

Getting setup

\$ docker pull ubuntu:latest

```
cd@DESKTOP-VCNQ3D1:~$ docker pull ubuntu:latest
latest: Pulling from library/ubuntu
4d32b49e2995: Pull complete
Digest: sha256:bea6d19168bbfd6af8d77c2cc3c572114eb5d113e6f422573c93cb605a0e2ffb
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

1. First start the container with /bin/bash:

\$ docker run -it ubuntu:16.04 /bin/bash

```
cd@DESKTOP-VCNQ3D1:~$ docker run -it ubuntu:16.04 /bin/bash
root@5e02c66db1df:/#
```

2. Try running ping in the terminal.

```
cd@DESKTOP-VCNQ3D1:~$ docker run -it ubuntu:16.04 /bin/bash
root@5e02c66db1df:/# ping google.com
bash: ping: command not found
root@5e02c66db1df:/#
```

3. But first we'll update our software list.

```
root@5e02c66db1df:/# apt-get update
Get:1 http://archive.ubuntu.com/ubuntu xenial InRelease [247 kB]
Get:2 http://security.ubuntu.com/ubuntu xenial-security InRelease [99.8 kB]
Get:3 http://security.ubuntu.com/ubuntu xenial-security/main amd64 Packages [2051 kB]
Get:4 http://archive.ubuntu.com/ubuntu xenial-updates InRelease [99.8 kB]
Get:5 http://archive.ubuntu.com/ubuntu xenial-backports InRelease [97.4 kB]
Get:6 http://archive.ubuntu.com/ubuntu xenial/main amd64 Packages [1558 kB]
Get:7 http://security.ubuntu.com/ubuntu xenial-security/restricted amd64 Packages [15.9 kB]
Get:8 http://security.ubuntu.com/ubuntu xenial-security/universe amd64 Packages [984 kB]
Get:9 http://archive.ubuntu.com/ubuntu xenial/restricted amd64 Packages [14.1 kB]
Get:10 http://archive.ubuntu.com/ubuntu xenial/universe amd64 Packages [9827 kB]
Get:11 http://security.ubuntu.com/ubuntu xenial-security/multiverse amd64 Packages [8820 B]
Get:12 http://archive.ubuntu.com/ubuntu xenial/multiverse amd64 Packages [176 kB]
Get:13 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 Packages [2560 kB]
Get:14 http://archive.ubuntu.com/ubuntu xenial-updates/restricted amd64 Packages [16.4 kB]
Get:15 http://archive.ubuntu.com/ubuntu xenial-updates/universe amd64 Packages [1544 kB]
Get:16 http://archive.ubuntu.com/ubuntu xenial-updates/multiverse amd64 Packages [26.2 kB]
Get:17 http://archive.ubuntu.com/ubuntu xenial-backports/main amd64 Packages [10.9 kB]
Get:18 http://archive.ubuntu.com/ubuntu xenial-backports/universe amd64 Packages [12.7 kB]
Fetched 19.3 MB in 39s (488 kB/s)
Reading package lists... Done
root@5e02c66db1df:/#
```

4. Now we can install the ping command.

```
root@5e02c66db1df:/# apt-get install iputils-ping
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libffi6 libgmp10 libgnutls-openssl27 libgnutls30 libhogweed4 libidn11 libnettle6 libp11-kit0 libtasn1-6
Suggested packages:
  gnutls-bin
The following NEW packages will be installed:
  iputils-ping libffi6 libgmp10 libgnutls-openssl27 libgnutls30 libhogweed4 libidn11 libnettle6
  libp11-kit0 libtasn1-6
0 upgraded, 10 newly installed, 0 to remove and 0 not upgraded.
Need to get 1307 kB of archives.
After this operation, 3785 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu xenial/main amd64 libgmp10 amd64 2:6.1.0+dfsg-2 [240 kB]
Get:2 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libnettle6 amd64 3.2-1ubuntu0.16.04.2 [93.7 kB]
Get:3 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libhogweed4 amd64 3.2-1ubuntu0.16.04.2 [136 kB]
Get:4 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libidn11 amd64 1.32-3ubuntu1.2 [46.5 kB]
Get:5 http://archive.ubuntu.com/ubuntu xenial/main amd64 libffi6 amd64 3.2.1-4 [17.8 kB]
Get:6 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libp11-kit0 amd64 0.23.2-5~ubuntu16.04.2 [107 kB]
Get:7 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libtasn1-6 amd64 4.7-3ubuntu0.16.04.3 [43.5 kB]
Get:8 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libgnutls30 amd64 3.4.10-4ubuntu1.9 [548 kB]
Get:9 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libgnutls-openssl27 amd64 3.4.10-4ubuntu1.9 [21.9 kB]
Get:10 http://archive.ubuntu.com/ubuntu xenial/main amd64 iputils-ping amd64 3:20121221-5ubuntu2 [52.7 kB]
Fetched 1307 kB in 25s (50.3 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package libgmp10:amd64.
(Reading database ... 4785 files and directories currently installed.)
Preparing to unpack .../libgmp10_2%3a6.1.0+dfsg-2_amd64.deb ...
Unpacking libgmp10:amd64 (2:6.1.0+dfsg-2) ...
Selecting previously unselected package libnettle6:amd64.
Preparing to unpack .../libnettle6_3.2-1ubuntu0.16.04.2_amd64.deb ...
Unpacking libnettle6:amd64 (3.2-1ubuntu0.16.04.2) ...
Selecting previously unselected package libhogweed4:amd64.
Preparing to unpack .../libhogweed4_3.2-1ubuntu0.16.04.2_amd64.deb ...
Unpacking libhogweed4:amd64 (3.2-1ubuntu0.16.04.2) ...
Selecting previously unselected package libidn11:amd64.
Preparing to unpack .../libidn11_1.32-3ubuntu1.2_amd64.deb ...
Unpacking libidn11:amd64 (1.32-3ubuntu1.2) ...
Selecting previously unselected package libffi6:amd64.
Preparing to unpack .../libffi6_3.2.1-4_amd64.deb ...
Unpacking libffi6:amd64 (3.2.1-4) ...
Selecting previously unselected package libp11-kit0:amd64.
Preparing to unpack .../libp11-kit0_0.23.2-5~ubuntu16.04.2_amd64.deb ...
Unpacking libp11-kit0:amd64 (0.23.2-5~ubuntu16.04.2) ...
Selecting previously unselected package libtasn1-6:amd64.
Preparing to unpack .../libtasn1-6_4.7-3ubuntu0.16.04.3_amd64.deb ...
Unpacking libtasn1-6:amd64 (4.7-3ubuntu0.16.04.3) ...
Selecting previously unselected package libgnutls30:amd64.
```

5. Finally, we should be able to use ping.

```
root@5e02c66db1df:/# ping google.com
PING google.com (173.194.222.100) 56(84) bytes of data:
64 bytes from 173.194.222.100: icmp_seq=1 ttl=37 time=160 ms
64 bytes from 173.194.222.100: icmp_seq=2 ttl=37 time=82.6 ms
64 bytes from 173.194.222.100: icmp_seq=3 ttl=37 time=84.7 ms
^C
--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 82.672/109.194/160.162/36.050 ms
root@5e02c66db1df:/#
```

Committing changes

6. Let's find our container to create the new image from.

7. `$ docker ps -a`

```
cd@DESKTOP-VCNQ3D1:~$ docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS              PORTS          NAMES
5e02c66db1df   ubuntu:16.04   "/bin/bash"             19 minutes ago Exited (0) 32 seconds ago           vibrant_panini
Fc23f50aa20e   ubuntu:16.04   "/bin/bash"             20 minutes ago Exited (0) 20 minutes ago           jovial_antonelli
f8e8526b0ef4   ubuntu:16.04   "/bin/bash"             23 hours ago   Exited (0) 23 hours ago           serene_burnell
574db01e3227   ubuntu:16.10   "/bin/echo 'Hello wo..." 23 hours ago   Exited (0) 23 hours ago           heuristic_meninsky
cd@DESKTOP-VCNQ3D1:~$
```

8. Now let's commit it as a new image.

```
cd@DESKTOP-VCNQ3D1:~$ docker commit --help

Usage:  docker commit [OPTIONS] CONTAINER [REPOSITORY[:TAG]]

Create a new image from a container's changes

Options:
  -a, --author string      Author (e.g., "John Hannibal Smith <hannibal@a-team.com>")
  -c, --change list        Apply Dockerfile instruction to the created image
  -m, --message string     Commit message
  -p, --pause              Pause container during commit (default true)
cd@DESKTOP-VCNQ3D1:~$

cd@DESKTOP-VCNQ3D1:~$ docker commit -a 'David Elner' -m 'Added ping utility.' 5e0 delner/ping
sha256:9869cc630d91667fb331b6e0dc860722138d091aa37f56bb1e606c1d6ac8039
cd@DESKTOP-VCNQ3D1:~$
```

```
sha256:9869cc630d91667fb331b6e0dc860722138d091aa37f56bb1e606c1d6ac8039
cd@DESKTOP-VCNQ3D1:~$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
delner/ping   latest    9869cc630d91   3 minutes ago  170MB
ubuntu        latest    ff0fea8310f3   8 days ago    72.8MB
ubuntu        16.04     b6f507652425   6 months ago  135MB
ubuntu        16.10     7d3f705d307c   4 years ago   107MB
cd@DESKTOP-VCNQ3D1:~$
```

9. Finally run your new image in a new container to see it in action!

```
cd@DESKTOP-VCNQ3D1:~$ docker run -it --rm delner/ping /bin/bash
root@a5699935c733:/# ping google.com
PING google.com (173.194.222.139) 56(84) bytes of data.
64 bytes from 173.194.222.139: icmp_seq=1 ttl=37 time=82.8 ms
64 bytes from 173.194.222.139: icmp_seq=2 ttl=37 time=83.7 ms
^C
--- google.com ping statistics ---
3 packets transmitted, 2 received, 33% packet loss, time 2003ms
rtt min/avg/max/mdev = 82.846/83.280/83.714/0.434 ms
root@a5699935c733:/#
```