

Experiment 2 - Docker on Linux/Windows/Play-with-Docker

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Section – B

SRN – PES2UG19CS076

Task 1: Installing Docker Engine

```
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/

[node1] (local) root@192.168.0.8 ~
$
```

Task 2: Docker images and docker files

2a

```
Sending build context to Docker daemon      47MB
Step 1/6 : FROM ubuntu:18.04
--> dcf4d4bef137
Step 2/6 : RUN apt-get update
--> Using cache
--> 0e2c836e71f0
Step 3/6 : RUN apt-get install gcc -y
--> Using cache
--> 45c8cd5f3168
Step 4/6 : COPY program.c program.c
--> fa8483ee29d3
Step 5/6 : RUN gcc program.c
--> Running in 096e99d5c7fa
Removing intermediate container 096e99d5c7fa
--> b96cf6427d6f
Step 6/6 : CMD ["/a.out"]
--> Running in 3a00d66706d8
Removing intermediate container 3a00d66706d8
--> 05b512691863
Successfully built 05b512691863
Successfully tagged task2:latest
[node1] (local) root@192.168.0.8 ~
$
```

2b)

The screenshot shows the Docker Hub repository page for `pes2ug19cs076/task2`. The page has a navigation bar with tabs: General, Tags, Builds, Collaborators, Webhooks, and Settings. Below the navigation bar, there is a section for "Advanced Image Management" with a "View preview" link. The main content area shows the repository name `pes2ug19cs076/task2` and a note that the repository does not have a description. It also shows the last pushed time as "a minute ago". On the right, there is a "Docker commands" section with a "Public View" button and a command box containing `docker push pes2ug19cs076/task2:tagname`. Below this, there is a "Tags and Scans" section with a table showing one tag, `v4`, with OS `linux` and pushed time "a minute ago". There is also a "VULNERABILITY SCANNING - DISABLED" button and an "Automated Builds" section with an "Upgrade to Pro" button.

General Tags Builds Collaborators Webhooks Settings

Advanced Image Management
View all your images and tags in this repository, clean up unused content, recover untagged images. Available with Pro, Team and Business subscriptions. [View preview](#)

pes2ug19cs076/task2
This repository does not have a description

Last pushed: a minute ago

Docker commands [Public View](#)
To push a new tag to this repository,
`docker push pes2ug19cs076/task2:tagname`

Tags and Scans [VULNERABILITY SCANNING - DISABLED](#) [Enable](#)
This repository contains 1 tag(s).

TAG	OS	PULLED	PUSHED
v4	linux	---	a minute ago

[See all](#)

Automated Builds
Manually pushing images to Hub? Connect your account to GitHub or Bitbucket to automatically build and tag new images whenever your code is updated, so you can focus your time on creating.
Available with Pro, Team and Business subscriptions.
[Upgrade to Pro](#) [Learn more](#)

Task 3: Exposing ports,docker networks

3a)

My SRN is PES2UG19CS076>

I am running a nginx container!

3b)

```
/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
2022/02/18 14:31:57 [notice] 1#1: using the "epoll" event method
2022/02/18 14:31:57 [notice] 1#1: nginx/1.21.6
2022/02/18 14:31:57 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2022/02/18 14:31:57 [notice] 1#1: OS: Linux 4.4.0-210-generic
2022/02/18 14:31:57 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/02/18 14:31:57 [notice] 1#1: start worker processes
2022/02/18 14:31:57 [notice] 1#1: start worker process 32
2022/02/18 14:31:57 [notice] 1#1: start worker process 33
2022/02/18 14:31:57 [notice] 1#1: start worker process 34
2022/02/18 14:31:57 [notice] 1#1: start worker process 35
2022/02/18 14:31:57 [notice] 1#1: start worker process 36
2022/02/18 14:31:57 [notice] 1#1: start worker process 37
2022/02/18 14:31:57 [notice] 1#1: start worker process 38
2022/02/18 14:31:57 [notice] 1#1: start worker process 39
```

3c)

```
Sending build context to Docker daemon 47.01MB
Step 1/5 : FROM python
----> dfce7257b7ba
Step 2/5 : RUN apt-get update
----> Using cache
----> 95b81c0f6c94
Step 3/5 : RUN pip install pymongo
----> Using cache
----> 32c82fdc2144
Step 4/5 : COPY sample.py sample.py
----> 29636ed569e8
Step 5/5 : CMD ["python", "sample.py"]
----> Running in 4034d91dd39c
Removing intermediate container 4034d91dd39c
----> 3c637490ca8b
Successfully built 3c637490ca8b
Successfully tagged task3b:latest
[node1] (local) root@192.168.0.8 ~
$ docker run task3b
Inserted into the MongoDB database!
Fetched from MongoDB: {'_id': ObjectId('620fb487321c915532cf63ae'), 'Name': 'Pravena', 'SRN': 'PES2UG19CS076'}
[node1] (local) root@192.168.0.8 ~
$
```

3d)

```
Removing intermediate container 4034d91dd39c
----> 3c637490ca8b
Successfully built 3c637490ca8b
Successfully tagged task3b:latest
[node1] (local) root@192.168.0.8 ~
$ docker run task3b
Inserted into the MongoDB database!
Fetched from MongoDB: {'_id': ObjectId('620fb487321c915532cf63ae'), 'Name': 'Pravena', 'SRN': 'PES2UG19CS076'}
[node1] (local) root@192.168.0.8 ~
$ docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS                               NAMES
c64da2679066   mongo     "docker-entrypoint.s..." 20 minutes ago Up 20 minutes 0.0.0.0:27017->27017/tcp            trusting_zhukovsky
[node1] (local) root@192.168.0.8 ~
$ docker stop c64da2679066
c64da2679066
[node1] (local) root@192.168.0.8 ~
$ docker network create my-bridge-network
8b398451fd02eca764bb26d10b69daebd9d4821b341b552149c440e94b235345
[node1] (local) root@192.168.0.8 ~
$ docker run -dp 27017:27017 --network=my-bridge-network --name=mongodb mongo:latest
cf29eb5badf2cad3a08de88347b78ece81e5e2215bc63675f321a0d03545ea96
[node1] (local) root@192.168.0.8 ~
$
```

3e)

```
Sending build context to Docker daemon 47.01MB
Step 1/5 : FROM python
----> dfce7257b7ba
Step 2/5 : RUN apt-get update
----> Using cache
----> 95b81c0f6c94
Step 3/5 : RUN pip install pymongo
----> Using cache
----> 32c82fdc2144
Step 4/5 : COPY sample.py sample.py
----> 3cf3b6b5cc68
Step 5/5 : CMD ["python", "sample.py"]
----> Running in a24500859a00
Removing intermediate container a24500859a00
----> 7c1002ce2f69
Successfully built 7c1002ce2f69
Successfully tagged task3c:latest
[node1] (local) root@192.168.0.8 ~
$ docker run --network=my-bridge-network task3c
Inserted into the MongoDB database!
Fetched from MongoDB: {'_id': ObjectId('620fb60f3a28a9c87bb1c719'), 'Name': 'Pravena', 'SRN': 'PES2UG19CS076'}
[node1] (local) root@192.168.0.8 ~
$
```

Task 4: Docker compose

4a)

```
a", "attr": {"remote": "172.20.0.3:58050", "client": "conn3", "doc": {"driver": {"name": "PyMongo", "version": "4.0.1"}, "os": {"type": "Linux", "name": "Linux", "architecture": "x86_64", "version": "4.4.0-210-generic"}, "platform": "CPython 3.10.2.final.0"}}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:18:35.315+00:00"},"s":"I", "c":"STORAGE", "id":20320, "ctx":"conn2", "msg":"createCollection", "attr":{"namespace":"sample_db.sample_collection", "uuidDisposition":"generated", "uuid":{"uuid":{"$uuid":"d60d880f-f88d-478f-9a73-9f864ed2a228"}}}, "options":{}}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:18:35.322+00:00"},"s":"I", "c":"INDEX", "id":20345, "ctx":"conn2", "msg":"Index build: done building", "attr":{"buildUUID":null, "namespace":"sample_db.sample_collection", "index":"_id_", "commitTimestamp":null}}
pycode_1 | Inserted into the MongoDB database!
pycode_1 | Fetched from MongoDB: {'_id': ObjectId('620fb8cbd05f2e4e101d334c'), 'Name': 'Pravena', 'SRN': 'PES2UG19CS076'}
mongodb_1 | {"t":{"$date":"2022-02-18T15:18:35.812+00:00"},"s":"I", "c":"-", "id":20883, "ctx":"conn1", "msg":"Interrupted operation as its client disconnected", "attr":{"opId":13}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:18:35.813+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn1", "msg":"Connection ended", "attr":{"remote":"172.20.0.3:58046", "uuid":"0d3cc192-1ca9-4b29-bd91-5afe1067564d", "connectionId":1, "connectionCount":2}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:18:35.821+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn2", "msg":"Connection ended", "attr":{"remote":"172.20.0.3:58048", "uuid":"9852d7ea-bb12-4629-8091-990f3fe2c4c2", "connectionId":2, "connectionCount":1}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:18:35.821+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn3", "msg":"Connection ended", "attr":{"remote":"172.20.0.3:58050", "uuid":"25861d9b-737e-42a4-95c7-25e5db4f3a7a", "connectionId":3, "connectionCount":0}}
root_pycode_1 exited with code 0
mongodb_1 | {"t":{"$date":"2022-02-18T15:19:35.250+00:00"},"s":"I", "c":"STORAGE", "id":22430, "ctx":"Checkpoint", "msg":"WiredTiger message", "attr":{"message":"[1645197575:250226][1:0x7fcla3e50700], WT_SESSION.checkpoint: [WT_VERB_CHECKPOINT_PROGRESS] saving checkpoint snapshot min: 42, snapshot max: 42 snapshot count: 0, oldest timestamp: (0, 0) , meta checkpoint timestamp: (0, 0) base write generation: 1"}}
n: 1"}}
```

4b)

```
[node1] (local) root@192.168.0.8 ~
$ docker-compose up --scale pycode=3
Starting root_mongodb_1 ... done
Starting root_pycode_1 ... done
Creating root_pycode_2 ... done
Creating root_pycode_3 ... done
Attaching to root_mongodb_1, root_pycode_1, root_pycode_2, root_pycode_3
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:14.989+00:00"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"-", "msg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:14.990+00:00"},"s":"I", "c":"NETWORK", "id":4915701, "ctx":"main", "msg":"Initialized wire specification", "attr":{"spec":{"incomingExternalClient":{"minWireVersion":0, "maxWireVersion":13}, "incomingInternalClient":{"minWireVersion":0, "maxWireVersion":13}, "outgoing":{"minWireVersion":0, "maxWireVersion":13}, "isInternalClient":true}}}
pycode_2 | Inserted into the MongoDB database!
pycode_2 | Fetched from MongoDB: {'_id': ObjectId('620fb8cbd05f2e4e101d334c'), 'Name': 'Pravena', 'SRN': 'PES2UG19CS076'}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:14.993+00:00"},"s":"W", "c":"ASIO", "id":22601, "ctx":"main", "msg":"No TransportLayer configured during NetworkInterface startup"}
pycode_1 | Inserted into the MongoDB database!
pycode_1 | Fetched from MongoDB: {'_id': ObjectId('620fb8cbd05f2e4e101d334c'), 'Name': 'Pravena', 'SRN': 'PES2UG19CS076'}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:14.994+00:00"},"s":"I", "c":"NETWORK", "id":4648601, "ctx":"main", "msg":"Implicit TCP Fastopen unavailable. If TCP Fastopen is required, set tcpFastopenServer, tcpFastopenClient, and tcpFastopenQueueSize."}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:14.997+00:00"},"s":"W", "c":"ASIO", "id":22601, "ctx":"main", "msg":"No TransportLayer configured during NetworkInterface startup"}
```

```
ed", "attr":{"remote":"172.20.0.4:57228", "uuid":"2b9baa97-e29f-4899-af21-22f0898cfe61", "connectionId":6, "connectionCount":1}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:18.595+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn5", "msg":"Connection ended", "attr":{"remote":"172.20.0.4:57226", "uuid":"88ecd3bc-c3c3-496c-ae0a-46da48d451e3", "connectionId":5, "connectionCount":0}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:18.976+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener", "msg":"Connection accepted", "attr":{"remote":"172.20.0.5:59762", "uuid":"5adba3fb-fd97-4213-a233-0bd1f0ceb231", "connectionId":7, "connectionCount":1}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:18.977+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn7", "msg":"client metadata", "attr":{"remote":"172.20.0.5:59762", "client":"conn7", "doc":{"driver":{"name":"PyMongo", "version":"4.0.1"}, "os":{"type":"Linux", "name":"Linux", "architecture":"x86_64", "version":"4.4.0-210-generic"}, "platform":"CPython 3.10.2.final.0"}}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:18.981+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener", "msg":"Connection accepted", "attr":{"remote":"172.20.0.5:59764", "uuid":"497c2bce-d328-48a3-8dc8-alb20cd783dc", "connectionId":8, "connectionCount":2}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:18.981+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener", "msg":"Connection accepted", "attr":{"remote":"172.20.0.5:59766", "uuid":"d54b88cb-476e-45f4-bdca-3b42190cd673", "connectionId":9, "connectionCount":3}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:18.982+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn9", "msg":"client metadata", "attr":{"remote":"172.20.0.5:59766", "client":"conn9", "doc":{"driver":{"name":"PyMongo", "version":"4.0.1"}, "os":{"type":"Linux", "name":"Linux", "architecture":"x86_64", "version":"4.4.0-210-generic"}, "platform":"CPython 3.10.2.final.0"}}}
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:18.982+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn8", "msg":"client metadata", "attr":{"remote":"172.20.0.5:59764", "client":"conn8", "doc":{"driver":{"name":"PyMongo", "version":"4.0.1"}, "os":{"type":"Linux", "name":"Linux", "architecture":"x86_64", "version":"4.4.0-210-generic"}, "platform":"CPython 3.10.2.final.0"}}}
pycode_3 | Inserted into the MongoDB database!
pycode_3 | Fetched from MongoDB: {'_id': ObjectId('620fb8cbd05f2e4e101d334c'), 'Name': 'Pravena', 'SRN': 'PES2UG19CS076'}
root_pycode_2 exited with code 0
mongodb_1 | {"t":{"$date":"2022-02-18T15:22:19.481+00:00"},"s":"I", "c":"-", "id":20883, "ctx":"conn7", "msg":"Interrupted operation as its client disconnected", "attr":{"opId":42}}
```