MICROSERVICES AND CONTAINERS

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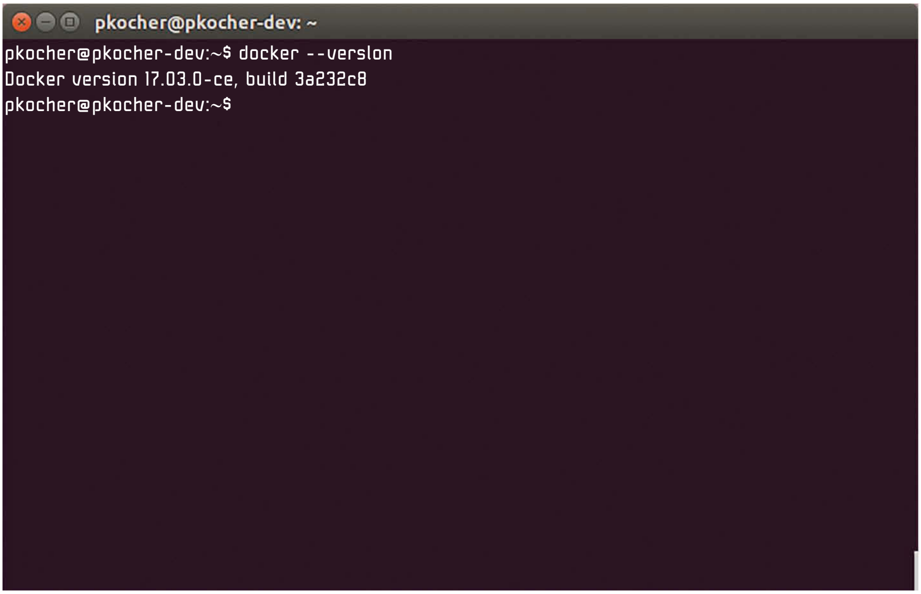
Microservices and Containers

7. Confirm the version, as shown in Figure 6.16:

   ```
   $ Docker --version
   ```



```
pkocher@pkocher-dev:~$ docker --version
Docker version 17.03.0-ce, build 3a232c8
pkocher@pkocher-dev:~$
```

Figure 6.16 *Docker installation confirmation*

That's it—your installation of Docker on Ubuntu Linux is complete.

Chapter 7

Docker Interface

In Chapter 5, "Docker Containers," we talked about Dockerfile, which contains a set of commands that are executed by the Docker daemon. In this chapter, we cover the most commonly used commands. Then we create a Dockerfile using the commands and execute the file to review results.

Key Docker Commands

You can think of the following compendium of commands as the proverbial bible that must be mastered to work successfully with Docker—everything from searching and building images to creating your own Dockerfile. We review the simpler commands first and then build on them to get to some more involved ones.

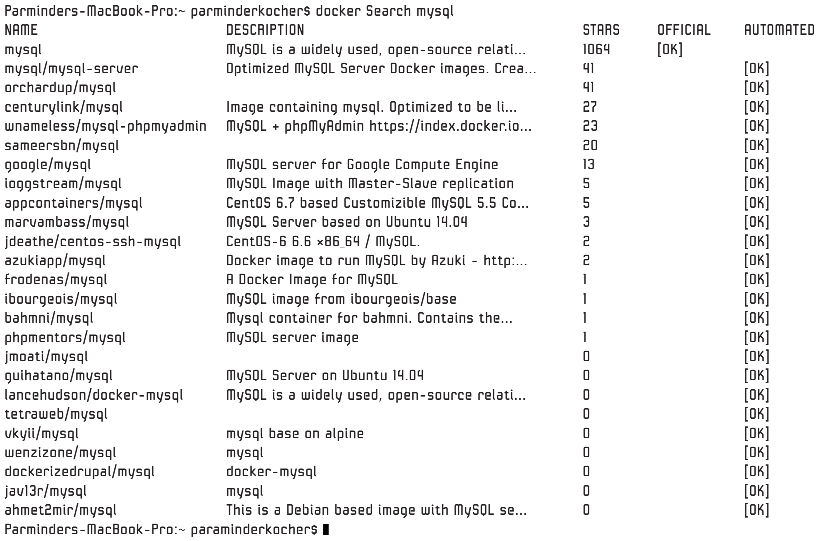
Docker Search

The `docker search` command can be run on Docker CLI to search the available images in the Docker registry:

```
docker search [options] term
```

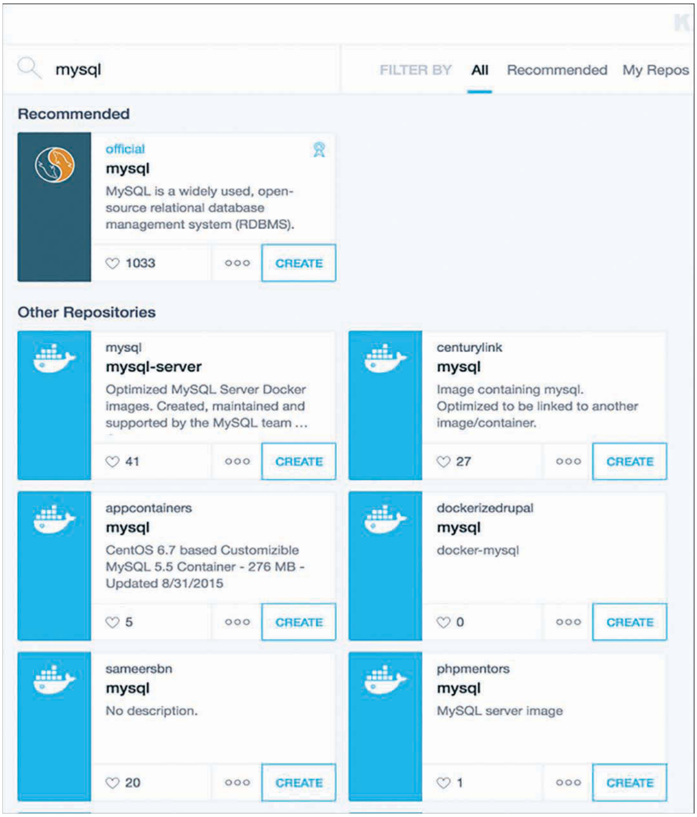
The GUI-based client also provides the search capability.

In the example shown in Figure 7.1, `docker search mysql` returns all the images that have "mysql" in the name of the image. As you can see, it returns the top 25 results. The GUI-based search provides similar results, as shown in Figure 7.2.



```
Parminders-MacBook-Pro:~ parminderkocher$ docker Search mysql
NAME                          DESCRIPTION                                     STARS     OFFICIAL   AUTOMATED
mysql                         MySQL is a widely used, open-source relati...   1064      [OK]
mysql/mysql-server            Optimized MySQL Server Docker images. Crea...   41                   [OK]
orchardup/mysql                                                               41                   [OK]
centurylink/mysql             Image containing mysql. Optimized to be li...   27                   [OK]
wnameless/mysql-phpmyadmin    MySQL + phpMyAdmin https://index.docker.io...   23                   [OK]
sameersbn/mysql                                                               20                   [OK]
google/mysql                  MySQL server for Google Compute Engine          13                   [OK]
ioggstream/mysql              MySQL Image with Master-Slave replication       5                    [OK]
appcontainers/mysql           CentOS 6.7 based Customizible MySQL 5.5 Co...   5                    [OK]
marvambass/mysql              MySQL Server based on Ubuntu 14.04              3                    [OK]
jdeathe/centos-ssh-mysql      CentOS-6 6.6 x86_64 / MySQL.                    2                    [OK]
azukiapp/mysql                Docker image to run MySQL by Azuki - http:...   2                    [OK]
frodenas/mysql                A Docker Image for MySQL                        1                    [OK]
ibourgeois/mysql              MySQL image from ibourgeois/base                1                    [OK]
bahmni/mysql                  Mysql container for bahmni. Contains the...     1                    [OK]
phpmentors/mysql              MySQL server image                              1                    [OK]
jmoati/mysql                                                                  0                    [OK]
guihatano/mysql               MySQL Server on Ubuntu 14.04                    0                    [OK]
lancehudson/docker-mysql      MySQL is a widely used, open-source relati...   0                    [OK]
tetraweb/mysql                                                                0                    [OK]
vkyii/mysql                   mysql base on alpine                            0                    [OK]
wenzizone/mysql               mysql                                           0                    [OK]
dockerizedrupal/mysql         docker-mysql                                    0                    [OK]
javl3r/mysql                  mysql                                           0                    [OK]
ahmet2mir/mysql               This is a Debian based image with MySQL se...   0                    [OK]
Parminders-MacBook-Pro:~ paraminderkocher$ ▮
```

Figure 7.1 *Docker search results for "mysql"*



Recommended

official
mysql
MySQL is a widely used, open-source relational database management system (RDBMS).
♡ 1033 ○○○ CREATE

Other Repositories

mysql
mysql-server
Optimized MySQL Server Docker images. Created, maintained and supported by the MySQL team ...
♡ 41 ○○○ CREATE

centurylink
mysql
Image containing mysql. Optimized to be linked to another image/container.
♡ 27 ○○○ CREATE

appcontainers
mysql
CentOS 6.7 based Customizible MySQL 5.5 Container - 276 MB - Updated 8/31/2015
♡ 5 ○○○ CREATE

dockerizedrupal
mysql
docker-mysql
♡ 0 ○○○ CREATE

sameersbn
mysql
No description.
♡ 20 ○○○ CREATE

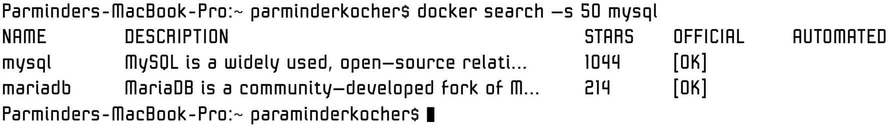
phpmentors
mysql
MySQL server image
♡ 1 ○○○ CREATE

Figure 7.2 *GUI-based search results for "mysql"*

Although some of the results, such as dockerizedrupal, are unique, many are duplicates because they've been uploaded by different users who have used them for custom purposes or made integrations. Using the -s option, the search produces only the widely used files based on feedback from other users:

```
docker search -s 50 mysql
```

This command returns all the images that have "mysql" in the name of the image and at least 50 stars in feedback, as shown in Figure 7.3.



```
Parminders-MacBook-Pro:~ parminderkocher$ docker search –s 50 mysql
NAME          DESCRIPTION                                    STARS    OFFICIAL     AUTOMATED
mysql         MySQL is a widely used, open–source relati...  1044     [OK]
mariadb       MariaDB is a community–developed fork of M...  214      [OK]
Parminders-MacBook-Pro:~ paraminderkocher$ ▮
```

Figure 7.3 *Search results with "mysql" in the name of the image and at least 50 stars in feedback*

In this case, only two entries are listed, as they are the only two with more than 50 ratings.

Note

Docker has been evolving at a tremendous pace, so commands, options, and even features and functionality change frequently across releases. For example, as this book was written, the -s in search was deprecated; a flag called `--filter` must be used instead. With the filter option, the command to list all the MySQL images with star ratings of 50 or more would be

```
docker search --filter stars=50 mysql
```

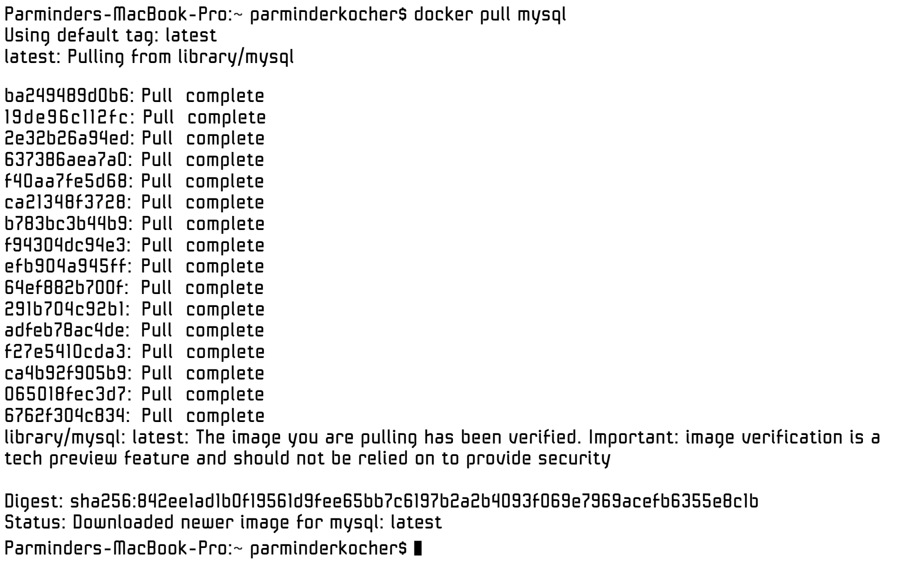
Docker Pull

The `docker pull` command downloads the requested image from the Docker registry to our local machine:

```
docker pull image:tag
```

For example, `docker pull MySQL`, shown in Figure 7.4, pulls the MySQL image from the registry. Unless a tag, such as version, is specified, this command appends the "latest" tag by default instead of pulling all the MySQL images available. The command is equivalent to

```
docker pull MySQL:latest
```



```
Parminders-MacBook-Pro:~ parminderkocher$ docker pull mysql
Using default tag: latest
latest: Pulling from library/mysql

ba249489d0b6: Pull  complete
19de96c112fc: Pull  complete
2e32b26a94ed: Pull  complete
637386aea7a0: Pull  complete
f40aa7fe5d68: Pull  complete
ca21348f3728: Pull  complete
b783bc3b44b9: Pull  complete
f94304dc94e3: Pull  complete
efb904a945ff: Pull  complete
64ef882b700f:  Pull  complete
291b704c92b1:  Pull  complete
adfeb78ac4de:  Pull  complete
f27e5410cda3:  Pull  complete
ca4b92f905b9:  Pull  complete
065018fec3d7:  Pull  complete
6762f304c834:  Pull  complete
library/mysql: latest: The image you are pulling has been verified. Important: image verification is a
tech preview feature and should not be relied on to provide security

Digest: sha256:842ee1ad1b0f19561d9fee65bb7c6197b2a2b4093f069e7969acefb6355e8c1b
Status: Downloaded newer image for mysql: latest
Parminders-MacBook-Pro:~ parminderkocher$ ▮
```

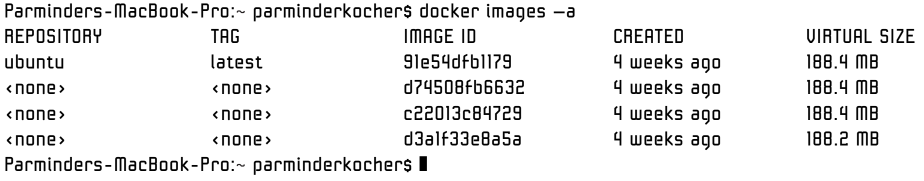
Figure 7.4 *The `docker pull` command pulling latest MySQL image from the registry*

Docker Images

The `docker images` command returns the list of available top-level images on our local machine:

```
docker images[options]
```

For example, `docker images -a` displays a list of all the top-level images, along with their repository, tag, create date, and virtual size, as shown in Figure 7.5. It does not show the intermediate layers' images.



```
Parminders-MacBook-Pro:~ parminderkocher$ docker images —a
REPOSITORY          TAG                 IMAGE ID            CREATED             VIRTUAL SIZE
ubuntu              latest              91e54dfb1179        4 weeks ago         188.4 MB
<none>              <none>              d74508fb6632        4 weeks ago         188.4 MB
<none>              <none>              c22013c84729        4 weeks ago         188.4 MB
<none>              <none>              d3a1f33e8a5a        4 weeks ago         188.2 MB
Parminders-MacBook-Pro:~ parminderkocher$ ▮
```

Figure 7.5 *The `docker images` command displaying list of all top-level images, along with their repository, tag, create date, and virtual size*

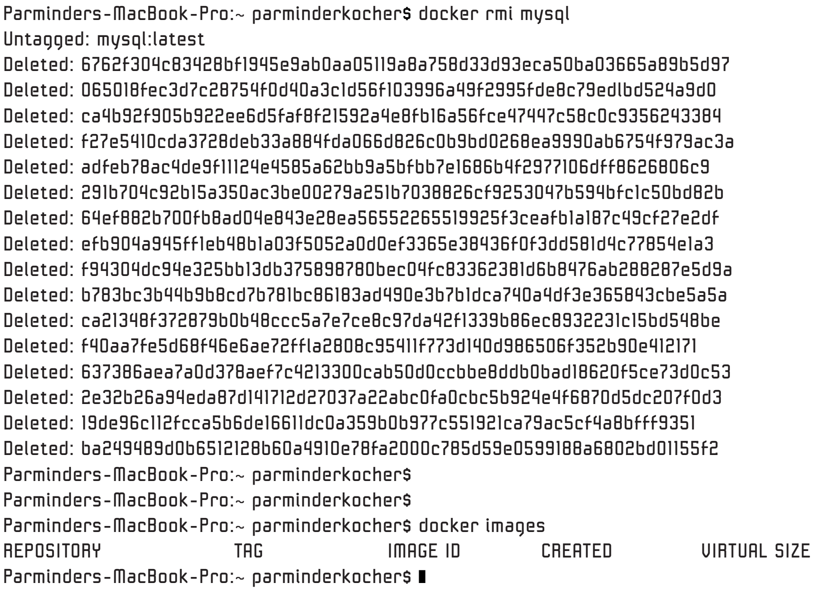
One important thing to keep in mind is that when we create or build Docker images on our local machine, various intermediate layers are created. For example, if we use a Dockerfile that may have multiple commands to build the image, each command executed will result in one image layer. This is one of the key aspects of Docker that make the containers lightweight and perfect for reuse.

Docker RMI

The `docker rmi` command removes the requested image(s) from our local machine:

```
docker rmi[options] image [image, image...]
```

For example, the `docker rmi MySQL` command, shown in Figure 7.6, removes the MySQL image, including all the layers that were installed, from the host.



```
Parminders-MacBook-Pro:~ parminderkocher$ docker rmi mysql
Untagged: mysql:latest
Deleted: 6762f304c83428bf1945e9ab0aa05119a8a758d33d93eca50ba03665a89b5d97
Deleted: 065018fec3d7c28754f0d40a3c1d56f103996a49f2995fde8c79ed1bd524a9d0
Deleted: ca4b92f905b922ee6d5faf8f21592a4e8fb16a56fce47447c58c0c9356243384
Deleted: f27e5410cda3728deb33a884fda066d826c0b9bd0268ea9990ab6754f979ac3a
Deleted: adfeb78ac4de9f11124e4585a62bb9a5bfbb7e1686b4f2977106dff8626806c9
Deleted: 291b704c92b15a350ac3be00279a251b7038826cf9253047b594bfc1c50bd82b
Deleted: 64ef882b700fb8ad04e843e28ea56552265519925f3ceafb1a187c49cf27e2df
Deleted: efb904a945ff1eb48b1a03f5052a0d0ef3365e38436f0f3dd581d4c77854e1a3
Deleted: f94304dc94e325bb13db375898780bec04fc83362381d6b8476ab288287e5d9a
Deleted: b783bc3b44b9b8cd7b781bc86183ad490e3b7b1dca740a4df3e365843cbe5a5a
Deleted: ca21348f372879b0b48ccc5a7e7ce8c97da42f1339b86ec8932231c15bd548be
Deleted: f40aa7fe5d68f46e6ae72ff1a2808c95411f773d140d986506f352b90e412171
Deleted: 637386aea7a0d378aef7c4213300cab50d0ccbbe8ddb0bad18620f5ce73d0c53
Deleted: 2e32b26a94eda87d141712d27037a22abc0fa0cbc5b924e4f6870d5dc207f0d3
Deleted: 19de96c112fcca5b6de16611dc0a359b0b977c551921ca79ac5cf4a8bfff9351
Deleted: ba249489d0b6512128b60a4910e78fa2000c785d59e0599188a6802bd01155f2
Parminders-MacBook-Pro:~ parminderkocher$
Parminders-MacBook-Pro:~ parminderkocher$
Parminders-MacBook-Pro:~ parminderkocher$ docker images
REPOSITORY              TAG                 IMAGE ID            CREATED             VIRTUAL SIZE
Parminders-MacBook-Pro:~ parminderkocher$ ▮
```

Figure 7.6 *MySQL image removed via* `docker rmi` *command*

Docker Run

Once we download (pull) an image, the next logical step is to execute (run) the image, and that's what the `docker run` command does:

```
docker run [options] image: tag [command, args]
```