Changing images

First download the ubuntu:16.04 image with docker pull. (You might already have this if you have completed the previous tutorial.)

```
hater@hater:~$ docker pull ubuntu:16.04
16.04: Pulling from library/ubuntu
Digest: sha256:0f71fa8d4d2d4292c3c617fda2b36f6dabe5c8b6e34c3dc5b0d17d4e704bd39c
Status: Image is up to date for ubuntu:16.04
docker.io/library/ubuntu:16.04
```

First start the container with /bin/bash:

```
hater@hater:~$ docker run -it ubuntu:16.04 /bin/bash
root@df1fc1bdcc70:/# ping google.com
bash: ping: command not found
root@df1fc1bdcc70:/#
```

Try running ping in the terminal.


```
hater@hater:~$ docker run -it ubuntu:16.04 /bin/bash
root@df1fc1bdcc70:/# ping google.com
bash: ping: command not found
root@df1fc1bdcc70:/#
```


By default, to reduce the image size, the Ubuntu image doesn't have a list of the available software packages. We need to update the list of available software:

```
hater@hater:~$ docker run -it ubuntu:16.04 /bin/bash
root@df1fc1bdcc70:/# ping google.com
bash: ping: command not found
root@df1fc1bdcc70:/# 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://archive.ubuntu.com/ubuntu xenial-updates InRelease [99.8 kB]
Get:4 http://archive.ubuntu.com/ubuntu xenial-backports InRelease [97.4 kB]
Get:5 http://security.ubuntu.com/ubuntu xenial-security/main amd64 Packages [2051 kB]
Get:6 http://archive.ubuntu.com/ubuntu xenial/main amd64 Packages [1558 kB]
Get:7 http://archive.ubuntu.com/ubuntu xenial/restricted amd64 Packages [14.1 kB]
Get:8 http://archive.ubuntu.com/ubuntu xenial/universe amd64 Packages [9827 kB]
Get:9 http://archive.ubuntu.com/ubuntu xenial/multiverse amd64 Packages [176 kB]
Get:10 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 Packages [2560 kB]
Get:11 http://security.ubuntu.com/ubuntu xenial-security/restricted amd64 Packages [15.9 kB]
Get:12 http://security.ubuntu.com/ubuntu xenial-security/universe amd64 Packages [984 kB]
Get:13 http://security.ubuntu.com/ubuntu xenial-security/multiverse amd64 Packages [8820 B]
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]
```

Call `apt-get install iputils-ping` to install the package containing `ping`:

```
root@df1fc1bdcc70:/# 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 3.2-1ubuntu0.1
6.04.2 [136 kB]
```

Ping your favorite website. When you've seen enough, `Ctrl+C` to interrupt, then `exit` the container.

```
root@df1fc1bdcc70:/# ping google.com
PING google.com (64.233.165.101) 56(84) bytes of data.
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=1 ttl=103 time=74.9 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=2 ttl=103 time=74.3 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=3 ttl=103 time=74.1 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=4 ttl=103 time=73.7 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=5 ttl=103 time=77.0 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=6 ttl=103 time=75.3 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=7 ttl=103 time=73.6 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=8 ttl=103 time=73.7 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=9 ttl=103 time=74.1 ms
64 bytes from lg-in-f101.1e100.net (64.233.165.101): icmp_seq=10 ttl=103 time=73.7 ms
^C
--- google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9012ms
rtt min/avg/max/mdev = 73.610/74.487/77.039/1.045 ms
root@df1fc1bdcc70:/#
```

Fortunately, we have a Docker container with our `ping` utility already installed from the previous steps. It should be stopped right now, but let's find its container ID.

```
hater@hater:~$ docker ps -a
CONTAINER ID   IMAGE                  COMMAND                  CREATED         STATUS
               PORTS                  NAMES
df1fc1bdcc70   ubuntu:16.04           "/bin/bash"              5 minutes ago   Exited (130) 44
seconds ago
```

`docker commit` takes a container, and allows you to commit its changes as a new image.

```
hater@hater:~$ 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)
hater@hater:~$
```

Pass the container ID, an author, commit message, and give it the name <DockerHub username>/ping:

```
hater@hater:~$ docker commit -a 'Alisher' -m 'Added ping utility.' df1 alisher/ping
sha256:5c7f69f4dd96623bfaaa93357cdea54e20a31f7753fc89819c990287fea6f000
hater@hater:~$
```

Then check `docker images` to see your new image:

```
hater@hater:~$ docker images
REPOSITORY              TAG                 IMAGE ID       CREATED          SIZE
alisher/ping            latest              5c7f69f4dd96   44 seconds ago   170MB
test                    latest              a4671517ab78   4 months ago     323MB
golang                  1.16-alpine         eee5af307da8   4 months ago     302MB
ubuntu                  16.04               b6f507652425   6 months ago     135MB
httpd                   latest              73b8cfec1155   8 months ago     138MB
bitnami/mongodb         4.4                 459fbddc53f3   8 months ago     427MB
portainer/portainer-ce  latest              865cf8021627   8 months ago     210MB
nats                    2.1.8-alpine3.11    96815e17bf11   18 months ago    16.3MB
hater@hater:~$
```

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

```
hater@hater:~$ docker run -it --rm alisher/ping /bin/bash
root@94ee0e16a011:/#
```