SCC 19/20 Project 2 Report

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Description

For the second assignement of the Cloud Computing Systems (SCC) course, we were challenged to deploy our solution for the first assignment in the Azure Kubernetes Service [1].

For this, we first created a Docker [2] image. This image extends the wildfly [3] image to contain our application *war* file. To generate this image, we created a Dockerfile, present in Annex A. Then, we uploaded this image into dockerhub [4]. Afterwards, we specified a Kubernetes deployment file, which contains two services: Redis [5] and our app. The Redis service had the port 6379, were given the name *azure-redis* and run the container "redis". Our app service had the port 8080, were given the name *azure-project* and run the a container with the image we created.

Having sucessfully deployed the application on Kubernetes, we were further challenged to also deploy the test application. For this, we created another Docker image to contain Artillery [6] and the scripts describing the tests. The Dockerfile used to create this image is present in Annex C and it was also uploaded into dockerhub [4]. Afterwards, we specified a new Kubernetes deployment file, which contains a StorageClass, a PersistentVolumeClaim, and a Pod. The StorageClass defines different tiers of storage and the reclaimPolicy, which controls the behavior of the underlying Azure storage resource when the pod is deleted. The PersistentVolumeClaim requests either Disk or File storage of a particular StorageClass, access mode, and size. We choosed a Disk with 5Gi in size. Finnaly, the pod runs the container of artillery with our test scripts, and mounts the previous Disk into the path "/mnt/azure", used to store the results of the tests' executions.

References

[1] "Azure Kubernetes Service," https://azure.microsoft.com/pt-pt/services/kubernetes-service/, accessed: 2019-12-07.
[2] "Docker: Debug your app, not your environment," https://www.docker.com/, accessed: 2019-12-07.
[3] "WildFly: Build and ship any application anywhere," https://wildfly.org/, accessed: 2019-12-07.
[4] "Dockerhub: Build and ship any application anywhere," https://hub.docker.com/, accessed: 2019-12-07.
[5] "Redis," https://redis.io/, accessed: 2019-11-23.
[6] "Artillery," https://www.npmjs.com/package/artillery, accessed: 2019-11-24.

ANNEX A: APPLICATION'S DOCKERFILE

```
FROM jboss/wildfly:14.0.1.Final
WORKDIR /opt/jboss/wildfly
ADD scc-backend-0.0.1-SNAPSHOT.war standalone/deployments/
RUN bin/add-user.sh admin Admin#70365 --silent
EXPOSE 9990
CMD ["bin/standalone.sh","-b","0.0.0.0","-bmanagement", "0.0.0.0"]
```

ANNEX B: APPLICATION'S YAML FILE

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: azure-redis
spec:
  replicas: 1
  selector:
    matchLabels:
      app: azure-redis
  template:
    metadata:
      labels:
        app: azure-redis
    spec:
      nodeSelector:
        "beta.kubernetes.io/os": linux
      containers:
      - name: azure-redis
        image: redis
        resources:
          requests:
            cpu: 100m
            memory: 128Mi
          limits:
            cpu: 250m
            memory: 256Mi
        ports:
        - containerPort: 6379
          name: redis
---
apiVersion: v1
kind: Service
metadata:
  name: azure-redis
spec:
  ports:
  - port: 6379
  selector:
    app: azure-redis
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: azure-project
spec:
```

```
  replicas: 3
  selector:
    matchLabels:
      app: azure-project
  template:
    metadata:
      labels:
        app: azure-project
    spec:
      nodeSelector:
        "beta.kubernetes.io/os": linux
      containers:
      - name: azure-project
        image: andreffrosa/scc1920-project:latest
        resources:
          requests:
            cpu: 400m
            memory: 512Mi
          limits:
            cpu: 600m
            memory: 640Mi
        ports:
        - containerPort: 8080
        env:
        - name: REDIS
          value: "azure-redis"
---
apiVersion: v1
kind: Service
metadata:
  name: azure-project
spec:
  type: LoadBalancer
  ports:
  - port: 8080
  selector:
    app: azure-project
```

ANNEX C: ARTILLERY'S DOCKERFILE

```
FROM nunopreguica/ccs1920-test:latest
WORKDIR /config
ADD package.json .
ADD src ./src
CMD ["npm", "run", "version"]
```

ANNEX D: ARTILLERY'S YAML FILE

```
kind: StorageClass
apiVersion: storage.k8s.io/v1
metadata:
  name: managed-standard-retain
provisioner: kubernetes.io/azure-disk
reclaimPolicy: Retain
parameters:
  storageaccounttype: Standard_LRS
  kind: Managed
---
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: azure-managed-disk
spec:
  accessModes:
  - ReadWriteOnce
  storageClassName: managed-standard-retain
  resources:
    requests:
      storage: 5Gi
---
apiVersion: v1
kind: Pod
metadata:
  name: artillery
spec:
  containers:
  - name: artillery
    image: andreffrosa/artillery:latest
    resources:
      requests:
        cpu: 100m
        memory: 128Mi
      limits:
        cpu: 250m
        memory: 256Mi
    volumeMounts:
    - mountPath: "/mnt/azure"
      name: volume
  volumes:
  - name: volume
    persistentVolumeClaim:
      claimName: azure-managed-disk
```

CCS : project 1

DEADLINE: 25 November

O nome, o nome de utilizador e a foto associados à sua Conta Google serão registados quando carregar ficheiros e enviar este formulário. O email **af.rosa@campus.fct.unl.pt** não lhe pertence? Mudar de conta

Os ficheiros que forem carregados serão partilhados fora da entidade a que pertencem.

*Obrigatório

Contact email *

Add emails for contact. The emails should be separated by ","

af.rosa@campus.fct.unl.pt;rfc.silva(

Student A

Name *

André Rosa

Number *

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Student B

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Project status

Students should provide information about the status of the delivered project.

Media REST endpoints *

Working correctly (as far as we know)

Users REST endpoints *

Working correctly (as far as we know)

Community REST endpoints *

Working correctly (as far as we know)

List other REST endpoints (initial page, etc.). *

/page/initial; /page/thread/{id}; /page/search

Está a editar uma resposta. Partilhar este URL permite que outras pessoas também editem a sua resposta.

PREENCHER UMA NOVA RESPOSTA

Likes: Do you maintain the list of users that likes a post.? *

- ○ No
- ○ Yes, in the Post document.
- ◉ Yes, in a separate Collection.

Paging: any endpoint implements paging, i.e., allow a follow-up call to get additional answers (e.g. threads with many post, initial page, etc.)? *

- ○ No
- ◉ Yes

3.1 Caching at the data center. List the information that is cached. *

Most Requested Users and Communities (faster verification on Creation of new Posts), Most Requested Posts, Most Requested Page replies of posts; Most Requested Images; Initial Page; Number of Likes and replies in total and in the last 24h;

From 1 to 5, classify the complexity / quality of your solution. *

	1	2	3	4	5	
trivial	○	○	○	○	◉	complex

3.2 Azure functions. List the type of function used and for what (1 line per each) *

@TimerTrigger Compute the Initial Page periodically and store it in the cache.
@TimerTrigger Clear and recompute the Hyperlogs of posts that received dislakes

From 1 to 5, classify the complexity / quality of your solution. *

	1	2	3	4	5	
trivial	○	○	○	◉	○	complex

3.3 Geo-replicated deployment. Briefly list the functionalities implemented to support this feature (1 line per each) *

Configuração do Cosmos para ser georeplicado; Deployment da web-app em 2 regiões; 2 instancias (uma em cada região) do Redis (não geo-replicado) e do Serviço de Pesquisa

From 0 to 5, classify the complexity / quality of your solution. *

	0	1	2	3	4	5	
not done	○	○	○	○	○	◉	complex

3.4 Support for advanced search. Briefly list the type of search supported (1 line per each) *

Search for posts and replies based on message, title, author and

From 0 to 5, classify the complexity / quality of your solution. *

	0	1	2	3	4	5	
not done	○	○	○	◉	○	○	complex

3.5 Other advanced features. List any other advanced search implemented (1 line per each) *

Só existe pesquisa por posts

From 0 to 5, classify the complexity / quality of your solution. *

	0	1	2	3	4	5	
not done	◉	○	○	○	○	○	complex

Main project source code

Submit a ZIP file (no strange archive formats, please :-). Please DO NOT include the target. ****IMPORTANT: run " mvn clean" before creating the ZIP. ***

scc1920-project - ...

Functions project source code

Submit a ZIP file (no strange archive formats, please :-). Please DO NOT include the target. Run " mvn clean" before creating the ZIP.

scc1920-serverles...

Note

Please print your replies and attach them to your project report.

Está a editar uma resposta. Partilhar este URL permite que outras pessoas também editem a sua resposta.

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