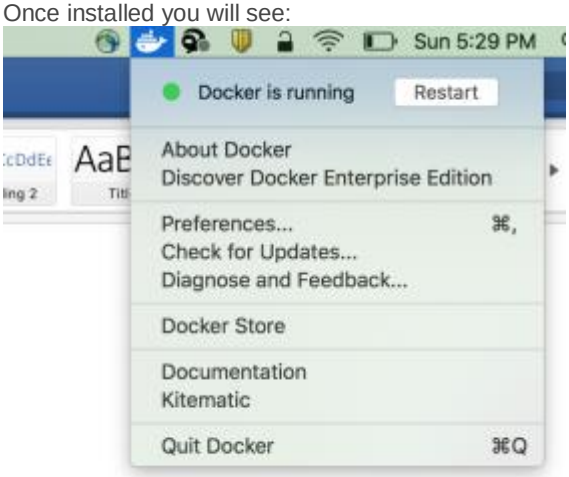
Docker Installation:

https://docs.docker.com/docker-for-mac/install/

Once installed you will see:




**Validate the installation:**
m-C02S23PLG8WM:docker-python-app aramar1$ ***docker version***
Client:
Version: 17.03.1-ce
API version: 1.27
Go version: go1.7.5
Git commit: c6d412e
Built: Tue Mar 28 00:40:02 2017
OS/Arch: darwin/amd64

Server:
Version: 17.03.1-ce
API version: 1.27 (minimum version 1.12)
Go version: go1.7.5
Git commit: c6d412e
Built: Fri Mar 24 00:00:50 2017
OS/Arch: linux/amd64
Experimental: true

**Docker commands:**

docker build -t <app name> .
docker run <appname>
docker stats
docker ps —>

**Step 1. How to write a Docker File:**
Write a Docker file with name **Dockerfile**

**Add your commands to build your application:**
**Eg:**
FROM python:2.7
ADD trackLocationFromWeb.py /
RUN pip install flask
RUN pip install web.py
RUN pip install geocode
EXPOSE 5000
CMD [ "python", "./<your server program>.py" ]

**Step 2. To build an App**

to build the app >**docker build -t <app name> .**

**Step 3. To verify the image created:**

**$docker images**

| REPOSITORY | TAG | IMAGE ID | CREATED | SIZE |
|---|---|---|---|---|
| track-python-app-exampl | 933d4845ac4c | 933d4845ac4c | 2 days ago | 740 MB |

**Step 4. To run your app.**

to run with log >**docker run —name logging-01 -t -d -v $(pwd):/tmp -w /tmp -p 5000:5000 <appName>**

Eg.

docker run --name logging-01 -t -d -v $(pwd):/tmp -w /tmp -p 5000:5000 track-python-app-exampl

**Step 5. To check the status of the Docker and check your application**

to see process >**docker ps or docker stats**

TO ssh into the container >**sudo docker exec -it <image-id-or-container id> bash**

To view the Docker Logs > **docker logs -f logging-02**

To test the application > **curl 127.0.0.1:5000 -v**

**Step 6: Pushing the Docker to a public hub:**

**To do this you must sign to Docker hub : https://docs.docker.com/engine/getstarted/step_five/**

**To push to google container registry: https://cloud.google.com/container-registry/docs/pushing**

#To Create an image with latest tag> docker tag fb37732d54a9 <imagename>:<tagid>

#To Push Docker image to hub > docker push <yourhubname/imagename>

Kubernetes Installation :
Refer: Kubernetes_install.pdf
https://confluence.walmart.com/download/attachments/189837932/Kubernetes_install.pdf?version=1&modificationDate=1491794785000&api=v2

**To Star the Kubernetes:**

minikube start

**Get Kubernetes cluster info :**

1. kubectl cluster-info

Kubernetes master is running at https://192.168.99.100:8443
KubeDNS is running at https://192.168.99.100:8443/api/v1/proxy/namespaces/kube-system/services/kube-dns
kubernetes-dashboard is running at https://192.168.99.100:8443/api/v1/proxy/namespaces/kube-system/services/kubernetes-dashboard

2. The above address would give unauthorized so you need to proxy with the

kubectl proxy --address="0.0.0.0" --port=9090

1. in Broswser access the port using local host
2. http://127.0.0.1:9090/api/v1/proxy/namespaces/kube-system/services/kubernetes-dashboard/#/pod?namespace=default

**Create the Deployment:**

**kubectl run <app-image-name> –image=<image-path> --port=5000**

## kubectl get deployments

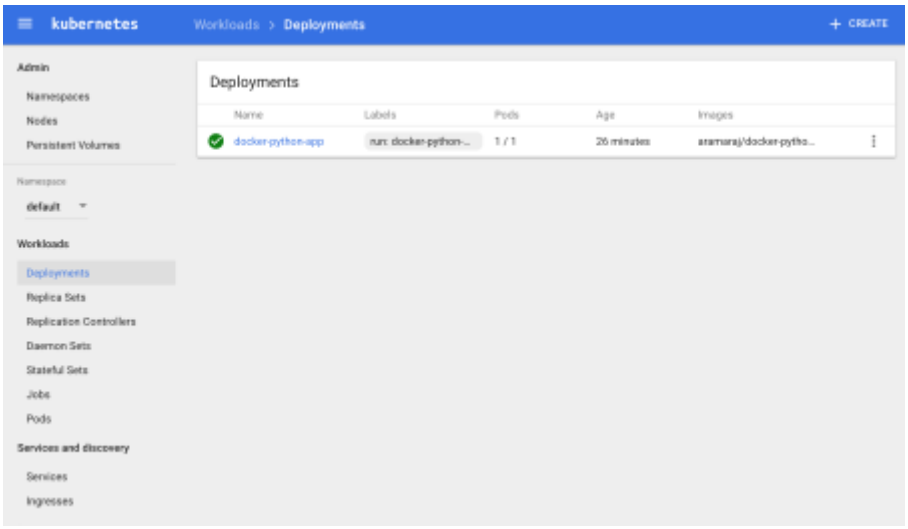
```
m-C02S23PLG8WM:docker-python-app aramar1$ kubectl get deployments
NAME              DESIRED   CURRENT   UP-TO-DATE   AVAILABLE   AGE
docker-python-app   1         1         1            1           3m
```

**check the status of the pod created:**

```
m-C02S23PLG8WM:docker-python-app aramar1$ kubectl get pods -o wide
NAME                              READY     STATUS    RESTARTS   AGE       IP           NODE
docker-python-app-3657222991-t5kb9   1/1       Running   0          3m        172.17.0.4   minikube
```

**Check the Events: (event log)**
**kubectl get events**

**Check the Deployment in Dash board:**



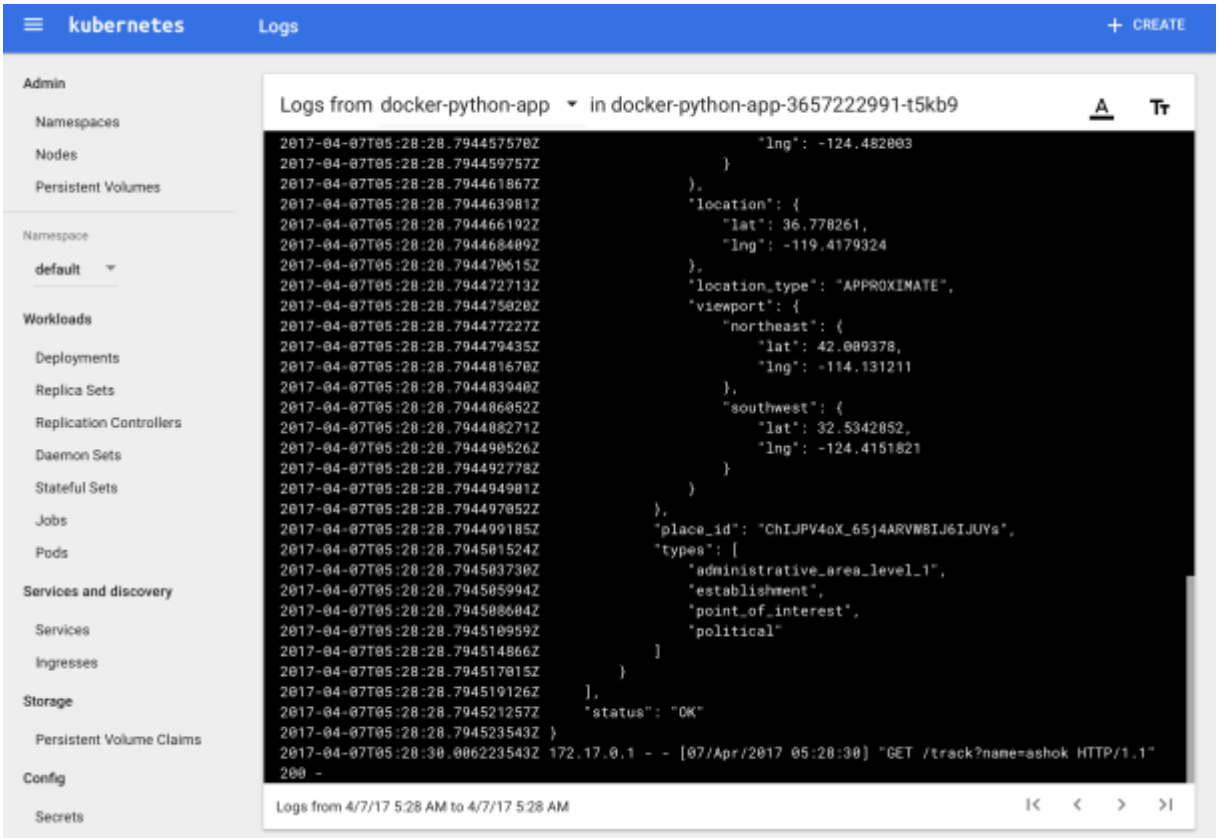

**Check the configuration:**

kubectl config view

```
m-C02S23PLG8WM:docker-python-app aramar1$ kubectl config view
apiVersion: v1
clusters:
- cluster:
    certificate-authority: /Users/aramar1/.minikube/ca.crt
    server: https://192.168.99.100:8443
  name: minikube
contexts:
- context:
    cluster: minikube
    user: minikube
  name: minikube
current-context: minikube
kind: Config
preferences: {}
users:
- name: minikube
  user:
    client-certificate: /Users/aramar1/.minikube/apiserver.crt
    client-key: /Users/aramar1/.minikube/apiserver.key
```

## Check if the application runs on the POD:

m-C02S23PLG8WM:docker-python-app aramar1$ minikube ssh
$ curl 172.17.0.4:5000/track?name=ashok
Location of the Delivery truck number ashok is 315-317 N 10th St, San Jose, CA 95112, USA and Map URL is
http://maps.google.com/?q=37.345622600,-121.884722400




## Create a Service to expose the service outside:

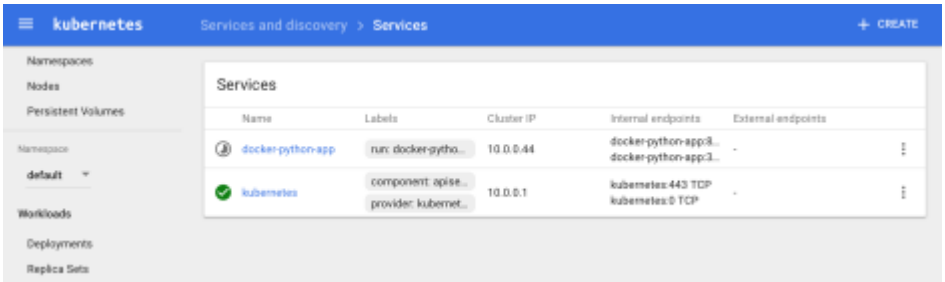
Note we must use the *type=NodePort* because *minikube* doesn't support the *LoadBalancer* service. We can check if the service was exposed by listing services:

m-C02S23PLG8WM:docker-python-app aramar1$ **kubectl expose deployment <service-name> --type=NodePort**
service "docker-python-app" exposed
m-C02S23PLG8WM:docker-python-app aramar1$

Get the services:

kubectl get svc

**Services Dash board:**



m-C02S23PLG8WM:kubernetes aramar1$ **kubectl get svc**

```
NAME         CLUSTER-IP   EXTERNAL-IP   PORT(S)        AGE
kubernetes   10.0.0.1     <none>        443/TCP        8h
web          10.0.0.34    <nodes>       80:30940/TCP   3m
```

**Get the Exposed Service URL:**

minikube service -n default --url docker-python-app
http://192.168.99.100:30587

# Kubernetes Scale:

**Scale the deployment pod:**
m-C02S23PLG8WM:docker-python-app aramar1$ **kubectl scale deployments/docker-python-app --replicas=3**
deployment "docker-python-app" scaled

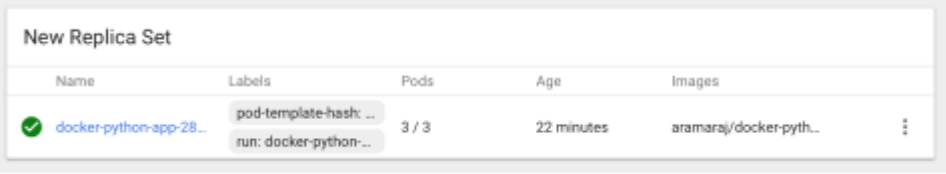
**get the deployments:**

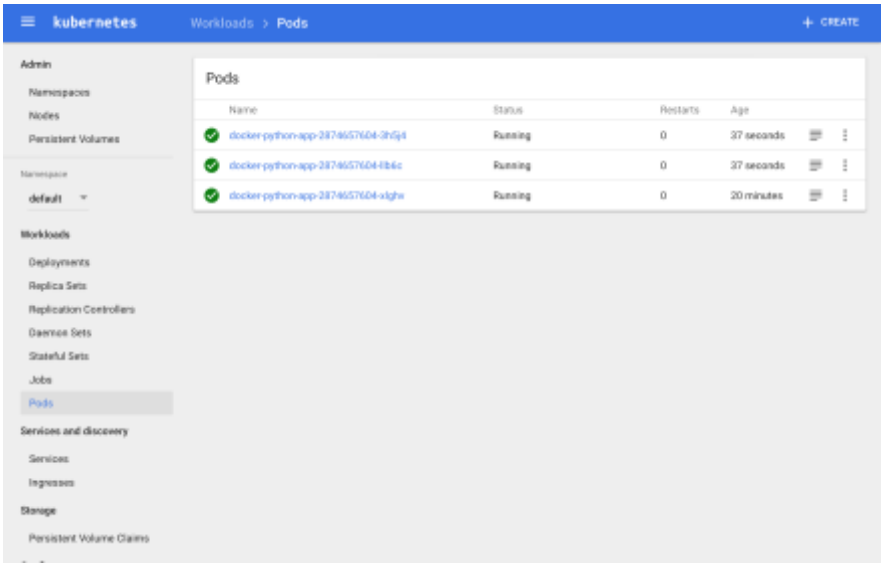
m-C02S23PLG8WM:docker-python-app aramar1$ **kubectl get deployments**

```
NAME              DESIRED   CURRENT   UP-TO-DATE   AVAILABLE   AGE
docker-python-app   3         3         3            3           23m
```

**get pods**
m-C02S23PLG8WM:docker-python-app aramar1$ **kubectl get pods -o wide**

```
NAME                                 READY     STATUS    RESTARTS   AGE       IP           NODE
docker-python-app-2874657604-3h5j4   1/1       Running   0          4m        172.17.0.2   minikube
docker-python-app-2874657604-llb6c   1/1       Running   0          4m        172.17.0.5   minikube
docker-python-app-2874657604-xlghv   1/1       Running   0          24m       172.17.0.6   minikube
```






**Describe the Deployment:**

```
m-C02S23PLG8WM:docker-python-app aramar1$ kubectl describe deployments/docker-python-app
Name:                   docker-python-app
Namespace:              default
CreationTimestamp:      Fri, 07 Apr 2017 01:30:37 -0700
Labels:                 run=docker-python-app
Annotations:            deployment.kubernetes.io/revision=3
Selector:               run=docker-python-app
Replicas:               3 desired | 3 updated | 3 total | 3 available | 0 unavailable
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  1 max unavailable, 1 max surge
Pod Template:
  Labels:  run=docker-python-app
  Containers:
   docker-python-app:
    Image:              aramaraj/docker-python-app
    Port:               5000/TCP
    Environment:        <none>
    Mounts:             <none>
  Volumes:              <none>
Conditions:
  Type          Status  Reason
  ----          ------  ------
  Available     True    MinimumReplicasAvailable
OldReplicaSets: <none>
NewReplicaSet:  <none>
Events:
  FirstSeen     LastSeen        Count   From                    SubObjectPath   Type            Reason
        Message
  ---------     --------        -----   ----                    -------------   --------        ------
  26m           26m             1       deployment-controller                   Normal
        ScalingReplicaSet Scaled up replica set docker-python-app-2874657604 to 1
  26m           26m             1       deployment-controller                   Normal
        ScalingReplicaSet Scaled down replica set docker-python-app-3657222991 to 0
  5m            5m              1       deployment-controller                   Normal
        ScalingReplicaSet Scaled up replica set docker-python-app-2874657604 to 3
```

# Load Balancing Kubernetes

Show the service hit by the URL

```
kubectl logs docker-python-app-2874657604-3h5j4
```

Running in Cloud:

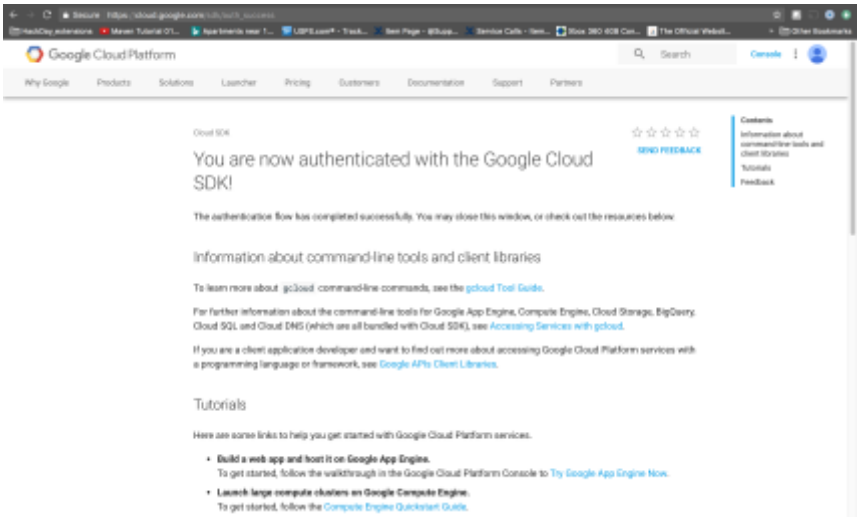
# Before you begin

1. Select or create a Cloud Platform project -
2. Enable billing for your project.
3. Enable the Cloud Datastore, Cloud Storage, and Cloud Pub/Sub APIs.
    1. https://console.cloud.google.com/apis/dashboard?project=kuernetes-java&duration=PT1H
4. Install and initialize the Cloud SDK. https://cloud.google.com/sdk/docs/

```
m-C02S23PLG8WM:Downloads aramar1$ cd google-cloud-sdk/
m-C02S23PLG8WM:google-cloud-sdk aramar1$ ls
LICENSE                         VERSION                         completion.zsh.inc install.sh
        path.fish.inc           properties
README                          bin                     help                    lib
                path.zsh.inc
RELEASE_NOTES                   completion.bash.inc     install.bat     path.bash.inc
        platform
m-C02S23PLG8WM:google-cloud-sdk aramar1$ ./google-cloud-sdk/install.sh
-bash: ./google-cloud-sdk/install.sh: No such file or directory
m-C02S23PLG8WM:google-cloud-sdk aramar1$ ./install.
-bash: ./install.: No such file or directory
m-C02S23PLG8WM:google-cloud-sdk aramar1$ ./install.sh
Welcome to the Google Cloud SDK!

To help improve the quality of this product, we collect anonymized usage data
and anonymized stacktraces when crashes are encountered; additional information
is available at <https://cloud.google.com/sdk/usage-statistics>. You may choose
to opt out of this collection now (by choosing 'N' at the below prompt), or at
any time in the future by running the following command:

   gcloud config set disable_usage_reporting true

Do you want to help improve the Google Cloud SDK (Y/n)?  Y


Your current Cloud SDK version is: 150.0.0
The latest available version is: 150.0.0

┌──────────────────────────────────────────────────────────────────────────────┐
│                                   Components                                 │
├──────────────┬──────────────────────────────────────────────────────┬────────┬──────────┤
│    Status    │                         Name                         │   ID   │   Size   │
├──────────────┼──────────────────────────────────────────────────────┼────────┼──────────┤
│ Not Installed │ App Engine Go Extensions                             │ app-engine-go          │ 47.7 MiB │
│ Not Installed │ Bigtable Command Line Tool                           │ cbt                    │  3.9 MiB │
│ Not Installed │ Cloud Datalab Command Line Tool                      │ datalab                │  < 1 MiB │
│ Not Installed │ Cloud Datastore Emulator                             │ cloud-datastore-emulator │ 15.4 MiB │
│ Not Installed │ Cloud Datastore Emulator (Legacy)                    │ gcd-emulator           │ 38.1 MiB │
│ Not Installed │ Cloud Pub/Sub Emulator                               │ pubsub-emulator        │ 21.0 MiB │
│ Not Installed │ Emulator Reverse Proxy                               │ emulator-reverse-proxy │ 56.8 MiB │
│ Not Installed │ Google Container Registry's Docker credential helper │ docker-credential-gcr  │  3.4 MiB │
│ Not Installed │ gcloud Alpha Commands                                │ alpha                  │  < 1 MiB │
│ Not Installed │ gcloud Beta Commands                                 │ beta                   │  < 1 MiB │
│ Not Installed │ gcloud app Java Extensions                           │ app-engine-java        │ 128.6 MiB │
```

```
| Not Installed | gcloud app PHP Extensions (Mac OS X)          | app-engine-php-darwin | 21.9 MiB |
| Not Installed | gcloud app Python Extensions                  | app-engine-python     | 6.1 MiB  |
| Not Installed | kubectl                                       | kubectl               | 14.8 MiB |
| Installed     | BigQuery Command Line Tool                    | bq                    | < 1 MiB  |
| Installed     | Cloud SDK Core Libraries                      | core                  | 5.8 MiB  |
| Installed     | Cloud Storage Command Line Tool               | gsutil                | 2.9 MiB  |
| Installed     | Default set of gcloud commands                | gcloud                |          |
└---------------┴-----------------------------------------------┴-----------------------┴----------┘

To install or remove components at your current SDK version [150.0.0], run:
  $ gcloud components install COMPONENT_ID
  $ gcloud components remove COMPONENT_ID

To update your SDK installation to the latest version [150.0.0], run:
  $ gcloud components update


Modify profile to update your $PATH and enable shell command
completion? (Y/n)?  Y

The Google Cloud SDK installer will now prompt you to update an rc
file to bring the Google Cloud CLIs into your environment.

Enter a path to an rc file to update, or leave blank to use
[/Users/aramar1/.bash_profile]:
Backing up [/Users/aramar1/.bash_profile] to [/Users/aramar1/.bash_profile.backup].
[/Users/aramar1/.bash_profile] has been updated.

==> Start a new shell for the changes to take effect.


For more information on how to get started, please visit:
  https://cloud.google.com/sdk/docs/quickstarts


m-C02S23PLG8WM:google-cloud-sdk aramar1$ ./google-cloud-sdk/bin/gcloud init
-bash: ./google-cloud-sdk/bin/gcloud: No such file or directory
m-C02S23PLG8WM:google-cloud-sdk aramar1$ ./bin/gcloud init
Welcome! This command will take you through the configuration of gcloud.

Your current configuration has been set to: [default]

You can skip diagnostics next time by using the following flag:
  gcloud init --skip-diagnostics

Network diagnostic detects and fixes local network connection issues.
Checking network
connection...done.
Reachability Check passed.
Network diagnostic (1/1 checks) passed.

You must log in to continue. Would you like to log in (Y/n)?  Y

Your browser has been opened to visit:

    https://accounts.google.com/o/oauth2/auth?redirect_uri=http%3A%2F%2Flocalhost%3A8085%2F&prompt=s
elect_account&response_type=code&client_id=32555940559.apps.googleusercontent.com&scope=https%3A%
2F%2Fwww.googleapis.com%2Fauth%2Fuserinfo.email+https%3A%2F%2Fwww.googleapis.com%2Fauth%2F
cloud-
platform+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fappengine.admin+https%3A%2F%2Fwww.goog
```

```
leapis.com%2Fauth%2Fcompute+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Faccounts.reauth&acce
ss_type=offline


You are logged in as: [ashok.ramaraj@gmail.com].

Pick cloud project to use:
 [1] crack-case-134420
 [2] culverttracker-1473314615838
 [3] daring-harmony-142406
 [4] inbound-object-131706
 [5] kuernetes-java
 [6] sammydemo-154906
 [7] trackerdemojs-1473447840777
Please enter numeric choice or text value (must exactly match list
item):  5

Your current project has been set to: [kuernetes-java].

Not setting default zone/region (this feature makes it easier to use
[gcloud compute] by setting an appropriate default value for the
--zone and --region flag).
See https://cloud.google.com/compute/docs/gcloud-compute section on how to set
default compute region and zone manually. If you would like [gcloud init] to be
able to do this for you the next time you run it, make sure the
Compute Engine API is enabled for your project on the
https://console.developers.google.com/apis page.

Created a default .boto configuration file at [/Users/aramar1/.boto]. See this file and
[https://cloud.google.com/storage/docs/gsutil/commands/config] for more
information about configuring Google Cloud Storage.
Your Google Cloud SDK is configured and ready to use!

* Commands that require authentication will use ashok.ramaraj@gmail.com by default
* Commands will reference project `kuernetes-java` by default
Run `gcloud help config` to learn how to change individual settings

This gcloud configuration is called [default]. You can create additional configurations if you work with multiple
accounts and/or projects.
Run `gcloud topic configurations` to learn more.

Some things to try next:

* Run `gcloud --help` to see the Cloud Platform services you can interact with. And run `gcloud help
COMMAND` to get help on any gcloud command.
* Run `gcloud topic -h` to learn about advanced features of the SDK like arg files and output formatting
m-C02S23PLG8WM:google-cloud-sdk aramar1$
```

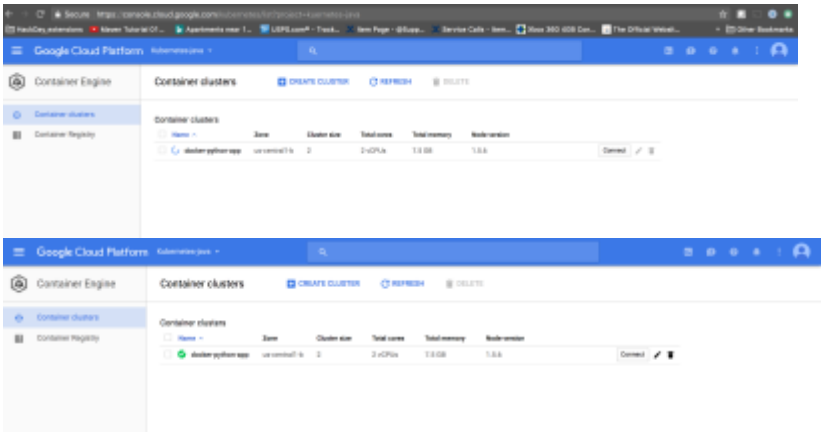



5. Install Docker. Docker is used to build container images locally.

# Creating a Container Engine cluster

m-C02S23PLG8WM:bin aramar1$ ./gcloud container clusters create docker-python-app --scopes "cloud-platform" --num-nodes 2
Creating cluster docker-python-app...|

m-C02S23PLG8WM:bin aramar1$ ./gcloud container clusters create docker-python-app --scopes "cloud-platform" --num-nodes 2
Creating cluster docker-python-app...done.
Created [https://container.googleapis.com/v1/projects/kuernetes-java/zones/us-central1-b/clusters/docker-python-app].
kubeconfig entry generated for docker-python-app.
NAME ZONE MASTER_VERSION MASTER_IP MACHINE_TYPE NODE_VERSION NUM_NODES STATUS
docker-python-app us-central1-b 1.5.6 <MASTER_IP> n1-standard-1 1.5.6 2 RUNNING




## Get the credentials for the cluster:

./gcloud container clusters get-credentials docker-python-app
Fetching cluster endpoint and auth data.
kubeconfig entry generated for docker-python-app.

Status

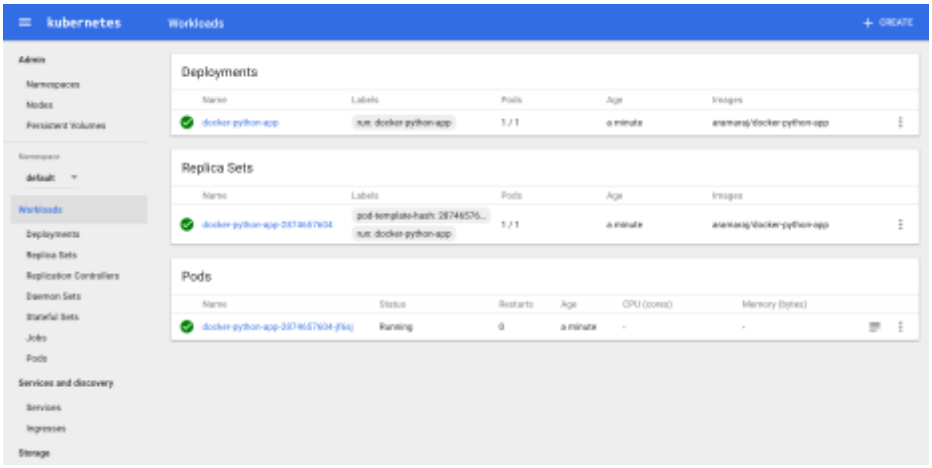
m-C02S23PLG8WM:bin aramar1$ kubectl cluster-info
Kubernetes master is running at https://<extenalip>
GLBCDefaultBackend is running at https://<extenalip>/api/v1/proxy/namespaces/kube-system/services/default-http-backend
Heapster is running at https://<extenalip>/api/v1/proxy/namespaces/kube-system/services/heapster
KubeDNS is running at https://<extenalip>/api/v1/proxy/namespaces/kube-system/services/kube-dns
kubernetes-dashboard is running at https://<extenalip>/api/v1/proxy/namespaces/kube-system/services/kubernetes-dashboard

Accesss the Dash board:

m-C02S23PLG8WM:bin aramar1$ kubectl proxy
Starting to serve on 127.0.0.1:8001

http://127.0.0.1:8001/api/v1/proxy/namespaces/kube-system/services/kubernetes-dashboard/#/workload?namespace=default

**Create the deployment :**
m-C02S23PLG8WM:bin aramar1$ kubectl run docker-python-app --image=aramaraj/docker-python-app --port=5000
deployment "docker-python-app" created

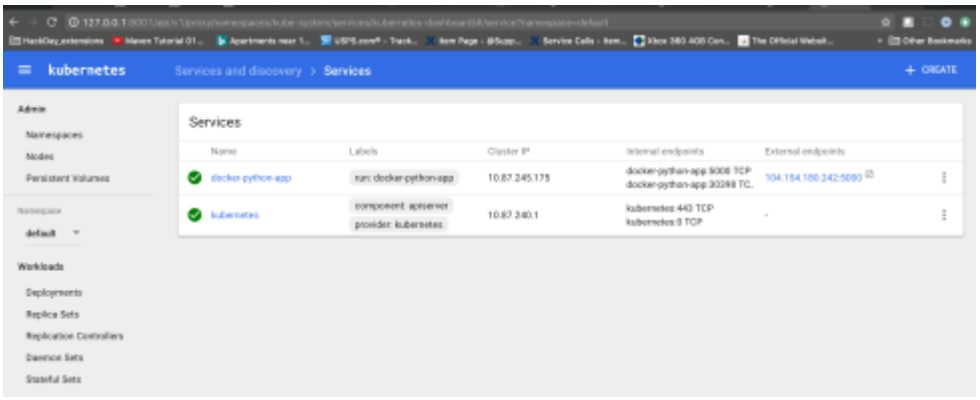



**Create the services**

m-C02S23PLG8WM:bin aramar1$ kubectl expose deployment docker-python-app --type=LoadBalancer
service "docker-python-app" exposed

**Get the Service details:**

m-C02S23PLG8WM:bin aramar1$ kubectl get svc
NAME CLUSTER-IP EXTERNAL-IP PORT(S) AGE
docker-python-app <clusterIP> <EXTERNAL_IP> 5000:30398/TCP 1m
kubernetes <kubernetes-ip> <none> 443/TCP 40m




http://<externalip>:5000/
Output:
welcome !