File server commands explanation

File server

1. Create file_server_server_DockerFile with following content. This file is used to build file server image.

```dockerfile
# declare base image
FROM python:3.8

ENV WORK_DIR=/home/server
# set work directory
RUN mkdir -p $WORK_DIR
# where server code lives
WORKDIR $WORK_DIR

# set environment variables
ENV PYTHONDONTWRITEBYTECODE 1
ENV PYTHONUNBUFFERED 1

# copy server project code
COPY server $WORK_DIR/
COPY server.py $WORK_DIR

# expose the port
EXPOSE 65432

# go to work directory and start the server.py
RUN cd $WORK_DIR
CMD ["python", "server.py"]
```

2. Build server image using `file_server_server_DockerFile`

```
docker build -t server -f file_server_server_DockerFile .
```

3. Run server container

```
docker run -d -p 65432:65432 server
```

File Client

1. Create file_server_client_DockerFile with following content. This file is used to build file client image.

```dockerfile
FROM python:3.8

ENV WORK_DIR=/home/client
# set work directory
RUN mkdir -p $WORK_DIR
# where client code lives
WORKDIR $WORK_DIR

# set environment variables
ENV PYTHONDONTWRITEBYTECODE 1
ENV PYTHONUNBUFFERED 1

# copy client project
COPY client.py $WORK_DIR

EXPOSE 65432

# go to work directory and start the client.py
RUN cd $WORK_DIR
CMD ["python", "client.py"]
```

2. Build client image

```
docker build -t client -f file_server_client_DockerFile .
```

3. Run client container in interative mode, open 3 terminal windows to create 3 client containers

```
docker run -i --net=host client
docker run -i --net=host client
docker run -i --net=host client
```

4. Client successfully connects to Server

- Server log

```
[(py37) ryanren@~/github.com/yan-ren/comp6231-distributed-systems-design/a3/Tasks [main]$ docker run -p 65432:65432 server

server started, waiting for client request...
Connection from :  ('172.17.0.1', 63544)
```

- Client log

```
[ryanren@~/github.com/yan-ren/comp6231-distributed-systems-design/a3/Tasks [main]$ docker run -i --net=host client
Connected to server at IP: 127.0.0.1 and Port: 65432
Handshake Done. EOF is: bytearray(b'<r/MAnjv9>')
Current Directory: /home/server:
|
--
-- server.py
-- jellyfish.jpg
-- user-guide-nokia-1-4-user-guide.pdf
-- taco_bell.mp3
-- about.txt
-- orca.jpg
$>
```

5. List all containers and ip

```
[ryanren@~/github.com/yan-ren/comp6231-distributed-systems-design/a3/Tasks [main]$ docker ps                                                                    ]
CONTAINER ID   IMAGE    COMMAND              CREATED        STATUS         PORTS                      NAMES
dd465db0067f   client   "python client.py"   8 minutes ago  Up 8 minutes                              stoic_mestorf
75663a3ec00a   client   "python client.py"   8 minutes ago  Up 8 minutes                              sharp_gould
0a41ebd0e63d   client   "python client.py"   9 minutes ago  Up 9 minutes                              upbeat_ritchie
4e03823ab6d8   server   "python server.py"   14 minutes ago Up 14 minutes  0.0.0.0:65432->65432/tcp  eager_wu
ryanren@~/github.com/yan-ren/comp6231-distributed-systems-design/a3/Tasks [main]$ docker inspect --format='{{.Name}} - {{range .NetworkSettings.Networks}}{{.IPAddress}}{{end}
}' $(docker ps -aq)

/stoic_mestorf -
/sharp_gould -
/upbeat_ritchie -
/eager_wu - 172.17.0.2
```