ID                            HOSTNAME   STATUS   AVAILABILITY   MANAGER ST
ATUS      ENGINE VERSION
92kts1c9x17gbqv3in9t1w4qm     node1      Ready    Active
          19.03.8
x5qbl7j7qp07amffbps56p562 *   node2      Ready    Active         Leader
          19.03.8
hs8r872ihh3e55k01b0u1khfb     node3      Ready    Active
          19.03.8
ubuntu@node2:~$
```

```
ubuntu@node2:~$ docker node update --availability drain node1
node1
ubuntu@node2:~$ docker node ls
ID                            HOSTNAME   STATUS   AVAILABILITY   MANAGER ST
ATUS      ENGINE VERSION
92kts1c9x17gbqv3in9t1w4qm     node1      Ready    Drain
          19.03.8
x5qbl7j7qp07amffbps56p562 *   node2      Ready    Active         Leader
          19.03.8
hs8r872ihh3e55k01b0u1khfb     node3      Ready    Active
          19.03.8
ubuntu@node2:~$
```

```
ubuntu@node2:~$ docker node update --availability active node1
node1
ubuntu@node2:~$ docker node ls
ID                              HOSTNAME        STATUS      AVAILABILITY        MANAGER ST
ATUS        ENGINE VERSION
92kts1c9x17gbqv3in9t1w4qm       node1           Ready       Active
            19.03.8
x5qbl7j7qp07amffbps56p562 *     node2           Ready       Active              Leader
            19.03.8
hs8r872ihh3e55k01b0u1khfb       node3           Ready       Active
            19.03.8
ubuntu@node2:~$
```

```
ubuntu@node2:~$ docker service create \
>     --name cluster \
>     --constraint "node.role == worker" \
>     -p:80:80/tcp \
>     russmckendrick/cluster
t2qao1mrm145tbsqd1jp8x4cf
overall progress: 1 out of 1 tasks
1/1: running
verify: Service converged
ubuntu@node2:~$ docker node ls
ID                              HOSTNAME        STATUS      AVAILABILITY        MANAGER ST
ATUS        ENGINE VERSION
92kts1c9x17gbqv3in9t1w4qm       node1           Ready       Active
            19.03.8
x5qbl7j7qp07amffbps56p562 *     node2           Ready       Active              Leader
            19.03.8
hs8r872ihh3e55k01b0u1khfb       node3           Ready       Active
            19.03.8
ubuntu@node2:~$
```

```
~    multipass list
Name                State           IPv4                Image
node1               Running         192.168.64.9        Ubuntu 18.04 LTS
node2               Running         192.168.64.10       Ubuntu 18.04 LTS
node3               Running         192.168.64.11       Ubuntu 18.04 LTS
~
```

f5b34ae6eaf6

```
ubuntu@node2:~$ docker service ls
ID                   NAME          MODE          REPLICAS       IMAGE
             PORTS
t2qao1mrm145         cluster       replicated    1/1            russmckendrick/clust
er:latest   *:80->80/tcp
ubuntu@node2:~$
```

```
ubuntu@node2:~$ docker service inspect cluster --pretty

ID:              t2qao1mrm145tbsqd1jp8x4cf
Name:            cluster
Service Mode:    Replicated
 Replicas:       1
Placement:
 Constraints:    [node.role == worker]
UpdateConfig:
 Parallelism:    1
 On failure:     pause
 Monitoring Period: 5s
 Max failure ratio: 0
 Update order:      stop-first
RollbackConfig:
 Parallelism:    1
 On failure:     pause
 Monitoring Period: 5s
 Max failure ratio: 0
 Rollback order:    stop-first
ContainerSpec:
 Image:          russmckendrick/cluster:latest@sha256:702d320906c5dd4429dfc488e4402e3f12737eea30f1d11
ed2cf02d75b74294c
 Init:           false
Resources:
Endpoint Mode:  vip
Ports:
 PublishedPort = 80
  Protocol = tcp
  TargetPort = 80
  PublishMode = ingress

ubuntu@node2:~$
```

```
ubuntu@node2:~$ docker node ps
ID                    NAME            IMAGE                    NODE            DESIRED STATE
CURRENT STATE         ERROR           PORTS
ubuntu@node2:~$ docker node ps node1
ID                    NAME            IMAGE                          NODE            DESIRED
STATE        CURRENT STATE          ERROR            PORTS
153tciatmc57          cluster.1       russmckendrick/cluster:latest  node1           Running
          Running 13 minutes ago
ubuntu@node2:~$ docker node ps node3
ID                    NAME            IMAGE                    NODE            DESIRED STATE
CURRENT STATE         ERROR           PORTS
ubuntu@node2:~$
```

```
ubuntu@node2:~$ docker service scale cluster=6
cluster scaled to 6
overall progress: 6 out of 6 tasks
1/6: running
2/6: running
3/6: running
4/6: running
5/6: running
6/6: running
verify: Service converged
ubuntu@node2:~$ docker service ls
ID                  NAME                MODE                REPLICAS            IMAGE
           PORTS
t2qao1mrm145        cluster             replicated          6/6                 russmckendrick/clust
er:latest    *:80->80/tcp
ubuntu@node2:~$ docker node ps node1
ID                  NAME                IMAGE                              NODE                DESIRED
STATE           CURRENT STATE           ERROR                 PORTS
153tciatmc57        cluster.1           russmckendrick/cluster:latest      node1               Running
           Running 18 minutes ago
q2y08dgek1we        cluster.2           russmckendrick/cluster:latest      node1               Running
           Running 28 seconds ago
j4hscclwety9        cluster.4           russmckendrick/cluster:latest      node1               Running
           Running 28 seconds ago
ubuntu@node2:~$ docker node ps node3
ID                  NAME                IMAGE                              NODE                DESIRED
STATE           CURRENT STATE           ERROR                 PORTS
f3rt582glywq        cluster.3           russmckendrick/cluster:latest      node3               Running
           Running 22 seconds ago
kbrsidjpwt7l        cluster.5           russmckendrick/cluster:latest      node3               Running
           Running 21 seconds ago
6ejfxxt9i6nr        cluster.6           russmckendrick/cluster:latest      node3               Running
           Running 22 seconds ago
ubuntu@node2:~$
```

```
ubuntu@node2:~$ docker stack deploy --compose-file=docker-compose.yml cluster
Creating network cluster_default
Creating service cluster_cluster
ubuntu@node2:~$ docker stack ls
NAME                SERVICES        ORCHESTRATOR
cluster             1               Swarm
ubuntu@node2:~$ docker stack services cluster
ID                  NAME                MODE            REPLICAS            IMAGE
          PORTS
msku81la7gz0        cluster_cluster     replicated      6/6                 russmckendrick/clust
er:latest   *:80->80/tcp
ubuntu@node2:~$ docker stack ps cluster
ID                  NAME                IMAGE                           NODE            DESIRED
STATE       CURRENT STATE           ERROR           PORTS
zfoe5seytvoh        cluster_cluster.1   russmckendrick/cluster:latest   node1           Running
          Running 2 minutes ago
oc1sygizmhsi        cluster_cluster.2   russmckendrick/cluster:latest   node3           Running
          Running 2 minutes ago
hzgjc6wt3usg        cluster_cluster.3   russmckendrick/cluster:latest   node1           Running
          Running 2 minutes ago
a7vknsn1k423        cluster_cluster.4   russmckendrick/cluster:latest   node3           Running
          Running 2 minutes ago
vnxkiiossx9n        cluster_cluster.5   russmckendrick/cluster:latest   node1           Running
          Running 2 minutes ago
rsht65pu6u8g        cluster_cluster.6   russmckendrick/cluster:latest   node3           Running
          Running 2 minutes ago
ubuntu@node2:~$
```
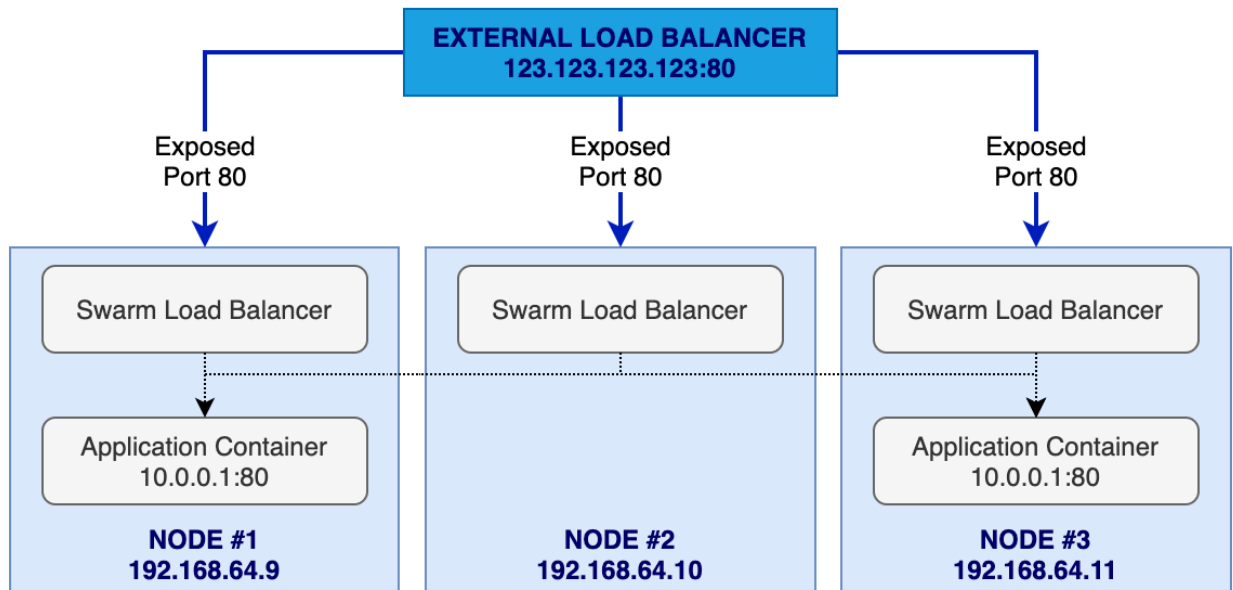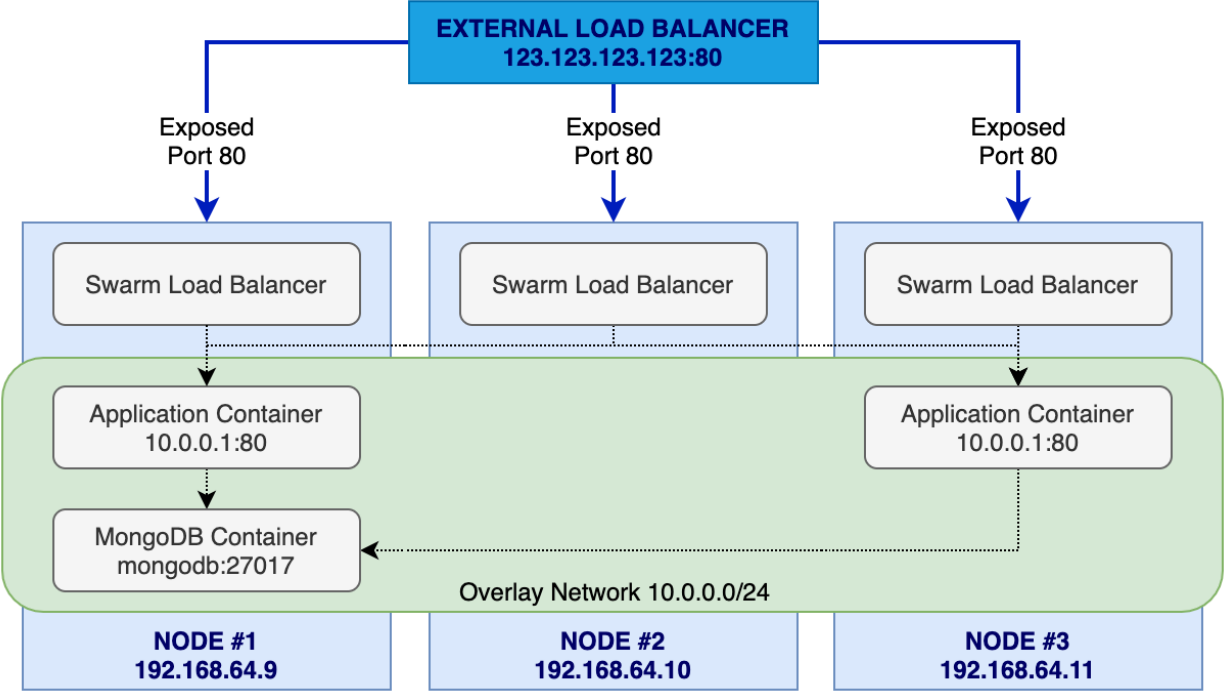
Chapter 9: Portainer – A GUI for Docker

```
russ.mckendrick@russs-mbp: ~                                    ⌥⌘1
~    docker image pull portainer/portainer
Using default tag: latest
latest: Pulling from portainer/portainer
d1e017099d17: Pull complete
a7dca5b5a9e8: Pull complete
Digest: sha256:4ae7f14330b56ffc8728e63d355bc4bc7381417fa45ba0597e5dd32682901080
Status: Downloaded newer image for portainer/portainer:latest
docker.io/portainer/portainer:latest
~    docker image ls
REPOSITORY             TAG          IMAGE ID       CREATED        SIZE
portainer/portainer    latest       2869fc110bf7   4 weeks ago    78.6MB
~    docker volume create portainer_data
portainer_data
~    docker container run -d \
    -p 9000:9000 \
    -v /var/run/docker.sock:/var/run/docker.sock \
    portainer/portainer
35af24a79e00bea3874f442da77f8a6853d8ce0ac6185d4eb6ce241130e35dc5
~
```

```
localhost
```
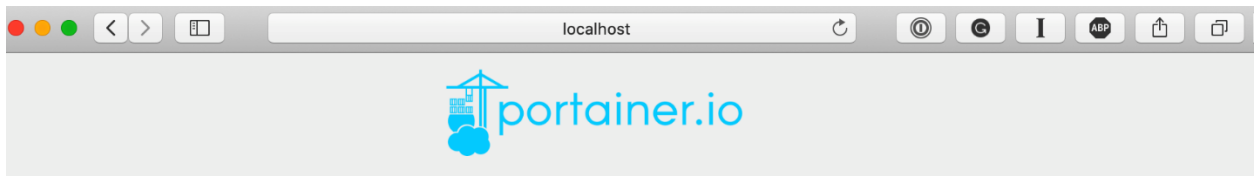
portainer.io

Connect Portainer to the Docker environment you want to manage.

✔			
🐳 **Local**	🐳 **Remote**	⚡ **Agent**	⬛ **Azure**
Manage the local Docker environment	Manage a remote Docker environment	Connect to a Portainer agent	Connect to Microsoft Azure ACI

Information

Manage the Docker environment where Portainer is running.

⚠ Ensure that you have started the Portainer container with the following Docker flag:

`-v "/var/run/docker.sock:/var/run/docker.sock"` (Linux).

or

`-v \\.\pipe\docker_engine:\\.\pipe\docker_engine` (Windows).

⚡ Connect

Home ⟳
Endpoints

🛟 Portainer support   👤 admin
🔧 my account   ⏻ log out

🔌 Endpoints

⟳ Refresh

🔍 Search by name, group, tag, status, URL...

🐳 **local** `up` 2020-04-18 15:52:37   Group: Unassigned ✏️
   ▦ 0 stacks ▤ 1 container - ⏻ 1 ⏻ 0 / 💚 0 💛 0 🔗 2 volumes 🖼 1 image   Standalone 19.03.8
   ▦ 6 🖳 2.1 GB - 🏷 No tags   /var/run/docker.sock

Items per page 10 ⬍

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Dashboard
Endpoint summary

🛟 Portainer support   👤 admin
🔧 my account   ⏻ log out

🎛 Endpoint info

Endpoint   local ▦ 6 🖳 2.1 GB - Standalone 19.03.8

URL   /var/run/docker.sock

Tags   -

▦ **0**
Stacks

▦ **1**
Container
💚 0 healthy   ⏻ 1 running
💛 0 unhealthy   ⏻ 0 stopped

🖼 **1**
Image
🏷 78.6 MB

⬢ **2**
Volumes

🔗 **3**
Networks

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Application templates list 🔄

Templates

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↯ LOCAL

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App Templates 🚀

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Settings ⚙

🚀 **Templates**

+ Add template

Show container templates 🔵

Select a category ▾

🔍 Search...

Registry ◊ container
Docker image registry
☑ Update **🗑 Delete**
docker

Nginx ◊ container
High performance web server
☑ Update **🗑 Delete**
webserver

Httpd ◊ container
Open-source HTTP server
☑ Update **🗑 Delete**
webserver

Caddy ◊ container
HTTP/2 web server with automatic HTTPS
☑ Update **🗑 Delete**
webserver

MySQL ◊ container
The most popular open-source database
☑ Update **🗑 Delete**
database

MariaDB ◊ container
Performance beyond MySQL
☑ Update **🗑 Delete**
database

---

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Search   Filter...

Lines   100

Actions   📋 Copy   📋 Copy selected lines   ✕ Unselect

```
2020-04-18 15:17:37,957 INFO supervisord started with pid 1
2020-04-18 15:17:38,960 INFO spawned: 'nginx' with pid 7
2020-04-18 15:17:38,961 INFO spawned: 'start' with pid 8
2020-04-18 15:17:38,969 INFO exited: start (exit status 0; not expected)
2020-04-18 15:17:38,972 INFO gave up: start entered FATAL state, too many start retries too quickly
2020-04-18 15:17:39,974 INFO success: nginx entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
```

Container console

Containers > cluster > Console

❌ Portainer support   👤 admin

🔧 my account   ⟶ log out

>_ **Execute**

Exec into container as **default user** using command **bash**   **Disconnect**

```
bash-4.4# cat /etc/*release
3.8.1
NAME="Alpine Linux"
ID=alpine
VERSION_ID=3.8.1
PRETTY_NAME="Alpine Linux v3.8"
HOME_URL="http://alpinelinux.org"
BUG_REPORT_URL="http://bugs.alpinelinux.org"
bash-4.4# whoami
root
bash-4.4# ps aux
PID   USER      TIME  COMMAND
    1 root      0:00 {supervisord} /usr/bin/python2 /usr/bin/supervisord -c /etc/supervisord.conf
    7 root      0:00 nginx: master process /usr/sbin/nginx
   11 nginx     0:00 nginx: worker process
   12 root      0:00 bash
   19 root      0:00 ps aux
bash-4.4# ls -lhat /var/www/html/
total 60
drwxr-xr-x    1 nginx     nginx        4.0K Apr 18 15:17 .
-rwxr-xr-x    1 nginx     nginx         300 Apr 18 15:17 index.html
drwxr-xr-x    1 root      root         4.0K Sep 30  2018 ..
-rw-r--r--    1 nginx     nginx       42.7K Sep 30  2018 swarm.png
bash-4.4#
```

Image list

Images

Pull image

Registry	DockerHub
Image	docker.io e.g. myImage:myTag

⚠ Image name is required.

🌐 **Advanced mode**

Pull the image

Images

⚙ **Settings**

🗑 Remove ▾   **+ Build a new image**   **⬆ Import**   **⬇ Export**

🔍 Search...

☐ Id Filter ▼	Tags ↓↑	Size	Created
☐ sha256:2869fc110bf706fd70120a66dadc62...	portainer/portainer:latest	78.6 MB	2020-03-19 22:46:29
☐ sha256:001f9f4d036df8fce9612b3dd45552...	russmckendrick/cluster:latest	53.2 MB	2018-09-30 13:20:02

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Host overview

Docker

Portainer support **admin**

Host Details

Hostname	**docker-desktop**
OS Information	**linux x86_64 Docker Desktop**
Kernel Version	**4.19.76-linuxkit**
Total CPU	**6**
Total memory	**2.1 GB**

Engine Details

Version	**19.03.8 (API: 1.40)**
Root directory	**/var/lib/docker**
Storage Driver	**overlay2**
Logging Driver	**json-file**
Volume Plugins	**local**
Network Plugins	**bridge, host, ipvlan, macvlan, null, overlay**

Sidebar

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```
ubuntu@node1:~$ curl -L https://downloads.portainer.io/portainer-agent-stack.yml -o portainer-agent-stack.yml
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   754  100   754    0     0    899      0 --:--:-- --:--:-- --:--:--   899
ubuntu@node1:~$ docker stack deploy --compose-file=portainer-agent-stack.yml portainer
Creating network portainer_agent_network
Creating service portainer_agent
Creating service portainer_portainer
ubuntu@node1:~$
```

Home 🔄
Endpoints

Portainer support 👤 admin
🔧 my account ➡ log out

🔌 Endpoints

🔄 Refresh

🔍 Search by name, group, tag, status, URL...

primary [up] 2020-04-18 18:22:45   Group: Unassigned ✏
☰ 1 stack   🗎 2 services   ☰ 4 containers - ⏻ 4 ⏻ 0 / 💚 0 💛 0   🗄 1 volume   🗐 4 images   Swarm 19.03.8 + ⚡ Agent
🏷 No tags   tasks.agent:9001

Items per page 10 ▼

---

portainer.io

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⚡ PRIMARY
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Dashboard
Endpoint summary

Portainer support 👤 admin
🔧 my account ➡ log out

🎛 Cluster information

Nodes in the cluster   3

🖵 Go to cluster visualizer

☰ 1
Stack

🗎 2
Services

☰ 4
Containers

💚 0 healthy   ⏻ 4 running
💛 0 unhealthy ⏻ 0 stopped

🗐 4
Images

◔ 120.4 MB

📦 1
Volume

🕸 18
Networks

Tasks

Status	Id	Actions	Slot	Node	Last Update ↑↓
running	cluster.3.lgjc6dpxh6i3x6xsf9qlt703f	📄 ℹ 📊 >_	3	node2	2020-04-18 18:40:53
running	cluster.4.yxuimqghwh8h9cairu5b93l81	📄 ℹ 📊 >_	4	node2	2020-04-18 18:40:52
running	cluster.5.b408jc7mbtjeq8sdnroa0r05y	📄 ℹ 📊 >_	5	node3	2020-04-18 18:40:52
running	cluster.6.yohec8xs0untifljb64gb7h6e	📄 ℹ 📊 >_	6	node3	2020-04-18 18:40:52
running	cluster.2.kzhj5mpb6yy46z54fwgguufli	📄 ℹ 📊 >_	2	node1	2020-04-18 18:40:41
running	cluster.1.12oa0k3z2kabp829h36kgusxd	📄 ℹ 📊 >_	1	node1	2020-04-18 18:40:14

Items per page 10

Container list

Containers

Portainer support   admin

my account   log out

Containers   Columns   Settings

Start   Stop   Kill   Restart   Pause   Resume   Remove   + Add container

Search...

Name	State ↕ Filter	Quick actions	Stack	Image	Created	IP Address
cluster.4.yxuimqghwh8h9cairu5b93l81	running	📄 ℹ 📊 >_	-	russmckendrick/cluster:latest	2020-04-18 18:40:50	10.0.0.13
cluster.3.lgjc6dpxh6i3x6xsf9qlt703f	running	📄 ℹ 📊 >_	-	russmckendrick/cluster:latest	2020-04-18 18:40:50	10.0.0.12
MobyCounter_mobycounter.1.kre...	running	📄 ℹ 📊 >_	MobyCounter	russmckendrick/moby-counter:latest	2020-04-18 18:33:59	10.0.2.6
portainer_agent.vy8n9mvg7v96g...	running	📄 ℹ 📊 >_	portainer	portainer/agent:latest	2020-04-18 18:17:14	10.0.1.4
cluster.2.kzhj5mpb6yy46z54fwgguufli	running	📄 ℹ 📊 >_	-	russmckendrick/cluster:latest	2020-04-18 18:40:40	10.0.0.11
cluster.1.12oa0k3z2kabp829h36kgusxd	running	📄 ℹ 📊 >_	-	russmckendrick/cluster:latest	2020-04-18 18:40:13	10.0.0.10
portainer_portainer.1.xy6xmkv...	running	📄 ℹ 📊 >_	portainer	portainer/portainer:latest	2020-04-18 18:17:43	10.0.0.6
portainer_agent.osagjzyrhxuom...	running	📄 ℹ 📊 >_	portainer	portainer/agent:latest	2020-04-18 18:17:37	10.0.1.3
cluster.6.yohec8xs0untifljb64gb7h6e	running	📄 ℹ 📊 >_	-	russmckendrick/cluster:latest	2020-04-18 18:40:49	10.0.0.15
cluster.5.b408jc7mbtjeq8sdnroa0r05y	running	📄 ℹ 📊 >_	-	russmckendrick/cluster:latest	2020-04-18 18:40:49	10.0.0.14

Items per page 10   ‹ 1 2 ›

portainer.io 1.23.2

☒ Cluster visualizer

portainer.io

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---

node1 🐧
manager
CPU: 1
Memory: 1.03 GB
ready

cluster
Image: russmckendrick/cluster:latest
Status: running
Update: 2020-04-18 18:40:14

cluster
Image: russmckendrick/cluster:latest
Status: running
Update: 2020-04-18 18:40:41

portainer_agent
Image: portainer/agent:latest
Status: running
Update: 2020-04-18 18:17:38

portainer_portainer
Image: portainer/portainer:latest
Status: running
Update: 2020-04-18 18:17:45

---

node2 🐧
worker
CPU: 1
Memory: 1.03 GB
ready

cluster
Image: russmckendrick/cluster:latest
Status: running
Update: 2020-04-18 18:40:53

cluster
Image: russmckendrick/cluster:latest
Status: running
Update: 2020-04-18 18:40:52

MobyCounter_mobycounter
Image: russmckendrick/moby-counter:latest
Status: running
Update: 2020-04-18 18:34:01

portainer_agent
Image: portainer/agent:latest
Status: running
Update: 2020-04-18 18:17:40

---

node3 🐧
worker
CPU: 1
Memory: 1.03 GB
ready

cluster
Image: russmckendrick/cluster:latest
Status: running
Update: 2020-04-18 18:40:52

cluster
Image: russmckendrick/cluster:latest
Status: running
Update: 2020-04-18 18:40:52

MobyCounter_redis
Image: redis:alpine
Status: running
Update: 2020-04-18 18:33:50

portainer_agent
Image: portainer/agent:latest
Status: running
Update: 2020-04-18 18:17:39

Portainer

Just another WordPress site

Sample Page

Search

UNCATEGORIZED

Hello world!

By Portainer   April 18, 2020   1 Comment

Welcome to WordPress. This is your first post. Edit or delete it, then start writing!

Chapter 10: Running Docker in Public Clouds
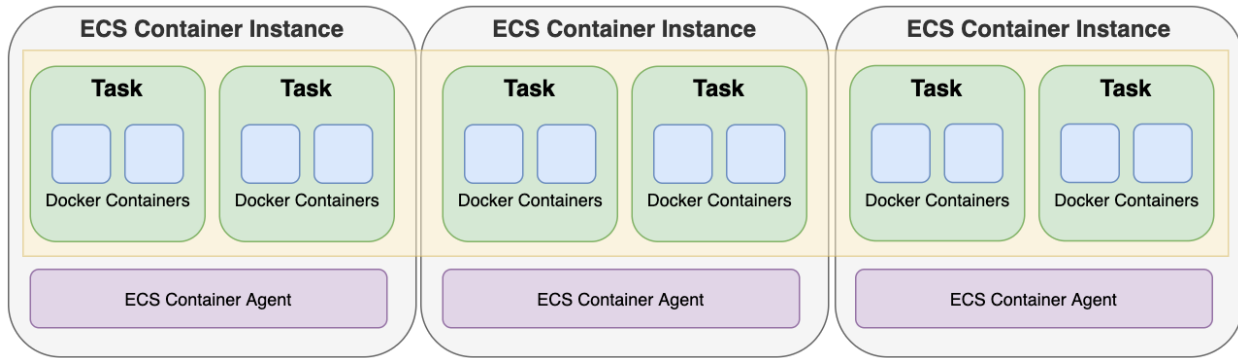
Clusters

An Amazon ECS cluster is a regional grouping of one or more container instances on which you can run task requests. Each account receives a default cluster the first time you use the Amazon ECS service. Clusters may contain more than one Amazon EC2 instance type.

For more information, see the ECS documentation.

Create Cluster   Get Started

View   list   card   view all ↻

                                                        <   0 - 0 of 0   >

No clusters found

Get Started

                                                                    <   >

✅ **ECS cluster**

ECS Cluster RussTestECSCluster successfully created

✅ **ECS Instance IAM Policy**

IAM Policy for the role ecsInstanceRole successfully attached

✅ **ECS Spot Fleet IAM Policy**

IAM Policy for the role ecsSpotFleetRole successfully attached

ℹ️ **CloudFormation Stack**

Creating CloudFormation stack resources

Cluster Resources

Instance type	m4.large
Desired number of instances	3
Key pair	
ECS AMI ID	ami-0dedf3dad92b89029
VPC	Pending...
VPC Availability Zones	eu-west-2a, eu-west-2b, eu-west-2c
Internet gateway	igw-0f610c3304f8941c7
Spot max bid price	
Spot Fleet request ID	Pending...

Cluster : RussTestECSCluster

Update Cluster **Delete Cluster**

Get a detailed view of the resources on your cluster.

Status	ACTIVE
Registered container instances	3
Pending tasks count	0 Fargate, 0 EC2
Running tasks count	0 Fargate, 0 EC2
Active service count	0 Fargate, 0 EC2
Draining service count	0 Fargate, 0 EC2

Services	Tasks	ECS Instances	Metrics	Scheduled Tasks	Tags	Capacity Providers

Create Update Delete Actions ▾   Last updated on February 23, 2020 12:28:59 PM (0m ago) ⟳ ?

▼ Filter in this page   **Launch type** ALL ▾   **Service type** ALL ▾

☐	Service Name	Status	Service ty...	Task Defin...	Desired ta...	Running t...	Launch ty...	Platform v...
				No results				

Create new Task Definition

| Step 1: Select launch type compatibility | Select launch type compatibility |

Step 2: Configure task and container definitions

Select which launch type you want your task definition to be compatible with based on where you want to launch your task.

FARGATE	EC2
Price based on task size	Price based on resource usage
Requires network mode awsvpc	Multiple network modes available
AWS-managed infrastructure, no Amazon EC2 instances to manage	Self-managed infrastructure using Amazon EC2 instances

*Required   Cancel   **Next step**

	Name		Group ID		Group Name		VPC ID		Type	Description		Owner
☐			sg-00df360d74bdc...		default		vpc-0462507010e...		EC2-VPC	default VPC securi...		687011238589
☑			sg-01718a60a8e9...		EC2ContainerSer...		vpc-0462507010e...		EC2-VPC	ECS Allowed Ports		687011238589
☐			sg-80f51be9		default		vpc-3856b551		EC2-VPC	default VPC securi...		687011238589

Create security group   **Actions ▾**

Filter by tags and attributes or search by keyword |< < 1 to 3 of 3 > >|

Security Group: sg-01718a60a8e9ef454

| Description | **Inbound Rules** | Outbound Rules | Tags |

Edit rules

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ
HTTP	TCP	80	0.0.0.0/0	
Custom TCP Rule	TCP	30000 - 60000	0.0.0.0/0	Container ports
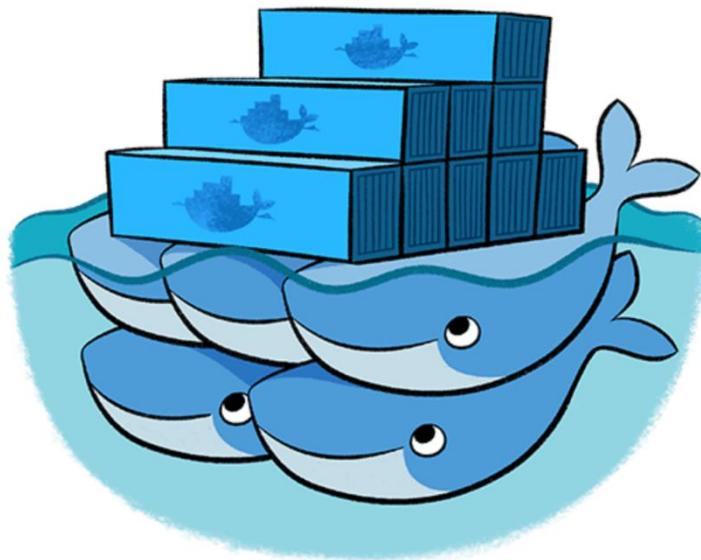
17d22027315c

Launch Status

We are creating resources for your service. This may take up to 10 minutes. When we're complete, you can view your service.

Back   🔄 **View service**   Enabled after service creation completes successfully

Additional features that you can add to your service after creation

Scale based on metrics
You can configure scaling rules based on CloudWatch metrics

Preparing service : 2 of 9 complete

ECS resource creation .... pending 🔄
   Cluster default .... complete ✅
   Task definition cluster-task:2 .... complete ✅
   Service .... pending 🔄

Additional AWS service integrations .... pending 🔄
   Log group /ecs/cluster-task .... complete ✅
   CloudFormation stack .... pending 🔄
   VPC .... pending 🔄
   Subnet 1 .... pending 🔄
   Subnet 2 .... pending 🔄
   Security group .... pending 🔄

Service : cluster-container-service

Update **Delete**

Cluster	default	**Desired count**	1
Status	ACTIVE	**Pending count**	1
Task definition	cluster-task:2	**Running count**	0
Service type	REPLICA		
Launch type	FARGATE		
Platform version	LATEST(1.3.0)		
Service role	AWSServiceRoleForECS		

Details	Tasks	Events	Auto Scaling	Deployments	Metrics	Tags	Logs

Load Balancing

Load Balancer Name	Container Name	Container Port
No load balancers		

Network Access

Allowed VPC	vpc-042e3d8026e050e15
Allowed subnets	subnet-09e9bc37332cb68f4,subnet-000e7bb3d75da5038
Security groups*	sg-0af47d69ce1c357e5
Auto-assign public IP	ENABLED
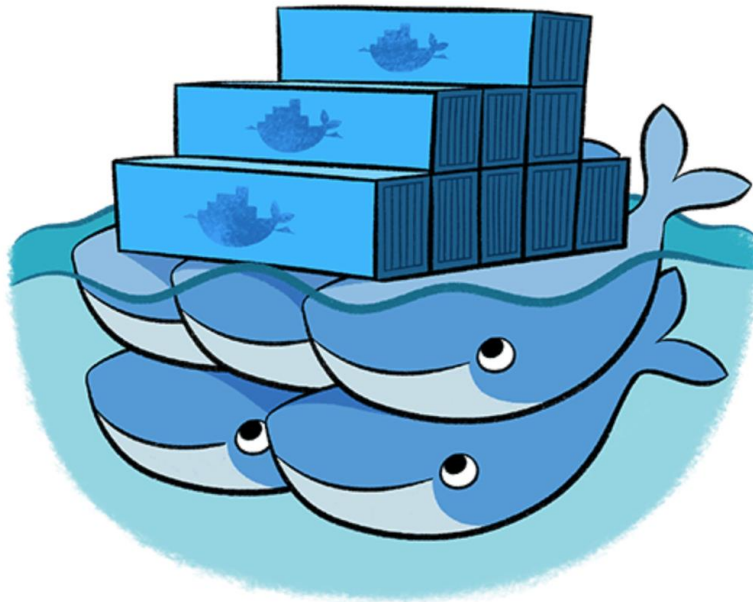
ip-10-0-1-73.eu-west-2.compute.internal

Task : 0a6ff7fa-b48a-4cce-82e4-1393bd7e4283

Run more like this   **Stop**

| Details | Tags | **Logs** |

Last updated on February 29, 2020 3:30:16 PM (1m ago)

| Filter logs | ✖ | All | 30s | 5m | 1h | 6h | 1d | 1w | ‹ 1-9 › |

Timestamp (UTC+00:00) ▼	Message
▸ 2020-02-29 15:29:18	2020-02-29 15:29:18,982 INFO success: nginx entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
▸ 2020-02-29 15:29:18	2020-02-29 15:29:18,982 INFO gave up: start entered FATAL state, too many start retries too quickly
▸ 2020-02-29 15:29:17	2020-02-29 15:29:17,981 INFO exited: start (exit status 0; not expected)
▸ 2020-02-29 15:29:17	2020-02-29 15:29:17,903 INFO spawned: 'nginx' with pid 7
▸ 2020-02-29 15:29:17	2020-02-29 15:29:17,905 INFO spawned: 'start' with pid 8
▸ 2020-02-29 15:29:16	2020-02-29 15:29:16,901 INFO RPC interface 'supervisor' initialized
▸ 2020-02-29 15:29:16	2020-02-29 15:29:16,901 CRIT Server 'unix_http_server' running without any HTTP authentication checking
▸ 2020-02-29 15:29:16	2020-02-29 15:29:16,901 INFO supervisord started with pid 1
▸ 2020-02-29 15:29:16	2020-02-29 15:29:16,893 INFO Set uid to user 0 succeeded

Microsoft Azure   Search resources, services, and docs (G+/)

Home > App Services

App Services

Add   Edit columns   Refresh   Export to CSV   Assign tags   Start   Restart   Stop   Delete   Feedback   Leave preview

Filter by name...   Subscription == **all**   Resource group == **all**   Location == **all**   Add filter

Showing 0 to 0 of 0 records.   No grouping

Name ↑↓   Status ↑↓   Location ↑↓   Pricing T... ↑↓   App Serv... ↑↓   Subscription ↑↓   App Type ↑↓

No app services to display

Create, build, deploy, and manage powerful web, mobile, and API apps for employees or customers using a single back-end.
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Create app service

Microsoft Azure   Search resources, services, and docs (G+/)

Home > Microsoft.Web-WebApp-Portal-a6f249bc-9b78 - Overview

Microsoft.Web-WebApp-Portal-a6f249bc-9b78 - Overview
Deployment

Search (Cmd+/)   Delete   Cancel   Redeploy   Refresh

- Overview
- Inputs
- Outputs
- Template

✓ **Your deployment is complete**

Deployment name: Microsoft.Web-WebApp-Portal-a6f249bc-9b78   Start time: 29/02/2020, 17:28:03
Subscription: Correlation ID: 7942cdc6-2e33-47a1-92dc-114dd918f1eb
Resource group: masteringdocker4thedition

∧ **Deployment details** (Download)

Resource	Type	Status	Operation details
✓ masteringdocker4theditio	Microsoft.Web/sites	OK	Operation details
✓ ASP-masteringdocker4the	Microsoft.Web/serverfar...	OK	Operation details

∧ **Next steps**

Go to resource

Browse   Stop   Swap   Restart   Delete   Get publish profile   Reset publish profile

The new version of Chrome is changing how it handles cross-site and iframe cookies.
Developers relying on these scenarios need to update their apps to handle these changes. Click to learn more. →

Resource group (change)   : masteringdocker4thedition   URL   : https://masteringdocker4thedition.azurewebsites.net

Status   : Running   App Service Plan   : ASP-masteringdocker4thedition-ad23 (B1: 1)

Location   : UK South   FTP/deployment userna... : No FTP/deployment user set

Subscription (change)   :   FTP hostname   :

Subscription ID   :   FTPS hostname   :

Tags (change)   : Click here to add tags

---

masteringdocker4thedition.azurewebsites.net
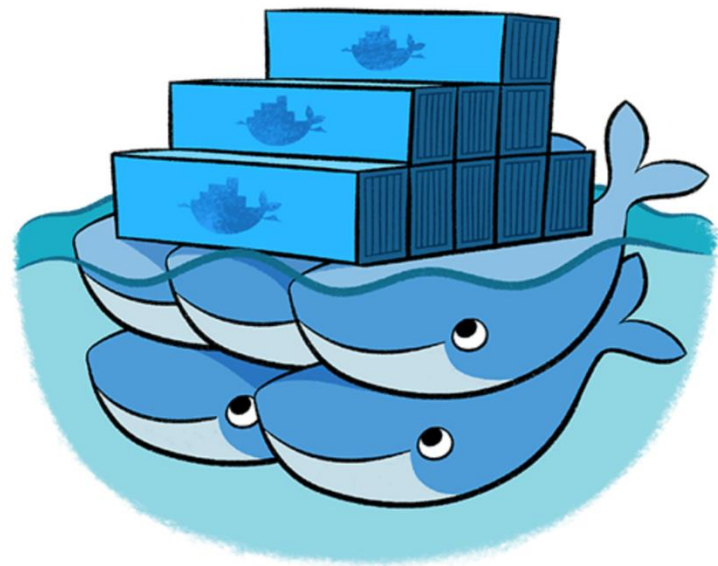
cb09f14e93d3

Single Container

Docker Compose (Preview)

Image source

| Azure Container Registry | Docker Hub | Private Registry |

Repository Access

| Public | Private |

Image and optional tag (eg 'image:tag')

russmckendrick/cluster:latest

Startup File

Continuous Deployment

| On | Off |

Webhook URL show url

| **** | 🗐 Copy |

Logs

```
2020_02_29_RD281878C79C0B_docker.log:
2020-02-29 17:34:47.997 INFO  - Pulling image from Docker hub: russmckendrick/cluster:latest
2020-02-29 17:34:49.475 INFO  - latest Pulling from russmckendrick/cluster
2020-02-29 17:34:49.476 INFO  - 4fe2ade4980c Pulling fs layer
2020-02-29 17:34:49.476 INFO  - 2f9062d62214 Pulling fs layer
2020-02-29 17:34:49.476 INFO  - 16bef1d029e2 Pulling fs layer
2020-02-29 17:34:49.476 INFO  - f8e2a84816df Pulling fs layer
2020-02-29 17:34:49.476 INFO  - 05c02146b7a3 Pulling fs layer
2020-02-29 17:34:49.476 INFO  - e0853236d1ac Pulling fs layer
2020-02-29 17:34:49.476 INFO  - 0429bfdc923e Pulling fs layer
2020-02-29 17:34:49.476 INFO  - a90ed61b6901 Pulling fs layer
```

| Download | Refresh |

≡ Microsoft Azure 🔍 Search resources, services, and docs (G+/) ⌨ ⬚ 🔔① ⚙

🔷 Microsoft.ContainerInstances-20200301103536 - Overview
Deployment

🔍 Search (Cmd+/) « | 🗑 Delete ⊘ Cancel ⬆ Redeploy ↻ Refresh

▸ Overview
🖼 Inputs
≔ Outputs
📄 Template

✅ **Your deployment is complete**

🔷 Deployment name: Microsoft.ContainerInstances-20200301103536   Start time: 01/03/2020, 10:57:22
Subscription: ▬▬▬▬▬▬▬▬▬   Correlation ID: 9be4a214-c690-4904-8dc5-aadf6829495
Resource group: masteringdocker4thedition-aci

∧ Deployment details (Download)

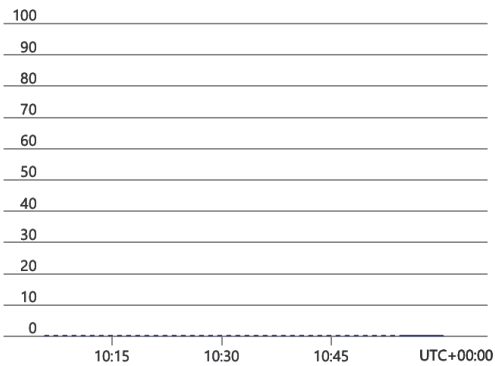| Resource	Type	Status	Operation details
✅ masteringdocker4theditio	Microsoft.ContainerInst…	OK	Operation details

∧ Next steps

[Go to resource]

▷ Start ↻ Restart ☐ Stop 🗑 Delete ↻ Refresh

Resource group (change) : masteringdocker4thedition-aci   OS type   : Linux
Status   : Running   IP address   : 51.11.47.17
Location   : UK South   FQDN   : masteringdocker4thedition-aci.uksouth.azurecontainer.io
Subscription (change)   : ▬▬▬▬▬▬▬▬   Container count : 1
Subscription ID   : ▬▬▬▬▬▬▬▬▬▬▬▬
Tags (change)   : Click here to add tags

∧ ∧

CPU 📌

```
100
 90
 80
 70
 60
 50
 40
 30
 20
 10
  0
      10:15      10:30      10:45    UTC+00:00
```
CPU Usage (Avg)
masteringdocker4thedition-aci
0

Memory 📌

```
20MB
15MB
10MB
 5MB
 0B
      10:15      10:30      10:45    UTC+00:00
```
Memory Usage (Avg)
masteringdocker4thedition-aci
17.96 MB
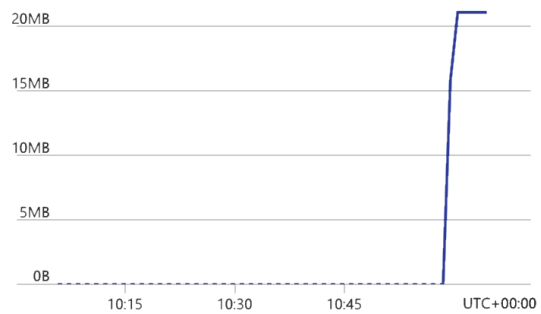
⟳ Refresh

1 container

Name	Image	State	Previous state	Start time	Restart count
masteringdocker4theditio...	russmckendrick/cluster:lat...	Running	-	2020-03-01T10:57:40Z	0

Events   Properties   Logs   **Connect**

⚙

```
/ # ps aux
PID   USER   TIME  COMMAND
    1 root   0:00 {supervisord} /usr/bin/python2 /usr/bin/supervisord -c /etc/supervisord.conf
    6 root   0:00 nginx: master process /usr/sbin/nginx
   10 nginx  0:00 nginx: worker process
   11 root   0:00 /bin/sh
   15 root   0:00 ps aux
/ #
```

● ● ● ⟨ ⟩ ▢   Not Secure — masteringdocker4thedition-aci.uksouth.azurecontainer.io   ⟳   ⓪ Ⓖ 𝐈 ⒶⒷ⒫ ⬆ ▢
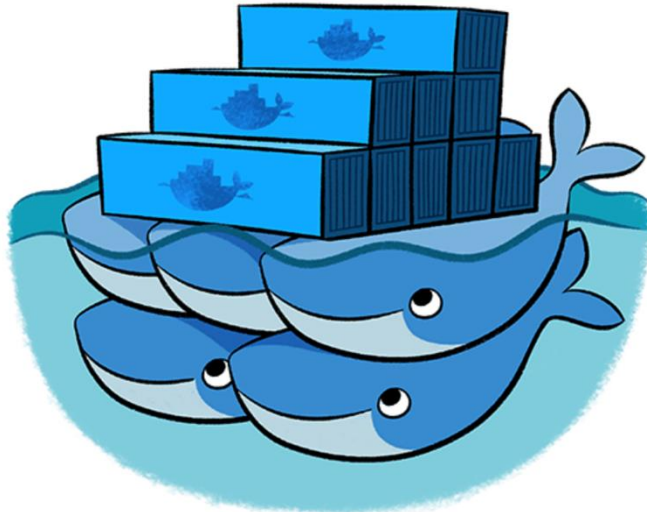
wk-caas-ca0c275b8f3e4ce2848c5802ee406a13-4e02f5281687aa1e58d98f

Chapter 11: Docker and Kubernetes

```
~  kubectl version
Client Version: version.Info{Major:"1", Minor:"15", GitVersion:"v1.15.5", GitCommit:"20c265fef0741dd
71a66480e35bd69f18351daea", GitTreeState:"clean", BuildDate:"2019-10-15T19:16:51Z", GoVersion:"go1.1
2.10", Compiler:"gc", Platform:"darwin/amd64"}
Server Version: version.Info{Major:"1", Minor:"15", GitVersion:"v1.15.5", GitCommit:"20c265fef0741dd
71a66480e35bd69f18351daea", GitTreeState:"clean", BuildDate:"2019-10-15T19:07:57Z", GoVersion:"go1.1
2.10", Compiler:"gc", Platform:"linux/amd64"}
~
```

```
~  kubectl get nodes
NAME            STATUS   ROLES    AGE   VERSION
docker-desktop  Ready    master   33m   v1.15.5
~
```

```
~  kubectl get namespaces
NAME             STATUS   AGE
default          Active   36m
docker           Active   34m
kube-node-lease  Active   36m
kube-public      Active   36m
kube-system      Active   36m
~  kubectl get --namespace kube-system pods
NAME                                     READY   STATUS    RESTARTS   AGE
coredns-5c98db65d4-c7nvh                 1/1     Running   1          36m
coredns-5c98db65d4-v2nks                 1/1     Running   1          36m
etcd-docker-desktop                      1/1     Running   0          34m
kube-apiserver-docker-desktop            1/1     Running   0          35m
kube-controller-manager-docker-desktop   1/1     Running   0          34m
kube-proxy-vzwkc                         1/1     Running   0          36m
kube-scheduler-docker-desktop            1/1     Running   0          34m
storage-provisioner                      1/1     Running   0          34m
~
```

```
~  kubectl logs --namespace kube-system kube-scheduler-docker-desktop -c kube-scheduler

I0503 11:11:03.933326       1 serving.go:319] Generated self-signed cert in-memory
W0503 11:11:04.921464       1 authentication.go:249] No authentication-kubeconfig provided in order
to lookup client-ca-file in configmap/extension-apiserver-authentication in kube-system, so client c
ertificate authentication won't work.
W0503 11:11:04.921659       1 authentication.go:252] No authentication-kubeconfig provided in order
to lookup requestheader-client-ca-file in configmap/extension-apiserver-authentication in kube-syste
m, so request-header client certificate authentication won't work.
W0503 11:11:04.921673       1 authorization.go:146] No authorization-kubeconfig provided, so Subject
AccessReview of authorization tokens won't work.
I0503 11:11:04.923621       1 server.go:142] Version: v1.15.5
I0503 11:11:04.923660       1 defaults.go:87] TaintNodesByCondition is enabled, PodToleratesNodeTain
ts predicate is mandatory
```

```
~  kubectl exec --namespace kube-system kube-scheduler-docker-desktop -- uname -a
Linux docker-desktop 4.19.76-linuxkit #1 SMP Thu Oct 17 19:31:58 UTC 2019 x86_64 GNU/Linux
~
```

```
russ.mckendrick@russs-mbp: ~                                    ⌥⌘2
~  kubectl apply -f https://raw.githubusercontent.com/kubernetes/dashboard/v2.0.0/aio/deploy/recom
mended.yaml
namespace/kubernetes-dashboard created
serviceaccount/kubernetes-dashboard created
service/kubernetes-dashboard created
secret/kubernetes-dashboard-certs created
secret/kubernetes-dashboard-csrf created
secret/kubernetes-dashboard-key-holder created
configmap/kubernetes-dashboard-settings created
role.rbac.authorization.k8s.io/kubernetes-dashboard created
clusterrole.rbac.authorization.k8s.io/kubernetes-dashboard created
rolebinding.rbac.authorization.k8s.io/kubernetes-dashboard created
clusterrolebinding.rbac.authorization.k8s.io/kubernetes-dashboard created
deployment.apps/kubernetes-dashboard created
service/dashboard-metrics-scraper created
deployment.apps/dashboard-metrics-scraper created
~
```

```
russ.mckendrick@russs-mbp: ~                                    ⌥⌘2
~  kubectl get namespaces
NAME                   STATUS    AGE
default                Active    65m
docker                 Active    63m
kube-node-lease        Active    65m
kube-public            Active    65m
kube-system            Active    65m
kubernetes-dashboard   Active    3m4s
~  kubectl get deployments --namespace kubernetes-dashboard
NAME                        READY   UP-TO-DATE   AVAILABLE   AGE
dashboard-metrics-scraper   1/1     1            1           3m44s
kubernetes-dashboard        1/1     1            1           3m45s
~  kubectl get services --namespace kubernetes-dashboard
NAME                        TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)    AGE
dashboard-metrics-scraper   ClusterIP   10.108.139.94    <none>        8000/TCP   3m52s
kubernetes-dashboard        ClusterIP   10.107.101.194   <none>        443/TCP    3m53s
~
```

```
kubectl proxy                      ⌥⌘2
~  kubectl proxy
Starting to serve on 127.0.0.1:8001
```

```
127.0.0.1

{
  "major": "1",
  "minor": "15",
  "gitVersion": "v1.15.5",
  "gitCommit": "20c265fef0741dd71a66480e35bd69f18351daea",
  "gitTreeState": "clean",
  "buildDate": "2019-10-15T19:07:57Z",
  "goVersion": "go1.12.10",
  "compiler": "gc",
  "platform": "linux/amd64"
}
```

Kubernetes Dashboard

⦿ Token

Every Service Account has a Secret with valid Bearer Token that can be used to log in to Dashboard. To find out more about how to configure and use Bearer Tokens, please refer to the Authentication section.

◯ Kubeconfig

Please select the kubeconfig file that you have created to configure access to the cluster. To find out more about how to configure and use kubeconfig file, please refer to the Configure Access to Multiple Clusters section.

Enter token *

Sign in

---

russ.mckendrick@russs-mbp: ~

```
~  kubectl create serviceaccount dashboard-admin-sa
serviceaccount/dashboard-admin-sa created
~  kubectl create clusterrolebinding dashboard-admin-sa --clusterrole=cluster-admin --serviceaccou
nt=default:dashboard-admin-sa
clusterrolebinding.rbac.authorization.k8s.io/dashboard-admin-sa created
~  kubectl get secrets
NAME                          TYPE                                   DATA   AGE
dashboard-admin-sa-token-z9x4g   kubernetes.io/service-account-token   3      23s
default-token-99zkm           kubernetes.io/service-account-token   3      126m
```

---

russ.mckendrick@russs-mbp: ~

```
~  kubectl describe secret dashboard-admin-sa-token-z9x4g
Name:         dashboard-admin-sa-token-z9x4g
Namespace:    default
Labels:       <none>
Annotations:  kubernetes.io/service-account.name: dashboard-admin-sa
              kubernetes.io/service-account.uid: c8ae5a24-e4b1-4065-9ad4-73113bd34ffc

Type:  kubernetes.io/service-account-token

Data
====
ca.crt:     1025 bytes
namespace:  7 bytes
```
```
token:      eyJhbGciOiJSUzI1NiIsImtpZCI6IiJ9.eyJpc3MiOiJrdWJlcm5ldGVzL3NlcnZpY2VhY2NvdW50Iiwia3ViZXJ
uZXRlcy5pby9zZXJ2aWNlYWNjb3VudC9uYW1lc3BhY2UiOiJkZWZhdWx0Iiwia3ViZXJuZXRlcy5pby9zZXJ2aWNlYWNjb3VudC9
zZWNyZXQubmFtZSI6ImRhc2hib2FyZC1hZG1pbi1zYS10b2tlbi16OXg0ZyIsImt1YmVybmV0ZXMuaW8vc2VydmljZWFjY291bnQ
vc2VydmljZS1hY2NvdW50Lm5hbWUiOiJkYXNoYm9hcmQtYWRtaW4tc2EiLCJrdWJlcm5ldGVzLmlvL3NlcnZpY2VhY2NvdW50L3N
lcnZpY2UtYWNjb3VudC51aWQiOiJjOGFlNWEyNC1lNGIxLTQwNjUtOWFkNC03MzExM2JkMzRmZmMiLCJzdWIiOiJzeXN0ZW06c2V
ydmljZWFjY291bnQ6ZGVmYXVsdDpkYXNoYm9hcmQtYWRtaW4tc2EifQ.AVAHGvEm5OmNxaziy_QiQ9f_koFXQ6Q5XtCxFnif7s7M
yY10z1tt4exgE5tsH0Ggvsi80icy3wCpFixk9jdS2QXk43tFBEPZQ4qHTWTQeXIUtuNbHMP7usdePojCXN-MQeccxVmOfIfR1cpN
xoRHziwv3XgrMbWPSHHCJtMU6axlKlt65m2aHOw1F2fPU0gSALW9jXT_QZ5syrdemfUjjaZJxQRyO-igTD5RaR1ns4EM9AjVMGEy
WUbJg-ZDNO6Q-qgv5J11Y1lHwNyZXKJctHXusPo7afcghsHJl3o3I2vgDeAHb1qgTqWnPRPF_gyZQsfIultEwnxenOwnTtXjKw
```

```
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack      master   kubectl get deploymen
ts
NAME       READY    UP-TO-DATE    AVAILABLE    AGE
cluster    6/6      6             6            3m41s
  ~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack      master   kubectl get services
NAME                 TYPE           CLUSTER-IP        EXTERNAL-IP    PORT(S)         AGE
cluster              ClusterIP      None              <none>        55555/TCP       3m47s
cluster-published    LoadBalancer   10.110.117.233    localhost     80:30568/TCP    3m47s
kubernetes           ClusterIP      10.96.0.1         <none>        443/TCP         179m
  ~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack      master
```
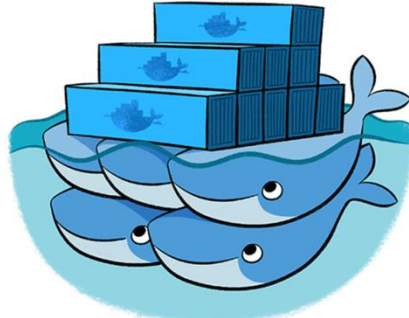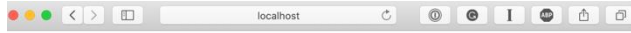

cluster-64ffb78467-fkf9f

Workloads > Pods > cluster-64ffb78467-6f5h7 > **Shell**

Shell in cluster ▾ in cluster-64ffb78467-6f5h7

```
bash-4.4# cat /etc/*release
3.8.1
NAME="Alpine Linux"
ID=alpine
VERSION_ID=3.8.1
PRETTY_NAME="Alpine Linux v3.8"
HOME_URL="http://alpinelinux.org"
BUG_REPORT_URL="http://bugs.alpinelinux.org"
bash-4.4# ps aux
PID   USER     TIME  COMMAND
    1 root      0:00 {supervisord} /usr/bin/python2 /usr/bin/supervisord -c /etc/supervisord.conf
    9 root      0:00 nginx: master process /usr/sbin/nginx
   13 nginx     0:00 nginx: worker process
   14 root      0:00 bash
   20 root      0:00 ps aux
bash-4.4# []
```


Workloads > Pods > cluster-64ffb78467-6f5h7

Metadata

Name	Namespace	Created	Age
cluster-64ffb78467-6f5h7	default	May 3, 2020	8 minutes ago

UID
60f9cfe1-1b03-483a-bcf1-fba2f40182bc

Labels
com.docker.service.id: cluster-cluster | com.docker.service.name: cluster | com.docker.stack.namespace: cluster | pod-template-hash: 64ffb78467

```
russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack                          ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master    kompose up
INFO We are going to create Kubernetes Deployments, Services and PersistentVolumeClaims for your Doc
kerized application. If you need different kind of resources, use the 'kompose convert' and 'kubectl
 create -f' commands instead.

INFO Deploying application in "default" namespace
INFO Successfully created Service: cluster
INFO Successfully created Pod: cluster

Your application has been deployed to Kubernetes. You can run 'kubectl get deployment,svc,pods,pvc'
for details.
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master
```

```
russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack                          ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master    kubectl get deploymen
t,svc,pods,pvc

NAME                  TYPE        CLUSTER-IP       EXTERNAL-IP    PORT(S)     AGE
service/cluster       ClusterIP   10.108.145.210   <none>         80/TCP      81s
service/kubernetes    ClusterIP   10.96.0.1        <none>         443/TCP     3h17m

NAME           READY    STATUS     RESTARTS    AGE
pod/cluster    1/1      Running    0           81s

~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master
```

```
russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack                          ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master    kompose down
INFO Deleting application in "default" namespace
INFO Successfully deleted Service: cluster
INFO Successfully deleted Pod: cluster
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master
```

```
russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack                          ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master    kompose convert
INFO Kubernetes file "cluster-service.yaml" created
INFO Kubernetes file "cluster-pod.yaml" created
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master
```

```
russ.mckendrick@russs-mbp: ~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack                          ⌥⌘1
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master    kubectl create -f clu
ster-pod.yaml
pod/cluster created
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master    kubectl create -f clu
ster-service.yaml
service/cluster created
~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master    kubectl get deploymen
t,svc,pods,pvc



NAME                  TYPE        CLUSTER-IP       EXTERNAL-IP    PORT(S)     AGE
service/cluster       ClusterIP   10.103.174.41    <none>         80/TCP      18s
service/kubernetes    ClusterIP   10.96.0.1        <none>         443/TCP     3h24m

NAME           READY    STATUS     RESTARTS    AGE
pod/cluster    1/1      Running    0           25s

~/Documents/Code/mastering-docker-fourth-edition/chapter12/stack    master
```

Chapter 12: Discovering other Kubernetes options

```
russ.mckendrick@russs-mbp: ~                            ⌥⌘1
~  minikube start
😃 minikube v1.9.2 on Darwin 10.15.4
✨ Automatically selected the hyperkit driver. Other choices: docker, virtualbox
💾 Downloading driver docker-machine-driver-hyperkit:
    > docker-machine-driver-hyperkit.sha256: 65 B / 65 B [---] 100.00% ? p/s 0s
    > docker-machine-driver-hyperkit: 10.90 MiB / 10.90 MiB  100.00% 531.53 KiB
🔑 The 'hyperkit' driver requires elevated permissions. The following commands will be executed:

    $ sudo chown root:wheel /Users/russ.mckendrick/.minikube/bin/docker-machine-driver-hyperkit
    $ sudo chmod u+s /Users/russ.mckendrick/.minikube/bin/docker-machine-driver-hyperkit

Password:
💿 Downloading VM boot image ...
    > minikube-v1.9.0.iso.sha256: 65 B / 65 B [--------------] 100.00% ? p/s 0s
    > minikube-v1.9.0.iso: 174.93 MiB / 174.93 MiB [-] 100.00% 5.59 MiB p/s 32s
👍 Starting control plane node m01 in cluster minikube
💾 Downloading Kubernetes v1.18.0 preload ...
    > preloaded-images-k8s-v2-v1.18.0-docker-overlay2-amd64.tar.lz4: 542.91 MiB
🔥 Creating hyperkit VM (CPUs=2, Memory=4000MB, Disk=20000MB) ...
🐳 Preparing Kubernetes v1.18.0 on Docker 19.03.8 ...
🌟 Enabling addons: default-storageclass, storage-provisioner
🚀 Done! kubectl is now configured to use "minikube"

❗ /usr/local/bin/kubectl is v1.15.5, which may be incompatible with Kubernetes v1.18.0.
💡 You can also use 'minikube kubectl -- get pods' to invoke a matching version
~
```

```
russ.mckendrick@russs-mbp: ~                            ⌥⌘1
~  minikube kubectl -- get pods
    > kubectl.sha256: 65 B / 65 B [--------------------------] 100.00% ? p/s 0s
    > kubectl: 47.84 MiB / 47.84 MiB [--------------] 100.00% 3.71 MiB p/s 13s
No resources found in default namespace.
```

```
russ.mckendrick@russs-mbp: ~                            ⌥⌘1
~  minikube kubectl -- get nodes
NAME       STATUS   ROLES    AGE    VERSION
minikube   Ready    master   62m    v1.18.0
~  minikube kubectl -- get namespaces
NAME              STATUS   AGE
default           Active   62m
kube-node-lease   Active   62m
kube-public       Active   62m
kube-system       Active   62m
~  minikube kubectl -- get --namespace kube-system pods
NAME                                    READY   STATUS    RESTARTS   AGE
coredns-66bff467f8-bfb7f                1/1     Running   0          62m
coredns-66bff467f8-wp9wz                1/1     Running   0          62m
etcd-minikube                           1/1     Running   0          62m
kube-apiserver-minikube                 1/1     Running   0          62m
kube-controller-manager-minikube        1/1     Running   0          62m
kube-proxy-jk27q                        1/1     Running   0          62m
kube-scheduler-minikube                 1/1     Running   0          62m
storage-provisioner                     1/1     Running   1          62m
~
```

```
russ.mckendrick@russs-mbp: ~                            ⌥⌘1
~  minikube kubectl -- create deployment hello-node --image=k8s.gcr.io/echoserver:1.4
deployment.apps/hello-node created
~  minikube kubectl -- get deployments
NAME         READY   UP-TO-DATE   AVAILABLE   AGE
hello-node   1/1     1            1           92s
~  minikube kubectl -- get pods
NAME                          READY   STATUS    RESTARTS   AGE
hello-node-7bf657c596-m68zv   1/1     Running   0          97s
~
```

```
●●●                      russ.mckendrick@russs-mbp: ~                      ⌥⌘1
  ~     minikube kubectl -- expose deployment hello-node --type=LoadBalancer --port=8080
service/hello-node exposed
  ~     minikube kubectl -- get services
NAME          TYPE          CLUSTER-IP        EXTERNAL-IP     PORT(S)           AGE
hello-node    LoadBalancer  10.101.90.81      <pending>       8080:31124/TCP    35s
kubernetes    ClusterIP     10.96.0.1         <none>          443/TCP           71m
  ~
```

```
●●●                      russ.mckendrick@russs-mbp: ~                      ⌥⌘1
  ~     minikube service hello-node
|-----------|------------|-------------|----------------------------|
| NAMESPACE |    NAME    | TARGET PORT |            URL             |
|-----------|------------|-------------|----------------------------|
| default   | hello-node |        8080 | http://192.168.64.14:31124 |
|-----------|------------|-------------|----------------------------|
🎉  Opening service default/hello-node in default browser...
  ~
```

```
●●● < >  ▣              192.168.64.14              ↻  ⓪ Ⓖ I ⒶⒷⓅ ⬆ ⧉  +

CLIENT VALUES:
client_address=172.17.0.1
command=GET
real path=/
query=nil
request_version=1.1
request_uri=http://192.168.64.14:8080/

SERVER VALUES:
server_version=nginx: 1.10.0 - lua: 10001

HEADERS RECEIVED:
accept=text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
accept-encoding=gzip, deflate
accept-language=en-gb
connection=keep-alive
host=192.168.64.14:31124
upgrade-insecure-requests=1
user-agent=Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_4) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1
Safari/605.1.15
BODY:
-no body in request-
```
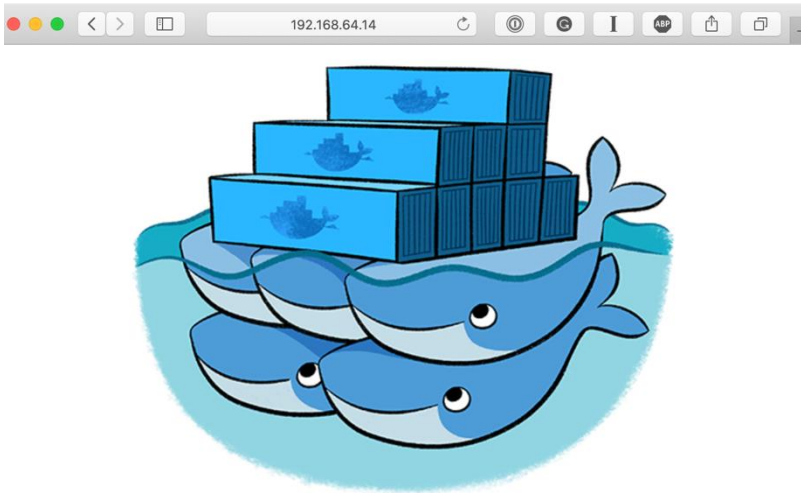

cluster-6f9f496ff5-jnhsx
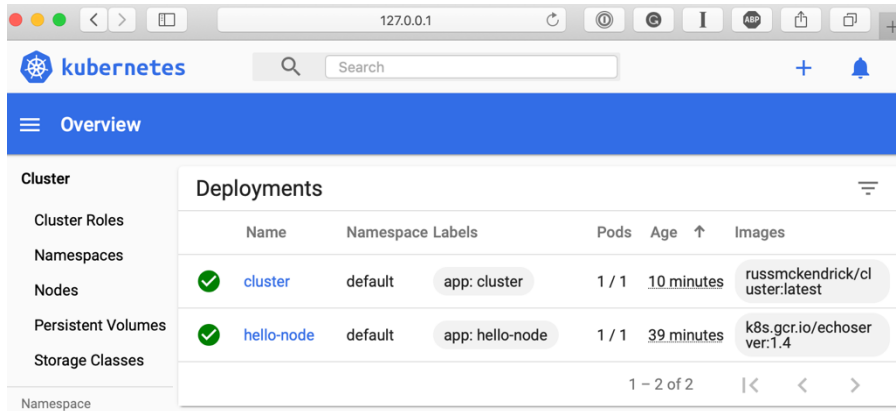
```
minikube dashboard --url
Enabling dashboard ...
🤔  Verifying dashboard health ...
🚀  Launching proxy ...
🤔  Verifying proxy health ...
http://127.0.0.1:52397/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/
```

```
minikube start --kubernetes-version=1.15.5 -p node2
😄  [node2] minikube v1.9.2 on Darwin 10.15.4
✨  Automatically selected the hyperkit driver. Other choices: docker, virtualbox
👍  Starting control plane node m01 in cluster node2
🔥  Creating hyperkit VM (CPUs=2, Memory=4000MB, Disk=20000MB) ...
🐳  Preparing Kubernetes v1.15.5 on Docker 19.03.8 ...
    > kubeadm.sha1: 41 B / 41 B [---------------------------] 100.00% ? p/s 0s
    > kubelet.sha1: 41 B / 41 B [---------------------------] 100.00% ? p/s 0s
    > kubectl.sha1: 41 B / 41 B [---------------------------] 100.00% ? p/s 0s
    > kubeadm: 38.33 MiB / 38.33 MiB [---------------] 100.00% 2.31 MiB p/s 16s
    > kubectl: 41.00 MiB / 41.00 MiB [---------------] 100.00% 2.29 MiB p/s 19s
    > kubelet: 114.14 MiB / 114.14 MiB [-------------] 100.00% 3.43 MiB p/s 33s
🌟  Enabling addons: default-storageclass, storage-provisioner
🏄  Done! kubectl is now configured to use "node2"
```

```
minikube profile list
|----------|-----------|---------|---------------|------|---------|---------|
| Profile  | VM Driver | Runtime |      IP       | Port | Version | Status  |
|----------|-----------|---------|---------------|------|---------|---------|
| minikube | hyperkit  | docker  | 192.168.64.14 | 8443 | v1.18.0 | Running |
| node2    | hyperkit  | docker  | 192.168.64.15 | 8443 | v1.15.5 | Running |
|----------|-----------|---------|---------------|------|---------|---------|
minikube profile
minikube
minikube profile node2
✅  minikube profile was successfully set to node2
minikube profile
node2
```

```
                        russ.mckendrick@russs-mbp: ~                    ⌥⌘1
  ~     kind create cluster
Creating cluster "kind" ...
 ✓ Ensuring node image (kindest/node:v1.18.2) 🖼
 ✓ Preparing nodes 📦
 ✓ Writing configuration 📜
 ✓ Starting control-plane 🕹
 ✓ Installing CNI 🔌
 ✓ Installing StorageClass 💾
Set kubectl context to "kind-kind"
You can now use your cluster with:

kubectl cluster-info --context kind-kind

Thanks for using kind! 😊
  ~
```



```
                        russ.mckendrick@russs-mbp: ~                    ⌥⌘1
  ~     kubectl --context kind-kind get nodes
NAME                STATUS    ROLES     AGE       VERSION
kind-control-plane  Ready     master    4m26s     v1.18.2
  ~     kubectl --context kind-kind get namespaces
NAME                STATUS    AGE
default             Active    4m41s
kube-node-lease     Active    4m43s
kube-public         Active    4m43s
kube-system         Active    4m43s
local-path-storage  Active    4m38s
  ~     kubectl --context kind-kind get --namespace kube-system pods
NAME                                          READY   STATUS    RESTARTS   AGE
coredns-66bff467f8-dzdql                      1/1     Running   0          4m32s
coredns-66bff467f8-x85rs                      1/1     Running   0          4m32s
etcd-kind-control-plane                       1/1     Running   0          4m47s
kindnet-ntr2q                                 1/1     Running   0          4m32s
kube-apiserver-kind-control-plane             1/1     Running   0          4m47s
kube-controller-manager-kind-control-plane    1/1     Running   0          4m47s
kube-proxy-6xg5x                              1/1     Running   0          4m32s
kube-scheduler-kind-control-plane             1/1     Running   0          4m47s
  ~
```



```
                                    localhost
CLIENT VALUES:
client_address=10.244.0.12
command=GET
real path=/hello-node/
query=nil
request_version=1.1
request_uri=http://localhost:8080/hello-node/

SERVER VALUES:
server_version=nginx: 1.10.0 - lua: 10001

HEADERS RECEIVED:
accept=text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
accept-encoding=gzip, deflate
accept-language=en-gb
cookie=portainer.datatable_text_filter_events=;
portainer.datatable_settings_events=%7B%22open%22%3Afalse%2C%22repeater%22%3A%7B%22autoRefresh%22%3Afalse%2C%22refreshRate%22%3
A%2230%22%7D%7D; portainer.datatable_pagination_events=100;
portainer.datatable_settings_images=%7B%22open%22%3Afalse%2C%22repeater%22%3A%7B%22autoRefresh%22%3Afalse%2C%22refreshRate%22%3
A%2230%22%7D%7D; _ga=GA1.1.2110206348.1577560597; portainer.datatable_settings_container-
networks=%7B%22open%22%3Afalse%2C%22repeater%22%3A%7B%22autoRefresh%22%3Afalse%2C%22refreshRate%22%3A%2230%22%7D%7D;
portainer.datatable_settings_container-
processes=%7B%22open%22%3Afalse%2C%22repeater%22%3A%7B%22autoRefresh%22%3Afalse%2C%22refreshRate%22%3A%2230%22%7D%7D;
portainer.LOGIN_STATE_UUID=56e4077c-97a3-4833-a6cb-6805c83ba06c; portainer.datatable_text_filter_home_endpoints=;
portainer.datatable_settings_containers=%7B%22open%22%3Afalse%2C%22repeater%22%3A%7B%22autoRefresh%22%3Afalse%2C%22refreshRate%
22%3A%2230%22%7D%2C%22truncateContainerName%22%3Atrue%2C%22containerNameTruncateSize%22%3A32%2C%22showQuickActionStats%22%3Atru
e%2C%22showQuickActionLogs%22%3Atrue%2C%22showQuickActionExec%22%3Atrue%2C%22showQuickActionInspect%22%3Atrue%2C%22showQuickAct
```

```
●●●                    russ.mckendrick@russs-mbp: ~                    ⌥⌘1
  ~     kubectl --kubeconfig=microk8s.yml get nodes
NAME        STATUS   ROLES     AGE    VERSION
microk8s    Ready    <none>    58m    v1.18.2-41+b5cdb79a4060a3
  ~     kubectl --kubeconfig=microk8s.yml get namespaces
NAME               STATUS    AGE
default            Active    58m
ingress            Active    56m
kube-node-lease    Active    58m
kube-public        Active    58m
kube-system        Active    58m
  ~     kubectl --kubeconfig=microk8s.yml get --namespace kube-system pods
NAME                       READY    STATUS     RESTARTS    AGE
coredns-588fd544bf-wvp77   1/1      Running    0           56m
  ~  ■
```

```
●●●                    russ.mckendrick@russs-mbp: ~                    ⌥⌘1
  ~     kubectl get nodes
NAME          STATUS    ROLES      AGE    VERSION
k3smaster     Ready     master     29m    v1.17.4+k3s1
k3snode1      Ready     <none>     27m    v1.17.4+k3s1
k3snode2      Ready     <none>     27m    v1.17.4+k3s1
  ~     kubectl get namespaces
NAME               STATUS    AGE
default            Active    29m
kube-system        Active    29m
kube-public        Active    29m
kube-node-lease    Active    29m
  ~     kubectl get --namespace kube-system pods
NAME                                    READY    STATUS       RESTARTS    AGE
metrics-server-6d684c7b5-dq7sr          1/1      Running      0           29m
local-path-provisioner-58fb86bdfd-zpvhl 1/1      Running      0           29m
helm-install-traefik-6xfrs              0/1      Completed    0           29m
coredns-6c6bb68b64-5gs94                1/1      Running      0           29m
svclb-traefik-fzmkx                     2/2      Running      0           28m
traefik-7b8b884c8-h85cx                 1/1      Running      0           28m
svclb-traefik-vnskm                     2/2      Running      0           28m
svclb-traefik-gnt5m                     2/2      Running      0           27m
  ~  ■
```

```
●●●                    russ.mckendrick@russs-mbp: ~                    ⌥⌘1
  ~     kubectl create deployment hello-node --image=k8s.gcr.io/echoserver:1.4
deployment.apps/hello-node created
  ~     kubectl expose deployment hello-node --type=LoadBalancer --port=8080
service/hello-node exposed
  ~     kubectl get services
NAME          TYPE            CLUSTER-IP       EXTERNAL-IP      PORT(S)           AGE
kubernetes    ClusterIP       10.43.0.1        <none>           443/TCP           39m
hello-node    LoadBalancer    10.43.225.197    192.168.64.19    8080:31846/TCP    4s
  ~  ■
```

```
●●●                    russ.mckendrick@russs-mbp: ~                    ⌥⌘1
  ~     kubectl create deployment cluster --image=russmckendrick/cluster:latest
deployment.apps/cluster created
  ~     kubectl expose deployment cluster --type=LoadBalancer --port=80
service/cluster exposed
  ~     kubectl get services
NAME          TYPE            CLUSTER-IP       EXTERNAL-IP      PORT(S)           AGE
kubernetes    ClusterIP       10.43.0.1        <none>           443/TCP           45m
hello-node    LoadBalancer    10.43.225.197    192.168.64.19    8080:31846/TCP    6m22s
cluster       LoadBalancer    10.43.169.108    <pending>        80:32042/TCP      5s
  ~  ■
```
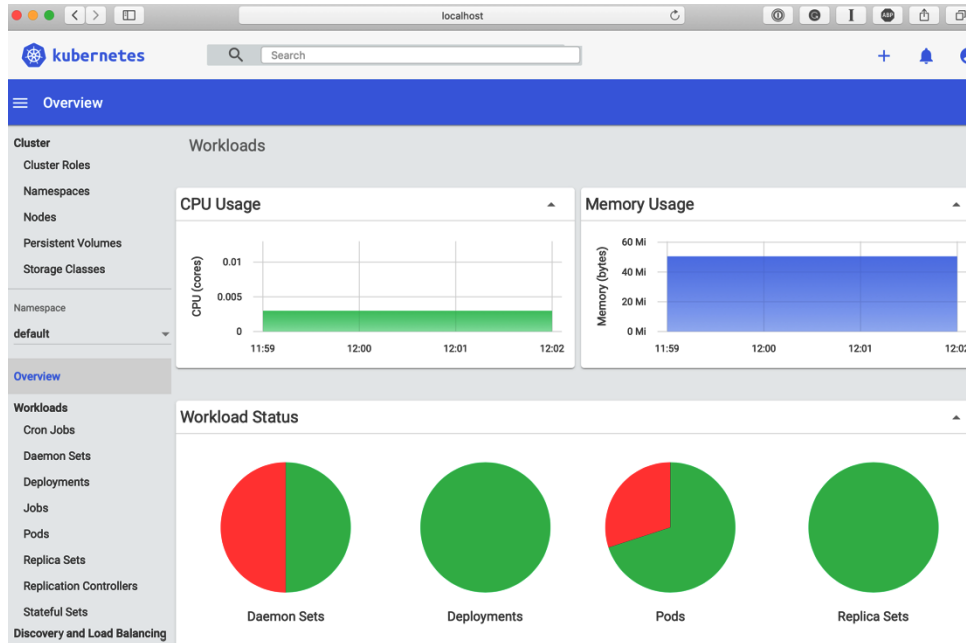
Chapter 13: Running Kubernetes in Public Clouds

Kubernetes services

+ Add   ⚙ Manage view ∨   ↻ Refresh   ↓ Export to CSV   ⊘ Assign tags   ♡ Feedback

| Filter by name... | Subscription == **all** | Type == **all** | Resource group == **all** ⊗ | Location == **all** ⊗ | ⊤ Add filter |

Showing 0 to 0 of 0 records.   No grouping

| Name ↑↓ | Type ↑↓ | Resource group ↑↓ | Kuberne... ↑↓ | Location ↑↓ | Subscription ↑↓ |

No Kubernetes services to display

Use Azure Kubernetes Service to create and manage Kubernetes clusters. Azure will handle cluster operations, including creating, scaling, and upgrading, freeing up developers to focus on their application. To get started, create a cluster with Azure Kubernetes Service.

Learn more ⊡

Create Kubernetes service

Create Kubernetes cluster

✓ Validation passed

Basics   Node pools   Authentication   Networking   Integrations   Tags   **Review + create**

Basics

Subscription	▪ ▪ ▪ ▪ ▪ ▪ ▪
Resource group	(new) mastering-docker-aks-rg
Region	East US
Kubernetes cluster name	mastering-docker-aks
Kubernetes version	1.15.10

Node pools

Node pools	1
Virtual nodes	Disabled
VM scale sets	Enabled

Authentication

Authentication method	Service principal
Role-based access control (RBAC)	Enabled

Create   < Previous   Next >   Download a template for automation

---

Home > microsoft.aks-20200524115630 | Overview

microsoft.aks-20200524115630 | Overview
Deployment

🔍 Search (Cmd+/) «   🗑 Delete   ⊘ Cancel   ⬆ Redeploy   ↻ Refresh

⚙ Overview   ✅ Your deployment is complete
🖥 Inputs
≡ Outputs   Deployment name: microsoft.aks-20200524115630   Start time: 24/05/2020, 13:02:01
                     Subscription: ▪ ▪ ▪ ▪ ▪ ▪   Correlation ID: 2fdd86f8-f2df-493a-83e7-0247f52700c4
📄 Template   Resource group: mastering-docker-aks-rg

                     ∨ **Deployment details** (Download)

                     ∧ **Next steps**

                     Go to resource
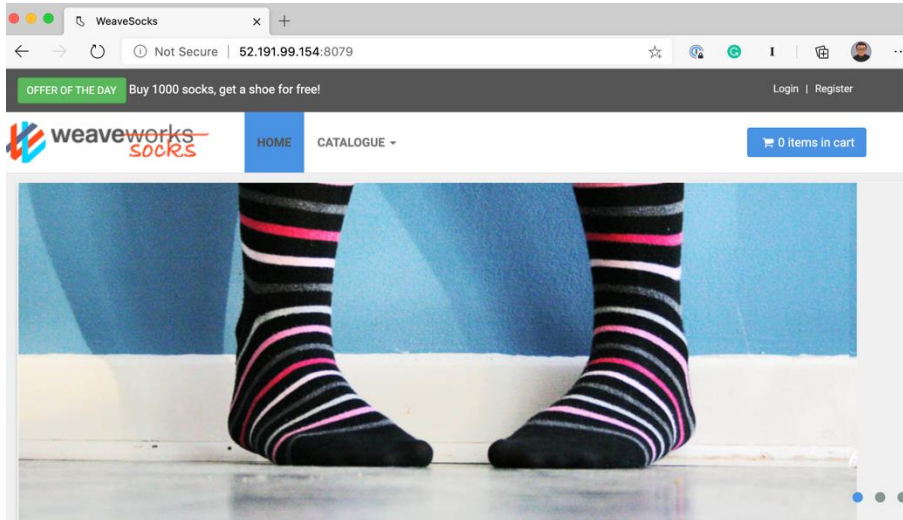
```
                              russ.mckendrick@Russs-MBP: ~                    ⌥⌘1
  →  kubectl -n sock-shop get services
NAME            TYPE         CLUSTER-IP      EXTERNAL-IP   PORT(S)         AGE
carts           ClusterIP    10.0.41.192     <none>        80/TCP          4m13s
carts-db        ClusterIP    10.0.233.14     <none>        27017/TCP       4m14s
catalogue       ClusterIP    10.0.247.188    <none>        80/TCP          4m12s
catalogue-db    ClusterIP    10.0.239.56     <none>        3306/TCP        4m13s
front-end       NodePort     10.0.123.103    <none>        80:30001/TCP    4m12s
orders          ClusterIP    10.0.66.63      <none>        80/TCP          4m11s
orders-db       ClusterIP    10.0.134.83     <none>        27017/TCP       4m11s
payment         ClusterIP    10.0.102.130    <none>        80/TCP          4m10s
queue-master    ClusterIP    10.0.84.31      <none>        80/TCP          4m10s
rabbitmq        ClusterIP    10.0.200.56     <none>        5672/TCP        4m9s
shipping        ClusterIP    10.0.65.166     <none>        80/TCP          4m8s
user            ClusterIP    10.0.136.88     <none>        80/TCP          4m7s
user-db         ClusterIP    10.0.254.126    <none>        27017/TCP       4m8s
  →  ■
```



```
                              russ.mckendrick@Russs-MBP: ~                    ⌥⌘1
  →    kubectl -n sock-shop describe services front-end-lb
Name:                     front-end-lb
Namespace:                sock-shop
Labels:                   name=front-end
Annotations:              <none>
Selector:                 name=front-end
Type:                     LoadBalancer
IP:                       10.0.123.45
LoadBalancer Ingress:     52.191.99.154
Port:                     <unset>   8079/TCP
TargetPort:               8079/TCP
NodePort:                 <unset>   30240/TCP
Endpoints:                10.244.2.5:8079
Session Affinity:         None
External Traffic Policy:  Cluster
Events:
  Type    Reason                Age    From               Message
  ----    ------                ----   ----               -------
  Normal  EnsuringLoadBalancer  33s    service-controller  Ensuring load balancer
  Normal  EnsuredLoadBalancer   20s    service-controller  Ensured load balancer
  →  ■
```

front-end

Overview   Details   Revision history   Events   YAML

| 1 h | 6 h | 1 d | 7 d | 30 d |

CPU ⓘ
May 24, 2020 17:35

Memory ⓘ
May 24, 2020 17:35

Disk ⓘ
May 24, 2020 17:35

⚲ 5   sum   ‹   sum   1 min interval (mean)   ‹   ⚲ 5   sum   1 min interval (mean)   ‹

● Used: ● Requested: ● Used: ● Requested: ● Used: ● Limit:
● Limit: ● Limit:

Cluster	mastering-docker-gke
Namespace	sock-shop
Labels	name : front-end

Logs Viewer   ✦ PREVIEW ▾   🕑 LAST 1 HOUR   ▦ PAGE LAYOUT

Query preview
resource.type="k8s_container" resource.labels.project_id="masteringdocker4" resource.labels.location="… Run Query ⇕

Logs field explorer   ✕

🔍 Search fields and values

⌃ SEVERITY
ⓘ Info   44
⚠ Error   8

⌃ LOG NAME
stdout   44
stderr   8

⌃ PROJECT_ID
masteringdocker4   52

⌃ LOCATION
us-central1-c   52

⌃ CLUSTER_NAME
mastering-docker-gke   52

Histogram   24/05/2020 17:41:00 - 18:42:00 BST   ✕

Query results   Jump to Now   Actions ▾   Configure ▾

SEVERITY	TIMESTAMP	BST ▾	SUMMARY
› ⓘ	2020-05-24 18:35:10.992 BST		[0mGET /catalogue?size=5 [32m200 [0m11.178 ms - - [0m
› ⓘ	2020-05-24 18:35:11.088 BST		Request received: /cart, undefined
› ⓘ	2020-05-24 18:35:11.088 BST		Customer ID: _cSMQq8Mg4B1AsMbLYYioDyhHOYXAqE3
› ⓘ	2020-05-24 18:35:11.118 BST		[0mGET /cart [32m200 [0m29.515 ms - - [0m
› ⓘ	2020-05-24 18:35:25.511 BST		[0mGET /catalogue?size=5 [32m200 [0m8.032 ms - - [0m

---

⚙ masteringdocker4 ▾   🔍 Search products and resources

Kub

Delete a cluster

Data in *hostPath* and *emptyDir* storage pods will be deleted. Any running containers will also be deleted. Learn more

Do you want to delete cluster mastering-docker-gke?

CANCEL   **DELETE**
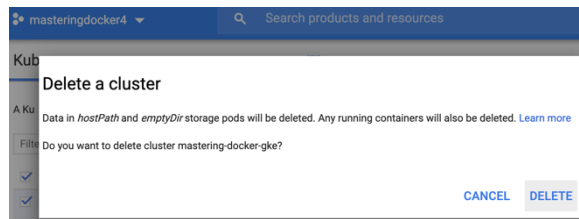
```
                              russ.mckendrick@Russs-MBP: ~
~    eksctl create cluster
[i]  eksctl version 0.19.0
[i]  using region eu-west-1
[i]  setting availability zones to [eu-west-1c eu-west-1b eu-west-1a]
[i]  subnets for eu-west-1c - public:192.168.0.0/19 private:192.168.96.0/19
[i]  subnets for eu-west-1b - public:192.168.32.0/19 private:192.168.128.0/19
[i]  subnets for eu-west-1a - public:192.168.64.0/19 private:192.168.160.0/19
[i]  nodegroup "ng-dd6ee5f9" will use "ami-023736532608ff45e" [AmazonLinux2/1.15]
[i]  using Kubernetes version 1.15
[i]  creating EKS cluster "extravagant-outfit-1590399495" in "eu-west-1" region with un-managed nodes
[i]  will create 2 separate CloudFormation stacks for cluster itself and the initial nodegroup
[i]  if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stacks --region
[i]  CloudWatch logging will not be enabled for cluster "extravagant-outfit-1590399495" in "eu-west-1"
[i]  you can enable it with 'eksctl utils update-cluster-logging --region=eu-west-1 --cluster=extravagant-ou
[i]  Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster
[i]  2 sequential tasks: { create cluster control plane "extravagant-outfit-1590399495", create nodegroup "n
[i]  building cluster stack "eksctl-extravagant-outfit-1590399495-cluster"
[i]  deploying stack "eksctl-extravagant-outfit-1590399495-cluster"
[i]  building nodegroup stack "eksctl-extravagant-outfit-1590399495-nodegroup-ng-dd6ee5f9"
[i]  --nodes-min=2 was set automatically for nodegroup ng-dd6ee5f9
[i]  --nodes-max=2 was set automatically for nodegroup ng-dd6ee5f9
[i]  deploying stack "eksctl-extravagant-outfit-1590399495-nodegroup-ng-dd6ee5f9"
[i]  waiting for the control plane availability...
[✓]  saved kubeconfig as "/Users/russ.mckendrick/.kube/config"
[i]  no tasks
[✓]  all EKS cluster resources for "extravagant-outfit-1590399495" have been created
[i]  adding identity "arn:aws:iam::687011238589:role/eksctl-extravagant-outfit-1590399-NodeInstanceRole-1BIU
[i]  nodegroup "ng-dd6ee5f9" has 0 node(s)
[i]  waiting for at least 2 node(s) to become ready in "ng-dd6ee5f9"
[i]  nodegroup "ng-dd6ee5f9" has 2 node(s)
[i]  node "ip-192-168-6-105.eu-west-1.compute.internal" is ready
[i]  node "ip-192-168-77-55.eu-west-1.compute.internal" is ready
[i]  kubectl command should work with "/Users/russ.mckendrick/.kube/config", try 'kubectl get nodes'
[✓]  EKS cluster "extravagant-outfit-1590399495" in "eu-west-1" region is ready
~
```

```
                              russ.mckendrick@Russs-MBP: ~                              ⌥⌘1
~    kubectl -n sock-shop describe services front-end-lb
Name:                   front-end-lb
Namespace:              sock-shop
Labels:                 name=front-end
Annotations:            <none>
Selector:               name=front-end
Type:                   LoadBalancer
IP:                     10.100.86.115
LoadBalancer Ingress:   a5fecbaee10a04cfaa19846e116081f8-624222238.eu-west-1.elb.amazonaws.com
Port:                   <unset>  8079/TCP
TargetPort:             8079/TCP
NodePort:               <unset>  32530/TCP
Endpoints:              192.168.75.7:8079
Session Affinity:       None
External Traffic Policy: Cluster
Events:
  Type    Reason                Age   From                Message
  ----    ------                ----  ----                -------
  Normal  EnsuringLoadBalancer  14s   service-controller  Ensuring load balancer
  Normal  EnsuredLoadBalancer   12s   service-controller  Ensured load balancer
~
```


Droplets
Kubernetes
Volumes
Databases
Spaces
Images
Networking
Monitoring

DISCOVER

ACCOUNT

Kubernetes in minutes

Create a cost-effective, ready-to-use Kubernetes cluster in minutes so you can focus on building your application.

Starting at $10/mo

✓ Master node included in starting price
✓ Pre-configured networking with Cilium
✓ Performance metrics
✓ Automated upgrades
✓ Integrated load balancers and persistent storage

Create a Kubernetes Cluster

k8s-1-17-5-do-0-nyc3-1590403077241
NYC3 - 1.17.5-do.0

Actions ⌄

Overview   Nodes   Insights   Settings

TOTAL CLUSTER CAPACITY   ACCESS CLUSTER CONFIG FILE

3vCPUs   **6 GB**   **150 GB**
CPU   Memory   Disk

Download Config File   Remind me how to do this

Certificates expire after 7 days. How do I update my certificate?

TOTAL CLUSTER COST   Updated daily at 1am UTC

$30 monthly projected cost   CLUSTER TAGS

This price does not include load balancer or block storage costs.

k8s   k8s:1519e178-4a6d-4b0f-be9e-081946a9d08c   Edit

● ● ●   russ.mckendrick@Russs-MBP: ~/microservices-demo/deploy/kubernetes   ⌥⌘1

```
unable to recognize "https://github.com/microservices-demo/microservices-demo/blob/master/deploy/kub
ernetes/complete-demo.yaml?raw=true": no matches for kind "Deployment" in version "extensions/v1beta
1"
unable to recognize "https://github.com/microservices-demo/microservices-demo/blob/master/deploy/kub
ernetes/complete-demo.yaml?raw=true": no matches for kind "Deployment" in version "extensions/v1beta
1"
unable to recognize "https://github.com/microservices-demo/microservices-demo/blob/master/deploy/kub
ernetes/complete-demo.yaml?raw=true": no matches for kind "Deployment" in version "extensions/v1beta
1"
unable to recognize "https://github.com/microservices-demo/microservices-demo/blob/master/deploy/kub
ernetes/complete-demo.yaml?raw=true": no matches for kind "Deployment" in version "extensions/v1beta
1"
unable to recognize "https://github.com/microservices-demo/microservices-demo/blob/master/deploy/kub
ernetes/complete-demo.yaml?raw=true": no matches for kind "Deployment" in version "extensions/v1beta
1"
unable to recognize "https://github.com/microservices-demo/microservices-demo/blob/master/deploy/kub
ernetes/complete-demo.yaml?raw=true": no matches for kind "Deployment" in version "extensions/v1beta
1"
unable to recognize "https://github.com/microservices-demo/microservices-demo/blob/master/deploy/kub
ernetes/complete-demo.yaml?raw=true": no matches for kind "Deployment" in version "extensions/v1beta
```

---

k8s-1-17-5-do-0-nyc3-1590403077241
NYC3 - 1.17.5-do.0

Kubernetes Dashboard ⧉   Actions ⌄

Overview   Nodes   Insights   Settings

Select object
k8s-1-17-5-do-0-nyc3-1590403077241 ⌄

Select period
1 hour ⌄

✓ DigitalOcean advanced metrics
View more options ⌄

Manage alert policies

Pod deployments [?]   05-25-2020 11:30 AM
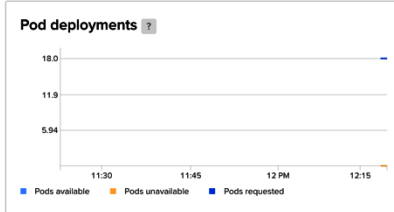
18.0   **POD DEPLOYMENTS**
                                                 ■ Pods available   N/A
11.9   ■ Pods unavailable   N/A
                                                 ■ Pods requested   N/A
5.94

                                                 DAEMONSET DEPLOYMENT STATUS
    11:30   11:45   12 PM   12:15   ■ Pods available   N/A
■ Pods available ■ Pods unavailable ■ Pods requested   ■ Pods unavailable   N/A
                                                 ■ Pods requested   N/A

Chapter 14: Docker Security

Quay Security Scanner has recognized **34** packages.

🟢 **34** packages with no vulnerabilities.

Packages

Filter Packages...

PACKAGE NAME	PACKAGE VERSION	VULNERABILITIES	REMAINING AFTER UPGRADE		UPGRADE IMPACT ↓	INTRODUCED IN LAYER
scanelf	1.2.6-r0	✓ None Detected	(N/A)	(N/A)	ADD	file:c92c248239f8c7b9b3c067650954815f391...
libtls-standalone	2.9.1-r1	✓ None Detected	(N/A)	(N/A)	ADD	file:c92c248239f8c7b9b3c067650954815f391...

```
russ.mckendrick@Russs-MBP: ~/anchore
~/anchore > docker-compose exec api anchore-cli system status
Service analyzer (anchore-quickstart, http://analyzer:8228): up
Service simplequeue (anchore-quickstart, http://queue:8228): up
Service policy_engine (anchore-quickstart, http://policy-engine:8228): up
Service apiext (anchore-quickstart, http://api:8228): up
Service catalog (anchore-quickstart, http://catalog:8228): up

Engine DB Version: 0.0.13
Engine Code Version: 0.7.2

~/anchore >
```

```
russ.mckendrick@Russs-MBP: ~/anchore
~/anchore > docker-compose exec api anchore-cli system feeds list
Feed              Group              LastSync                    RecordCount
github            github:composer    pending                     None
github            github:gem         pending                     None
github            github:java        pending                     None
github            github:npm         pending                     None
github            github:nuget       pending                     None
github            github:python      pending                     None
nvdv2             nvdv2:cves         pending                     None
vulnerabilities   alpine:3.10        2020-06-07T15:34:43.321825  1725
vulnerabilities   alpine:3.11        2020-06-07T15:35:06.448980  1904
```

```
russ.mckendrick@Russs-MBP: ~/anchore
~/anchore > docker-compose exec api anchore-cli image add russmckendrick/moby-counter:old
Image Digest: sha256:157cbbab5607b45c02c5f6a609f40bf95561b7fbdf21a63ca85cb8813a2ef700
Parent Digest: sha256:157cbbab5607b45c02c5f6a609f40bf95561b7fbdf21a63ca85cb8813a2ef700
Analysis Status: analyzed
Image Type: docker
Analyzed At: 2020-06-07T16:20:28Z
Image ID: de9ae734622dc82cdc9b40654d536694bd6a04e058d17a6ea39c8ec867ecec18
Dockerfile Mode: Guessed
Distro: alpine
Distro Version: 3.7.0
Size: 110960640
Architecture: amd64
Layer Count: 6

Full Tag: docker.io/russmckendrick/moby-counter:old
Tag Detected At: 2020-06-07T16:19:09Z
```

```
~/anchore   docker-compose exec api anchore-cli image vuln russmckendrick/moby-counter:old os
Vulnerability ID   Package                                        Severity       Fix
        CVE Refs     Vulnerability URL                                                      Type
     Feed Group    Package Path
CVE-2019-14697     musl-1.1.18-r3                                 High           1.1.18-r4
                     http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2019-14697       APKG
     alpine:3.7    pkgdb
CVE-2019-14697     musl-utils-1.1.18-r3                           High           1.1.18-r4
                     http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2019-14697       APKG
     alpine:3.7    pkgdb
CVE-2018-0495      libressl2.6-libcrypto-2.6.3-r0                 Low            2.6.5-r0
                     http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2018-0495        APKG
     alpine:3.7    pkgdb
CVE-2018-0495      libressl2.6-libssl-2.6.3-r0                    Low            2.6.5-r0
                     http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2018-0495        APKG
     alpine:3.7    pkgdb
```

Chapter 15: Docker Workflows

```
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress  master  ls -lhat w
ordpress/web | grep wp-config
-rw-r--r--@  1 russ.mckendrick  staff   2.8K  6 Feb 06:33 wp-config-sample.php
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress  master  docker-com
pose run wp core config --dbname=wordpress --dbuser=wordpress --dbpass=wordpress --dbhost=mysql --db
prefix=wp_
Success: Generated 'wp-config.php' file.
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress  master  ls -lhat w
ordpress/web | grep wp-config
-rw-r--r--   1 russ.mckendrick  staff   2.7K 21 Jun 10:45 wp-config.php
-rw-r--r--@  1 russ.mckendrick  staff   2.8K  6 Feb 06:33 wp-config-sample.php
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress  master
```



```
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress  master  docker-com
pose run wp core install \
  --title="Blog Title" \
  --url="http://localhost:8080" \
  --admin_user="admin" \
  --admin_password="password" \
  --admin_email="email@domain.com"
sendmail: can't connect to remote host (127.0.0.1): Connection refused
Success: WordPress installed successfully.
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress  master
```

Blog Title

Just another WordPress site

Search

Menu

UNCATEGORIZED

Hello world!

By admin   June 21, 2020   1 Comment

Welcome to WordPress. This is your first post. Edit or delete it, then start writing!

```
russ.mckendrick@Russs-MBP: ~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master    docker-com
pose run wp plugin install jetpack --activate
Installing Jetpack by WordPress.com (8.6.1)
Downloading installation package from https://downloads.wordpress.org/plugin/jetpack.8.6.1.zip...
Unpacking the package...
Installing the plugin...
Plugin installed successfully.
Activating 'jetpack'...
Plugin 'jetpack' activated.
Success: Installed 1 of 1 plugins.
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master
```

```
russ.mckendrick@Russs-MBP: ~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master    docker-com
pose run wp theme install sydney --activate
Installing Sydney (1.63)
Downloading installation package from https://downloads.wordpress.org/theme/sydney.1.63.zip...
Unpacking the package...
Installing the theme...
Theme installed successfully.
Activating 'sydney'...
Success: Switched to 'Sydney' theme.
Success: Installed 1 of 1 themes.
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master
```

Blog Title

Just another WordPress site

UNCATEGORIZED

Hello world!

POSTED ON JUNE 21, 2020

Welcome to WordPress. This is your first post. Edit or delete it, then start writing!

Search ...

```
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master   docker-com
pose down
Stopping docker-wordpress_web_1        ... done
Stopping docker-wordpress_wordpress_1 ... done
Stopping docker-wordpress_mysql_1      ... done
Removing docker-wordpress_wp_run_7738c40924b8 ... done
Removing docker-wordpress_wp_run_9b31fea3afec ... done
Removing docker-wordpress_wp_run_c50f43d6f374 ... done
Removing docker-wordpress_wp_run_af35bbcf6204 ... done
Removing docker-wordpress_web_1               ... done
Removing docker-wordpress_wordpress_1         ... done
Removing docker-wordpress_wp_1                ... done
Removing docker-wordpress_mysql_1             ... done
Removing network docker-wordpress_default
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master
```



```php
<?php
/**
 * Loads the WordPress environment and template.
 *
 * @package WordPress
 */

if ( ! isset( $wp_did_header ) ) {

	$wp_did_header = true;

	// Load the WordPress library.
	require_once __DIR__ . '/wp-load.php';

	// Set up the WordPress query.
	wp();

	// Load the theme template.
	require_once ABSPATH . WPINC . '/template-loader.php';
}

echo "Testing editing in the IDE";
```


Proudly powered by WordPress | Theme: Sydney by aThemes.

Testing editing in the IDE

```
russ.mckendrick@Russs-MBP: ~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master  ls -lha wo
rdpress/export
total 0
drwxr-xr-x@ 2 russ.mckendrick  staff    64B 21 Jun 11:09 .
drwxr-xr-x@ 7 russ.mckendrick  staff   224B 21 Jun 11:09 ..
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master  docker-com
pose run wp db export --add-drop-table /export/wordpress.sql
Success: Exported to '/export/wordpress.sql'.
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master  ls -lha wo
rdpress/export
total 80
drwxr-xr-x@ 3 russ.mckendrick  staff    96B 21 Jun 11:10 .
drwxr-xr-x@ 7 russ.mckendrick  staff   224B 21 Jun 11:10 ..
-rw-r--r--  1 russ.mckendrick  staff    39K 21 Jun 11:10 wordpress.sql
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master  head -5 wo
rdpress/export/wordpress.sql
-- MariaDB dump 10.17  Distrib 10.4.13-MariaDB, for Linux (x86_64)
--
-- Host: mysql    Database: wordpress
-- ------------------------------------------------------
-- Server version       5.7.30
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master 
```
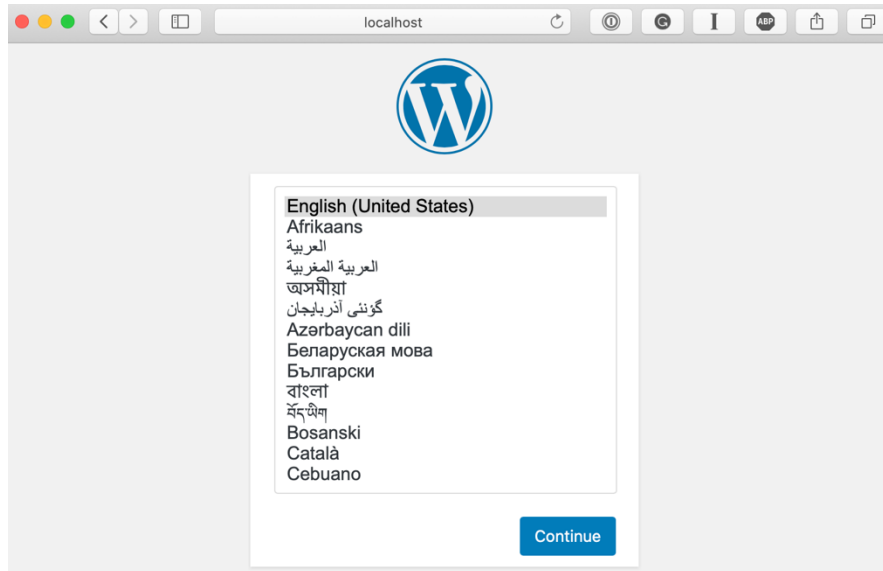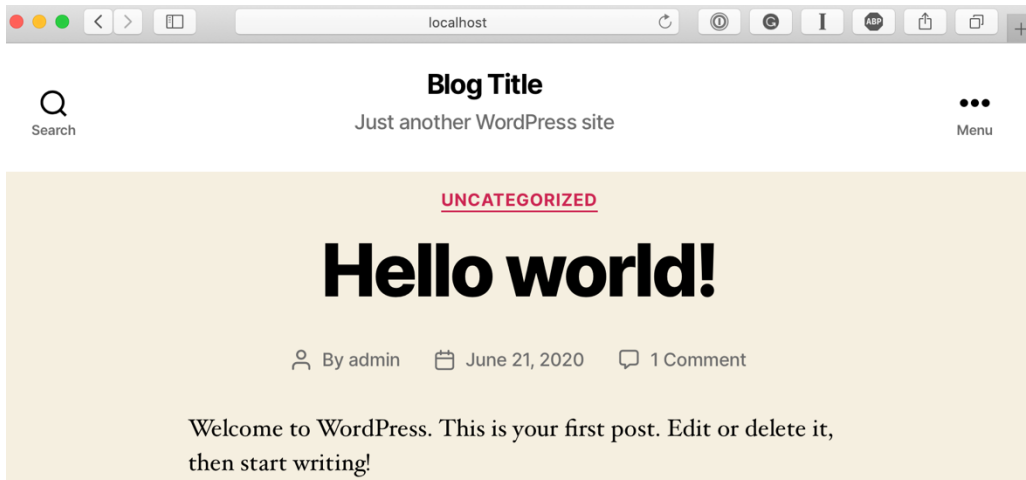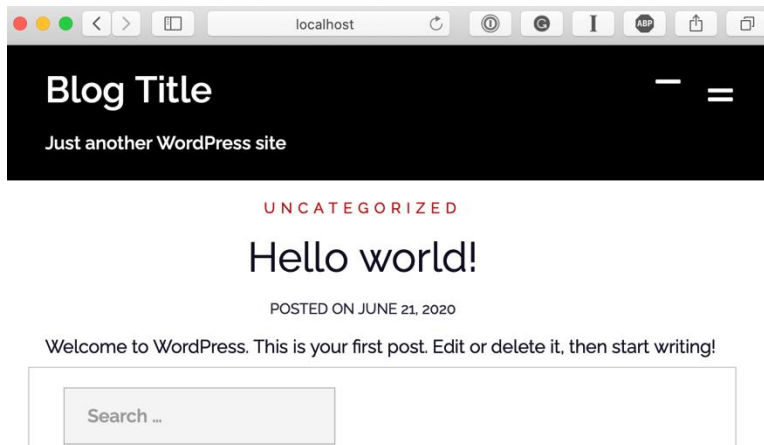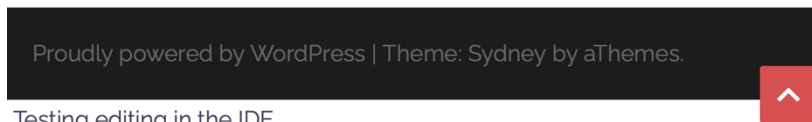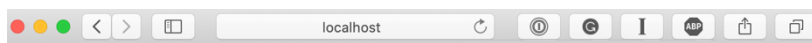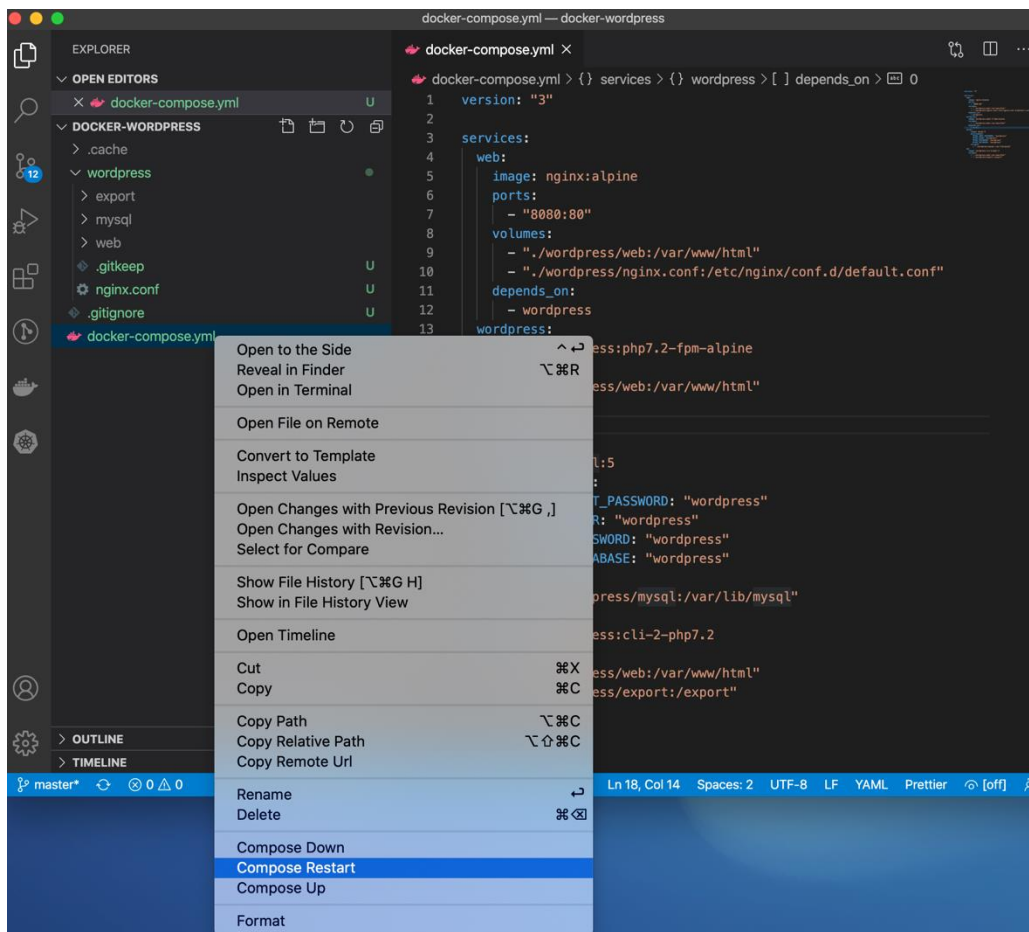
```
russ.mckendrick@Russs-MBP: ~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master  docker-com
pose run wp db import /export/wordpress.sql
Success: Imported from '/export/wordpress.sql'.
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/docker-wordpress    master 
```

Docker — Mastering-Docker-Fourth-Edition

DOCKER

CONTAINERS
- ▷ nginx:alpine (docker-wordpress_web_1 - Up 3 ...
- ▷ wordpress:php7.2-fpm-alpine (docker-wordpr...
- ▷ mysql:5 (docker-wordpress_mysql_1 - Up 3 ho...

IMAGES
- ▷ 🗔 alpine
- ▽ 🗔 masteringdockerfourthedition
  - 🗔 late
    - Run
    - Run Interactive
    - Inspect
    - Pull
    - **Push...**
    - Tag...
    - Copy Full Tag
    - Remove...
- ▷ 🗔 mysq
- ▷ 🗔 nginx

REGISTRIES
- ▷ 🐳 Dock

NETWORKS
- docker-wordpress_default (bridge - 3 hours a...

chapter02 > dockerfile-example > 🐳 Dockerfile >

You, 3 months ago | 1 author (You)
```
1   FROM alpine:latest
2   LABEL maintainer="Russ McKendrick <russ@mckendrick.io>"
3   LABEL description="This example Dockerfile installs NGINX."
4   RUN apk add --update nginx && \
5       rm -rf /var/cache/apk/* && \
6       mkdir -p /tmp/nginx/
7
8   COPY files/nginx.conf /etc/nginx/nginx.conf
9   COPY files/default.conf /etc/nginx/conf.d/default.conf
```

PROBLEMS   OUTPUT   TERMINAL   1: Docker

```
Step 8/10 : EXPOSE 80/tcp
 ---> Running in 23b813165402
Removing intermediate container 23b813165402
 ---> 6c597d0a4c63
Step 9/10 : ENTRYPOINT ["nginx"]
 ---> Running in 0325e735aa82
Removing intermediate container 0325e735aa82
 ---> 7dc51f2b1a85
Step 10/10 : CMD ["-g", "daemon off;"]
 ---> Running in bf953509576d
Removing intermediate container bf953509576d
 ---> bc9a9502e3c8
Successfully built bc9a9502e3c8
Successfully tagged masteringdockerfourthedition:latest
~/Documents/Code/Mastering-Docker-Fourth-Edition  master
```

master*   0   0   Git Graph   Open IcePanel   You, 3 months ago   Ln 15, Col 26   Spaces: 8   UTF-8   LF   Dockerfile   [off]

Docker — Mastering-Docker-Fourth-Edition

DOCKER

CONTAINERS
- ▷ masteringdockerfo
  - View Logs
  - Attach Shell
  - Inspect
  - **Open in Browser**
  - Stop
  - Restart
  - Remove...
- ▷ nginx:alpine (dock
- ▷ wordpress:php7.2-
- ▷ mysql:5 (docker-w

IMAGES
- ▷ 🗔 alpine
- ▽ 🗔 masteringdockerfourthedition
  - 🗔 latest (a few seconds ago)
- ▷ 🗔 mysql
- ▷ 🗔 nginx

REGISTRIES
- ▷ 🐳 Docker Hub

NETWORKS
- docker-wordpress_default (bridge - 3 hours a...

chapter02 > dockerfile-example > 🐳 Dockerfile > ...

You, 3 months ago | 1 author (You)
```
1   FROM alpine:latest
2   LABEL maintainer="Russ McKendrick <russ@mckendrick.io>"
3   LABEL description="This example Dockerfile installs NGINX."
4   RUN apk add --update nginx && \
5       rm -rf /var/cache/apk/* && \
6       mkdir -p /tmp/nginx/
7
8   COPY files/nginx.conf /etc/nginx/nginx.conf
9   COPY files/default.conf /etc/nginx/conf.d/default.conf
```

PROBLEMS   OUTPUT   TERMINAL   2: masteringdockerfourthed

```
docker run --rm -d -p 80:80/tcp masteringdockerfourthedition:latest
~/Documents/Code/Mastering-Docker-Fourth-Edition  master docker run --rm -d -p 8
0:80/tcp masteringdockerfourthedition:latest
c38d51b97743d2efef7d57817759d3da21ce3b024d8a6edabfbe88f995c56bb6
~/Documents/Code/Mastering-Docker-Fourth-Edition  master
```

master*   0   0   Git Graph   Open IcePanel   You, 3 months ago   Ln 15, Col 26   Spaces: 8   UTF-8   LF   Dockerfile   [off]

Dockerfile — helloworld-master

EXPLORER

OPEN EDITORS
- × 🐳 Dockerfile

HELLOWORLD-MASTER
- 🐳 .dockerignore
- ! .drone.yml
- .gitignore
- 🐳 docker-compose.yml
- ! docker-compose.debug.yml
- 🐳 Dockerfile
- 🐍 LICENSE
- 🔹 main.go
- 🔹 main_test.go
- ⓘ README.md

OUTLINE

TIMELINE

🐳 Dockerfile > ...
```
2   #build stage
3   FROM golang:alpine AS builder
4   WORKDIR /go/src/app
5   COPY . .
6   RUN apk add --no-cache git
7   RUN go get -d -v ./...
8   RUN go install -v ./...
9
10  #final stage
11  FROM alpine:latest
12  RUN apk --no-cache add ca-certificates
13  COPY --from=builder /go/bin/app /app
14  ENTRYPOINT ./app
15  LABEL Name=helloworld-master Version=0.0.1
16  EXPOSE 3000
17
```

0   0   Open IcePanel   Ln 9, Col 1   Spaces: 4   UTF-8   LF   Dockerfile   [off]

Starting: Build & Push container
Task   : Docker
Description : Build or push Docker images, login or logout, or run a Docker command
Version   : 2.170.2
Author   : Microsoft Corporation
Help   : https://aka.ms/azpipes-docker-tsg

cf2ff8ec-0dfd-4e51-b1dc-7b0fd65a4326 exists true
/usr/bin/docker build -f /home/vsts/work/1/s/Dockerfile --label com.azure.dev.image.system.teamfoundationcollectionuri=https
Sending build context to Docker daemon 68.61kB

Step 1/17 : FROM golang:latest as builder
latest: Pulling from library/golang
e9afc4f90ab0: Pulling fs layer
989e6b19a265: Pulling fs layer
af14b6c2f878: Pulling fs layer
5573c4b30949: Pulling fs layer

```
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/prometheus  master  docker-compose up -d
Creating network "prometheus_back" with the default driver
Creating network "prometheus_front" with the default driver
Creating volume "prometheus_prometheus_data" with default driver
Creating volume "prometheus_grafana_data" with default driver
Creating cadvisor    ... done
Creating prometheus  ... done
Creating grafana     ... done
~/Documents/Code/Mastering-Docker-Fourth-Edition/chapter14/prometheus  master 
```

```
ield is deprecated. Please use secureJsonData.basicAuthPassword" logger=provisioning.datasources datasource name=Prometheus
grafana    | t=2020-06-21T11:54:00+0000 lvl=info msg="inserting datasource from configuration " logger=provisioning.datasources name=Prometheus uid=
grafana    | t=2020-06-21T11:54:00+0000 lvl=eror msg="Can't read alert notification provisioning files from directory" logger=provisioning.notifiers path=/etc/grafana/provisioning/notifiers error="open /etc/grafana/provisioning/notifiers: no such file or directory"
grafana    | t=2020-06-21T11:54:00+0000 lvl=info msg="HTTP Server Listen" logger=http.server address=[::]:3000 protocol=http subUrl= socket=
```