

## THỰC HÀNH THAO TÁC DOCKER CƠ BẢN

1. Kiểm tra xem hệ thống Docker Engine vận hành thành công với ví dụ mẫu Hello World container

```
osboxes@osboxes:~$ sudo docker container run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
c1ec31eb5944: Already exists
Digest: sha256:4bd78111b6914a99dbc560e6a20eab57ff6655aea4a80c50b0c5491968cbc2e6
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/
```

2. Thao tác với container Alpine (lightweight Linux distribution , khoảng 5MB). Trước tiên ta sẽ tải image của Alpine trên Docker Registry về (ở đây là Docker Hub Cloud)

```
osboxes@osboxes:~$ sudo docker image pull alpine
Using default tag: latest
latest: Pulling from library/alpine
661ff4d9561e: Already exists
Digest: sha256:51b67269f354137895d43f3b3d810bfacd3945438e94dc5ac55fdac340352f48
Status: Downloaded newer image for alpine:latest
docker.io/library/alpine:latest
```

3. Kiểm tra tất cả các image trong hệ thống Docker hiện tại trên máy đang có

```
osboxes@osboxes:~$ sudo docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
alpine	latest	f8c20f8bbcb6	6 weeks ago	7.38MB
hello-world	latest	d2c94e258dcb	8 months ago	13.3kB

4. Khởi chạy và xem cấu trúc bên trong của container Alpine

```
osboxes@osboxes:~$ sudo docker container run alpine ls -l
total 56
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 bin
drwxr-xr-x  5 root    root    340 Jan 21 06:06 dev
drwxr-xr-x  1 root    root    4096 Jan 21 06:06 etc
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 home
drwxr-xr-x  7 root    root    4096 Dec  7 09:43 lib
drwxr-xr-x  5 root    root    4096 Dec  7 09:43 media
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 mnt
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 opt
dr-xr-xr-x 179 root    root      0 Jan 21 06:06 proc
drwx----- 2 root    root    4096 Dec  7 09:43 root
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 run
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 sbin
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 srv
dr-xr-xr-x 13 root    root      0 Jan 21 06:06 sys
drwxrwxrwt  2 root    root    4096 Dec  7 09:43 tmp
drwxr-xr-x  7 root    root    4096 Dec  7 09:43 usr
drwxr-xr-x 12 root    root    4096 Dec  7 09:43 var
```

##### 5. Thâm nhập vào lõi của container Alpine

```
osboxes@osboxes:~$ sudo docker run -it alpine
/ #
```

Dùng lệnh Linux Shell để tương tác lõi container, ví dụ: lệnh `ls -l` để liệt kê các thư mục bên trong container

```
/ # ls -l
total 56
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 bin
drwxr-xr-x  5 root    root    360 Jan 21 06:09 dev
drwxr-xr-x  1 root    root    4096 Jan 21 06:09 etc
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 home
drwxr-xr-x  7 root    root    4096 Dec  7 09:43 lib
drwxr-xr-x  5 root    root    4096 Dec  7 09:43 media
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 mnt
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 opt
dr-xr-xr-x 175 root    root      0 Jan 21 06:09 proc
drwx----- 1 root    root    4096 Jan 21 06:10 root
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 run
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 sbin
drwxr-xr-x  2 root    root    4096 Dec  7 09:43 srv
dr-xr-xr-x 13 root    root      0 Jan 21 06:09 sys
drwxrwxrwt  2 root    root    4096 Dec  7 09:43 tmp
drwxr-xr-x  7 root    root    4096 Dec  7 09:43 usr
drwxr-xr-x 12 root    root    4096 Dec  7 09:43 var
```

Dùng lệnh `exit` để thoát khỏi bash của lõi container

```
/ # exit
osboxes@osboxes:~$
```

##### 6. Đưa container vào chạy tiến trình ngầm (background hay detached mode)

```
osboxes@osboxes:~$ sudo docker run -d -it alpine
1c4d36e2eb09df6f7ac78155b34a23887de8c60e8f00aa636cb5a4d3c5402104
```

## 7. Xem các container đang chạy

```
osboxes@osboxes:~$ sudo docker container ls
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
1c4d36e2eb09	alpine	"/bin/sh"	About a minute ago	Up About a minute		mystifying_cori

## 8. Truy cập container

```
osboxes@osboxes:~$ sudo docker attach 1c4d36e2eb09
/ # exit
```

## 9. Dừng container đang chạy

```
osboxes@osboxes:~$ sudo docker stop 1c4d36e2eb09
1c4d36e2eb09
```

## 10. Xem danh sách các container đang chạy

```
osboxes@osboxes:~$ sudo docker container ls
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
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## 11. Xóa container

```
osboxes@osboxes:~$ sudo docker rm 1c4d36e2eb09
1c4d36e2eb09
```

## 12. Xem danh sách các container hiện có

```
osboxes@osboxes:~$ sudo docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
543d7a807cac	alpine	"/bin/sh"	10 minutes ago	Exited (0) 8 minutes ago		hardcore_mayer
6a8f6963d02c	alpine	"ls -l"	14 minutes ago	Exited (0) 13 minutes ago		serene_moser
3fa807ef3455	hello-world	"/hello"	25 minutes ago	Exited (0) 25 minutes ago		nice_goldwasser
ea361a7cca0c	829438d0a175	"python3 /usr/src/ap..."	3 hours ago	Exited (137) 3 hours ago		gracious_hermann
2aa5bde3b424	829438d0a175	"python3 /usr/src/ap..."	3 hours ago	Exited (0) 3 hours ago		naughty_maxwell
b3f56c581759	829438d0a175	"python3 /usr/src/ap..."	13 hours ago	Exited (0) 13 hours ago		quirky_aryabhata
4f4206b73c24	829438d0a175	"python3 /usr/src/ap..."	13 hours ago	Exited (0) 13 hours ago		serene_haslett
a257d9b58e92	d5daa9511508	"python3 /usr/src/ap..."	14 hours ago	Exited (1) 14 hours ago		interesting_lamport
0e02531e554e	5bbce1ac50ba	"python3 /usr/src/ap..."	14 hours ago	Exited (1) 14 hours ago		competent_chatelet
4efb3f3efff3	alpine	"/bin/sh"	3 days ago	Exited (0) 3 days ago		musing_wing
9beb0643970e	alpine	"/bin/sh"	3 days ago	Exited (0) 3 days ago		agitated_newton
c068aaf59b6e	alpine	"/bin/sh"	3 days ago	Exited (0) 3 days ago		elegant_lichterman
77c4f510b21a	alpine	"ls -l"	3 days ago	Exited (0) 3 days ago		nifty_kilby
bc460aca2da4	hello-world	"/hello"	3 days ago	Exited (0) 3 days ago		friendly_cerf

## 13. Xem danh sách các images

```
osboxes@osboxes:~$ sudo docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
alpine	latest	f8c20f8bbcb6	6 weeks ago	7.38MB
hello-world	latest	d2c94e258dcb	8 months ago	13.3kB

## 14. Xóa image

```
osboxes@osboxes:~$ sudo docker image rm -f f8c20f8bbcb6
Untagged: alpine:latest
Untagged: alpine@sha256:51b67269f354137895d43f3b3d810bfacd3945438e94dc5ac55fdac340352f48
Deleted: sha256:f8c20f8bbcb684055b4fea470fdd169c86e87786940b3262335b12ec3adef418

osboxes@osboxes:~$ sudo docker image rm -f d2c94e258dcb
Untagged: hello-world:latest
Untagged: hello-world@sha256:4bd78111b6914a99dbc560e6a20eab57ff6655aea4a80c50b0c5491968cbc2e6
Deleted: sha256:d2c94e258dcb3c5ac2798d32e1249e42ef01cba4841c2234249495f87264ac5a
```

## 15. Xem lại danh sách các image

## PHỤ LỤC CÁC COMMAND CẦN THIẾT TRONG DOCKER

### System

```
$ docker <COMMAND> --help # shows complete information about a command
$ docker version           # shows Docker's version and other minor details
$ docker info              # shows complete Docker information
$ docker system prune      # clears space by deleting unused components
```

### Image interaction

```
$ docker image pull <IMAGE>. # downloads an image to the local cache
$ docker build -t <TAG> .    # builds an image from a Dockerfile located in the current folder

$ docker image ls            # lists the images in the local cache
$ docker images              # lists the images in the local cache

$ docker image rm <IMAGE>    # deletes an image from the local cache
$ docker rmi <IMAGE>         # deletes an image from the local cache

$ docker image inspect <IMAGE> # shows information about an image
```

### Container interaction

```
$ docker container run <IMAGE> [COMMAND] # runs a container and optionally sends it a starting command
$ docker container run -it <IMAGE>        # runs a container in interactive mode
$ docker container run -d <IMAGE>         # runs a container in the background (as a daemon)

$ docker exec -it <IMAGE> <COMMAND>      # starts a terminal in a running container and executes a command

$ docker container ls          # lists all running containers
$ docker container ls -a       # lists all containers that were run or are running
$ docker container inspect <ID> # shows information about a container

$ docker attach <ID>          # attaches to a container
$ docker stop <ID>             # stops a container
$ docker restart <ID>          # restarts a container
$ docker rm <ID>               # deletes a container

$ docker ps                    # lists running containers
$ docker logs <ID>             # shows logs from a container
$ docker top <ID>              # shows the processes running in a container
```