**Containerization hands-on excercise**

Repository Link: <https://github.com/Vish-TechOps/ceres-hands-on-go-kind-master>

## Prerequisites

1. Docker Desktop and Kind deployed
2. Kind cluster created. See kind/ directory

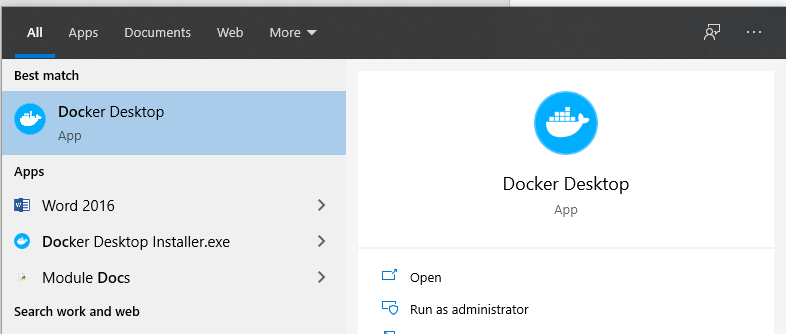
Follow reference documents for Installing Docker Desktop and Kind Cluster Creation

Installing Docker Desktop

<https://docs.docker.com/docker-for-windows/install/>

Docker Desktop for Windows is the Community version of Docker for Microsoft Windows. You can download Docker Desktop for Windows from Docker Hub.

Packages: <https://hub.docker.com/editions/community/docker-ce-desktop-windows/> and <https://docs.microsoft.com/en-us/windows/wsl/install-win10#step-4---download-the-linux-kernel-update-package>



Kind cluster created

Now follow clsuter creations steps

<https://github.com/Vish-TechOps/ceres-hands-on-go-kind-master/tree/master/kind>

Creating cluster

Install prerequisites

Chage directory to kind - this will allow you to mount data volume from relative path

Run

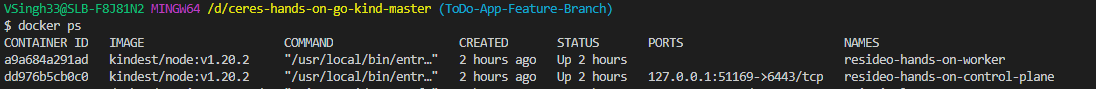
$ **kind create cluster --config kind.yaml4**

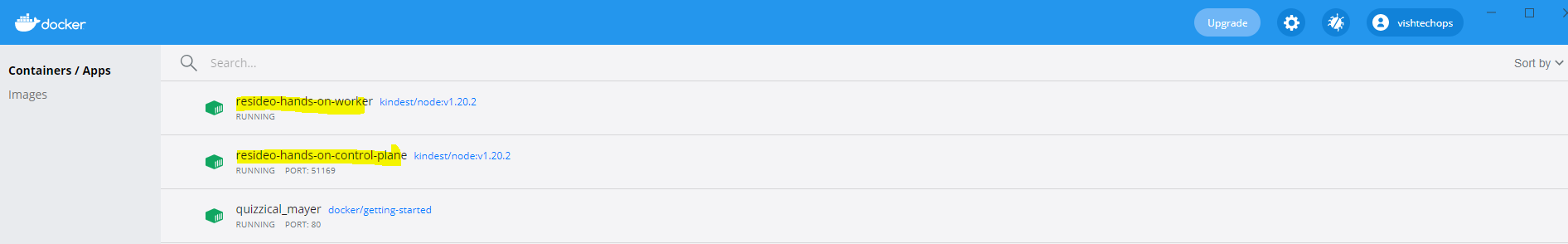
$ **kind get clusters**

$ **kubectl cluster-info --context kind-resideo-hands-on**

VERIFY IN DOCKER Desktop

Worker node and control plan should be running





## Task

<https://github.com/Vish-TechOps/ceres-hands-on-go-kind-master>

This repository Golang ToDo web application that requires Mongo backend. The goal of the task is to demonstrate understanding of containerized deployments.

### Primary goals

1. Build container with ToDo list web application
2. Run it alongside Mongo container
3. Demonstrate end-to-end setup
4. Create a pull request containing end-to-end build and deployment code against this repository
5. Be prepared to answer PR-related questions

**<STEP1>**

1) Create Private repo in GitHub

2) Git clone empty repo and unzip ceres-hands-on-go-kind-master.zip

3) Git commands to push changes into Master in repo

4) Visual studio is set for git commands with github repo

**<STEP2>**

Now work on tasks

https://github.com/Vish-TechOps/ceres-hands-on-go-kind-master

Task section

**$ git checkout -b ToDo-App-Feature-Branch**

Switched to a new branch 'ToDo-App-Feature-Branch'

Singh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ ls -rlt**

total 12

-rw-r--r-- 1 VSingh33 1049089 1381 Feb 8 22:39 README.md

drwxr-xr-x 1 VSingh33 1049089 0 Feb 8 22:39 kind

-rw-r--r-- 1 VSingh33 1049089 5222 Feb 8 22:39 main.go

drwxr-xr-x 1 VSingh33 1049089 0 Feb 8 22:39 static

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ pwd**

/d/ceres-hands-on-go-kind-master

## Clone the source code to your $GOPATH/src directory, use go get . command to run the install the dependencies.

Run below commads on feature branch

**$ export GOPATH=/d/ceres-hands-on-go-kind-master**

**$ echo $GOPATH**

**$ go env GOPATH**

D:/ceres-hands-on-go-kind-master

**$ go get .**

**$ go build**

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

$ ls -lrt

total 201

-rw-r--r-- 1 VSingh33 1049089 15396 Feb 9 00:28 demonstrate-end-to-end-setup-logs.txt

-rw-r--r-- 1 VSingh33 1049089 1381 Feb 9 09:43 README.md

drwxr-xr-x 1 VSingh33 1049089 0 Feb 9 09:43 kind

-rw-r--r-- 1 VSingh33 1049089 5222 Feb 9 09:43 main.go

-rw-r--r-- 1 VSingh33 1049089 213 Feb 9 09:53 Dockerfile

-rw-r--r-- 1 VSingh33 1049089 172179 Feb 9 09:53 demonstrate-end-to-end-setup.docx

drwxr-xr-x 1 VSingh33 1049089 0 Feb 12 20:19 static

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ echo $GOPATH**

C:\Users\vsingh33\go

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ echo $GOROOT**

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ go build**

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

$ ls -lrt

total 201

-rw-r--r-- 1 VSingh33 1049089 15396 Feb 9 00:28 demonstrate-end-to-end-setup-logs.txt

-rw-r--r-- 1 VSingh33 1049089 1381 Feb 9 09:43 README.md

drwxr-xr-x 1 VSingh33 1049089 0 Feb 9 09:43 kind

-rw-r--r-- 1 VSingh33 1049089 5222 Feb 9 09:43 main.go

-rw-r--r-- 1 VSingh33 1049089 213 Feb 9 09:53 Dockerfile

-rw-r--r-- 1 VSingh33 1049089 172179 Feb 9 09:53 demonstrate-end-to-end-setup.docx

drwxr-xr-x 1 VSingh33 1049089 0 Feb 12 20:19 static

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

$ ls -lrt

total 12337

-rw-r--r-- 1 VSingh33 1049089 15396 Feb 9 00:28 demonstrate-end-to-end-setup-logs.txt

-rw-r--r-- 1 VSingh33 1049089 1381 Feb 9 09:43 README.md

drwxr-xr-x 1 VSingh33 1049089 0 Feb 9 09:43 kind

-rw-r--r-- 1 VSingh33 1049089 5222 Feb 9 09:43 main.go

-rw-r--r-- 1 VSingh33 1049089 213 Feb 9 09:53 Dockerfile

-rw-r--r-- 1 VSingh33 1049089 172179 Feb 9 09:53 demonstrate-end-to-end-setup.docx

drwxr-xr-x 1 VSingh33 1049089 0 Feb 12 20:19 static

-rwxr-xr-x 1 VSingh33 1049089 12425216 Feb 12 21:02 ceres-hands-on-go-kind-master.exe

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

$ ./ceres-hands-on-go-kind-master.exe

2021/02/12 21:05:45 no reachable servers

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ docker ps**

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

a9a684a291ad kindest/node:v1.20.2 "/usr/local/bin/entr…" 3 days ago Up 3 days resideo-hands-on-worker

dd976b5cb0c0 kindest/node:v1.20.2 "/usr/local/bin/entr…" 3 days ago Up 3 days 127.0.0.1:51169->6443/tcp resideo-hands-on-control-plane

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ docker pull mongo:3.6.22**

3.6.22: Pulling from library/mongo

4007a89234b4: Pull complete

5dfa26c6b9c9: Pull complete

0ba7bf18aa40: Pull complete

4c6ec688ebe3: Pull complete

6e27db06de4c: Pull complete

bbecf0ce3761: Pull complete

ce97543d924d: Pull complete

7299669aa5f5: Pull complete

e5fda94ce451: Pull complete

3673227c8d34: Pull complete

4bb718560867: Pull complete

c687b7b215c2: Pull complete

b31a5ddc71fa: Pull complete

Digest: sha256:4f509daa35e7a383312592432ae624721b0f2d16210e787a5c90965907859f8d

Status: Downloaded newer image for mongo:3.6.22

docker.io/library/mongo:3.6.22

Run MongoDB

**docker run -itd -p 27017:27017 --name mongodb mongo:3.6.22**

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ docker ps**

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

f83669a868a0 mongo:3.6.22 "docker-entrypoint.s…" About a minute ago Up About a minute 0.0.0.0:27017->27017/tcp mongodb

a9a684a291ad kindest/node:v1.20.2 "/usr/local/bin/entr…" 3 days ago Up 3 days resideo-hands-on-worker

dd976b5cb0c0 kindest/node:v1.20.2 "/usr/local/bin/entr…" 3 days ago Up 3 days 127.0.0.1:51169->6443/tcp resideo-hands-on-control-plane

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ docker exec -it f83669a868a0 bash**

root@f83669a868a0:/# **mongo -host localhost -port 27017**

MongoDB shell version v3.6.22

connecting to: mongodb://localhost:27017/?gssapiServiceName=mongodb

Implicit session: session { "id" : UUID("1bca75e3-313e-4459-b855-65f475476a39") }

MongoDB server version: 3.6.22

Welcome to the MongoDB shell.

For interactive help, type "help".

For more comprehensive documentation, see

http://docs.mongodb.org/

Questions? Try the support group

http://groups.google.com/group/mongodb-user

Server has startup warnings:

2021-02-12T16:08:30.376+0000 I STORAGE [initandlisten]

2021-02-12T16:08:30.376+0000 I STORAGE [initandlisten] \*\* WARNING: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine

2021-02-12T16:08:30.376+0000 I STORAGE [initandlisten] \*\* See http://dochub.mongodb.org/core/prodnotes-filesystem

2021-02-12T16:08:31.003+0000 I CONTROL [initandlisten]

2021-02-12T16:08:31.004+0000 I CONTROL [initandlisten] \*\* WARNING: Access control is not enabled for the database.

2021-02-12T16:08:31.004+0000 I CONTROL [initandlisten] \*\* Read and write access to data and configuration is unrestricted.

2021-02-12T16:08:31.004+0000 I CONTROL [initandlisten]

2021-02-12T16:08:31.005+0000 I CONTROL [initandlisten]

2021-02-12T16:08:31.005+0000 I CONTROL [initandlisten] \*\* WARNING: /sys/kernel/mm/transparent\_hugepage/enabled is 'always'.

2021-02-12T16:08:31.005+0000 I CONTROL [initandlisten] \*\* We suggest setting it to 'never'

2021-02-12T16:08:31.005+0000 I CONTROL [initandlisten]

**> use demo\_todo**

switched to db demo\_todo

**> db.createCollection("todo")**

{ "ok" : 1 }

>

===

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

$ ls -lrt

total 12337

-rw-r--r-- 1 VSingh33 1049089 15396 Feb 9 00:28 demonstrate-end-to-end-setup-logs.txt

-rw-r--r-- 1 VSingh33 1049089 1381 Feb 9 09:43 README.md

drwxr-xr-x 1 VSingh33 1049089 0 Feb 9 09:43 kind

-rw-r--r-- 1 VSingh33 1049089 5222 Feb 9 09:43 main.go

-rw-r--r-- 1 VSingh33 1049089 172179 Feb 9 09:53 demonstrate-end-to-end-setup.docx

-rwxr-xr-x 1 VSingh33 1049089 12425216 Feb 12 21:02 ceres-hands-on-go-kind-master.exe

drwxr-xr-x 1 VSingh33 1049089 0 Feb 12 21:44 static

-rw-r--r-- 1 VSingh33 1049089 275 Feb 12 21:59 Dockerfile

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ docker build -t todo-app-go:v1.2.0 .**

[+] Building 145.9s (10/10) FINISHED

=> [internal] load build definition from Dockerfile 0.0s

=> => transferring dockerfile: 227B 0.0s

=> [internal] load .dockerignore 0.0s

=> => transferring context: 2B 0.0s

=> [internal] load metadata for docker.io/library/golang:1.10 5.9s

=> [auth] library/golang:pull token for registry-1.docker.io 0.0s

=> [1/4] FROM docker.io/library/golang:1.10@sha256:6d5e79878a3e4f1b30b7aa4d24fb6ee6184e905a9b172fc72593935633be4c46 138.8s

=> => resolve docker.io/library/golang:1.10@sha256:6d5e79878a3e4f1b30b7aa4d24fb6ee6184e905a9b172fc72593935633be4c46 0.0s

=> => sha256:741437d97401b83849ccbfe4ed8964049b752081647d7f1ea8aea29d989f8968 45.34MB / 45.34MB 59.2s

=> => sha256:6d5e79878a3e4f1b30b7aa4d24fb6ee6184e905a9b172fc72593935633be4c46 3.46kB / 3.46kB 0.0s

=> => sha256:6fd1f7edb6ab06a00b9d8a68836202042694651c5963f463afca8b76a693e099 5.47kB / 5.47kB 0.0s

=> => sha256:0a108aa2667933b852b8d003f97b344d014fcd7e06a0c0e6e04f2d6906738388 4.34MB / 4.34MB 3.9s

=> => sha256:eac40ba14416262e26def90a2d6f10d6ff579ea61c267963f6cbfbbe63b0ea7b 1.80kB / 1.80kB 0.0s

=> => sha256:34d8874714d74b636739b8a52204650a664fca8ff9741dd66810f30196f103e2 10.78MB / 10.78MB 21.2s

=> => sha256:7f0334c36886bd4619e8d05ccf68003e53b0b6098b2166a216bd009dba678ed8 50.06MB / 50.06MB 82.2s

=> => sha256:d35724ed4672cc1ac62dca685634f02297e306fd1920dd76996799c00b728cbb 57.62MB / 57.62MB 104.5s

=> => extracting sha256:741437d97401b83849ccbfe4ed8964049b752081647d7f1ea8aea29d989f8968 2.7s

=> => sha256:c0eaf021aeaf304faaa8b6cb5a967532e83d0c9af364ab091bb947943e31c874 102.19MB / 102.19MB 131.7s

=> => extracting sha256:34d8874714d74b636739b8a52204650a664fca8ff9741dd66810f30196f103e2 0.5s

=> => extracting sha256:0a108aa2667933b852b8d003f97b344d014fcd7e06a0c0e6e04f2d6906738388 0.2s

=> => sha256:d3d9c96611f1f779cd0bf0d343ff910d5bc1aafb180b4e3aac7190db8269a829 126B / 126B 83.8s

=> => extracting sha256:7f0334c36886bd4619e8d05ccf68003e53b0b6098b2166a216bd009dba678ed8 3.6s

=> => extracting sha256:d35724ed4672cc1ac62dca685634f02297e306fd1920dd76996799c00b728cbb 3.3s

=> => extracting sha256:c0eaf021aeaf304faaa8b6cb5a967532e83d0c9af364ab091bb947943e31c874 6.5s

=> => extracting sha256:d3d9c96611f1f779cd0bf0d343ff910d5bc1aafb180b4e3aac7190db8269a829 0.0s

=> [internal] load build context 0.2s

=> => transferring context: 12.43MB 0.2s

=> [2/4] COPY ceres-hands-on-go-kind-master.exe bin/ 0.4s

=> [3/4] WORKDIR bin 0.1s

=> [4/4] RUN chmod +x ceres-hands-on-go-kind-master.exe 0.4s

=> exporting to image 0.2s

=> => exporting layers 0.2s

=> => writing image sha256:d7b1dfff44aa0a19c02be6f110241cfcfb6f1ef1a064057b9acb3f7c4b437cf8 0.0s

=> => naming to docker.io/library/todo-app-go:v1.1.0 0.0s

==========================================================================================

DOCKER COMPOSE Setup

VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

$ cat docker-compose.yml

version: "3.5"

services:

goapp:

image: todo-app-go:v1.1.0

links:

- mongodb

ports:

- "9000:9000"

networks:

- backend

mongodb:

image: mongo:v1-3.6.22

ports:

- "27017:27017"

volumes:

- ./data:/data/db

networks:

- backend

networks:

backend:

driver: "bridge"

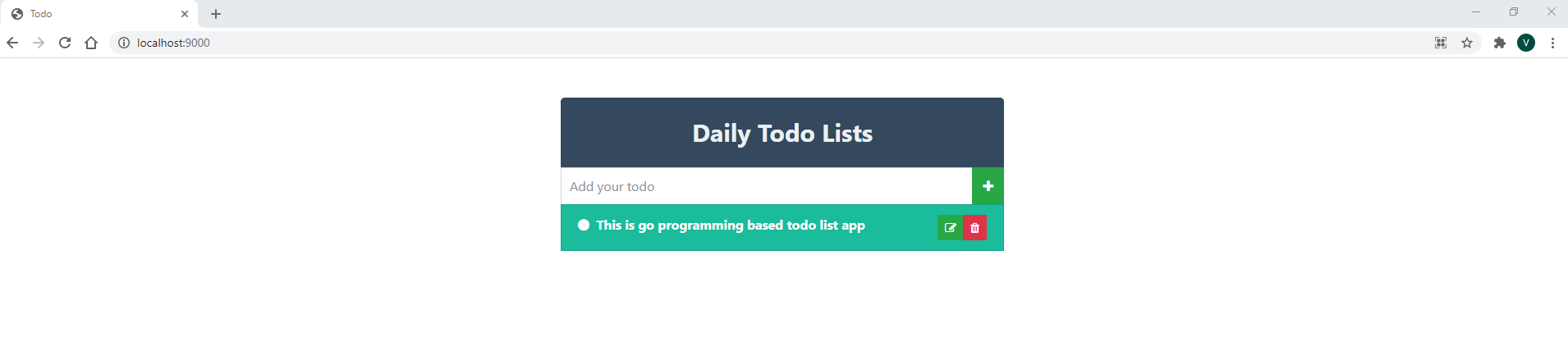
VSingh33@SLB-F8J81N2 MINGW64 /d/ceres-hands-on-go-kind-master (ToDo-App-Feature-Branch)

**$ docker-compose up -d**

Creating network "ceres-hands-on-go-kind-master\_backend" with driver "bridge"

Creating ceres-hands-on-go-kind-master\_mongodb\_1 ... done

Creating ceres-hands-on-go-kind-master\_goapp\_1 ... done



**<STEP4>**

Cleanup

Remove Kind cluster

kind delete cluster --name resideo-hands-on

Remove Mongo data

rm -rf kind/data/\*