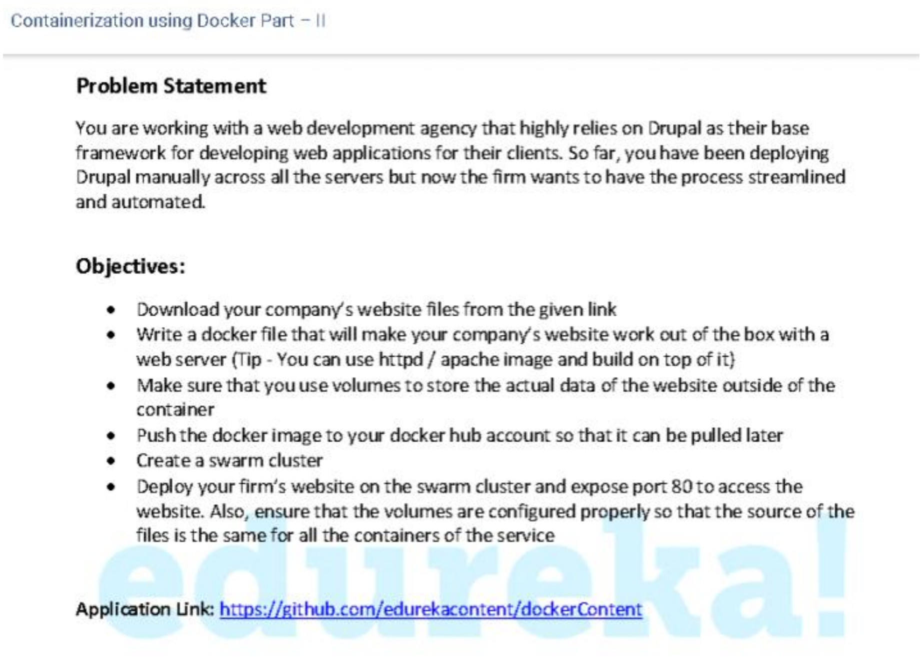
# CASE_STUDY_6_Docker



Containerization using Docker Part – II

**Problem Statement**

You are working with a web development agency that highly relies on Drupal as their base framework for developing web applications for their clients. So far, you have been deploying Drupal manually across all the servers but now the firm wants to have the process streamlined and automated.

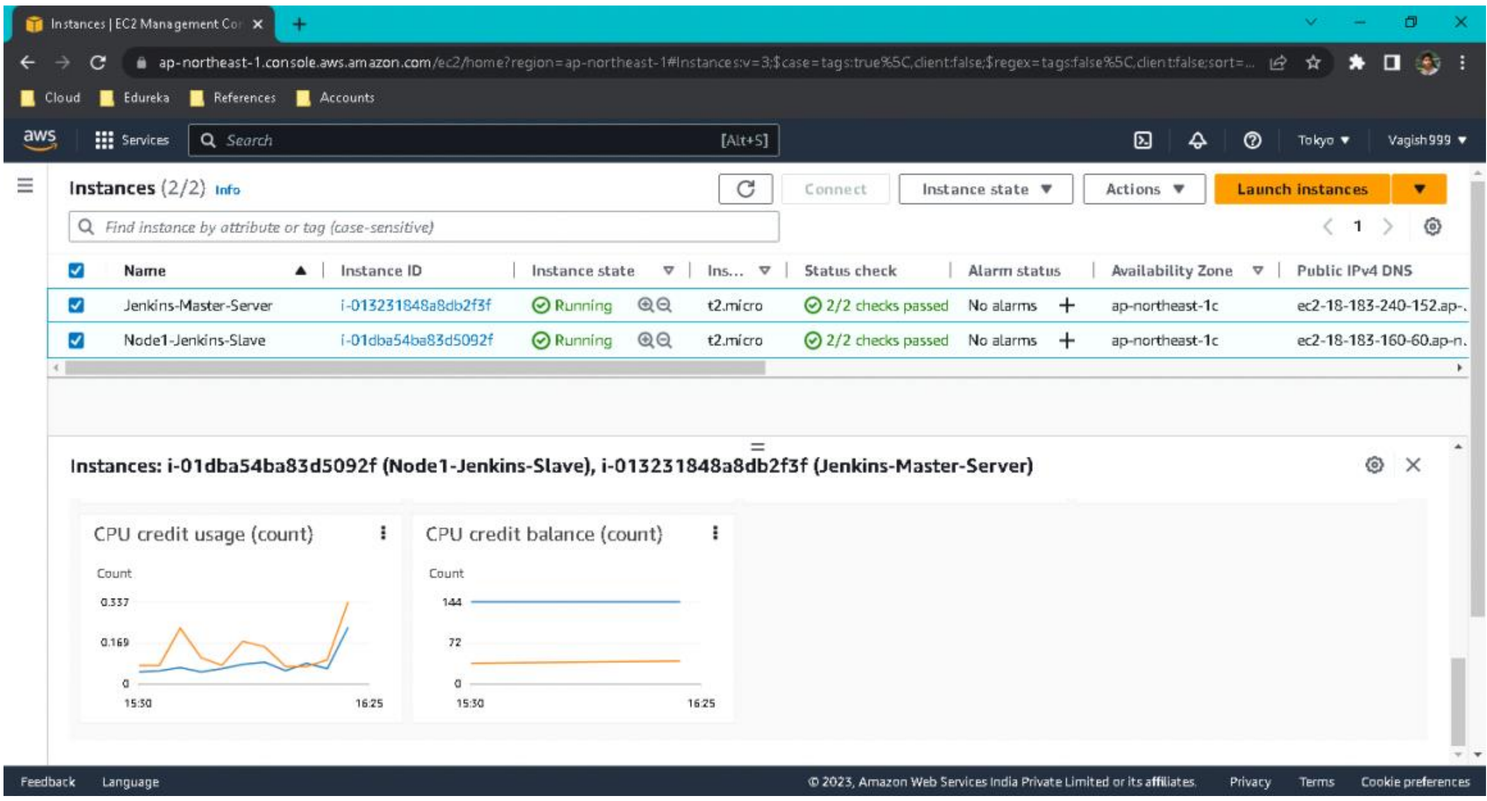
**Objectives:**

- Download your company's website files from the given link
- Write a docker file that will make your company's website work out of the box with a web server (Tip - You can use httpd / apache image and build on top of it)
- Make sure that you use volumes to store the actual data of the website outside of the container
- Push the docker image to your docker hub account so that it can be pulled later
- Create a swarm cluster
- Deploy your firm's website on the swarm cluster and expose port 80 to access the website. Also, ensure that the volumes are configured properly so that the source of the files is the same for all the containers of the service

**Application Link:** https://github.com/edurekacontent/dockerContent

Solution:
-> Used AWS to get two VM instances used as Manager and Worked Node for Swarm cluster.
-> Used GIT checkout to get Website code within both the Nodes.

1. AWS Nodes Created : Master and Slave

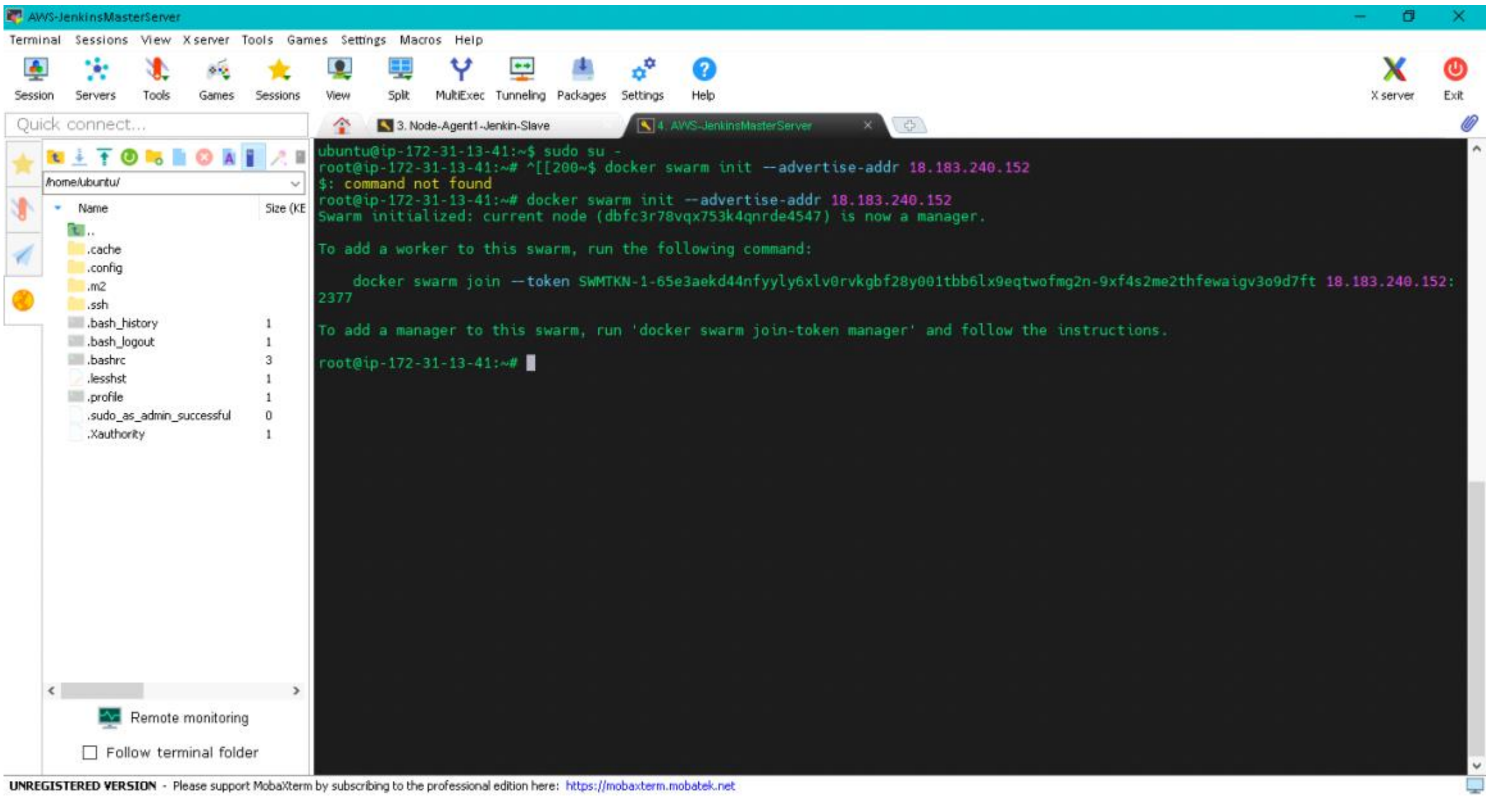


Instances (2/2)

| Name | Instance ID | Instance state | Ins... | Status check | Alarm status | Availability Zone | Public IPv4 DNS |
|---|---|---|---|---|---|---|---|
| Jenkins-Master-Server | i-013231848a8db2f3f | Running | t2.micro | 2/2 checks passed | No alarms | ap-northeast-1c | ec2-18-183-240-152.ap-. |
| Node1-Jenkins-Slave | i-01dba54ba83d5092f | Running | t2.micro | 2/2 checks passed | No alarms | ap-northeast-1c | ec2-18-183-160-60.ap-n. |

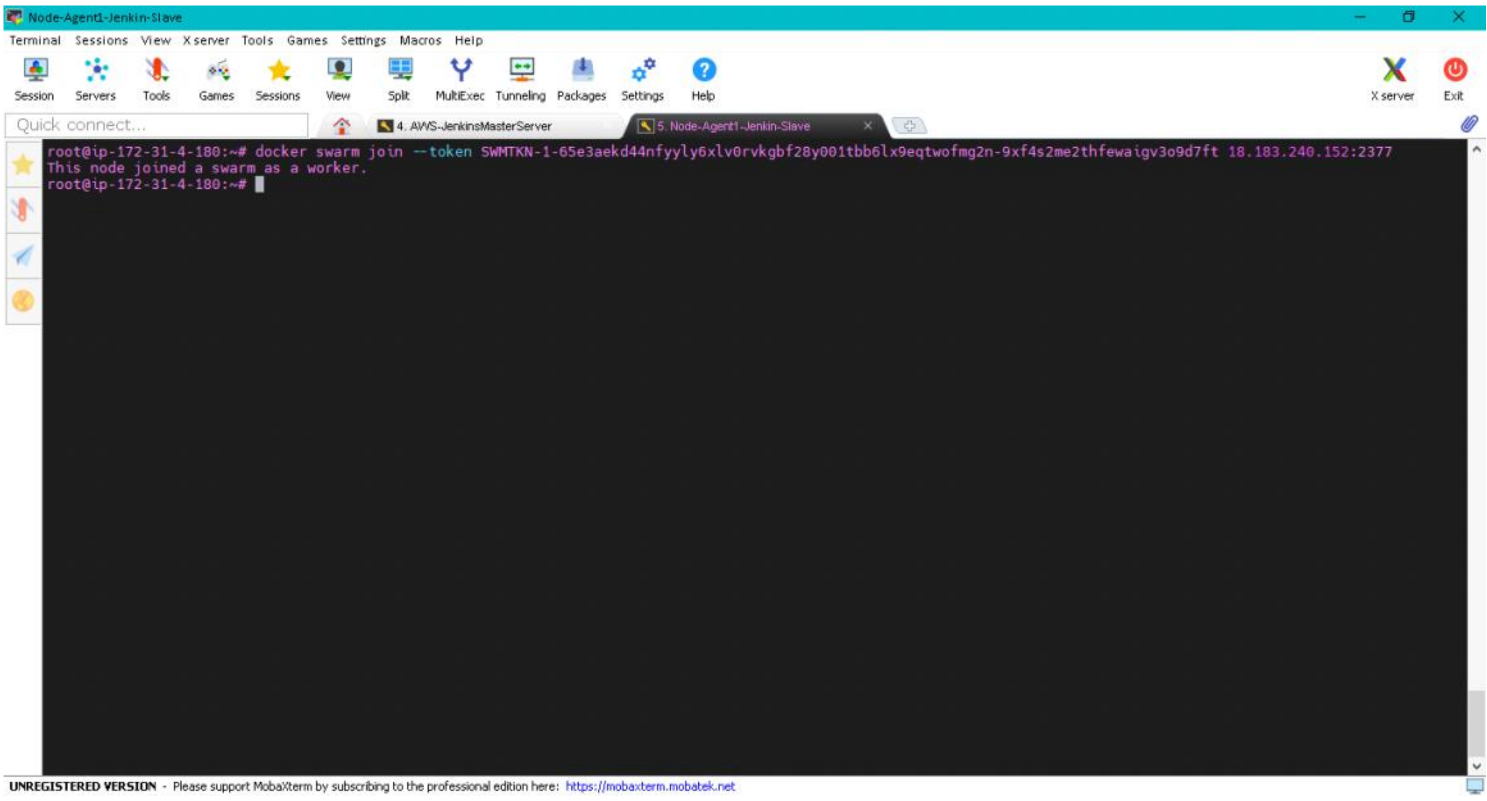
Instances: i-01dba54ba83d5092f (Node1-Jenkins-Slave), i-013231848a8db2f3f (Jenkins-Master-Server)

## 2. Initiating Docker Swarm in Manager Node



```
ubuntu@ip-172-31-13-41:~$ sudo su -
root@ip-172-31-13-41:~# ^[[200~$ docker swarm init --advertise-addr 18.183.240.152
$: command not found
root@ip-172-31-13-41:~# docker swarm init --advertise-addr 18.183.240.152
Swarm initialized: current node (dbfc3r78vqx753k4qnrde4547) is now a manager.

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

    docker swarm join --token SWMTKN-1-65e3aekd44nfyyly6xlv0rvkgbf28y001tbb6lx9eqtwofmg2n-9xf4s2me2thfewaigv3o9d7ft 18.183.240.152:
2377

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

root@ip-172-31-13-41:~# 
```

## 3. Joining Worker Node in Docker Swarm Cluster


Node-Agent1-Jenkin-Slave
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help X server Exit
Quick connect...
4. AWS-JenkinsMasterServer
5. Node-Agent1-Jenkin-Slave
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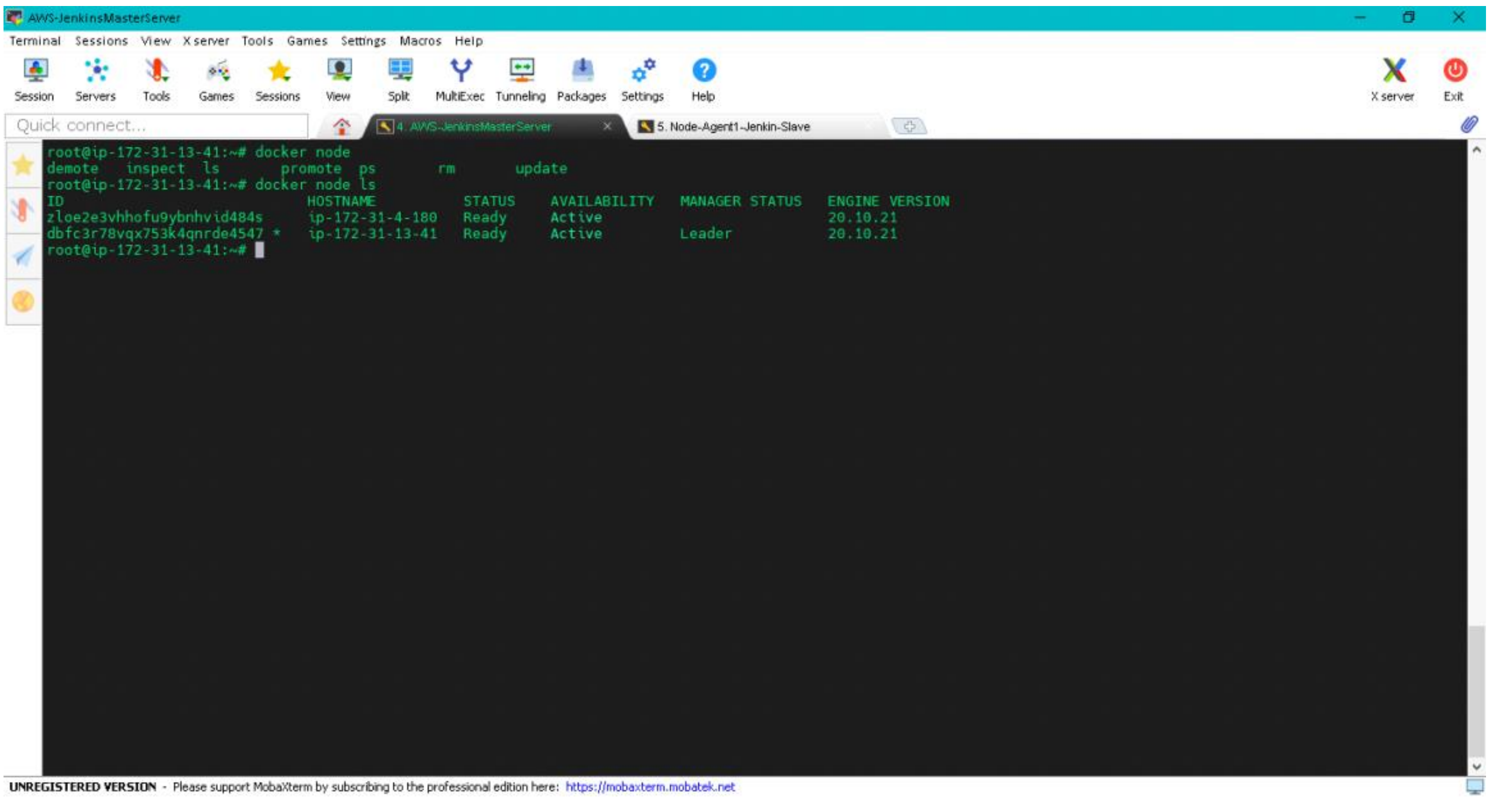
```
root@ip-172-31-4-180:~# docker swarm join --token SWMTKN-1-65e3aekd44nfyyly6xlv0rvkgbf28y001tbb6lx9eqtwofmg2n-9xf4s2me2thfewaigv3o9d7ft 18.183.240.152:2377
This node joined a swarm as a worker.
root@ip-172-31-4-180:~# 
```

4. Both the nodes are linked now.


AWS-JenkinsMasterServer
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help X server Exit
Quick connect...
4. AWS-JenkinsMasterServer
5. Node-Agent1-Jenkin-Slave
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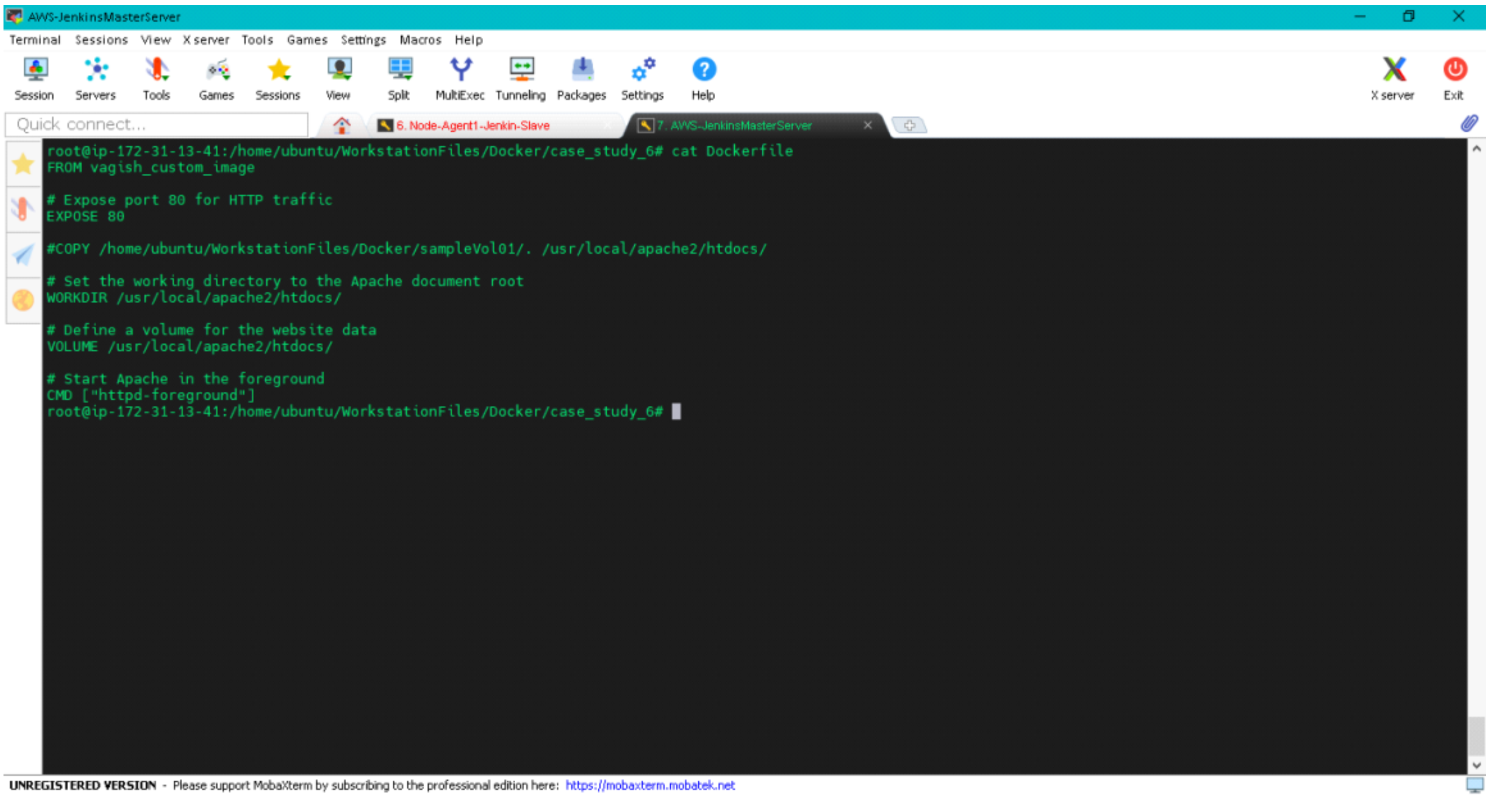
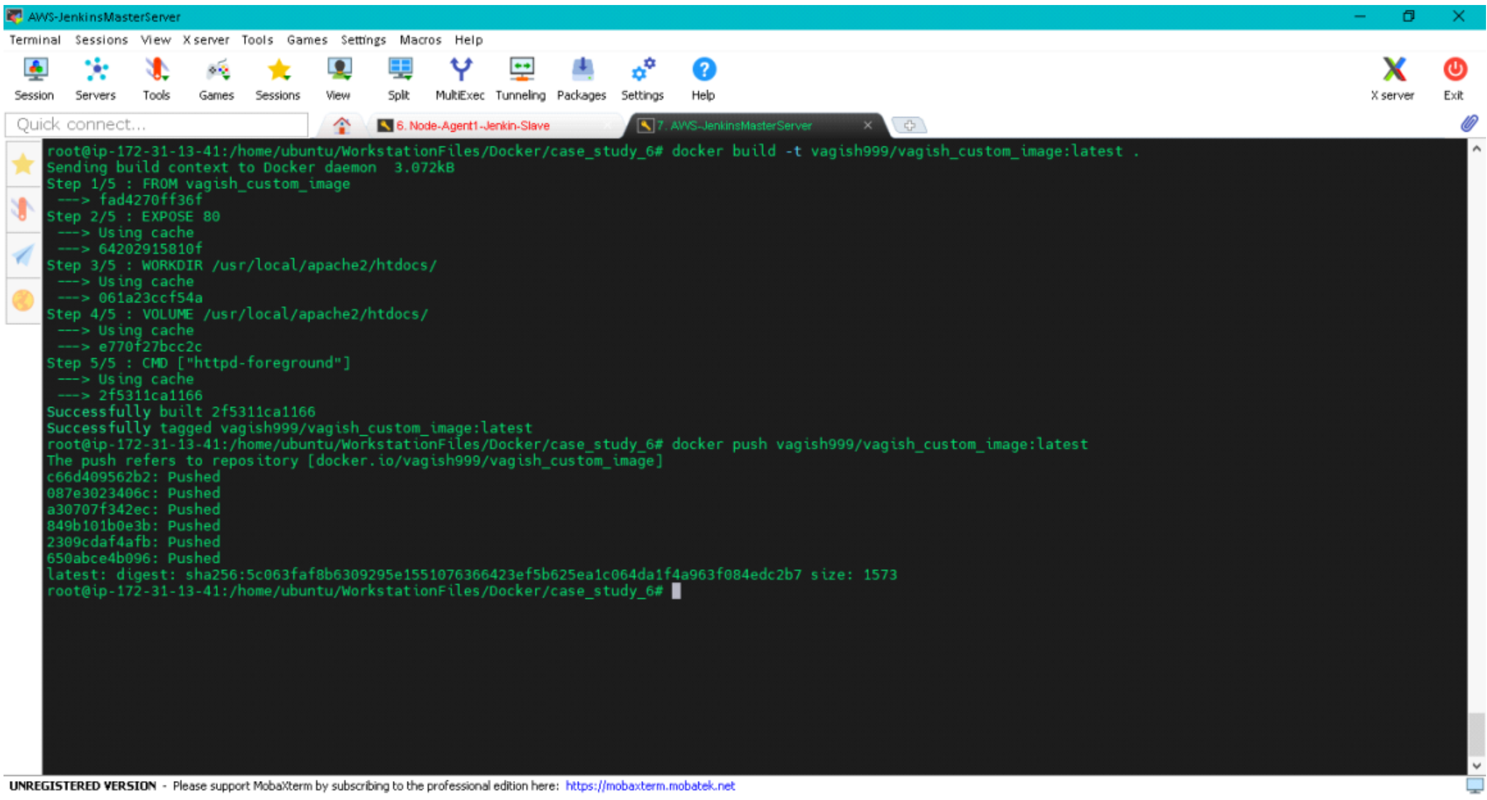
```
root@ip-172-31-13-41:~# docker node
demote   inspect  ls       promote  ps       rm       update
root@ip-172-31-13-41:~# docker node ls
ID                            HOSTNAME          STATUS    AVAILABILITY   MANAGER STATUS   ENGINE VERSION
zloe2e3vhhofu9ybnhvid484s     ip-172-31-4-180   Ready     Active                          20.10.21
dbfc3r78vqx753k4qnrde4547 *   ip-172-31-13-41   Ready     Active         Leader           20.10.21
root@ip-172-31-13-41:~# 
```

5. Creating  Dockerfile to initiate server
   for website using custom Docker image
   and external Volume exposing Port 80



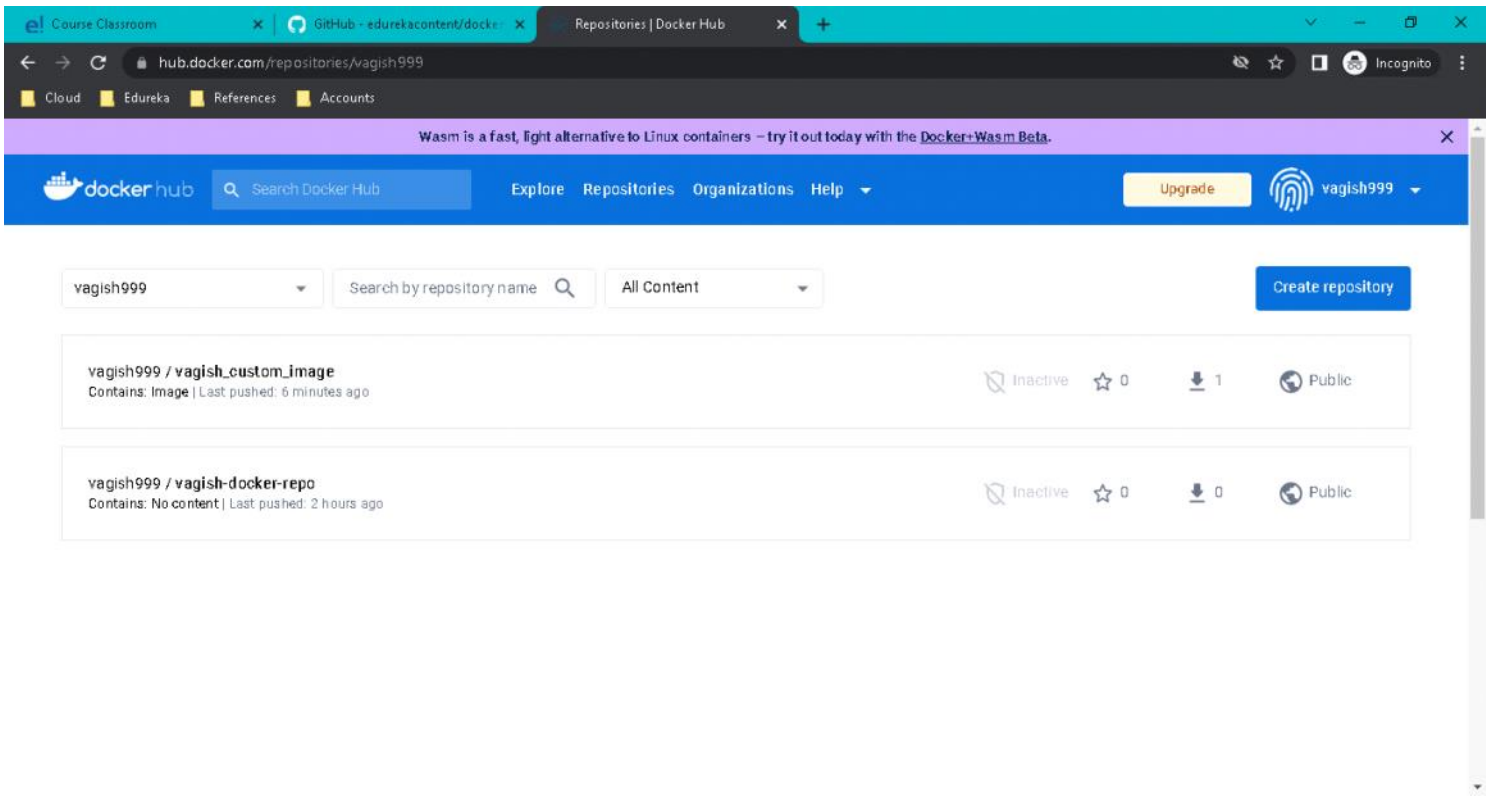
```
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# cat Dockerfile
FROM vagish_custom_image

# Expose port 80 for HTTP traffic
EXPOSE 80

#COPY /home/ubuntu/WorkstationFiles/Docker/sampleVol01/. /usr/local/apache2/htdocs/

# Set the working directory to the Apache document root
WORKDIR /usr/local/apache2/htdocs/

# Define a volume for the website data
VOLUME /usr/local/apache2/htdocs/

# Start Apache in the foreground
CMD ["httpd-foreground"]
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6#
```

6. Pushing Custom Docker image from Manager Node into Docker Hub



```
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# docker build -t vagish999/vagish_custom_image:latest .
Sending build context to Docker daemon  3.072kB
Step 1/5 : FROM vagish_custom_image
 ---> fad4270ff36f
Step 2/5 : EXPOSE 80
 ---> Using cache
 ---> 64202915810f
Step 3/5 : WORKDIR /usr/local/apache2/htdocs/
 ---> Using cache
 ---> 061a23ccf54a
Step 4/5 : VOLUME /usr/local/apache2/htdocs/
 ---> Using cache
 ---> e770f27bcc2c
Step 5/5 : CMD ["httpd-foreground"]
 ---> Using cache
 ---> 2f5311ca1166
Successfully built 2f5311ca1166
Successfully tagged vagish999/vagish_custom_image:latest
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# docker push vagish999/vagish_custom_image:latest
The push refers to repository [docker.io/vagish999/vagish_custom_image]
c66d409562b2: Pushed
087e3023406c: Pushed
a30707f342ec: Pushed
849b101b0e3b: Pushed
2309cdaf4afb: Pushed
650abce4b096: Pushed
latest: digest: sha256:5c063faf8b6309295e1551076366423ef5b625ea1c064da1f4a963f084edc2b7 size: 1573
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6#
```

7. Custom docker image pushed into Docker hub


Course Classroom
GitHub - edurekacontent/docke
Repositories | Docker Hub
hub.docker.com/repositories/vagish999
Incognito
Cloud
Edureka
References
Accounts
Wasm is a fast, light alternative to Linux containers – try it out today with the Docker+Wasm Beta.
docker hub
Search Docker Hub
Explore
Repositories
Organizations
Help
Upgrade
vagish999

vagish999

Search by repository name

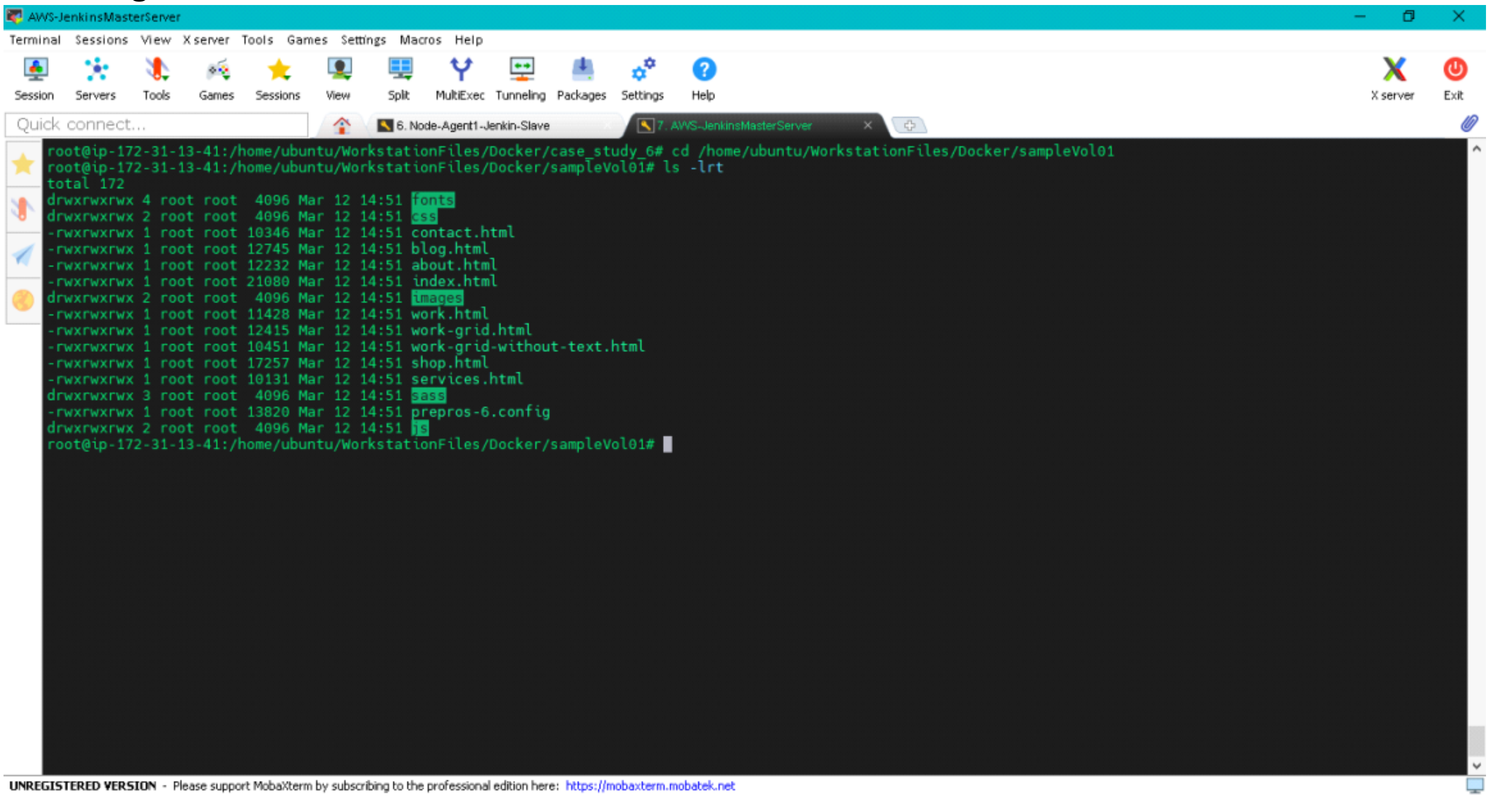
All Content

Create repository

vagish999 / vagish_custom_image
Contains: Image | Last pushed: 6 minutes ago — Inactive — 0 — 1 — Public

vagish999 / vagish-docker-repo
Contains: No content | Last pushed: 2 hours ago — Inactive — 0 — 0 — Public

8. Checked out shared website data into Manager node from GIT.



```
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# cd /home/ubuntu/WorkstationFiles/Docker/sampleVol01
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/sampleVol01# ls -lrt
total 172
drwxrwxrwx 4 root root  4096 Mar 12 14:51 fonts
drwxrwxrwx 2 root root  4096 Mar 12 14:51 css
-rwxrwxrwx 1 root root 10346 Mar 12 14:51 contact.html
-rwxrwxrwx 1 root root 12745 Mar 12 14:51 blog.html
-rwxrwxrwx 1 root root 12232 Mar 12 14:51 about.html
-rwxrwxrwx 1 root root 21080 Mar 12 14:51 index.html
drwxrwxrwx 2 root root  4096 Mar 12 14:51 images
-rwxrwxrwx 1 root root 11428 Mar 12 14:51 work.html
-rwxrwxrwx 1 root root 12415 Mar 12 14:51 work-grid.html
-rwxrwxrwx 1 root root 10451 Mar 12 14:51 work-grid-without-text.html
-rwxrwxrwx 1 root root 17257 Mar 12 14:51 shop.html
-rwxrwxrwx 1 root root 10131 Mar 12 14:51 services.html
drwxrwxrwx 3 root root  4096 Mar 12 14:51 sass
-rwxrwxrwx 1 root root 13820 Mar 12 14:51 prepros-6.config
drwxrwxrwx 2 root root  4096 Mar 12 14:51 js
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/sampleVol01# 
```

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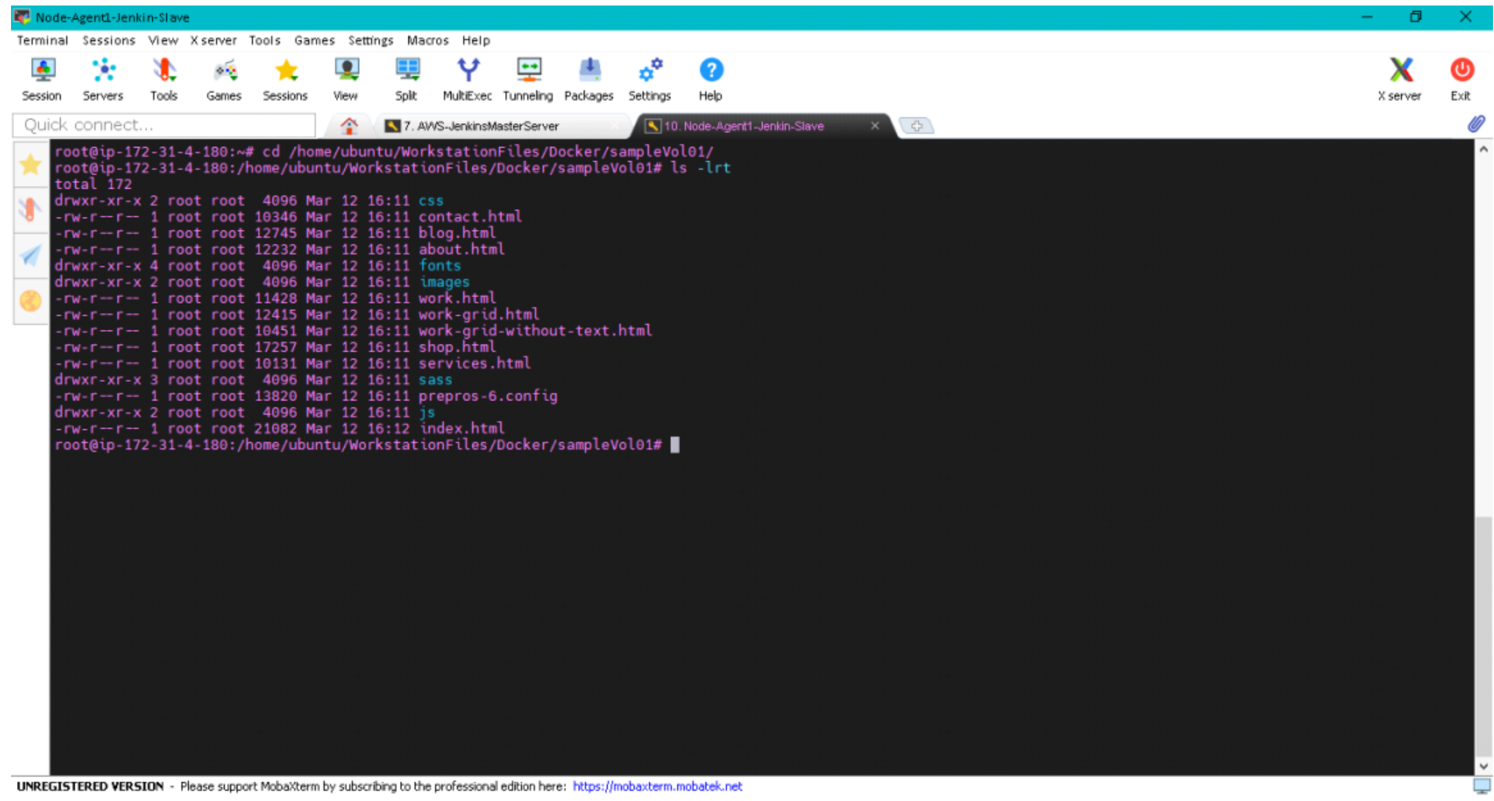
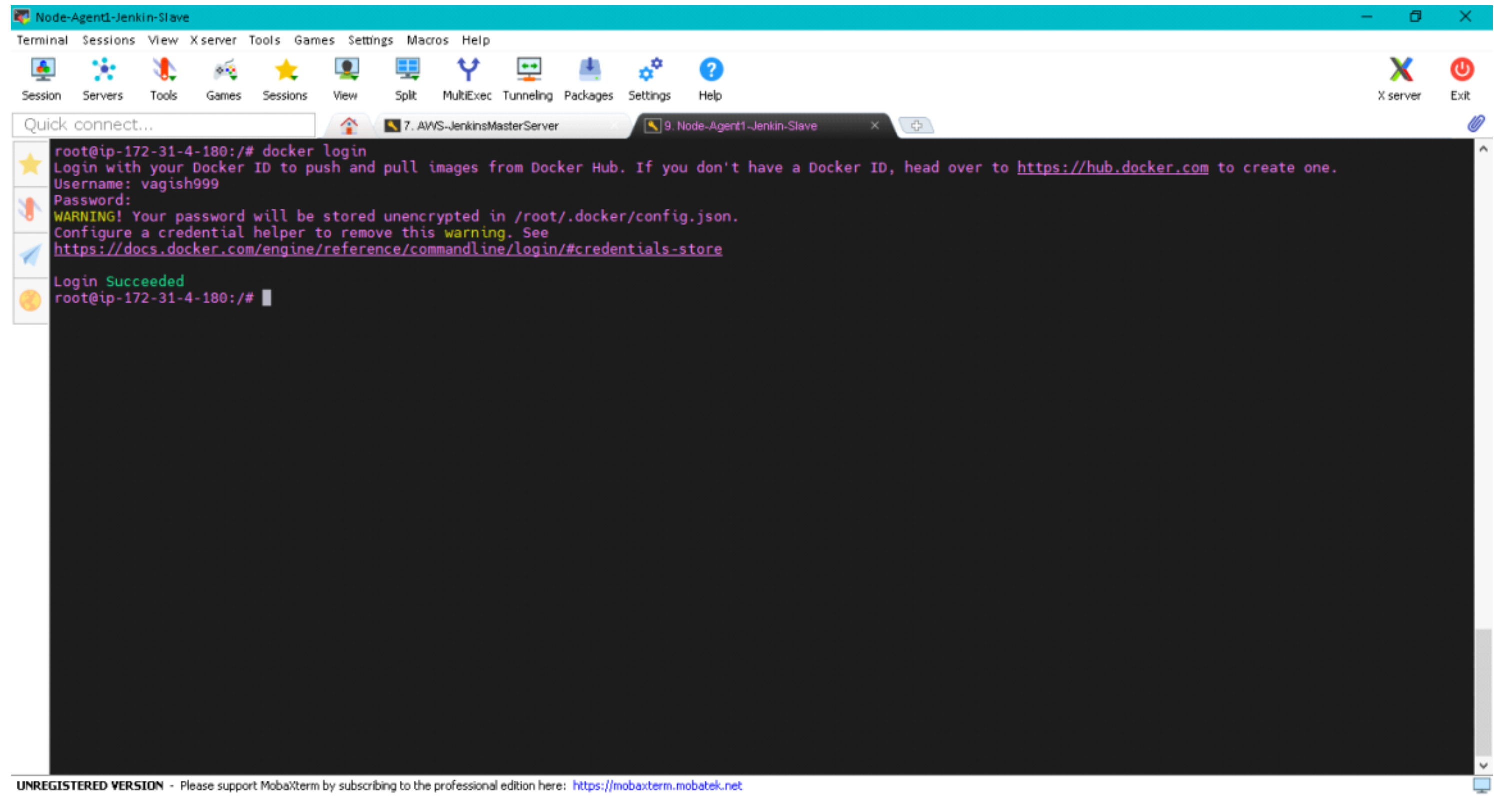
9. Checked out shared website data into Worker Node from GIT.



```
root@ip-172-31-4-180:~# cd /home/ubuntu/WorkstationFiles/Docker/sampleVol01/
root@ip-172-31-4-180:/home/ubuntu/WorkstationFiles/Docker/sampleVol01# ls -lrt
total 172
drwxr-xr-x 2 root root  4096 Mar 12 16:11 css
-rw-r--r-- 1 root root 10346 Mar 12 16:11 contact.html
-rw-r--r-- 1 root root 12745 Mar 12 16:11 blog.html
-rw-r--r-- 1 root root 12232 Mar 12 16:11 about.html
drwxr-xr-x 4 root root  4096 Mar 12 16:11 fonts
drwxr-xr-x 2 root root  4096 Mar 12 16:11 images
-rw-r--r-- 1 root root 11428 Mar 12 16:11 work.html
-rw-r--r-- 1 root root 12415 Mar 12 16:11 work-grid.html
-rw-r--r-- 1 root root 10451 Mar 12 16:11 work-grid-without-text.html
-rw-r--r-- 1 root root 17257 Mar 12 16:11 shop.html
-rw-r--r-- 1 root root 10131 Mar 12 16:11 services.html
drwxr-xr-x 3 root root  4096 Mar 12 16:11 sass
-rw-r--r-- 1 root root 13820 Mar 12 16:11 prepros-6.config
drwxr-xr-x 2 root root  4096 Mar 12 16:11 js
-rw-r--r-- 1 root root 21082 Mar 12 16:12 index.html
root@ip-172-31-4-180:/home/ubuntu/WorkstationFiles/Docker/sampleVol01#
```

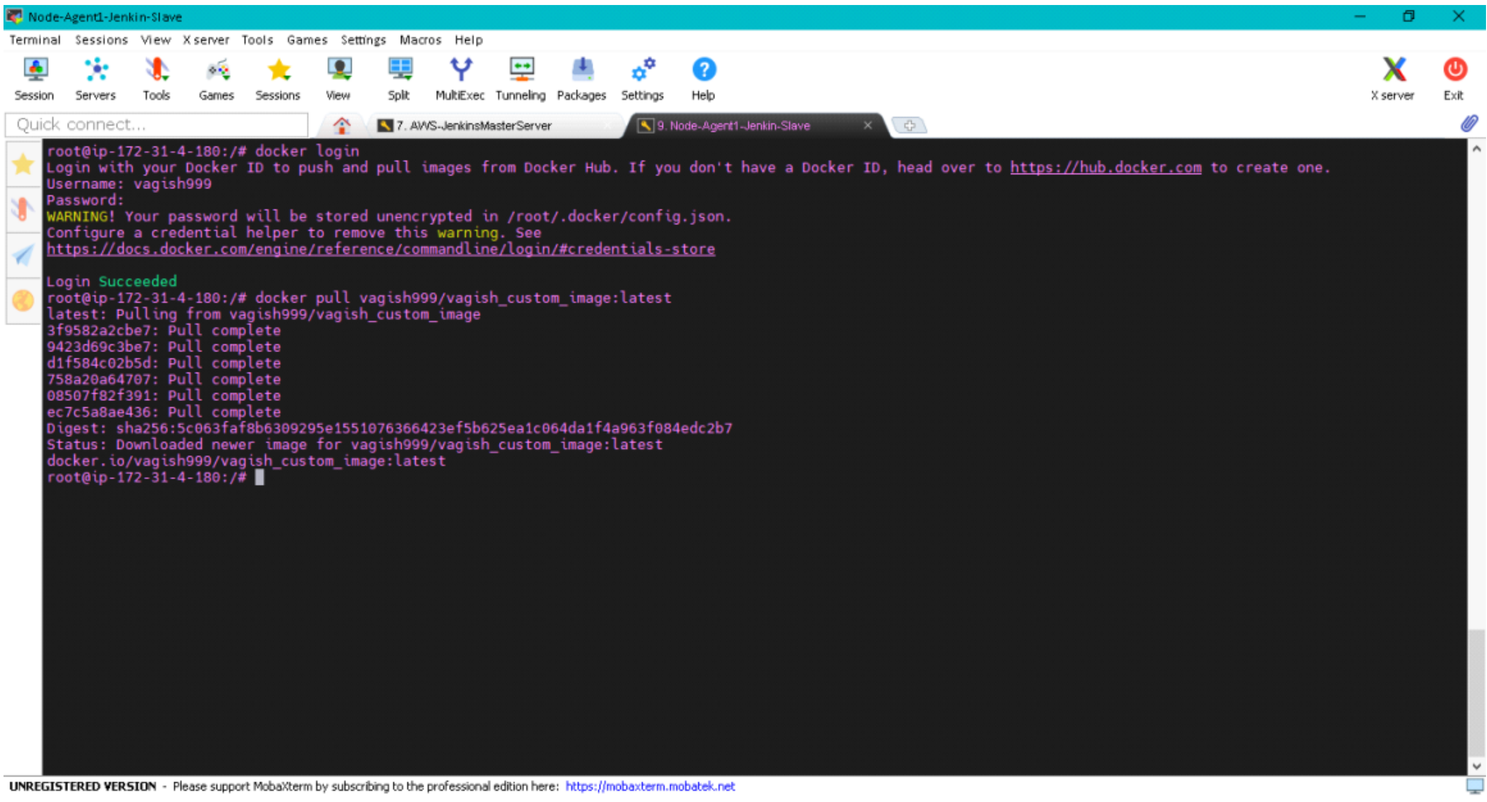
10. Login into Docker Hub from Worker Node



```
root@ip-172-31-4-180:/# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.
Username: vagish999
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
root@ip-172-31-4-180:/#
```

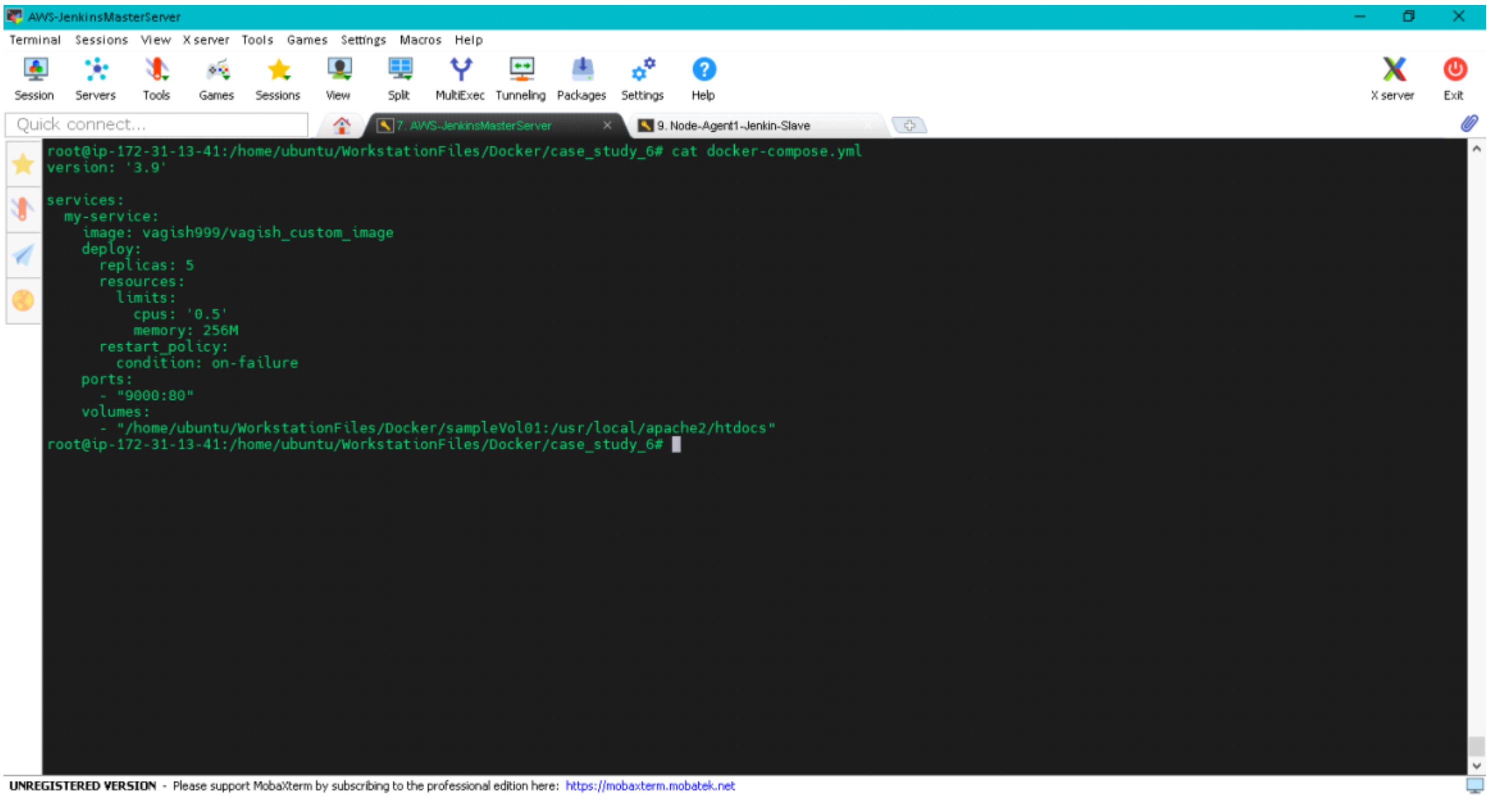
11. Pulling Custom image pushed from Manager node in Worker Node from Docker Hub


Node-Agent1-Jenkin-Slave
7. AWS-JenkinsMasterServer
9. Node-Agent1-Jenkin-Slave
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: https://mobaxterm.mobatek.net

```
root@ip-172-31-4-180:/# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.
Username: vagish999
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
root@ip-172-31-4-180:/# docker pull vagish999/vagish_custom_image:latest
latest: Pulling from vagish999/vagish_custom_image
3f9582a2cbe7: Pull complete
9423d69c3be7: Pull complete
d1f584c02b5d: Pull complete
758a20a64707: Pull complete
08507f82f391: Pull complete
ec7c5a8ae436: Pull complete
Digest: sha256:5c063faf8b6309295e1551076366423ef5b625ea1c064da1f4a963f084edc2b7
Status: Downloaded newer image for vagish999/vagish_custom_image:latest
docker.io/vagish999/vagish_custom_image:latest
root@ip-172-31-4-180:/#
```

12. Creating docker-compose.yml to deploy & run website using Custom Docker image in Docker Swarm Cluster (i.e. Manager & Worker node both)
    Note: Volume is mapped from external folder.


AWS-JenkinsMasterServer
7. AWS-JenkinsMasterServer
9. Node-Agent1-Jenkin-Slave
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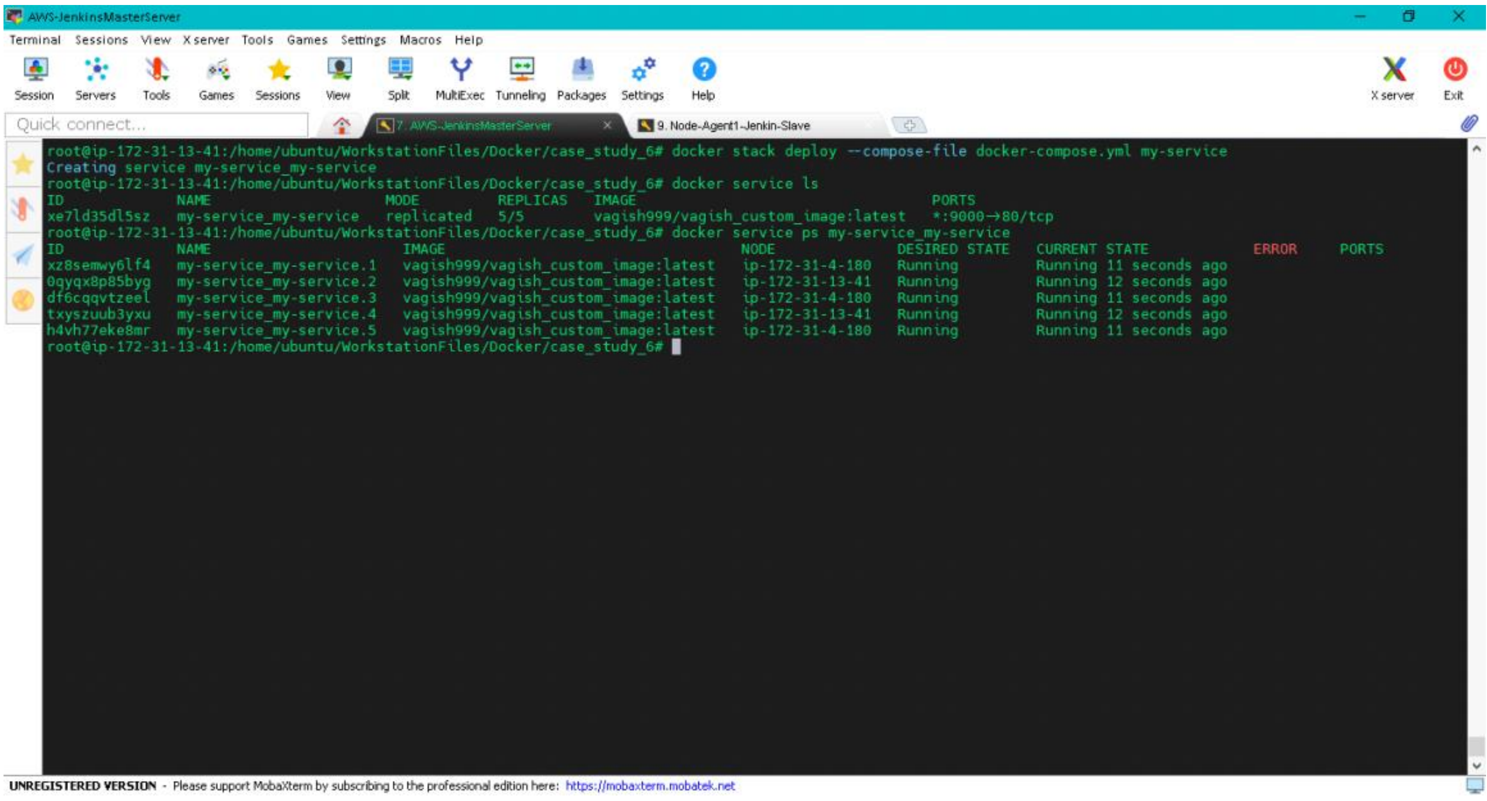
```
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# cat docker-compose.yml
version: '3.9'

services:
  my-service:
    image: vagish999/vagish_custom_image
    deploy:
      replicas: 5
      resources:
        limits:
          cpus: '0.5'
          memory: 256M
      restart_policy:
        condition: on-failure
    ports:
      - "9000:80"
    volumes:
      - "/home/ubuntu/WorkstationFiles/Docker/sampleVol01:/usr/local/apache2/htdocs"
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6#
```

13. Deploying docker-compose into Docker Swarm cluster


AWS-JenkinsMasterServer
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help X server Exit
Quick connect...
7. AWS-JenkinsMasterServer
9. Node-Agent1-Jenkin-Slave

```
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# docker stack deploy --compose-file docker-compose.yml my-service
Creating service my-service_my-service
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# docker service ls
ID             NAME                    MODE         REPLICAS   IMAGE                                  PORTS
xe7ld35dl5sz   my-service_my-service   replicated   5/5        vagish999/vagish_custom_image:latest   *:9000->80/tcp
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# docker service ps my-service_my-service
ID             NAME                      IMAGE                                  NODE              DESIRED STATE   CURRENT STATE            ERROR     PORTS
xz8semwy6lf4   my-service_my-service.1   vagish999/vagish_custom_image:latest   ip-172-31-4-180   Running         Running 11 seconds ago
0qyqx8p85byg   my-service_my-service.2   vagish999/vagish_custom_image:latest   ip-172-31-13-41   Running         Running 12 seconds ago
df6cqqvtzeel   my-service_my-service.3   vagish999/vagish_custom_image:latest   ip-172-31-4-180   Running         Running 11 seconds ago
txyszuub3yxu   my-service_my-service.4   vagish999/vagish_custom_image:latest   ip-172-31-13-41   Running         Running 12 seconds ago
h4vh77eke8mr   my-service_my-service.5   vagish999/vagish_custom_image:latest   ip-172-31-4-180   Running         Running 11 seconds ago
root@ip-172-31-13-41:/home/ubuntu/WorkstationFiles/Docker/case_study_6# 
```

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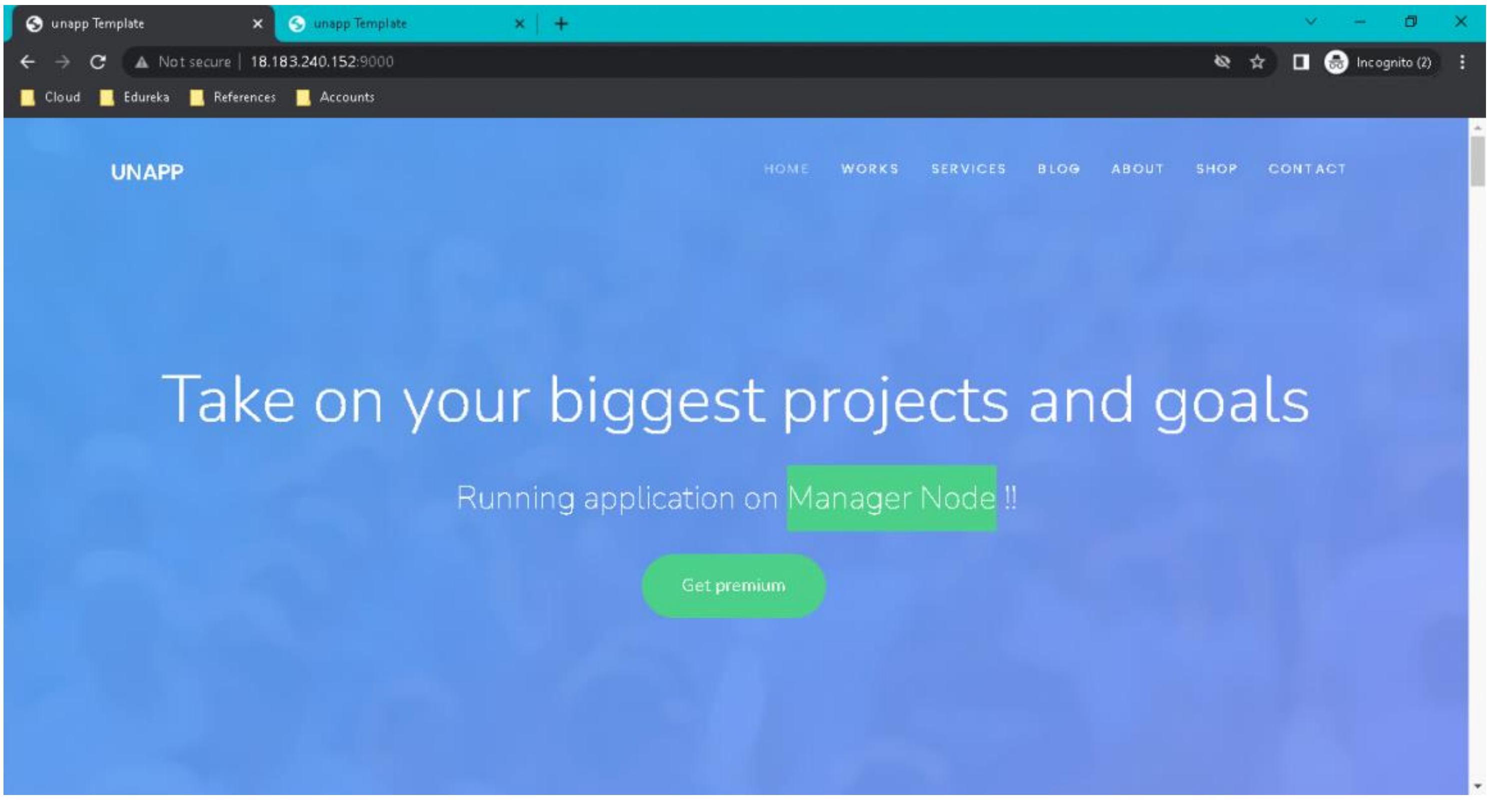
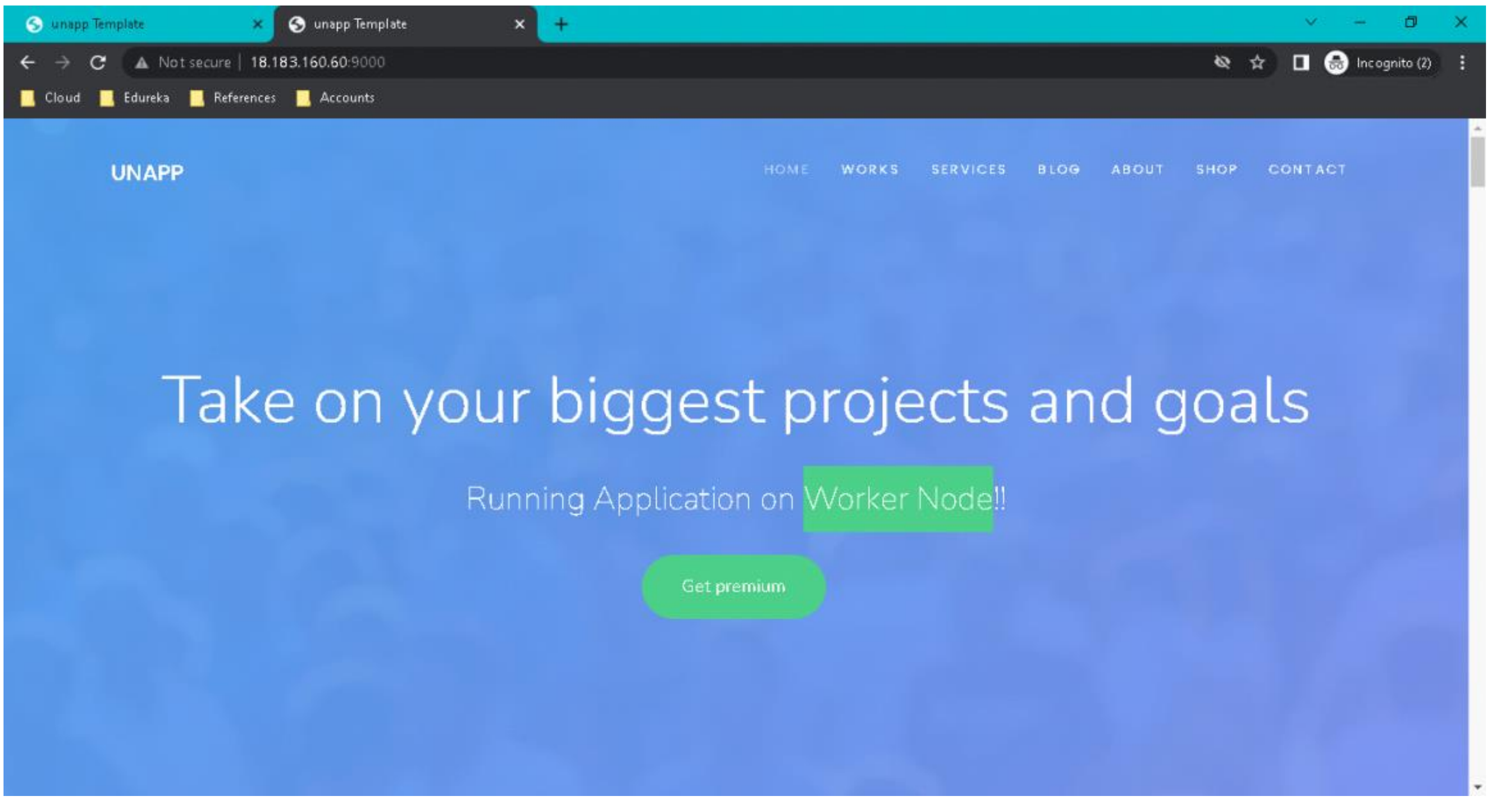
14. Manager Node Result


unapp Template
unapp Template
Not secure | 18.183.240.152:9000
Incognito (2)
Cloud
Edureka
References
Accounts
UNAPP
HOME WORKS SERVICES BLOG ABOUT SHOP CONTACT
Take on your biggest projects and goals
Running application on Manager Node !!
Get premium

15. Worker node Result



Uploaded PDF with consolidated Screenshots.
Below tasks are performed:

1. Created 2 AWS VM instance to be used as manager & worker node in Docker Swarm
2. Created Docker Swarm Cluster
3. Checked out GIT code shared in case study.
4. Created Docker Image and pushed into Docker hub from Manager node
5. Custom Docker image pulled into Worker node.
6. Created docker-compose.yaml to deploy website via Docker image into Docker Swarm Cluster.
7. Accessed website page using Public Ip of Manager & Worker node separately.