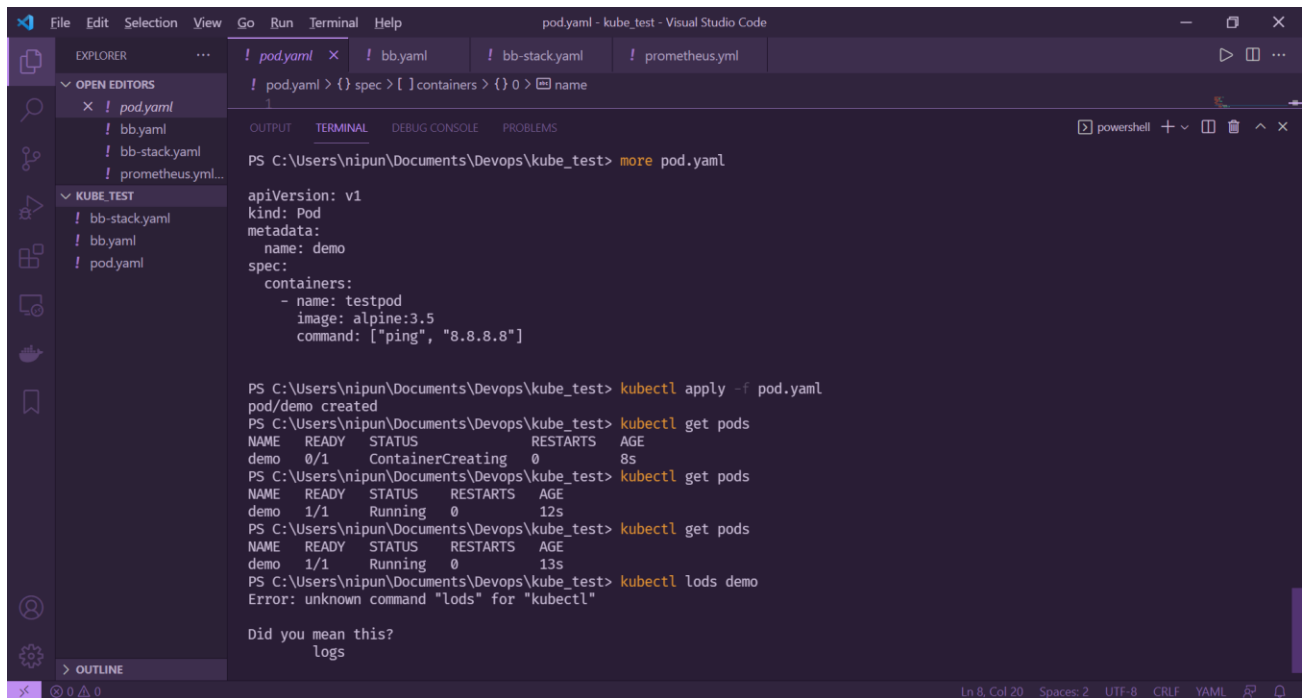


Creating a kubernetes pod isolating ping to

8.8.8.8

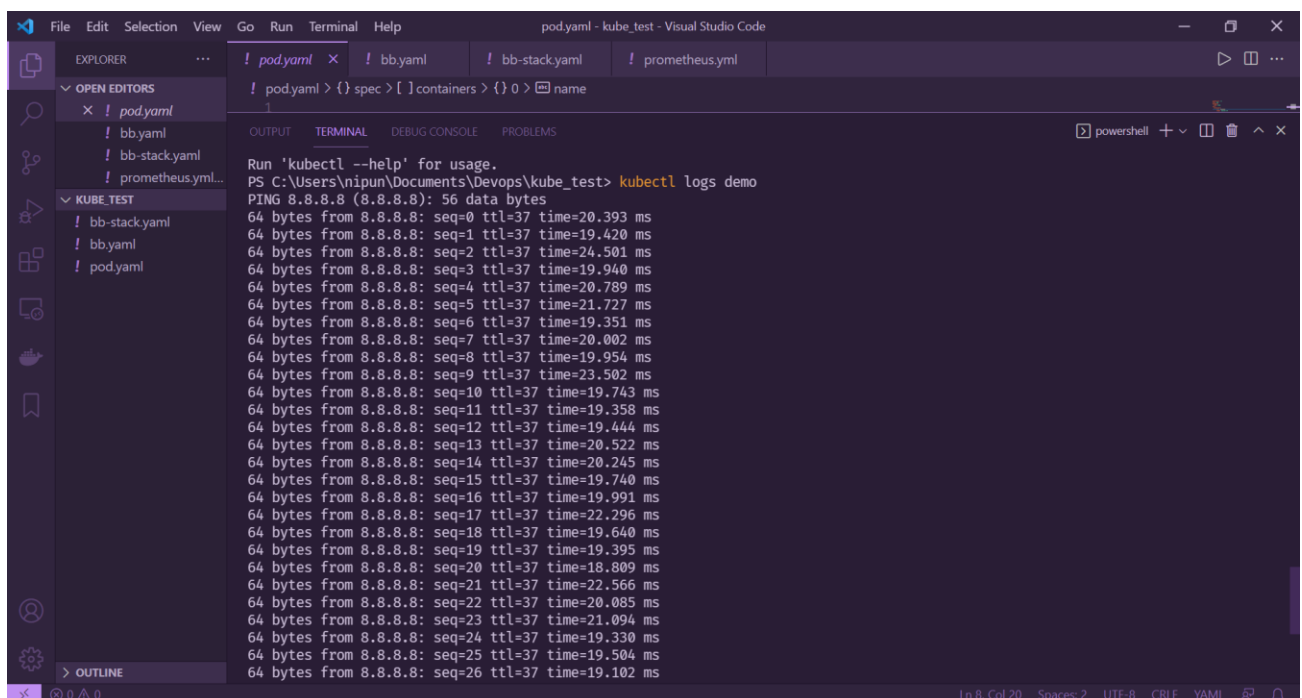


The screenshot shows the Visual Studio Code interface with a terminal window. The terminal displays the following commands and output:

```
PS C:\Users\nipun\Documents\Devops\kube_test> more pod.yaml
apiVersion: v1
kind: Pod
metadata:
  name: demo
spec:
  containers:
  - name: testpod
    image: alpine:3.5
    command: ["ping", "8.8.8.8"]

PS C:\Users\nipun\Documents\Devops\kube_test> kubectl apply -f pod.yaml
pod/demo created
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get pods
NAME READY STATUS RESTARTS AGE
demo 0/1 ContainerCreating 0 8s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get pods
NAME READY STATUS RESTARTS AGE
demo 1/1 Running 0 12s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get pods
NAME READY STATUS RESTARTS AGE
demo 1/1 Running 0 13s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl lods demo
Error: unknown command "lods" for "kubectl"

Did you mean this?
logs
```



The screenshot shows the Visual Studio Code interface with a terminal window. The terminal displays the following commands and output:

```
Run 'kubectl --help' for usage.
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl logs demo
PING 8.8.8.8 (8.8.8.8): 56 data bytes
64 bytes from 8.8.8.8: seq=0 ttl=37 time=20.393 ms
64 bytes from 8.8.8.8: seq=1 ttl=37 time=19.420 ms
64 bytes from 8.8.8.8: seq=2 ttl=37 time=24.501 ms
64 bytes from 8.8.8.8: seq=3 ttl=37 time=19.940 ms
64 bytes from 8.8.8.8: seq=4 ttl=37 time=20.789 ms
64 bytes from 8.8.8.8: seq=5 ttl=37 time=21.727 ms
64 bytes from 8.8.8.8: seq=6 ttl=37 time=19.351 ms
64 bytes from 8.8.8.8: seq=7 ttl=37 time=20.002 ms
64 bytes from 8.8.8.8: seq=8 ttl=37 time=19.954 ms
64 bytes from 8.8.8.8: seq=9 ttl=37 time=23.502 ms
64 bytes from 8.8.8.8: seq=10 ttl=37 time=19.743 ms
64 bytes from 8.8.8.8: seq=11 ttl=37 time=19.358 ms
64 bytes from 8.8.8.8: seq=12 ttl=37 time=19.444 ms
64 bytes from 8.8.8.8: seq=13 ttl=37 time=20.522 ms
64 bytes from 8.8.8.8: seq=14 ttl=37 time=20.245 ms
64 bytes from 8.8.8.8: seq=15 ttl=37 time=19.740 ms
64 bytes from 8.8.8.8: seq=16 ttl=37 time=19.991 ms
64 bytes from 8.8.8.8: seq=17 ttl=37 time=22.296 ms
64 bytes from 8.8.8.8: seq=18 ttl=37 time=19.640 ms
64 bytes from 8.8.8.8: seq=19 ttl=37 time=19.395 ms
64 bytes from 8.8.8.8: seq=20 ttl=37 time=18.809 ms
64 bytes from 8.8.8.8: seq=21 ttl=37 time=22.566 ms
64 bytes from 8.8.8.8: seq=22 ttl=37 time=20.085 ms
64 bytes from 8.8.8.8: seq=23 ttl=37 time=21.094 ms
64 bytes from 8.8.8.8: seq=24 ttl=37 time=19.330 ms
64 bytes from 8.8.8.8: seq=25 ttl=37 time=19.504 ms
64 bytes from 8.8.8.8: seq=26 ttl=37 time=19.102 ms
```

Using docker swarm to run a service that isolates a ping to 8.8.8.8

```
Windows PowerShell
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get pods
NAME      READY   STATUS    RESTARTS   AGE
demo      1/1     Running   0           4m10s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl delete -f pod.yaml
pod "demo" deleted
PS C:\Users\nipun\Documents\Devops\kube_test> docker swarm init
Swarm initialized: current node (ujsgy847qqjmzc2y3znhrdup3) is now a manager.

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

    docker swarm join --token SWMTKN-1-3ux6mmgfdcxq6ca7dpfimaenr2h7pao6rd92b4fqo4xm3hjekd-9834pky6d5hk3aspcmpgkgvmr 192.168.65.3:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.
PS C:\Users\nipun\Documents\Devops\kube_test> docker service create --name demo alpine 3.5 ping 8.8.8.8
overall progress: 0 out of 1 tasks
1/1: ready [=====]
Operation continuing in background.
Use 'docker service ps 03h297qt0wkygbckze39e857q' to check progress.
PS C:\Users\nipun\Documents\Devops\kube_test> docker service logs demo
PS C:\Users\nipun\Documents\Devops\kube_test> docker service create --name demo alpine:3.5 ping 8.8.8.8
Error response from daemon: rpc error: code = AlreadyExists desc = name conflicts with an existing object: service demo already exists
PS C:\Users\nipun\Documents\Devops\kube_test> docker service r, demo

Usage:  docker service COMMAND

Manage services

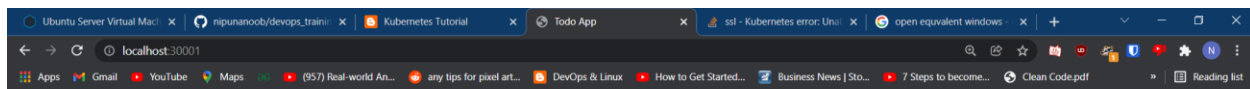
Commands:
```

```
Windows PowerShell
PS C:\Users\nipun\Documents\Devops\kube_test> docker service create --name demo alpine:3.5 ping 8.8.8.8
ou5fhqnjjd0xtobpb4vr57ria
overall progress: 1 out of 1 tasks
1/1: running [=====]
verify: Service converged
PS C:\Users\nipun\Documents\Devops\kube_test> docker service logs demo
demo.1.z2yveale96dd@docker-desktop | PING 8.8.8.8 (8.8.8.8): 56 data bytes
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=0 ttl=37 time=19.075 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=1 ttl=37 time=19.535 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=2 ttl=37 time=19.918 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=3 ttl=37 time=23.379 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=4 ttl=37 time=19.637 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=5 ttl=37 time=20.118 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=6 ttl=37 time=19.411 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=7 ttl=37 time=19.089 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=8 ttl=37 time=20.778 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=9 ttl=37 time=26.953 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=10 ttl=37 time=19.747 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=11 ttl=37 time=18.652 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=12 ttl=37 time=20.224 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=13 ttl=37 time=19.199 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=14 ttl=37 time=19.850 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=15 ttl=37 time=19.557 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=16 ttl=37 time=25.932 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=17 ttl=37 time=25.795 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=18 ttl=37 time=19.411 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=19 ttl=37 time=20.269 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=20 ttl=37 time=20.040 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=21 ttl=37 time=19.909 ms
demo.1.z2yveale96dd@docker-desktop | 64 bytes from 8.8.8.8: seq=22 ttl=37 time=19.331 ms
```

Deploying a task list app using kubernetes

```
Windows PowerShell
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl apply -f bb.yaml
deployment.apps/bb-demo created
service/bb-entrypoint created
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           8s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           10s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           19s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           33s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           46s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           81s
PS C:\Users\nipun\Documents\Devops\kube_test> more bb.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: bb-demo
  namespace: default
spec:
  replicas: 1
  selector:
    matchLabels:
      bb: web
  template:
    metadata:
      labels:
        bb: web
    spec:
      containers:
      - name: bb-site
```

```
Windows PowerShell
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl apply -f bb.yaml
deployment.apps/bb-demo created
service/bb-entrypoint created
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           18s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           19s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           20s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   0/1     1            0           21s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
bb-demo   1/1     1            1           28s
PS C:\Users\nipun\Documents\Devops\kube_test> |
```



Deploying task list app using docker swarm

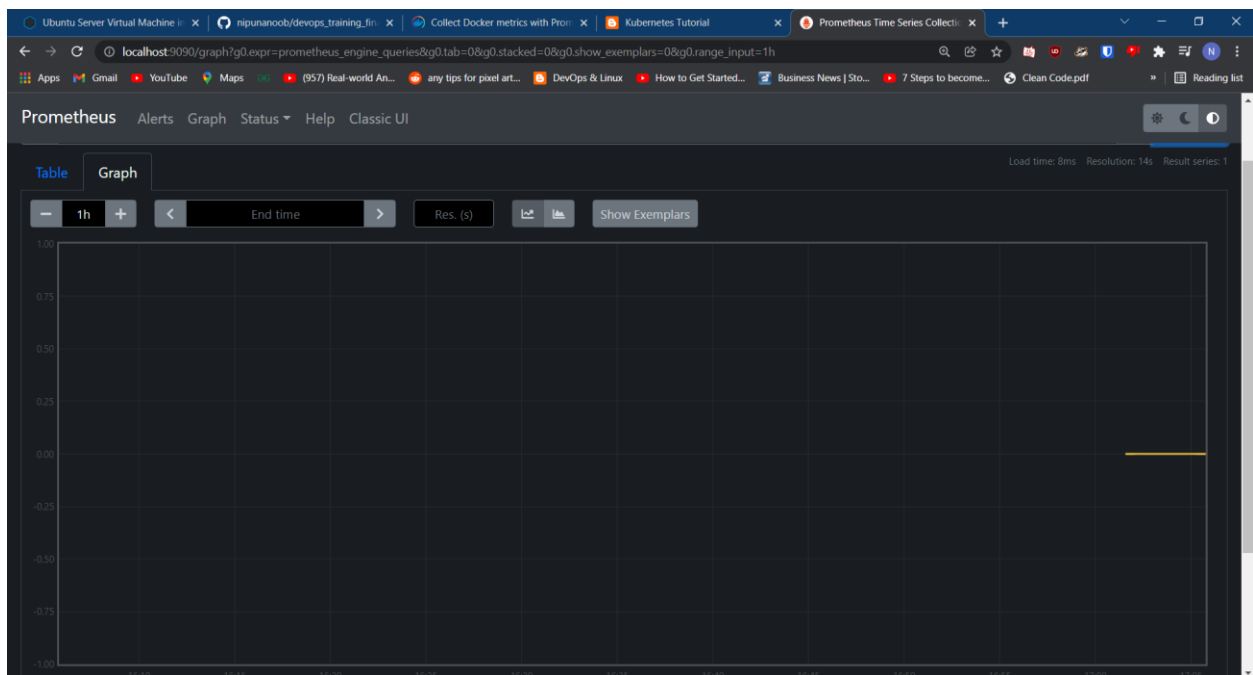
```
Windows PowerShell
Creating network demo_default
Creating service demo_bb-app
PS C:\Users\nipun\Documents\Devops\kube_test> docker services
docker: 'services' is not a docker command.
See 'docker --help'
PS C:\Users\nipun\Documents\Devops\kube_test> docker service
Usage: docker service COMMAND
Manage services
Commands:
  create      Create a new service
  inspect     Display detailed information on one or more services
  logs        Fetch the logs of a service or task
  ls          List services
  ps          List the tasks of one or more services
  rm          Remove one or more services
  rollback    Revert changes to a service's configuration
  scale       Scale one or multiple replicated services
  update      Update a service
Run 'docker service COMMAND --help' for more information on a command.
PS C:\Users\nipun\Documents\Devops\kube_test> docker service ls
ID            NAME          MODE          REPLICAS  IMAGE          PORTS
zmog4v2azzde  demo_bb-app  replicated    1/1        getting-started:latest  *:8000->3000/tcp
PS C:\Users\nipun\Documents\Devops\kube_test> docker rm zmog4v2azzde
Error: No such container: zmog4v2azzde
PS C:\Users\nipun\Documents\Devops\kube_test> docker service rm zmog4v2azzde
zmog4v2azzde
PS C:\Users\nipun\Documents\Devops\kube_test> docker service ls
ID            NAME          MODE          REPLICAS  IMAGE          PORTS
PS C:\Users\nipun\Documents\Devops\kube_test> docker stack deploy -c bb-stack.yaml demo
Creating service demo_bb-app
PS C:\Users\nipun\Documents\Devops\kube_test> docker stack rm remo
Nothing found in stack: remo
PS C:\Users\nipun\Documents\Devops\kube_test> docker stack rm remo
Nothing found in stack: remo
PS C:\Users\nipun\Documents\Devops\kube_test> docker stack rm demo
Removing service demo_bb-app
```

Collect docker metrics with Prometheus

```
Windows PowerShell
PS C:\Users\nipun\Documents\Devops\kube_test> docker service create --replicas 1 --name my-prometheus
"docker service create" requires at least 1 argument.
See 'docker service create --help'.

Usage: docker service create [OPTIONS] IMAGE [COMMAND] [ARG...]

Create a new service
PS C:\Users\nipun\Documents\Devops\kube_test> docker service create --replicas 1 --name my-prometheus `
>> --mount type=bind,source=C:/tmp/prometheus.yml,destination=/etc/prometheus/prometheus.yml `
>> --publish published=9090,target=9090,protocol=tcp `
>> prom/prometheus
tc8zplnqyx6t0bu20w4jp4dih
overall progress: 1 out of 1 tasks
1/1: running [=====]
verify: Service converged
PS C:\Users\nipun\Documents\Devops\kube_test> docker service ls
ID                NAME                MODE                REPLICAS            IMAGE                PORTS
tc8zplnqyx6t      my-prometheus        replicated          1/1                  prom/prometheus:latest  *:9090->9090/tcp
PS C:\Users\nipun\Documents\Devops\kube_test> docker service create `
>> --replicas 10 `
>> --name ping_service `
>> alpine ping docker.com
zs5d579u7ewkvszvbzico8ia
overall progress: 10 out of 10 tasks
1/10: running [=====]
2/10: running [=====]
3/10: running [=====]
4/10: running [=====]
5/10: running [=====]
6/10: running [=====]
7/10: running [=====]
8/10: running [=====]
9/10: running [=====]
10/10: running [=====]
verify: Service converged
PS C:\Users\nipun\Documents\Devops\kube_test> |
```



Targets

All Unhealthy Collapse All

docker (0/1 up) [show logs](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://localhost:9323/metrics	DOWN	instance="localhost:9323" job="docker"	7.642s ago	1.001ms	Get "http://localhost:9323/metrics": dial tcp 127.0.0.1:9323: connect: connection refused

prometheus (1/1 up) [show logs](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://host.docker.internal:9090/metrics	UP	instance="host.docker.internal:9090" job="prometheus"	6.301s ago	7.430ms	

Stateful applications: Deploying WordPress & MySQL with persistent volumes

```
! wordpress-deployment.yaml ! mysql-deployment.yaml ! kustomization.yaml X
! kustomization.yaml > [ ] resources > 1
kustomization.yaml (kustomization.json)
1 secretGenerator:
2 - name: mysql-pass
3   literals:
4     - password=secret
5 resources:
6 - mysql-deployment.yaml
7 - wordpress-deployment.yaml
```

```
1  apiVersion: v1
2  kind: Service
3  metadata:
4    name: wordpress-mysql
5    labels:
6      app: wordpress
7  spec:
8    ports:
9      - port: 3306
10     selector:
11       app: wordpress
12       tier: mysql
13     clusterIP: None
14
15  apiVersion: v1
16  kind: PersistentVolumeClaim
17  metadata:
18    name: mysql-pv-claim
19    labels:
20      app: wordpress
21  spec:
22    accessModes:
23      - ReadWriteOnce
24    resources:
25      requests:
26        storage: 20Gi
27
28  apiVersion: apps/v1
29  kind: Deployment
30  metadata:
```

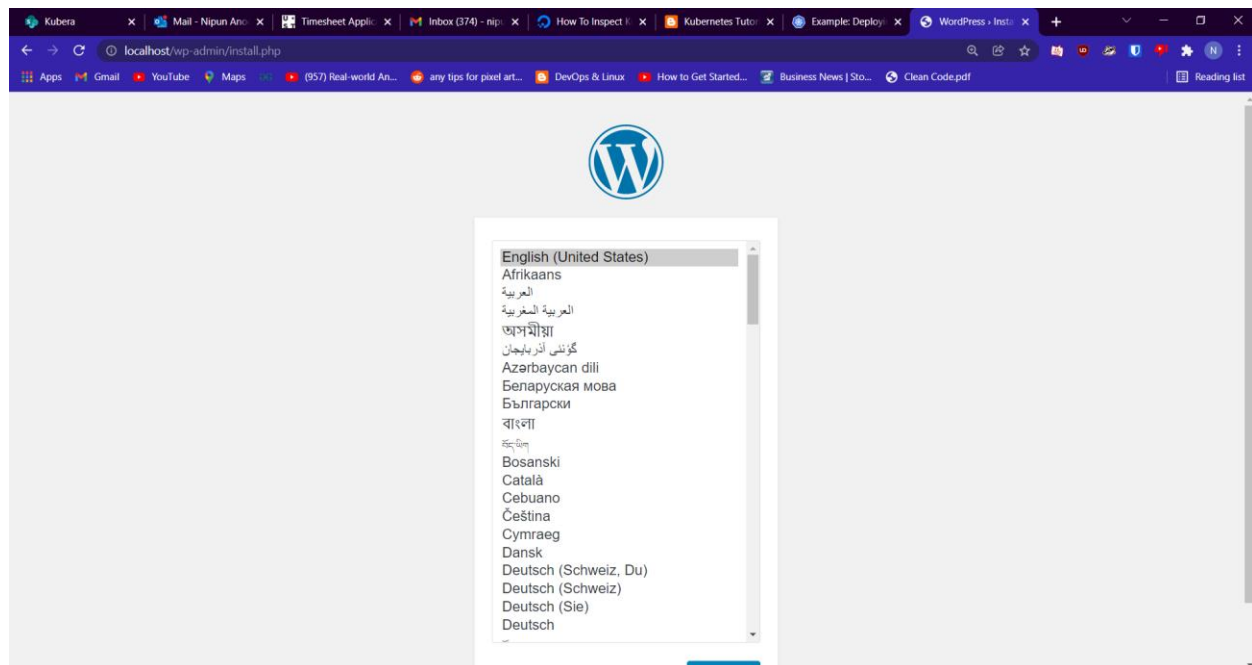
```
31  name: wordpress-mysql
32  labels:
33    app: wordpress
34  spec:
35    selector:
36      matchLabels:
37        app: wordpress
38        tier: mysql
39    strategy:
40      type: Recreate
41    template:
42      metadata:
43        labels:
44          app: wordpress
45          tier: mysql
46      spec:
47        containers:
48          - image: mysql:5.6
49            name: mysql
50            env:
51              - name: MYSQL_ROOT_PASSWORD
52                valueFrom:
53                  secretKeyRef:
54                    name: mysql-pass
55                    key: password
56          ports:
57            - containerPort: 3306
58              name: mysql
59          volumeMounts:
60            - name: mysql-persistent-storage
```

```
61  mountPath: /var/lib/mysql
62  volumes:
63    - name: mysql-persistent-storage
64      persistentVolumeClaim:
65        claimName: mysql-pv-claim
66
```

```

PS C:\Users\nipun\Documents\Devops\kube_test> kubectl apply -k ./
secret/mysql-pass-m4d885dchh created
service/wordpress created
service/wordpress-mysql created
persistentvolumeclaim/mysql-pv-claim created
persistentvolumeclaim/wp-pv-claim created
wordpress LoadBalancer 10.99.42.76 localhost 80:31695/TCP 2m20s
PS C:\Users\nipun\Documents\Devops\kube_test> kubectl delete -k ./
secret "mysql-pass-m4d885dchh" deleted
service "wordpress" deleted
service "wordpress-mysql" deleted
persistentvolumeclaim "mysql-pv-claim" deleted
persistentvolumeclaim "wp-pv-claim" deleted
deployment.apps "wordpress" deleted
deployment.apps "wordpress-mysql" deleted

```




```
1 apiVersion: v1
2 kind: Service
3 metadata:
4   name: wordpress
5   labels:
6     app: wordpress
7 spec:
8   ports:
9     - port: 80
10  selector:
11    app: wordpress
12    tier: frontend
13  type: LoadBalancer
14
15 apiVersion: v1
16 kind: PersistentVolumeClaim
17 metadata:
18   name: wp-pv-claim
19   labels:
20     app: wordpress
21 spec:
22   accessModes:
23     - ReadWriteOnce
24   resources:
25     requests:
26       storage: 20Gi
27
28 apiVersion: apps/v1
29 kind: Deployment
30 metadata:
```

```
31   name: wordpress
32   labels:
33     app: wordpress
34 spec:
35   selector:
36     matchLabels:
37       app: wordpress
38       tier: frontend
39   strategy:
40     type: Recreate
41   template:
42     metadata:
43       labels:
44         app: wordpress
45         tier: frontend
46     spec:
47       containers:
48         - image: wordpress:4.8-apache
49           name: wordpress
50           env:
51             - name: WORDPRESS_DB_HOST
52               value: wordpress-mysql
53             - name: WORDPRESS_DB_PASSWORD
54               valueFrom:
55                 secretKeyRef:
56                   name: mysql-pass
57                   key: password
58           ports:
59             - containerPort: 80
60             name: wordpress
```

```
61     volumeMounts:
62     - name: wordpress-persistent-storage
63       mountPath: /var/www/html
64     volumes:
65     - name: wordpress-persistent-storage
66       persistentVolumeClaim:
67         claimName: wp-pv-claim
68
```