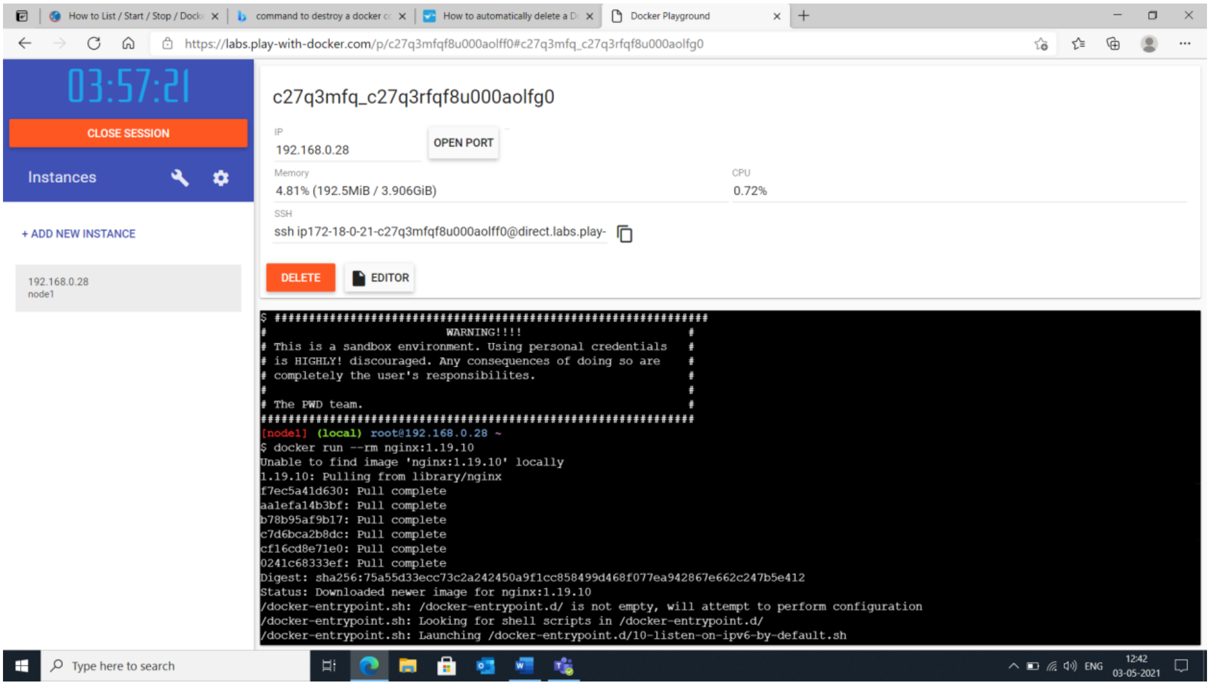
DOCKER – EXERCISES

1) Spin up a temporary container with image nginx:1.19.10 and execute inside it, such that the container should be destroyed, once you exit from the container

- docker run - -rm nginx:1.19.10

- docker ps -a


How to List / Start / Stop / Dock
command to destroy a docker c
How to automatically delete a D
Docker Playground
https://labs.play-with-docker.com/p/c27q3mfqf8u000aolff0#c27q3mfq_c27q3rfqf8u000aolfg0
03:57:21
CLOSE SESSION
Instances
+ ADD NEW INSTANCE
192.168.0.28
node1
OPEN PORT
DELETE
EDITOR
Type here to search
ENG
12:42
03-05-2021

c27q3mfq_c27q3rfqf8u000aolfg0

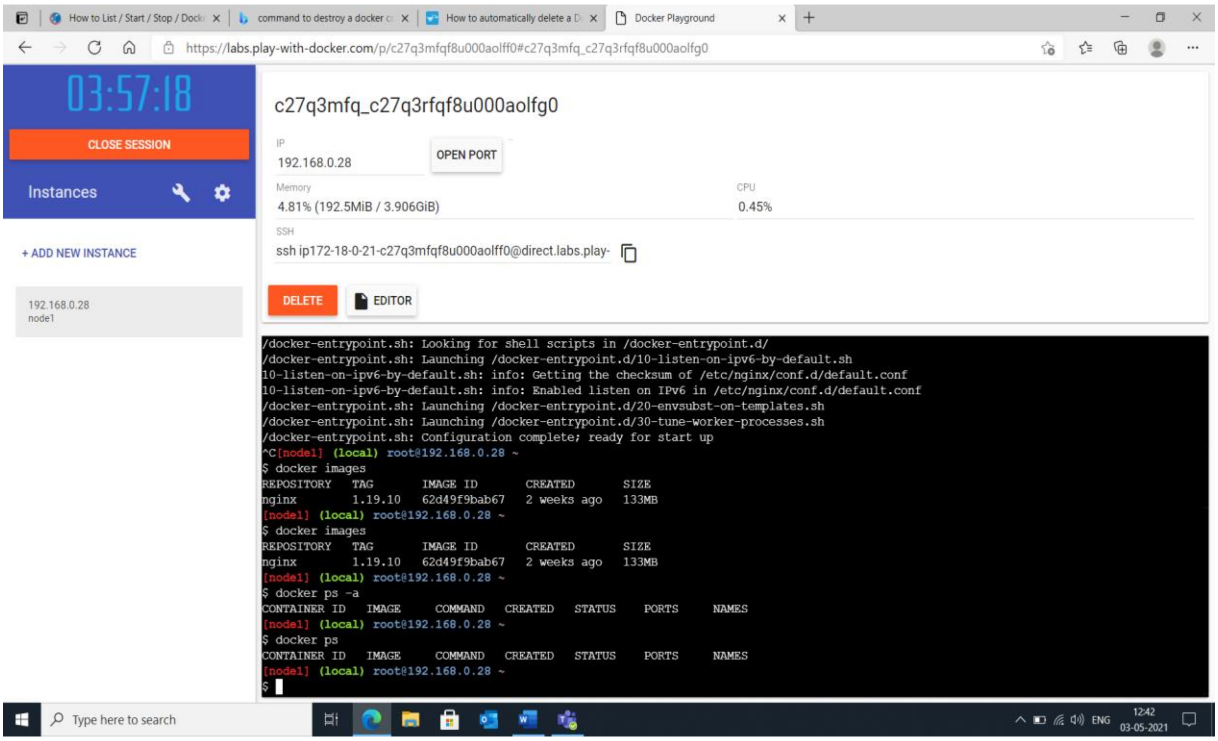
IP: 192.168.0.28

Memory: 4.81% (192.5MiB / 3.906GiB)

CPU: 0.72%

SSH: ssh ip172-18-0-21-c27q3mfqf8u000aolff0@direct.labs.play-

```
$ ###################################################################
#                          WARNING!!!!                              #
# This is a sandbox environment. Using personal credentials         #
# is HIGHLY! discouraged. Any consequences of doing so are          #
# completely the user's responsibilites.                            #
#                                                                   #
# The PWD team.                                                     #
#####################################################################
[node1] (local) root@192.168.0.28 ~
$ docker run --rm nginx:1.19.10
Unable to find image 'nginx:1.19.10' locally
1.19.10: Pulling from library/nginx
f7ec5a41d630: Pull complete
aa1efa14b3bf: Pull complete
b78b95af9b17: Pull complete
c7d6bca2b8dc: Pull complete
cf16cd8e71e0: Pull complete
0241c68333ef: Pull complete
Digest: sha256:75a55d33ecc73c2a242450a9f1cc858499d468f077ea942867e662c247b5e412
Status: Downloaded newer image for nginx:1.19.10
/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
```


How to List / Start / Stop / Dock
command to destroy a docker c
How to automatically delete a D
Docker Playground
https://labs.play-with-docker.com/p/c27q3mfqf8u000aolff0#c27q3mfq_c27q3rfqf8u000aolfg0
03:57:18
CLOSE SESSION
Instances
+ ADD NEW INSTANCE
192.168.0.28
node1
OPEN PORT
DELETE
EDITOR
Type here to search
ENG
12:42
03-05-2021

c27q3mfq_c27q3rfqf8u000aolfg0

IP: 192.168.0.28

Memory: 4.81% (192.5MiB / 3.906GiB)

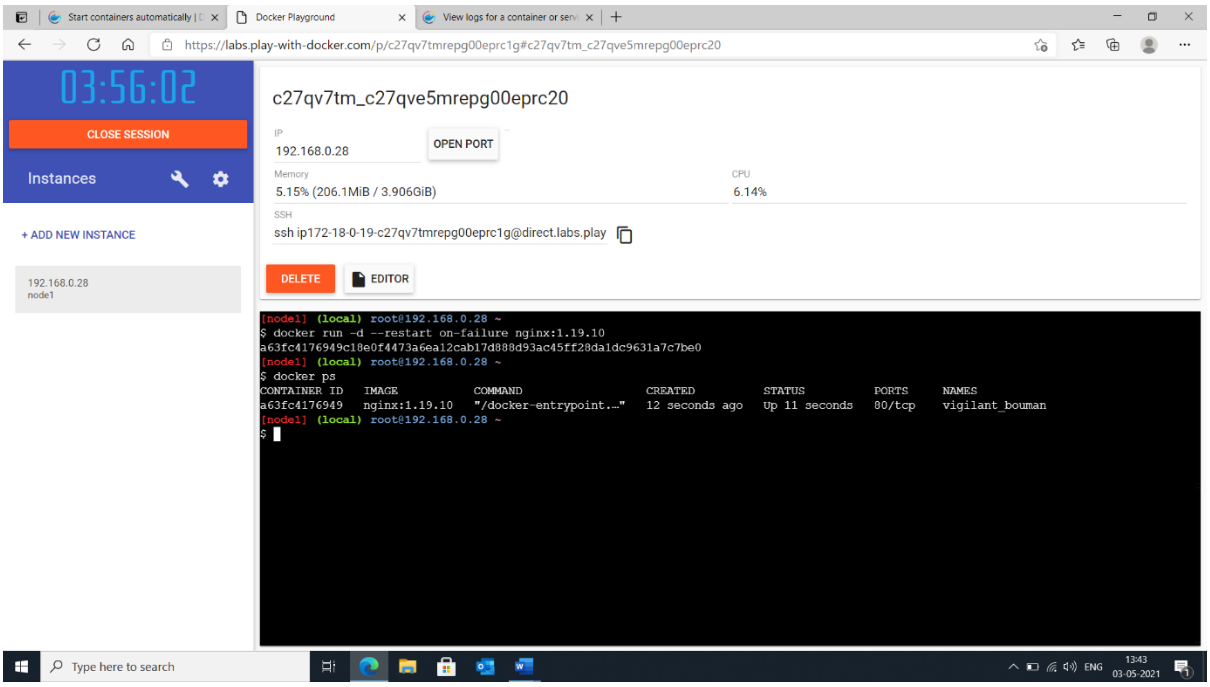
CPU: 0.45%

SSH: ssh ip172-18-0-21-c27q3mfqf8u000aolff0@direct.labs.play-

```
/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
^C[node1] (local) root@192.168.0.28 ~
$ docker images
REPOSITORY   TAG       IMAGE ID       CREATED       SIZE
nginx        1.19.10   62d49f9bab67   2 weeks ago   133MB
[node1] (local) root@192.168.0.28 ~
$ docker images
REPOSITORY   TAG       IMAGE ID       CREATED       SIZE
nginx        1.19.10   62d49f9bab67   2 weeks ago   133MB
[node1] (local) root@192.168.0.28 ~
$ docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[node1] (local) root@192.168.0.28 ~
$ docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[node1] (local) root@192.168.0.28 ~
$ 
```

2) Spin up a container with image nginx:1.19.10 such that it should restart automatically if any fatal errors are encountered

- docker run -d - -restart on-failure nginx:1.19.10
- docker ps


Start containers automatically | D
Docker Playground
View logs for a container or serv
https://labs.play-with-docker.com/p/c27qv7tmrepg00eprc1g#c27qv7tm_c27qve5mrepg00eprc20
03:56:02
CLOSE SESSION
Instances
+ ADD NEW INSTANCE
192.168.0.28
node1
OPEN PORT
DELETE
EDITOR
Type here to search
ENG
13:43
03-05-2021

c27qv7tm_c27qve5mrepg00eprc20

IP: 192.168.0.28

Memory: 5.15% (206.1MiB / 3.906GiB)

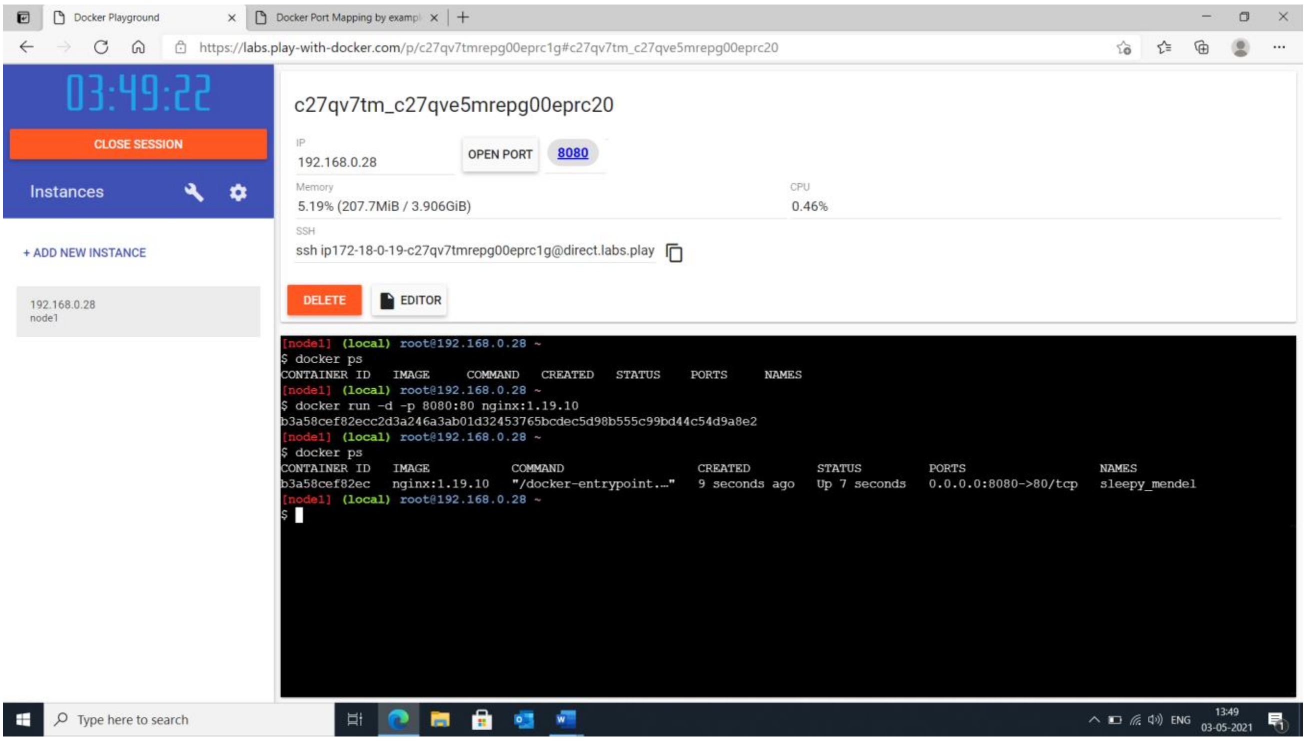
CPU: 6.14%

SSH: ssh ip172-18-0-19-c27qv7tmrepg00eprc1g@direct.labs.play

```
[node1] (local) root@192.168.0.28 ~
$ docker run -d --restart on-failure nginx:1.19.10
a63fc4176949c18e0f4473a6ea12cab17d888d93ac45ff28da1dc9631a7c7be0
[node1] (local) root@192.168.0.28 ~
$ docker ps
CONTAINER ID   IMAGE           COMMAND                  CREATED          STATUS          PORTS     NAMES
a63fc4176949   nginx:1.19.10   "/docker-entrypoint.…"   12 seconds ago   Up 11 seconds   80/tcp    vigilant_bouman
[node1] (local) root@192.168.0.28 ~
$ 
```

3) Spin up a container with image nginx:1.19.10 such that port 80 of the container can be connected from port 8080 of the host

- docker run -d -p 8080:80 nginx:1.19.10



c27qv7tm_c27qve5mrepg00eprc20

IP: 192.168.0.28

Memory: 5.19% (207.7MiB / 3.906GiB)

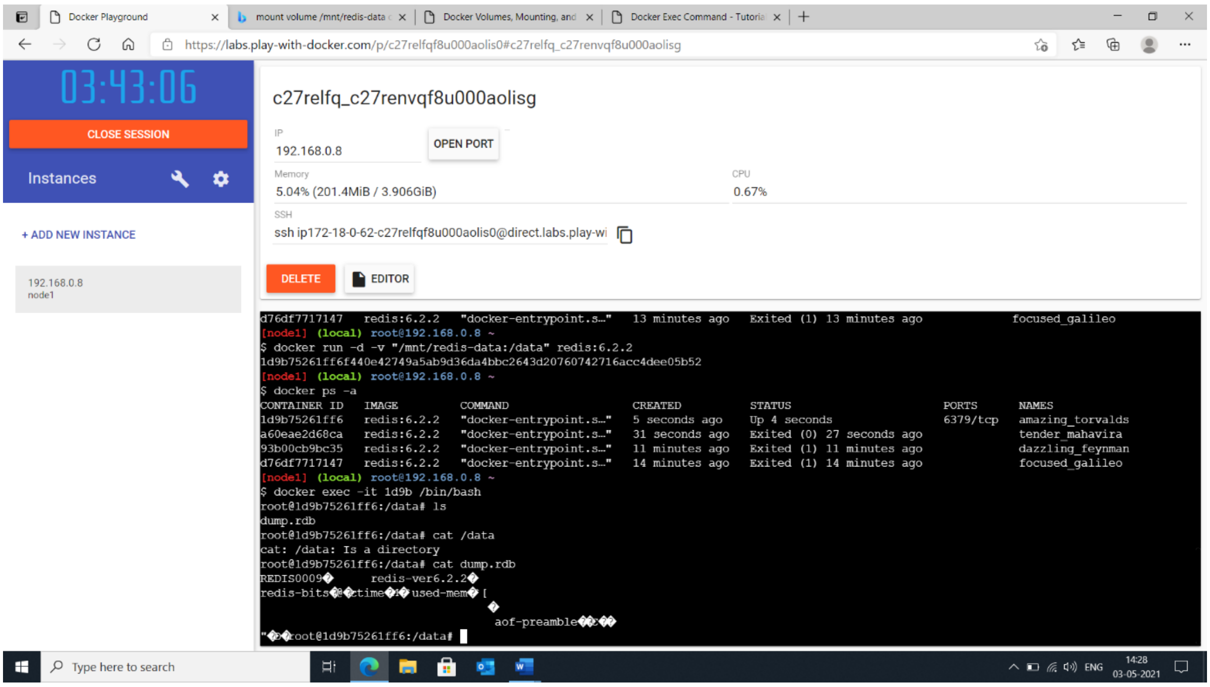
CPU: 0.46%

SSH: ssh ip172-18-0-19-c27qv7tmrepg00eprc1g@direct.labs.play

```
[node1] (local) root@192.168.0.28 ~
$ docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[node1] (local) root@192.168.0.28 ~
$ docker run -d -p 8080:80 nginx:1.19.10
b3a58cef82ecc2d3a246a3ab01d32453765bcdec5d98b555c99bd44c54d9a8e2
[node1] (local) root@192.168.0.28 ~
$ docker ps
CONTAINER ID   IMAGE           COMMAND                  CREATED         STATUS         PORTS                  NAMES
b3a58cef82ec   nginx:1.19.10   "/docker-entrypoint.…"   9 seconds ago   Up 7 seconds   0.0.0.0:8080->80/tcp   sleepy_mendel
[node1] (local) root@192.168.0.28 ~
$ 
```

4) Spin up a container with image redis:6.2.2 and mount volume /mnt/redis-data of host to the /data of the container

- docker run -d -v "/mnt/redis-data: /data " redis:6.2.2
- docker exec -it #container_id /bin/bash



https://labs.play-with-docker.com/p/c27relfqf8u000aolis0#c27relfq_c27renvqf8u000aolisg

c27relfq_c27renvqf8u000aolisg

IP: 192.168.0.8

Memory: 5.04% (201.4MiB / 3.906GiB)

CPU: 0.67%

SSH: ssh ip172-18-0-62-c27relfqf8u000aolis0@direct.labs.play-wi

192.168.0.8
node1

```
d76df7717147   redis:6.2.2   "docker-entrypoint.s…"   13 minutes ago   Exited (1) 13 minutes ago              focused_galileo
[node1] (local) root@192.168.0.8 ~
$ docker run -d -v "/mnt/redis-data:/data" redis:6.2.2
1d9b75261ff6f440e42749a5ab9d36da4bbc2643d20760742716acc4dee05b52
[node1] (local) root@192.168.0.8 ~
$ docker ps -a
CONTAINER ID   IMAGE         COMMAND                  CREATED          STATUS                      PORTS      NAMES
1d9b75261ff6   redis:6.2.2   "docker-entrypoint.s…"   5 seconds ago    Up 4 seconds                6379/tcp   amazing_torvalds
a60eae2d68ca   redis:6.2.2   "docker-entrypoint.s…"   31 seconds ago   Exited (0) 27 seconds ago              tender_mahavira
93b00cb9bc35   redis:6.2.2   "docker-entrypoint.s…"   11 minutes ago   Exited (1) 11 minutes ago              dazzling_feynman
d76df7717147   redis:6.2.2   "docker-entrypoint.s…"   14 minutes ago   Exited (1) 14 minutes ago              focused_galileo
[node1] (local) root@192.168.0.8 ~
$ docker exec -it 1d9b /bin/bash
root@1d9b75261ff6:/data# ls
dump.rdb
root@1d9b75261ff6:/data# cat /data
cat: /data: Is a directory
root@1d9b75261ff6:/data# cat dump.rdb
REDIS0009�      redis-ver6.2.2�
redis-bits�@�ctime��used-mem�[
                                  �
                                   aof-preamble���
"��root@1d9b75261ff6:/data# 
```

5) Create a dockerfile with base image centos:7, and build an image with any sample application file

- **vi app.py**

  from flask import Flask

  app = Flask(_name_)

  @app.route('/')

  def disp():

      return ''This is Sakthi Sri's sample application''

- **vi Dockerfile**

  # Dockerfile starts here

  ✓ FROM centos:7

  ✓ LABEL "about" = "This is a sample application file"

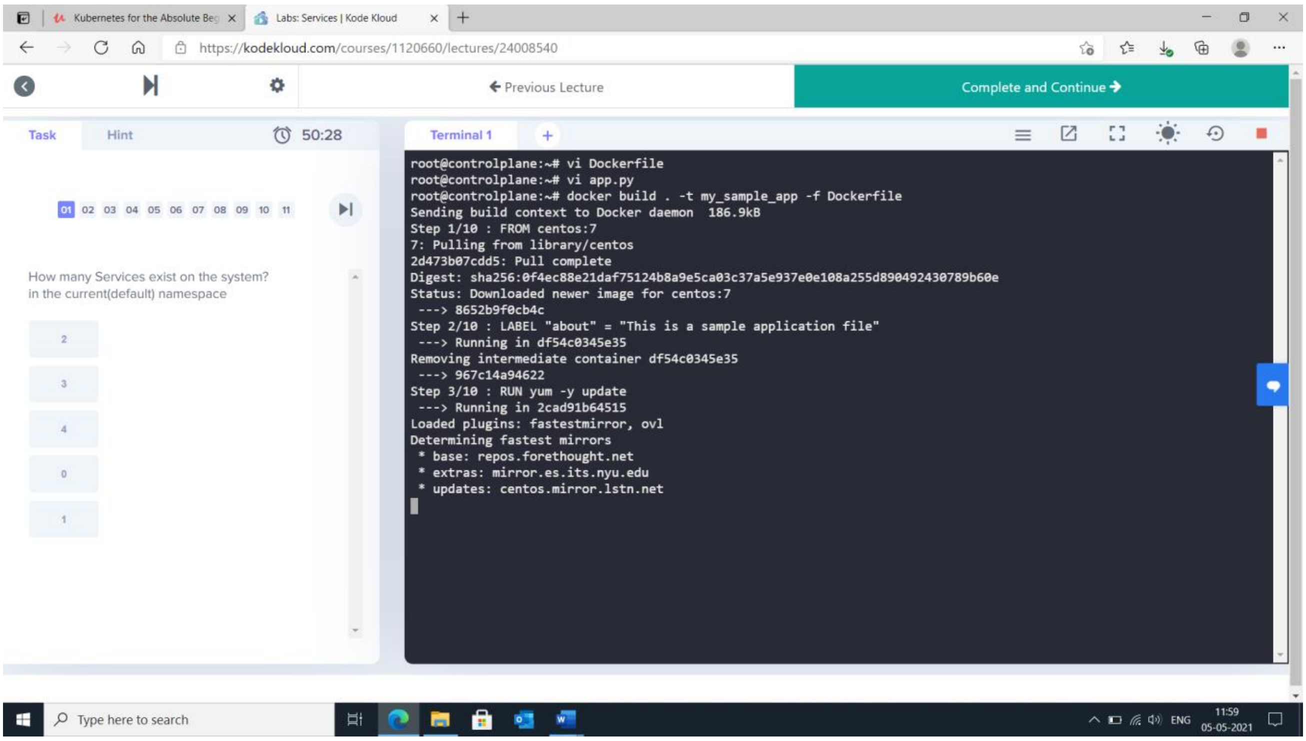
  ✓ RUN yum -y update

  ✓ RUN yum -y install python

- ✓ RUN yum -y install epel-release && yum clean all
- ✓ RUN yum -y install python-pip
- ✓ RUN pip install flask
- ✓ COPY ./app.py /app.py
- ✓ CMD [“echo”, “File copied”]
- ✓ ENTRYPOINT FLASK_APP = /app.py flask run - -host 0.0.0.0

# Dockerfile ends here

- docker build .-t my_sample_app -f Dockerfile
- docker images
- docker run -p 8080:5000 -d - -name=my_sample_application my_sample_app
- docker ps



How many Services exist on the system?
in the current(default) namespace

2

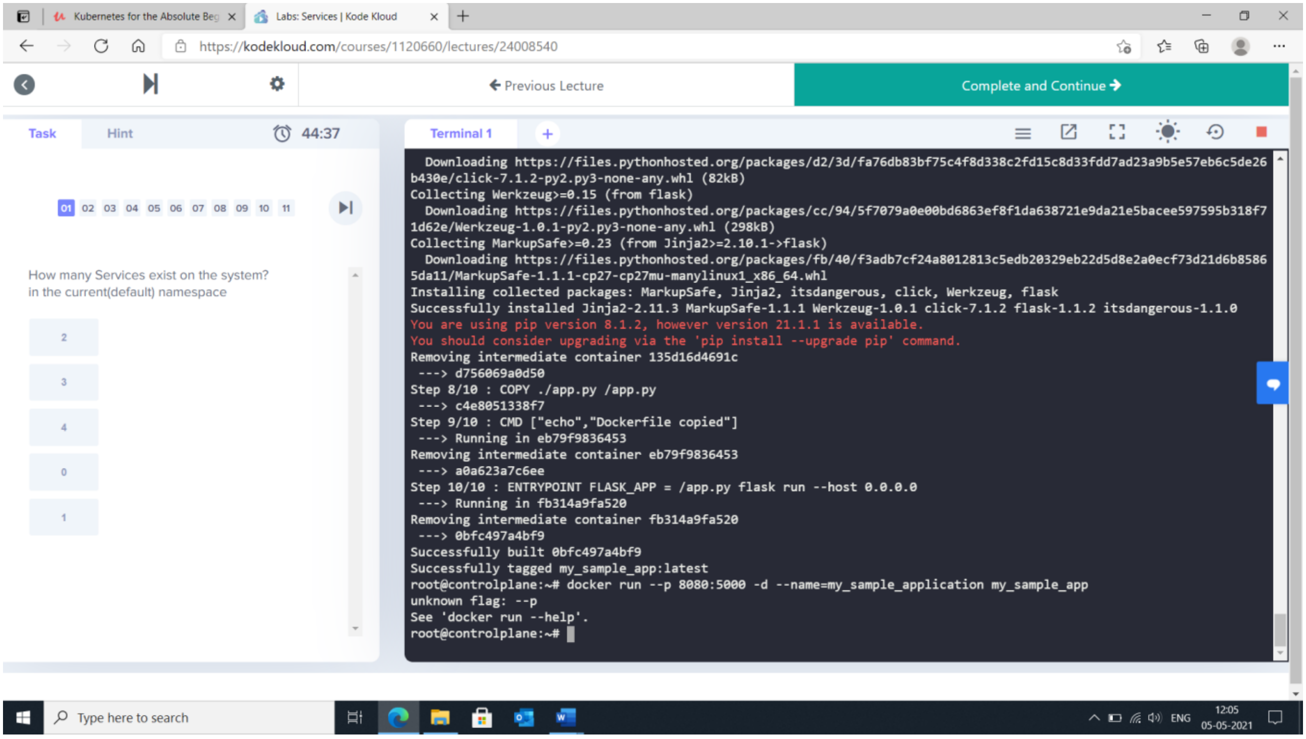
3

4

0

1

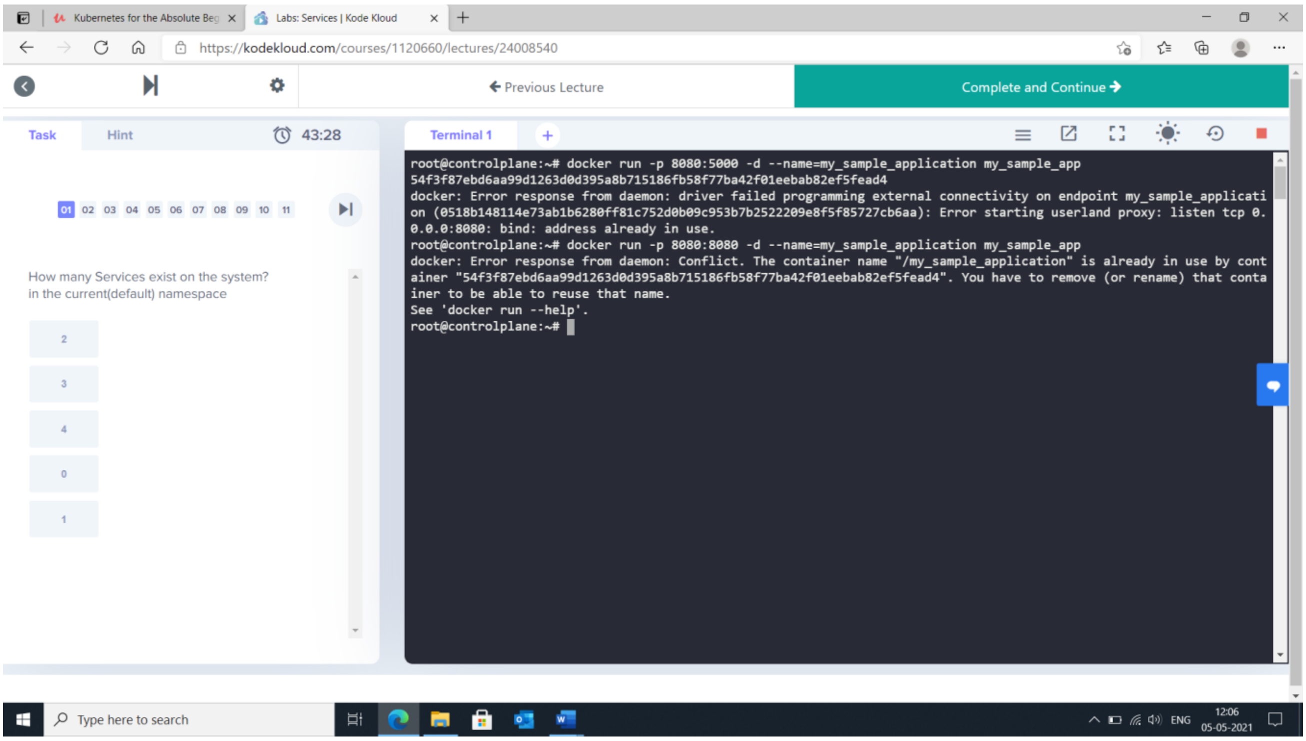
```
root@controlplane:~# vi Dockerfile
root@controlplane:~# vi app.py
root@controlplane:~# docker build . -t my_sample_app -f Dockerfile
Sending build context to Docker daemon  186.9kB
Step 1/10 : FROM centos:7
7: Pulling from library/centos
2d473b07cdd5: Pull complete
Digest: sha256:0f4ec88e21daf75124b8a9e5ca03c37a5e937e0e108a255d890492430789b60e
Status: Downloaded newer image for centos:7
 ---> 8652b9f0cb4c
Step 2/10 : LABEL "about" = "This is a sample application file"
 ---> Running in df54c0345e35
Removing intermediate container df54c0345e35
 ---> 967c14a94622
Step 3/10 : RUN yum -y update
 ---> Running in 2cad91b64515
Loaded plugins: fastestmirror, ovl
Determining fastest mirrors
 * base: repos.forethought.net
 * extras: mirror.es.its.nyu.edu
 * updates: centos.mirror.lstn.net
```



How many Services exist on the system?
in the current(default) namespace

○ 2
○ 3
○ 4
○ 0
○ 1

```
  Downloading https://files.pythonhosted.org/packages/d2/3d/fa76db83bf75c4f8d338c2fd15c8d33fdd7ad23a9b5e57eb6c5de26
b430e/click-7.1.2-py2.py3-none-any.whl (82kB)
Collecting Werkzeug>=0.15 (from flask)
  Downloading https://files.pythonhosted.org/packages/cc/94/5f7079a0e00bd6863ef8f1da638721e9da21e5bacee597595b318f7
1d62e/Werkzeug-1.0.1-py2.py3-none-any.whl (298kB)
Collecting MarkupSafe>=0.23 (from Jinja2>=2.10.1->flask)
  Downloading https://files.pythonhosted.org/packages/fb/40/f3adb7cf24a8012813c5edb20329eb22d5d8e2a0ecf73d21d6b8586
5da11/MarkupSafe-1.1.1-cp27-cp27mu-manylinux1_x86_64.whl
Installing collected packages: MarkupSafe, Jinja2, itsdangerous, click, Werkzeug, flask
Successfully installed Jinja2-2.11.3 MarkupSafe-1.1.1 Werkzeug-1.0.1 click-7.1.2 flask-1.1.2 itsdangerous-1.1.0
You are using pip version 8.1.2, however version 21.1.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
Removing intermediate container 135d16d4691c
 ---> d756069a0d50
Step 8/10 : COPY ./app.py /app.py
 ---> c4e8051338f7
Step 9/10 : CMD ["echo","Dockerfile copied"]
 ---> Running in eb79f9836453
Removing intermediate container eb79f9836453
 ---> a0a623a7c6ee
Step 10/10 : ENTRYPOINT FLASK_APP = /app.py flask run --host 0.0.0.0
 ---> Running in fb314a9fa520
Removing intermediate container fb314a9fa520
 ---> 0bfc497a4bf9
Successfully built 0bfc497a4bf9
Successfully tagged my_sample_app:latest
root@controlplane:~# docker run --p 8080:5000 -d --name=my_sample_application my_sample_app
unknown flag: --p
See 'docker run --help'.
root@controlplane:~# 
```



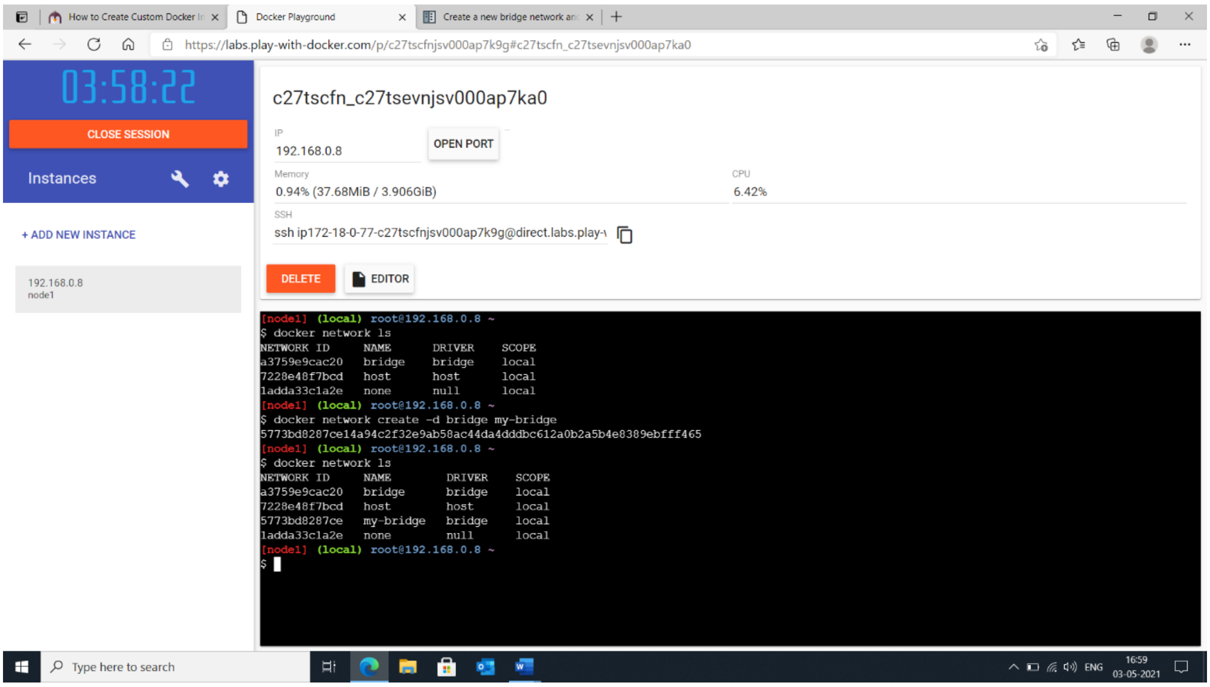
How many Services exist on the system?
in the current(default) namespace

○ 2
○ 3
○ 4
○ 0
○ 1

```
root@controlplane:~# docker run -p 8080:5000 -d --name=my_sample_application my_sample_app
54f3f87ebd6aa99d1263d0d395a8b715186fb58f77ba42f01eebab82ef5fead4
docker: Error response from daemon: driver failed programming external connectivity on endpoint my_sample_applicati
on (0518b148114e73ab1b6280ff81c752d0b09c953b7b2522209e8f5f85727cb6aa): Error starting userland proxy: listen tcp 0.
0.0.0:8080: bind: address already in use.
root@controlplane:~# docker run -p 8080:8080 -d --name=my_sample_application my_sample_app
docker: Error response from daemon: Conflict. The container name "/my_sample_application" is already in use by cont
ainer "54f3f87ebd6aa99d1263d0d395a8b715186fb58f77ba42f01eebab82ef5fead4". You have to remove (or rename) that conta
iner to be able to reuse that name.
See 'docker run --help'.
root@controlplane:~# 
```

6) Create a bridge network called test-app and spin up nginx and redis containers in that network

- docker network ls
- docker network create -d bridge my-bridge
- docker images
- docker network inspect my-bridge
- docker network ls
- docker run -d nginx
- docker run -d redis
- docker ps
- docker images
- docker network connect my-bridge #container_id_of_nginx
- docker network connect my-bridge #container_id_of_redis
- docker network inspect my-bridge



How to Create Custom Docker I
Docker Playground
Create a new bridge network an
https://labs.play-with-docker.com/p/c27tscfnjsv000ap7k9g#c27tscfn_c27tsevnjsv000ap7ka0
03:58:22
CLOSE SESSION
Instances
+ ADD NEW INSTANCE
192.168.0.8
node1
OPEN PORT
DELETE
EDITOR
Type here to search
ENG
16:59
03-05-2021

c27tscfn_c27tsevnjsv000ap7ka0

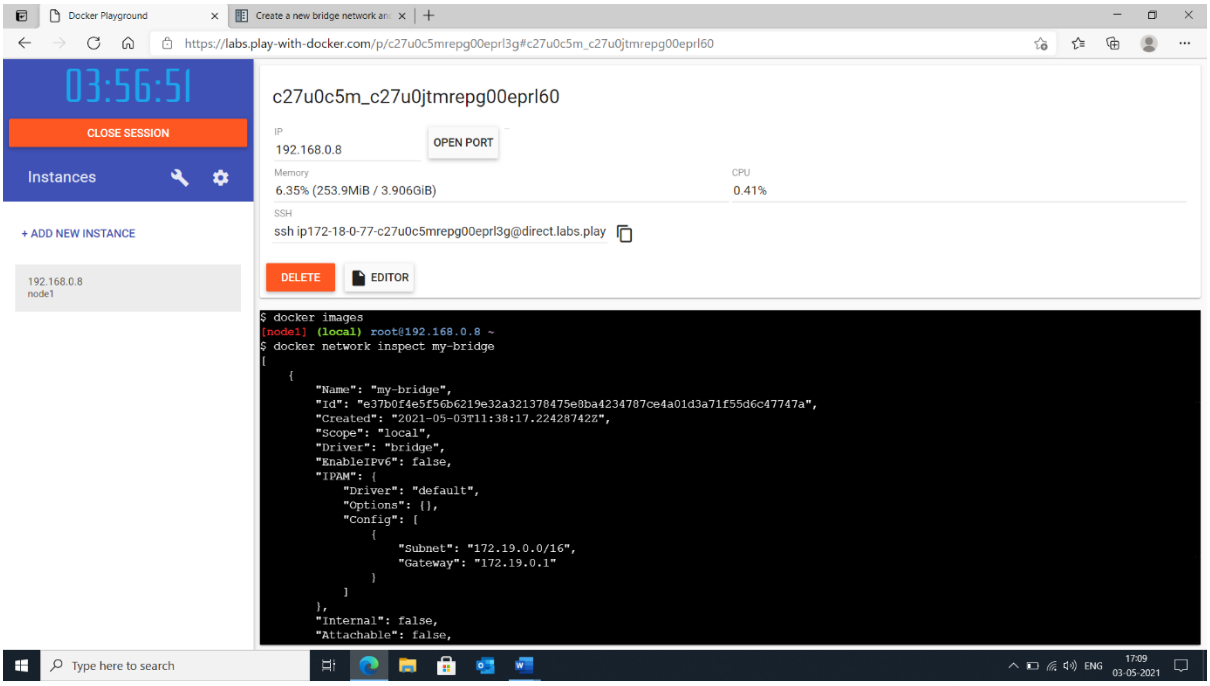
IP: 192.168.0.8

Memory: 0.94% (37.68MiB / 3.906GiB)

CPU: 6.42%

SSH: ssh ip172-18-0-77-c27tscfnjsv000ap7k9g@direct.labs.play-\

```
[node1] (local) root@192.168.0.8 ~
$ docker network ls
NETWORK ID     NAME      DRIVER    SCOPE
a3759e9cac20   bridge    bridge    local
7228e48f7bcd   host      host      local
1adda33c1a2e   none      null      local
[node1] (local) root@192.168.0.8 ~
$ docker network create -d bridge my-bridge
5773bd8287ce14a94c2f32e9ab58ac44da4dddbc612a0b2a5b4e8389ebfff465
[node1] (local) root@192.168.0.8 ~
$ docker network ls
NETWORK ID     NAME        DRIVER    SCOPE
a3759e9cac20   bridge      bridge    local
7228e48f7bcd   host        host      local
5773bd8287ce   my-bridge   bridge    local
1adda33c1a2e   none        null      local
[node1] (local) root@192.168.0.8 ~
$ 
```



c27u0c5m_c27u0jtmrepg00eprl60

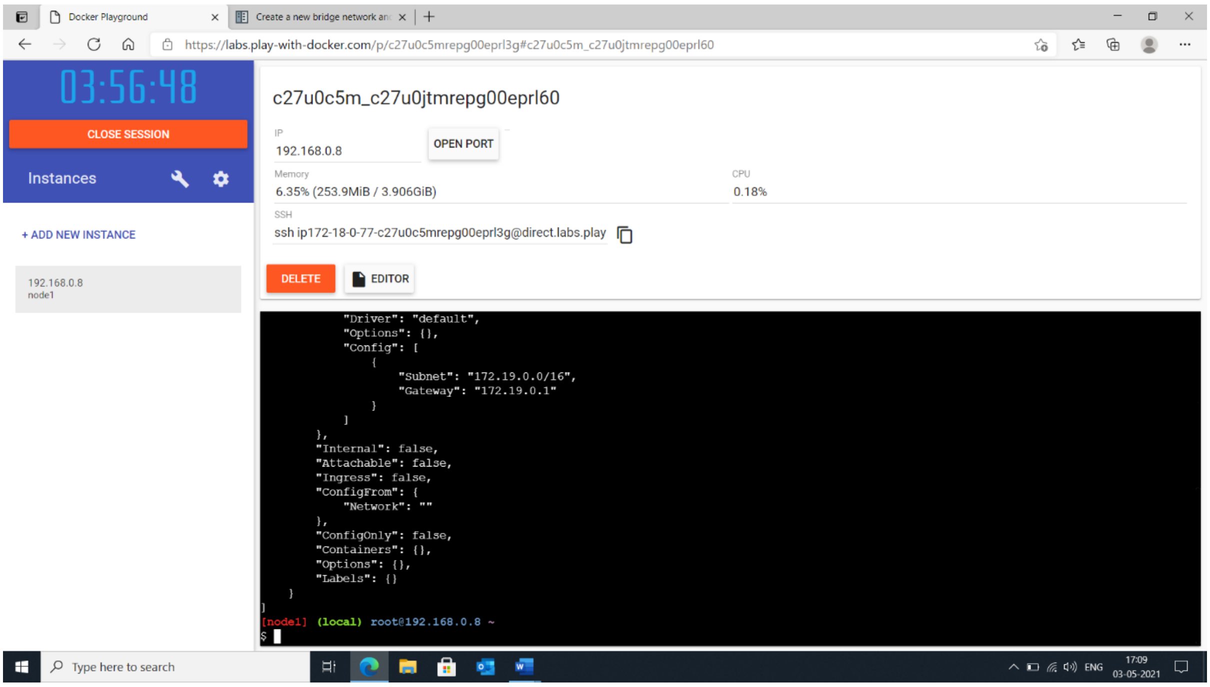
IP: 192.168.0.8

Memory: 6.35% (253.9MiB / 3.906GiB)

CPU: 0.41%

SSH: ssh ip172-18-0-77-c27u0c5mrepg00eprl3g@direct.labs.play

```
$ docker images
[node1] (local) root@192.168.0.8 ~
$ docker network inspect my-bridge
[
    {
        "Name": "my-bridge",
        "Id": "e37b0f4e5f56b6219e32a321378475e8ba4234787ce4a01d3a71f55d6c47747a",
        "Created": "2021-05-03T11:38:17.22428742Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "172.19.0.0/16",
                    "Gateway": "172.19.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
```



c27u0c5m_c27u0jtmrepg00eprl60

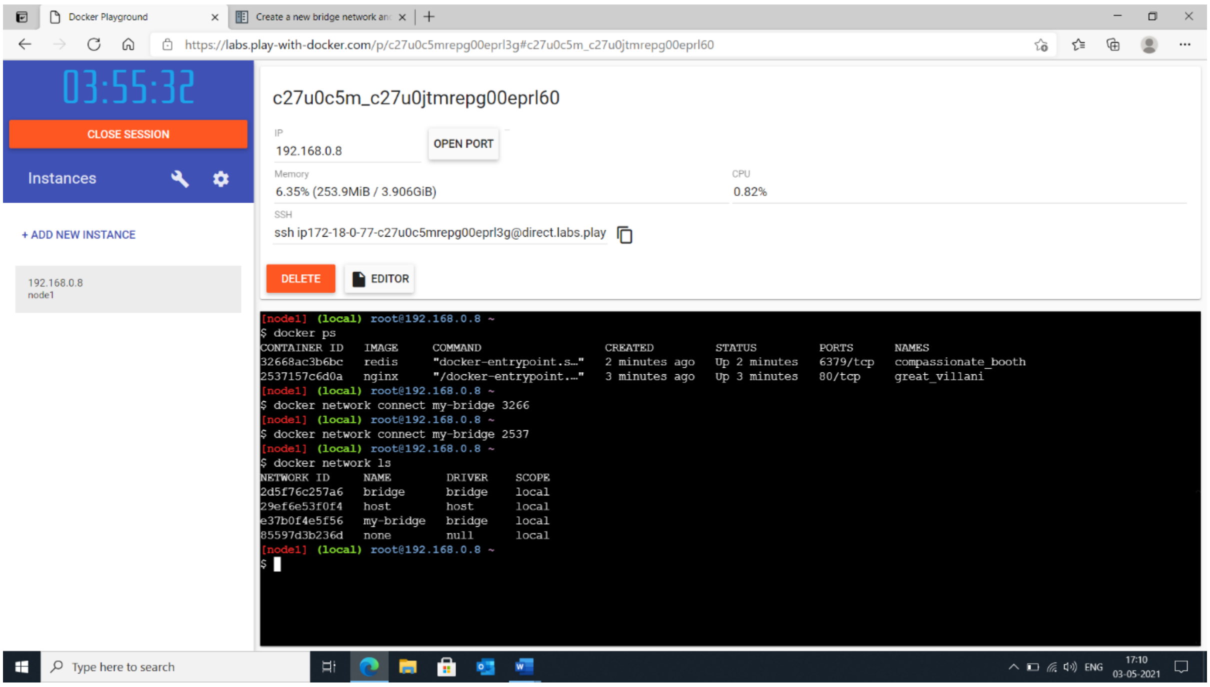
IP: 192.168.0.8

Memory: 6.35% (253.9MiB / 3.906GiB)

CPU: 0.18%

SSH: ssh ip172-18-0-77-c27u0c5mrepg00eprl3g@direct.labs.play

```
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "172.19.0.0/16",
                    "Gateway": "172.19.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {},
        "Options": {},
        "Labels": {}
    }
]
[node1] (local) root@192.168.0.8 ~
$
```



c27u0c5m_c27u0jtmrepg00eprl60

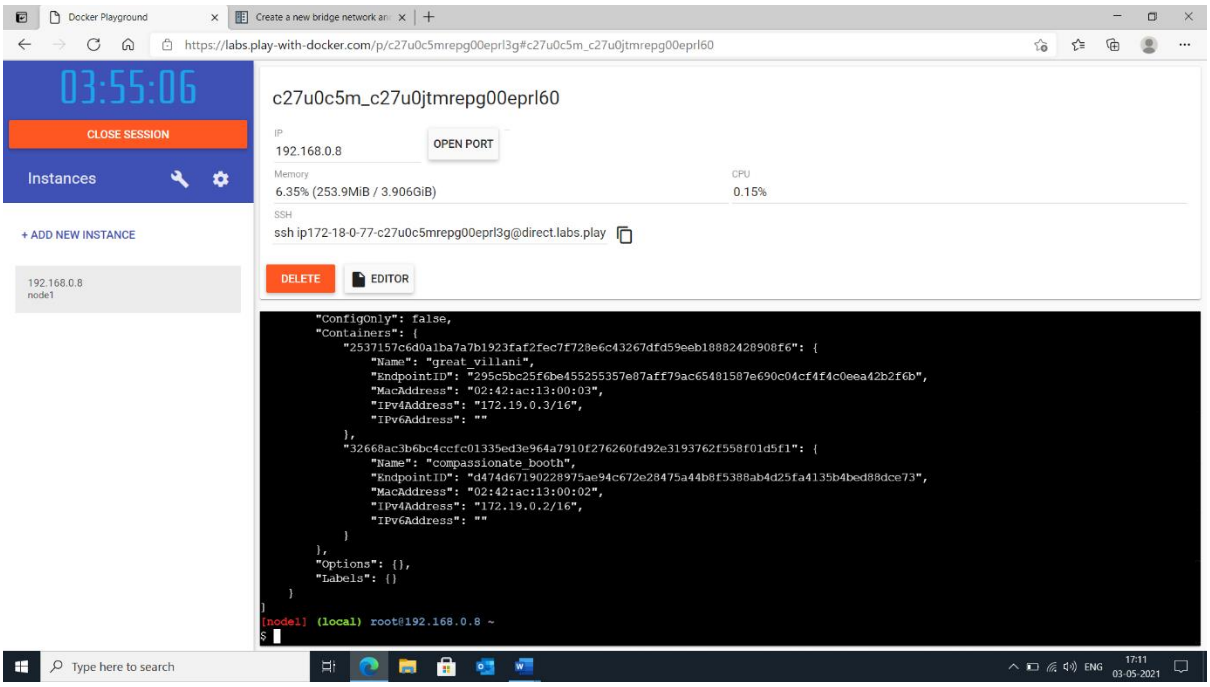
IP: 192.168.0.8

Memory: 6.35% (253.9MiB / 3.906GiB)

CPU: 0.82%

SSH: ssh ip172-18-0-77-c27u0c5mrepg00eprl3g@direct.labs.play

```
[node1] (local) root@192.168.0.8 ~
$ docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED         STATUS         PORTS      NAMES
32668ac3b6bc   redis     "docker-entrypoint.s…"   2 minutes ago   Up 2 minutes   6379/tcp   compassionate_booth
2537157c6d0a   nginx     "/docker-entrypoint.…"   3 minutes ago   Up 3 minutes   80/tcp     great_villani
[node1] (local) root@192.168.0.8 ~
$ docker network connect my-bridge 3266
[node1] (local) root@192.168.0.8 ~
$ docker network connect my-bridge 2537
[node1] (local) root@192.168.0.8 ~
$ docker network ls
NETWORK ID     NAME        DRIVER    SCOPE
2d5f76c257a6   bridge      bridge    local
29ef6e53f0f4   host        host      local
e37b0f4e5f56   my-bridge   bridge    local
85597d3b236d   none        null      local
[node1] (local) root@192.168.0.8 ~
$
```



c27u0c5m_c27u0jtmrepg00eprl60

IP
192.168.0.8

Memory
6.35% (253.9MiB / 3.906GiB)

CPU
0.15%

SSH
ssh ip172-18-0-77-c27u0c5mrepg00eprl3g@direct.labs.play

```
        "ConfigOnly": false,
        "Containers": {
            "2537157c6d0a1ba7a7b1923faf2fec7f728e6c43267dfd59eeb18882428908f6": {
                "Name": "great_villani",
                "EndpointID": "295c5bc25f6be455255357e87aff79ac65481587e690c04cf4f4c0eea42b2f6b",
                "MacAddress": "02:42:ac:13:00:03",
                "IPv4Address": "172.19.0.3/16",
                "IPv6Address": ""
            },
            "32668ac3b6bc4ccfc01335ed3e964a7910f276260fd92e3193762f558f01d5f1": {
                "Name": "compassionate_booth",
                "EndpointID": "d474d67190228975ae94c672e28475a44b8f5388ab4d25fa4135b4bed88dce73",
                "MacAddress": "02:42:ac:13:00:02",
                "IPv4Address": "172.19.0.2/16",
                "IPv6Address": ""
            }
        },
        "Options": {},
        "Labels": {}
    }
]
[node1] (local) root@192.168.0.8 ~
$
```