

Project IDS

Book Store using Google App Engine

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1 Technologies Used

- Google App Engine (<https://cloud.google.com/appengine/>)
- Google Cloud Postgresql (<https://cloud.google.com/sql/docs/postgres/>)
- Google Cloud SDK (<https://cloud.google.com/sdk/>)
- Docker (<https://www.docker.com/get-docker>)
- Kubernetes (<https://kubernetes.io>)
- Maven
- Git
- Java Spring Boot

2 Framework Used

- Yeoman (<http://yeoman.io/>)
- Node.js (<https://nodejs.org/en/about/>)

2.1 Yeoman

It is a generator ecosystem which helps us proscribing best practices and tools to stay productive. The workflow that it provides is a client-side stack, comprising tools and frameworks that can help quickly build web applications.

2.2 Node

Node.js is an event driven and therefore asynchronous I/O runtime library and environment that runs on the JavaScript interpreter created by Google V8. The truth is that it is very fashionable but not something new since there are libraries like Twisted that do exactly the same but if it is true that is the first based on JavaScript and has a great performance

3 Logic

The basic idea was to create a web application using JHipster and then deploy it on the Google Container engine using Kubernetes. The Google Cloud SQL was used as Postgresql database.

3.1 Why JHipster?

JHipster uses the following Client Side (Front end) technologies Yeoman, Webpack, Angular JS, Bootstrap. Also it uses the following Server Side (Back end) technologies Maven, Spring, Spring MVC REST, Spring data jpa. It uses a ‘monolithic architecture’ which contains both front-end and back-end code. It basically creates a decent architecture for the type of entities we want.

3.2 Step-by-Step Implementation

3.2.1 Application

- Create the environment on the local machine.
- Create the structure of our application
- Write logic for database entry and changes for UI.

3.2.2 Docker and Kubernetes

Following were the steps to deploy the web application [\[doc\]](#)[\[kub\]](#).

- Create Google Cloud Project and set the project as default
gcloud config set project bookstoreids
- Create a Google SQL Instance
gcloud beta sql instances create bookstoresql --region=europe-west1 --tier=db-f1-micro --authorized-networks='curl-s ifconfig.co' --backup-start-time=01:00 --enable-bin-log --activation-policy=ALWAYS --storage-type=HDD --storage-size=10GB
- Create a Container Cluster
gcloud container clusters create bookstore-1 --zone=europe-west1-b --machine-type=g1-small --num-nodes=3
- Get the credentials for kubectl gcloud container clusters get-credentials bookstore-1
- Build and push a docker image
docker image tag bookstore alarreine/bookstore:v1
It is better to add a version
gcloud docker -- push bookstore alarreine/bookstore:v1
- Create Credentials to use Cloud SQL Proxy
gcloud iam service-accounts create bookstore-app --display-name="Bookstore App"
- Get access to the service account gcloud projects add-iam-policy-binding bookstoreids --member serviceAccount:service@created.com --role roles/editor
- Create the key to use the proxy
gcloud iam service-accounts keys create --iam-account service@created.com application-credentials.json
- Add this key to the cluster Kubernetes
kubectl create secret generic cloudsql-oauth-credentials --from-file=credentials.json=application-credentials.json
- Add this credential to the pod file [\[con\]](#)
- Deploy the cluster
kubectl apply -f bookstore
- Get the external IP
kubectl get services

4 Architecture

4.1 Google Container

The architecture of Google Container with Kubernetes Figure.

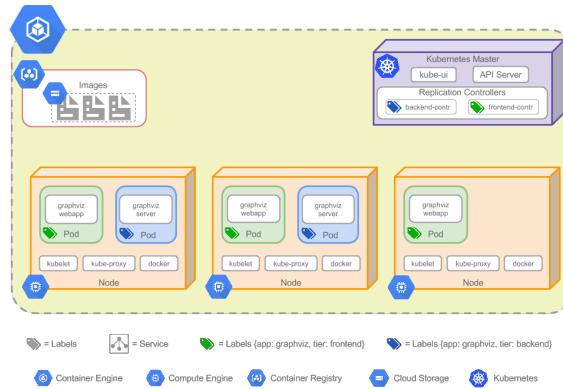


Figure 1: Compute Engine.[Ome]

4.2 Bookstore

The architecture of Bookstore is Figure 2.

References

- [con] Connecting from google container engine.
- [doc] Docker documentations.
- [kub] Kubernetes documentations.
- [Ome] Omer Dawelbeit. Getting started with kubernetes on google container engine.

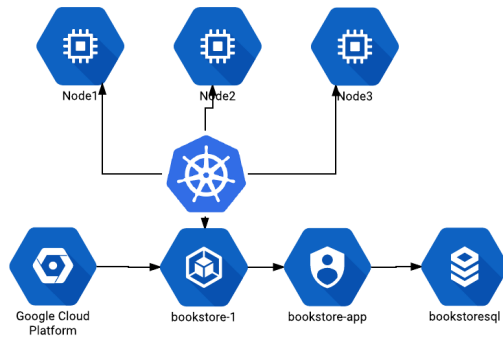


Figure 2: Architecture Bookstore.