



**Ganpat
University**

॥ विद्यया समाजोत्कर्षः ॥

**Institute of
Computer
Technology**

Name: Tushar Panchal

En.No: 21162101014

Sub: CS (Cloud Security)

Branch: CBA

Batch:71

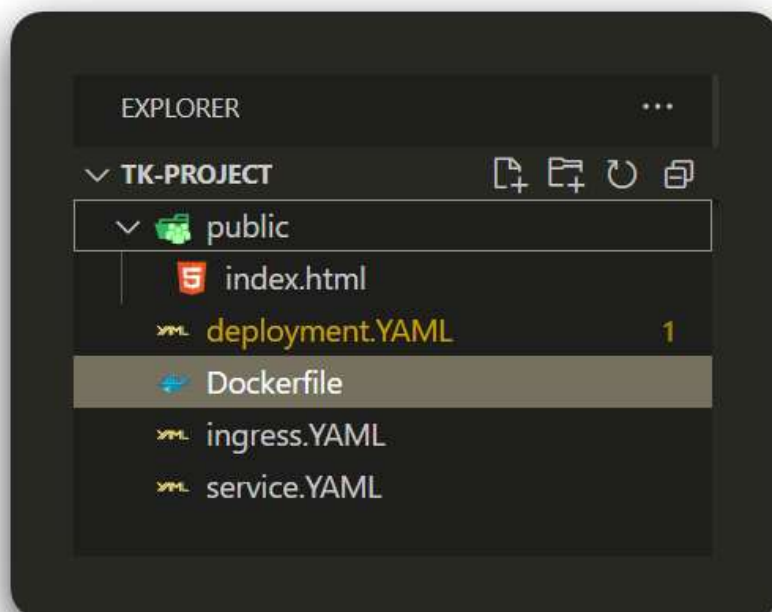
PRACTICAL 04

❖ Scenario :

Create docker container for deploying on containerized platform. Here you need to build Node js Web Application on Docker Containers and will run the it using Kubernetes Service on IBM Cloud

» Create Dockerfile for node project.

Here, project contains public folder with html file to be hosted using express module, whose structure looks like :



Dockerfile :

```
# Use a lightweight Node.js image as the base image
FROM node:18-alpine

# Set the working directory inside the container
WORKDIR /app

# Copy only the necessary files to the container
COPY public/ ./public/

# Create a minimal package.json for the express server
RUN echo '{ "name": "tk-html", "version": "1.0.0", "main": "app.js",
"dependencies": { "express": "^4.18.2" } }' > package.json

# Install only production dependencies (so it will be quick)
RUN npm install

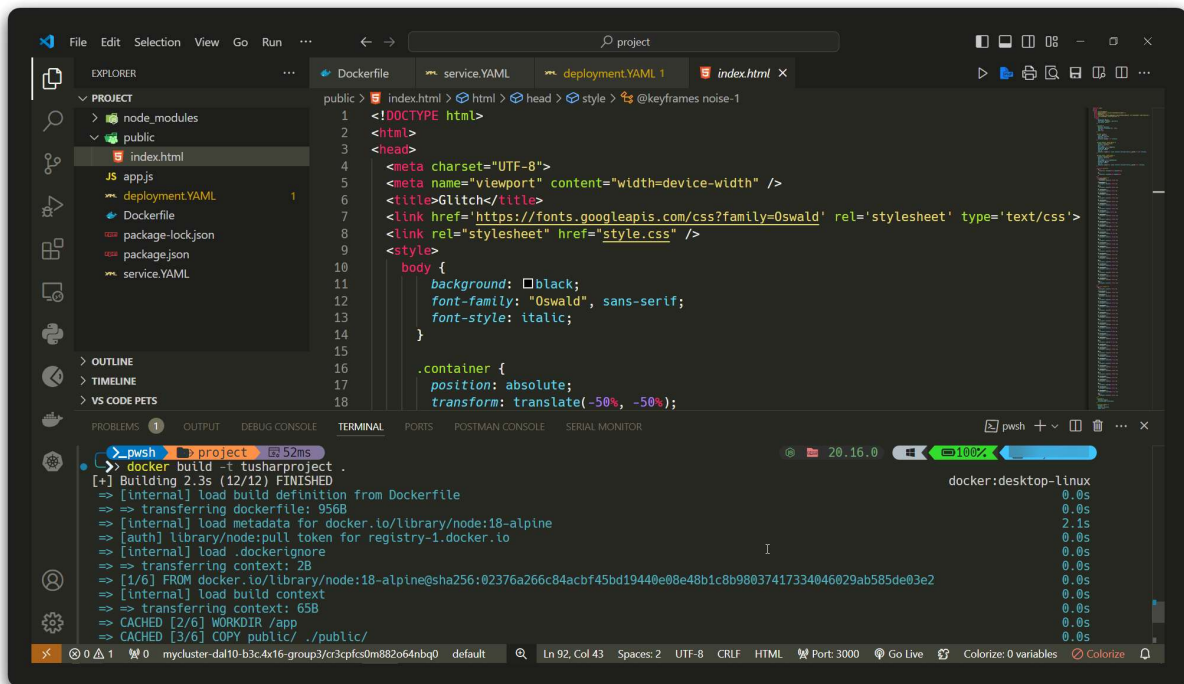
# Create the app.js file to serve the static content
RUN echo "const express = require('express'); const path =
require('path'); const app = express();
app.use(express.static(path.join(__dirname, 'public'))); const port =
3000; app.listen(port, () => { console.log('Server running on
http://localhost:' + port); });" > app.js

# Expose port 3000
EXPOSE 3000

# Define the command to run the application
CMD ["node", "app.js"]
```

» Build docker image in local system.

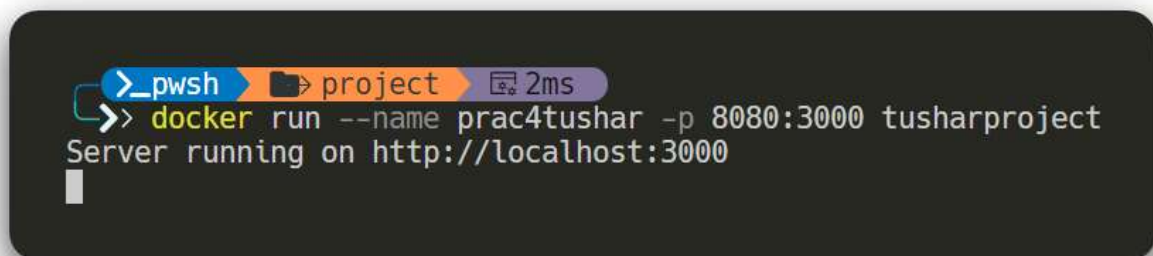
Command: `docker build -t tusharproject .`



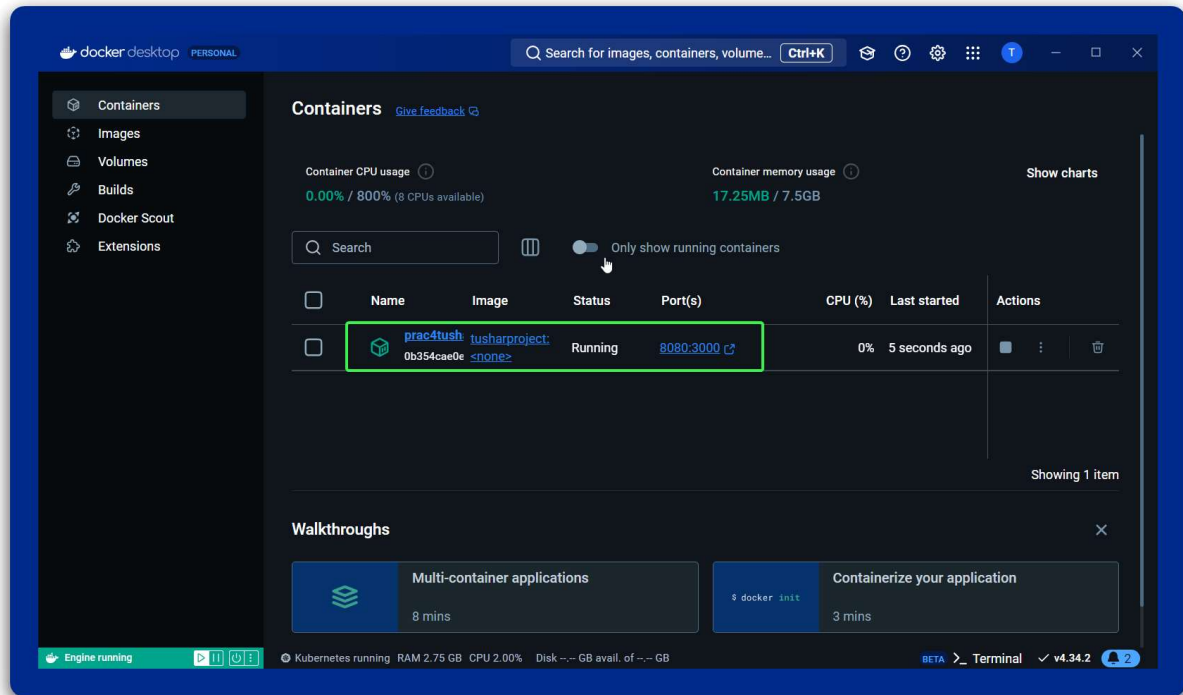
» Now run it on port .

Commands :

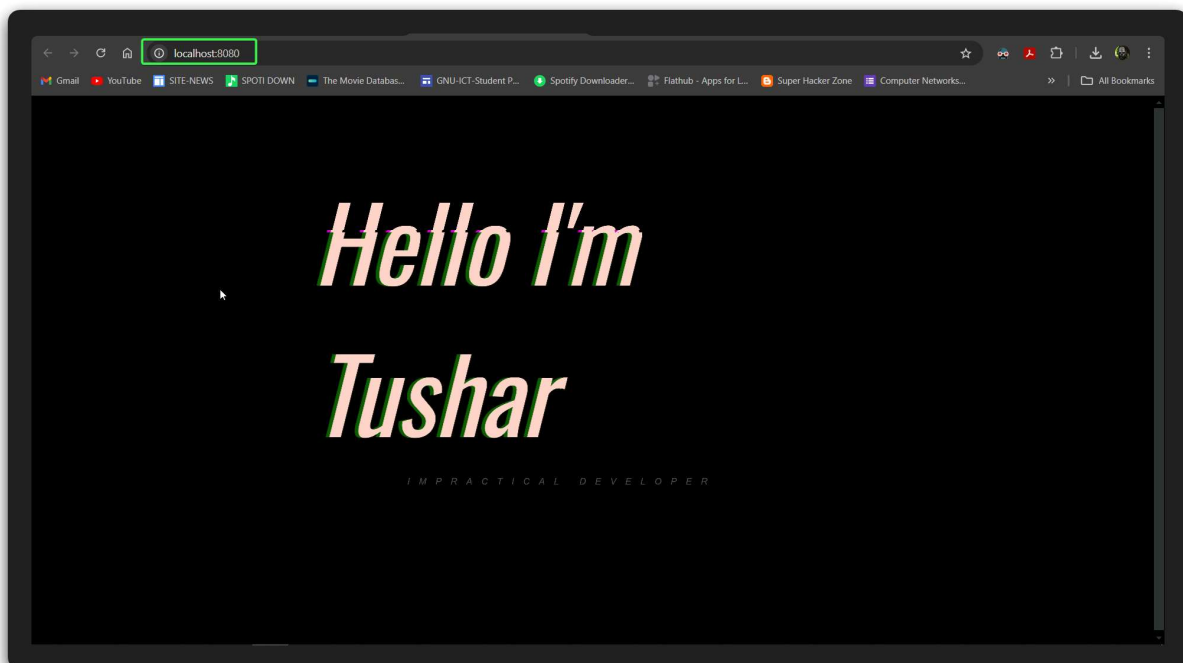
`docker run --name prac4tushar -p 8080:3000 tusharproject`



» Here container is created



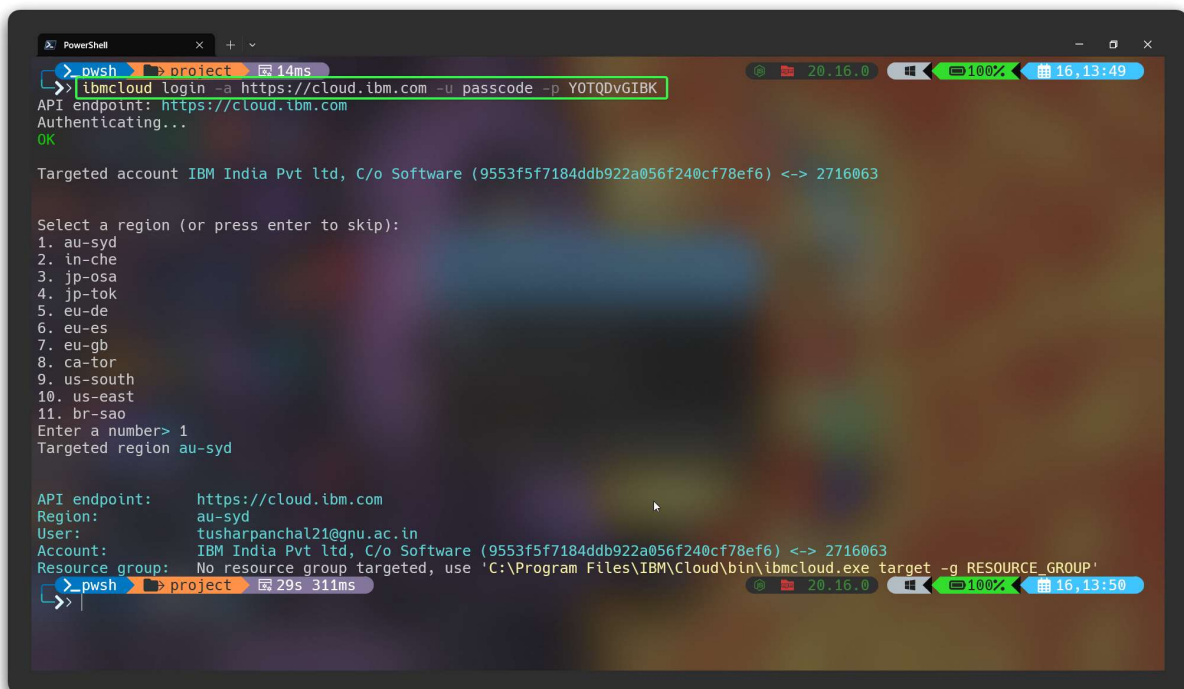
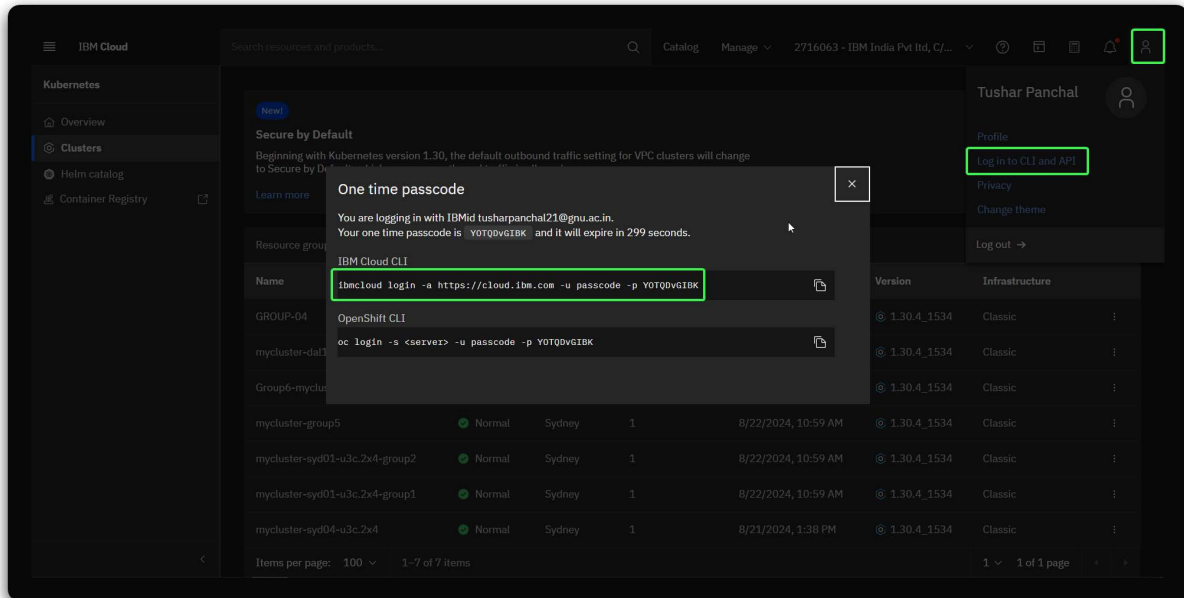
» Go to localhost:8080



Now run command from your ibm cloud for IBMcloud CLI :

Commands :

```
ibmcloud login -a https://cloud.ibm.com -u passcode -p YOTQDvGIBK
```



Now install container service

Command: `ibmcloud plugin install container-service`

```
> pwsh -p project 4ms
>> ibmcloud plugin install container-service
Looking up 'container-service' from repository 'IBM Cloud'...
Plug-in 'container-service[kubernetes-service/ks] 1.0.657' found in repository 'IBM Cloud'
Plug-in 'container-service[kubernetes-service/ks] 1.0.657' was already installed. Do you want to re-install it or not? [y/N]
> N
Plugin installation was canceled.
```

Now install container-registry

Command: `ibmcloud plugin install container-registry`

```
> pwsh -p project 4ms
>> ibmcloud plugin install container-registry
Looking up 'container-registry' from repository 'IBM Cloud'...
Plug-in 'container-registry[cr] 1.3.10' found in repository 'IBM Cloud'
Plug-in 'container-registry[cr] 1.3.10' was already installed. Do you want to re-install it or not? [y/N] > N
Plugin installation was canceled.
```

Now we have to target resource group as default

Command: `ibmcloud target -g default`

```
> pwsh -p project 2ms
>> ibmcloud target -g default
Targeted resource group default

API endpoint: https://cloud.ibm.com
Region: au-syd
User: tusharpanchal21@gnu.ac.in
Account: IBM India Pvt ltd, C/o Software (9553f5f7184ddb922a056f240cf78ef6) <--> 2716063
Resource group: default
```

Now go to Kubernetes cluster & copy cluster ID :

The screenshot shows the IBM Cloud Kubernetes dashboard for a cluster named 'mycluster-dal10-b3c.4x16-group3'. The cluster is in a 'Normal' state. The 'Overview' tab is selected, showing various status metrics: 1 of 1 worker nodes are healthy, 0 of 0 add-ons are healthy, and the master status is 'Normal'. In the 'Details' section, the 'Cluster ID' is highlighted with a green box, showing the value 'c3cpfcs9m882o64nbq8'. Other details include the version '1.30.4_1534', infrastructure type 'Classic', master location 'Sydney', worker zones 'Sydney 01', creation time '8/22/2024, 10:59 AM', resource group 'default', and image security enforcement set to 'Disable'.

Now log in to IBMcloud and see namespace lists:

Command: `ibmcloud cr login`

Command: `ibmcloud cr namespace-list`

```

PowerShell
> pwsh -> project 2ms
>> ibmcloud cr login
Logging 'docker' in to 'au.icr.io'...
Logged in to 'au.icr.io'.

OK
> pwsh -> project 9s 326ms
>> ibmcloud cr namespace-list
Listing namespaces for account 'IBM India Pvt ltd, C/o Software' in registry 'au.icr.io'...

Namespace
aniketnamespace
aryannamespace
cb-namespace-one
cd-namespace-one
devnm
dhairyanm
dhruvnamespace
dhyey-deployment
harshnamespace
kirtannamespace
krupal-ns
krupalnamespace
kshitijname
nazirnamespace
prarthinspace
praveen-yagna-np
raj-profile-project
rajspace
ronak
shivamnamespace
testapikey
tushar-nmspc
vishwanamespace
vivek
  
```

Now we add our namespace to list :

Command: `ibmcloud cr namespace-add Tushar`

```

> pwsh -> project 1ms
>> ibmcloud cr namespace-add tushar007
Adding namespace 'tushar007' in resource group 'default' for account IBM India Pvt ltd, C/o Software in registry au.icr.io...

Successfully added namespace 'tushar007'

OK
  
```

Resource list Create resource +

Name	Group	Location	Product	Status	Tags
tushar007	Filter by group or org...	Filter...	Filter...	Filter...	Filter...
Containers (1 / 44)					
tushar007	default	Sydney	Container Registry	—	—

Now tag the docker Image with name space and give it a name then push

Commands :

```
docker tag tusharproject au.icr.io/tushar/newimagetushar
```

```
docker push au.icr.io/tushar/newimagetushar
```

```

> pwsh - project 2ms
>> docker tag tusharproject au.icr.io/tushar/newimagetushar
> pwsh - project 87ms
>> docker push au.icr.io/tushar/newimagetushar
Using default tag: latest
The push refers to repository [au.icr.io/tushar/newimagetushar]
344ecfade95b: Mounted from tushar-nmspc/tusharproject
edd3315bdf6b: Mounted from tushar-nmspc/tusharproject
db9ff5f4a081: Mounted from tushar-nmspc/tusharproject
78def15d55c1: Mounted from tushar-nmspc/tusharproject
e9850b342290: Mounted from tushar-nmspc/tusharproject
e2be10e97665: Mounted from tushar-nmspc/tusharproject
06fd85419b65: Mounted from tushar-nmspc/tusharproject
f58c462fa079: Mounted from tushar-nmspc/tusharproject
63ca1fbb43ae: Mounted from tushar-nmspc/tusharproject
latest: digest: sha256:1bb05b89a659514f8f32052836ffff99d07457155a7c9acd069bb93d0d4b3dfb5 size: 2197
> pwsh - project 15s 790ms
  
```

Now open files in vs code and make changes Change name of :
deploy name , app: , image , name

```

1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: tushar-deployment
5  spec:
6    selector:
7      matchLabels:
8        app: tushar-app # This should match the label in the pod
9    replicas: 1
10 template:
11   metadata:
12     labels:
13       app: tushar-app # Ensure this label matches the selector
14   spec:
15     containers:
16       - name: tushar007
17         image: au.icr.io/tushar007/newimagetushar
18         ports:
19           - containerPort: 8080
20
  
```


Also change in service.yaml, Change of name : app, service name

```

1  apiVersion: v1
2  kind: Service
3  metadata:
4    labels:
5      app: tushar-app
6      name: tushar-service
7      namespace: default
8  spec:
9    type: NodePort
10   ports:
11     - name: http
12       protocol: TCP
13       port: 3000
14   selector:
15     app: tushar-app

```

Now run command to deploy

Commands :

kubectl apply -f deployment.yaml

```

>_pwsh project 1s 622ms
>> kubectl apply -f deployment.yaml
deployment.apps/tushar-deployment created

```

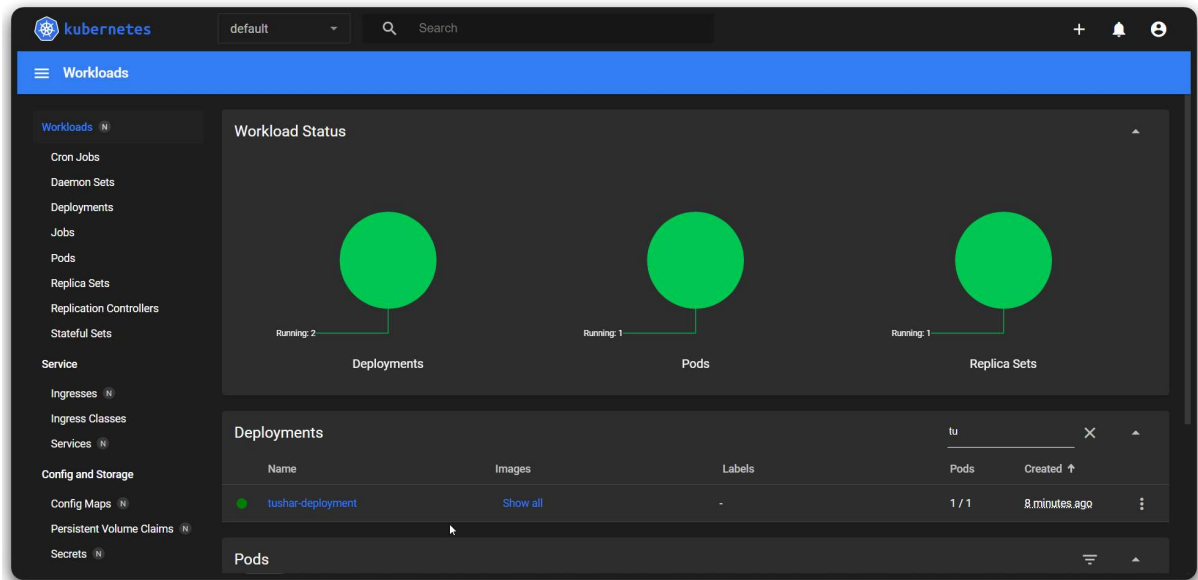
Kubectl apply -f service.yaml

```

>_pwsh project 2ms
>> kubectl apply -f .\service.yaml
service/tushar-service unchanged

```

As we can see in below screenshot that its deployed

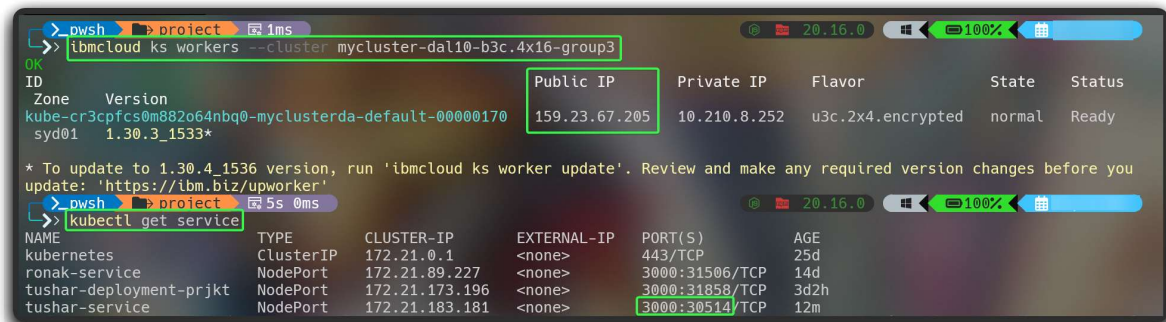


Now run this command to get public ID and port number

Command :

```
ibmcloud ks workers --cluster mycluster-dal10-b3c.4x16-group3
```

```
kubectl get service
```



**Now take public id and copy to new tab and take port
159.23.67.205: 30514**

