Deploying Prometheus And Grafana in Kubernetes in one CLICK...

Before explanation of the task, let's first see something about Prometheus and Grafana...

Prometheus: Prometheus is a free software application used for event monitoring and alerting. It records real-time metrics in a time series database built using an HTTP pull model, with flexible queries and real-time alerting.

Grafana: **Grafana** is an open-source platform for data visualization, monitoring, and analysis. Most of the time, we use it with Prometheus. **Grafana** focuses on presenting time-series charts based on specific metrics such as CPU and I/O utilization.

So let's see what we are going to do...

Integrate Prometheus and Grafana and perform in the following way:

1. Deploy them as pods on top of Kubernetes by creating resources Deployment, ReplicaSet, Pods, or Services.

2. Make their data remain persistent and both of them should be exposed to the outside world.

Github Link for reference: https://github.com/Anuddeeph/prometheus-grafana-persistent.git

Let's start now...

- The first thing which we need to set up Kubernetes locally. Check this as a reference for setting Kubernetes with Minikube...
- For launch the whole setup I created yaml file and one kustomization file. Let me explain all the file one by one...
- For download image, you can check my docker hub account... https://hub.docker.com/u/anuddeeph
- **I created one ConfigMap for attaching config file with prometheus server...**

```
apiVersion: v1
kind: ConfigMap
metadata:
  name: prom-config
  labels:
    app: prom
data:
  prometheus.yml: |
    global:
      scrape_interval:     15s
      evaluation_interval: 15s
    scrape_configs:
     - job_name: 'prometheus'
       static_configs:

       - targets: ['localhost:9090']
```

A **ConfigMap** is an API object that lets you store configuration for other objects to use. Unlike most **Kubernetes** objects that have a spec , a **ConfigMap** has a data section to store items (keys) and their values.

- **This is the code for creating one PVC resource to make Prometheus data persistent...**

```
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
```

```
  name: task-prom-claim
spec:
  accessModes:
    - ReadWriteOnce
  resources:
    requests:

      storage: 3Gi
```

- **This is for creating one service and deployment to launch and expose Prometheus...**

```
apiVersion: v1
kind: Service
metadata:
  name: prometheus
  labels:
    app: prom
spec:
  ports:
    - port: 9090
  selector:
    app: prom
  type: NodePort
---


apiVersion: apps/v1 # for versions before 1.9.0 use apps/v1beta2
kind: Deployment
metadata:
  name: prom-deploy
  labels:
    app: prom
spec:
  replicas: 1
  selector:
    matchLabels:
      app: prom
  strategy:
    type: Recreate
  template:
    metadata:
      labels:
        app: prom
    spec:
      containers:
      - image: anuddeeph/Prometheus:v1
        name: prom
        ports:
        - containerPort: 9090
          name: prom
        volumeMounts:
        - name: prom-config
          mountPath: /prometheus-2.19.2.linux-amd64/prometheus.yml
```

```
          subPath: prometheus.yml
        - name: task-prom-claim
          mountPath: /prometheus-2.19.2.linux-amd64/data
      volumes:
        - name: prom-config
          configMap:
            name: prom-config
        - name: task-prom-claim
          persistentVolumeClaim:
            claimName: task-prom-claim
```

- **This is the code for creating one service, PVC, and deployment resource for launch, expose and make Grafana persistent...**

```
apiVersion: v1
kind: Service
metadata:
  name: grafana
  labels:
    app: graf
spec:
  ports:
    - port: 3000
  selector:
    app: graf
  type: NodePort
---
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: task-graf-claim
spec:
  accessModes:
    - ReadWriteOnce
  resources:
    requests:
      storage: 3Gi
---
apiVersion: apps/v1 # for versions before 1.9.0 use apps/v1beta2
kind: Deployment
metadata:
  name: graf-deploy
  labels:
    app: graf
spec:
  replicas: 1
  selector:
    matchLabels:
      app: graf
  strategy:
    type: Recreate
  template:
    metadata:
      labels:
        app: graf
```

```
    spec:
      containers:
      - image: anuddeeph/Grafana:v1
        name: graf
        ports:
        - containerPort: 3000
          name: graf
        volumeMounts:
        - name: task-graf
          mountPath: "/usr/share/grafana/data"
      volumes:
        - name: task-graf
          persistentVolumeClaim:
            claimName: task-graf-claim
```

- **Now the last thing, we are going to create a kustomization file for launch the whole setup in one click...**

```
apiVersion: kustomize.config.k8s.io/v1beta1
kind: Kustomization
resources:
  - configmap.yml
  - promvolume.yml
  - prometheus.yml

  - grafana.yml
```

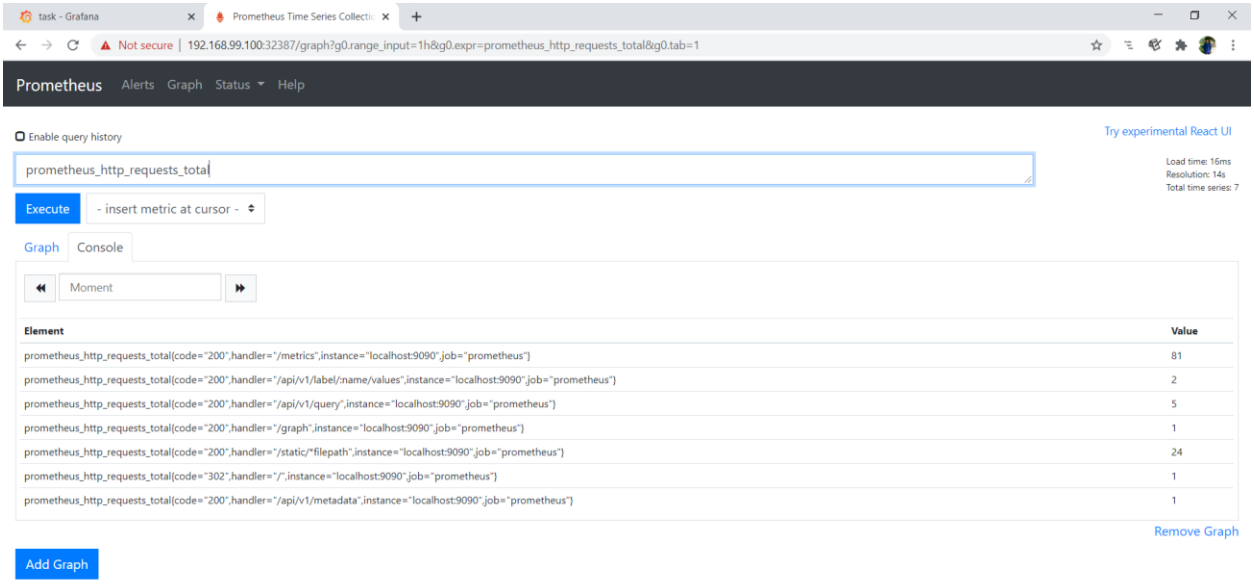
Let's check the output now...

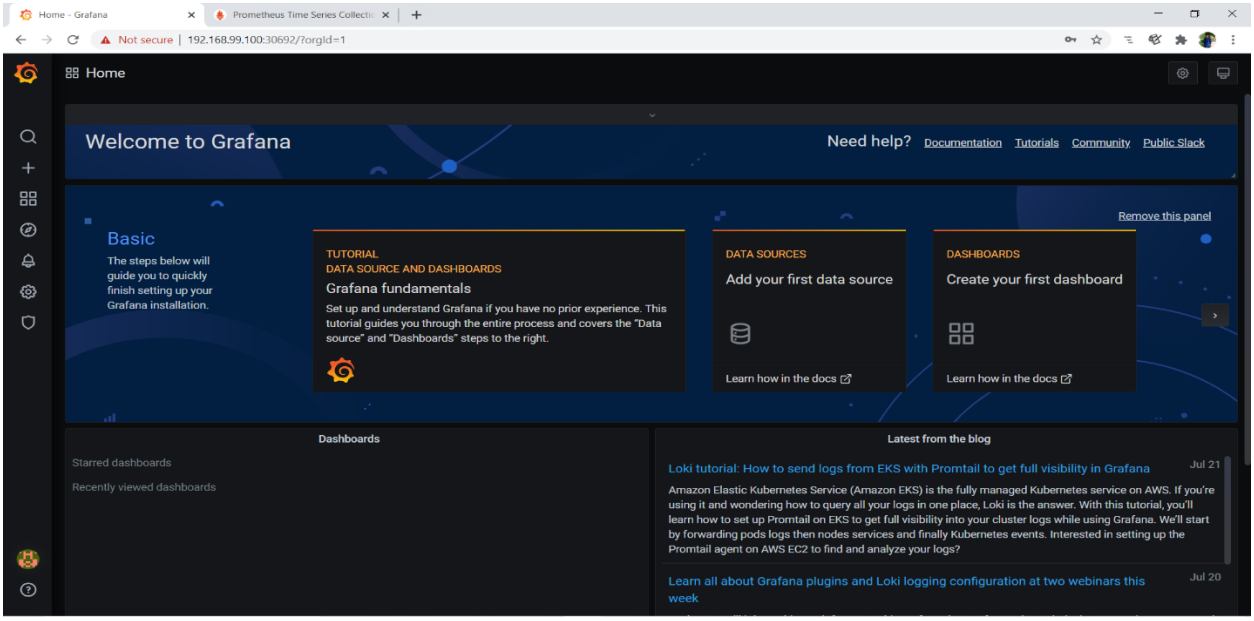
Command Prompt

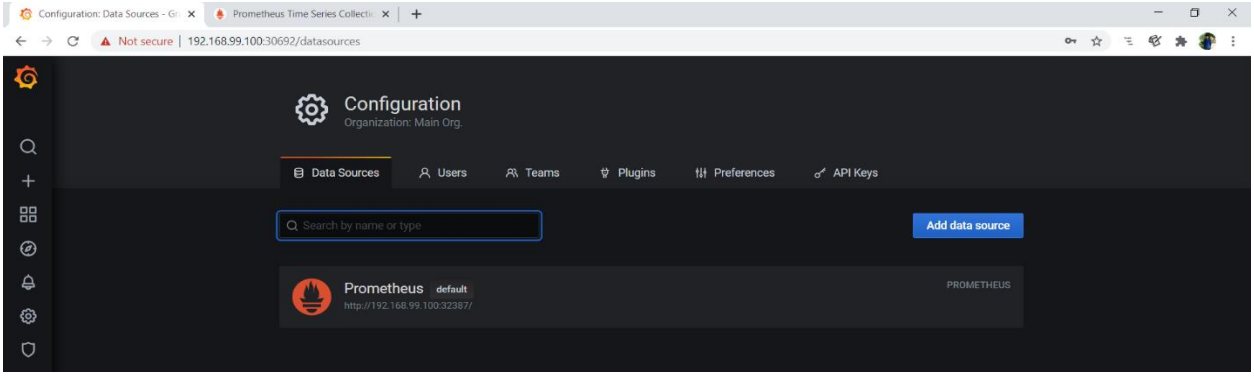
```
C:\Users\Anuddeeph Nalla\Desktop\Devops\DevopsTask5>dir
 Volume in drive C has no label.
 Volume Serial Number is E023-1724

 Directory of C:\Users\Anuddeeph Nalla\Desktop\Devops\DevopsTask5

21-07-2020  22:43    <DIR>          .
21-07-2020  22:43    <DIR>          ..
30-06-2020  07:33               312 configmap.yml
21-07-2020  22:27             1,026 grafana.yml
30-06-2020  07:33               152 kustomization.yml
21-07-2020  22:28             1,091 prometheus.yml
30-06-2020  07:33               164 promvolume.yml
               5 File(s)          2,745 bytes
               2 Dir(s)  22,857,048,064 bytes free

C:\Users\Anuddeeph Nalla\Desktop\Devops\DevopsTask5>kubectl apply -k .
configmap/prom-config created
service/grafana created
service/prometheus created
deployment.apps/graf-deploy created
deployment.apps/prom-deploy created
persistentvolumeclaim/task-graf-claim created
persistentvolumeclaim/task-prom-claim created
```

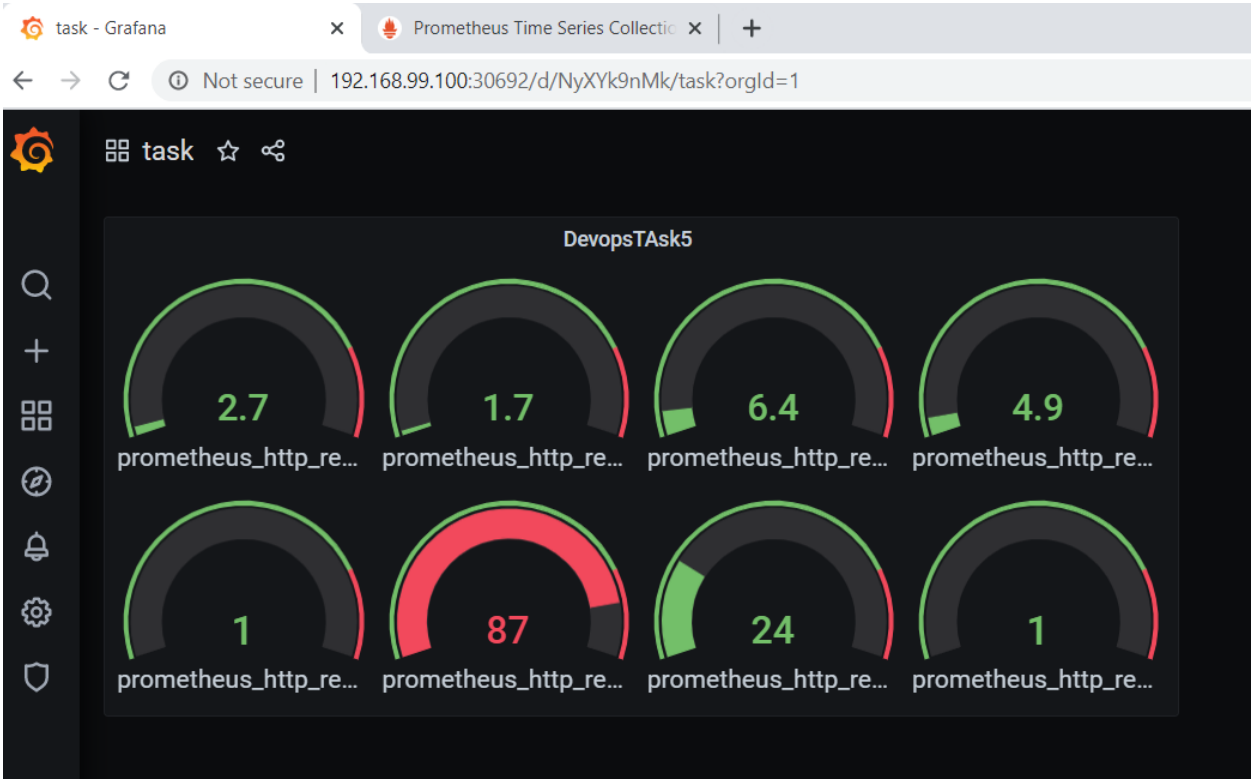
You can check here that all the resources are launch by single command...

kubectl apply -k .





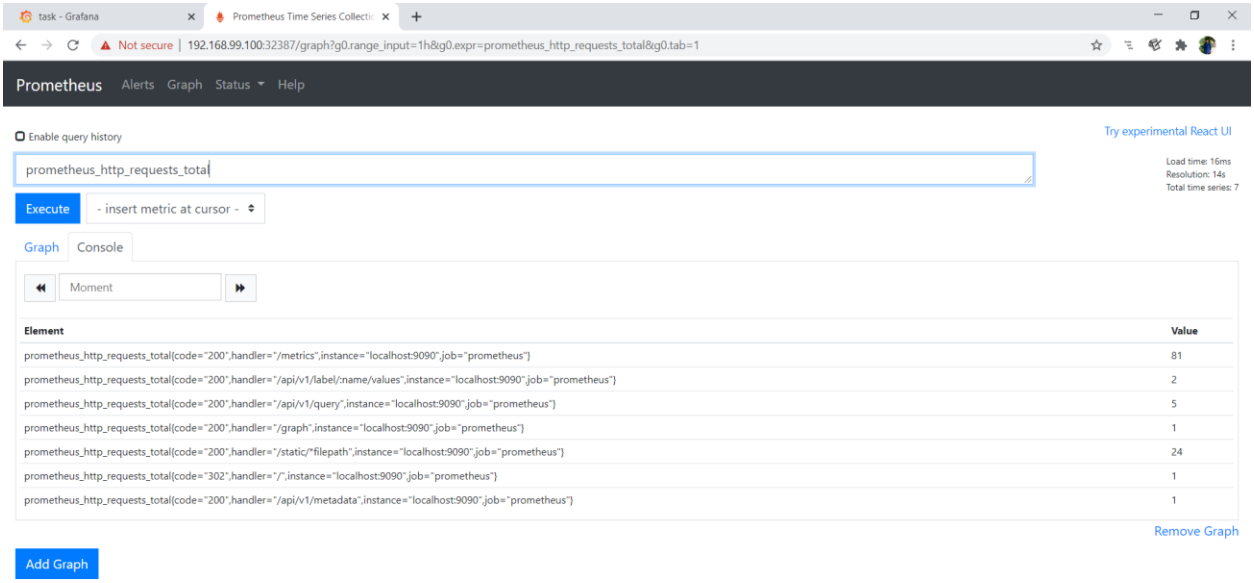


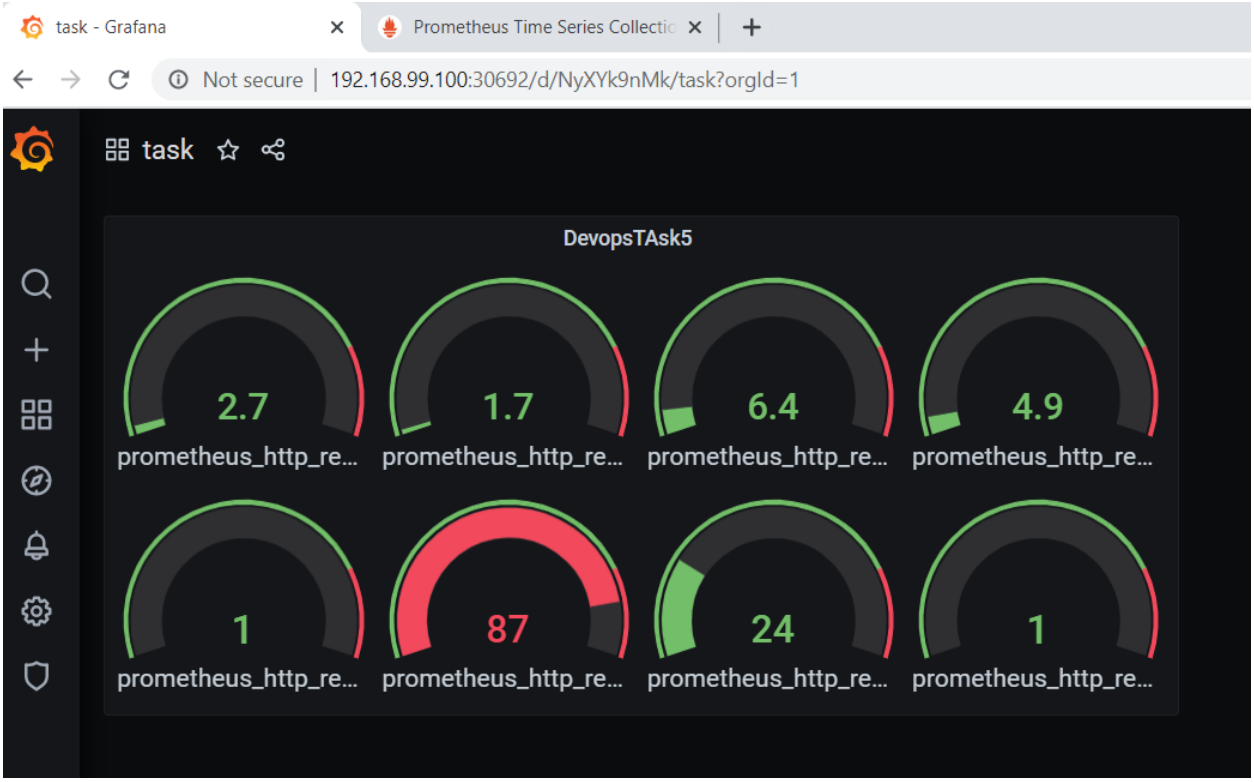


Now if you either delete any deployment or pod, your data remain persistent..

Command Prompt

```
C:\Users\Anuddeeph Nalla\Desktop\Devops\DevopsTask5>kubectl delete pods --all
pod "graf-deploy-584d56674-9m8lr" deleted
pod "prom-deploy-5555b65c49-lwrbc" deleted

C:\Users\Anuddeeph Nalla\Desktop\Devops\DevopsTask5>kubectl get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/graf-deploy-584d56674-xcrdr     1/1     Running   0          17s
pod/prom-deploy-5555b65c49-tm5c9    1/1     Running   0          17s

NAME                 TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)          AGE
service/grafana      NodePort    10.104.239.245   <none>        3000:30692/TCP   48m
service/kubernetes   ClusterIP   10.96.0.1        <none>        443/TCP          49m
service/prometheus   NodePort    10.102.140.39    <none>        9090:32387/TCP   48m

NAME                           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/graf-deploy    1/1     1            1           48m
deployment.apps/prom-deploy    1/1     1            1           48m

NAME                                      DESIRED   CURRENT   READY   AGE
replicaset.apps/graf-deploy-584d56674     1         1         1       48m
replicaset.apps/prom-deploy-5555b65c49    1         1         1       48m
```





Feel free to DM me if you have any query regarding this setup...

Thanks for reading...😊