K6 Load Testing

Introduction
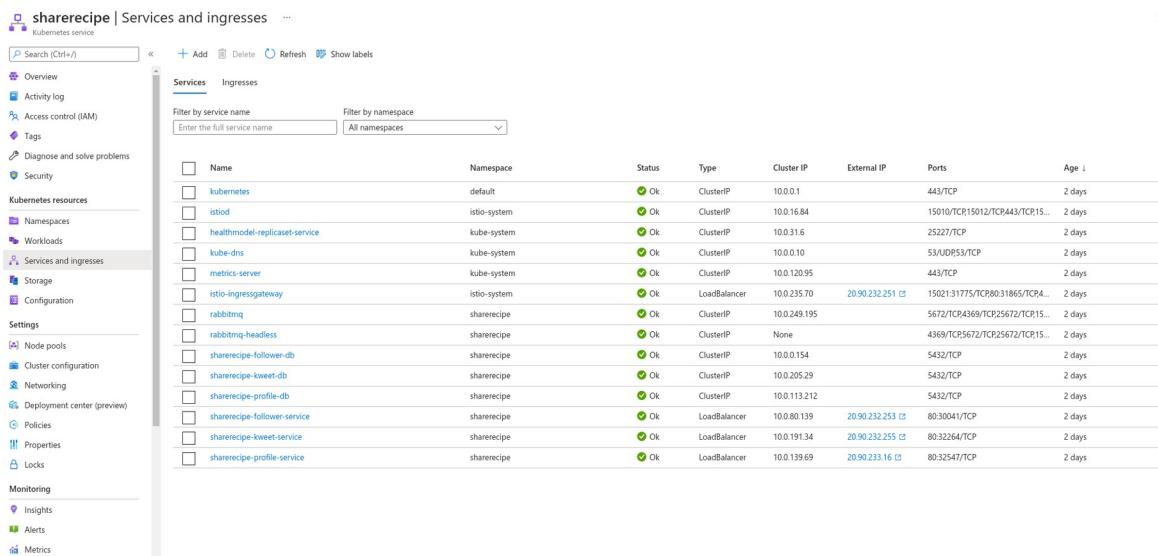
In this document you will find the information on the load tests that where done with the tool k6. The goal of this document is to show the scalability of the project.
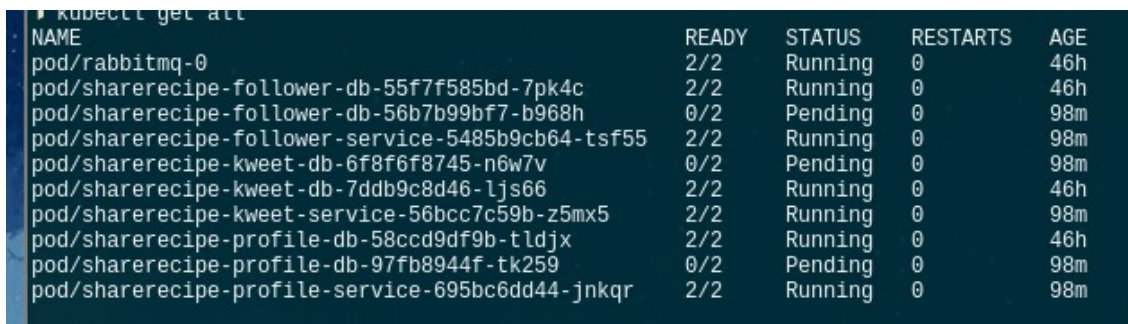
Test Setup

We will be testing scalability in the Azure environment and on the local environment. The reason for this is that the scalability is poorly shown on the azure environment since my subscription has limited me in the amount of cpu I can use for my project.

Cloud

For my cloud setup I have everything setup in azure as can be seen in the image below.

Local

For my local setup I have the current configuration. In this example I can make use of an Horizontal scaler to automatically scale my application.

```
Semester6/ShareRecipe/K8s   master x
▸ kubectl get all
NAME                                                READY   STATUS    RESTARTS   AGE
pod/rabbitmq-0                                       2/2     Running   0          8m10s
pod/sharerecipe-follower-db-55f7f585bd-7pxkd         2/2     Running   0          8m9s
pod/sharerecipe-follower-service-6f7f888d6f-zp7vs    2/2     Running   0          8m9s
pod/sharerecipe-kweet-db-7ddb9c8d46-mfbz2            2/2     Running   0          8m9s
pod/sharerecipe-kweet-service-77f4b85455-tsbnj       2/2     Running   0          8m9s
pod/sharerecipe-profile-db-58ccd9df9b-7rsg2          2/2     Running   0          8m9s
pod/sharerecipe-profile-service-79d7df789c-4s8sr     2/2     Running   0          8m9s

NAME                                  TYPE           CLUSTER-IP       EXTERNAL-IP     PORT(S)                                  AGE
service/rabbitmq                      ClusterIP      10.111.230.215   <none>          5672/TCP,4369/TCP,25672/TCP,15672/TCP    8m10s
service/rabbitmq-headless             ClusterIP      None             <none>          4369/TCP,5672/TCP,25672/TCP,15672/TCP    8m10s
service/sharerecipe-follower-db       ClusterIP      10.104.78.36     <none>          5432/TCP                                 8m10s
service/sharerecipe-follower-service  LoadBalancer   10.110.183.80    192.168.49.1    80:32585/TCP                             8m9s
service/sharerecipe-kweet-db          ClusterIP      10.104.228.141   <none>          5432/TCP                                 8m9s
service/sharerecipe-kweet-service     LoadBalancer   10.102.74.44     192.168.49.2    80:30240/TCP                             8m9s
service/sharerecipe-profile-db        ClusterIP      10.104.105.60    <none>          5432/TCP                                 8m9s
service/sharerecipe-profile-service   LoadBalancer   10.111.229.253   192.168.49.3    80:31258/TCP                             8m9s

NAME                                          READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/sharerecipe-follower-db       1/1     1            1           8m10s
deployment.apps/sharerecipe-follower-service  1/1     1            1           8m9s
deployment.apps/sharerecipe-kweet-db          1/1     1            1           8m9s
deployment.apps/sharerecipe-kweet-service     1/1     1            1           8m9s
deployment.apps/sharerecipe-profile-db        1/1     1            1           8m9s
deployment.apps/sharerecipe-profile-service   1/1     1            1           8m9s

NAME                                                     DESIRED   CURRENT   READY   AGE
replicaset.apps/sharerecipe-follower-db-55f7f585bd       1         1         1       8m9s
replicaset.apps/sharerecipe-follower-service-6f7f888d6f  1         1         1       8m9s
replicaset.apps/sharerecipe-kweet-db-7ddb9c8d46          1         1         1       8m9s
replicaset.apps/sharerecipe-kweet-service-77f4b85455     1         1         1       8m9s
replicaset.apps/sharerecipe-profile-db-58ccd9df9b        1         1         1       8m9s
replicaset.apps/sharerecipe-profile-service-79d7df789c   1         1         1       8m9s

NAME                         READY   AGE
statefulset.apps/rabbitmq    1/1     8m10s

NAME                                                                     REFERENCE                                  TARGETS         MINPODS   MAXPODS   REPLICAS   AGE
horizontalpodautoscaler.autoscaling/sharerecipe-follower-service-autoscaler   Deployment/sharerecipe-follower-service   <unknown>/75%   1         5         1          8m9s
horizontalpodautoscaler.autoscaling/sharerecipe-kweet-service-autoscaler      Deployment/sharerecipe-kweet-service      <unknown>/75%   1         5         1          8m9s
horizontalpodautoscaler.autoscaling/sharerecipe-profile-service-autoscaler    Deployment/sharerecipe-profile-service    <unknown>/75%   1         5         1          8m9s
Semester6/ShareRecipe/K8s   master x
```
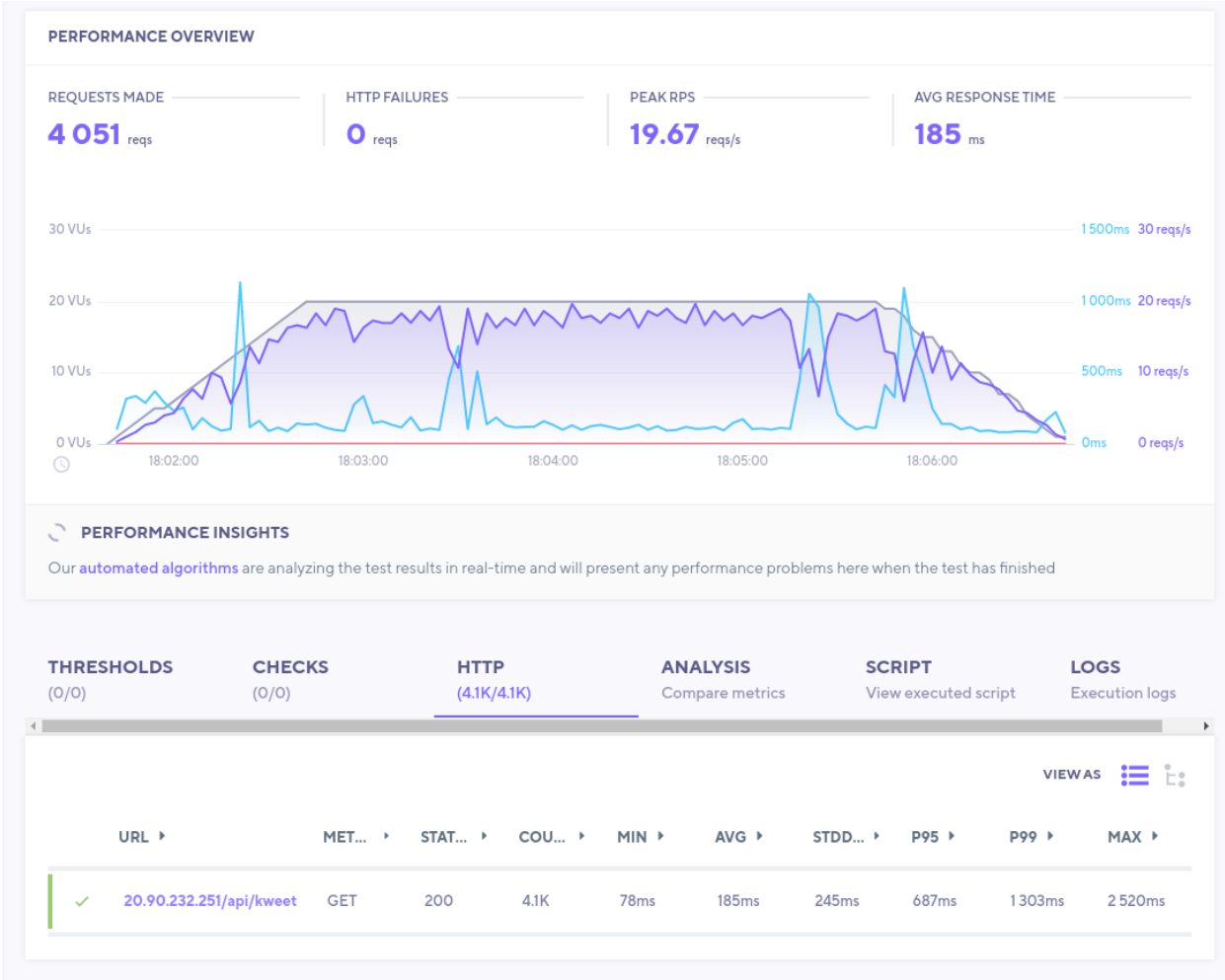
Test Results

Cloud

For my cloud environment this was the result. the reason for this is that the services were limited on the amount of cpu which caused it to not scale properly. This is the reason for those spikes you see in the report. Blue line shows the response time while the purple gradient shows the amount of requests being sent at the same time. As you can see it struggles a bit when it's trying to process 20 requests at the same time.

PERFORMANCE OVERVIEW

REQUESTS MADE	HTTP FAILURES	PEAK RPS	AVG RESPONSE TIME
4 051 reqs	**0** reqs	**19.67** reqs/s	**185** ms

PERFORMANCE INSIGHTS

Our **automated algorithms** are analyzing the test results in real-time and will present any performance problems here when the test has finished

THRESHOLDS (0/0)	CHECKS (0/0)	HTTP (4.1K/4.1K)	ANALYSIS Compare metrics	SCRIPT View executed script	LOGS Execution logs

VIEW AS

	URL ▸	MET... ▸	STAT... ▸	COU... ▸	MIN ▸	AVG ▸	STDD... ▸	P95 ▸	P99 ▸	MAX ▸
✓	20.90.232.251/api/kweet	GET	200	4.1K	78ms	185ms	245ms	687ms	1 303ms	2 520ms

Local

This is the results on local. In this load test you see there are a lot les spikes. Another thing you can see is that It will showcase the load that the service is facing in the autoscaler.

This looks a lot better since here the autoscaler does it's job and makes the service scale when necessary and descale when it's not necessary anymore. At the same time you can see that the time it takes for requests has drastically reduced.