Experiment 6

AIM: Docker linking and docker swarm

6A) Linking

Run postgres container:

```
root@ubuntu-xenial:/home/vagrant# docker run -it -d --name db training/postgres
Unable to find image 'training/postgres:latest' locally
latest: Pulling from training/postgres
a3ed95caeb02: Pull complete
6e71c809542e: Downloading [=======================================>           ]  53.25MB/67.48MB
6e71c809542e: Pull complete
2978d9af87ba: Pull complete
e1bca35b062f: Pull complete
500b6decf741: Pull complete
74b14ef2151f: Pull complete
7afd5ed3826e: Pull complete
3c69bb244f5e: Pull complete
d86f9ec5aedf: Pull complete
010fabf20157: Pull complete
Digest: sha256:a945dc6dcfbc8d009c3d972931608344b76c2870ce796da00a827bd50791907e
Status: Downloaded newer image for training/postgres:latest
```

Run webapp container linked to postgres:

```
root@ubuntu-xenial:/home/vagrant# docker run -it -d --name web --link db:mydb training/webapp
Unable to find image 'training/webapp:latest' locally
fca59b508e9f: Downloading [==============================>                    ]  31.03MB/50.25MB
e190868d63f8: Downloading [==================>                                ]  24.26MB/65.77MB
909cd34c6fd7: Download complete
0b9bfabab7c1: Download complete
a3ed95caeb02: Download complete
```

List running containers:

```
root@ubuntu-xenial:/home/vagrant# docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS
      NAMES
1399f2f3b657        training/webapp     "python app.py"          About a minute ago   Up About a minute   5000/tcp
      web
269fe589c309        training/postgres   "su postgres -c '/us…"   8 minutes ago       Up 8 minutes        5432/tcp
      db
```

Ping the linked containers:

```
root@ubuntu-xenial:/home/vagrant# docker exec -it web bash
root@1399f2f3b657:/opt/webapp# ping mydb
PING mydb (172.17.0.2) 56(84) bytes of data.
64 bytes from mydb (172.17.0.2): icmp_seq=1 ttl=64 time=0.426 ms
64 bytes from mydb (172.17.0.2): icmp_seq=2 ttl=64 time=0.168 ms
64 bytes from mydb (172.17.0.2): icmp_seq=3 ttl=64 time=0.152 ms
^C
--- mydb ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2111ms
rtt min/avg/max/mdev = 0.152/0.248/0.426/0.126 ms
```

Monitoring:

```
root@ubuntu-xenial:/home/vagrant# docker run -it -d -p 80:80 nginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
45b42c59be33: Already exists
f201eed3edb3: Pull complete
32b8d3b748d6: Pull complete
541dfa80698c: Pull complete
12d7728b7b65: Pull complete
d7616c5653f5: Pull complete
Digest: sha256:0cfa0918932da366879630b304a61f45a43a59cd10fcfc6dd8f09a3be4f9161f
Status: Downloaded newer image for nginx:latest
58c8bc8c38e0d989b68b4a48e487aaff95e15f4c72166d6232dd75cf878fac57
```

Stats:

```
/home/vagrant# docker stats
```

```
CONTAINER ID        NAME                CPU %               MEM USAGE / LIMIT     MEM %               NET I/O
   BLOCK I/O           PIDS
58c8bc8c38e0        suspicious_galileo   0.00%               1.387MiB / 991.9MiB   0.14%               690B / 0B
   5.82MB / 8.19kB     2
1399f2f3b657        web                 6.95%               44.18MiB / 991.9MiB   4.45%               22.4MB / 402kB
   11MB / 87.1MB       4
269fe589c309        db                  0.00%               3.148MiB / 991.9MiB   0.32%               1.72kB / 378B
   2.89MB / 28.5MB     7
```

Logs for db container

```
root@ubuntu-xenial:/home/vagrant# docker logs db
2021-03-12 05:55:47 UTC LOG:  database system was interrupted; last known up at 2014-06-02 23:51:25 UTC
2021-03-12 05:55:47 UTC LOG:  database system was not properly shut down; automatic recovery in progress
2021-03-12 05:55:47 UTC LOG:  redo starts at 0/1782F38
2021-03-12 05:55:47 UTC LOG:  record with zero length at 0/17835C8
2021-03-12 05:55:47 UTC LOG:  redo done at 0/1783598
2021-03-12 05:55:47 UTC LOG:  last completed transaction was at log time 2014-06-02 23:51:25.978993+00
2021-03-12 05:55:47 UTC LOG:  database system is ready to accept connections
```

Logs for nginx container

```
root@ubuntu-xenial:/home/vagrant# docker logs 58c8bc8c38e0
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
```

6B) Docker Swarm

docker swarm init

```
$ docker swarm intit

Usage:  docker swarm COMMAND

Manage Swarm

Options:


Commands:
  ca          Display and rotate the root CA
  init        Initialize a swarm
  join        Join a swarm as a node and/or manager
  join-token  Manage join tokens
  leave       Leave the swarm
  unlock      Unlock swarm
  unlock-key  Manage the unlock key
  update      Update the swarm

Run 'docker swarm COMMAND --help' for more information on a command.
$ docker swarm init
Swarm initialized: current node (y8m924jdpmgaumklgdq5nu4gp) is now a manager.

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

    docker swarm join --token SWMTKN-1-5vgz3h44b4umxlpdli9ozp5zhowxoxx87ljrlfqysy4quc3o14-9z2ovnt9wozt83xlycue9s
j0t 172.17.0.64:2377

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

docker node ls

```
$ docker node ls
ID                            HOSTNAME            STATUS              AVAILABILITY        MANAGER STATUS
ubkjjqa8lh4578tkdt1cwonbr     base-xenial         Down                Active
y8m924jdpmgaumklgdq5nu4gp *   base-xenial         Ready               Active              Leader
$
```

docker swarm join –token *token* (on another node)

```
$ docker swarm join --token SWMTKN-1-5vgz3h44b4umxlpdli9ozp5zhowxoxx87ljrlfqysy4quc3o14-9z2ovnt9wozt83xlycue9sj0t 172.17.0.64:2377
This node joined a swarm as a worker.
$
```

docker node ls

```
$ docker node ls
ID                            HOSTNAME            STATUS              AVAILABILITY        MANAGER STATUS
t0iuqlmd0ee0106dph9jju2c1     base-xenial         Ready               Active
ubkjjqa8lh4578tkdt1cwonbr     base-xenial         Down                Active
y8m924jdpmgaumklgdq5nu4gp *   base-xenial         Ready               Active              Leader
$
```