

# Creating a Kubernetes Cluster for a containerised application

Github link: <https://github.com/RyanSpeirs/sit323-2025-prac6p>

In this submission I use docker and kubernetes to deploy a simple JavaScript web server hosting a “hello world” message, there were some complications as shown here.

Leftover existing kubernetes service.

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get svc
NAME          TYPE          CLUSTER-IP    EXTERNAL-IP    PORT(S)    AGE
kubernetes    ClusterIP     10.96.0.1     <none>         443/TCP    11d

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>
```

Pod from earlier working with mongo still active, but no hello pod

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-657669984b-cxfv2             1/1     Running   2 (22h ago)  5d23h
```

Building the image, a ‘.’ is where a ‘/’ should be which becomes relevant in the next step

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>docker build -t ryanspeirs.sit323-6-lp-app .
[+] Building 7.7s (11/11) FINISHED                                docker:desktop-linux
=> [internal] load build definition from dockerfile              0.1s
=> => transferring dockerfile: 527B                             0.0s
=> [internal] load metadata for docker.io/library/node:16       2.2s
=> [auth] library/node:pull token for registry-1.docker.io      0.0s
=> [internal] load .dockerignore                                 0.0s
=> => transferring context: 2B                                    0.0s
=> [internal] load build context                                0.3s
=> => transferring context: 109.71kB                             0.3s
=> [1/5] FROM docker.io/library/node:16@sha256:f77a1aef2da8d83e45ec990f45df50f1a286c5fe8bbfb8c6e4246c6389705c0b  0.0s
=> CACHED [2/5] WORKDIR /app                                    0.0s
=> [3/5] COPY package*.json ./                                  0.1s
=> [4/5] RUN npm install                                         4.6s
=> [5/5] COPY . .                                                0.0s
=> exporting to image                                           0.2s
=> => exporting layers                                           0.1s
=> writing image sha256:3e687f12251e96a4da96f647f136cdd1f965e961203d1872773c7f37502c705b  0.0s
=> naming to docker.io/library/ryanspeirs.sit323-6-lp-app      0.0s

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/x62fi5cb5fo9bn9mtdgsa0u3k

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>
```

Image fails to push to docker hub because of login error or image name format

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>docker push ryanspeirs.sit323-6-lp-app
Using default tag: latest
The push refers to repository [docker.io/library/ryanspeirs.sit323-6-lp-app]
3047c3e63cd9: Preparing
785bddfe342d: Preparing
753f7a11163c: Preparing
1c52bda05e67: Preparing
be322b479aee: Preparing
d41bcd3a037b: Waiting
fe0d845e767b: Waiting
f25ec1d93a58: Waiting
794ce8b1b516: Waiting
3220beed9b06: Waiting
684f82921421: Waiting
9af5f53e8f62: Waiting
denied: requested access to the resource is denied

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>
```

SIT323 6.1P Ryan Speirs 600152989

Login to docker hub to fix issue

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>docker login
Authenticating with existing credentials... [Username: ryanspeirs]

Info → To login with a different account, run 'docker logout' followed by 'docker login'

Login Succeeded
```

Try to tag image before pushing to docker hub, discover name mismatch

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>docker tag sit323-6-1p-app ryanspeirs/sit323-6-1p-app
Error response from daemon: No such image: sit323-6-1p-app:latest

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
ryanspeirs.sit323-6-1p-app	latest	3e687f12251e	4 minutes ago	914MB
mongo	latest	6595a4d1b15f	8 days ago	888MB

Rename the image

```
\Docker\sit323-2025-prac6p>docker tag ryanspeirs.sit323-6-1p-app ryanspeirs/sit323-6-1p-app
```

Results in duplicated images

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>docker images
```

REPOSITORY	TAG
ryanspeirs.sit323-6-1p-app	latest
ryanspeirs/sit323-6-1p-app	latest
mongo	latest

<input type="checkbox"/>	Name	Tag	Image ID	Created	Size	Actions
<input type="checkbox"/>	ryanspeirs.sit323-6-1p-app	latest	3e687f12251e	16 minutes ago	914.15 MB	
<input type="checkbox"/>	ryanspeirs/sit323-6-1p-app	latest	3e687f12251e	16 minutes ago	914.15 MB	

We can now push to docker hub

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>docker push ryanspeirs/sit323-6-1p-app
Using default tag: latest
The push refers to repository [docker.io/ryanspeirs/sit323-6-1p-app]
3047c3e63cd9: Pushed
785bddfe342d: Pushed
753f7a11163c: Pushed
1c52bda05e67: Pushed
be322b479aee: Pushed
d41bcd3a037b: Pushed
fe0d845e767b: Pushed
f25ec1d93a58: Pushed
794ce8b1b516: Pushed
3220beed9b06: Pushed
684f82921421: Pushed
9af5f53e8f62: Pushed
latest: digest: sha256:2575024ee0e5245b371227e06e2527a45bde2cb2b76516b6fccf40478c6050fd size: 2838

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>
```

Docker Hub

	Tags	OS	Vulnerabilities	Last pushed	Size
ryanspeirs/sit323-6-1p-app	latest		Inactive	44 minutes ago	351.03 MB

Apply both yaml files

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl apply -f deployment.yaml
deployment.apps/sit323-hello-deployment created
```

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl apply -f service.yaml
service/sit323-hello-service created
```

Here I notice that it doesn't mention the task name in the metadata

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-657669984b-cxfv2             1/1     Running   2 (22h ago) 5d23h
sit323-hello-deployment-7c79d65b6c-n724j 1/1     Running   0           3m33s
```

I go into both yaml files to amend them with "prac6p"

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl apply -f deployment.yaml
deployment.apps/sit323-hello-prac6p-deployment created
```

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl apply -f service.yaml
The Service "sit323-hello-prac6p-service" is invalid: spec.ports[0].nodePort: Invalid value:
30080: provided port is already allocated
```

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl rollout restart deployment sit323-hello-prac6p-deployment
deployment.apps/sit323-hello-prac6p-deployment restarted
```

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get deployments
NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
mongo                              1/1     1             1           5d23h
sit323-hello-deployment            1/1     1             1           17m
sit323-hello-prac6p-deployment     1/1     1             1           40s
```

Stop the pod running the old name

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-657669984b-cxfv2             1/1     Running   2 (22h ago) 5d23h
sit323-hello-deployment-7c79d65b6c-n724j 1/1     Running   0           17m
sit323-hello-prac6p-deployment-6595dcfc58-dkfpj 1/1     Running   0           43s
```

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl delete deployment sit323-hello-deployment
deployment.apps "sit323-hello-deployment" deleted
```

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-657669984b-cxfv2             1/1     Running   2 (22h ago) 5d23h
sit323-hello-deployment-7c79d65b6c-n724j 1/1     Terminating   0           18m
sit323-hello-prac6p-deployment-6595dcfc58-dkfpj 1/1     Running   0           103s
```

Attempt to apply the services.yaml file again

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl apply -f service.yaml
The Service "sit323-hello-prac6p-service" is invalid: spec.ports[0].nodePort: Invalid value:
30080: provided port is already allocated

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get svc
NAME                TYPE          CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
kubernetes           ClusterIP     10.96.0.1      <none>          443/TCP           12d
sit323-hello-service NodePort       10.108.27.109  <none>          3000:30080/TCP   19m

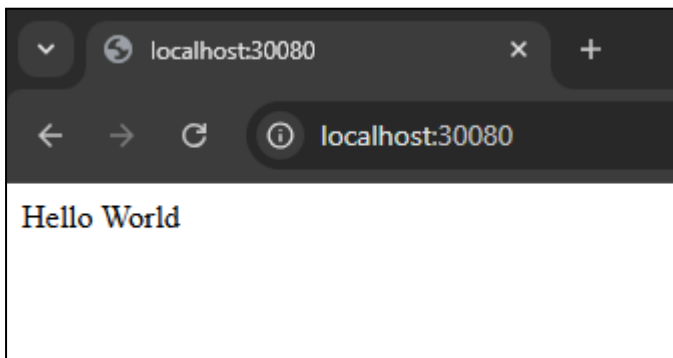
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl delete service sit323-hello-service
service "sit323-hello-service" deleted

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get svc
NAME                TYPE          CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
kubernetes           ClusterIP     10.96.0.1      <none>          443/TCP           12d

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl apply -f service.yaml
service/sit323-hello-prac6p-service created
```

```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>kubectl get svc
NAME                TYPE          CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
kubernetes           ClusterIP     10.96.0.1      <none>          443/TCP           12d
sit323-hello-prac6p-service NodePort       10.109.104.211 <none>          3000:30080/TCP   21s
```

The webpage displayed by the server and the second push to docker hub with the amended names for deployment and service.



```
C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>docker push ryanspeirs/sit323-6-1p-app
Using default tag: latest
The push refers to repository [docker.io/ryanspeirs/sit323-6-1p-app]
2c138f2540a0: Layer already exists
785bddfe342d: Layer already exists
753f7a11163c: Layer already exists
1c52bda05e67: Layer already exists
be322b479aee: Layer already exists
d41bcd3a037b: Layer already exists
fe0d845e767b: Layer already exists
f25ec1d93a58: Layer already exists
794ce8b1b516: Layer already exists
3220beed9b06: Layer already exists
684f82921421: Layer already exists
9af5f53e8f62: Layer already exists
latest: digest: sha256:48acf84793de02c5e6795036fedc178291eaa6aaa5fe81b717b268c569069895 size:
2839

C:\Users\Ryan\Documents\SIT\SIT323\Docker\sit323-2025-prac6p>
```