

Setup

```
hafelago@DESKTOP-208TC4I:~$ docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
c1ec31eb5944: Pull complete
Digest: sha256:a26bff933ddc26d5cdf7faa98b4ae1e3ec20c4985e6f87ac0973052224d24302
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/

hafelago@DESKTOP-208TC4I:~$ |
```

<input type="checkbox"/>	Name	Tag	Status	Created	Size	Actions
<input type="checkbox"/>	hello-world d2c94e258dcb 	latest	In use	1 year ago	13.25 KB	  

1.0 Running your first Container

```
hafelago@DESKTOP-208TC4I:~$ docker pull alpine
Using default tag: latest
latest: Pulling from library/alpine
4abcf2066143: Pull complete
Digest: sha256:c5b1261d6d3e43071626931fc004f70149baeba2c8ec672bd4f27761f8e1ad6b
Status: Downloaded newer image for alpine:latest
docker.io/library/alpine:latest

What's Next?
  View a summary of image vulnerabilities and recommendations → docker scout quickview alpine
hafelago@DESKTOP-208TC4I:~$
```

<input type="checkbox"/>	Name	Tag	Status	Created	Size	Actions
<input type="checkbox"/>	alpine 05455a08881e	latest	Unused	3 months ago	7.37 MB	
<input type="checkbox"/>	hello-world d2c94e258dcb	latest	In use	1 year ago	13.25 KB	

Docker Images to see all images

What's Next?
View a summary of image vulnerabilities and recommendations → [docker scout quickview alpine](#)

```
hafelago@DESKTOP-208TC4I:~$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
alpine	latest	05455a08881e	3 months ago	7.38MB
hello-world	latest	d2c94e258dcb	12 months ago	13.3kB

```
hafelago@DESKTOP-208TC4I:~$
```

Docker run

```
hafelago@DESKTOP-208TC4I:~$ docker run alpine ls -l
```

```
total 56
```

drwxr-xr-x	2	root	root	4096	Jan 26 17:53	bin
drwxr-xr-x	5	root	root	340	May 10 03:06	dev
drwxr-xr-x	1	root	root	4096	May 10 03:06	etc
drwxr-xr-x	2	root	root	4096	Jan 26 17:53	home
drwxr-xr-x	7	root	root	4096	Jan 26 17:53	lib
drwxr-xr-x	5	root	root	4096	Jan 26 17:53	media
drwxr-xr-x	2	root	root	4096	Jan 26 17:53	mnt
drwxr-xr-x	2	root	root	4096	Jan 26 17:53	opt
dr-xr-xr-x	330	root	root	0	May 10 03:06	proc
drwx-----	2	root	root	4096	Jan 26 17:53	root
drwxr-xr-x	2	root	root	4096	Jan 26 17:53	run
drwxr-xr-x	2	root	root	4096	Jan 26 17:53	sbin
drwxr-xr-x	2	root	root	4096	Jan 26 17:53	srv
dr-xr-xr-x	11	root	root	0	May 10 03:06	sys
drwxrwxrwt	2	root	root	4096	Jan 26 17:53	tmp
drwxr-xr-x	7	root	root	4096	Jan 26 17:53	usr
drwxr-xr-x	12	root	root	4096	Jan 26 17:53	var

```
hafelago@DESKTOP-208TC4I:~$
```

```
docker run alpine echo "hello from alpine"
```

```
hafelago@DESKTOP-208TC4I:~$ docker run alpine echo "hello from alpine"
hello from alpine
hafelago@DESKTOP-208TC4I:~$
```

```
docker run -it alpine /bin/sh.
```

```

hafeLago@DESKTOP-208TC4I:~$ docker run -it alpine /bin/sh
/ # ls -l
total 56
drwxr-xr-x    2 root    root          4096 Jan 26 17:53 bin
drwxr-xr-x    5 root    root          360 May 10 03:13 dev
drwxr-xr-x    1 root    root          4096 May 10 03:13 etc
drwxr-xr-x    2 root    root          4096 Jan 26 17:53 home
drwxr-xr-x    7 root    root          4096 Jan 26 17:53 lib
drwxr-xr-x    5 root    root          4096 Jan 26 17:53 media
drwxr-xr-x    2 root    root          4096 Jan 26 17:53 mnt
drwxr-xr-x    2 root    root          4096 Jan 26 17:53 opt
dr-xr-xr-x  336 root    root           0 May 10 03:13 proc
drwx-----   1 root    root          4096 May 10 03:13 root
drwxr-xr-x    2 root    root          4096 Jan 26 17:53 run
drwxr-xr-x    2 root    root          4096 Jan 26 17:53 sbin
drwxr-xr-x    2 root    root          4096 Jan 26 17:53 srv
dr-xr-xr-x   11 root    root           0 May 10 03:13 sys
drwxrwxrwt    2 root    root          4096 Jan 26 17:53 tmp
drwxr-xr-x    7 root    root          4096 Jan 26 17:53 usr
drwxr-xr-x   12 root    root          4096 Jan 26 17:53 var
/ #

```

```

angry_edison
hafeLago@DESKTOP-208TC4I:~$ docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS        NAMES
hafeLago@DESKTOP-208TC4I:~$

```

docker ps -a

```

hafeLago@DESKTOP-208TC4I:~$ docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS        NAMES
f88aea22611b   alpine        "/bin/sh"               2 minutes ago   Exited (127) 49 seconds ago
b77bc845f6a2   alpine        "echo 'hello from al..." 5 minutes ago   Exited (0) 5 minutes ago
3d9ea50b8ecc   alpine        "ls -l"                 9 minutes ago   Exited (0) 9 minutes ago
b75ee6f5f068   hello-world   "/hello"                17 minutes ago   Exited (0) 17 minutes ago
hafeLago@DESKTOP-208TC4I:~$ docker ps -a

```

```
hafelago@DESKTOP-208TC4I:~$ docker run --help
```

```
Usage: docker run [OPTIONS] IMAGE [COMMAND] [ARG...]
```

Create and run a new container from an image

Aliases:

docker container run, docker run

Options:

--add-host list	Add a custom host-to-IP mapping (host:ip)
--annotation map	Add an annotation to the container (passed through to the OCI runtime) (default map[])
-a, --attach list	Attach to STDIN, STDOUT or STDERR
--blkio-weight uint16	Block IO (relative weight), between 10 and 1000, or 0 to disable (default 0)
--blkio-weight-device list	Block IO weight (relative device weight) (default [])
--cap-add list	Add Linux capabilities
--cap-drop list	Drop Linux capabilities
--cgroup-parent string	Optional parent cgroup for the container
--cgroupns string	Cgroup namespace to use (host private)
	'host': Run the container in the Docker host's cgroup namespace
	'private': Run the container in its own private cgroup namespace
	':': Use the cgroup namespace as configured by the default-cgroupns-mode option on the daemon (default)
--cidfile string	Write the container ID to the file
--cpu-period int	Limit CPU CFS (Completely Fair Scheduler) period
--cpu-quota int	Limit CPU CFS (Completely Fair Scheduler) quota
--cpu-rt-period int	Limit CPU real-time period in microseconds
--cpu-rt-runtime int	Limit CPU real-time runtime in microseconds




1.2 Terminology

```
hafe lago@DESKTOP-208TC4I:~$ docker inspect alpine
[
  {
    "Id": "sha256:05455a08881ea9cf0e752bc48e61bbd71a34c029bb13df01e40e3e70e0d007bd",
    "RepoTags": [
      "alpine:latest"
    ],
    "RepoDigests": [
      "alpine@sha256:c5b1261d6d3e43071626931fc004f70149baeba2c8ec672bd4f27761f8e1ad6b"
    ],
    "Parent": "",
    "Comment": "",
    "Created": "2024-01-27T00:30:48.743965523Z",
    "ContainerConfig": {
      "Hostname": "",
      "Domainname": "",
      "User": "",
      "AttachStdin": false,
      "AttachStdout": false,
      "AttachStderr": false,
      "Tty": false,
      "OpenStdin": false,
      "StdinOnce": false,
      "Env": null,
      "Cmd": null,
      "Image": "",
      "Volumes": null,
      "WorkingDir": "",
      "Entrypoint": null,
      "OnBuild": null,
      "Labels": null
    }
  }
]
```

2.1 Run a static website in a container

```
hafe lago@DESKTOP-208TC4I:~$ docker pull dockersamples/static-site
Using default tag: latest
latest: Pulling from dockersamples/static-site
fdd5d7827f33: Pull complete
a3ed95caeb02: Pull complete
716f7a5f3082: Pull complete
7b10f03a0309: Pull complete
aff3ab7e9c39: Pull complete
Digest: sha256:daa686c61d7d239b7977e72157997489db49f316b9b9af3909d9f10fd28b2dec
Status: Downloaded newer image for dockersamples/static-site:latest
docker.io/dockersamples/static-site:latest

What's Next?
View a summary of image vulnerabilities and recommendations → docker scout quickview dockersamples/static-site
hafe lago@DESKTOP-208TC4I:~$
```

	dockersamples/static-site	latest	Unused	8 years ago	190.52 MB		:	
Showing 3 items								

```

hafelago@DESKTOP-208TC4I:~$ docker pull dockersamples/static-site
Using default tag: latest
latest: Pulling from dockersamples/static-site
Digest: sha256:daa686c61d7d239b7977e72157997489db49f316b9b9af3909d9f10fd28b2dec
Status: Image is up to date for dockersamples/static-site:latest
docker.io/dockersamples/static-site:latest

What's Next?
  View a summary of image vulnerabilities and recommendations → docker scout quickview dockersamples/static-site
hafelago@DESKTOP-208TC4I:~$ docker run -d dockersamples/static-site
08231a2a77d90c2e01c4509d303ea11d024f0b086a74f55a747b911253243889
hafelago@DESKTOP-208TC4I:~$

```

```

hafelago@DESKTOP-208TC4I:~$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS
08231a2a77d9   dockersamples/static-site           "/bin/sh -c 'cd /usr..." 2 minutes ago  Up 2 minutes  80/
tcp, 443/tcp   hopeful_elbakyan
hafelago@DESKTOP-208TC4I:~$

```

```

hafelago@DESKTOP-208TC4I:~$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES
08231a2a77d9   dockersamples/static-site           "/bin/sh -c 'cd /usr..." 8 minutes ago  Up 8 minutes  80/
tcp, 443/tcp   hopeful_elbakyan
hafelago@DESKTOP-208TC4I:~$ docker stop 08231a2a77d9

^[[A^[[B08231a2a77d9
hafelago@DESKTOP-208TC4I:~$
hafelago@DESKTOP-208TC4I:~$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES
hafelago@DESKTOP-208TC4I:~$ docker rm 08231a2a77d9
08231a2a77d9
hafelago@DESKTOP-208TC4I:~$

```

Containers [Give feedback](#)



Your running containers show up here

A container is an isolated environment for your code



What is a container?

5 mins

```
1 FROM node
2 RUN mkdir -p
3 WORKDIR /app
4 COPY packa
```

How do I run a container?

6 mins

[View more in the Learning center](#)

```
hafeLago@DESKTOP-208TC4I:~$ docker ps
CONTAINER ID   IMAGE                  COMMAND                  CREATED        STATUS
PORTS         NAMES
463d6ad9d940   dockersamples/static-site  "/bin/sh -c 'cd /usr..." About a minute ago Up About a minute
0.0.0.0:32771->80/tcp, 0.0.0.0:32770->443/tcp static-site
hafeLago@DESKTOP-208TC4I:~$ docker run --name static-site -e AUTHOR="HAROLD" -d -P dockersamples/static-site
3527657d328f8fcd4fcab66da958a2edc0a277d4676d075a12ece9d0042bf242
hafeLago@DESKTOP-208TC4I:~$
```

```
hafeLago@DESKTOP-208TC4I:~$ docker port static-site
80/tcp -> 0.0.0.0:32773
443/tcp -> 0.0.0.0:32772
hafeLago@DESKTOP-208TC4I:~$
```

Hello HAROLD!

This is being served from a **docker** container running Nginx.

```
443/tcp -> 0.0.0.0:32772
hafelago@DESKTOP-208TC4I:~$ docker stop static-site
static-site
hafelago@DESKTOP-208TC4I:~$ docker rm static-site
static-site
hafelago@DESKTOP-208TC4I:~$ docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS          NAMES
hafelago@DESKTOP-208TC4I:~$
```

2.2 Docker Images

```
hafelago@DESKTOP-208TC4I:~$ docker images
REPOSITORY          TAG         IMAGE ID      CREATED        SIZE
alpine               latest      05455a08881e  3 months ago  7.38MB
hello-world          latest      d2c94e258dcb  12 months ago 13.3kB
dockersamples/static-site latest      f589ccde7957  8 years ago   191MB
hafelago@DESKTOP-208TC4I:~$ |
```

docker pull ubuntu:12.04


```

hafelago@DESKTOP-208TC4I:~$ docker pull ubuntu:12.04
12.04: Pulling from library/ubuntu
d8868e50ac4c: Pull complete
83251ac64627: Pull complete
589bba2f1b36: Pull complete
d62ecaceda39: Pull complete
6d93b41cfc6b: Pull complete
Digest: sha256:18305429afa14ea462f810146ba44d4363ae76e4c8dfc38288cf73aa07485005
Status: Downloaded newer image for ubuntu:12.04
docker.io/library/ubuntu:12.04

```

```

hafelago@DESKTOP-208TC4I:~$ docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
49b384cc7b4a: Pull complete
Digest: sha256:3f85b7caad41a95462cf5b787d8a04604c8262cdcdf9a472b8c52ef83375fe15
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest

```

What's Next?

View a summary of image vulnerabilities and recommendations → [docker scout quickview ubuntu](#)

```

hafelago@DESKTOP-208TC4I:~$ docker images
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
ubuntu              latest     bf3dc08bfed0  11 days ago  76.2MB
alpine              latest     05455a08881e  3 months ago  7.38MB
hello-world         latest     d2c94e258dcb  12 months ago 13.3kB
ubuntu              12.04     5b117edd0b76  7 years ago  104MB
dockersamples/static-site latest     f589ccde7957  8 years ago  191MB
hafelago@DESKTOP-208TC4I:~$

```

2.3.1

```

FLASK-APP [WSL: UBUNTU]
├── templates
│   └── index.html
├── app.py
├── Dockerfile
└── requirements.txt

```

```

1 from flask import Flask, render_template
2 import random
3
4 app = Flask(__name__)
5
6 # list of cat images
7 images = [
8     "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr05/15/9/anigif_enhanced-buzz-26388-1381844103-11.gif",
9     "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr01/15/9/anigif_enhanced-buzz-31540-1381844535-8.gif",
10    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr05/15/9/anigif_enhanced-buzz-26390-1381844163-18.gif",
11    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr06/15/10/anigif_enhanced-buzz-1376-1381846217-0.gif",
12    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr03/15/9/anigif_enhanced-buzz-3391-1381844336-26.gif",
13    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr06/15/10/anigif_enhanced-buzz-29111-1381845968-0.gif",
14    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr03/15/9/anigif_enhanced-buzz-3409-1381844582-13.gif",
15    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr02/15/9/anigif_enhanced-buzz-19667-1381844937-10.gif",
16    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr05/15/9/anigif_enhanced-buzz-26358-1381845843-13.gif",
17    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr06/15/9/anigif_enhanced-buzz-18774-1381844645-6.gif",
18    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr06/15/9/anigif_enhanced-buzz-25158-1381844793-0.gif",
19    "http://img.buzzfeed.com/buzzfeed-static/static/2013-10/enhanced/webdr03/15/10/anigif_enhanced-buzz-11980-1381846269-1.gif"
20 ]
21
22 @app.route('/')
23 def index():
24     url = random.choice(images)
25     return render_template('index.html', url=url)
26
27 if __name__ == "__main__":
28     app.run(host="0.0.0.0")

```

```

hafelago@DESKTOP-208TC4I:~/flask-app$ ls
Dockerfile  app.py  requirements.txt  templates
hafelago@DESKTOP-208TC4I:~/flask-app$

```

2.3.2 write a dockerfile

```
EXPLORER
FLASK-APP [WSL: UBUNTU]
  templates
  index.html
  app.py
  Dockerfile
  requirements.txt
Dockerfile > ...
1
2 FROM alpine:3.5
3
4 # Install python and pip
5 RUN apk add --update py2-pip
6
7 # install Python modules needed by the Python app
8 COPY requirements.txt /usr/src/app/
9 RUN pip install --no-cache-dir -r /usr/src/app/requirements.txt
10
11 # copy files required for the app to run
12 COPY app.py /usr/src/app/
13 COPY templates/index.html /usr/src/app/templates/
14
15 # tell the port number the container should expose
16 EXPOSE 5000
17
18 # run the application
19 CMD ["python", "/usr/src/app/app.py"]
20
```

2.3.3 Build the image

```
hafelago@DESKTOP-208TC4I:~/Flask-app$ docker build -t hafelago .
[*] Building 7.4s (12/12) FINISHED
[+] Building 7.4s (12/12) FINISHED
=> [internal] load build definition from Dockerfile
=> [internal] load build definition from Dockerfile: 727B
=> [internal] load metadata for docker.io/library/alpine:latest
=> [internal] load .dockerignore
=> [internal] load build context
=> transferring context: 2B
=> [1/7] FROM docker.io/library/alpine:latest
=> [internal] load build context
=> transferring context: 857B
=> CACHED [2/7] RUN apk add --update python3 py3-pip && rm -rf /var/cache/apk/*
=> [3/7] RUN python3 -m venv /usr/src/app/venv
=> [4/7] RUN /usr/src/app/venv/bin/activate
=> [5/7] COPY requirements.txt /usr/src/app/
=> [6/7] RUN /usr/src/app/venv/bin/pip install --no-cache-dir -r /usr/src/app/requirements.txt
=> [7/7] COPY . /usr/src/app/
=> exporting to image
=> exporting layers
=> writing image sha256:6ca0a308a571ee53decdf30b5d2b0804efdb4f5806b35a39d130bcb012b57e
=> naming to docker.io/library/hafelago
What's Next?
View a summary of image vulnerabilities and recommendations + docker scout quickview
hafelago@DESKTOP-208TC4I:~/Flask-app$
```

```
hafelago@DESKTOP-208TC4I:~$ docker run -p 5000:5000 hafelago
* Serving Flask app 'app'
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5000
* Running on http://172.17.0.2:5000
Press CTRL+C to quit
172.17.0.1 - - [11/May/2024 01:42:52] "GET / HTTP/1.1" 200 -
172.17.0.1 - - [11/May/2024 01:42:53] "GET /favicon.ico HTTP/1.1" 404 -
```

CAT GIF OF THE DAY

This image is no longer available.

Courtesy: [Buzzfeed](#)

Push the image

```
hafelago@DESKTOP-208TC4I:~/flask-app$ docker tag hafelago hafelago/flask-app:latest
hafelago@DESKTOP-208TC4I:~/flask-app$ docker push hafelago/flask-app:latest
The push refers to repository [docker.io/hafelago/flask-app]
106b903ee992: Pushed
9e4d3b700542: Pushed
f3612fe1c909: Pushed
702634fcd87e: Pushed
abbe2f6b6712: Pushed
aa9d6dba5958: Pushed
d4fc045c9e3a: Mounted from library/alpine
latest: digest: sha256:73d830afaeead86fce7334b0e62704a71a248daa776df2a4fa464088f4b97224 size: 1783
hafelago@DESKTOP-208TC4I:~/flask-app$
```

The screenshot shows the Docker Hub search results for the user 'hafelago'. The top navigation bar includes 'dockerhub', 'Explore', 'Repositories', 'Organizations', a search bar, and user controls. Below the navigation bar, there's a search filter for 'hafelago' and a 'Create repository' button. A search result for 'hafelago / flask-app' is displayed, showing it contains an image, was last pushed 3 minutes ago, has 0 stars, 1 pull, and is public. To the right, there's a 'Create An Organization' card with a diagram of three nodes and text explaining that organizations are used to create and manage users and grant access to repositories.

The screenshot shows the Docker Hub repository page for 'hafelago/flask-app'. The top navigation bar is the same as the previous screenshot. Below it, the breadcrumb 'Explore / hafelago/flask-app' is visible. The repository card shows a cube icon, the name 'hafelago/flask-app' with 0 stars, and a 'Manage Repository' button. It also indicates it was updated 7 minutes ago and has 1 pull. Below the repository card, there are two tabs: 'Overview' and 'Tags'. The 'Overview' tab is active, showing a message 'No overview available' with a hamburger menu icon. To the right, there's a 'Docker Pull Command' section with the command 'docker pull hafelago/flask-app' and a 'Copy' button.

3.0 Deploying an app to a Swarm

```
hafelago@DESKTOP-208TC4I:~$ git clone https://github.com/docker/example-voting-app.git
cd example-voting-app
Cloning into 'example-voting-app'...
remote: Enumerating objects: 1140, done.
remote: Counting objects: 100% (8/8), done.
remote: Compressing objects: 100% (8/8), done.
remote: Total 1140 (delta 1), reused 3 (delta 0), pack-reused 1132
Receiving objects: 100% (1140/1140), 1.21 MiB | 4.38 MiB/s, done.
Resolving deltas: 100% (435/435), done.
hafelago@DESKTOP-208TC4I:~/example-voting-app$
```

```
hafelago@DESKTOP-208TC4I:~/example-voting-app$ docker swarm init
Swarm initialized: current node (jylrnoljch3qc2ifocua9nls) is now a manager.

To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-2bcbmv0np0kobnrf5vfsk46vgqrwaiqgp2l8jvbf43xphvmmyo-aptpf45b5jc9b63n34ba0qukh 192.168.65.3:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.

hafelago@DESKTOP-208TC4I:~/example-voting-app$
```

```
hafelago@DESKTOP-208TC4I:~/example-voting-app$ docker swarm init
Swarm initialized: current node (jylrnoljch3qc2ifocua9nls) is now a manager.

To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-2bcbmv0np0kobnrf5vfsk46vgqrwaiqgp2l8jvbf43xphvmmyo-aptpf45b5jc9b63n34ba0qukh 192.168.65.3:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.

hafelago@DESKTOP-208TC4I:~/example-voting-app$ docker stack deploy --compose-file docker-stack.yml vote
Since --detach=false was not specified, tasks will be created in the background.
In a future release, --detach=false will become the default.
Creating network vote_frontend
Creating network vote_backend
Creating service vote_worker
Creating service vote_redis
Creating service vote_db
Creating service vote_vote
Creating service vote_result
```

```
EXPLORER
Welcome
docker-stack.yml
1 version: "3"
2 services:
3
4   redis:
5     image: redis:alpine
6     ports:
7       - "6379"
8     networks:
9       - frontend
10    deploy:
11      replicas: 2
12      update_config:
13        parallelism: 2
14      delay: 10s
15      restart_policy:
16        condition: on-failure
17  db:
18    image: postgres:9.4
19    volumes:
20      - db-data:/var/lib/postgresql/data
21    networks:
22      - backend
23    deploy:
24      placement:
25        constraints: [node.role == manager]
26  vote:
27    image: dockersamples/examplevotingapp_vote:before
28    ports:
29      - 5000:80
30    networks:
31      - frontend
32    depends_on:
33      - redis
34    deploy:
35      replicas: 2
36      update_config:
37        parallelism: 2
38      restart_policy:
39        condition: on-failure
40  result:
41    image: dockersamples/examplevotingapp_result:before
42    ports:
43      - 5001:80
44    networks:
45      - backend
46    depends_on:
47      - db
48    deploy:
```

Verify

```
hafelago@DESKTOP-208TC4I:~/example-voting-app$ docker stack deploy --compose-file docker-stack.yml vote
Since --detach=false was not specified, tasks will be created in the background.
In a future release, --detach=false will become the default.
Creating network vote_frontend
Creating network vote_backend
Creating service vote_worker
Creating service vote_redis
Creating service vote_db
Creating service vote_vote
Creating service vote_result
hafelago@DESKTOP-208TC4I:~/example-voting-app$ docker stack services vote
ID                NAME      MODE      REPLICAS  IMAGE                                  PORTS
mf77txonlifv6     vote_db   replicated 1/1        postgres:15-alpine
e4wadwlz0x9r      vote_redis replicated 1/1        redis:alpine
flyp19y97z6l      vote_result replicated 1/1        dockersamples/examplevotingapp_result:latest  *:5001->80/tcp
xeex7dns81xu      vote_vote  replicated 2/2        dockersamples/examplevotingapp_vote:latest    *:5000->80/tcp
p3x7l8y24r2y      vote_worker replicated 2/2        dockersamples/examplevotingapp_worker:latest
```

Localhost:5000

Cats vs Dogs!

CATS

DOGS

(Tip: you can change your vote)

Processed by container ID
a80313c0e6bb

CATS
0.0%

DOGS
100.0%

1 vote

```
hanelago@DESKTOP-208TC4I:~/example-voting-app$ docker stack deploy --compose-file docker-stack.yml vote
Since --detach=false was not specified, tasks will be created in the background.
In a future release, --detach=false will become the default.
Updating service vote_redis (id: e4wadw1z0x9r6ohsp4725eozh)
Updating service vote_db (id: mf7txonlifv66w2fkxlbwbkxpx)
Updating service vote_vote (id: xeex7dns81xuanrbjps0cbhh0)
Updating service vote_result (id: flyp19y97z6lk2zv14tczlea2)
Updating service vote_worker (id: p3x7l8y24r2yv35vip1jlhfgs)
hanelago@DESKTOP-208TC4I:~/example-voting-app$
```

Cats vs Dogs!

CATS



DOGS

(Tip: you can change your vote)

CATS
100.0%

DOGS
0.0%


```
hafelago@DESKTOP-208TC4I:~/example-voting-app$ docker stack rm vote
Removing service vote_db
Removing service vote_redis
Removing service vote_result
Removing service vote_vote
Removing service vote_worker
Removing network vote_backend
Removing network vote_frontend
hafelago@DESKTOP-208TC4I:~/example-voting-app$
```