Docker 安装运行实验

按照网上资料安装好 Docker 后，检查 Docker 安装：

```
fisco-bcos@fiscobcos-VirtualBox:~$ docker version
Client: Docker Engine - Community
 Version:           19.03.5
 API version:       1.40
 Go version:        go1.12.12
 Git commit:        633a0ea838
 Built:             Wed Nov 13 07:29:52 2019
 OS/Arch:           linux/amd64
 Experimental:      false

Server: Docker Engine - Community
 Engine:
  Version:          19.03.5
  API version:      1.40 (minimum version 1.12)
  Go version:       go1.12.12
  Git commit:       633a0ea838
  Built:            Wed Nov 13 07:28:22 2019
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.2.10
  GitCommit:        b34a5c8af56e510852c35414db4c1f4fa6172339
 runc:
  Version:          1.0.0-rc8+dev
  GitCommit:        3e425f80a8c931f88e6d94a8c831b9d5aa481657
 docker-init:
  Version:          0.18.0
  GitCommit:        fec3683
```

运行镜像：

```
fisco-bcos@fiscobcos-VirtualBox:~$ docker run hello-world


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/
```

拉取 MySQL 镜像:

```
fisco-bcos@fiscobcos-VirtualBox:~$ docker pull mysql:5.7
5.7: Pulling from library/mysql
d599a449871e: Pull complete
f287049d3170: Pull complete
08947732a1b0: Pull complete
96f3056887f2: Pull complete
871f7f65f017: Pull complete
1dd50c4b99cb: Pull complete
5bcbdf508448: Pull complete
02a97db830bd: Pull complete
c09912a99bce: Pull complete
08a981fc6a89: Pull complete
818a84239152: Pull complete
Digest: sha256:5779c71a4730da36f013a23a437b5831198e68e634575f487d37a0639470e3a8
Status: Downloaded newer image for mysql:5.7
docker.io/library/mysql:5.7
fisco-bcos@fiscobcos-VirtualBox:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
hello               latest              3224af6bbd19        24 hours ago        64.2MB
mysql               5.7                 1e4405fe1ea9        3 weeks ago         437MB
ubuntu              latest              775349758637        6 weeks ago         64.2MB
hello-world         latest              fce289e99eb9        11 months ago       1.84kB
```

构建 docker 镜像练习:

录入内容+构造镜像:

```
fisco-bcos@fiscobcos-VirtualBox:~/mydock$ vi dockerfile
fisco-bcos@fiscobcos-VirtualBox:~/mydock$ docker build . -t hello
Sending build context to Docker daemon   32.26kB
Step 1/3 : FROM ubuntu
 ---> 775349758637
Step 2/3 : ENTRYPOINT ["top", "-b"]
 ---> Running in a559c1ada3ce
Removing intermediate container a559c1ada3ce
 ---> 5625bd198694
Step 3/3 : CMD ["-c"]
 ---> Running in 585c7ed6ce00
Removing intermediate container 585c7ed6ce00
 ---> 3224af6bbd19
Successfully built 3224af6bbd19
Successfully tagged hello:latest
```

运行镜像:

```
fisco-bcos@fiscobcos-VirtualBox:~/mydock$ docker run -it --rm hello -H
top - 09:38:46 up 39 min,  0 users,  load average: 0.01, 0.08, 0.16
Threads:   1 total,   1 running,   0 sleeping,   0 stopped,   0 zombie
%Cpu(s):  2.3 us,  2.3 sy,  0.1 ni, 90.5 id,  4.7 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem :  4012684 total,  1734756 free,  1262612 used,  1015316 buff/cache
KiB Swap:   969960 total,   969960 free,        0 used.  2505636 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM     TIME+ COMMAND
    1 root      20   0   36480   3100   2748 R  0.0  0.1   0:00.28 top

top - 09:38:49 up 39 min,  0 users,  load average: 0.01, 0.08, 0.16
Threads:   1 total,   1 running,   0 sleeping,   0 stopped,   0 zombie
%Cpu(s):  1.7 us,  1.0 sy,  0.0 ni, 97.3 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem :  4012684 total,  1734724 free,  1262656 used,  1015304 buff/cache
KiB Swap:   969960 total,   969960 free,        0 used.  2505584 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM     TIME+ COMMAND
    1 root      20   0   36480   3100   2748 R  0.0  0.1   0:00.28 top
```

可以看到，每隔数秒便会弹出 log 显示镜像的状态。

使用 MySQL 容器：

启动服务器：

```
fisco-bcos@fiscobcos-VirtualBox:~$ sudo docker run -p 3306:3306 --name mysql6 -e MYSQL_ROOT_PASSWORD=root -d mysql:5.7
98b62788af73df4e05cdf397efc08c8d7316826240331edf25a17d7a6a148252
fisco-bcos@fiscobcos-VirtualBox:~$ docker ps
CONTAINER ID        IMAGE          COMMAND              CREATED          STATUS          PORTS                              N
AMES
98b62788af73        mysql:5.7      "docker-entrypoint.s…"   46 seconds ago   Up 43 seconds   0.0.0.0:3306->3306/tcp, 33060/tcp   m
ysql6
```

数据库文件：

```
fisco-bcos@fiscobcos-VirtualBox:~$ docker exec -it mysql2 bash
root@88c7096b03be:/# ls /var/lib/mysql
auto.cnf    ca.pem            client-key.pem   ib_logfile0  ibdata1   mysql              private_key.pem  server-cert.pem  sys
ca-key.pem  client-cert.pem   ib_buffer_pool   ib_logfile1  ibtmp1    performance_schema  public_key.pem   server-key.pem
```

创建卷并挂载：

```
fisco-bcos@fiscobcos-VirtualBox:~$ docker rm $(docker ps -a -q) -f -v
98b62788af73
09d62423e636
597ed6088a9f
3581de131398
245d5ea031de
9c34c6c54b20
0a4303e14117
25e2c84456ce
a4ccec70c41b
41ad8e01785f
fisco-bcos@fiscobcos-VirtualBox:~$ docker volume create mydb
mydb
fisco-bcos@fiscobcos-VirtualBox:~$ docker run --name mysql2 -e MYSQL_ROOT_PASSWORD=root -v mydb:/var/lib/mysql -d mysql:5.7
88c7096b03beedfb9a5bfdaf9f389a47cdba53947c2d06355f45562a88df4498
```

启动客户端容器连接服务器：

```
fisco-bcos@fiscobcos-VirtualBox:~$ docker run --name myclient --link mysql2:mysql -it mysql:5.7 bash
root@adc2a89beed0:/# env
MYSQL_ENV_MYSQL_ROOT_PASSWORD=root
MYSQL_PORT_3306_TCP_PROTO=tcp
HOSTNAME=adc2a89beed0
MYSQL_PORT_33060_TCP_PORT=33060
MYSQL_NAME=/myclient/mysql
MYSQL_ENV_MYSQL_MAJOR=5.7
MYSQL_PORT=tcp://172.17.0.2:3306
MYSQL_PORT_3306_TCP=tcp://172.17.0.2:3306
PWD=/
MYSQL_ENV_MYSQL_VERSION=5.7.28-1debian9
HOME=/root
MYSQL_MAJOR=5.7
GOSU_VERSION=1.7
MYSQL_PORT_3306_TCP_PORT=3306
MYSQL_PORT_3306_TCP_ADDR=172.17.0.2
MYSQL_PORT_33060_TCP_ADDR=172.17.0.2
MYSQL_VERSION=5.7.28-1debian9
TERM=xterm
MYSQL_PORT_33060_TCP_PROTO=tcp
SHLVL=1
MYSQL_PORT_33060_TCP=tcp://172.17.0.2:33060
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
MYSQL_ENV_GOSU_VERSION=1.7
_=/usr/bin/env
root@adc2a89beed0:/# mysql -hmysql -P3306 -uroot -proot
```

```
root@adc2a89beed0:/# mysql -hmysql -P3306 -uroot -proot
mysql: [Warning] Using a password on the command line interface can be insecure.
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 2
Server version: 5.7.28 MySQL Community Server (GPL)

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```