

Docker Lab2

1. Problem 1:

Create bridge network with subnet 192.168.0.0/24.

```
root@localhost:~  
File Edit View Search Terminal Tabs Help  
maly@localhost:~/docker-labs/lab1/simp... x root@localhost:~ x  
[root@localhost ~]# docker network ls  
NETWORK ID          NAME                DRIVER              SCOPE  
3f6523e9bcc6         bridge             bridge              local  
9c824f6d6ee5         host              host                local  
22e9d82c0a3b         none              null                local  
[root@localhost ~]# docker network create NW1 --driver=bridge --subnet=192.168.0.0/24  
2ba37918b6579b5dc42730d5212b0c20a55990bd11a8b59f77ae2ad2693a61d1  
[root@localhost ~]# docker network create NW2 --driver=bridge --subnet=10.5.0.0/24  
02ce05b049025a802a5e4cd64c4592dfd1a51d2c11e59fa73c19c2f70e2be06a  
[root@localhost ~]# docker network ls  
NETWORK ID          NAME                DRIVER              SCOPE  
2ba37918b657         NW1                bridge              local  
02ce05b04902         NW2                bridge              local  
3f6523e9bcc6         bridge             bridge              local  
9c824f6d6ee5         host              host                local  
22e9d82c0a3b         none              null                local  
[root@localhost ~]#
```

Run 2 containers and attach containers to this network.

```
root@localhost:~  
File Edit View Search Terminal Tabs Help  
maly@localhost:~/docke... x root@localhost:~ x root@localhost:~ x  
[root@localhost ~]# docker run -d --network=NW1 nginx  
Unable to find image 'nginx:latest' locally  
latest: Pulling from library/nginx  
025c56f98b67: Pull complete  
ca9c7f45d396: Pull complete  
ed6bd111fc08: Pull complete  
e25b13a5f70d: Pull complete  
9bbabac55ab6: Pull complete  
e5c9ba265ded: Pull complete  
Digest: sha256:ab589a3c466e347b1c0573be23356676df90cd7ce2dbf6ec332a5f0a8b5e59db  
Status: Downloaded newer image for nginx:latest  
f7934aad756210934ded28f7ce01892c7823054d5db8e1d00e6865a90a2f58fc  
[root@localhost ~]# docker run -d --network=NW1 nginx  
4745caf21fb25854d156582421fbb8f3112a762a281c7395b7c102ed9e35f090  
[root@localhost ~]# docker ps  
CONTAINER ID        IMAGE               COMMAND              CREATED            STATUS  
PORTS  
4745caf21fb2        nginx              "/docker-entrypoint..." 9 seconds ago      Up 6 seconds  
80/tcp             pensive_meninsky  
f7934aad7562        nginx              "/docker-entrypoint..." About a minute ago  Up About a minut  
e 80/tcp             pedantic_wilson  
[root@localhost ~]# docker inspect 4745caf21fb2 | grep NW1  
    "NetworkMode": "NW1",  
    "NW1": {  
[root@localhost ~]# docker inspect f7934aad7562 | grep NW1  
    "NetworkMode": "NW1"
```

Create another bridge network with subnet 10.5.0.0/24.

```
root@localhost:~  
File Edit View Search Terminal Tabs Help  
maly@localhost:~/docker-labs/lab1/simp... x root@localhost:~ x  
[root@localhost ~]# docker network ls  
NETWORK ID      NAME      DRIVER      SCOPE  
3f6523e9bcc6    bridge   bridge      local  
9c824f6d6ee5    host     host        local  
22e9d82c0a3b    none     null        local  
[root@localhost ~]# docker network create NW1 --driver=bridge --subnet=192.168.0.0/24  
2ba37918b6579b5dc42730d5212b0c20a55990bd11a8b59f77ae2ad2693a61d1  
[root@localhost ~]# docker network create NW2 --driver=bridge --subnet=10.5.0.0/24  
02ce05b049025a802a5e4cd64c4592dfd1a51d2c11e59fa73c19c2f70e2be06a  
[root@localhost ~]# docker network ls  
NETWORK ID      NAME      DRIVER      SCOPE  
2ba37918b657    NW1       bridge      local  
02ce05b04902    NW2       bridge      local  
3f6523e9bcc6    bridge   bridge      local  
9c824f6d6ee5    host     host        local  
22e9d82c0a3b    none     null        local  
[root@localhost ~]#
```

Run any container and attach it to the new network.

```
[root@localhost ~]# docker run -d --network=NW2 nginx  
03ecff3bdb3af184c1e427e7998d8af59b238fca8fa05e611c793daa76da99f0  
[root@localhost ~]# docker ps  
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS  
NAMES  
03ecff3bdb3a   nginx     "/docker-entrypoint..." 9 seconds ago  Up 7 seconds  80/tcp  
musing_lederberg  
4745caf21fb2   nginx     "/docker-entrypoint..." 6 minutes ago  Up 6 minutes  80/tcp  
pensive_meninsky  
f7934aad7562   nginx     "/docker-entrypoint..." 8 minutes ago  Up 8 minutes  80/tcp  
pedantic_wilson  
[root@localhost ~]# docker inspect 03ecff3bdb3a | grep NW2  
    "NetworkMode": "NW2",  
    "NW2": {
```

Make sure that the containers at different network can't ping each other

```
root@localhost:~  
File Edit View Search Terminal Tabs Help  
maly@localhost:~/docke... x root@localhost:~ x root@localhost:~  
ping: usage error: Destination address required  
root@4745caf21fb2:/# ping 10.5.0.2  
PING 10.5.0.2 (10.5.0.2) 56(84) bytes of data.  
^C  
--- 10.5.0.2 ping statistics ---  
433 packets transmitted, 0 received, 100% packet loss, time 434160ms  
  
root@4745caf21fb2:/# ping 192.168.0.2  
PING 192.168.0.2 (192.168.0.2) 56(84) bytes of data.  
64 bytes from 192.168.0.2: icmp_seq=1 ttl=64 time=0.178 ms  
64 bytes from 192.168.0.2: icmp_seq=2 ttl=64 time=0.213 ms  
64 bytes from 192.168.0.2: icmp_seq=3 ttl=64 time=0.210 ms  
64 bytes from 192.168.0.2: icmp_seq=4 ttl=64 time=0.212 ms  
64 bytes from 192.168.0.2: icmp_seq=5 ttl=64 time=0.372 ms  
^C  
--- 192.168.0.2 ping statistics ---  
5 packets transmitted, 5 received, 0% packet loss, time 3996ms  
rtt min/avg/max/mdev = 0.178/0.237/0.372/0.068 ms  
root@4745caf21fb2:/# ping 192.168.0.3  
PING 192.168.0.3 (192.168.0.3) 56(84) bytes of data.  
64 bytes from 192.168.0.3: icmp_seq=1 ttl=64 time=0.053 ms  
64 bytes from 192.168.0.3: icmp_seq=2 ttl=64 time=0.091 ms  
64 bytes from 192.168.0.3: icmp_seq=3 ttl=64 time=0.185 ms  
64 bytes from 192.168.0.3: icmp_seq=4 ttl=64 time=0.098 ms
```

2. Problem 2:

Create static html file

Write Dockerfile to build image based on httpd to host the html file and specify the following

Copy the html file.

Copy a new configuration file to listen on port 9999 instead of 80

Open the port 9999 in the container

Add environment variable CONTAINER with value docker.




Add startup command to echo the variable

```
Get Started | helloworld.html x
home > maly > docker-labs > lab2 > problem2 > helloworld.html > html > head
1  <!DOCTYPE html>
2  <html>
3  |   <head>
4  |   |   <title>Hello, World!</title>
5  |   </head>
6  |   <body>
7  |   |   <p>Hello, World!</p>
8  |   </body>
9  </html>
```

```
Get Started | Dockerfile x | helloworld.html
home > maly > docker-labs > lab2 > problem2 > Dockerfile > ...
1  FROM httpd
2  COPY ./helloworld.html /var/www/html/
3  COPY ./httpd.conf /etc/httpd/conf/httpd.conf
4  ENV CONTAINER=docker
5  EXPOSE 9999
6  CMD echo $CONTAINER && httpd -D FOREGROUND
7
```






```
[maly@localhost problem2]$ sudo docker build -t html-image .
[sudo] password for maly:
Sending build context to Docker daemon 15.87kB
Step 1/6 : FROM httpd
---> 157dcdf23d6c
Step 2/6 : COPY ./helloworld.html /var/www/html/
---> e0995cd3dddd
Step 3/6 : COPY ./httpd.conf /etc/httpd/conf/httpd.conf
---> c9e3ffc164bb
Step 4/6 : ENV CONTAINER=docker
---> Running in 24cf8aa850dc
Removing intermediate container 24cf8aa850dc
---> 052788a31e7e
Step 5/6 : EXPOSE 9999
---> Running in fe9able32c5c
Removing intermediate container fe9able32c5c
---> 4b1f4216a9bf
Step 6/6 : CMD echo $CONTAINER && httpd -D FOREGROUND
---> Running in 2cc3739aabdd
Removing intermediate container 2cc3739aabdd
---> 031ballab3c6
Successfully built 031ballab3c6
Successfully tagged html-image:latest
[maly@localhost problem2]$ sudo docker run -p 9999:9999 html-image
docker
```

```
#|
ServerRoot "/etc/httpd"
#
# Listen: Allows you to bind
# ports, instead of the defa
# directive.
#
# Change this to Listen on s
# prevent Apache from glommi
#
#Listen 12.34.56.78:80
Listen 9999
```

| Name |
|---|
|  Dockerfile |
|  helloworld.html |
|  httpd.conf |

⌕ Hello, World! × +

← → ↻ ⓘ localhost:9999/helloworld.html

 Gmail  YouTube  Maps  Fake Email Gen...  Git - Do

Hello, World!

3. Problem 3:

Create a docker compose to setup web container (flask app from lab1 if not exist) and nginx, MySQL, the app container depends on nginx and MySQL

Add volume for MySQL dB

```
Get Started docker-compose.yml
home > maly > docker-labs > lab2 > problem3 > docker-compose.yml
1  version: '3.9'
2  services:
3    app:
4      build:
5        context: .
6        dockerfile: Dockerfile
7      image: flask-app:v5
8      container_name: app
9      restart: unless-stopped
10     ports:
11       - "8090:5000"
12     networks:
13       - app-network
14     depends_on:
15       - web
16       - db
17   #Nginx Service
18   web:
19     image: nginx:alpine
20     container_name: webserver
21     restart: unless-stopped
22     ports:
23       - "8080:80"
24     networks:
25       - app-network
```

```
Get Started docker-compose.yml x
home > maly > docker-labs > lab2 > problem3 > docker-compose.yml
27  db:
28    image: mysql:5.7
29    container_name: Mysqldb
30    restart: unless-stopped
31    volumes:
32      - db_data:/var/lib/mysql
33    ports:
34      - "3306:3306"
35    environment:
36      MYSQL_ROOT_PASSWORD_FILE: /run/secrets/db_root_password
37      MYSQL_DATABASE: flask
38      MYSQL_USER: flask-user
39      MYSQL_PASSWORD_FILE: /run/secrets/db_password
40    secrets:
41      - db_root_password
42      - db_password
43    networks:
44      - app-network
45  secrets:
46    db_password:
47      file: db_password.txt
48    db_root_password:
49      file: db_root_password.txt
50  volumes:
51    db_data:
52  networks:
53    app-network:
54      driver: bridge
```

Go to Line/Column

Home

docker-labs

lab2








problem3 ▾ ▶

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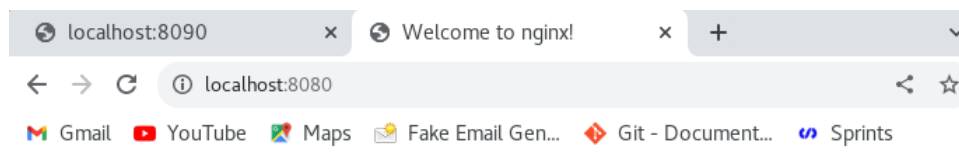
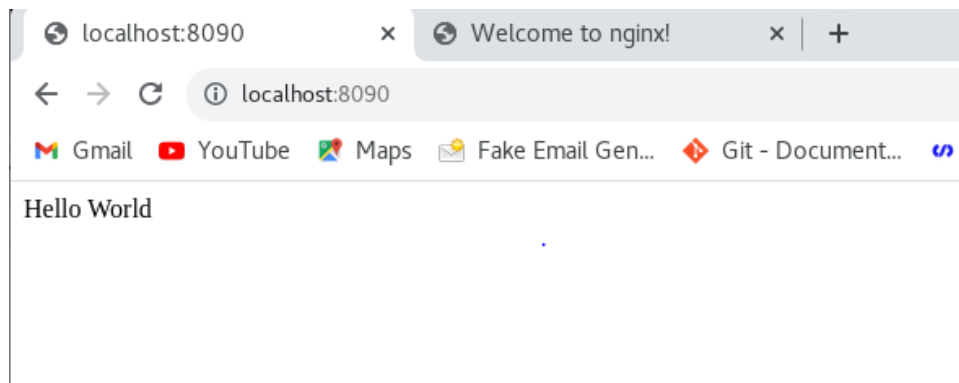
≡

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| Name ▾ | Size | Modified |
|--|-----------|----------|
|  app.py | 169 bytes | 4 Dec |
|  db_password.txt | 0 bytes | 18:56 |
|  db_root_password.txt | 0 bytes | 18:56 |
|  docker-compose.yml | 1.1 kB | 13:59 |
|  Dockerfile | 122 bytes | 4 Dec |
|  README.md | 18 bytes | 4 Dec |
|  requirements.txt | 64 bytes | 4 Dec |

⏮

```
[maly@localhost problem3]$ sudo docker compose -f ./docker-compose.yml up
[sudo] password for maly:
[+] Running 2/2
  # Container Mysqldb Created 0.4s
  # Container app Created 0.5s
Attaching to Mysqldb, app, webserver
webserver | /docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
webserver | /docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
webserver | /docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
webserver | 10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
Mysqldb | 2022-12-11 16:56:40+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.40-1.el7 started.
webserver | 10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
webserver | /docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
webserver | /docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
webserver | /docker-entrypoint.sh: Configuration complete; ready for start up
webserver | 2022/12/11 16:56:41 [notice] 1#1: using the "epoll" event method
webserver | 2022/12/11 16:56:41 [notice] 1#1: nginx/1.23.2
webserver | 2022/12/11 16:56:41 [notice] 1#1: built by gcc 11.2.1 20220219 (Alpine 11.2.1_git20220219)
webserver | 2022/12/11 16:56:41 [notice] 1#1: OS: Linux 4.18.0-408.el8.x86_64
webserver | 2022/12/11 16:56:41 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
webserver | 2022/12/11 16:56:41 [notice] 1#1: start worker processes
webserver | 2022/12/11 16:56:41 [notice] 1#1: start worker process 30
Mysqldb | 2022-12-11 16:56:44+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
Mysqldb | 2022-12-11 16:56:44+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.40-1.el7 started.
```



Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

```
[root@localhost ~]# docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS      PORTS
bdcf392fc442   flask-app:v5 "python app.py"         16 minutes ago Up 16 mi
nutes          0.0.0.0:8090->5000/tcp, :::8090->5000/tcp   app
f2d22405b51c   mysql:5.7   "docker-entrypoint.s..." 16 minutes ago Restarti
ng (1) 10 seconds ago           Mysqldb
b4a0b7356af4   nginx:alpine "/docker-entrypoint...." 28 minutes ago Up 16 mi
nutes          0.0.0.0:8080->80/tcp, :::8080->80/tcp       webserver
[root@localhost ~]#
```