

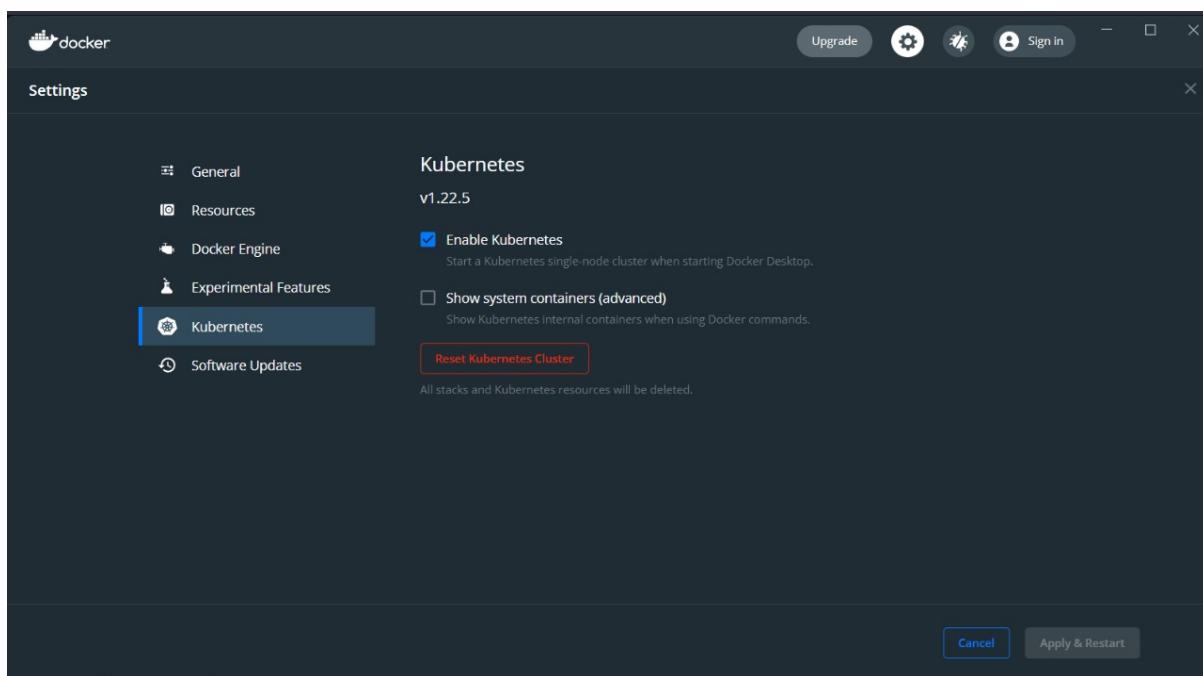
# Cloud Computing Lab

## CAT - 2 Report

1934013 Jeevasurya V, 1934018 Kishore Kumar R, 1934027 Prakash R

## Architecture and Concepts

Cluster creation using docker hub



Setting up Kubernetes cluster with a single node and then replicated to two nodes

DIVE plugin is used to visualize the layers in the image.

## Application

FindAFriend is an online medium to find new people who share the same passions as you. By setting preferences, users will be able to find new people to share and discover new ideologies. This would be beneficial to recruiters, collaborators, to help find a correct person to hang out with. Overall FindAFriend will be a medium for people to discover the perfect buddy of their choice.

One can ask questions, music recommendations, etc. beforehand, and based on the answers they can decide whether to connect with them.

Due to this large number of information, it required a compulsory database to be attached to the server. The potential may lead to a large user coming in, which may lead to hardships in server requirements and experimentation.

## Solution

The use of Container Orchestral tools like Kubernetes will resolve such challenges, by improving the resources based on user scale, allowing fault tolerance, undo rollout for updates, and easy management of the database.

## Docker:

### Image Build:

We are building a Docker container for one of our Lab projects. It is a series of simple static web pages, which are hyperlinked to each other. So we are using nginx to view the HTML pages.

```
FROM nginx:alpine
COPY . /usr/share/nginx/html
```

The above snippet is the contents of the Dockerfile. Then in a terminal, we can use the docker build command to build the image.

```
sudo docker build -t faf:latest .
```

```
kishore@kishore-VirtualBox:~/CAT - 2/FindAFriend - Dockerized/html$ sudo docker
build -t faf:latest .
Sending build context to Docker daemon 36.55MB
Step 1/2 : FROM nginx:alpine
--> bef258acf10d
Step 2/2 : COPY . /usr/share/nginx/html
--> 8b7b29dc896a
Successfully built 8b7b29dc896a
Successfully tagged faf:latest
```

### Image Caching:

To view the different layers of Image caching, we looked up and used a Golang based tool, [dive](#) for viewing the different layers and how the contents are cached.

```

kishore@kishore-VirtualBox:~$ wget https://github.com/wagoodman/dive/releases/download/v0.9.2/dive_0.9.2_linux_amd64.deb
--2022-01-26 17:34:54--  https://github.com/wagoodman/dive/releases/download/v0.9.2/dive_0.9.2_linux_amd64.deb
Resolving github.com (github.com)... 13.234.210.38
Connecting to github.com (github.com)|13.234.210.38|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/133251103/5db79280-4b50-11ea-8123-4A%2F20220126%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20220126T120454Z&X-Amz-Expires=300&X-Amz-Signature=9c284cc9eb053
id=0&key_id=0&repo_id=133251103&response-content-disposition=attachment%3B%20filename%3Ddive_0.9.2_linux_amd64.deb&respons
--2022-01-26 17:34:54--  https://objects.githubusercontent.com/github-production-release-asset-2e65be/133251103/5db79280-4
IWNjYAX4CSVEHS3A%2F20220126%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20220126T120454Z&X-Amz-Expires=300&X-Amz-Signature=
ers=host&actor_id=0&key_id=0&repo_id=133251103&response-content-disposition=attachment%3B%20filename%3Ddive_0.9.2_linux_am
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.109.133, 185.199.111.133, 185.199.110.1
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.109.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 4765140 (4.5M) [application/octet-stream]
Saving to: 'dive_0.9.2_linux_amd64.deb'

dive_0.9.2_linux_am 100%[=====] 4.54M 6.57MB/s in 0.7s

2022-01-26 17:34:56 (6.57 MB/s) - 'dive_0.9.2_linux_amd64.deb' saved [4765140/4765140]

kishore@kishore-VirtualBox:~$ sudo apt install ./dive_0.9.2_linux_amd64.deb
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'dive' instead of './dive_0.9.2_linux_amd64.deb'
The following NEW packages will be installed:
  dive
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 0 B/4,765 kB of archives.
After this operation, 12.4 MB of additional disk space will be used.
Get:1 /home/kishore/dive_0.9.2_linux_amd64.deb dive amd64 0.9.2 [4,765 kB]
Selecting previously unselected package dive.
(Reading database ... 160644 files and directories currently installed.)
Preparing to unpack .../dive_0.9.2_linux_amd64.deb ...
Unpacking dive (0.9.2) ...
Setting up dive (0.9.2) ...
kishore@kishore-VirtualBox:~$ 

```

After installing dive, we can see the cached layers, using:

```

sudo dive <IMAGE_ID>

```

Layers		Current Layer Contents			
Cmp	Size	Command	Permission	UID/GID	
15.6 MB	FROM ab67e75fc1ce660		rwxr-xr-x	0:0 825 kB	bin
18 MB	set -x && addgroup -g 101 -S nginx && adduser -S -D -H -u 101 -h /var/cache/nginx	/etc/nginx	rwxrwxrwx	0:0 0 B	arch → /bin/busybox
1.2 kB	#(nop) COPY file:65504f71f585ca017fb64d502ce873a1b2e0decdf5297abfb0a287f97acf92 in /		rwxrwxrwx	0:0 0 B	ash → /bin/busybox
2.0 kB	#(nop) COPY file:0b8860f3fc1ef5b03c4e6c8c513ae014f691fb05d30257dffdd7035c1b75da in /doc		rwxrwxrwx	0:0 0 B	base64 → /bin/busybox
1.0 kB	#(nop) COPY file:0fd5fca330dc6da7de297435e32af634f29f7132ed0550d342cad9fd20158258 in /doc		rwxrwxrwx	0:0 0 B	bbconfig → /bin/busybox
4.6 kB	#(nop) COPY file:09a214a0e97c919a0f2fb2d7c749cbc446b8c10eb217366e5a65640ee9edcc25 in /doc		rwxr-xr-x	0:0 825 kB	busybox
3.6 MB	#(nop) COPY dir:/9ef0cabad67a803cdb71e506de26e30053ac0ff42gec1a43ed687484dc383 in /usr/		rwxrwxrwx	0:0 0 B	cat → /bin/busybox
			rwxrwxrwx	0:0 0 B	chgrp → /bin/busybox
			rwxrwxrwx	0:0 0 B	chmod → /bin/busybox
			rwxrwxrwx	0:0 0 B	chown → /bin/busybox
			rwxrwxrwx	0:0 0 B	cp → /bin/busybox
			rwxrwxrwx	0:0 0 B	date → /bin/busybox
			rwxrwxrwx	0:0 0 B	dd → /bin/busybox
			rwxrwxrwx	0:0 0 B	df → /bin/busybox
			rwxrwxrwx	0:0 0 B	dmesg → /bin/busybox
			rwxrwxrwx	0:0 0 B	dnsdomainname → /bin/busybox
			rwxrwxrwx	0:0 0 B	dumpkmap → /bin/busybox
			rwxrwxrwx	0:0 0 B	echo → /bin/busybox
			rwxrwxrwx	0:0 0 B	ed → /bin/busybox
			rwxrwxrwx	0:0 0 B	egrep → /bin/busybox
			rwxrwxrwx	0:0 0 B	false → /bin/busybox
			rwxrwxrwx	0:0 0 B	fstat → /bin/busybox
			rwxrwxrwx	0:0 0 B	fdflush → /bin/busybox
			rwxrwxrwx	0:0 0 B	fgrep → /bin/busybox
			rwxrwxrwx	0:0 0 B	fsync → /bin/busybox
			rwxrwxrwx	0:0 0 B	getopt → /bin/busybox
			rwxrwxrwx	0:0 0 B	grep → /bin/busybox
			rwxrwxrwx	0:0 0 B	gunzip → /bin/busybox
			rwxrwxrwx	0:0 0 B	gzip → /bin/busybox
			rwxrwxrwx	0:0 0 B	hostname → /bin/busybox
			rwxrwxrwx	0:0 0 B	ionice → /bin/busybox
			rwxrwxrwx	0:0 0 B	iostat → /bin/busybox
			rwxrwxrwx	0:0 0 B	ipcalc → /bin/busybox
			rwxrwxrwx	0:0 0 B	kbd_node → /bin/busybox
			rwxrwxrwx	0:0 0 B	kill → /bin/busybox
			rwxrwxrwx	0:0 0 B	link → /bin/busybox
			rwxrwxrwx	0:0 0 B	linux32 → /bin/busybox
			rwxrwxrwx	0:0 0 B	linux64 → /bin/busybox
			rwxrwxrwx	0:0 0 B	ln → /bin/busybox
			rwxrwxrwx	0:0 0 B	login → /bin/busybox
			rwxrwxrwx	0:0 0 B	ls → /bin/busybox
			rwxrwxrwx	0:0 0 B	lzip → /bin/busybox
			rwxrwxrwx	0:0 0 B	makemime → /bin/busybox
			rwxrwxrwx	0:0 0 B	mkdir → /bin/busybox
			rwxrwxrwx	0:0 0 B	mknode → /bin/busybox

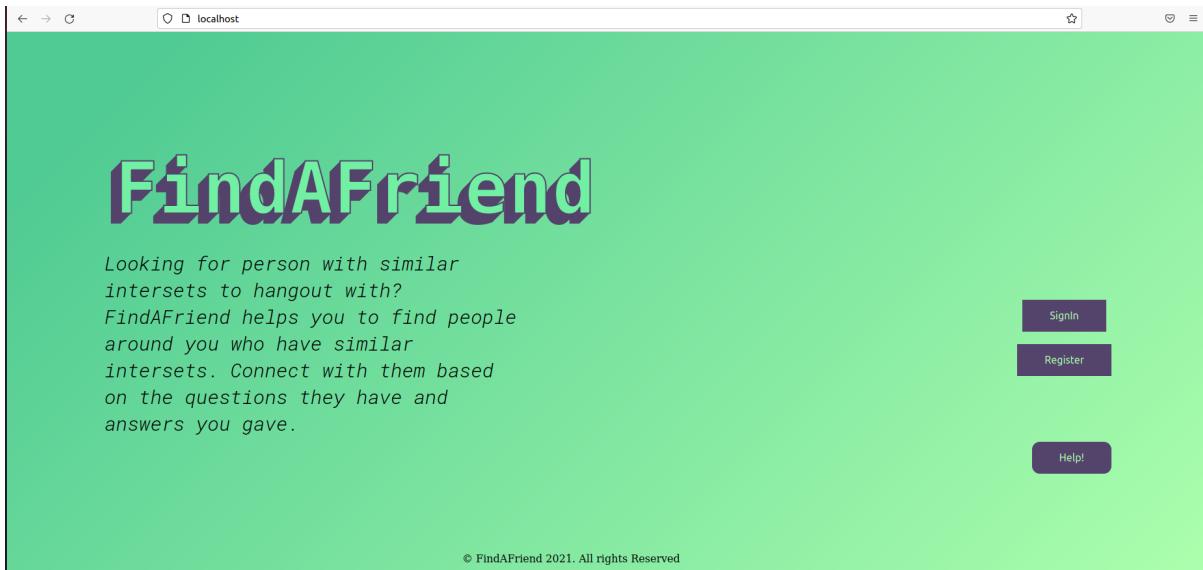
## Container Deployment:

The container can be deployed using the docker run command

```
sudo docker run faf:latest
```

```
kishore@kishore-VirtualBox:~/CAT - 2/FindAFriend - Dockerized/html$ sudo docker run faf:latest
/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
2022/01/26 12:17:09 [notice] 1#1: using the "epoll" event method
2022/01/26 12:17:09 [notice] 1#1: nginx/1.21.6
2022/01/26 12:17:09 [notice] 1#1: built by gcc 10.3.1 20211027 (Alpine 10.3.1_git20211027)
2022/01/26 12:17:09 [notice] 1#1: OS: Linux 5.13.0-27-generic
2022/01/26 12:17:09 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/01/26 12:17:09 [notice] 1#1: start worker processes
2022/01/26 12:17:09 [notice] 1#1: start worker process 32
2022/01/26 12:17:09 [notice] 1#1: start worker process 33
2022/01/26 12:17:09 [notice] 1#1: start worker process 34
2022/01/26 12:17:09 [notice] 1#1: start worker process 35
2022/01/26 12:17:15 [notice] 1#1: signal 28 (SIGWINCH) received
2022/01/26 12:17:15 [notice] 1#1: signal 28 (SIGWINCH) received
```

The nginx server will be hosted in the local host.



## Container service exposure:

The service of the container can be exposed to local port using the -p command with docker run.

```
sudo docker run -p 80:80faf:latest
```

```
tshore@ktshore-VirtualBox:~/CAT - 2/FindAFriend - Dockerized/html$ sudo docker run -p 80:80faf:latest
/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
2022/01/26 12:22:57 [notice] 1#1: using the "epoll" event method
2022/01/26 12:22:57 [notice] 1#1: nginx/1.21.0
2022/01/26 12:22:57 [notice] 1#1: built by gcc 10.3.1 20211027 (Alpine 10.3.1_git20211027)
2022/01/26 12:22:57 [notice] 1#1: OS: Linux 5.13.0-27-generic
2022/01/26 12:22:57 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/01/26 12:22:57 [notice] 1#1: start worker processes
2022/01/26 12:22:57 [notice] 1#1: start worker process 32
2022/01/26 12:22:57 [notice] 1#1: start worker process 33
2022/01/26 12:22:57 [notice] 1#1: start worker process 34
2022/01/26 12:22:57 [notice] 1#1: start worker process 35
172.17.0.1 - - [26/Jan/2022:12:22:59 +0000] "GET / HTTP/1.1" 200 1145 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:96.0) Gecko/20100101 Firefox/96.0" "-"
172.17.0.1 - - [26/Jan/2022:12:22:59 +0000] "GET / HTTP/1.1" 304 0 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:96.0) Gecko/20100101 Firefox/96.0" "-"
```

## Logs Fetching

Logs of the container can be fetched using:

```
sudo docker logs <CONTAINER_ID>
```

```
kishore@kishore-VirtualBox:~/CAT - 2/FindAFriend - Dockerized/html$ sudo docker logs 0be726ac13ff
/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
2022/01/26 12:25:34 [notice] 1#1: using the "epoll" event method
2022/01/26 12:25:34 [notice] 1#1: nginx/1.21.6
2022/01/26 12:25:34 [notice] 1#1: built by gcc 10.3.1 20211027 (Alpine 10.3.1_git20211027)
2022/01/26 12:25:34 [notice] 1#1: OS: Linux 5.13.0-27-generic
2022/01/26 12:25:34 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/01/26 12:25:34 [notice] 1#1: start worker processes
2022/01/26 12:25:34 [notice] 1#1: start worker process 34
2022/01/26 12:25:34 [notice] 1#1: start worker process 35
2022/01/26 12:25:34 [notice] 1#1: start worker process 36
2022/01/26 12:25:34 [notice] 1#1: start worker process 37
kishore@kishore-VirtualBox:~/CAT - 2/FindAFriend - Dockerized/html$
```

## Entering into the container

We can enter into the container using the exec command as follows:

```
sudo docker exec -it <CONTAINER_ID> sh
```

```
kishore@kishore-VirtualBox:~/CAT - 2/FindAFriend - Dockerized/html$ sudo docker exec -it 0be726ac13ff sh
/ # ls
bin          docker-entrypoint.sh  lib          opt          run          sys          var
dev          etc          media        proc        sbtIn        tmp
docker-entrypoint.d  home        mnt          root        srv          usr
/ # cd usr/share
/usr/share # cd nginx
/usr/share/nginx # cd html
/usr/share/nginx/html # ls
50x.html      Men (4).jpg      deployment      getRegisterData.js  loginAuth.js    user1.html
Dockerfile    Men (5).jpg      dlove_0.9.2_linux_amd64.deb  home.html     myprofile.html  user2.html
Help.html    Men (6).jpg      filter.js      homeCSS.css   pagestyle.css  user3.html
Men (1).jpg  README.md       filters.html  homeSwltch.js profile.js     user4.html
Men (2).jpg  Register.html   formCSS.css  index.html    profileCSS.css  user5.html
Men (3).jpg  SignIn.html    getQuestionnaireData.js indexCSS.css  questionnaire.html  users.json
/usr/share/nginx/html #
```

## Kubernetes:

- Creating Namespace:

```
apiVersion: v1
kind: Namespace
```

```
metadata:  
  name: faf
```

```
kubectl create -f docker-namespace.yml
```

With this command we have created the name space:

```
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) % kubectl get namespaces  
NAME      STATUS   AGE  
default   Active   14h  
docker    Active   13h  
faf       Active   28s  
kube-node-lease Active  14h  
kube-public Active  14h  
kube-system Active  14h
```

- Deploy the pod in that namespace

```
apiVersion: apps/v1  
kind: Deployment  
metadata:  
  labels:  
    app: faf  
  name: faf-deployment  
  namespace: faf  
spec:  
  replicas: 1  
  selector:  
    matchLabels:  
      app: faf  
  template:  
    metadata:  
      labels:  
        app: faf  
    spec:  
      containers:  
        - image: faf:latest  
          imagePullPolicy: Never  
          name: faf  
          ports:  
            - containerPort: 80
```

```
kubectl apply -f docker-deployment.yml
```

With this command, we have deployed our pod in the 1 node cluster that we have created using minikube.

```
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) % kubectl create -f deployment/docker-namespace.yml
namespace/faf created
```

```
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) % kubectl get deployment -n=faf
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
faf-deployment   1/1     1          1          13m
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) % kubectl get pods -n=faf
NAME                  READY   STATUS    RESTARTS   AGE
faf-deployment-65647bbc87-vcnbr   1/1     Running   0          4m17s
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) %
```

- set the replica factor:

```
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    app: fab
  name: fab-deployment
  namespace: fab
spec:
  replicas: 2
  selector:
    matchLabels:
      app: fab
  template:
    metadata:
      labels:
        app: fab
    spec:
      containers:
        - image: fab:latest
          imagePullPolicy: Never
          name: fab
          ports:
            - containerPort: 80
```

```
kubectl apply -f docker-deployment.yml
```

After we update our deployment config and created a new deployment with 2 replicas

```
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) % kubectl apply -f deployment/docker-deployment.yaml
deployment.apps/fab-deployment configured
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) % kubectl get pods -n=fab
NAME      READY   STATUS    RESTARTS   AGE
fab-deployment-65647bbc87-98xlg   1/1     Running   0          13s
fab-deployment-65647bbc87-vcnbr   1/1     Running   0          4m52s
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) %
```

- expose service and make it accessible by other pods or from the external:

```
apiVersion: v1
kind: Service
metadata:
  name: faf-service
  namespace: faf
spec:
  selector:
    app: faf
  type: LoadBalancer
  ports:
    - protocol: TCP
      port: 8080
      targetPort: 80
      nodePort: 30000
```

```
kubectl apply -f docker-deployment.yml
```

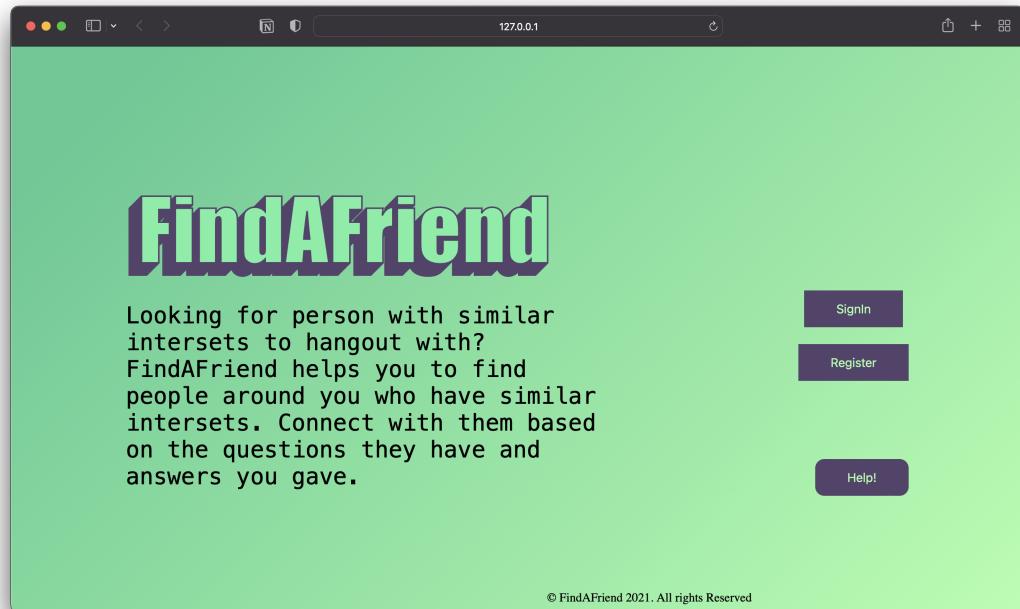
After we created our service, we have exposed our port using minikube service command

```
minikube service faf-deployment -n faf
```

Here is the deployment service and we have opened the port of 30000.

```
(base) prakashramesh@prakashs-MacBook-Air DCC-Cat-2(kubes) % minikube service faf-service -n=faf
|-----|-----|-----|-----|
| NAMESPACE |     NAME      | TARGET PORT |          URL       |
|-----|-----|-----|-----|
| faf        | faf-service |      8080 | http://192.168.49.2:30000 |
|-----|-----|-----|-----|
★ Starting tunnel for service faf-service.
|-----|-----|-----|-----|
| NAMESPACE |     NAME      | TARGET PORT |          URL       |
|-----|-----|-----|-----|
| faf        | faf-service |           | http://127.0.0.1:50964 |
|-----|-----|-----|-----|
👉 Opening service faf/faf-service in default browser...
❗ Because you are using a Docker driver on darwin, the terminal needs to be open to run it.
```

Here is our website hosted with kubes.



set the resource limit and show what happens when the limit reached, exceeded:

```
# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    app:faf
  name:faf-deployment
  namespace:faf
spec:
  replicas: 2
  selector:
    matchLabels:
      app:faf
  template:
    metadata:
      labels:
        app:faf
    spec:
      containers:
        - image:faf:change1
          imagePullPolicy:Never
          name:faf
          ports:
            - containerPort:80
      resources:
        requests:
          cpu:0.1
          memory:1Mi
        limits:
          cpu:0.1
          memory:1Mi
```

with this configuration, our system will be out of memory exactly like mentioned in the picture below

```

DCC-Cat-2(kubes) - docker-deployment.yaml
  metadata:
    labels:
      app:faf
    name:faf-deployment
    namespace:faf
  spec:
    replicas: 2
    selector:
      matchLabels:
        app:faf
    template:
      Document 1/1 > spec:
Type: Projected (a volume that contains injected data from multiple sources)
TokenExpirationSeconds: 3607
ConfigMapName: kube-root-ca.crt
ConfigMapOptional1: <nil>
ConfigMapOptional2: <nil>
DownwardAPI: true
QoS Class: Guaranteed
Node-Selectors: <none>
Tolerations: node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type Reason Age From Message
  ---- ---- -- -- --
  Normal Scheduled 39s default-scheduler Successfully assignedfaf/faf-deployment-56d86b545b-7jr24 to minikube
  Warning FailedCreatePodSandBox 34s (x2 over 38s) kubelet Failed to create pod sandbox: rpc error: code = Unknown desc = failed to start sandbox container for pod "faf-deployment-56d86b545b-7jr24": Error response from daemon: OCI runtime create failed: container_linux.go:380: starting container process caused: process_linux.go:545: container init caused: read init-p: connection reset by peer: unknown
  Normal SandboxChanged 26s (x12 over 37s) kubelet Pod sandbox changed, it will be killed and re-created.
  Warning FailedCreatePodSandBox 25s (x11 over 37s) kubelet Failed to create pod sandbox: rpc error: code = Unknown desc = failed to start sandbox container for pod "faf-deployment-56d86b545b-7jr24": Error response from daemon: OCI runtime create failed: container_linux.go:380: starting container process caused: container init was OOM-killed (memory limit too low): unknown
(base) prakashrshes@prakashs-MacBook-Air DCC-Cat-2(kubes) %

```

make changes in the code and deploy it again, explain the rollback strategy:

## 1st version:

```

# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    app:faf
  name:faf-deployment
  namespace:faf
spec:
  replicas: 2
  selector:
    matchLabels:
      app:faf
  template:
    metadata:
      labels:
        app:faf
  spec:
    containers:
      - image:faf:latest
        imagePullPolicy:Never
        name:faf
        ports:
          - containerPort:80
    resources:

```

```

    requests:
      cpu: 0.1
      memory: 1Mi
    limits:
      cpu: 0.1
      memory: 1Mi

```

Duncan Idaho 28

**Ohio**

**Writer**

Even before they are published authors, writers need a strong professional biography on their social media pages and websites. They also need to submit short blurbs about themselves when they submit work for publication. Like other project-based professions, it's beneficial for writers to include their current or next projects in their biographies.

Save    Clear

Home    Logout    Help

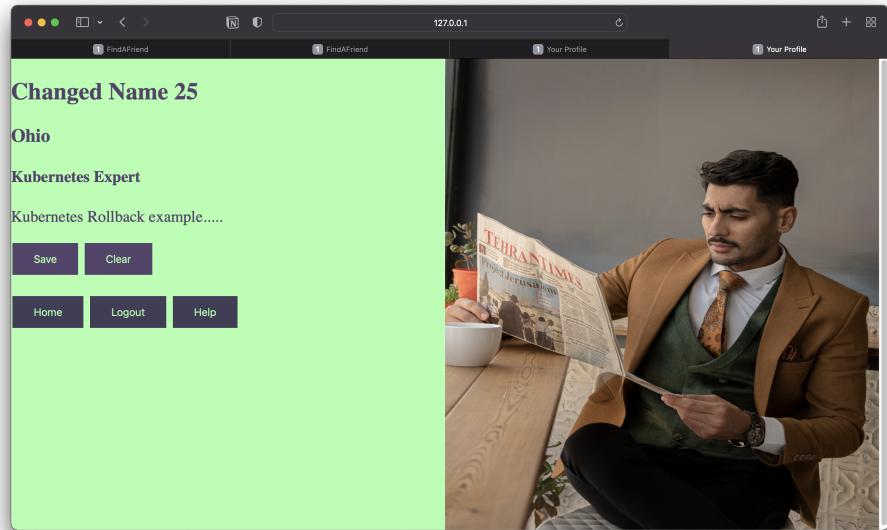
## 2nd version:

```

# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    app:faf
  name:faf-deployment
  namespace:faf
spec:
  replicas: 2
  selector:
    matchLabels:
      app:faf
  template:
    metadata:
      labels:
        app:faf
  spec:
    containers:
      - image:faf:change1
        imagePullPolicy:Never
        name:faf
      ports:

```

```
- containerPort: 80
resources:
  requests:
    cpu: 0.1
    memory: 1Mi
  limits:
    cpu: 0.1
    memory: 1Mi
```



## rollback strategy:

```
kubectl rollout undo deployfaf-deployment --to-revision=11 -n faf
```

- First we have create the new version that is

The screenshot shows a developer's environment with multiple windows open:

- Code Editors:** Two tabs are visible: "DCC-Cat-2(kubes) - deployment" and "DCC-Cat-2(kubes) - docker-deployment.yaml". The deployment file contains a Docker configuration for a service named "faf".
- Terminal:** A terminal window titled "Local (2)" shows the command `kubectl rollout history deployment.faf` being run, listing revision history from 11 to 23.
- Browser:** A browser window at address 127.0.0.1 displays a webpage with the heading "Changed Name 25" and the text "Ohio". Below the heading is the subtext "Kubernetes Expert" and "Kubernetes Rollback example.....".
- Image:** A photograph of a man in a brown blazer and green vest reading a newspaper.

- And then we have rolled back to the version that we have created at revision 11 and got the older website

The screenshot shows a developer's environment with multiple windows open:

- Code Editors:** Two tabs are visible: "DCC-Cat-2(kubes) - deployment" and "DCC-Cat-2(kubes) - docker-deployment.yaml". The deployment file contains a Docker configuration for a service named "faf".
- Terminal:** A terminal window titled "Local" shows the command `kubectl rollout history deployment.faf` being run, listing revision history from 12 to 27.
- Browser:** A browser window at address 127.0.0.1 displays a webpage with the heading "Duncan Idaho 28" and the text "Ohio". Below the heading is the subtext "Writer".
- Text:** A block of text explaining the importance of professional biographies for writers, mentioning the need to submit short blurbs about themselves when submitting work for publication.
- Image:** A photograph of a man in a brown blazer and green vest reading a newspaper.

Deployment description and event in it:

Events:					
Type	Reason	Age	From	Message	
Normal	ScalingReplicaSet	4m57s (x2 over 3h4m)	deployment-controller	Scaled up replica set faf-deployment-648599699 to 1	
Normal	ScalingReplicaSet	4m57s (x2 over 155m)	deployment-controller	Scaled down replica set faf-deployment-545f99c795 to 0	
Normal	ScalingReplicaSet	4m53s (x2 over 3h4m)	deployment-controller	Scaled up replica set faf-deployment-648599699 to 2	
Normal	ScalingReplicaSet	4m53s	deployment-controller	Scaled down replica set faf-deployment-797d58667 to 1	
Normal	ScalingReplicaSet	4m51s	deployment-controller	Scaled down replica set faf-deployment-797d58667 to 0	

- First, it has scaled up to 1 pod for 648599699 replica-set
- It was scaled another replica-set(545f99d795) to 0
- then it scales 648599699 to 2 pods
- then it scaled 797d58667 to 1
- then it scaled 797d58667 to 0

Pods description and events in it:

node.kubernetes.io/unreachable:NoExecute op=Exists for 300s					
Events:					
Type	Reason	Age	From	Message	
Normal	Scheduled	3m48s	default-scheduler	Successfully assigned faf/faf-deployment-648599699-26ftv to minikube	
Normal	Pulled	3m45s	kubelet	Container image "faf" already present on machine	
Normal	Created	3m45s	kubelet	Created container faf	
Normal	Started	3m45s	kubelet	Started container faf	

- assigned the deployment
- pulled the image
- created the container
- started running the container