

KUBERNETES

Enabling Kubernetes

```
File Edit Selection View Go Run Terminal Help pod.yaml - Final - Visual Studio Code

EXPLORER
  FINAL
    > getting-started
    > GettingStarted
    > Kubernetes
      ! pod.yaml

Kubernetes > ! pod.yaml
1  apiVersion: v1
2  kind: Pod
3  metadata:
4    name: demo
5  spec:
6    containers:
7      - name: testpod
8        image: alpine:3.5
9        command: ["ping", "8.8.8.8"]

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS H:\DevOpsTraining\Docker\Final>
PS H:\DevOpsTraining\Docker\Final>
PS H:\DevOpsTraining\Docker\Final> cd kubernetes
PS H:\DevOpsTraining\Docker\Final\kubernetes> kubectl apply -f pod.yaml
pod/demo created
PS H:\DevOpsTraining\Docker\Final\kubernetes> kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
bb-demo-589d9c588f-dwmkcm  1/1     Running   5 (16h ago)  10d
demo          1/1     Running   0           17s
PS H:\DevOpsTraining\Docker\Final\kubernetes> 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=69.276 ms
64 bytes from 8.8.8.8: seq=1 ttl=37 time=18.489 ms
64 bytes from 8.8.8.8: seq=2 ttl=37 time=18.353 ms
64 bytes from 8.8.8.8: seq=3 ttl=37 time=23.954 ms
64 bytes from 8.8.8.8: seq=4 ttl=37 time=23.161 ms
64 bytes from 8.8.8.8: seq=5 ttl=37 time=18.123 ms
64 bytes from 8.8.8.8: seq=6 ttl=37 time=18.213 ms
64 bytes from 8.8.8.8: seq=7 ttl=37 time=18.699 ms
64 bytes from 8.8.8.8: seq=17 ttl=37 time=19.166 ms
64 bytes from 8.8.8.8: seq=18 ttl=37 time=21.749 ms
64 bytes from 8.8.8.8: seq=19 ttl=37 time=19.096 ms
64 bytes from 8.8.8.8: seq=20 ttl=37 time=19.194 ms
```

```
File Edit Selection View Go Run Terminal Help pod.yaml - Final - Visual Studio Code

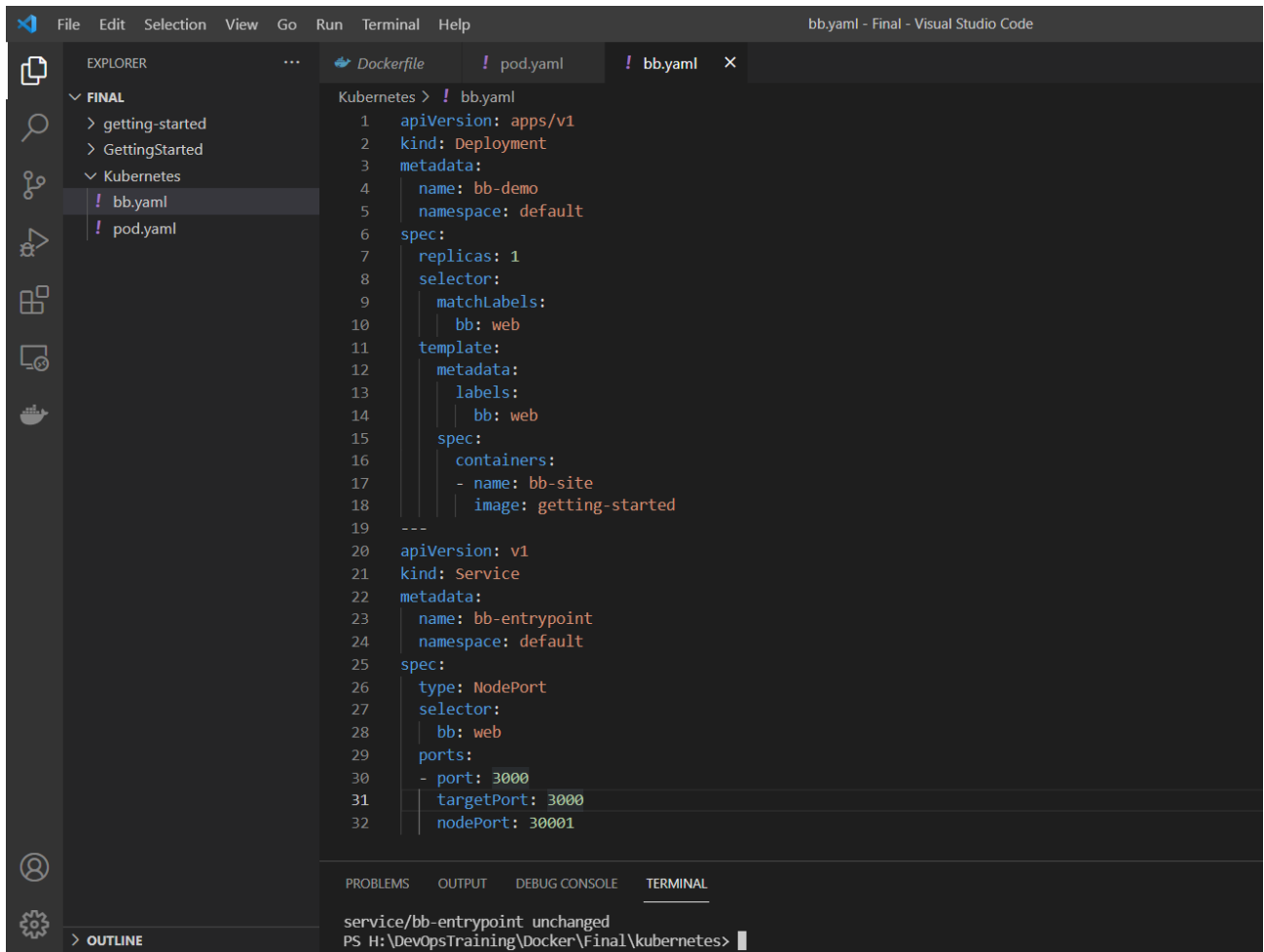
EXPLORER
  FINAL
    > getting-started
    > GettingStarted
    > Kubernetes
      ! pod.yaml

Kubernetes > ! pod.yaml
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2  kind: Pod
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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

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64 bytes from 8.8.8.8: seq=19 ttl=37 time=19.096 ms
64 bytes from 8.8.8.8: seq=20 ttl=37 time=19.194 ms
64 bytes from 8.8.8.8: seq=21 ttl=37 time=19.347 ms
64 bytes from 8.8.8.8: seq=22 ttl=37 time=18.554 ms
64 bytes from 8.8.8.8: seq=23 ttl=37 time=18.937 ms
64 bytes from 8.8.8.8: seq=24 ttl=37 time=19.020 ms
64 bytes from 8.8.8.8: seq=25 ttl=37 time=19.095 ms
64 bytes from 8.8.8.8: seq=26 ttl=37 time=18.271 ms
64 bytes from 8.8.8.8: seq=27 ttl=37 time=19.807 ms
64 bytes from 8.8.8.8: seq=28 ttl=37 time=21.471 ms
64 bytes from 8.8.8.8: seq=29 ttl=37 time=18.430 ms
64 bytes from 8.8.8.8: seq=30 ttl=37 time=18.221 ms
64 bytes from 8.8.8.8: seq=31 ttl=37 time=18.295 ms
64 bytes from 8.8.8.8: seq=32 ttl=37 time=20.495 ms
64 bytes from 8.8.8.8: seq=33 ttl=37 time=18.776 ms
PS H:\DevOpsTraining\Docker\Final\kubernetes> kubectl delete -f pod.yaml
pod "demo" deleted
PS H:\DevOpsTraining\Docker\Final\kubernetes>
```

Deploy to Kubernetes

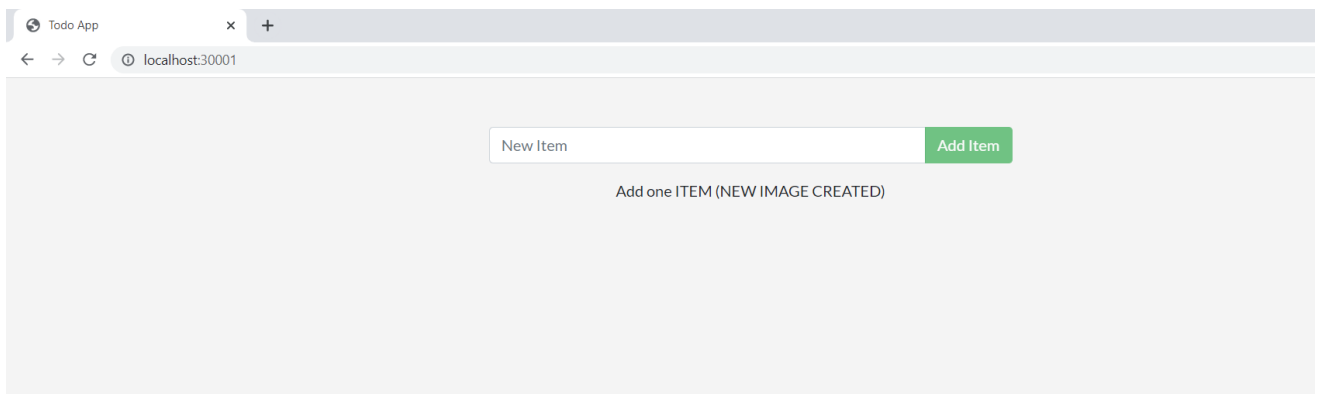


The screenshot shows the Visual Studio Code interface with the following components:

- EXPLORER:** A tree view on the left showing the project structure. The 'Kubernetes' folder is expanded, showing 'bb.yaml' and 'pod.yaml'.
- Editor:** The 'bb.yaml' file is open, displaying a Kubernetes Deployment and Service configuration. The Deployment is named 'bb-demo' and the Service is named 'bb-entripoint'.
- Terminal:** The terminal at the bottom shows the command 'service/bb-entripoint unchanged' and the prompt 'PS H:\DevOpsTraining\Docker\Final\kubernetes>'.

```
1 apiVersion: apps/v1
2 kind: Deployment
3 metadata:
4   name: bb-demo
5   namespace: default
6 spec:
7   replicas: 1
8   selector:
9     matchLabels:
10      bb: web
11   template:
12     metadata:
13       labels:
14         bb: web
15     spec:
16       containers:
17       - name: bb-site
18         image: getting-started
19 ---
20 apiVersion: v1
21 kind: Service
22 metadata:
23   name: bb-entripoint
24   namespace: default
25 spec:
26   type: NodePort
27   selector:
28     bb: web
29   ports:
30   - port: 3000
31     targetPort: 3000
32     nodePort: 30001
```

service/bb-entripoint unchanged
PS H:\DevOpsTraining\Docker\Final\kubernetes>



Deploy to Swarm

```
Kubernetes > ! bb-stack.yaml
1  version: '3.7'
2
3  services:
4    bb-app:
5      image: getting-started
6      ports:
7        - "8000:3000"
```

service/bb-entrypoint unchanged

PS H:\DevOpsTraining\docker\Final\kubernetes> kubectl get deployments

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
bb-demo	1/1	1	1	10d

PS H:\DevOpsTraining\docker\Final\kubernetes> kubectl get services

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
bb-entrypoint	NodePort	10.97.79.197	<none>	3000:30001/TCP	10d
kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	12d

PS H:\DevOpsTraining\docker\Final\kubernetes> kubectl delete -f bb.yaml

deployment.apps "bb-demo" deleted

service "bb-entrypoint" deleted

PS H:\DevOpsTraining\docker\Final\kubernetes> kubectl get services

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	12d

PS H:\DevOpsTraining\docker\Final\kubernetes> docker stack deploy -c bb-stack.yaml demo

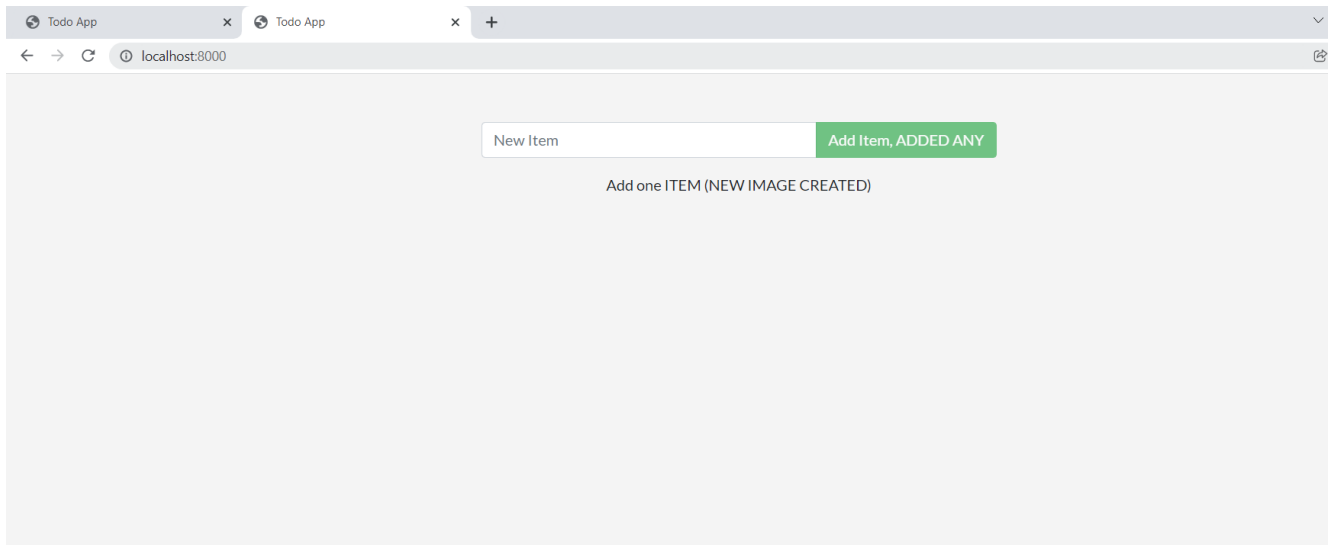
Creating network demo_default

Creating service demo_bb-app

PS H:\DevOpsTraining\docker\Final\kubernetes> docker service ls

ID	NAME	MODE	REPLICAS	IMAGE	PORTS
6046hwa5q4gu	demo_bb-app	replicated	1/1	getting-started:latest	*:8000->3000/tcp
ksp26vtc6wqy	my-prometheus	replicated	1/1	prom/prometheus:latest	*:9090->9090/tcp

PS H:\DevOpsTraining\docker\Final\kubernetes>



Collect Docker metrics with Prometheus

Visual Studio Code interface showing the Prometheus configuration file (prometheus.yml) and the Prometheus web interface.

prometheus.yml - Final - Visual Studio Code

```
Kubernetes > tmp > ! prometheus.yml
1 # my global config
2 global:
3   scrape_interval: 15s # Set the scrape interval to every 15 seconds. Default is every 1 minute.
4   evaluation_interval: 15s # Evaluate rules every 15 seconds. The default is every 1 minute.
5   # scrape_timeout is set to the global default (10s).
6
7   # Attach these labels to any time series or alerts when communicating with
8   # external systems (federation, remote storage, Alertmanager).
9   external_labels:
10     monitor: 'codelab-monitor'
11
12 # Load rules once and periodically evaluate them according to the global 'evaluation_interval'.
13 rule_files:
14   # - "first.rules"
15   # - "second.rules"
16
17 # A scrape configuration containing exactly one endpoint to scrape:
18 # Here it's Prometheus itself.
19 scrape_configs:
20   # The job name is added as a label `job=<job_name>` to any timeseries scraped from this config.
21   - job_name: 'prometheus'
22
23     # metrics_path defaults to '/metrics'
24     # scheme defaults to 'http'.
25
26     static_configs:
27       - targets: ['host.docker.internal:9090'] # Only works on Docker Desktop for Windows
28
29   - job_name: 'docker'
30
31     # metrics_path defaults to '/metrics'
32     # scheme defaults to 'http'.
33
34     static_configs:
35       - targets: ['192.168.65.1:9323']
```

Prometheus Alerts Graph Status Help Classic UI

Use local time Enable query history ☒ Enable autocomplete ☒ Enable highlighting ☒ Enable linter

Search: prometheus_engine_query_duration_seconds_count Execute

Table Graph

Load time: 9ms Resolution: 1s Result series: 4

Legend:

- prometheus_engine_query_duration_seconds_count(instance="host.docker.internal:9090", job="prometheus", slice="inner_eval")
- prometheus_engine_query_duration_seconds_count(instance="host.docker.internal:9090", job="prometheus", slice="prepare_time")

Targets

All Unhealthy Collapse All

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

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://192.168.65.1:9323/metrics	UNKNOWN	instance="192.168.65.1:9323" job="docker"	Never	0s	

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

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://host.docker.internal:9090/metrics	UP	instance="host.docker.internal:9090" job="prometheus"	113.000ms ago	53.878ms	